

**SUZUKI**

**RF600R**

**SERVICE MANUAL**



99500-35034-01E

## FOREWORD

*This manual contains an introductory description on SUZUKI RF600R and procedures for its inspection/service and overhaul of its main components. Other information considered as generally known is not included.*

*Read GENERAL INFORMATION section to familiarize yourself with outline of the vehicle and MAINTENANCE and other sections to use as a guide for proper inspection and service.*

*This manual will help you know the vehicle better so that you can assure your customers of your optimum and quick service.*

*\* This manual has been prepared on the basis of the latest specification at the time of publication.*

*If modification has been made since then, difference may exist between the content of this manual and the actual vehicle.*

*\* Illustrations in this manual are used to show the basic principles of operation and work procedures.*

*They may not represent the actual vehicle exactly in detail.*

*\* This manual is intended for those who have enough knowledge and skills for servicing SUZUKI vehicles. Without such knowledge and skills, you should not attempt servicing by relying on this manual only.*

*Instead, please contact your nearby authorized SUZUKI motorcycle dealer.*

### SUZUKI MOTOR CORPORATION

*Motorcycle Service Department*

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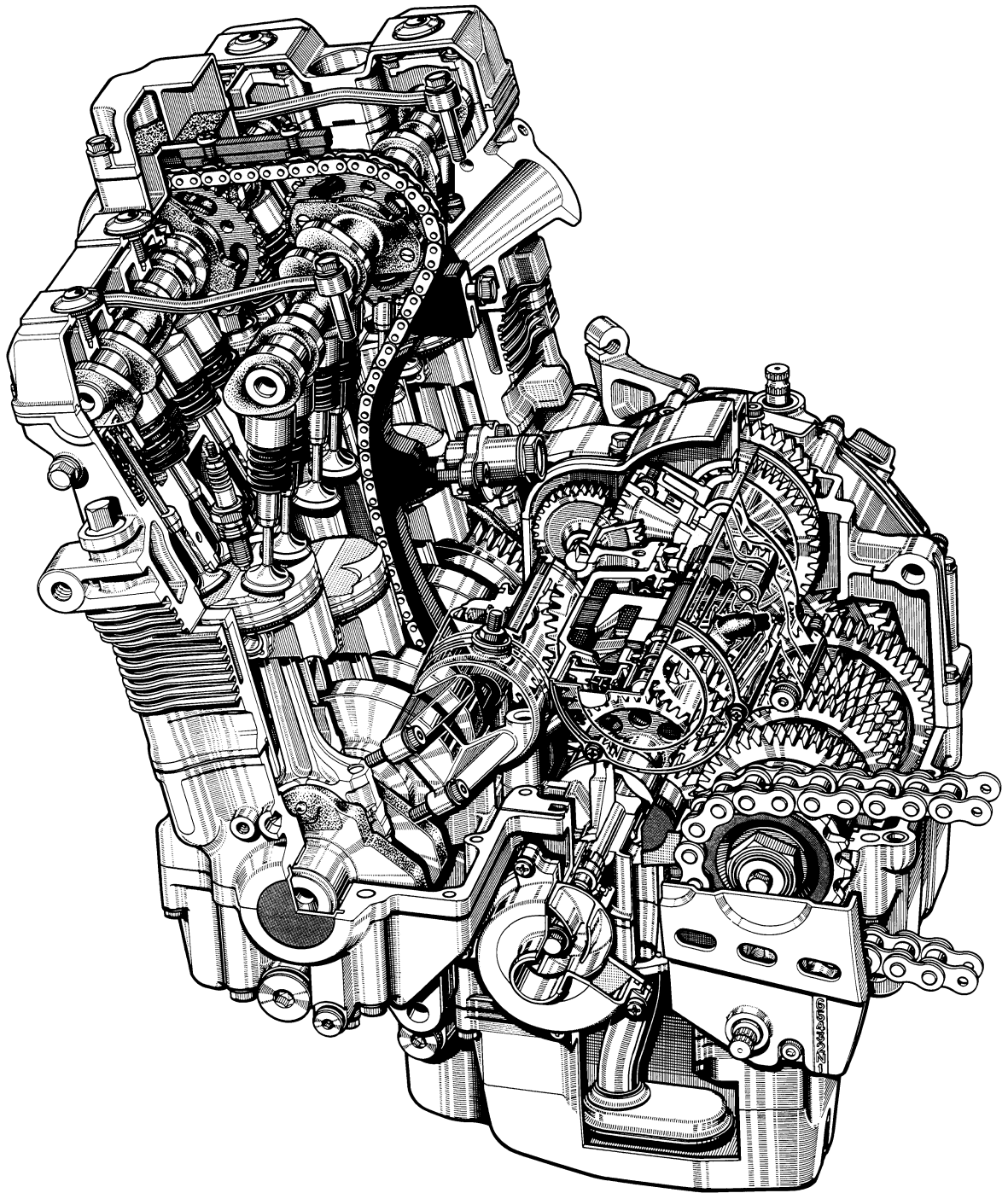
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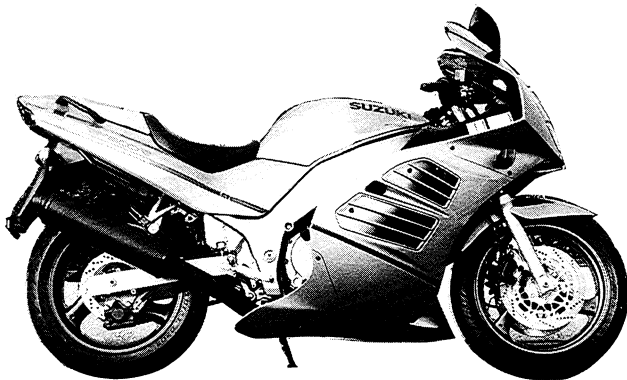




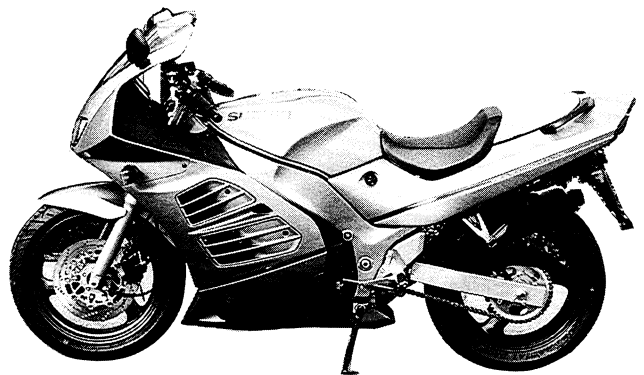
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## SUZUKI RF600RP ('93-MODEL)



RIGHT SIDE

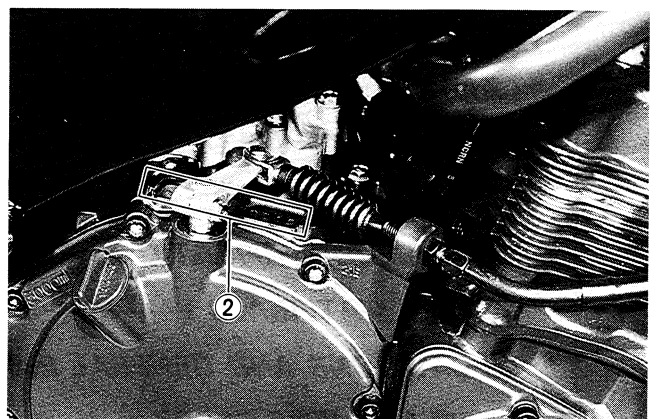


LEFT SIDE

\*Difference between photographs and actual motorcycles depends on the markets.

## SERIAL NUMBER LOCATION

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



## FUEL, OIL AND ENGINE COOLANT RECOMMENDATIONS

### FUEL (For U.S.A. model)

1. 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.
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 you fuel supplier to be sure that the fuel you intend to use meets the requirements listed above.

### FUEL (For Canadian model)

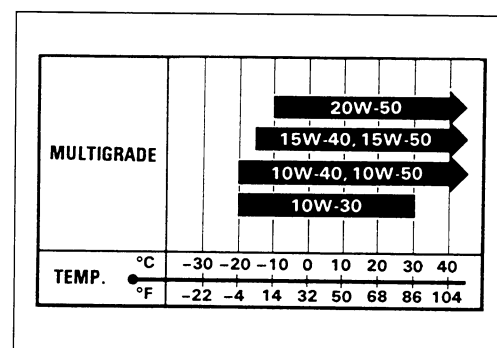
Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) method or 91 octane or higher rated by the research method.

### FUEL (For the other models)

Gasoline used should be graded 85—95 octane (Research Method) or higher. An unleaded gasoline type 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.



## ENGINE OIL (For the 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 an SAE 10W/40 motor oil is not available, select an alternate according to the right chart.

## BRAKE FLUID

Specification and classification: DOT4

### 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 a previous servicing, which has been stored for a long period.

## FRONT FORK OIL

Use fork oil # 10

## ENGINE COOLANT

Use an anti-freeze/engine coolant compatible with an aluminum radiator, mixed with distilled water only.

## WATER FOR MIXING

Use distilled water only. Water other than distilled water can corrode and clog the aluminum radiator.

## ANTI-FREEZE/ENGINE COOLANT

The engine coolant perform as a corrosion and rust inhabit as well as anti-freeze. Therefore, the engine coolant should be used at all times even though the atmospheric temperature in your area does not go down to freezing point.

Suzuki recommends the use of SUZUKI GOLDEN CRUISER 1200NA anti-freeze/engine coolant. If this is not available, use an equivalent which is compatible with an aluminum radiator.

## LIQUID AMOUNT OF WATER/ENGINE COOLANT

Solution capacity (total): 2450 ml (2.6/2.2 US/Imp qt)

For engine coolant mixture information, refer to cooling system section, page 5-4.

### CAUTION:

Mixing of anti-freeze/engine coolant should be limited to 60%. Mixing beyond it would reduce its efficiency. If the anti-freeze/engine coolant mixing ratio is below 50%, rust inhabiting performance is greatly reduced. Be sure to mix it above 50% even though the atmospheric temperature does not go down to the freezing point.

# 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 7000 r/min**

**Up to 1600 km (1000 miles): Below 10000 r/min**

**Over 1600 km (1000 miles): Below 13500 r/min**







- Upon reaching an odometer reading of 1600 km (1000 miles) you can subject the motorcycle to full throttle operation. However, do not exceed 13500 r/min at any time.

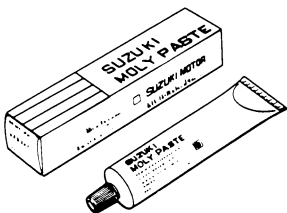
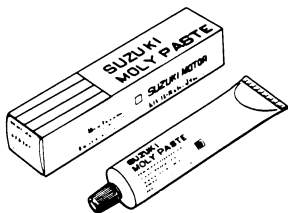
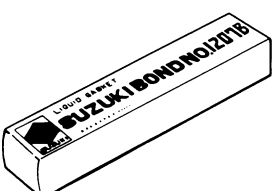
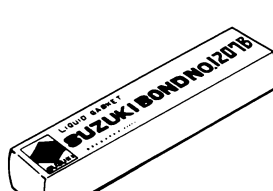




# CYLINDER IDENTIFICATION





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

## SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the RF600R, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

MATERIAL		PART	PAGE
For U.S.A.	For other countries		
 <p>SUZUKI BRAKE FLUID DOT3 &amp; DOT4 99000-23110</p>	 <p>SUZUKI BRAKE FLUID DOT3 &amp; DOT4 99000-23110</p>	<ul style="list-style-type: none"> <li>• Brakes</li> </ul>	2-14 7-20 7-23 7-38 7-40
 <p>SUZUKI GOLDEN CRUISER 1200NA 99000-99032-10X</p>	 <p>SUZUKI GOLDEN CRUISER 1200NA 99000-99032-10X</p>	<ul style="list-style-type: none"> <li>• Coolant</li> </ul>	2-13 5- 4
 <p>SUZUKI SUPER GREASE "A" 99000-25030</p>	 <p>SUZUKI SUPER GREASE "A" 99000-25010</p>	<ul style="list-style-type: none"> <li>• Brake pedal pivot</li> <li>• Footrest pivot</li> <li>• Gearshift lever pivot</li> <li>• Side-stand pivot and spring hook</li> <li>• Driveshaft oil seal</li> <li>• Generator O-ring</li> <li>• Starter motor O-ring</li> <li>• Water pump O-ring</li> <li>• Starter motor oil seal</li> <li>• Wheel bearing</li> <li>• Speedometer gear box dust seal</li> <li>• Steering stem bearing and dust seat</li> <li>• Swingarm spacer, washer, bearing and dust seal</li> <li>• Cushion lever/rod bearing</li> <li>• Water pump oil seal</li> <li>• Sprocket mounting drum bearing and oil seal</li> </ul>	2- 2 2- 2 2- 2 2- 2 3-42 3-57 3-57 3-56 6-17 7-9, 44 7-10 7-32 7-51 7-52 5-13 7-45

MATERIAL		PART	PAGE
For U.S.A.	For other countries		
 <p>SUZUKI MOLY PASTE 99000-25140</p>	 <p>SUZUKI MOLY PASTE 99000-25140</p>	<ul style="list-style-type: none"> <li>• Valve stem</li> <li>• Conrod big end bearing</li> <li>• Countershaft and driveshaft</li> <li>• Piston pin</li> <li>• Crankshaft journal bearing</li> <li>• Camshaft journal and cam face</li> <li>• Starter motor armature end</li> </ul>	<p>3-26</p> <p>3-36</p> <p>3-42</p> <p>3-58</p> <p>3-49</p> <p>3-60</p> <p>6-17</p>
 <p>SUZUKI BOND NO.1207B 99104-31140</p>	 <p>SUZUKI BOND NO.1207B 99000-31140</p>	<ul style="list-style-type: none"> <li>• Oil pressure switch</li> <li>• Mating surface of upper and lower crankcases</li> <li>• Mating surface of clutch cover</li> <li>• Signal generator lead wire grommet</li> <li>• Mating surface of starter clutch cover</li> <li>• Mating surface of signal generator cover</li> <li>• Camshaft end cap and head cover groove</li> <li>• Water pump mechanical seal</li> </ul>	<p>3-51</p> <p>3-49</p> <p>3-54</p> <p>3-55</p> <p>3-56</p> <p>3-64</p> <p>3-64</p> <p>5-13</p>
 <p>THREAD LOCK SUPER "1303" 99000-32030</p>	 <p>THREAD LOCK SUPER "1303" 99000-32030</p>	<ul style="list-style-type: none"> <li>• Cam sprocket bolt</li> <li>• Cam chain guide screw and bolt</li> <li>• Starter clutch bolt</li> <li>• Gearshift arm stopper bolt</li> </ul>	<p>3-29</p> <p>3-30</p> <p>3-46</p> <p>3-51</p>
 <p>THREAD LOCK "1342" 99000-32050</p>	 <p>THREAD LOCK "1342" 99000-32050</p>	<ul style="list-style-type: none"> <li>• Starter motor housing bolt</li> <li>• Front fork damper rod bolt</li> <li>• Countershaft bearing retainer screw</li> <li>• Gearshift cam guide screw and pawl lifter screw and nut</li> <li>• Carburetor set plate screw</li> <li>• Generator bearing retainer screw</li> <li>• Oil pump mounting bolt</li> <li>• Gearshift cam stopper bolt</li> <li>• Gearshift cam stopper plate bolt</li> </ul>	<p>6-17</p> <p>7-27</p> <p>3-51</p> <p>3-51</p> <p>4-11</p> <p>6- 7</p> <p>3-47</p> <p>3-20</p> <p>3-47</p>

MATERIAL		PART	PAGE
For U.S.A.	For other countries		
  THREAD LOCK SUPER "1360" 99000-32130	  THREAD LOCK SUPER "1360" 99000-32130	<ul style="list-style-type: none"><li>• Brake disc mounting bolt</li></ul>	7-9, 47
  SUZUKI FORK OIL #10 99000-99044-10G	  SUZUKI FORK OIL #10 99000-99044-10G	<ul style="list-style-type: none"><li>• Front fork</li></ul>	7-28



## PRECAUTIONS AND GENERAL INSTRUCTIONS

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

- ☐ Do not run engine indoors with little or no ventilation.
- ☐ Be sure to replace packing, 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 cylinder head and case bolts and nuts beginning with larger diameter and engine with smaller diameter, and from inside to out-side diagonally, to the specified tightening torque.
- ☐ Use special tools where specified.
- ☐ Use genuine parts and recommended oils.
- ☐ When 2 or more persons work together, pay attention to 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 may be involved. Disregarding this information could result in injury to the rider.

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

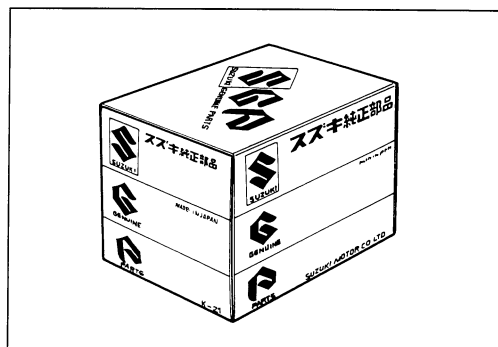
**NOTE** ..... This provides special information to make maintenance easier or important instructions clearer.

## REPLACEMENT PARTS

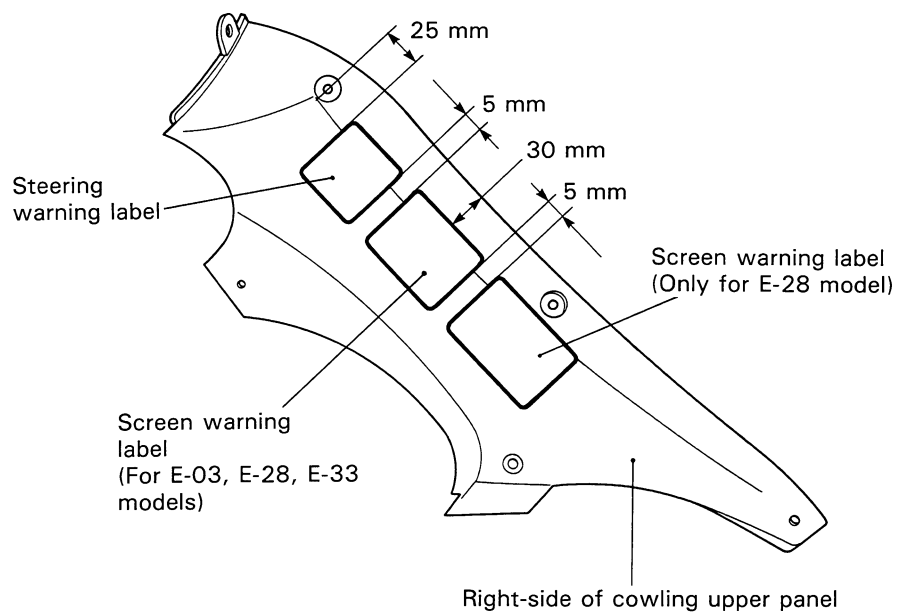
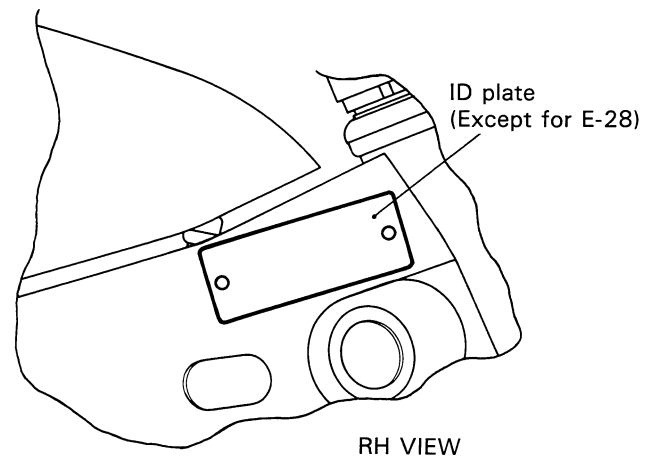
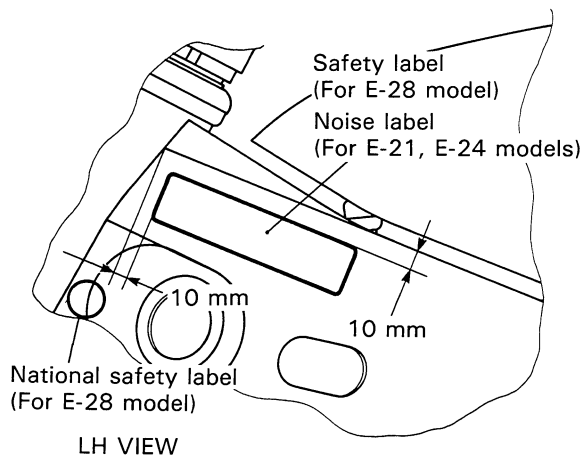
When you replace any parts, use only genuine SUZUKI replacement parts, or their equivalent. Genuine SUZUKI parts are high quality parts which are designed and built specifically for SUZUKI vehicles.

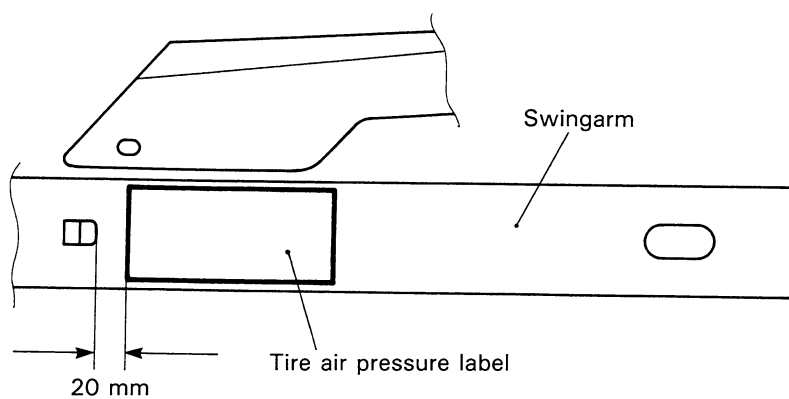
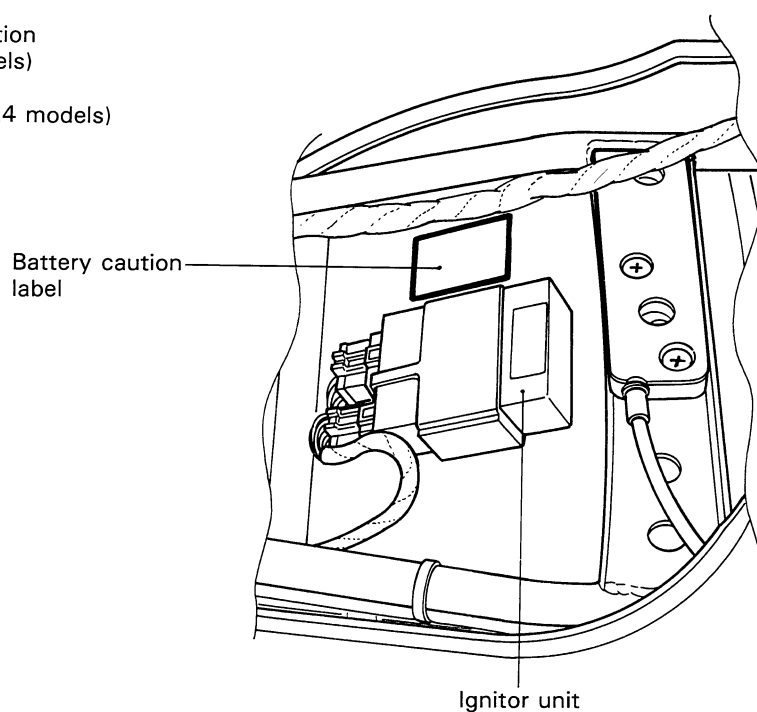
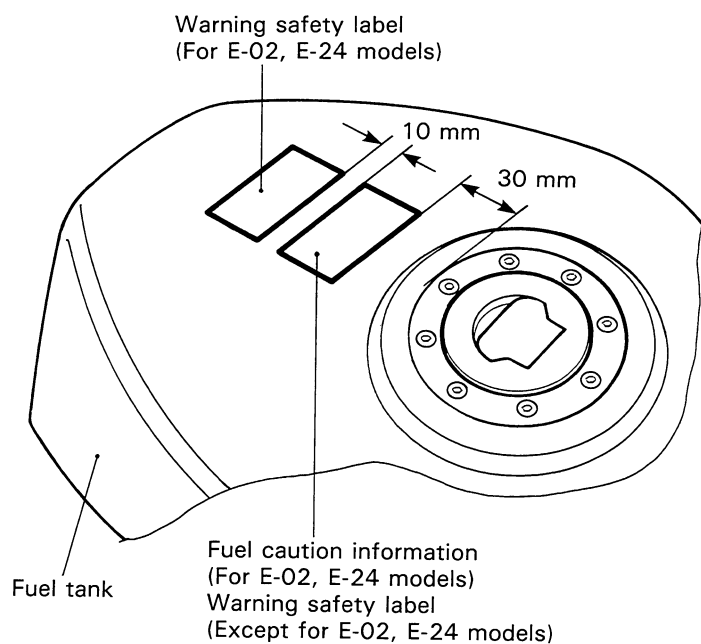
### CAUTION:

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



## INFORMATION LABELS





## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length .....	2 110 mm (83.1 in) .....	E-04,21,24,25,28,34,53
	2 160 mm (85.0 in) .....	E-15,17,18,22
Overall width .....	710 mm (28.0 in)	
Overall height .....	1 175 mm (46.3 in)	
Wheelbase .....	1 430 mm (56.3 in)	
Ground clearance .....	120 mm ( 4.7 in)	
Dry mass .....	195 kg (429 lbs)	

### ENGINE

Type .....	Four-stroke, Water-cooled, DOHC, TSCC
Number of cylinders .....	4
Bore .....	65.0 mm (2.559 in)
Stroke .....	45.2 mm (1.780 in)
Piston displacement .....	600 cm <sup>3</sup> (36.6 cu. in)
Carburetor .....	MIKUNI BDST33 ..... For E-18 model
	MIKUNI BDST36 ..... For other markets
Air cleaner .....	Non-woven fabric element
Starter system .....	Electric starter
Lubrication system .....	Wet sump

### TRANSMISSION

Clutch .....	Wet multi-plate type
Transmission .....	6-speed constant mesh
Gearshift pattern .....	1-down, 5-up
Primary reduction ratio .....	1.744 (75/43)
Final reduction ratio .....	3.071 (43/14)
Gear ratios, Low .....	3.142 (44/14)
2nd .....	2.058 (35/17)
3rd .....	1.650 (33/20)
4th .....	1.428 (30/21)
5th .....	1.260 (29/23)
Top .....	1.120 (28/25)
Drive chain .....	TAKASAGO RK50GSVZ1, 108 links or DAIDO DID 50VA7, 108 links

## CHASSIS

Front suspension .....	Telescopic, coil spring, oil damped, spring pre-load adjustable.
Rear suspension .....	Link type system, oil damped, coil spring, spring pre-load adjustable and rebound damping force adjustable.
Steering angle .....	30° (right & left)
Caster .....	65°
Trail .....	103 mm (4.1 in)
Turning radius .....	3.2 m (10.5 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Disc brake
Front tire size .....	120/70 ZR17, tubeless
Rear tire size .....	160/60 ZR17, tubeless
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	130 mm (5.1 in)

## ELECTRICAL

Ignition type .....	Fully Transistorized
Ignition timing .....	13° B.T.D.C. at 1500 r/min ..... For E-02 and others 7° B.T.D.C. at 1500 r/min ..... For E-18,22 models
Spark plug .....	N.G.K.: CR9E, NIPPONDENSO U27ESR-N
Battery .....	12V 28.8 kC (8 Ah)/10 HR
Generator .....	Three-phase A.C. Generator
Main fuse .....	30A
Fuse .....	15/15/15/10/10A
Headlight .....	12V 60/55W
Turn signal light .....	12V 21W
Parking or city light .....	12V 4W ..... Except for E-24,28 models
Taillight .....	12V 5W
Brake light .....	12V 21W x 2
License plate light .....	12V 5W
Speedometer light .....	12V 1.7W x 2
Tachometer light .....	12V 1.7W x 2
Engine coolant temp. meter light .....	12V 1.7W
Neutral indicator light .....	12V 3.4W
High beam indicator light .....	12V 3.4W
Turn signal indicator light .....	12V 3.4W
Oil pressure indicator light .....	12V 3.4W

## CAPACITIES

Fuel tank, including reserve .....	17.0 L (4.5/3.7 US/Imp gal)
Engine oil, oil change .....	3 000 ml (3.2/2.6 US/Imp qt)
with filter change .....	3 300 ml (3.5/2.9 US/Imp qt)
overhaul .....	3 900 ml (4.1/3.4 US/Imp qt)
Front fork oil .....	503 ml (17.0/17.7 US/Imp oz)
Coolant .....	2 450 ml (2.6/2.2 US/Imp qt)

These specifications are subject to change without notice.

## COUNTRY OR AREA

The series of symbols on the left stand for the countries or area on the right.

SYMBOL	COUNTRY or AREA
E-02	England
E-04	France
E-15	Finland
E-16	Norway
E-17	Sweden
E-18	Switzerland
E-21	Belgium
E-22	Germany
E-24	Australia
E-25	Netherlands
E-28	Canada
E-34	Italy
E-53	Spain

# PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

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## PERIODIC MAINTENANCE SCHEDULE

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

**NOTE:**

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

## PERIODIC MAINTENANCE CHART

Interval Item	km	1000	6000	12000	18000	24000
	miles	600	4000	7500	11000	15000
	months	2	12	24	36	48
Exhaust pipe bolts		—	T	T	T	T
Air cleaner		—	I	I	R	I
Tappet clearance		—	—	I	—	I
Spark plug		—	I	R	I	R
Engine oil		R	R	R	R	R
Engine oil filter		R	—	R	—	R
Fuel line (EVAP hose . . . . . California model only)		—	I	I	I	I
		Replace every 4 years				
Fuel filter		—	—	C	—	C
Engine idle rpm (Carburetor)		I	I	I	I	I
Throttle cable play (Carburetor)		I	I	I	I	I
Clutch cable play		—	I	I	I	I
Drive chain		I	I	I	I	I
		Lubricate every 1000 km (600 miles)				
Radiator hose		—	I	I	I	I
		Replace every 4 years				
Engine coolant		Replace every 2 years				
Brake		I	I	I	I	I
Brake hose		—	I	I	I	I
		Replace every 4 years				
Brake fluid		—	I	I	I	I
		Replace every 2 years				
Tire		—	I	I	I	I
Steering		I	—	I	—	I
Front fork		—	—	I	—	I
Rear suspension		—	—	I	—	I
Chassis bolts and nuts		T	T	T	T	T

*I = Inspection and adjust, clean, lubricate or replace as necessary*

*C = Clean*

*R = Replace*

*T = Tighten*



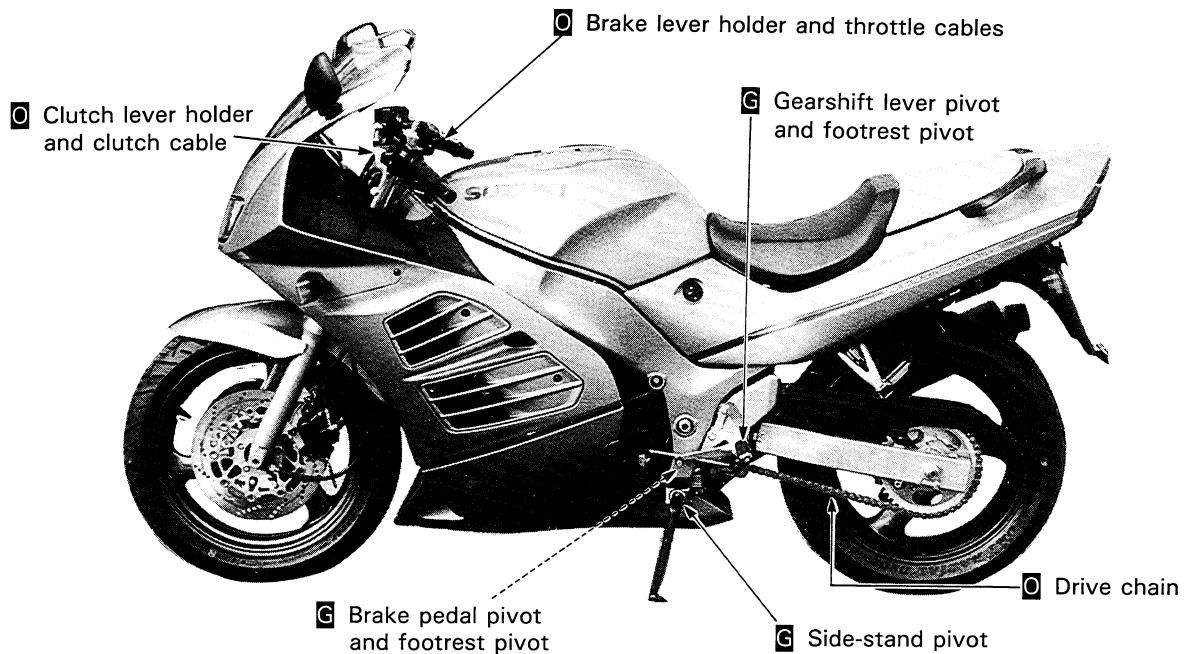
## LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle.

Major lubrication points are indicated below.

Oil

Grease



### NOTE:

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

## MAINTENANCE AND TUNE-UP PROCEDURES

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

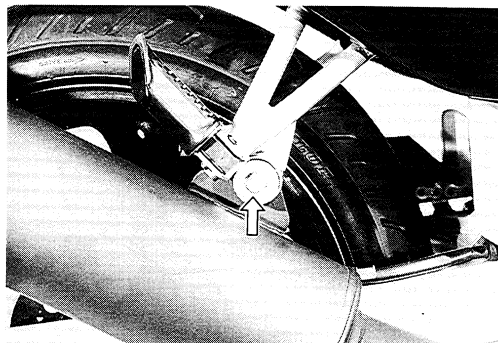
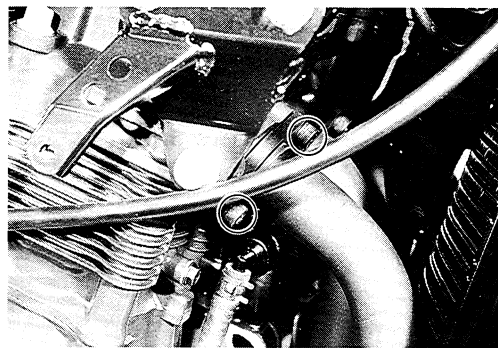
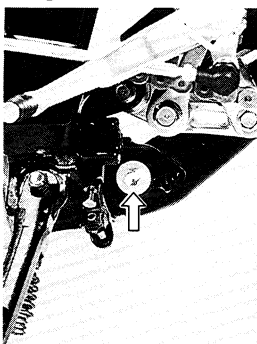
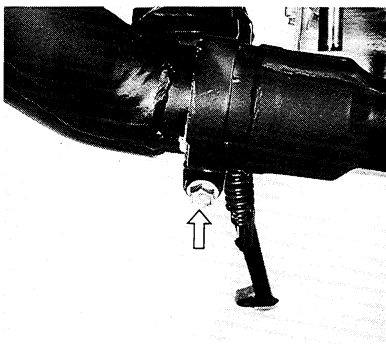
### EXHAUST PIPE BOLTS

**Tighten Every 6000 km (4000 miles, 12 months).**

- Remove the lower cowl assembly. (Refer to page 7-2.)
- Remove the radiator mounting bolts. (Refer to page 3-4.)
- Tighten the exhaust pipe clamp bolts and muffler mounting bolts to the specified torque with a torque wrench.

Exhaust pipe clamp bolt    18–28 N·m

& Muffler mounting bolt    : (1.8–2.8 kg-m, 13.0–20.0 lb-ft)





### AIR CLEANER

**Inspect Every 6000 km (4000 miles, 12 months) and Replace Every 18000 km (11000 miles, 36 months).**

- Remove the seats, frame cover assembly and fuel tank. (Refer to pages 7-5 and 4-5.)
- Remove the air cleaner element by removing the screws.
- Carefully use air hose to blow the dust from the cleaner element.

#### CAUTION:

Always use air pressure on the inside of the air cleaner element. If air pressure is used on the outside, dirt will be forced into the pores of the air cleaner element thus restricting air flow through the air cleaner element.

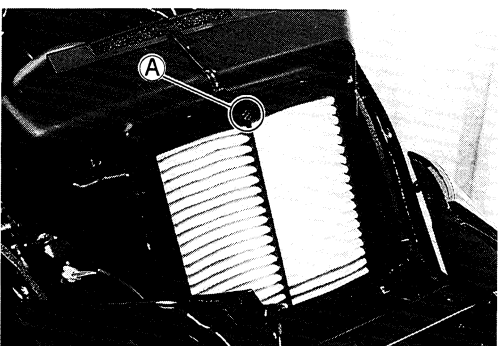
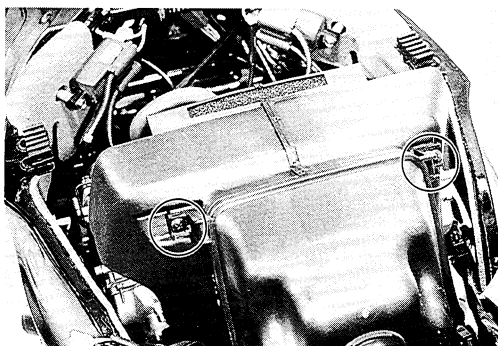
- Reinstall the cleaned or new air cleaner element in the reverse order of removal.
- When installing the air cleaner element in the cleaner case, make sure that the  mark  comes upward.

#### CAUTION:

If driving under dusty condition, 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!

#### NOTE:

When you clean the air cleaner element, drain water from the air cleaner drain hose by removing the drain plug.



## TAPPET CLEARANCE

**Inspect Every 12000 km (7500 miles, 24 months).**

- Remove the seats, frame cover assembly, lower cowling assembly and fuel tank. (Refer to pages 7-2, 7-5 and 4-5.)
- Remove the air cleaner box and carburetors. (Refer to pages 3-2 and 3.)
- Remove all the spark plugs.
- Remove the cylinder head cover. (Refer to page 3-10.)

The tappet clearance specification is different for intake and exhaust valves.

Tappet clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

**Tappet clearance (when cold):**

**IN. : 0.10—0.20 mm (0.004—0.008 in)**

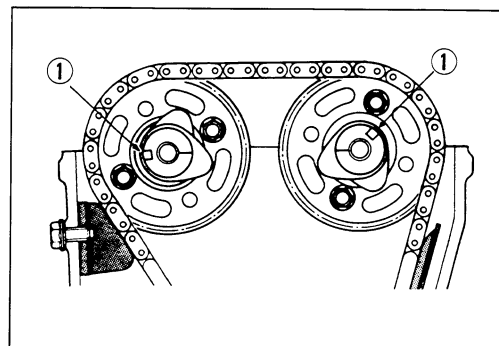
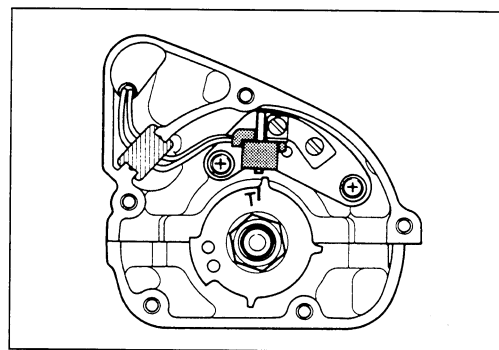
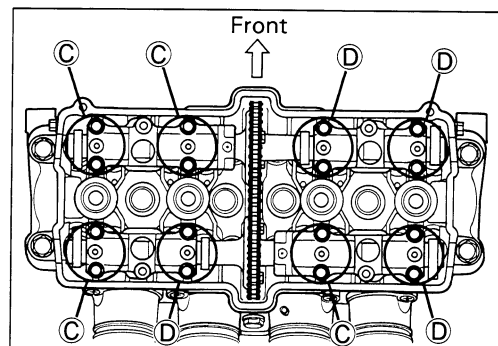
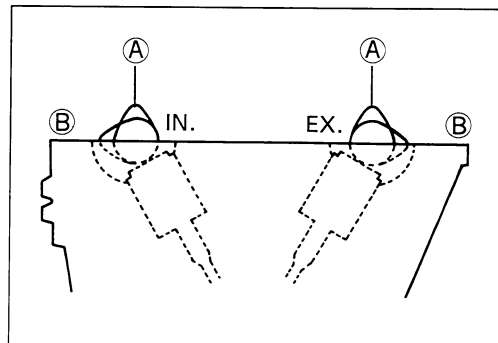
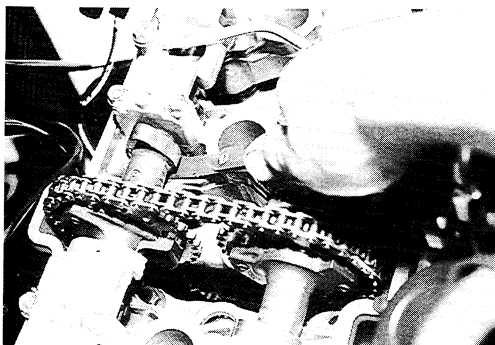
**EX.: 0.20—0.30 mm (0.008—0.012 in)**

**NOTE:**





- \* The cam must be at positions, ① or ②, in order to check the tappet clearance, or to adjust tappet clearance. Clearance readings should not be taken with the cam in any other position than these two positions.
- \* The clearance specification is for COLD state.
- \* To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench, and rotate in the normal running direction. All spark plugs should be removed.

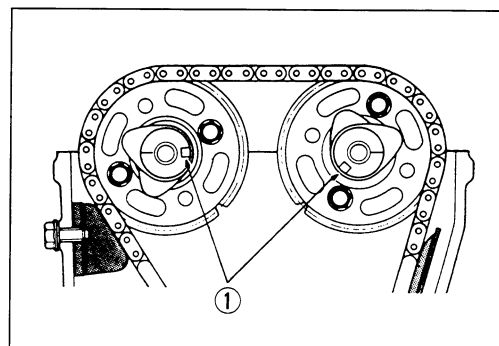
- Turn crankshaft to bring the "T" mark on the rotor to the center of pick-up coil and also to bring the notches ① in the right ends of both camshafts (Ex and In) to the positions shown. In this condition, read the tappet clearance at the valves ③ (In and Ex of No.1 cylinder, Ex of No.2 and In of No.3).
- Use a thickness gauge between the tappet and the cam. If the clearance is out of specification, bring it into the specified range.

**09900-20803: Thickness gauge**



- Turn the crankshaft 360° (one rotation) to bring the "T" mark on the rotor to the center of pick-up coil and also to bring the notches ① to the positions shown.
- Read the clearance at the remaining valves ② and adjust the clearance if necessary.

Cam Position	Notch ① position	
	Intake Camshaft	Exhaust Camshaft
Ⓒ		
Ⓓ		



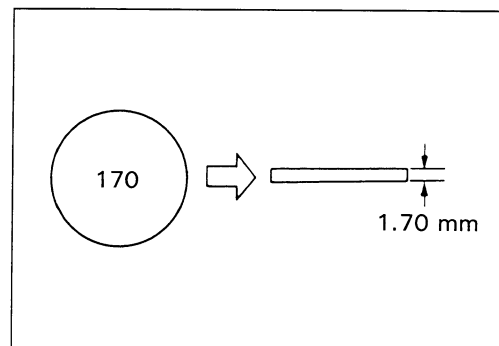
### TAPPET CLEARANCE ADJUSTMENT

The clearance is adjusted by replacing the existing tappet shim by a thicker or thinner shim.

- Remove the intake or exhaust camshafts. (Refer to page 3-11.)
- Remove the tappet and shim by fingers or magnetic hand. (Refer to page 3-21.)

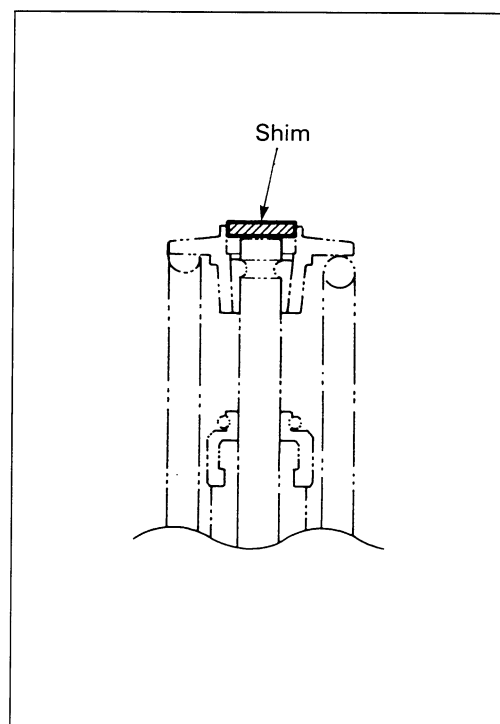
- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range. For the purpose of this adjustment, a total of 21 sizes of tappet shim are available ranging from 1.20 to 2.20 mm in steps of 0.05 mm. Fit the selected shim to the valve stem end, with numbers toward tappet. Be sure to check shim size with micrometer to ensure its size.

Refer to the tappet shim selection table for details.



#### NOTE:

- \* Be sure to apply engine oil to tappet shim top and bottom faces.
- \* When seating the tappet shim, be sure to face figure printed surface to the tappet.
- After replacing the tappet shim and camshafts, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.
- When installing the cylinder head cover, apply SUZUKI BOND NO. 1207B to the head cover groove and cam end caps. (Refer to page 3-64.)
- Tighten the head cover bolts to the specified torque. (Refer to page 3-65.)



(INTAKE SIDE)

TAPPET SHIM SET NO. (12800-05820)

TAPPET SHIM SELECTION TABLE (INTAKE)  
TAPPET SHIM NO.(12892-05C00- x x x)

MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO.	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	
		PRESENT SHIM SIZE (mm)	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.00-0.04																							
0.05-0.09																							
0.10-0.20																							
0.21-0.25																							
0.26-0.30																							
0.31-0.35																							
0.36-0.40																							
0.41-0.45																							
0.46-0.50																							
0.51-0.55																							
0.56-0.60																							
0.61-0.65																							
0.66-0.70																							
0.71-0.75																							
0.76-0.80																							
0.81-0.85																							
0.86-0.90																							
0.91-0.95																							
0.96-1.00																							
1.01-1.05																							
1.06-1.10																							
1.11-1.15																							

HOW TO USE THIS CHART:

I. Measure tappet clearance. "ENGINE IS COLD"

II. Measure present shim size.

III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.23 mm

Present shim size is 1.70

## HOW TO USE THIS CHART:

- Measure tappet clearance. "ENGINE IS COLD"
- Measure present shim size.
- Match clearance in vertical column with present shim size in horizontal column.

## EXAMPLE

Tappet clearance is 0.23 mm  
 Present shim size 1.70 mm  
 Shim size to be used 1.80 mm

(EXHAUST SIDE)

TAPPET SHIM SELECTION TABLE [EXHAUST]  
TAPPET SHIM NO.(12892-05C00- x x x)

TAPPET SHIM SET NO. (12800-05820)

MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO.	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
		SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																				
PRESENT SHIM SIZE (mm)		1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.05-0.09																						
0.10-0.14																						
0.15-0.19																						
0.20-0.30																						
0.31-0.35		1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		
0.36-0.40		1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20			
0.41-0.45		1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20				
0.46-0.50		1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20					
0.51-0.55		1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20						
0.56-0.60		1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20							
0.61-0.65		1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20								
0.66-0.70		1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20									
0.71-0.75		1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20										
0.76-0.80		1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20											
0.81-0.85		1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20												
0.86-0.90		1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20													
0.91-0.95		1.90	1.95	2.00	2.05	2.10	2.15	2.20														
0.96-1.00		1.95	2.00	2.05	2.10	2.15	2.20															
1.01-1.05		2.00	2.05	2.10	2.15	2.20																
1.06-1.10		2.05	2.10	2.15	2.20																	
1.11-1.15		2.10	2.15	2.20																		
1.16-1.20		2.15	2.20																			
1.21-1.25		2.20																				

HOW TO USE THIS CHART:

I. Measure tappet clearance. "ENGINE IS COLD"

II. Measure present shim size.

III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.33 mmPresent shim size 1.70 mm

HOW TO USE THIS CHART:

- I. Measure tappet clearance. "ENGINE IS COLD"
- II. Measure present shim size.
- III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.33 mm  
Present shim size 1.70 mm  
Shim size to be used 1.80 mm

## SPARK PLUG

Inspect at 6000 km (4000 miles, 12 months), 18000 km (11000 miles, 36 months) and Replace Every 12000 km (7500 miles, 24 months).

- Remove the seats, frame cover assembly and fuel tank. (Refer to pages 7-5 and 4-5.)
- Remove all the spark plugs.

### NOTE:

If it is difficult to remove the spark plug cap, pry up it with a screwdriver.

**09930-10121: Spark plug socket wrench set**

**09930-14530: Universal joint**

**09914-24510: T handle**

**09900-20803: Thickness gauge**

	Standard	Cold type	Hot type
NGK	CR9E	CR10E	CR8E
ND	U27ESR-N	U31ESR-N	U24ESR-N

### CARBON DEPOSIT

Check to see the carbon deposit on the plug.

If the carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.

### SPARK PLUG GAP

Measure the plug gap with a thickness gauge if it is correct. If not, adjust it to the following gap.

Spark plug gap	Standard
	0.7—0.8 mm (0.028—0.032 in)

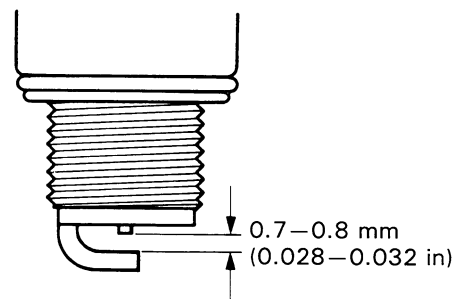
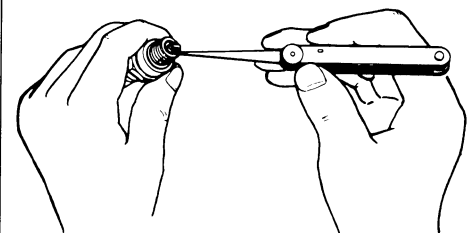
**09900-20803: Thickness gauge**

### ELECTRODE'S CONDITION

Check to see the worn or burnt condition of the electrodes. If it is extremely worn or burnt, replace the plug. And also replace the plug if it has a broken insulator, damaged thread, etc.

### CAUTION:

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.



## ENGINE OIL AND OIL FILTER

### (ENGINE OIL)

Replace Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

### OIL FILTER

Replace Initially at 1000 km (600 miles, 2 months) and Every 12000 km (7500 miles, 24 months) thereafter.

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

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain the oil by removing the drain plug ① and filler cap ②.
- Remove the oil filter ③ by using the oil filter wrench. (Special tool A)
- Apply engine oil lightly to the gasket of the new filter before installation.
- Install the new filter turning it by hand until you feel that the filter gasket contacts the mounting surface. Then tighten it 2 turns using the oil filter wrench. (Special tool A)

### 09915-40610: Oil filter wrench

#### NOTE:

*To properly tighten the filter, use the special tool. Never tighten the filter by hand.*

- Fit the drain plug ① securely, and pour fresh oil through the oil filler. The engine will hold about 3.3 L (3.5 US qt) 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 seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ④. If the level is below mark "F", add oil to that level.

### NECESSARY AMOUNT OF ENGINE OIL

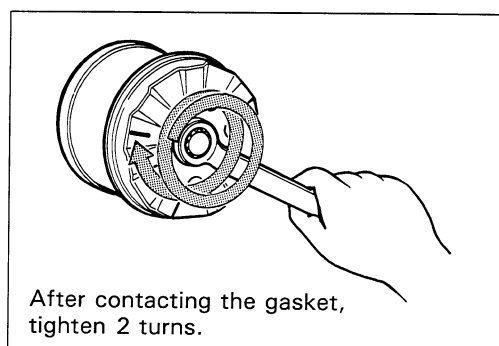
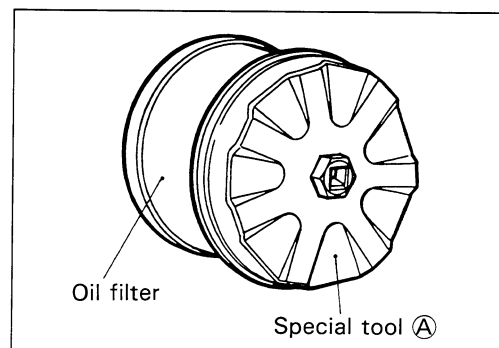
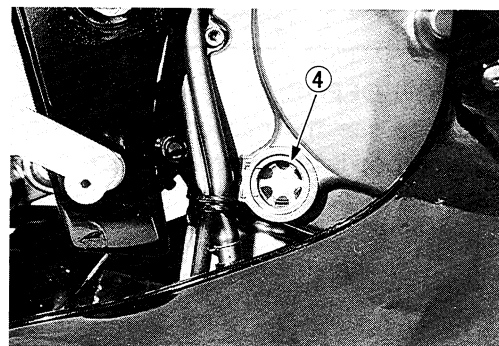
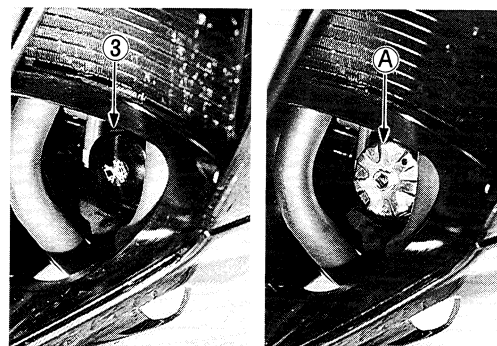
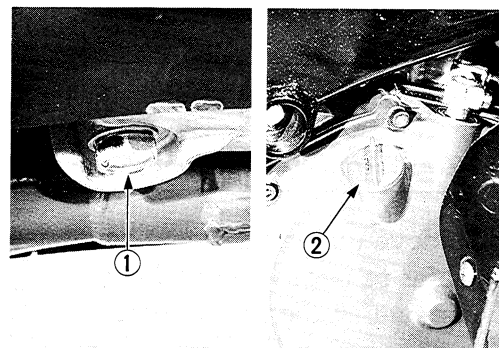
Oil change: 3.0 L (3.2/2.6 US/lmp qt)

Filter change: 3.3 L (3.5/2.9 US/lmp qt)

Overhaul engine: 3.9 L (4.1/3.4 US/lmp qt)

#### CAUTION:

Use SUZUKI MOTORCYCLE GENUINE OIL FILTER only, since the other make's genuine filters and after-market parts may differ in thread specifications (thread diameter and pitch), filtering performance and durability, which could cause engine damage or oil leaks. Suzuki automobile genuine oil filter is also not usable for the motorcycles.





**FUEL LINE (EVAP HOSE ... California model only)**

Inspect Every 6000 km (4000 miles, 12 months).  
Replace Every 4 years.

**FUEL FILTER**

Clean Every 12000 km (7500 miles, 24 months).

(Refer to page 4-5.)

**CARBURETOR****IDLE RPM (Idling adjustment)**

Inspect Initially at 1000 km (600 miles, 2 months) and  
Every 6000 km (4000 miles, 12 months) thereafter.

**NOTE:**

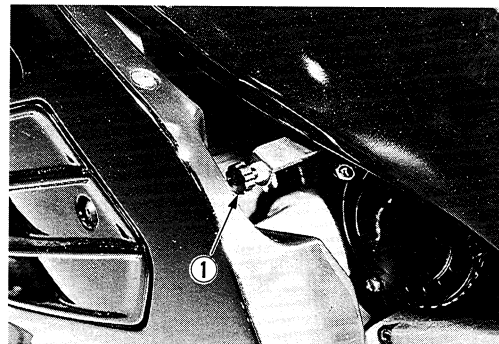
*Make this adjustment when the engine is hot.*

- Connect a tachometer.
- Start up the engine and set its speed at anywhere between 1100 and 1300 r/min by turning throttle stop screw ①.

**Engine idle speed:**

1200 ± 100 r/min ..... E-02,04 and others

1300 ± 100 r/min ..... E-15,17,18,22 and 24

**THROTTLE CABLE PLAY****Pulling cable play ①**

There should be 0.5—1.0 mm (0.02—0.04 in) play ① in the throttle cable. Adjust the throttle cable play with the following procedures.

- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Tighten the lock nut ① while holding the adjuster.

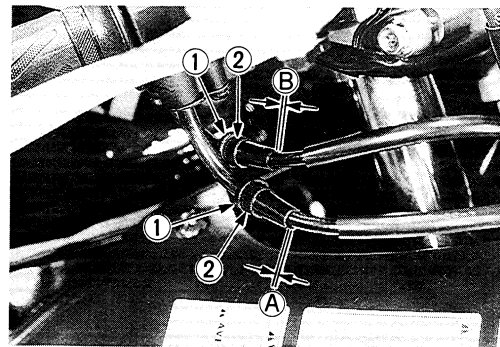
**Returning cable play ②**

- Adjust the returning cable to the specified play in the same manner as the pulling cable play adjustment.

**Throttle cable play (① and ②): 0.5—1.0 mm (0.02—0.04 in)**

**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.



## CLUTCH

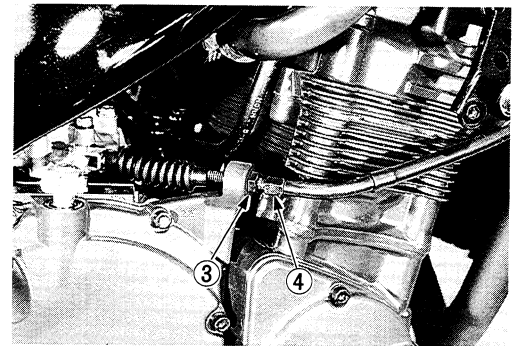
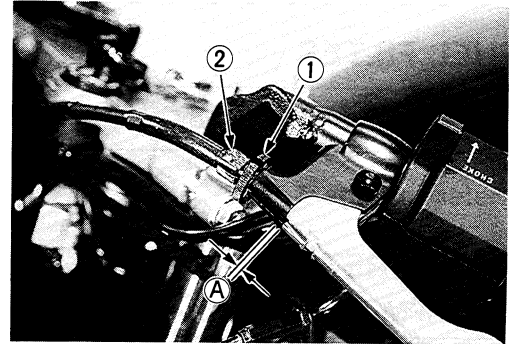
**Inspect Every 6000 km (4000 miles, 12 months).**

- Remove the lower cowling assembly.
- Loosen the cable adjuster lock nut ① and screw in the cable adjuster ②.
- Loosen the cable adjuster lock nut ③ and screw in the cable adjuster ④ to provide a play in the cable.
- Adjust the cable play with the cable adjuster ④ until play Ⓐ of the clutch lever is within the following value.

Clutch cable play Ⓐ

2—3 mm (0.08—0.12 in)

- If the specified play can not be obtained with the cable adjuster ④, carry out the adjustment with the cable adjuster ② on the clutch lever side.
- After adjusting the play, tighten the both cable adjuster lock nuts, ① and ③.



## DRIVE CHAIN

**Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.  
Lubricate Every 1000 km (600 miles).**

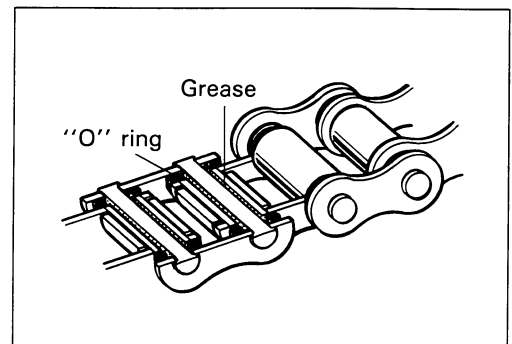
Visually check the drive chain for the possible defects listed below. (Support the motorcycle by a jack and a wooden block, turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

- |                           |                             |
|---------------------------|-----------------------------|
| * Loose pins              | * Excessive wear            |
| * Damaged rollers         | * Improper chain adjustment |
| * Dry or rusted links     | * Missing O-ring seals      |
| * Kinked or binding links |                             |

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

### NOTE:

*When replacing the drive chain, replace the drive chain and sprockets as a set.*



**CHECKING**

- Remove the axle cotter pin. (For E-03, 28 and 33 models)
- Loosen the axle nut ① .
- Tense the drive chain fully by turning both chain adjusters ② .
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.

	Service Limit
Drive chain 20-pitch length	319.4 mm (12.6 in)

**ADJUSTING**

- Loosen or tighten both chain adjusters ② until the chain has 30–40 mm (1.2–1.6 in) of slack in the middle between engine and rear sprockets. The mark ③ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.
- Place the motorcycle on its side-stand for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut ① securely.
- Tighten both chain adjusters ② securely.

**Rear axle nut: 85–115 N·m**  
(8.5–11.5 kg-m, 61.5–83.0 lb-ft)

**CLEANING AND LUBRICATING**

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

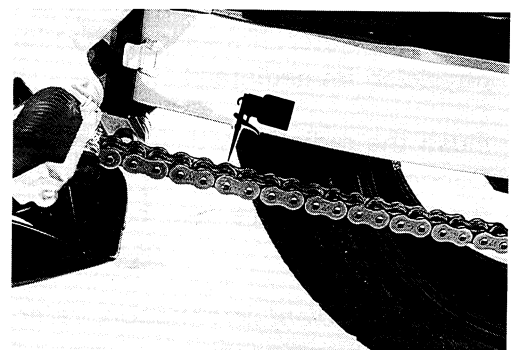
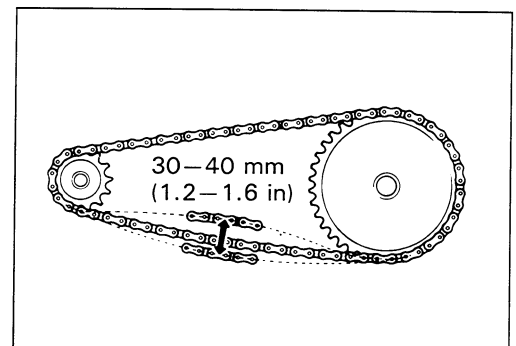
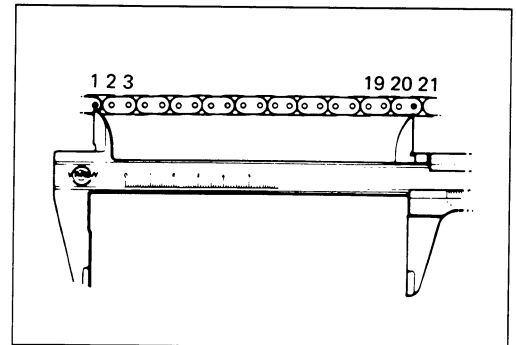
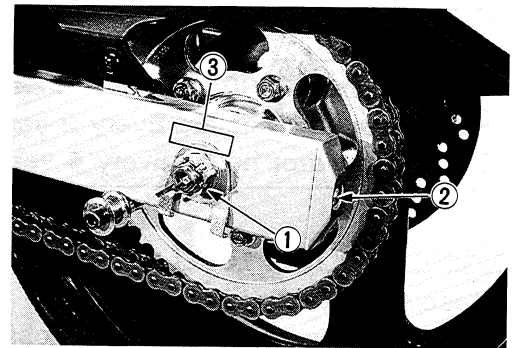
**CAUTION:**

**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, they 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 can damage the "O"-rings (or seals).
- \* The standard drive chain TAKASAGO RK50GSVZ1 or DAIDO DID50VA7. SUZUKI recommends that this standard drive chain should be used for the replacement.

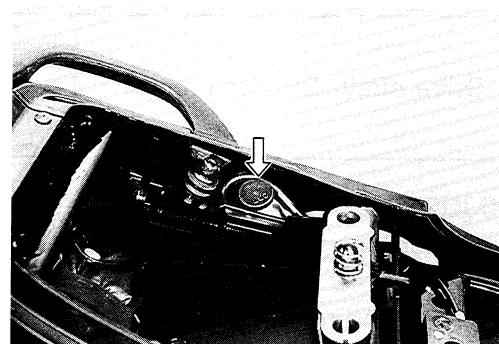
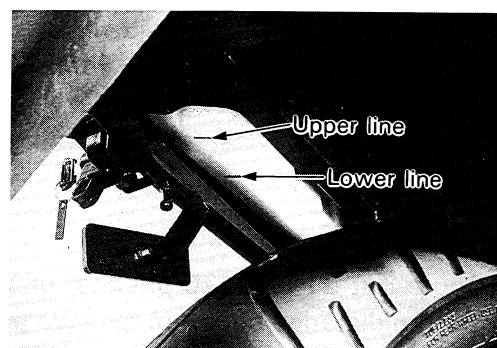


## COOLING SYSTEM

Inspect Every 6000 km (4000 miles, 12 months).  
 Replace engine coolant Every 2 years.  
 Replace radiator hoses Every 4 years.

### ENGINE COOLANT LEVEL

- Keep the motorcycle upright.
- Check the engine coolant level by observing the upper and lower limit lines on the engine coolant reservoir.
- If the level is below the lower limit line, add engine coolant to the upper limit line from the engine coolant reservoir filler.

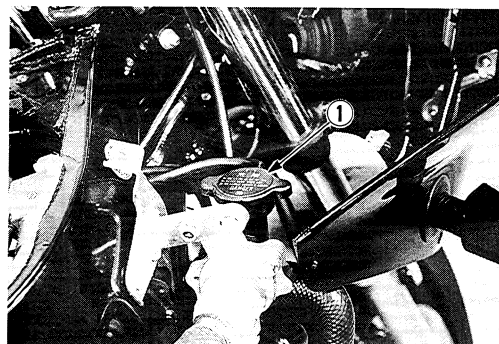


### ENGINE COOLANT CHANGE

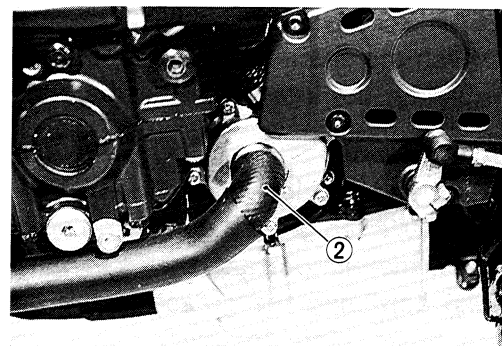
- Remove the seats, frame cover assembly, lower cowling assembly and right side of cowling upper panel. (Refer to pages 7-2 and 5.)
- Remove the radiator cap ① and disconnect the water hose ②, and drain engine coolant.

#### WARNING:

- \* Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- \* Engine coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If engine coolant gets into the eyes or in contact with the skin, flush thoroughly with plenty of water. If swallowed, induce vomiting and call physician immediately!



- Flush the radiator with fresh water if necessary.
- Connect the water hose ② securely.
- Pour the specified engine coolant up to the radiator inlet.



#### NOTE:

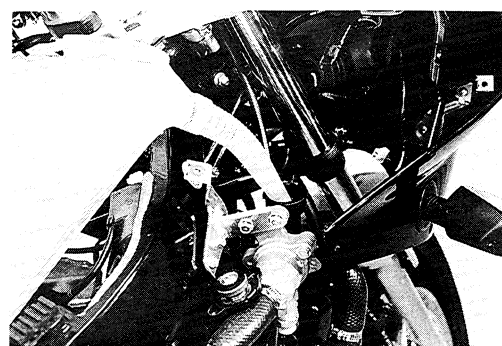
For engine coolant information, refer to page 5-4.

- Close the radiator cap ① securely.
- After warming up and cooling down the engine, add the specified engine coolant up to the engine coolant reservoir.

#### CAUTION:

Repeat above procedure several times and make sure that the radiator is filled with engine coolant up to the engine coolant reservoir.

Engine coolant capacity: 2450 ml (2.6/2.2 US/Imp qt)



## BRAKE

### (BRAKE)

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

### (BRAKE HOSE AND BRAKE FLUID)

Inspect Every 6000 km (4000 miles, 12 months). Replace hoses Every 4 years. Replace fluid Every 2 years.

### BRAKE FLUID LEVEL

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

**Specification and Classification: DOT4**

### 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 or petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period.

### WARNING:

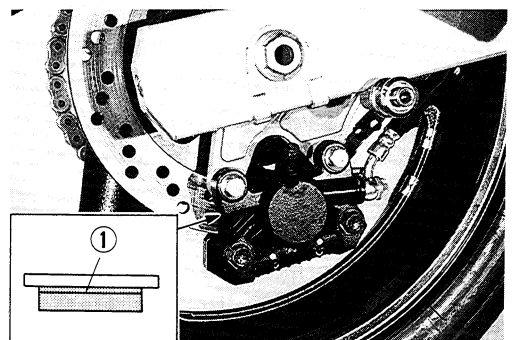
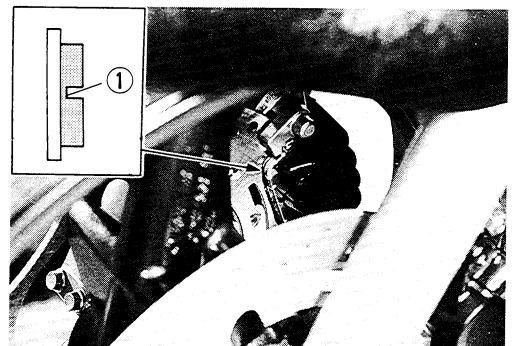
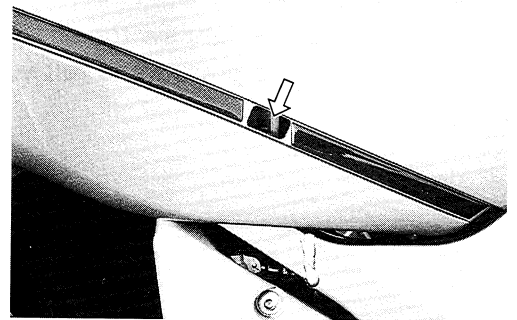
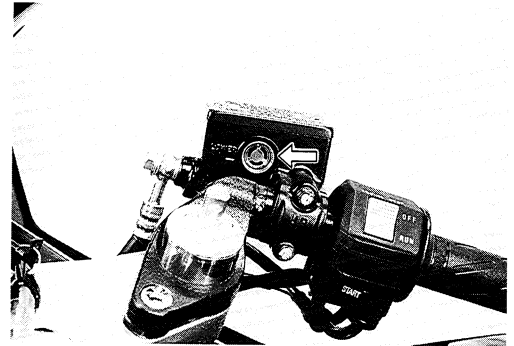
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hoses and hose joints for cracks and oil leakage before riding.

### BRAKE PADS

The extent of brake pad wear can be checked by observing the grooved limit line ① on the pad. When the wear exceeds the grooved limit line, replace the pads with new ones. (Refer to pages 7-17 and 7-35.)

### CAUTION:

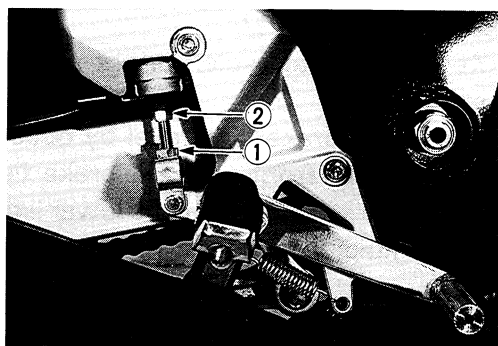
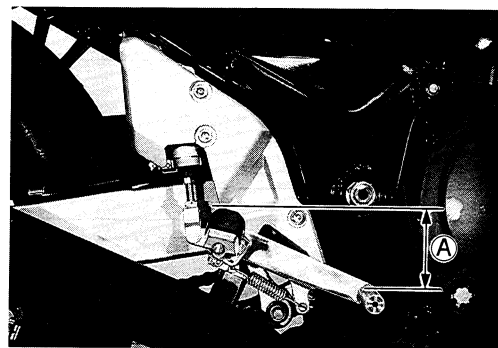
Replace the brake pad as a set, otherwise braking performance will be adversely affected.



### BRAKE PEDAL HEIGHT

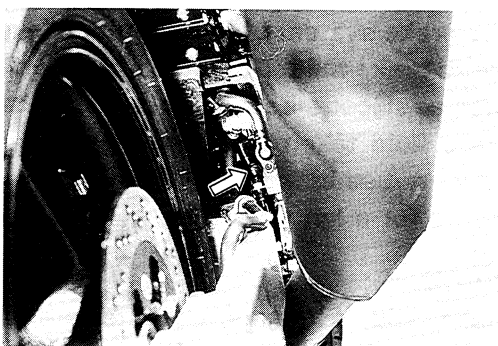
- Loosen the lock nut ① and rotate the push rod ② to locate brake pedal 50–60 mm (2.0–2.4 in) ③ below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

Brake pedal height ③ : 50–60 mm (2.0–2.4 in)



### BRAKE LIGHT SWITCH

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



### AIR BLEEDING THE BRAKE FLUID CIRCUIT

Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the 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 re-mounting 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” line. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

#### Bleeder valve

tightening torque: 6—9 N·m

(0.6—0.9 kg-m, 4.5—6.5 lb-ft)

- Front brake: Bleed the air from the air 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:

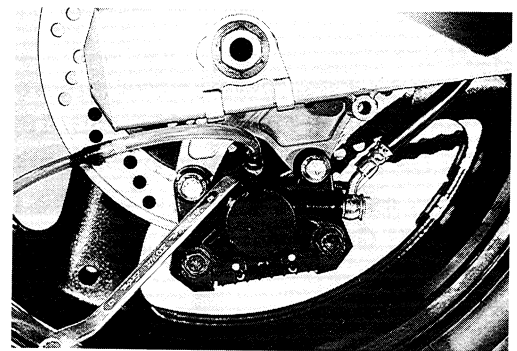
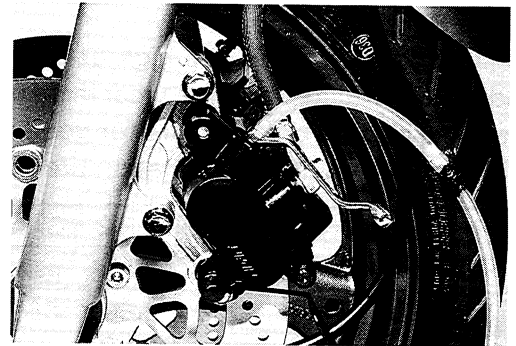
*Replenish the brake fluid in the reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.*

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the “UPPER” line.

#### CAUTION:

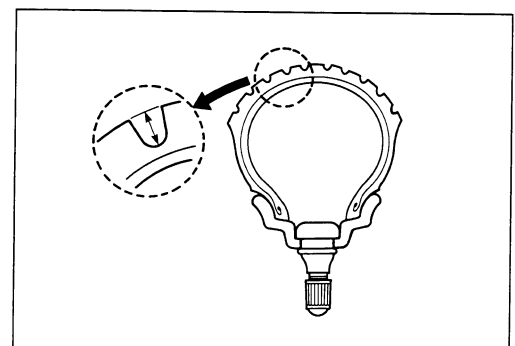
**Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc.**

- The only difference between bleeding the front and rear brakes is that the rear master cylinder is actuated by a pedal.



## TIRE

**Inspect Every 6000 km (4000 miles, 12 months).**



**TIRE TREAD CONDITION**

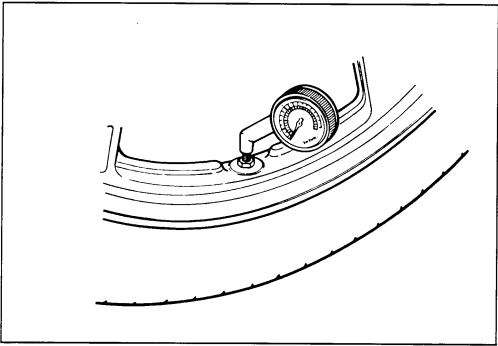
Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

**Tire tread depth limit: FRONT 1.6 mm (0.06 in)**  
**REAR 2.0 mm (0.08 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.

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42



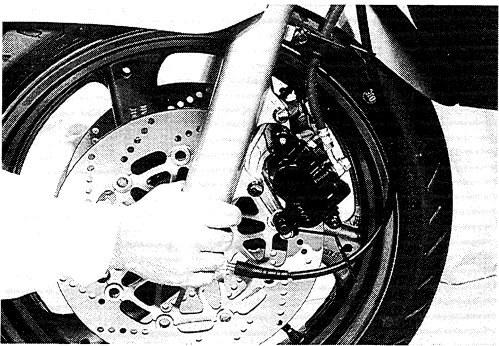
**CAUTION:**

The standard tire fitted on this motorcycle is 120/70 ZR17 for front (DUNLOP D202F) and 160/60 ZR17 for rear (DUNLOP D202). The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

**STEERING**

**Inspect Initially at 1000 km (600 miles, 2 months) and Every 12000 km (7500 miles, 24 months) thereafter.**

Taper roller type bearings are used on the steering system for better handling. Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 7-33 of this manual.





## FRONT FORK

**Inspect Every 12000 km (7500 miles, 24 months).**

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (Refer to page 7-24.)

## REAR SUSPENSION

**Inspect Every 12000 km (7500 miles, 24 months).**

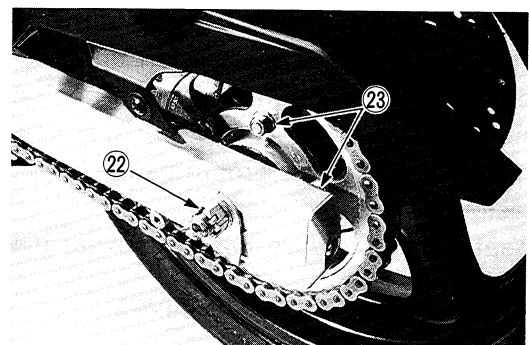
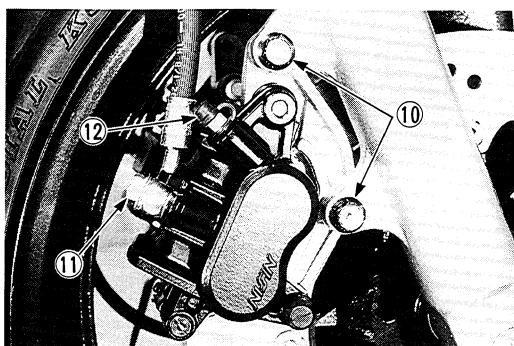
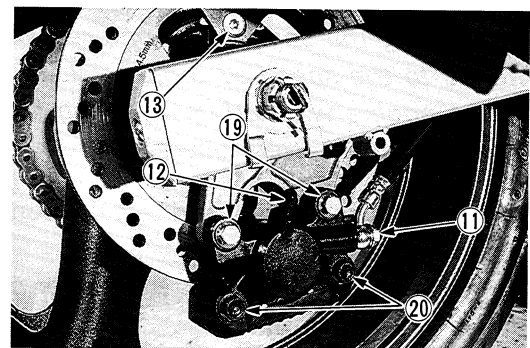
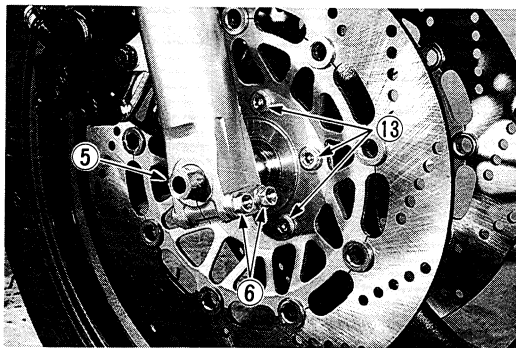
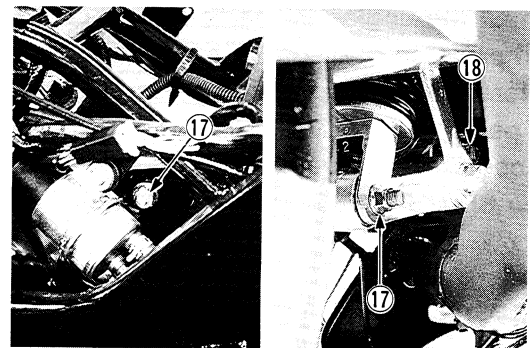
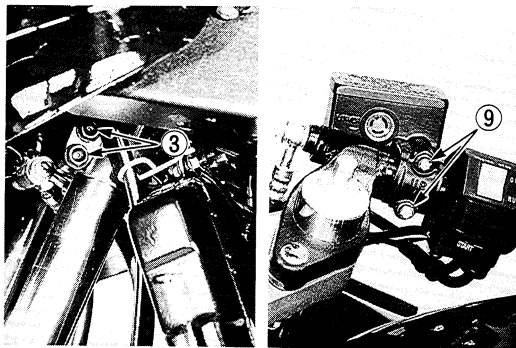
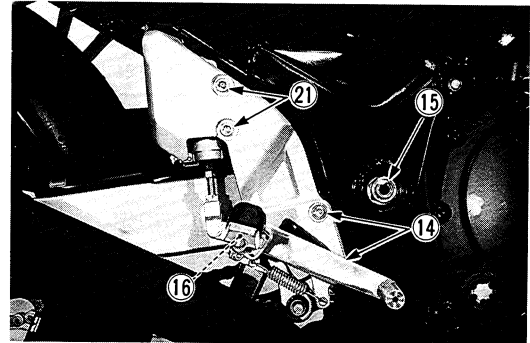
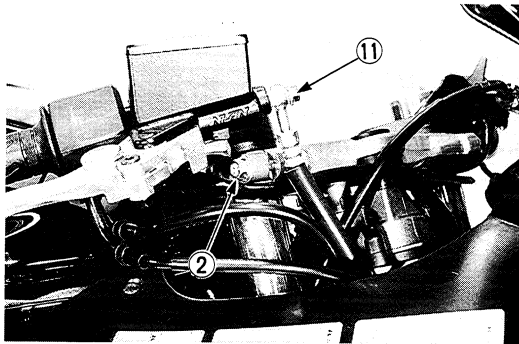
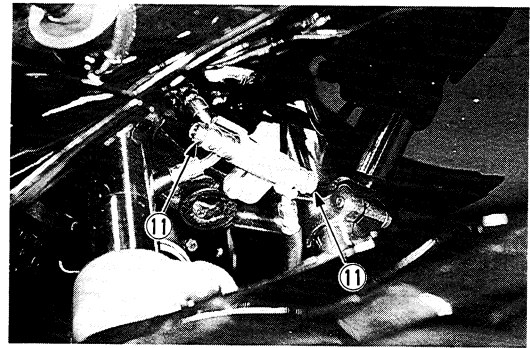
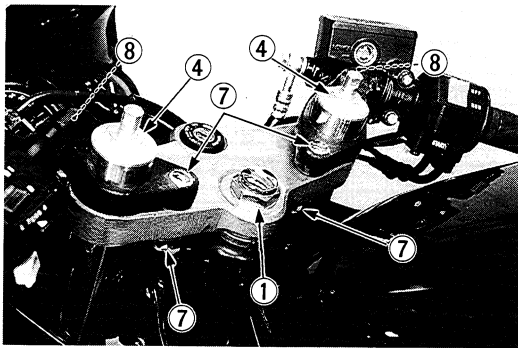
Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

## CHASSIS BOLTS AND NUTS

**Tighten Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.**

The nuts and bolts listed below are important safety related parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-20 for the locations of the following nuts and bolts on the motorcycle.)

Item	N·m	kg-m	lb-ft
① Steering stem head nut	80–100	8.0–10.0	58.0–72.5
② Front fork upper clamp bolt	18–28	1.8–2.8	13.0–20.0
③ Front fork lower clamp bolt	18–28	1.8–2.8	13.0–20.0
④ Front fork cap bolt	30–40	3.0–4.0	21.5–29.0
⑤ Front axle	50–80	5.0–8.0	36.0–58.0
⑥ Front axle pinch bolt	18–28	1.8–2.8	13.0–20.0
⑦ Handlebar holder mounting bolt and nut	22–35	2.2–3.5	16.0–25.5
⑧ Handlebar set bolt	18–28	1.8–2.8	13.0–20.0
⑨ Front brake master cylinder mounting bolt	8–12	0.8–1.2	6.0–8.5
⑩ Front brake caliper mounting bolt	20–30	2.0–3.0	14.5–21.5
⑪ Brake hose union bolt (Cylinder & Caliper)	15–20	1.5–2.0	11.0–14.5
⑫ Air bleeder valve (Front & Rear)	6–9	0.6–0.9	4.5–6.5
⑬ Front and rear disc bolt	18–28	1.8–2.8	13.0–20.0
⑭ Front footrest bracket mounting bolt	18–28	1.8–2.8	13.0–20.0
⑮ Swingarm pivot nut	85–115	8.5–11.5	61.5–83.0
⑯ Front footrest nut	42–66	4.2–6.6	30.5–47.5
⑰ Rear shock absorber mounting nut (Upper & Lower)	40–60	4.0–6.0	29.0–43.5
⑱ Rear cushion lever/rod mounting nut	70–100	7.0–10.0	50.5–72.5
⑲ Rear brake caliper mounting bolt	20–30	2.0–3.0	14.5–21.5
⑳ Rear brake caliper housing bolt	30–36	3.0–3.6	21.5–26.0
㉑ Rear brake master cylinder mounting bolt	18–28	1.8–2.8	13.0–20.0
㉒ Rear axle nut	85–115	8.5–11.5	61.5–83.0
㉓ Rear sprocket nut	48–72	4.8–7.2	35.0–52.0



## COMPRESSION PRESSURE CHECK

The compression of a cylinder is a good indicator of its internal condition.

The decision to overhaul the cylinder is often based on the results of a compression test. Periodic maintenance records kept at your dealership should include compression readings for each maintenance service.

### COMPRESSION PRESSURE SPECIFICATION

Standard	Limit	Difference
1000–1500 kPa (10–15 kg/cm <sup>2</sup> ) (142–213 psi)	800 kPa (8 kg/cm <sup>2</sup> ) (114 psi)	200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)

**Low compression pressure can indicate any of the following conditions:**

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

**Overhaul the engine in the following cases:**

- \* Compression pressure in one of the cylinders is less than 800 kPa (8 kg/cm<sup>2</sup>, 114 psi).
- \* Difference in compression pressure between any two cylinders is more than 200 kPa (2 kg/cm<sup>2</sup>, 28 psi).
- \* All compression pressure are below 1000 kPa (10 kg/cm<sup>2</sup>, 142 psi) even when they measure more than 800 kPa (8 kg/cm<sup>2</sup>, 114 psi).

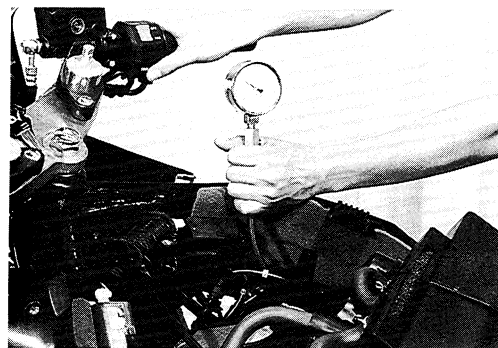
## COMPRESSION TEST PROCEDURE

### NOTE:

- \* *Before testing the engine for compression pressure, make sure that the cylinder head bolts are tightened to the specified torque values and valves are properly adjusted.*
- \* *Have the engine warmed up by idling before testing.*
- \* *Be sure that the battery used is in fully-charged condition.*

Remove the parts concerned and test the compression pressure in the following manner.

- Remove the seats, fuel tank and lower cowling. (Refer to pages 7-2 and 4-5.)
- Remove all the spark plugs.
- Fit the compression gauge in one of the plug holes, while taking care that the connection tight.
- Keep the throttle grip in full-open position.
- While cranking the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.
- Repeat this procedure with the other cylinders.



**09915-64510: Compression gauge**

**09915-63310: Adaptor**

## OIL PRESSURE CHECK

Check periodically the oil pressure in the engine to judge roughly the condition of the moving parts.

### OIL PRESSURE SPECIFICATION

<b>Above 300 kPa (3.0 kg/cm<sup>2</sup>, 43 psi)</b> <b>Below 600 kPa (6.0 kg/cm<sup>2</sup>, 85 psi)</b>	<b>at 3000 r/min., Oil temp. at 60°C (140°F)</b>
--	--

If the oil pressure is lower or higher than the specification, the following causes may be considered.

#### LOW OIL PRESSURE

- \* Clogged oil filter
- \* Oil leakage from the oil passage way
- \* Damaged O-ring
- \* Defective oil pump
- \* Combination of above items

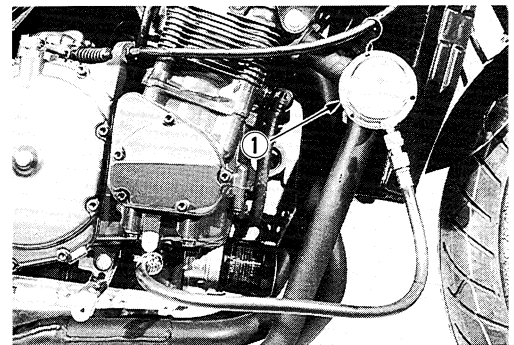
#### HIGH OIL PRESSURE

- \* Used a engine oil which is too heavy a weight
- \* Clogged oil passage way
- \* Combination of above items

### OIL PRESSURE TEST PROCEDURE

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

- Remove the lower cowling.
- Remove the main oil gallery plug.
- Install the oil pressure gauge ① with adaptor in the position shown in the figure.
- Warm up the engine as follows:  
 Summer 10 min. at 2000 r/min.  
 Winter 20 min. at 2000 r/min.
- After warming up, increase the engine speed to 3000 r/min. (with the engine tachometer), and read the oil pressure gauge.



**09915-74510: Oil pressure gauge**

**09915-74540: Adaptor**

**09915-77330: Meter (for high pressure)**

# ENGINE

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## ENGINE COMPONENTS REMOVABLE WITH 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 each section for removal and reinstallation instructions.

### ENGINE CENTER

	See page
Radiator .....	3- 4
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Oil pressure switch .....	3-51
Oil hose .....	3-11
Oil filter .....	3-10
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Carburetors .....	3- 3
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Cylinder head cover .....	3-10 and 65
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### ENGINE LEFT SIDE

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Engine sprocket cover .....	3- 6
Water pump .....	3-16
Engine sprocket and drive chain .....	3- 6
Neutral indicator switch body .....	3-16

### ENGINE RIGHT SIDE

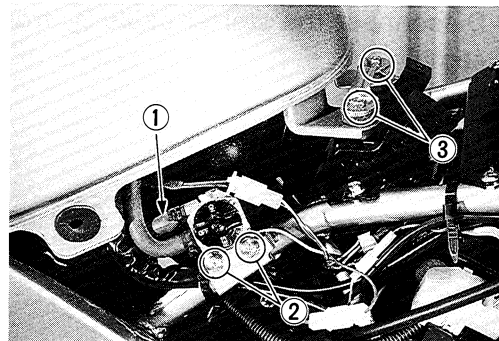
	See page
Clutch cover .....	3-14 and 54
Signal generator .....	3-14 and 55
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Clutch sleeve hub .....	3-15 and 53
Oil pump driven gear .....	3-16 and 52
Generator/oil pump drive gears .....	3-15 and 53
Primary driven gear .....	3-15 and 53
Gearshift shaft .....	3-16 and 52
Gearshift cam shifter .....	3-16 and 47

## ENGINE REMOVAL AND REINSTALLATION

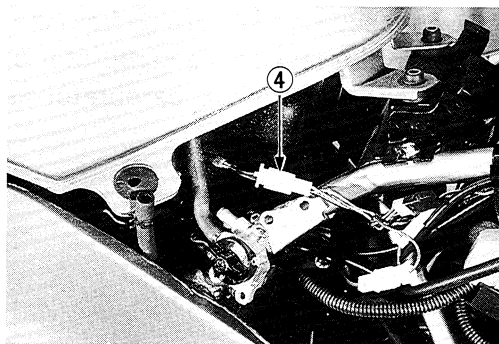
### ENGINE REMOVAL

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

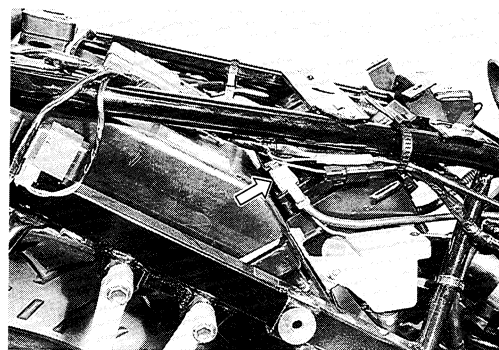
- Remove the oil drain plug to drain out engine oil.
- Remove the front and rear seats.
- Remove the frame cover assembly. (See page 7-5.)
- Remove the lower cowling assembly. (See page 7-2.)
- Turn the fuel cock to "OFF" position and disconnect the fuel hose ① from the fuel cock.
- Remove the fuel cock mounting screws ②.
- Remove the fuel tank mounting bolts ③.



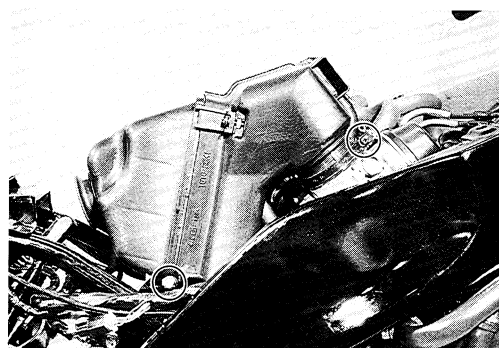
- Disconnect the fuel level indicator switch lead wire coupler ④ and remove the fuel tank.



- Disconnect the battery ⊖ lead wire terminal and battery ⊖ lead wire coupler.

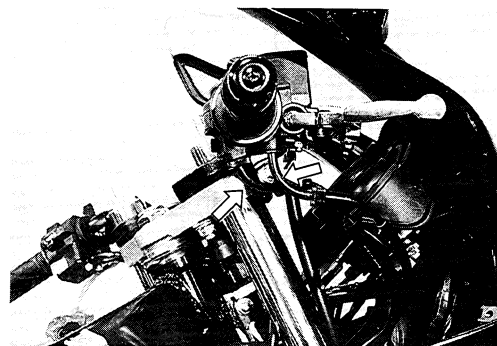


- Loosen the respective carburetor clamp screws (air cleaner side).
- Remove the air cleaner box by removing its mounting screws, left and right.

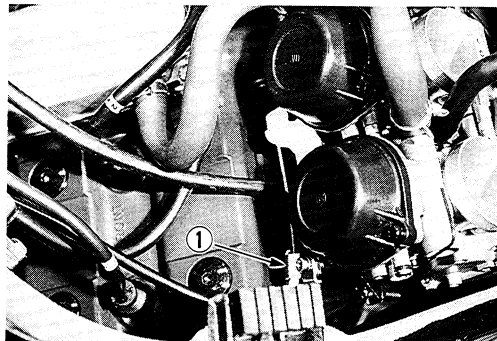




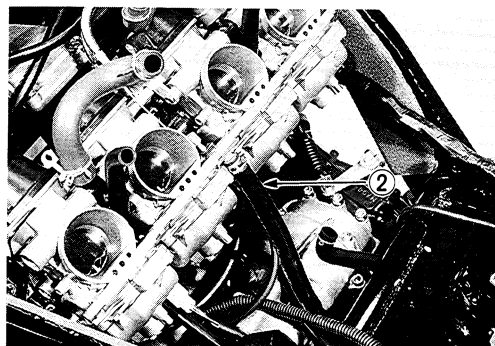
- Disconnect the throttle cables from the throttle grip.



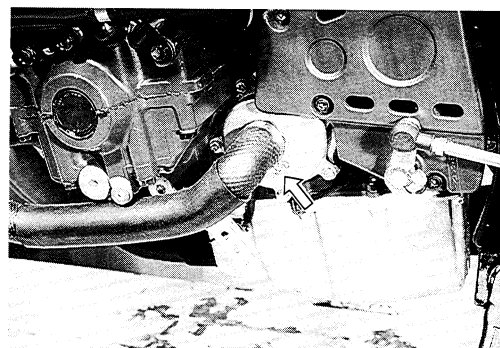
- Disconnect the starter cable ① from the carburetor assembly.



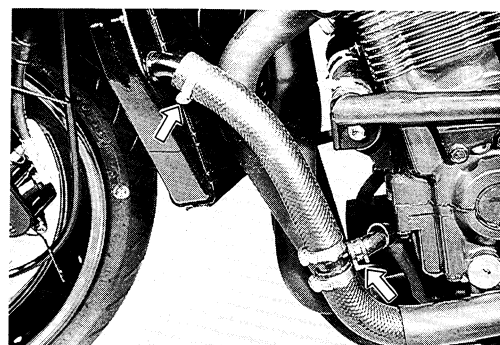
- Disconnect the fuel hose ② from the carburetor assembly.
- Loosen the respective carburetor clamp screws (engine side) and remove the carburetor assembly.

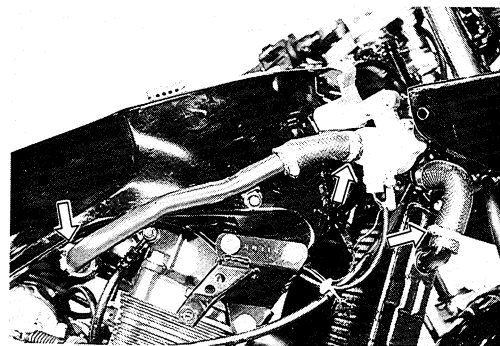


- Disconnect the water hose by loosening its clamp to drain out engine coolant.

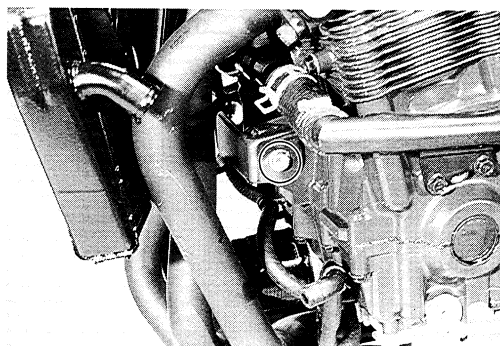
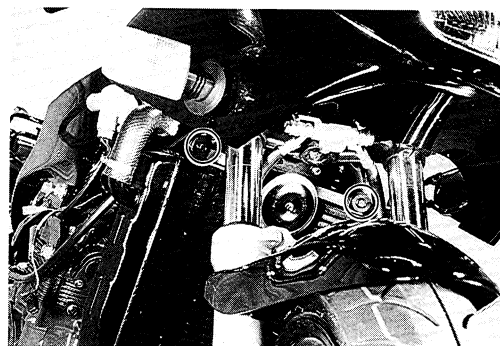


- Disconnect the water hoses by loosening their clamps.

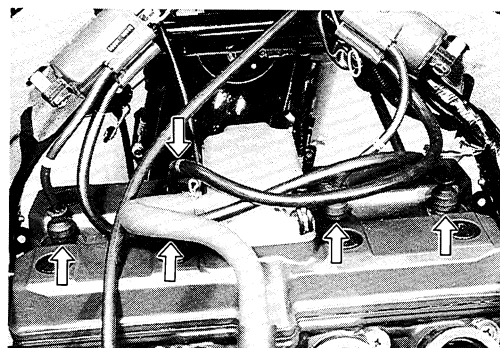




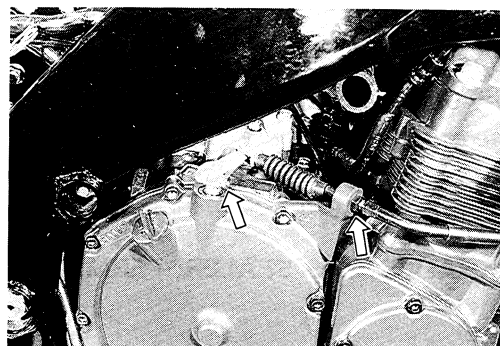
- Remove the radiator by removing its mounting bolts.



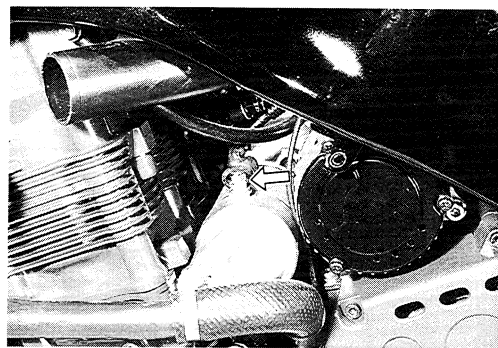
- Disconnect all the spark plug caps.
- Disconnect the breather hose.



- Remove the clutch release lever and disconnect the clutch cable.

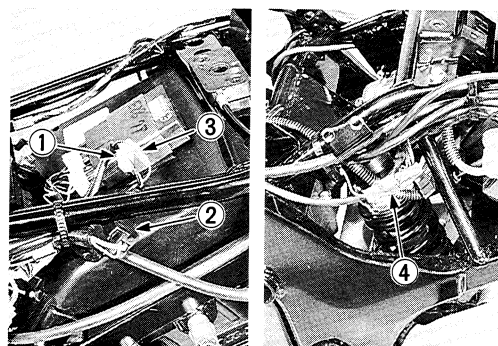


- Disconnect the starter motor lead wire.

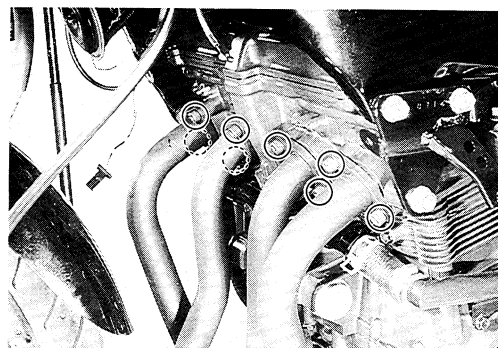


- Disconnect the various lead wires.

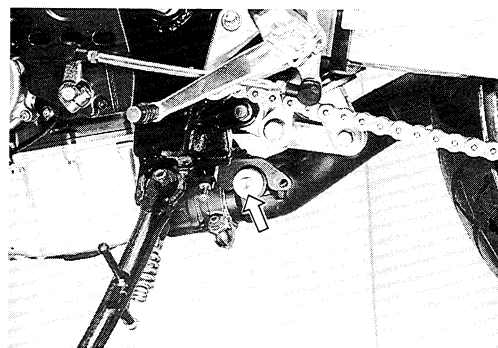
- ① Signal generator
- ② Generator
- ③ Oil pressure switch
- ④ Neutral switch



- Remove the eight exhaust pipe clamp bolts.



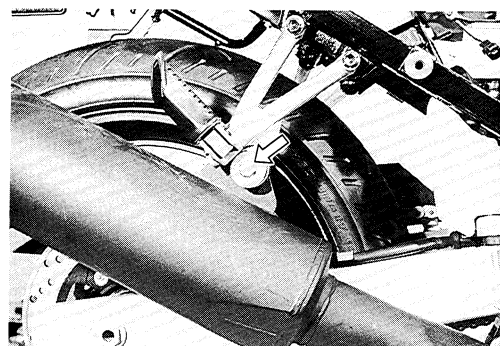
- Remove the muffler mounting bolts, then remove the exhaust pipe/muffler assembly.



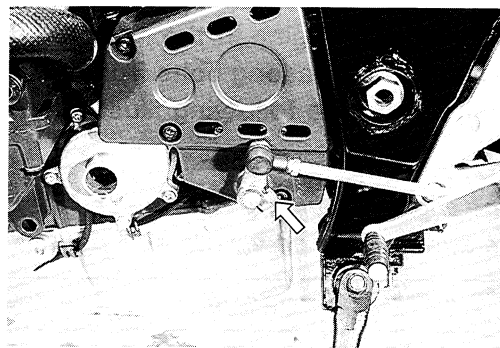
**NOTE:**

*When installing a new exhaust pipe/muffler connector, clean any old dried sealer from the exhaust pipe and from inside the muffler and the exhaust gas sealer should be applied to both the inside and outside of the exhaust pipe/muffler connector.*

**EXHAUST GAS SEALER: PERMATEX 1372**



- Remove the gearshift lever by removing its mounting bolt.



- Remove the engine sprocket cover by removing the bolts.

**NOTE:**

*When installing the engine sprocket cover bolts, apply a small quantity of the THREAD LOCK "1342" to their threads.*

**99000-32050: THREAD LOCK "1342"**

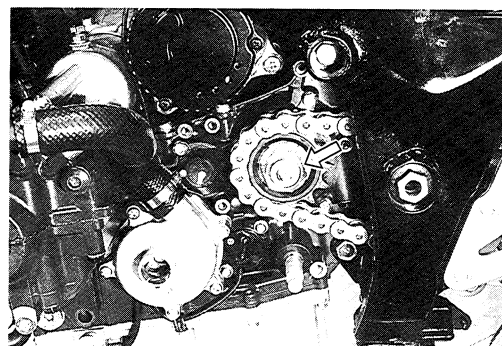
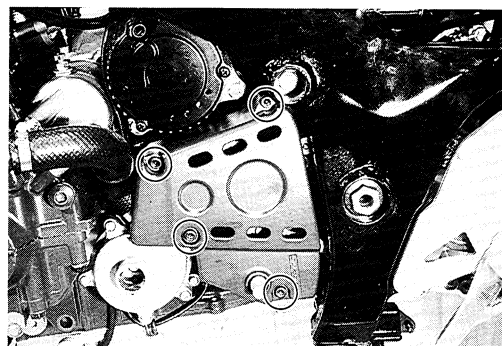
**Tightening torque: 4–7 N·m**

**(0.4–0.7 kg-m, 3.0–5.0 lb-ft)**

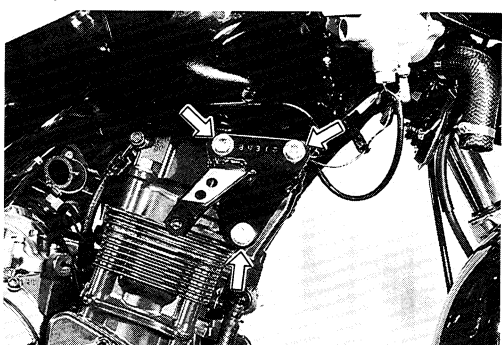
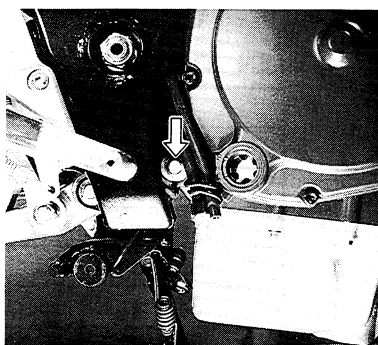
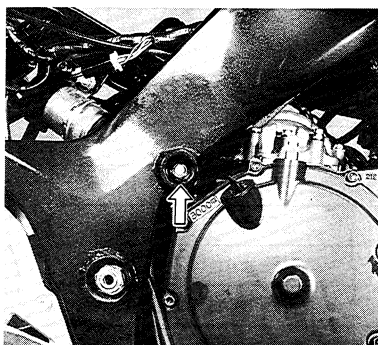
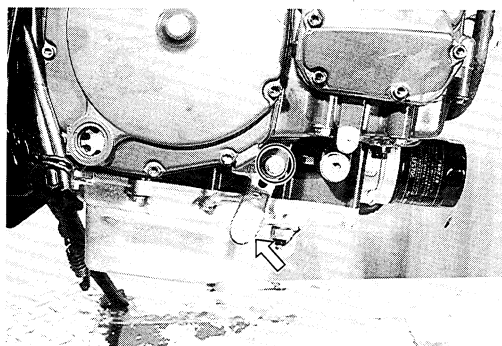
- Remove the engine sprocket nut while depressing the rear brake pedal.
- Remove the engine sprocket.

**NOTE:**

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



- Remove the lower cowlings brackets, left and right.
- Support the engine with a proper engine jack.
- Remove the engine mounting bolts, nuts, spacers and brackets.
- Gradually lower the engine assembly.



ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

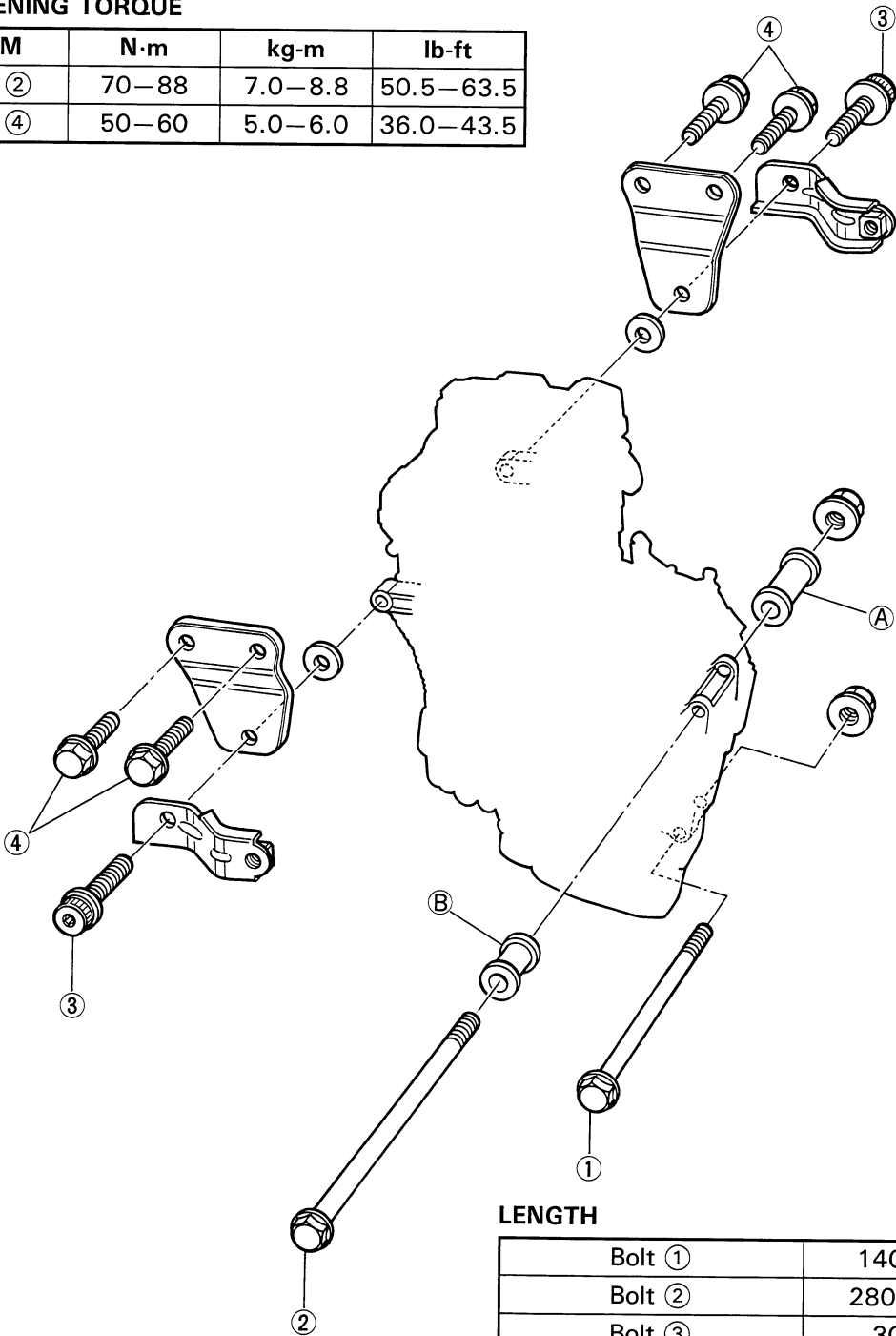
- Insert the two long bolts from left side. Install the brackets, spacers, bolts and nuts properly, as shown in the following illustration.

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.

TIGHTENING TORQUE

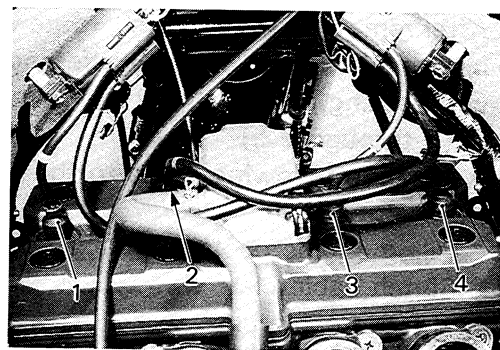
ITEM	N·m	kg-m	lb-ft
① , ②	70—88	7.0—8.8	50.5—63.5
③ , ④	50—60	5.0—6.0	36.0—43.5



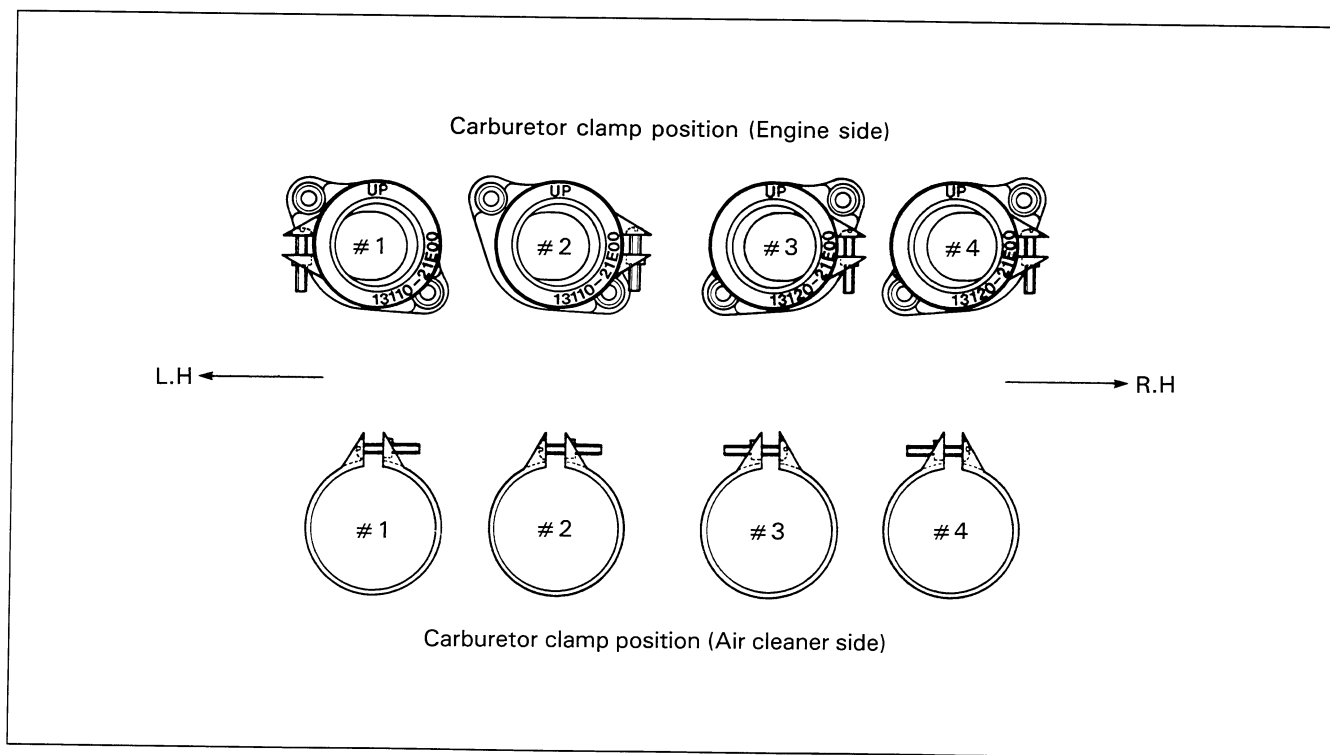
LENGTH

Bolt ①	140 mm (5.5 in)
Bolt ②	280 mm (11.0 in)
Bolt ③	30 mm (1.2 in)
Bolt ④	30 mm (1.2 in)
Spacer RH ①	65 mm (2.6 in)
Spacer LH ②	45 mm (1.8 in)

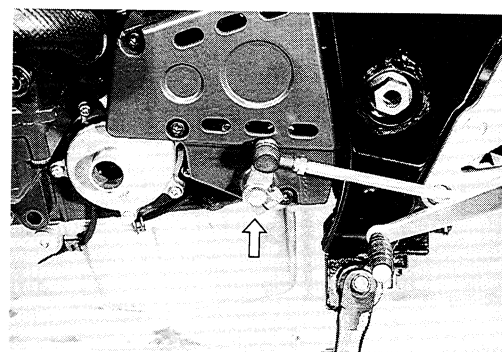
- Replace the plug caps on the spark plugs so that their code markings correspond to the cylinder numbers arranged in the order of 1, 2, 3, and 4 from the left hand.



- Locate the carburetor clamps, as shown in the illustration.



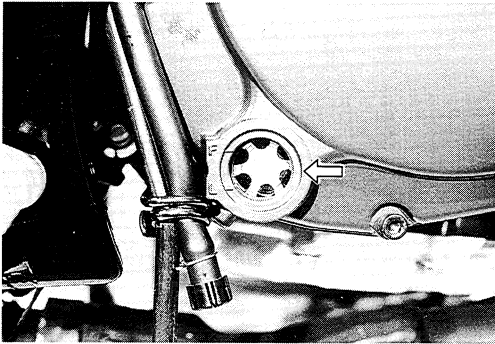
- Install the gearshift lever to the gearshift shaft in the correct position.



- After remounting the engine, route wiring harnesses, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (See pages 8-12 through 22.)
- Adjust the following items to the specification.

	Page
* Filling engine coolant .....	2-13
* Clutch cable play .....	2-11
* Throttle cable play .....	2-10
* Idling adjustment .....	4-18
* Balancing carburetors .....	4-17
* Drive chain .....	2-11
- Pour 3.9 L (4.1/3.4 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 several minutes after stopping engine, check that the oil level remains between the marks of oil level inspection window.

Change	3000 ml (3.2/2.6 US/Imp qt)
Filter change	3300 ml (3.5/2.9 US/Imp qt)
Overhaul	3900 ml (4.1/3.4 US/Imp qt)



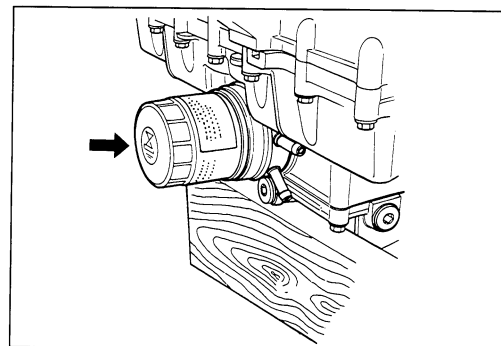
## ENGINE DISASSEMBLY

- Remove the oil filter by using the special tool.

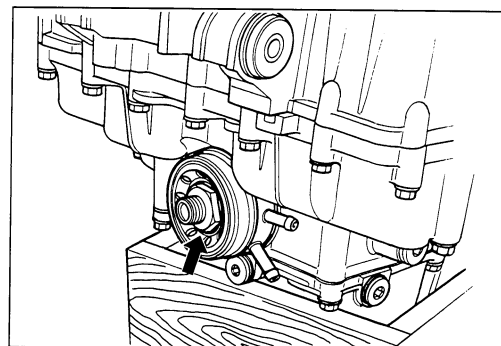
**09915-40610: Oil filter wrench**

**NOTE:**

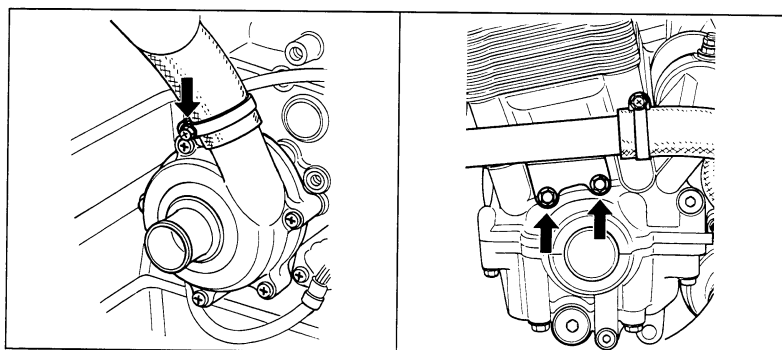
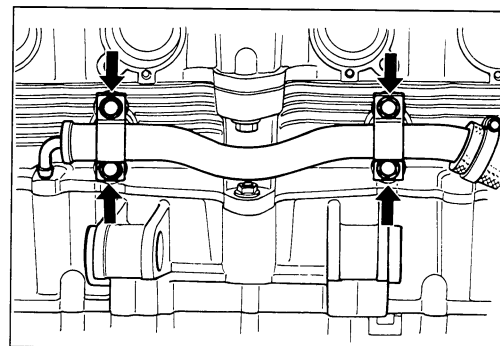
*Refer to page 2-9 for installation procedures.*



- Remove the oil cooler by removing its union bolt.



- Remove the inlet and outlet water pipes/hoses by removing the mounting bolts and clamp screws.

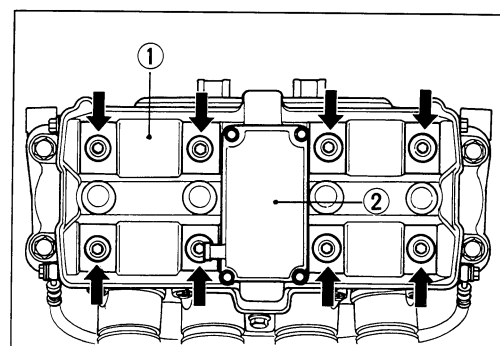


- Remove the cylinder head cover ① by removing the bolts.

**NOTE:**

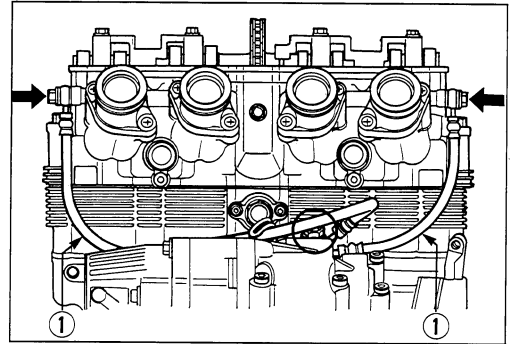
*The cylinder head breather cover ② is to be removed only when replacing it or when removing the engine from the frame.*

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



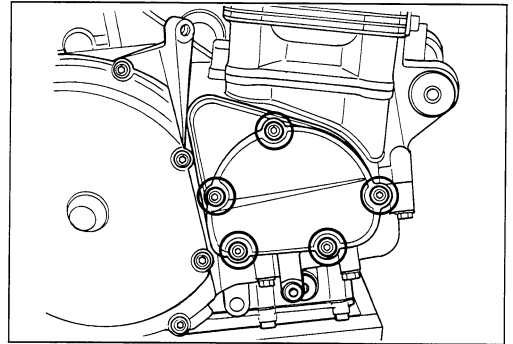


- Remove the left and right oil hoses ① by removing the union bolts.

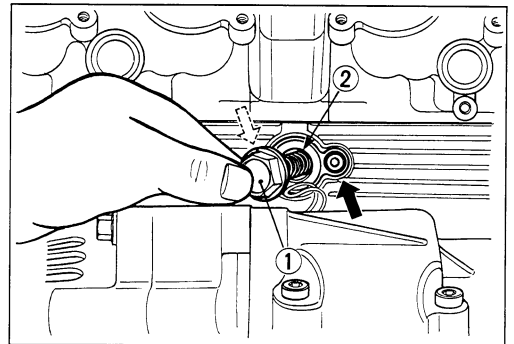


- Remove the signal generator cover by removing the bolts.

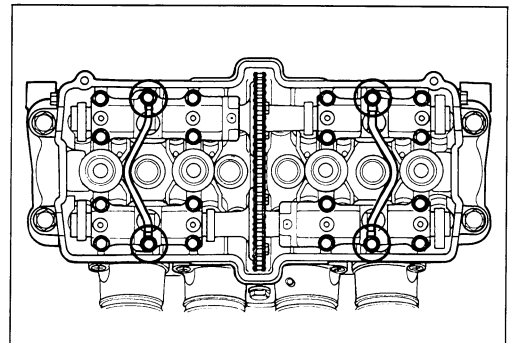
**09911-73730: 5 mm "T" type hexagon wrench**



- After removing the spring holder bolt ① and spring ②, remove the cam chain tensioner by removing the mounting bolts.



- Remove the left and right oil pipes by removing the bolts.

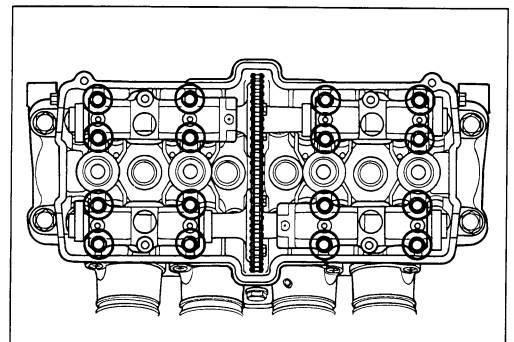


- Remove the four camshaft journal holders by removing the bolts.

**NOTE:**

*Be sure to loosen camshaft journal holder bolts evenly by shifting the wrench diagonally.*

- Remove the two camshafts, intake and exhaust.



- The cylinder head becomes free for removal when its one 6-mm bolt **A** and twelve 10-mm bolts are removed.

**09911-74520: Long socket 12 mm**

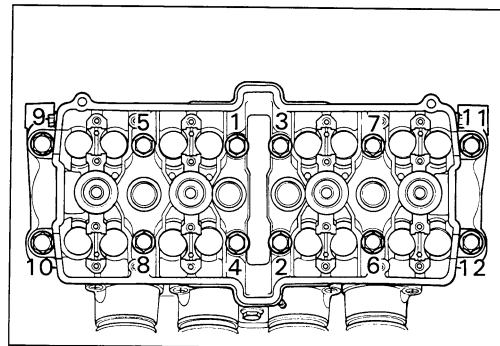
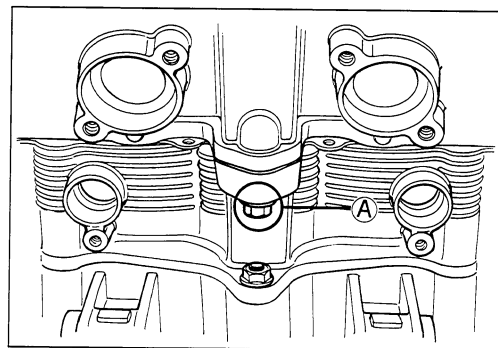
**09914-24510: T-handle**

**NOTE:**

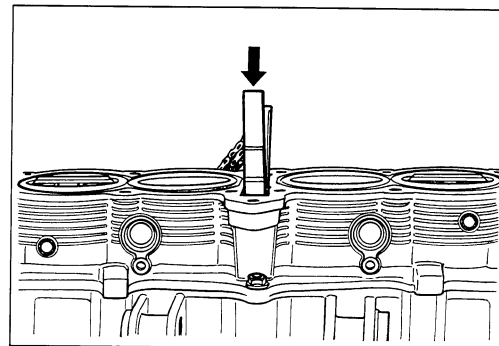
*When loosening the cylinder head bolts, loosen each bolt little by little, in a descending order, according to the numbers.*

**CAUTION:**

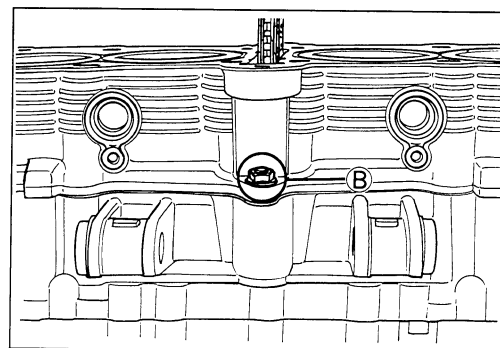
Be careful not to damage the fins when removing or handling the cylinder head. This precaution applies to the cylinder block also.



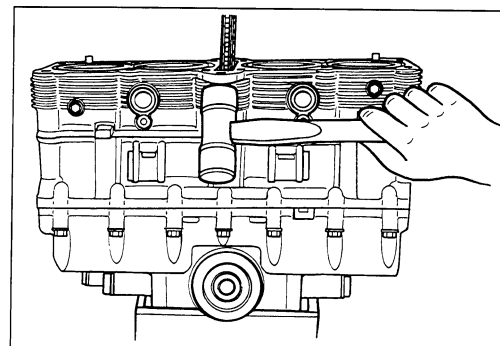
- Remove the cam chain guide.



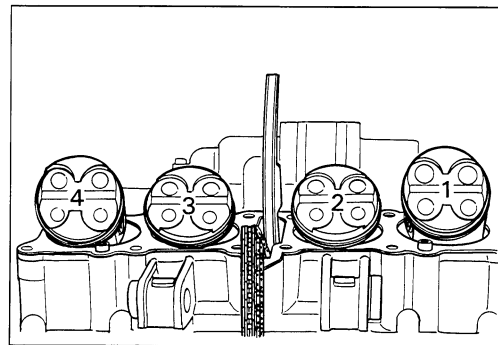
- Remove the cylinder nut **B**.



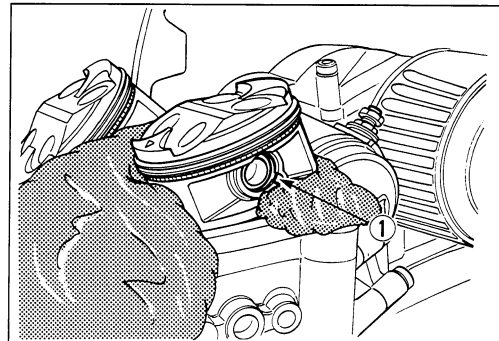
- Firmly grip the cylinder block at both ends, and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to make the gasketed joint loose.



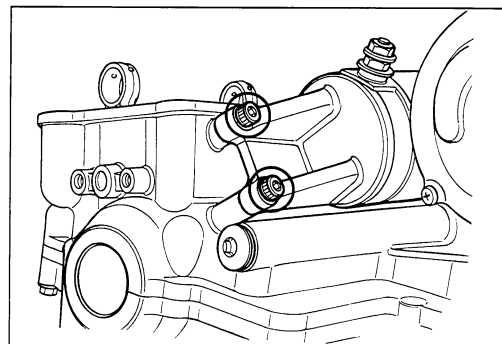
- Scribe the cylinder number on the head of the respective pistons.



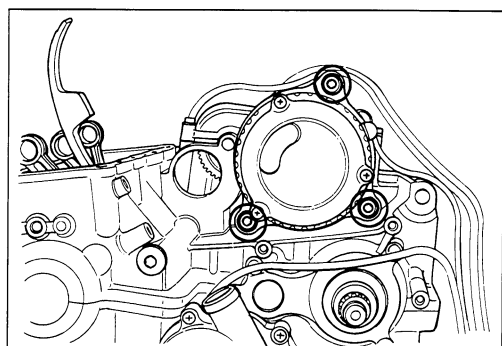
- Place a cloth beneath the piston so as not to drop any parts in the crankcase, and remove the circlip ① with long-nose pliers.
- Draw out the piston pin. Place each piston pin in the same piston as that it was removed from.



- Remove the starter motor by removing the bolts.

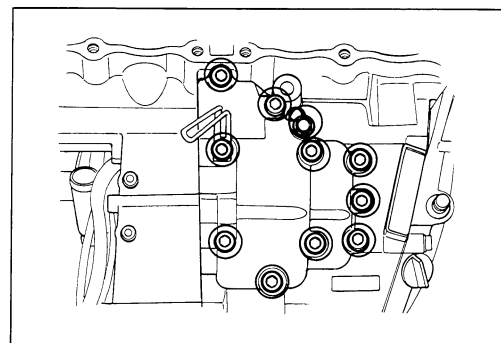


- Remove the generator by removing the bolts.

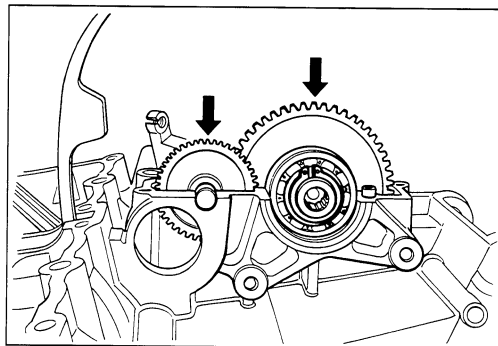


- Remove the starter clutch cover by removing the bolts.

**09911-73730: 5 mm "T" type hexagon wrench**

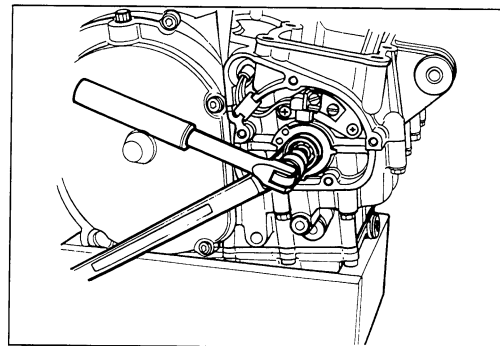


- Remove the starter idle gear and its shaft.
- Remove the starter clutch assembly.

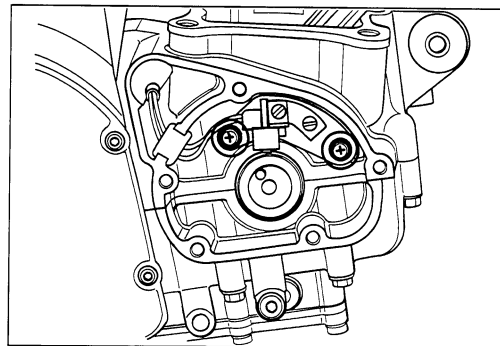


- Remove the signal generator rotor by removing the bolt.

**09900-00410: Hexagon wrench set**

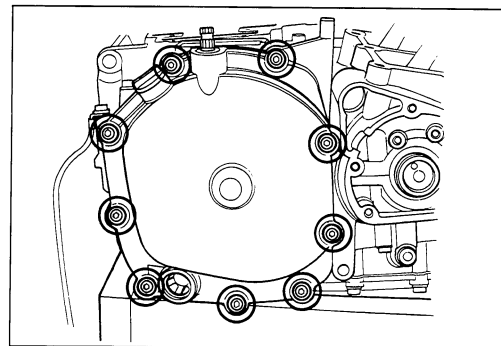


- Remove the signal generator stator by removing the two screws.



- Remove the clutch cover by removing the bolts.

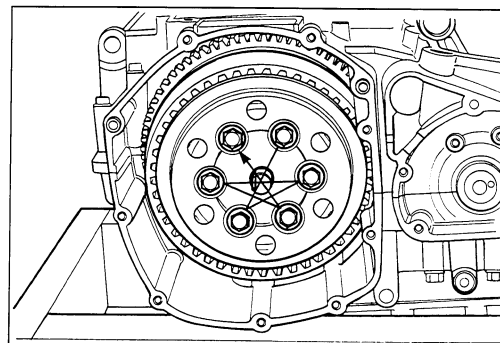
**09911-73730: 5 mm "T" type hexagon wrench**



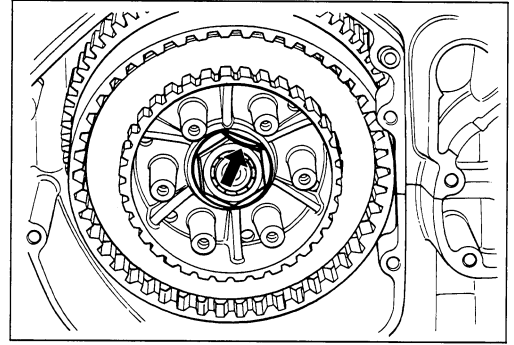
- Remove the clutch spring set bolts diagonally while holding the conrod with the special tool.

**09910-20116: Conrod stopper**

- Remove the clutch pressure plate along with its release bearing and rack.

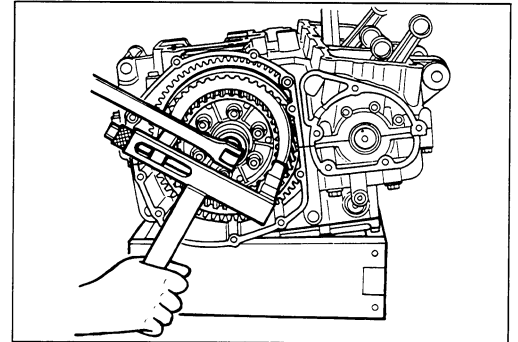


- Flatten the lock washer of the clutch sleeve nut.

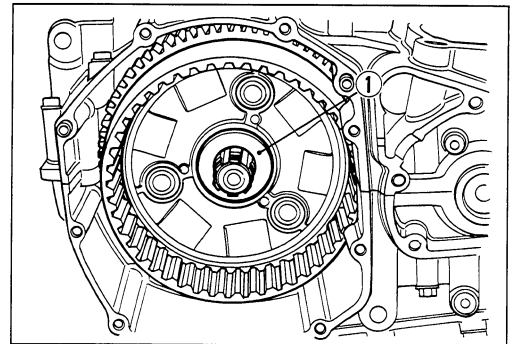


- After removing the several clutch plates, remove the clutch sleeve hub nut after firmly locking the clutch sleeve hub with a clutch sleeve hub holder, and then remove the remainder of clutch drive and driven plates along with the clutch sleeve hub.

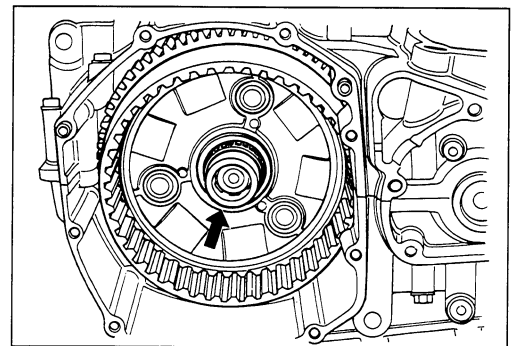
## 09920-53740: Clutch sleeve hub holder



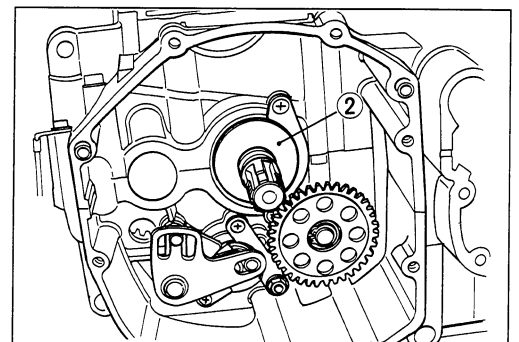
- Remove the thrust washer ① .



- With the spacer and bearing removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.
- Remove the primary driven gear assembly with the generator/oil pump drive gears.



- Remove the thrust washer ② .

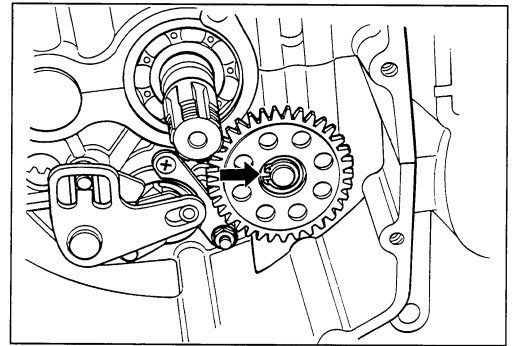


- Remove the oil pump driven gear by removing the circlip.

**09900-06107: Snap ring pliers**

**NOTE:**

*Do not lose the circlip, pin and washers.*



- Remove the circlip and washer from the gearshift shaft.

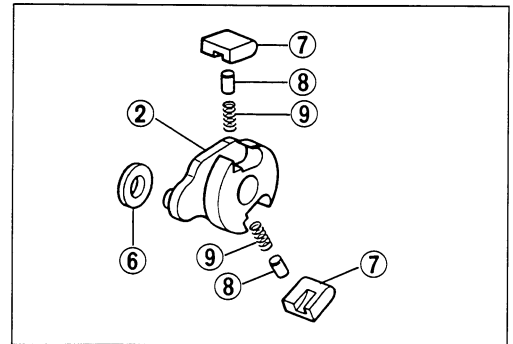
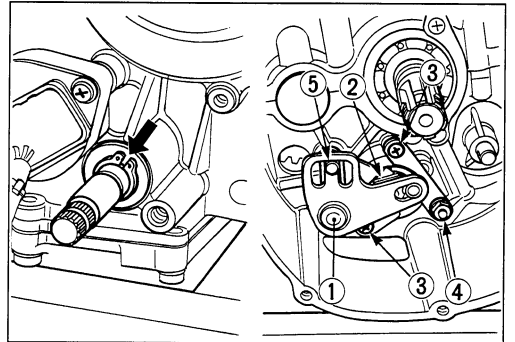
**09900-06107: Snap ring pliers**

- Draw out the gearshift shaft/gearshift arm ①, and then remove the cam shifter ② by removing the screws ③, nut ④ and arm stopper bolt ⑤.

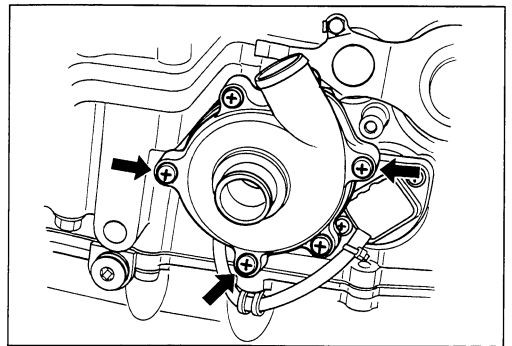
**09900-09003: Impact driver set**

**NOTE:**

*When removing the cam shifter ②, do not lose the gear shifting roller ⑥, pawl ⑦, pin ⑧ and spring ⑨.*



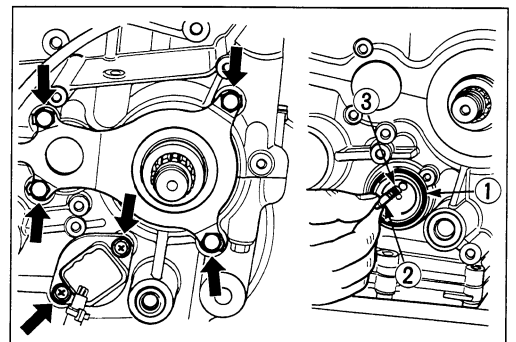
- Remove the water pump by removing the mounting screws.



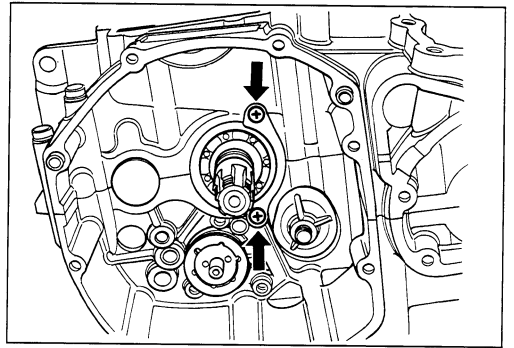
- Flatten the lock portions of the oil seal retainer and remove it by removing the four bolts.
- Remove the neutral position indicator switch by removing the screws.

**NOTE:**

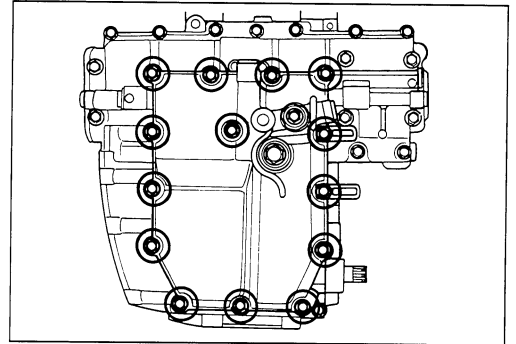
*Do not lose the O-ring ①, switch contact ② and its spring ③.*



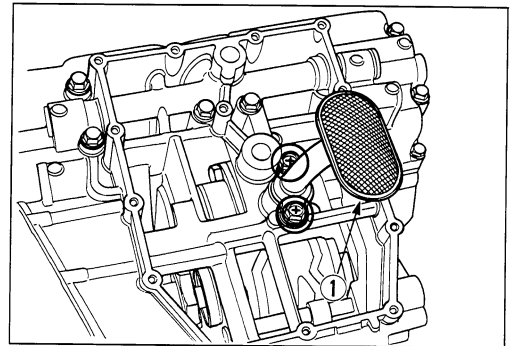
- Remove the countershaft bearing retainer by removing the two screws.



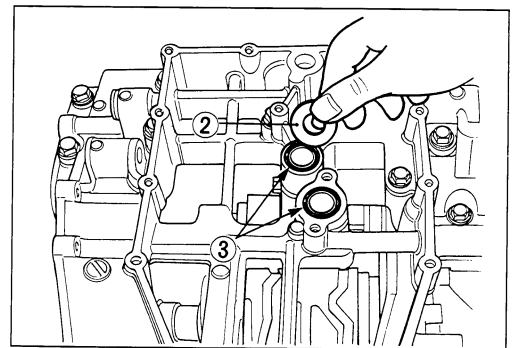
- Remove the oil pan by removing the bolts.



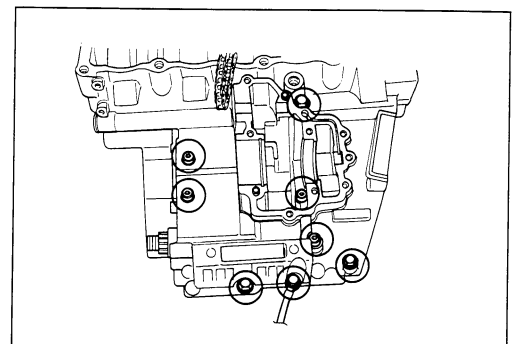
- Remove the oil sump filter ① by removing the two bolts.



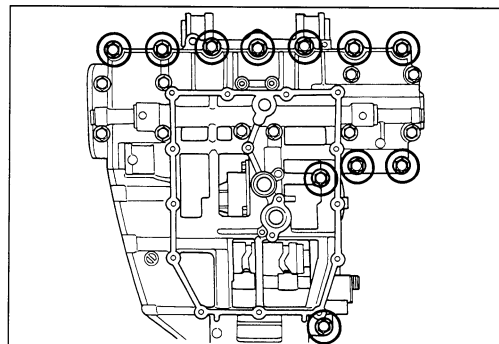
- Remove the shim ② and O-rings ③ .



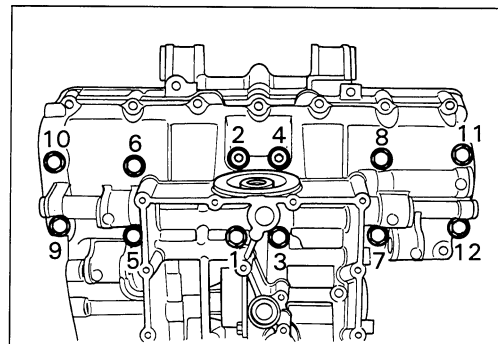
- Remove the upper crankcase tightening bolts.



- Remove the lower crankcase tightening bolts.



- When removing the crankshaft tightening bolts, loosen them in the descending order of numbers assigned to these bolts.
- Make sure that all bolts are removed without fail. Hammer lightly the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.



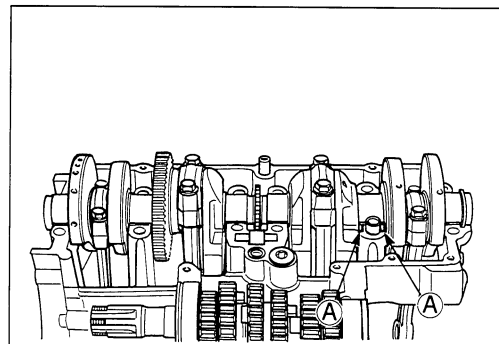
**CAUTION:**

**Do not drop the crankshaft journal bearings from the lower crankcase.**

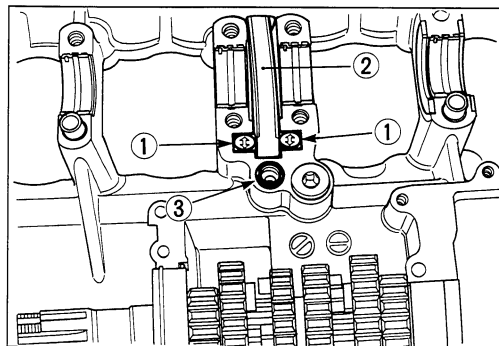
- Remove the crankshaft assembly from the upper crankcase.

**NOTE:**

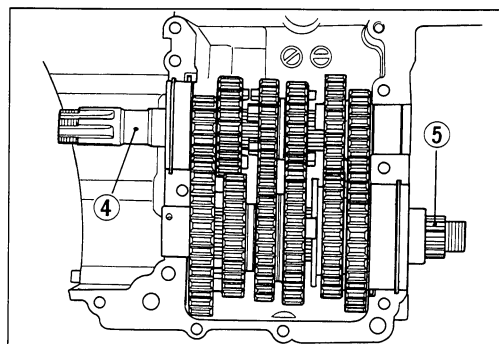
*Bear in mind that the crankshaft thrust bearings (A) are located between the shaft and the case.*



- Remove the two dampers (1) and cam chain guide (2) .
- Remove the O-ring (3) .



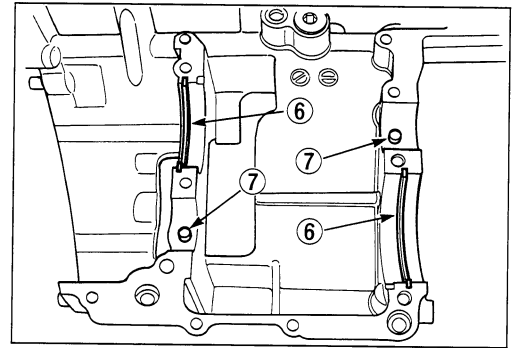
- Remove the countershaft assembly (4) and driveshaft assembly (5) .



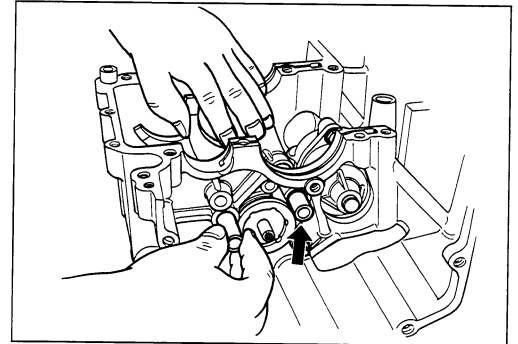


## NOTE:

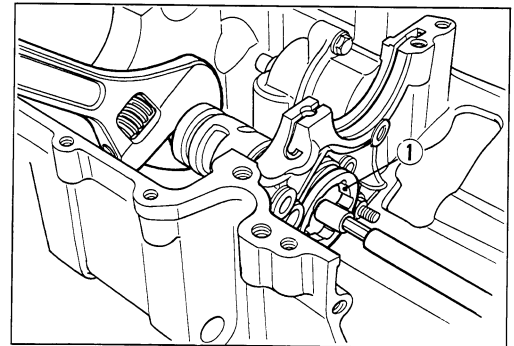
Do not lose the C-rings ⑥ and bearing pins ⑦ .



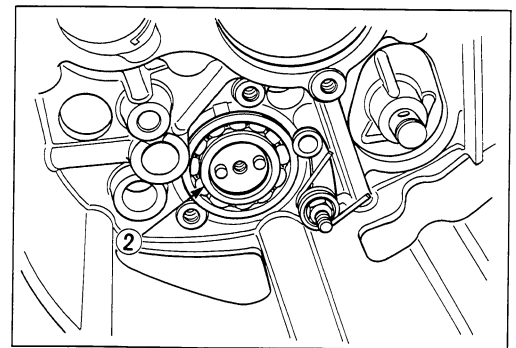
- Hold the gearshift forks by hand while drawing out the gearshift fork shafts from the lower crankcase.



- Remove the gearshift cam stopper plate ① by removing the bolt while holding the gearshift cam with an adjuster wrench.



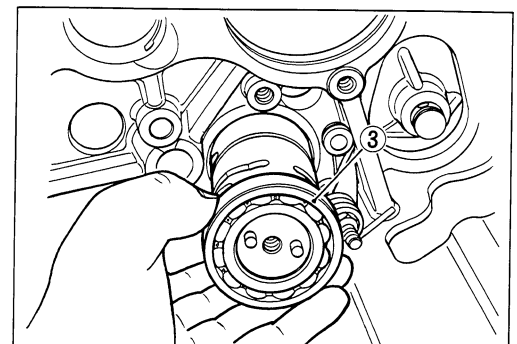
- Remove the washer ② .



- Draw out the gearshift cam with bearing from the lower crankcase.

## NOTE:

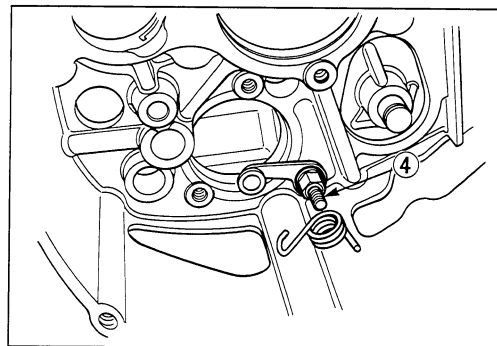
Rotate the bearing ③ on the gearshift cam by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.



**NOTE:**

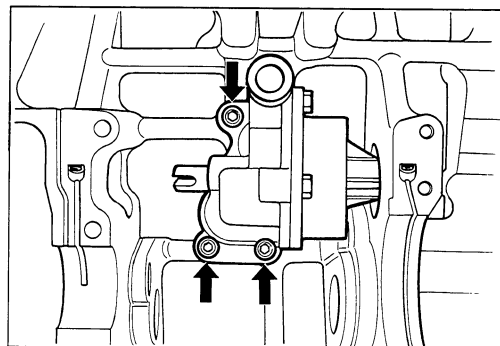
When replacing the gearshift cam stopper bolt ④, apply a small quantity of **THREAD LOCK "1342"** to the bolt.

**99000-32050: THREAD LOCK "1342"**

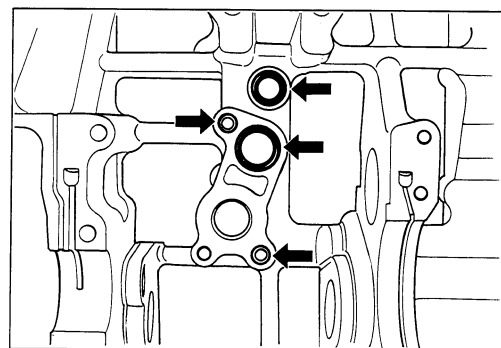
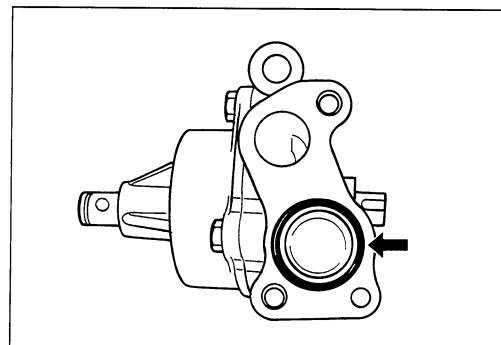


- Remove the oil pump by removing the mounting bolts.

**09900-00410: Hexagon wrench set**



- Remove the oil pump O-rings and dowel pins.



## ENGINE COMPONENTS INSPECTION AND SERVICE

### CYLINDER HEAD SERVICE

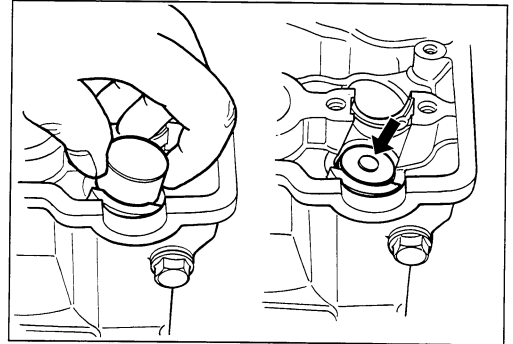
#### CAUTION:

Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "No.1", "No.2", "Exhaust", "Inlet", so that each will be restored to the original location during assembly.

#### NOTE:

If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.

- Remove the tappets and shims by fingers or magnetic hand.

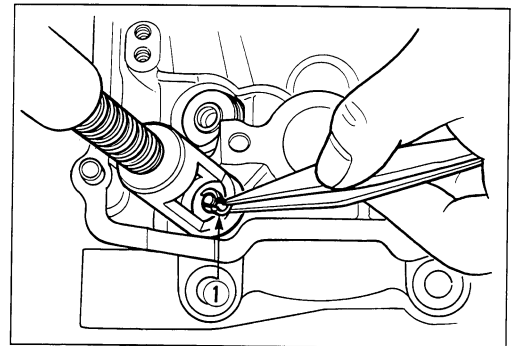
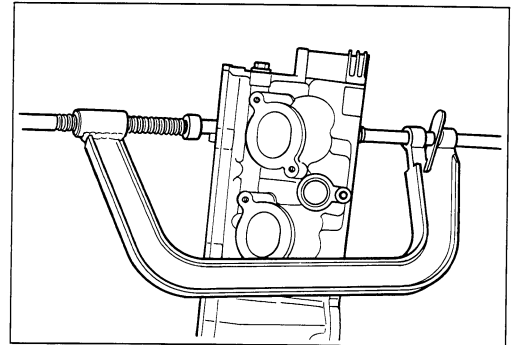


- Using special tools, compress the valve spring and remove the two cotter halves ① from valve stem.

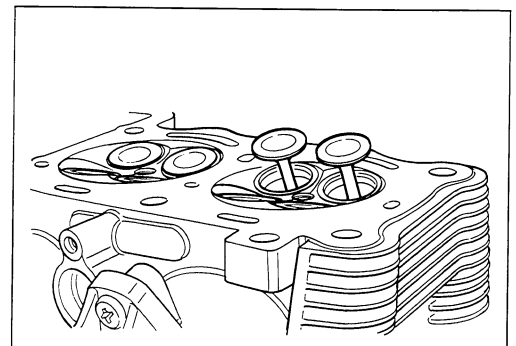
**09916-14510: Valve lifter**

**09916-14520: Valve lifter attachment**

**09916-84511: Tweezers**



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



## CYLINDER HEAD DISTORTION

Decarbonize the combustion chambers.

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

**09900-20803: Thickness gauge**

**Service Limit: 0.2 mm (0.008 in.)**

## VALVE STEM RUNOUT

Support the valve with "V" blocks, as shown, and check its runout with a dial gauge.

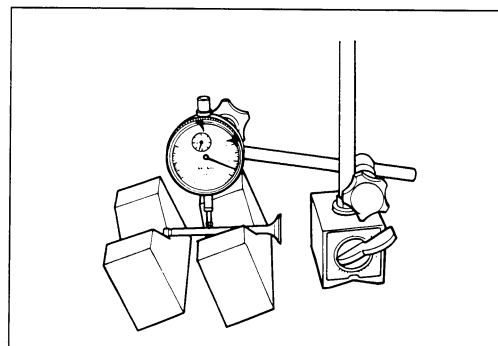
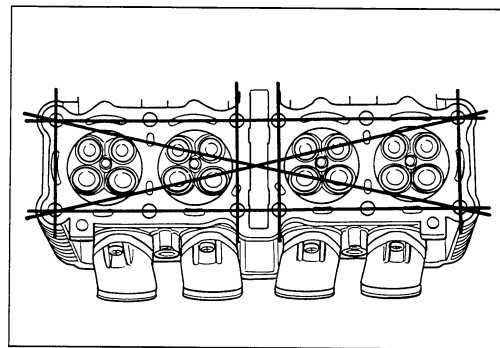
The valve must be replaced if the runout exceeds the limit.

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

**09900-20701: Magnetic stand**

**09900-21304: V-block (100 mm)**

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



## VALVE HEAD RADIAL RUNOUT

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

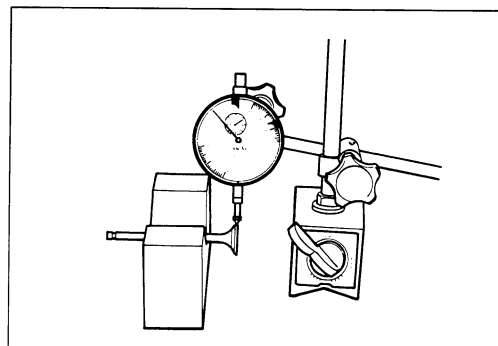
If it measures more than the limit, replace the valve.

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

**09900-20701: Magnetic stand**

**09900-21304: V-block (100 mm)**

**Service Limit: 0.03 mm (0.001 in.)**



## VALVE FACE WEAR

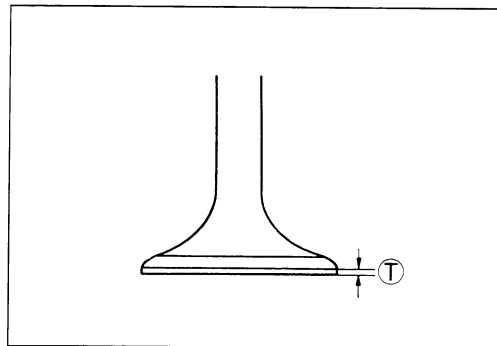
Visually inspect each valve for wear of its seating face.

Replace any valve with an abnormally worn face. The thickness  $\textcircled{T}$  decreases as the wear of the face advances.

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

**09900-20102: Vernier calipers**

**Service Limit  $\textcircled{T}$ : 0.5 mm (0.02 in)**



## VALVE STEM DEFLECTION

Lift the valve about 10 mm (0.39 in) from the valve seat.

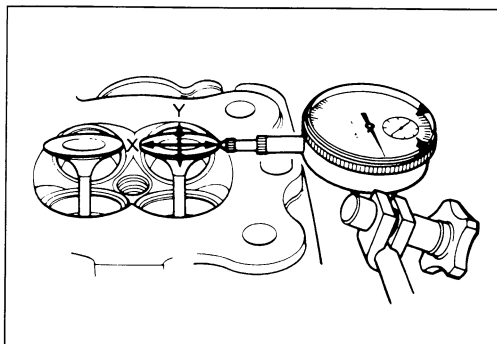
Measure the valve stem deflection in two directions, "X" and "Y", perpendicular to each other, by positioning the dial gauge as shown. If the deflection measured exceeds the limit, (see below) then determine whether the valve or the guide should be replaced with a new one.

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

**09900-20701: Magnetic stand**

**Service Limit**

**Intake and exhaust valves: 0.35 mm (0.014 in)**



## VALVE STEM WEAR

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

**09900-20205: Micrometer (0—25 mm)**

### Standard

**Intake valves : 4.465—4.480 mm (0.1758—0.1764 in)**

**Exhaust valves: 4.455—4.470 mm (0.1754—0.1760 in)**

## VALVE GUIDE SERVICING

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

**09916-43210: Valve guide remover/installer**

### NOTE:

- \* *Discard the removed valve guide subassemblies.*
- \* *Only oversized valve guides are available as replacement parts. (Part No. 11115-17E70)*

- Re-finish the valve guide holes in cylinder head with the reamer and handle.

**09916-34580: Valve guide reamer**

**09916-34542: Reamer handle**

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

**09916-43210: Valve guide remover/installer**

**09916-43230: Attachment**

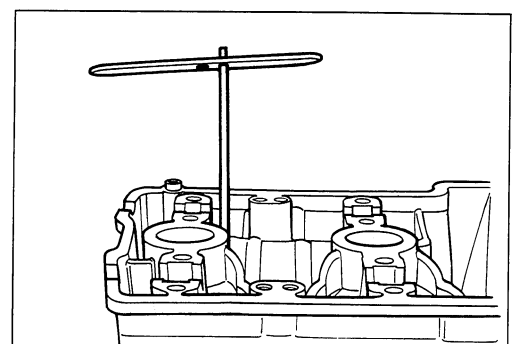
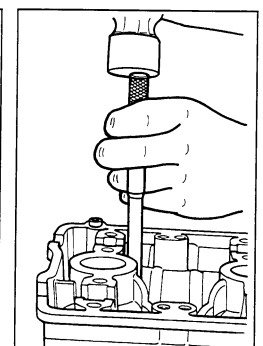
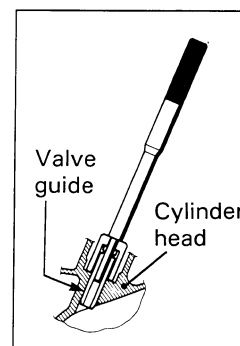
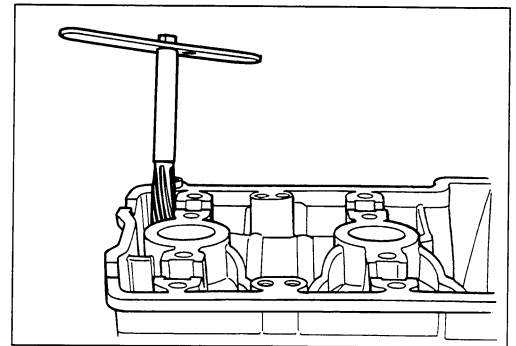
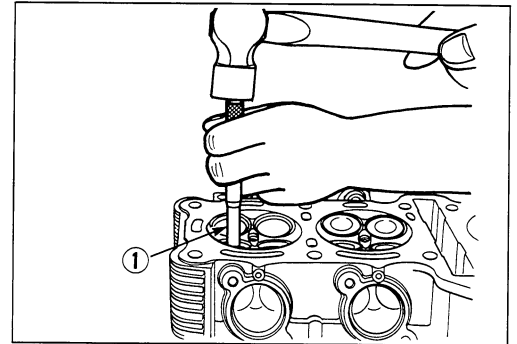
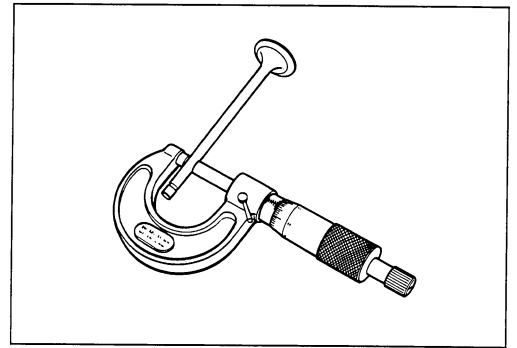
### CAUTION:

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

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

**09916-33210: Valve guide reamer**

**09916-34542: Reamer handle**



## VALVE SEAT WIDTH

- Coat the valve seat uniformly with Prussian blue. 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 lap- per 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 following specification:

### Standard

Valve seat width  $\textcircled{W}$ : 0.9—1.1 mm (0.035—0.043 in)

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

## VALVE SEAT SERVICING

The valve seats for both intake and exhaust valves are machined to four different angles. (The seat contact surface is cut 45°.)

	INTAKE		EXHAUST
45°	N-116 or N-122	45°	N-116 or N-122
30°	N-126	15°	N-120 or N-121
60°	N-111		

Valve seat cutter: (N-111), (N-126), (N-121), (N-122), (N-116) and (N-120)

Solid pilot: (N-100-4.5)

### NOTE:

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

09916-20610: Valve seat cutter (N-121)

09916-20620: Valve seat cutter (N-122)

09916-20630: Valve seat cutter (N-126)

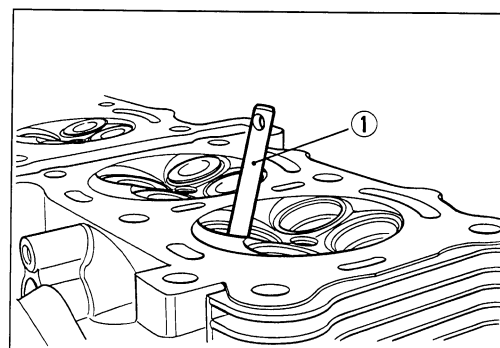
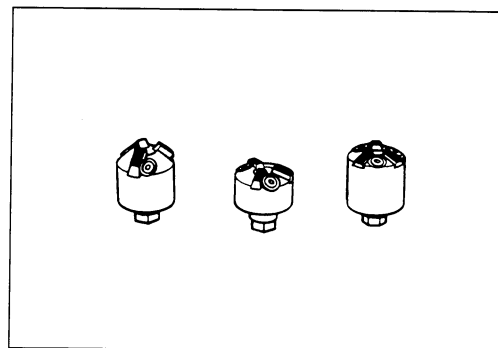
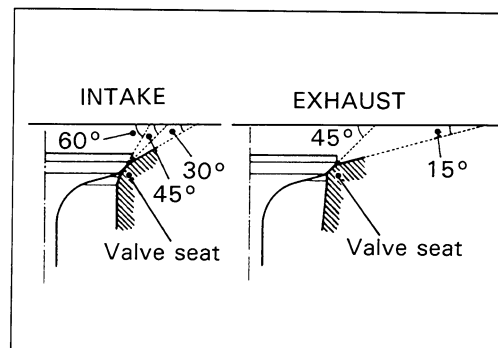
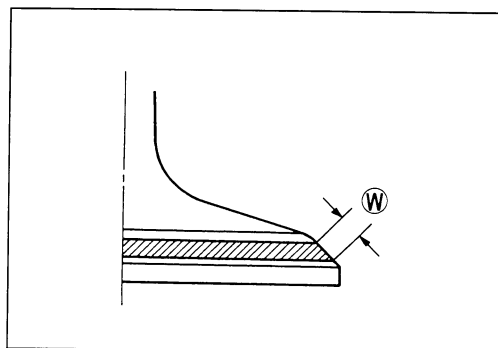
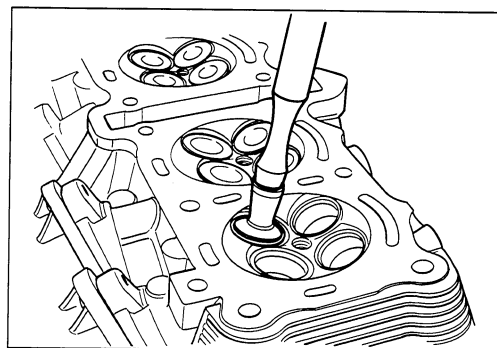
09916-20640: Solid pilot (N-100-4.5)

09916-21110: Valve seat cutter set

- Insert the solid pilot  $\textcircled{1}$  with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T-handle.
- Using the 45° cutter, descale and clean up the seat with one or two turns.
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

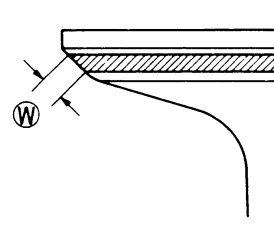
### NOTE:

*Cut only the minimum amount necessary from the seat to prevent the possibility of the tappet shim replacement.*



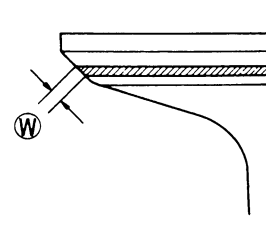
If the contact area is too high on the valve, or if it is too wide, use the 15° cutter (for exhaust side) and 30°/60° cutters (for intake side) to lower and narrow the contact area.

Contact area too high and too wide 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 low and too narrow on face of valve



- 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.

#### CAUTION:

**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.

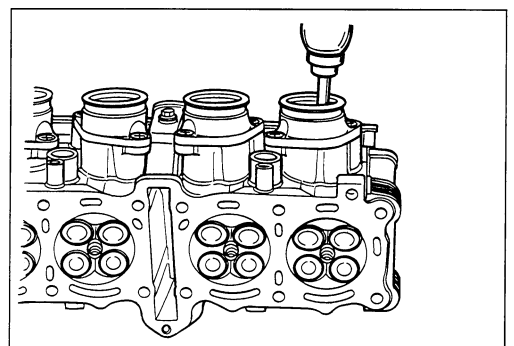
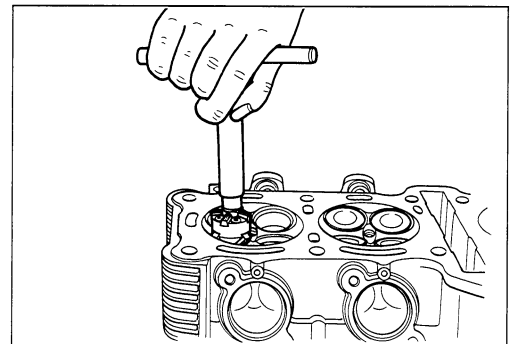
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

#### WARNING:

**Always use extreme caution when handling gasoline.**

#### NOTE:

*After servicing the valve seats, be sure to check the tappet clearance after the cylinder head has been reinstalled. (see page 2-4.)*



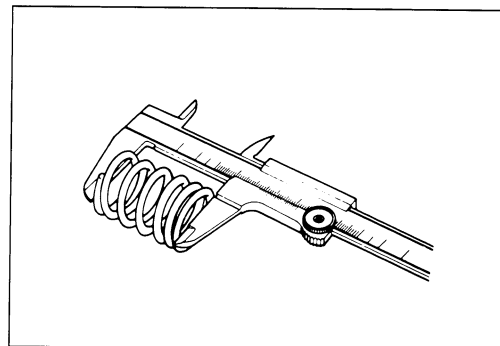
## VALVE SPRING

The force of the coil spring keeps the valve seat tight. Weakened spring result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.

Check the valve spring for proper strength by measuring its free length and also by the force required to compress it. If the spring length is less than the service limit, or if the force required to compress the spring does not fall within the range specified, replace the spring.

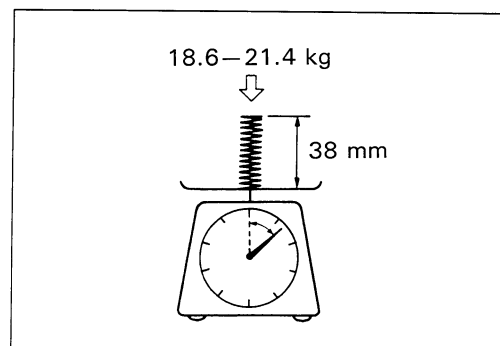
### Valve spring free length

**Service Limit: 43.0 mm (1.69 in)**



### Valve spring tension

**Standard: 18.6—21.4 kg/38 mm (41.0—47.2 lbs/1.5 in)**



## REASSEMBLY

- Oil each oil seal, and press-fit them into position with the valve guide installer.

**09916-43210: Valve guide remover/installer**

### CAUTION:

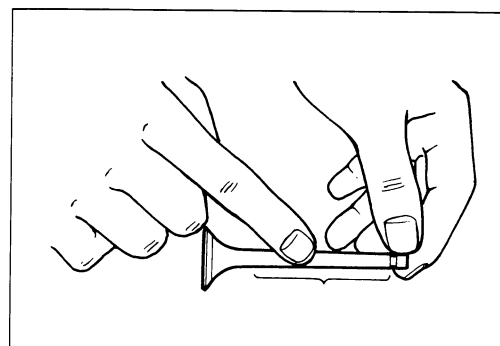
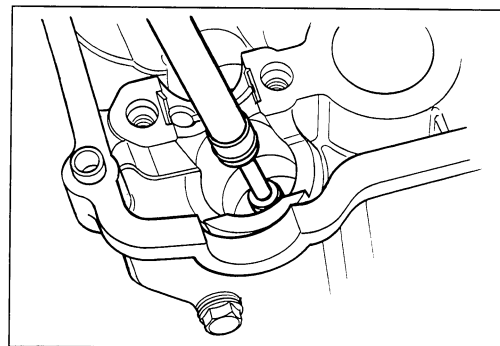
**Do not reuse the oil seals.**

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

### CAUTION:

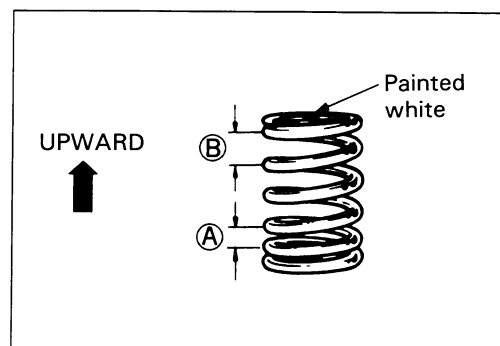
**When inserting each valve, take care not to damage the lip of the oil seal.**

**99000-25140: SUZUKI MOLY PASTE**

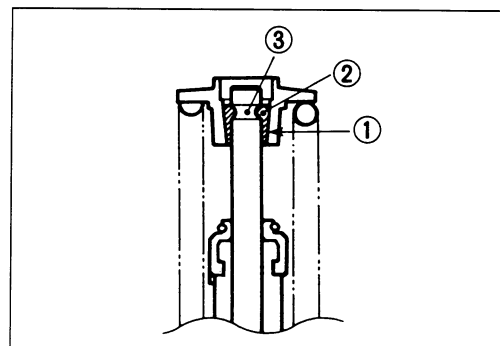




- Install the valve spring with the small-pitch portion (A) facing cylinder head. (B) Large-pitch portion.



- Put on the valve spring retainer and, using the valve lifter, press down the spring, fit the cotter halves to the stem end, and release the lifter to allow the cotter (1) to wedge in between retainer and stem. Be sure that the rounded lip (2) of the cotter fits snugly into the groove (3) in the stem end.



**09916-14510: Valve lifter**

**09916-14520: Valve lifter attachment**

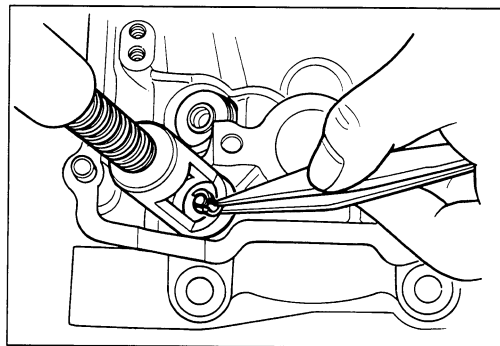
**09916-84511: Tweezers**

#### CAUTION:

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

#### NOTE:

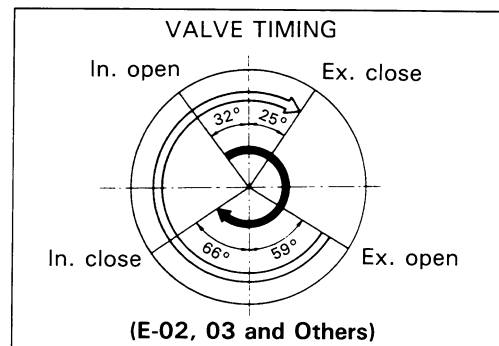
Apply engine oil to the shim and tappet before fitting them.



## CAMSHAFT

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

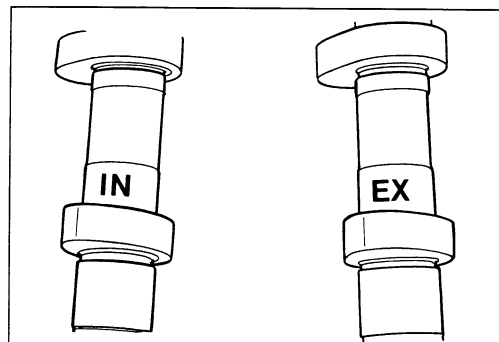
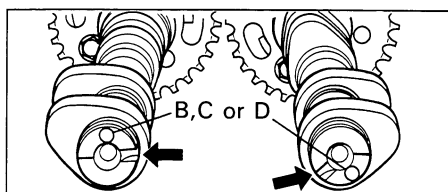
	In. open	In. close	Ex. open	Ex. close
E-04	36°	62°	55°	29°
E-18 and 39	9°	65°	59°	22°



The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake).

Similarly, the right end can be distinguished by the notch from the left end.

	In.	Ex.
E-04	D	D
E-18 and 39	C	C
E-02,03 and others	B	B



## CAM WEAR

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

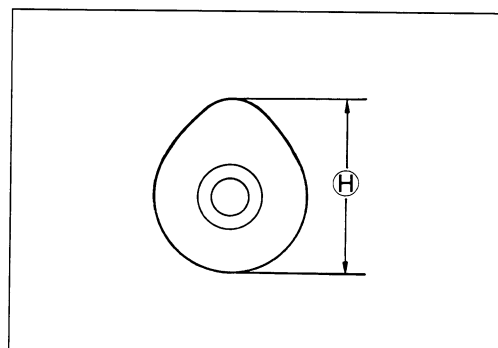
The limit of cam wear is specified for both intake and exhaust cams in terms of cam height  $\textcircled{H}$ , which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

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

**Cam height  $\textcircled{H}$**

**Service Limit**

	Intake cams	Exhaust cams
E-02,03 and others	36.02 mm (1.418 in)	35.61 mm (1.402 in)
E-18 and 33	34.25 mm (1.348 in)	33.83 mm (1.332 in)
E-04	36.02 mm (1.418 in)	35.61 mm (1.402 in)



## CAMSHAFT JOURNAL WEAR

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

**Camshaft-Journal oil clearance (IN & EX)**

**Service Limit: 0.150 mm (0.0059 in)**

**09900-22301: Plastigauge**

**NOTE:**

*Install each holder to their original positions. (page 3-62.)*

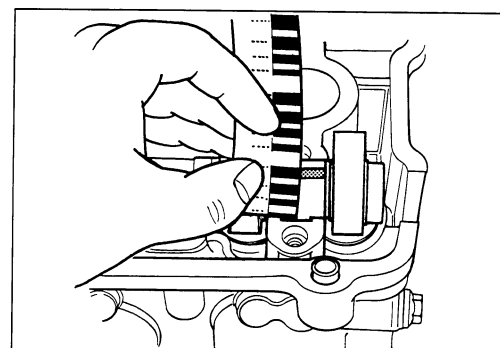
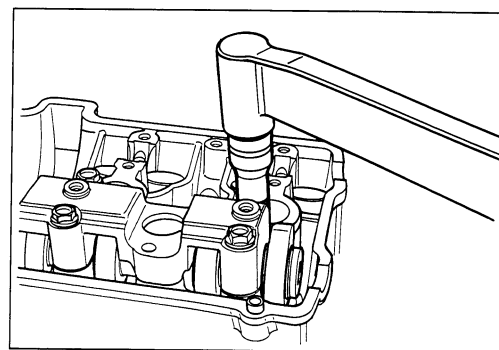
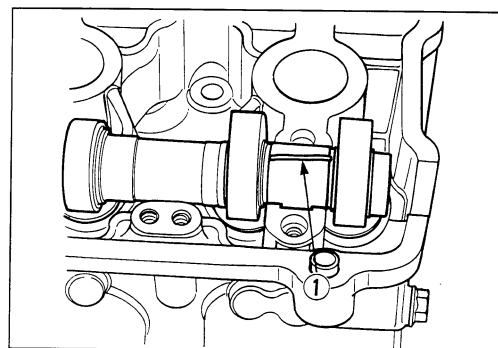
Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

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

**NOTE:**

*Do not rotate the camshafts with the plastigauge in place.*

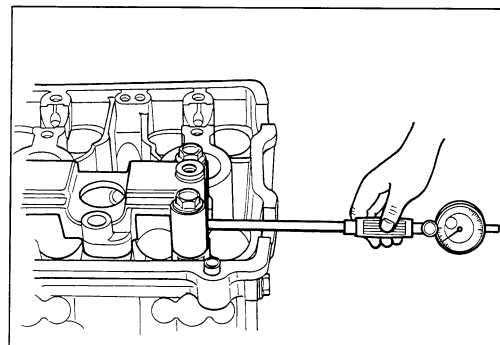
Remove the camshaft holders, and read the width of the compressed plastigauge with envelope scale. This measurement should be taken at the widest part.



If the camshaft journal oil clearance measured exceeds the limit, measure the inside diameter of the camshaft journal holder and outside diameter of the camshaft journal. Replace the camshaft or the cylinder head depending upon which one exceeds the specification.

#### Standard

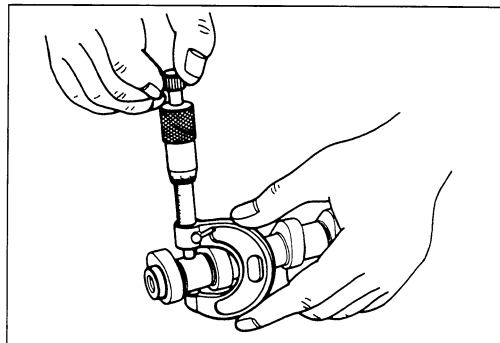
**Journal holder I.D. (IN & EX): 22.012–22.025 mm**  
(0.8666–0.8671 in)



**09900-20205: Micrometer (0–25 mm)**

#### Standard

**Camshaft journal O.D. (IN & EX): 21.959–21.980 mm**  
(0.8645–0.8654 in)



## CAMSHAFT RUNOUT

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

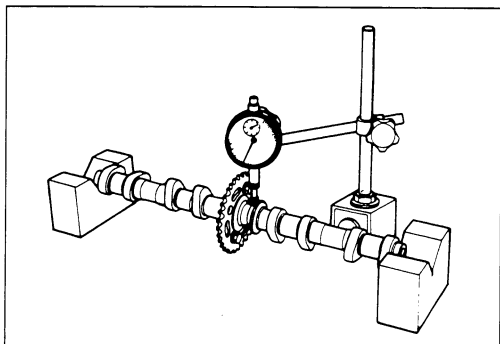
**Camshaft runout (IN & EX)**

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

**09900-20606: Dial gauge (1/100 mm, 10 mm)**

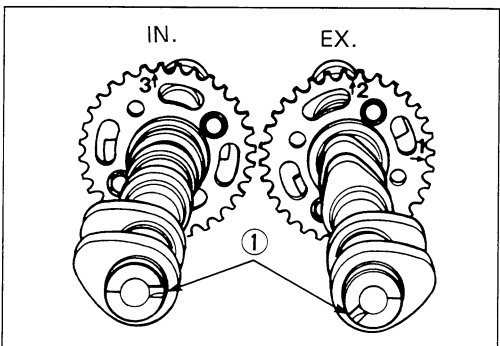
**09900-20701: Magnetic stand**

**09900-21304: V-block (100 mm)**



## CAM SPROCKET

The fixed position of each cam sprocket on each camshaft is determined by arrow mark "3" (on INTAKE sprocket) or arrow marks "1" and "2" (on EXHAUST sprocket) located (as shown) in reference to the notch ① in the right end of each camshaft.

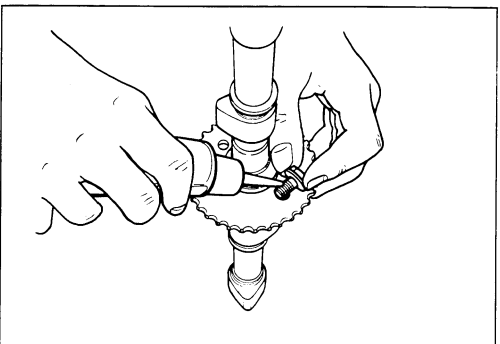


## REASSEMBLY

- Apply THREAD LOCK SUPER "1303" to the threads of cam sprocket bolts, and tighten them to the following torque value:

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

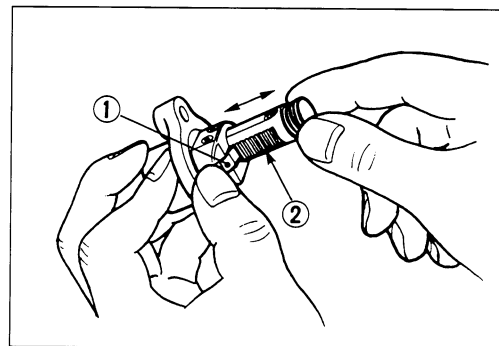
**Tightening torque: 24–26 N·m**  
(2.4–2.6 kg-m, 17.5–19.0 lb-ft)



## CAM CHAIN TENSIONER

The cam chain tensioner is maintained at the proper tension by an automatically adjusted tensioner.

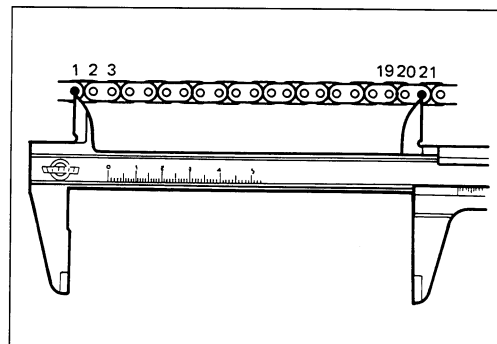
Unlock the ratchet mechanism ①, and move the push rod ② in place to see if it slides smoothly. If any stickiness is noted or ratchet mechanism is faulty, replace the cam chain tensioner assembly with a new one.



## CAM CHAIN 20-PITCH LENGTH

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

**Service Limit: 158.0 mm (6.22 in)**



## CAM CHAIN GUIDE

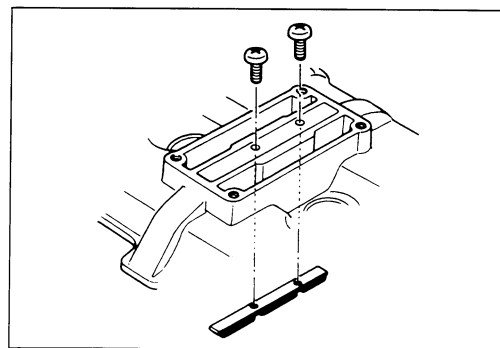
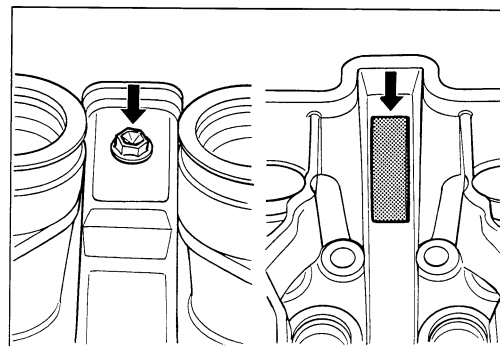
### NOTE:

When replacing the cam chain guides, apply **SUZUKI THREAD LOCK SUPER "1303"** to threads of bolt and screws.

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

**Cam chain guide**

**mounting bolt: 4–7 N·m**  
(0.4–0.7 kg-m, 3.0–5.0 lb-ft)



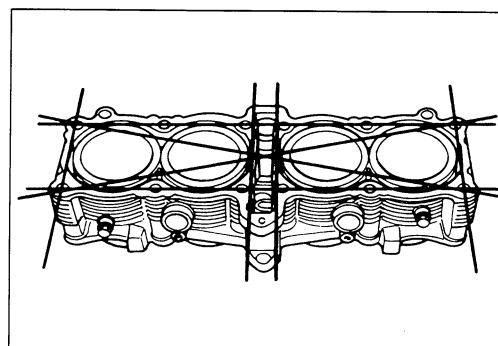
## CYLINDER BLOCK DISTORTION

Check the gasketed surface of the cylinder block 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 block.

**09900-20803: Thickness gauge**

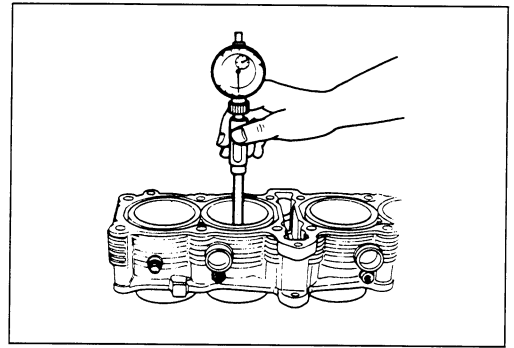
**Cylinder distortion**

**Service Limit: 0.2 mm (0.008 in)**



## CYLINDER BORE

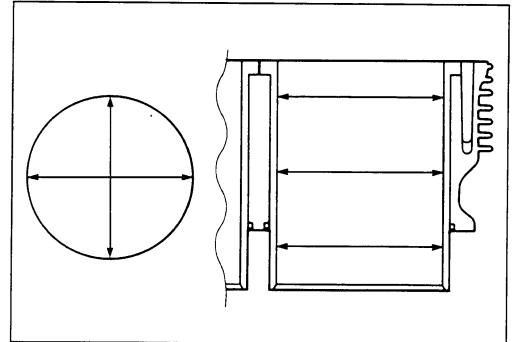
Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize piston. The remaining cylinders must be also rebored accordingly. Otherwise, the imbalance might cause excess vibration.



### Cylinder bore

**Service Limit:** 65.075 mm (2.5620 in)

**09900-20508:** Cylinder gauge set

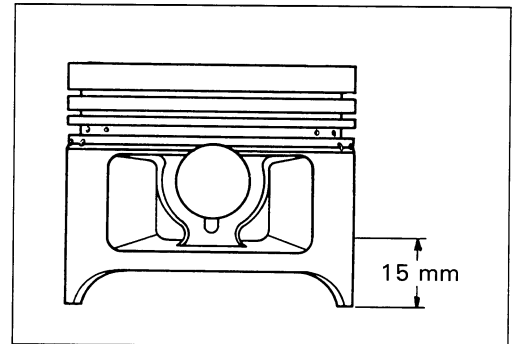


## PISTON DIAMETER

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

**Service Limit:** 64.880 mm (2.5543 in)

**09900-20203:** Micrometer (50—75 mm)

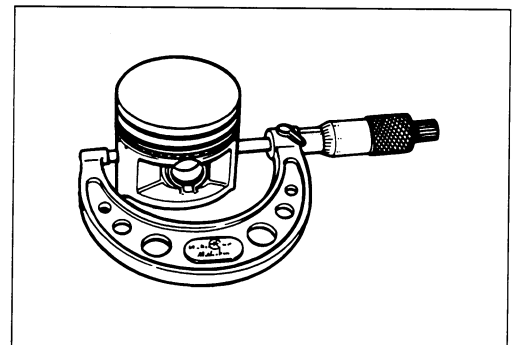


## PISTON-CYLINDER CLEARANCE

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

**Service Limit:** 0.12 mm (0.0047 in)

**Piston oversize:** 0.5, 1.0 mm



## PISTON RING-GROOVE CLEARANCE

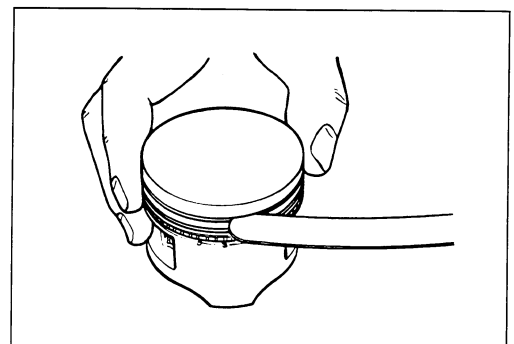
Using a thickness gauge, measure the side clearances of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

**09900-20803:** Thickness gauge

**Piston ring-groove clearance**

**Service Limit**

**1st & 2nd:** 0.18 mm (0.007 in)



**Piston ring groove width**

1st : 0.83–0.85 mm (0.032–0.033 in)

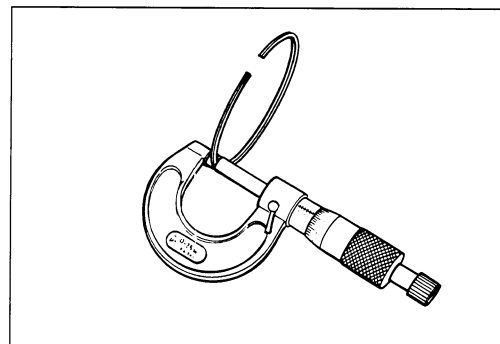
Standard 2nd: 0.82–0.84 mm (0.032–0.033 in)

Oil : 1.51–1.53 mm (0.059–0.060 in)

**Piston ring thickness**

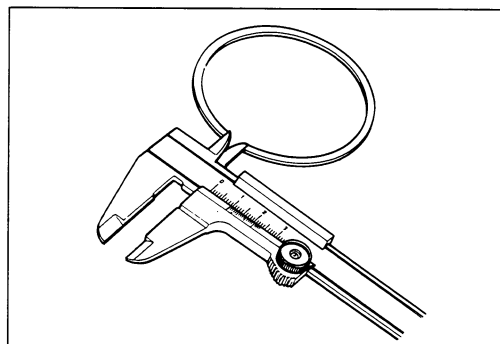
Standard

1st &amp; 2nd: 0.77–0.79 mm (0.030–0.031 in)

**PISTON RING FREE END GAP AND PISTON RING END GAP**

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

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

**Piston ring free end gap**

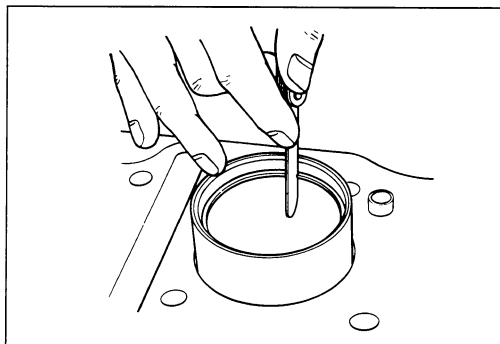
1st : 6.0 mm (0.24 in)

Service Limit 2nd: 6.4 mm (0.25 in)

**09900-20102: Vernier calipers****Piston ring end gap**

Service Limit

1st &amp; 2nd: 0.5 mm (0.02 in)

**09900-20803: Thickness gauge****Oversize piston ring**

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

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

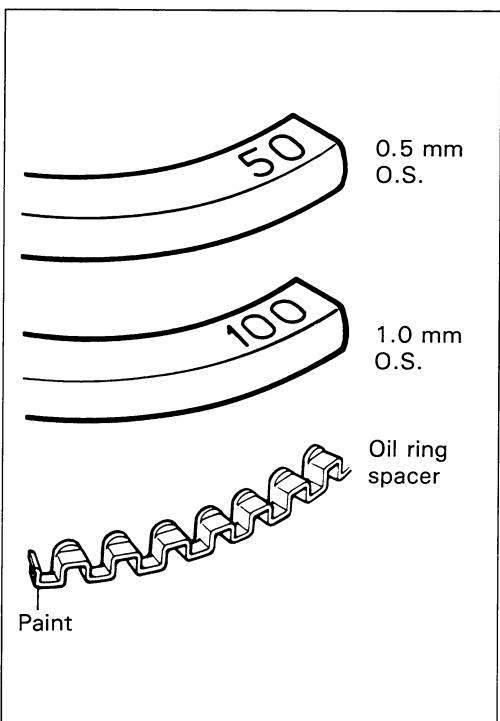
**Oversize oil ring**

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

SIZE	COLOR
STD	NIL
0.5 mm O.S.	Painted red
1.0 mm O.S.	Painted yellow

**Oversize side rail**

Just measure out side diameter to identify the size.



## PISTON PIN AND PIN BORE

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

**Piston pin bore I.D.**

**Service Limit: 16.030 mm (0.6311 in)**

**09900-20602: Dial gauge (1/1000 mm, 1 mm)**

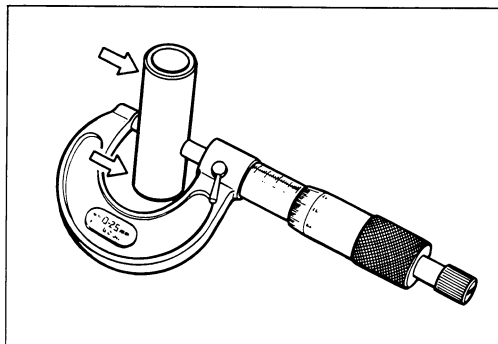
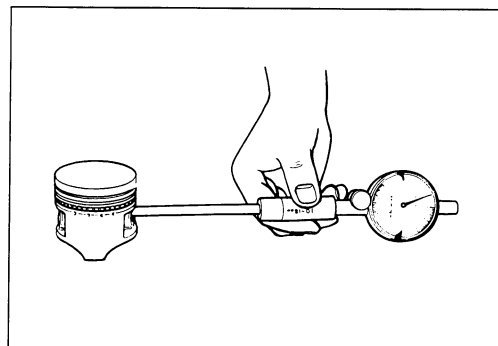
**09900-22401: Small bore gauge (10–18 mm)**

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

**Piston pin O.D.**

**Service Limit: 15.980 mm (0.6291 in)**

**09900-20205: Micrometer (0–25 mm)**



## CONROD SMALL END I.D.

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

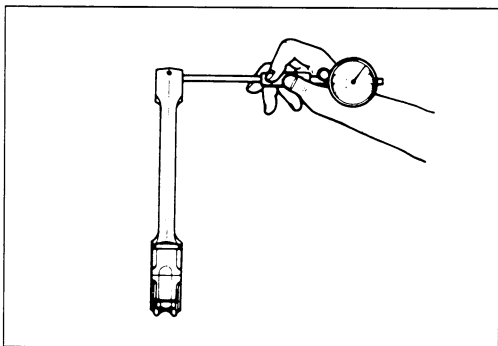
**09900-20602: Dial gauge (1/1000 mm, 1 mm)**

**09900-22401: Small bore gauge (10–18 mm)**

**Conrod small end I.D.**

**Service Limit: 16.040 mm (0.6315 in)**

If the conrod small end inside diameter exceeds the above-mentioned limit, replace the conrod.

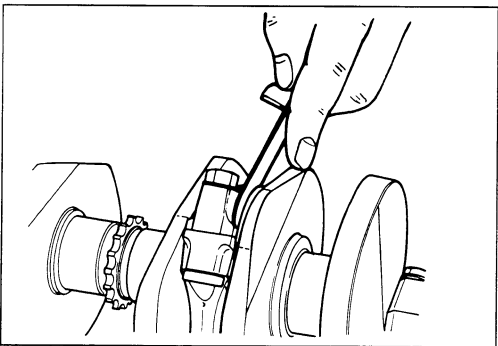


## CONROD BIG END SIDE CLEARANCE

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

**Service Limit: 0.3 mm (0.01 in)**

**09900-20803: Thickness gauge**



**Standard**

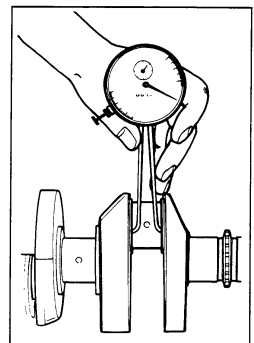
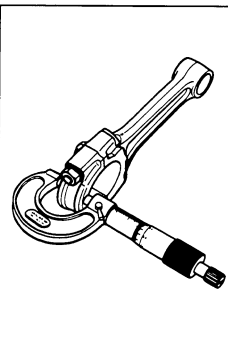
**Big end width: 20.95–21.00 mm (0.825–0.827 in)**

**Standard**

**Crank pin width: 21.10–21.15 mm (0.831–0.833 in)**

**09900-20205: Micrometer (0–25 mm)**

**09900-20605: Dial calipers (10–34 mm)**



## CONROD-CRANK PIN BEARING SELECTION

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

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

**Initial tightening torque: 32–37 N·m**

**(3.2–3.7 kg-m, 23.0–27.0 lb-ft)**

**Final tightening torque: 65–68 N·m**

**(6.5–6.8 kg-m, 47.0–49.0 lb-ft)**

### 09900-22301: Plastigauge

#### NOTE:

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

#### NOTE:

*Never rotate the crankshaft or conrod when a piece of plastigauge is in the clearance.*

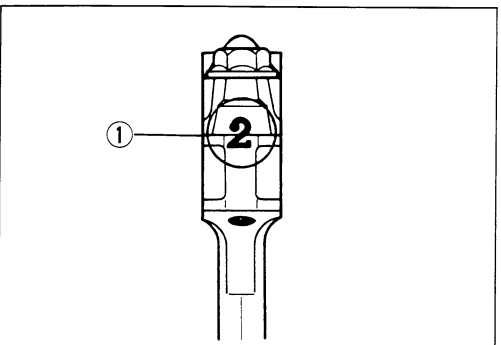
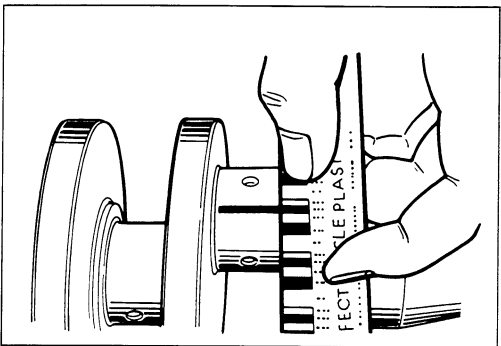
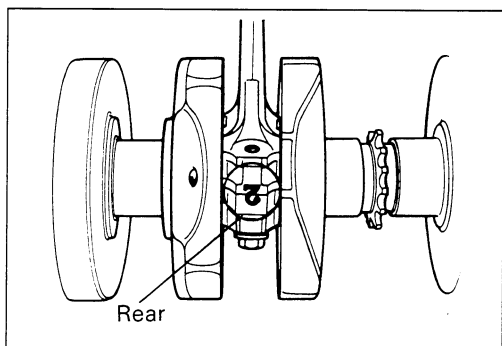
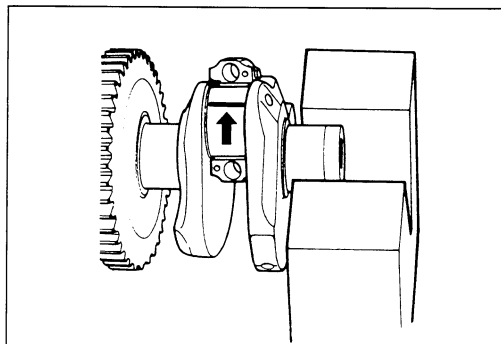
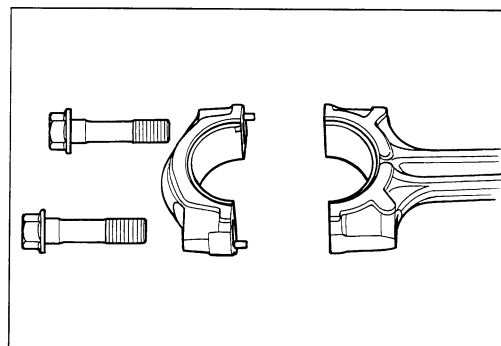
- Remove the caps, and measure the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

#### Crank pin bearing oil clearance

**Standard: 0.032–0.056 mm (0.0013–0.0022 in)**

**Service Limit: 0.080 mm (0.0031 in)**

- If oil clearance exceeds the service limit, select the specified bearings from the bearing selection table.
- Check the corresponding conrod I.D. code number ①, "1" or "2".





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

#### Bearing selection table

		Crank pin O.D. ②		
	Code	1	2	3
Conrod I.D. ①	1	Green	Black	Brown
	2	Black	Brown	Yellow

#### Conrod I.D. specification

Code	I.D. specification
1	37.000–37.008 mm (1.4567–1.4570 in)
2	37.008–37.016 mm (1.4570–1.4573 in)

#### Crank pin O.D. specification

Code	O.D. specification
1	33.992–34.000 mm (1.3383–1.3386 in)
2	33.984–33.992 mm (1.3380–1.3383 in)
3	33.976–33.984 mm (1.3376–1.3380 in)

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

#### Bearing thickness

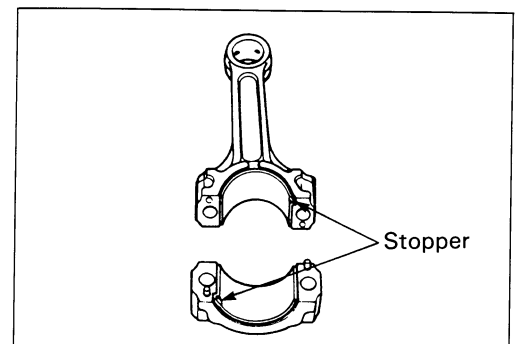
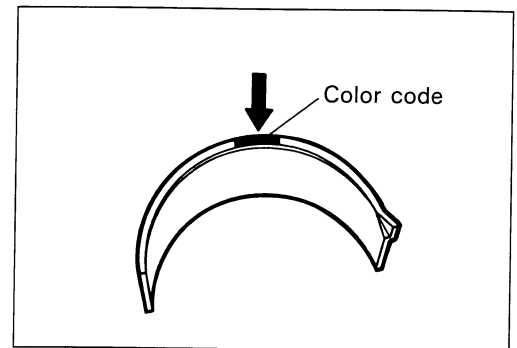
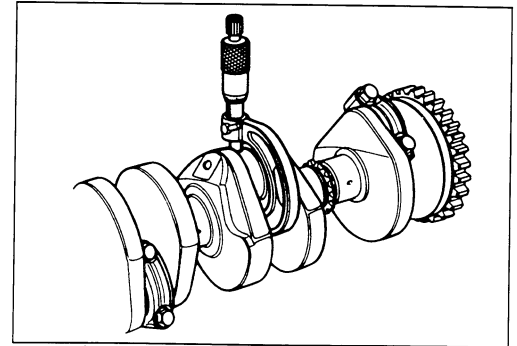
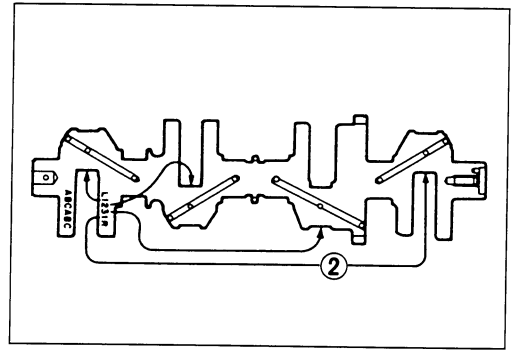
Color (Part No.)	Thickness
Green (12164-18E00-OA0)	1.480–1.484 mm (0.0583–0.0584 in)
Black (12164-18E00-OB0)	1.484–1.488 mm (0.0584–0.0586 in)
Brown (12164-18E00-OC0)	1.488–1.492 mm (0.0586–0.0587 in)
Yellow (12164-18E00-OD0)	1.492–1.496 mm (0.0587–0.0589 in)

#### CAUTION:

Bearing should be replaced as a set.

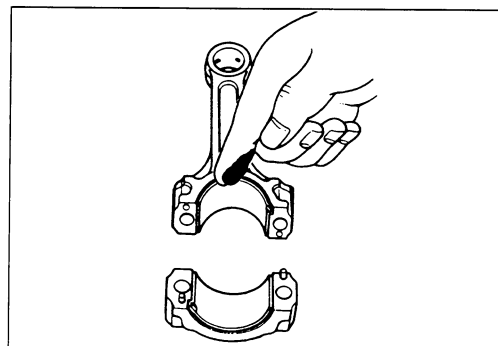
#### BEARING ASSEMBLY

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



- Apply engine oil or SUZUKI MOLY PASTE to the crank pin and bearing surface.

#### 99000-25140: SUZUKI MOLY PASTE



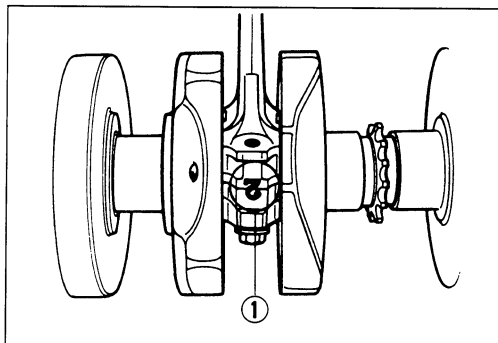
- When mounting the conrod on the crankshaft, make sure that numeral figure ① of the conrod faces rearward.
- Tighten the bearing cap bolts with specified torque.

**Initial tightening torque: 32–37 N·m**

(3.2–3.7 kg-m, 23.0–27.0 lb-ft)

**Final tightening torque : 65–68 N·m**

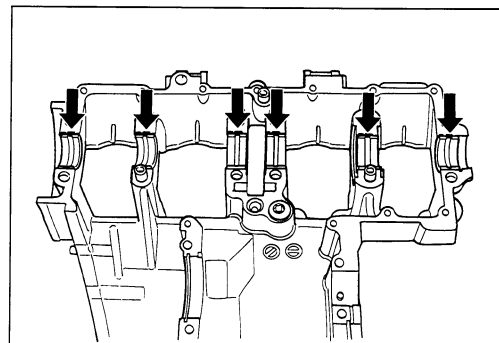
(6.5–6.8 kg-m, 47.0–49.0 lb-ft)



- Check the conrod movement for smooth turning.

### CRANKCASE-CRANKSHAFT BEARING SELECTION

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

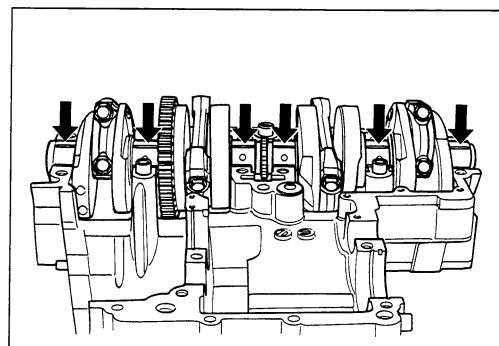


- Place the plastigauge on each crankshaft journal in the usual manner.

#### 09900-22301: Plastigauge

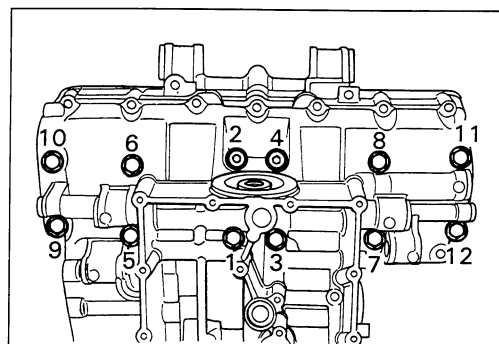
##### NOTE:

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



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

Tightening torque	Initial Tightening	Final Tightening
9 mm bolt	13 N·m 1.3 kg-m 9.5 lb-ft	24–28 N·m 2.4–2.8 kg-m 17.5–20.0 lb-ft



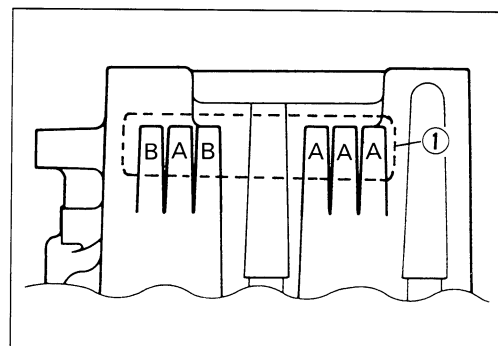
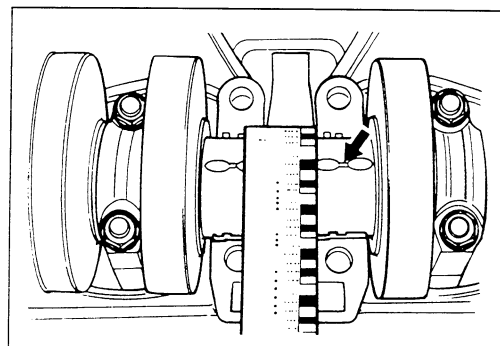
- Remove the lower crankcase, and measure the width of compressed plastigauge in the usual manner.

### Crank journal bearing oil clearance

**Standard:** 0.020–0.044 mm (0.0008–0.0017 in)

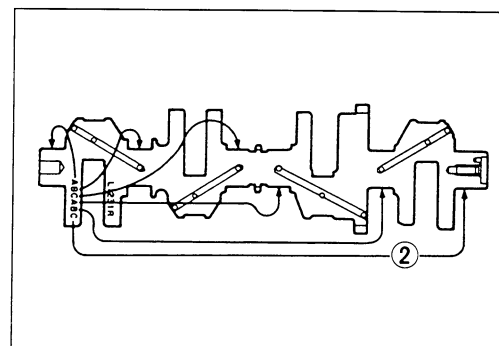
**Service Limit:** 0.08 mm (0.0031 in)

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



### Bearing selection table

		Crankshaft O.D. ②			
		Code	A	B	C
Crankcase I.D. ①	A	Green	Black	Brown	
	B	Black	Brown	Yellow	

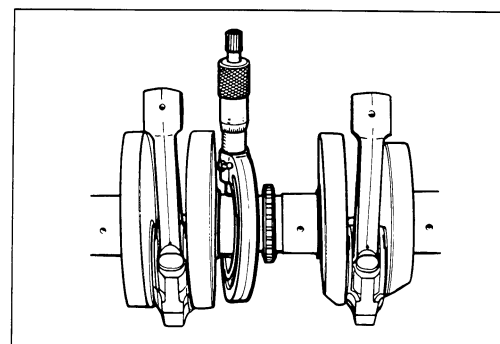


### Crankcase I.D. specification

Code	I.D. specification
A	37.000–37.008 mm (1.4567–1.4570 in)
B	37.008–37.016 mm (1.4570–1.4573 in)

### Crankshaft journal O.D. specification

Code	O.D. specification
A	33.992–34.000 mm (1.3383–1.3386 in)
B	33.984–33.992 mm (1.3380–1.3383 in)
C	33.976–33.984 mm (1.3376–1.3380 in)



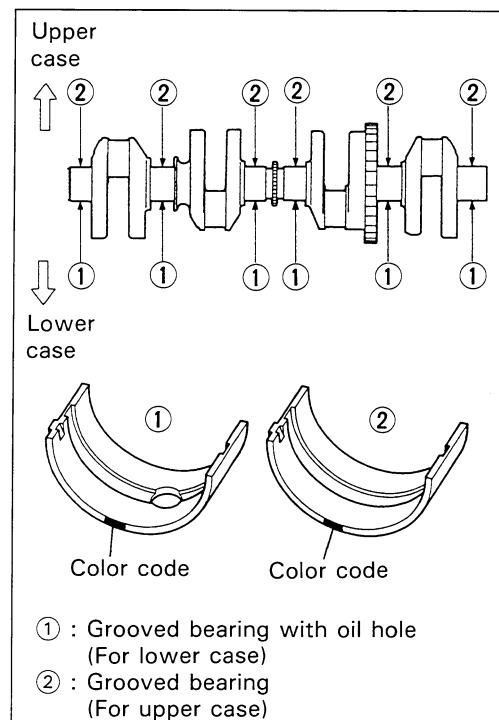
09900-20202: Micrometer (25–50 mm)

**Bearing thickness specification**  
**(Grooved bearing with oil hole ..... For lower case)**

Color (Part No.)	Specification
Green (12229-17E00-0A0)	1.486—1.490 mm (0.0585—0.0587 in)
Black (12229-17E00-0B0)	1.490—1.494 mm (0.0587—0.0588 in)
Brown (12229-17E00-0C0)	1.494—1.498 mm (0.0588—0.0590 in)
Yellow (12229-17E00-0D0)	1.498—1.502 mm (0.0590—0.0591 in)

**NOTE:**

- \* Grooved bearings have the same specification as the Grooved bearing with oil hole.
- \* These parts numbers are shown as follows.  
12229-17E10-XXX. (Grooved bearing)

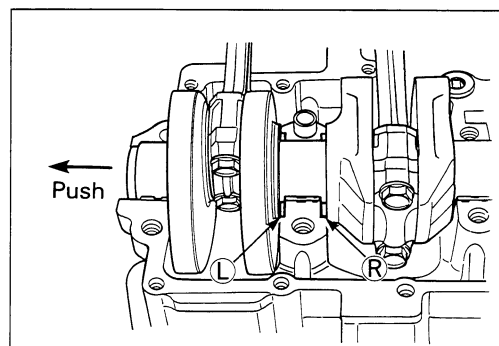


**CRANKSHAFT THRUST CLEARANCE**

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

**NOTE:**

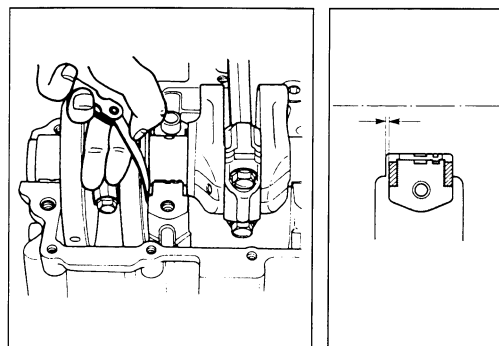
Push the crankshaft to the left-side, so that there is no clearance on the right-side thrust bearing.



**Thrust clearance**

**Standard: 0.055—0.110 mm (0.0022—0.0043 in)**

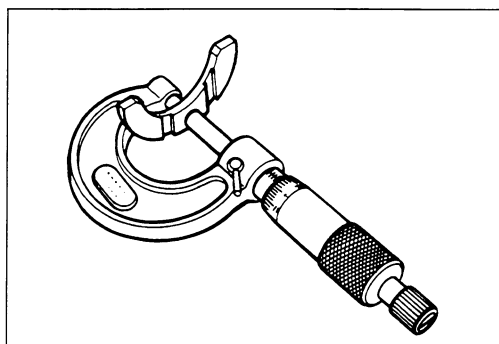
If the thrust clearance exceeds the standard range, adjust the thrust clearance by the following procedures:



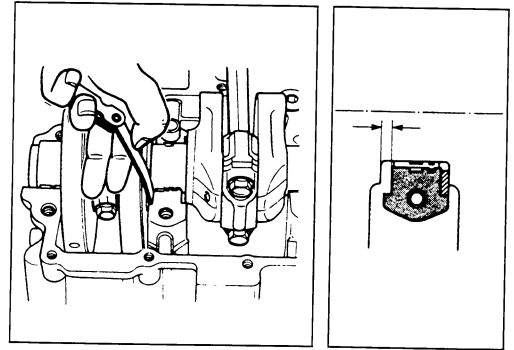
- Remove the right-side thrust bearing and measure its thickness with a micrometer. If the thickness of the right-side thrust bearing is below standard, replace with a new bearing and once again perform the thrust clearance measurement listed above, checking to make sure it is within standard.

**Right-side thrust bearing thickness**

**Standard: 2.425—2.450 mm (0.0955—0.0965 in)**



- If the right-side thrust bearing is within the standard range, reinsert the right-side thrust bearing and remove the left-side thrust bearing.
- As shown in the illustration, use a thickness gauge to measure the clearance before inserting of the left-side thrust bearing, and select a left-side thrust bearing from the selection table.



Thrust bearing selection table

Clearance before inserting left-side thrust bearing	Color (Part No.)	Thrust bearing thickness	Thrust clearance
2.560—2.585 mm (0.1008—0.1018 in)	White (12228-17E00-0F0)	2.475—2.500 mm (0.0974—0.0984 in)	0.060—0.110 mm (0.0024—0.0043 in)
2.535—2.560 mm (0.0998—0.1008 in)	Yellow (12228-17E00-0E0)	2.450—2.475 mm (0.0965—0.0974 in)	0.060—0.110 mm (0.0024—0.0043 in)
2.510—2.535 mm (0.0988—0.0998 in)	Green (12228-17E00-0D0)	2.425—2.450 mm (0.0955—0.0965 in)	0.060—0.110 mm (0.0024—0.0043 in)
2.485—2.510 mm (0.0978—0.0988 in)	Blue (12228-17E00-0C0)	2.400—2.425 mm (0.0945—0.0955 in)	0.060—0.110 mm (0.0024—0.0043 in)
2.460—2.485 mm (0.0969—0.0978 in)	Black (12228-17E00-0B0)	2.375—2.400 mm (0.0935—0.0945 in)	0.060—0.110 mm (0.0024—0.0043 in)
2.430—2.460 mm (0.0957—0.0969 in)	Red (12228-17E00-0A0)	2.350—2.375 mm (0.0925—0.0935 in)	0.055—0.110 mm (0.0022—0.0043 in)

- After selecting a left-side thrust bearing, insert it and again perform the thrust clearance measurement to make sure it falls within the standard range.

#### NOTE:

Right-side thrust bearing has the same specification as the GREEN (12228-17E00-0D0) of left-side thrust bearing.

## CRANKSHAFT RUNOUT

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

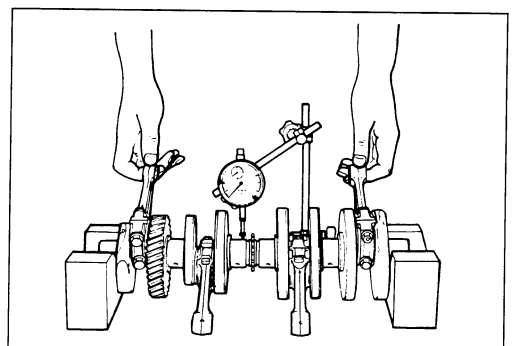
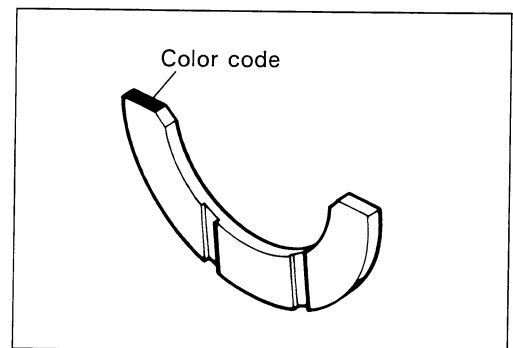
**09900-20606: Dial gauge (1/100 mm, 10 mm)**

**09900-20701: Magnetic stand**

**09900-21304: V-block (100 mm)**

**Crankshaft runout**

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



## CLUTCH DRIVE AND DRIVEN PLATES

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

**09900-20102: Vernier calipers (200 mm)**

**09900-20803: Thickness gauge**

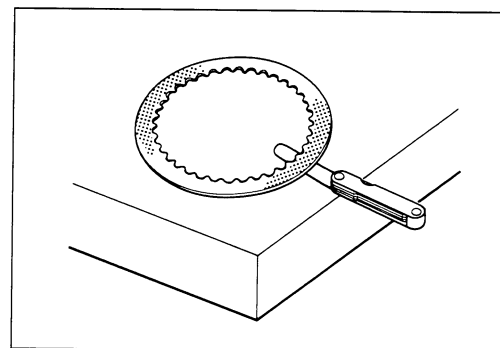
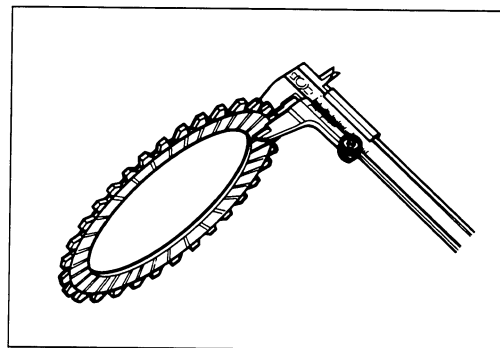
### Drive plate thickness

**Standard: 2.12–2.28 mm (0.083–0.090 in)**

**Service Limit: 1.82 mm (0.072 in)**

### Driven plate distortion

**Service Limit: 0.10 mm (0.004 in)**



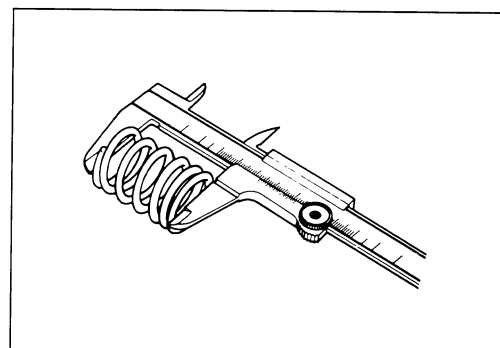
## CLUTCH SPRING FREE LENGTH

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

**09900-20102: Vernier calipers (200 mm)**

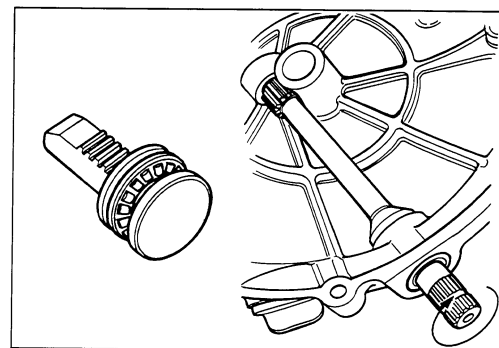
### Clutch spring free length

**Service Limit: 47.5 mm (1.87 in)**



## CLUTCH RELEASE BEARING

Inspect the clutch release bearing for any abnormality 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.



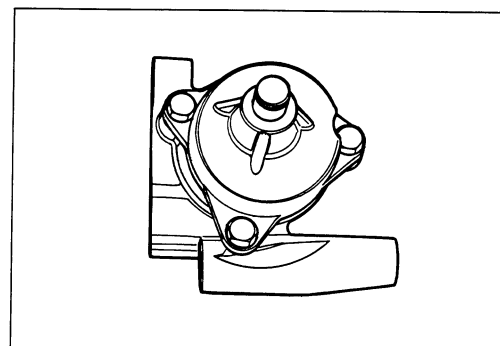
## CLUTCH RELEASE PINION AND RACK

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.

## OIL PUMP

### CAUTION:

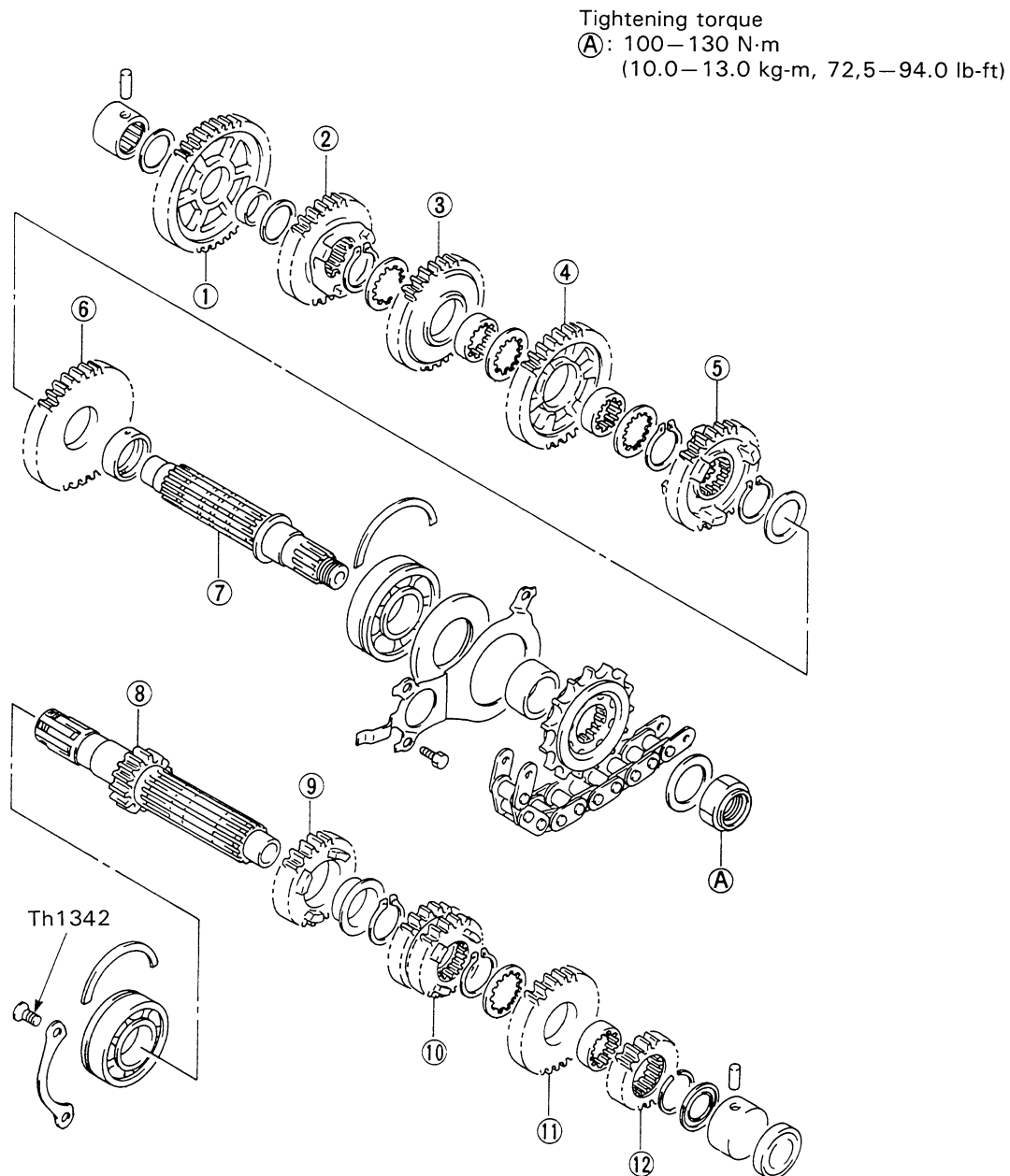
**Do not attempt to disassemble the oil pump assembly. The oil pump is available only as an assembly.**



## TRANSMISSION

### DISASSEMBLY

- Disassemble the transmission gears as shown in the illustration.



- ① Low driven gear
- ② 5th driven gear
- ③ 4th driven gear
- ④ 3rd driven gear
- ⑤ Top driven gear
- ⑥ 2nd driven gear
- ⑦ Driveshaft
- ⑧ Countershaft/Low drive gear
- ⑨ 5th drive gear
- ⑩ 3rd/4th drive gears
- ⑪ Top drive gear
- ⑫ 2nd drive gear

Th1342: Apply THREAD LOCK "1342".

## REASSEMBLY

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

### NOTE:

- \* Before installing the gears, rotate the bearing by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.
- \* Before installing the gears, lightly coat moly paste or engine oil to the driveshaft and countershaft.
- \* Before installing the oil seal, apply grease to the oil seal lip.

**99000-25140: SUZUKI MOLY PASTE**

**99000-25010: SUZUKI SUPER GREASE "A"**

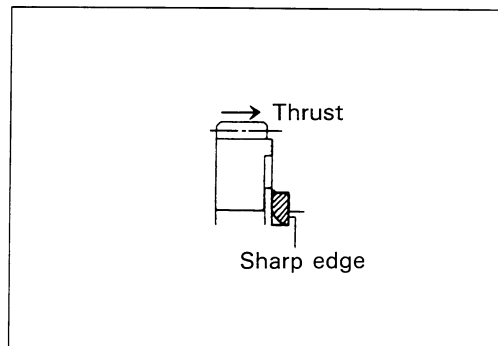
### CAUTION:

- \* Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded, 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.

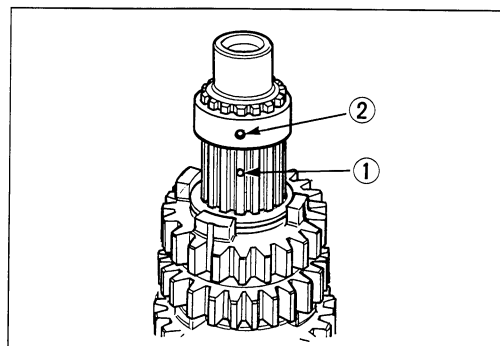
### NOTE:

*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. (Refer to page 3-43.)*

- 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 the illustration.

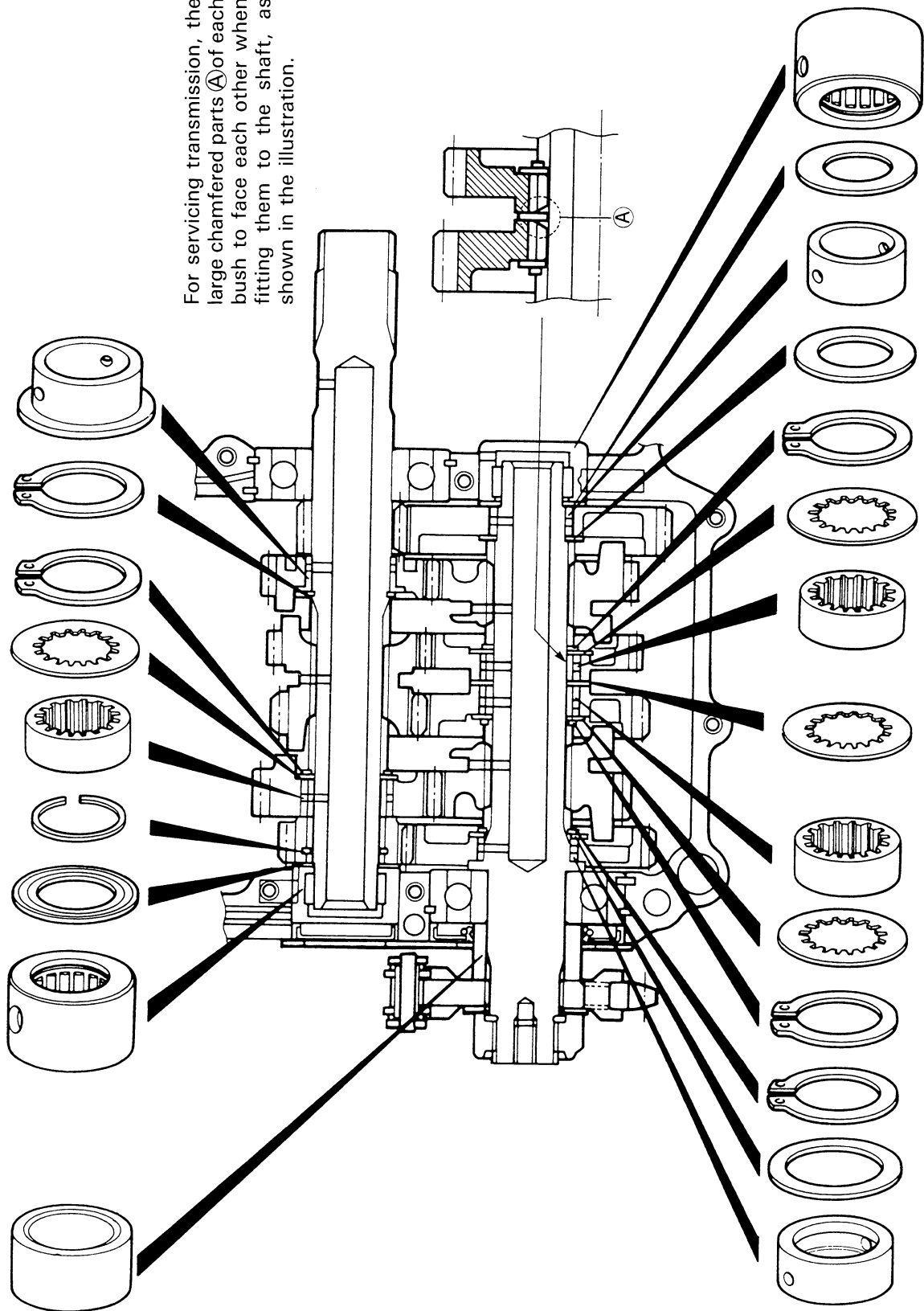


- When installing the gear bushing onto the shaft, align the shaft oil hole ① with the bushing oil hole ②.





For servicing transmission, the large chamfered parts Ⓐ of each bush to face each other when fitting them to the shaft, as shown in the illustration.



## GEARSHIFT FORK-GROOVE CLEARANCE

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

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

### Gearshift fork-Groove clearance

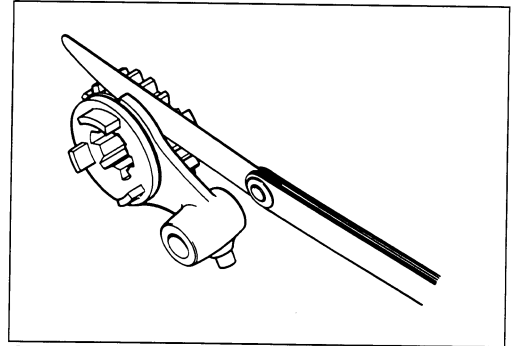
**Standard** : 0.10—0.30 mm (0.004—0.012 in)

**Service Limit**: 0.50 mm (0.020 in)

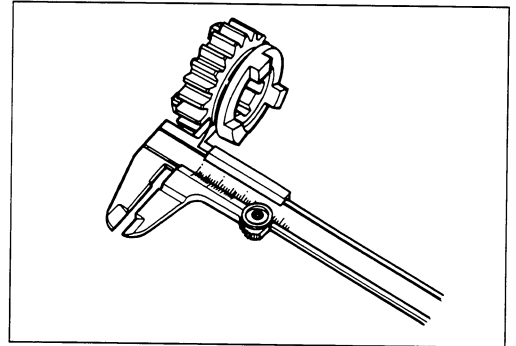
If the clearance checked is noted to exceed the limit specified, replace the fork or its gear, or both.

**09900-20803: Thickness gauge**

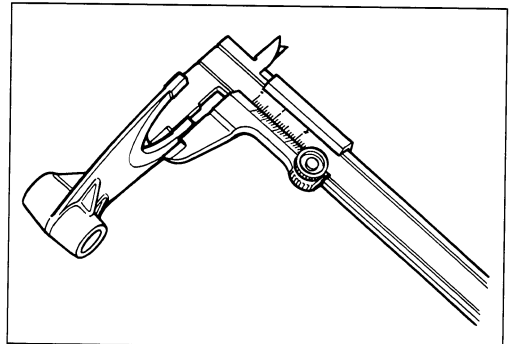
**09900-20102: Vernier calipers**



Checking clearance



Checking groove width



Checking thickness

### 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)

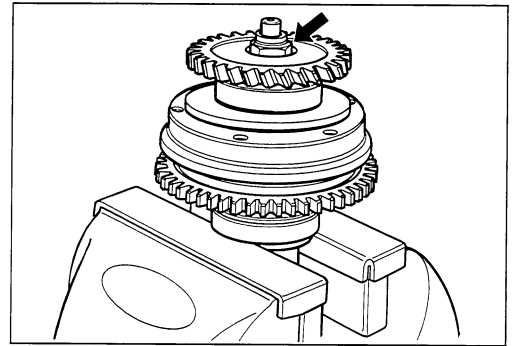
## STARTER CLUTCH

### DISASSEMBLY AND INSPECTION

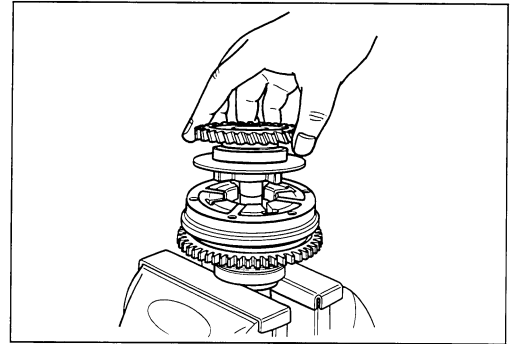
- Hold the starter clutch shaft to use a vise and appropriate pieces of soft metals, and remove the nut as shown in the Fig.

#### CAUTION:

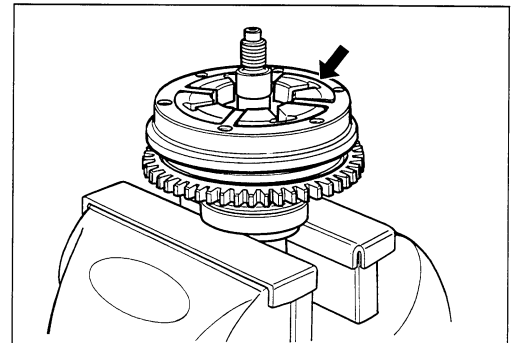
This is a left-hand thread nut.



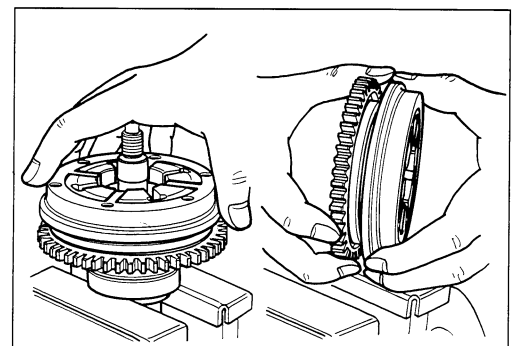
- Remove the generator driven gear assembly.



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

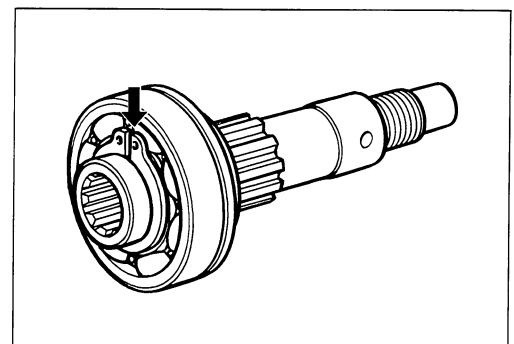


- Remove the starter clutch and its driven gear.
- Remove the driven gear from the starter clutch.



- Remove the circlip from the starter clutch shaft.

09900-06107: Snap ring pliers



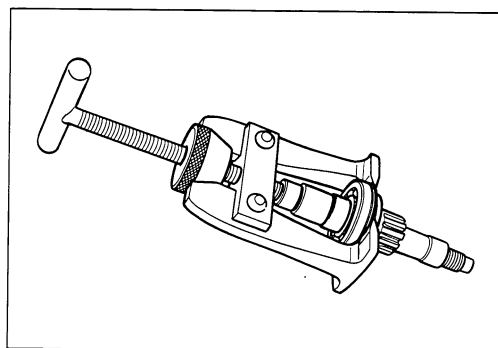
- Remove the bearing with a bearing puller.

**NOTE:**

*Before removing the bearing, rotate the outer race by hand to inspect for abnormal noise and smooth rotation.*

**CAUTION:**

The removed bearing should be replaced with a new one.

**REASSEMBLY**

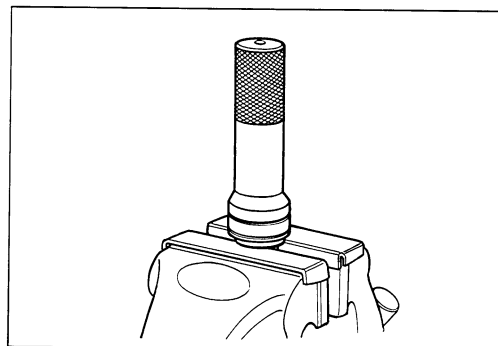
Assemble the starter clutch in the reverse order of disassembly. Pay attention to the following points:

**NOTE:**

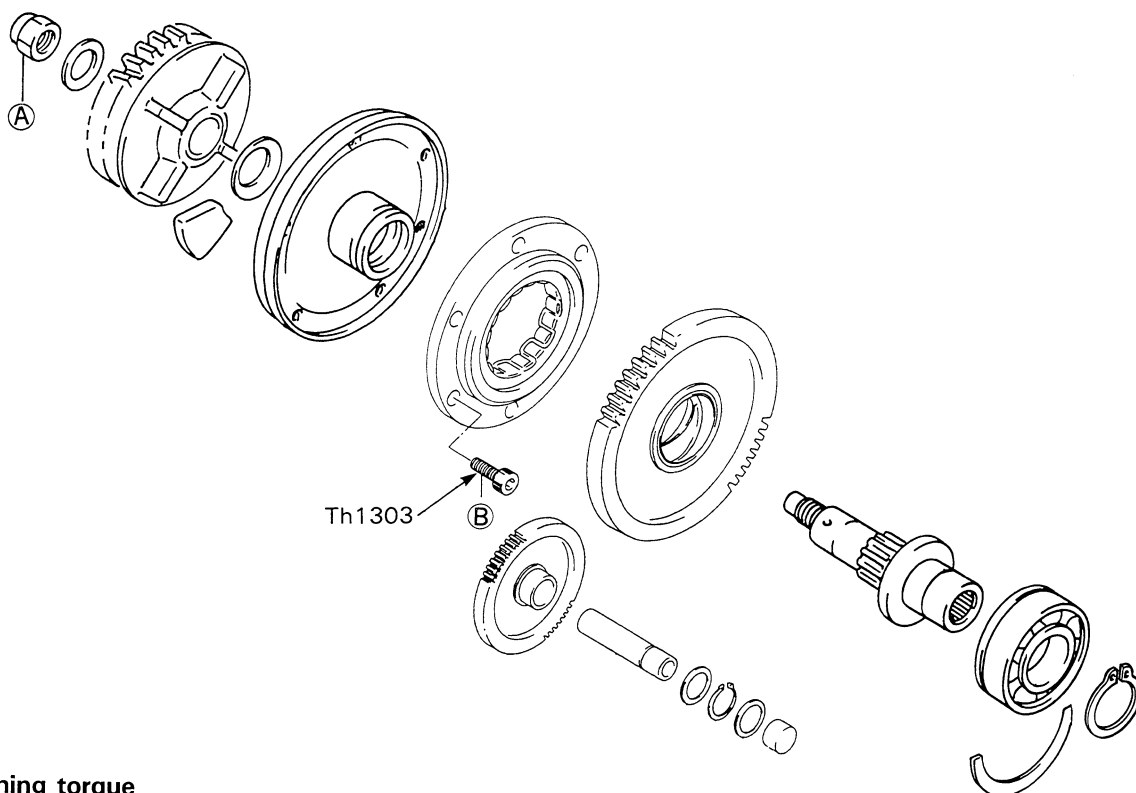
*Apply engine oil to each starter clutch part before reassembling.*

- Install the bearing with a bearing installer.

**09951-16080: Bearing installer**



Th1303: Apply THREAD LOCK SUPER "1303"

**Tightening torque**

ITEM	N·m	kg-m	lb-ft
Ⓐ	40-60	4.0-6.0	29.0-43.5
Ⓑ	8-12	0.8-1.2	6.0-8.5

## ENGINE REASSEMBLY

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

**NOTE:**

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

- Fit the O-rings ( ① , ② and ③ ) and dowel pins ④ to the correct positions, as shown in the Figs.

**CAUTION:**

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

- Install the oil pump to the lower crankcase with three bolts and tighten them to the specified torque.

**NOTE:**

*Apply a small quantity of THREAD LOCK "1342" to the bolts.*

**99000-32050: THREAD LOCK "1342"**

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

**NOTE:**

*Check the oil jets ( ⑤ and ⑥ ) fitted on the lower crankcase for clogging.*

Each oil jet can be distinguished by the numbers and colors.

- ⑤ Oil jet . . . . . Number 12, Yellow
- ⑥ Oil jet . . . . . Number 14, White

- Install the gearshift cam related parts.

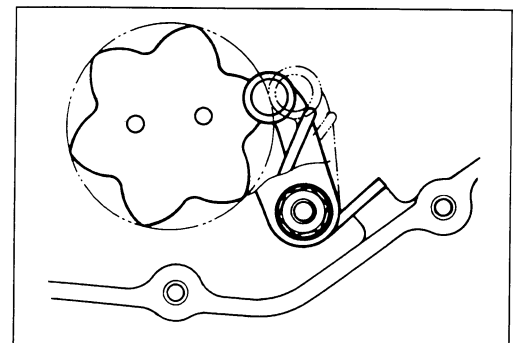
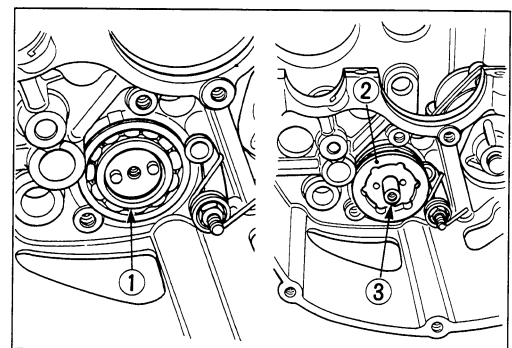
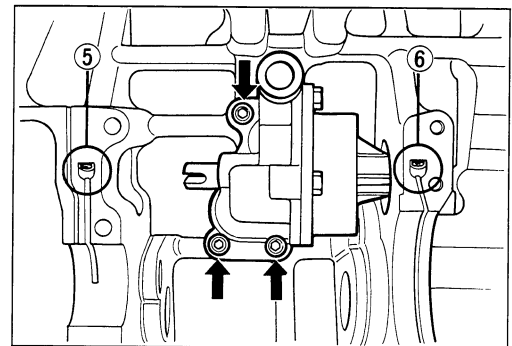
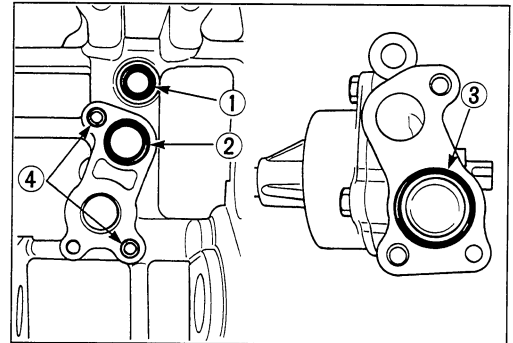
- ① Washer
- ② Gearshift cam stopper plate
- ③ Bolt

**NOTE:**

*When installing the gearshift cam stopper plate ② , apply a small quantity of THREAD LOCK "1342" to its bolt ③ .*

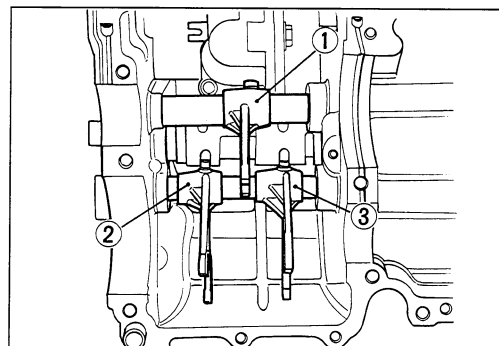
**99000-32050: THREAD LOCK "1342"**

- Position the gearshift cam as shown in Fig. so that the gearshift forks and transmission can be installed easily.

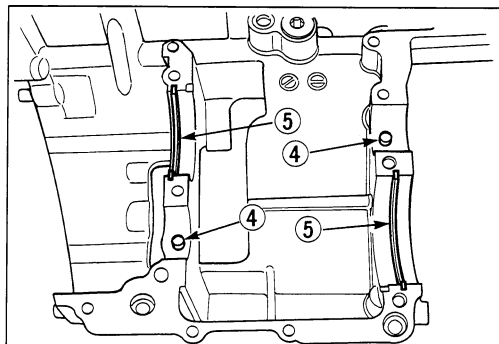


- Install the gearshift forks to the crankcase in the correct positions and directions.

- ① For 3rd/4th drive gears
- ② For Top driven gear
- ③ For 5th driven gear



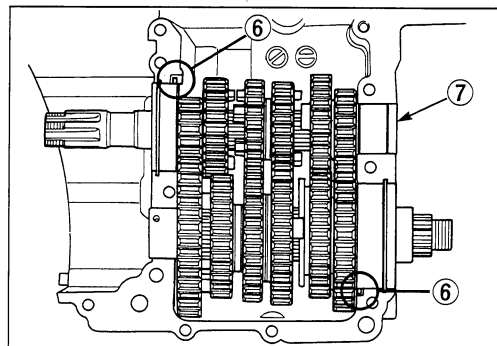
- Fit the bearing pins ④ and C-rings ⑤ on the upper crankcase.



- Install the countershaft assembly and driveshaft assembly on the upper crankcase.

**NOTE:**

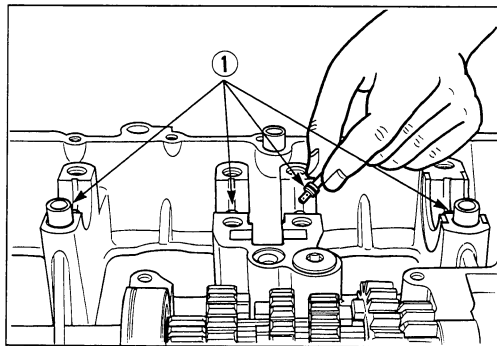
- \* Be sure to install the bearing dowel pins ⑥ in the respective positions.
- \* Install the countershaft end cap to the position ⑦ .
- \* Make sure that the countershaft turns freely while holding the driveshaft. If not, shift the gear which is engaged to the neutral position.



**NOTE:**

Before fitting the crankshaft journal bearings, check the nozzles ① fitted on the upper crankcase for clogging.

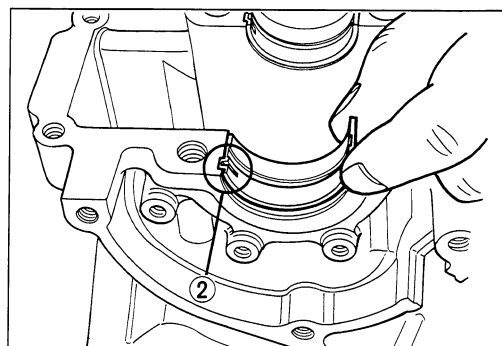
- ① Nozzle (4 pcs) ..... For upper case



- When fitting the crankshaft journal bearings to the upper and lower crankcases, be sure to fix the stopper part ② first and press the other end. (Refer to page 3-38.)

**CAUTION:**

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



- Install the cam chain guide ① and two dampers ② properly.

**NOTE:**

Be sure to face the arrow mark on the damper to the front and rear, not to the left and right.

- Fit the O-ring ③ .

**CAUTION:**

Replace the O-ring with a new one to prevent oil leakage.

- Before installing the crankshaft, apply SUZUKI MOLY PASTE to each journal bearing lightly.

**99000-25140: SUZUKI MOLY PASTE**

- Install the crankshaft with the cam chain to the upper crankcase.
- Insert the right and left-thrust bearings with oil grooved facing the crank web. (Refer to page 3-38.)
- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Install the dowel pins to the upper crankcase.
- Apply SUZUKI BOND NO. 1207B to the mating surface of the lower crankcase and crankshaft left end cap in the following procedure.

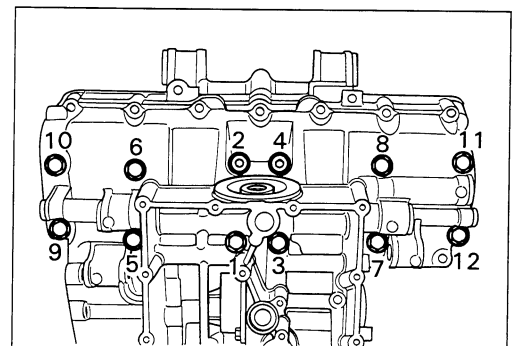
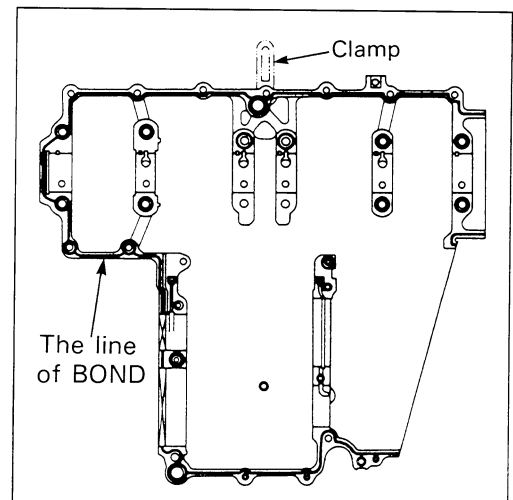
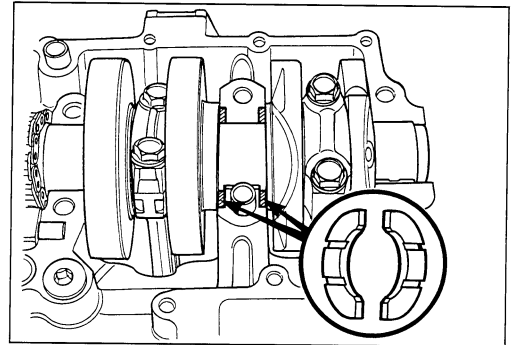
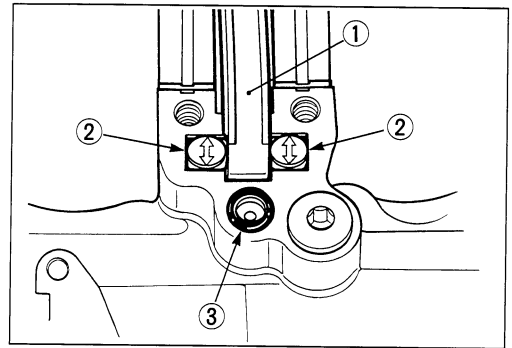
**99000-31140: SUZUKI BOND NO. 1207B****NOTE:**

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

- \* Make surfaces free from moisture, oil, dust and other foreign materials.
- \* Spread on surfaces thinly to form an even layer, and assemble the cases within few minutes.
- \* Take extreme care not to apply any BOND NO. 1207B to the bearing surfaces.
- \* Apply to cornered surface as it forms a comparatively thick film.

- Tighten the crankshaft tightening 9-mm bolts in ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten the lower and upper crankcase tightening bolts to the specified torque values.

Tightening torque	Initial tightening			Final tightening		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
6 mm bolt	6	0.6	4.5	13	1.3	9.5
8 mm bolt	13	1.3	9.5	26	2.6	19.0
9 mm bolt	13	1.3	9.5	26	2.6	19.0

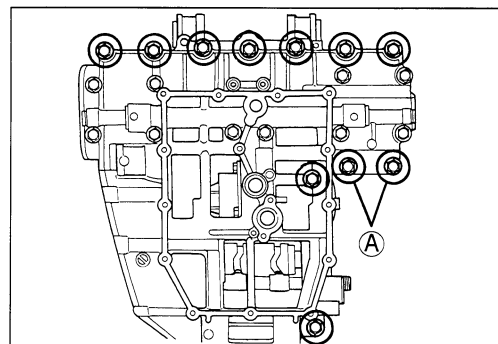


- Fit the new gaskets to the lower crankcase bolts **A** correctly as shown in the Fig.

**CAUTION:**

Use a new gasket to prevent oil leakage.

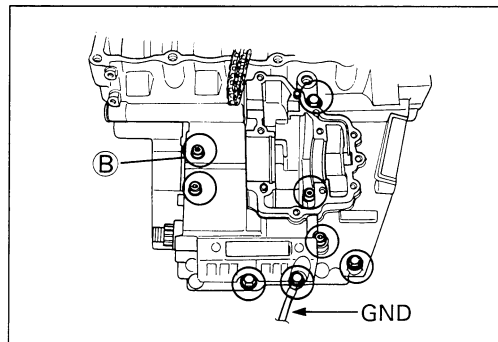
09900-00410: Hexagon bit wrench set



- Fit the engine ground wire to the correct position as shown in the Fig.
- Fit a new gasket to the upper crankcase bolt **B** correctly as shown in the Fig.

**CAUTION:**

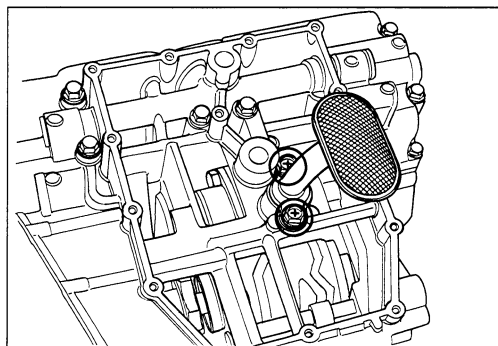
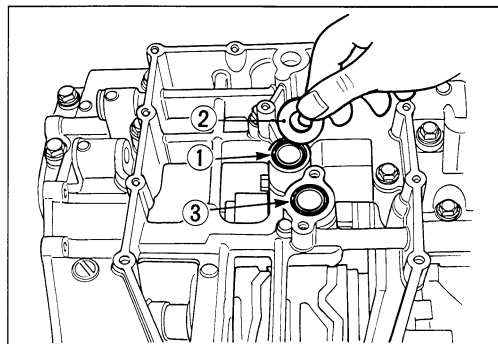
Use a new gasket to prevent oil leakage.



- Fit a new O-ring **①** and shim **②** .
- Fit a new O-ring **③** and install the oil sump filter to the lower crankcase.

**CAUTION:**

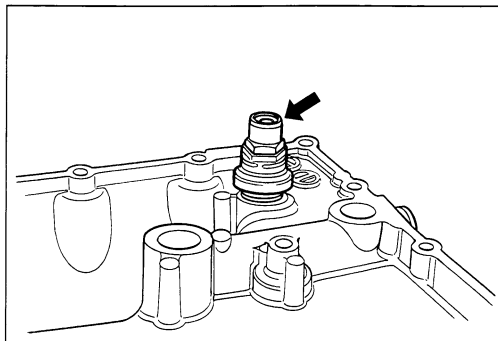
Replace the O-rings with new ones to prevent oil leakage.



- Seat the washer and install the oil pressure regulator to the oil pan and tighten it to the specified torque.

**Tightening torque: 25—30 N·m**

**(2.5—3.0 kg-m, 18.0—21.5 lb-ft)**

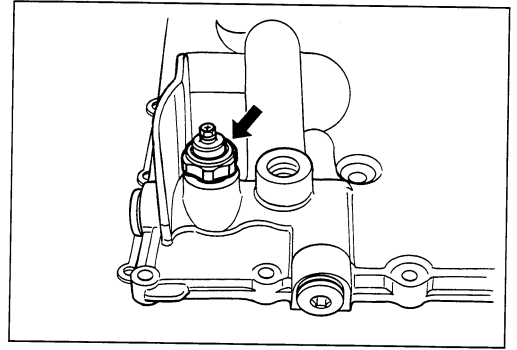




**NOTE:**

When replacing the oil pressure switch, apply SUZUKI BOND NO. 1207B to its thread lightly.

**99000-31140: SUZUKI BOND NO. 1207B**



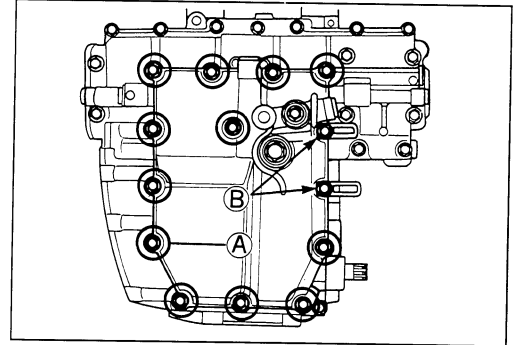
- Fit the gasket and install the oil pan. Tighten the oil pan bolts to the specified torque.

**Tightening torque: 12–16 N·m**

**(1.2–1.6 kg-m, 8.5–11.5 lb-ft)**

**NOTE:**

- \* Fit a new gasket to the oil pan bolt **A** correctly as shown in the Fig.
- \* Fit the lead wire clamps to the oil pan bolts **B** correctly as shown in the Fig.

**CAUTION:**

**Use a new gasket to prevent oil leakage.**

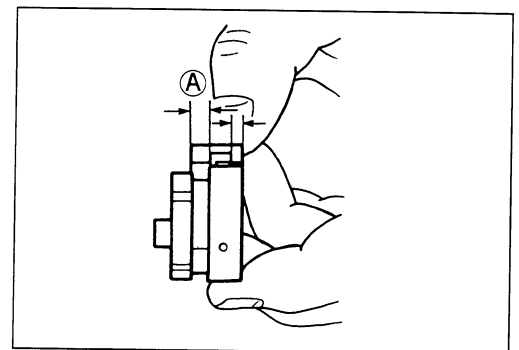
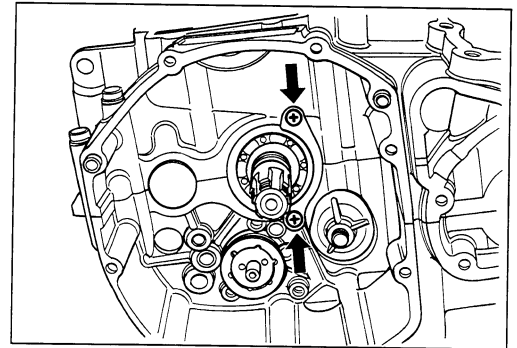
- Tighten the engine oil drain plug to the specified torque. (Refer to page 8-29.)
- Install the countershaft bearing retainer with two screws.

**NOTE:**

Apply a small quantity of **THREAD LOCK "1342"** to the two screws.

**99000-32050: THREAD LOCK "1342"**

- Install each gear shifting pawl into the cam shifter. The large shoulder **A** must face to the outside as shown.



- Apply a small quantity of **THREAD LOCK "1342"** to the screws **①** and nut **②**.

**99000-32050: THREAD LOCK "1342"**

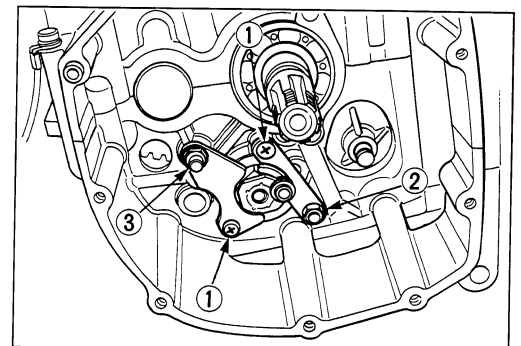
**09900-09003: Impact driver set**

- Apply a small quantity of **THREAD LOCK SUPER "1303"** to the gearshift arm stopper bolt **③** and tighten it to the specified torque.

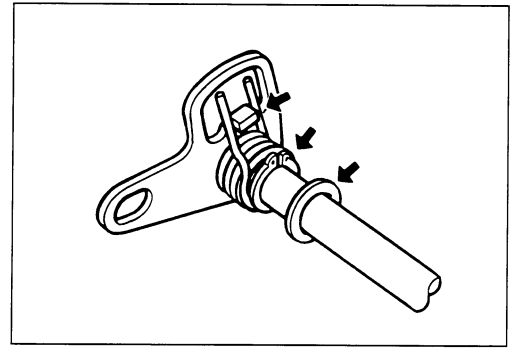
**99000-32030: THREAD LOCK SUPER "1303"**

**Tightening torque: 15–23 N·m**

**(1.5–2.3 kg-m, 11.0–16.5 lb-ft)**



- Install the gearshift shaft return spring, circlip and washer onto the gearshift shaft properly.

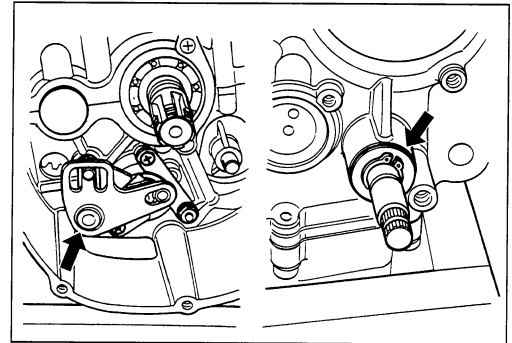


- Install the gearshift shaft and washer.
- Fix the gearshift shaft with the circlip.

**09900-06107: Snap ring pliers**

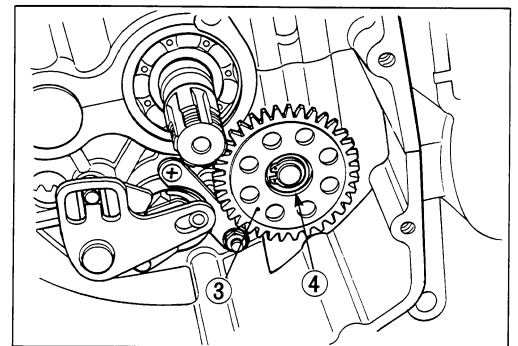
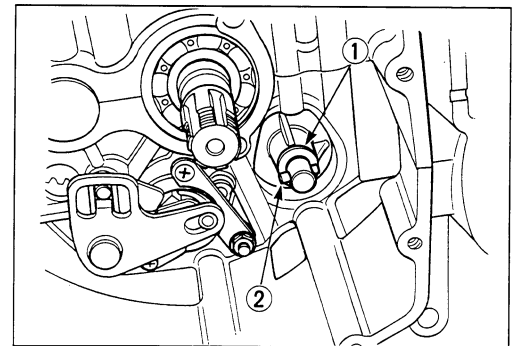
**CAUTION:**

**Replace the gearshift shaft oil seal with a new one.**



- Install the washer ①, pin ②, oil pump driven gear ③ and washer ④.
- Fix the oil pump driven gear with the circlip.

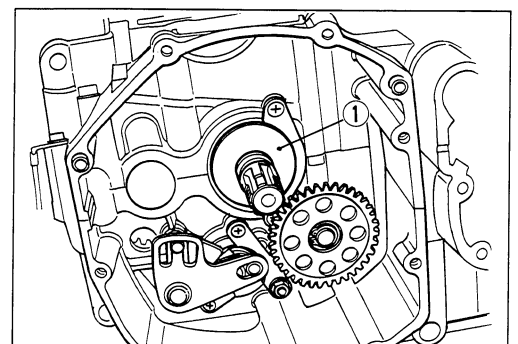
**09900-06107: Snap ring pliers**



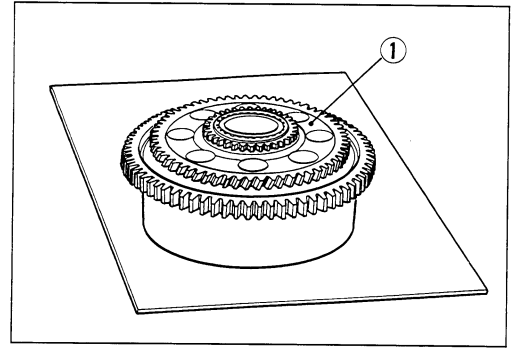
- Install the thrust washer ① onto the countershaft.

**NOTE:**

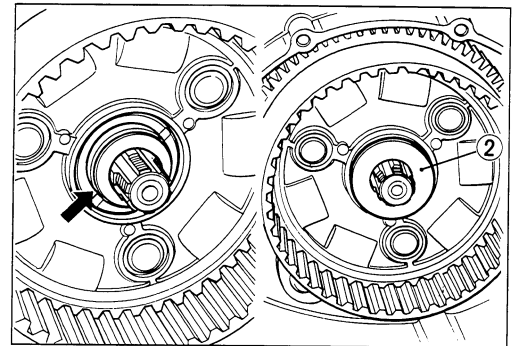
*Flat surface of washer is positioned outside.*



- Install the generator/oil pump drive gears ① onto the primary driven gear.



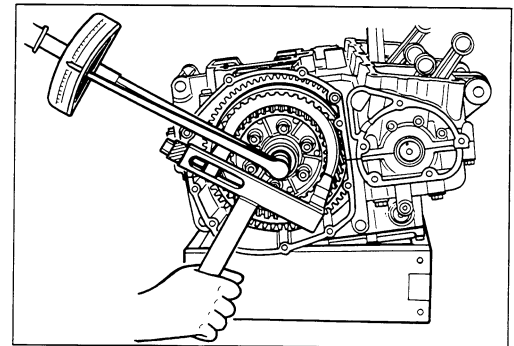
- Install the primary driven gear assembly onto the countershaft, and apply engine oil to the needle bearing and spacer.
- Install the thrust washer ② onto the countershaft.



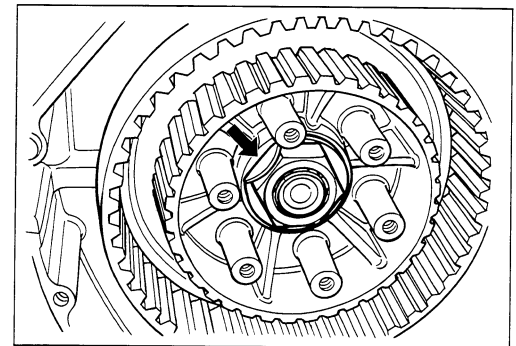
- Install the clutch sleeve hub onto the countershaft.
- Tighten the clutch sleeve hub nut to the specified torque by using the torque wrench and clutch sleeve hub holder.

#### 09920-53740: Clutch sleeve hub holder

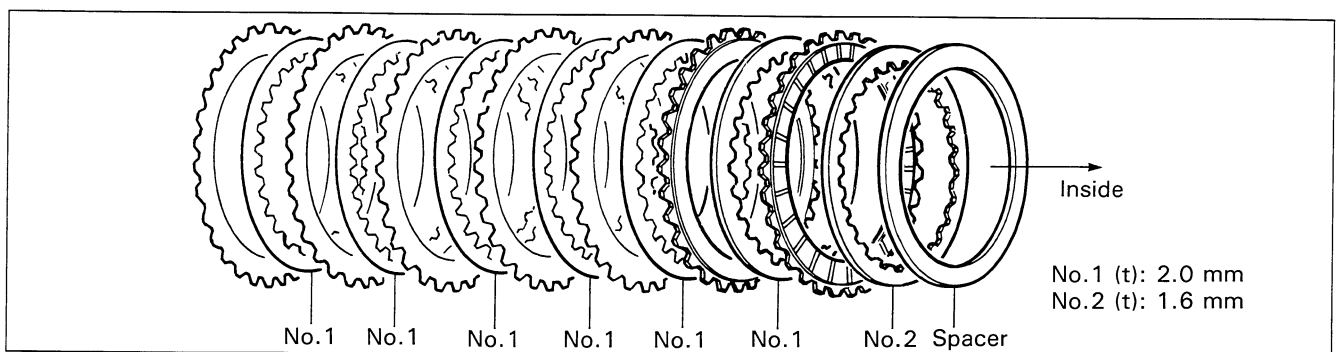
**Tightening torque: 80–100 N·m  
(8.0–10.0 kg-m, 58.0–72.5 lb-ft)**



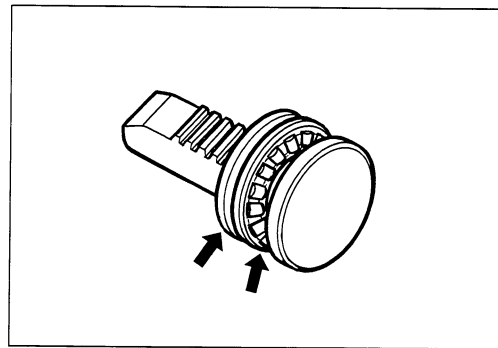
- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of lock washer.



- Insert the clutch driven plates and drive plates one by one into the clutch sleeve hub in the prescribed order, driven plate first.  
No.1 and No.2 driven plates can be distinguished by the thickness.



- Set the clutch release bearing and washer onto the clutch release rack.



- Put the clutch pressure plate onto the clutch sleeve hub.
- Put the clutch spring set bolts onto the clutch pressure plate properly.
- Tighten the clutch spring set bolts in the order.

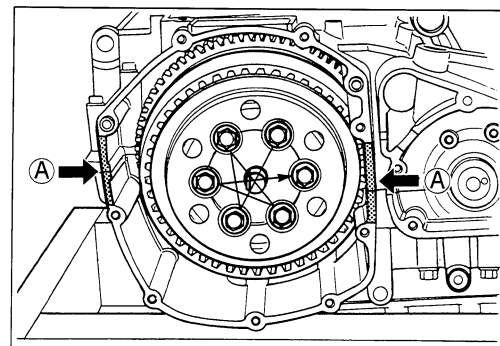
**NOTE:**

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

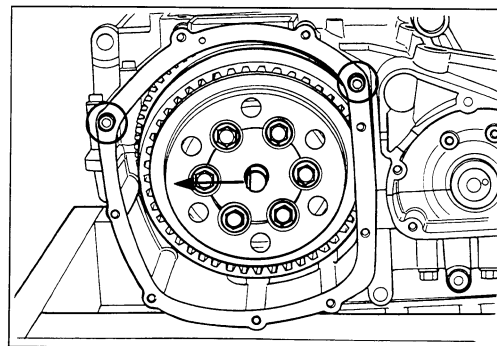
**Clutch spring set bolt: 11 – 13 N·m  
(1.1 – 1.3 kg·m, 8.0 – 9.5 lb-ft)**

- Coat SUZUKI BOND NO. 1207B lightly to the mating surfaces ① between upper and lower crankcases as shown in the Fig.

**99000-31140: SUZUKI BOND NO. 1207B**



- Install the dowel pins, a new gasket and clutch cover.
- Face the clutch release rack to the rear side so that the clutch release rack and pinion can be engaged easily.



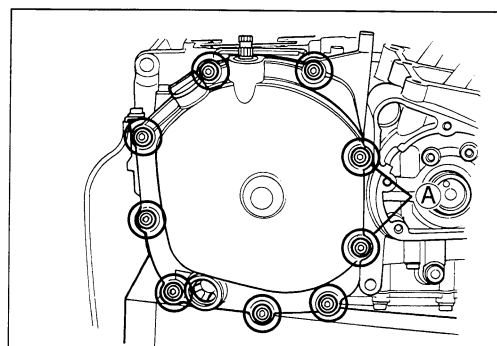
- Tighten the cover bolts securely.

**NOTE:**

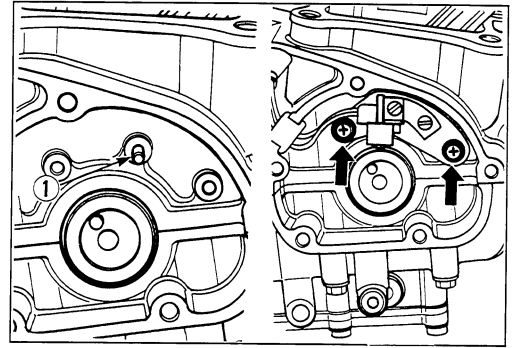
*Fit the two gaskets to the clutch cover bolts ① correctly as shown in the Fig.*

**CAUTION:**

**Use only new gasket to prevent oil leakage.**



- Put the signal generator dowel pin ① to the crankcase.
- Install the signal generator stator with two screws.

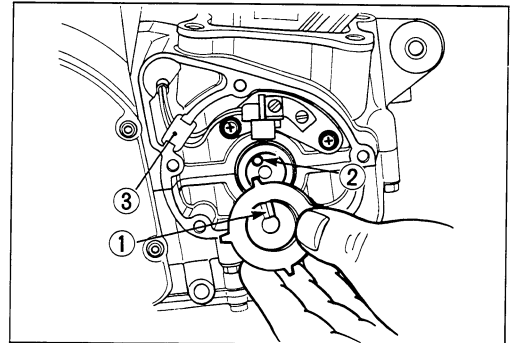


- Make sure to fit the slot ① on the back surface of the signal generator rotor over the locating pin ② at the end of crankshaft.

**NOTE:**

*BOND NO. 1207B should be applied to the groove of the signal generator lead wire grommet ③ .*

**99000-31140: SUZUKI BOND NO. 1207B**

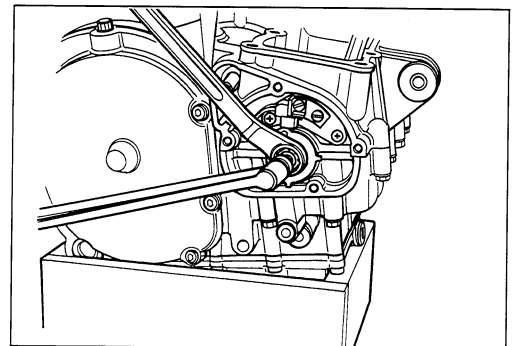


- Hold the crankshaft turning nut and tighten the rotor bolt to the specified torque using 6-mm hexagon wrench.

**09900-00410: Hexagon wrench set**

**Tightening torque: 23—26 N·m**

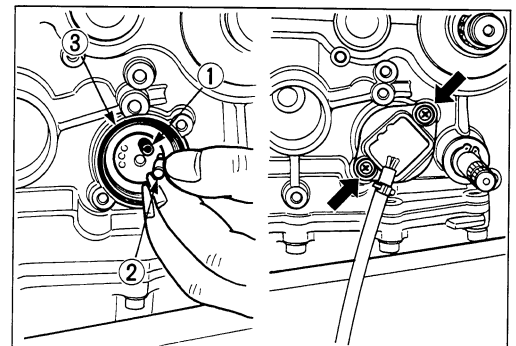
**(2.3—2.6 kg-m, 16.5—19.0 lb-ft)**



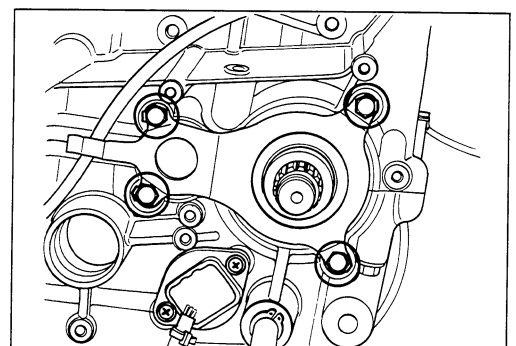
- Install the neutral position indicator switch with two screws.

**NOTE:**

*When installing the neutral position indicator switch, be sure to locate the spring ① , switch contact ② and O-ring ③ .*



- Install the oil seal retainer with four bolts, and positively bend the lock portion of the retainer.

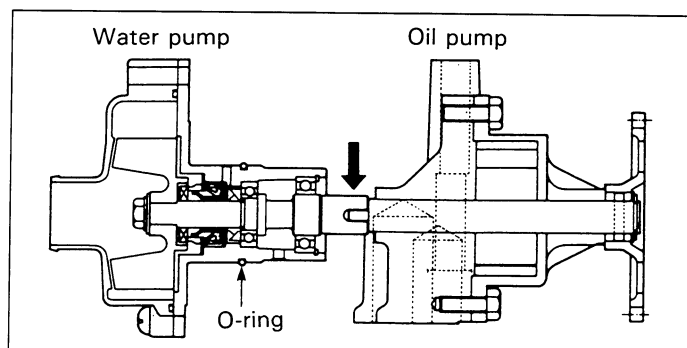
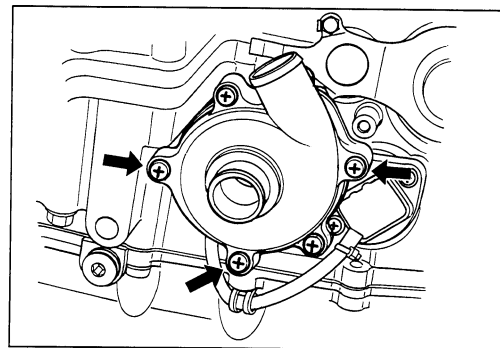


- Install the water pump with three screws.

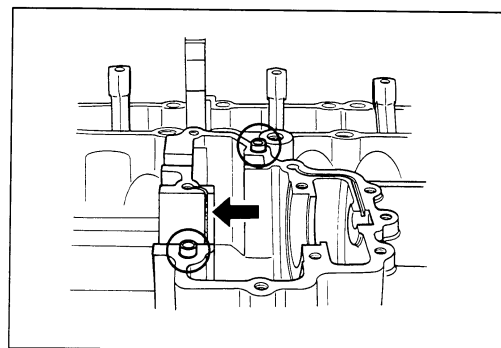
**NOTE:**

- \* Apply **SUZUKI SUPER GREASE "A"** to the water pump O-ring.
- \* Set the water pump shaft to the oil pump shaft.

**99000-25010: SUZUKI SUPER GREASE "A"**



- Install the two dowel pins and C-ring.



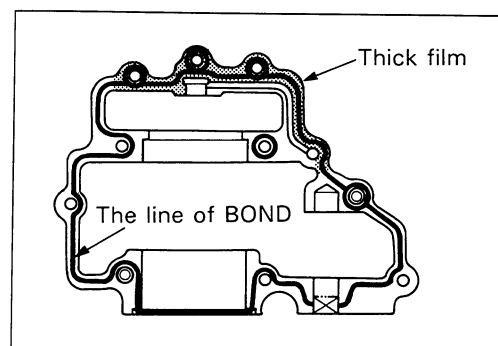
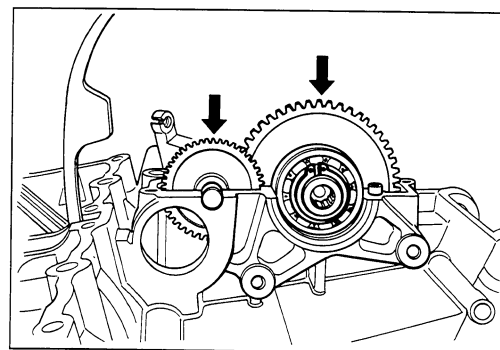
- Install the starter clutch assembly.
- Install the starter idle gear and its shaft.
- Install the shaft end cap to the position ①.
- Clean the mating surfaces of the upper crankcase and starter clutch cover.
- Apply **SUZUKI BOND NO. 1207B** to the mating surface of the starter clutch cover.

**99000-31140: SUZUKI BOND NO. 1207B**

**NOTE:**

*Use of SUZUKI BOND NO. 1207B is as follows:*

- \* Make surfaces free from moisture, oil, dust and other foreign materials.
- \* Spread on surfaces thinly to form an even layer, and assemble the cover within few minutes.
- \* Take extreme care not to apply any **BOND NO. 1207B** to the bearing surfaces.
- \* Apply to cornered surface as it forms a comparatively thick film.



- Place the starter clutch cover and tighten its bolts to the specified torque.

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

**NOTE:**

- \* Fit the gaskets to the starter clutch cover bolt ① and bolts ② correctly as shown in the Fig.
- \* Fit the oil hose clamp to the starter clutch cover bolt ③ correctly as shown in the Fig.

Bolt ① : Copper washer gasket

Bolt ② : Steel washer with rubber gasket

**CAUTION:**

Use a new gasket to prevent oil leakage.

- Install the generator with three bolts.

**Tightening torque: 21–29 N·m**  
(2.1–2.9 kg-m, 15.0–21.0 lb-ft)

**NOTE:**

Apply SUZUKI SUPER GREASE "A" to the generator O-ring.

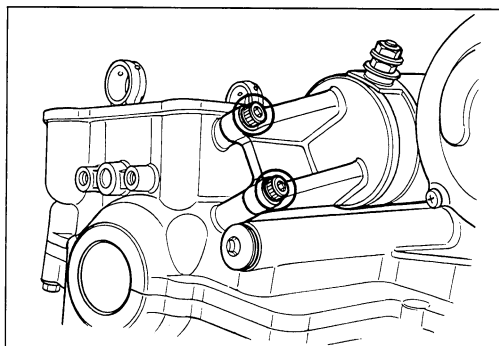
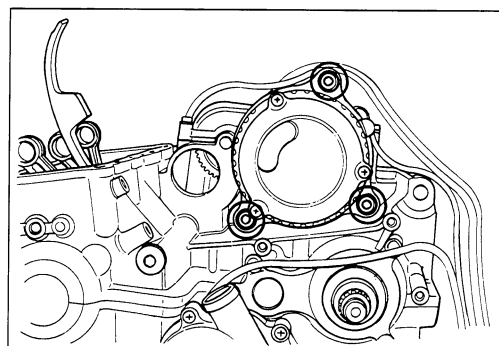
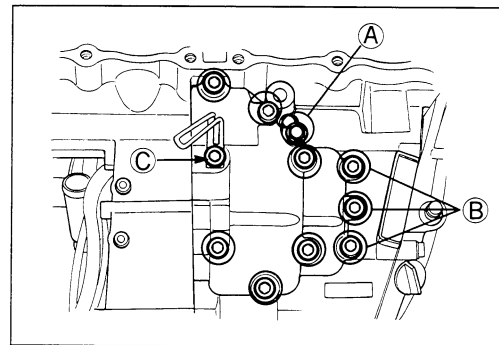
**99000-25010: SUZUKI SUPER GREASE "A"**

- Install the starter motor with two bolts.

**Tightening torque: 4.0–7.0 N·m**  
(0.4–0.7 kg-m, 3.0–5.0 lb-ft)

**NOTE:**

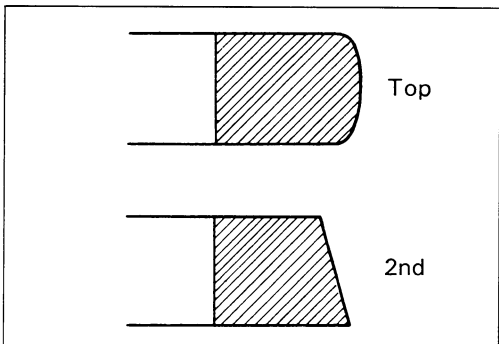
Apply SUZUKI SUPER GREASE "A" to the starter motor O-ring.



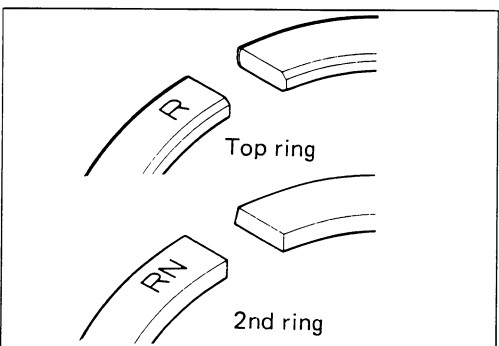
- Install the piston rings in the order of oil ring, 2nd ring and top ring.

**NOTE:**

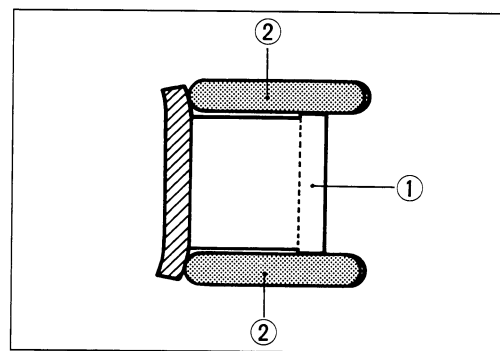
Top ring and 2nd ring differ in the shape of the ring face.



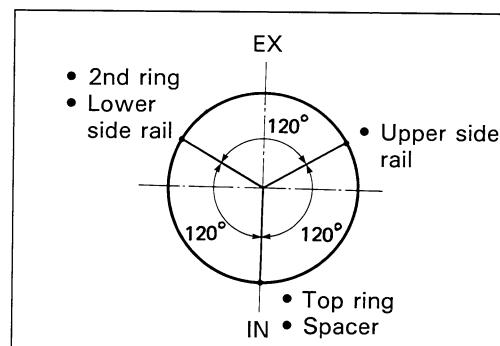
- Top and 2nd rings have a letter "R" or "RN" marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.



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

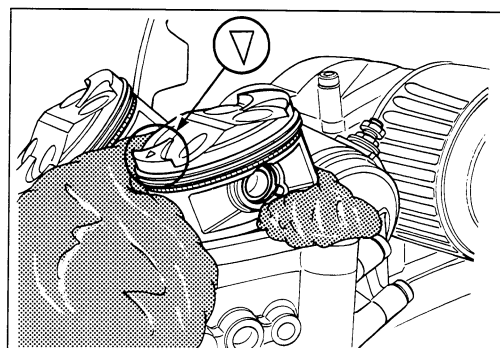


- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



**NOTE:**

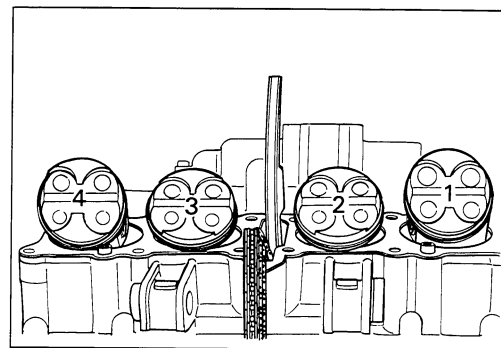
*When fitting the piston, turn the triangle mark on the piston head to exhaust side.*



- Be sure to install the pistons in the cylinder from which they were removed in disassembly, refer to the letter mark, "1" through "4", scribed on the piston.
- Have each piston pin moly paste oiled lightly before installing it.
- Place a cloth beneath the piston, and install the circlips.

**NOTE:**

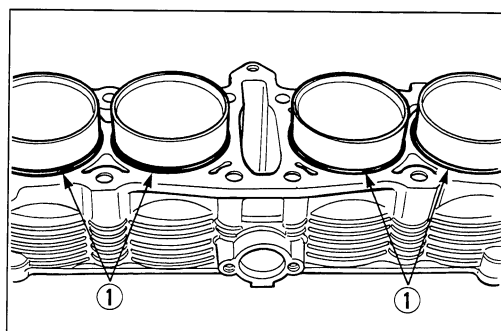
*Be sure to use new circlips.*



- Before putting on the cylinder block, oil the big and small ends of each conrod and also the sliding surface of each piston.
- Place the new O-rings ① to each cylinder sleeve correctly as shown in the Fig.

**CAUTION:**

**Use a new O-ring to prevent water leakage.**





- Place the dowel pins and new cylinder gasket on the crankcase.

**CAUTION:**

Use a new gasket to prevent oil leakage.

**NOTE:**

Be sure to identify the top surface by "UP" mark on the cylinder gasket as shown in the Fig.

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

**09916-74521: Holder body**

**09916-74540: Band**

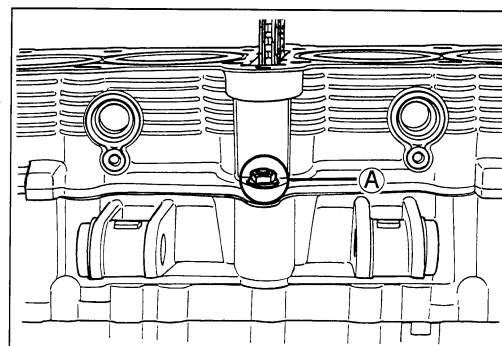
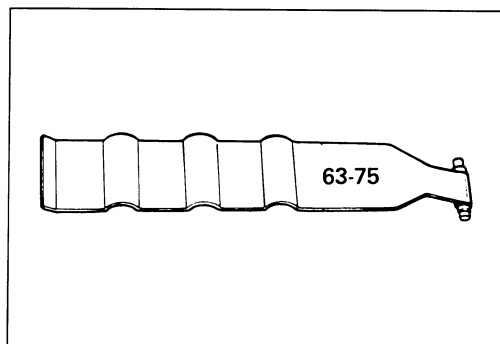
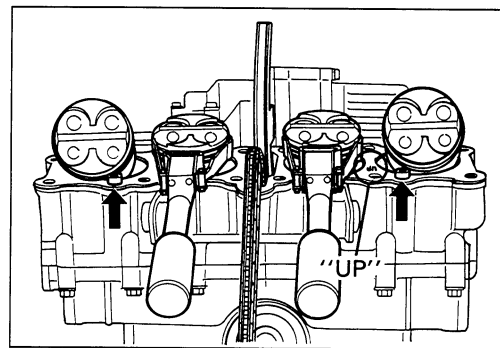
**NOTE:**

Do not overtighten the special tool bands or the pistons entry into the cylinders will be difficult.

- Tighten the cylinder nut **A** to the specified torque.

**Tightening torque: 7–11 N·m**

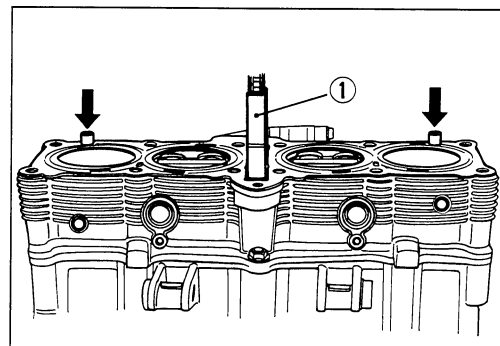
**(0.7–1.1 kg-m, 5.0–8.0 lb-ft)**



- Install the cam chain guide **①** properly.
- Place the dowel pins and new cylinder head gasket on the cylinder.

**CAUTION:**

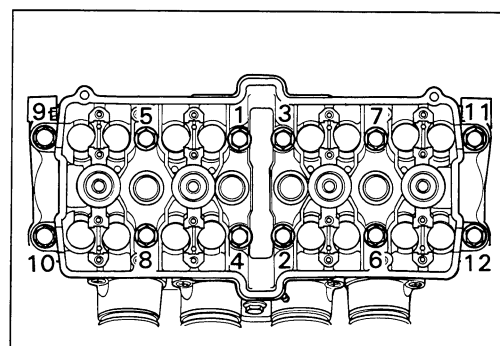
Use a new gasket to prevent gas leakage.



- Place the cylinder head on the cylinder block.
- Tighten the twelve 10-mm bolts to the specified torque with a torque wrench sequentially in the ascending order of numbers.

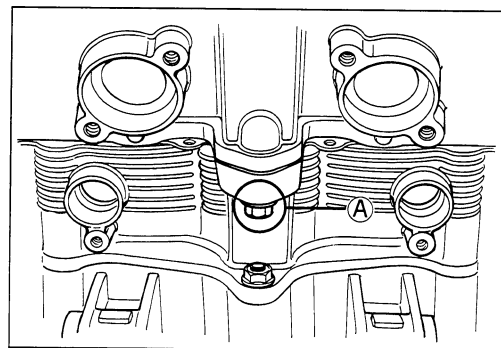
**Tightening torque: 40–45 N·m**

**(4.0–4.5 kg-m, 29.0–32.5 lb-ft)**



- After firmly tightening the twelve 10-mm bolts, install one 6-mm bolt (A) and tighten it to the specified torque.

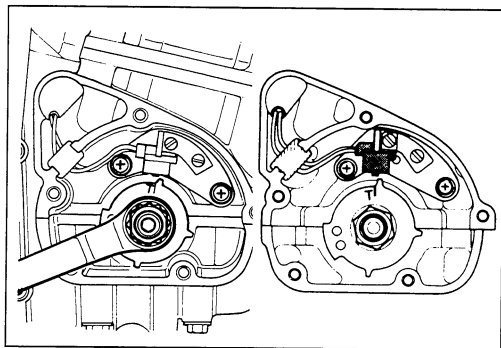
**Tightening torque: 8 – 12 N·m**  
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)



- While holding down the cam chain, rotate the crankshaft in normal direction to bring the “T” mark on the rotor to the center of pick-up coil.

**CAUTION:**

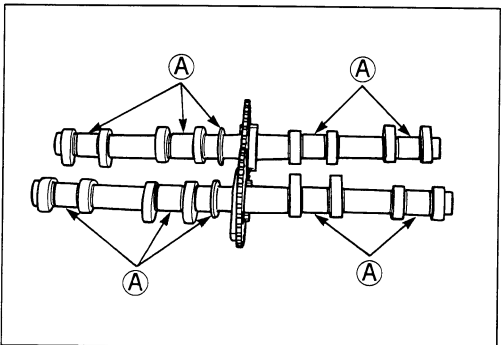
To turn over crankshaft, torque nut with a 19 mm wrench. Never try to rotate crankshaft by putting a 6 mm T-type wrench over the bolt.



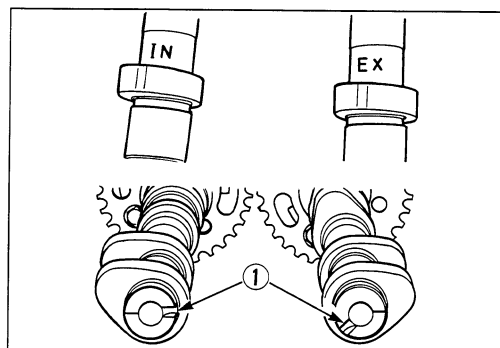
**NOTE:**

Just before placing the camshaft on the cylinder head, apply SUZUKI MOLY PASTE to its journals, fully coating each journal (A) with the paste, taking care not to leave any dry spot. Apply engine oil to the camshaft journal holders.

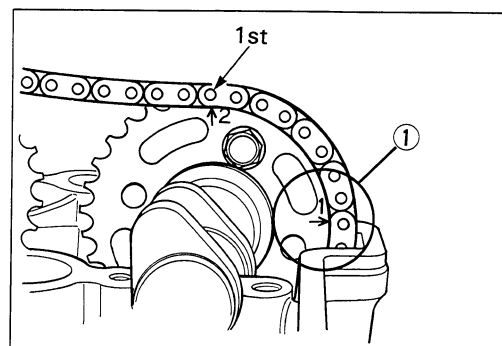
**99000-25140: SUZUKI MOLY PASTE**



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



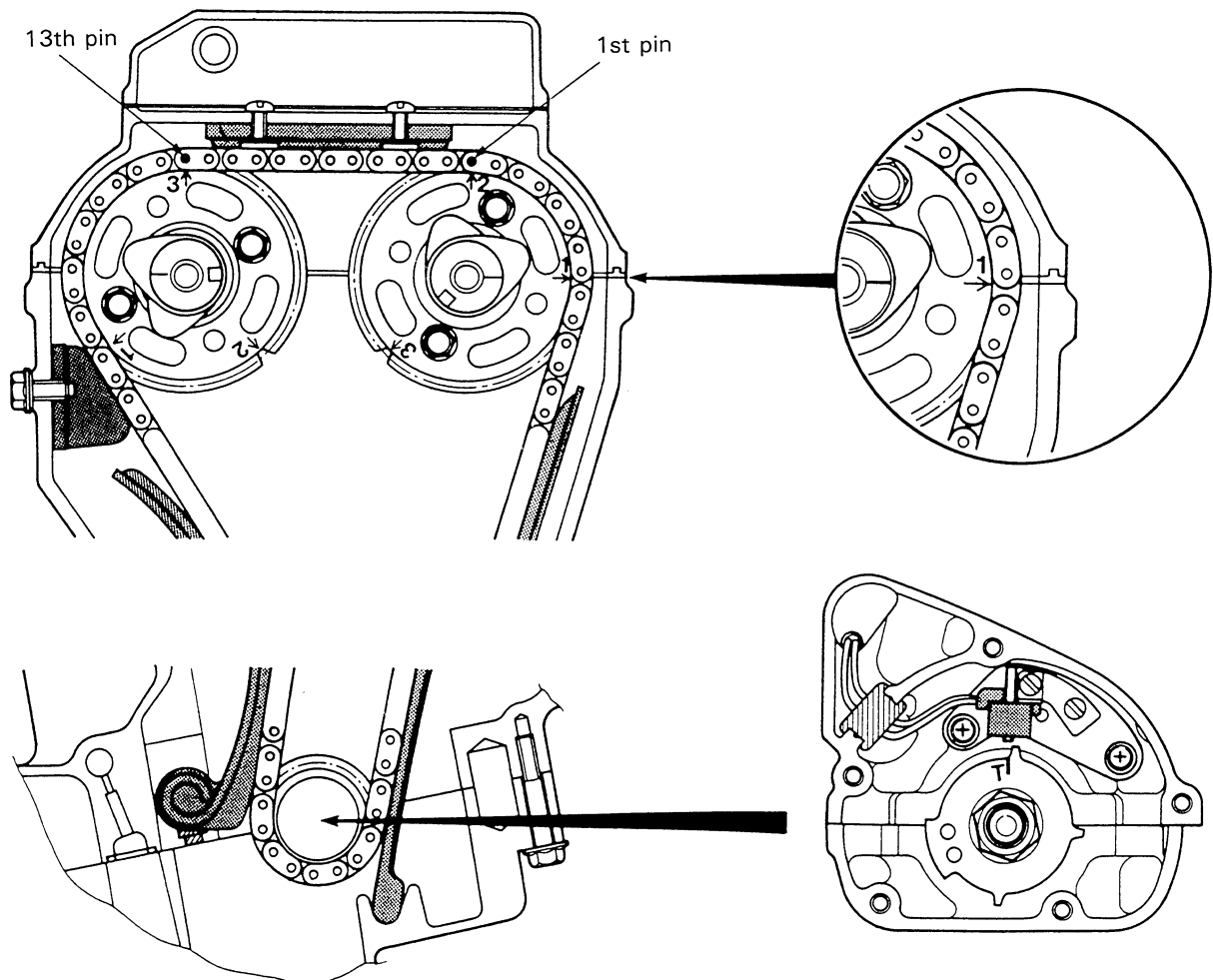
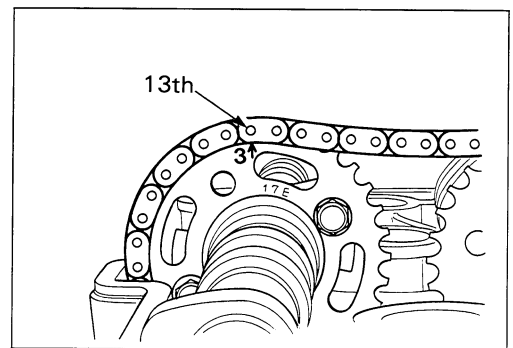
- With “T” mark accurately lined up with the timing mark, hold the camshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- The exhaust sprocket bears an arrow marked “1” indicated as (1). Turn over the exhaust camshaft so that the arrow points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



- The other arrow marked "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 13th roller pin. Engage the cam chain with intake sprocket, locating the 13th pin at the above the arrow marked "3" on the intake sprocket.

**NOTE:**

*The cam chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the camshaft journal holders and cam chain tensioner are secured.*



- Each camshaft journal holder is identified with a cast-on letter. Install the dowel pins to each camshaft journal holder.
- Fasten the camshaft journal holders evenly by tightening the camshaft journal holder bolts sequentially in the ascending order of numbers. (Try to equalize the pressure by shifting the wrench in this above manner, to fasten the shafts evenly.)

**NOTE:**

*Damage to head or camshaft journal holder thrust surfaces may result if the camshaft journal holders are not drawn down evenly.*

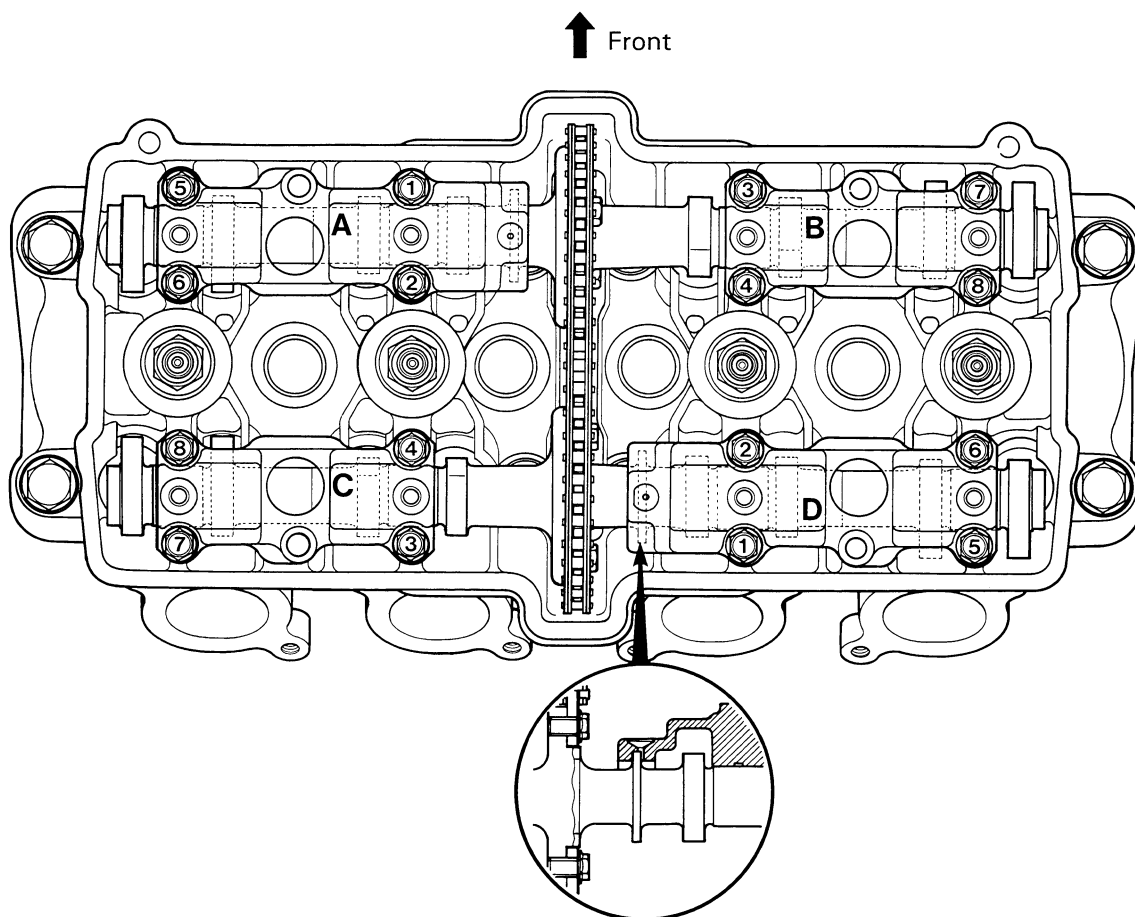
- Tighten the camshaft journal holder bolts to the specified torque.

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

**CAUTION:**

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

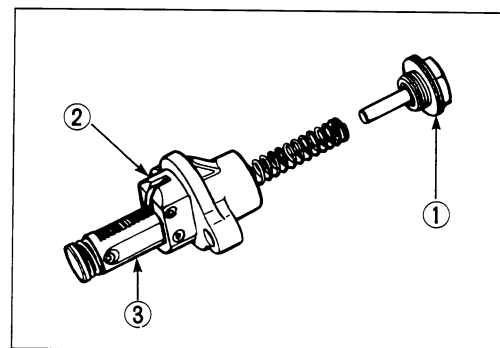
Take special care not to use other types of bolts instead of these special bolts. To identify these bolts, each of them has a figure “9” on its head.



- After removing the spring holder bolt ① and spring, unlock the ratchet mechanism ② and push in the push rod ③ all the way.

**NOTE:**

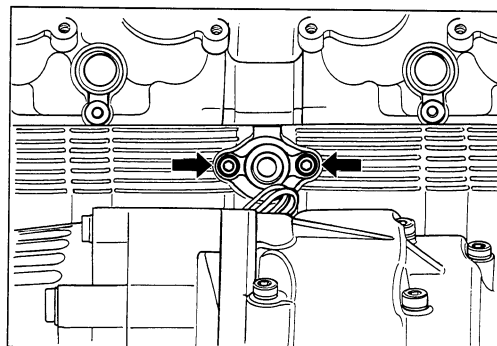
Before installing the cam chain tensioner, turn the crankshaft clockwise to remove the cam chain slack between the crank sprocket and exhaust sprocket.



- Install a new gasket and the cam chain tensioner to the cylinder block with two bolts and tighten them to the specified torque.

**Tightening torque: 6–8 N·m**

(0.6–0.8 kg-m, 4.5–6.0 lb-ft)



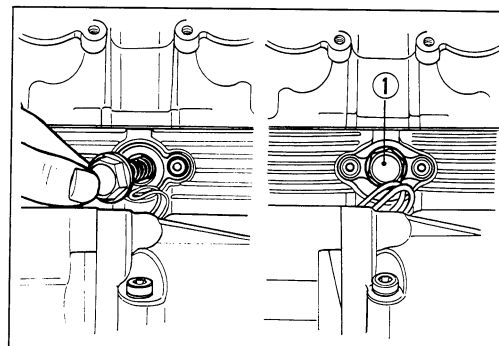
- Insert the spring into the cam chain tensioner and tighten the spring holder bolt ① to the specified torque.

**Tightening torque: 30–45 N·m**

(3.0–4.5 kg-m, 21.5–32.5 lb-ft)

**CAUTION:**

After installing the cam chain tensioner, check to be sure that the tensioner work properly by checking the slack of cam chain.



- Pour about 50 ml of engine oil in each oil pocket in the head.

**NOTE:**

Turn the crankshaft and check that all the moving parts such as cam follower, camshaft, work properly.

**CAUTION:**

Be sure to check the tappet clearance. (Refer to page 2-4.)

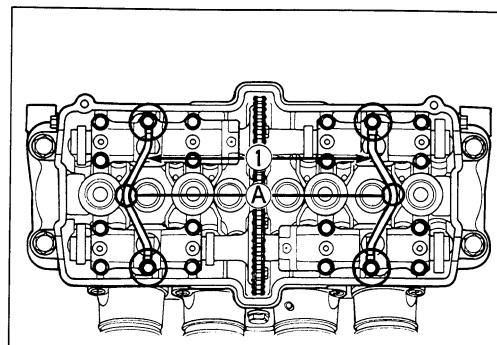
- Place the oil pipes ① to the camshaft journal holders as shown in the Fig.

**NOTE:**

Be sure to bring the white painted side (A) on the oil pipes to the top when installing them to the camshaft journal holders.

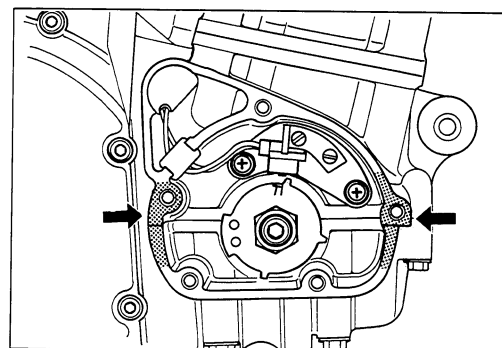
**Tightening torque: 8–12 N·m**

(0.8–1.2 kg-m, 6.0–8.5 lb-ft)



- Coat SUZUKI BOND NO. 1207B lightly to the mating surfaces between upper and lower crankcases as shown in the Fig.

**99000-31140: SUZUKI BOND NO. 1207B**



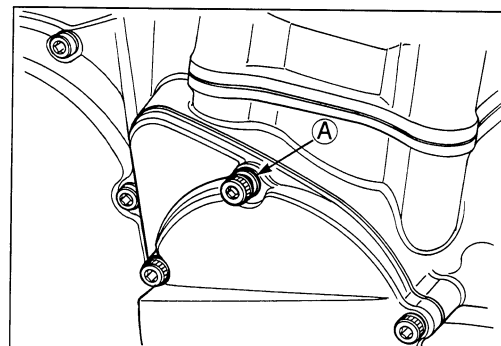
- Install a new gasket and the signal generator cover with five bolts.

**NOTE:**

*Fit a gasket to the signal generator cover bolt (A) correctly as shown in the Fig.*

**CAUTION:**

**Use a new gasket to prevent oil leakage.**



- Place the left and right oil hoses as shown in the Fig.

**NOTE:**

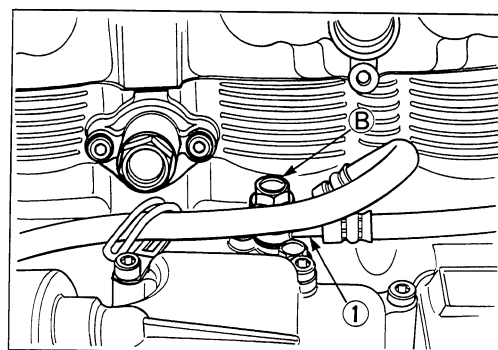
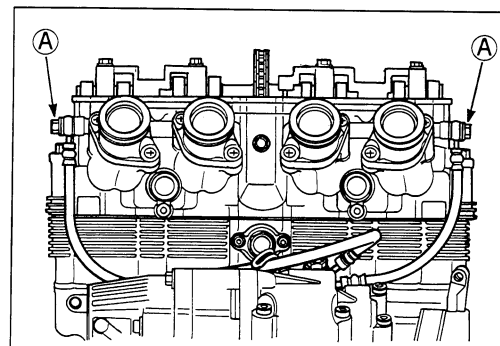
- \* Install the new gaskets to both sides of the union bolt.
- \* Be sure to bring the green painted side ① on the oil hoses to the top when installing them. Refer to page 8-17.

**CAUTION:**

**Replace the gaskets with new ones to prevent oil leakage.**

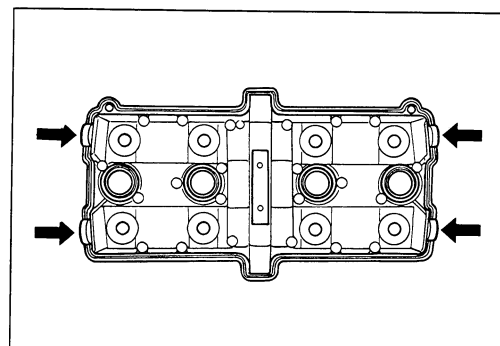
**Tightening torque**

- Upper side (A) : 20–23 N·m  
(2.0–2.3 kg-m, 14.5–16.5 lb-ft)
- Lower side (B) : 25–29 N·m  
(2.5–2.9 kg-m, 18.0–21.0 lb-ft)



- Before installing the cylinder head cover gaskets on the cylinder head cover, apply SUZUKI BOND NO. 1207B to the grooves of the head cover.
- Apply SUZUKI BOND NO. 1207B to the four cam end caps of the gasket as shown in the Fig.

**99000-31140: SUZUKI BOND NO. 1207B**



- Place the cylinder head cover on the cylinder head.
- Fit the eight gaskets to each head cover bolt.

**NOTE:**

*Be sure to face the arrow mark on the cylinder head cover to the front side.*

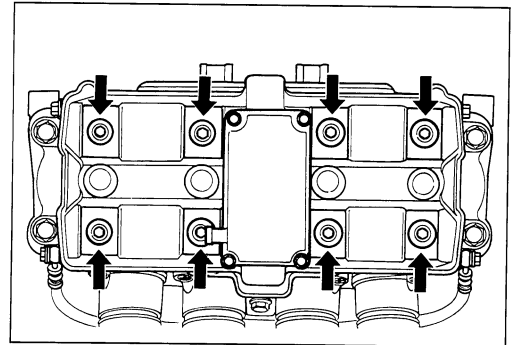
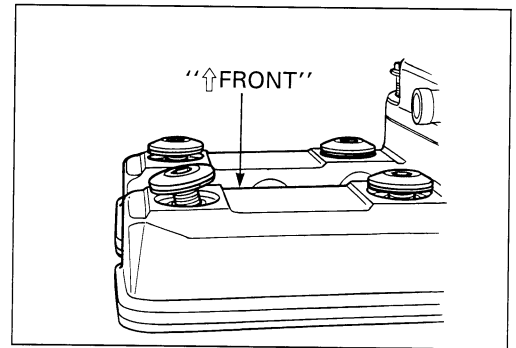
**CAUTION:**

**Replace the gaskets with new ones to prevent oil leakage.**

**Tightening torque**

**Head cover bolt: 13–15 N·m**

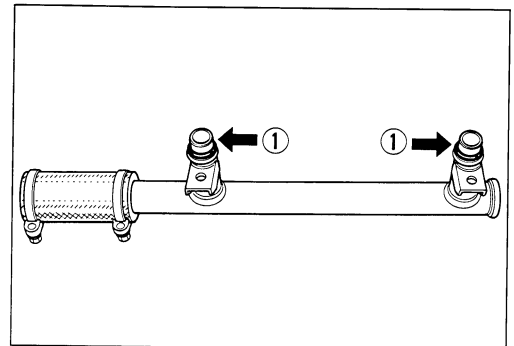
**(1.3–1.5 kg-m, 9.5–11.0 lb-ft)**



- Fit the new O-rings ① to the inlet and outlet water pipes.

**NOTE:**

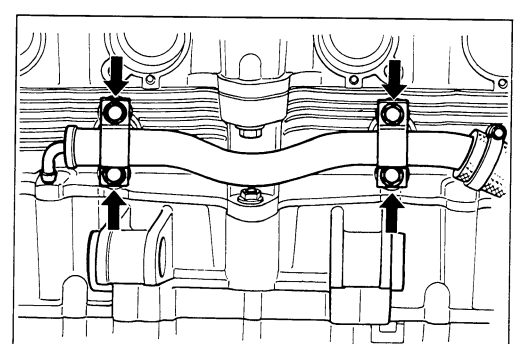
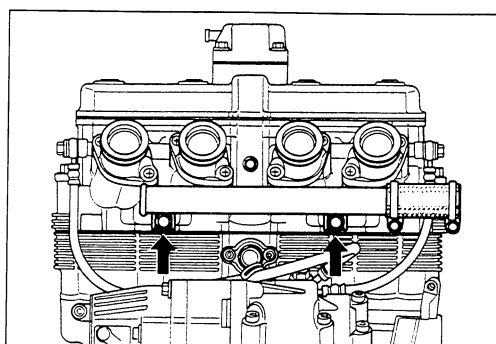
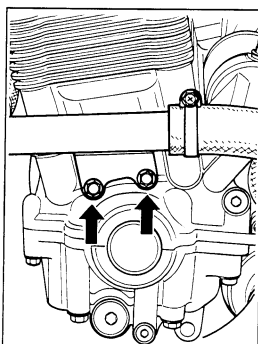
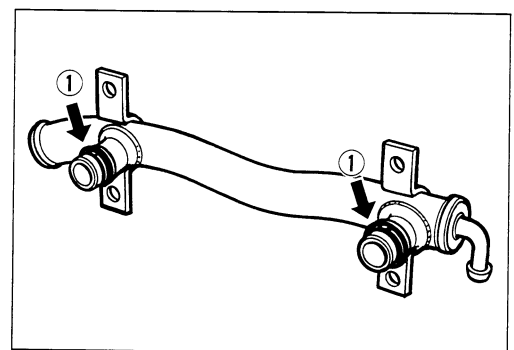
*Before installing the water pipes to the cylinder block, apply engine oil lightly to each O-ring.*



- Install the inlet and outlet water pipes to the cylinder block.
- Tighten the water pipe mounting bolts to the specified torque.

**Tightening torque: 8–12 N·m**

**(0.8–1.2 kg-m, 6.0–8.5 lb-ft)**



**NOTE:**

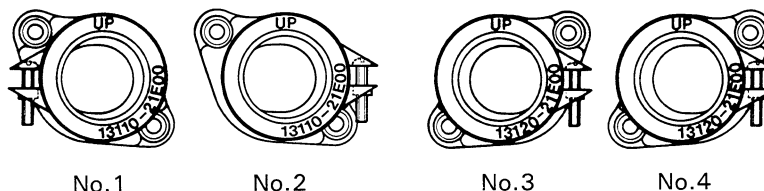
When replacing the intake pipes, identify the different intake pipes according to each I.D. code.

(13110-21E00 for No.1 cylinder)

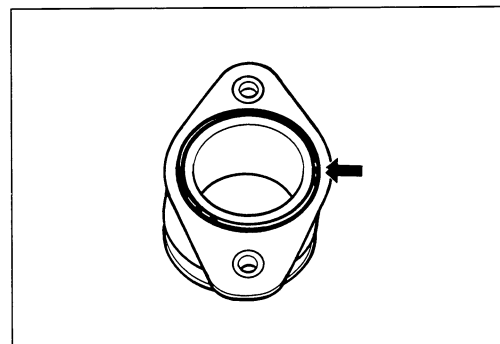
(13110-21E00 for No.2 cylinder)

(13120-21E00 for No.3 cylinder)

(13120-21E00 for No.4 cylinder)

**CAUTION:**

Use a new O-ring to prevent sucking air from the joint.



- Install the oil cooler and tighten its mounting bolt to the specified torque.

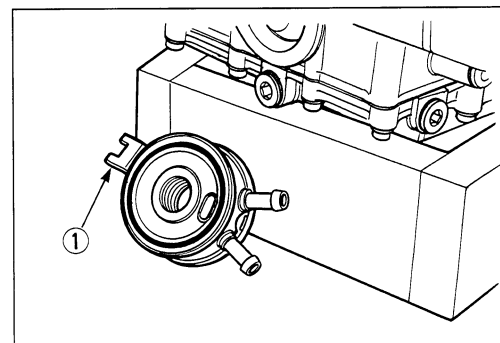
**NOTE:**

\* Before installing the oil cooler, apply engine oil lightly to its O-ring.

\* Set the lug ① of the oil cooler to the recess of the crankcase.

**Tightening torque: 53—64 N·m**

**(5.3—6.4 kg-m, 38.5—46.5 lb-ft)**

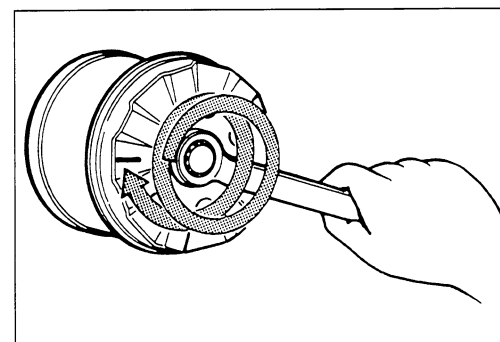


- Install the oil filter turning it by hand until you feel that the filter gasket contacts the mounting surface. Then tighten it 2 turns by using the special tool.

**09915-40610: Oil filter wrench**

**NOTE:**

Before installing the oil filter, apply engine oil lightly to its O-ring.





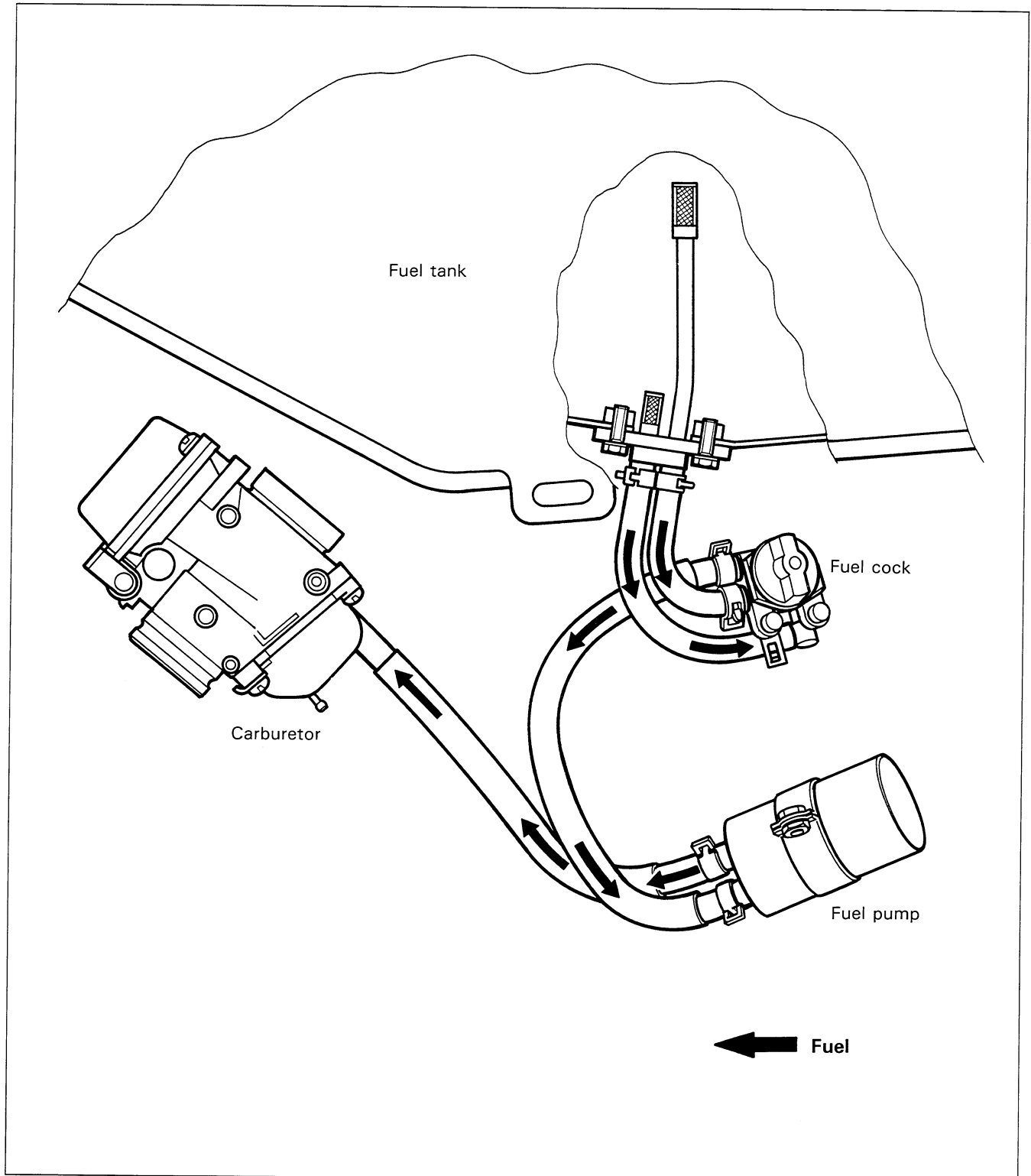
# FUEL AND LUBRICATION SYSTEM

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## FUEL SYSTEM

The fuel pump is operated by an electro-magnetic force and its electrical energy is supplied from the battery which is controlled by the fuel pump relay's control circuit. The fuel sent under pressure by the fuel pump flows into the float chamber when the float of the carburetor has dropped and the needle valve is open. When the needle valve closes, the pressure of the fuel in the hose connecting the carburetor and the fuel pump increases, and when the set pressure is reached, the operation of the fuel pump is stopped by the fuel pressure to prevent excessive supply.



## FUEL PUMP

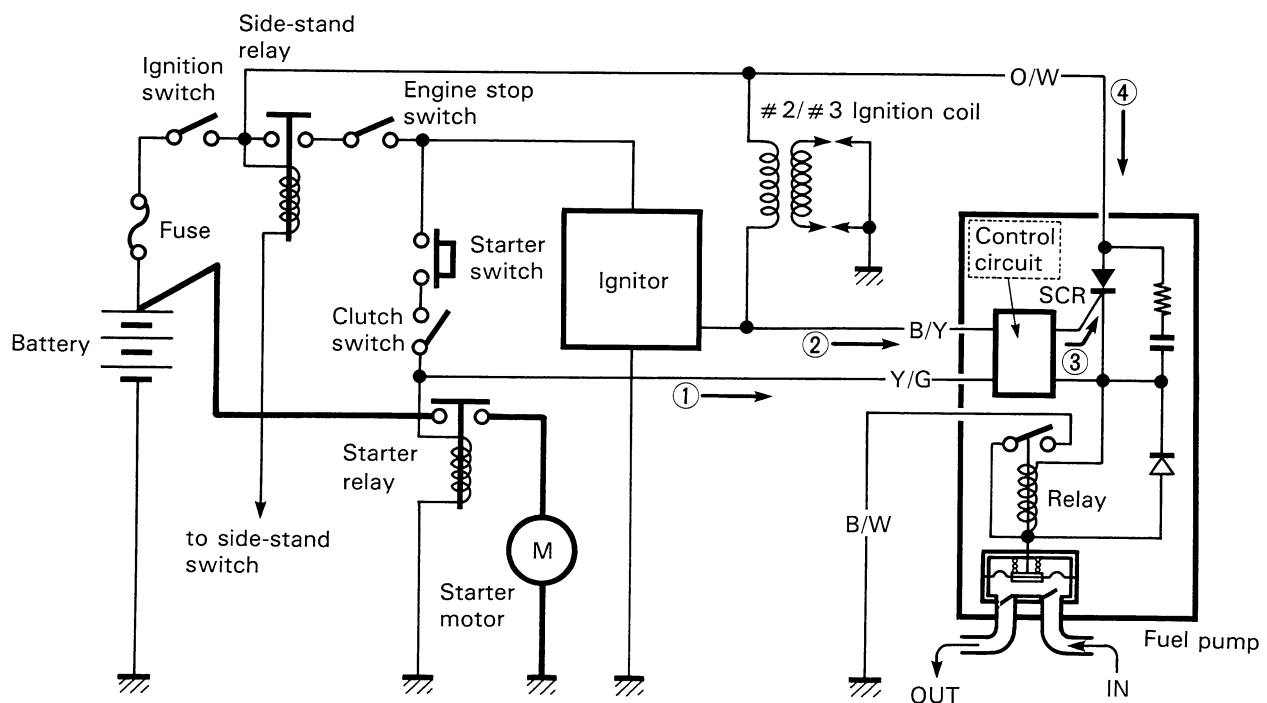
### DESCRIPTION

#### Starting Engine:

In order to supplement fuel supply when starting the engine by turning the starter switch ON, current ① is sent directly from the battery and passes through the fuel pump relay, thus operating the fuel pump.

#### After start:

The current ② generated at coils No.2/No.3 flows to the fuel pump relay's control circuit. The control circuit receives this current ② and sends signal ③ to the SCR, turning it ON. When the SCR turns ON, current ④ is sent from the battery through the fuel pump relay, thus operating the fuel pump.



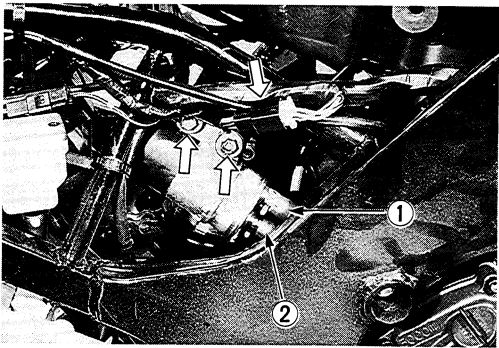
#### WIRE COLOR

B/W : Black with White tracer  
 Y/G : Yellow with Green tracer  
 B/Y : Black with Yellow tracer  
 O/W : Orange with White tracer

FUEL PUMP REMOVAL

- Remove the seats. (Refer to page 7-5.)
- Remove the frame cover assembly.
- Turn the fuel cock “OFF” position and disconnect the fuel hoses (① and ②) from the fuel pump.
- Disconnect the fuel pump lead wire coupler and remove the fuel pump mounting bolts.

- ①: Outlet hose
- ②: Inlet hose



FUEL PUMP INSPECTION

- Using the pocket tester (x kΩ range), measure the resistance between the lead wires in the following table. If the resistance checked is incorrect, replace the fuel pump.

09900-25002: Pocket tester

NOTE:

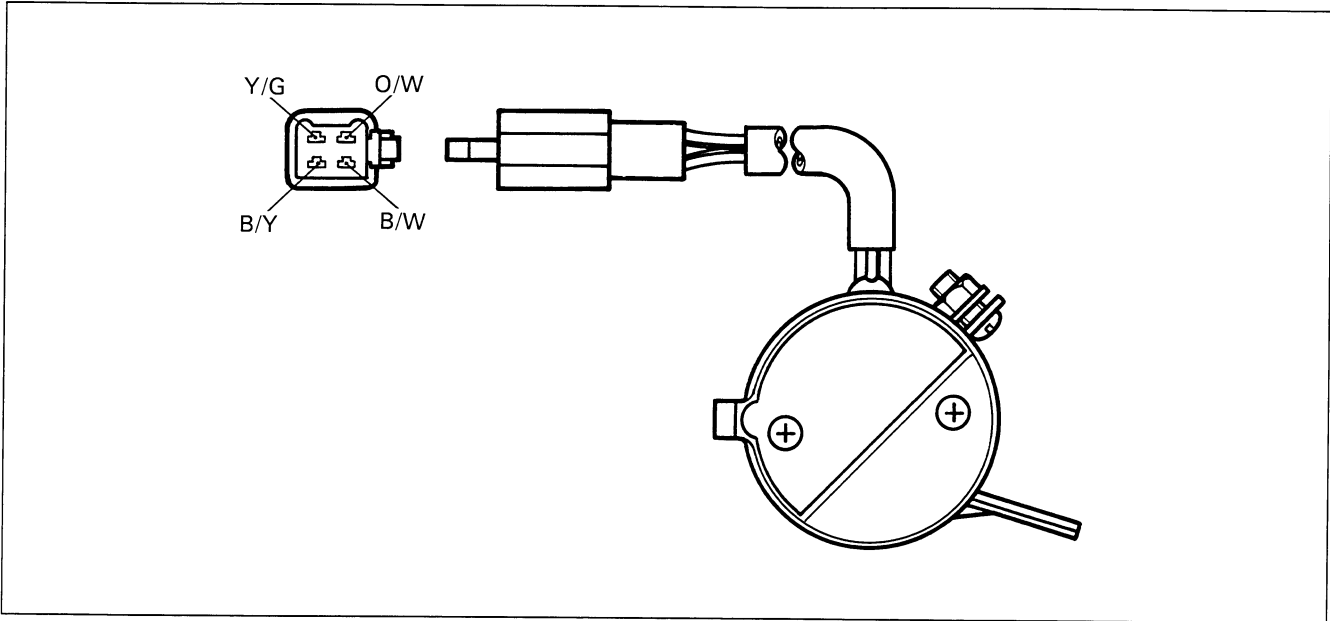
As capacitor, diodes, etc. are used inside this fuel pump, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.

(Approx. kΩ)

		⊕ Probe of tester to:			
		O/W	B/Y	Y/G	B/W
⊖ Probe of tester to:	O/W		∞	∞	∞
	B/Y	∞		∞	∞
	Y/G	∞	45 – 55		10 – 12
	B/W	∞	31 – 37	10 – 12	

WIRE COLOR

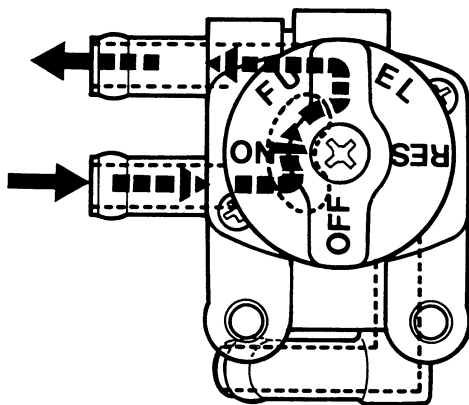
- O/W : Orange with White tracer
- B/Y : Black with Yellow tracer
- Y/G : Yellow with Green tracer
- B/W : Black with White tracer
- ∞ : Infinity



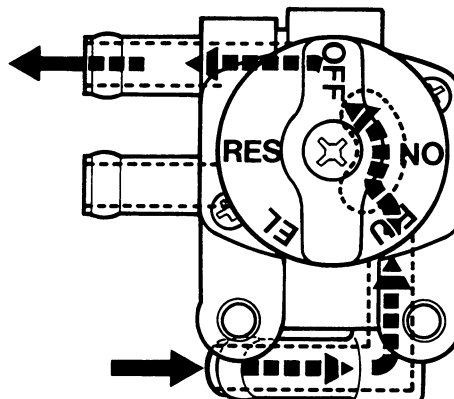
## FUEL COCK

### FUEL COCK MECHANISM

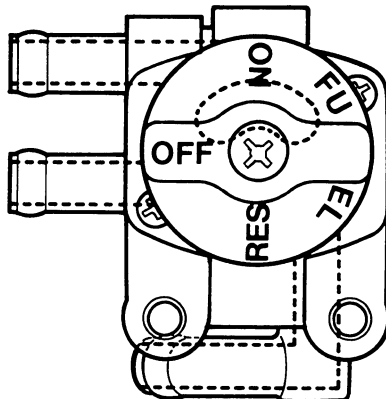
A valve is provided at the end of the fuel cock lever and can switch over to "OFF", "ON" and "RES". With the valve "ON" (normal), the main passage opens. With the valve "OFF", both holes close.



"ON" position



"RES" position



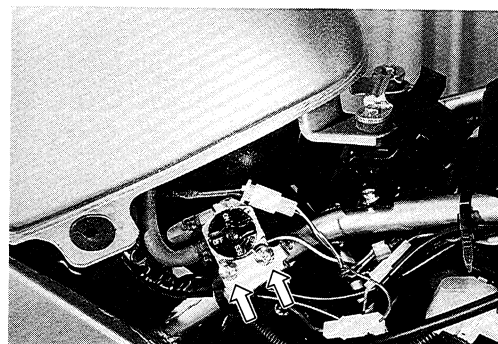
"OFF" position

### FUEL COCK REMOVAL

- Remove the seats and frame cover assembly. (Refer to page 7-5.)
- Remove the fuel cock mounting screws.
- Bend the fuel hoses with a soft clip and disconnect the fuel hoses from the fuel cock.

#### WARNING:

Gasoline is very explosive. Extreme care must be taken.



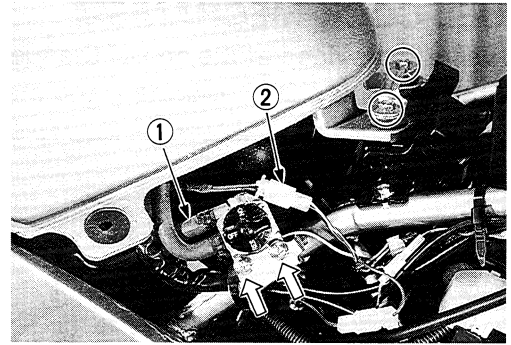
## FUEL TANK AND FUEL FILTER

### FUEL TANK REMOVAL

- Remove the seats and frame cover assembly. (Refer to page 7-5.)
- Turn the fuel cock to “OFF” position and disconnect the fuel cock outlet hose ①.
- Disconnect the fuel level indicator switch lead wire coupler ②.
- Remove the fuel cock mounting screws.
- Remove the fuel tank by removing the mounting bolts.

#### WARNING:

Gasoline is very explosive. Extreme care must be taken.

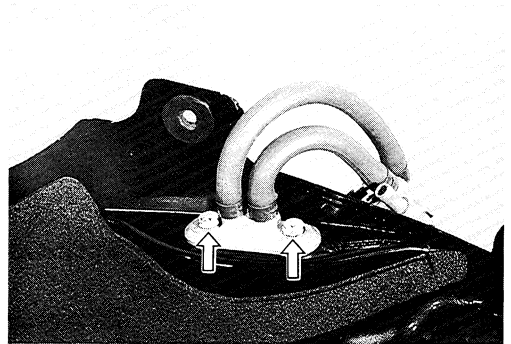


### FUEL FILTER REMOVAL

- Remove the fuel filter assembly by removing the bolts.

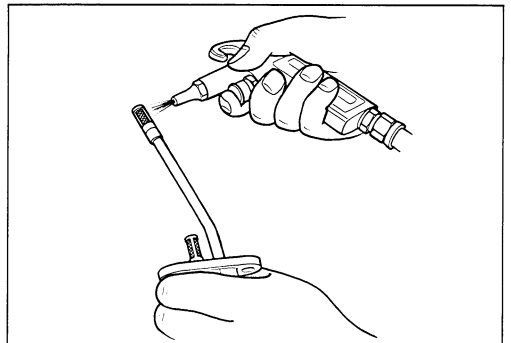
#### WARNING:

Gasoline is very explosive. Extreme care must be taken. Gaskets and O-ring must be replaced with new ones to prevent fuel leakage.

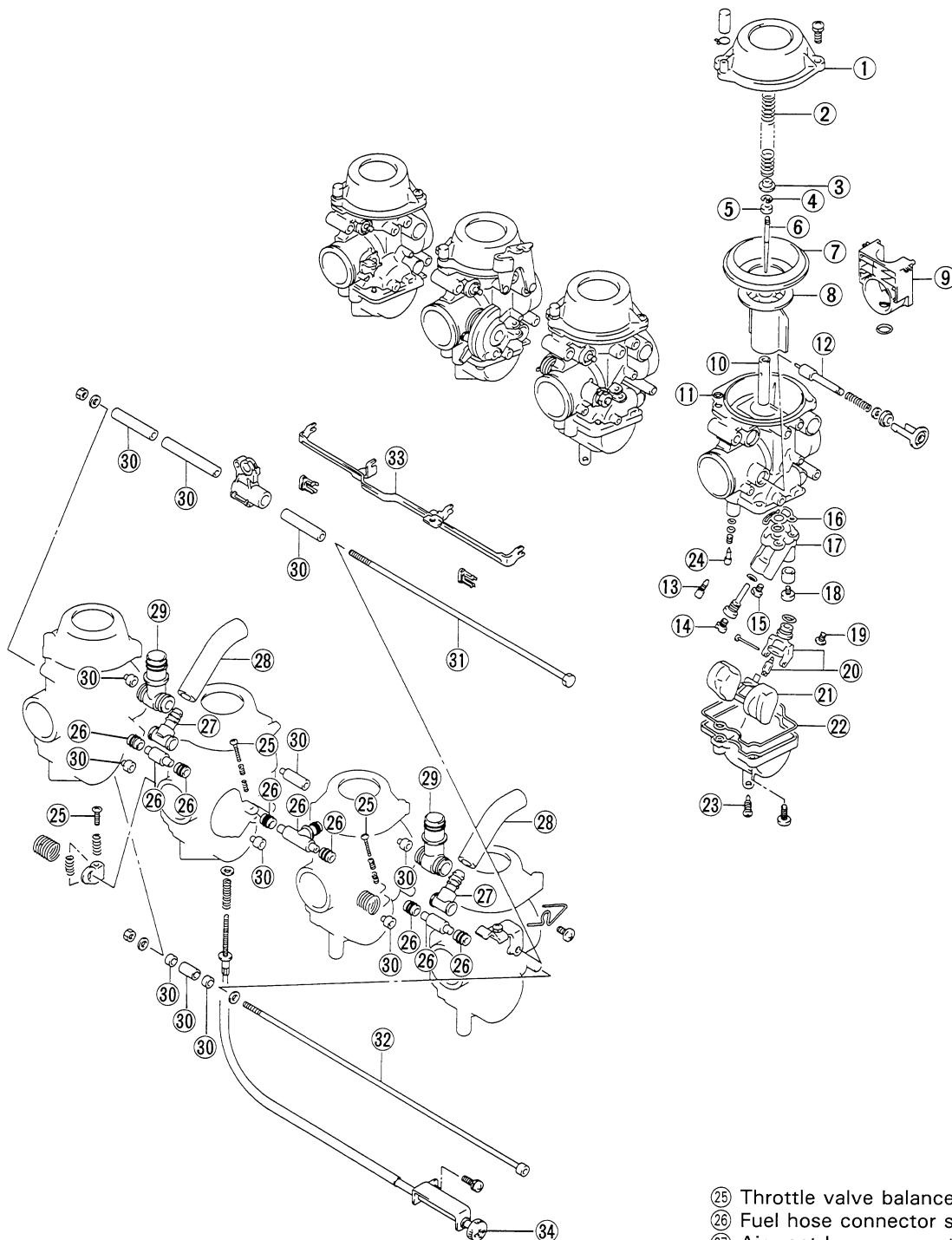


### INSPECTION AND CLEANING

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



# CARBURETOR CONSTRUCTION



- ① Top cap
- ② Spring
- ③ Spring seat
- ④ E-ring
- ⑤ Washer
- ⑥ Jet needle
- ⑦ Diaphragm
- ⑧ Piston valve

- ⑨ Piston valve guide
- ⑩ Needle jet
- ⑪ O-ring
- ⑫ Starter plunger
- ⑬ Pilot jet
- ⑭ Main jet
- ⑮ Starter jet
- ⑯ Gasket

- ⑰ Mixing body
- ⑱ Needle jet set bolt
- ⑲ Needle valve ass'y set screw
- ⑳ Needle valve ass'y
- ㉑ Float
- ㉒ Gasket
- ㉓ Drain screw
- ㉔ Pilot screw

- ㉕ Throttle valve balance screw
- ㉖ Fuel hose connector set
- ㉗ Air vent hose connector
- ㉘ Air vent hose
- ㉙ Diaphragm chamber hose connector
- ㉚ Spacer
- ㉛ Carburetor set upper shaft
- ㉜ Carburetor set lower shaft
- ㉝ Starter shaft lever
- ㉞ Throttle stop screw

## SPECIFICATIONS

ITEM	SPECIFICATION			
	E-02 and others	E-15,22,24	E-18	E-17,22-U type
Carburetor type	MIKUNI BDST36SS	←	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	←	33 mm	36 mm
I.D. No.	21E0	21E1	21E2	21E3
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min	←	←
Float height	6.9 mm (0.27 in)			
Main jet (M.J.)	# 112.5	←	# 110	# 112.5
Main air jet (M.A.J.)	0.6 mm	←	0.7 mm	0.6 mm
Jet needle (J.N.)	5E93-3rd	←	5E93-4th	5E93-3rd
Needle jet (N.J.)	O-9	←	O-8	O-9
Throttle valve (Th.V.)	# 125	←	# 120	# 125
Pilot jet (P.J.)	# 15	←	# 10	# 15
By-pass (B.P.)	0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←
Valve seat (V.S.)	1.5 mm	←	←	←
Starter jet (G.S.)	# 47.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1¼ turns out)	←	PRE-SET (1½ turns out)	PRE-SET (1¼ turns out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

E-02: England

E-04: France

E-15: Finland

E-17: Sweden

E-18: Switzerland

E-21: Belgium

E-22: Germany

E-24: Australia

E-25: Netherlands

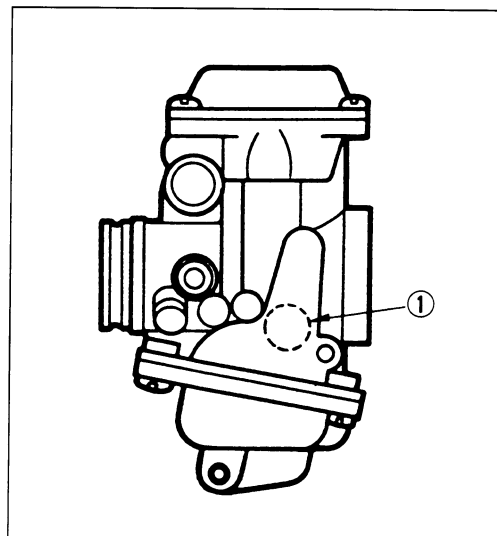
E-28: Canada

E-34: Italy

E-53: Spain

## I.D. NO. LOCATION

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



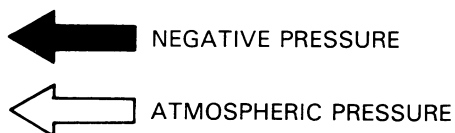
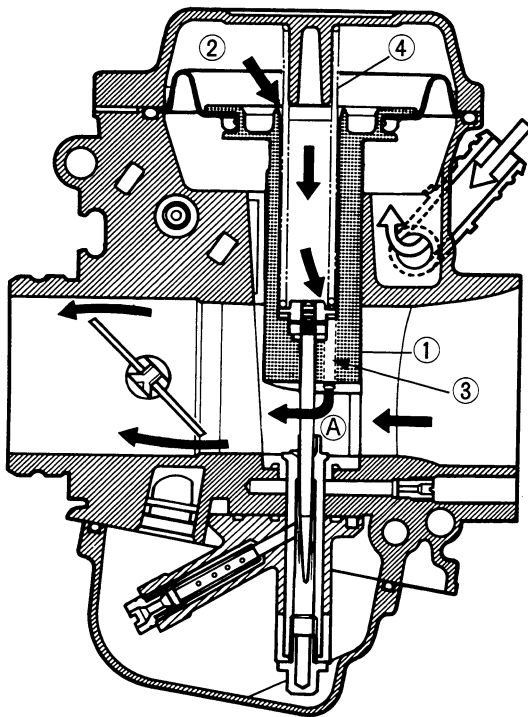


## DIAPHRAGM AND PISTON OPERATION

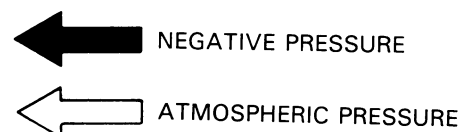
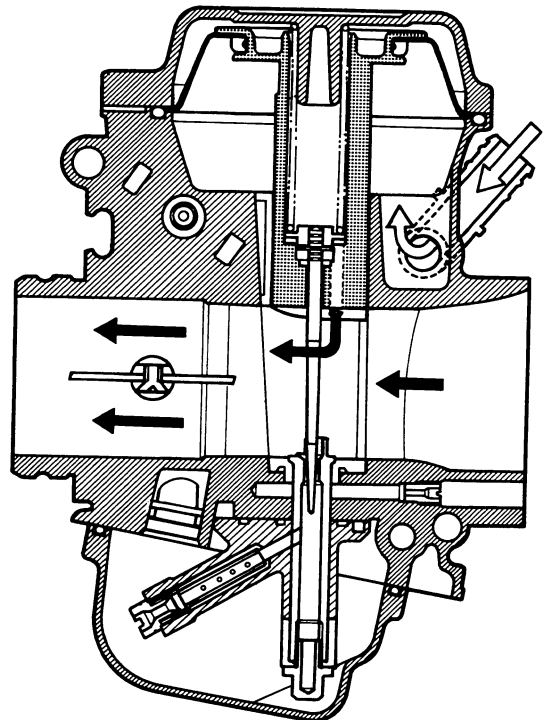
The carburetor is a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston valve ① which moves according to the negative pressure present on the downstream side of the venturi (A). Negative pressure is admitted into the diaphragm chamber ② through two orifices ③ provided in the piston valve ①.

Rising negative pressure overcomes the spring ④ force, causing the piston valve ① to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing optimum ratio of fuel/air mixture.

LOWER POSITION OF PISTON VALVE

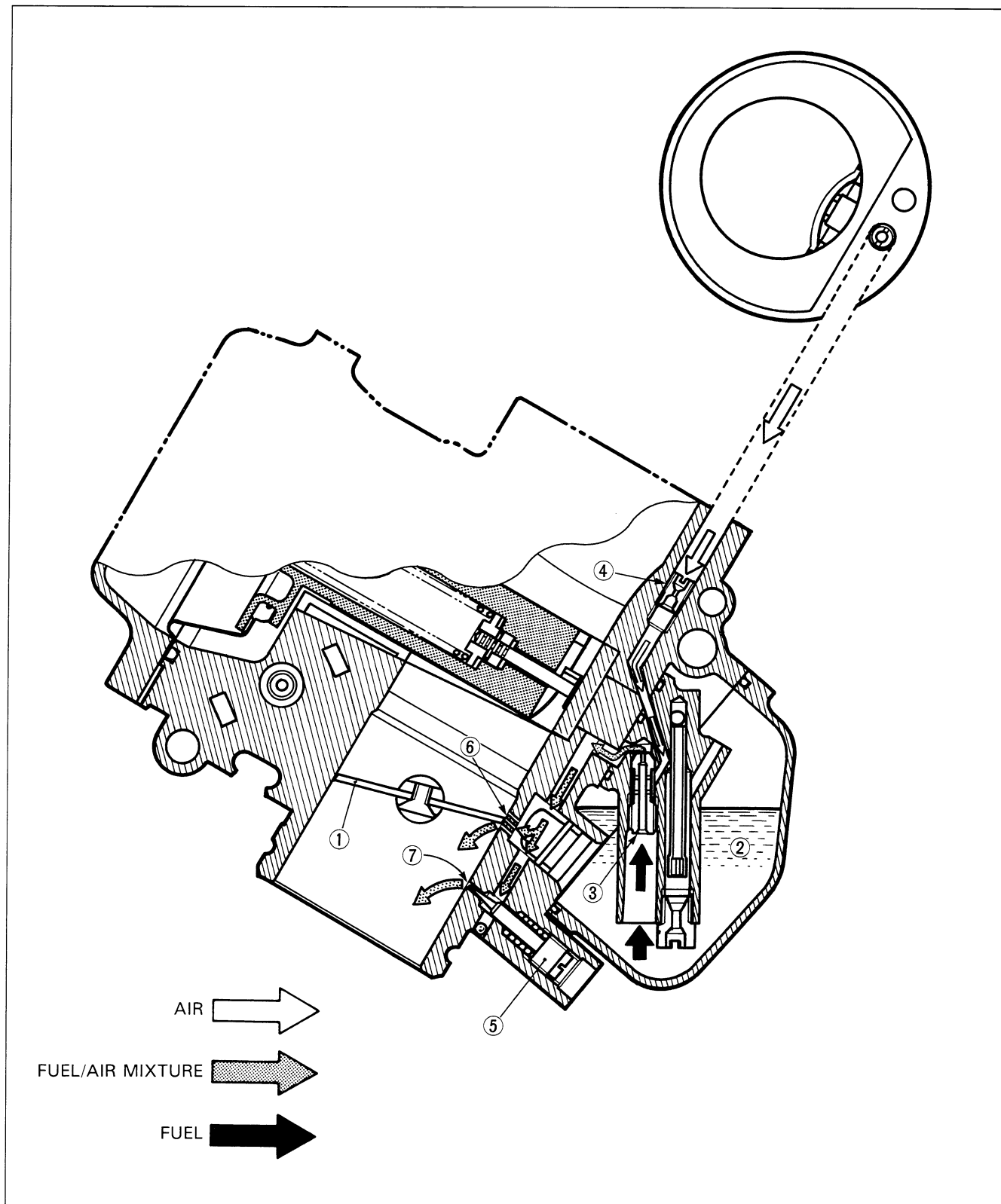


UPPER POSITION OF PISTON VALVE



## SLOW SYSTEM

This system supplies fuel during engine operation with throttle valve ① closed or slight opened. The fuel from float chamber ② is metered by pilot jet ③ where it mixes with air coming in through pilot air jet ④. This mixture, rich with fuel, then goes up through pilot passage to pilot screw ⑤. A part of the mixture is discharged into the main bore out of bypass ports ⑥. The remainder is then metered by pilot screw ⑤ and sprayed out into the main bore through pilot outlet ⑦.

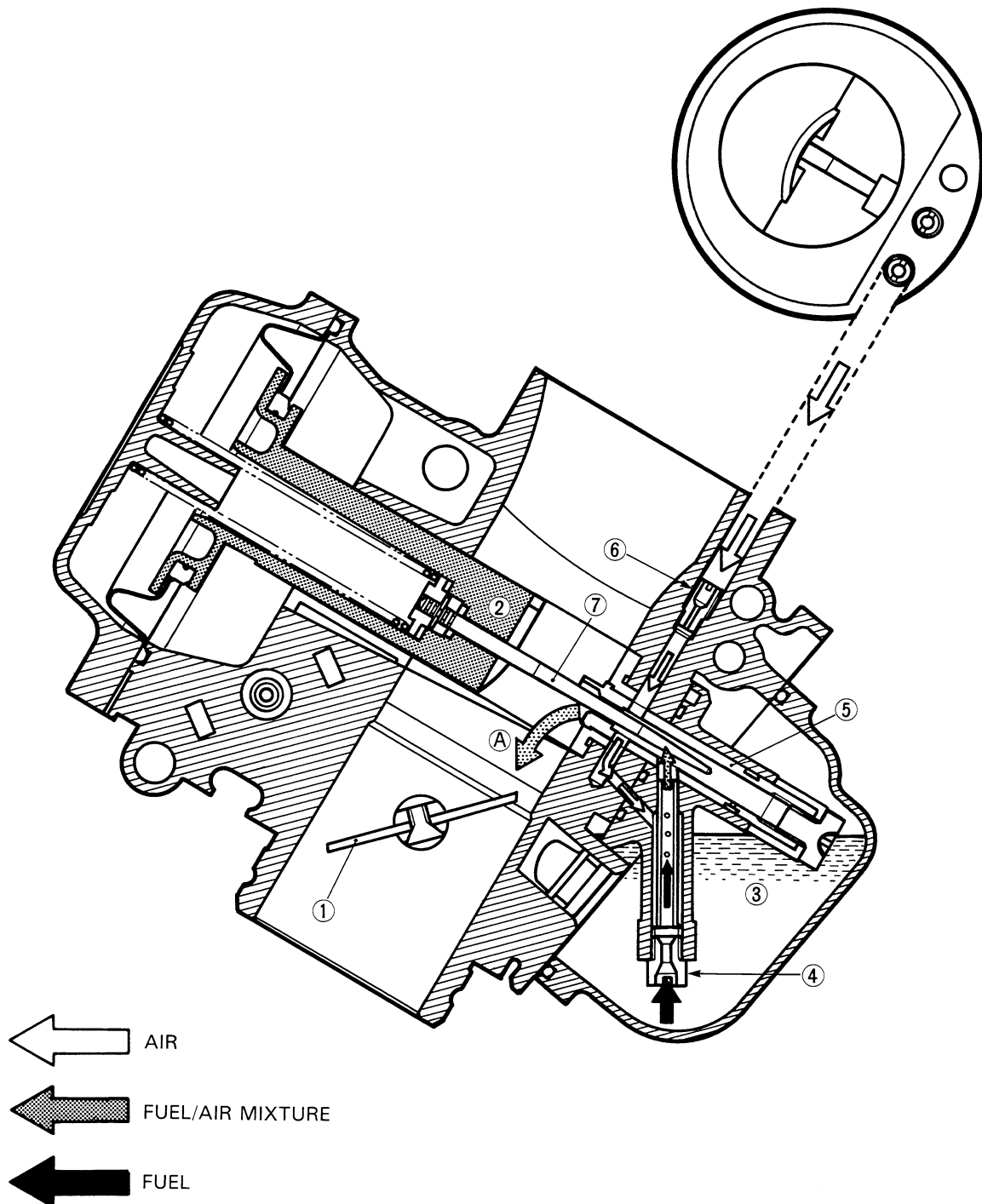


## MAIN SYSTEM

As throttle valve ① is opened, engine speed rises, and this increases negative pressure in the venturi A. Consequently the piston valve ② moves upward.

Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel enters needle jet ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion.

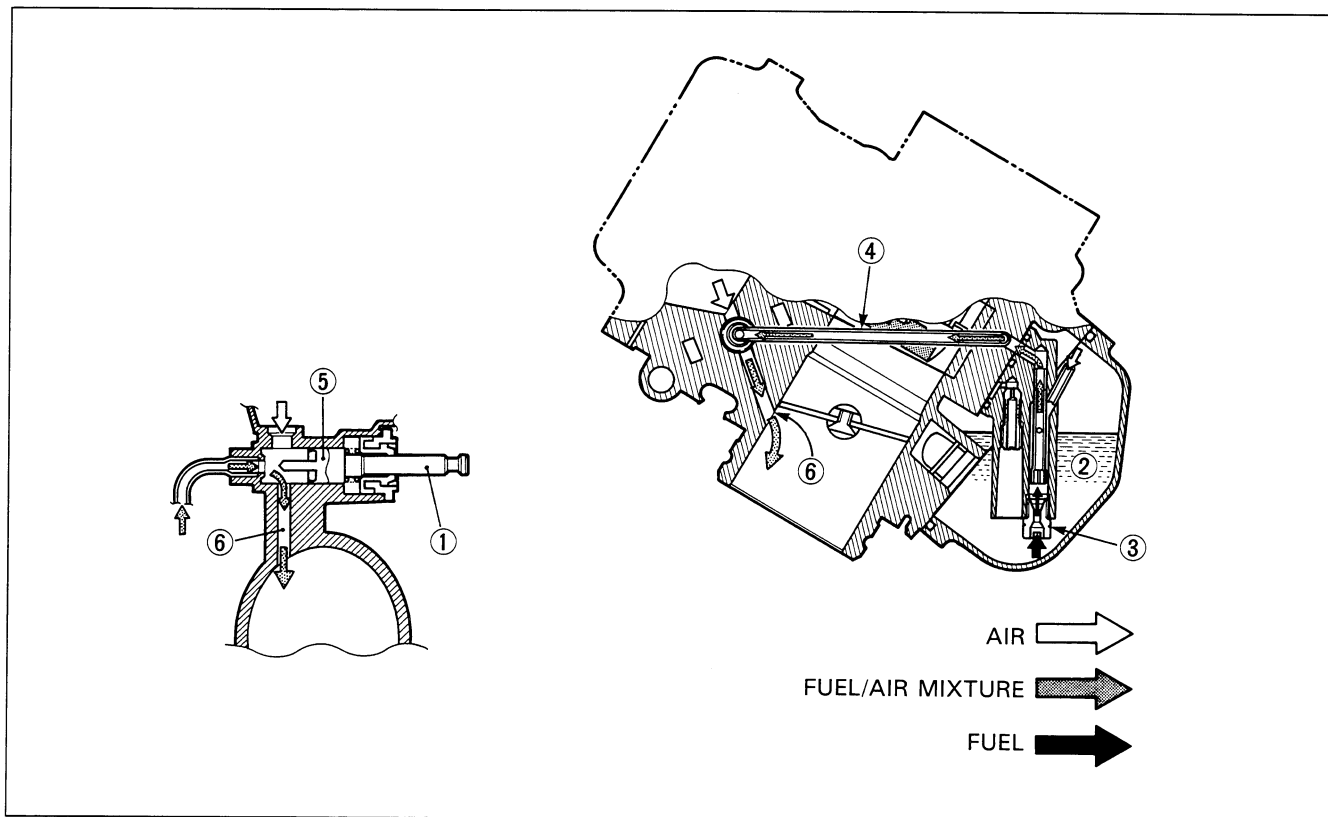
The emulsified fuel then passes through the clearance between needle jet ⑤ and jet needle ⑦, and is discharged into the venturi A, in which it meets main air stream being drawn by the engine. Mixture proportioning is accomplished in needle jet ⑤; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.



## STARTER SYSTEM

Pulling up the starter shaft ①, fuel is drawn into the starter circuit from the float chamber ②. Starter jet ③ meters this fuel, which then flows into starter pipe ④ and mixes with the air coming from the float chamber ②. The mixture, rich in fuel content, reaches starter plunger ⑤ and mixes again with the air coming through a passage extending from behind the diaphragm.

The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet ⑥ into the main bore.



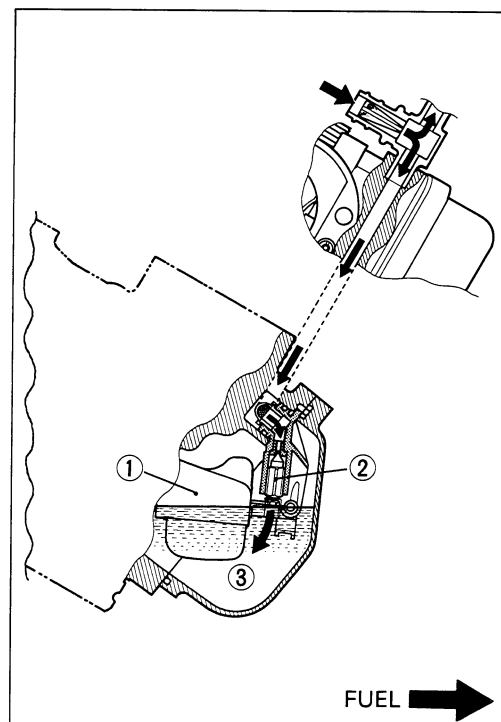
## FLOAT SYSTEM

Floats ① and needle valve ② are associated with the same mechanism, so that, as the floats ① move up and down, the needle valve ② too moves likewise.

When fuel level is up in float chamber ③, floats ① are up and needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters the float chamber ③.

As the fuel level falls, floats ① go down and needle valve ② unseats itself to admit fuel into the chamber ③.

In this manner, needle valve ② admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber ③.

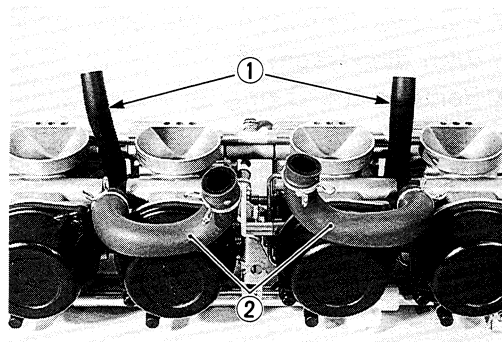
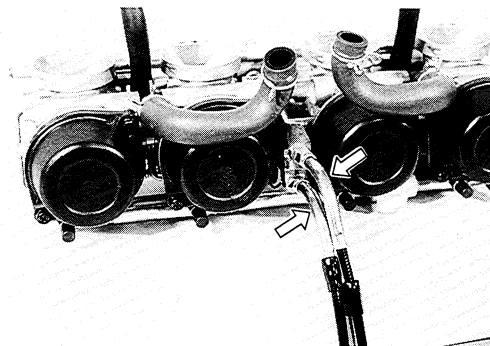


## REMOVAL

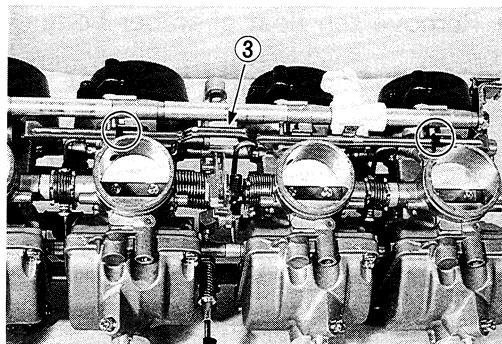
Refer to page 3-3.

## DISASSEMBLY

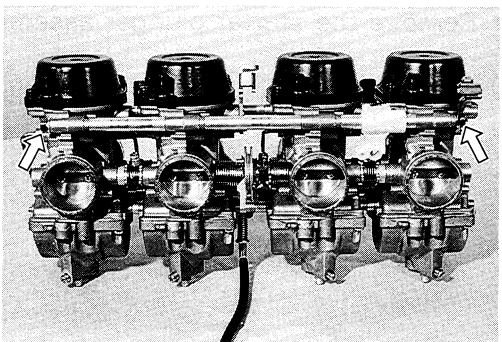
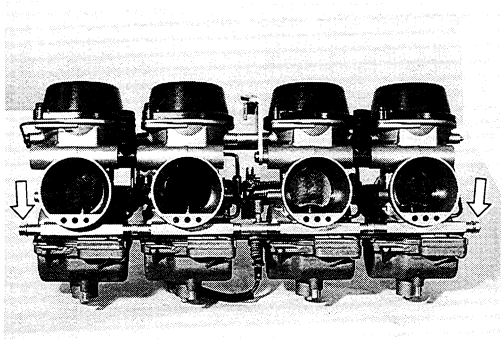
- Remove the throttle cables from the throttle lever.
- Disconnect the air vent hoses ① and diaphragm chamber air cleaner hoses ② .



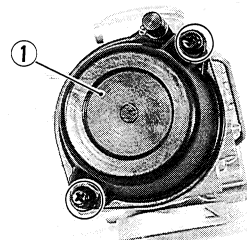
- Remove the starter shaft lever ③ .



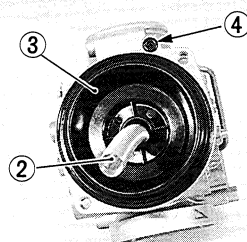
- Remove the upper and lower carburetor set shafts.
- Separate the carburetor assembly.



- Remove the carburetor top cap ① .

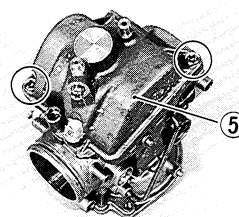


- Remove the piston valve return spring ② and piston valve with diaphragm ③ .
- Remove the O-ring ④ .

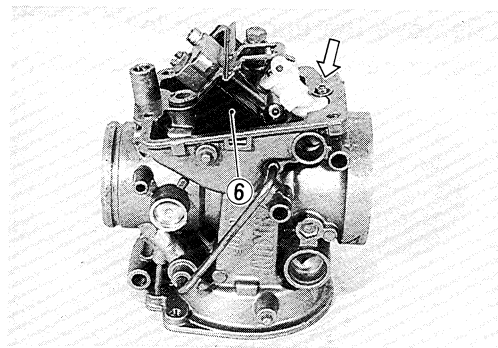


- Remove the float chamber body ⑤ .

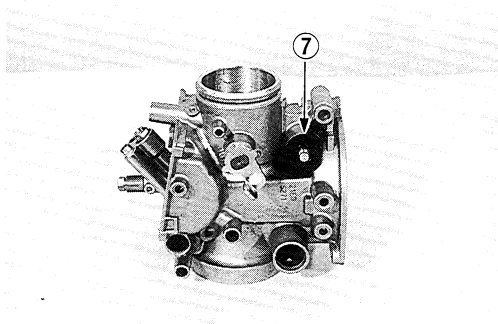
**09900-09003: Impact driver set**



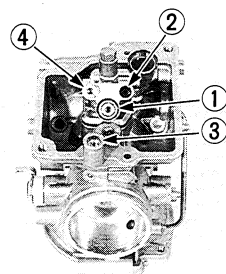
- Remove the float assembly ⑥ .



- Remove the starter plunger assembly ⑦ .



- Remove the main jet ① , pilot jet ② , pilot screw ③ and starter jet ④ .

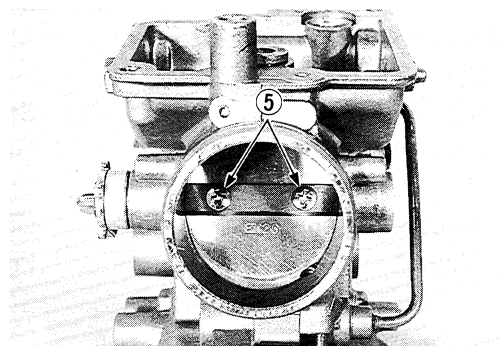


- Remove two throttle valve screws ⑤ and pull out throttle valve plate.

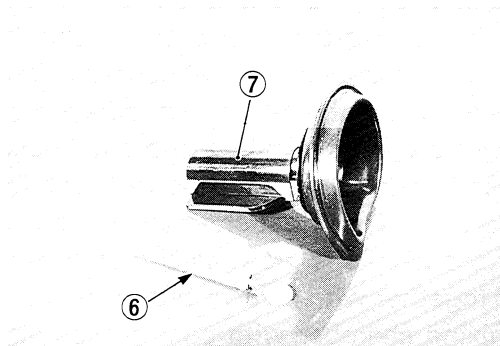
**09900-09003: Impact driver set**

**CAUTION:**

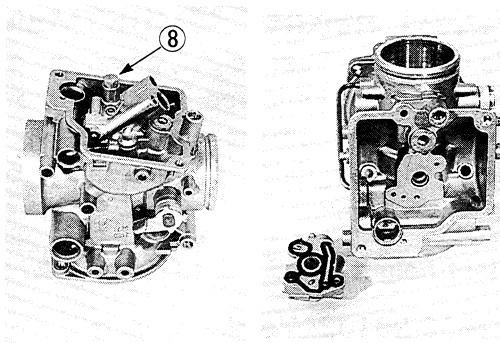
These two screws are locked by punching these ends. Once removing the screws, they will be damaged.



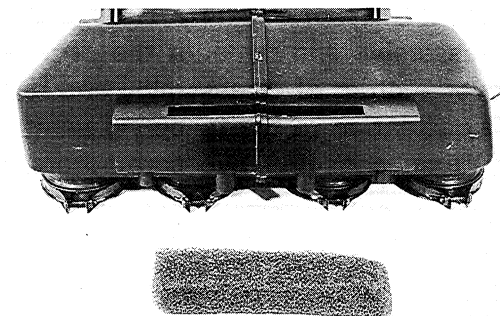
- Remove the jet needle ⑥ from the piston valve ⑦ .



- Remove the mixing body by removing the bolt ⑧ .



- Remove the carb. diaphragm chamber air cleaner element.



### Cleaning of Carb. diaphragm chamber air cleaner element

- 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.

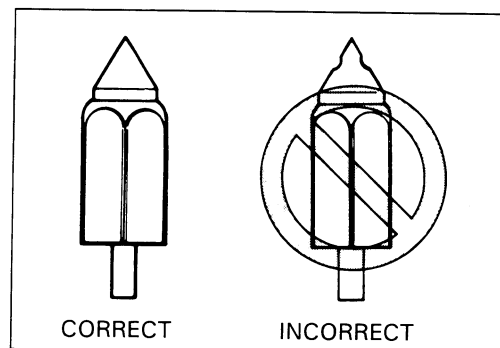
## INSPECTION AND ADJUSTMENT

Check following items for any damage or clogging.

- |                                |                                  |
|--------------------------------|----------------------------------|
| * Pilot jet                    | * Needle valve                   |
| * Main jet                     | * Starter jet                    |
| * Main air jet                 | * Gasket and O-ring              |
| * Pilot air jet                | * Throttle shaft oil seal        |
| * Needle jet air bleeding hole | * Diaphragm                      |
| * Float                        | * 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.

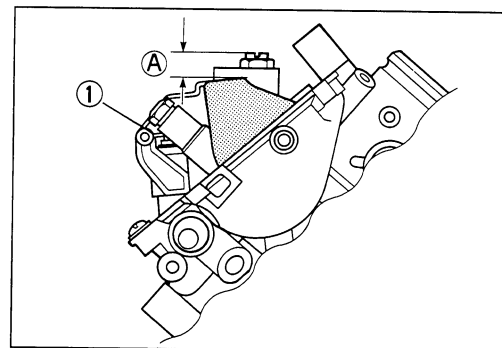


### FLOAT HEIGHT ADJUSTMENT

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

Float height ① :  $6.9 \pm 1.0$  mm ( $0.27 \pm 0.04$  in)

09900-20102: Vernier calipers

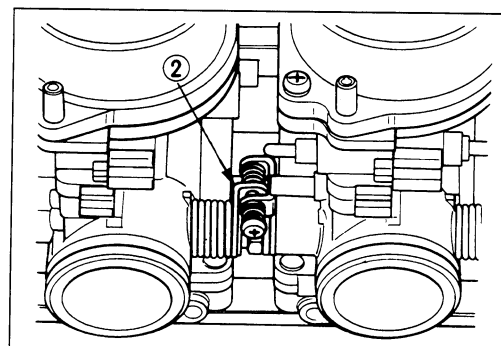


### REASSEMBLY AND REMOUNTING

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

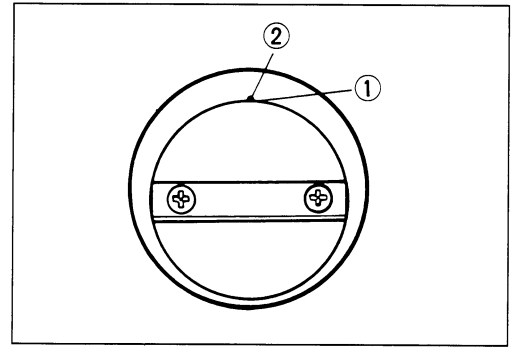
Pay attention to the following points:

- When engaging two carburetors, position the throttle valve control lever ② correctly.





- Set each throttle valve in such a way that its top end ① meets the foremost by-pass ②. This is accomplished by turning the throttle stop screw and throttle valve balance screw.



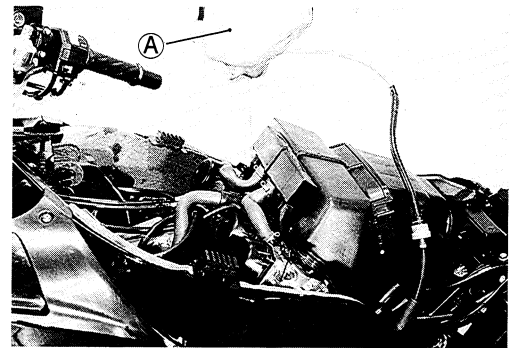
- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
  - \* Engine idle r/min ..... Page 2-10
  - \* Throttle cable play ..... Page 2-10
  - \* Balancing carburetors ..... Page 4-17

## BALANCE OF CARBURETORS

Check the four carburetors for balancing movement according to the following procedures.

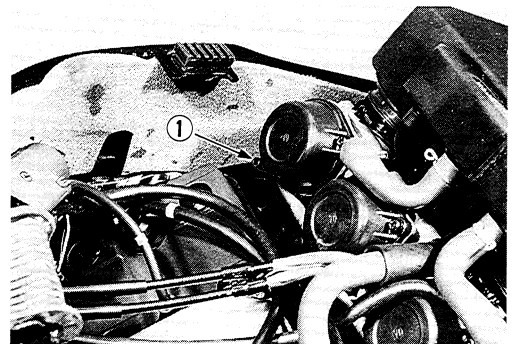
### NOTE:

*When balancing the carburetors, remove the fuel tank and fuel should be supplied by a separate fuel tank ①.*



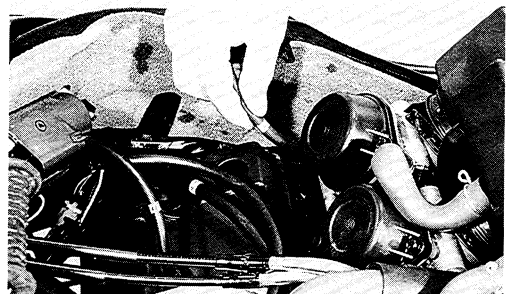
## CALIBRATING EACH GAUGE

- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove the vacuum inlet cap ① for No. 1 or No. 4 cylinder.

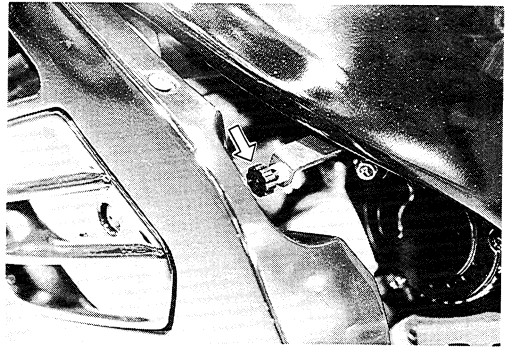


- Connect one of the four rubber hoses of balancer gauge to this inlet.

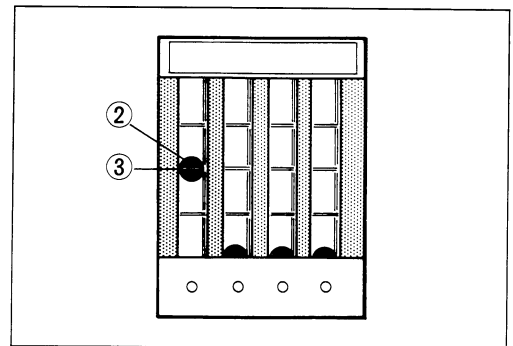
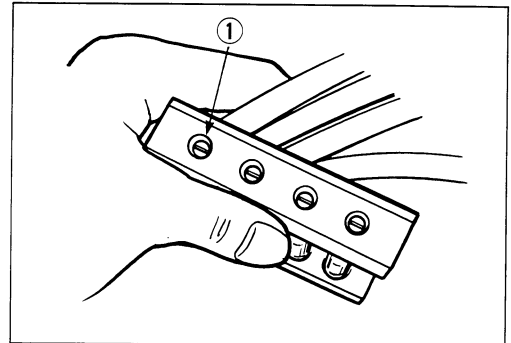
**09913-13121: Carburetor balancer**



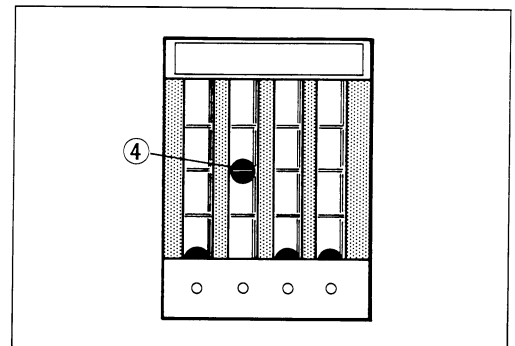
- Start up the engine and keep it running at 1 750 r/min by turning throttle stop screw.



- Turn the air screw ① of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ② in the tube to the center line ③ .



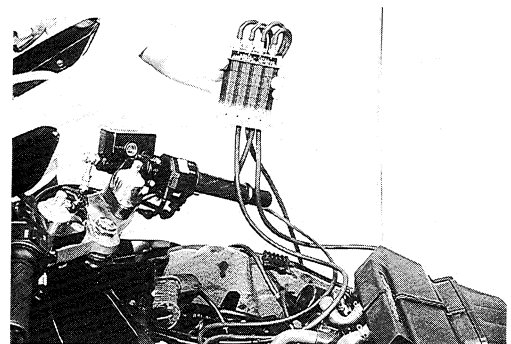
- After making sure that the steel ball stays steady at the center line, disconnect the hose from inlet and connect the next hose to the inlet.
- Turn air screw to bring the other steel ball ④ to the center line.
- Repeat the above process on the third and fourth hoses. The balancer gauge is now ready for use in balancing the carburetors.



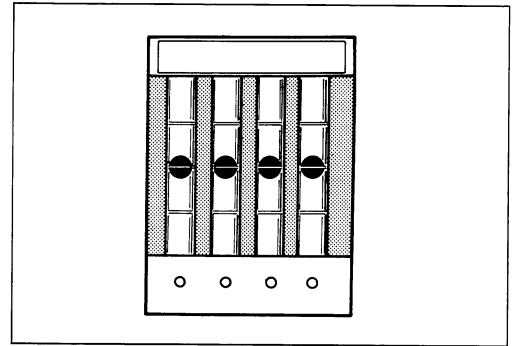
### BALANCING CARBURETORS

For balancing all the carburetor movement, remove all the vacuum inlet caps from each carburetor. Connect the balancer gauge hoses to these vacuum inlets and adjust the balance of four carburetors as follows:

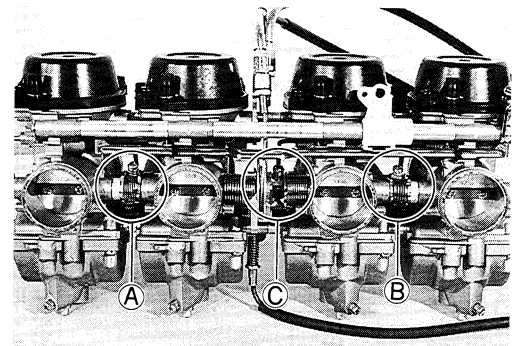
- Start up the engine and keep it running at 1 750 r/min to see engine tachometer reading.



A correctly adjusted carburetor has the steel balls in the Nos. 1 through 4 tubes at the same level.



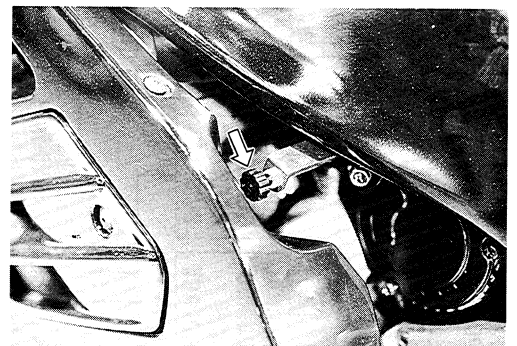
- If the steel balls are not in correct positions, adjust the throttle valve balance screws correctly.
- Adjusting order is as follows.



- After balancing the carburetors, set there speed between 1100 and 1300 r/min. by turning the throttle stop screw referring engine tachometer reading.

Idle r/min:  $1200 \pm 100$  r/min ... E-02, 04 and others

Idle r/min:  $1300 \pm 100$  r/min ... E-15, 17, 18, 22 and 24



## LUBRICATION SYSTEM

### OIL PRESSURE

Refer to page 2-22.

### OIL FILTER

Refer to page 2-9.

### OIL SUMP FILTER

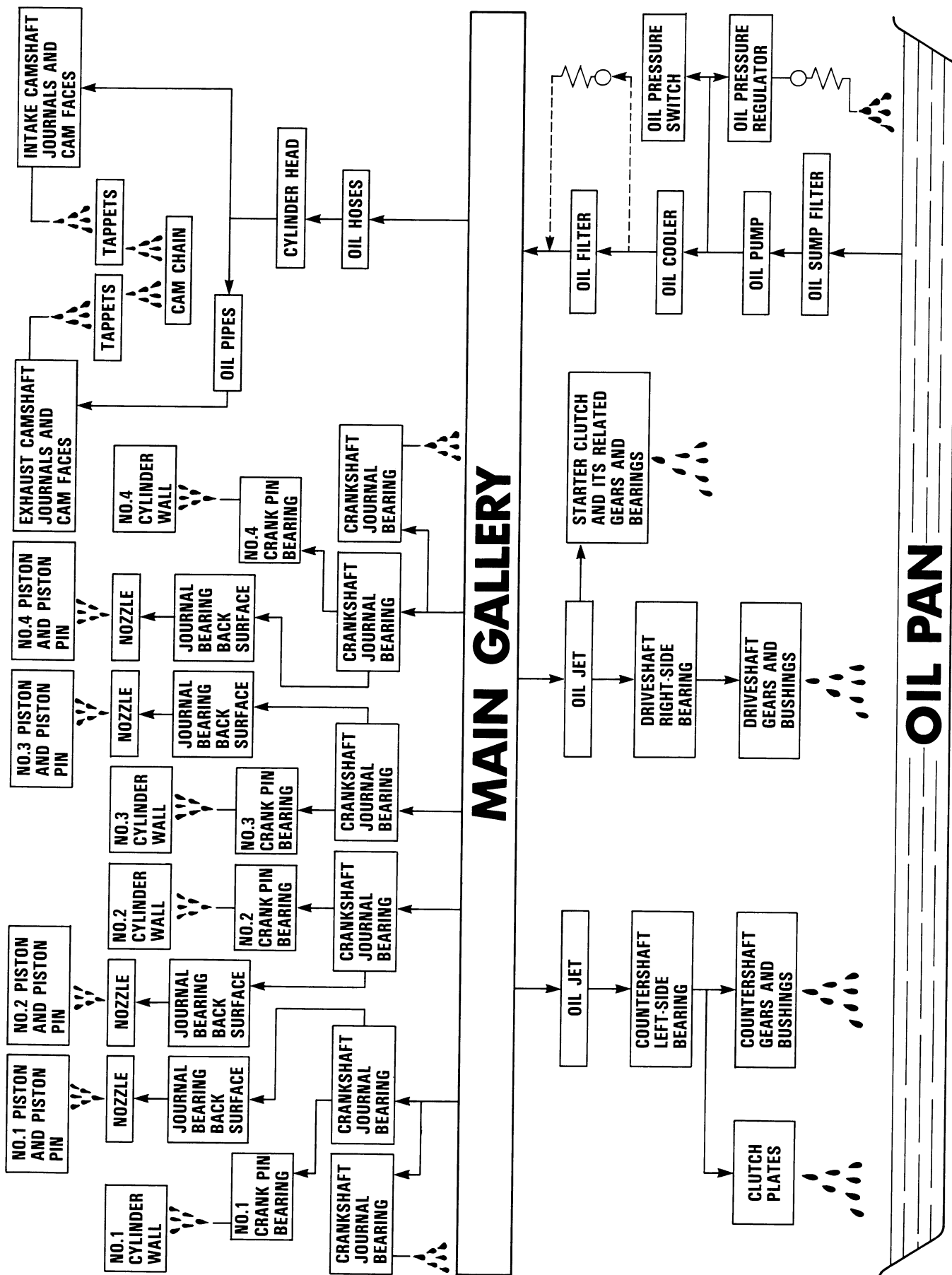
When you wash the oil pan, check to be sure that the oil sump filter is free from any sign of rupture, also wash the filter clean periodically.

#### CAUTION:

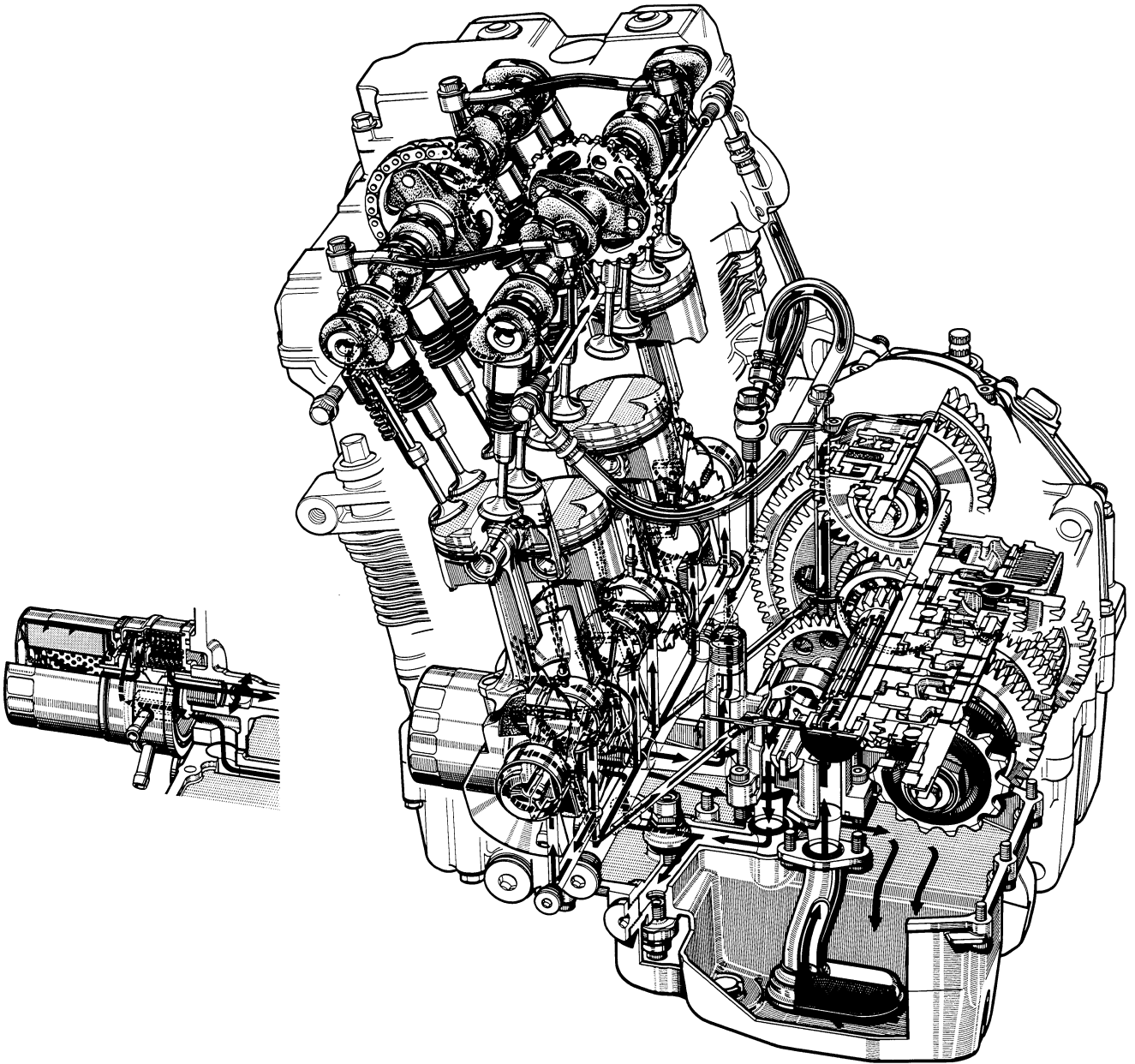
Replace the oil pan gasket with a new one to prevent oil leakage.

(Refer to pages 3-50 and 3-51.)

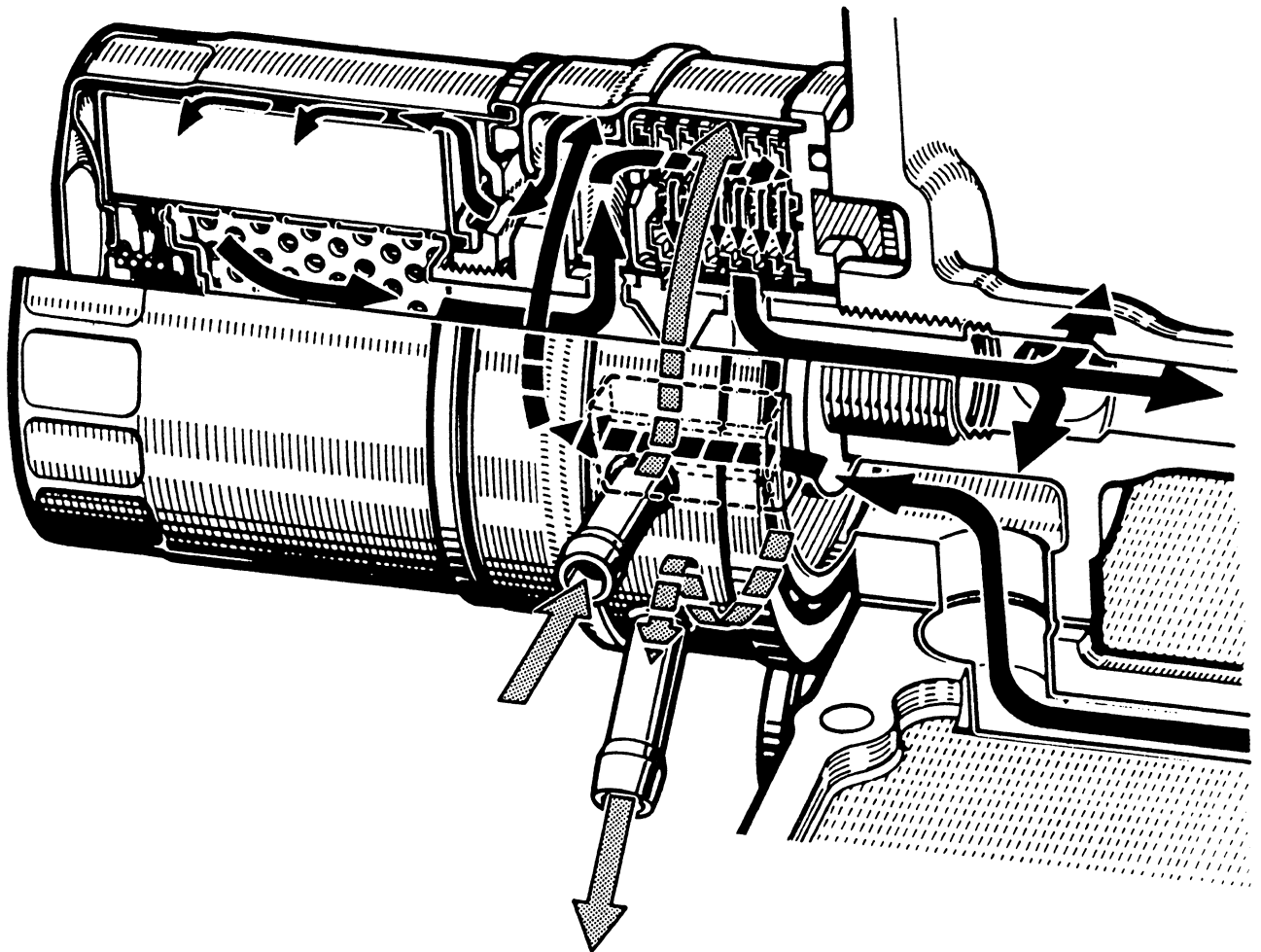
## ENGINE LUBRICATION SYSTEM CHART



## ENGINE LUBRICATION SYSTEM



## ENGINE OIL COOLING SYSTEM



← WATER FLOW  
← OIL FLOW

# COOLING SYSTEM

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## COOLING SYSTEM

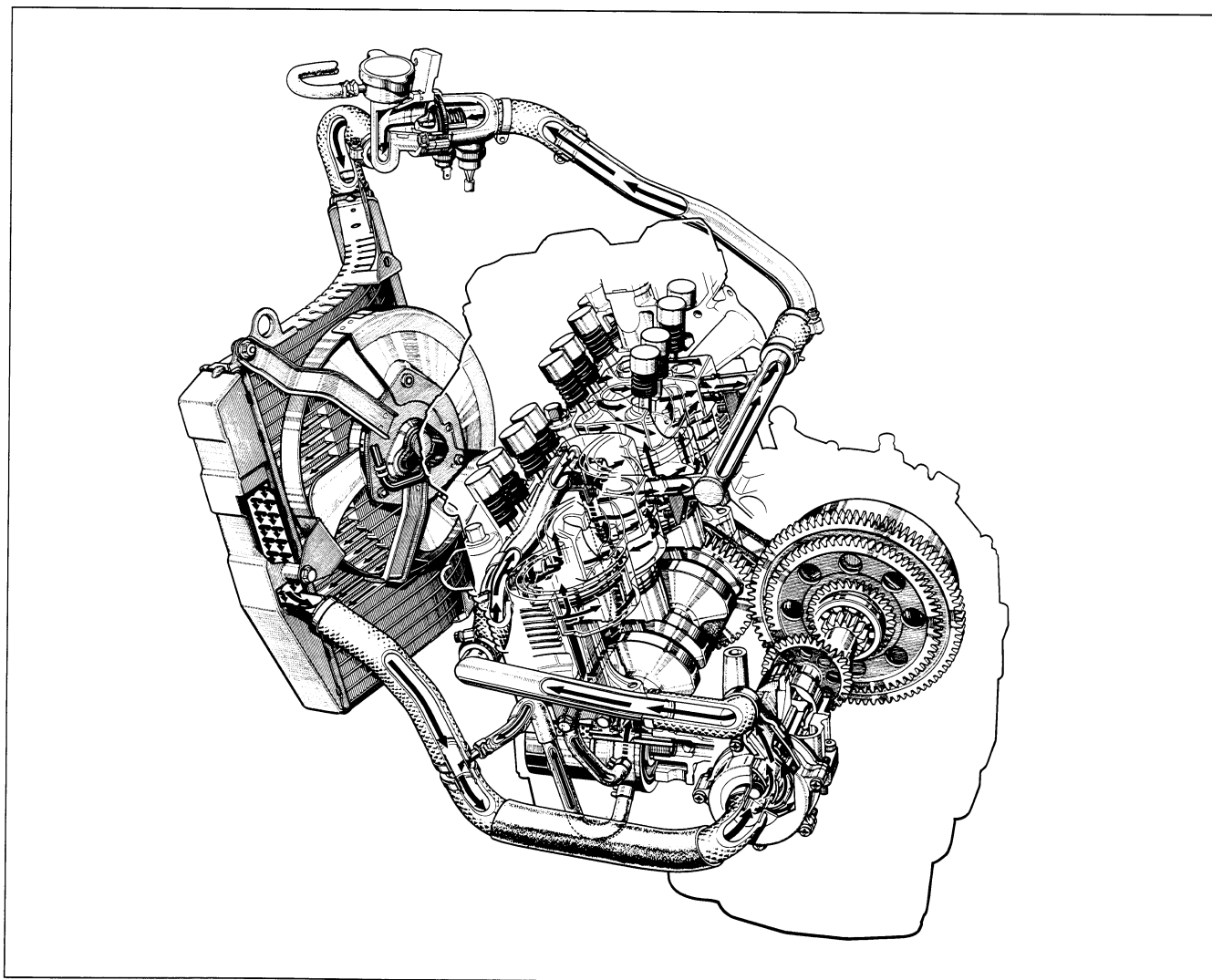
### DESCRIPTION

The engine is cooled by engine coolant set in forced recirculation through jackets formed in the cylinder and cylinder head, and through the radiator. For the water pump, a high-capacity centrifugal pump is used. The radiator is a tube-and-fin type made of aluminum material, which is characterized by lightness in weight and good heat dissipation.

The thermostat is of wax pellet type, complete with a valve as the means of temperature-dependent control over the flow of engine coolant through the radiator. The valve is actuated by the temperature-sensitive wax contained in the pellet.

Referring to the following illustration, the thermostat is in the closed condition, so that engine coolant recirculates through the route comprising pump, engine, by-pass hole of the thermostat and radiator in the regulated condition.

As the engine coolant temperature rises to  $76.5^{\circ}\text{C}$  and the thermostat valve unseats, the normal engine coolant flow is established. At about  $90^{\circ}\text{C}$  of engine coolant temperature, the thermostat becomes completely open and most of heat is released to the atmosphere through the radiator core.

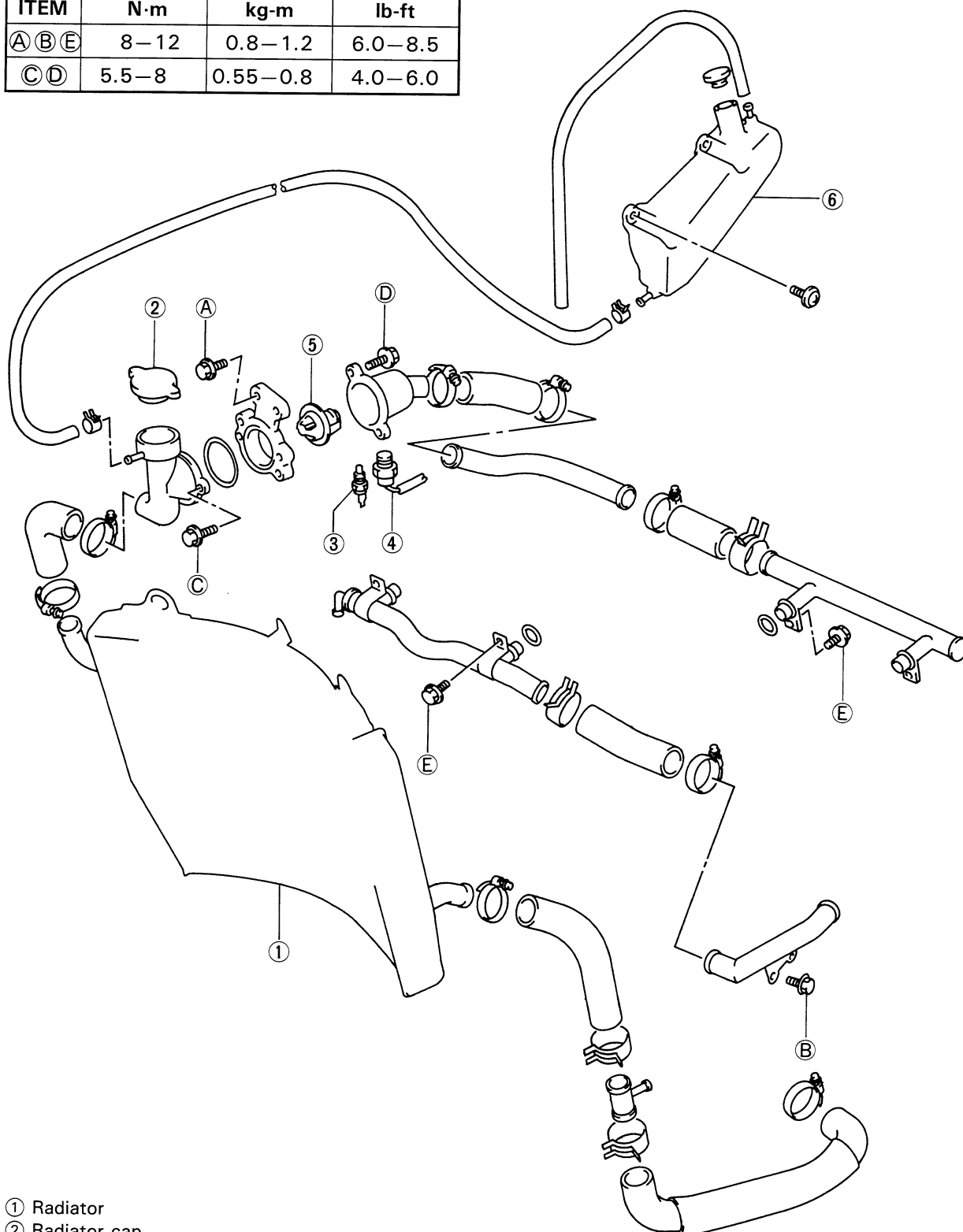




## CONSTRUCTION

## Tightening torque

ITEM	N·m	kg·m	lb·ft
Ⓐ Ⓑ Ⓔ	8—12	0.8—1.2	6.0—8.5
Ⓒ Ⓓ	5.5—8	0.55—0.8	4.0—6.0

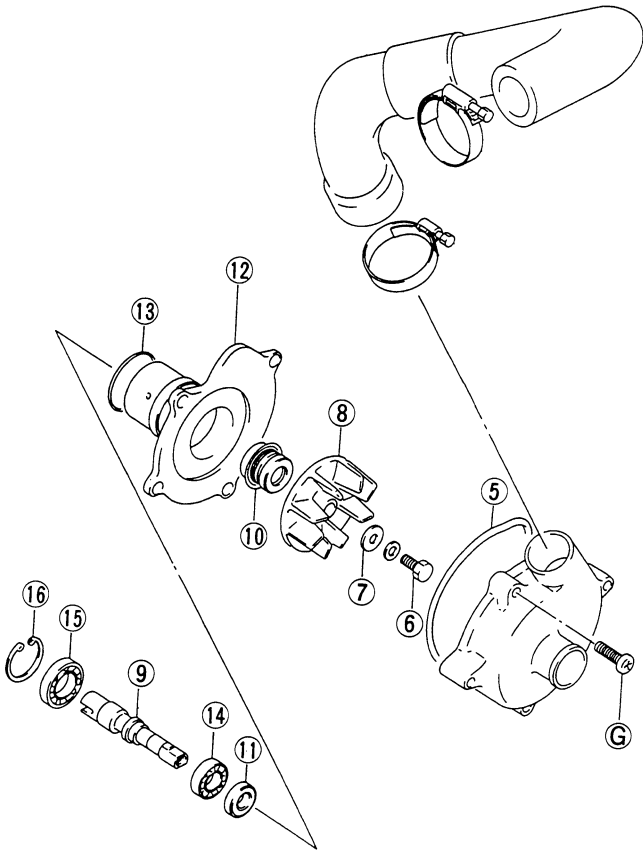
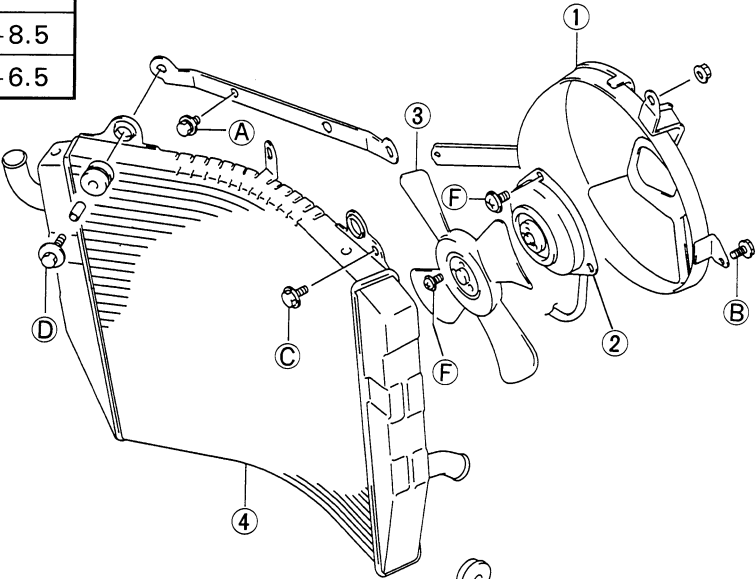


- ① Radiator
- ② Radiator cap
- ③ Engine coolant temperature gauge
- ④ Cooling fan thermo-switch
- ⑤ Thermostat
- ⑥ Engine coolant reservoir

Tightening torque

ITEM	N·m	kg·m	lb·ft
Ⓐ Ⓑ Ⓒ	4—7	0.4—0.7	3.0—5.0
Ⓓ Ⓔ	8—12	0.8—1.2	6.0—8.5
Ⓕ	7—9	0.7—0.9	5.0—6.5

- ① Shroud
- ② Fan motor
- ③ Cooling fan
- ④ Radiator



- ⑤ O-ring
- ⑥ Bolt
- ⑦ Gasket
- ⑧ Impeller
- ⑨ Impeller shaft
- ⑩ Mechanical seal
- ⑪ Oil seal
- ⑫ Stuffing box
- ⑬ O-ring
- ⑭ Bearing
- ⑮ Bearing
- ⑯ Circlip

Tightening Torque

ITEM	N·m	kg·m	lb·ft
Ⓒ	7—11	0.7—1.1	5.0—8.0
⑥	7—9	0.7—0.9	5.0—6.5

## COOLING SOLUTION

At the time of manufacture, the cooling system is filled with a 50 : 50 solution of distilled water and anti-freeze/summer coolant. This 50 : 50 mixture will provide excellent heat protection, and will protect the cooling system from freezing at temperatures above  $-31^{\circ}\text{C}$  ( $-24^{\circ}\text{F}$ ).

If the motorcycle is to be exposed to temperatures below  $-31^{\circ}\text{C}$  ( $-24^{\circ}\text{F}$ ), this mixing ratio should be increased up to 55% or 60% according to the Fig. 2.

**NOTE:**

*The characteristics of different anti-freezes vary. Read the label to know the protection you will have.*

**CAUTION:**

**Do not put in more than 60% anti-freeze or less than 50%.**

**Do not mix different brands of anti-freeze.**

50%	Water	1225 ml (1.3/1.1 US/Imp. qt)
	Engine coolant	1225 ml (1.3/1.1 US/Imp. qt)

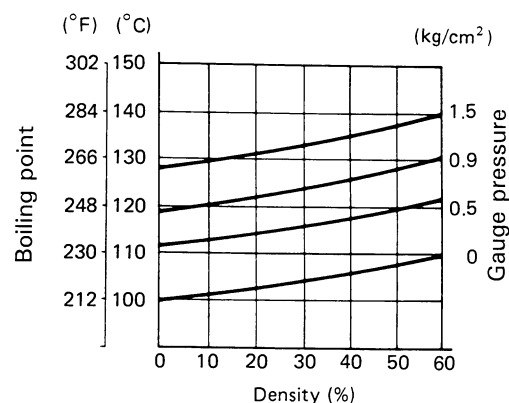


Fig. 1 Engine coolant density-boiling point curve.

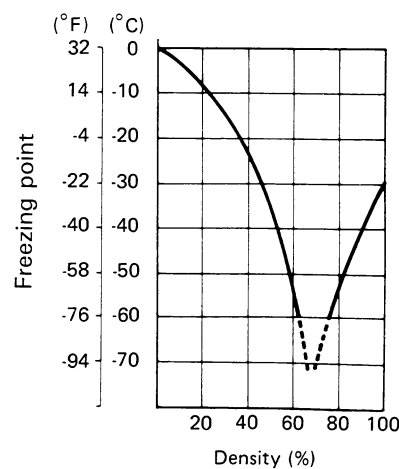
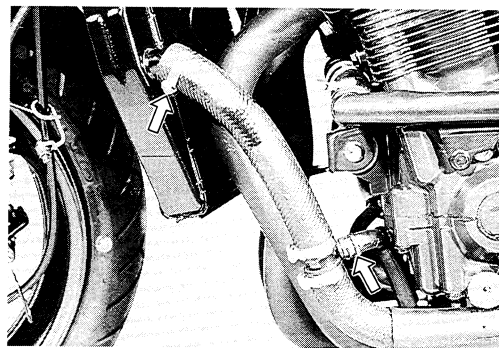
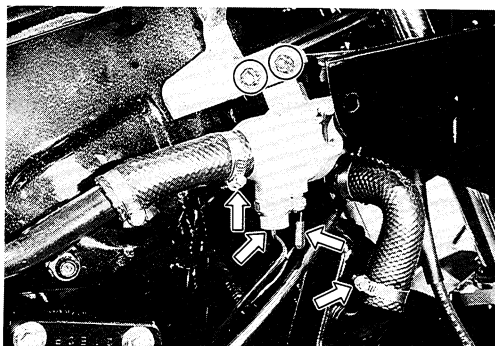
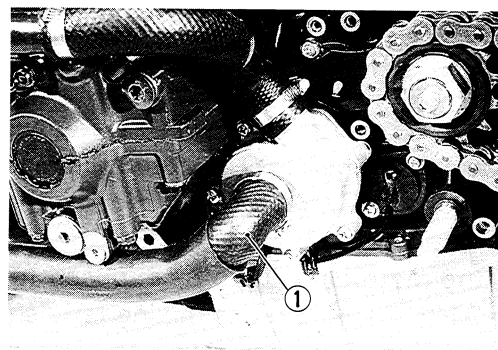


Fig. 2 Engine coolant density-freezing point curve.

## COOLING SYSTEM REMOVAL AND DISASSEMBLY

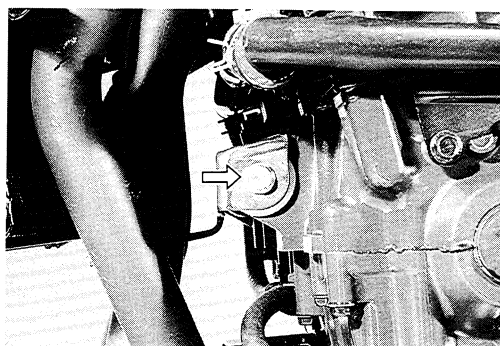
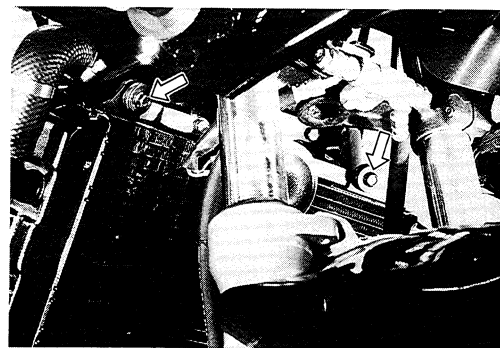
### WATER HOSES AND THERMOSTAT CASE

- Remove the lower cowling. (Refer to page 7-2.)
  - Remove the gearshift lever and engine sprocket cover. (Refer to page 3-6.)
  - Drain out engine coolant by removing the water hose ①.
- 
- Remove the thermostat case bracket mounting bolts.
  - Loosen the clamp screws and disconnect water hoses.
  - Disconnect the engine coolant temperature gauge lead wire, cooling fan switch lead wire coupler and ground wire.
  - Remove the thermostat case along with the water hoses.



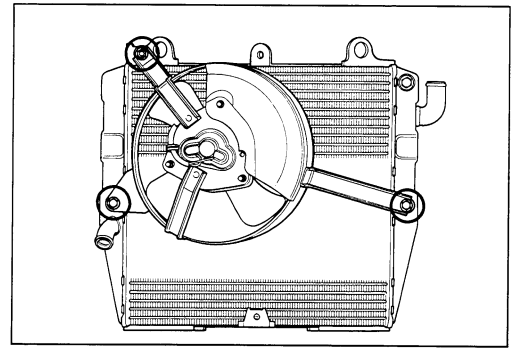
### RADIATOR

- Remove the radiator by removing the mounting bolts.



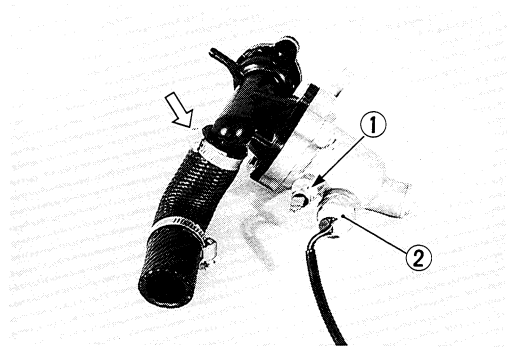
## COOLING FAN

- Remove the cooling fan.



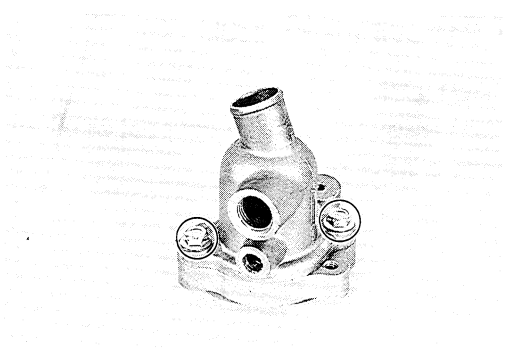
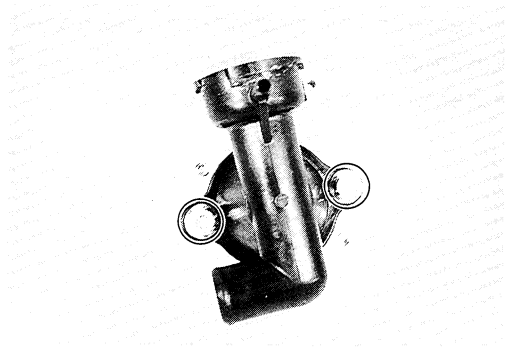
## ENGINE COOLANT TEMPERATURE GAUGE AND COOLING FAN THERMO-SWITCH

- Loosen the clamp screw and disconnect the water hose.
- Remove the water temperature gauge ① and cooling fan thermo-switch ②.



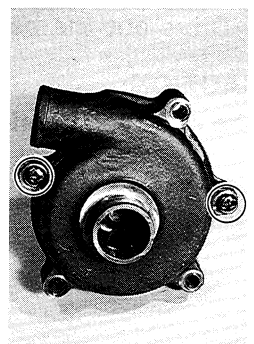
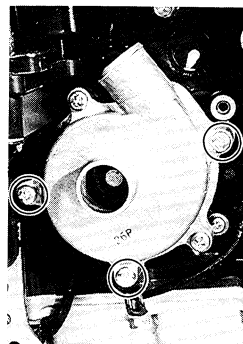
## THERMOSTAT

- Separate the thermostat case into halves and remove the thermostat.

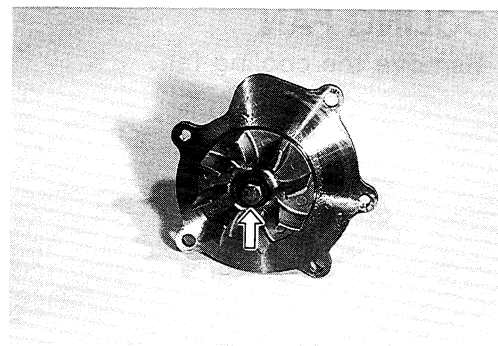


## WATER PUMP

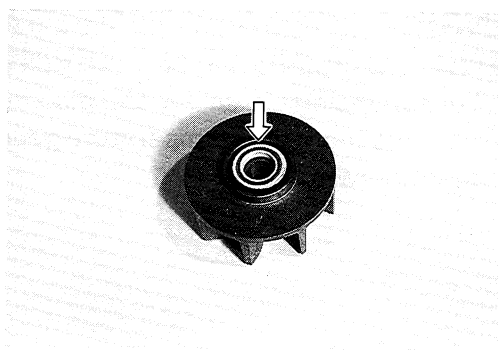
- Remove the gearshift lever and engine sprocket cover. (Refer to page 3-6.)
- Remove the water pump assembly.
- Remove the water pump cover.



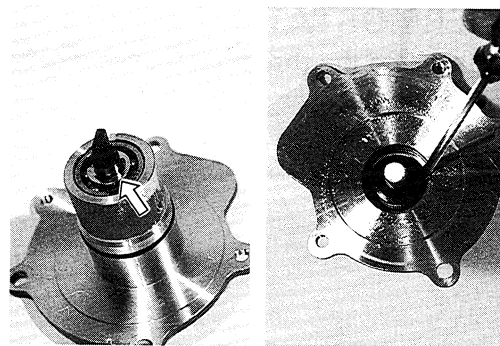
- Remove the impeller securing bolt by holding the impeller shaft with a water pump pliers.



- Remove the mechanical seal ring.



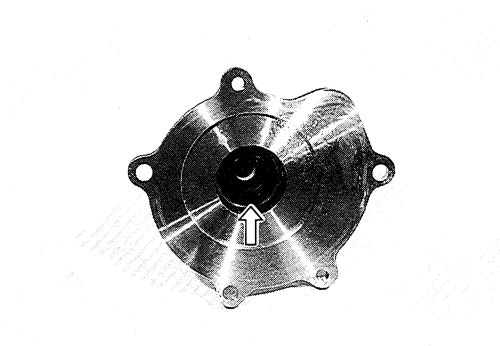
- Remove the circlip from the impeller shaft.
- Remove the impeller shaft.
- Remove the mechanical seal.



- Remove the oil seal.

**CAUTION:**

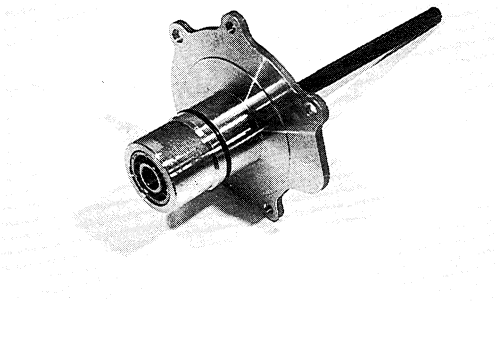
The removed mechanical seal or oil seal should be replaced with a new one.



- Drive out the bearings by using a suitable bar.

**CAUTION:**

The removed bearings should be replaced with new ones.

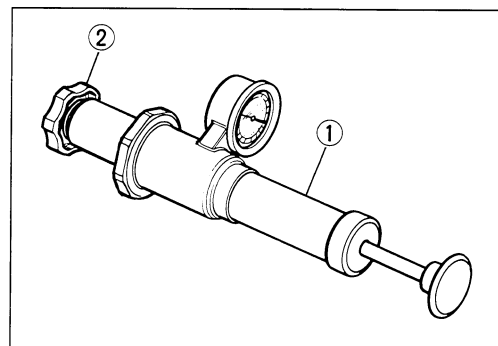


## RADIATOR

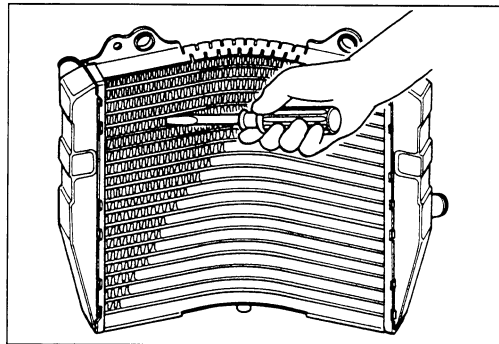
### INSPECTION

Before removing the radiator and draining the engine coolant, inspect the following items.

1. Test the cooling system for tightness by using the radiator tester as follows: Remove the radiator cap, and connect the tester to the filler. Give a pressure of about  $1.2 \text{ kg/cm}^2$  (17 psi, 120 kPa) and see if the system holds this pressure for 10 seconds. If the pressure should fall during this 10-second interval, it means that there is a leaking point in the system. In such a case, inspect the entire system and replace the leaking component or part.
2. Test the radiator cap for relieving pressure by using the radiator tester in the following manner: Fit the cap to the tester, as shown, and build up pressure slowly by operating the tester. Make sure that the pressure build-up stops at  $1.1 \pm 0.15 \text{ kg/cm}^2$  ( $15.6 \pm 2.1 \text{ psi}$ ,  $110 \pm 15 \text{ kPa}$ ) and that, with the tester held standstill, the cap is capable of that pressure for at least 10 seconds. Replace the cap if it is found not to satisfy either of these two requirements.



① Radiator cap tester    ② Radiator cap



#### Radiator cap valve

release pressure:  $1.1 \pm 0.15 \text{ kg/cm}^2$   
( $15.6 \pm 2.1 \text{ psi}$ ,  $110 \pm 15 \text{ kPa}$ )

3. Road dirt or trash stuck to the fins must be removed. Use of compressed air is recommended for this cleaning. Fins bent down or dented can be repaired by straightening them with the blade of a small screwdriver.
4. Any water hose found in a cracked condition or flattened must be replaced. Any leakage from the connecting section should be corrected by proper tightening.

### REMOVAL

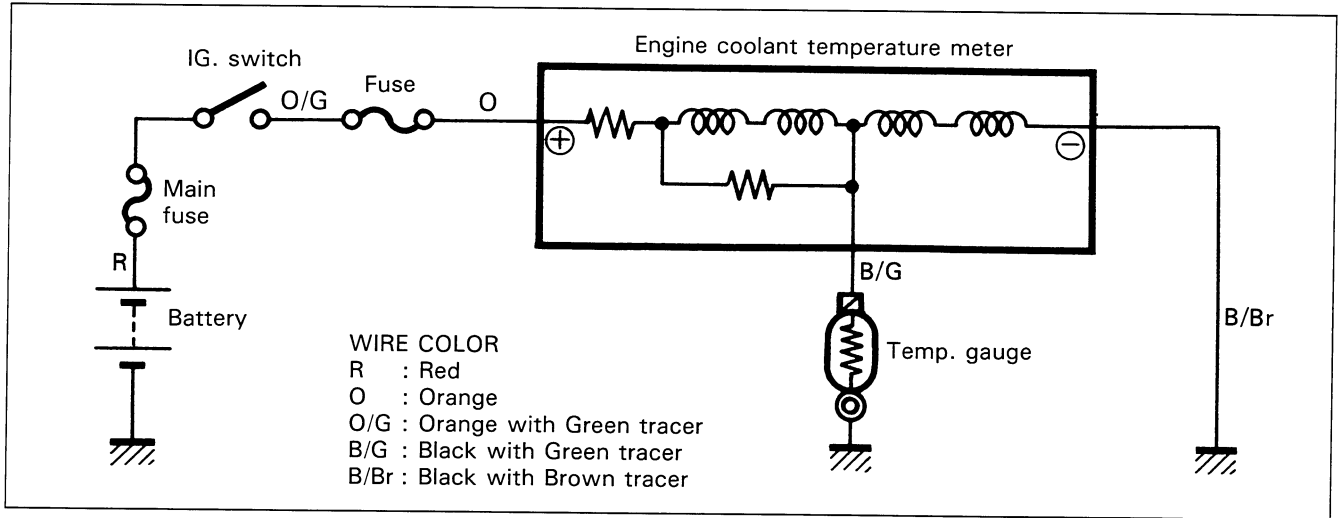
- Refer to page 5-5.

### INSTALLATION

The radiator is to be installed in the reverse order of the removal procedure. After installing the radiator, be sure to add engine coolant: refer to page 2-13 for refilling information.

## ENGINE COOLANT TEMPERATURE GAUGE

The following circuit diagram shows the electrical wiring for the thermometer. The major components are temperature gauge in contact with engine coolant; and temperature indicator (engine coolant temperature meter).

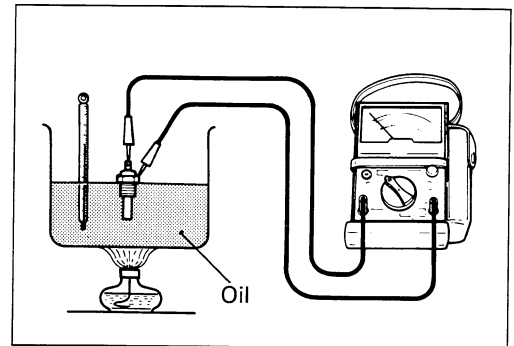


### REMOVAL

- Refer to page 5-6.

### INSPECTION

Test the temperature gauge at the bench to see if its ohmic value changes, as specified, with temperature. The test is to be run as follows: Connect the temperature gauge to the ohmmeter and place it in the oil contained in a pan, which is placed on a stove; heat the oil to raise its temperature slowly, reading the thermometer placed in the pan and also the ohmmeter. A temperature gauge whose ohmic value does not change in the proportion indicated in the table must be replaced.



#### 09900-25002: Pocket tester

#### Temperature gauge specification

Engine coolant temperature	Standard resistance
50°C (122°F)	Approx. 153.9 Ω
80°C (176°F)	Approx. 51.9 Ω
100°C (212°F)	Approx. 27.4 Ω
120°C (248°F)	Approx. 16.1 Ω

If the resistance noted to show infinity or too much different resistance value, temperature gauge must be replaced. For inspecting the engine coolant temperature meter, refer to page 6-24.



## REASSEMBLY

Apply SUZUKI BOND NO.1207B to the thread portion of the temperature gauge and tighten it to the specified torque.

**99000-31140: SUZUKI BOND NO.1207B**

**Tightening torque**

**Engine coolant temperature gauge: 6.0—9.0 N·m**  
(0.6—0.9 kg-m, 4.5—6.5 lb-ft)

### CAUTION:

**Take special care when handling the temperature gauge. If may cause damage if it gets a sharp impact.**

- Fill the specified engine coolant. (Refer to page 2-13.)

## COOLING FAN

### REMOVAL

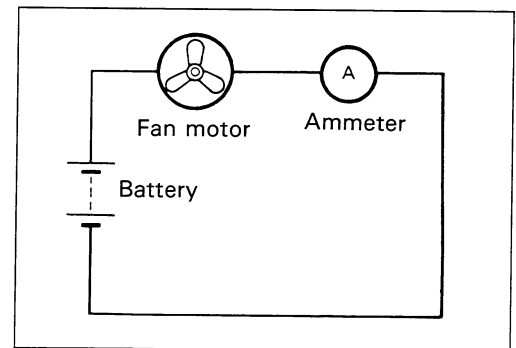
- Refer to page 5-6.

### INSPECTION

Test the cooling fan drive motor for load current with an ammeter connected as shown in the illustration.

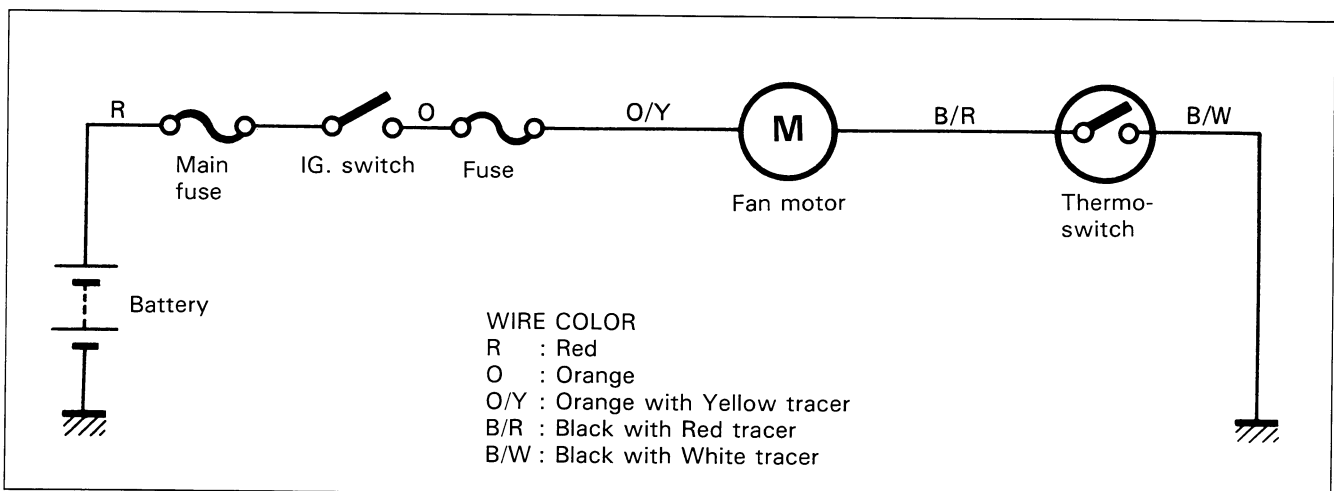
The voltmeter is for making sure that the battery applies 12 volts to the motor. With the motor with electric motor fan running at full speed, the ammeter should be indicating not more than 5 amperes.

If the fan motor does not turn, replace the motor assembly with a new one.



## COOLING FAN THERMO-SWITCH

The cooling fan, being located behind the radiator, is secured to the radiator by three bolts. The fan drive motor is automatically controlled by the thermo-switch. This switch remains open when the temperature of engine coolant is low, but it closes at about 105°C (221°F) of rising engine coolant temperature to set the fan in motion.



## REMOVAL

- Refer to page 5-6.

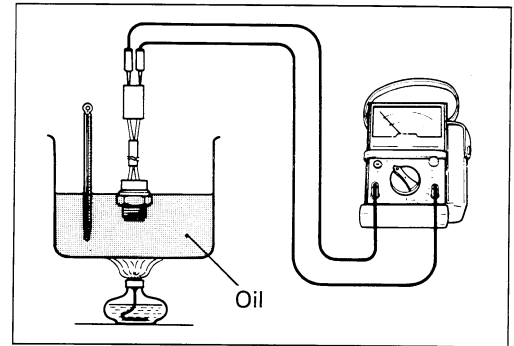
## INSPECTION

- The thermo-switch must be checked for its temperature-initiated closing action at the specification value of 105°C (221°F) by testing it at the bench as shown in the figure. Connect the thermo-switch to a circuit tester and place it in the oil contained in a pan, which is placed on a stove; heat the oil to raise its temperature slowly, and read the column thermometer when the switch closes.

### 09900-25002: Pocket tester

#### Thermo-switch specification

OFF → ON	Approx. 105°C (221°F)
ON → OFF	Approx. 100°C (212°F)



## REASSEMBLY

### NOTE:

*Do not forget the new O-ring.*

### Tightening torque

Thermo-switch: 9.0—14 N·m  
(0.9—1.4 kg-m, 6.5—10.0 lb-ft)

### CAUTION:

Take special care when handling the thermo-switch. It may cause damage if it gets a sharp impact.

Replace the O-ring with a new one.

# THERMOSTAT

## REMOVAL

- Refer to page 5-6.

## INSPECTION

Inspect the thermostat pellet for signs of cracking.

Test the thermostat at the bench for control action, in the following manner.

- Pass a string between flange, as shown in the illustration.
- Immerse the thermostat in the water contained in a beaker, as shown in the illustration. Note that the immersed thermostat is in suspension. Heat the water by placing the beaker on a stove and observe the rising temperature on a thermometer.
- Read the thermometer just when opening the thermostat. This reading, which is the temperature level at which the thermostat valve begins to open, should be anywhere between 74.5°C (166.1°F) and 78.5°C (173.3°F).

**Thermostat valve opening temperature: 74.5—78.5°C  
(166.1—173.3°F)**

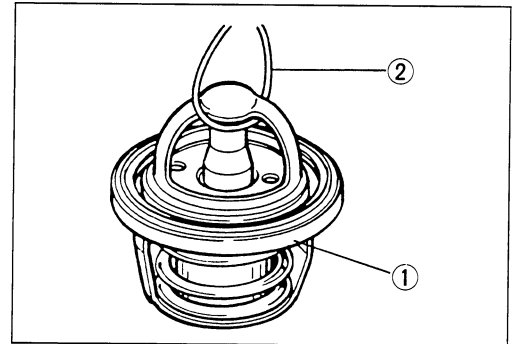
- Keep on heating the water to raise its temperature to and beyond 90°C (194°F).
- Just when the water reaches 90°C (194°F), the thermostat valve should have lifted by at least 7.0 mm (0.28 in).

**Thermostat valve lift: Over 7.0 mm at 90°C  
(Over 0.28 in at 194°F)**

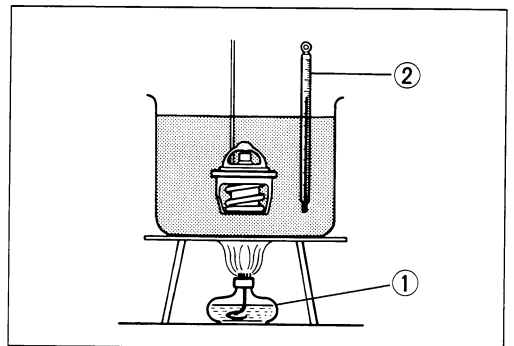
- A thermostat failing to satisfy either of the two requirements (start-to-open temperature and valve lift) must be replaced.

## REASSEMBLY

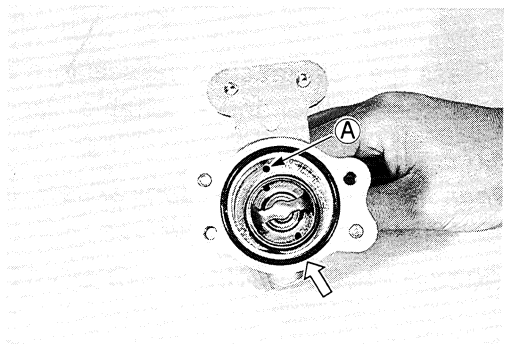
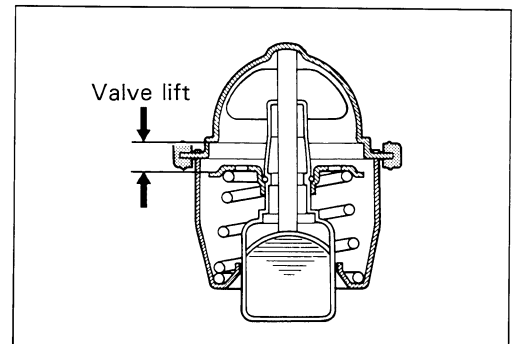
- The air bleeder hole Ⓐ of the thermostat faces upside.
- Replace the O-ring with a new one.



① Thermostat ② String



① Stove ② Thermometer



## WATER PUMP

### REMOVAL AND DISASSEMBLY

- Refer to page 5-6 for the water pump removal and disassembly procedures.

### INSPECTION

#### WATER PUMP BEARING

Turn the inner race and check the bearing play. If abnormal noise occurs or any sign of stickiness is noted, replace the bearing with a new one.

#### MECHANICAL SEAL

Visually inspect the mechanical seal for damage, with particular attention given to the sealing face. Replace the mechanical seal that shows indications of leakage. Also replace the oil seal if necessary.

### REASSEMBLY

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

- Press the new bearings into the stuffing box with the special tool and a suitable size sleeve etc.

**09924-84521: Bearing installer**

- Apply grease to the oil seal lip before installing.

**99000-25010: SUZUKI SUPER GREASE "A"**

- Press the new oil seal into the stuffing box with the special tool and a suitable size sleeve etc.

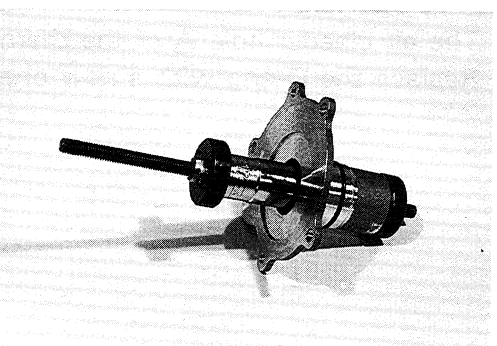
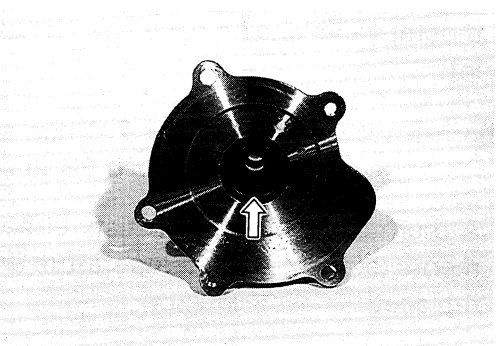
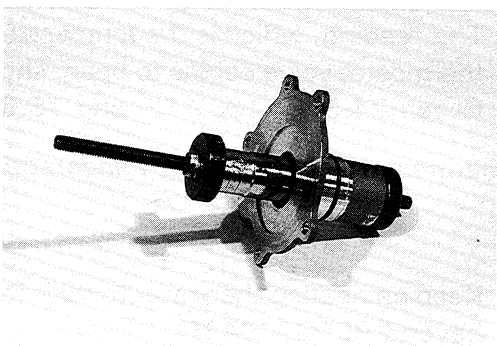
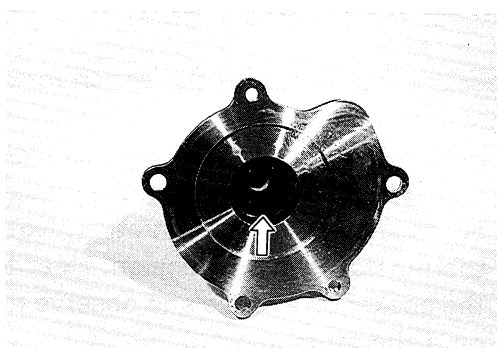
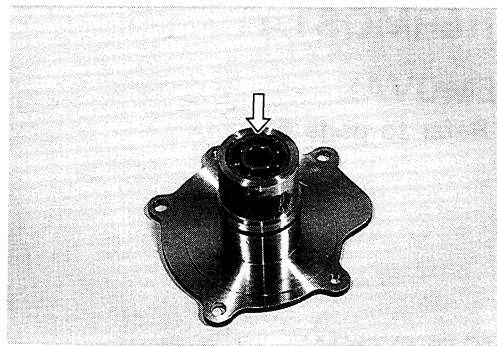
**09924-84521: Bearing installer**

- Press the new mechanical seal into the stuffing box with the special tool and a suitable size sleeve etc.

#### NOTE:

*When installing the mechanical seal, apply SUZUKI BOND NO.1207B to its outer surface.*

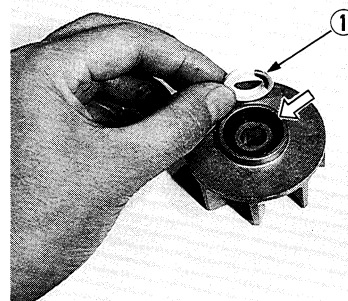
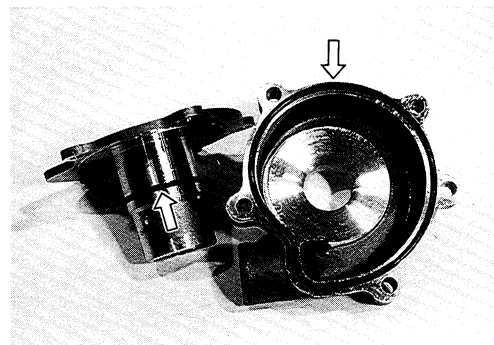
**99000-31140: SUZUKI BOND NO.1207B**



- Replace the O-rings and water seal with new ones when reassembling the water pump.

**NOTE:**

The mechanical seal ring must be assembled with marked face ① of the ring toward the impeller.

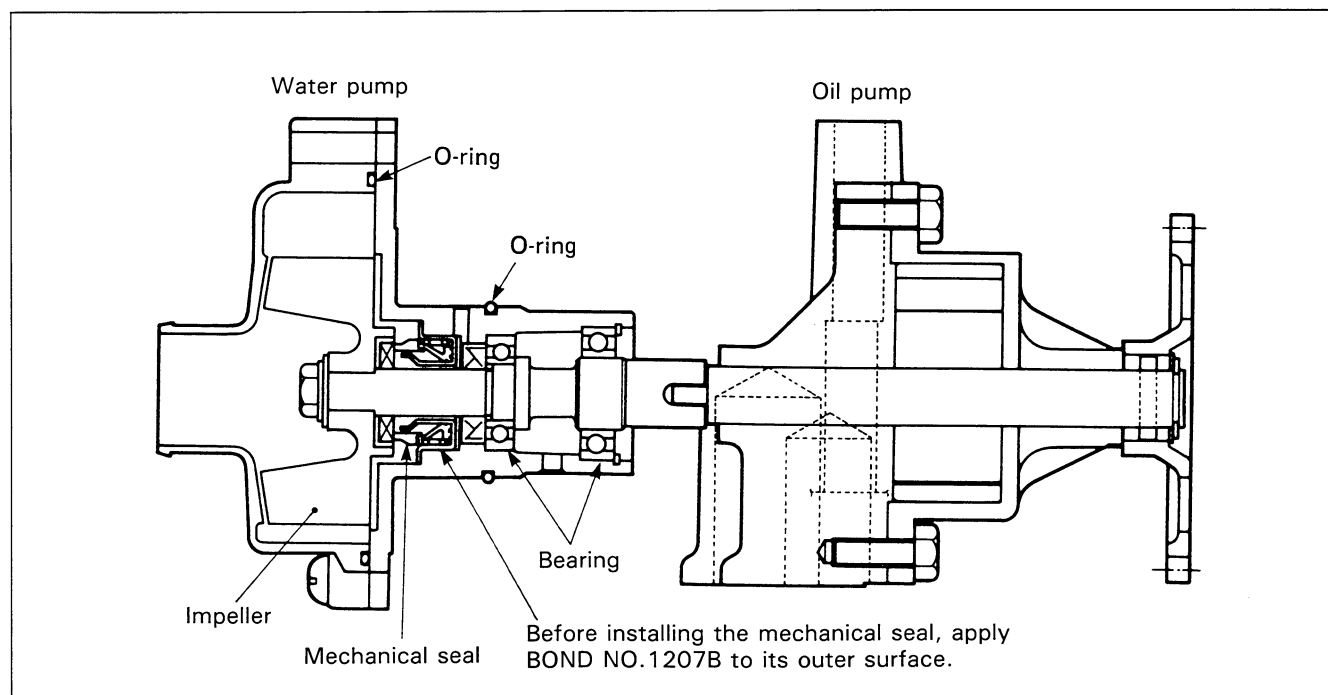
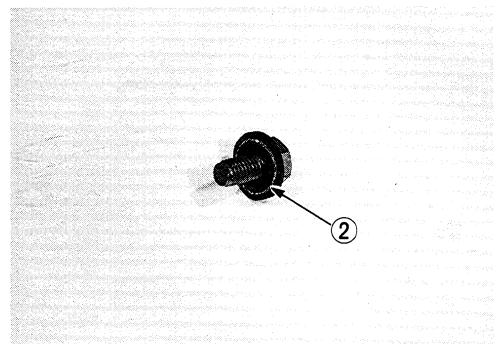


- Tightening the impeller securing bolt to the specified torque.

**Tightening torque: 7–9 N·m**  
(0.7–0.9 kg-m, 5.0–6.5 lb-ft)

**NOTE:**

The seal lip side ② faces impeller.



Refer to page 8-18 for the radiator hose routing.

# ELECTRICAL SYSTEM

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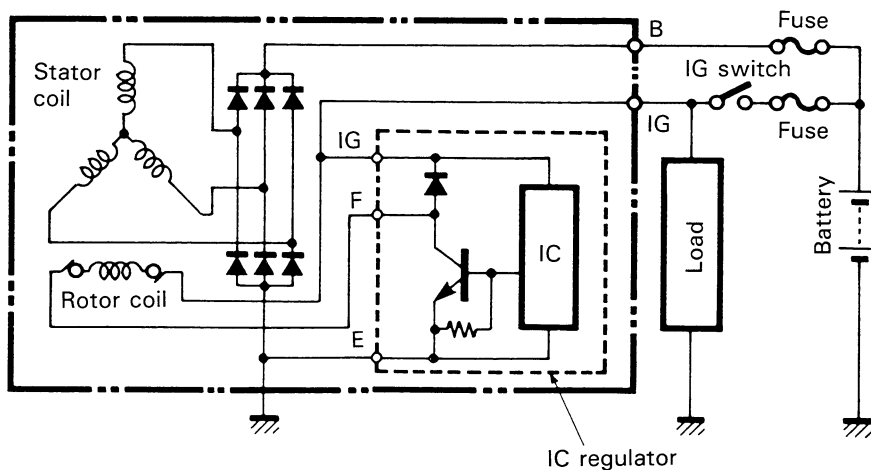
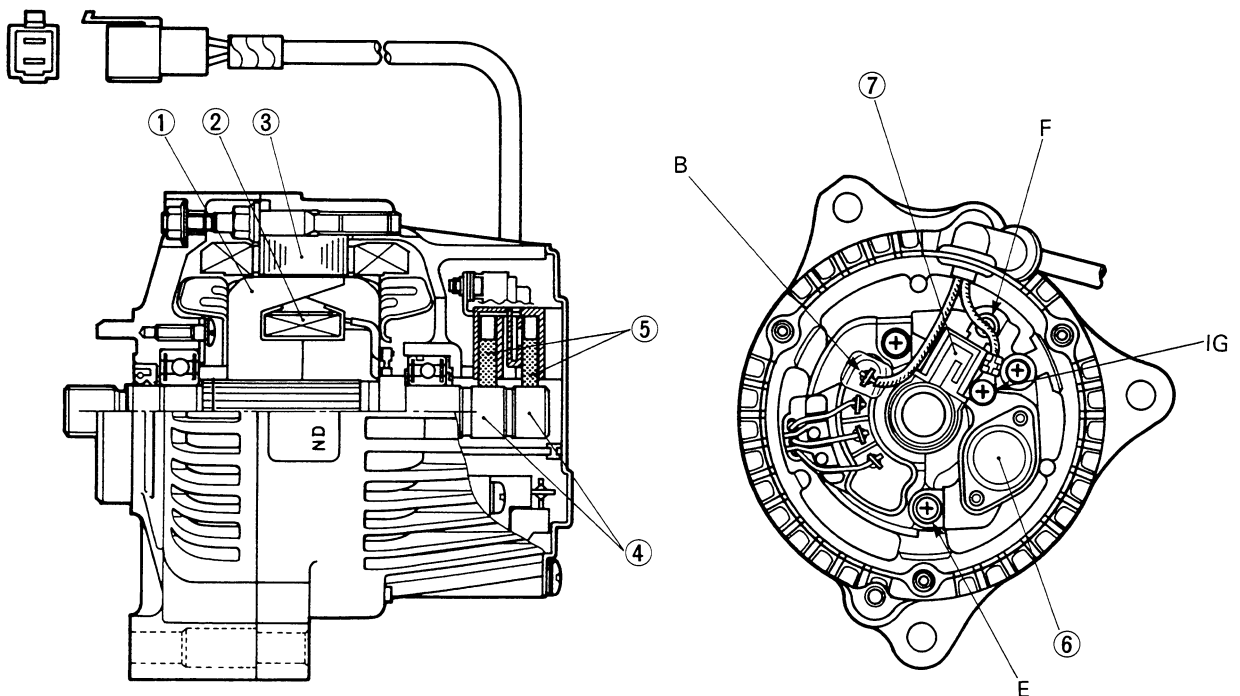
## CHARGING SYSTEM

### DESCRIPTION (GENERATOR WITH IC REGULATOR)

The generator features a solid state regulator that is mounted inside the generator. All regulator components are enclosed into a solid mold, and this unit is attached to the brush holder frame. The regulator voltage setting cannot be adjusted.

Two brushes carry current through the two slip rings to the rotor coil mounted on the rotor.

The stator windings are assembled on the inside of a laminated core that forms part of the generator housing. A rectifier bridge connected to the stator windings contains six diodes, and electrically changes the stator A.C. voltages to a D.C. voltage which appears at the generator output terminal.



- ① Rotor
- ② Rotor coil
- ③ Stator coil
- ④ Slip ring
- ⑤ Brush
- ⑥ IC regulator
- ⑦ Brush holder

B : Battery terminal  
 IG : Ignition terminal  
 F : Rotor coil terminal  
 E : Ground

## CHARGING OUTPUT CHECK

- Remove the front seat.
- Start the engine and keep it running at 5 000 r/min.
- Measure the DC voltage between the battery terminals  $\oplus$  and  $\ominus$  with a pocket tester. If the tester reads under 13.5V, check the stator coil, rectifier and IC regulator mounted in the generator.

### CAUTION:

If the pocket tester is set to read current or resistance and a voltage is applied across the test probes, damage will result. Therefore, it is important that the tester knob on the pocket tester be set the proper position before making any measurements.

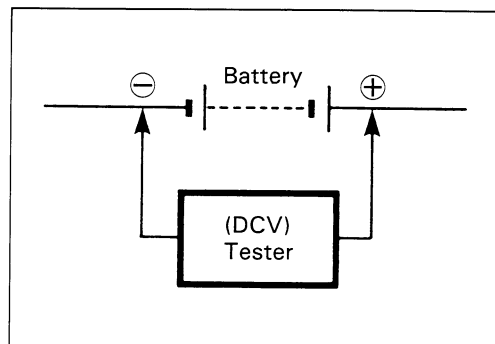
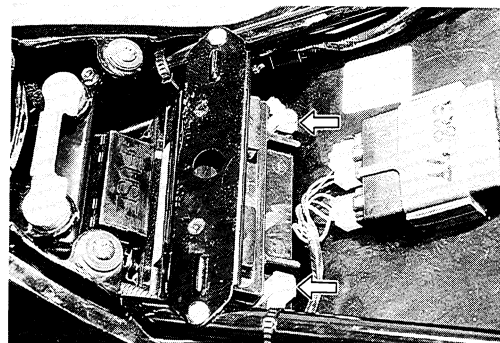
### NOTE:

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

**09900-25002: Pocket tester**

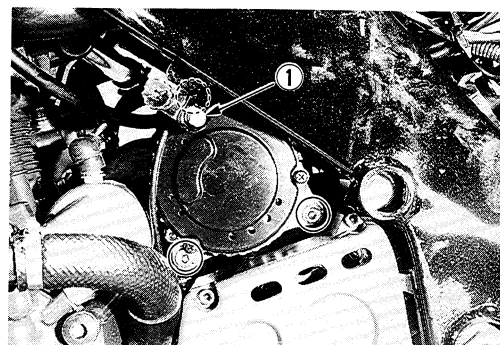
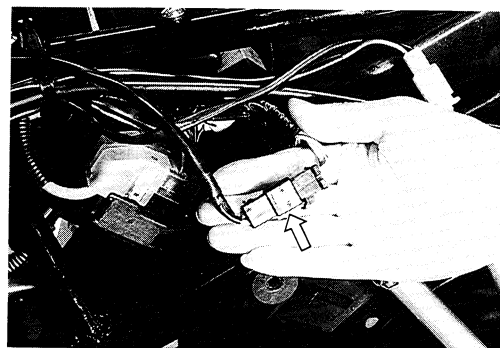
**Tester knob indication: DC25V**

STD charging output	Above DC13.5V at 5 000 r/min
---------------------	---------------------------------



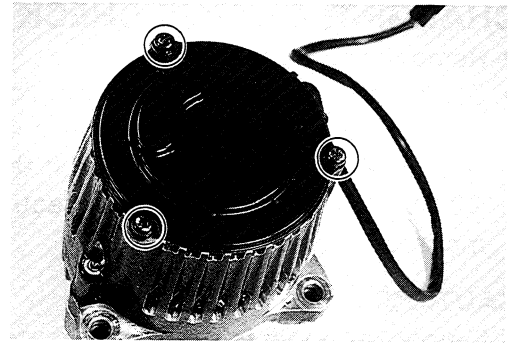
## REMOVAL AND DISASSEMBLY

- Remove the seats and frame cover assembly.
- Remove the lower cowling. (Refer to page 7-2.)
- Disconnect the generator lead wires coupler.
- Remove the throttle stop screw bracket bolt ①.
- Remove the generator by removing the bolts.

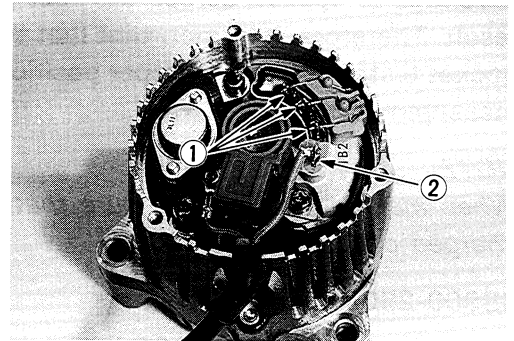




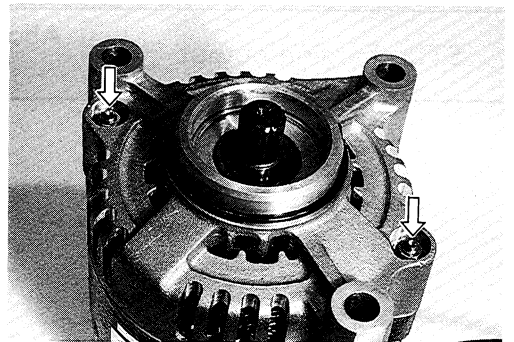
- Remove the generator end cover.



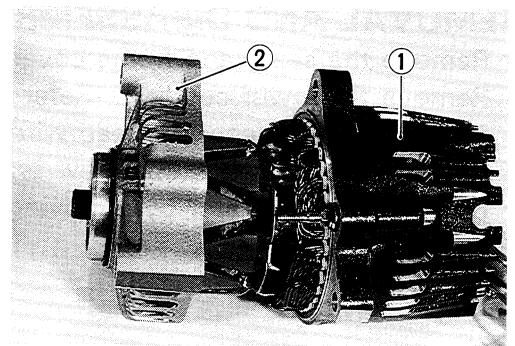
- Disconnect the stator coil lead wires ① and battery lead wire ② by using a soldering iron.
- Remove the brush holder, IC regulator and rectifier to remove three screws.



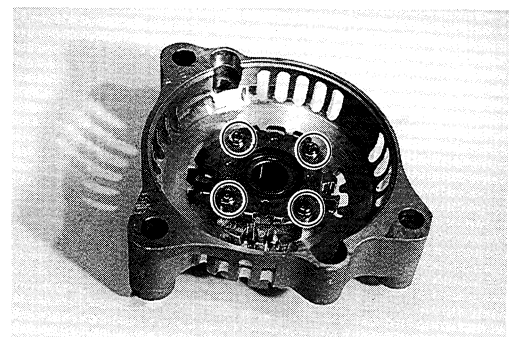
- Remove the two nuts.



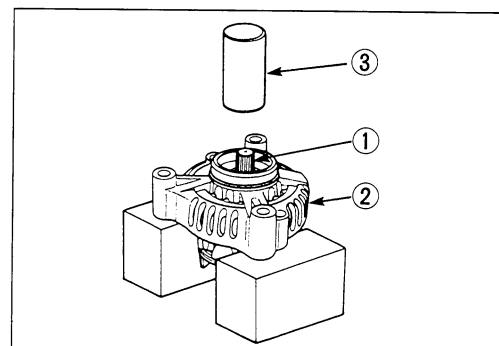
- Remove the generator housing ① from generator end housing ②.



- Remove the four bearing retainer screws.



- Remove the rotor ① from generator end housing ② by using a hand-press ③ as shown.



## INSPECTION

### ROTOR BEARING

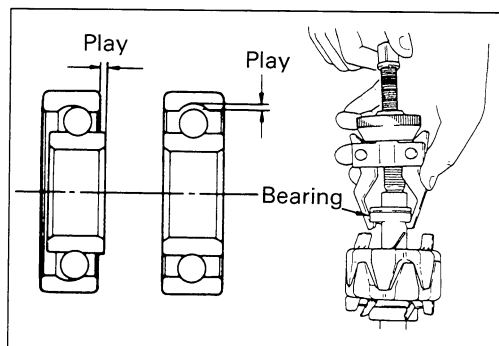
Inspect the rotor bearings for abnormal noise and smooth rotation to rotate them by hand.

If there is anything unusual, remove the bearing with a bearing puller.

**09913-60910: Bearing puller (40—60 mm)**

#### CAUTION:

The removed bearing should be replaced with a new one.

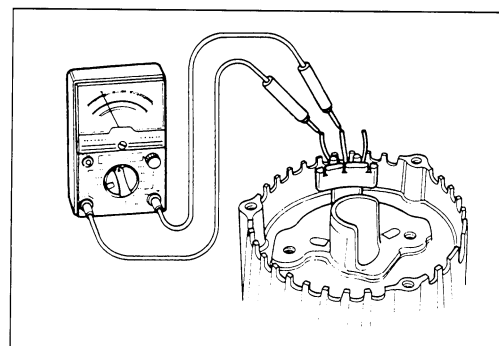


### STATOR COIL CONTINUITY CHECK

Check the continuity between the lead wires of the stator with a pocket tester.

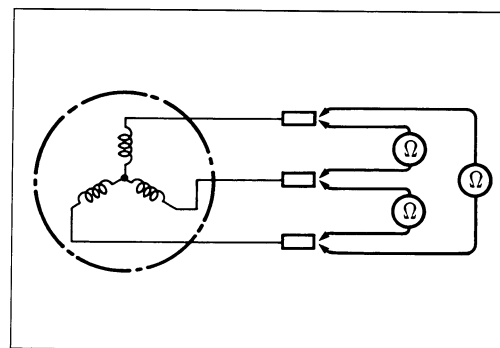
If there is no continuity, replace the stator.

Also check that the stator core is insulated.



**09900-25002: Pocket tester**

Tester knob indication: X 1Ω range



### ROTOR COIL CONTINUITY CHECK

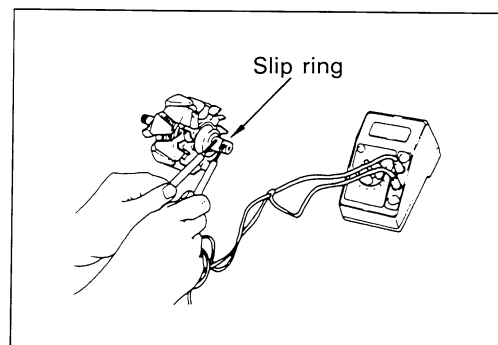
Check the continuity between the two slip rings of the rotor with a pocket tester.

If there is no continuity, replace the rotor.

Also check that the rotor is insulated.

**09900-25002: Pocket tester**

Tester knob indication: x 1Ω range

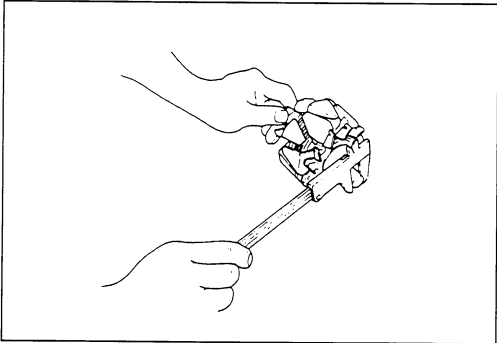


**SLIP RING**

If the slip ring surface is dirty, polish it with #400 fine emery paper to protect the charging performance. After polishing, wipe the slip ring with a clean dry cloth.

**09900-20102: Vernier calipers (200 mm)**

Slip ring O.D.	Service Limit
	14.0 mm (0.55 in)

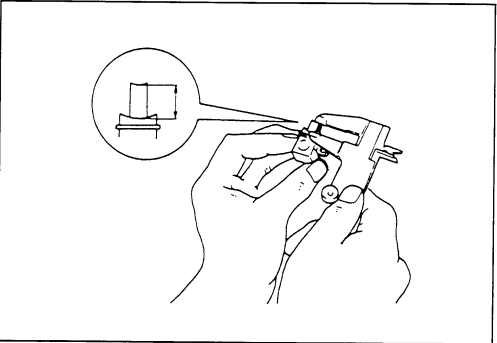


**CARBON BRUSH**

Measure the length of the brushes as shown. If it exceeds the service limit, replace them with new ones.

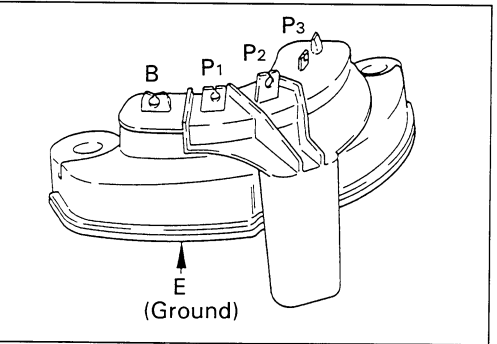
**09900-20102: Vernier calipers (200 mm)**

Brush length	Service Limit
	4.5 mm (0.18 in)



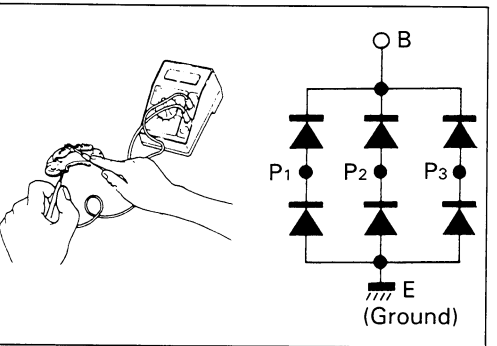
**RECTIFIER**

Check the continuity between terminals and ground. Put one tester lead to terminal "B" and the other lead to ground or other terminals; then swap the two leads. Of the two tester indications, one should be continuity, and the other should be infinity (non continuity). If not, replace the rectifier assembly.



**09900-25002: Pocket tester**

Tester knob indication: X 1Ω range



**IC REGULATOR**

Use a variable DC power source, switch, bulb and pocket tester, check the IC regulator, which requires two steps described below:

**First check:**

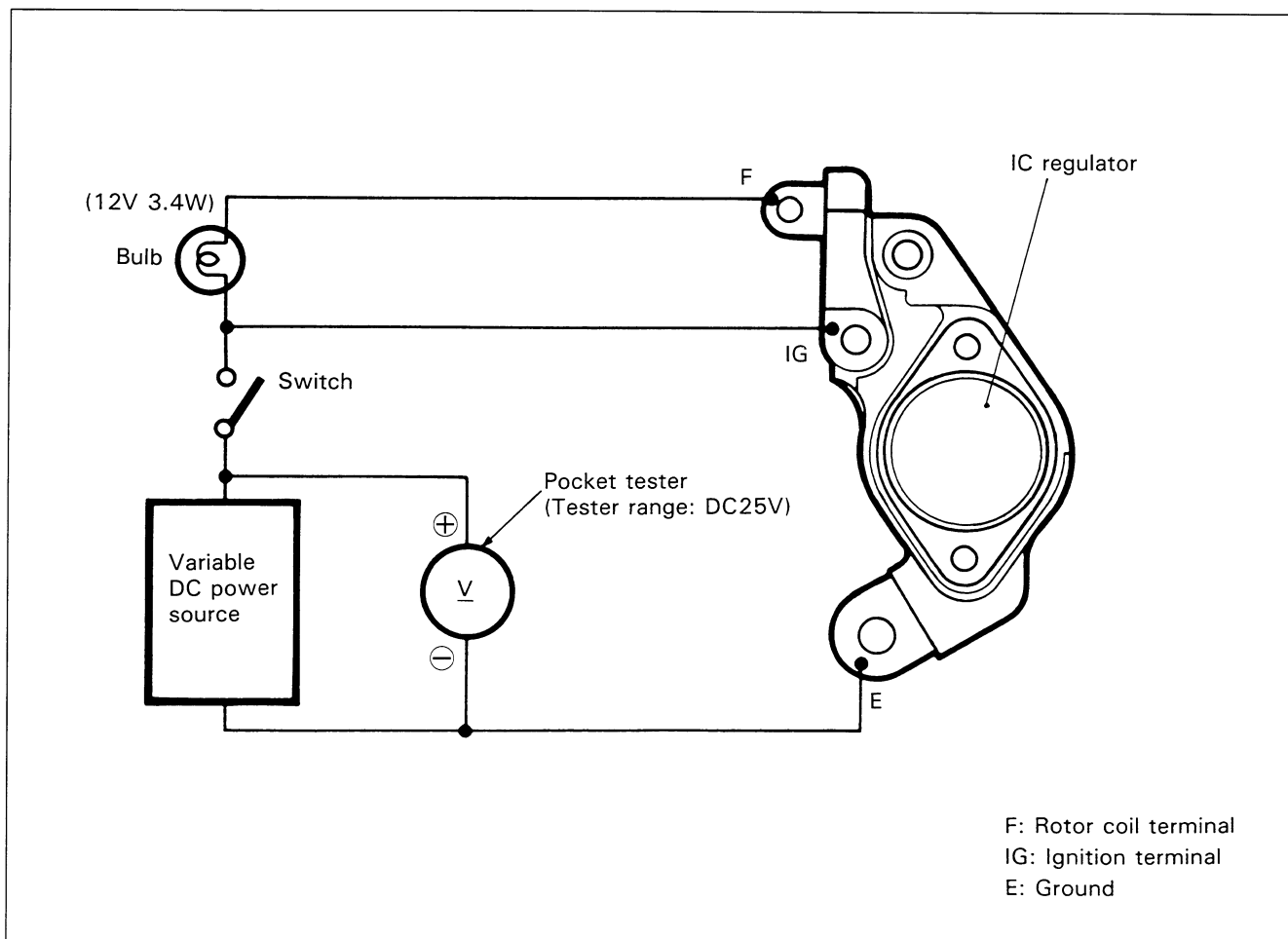
Set the variable DC power source to 12V and turn the switch to the ON position. If the bulb does not light, replace the IC regulator. If the bulb is lighting ON, this IC regulator has passed the first check.

**Second check:**

Under the above condition, set the variable DC power source to 14.5V, if the bulb goes out, the IC regulator is in good condition. If the bulb remains lit, replace the IC regulator.

**09900-25002: Pocket tester**

**Tester knob indication: DC25V**



## REASSEMBLY AND REMOUNTING

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

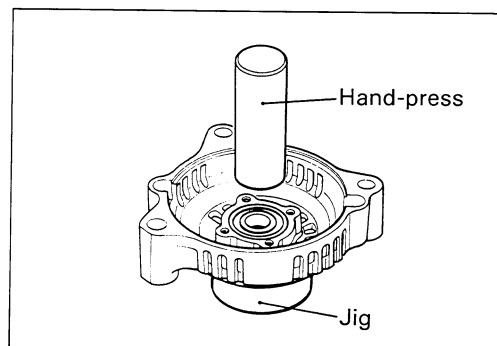
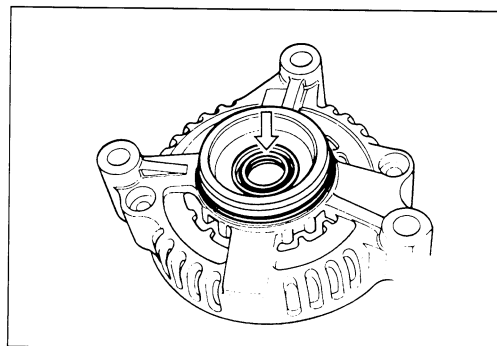
- Apply grease to the lip of the oil seal.

**99000-25010: SUZUKI SUPER GREASE "A"**

### CAUTION:

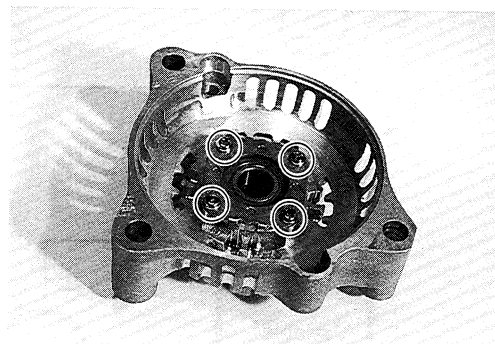
The removed oil seal should be replaced with a new one.

- Install the bearing by using a hand-press as shown.

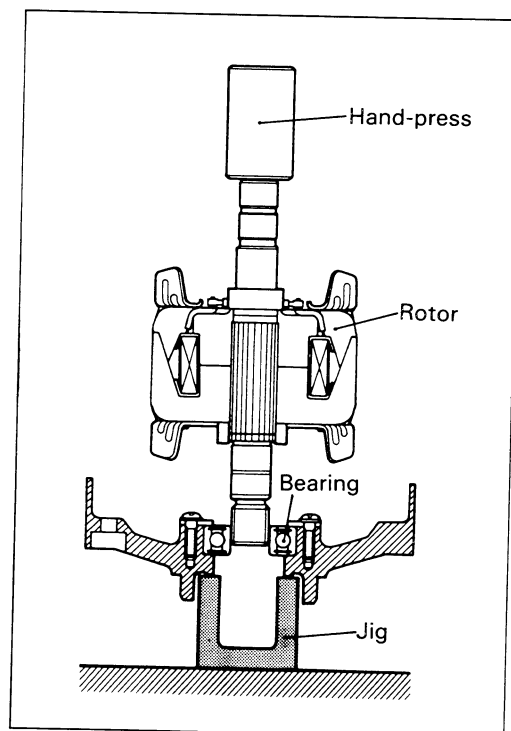
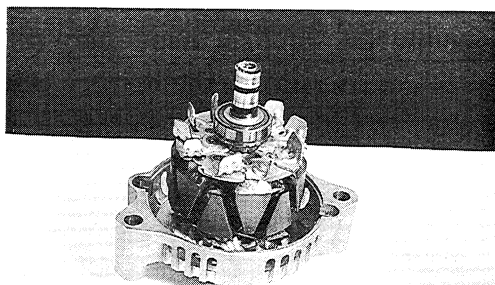


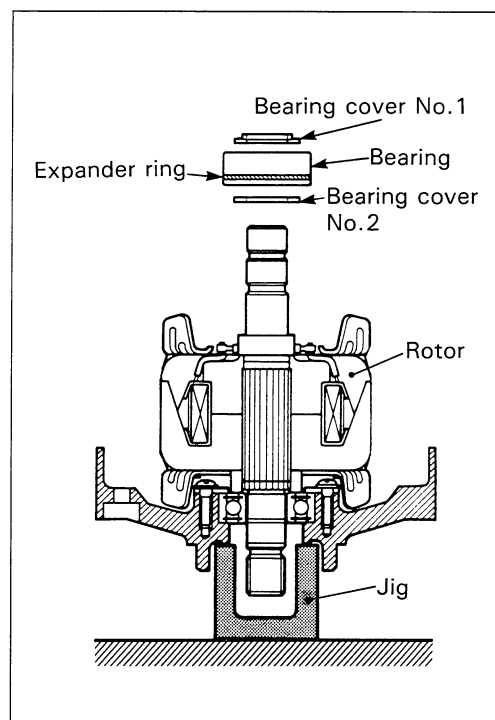
- Apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws.

**99000-32050: THREAD LOCK "1342"**

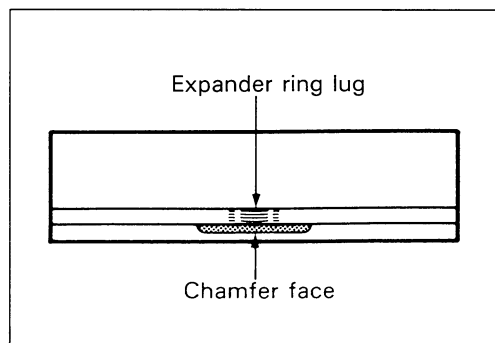


- Install the rotor and bearing by using a hand-press as shown.

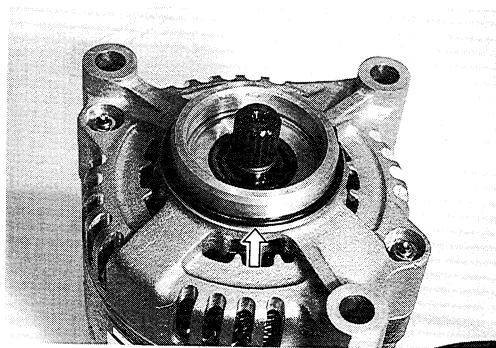


**NOTE:**

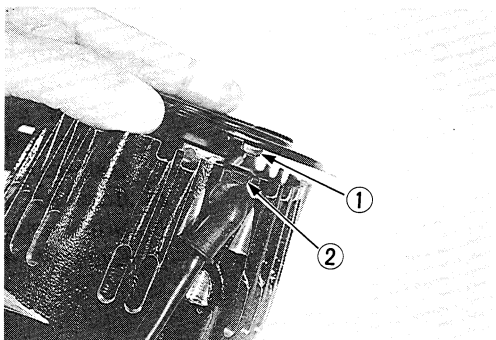
*Before reinstalling the slip ring side bearing to generator end housing, turn the expander ring and align the expander ring lug with the center of chamfer face of bearing outer race.*



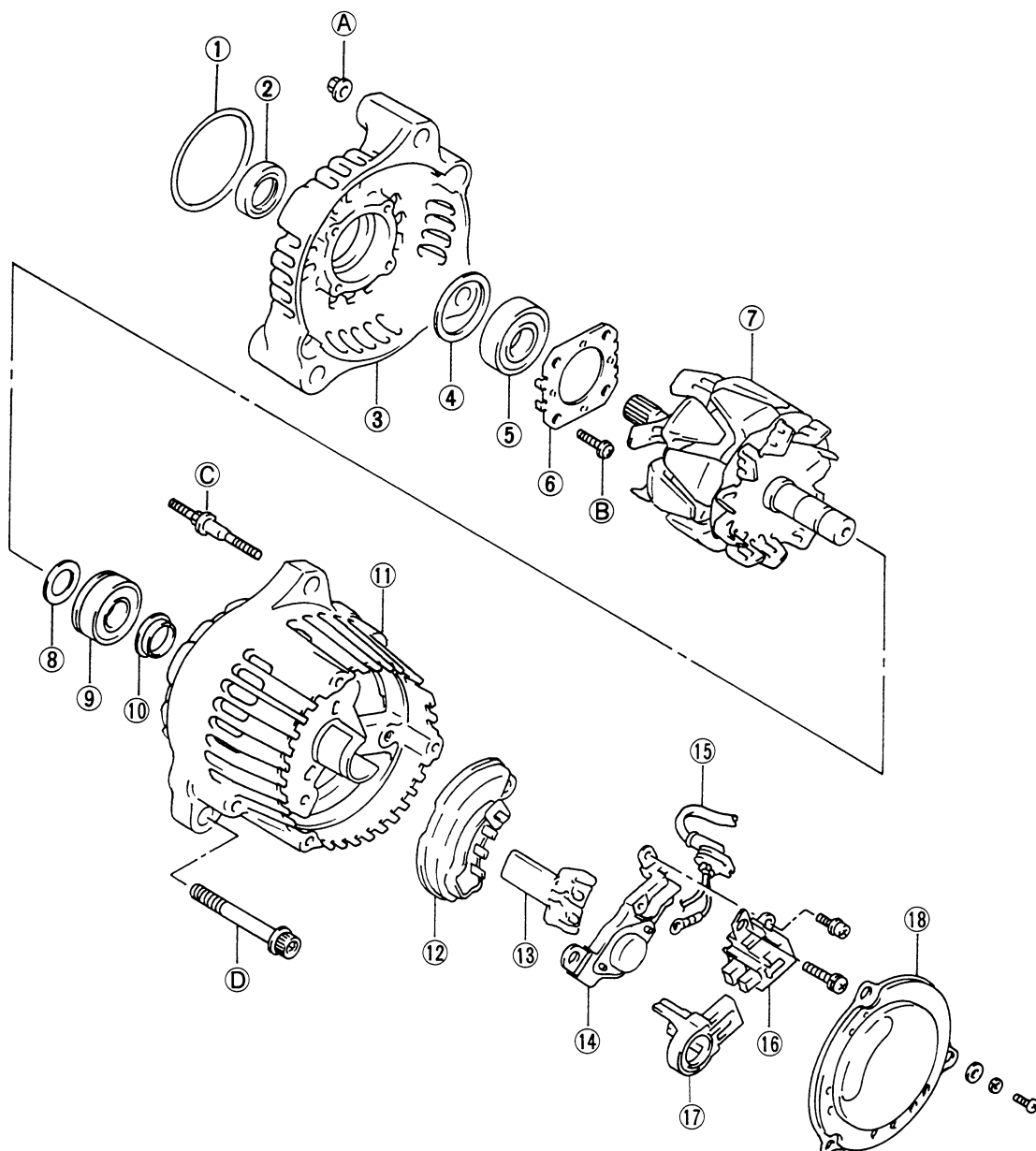
- Fit a new O-ring to the generator end housing.



- Align the lug ① of the generator end cover with the groove ② of the lead wire grommet.



## REASSEMBLY INFORMATION



- |                         |                       |
|-------------------------|-----------------------|
| ① O-ring                | ⑪ Generator housing   |
| ② Oil seal              | ⑫ Rectifier           |
| ③ Generator end housing | ⑬ Rectifier cover     |
| ④ Bearing seat          | ⑭ IC regulator        |
| ⑤ Bearing               | ⑮ Generator lead wire |
| ⑥ Bearing retainer      | ⑯ Brush holder        |
| ⑦ Rotor                 | ⑰ Brush cover         |
| ⑧ Bearing cover No. 2   | ⑱ Generator end cover |
| ⑨ Bearing               |                       |
| ⑩ Bearing cover No. 1   |                       |

Tightening torque			
ITEM	N·m	kg-m	lb-ft
Ⓐ	3.7-5.5	0.37-0.55	2.6-4.0
Ⓑ	2.2-3.3	0.22-0.33	1.5-2.5
Ⓒ	3.7-5.5	0.37-0.55	2.6-4.0
Ⓓ	21-29	2.1-2.9	15.0-21.0

## IGNITION SYSTEM (DIGITAL IGNITOR)

### DESCRIPTION

The fully transistorized ignition system consists of a signal generator, ignitor unit (including 8-BIT MICROCOMPUTER and CERAMIC 4MHZ VIBRATOR), ignition coils and spark plugs. The characteristic of the ignition timing is programmed and stored in the "ROM" (READ ONLY MEMORY) of the ignitor unit.

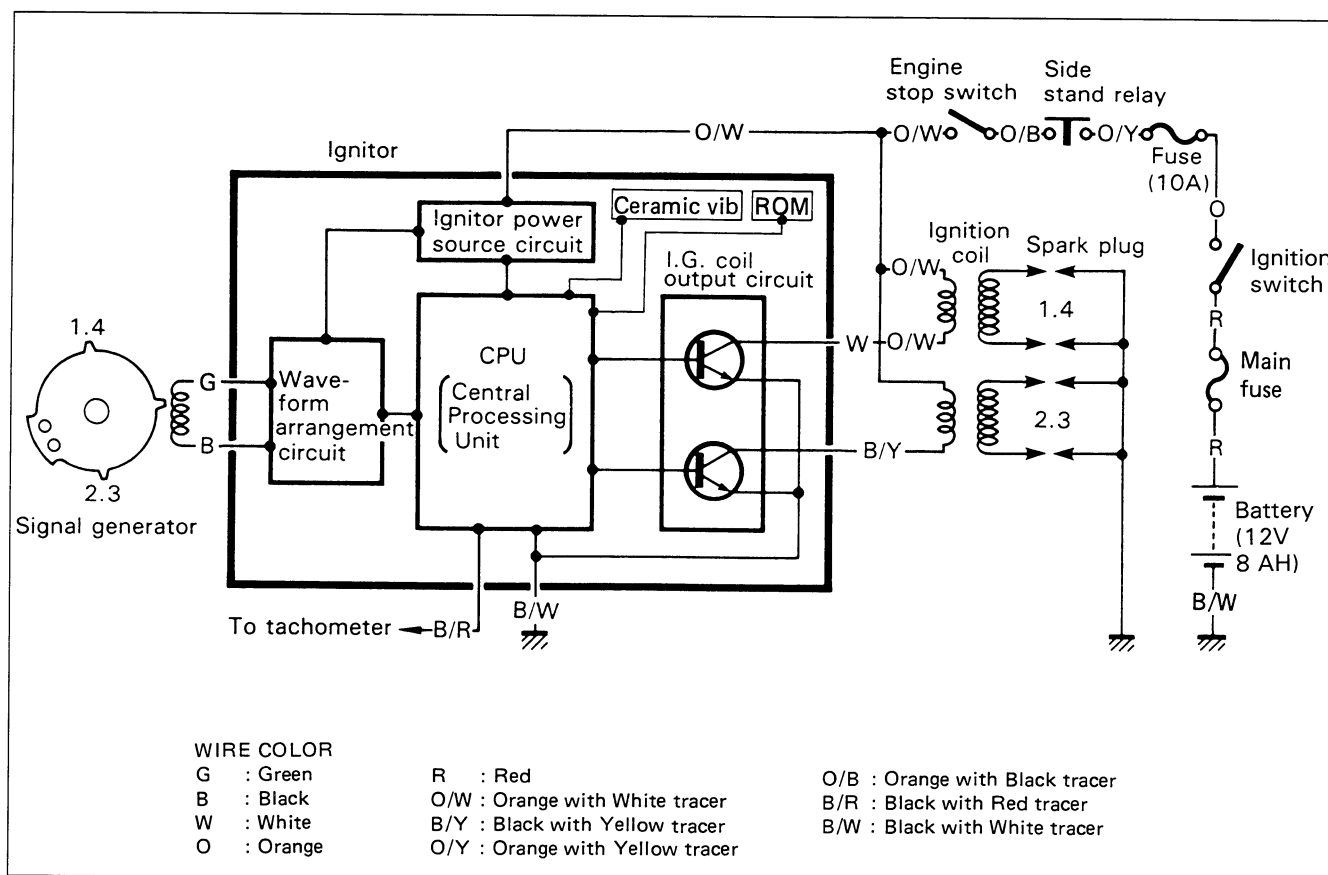
The signal generator comprises the rotor tip and pickup coil.

The signal generator is mounted at the right end of the crankshaft. The induced signal in the signal generator is sent to wave-form arrangement circuit, and CPU receives this signal and calculates the best ignition timing from the signal of ceramic vibrator and data stored in the ROM. The CPU outputs signal to the transistor of the I.G. coil output circuit which is connected to the primary windings of the ignition coil which is turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.

Ignition cut-off circuit is incorporated in the ignitor unit to prevent over-running engine. If engine r/min. reaches 12 800 r/min., this circuit cuts off the ignition primary current for all spark plugs.

### CAUTION:

**Engine can run over 12 800 r/min. without load, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 12 800 r/min. at anytime.**





## INSPECTION

### IGNITION COIL (Checking with Electro Tester)

- Remove the seats, frame cover assembly and fuel tank. (Refer to pages 7-5 and 4-5.)
- Remove the ignition coils.

#### NOTE:

Make sure that the three-needle sparking distance of electro tester is set at 8 mm (0.3 in).

- With the tester and jumper wire, test the ignition coil for sparking performance in accordance with the following two steps.

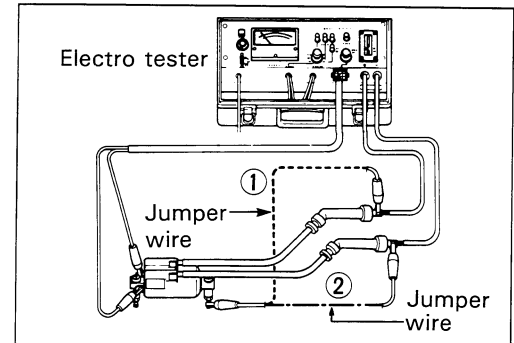
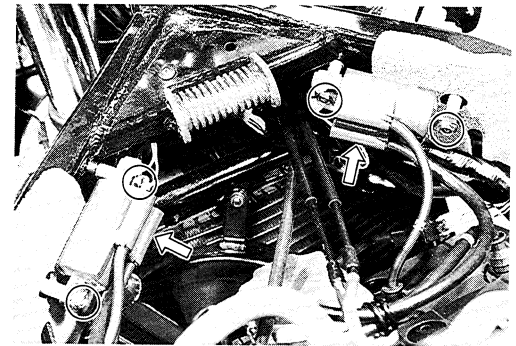
STEP ① : Connect the jumper wire to the spark plug cap and ignition coil ground.

STEP ② : Switch over the jumper wire to the other plug cap and ground.

If no sparking or orange color sparking occurs in the above conditions, it may be caused by defective coil.

#### 09900-28106: Electro tester

Spark performance	Over 8 mm (0.3 in)
-------------------	--------------------

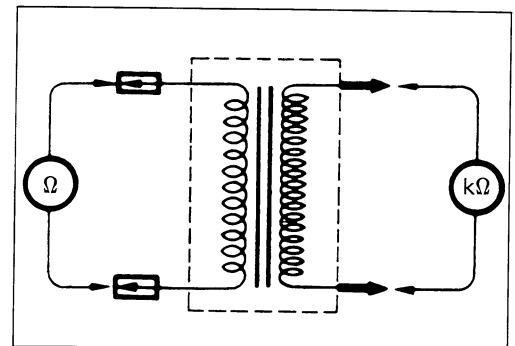
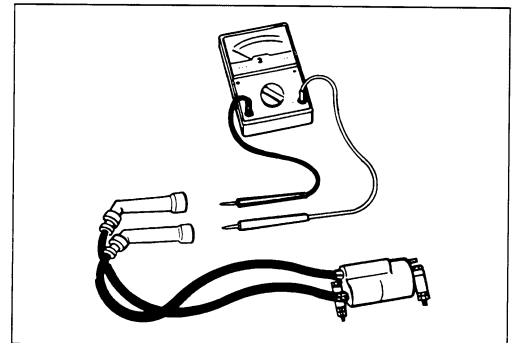


### IGNITION COIL (Checking with Pocket Tester)

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

#### 09900-25002: Pocket tester

Ignition coil resistance	
Primary	$\oplus$ tap — $\ominus$ tap 2.4 — 3.2 $\Omega$ Tester range: (X 1 $\Omega$ )
Secondary	Plug cap — Plug cap 30 — 40 k $\Omega$ Tester range: (X 1 k $\Omega$ )



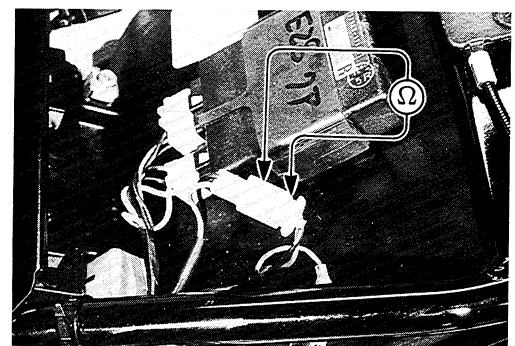
### SIGNAL GENERATOR (Checking with Pocket Tester)

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

#### 09900-25002: Pocket tester

Signal coil resistance	Approx. 135 — 200 $\Omega$ (Black — Green)
------------------------	---

Tester knob indication: X 100  $\Omega$  range



## SPARK PLUGS

- Remove the seats, frame cover assembly and fuel tank.  
(Refer to pages 7-5 and 4-5.)
- Remove all the spark plugs.

### Carbon Deposit

Check to see the carbon deposit on the plug.

If the carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.

### Spark Plug Gap

Measure the plug gap with a thickness gauge if it is correct. If not, adjust it to the following gap.

#### 09900-20803: Thickness gauge

Spark plug gap	Standard
	0.7–0.8 mm (0.028–0.032 in)

### Electrode's Condition

Check to see a worn or burnt condition of the electrode. If it is extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.

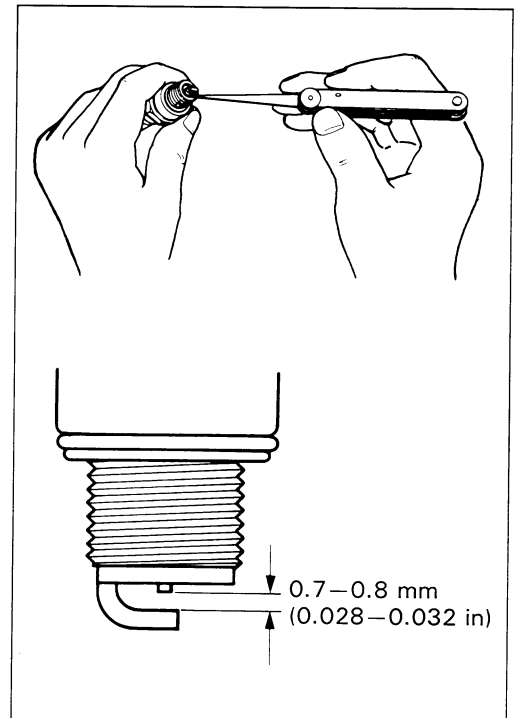
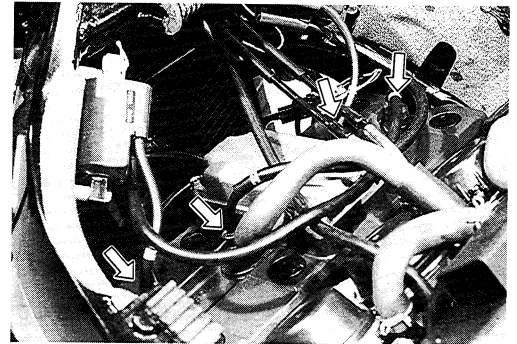
### Heat Range

NGK CR9E should be used as the standard. However, the heat range of the spark plug should be selected to meet the requirements of speed, actual load, fuel and etc. Proper heat range would be indicated if all insulators were LIGHT BROWN in color. If they are baked white, they should be replaced with a cold type plug NGK CR10E or NIPPON-DENSO U31ESR-N.

	Standard	Cold type	Hot type
NGK	CR9E	CR10E	CR8E
NIPPONDENSO	U27ESR-N	U31ESR-N	U24ESR-N

### CAUTION:

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.



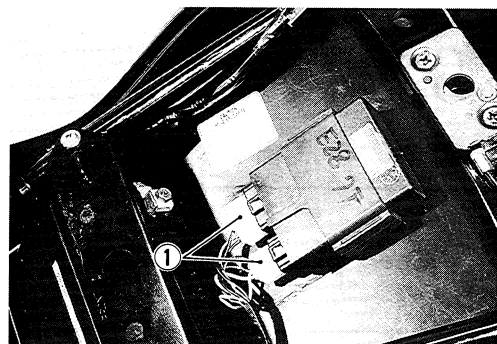
**IGNITOR UNIT (Checking with Digital Ignitor Checker)**

This section explains the checking procedure for the ignitor unit using Digital Ignitor Checker (special tool).

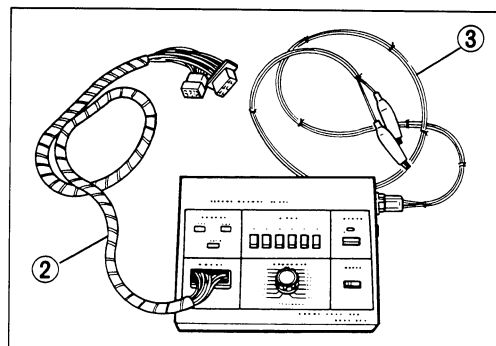
With this checker, the ignitor unit can be checked either on the machine or off the machine. The following explains the checking procedure on the machine.

**09931-94430: Digital ignitor checker****WIRING PROCEDURE:**

- Remove the front seat.
- Disconnect two ignitor lead wire couplers ① at the ignitor unit.



- Prepare the ignitor checker lead wire "MODE 1" ② which comes supplied with the ignitor checker and connect its end to the ignitor unit and another end to the checker.
- Connect the power source leads ③ to the battery.

**CAUTION:**

- \* Be sure that the **BLACK** lead is connected to the battery  $\ominus$  terminal and **RED** lead to the  $\oplus$  terminal.
- \* Before connecting the power source leads, make sure that both "POWER" button and "START" switch are in "off" position (POWER button not depressed).

**NOTE:**

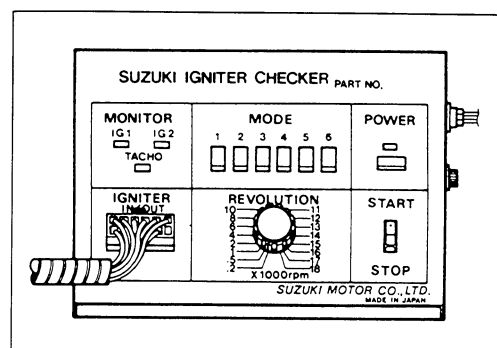
*Be sure that the battery used is in fully-charged condition.*

**CHECK PROCEDURE:**

With all the lead wires properly connected, check the ignitor unit in the following four steps.

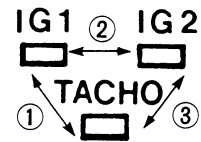
**First Step:**

Depress "MODE 1" button then "POWER" button. This time, "POWER" lamp should come on, if not, battery is undercharged.



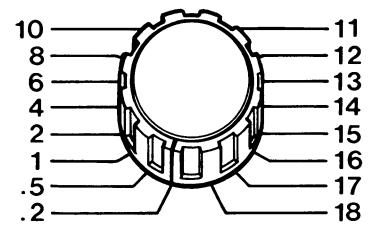
**Second Step:**

Set "REVOLUTION" dial pointer to ".2" position in which the checker produces the ignition primary current pulses simulating 200 r/min of engine revolution when "START" switch is turned on. With "START" switch is turned to ON position, check that three "MONITOR" lamps turn on and off in slow frequency in order of ①—②—③ or ①—③—② as illustrated.

**MONITOR****Third Step:**

Turn "REVOLUTION" dial up gradually (assuming the engine gradually revved up) and check that the MONITOR lamp flash frequency as explained in the second step above increases. As the dial pointer passes beyond the graduation "4" (4 000 r/min), all the three lamps should show continuously lighted.

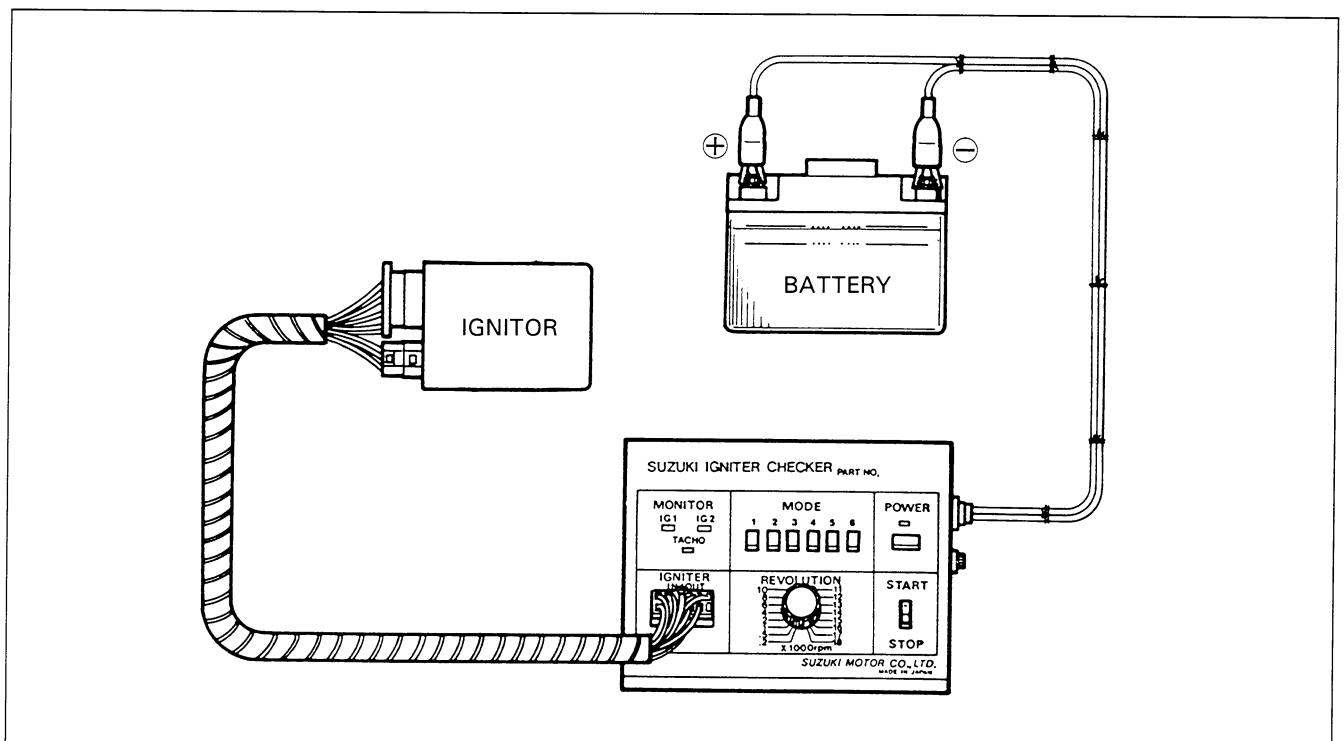
When REVOLUTION dial pointer reaches between "12" and "13" (12 000—13 000 r/min), MONITOR "IG1" and "IG2" lamps should go off while "TACHO" lamp stays on. This is because the ignition "cut-off" provided in the RF600R ignition system functions at  $12\,800 \pm 100$  r/min. If the lamps go off at the graduation below "12", the engine can not perform properly and therefore the ignitor unit must be replaced.

**REVOLUTION**

X 1000rpm

**Fourth Step:**

Turn "START" switch to STOP position. If the "IG1" or "IG2", or both lamps remain light more than 5 seconds, the ignitor unit must be replaced.

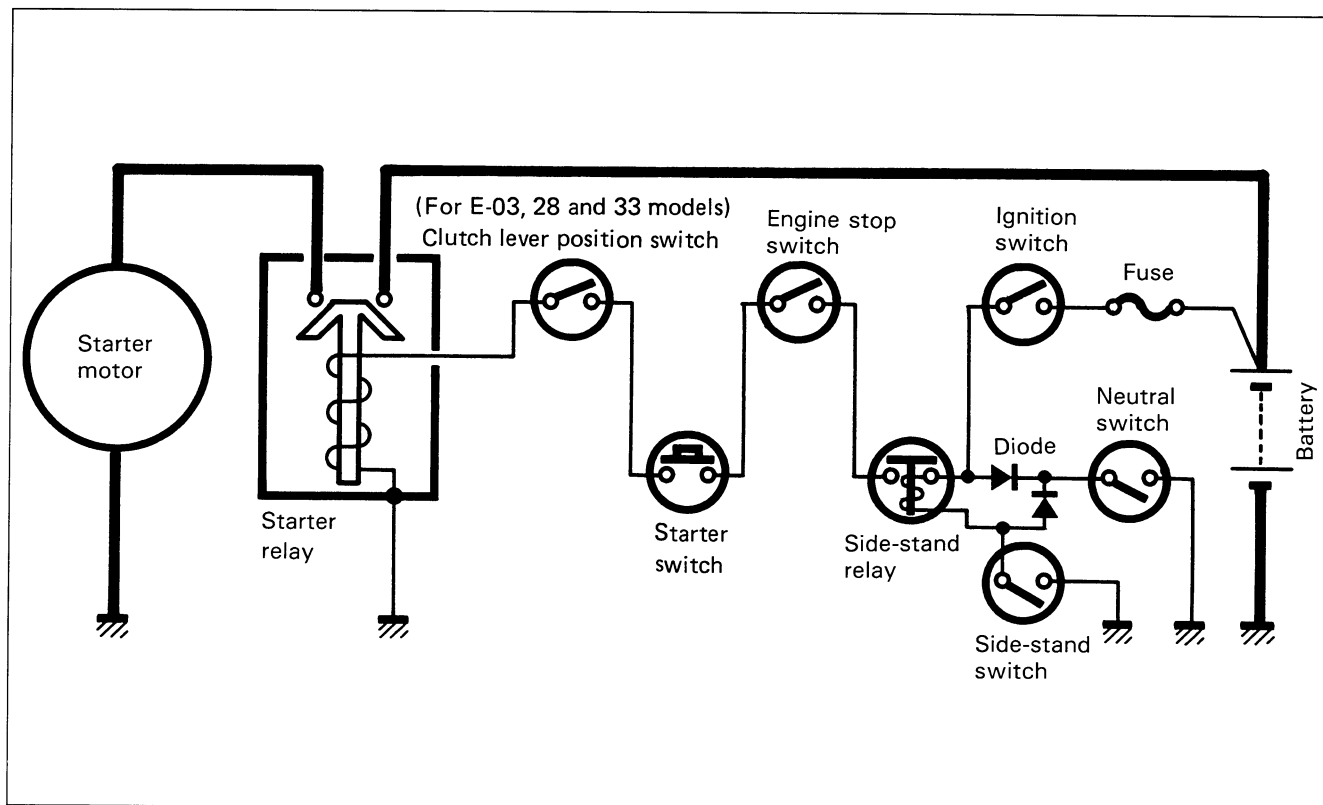


## STARTER SYSTEM

### DESCRIPTION

The starter system is shown in the diagram below: namely, the starter motor, starter relay, side-stand relay, side-stand switch, neutral switch, clutch lever position switch, starter switch, engine stop switch, IG switch and battery.

Depressing the starter switch (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.

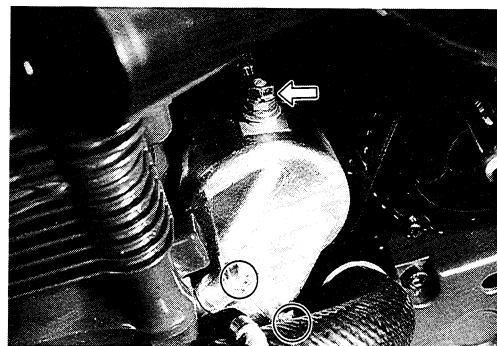


### REMOVAL AND DISASSEMBLY

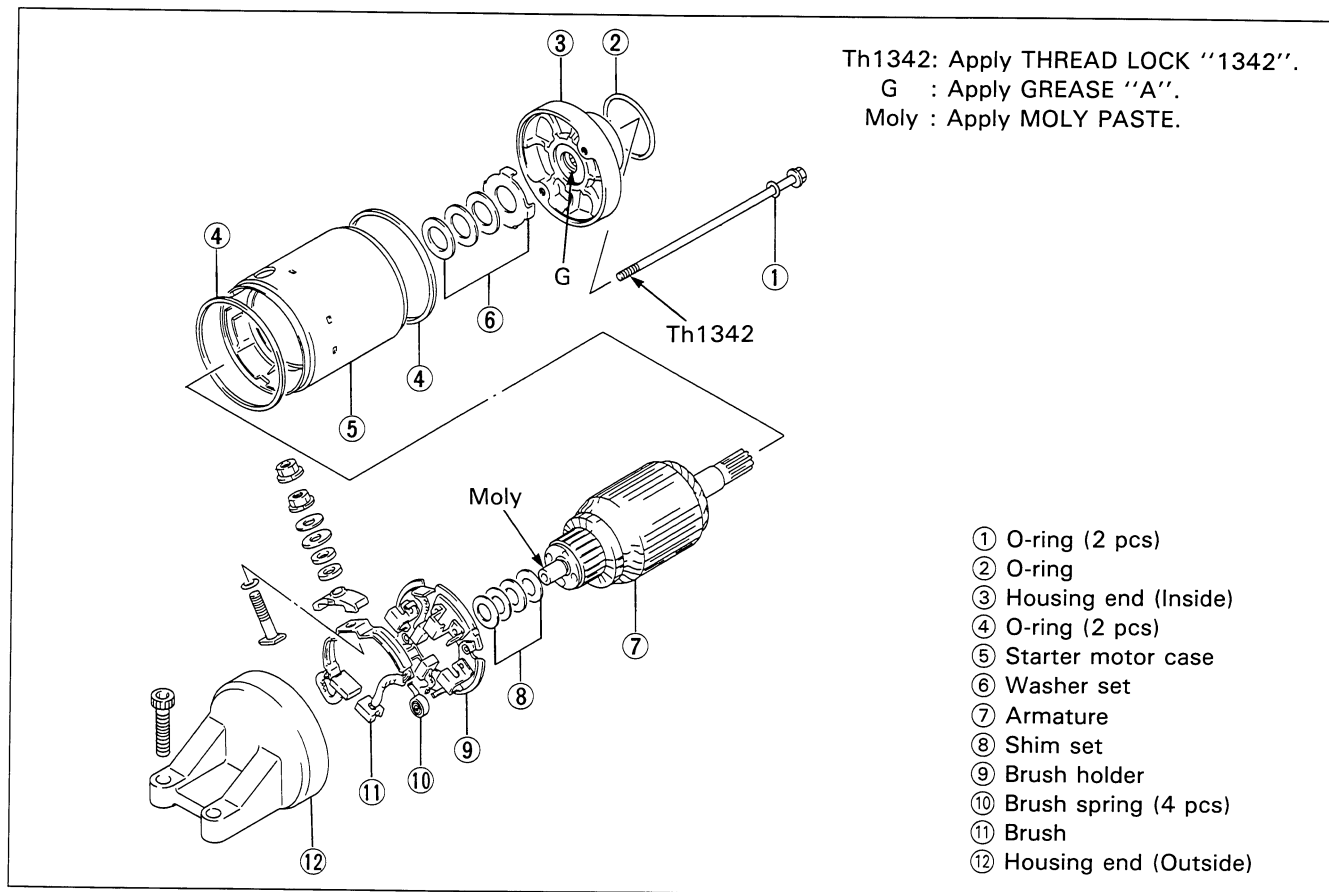
- Remove the lower cowl assembly. (Refer to page 7-2.)
- Disconnect the starter motor lead wire and remove the starter motor by removing the mounting bolts.

#### NOTE:

*If it is difficult to remove the starter motor, remove the water hose mounting bolts to provide additional space.*



- Disassemble the starter motor as shown in the illustration.



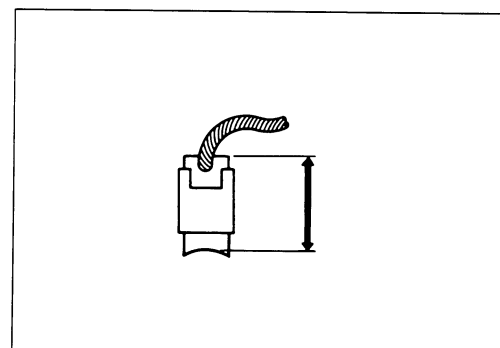
## INSPECTION

### CARBON BRUSH

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

#### 09900-20102: Vernier calipers (200 mm)

Brush length	Service Limit
	6 mm (0.2 in)



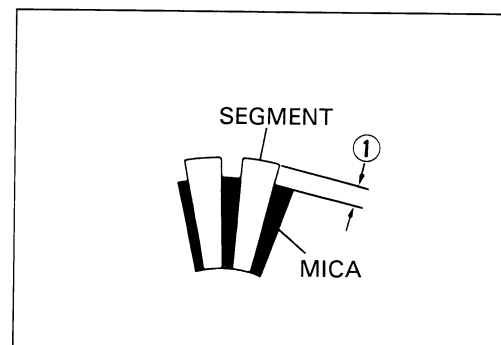
### COMMUTATOR

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

Measure the commutator under cut ① with a vernier calipers.

#### 09900-20102: Vernier calipers (200 mm)

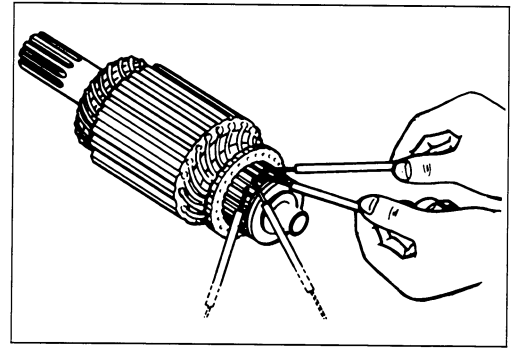
Commutator under-cut	Service Limit
	0.2 mm (0.008 in)



**ARMATURE COIL**

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

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

**09900-25002: Pocket tester**

**Tester knob indication:** X 1 $\Omega$  range

**OIL SEAL**

Check the seal lip for damage or oil leakage. If any damage is found, replace it.

**REASSEMBLY****O-RING****CAUTION:**

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

**HOUSING END (Inside)**

- Apply grease to the lip of oil seal. (Refer to page 6-16.)

**99000-25010: SUZUKI SUPER GREASE "A"****HOUSING END (Outside)**

- Apply a small quantity of SUZUKI MOLY PASTE to the armature end. (Refer to page 6-16.)

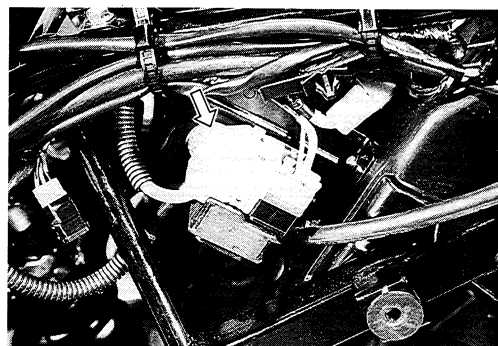
**99000-25140: SUZUKI MOLY PASTE**

- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing screws. (Refer to page 6-16.)

**99000-32050: THREAD LOCK "1342"**

## STARTER RELAY INSPECTION

- Remove the seats and frame cover assembly.
- Disconnect the starter motor lead wire and battery lead wire at the starter relay which is located behind the left frame cover.
- Disconnect the lead wire coupler from the starter relay.



- Apply 12 volts to ① and ② terminals, inspect the continuity between the terminals, positive and negative. If the starter relay is in sound condition, continuity is found.

**09900-25002: Pocket tester**

**Tester knob indication: X 1Ω range**

### CAUTION:

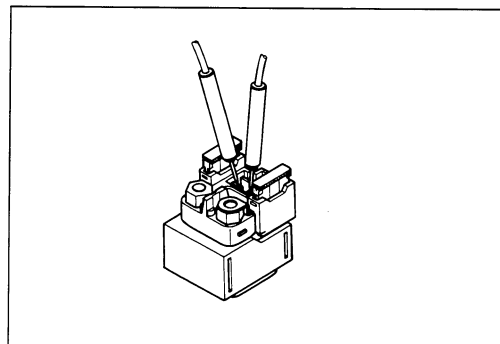
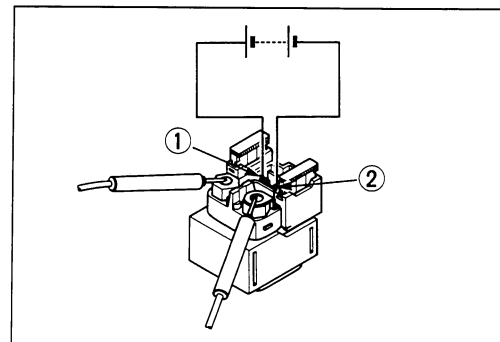
- \* Do not apply a battery voltage more than 5 seconds to the starter relay as it may overheat and cause damage to the relay coil.

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

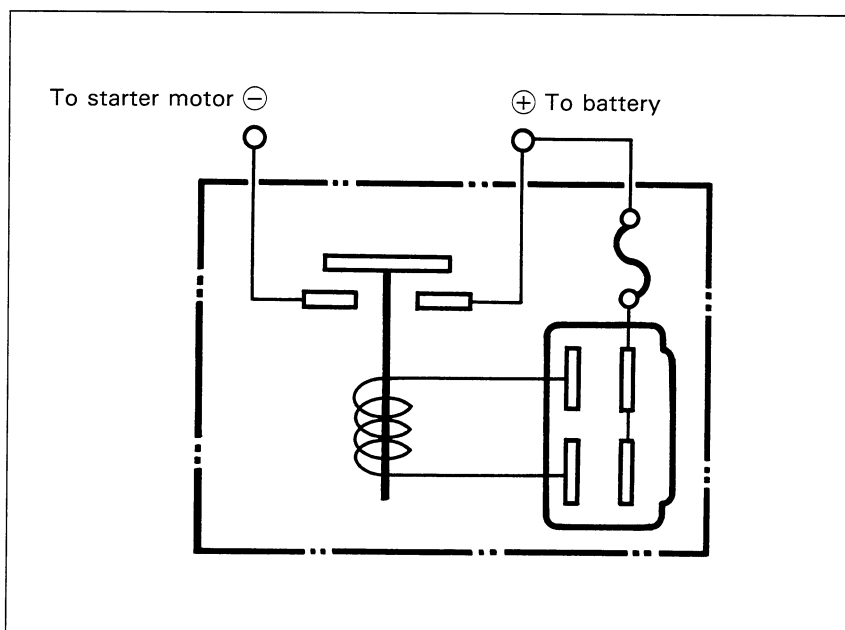
**09900-25002: Pocket tester**

**Tester knob indication: X 1Ω range**

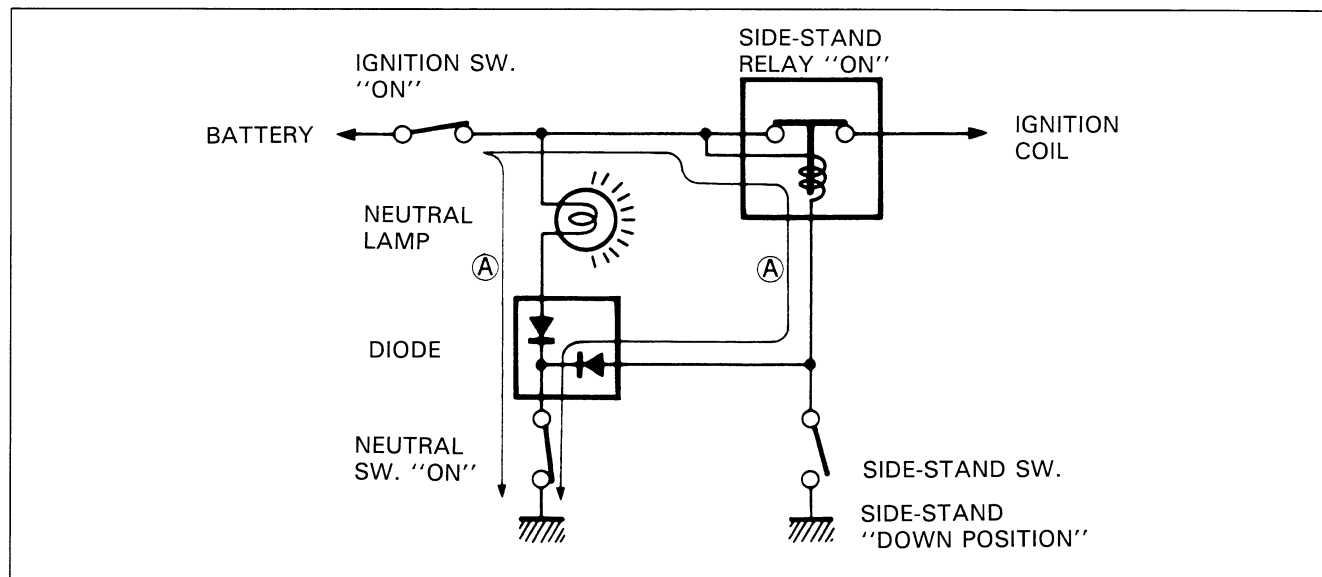
Starter relay resistance	Standard
	3 – 5Ω



## STARTER RELAY CIRCUIT DIAGRAM

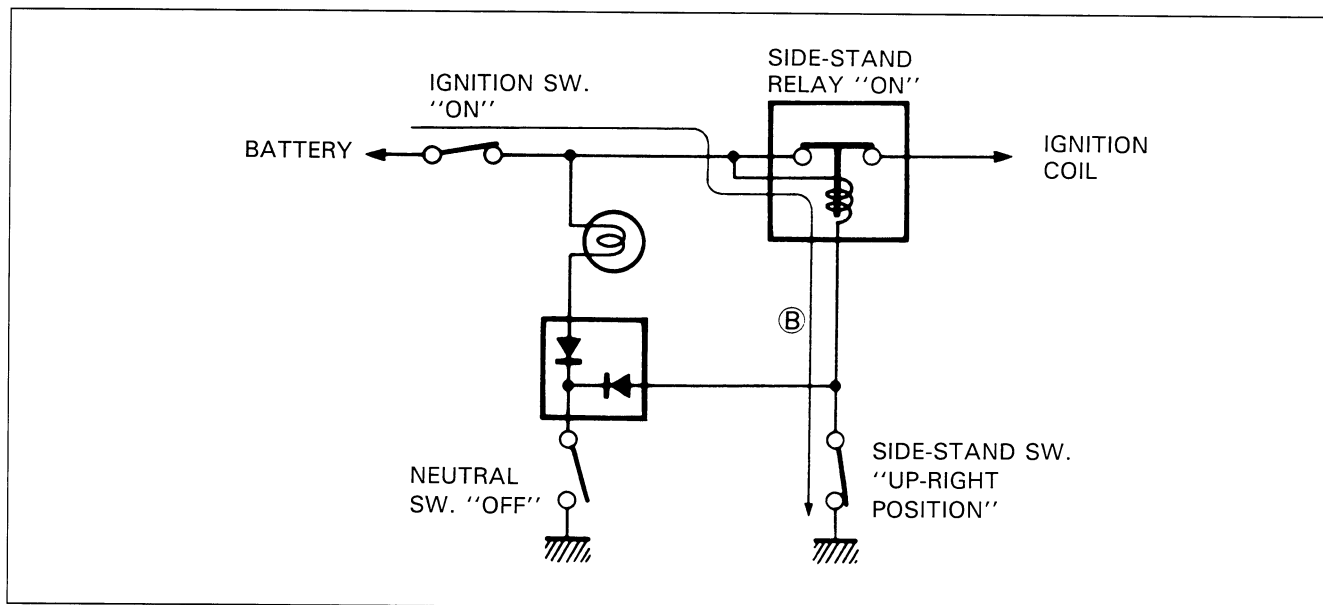






## 2. Side-stand: "UP-RIGHT (ON)"

The current flow ⑥ turns "ON" the relay and the ignition coil lives. The engine can be easily started at any transmission position.



## INSPECTION

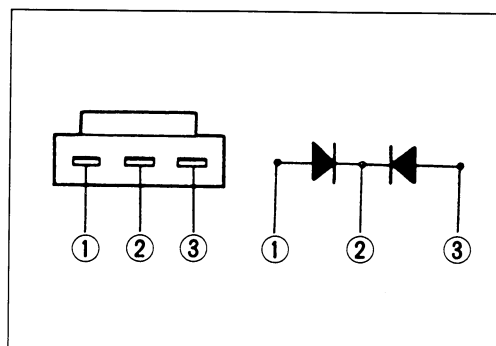
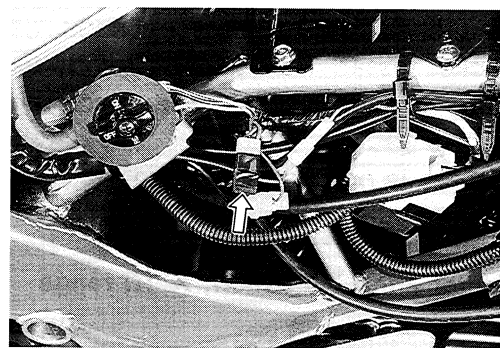
If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with a new one.

### 09900-25002: Pocket tester

#### Diode

The diode is located behind the left frame cover. The diode can pass current only in one direction.

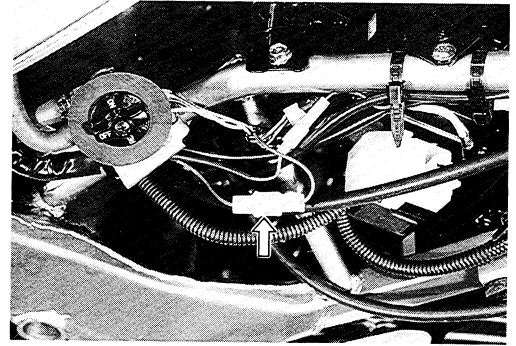
- Check the continuity between ① and ②. If one way continuity the diode is in good condition.
- Also check the continuity between ② and ③ as required.



### Neutral switch

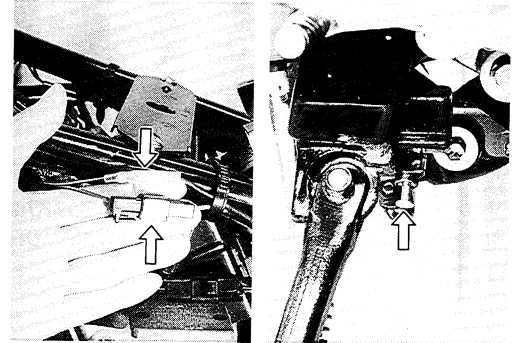
The neutral lead wire coupler is located behind the left frame cover.

- Remove the seats and frame cover assembly.
- Disconnect the neutral switch lead and check the continuity between Blue and Ground with the transmission in "NEUTRAL".



### Side-stand switch

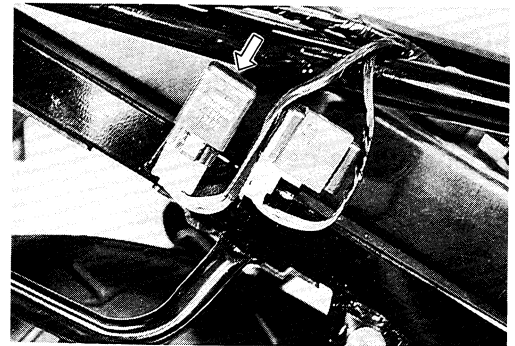
	Green	Black/White
ON (UP-right position)		
OFF (Down position)		



### Side-stand/ignition interlock relay

The side-stand/ignition interlock relay is located behind the right frame cover.

- Remove the seats and frame cover assembly.

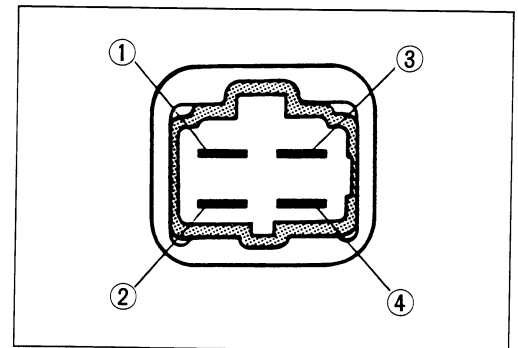


First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.

If there is no continuity, replace it with a new one.

**09900-25002: Pocket tester**

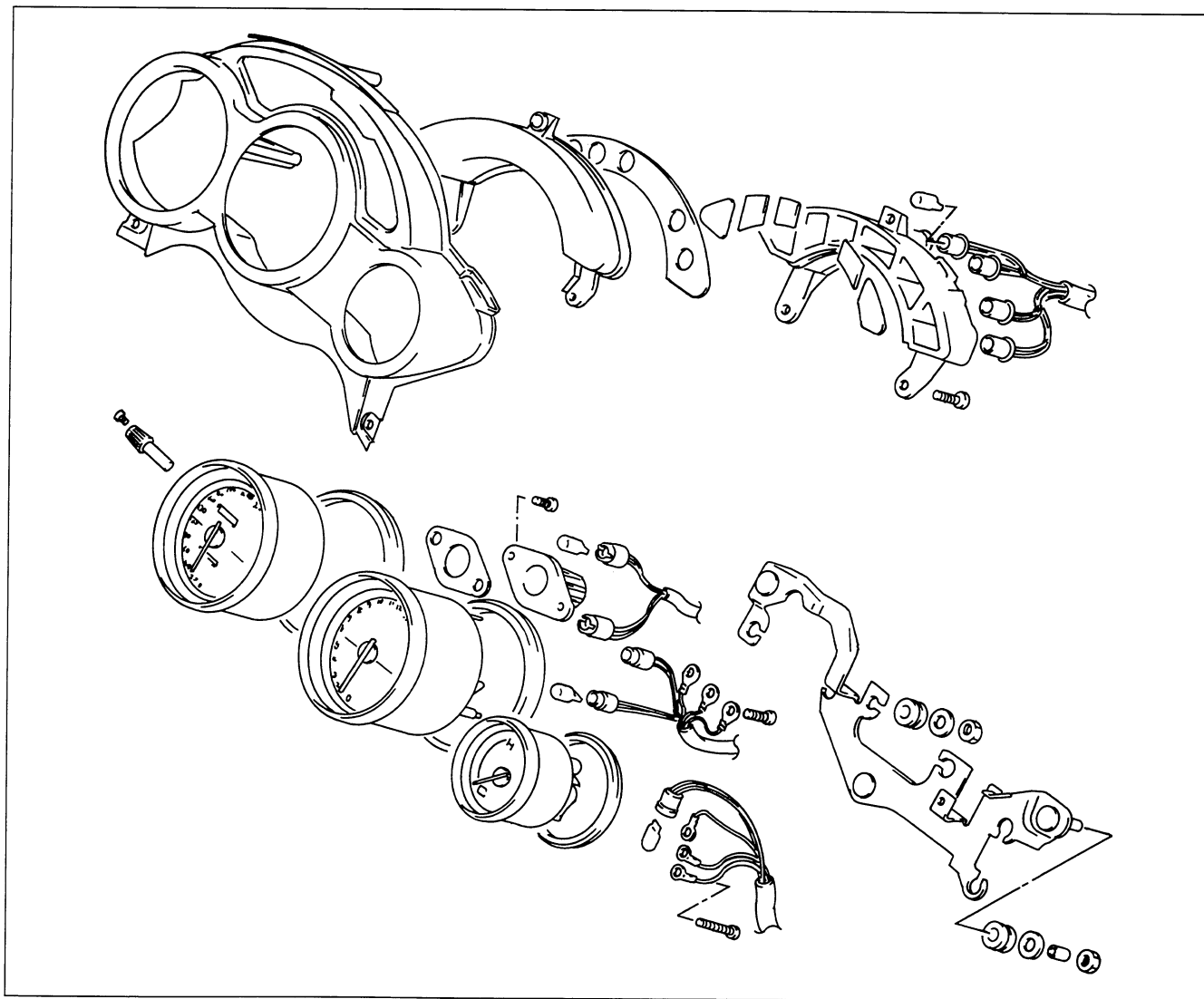
**Tester knob indication: X 1Ω range**



## COMBINATION METER

### REMOVAL AND DISASSEMBLY

- Remove the combination meter.
- Disassemble the combination meter as follows.



### INSPECTION

Using the pocket tester, check the continuity between lead wires in the diagram on next page.

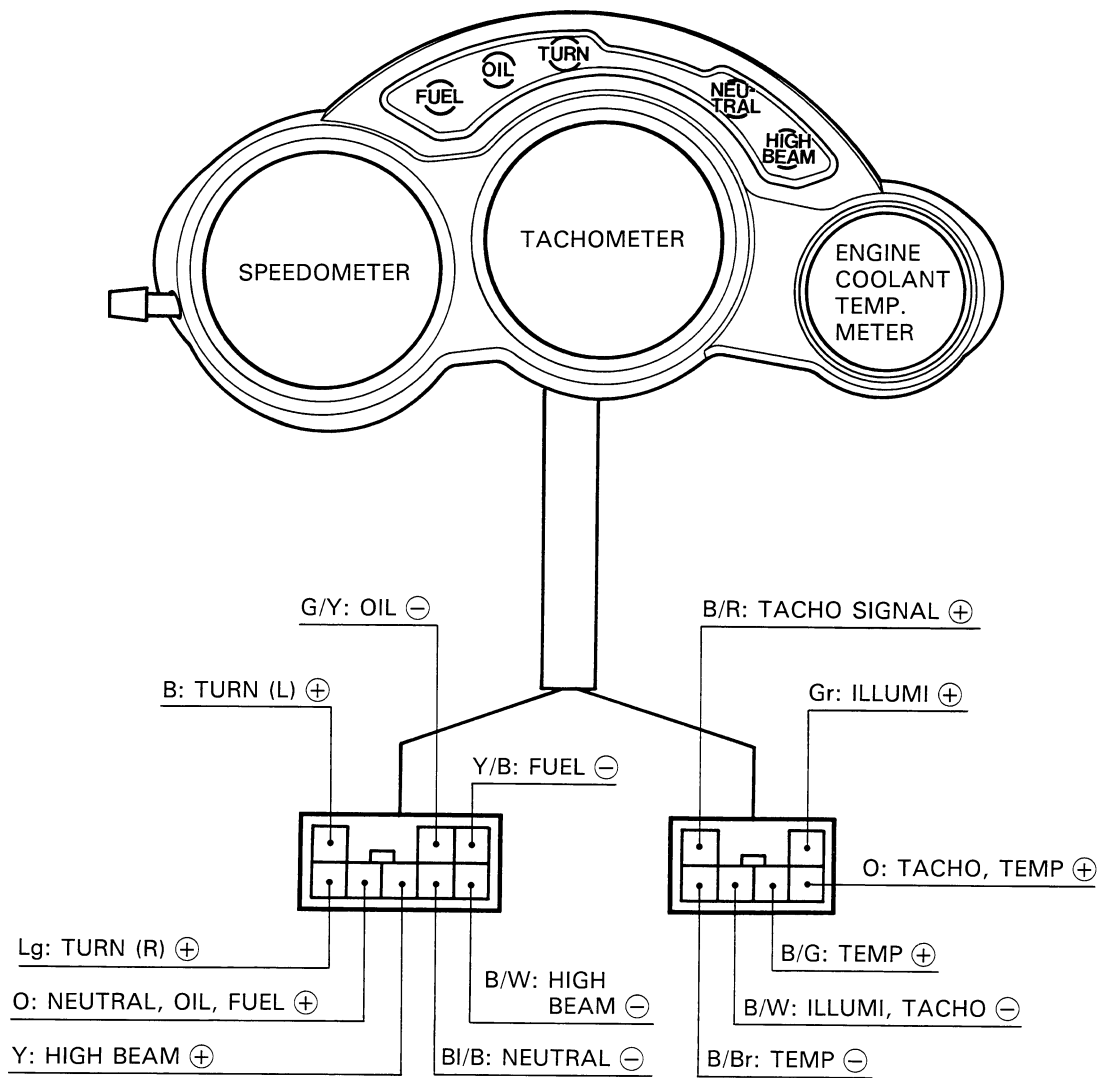
If the continuity measured is incorrect, replace the respective parts.

**09900-25002: Pocket tester**

**Tester knob indication: X 1 $\Omega$  range**

**NOTE:**

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



ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
OIL	O	G/Y
TURN (L)	B	Lg
TACHO SIGNAL	B/R	B/W
HIGH BEAM	Y	B/W
TURN (R)	Lg	B
NEUTRAL	O	BI/B
ILLUMI	Gr	B/W
TEMP	O	B/Br
TEMP	O	B/G
TACHO	O	B/W
FUEL	O	Y/B

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

## ENGINE COOLANT TEMPERATURE METER

### INSPECTION

As the coil spring is installed on the needle shaft of the engine coolant temperature meter, the needle is forcibly back to the original position when ignition switch is turned OFF. To test the engine coolant temperature meter two different checks may be used. The first, and simplest test will tell if the meter is operating but will not indicate the meters accuracy throughout the range.

To perform this test, remove the service lid on the lower cowl and disconnect the B/G lead wire of the engine coolant temperature meter from the engine coolant temperature gauge. Connect a jumper wire between B/G wire coming from the main wiring harness and engine ground. With the ignition switch turned on, the engine coolant temperature meter should indicate "H".

B/G: Black with Green tracer

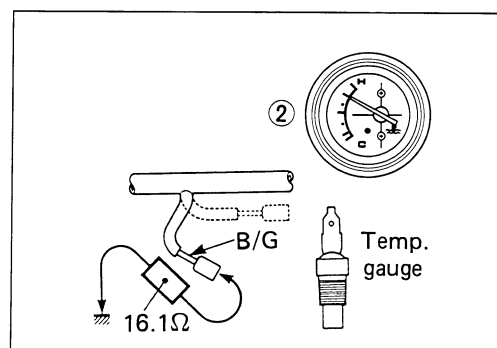
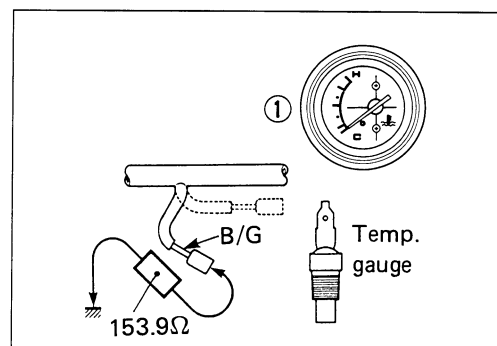
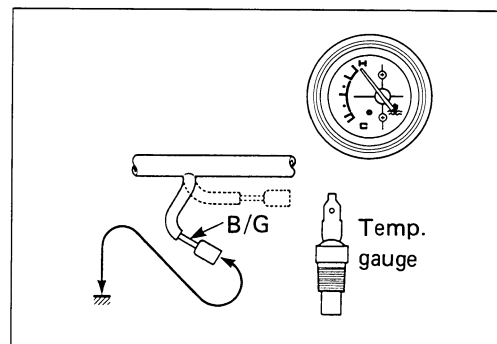
The second test will check the accuracy of the meter in the "H" and "C" positions.

Connect a 153.9-ohm resistor between the B/G lead wire of the engine coolant temperature meter and engine ground. The engine coolant temperature meter is normal if its pointer indicates the ① position when the specified voltage is applied to the circuit and if its pointer indicates the ② position when the resistor is changed to 16.1 ohms. If either one or both indications are abnormal, replace the engine coolant temperature meter with a new one.

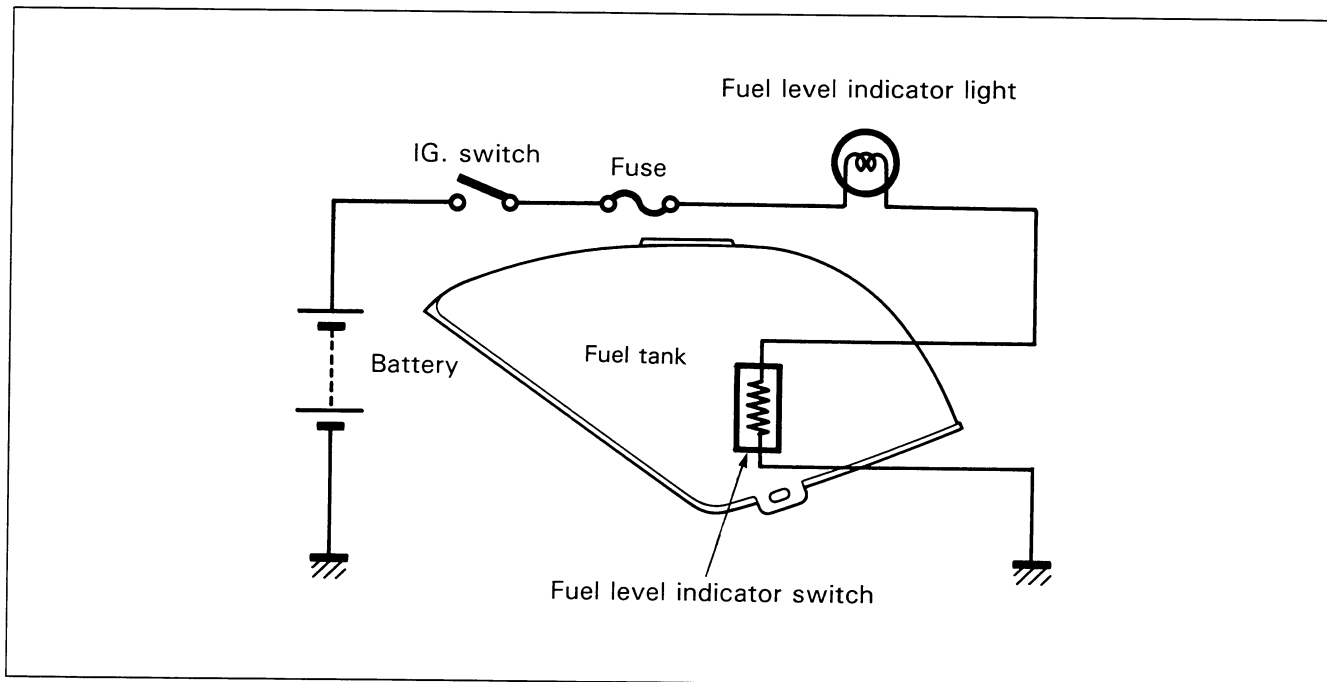
The relation between the position of the engine coolant temperature meter and resistance is shown in the following table.

POSITION	RESISTANCE
①	153.9 $\Omega$
②	16.1 $\Omega$

For inspecting the engine coolant temperature gauge, refer to page 5-9.

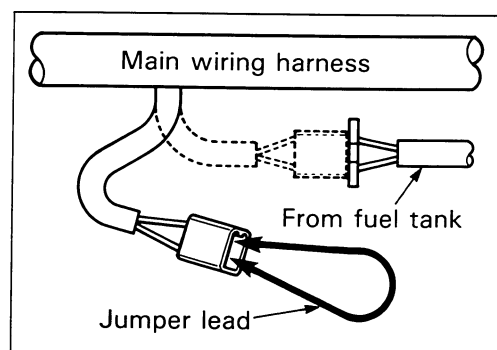


## FUEL LEVEL INDICATOR

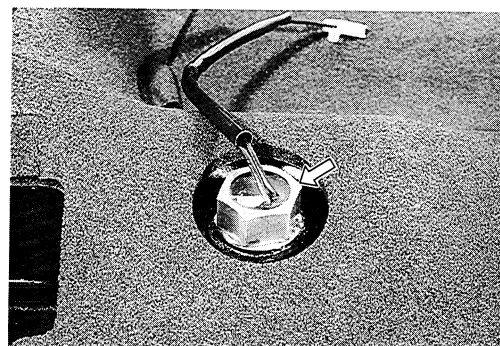


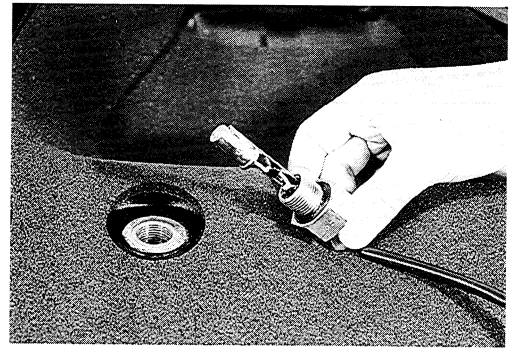
### INSPECTION

- Remove the seats and frame cover assembly. (Refer to page 7-5.)
- With the engine has started, disconnect the two lead wires going into the fuel level indicator switch, connect the lead wires from the main wiring harness with a jumper lead and check whether the fuel level indicator light is ON. If a "LIGHT" is indicated, the circuit of fuel level indicator light is in good condition. If the fuel level indicator light does not light, replace the indicator bulb or repair the circuit connection. If the bulb is in good condition, the level indicator switch may be faulty, replace the indicator switch with a new one or inspect the fuel level indicator switch.

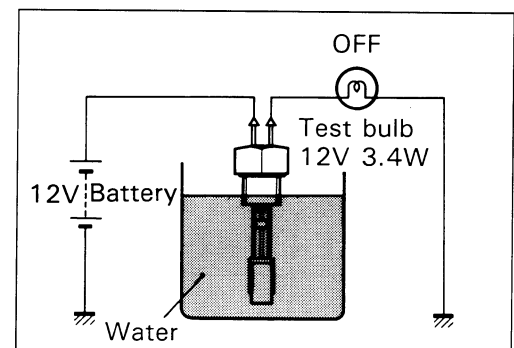
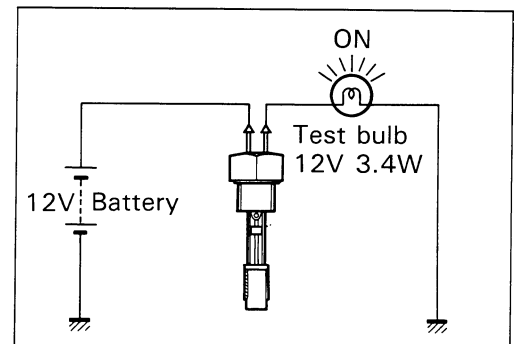


- Remove the fuel tank. (Refer to page 4-5.)
- Remove the fuel level indicator switch from the fuel tank.





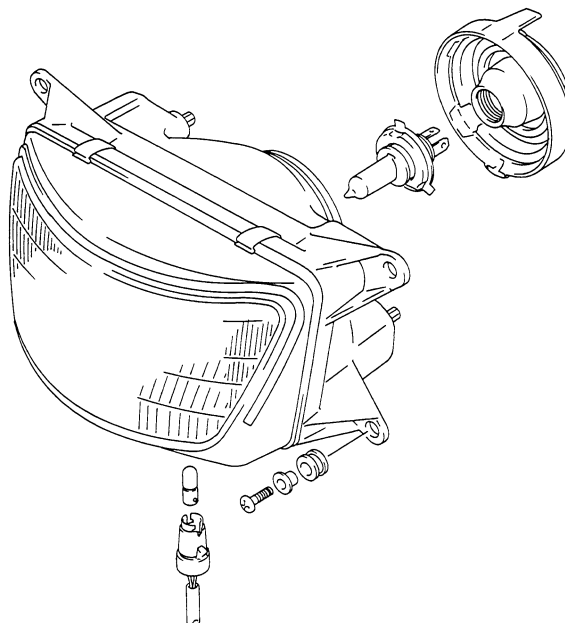
- Connect 12V battery to the fuel level indicator switch and ground through a 3.4W bulb. The bulb should light up after several seconds if the switch is in good condition.
- When the switch is immersed in water under the above condition, the bulb should go out. If the bulb remains lit, replace the fuel level indicator switch.





## LAMPS

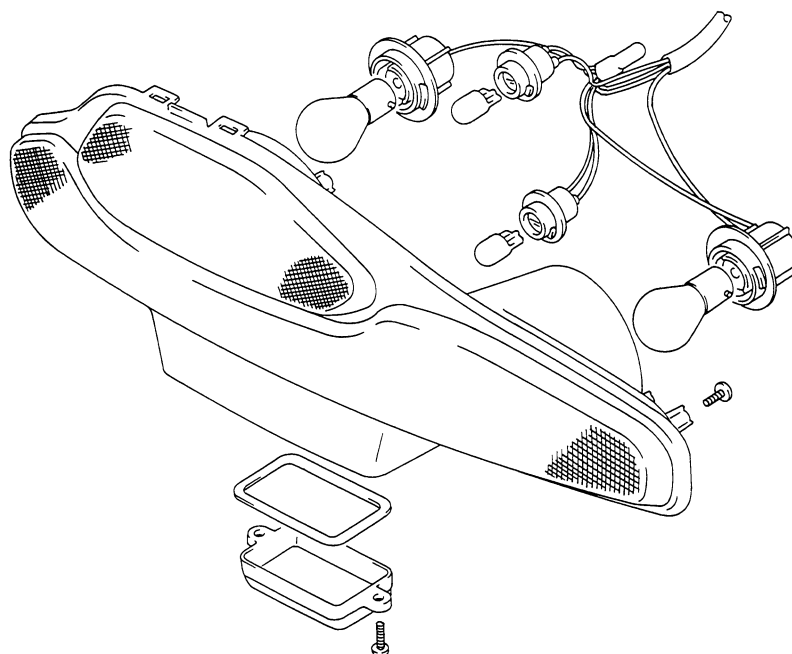
### HEADLIGHT



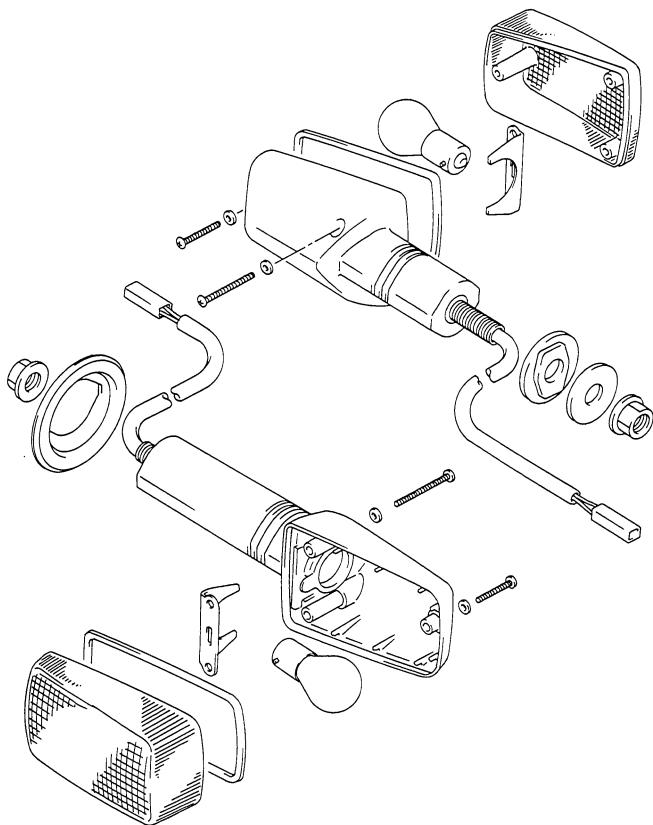
**NOTE:**

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

### TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT



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

SWITCHES

Inspect each switch for continuity with the pocket tester referring to the WIRING DIAGRAM. If any abnormality is found, replace the respective switch assemblies with new ones. (Refer to the chapter 8 for wiring diagram.)

**09900-25002: Pocket tester**

**Tester knob indication: X 1Ω range**

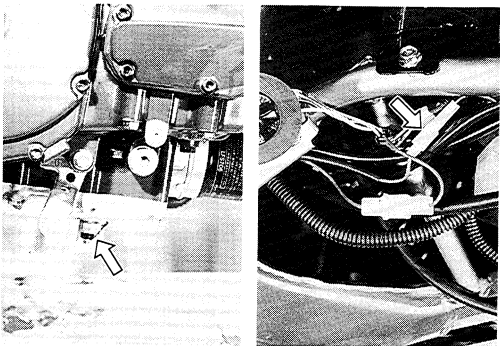
OIL PRESSURE SWITCH

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

	Black or Green/Yellow	Ground
ON		
OFF		

**NOTE:**

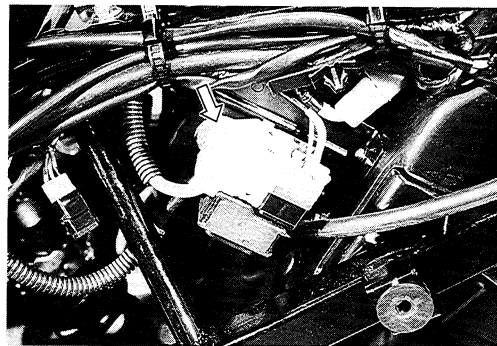
Before inspecting the oil pressure switch, check if the engine oil level is enough.



## RELAY

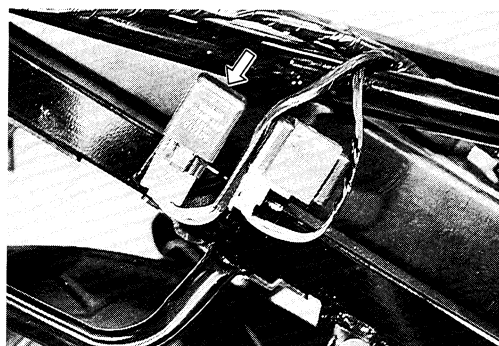
### STARTER RELAY

The starter relay is located behind the left frame cover. (Refer to page 6-18 for details.)



### SIDE-STAND RELAY

The side-stand relay is located behind the right frame cover. (Refer to page 6-21 for details.)



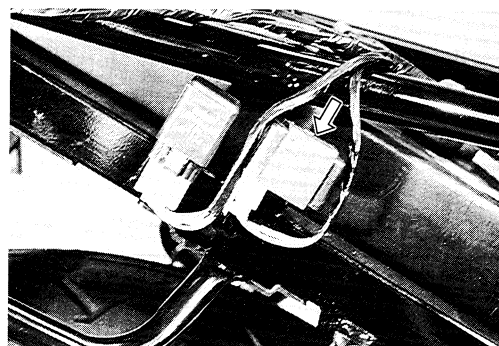
### TURN SIGNAL RELAY

The turn signal relay is located behind the right frame cover. If the turn signal light does not light. Inspect the bulb or repair the circuit connection.

If the bulb and circuit connection checked are correct, the turn signal relay may be faulty, replace it with a new one.

**NOTE:**

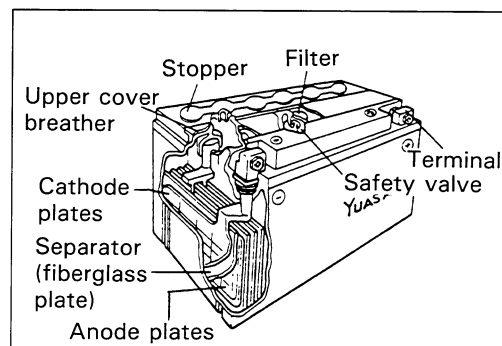
*Be sure that the battery used is in fully-charged condition.*



# BATTERY

## SPECIFICATIONS

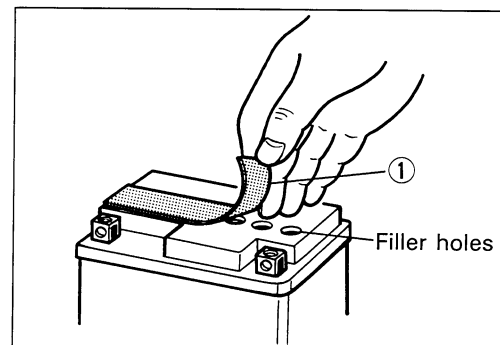
Type designation	YTX9-BS
Capacity	12V, 28.8 kC (8 Ah)/10HR
Standard electrolyte S.G.	1.320 at 20°C (68°F)



## INITIAL CHARGING

### Filling electrolyte

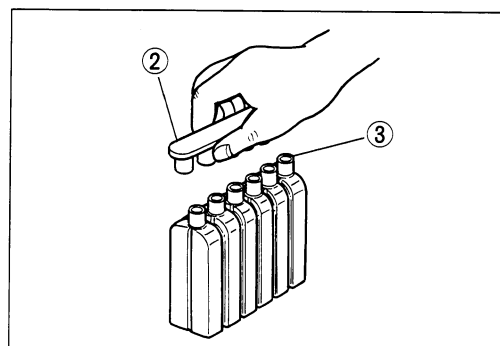
- Remove the aluminum tape ① sealing the battery electrolyte filler holes.



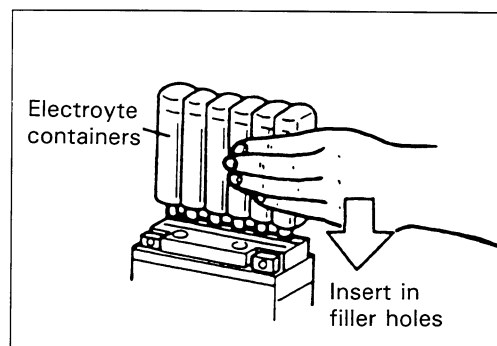
- Remove the caps ②.

### NOTE:

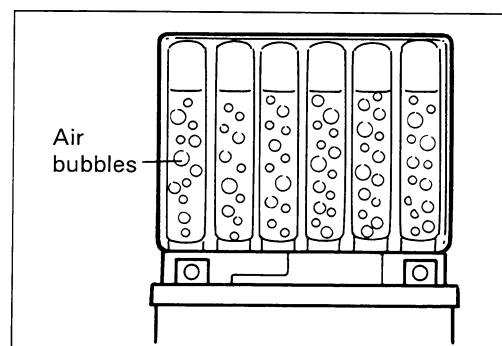
- After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.*
- Do not remove or pierce the sealed areas ③ of the electrolyte container.*



- Insert the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall. Take precaution not to allow any of the fluid to spill.



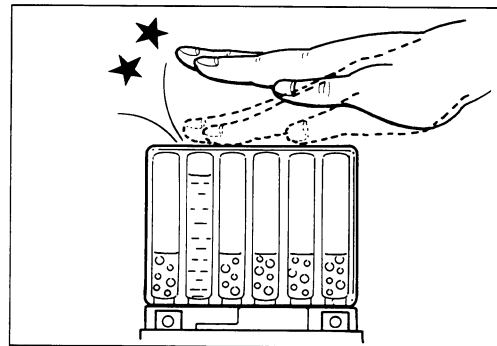
- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.



**NOTE:**

*If no air bubbles are coming up from a filler port, tap the bottom of the two or three times.*

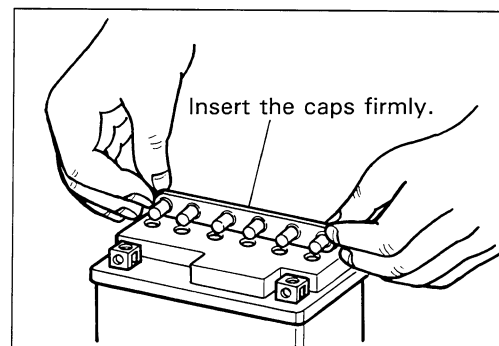
*Never remove the container from the battery.*



- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for around 20 minutes.
- Insert the caps into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.

**CAUTION:**

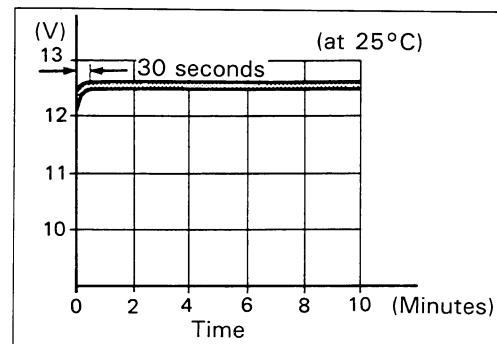
- \* **Never use anything except the specified battery.**
- \* **Once install the caps to the battery; do not remove the caps.**



- Using SUZUKI pocket tester, measure the battery voltage. The tester should indicate more than 12.5–12.6V (DC) as shown in the Fig. If the battery voltage is lower than the specification, charge the battery with a battery charger. (Refer to the recharging operation.)

**NOTE:**

*Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.*

**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.

## RECHARGING OPERATION

- Using the pocket tester, check the battery voltage. If the voltage reading is less than the 12.0V (DC), recharge the battery with a battery charger.

### CAUTION:

When recharging the battery, remove the battery from the motorcycle.

### NOTE:

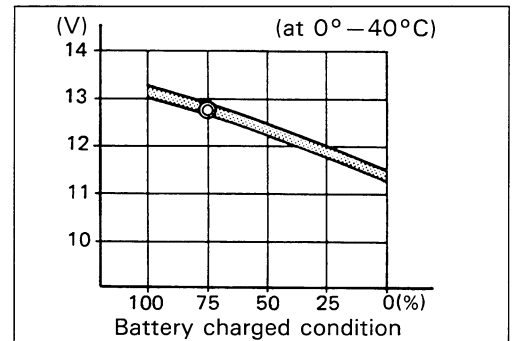
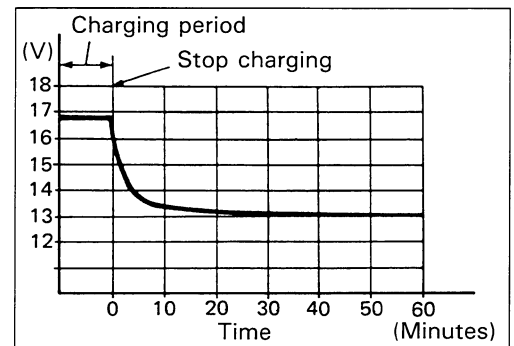
Do not remove the caps on the battery top while recharging.

Recharging time: 4A for one hour or 0.9A for 5 hours

### CAUTION:

Be careful not to permit the charging current to exceed 4A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a pocket tester.
- If the battery voltage is less than the 12.5V, recharge the battery again.
- If battery voltage is still less than 12.5V, after recharging, replace the battery with a new one.
- When the motorcycle is not used for a long period, check the battery every 1 month to prevent the battery discharge.

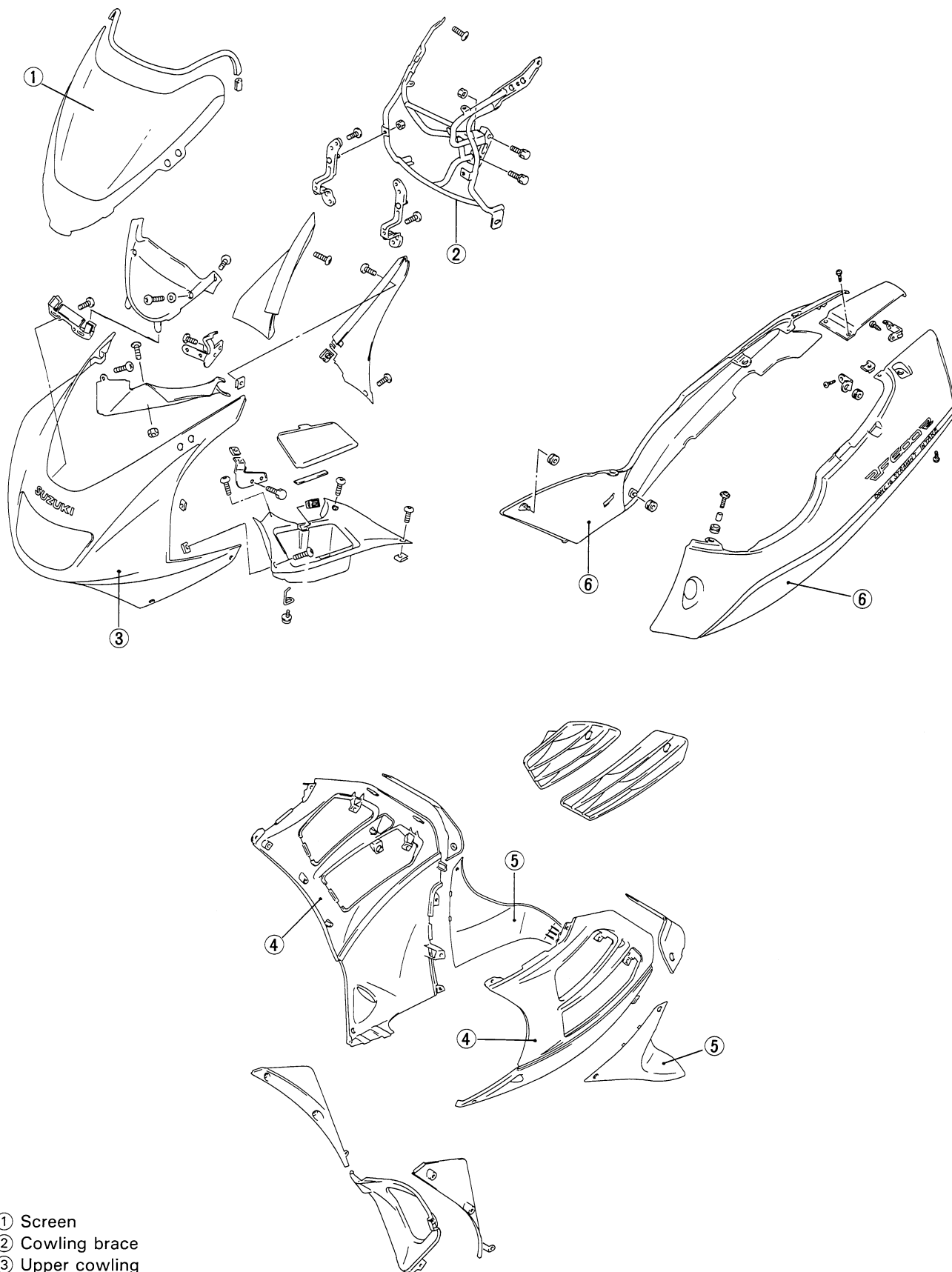


# CHASSIS

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## COWLING AND FRAME COVER



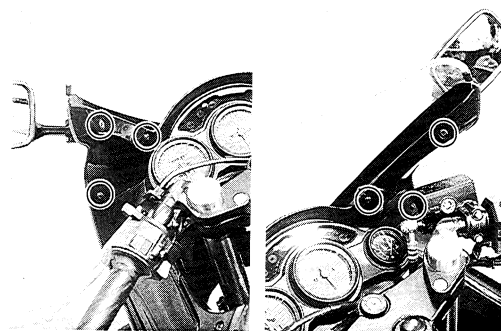
- ① Screen
- ② Cowling brace
- ③ Upper cowl
- ④ Lower cowl
- ⑤ Lower cowl of rear
- ⑥ Frame cover



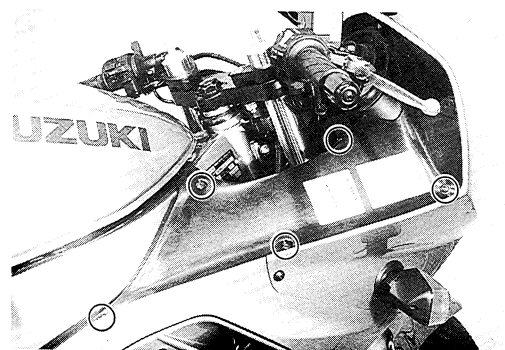
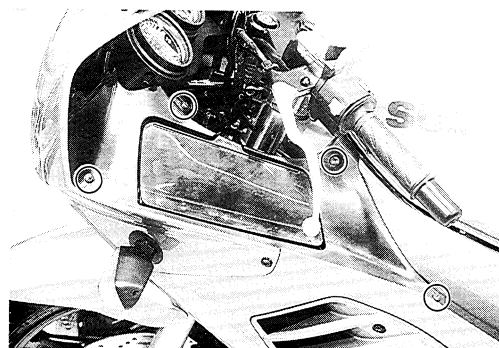
## REMOVAL

### COWLING ASSEMBLY AND COWLING BRACE

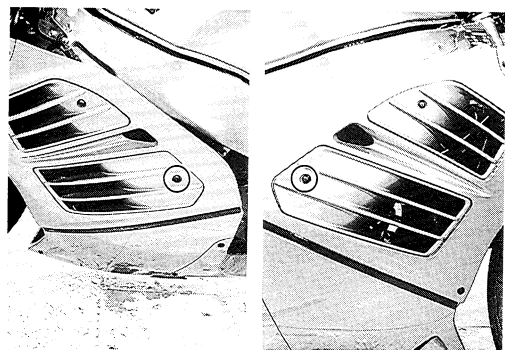
1. Remove the cowling upper panels of front by removing the screws, left and right.



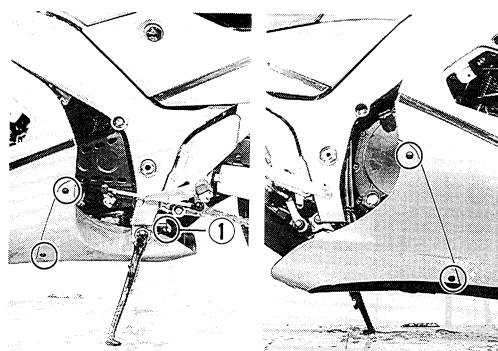
2. Remove the cowling upper panels of rear by removing the screws, left and right.



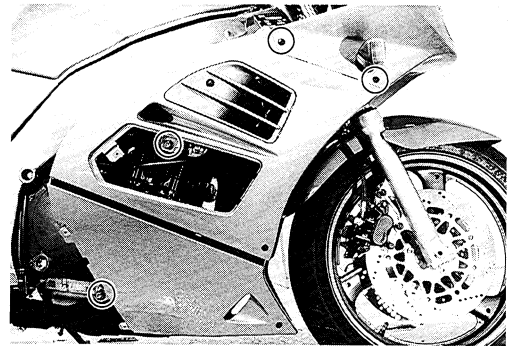
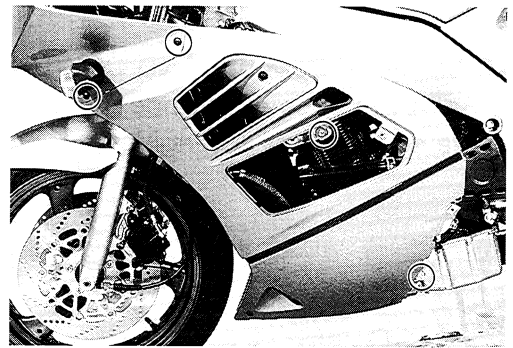
3. Remove the service lids on the lower cowling by removing the screws, left and right.



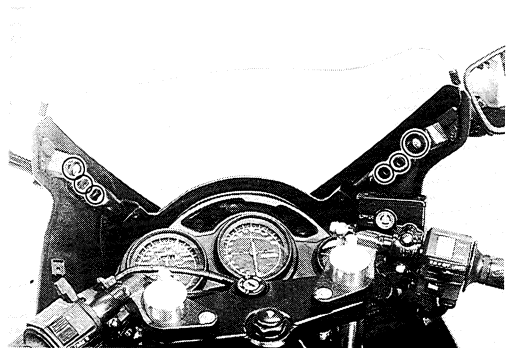
4. Remove the lower cowling of rear by removing the screws and nut ①.



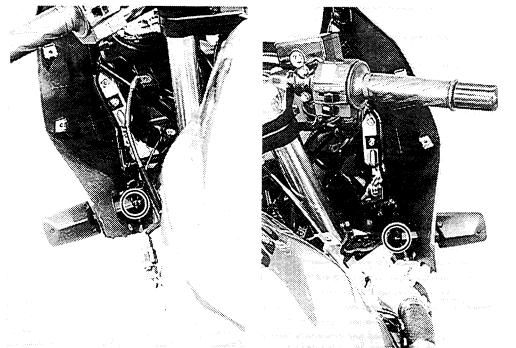
5. Remove the lower cowling assembly by removing the screws and bolts, left and right.



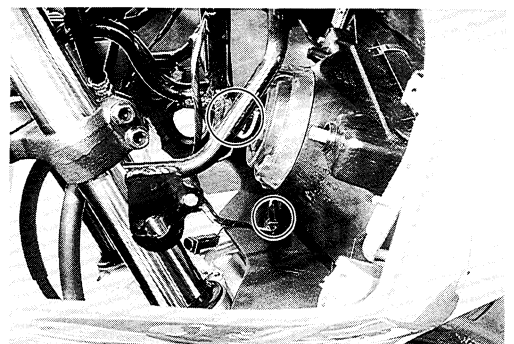
6. Remove the rear-view mirrors by removing the bolts, left and right.



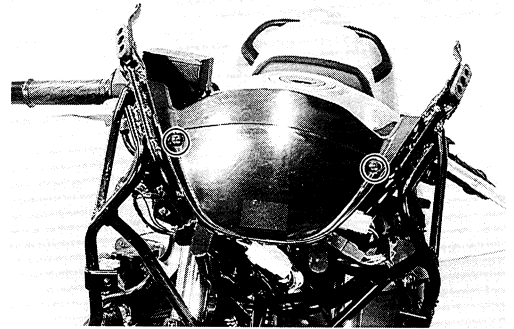
7. Remove the front turn signal lights after disconnecting the their lead wire couplers, left and right.



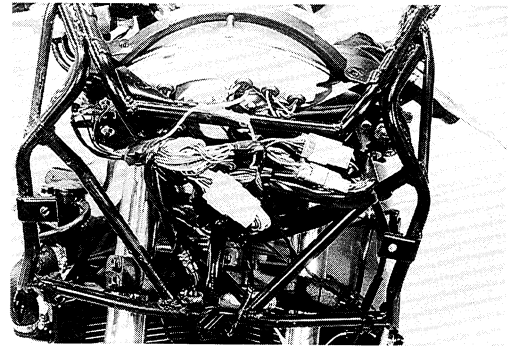
8. Disconnect the headlight and position light lead wire couplers.  
9. Remove the upper cowling along with the screen and headlight.



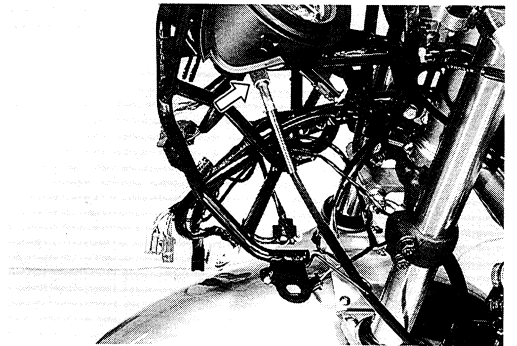
10. Remove the center panel.



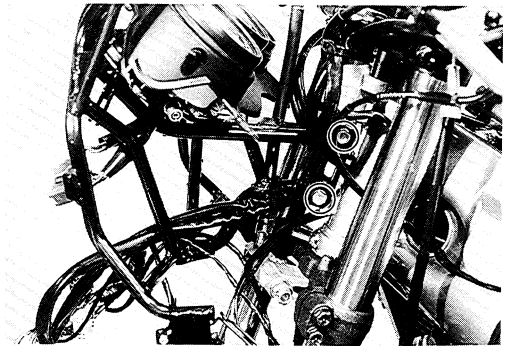
11. Disconnect the various lead wire couplers.



12. Disconnect the speedometer cable.

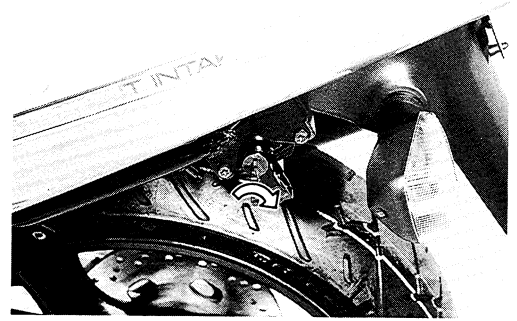


13. Remove the cowling brace along with the combination meter by removing the bolts and nut.

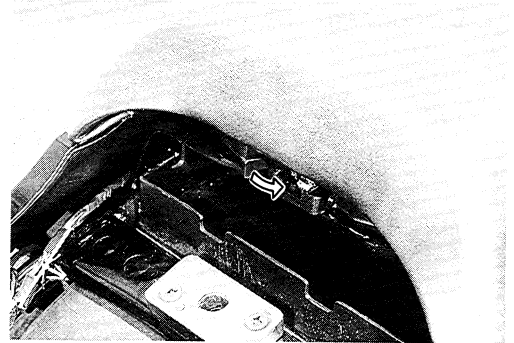


### FRAME COVER ASSEMBLY

1. Remove the front seat with the ignition key.

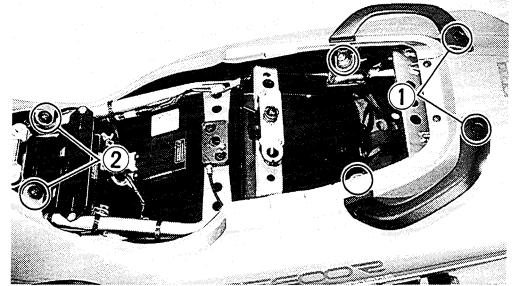


2. Remove the rear seat with the seat lock lever.

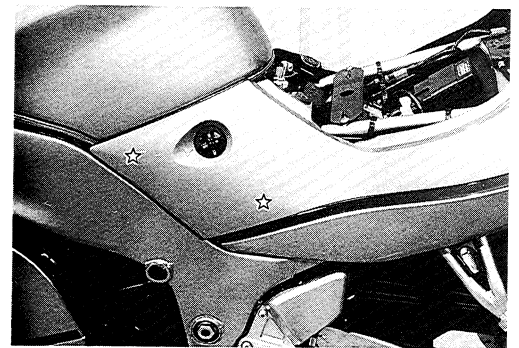


3. Remove the pillion rider grabber mounting bolts after removing the caps ① .

4. Remove the frame cover mounting screws ② .

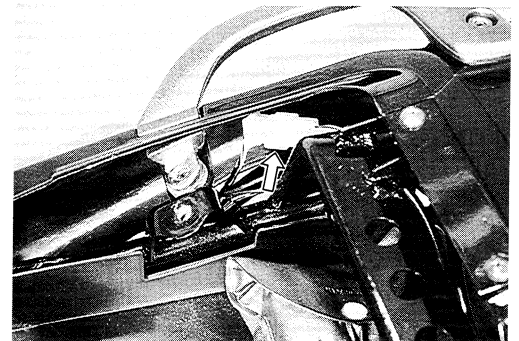


5. Extract the hooked parts of frame cover, left and right.



☆: hooked part

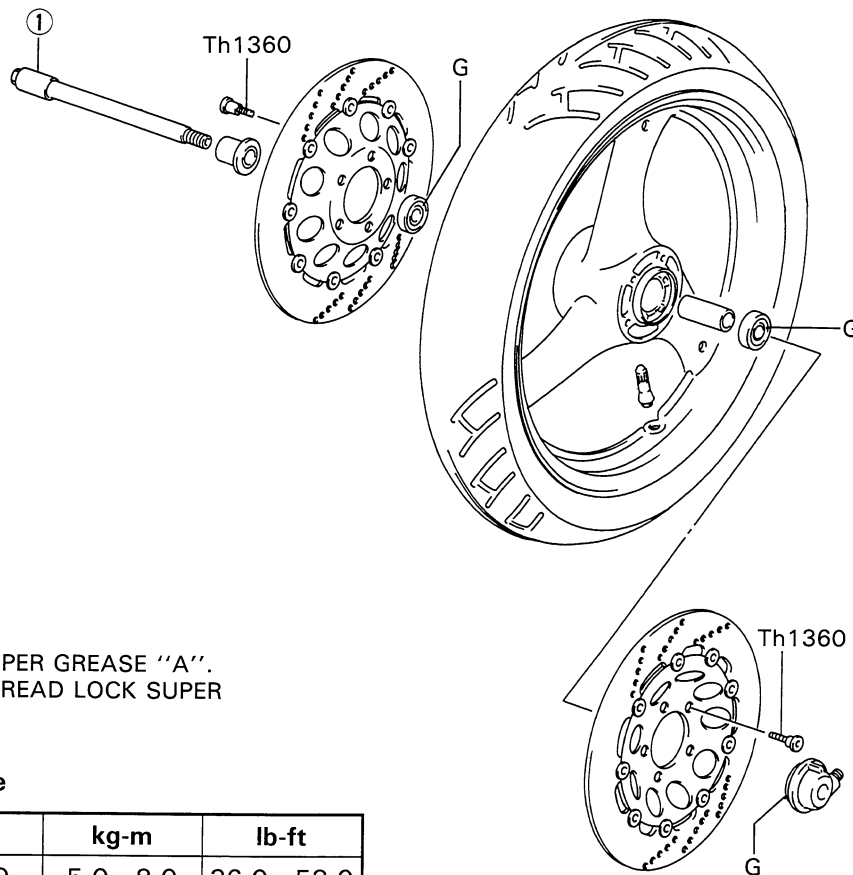
6. Remove the frame cover after disconnecting the tail/brake light lead wire coupler.



## REMOUNTING

Remount the cowl and frame cover in the reverse order of its removal. (Refer to pages 8-23, 8-24 and 8-25.)

## FRONT WHEEL

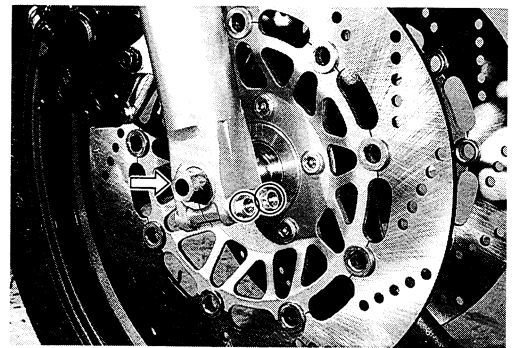


### Tightening torque

ITEM	N·m	kg-m	lb-ft
①	50—80	5.0—8.0	36.0—58.0
②	18—28	1.8—2.8	13.0—20.0

## REMOVAL

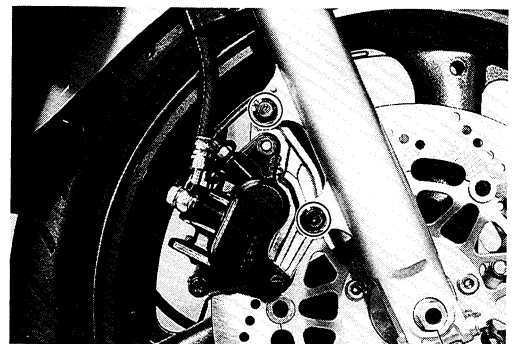
1. Remove the lower cowling. (Refer to page 7-2.)
2. Support the motorcycle with a jack or a wooden block.
3. Loosen the axle pinch bolts.
4. Loosen the axle shaft.



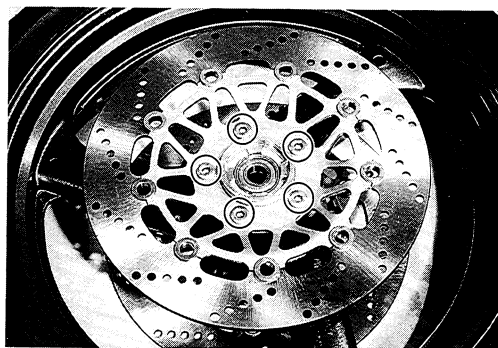
5. Remove the brake calipers, left and right.
6. Remove the axle shaft and front wheel.

### CAUTION:

- \* Do not operate the brake lever while dismounting the brake calipers.
- \* Hang the brake calipers on the motorcycle frame with a string etc., taking care not to bend the brake hose.



7. Remove the both brake discs off the front wheel by removing the mounting bolts.



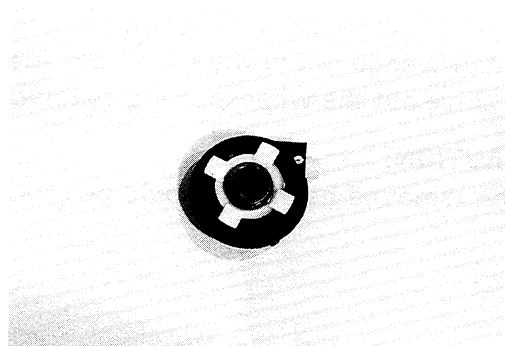
## INSPECTION AND DISASSEMBLY

### SPEEDOMETER GEARBOX DUST SEAL

Inspect the lip of dust seal for damage.

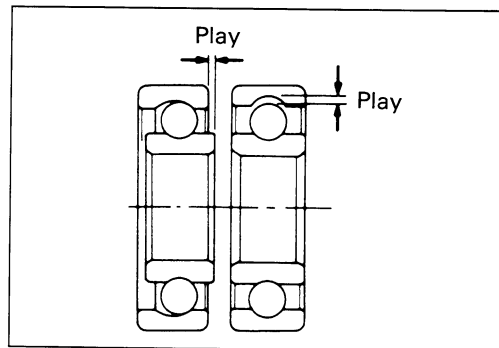
### TIRE

Refer to page 7-12.



### WHEEL BEARINGS

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



### AXLE SHAFT

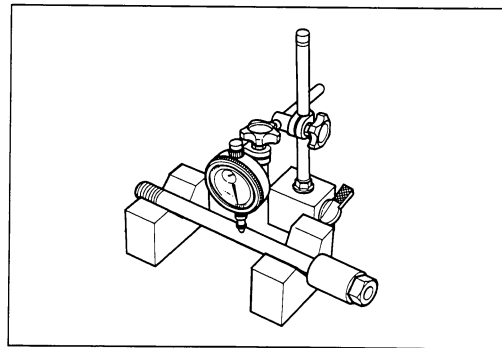
Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

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

**09900-20701: Magnetic stand**

**09900-21304: V-block set (100 mm)**

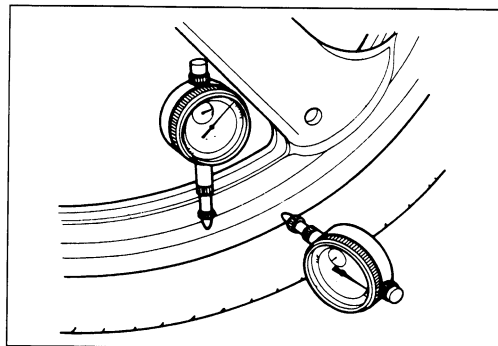
**Service Limit: 0.25 mm (0.010 in)**



### WHEEL

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

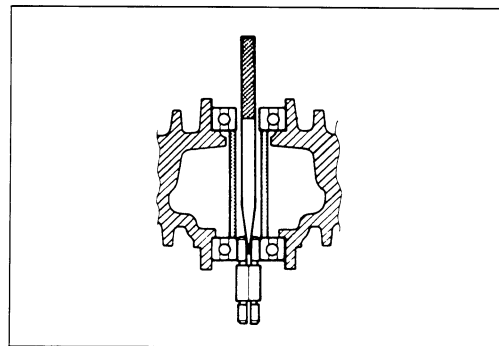
**Service Limit (Axial and Radial): 2.0 mm (0.08 in)**



- Drive out both wheel bearings by using the special tool in the following procedures.

### 09941-50111: Bearing remover

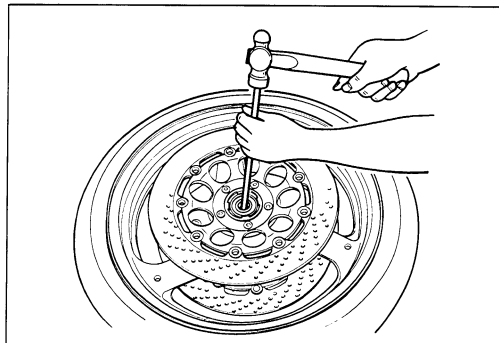
- Insert the special tool into the wheel bearing.



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

### CAUTION:

The removed bearings should be replaced with new ones.



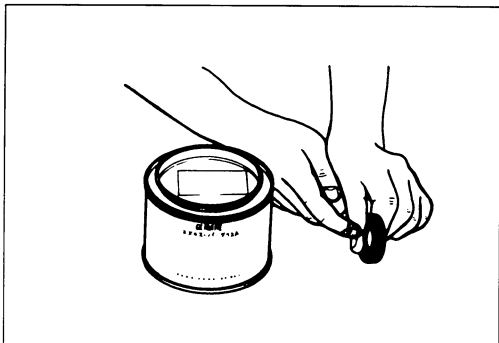
## REASSEMBLY AND REMOUNTING

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

### WHEEL BEARING

- Apply grease to the bearing before installing.

### 99000-25010: SUZUKI SUPER GREASE "A"

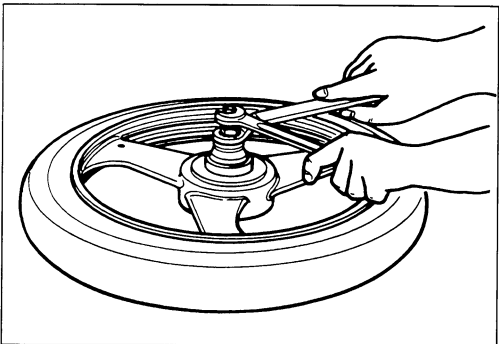


- Install the wheel bearings as follows by using the special tool.

### 09924-84510: Bearing installer set

#### NOTE:

First install the left wheel bearing, then install the right wheel bearing. The sealed cover on the bearing is positioned outside. Refer to page 7-11 for details.



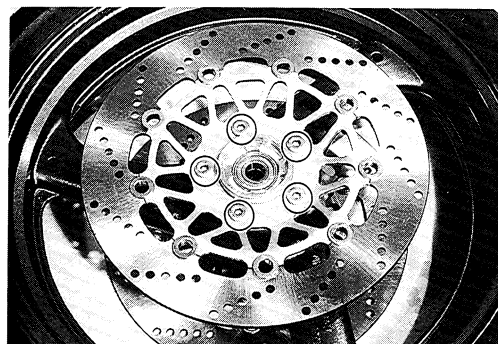
### BRAKE DISC

- Make sure that the brake disc is clean and free of any greasy matter. Apply THREAD LOCK SUPER "1360" to the disc mounting bolts and tighten them to the specified torque.

Tightening torque: 18—28 N·m

(1.8—2.8 kg-m, 13.0—20.0 lb-ft)

### 99000-32130: THREAD LOCK SUPER "1360"



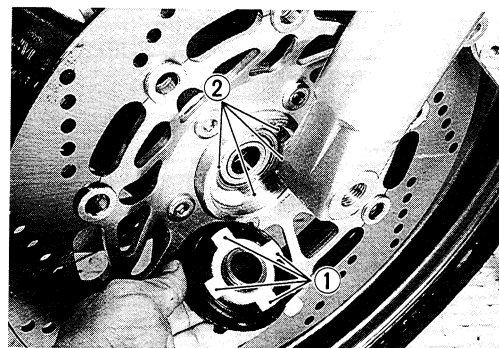


### SPEEDOMETER GEARBOX

- Before installing the speedometer gearbox, apply grease to its dust seal lip and align the drive lugs ① to the recesses ② of the wheel hub and attach the speedometer gearbox to the wheel hub.

**99000-25010: SUZUKI SUPER GREASE "A"**

- Set the stopper on the speedometer gearbox to the lug ③ on the left front fork.



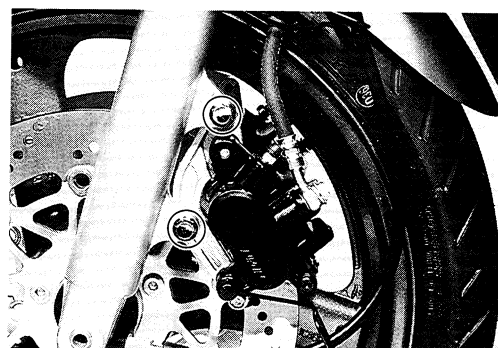
### BRAKE CALIPER

- Tighten the brake caliper mounting bolts to the specified torque.

**Tightening torque: 20–30 N·m**  
(2.0–3.0 kg-m, 14.5–21.5 lb-ft)

**NOTE:**

*Push the pistons all the way into the caliper and remount the calipers.*



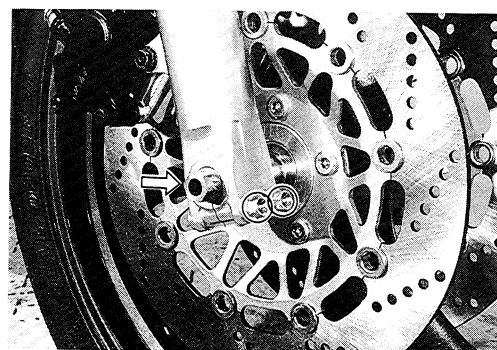
### AXLE SHAFT

- Tighten the axle shaft to the specified torque.

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

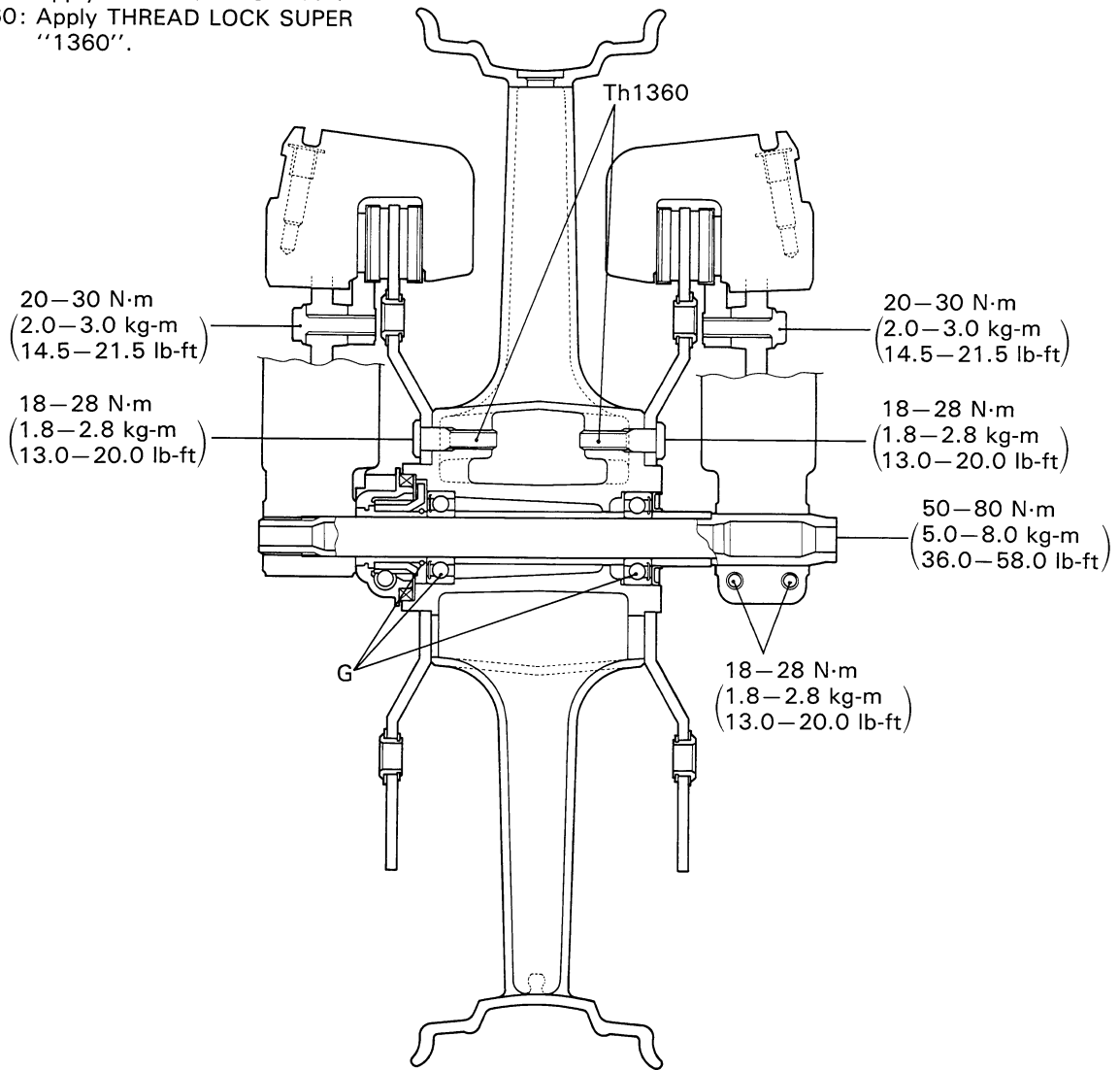
- Tighten the pinch bolt to the specified torque.

**Tightening torque: 18–28 N·m**  
(1.8–2.8 kg-m, 13.0–20.0 lb-ft)



## 7-11 CHASSIS

G : Apply SUPER GREASE "A".  
Th1360: Apply THREAD LOCK SUPER  
"1360".

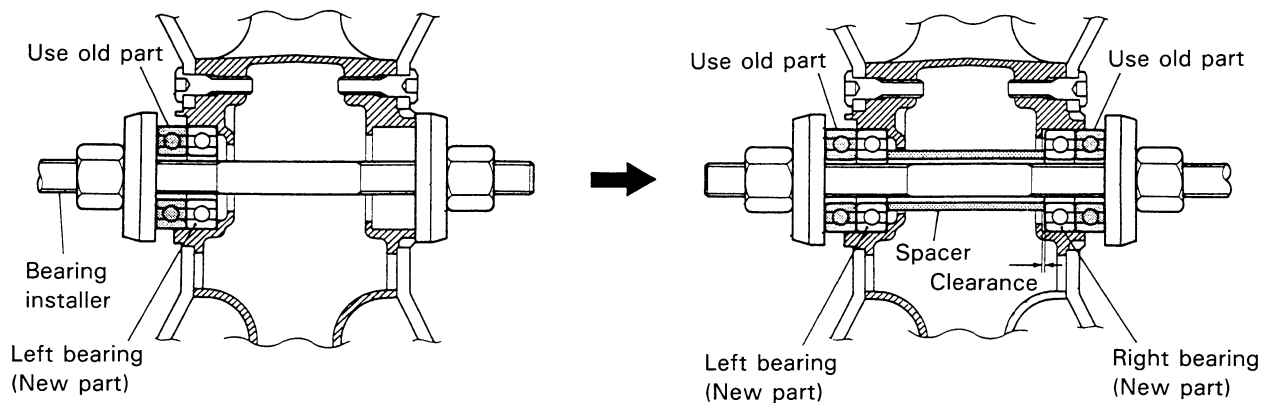


Left ←

⇒ Right

Left ←

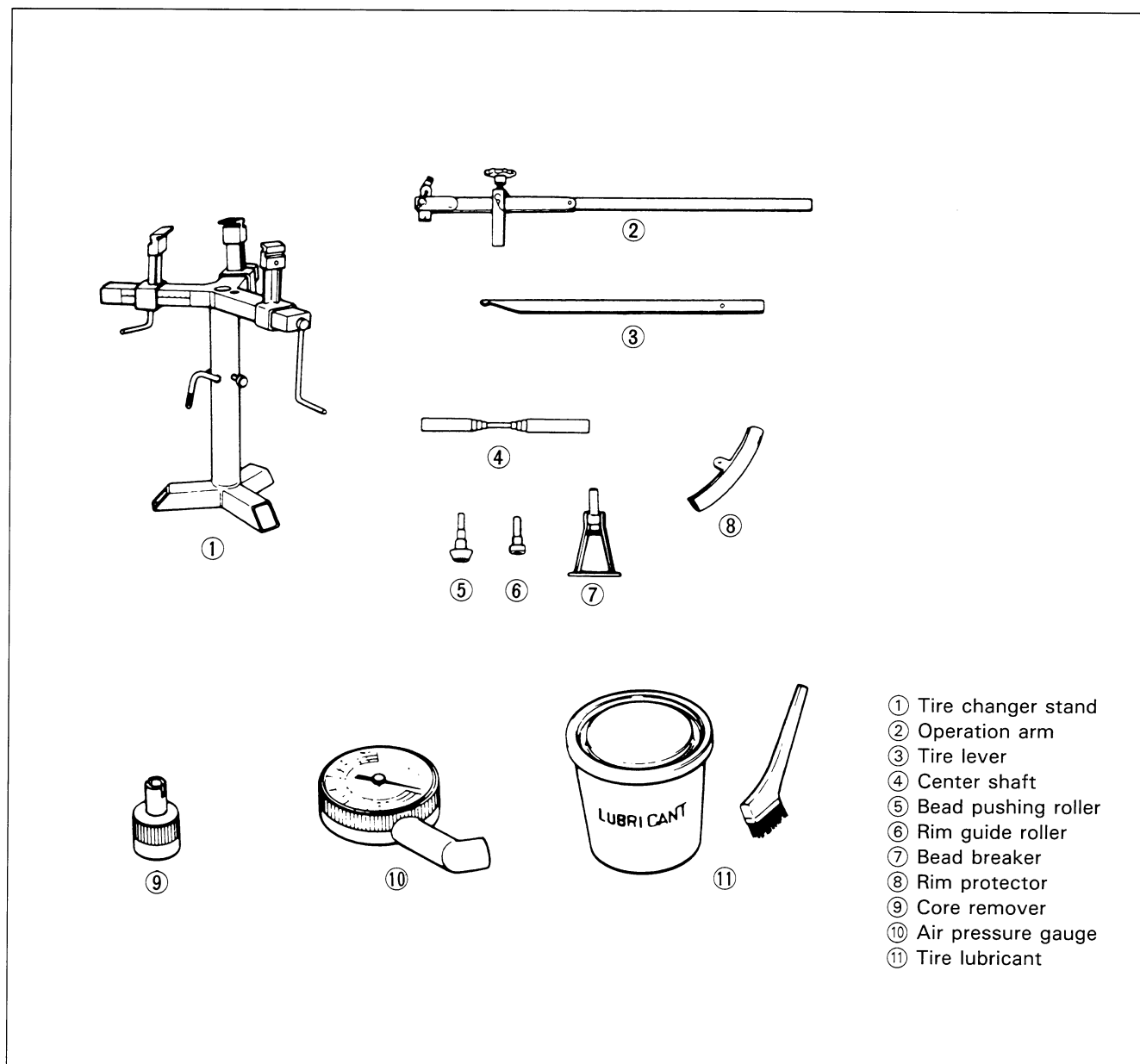
⇒ Right



## TIRE AND WHEEL

### TIRE REMOVAL

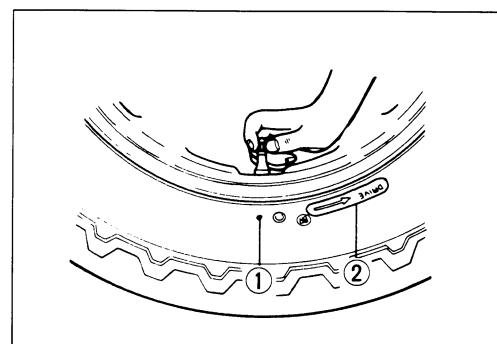
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers. For tire removal, the following tools are required.



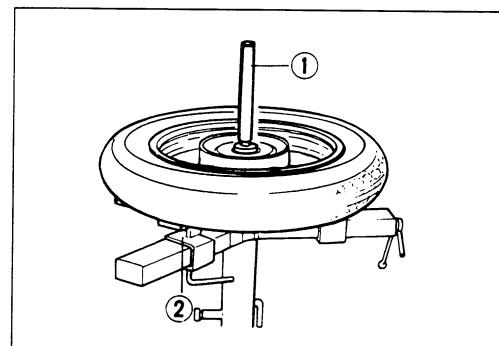
- Remove the valve core from the valve stem, and deflate the tire completely.

#### NOTE:

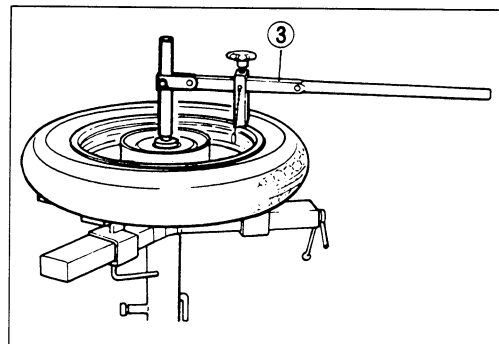
Mark the tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



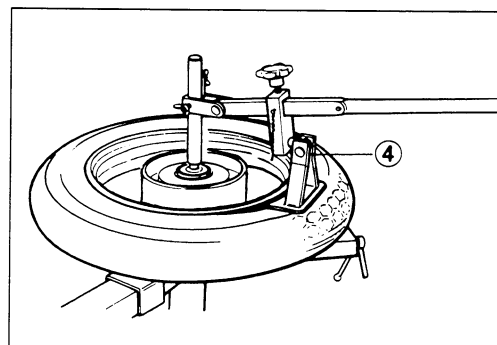
- Place the center shaft ① to the wheel, and fix the wheel with the rim holder ② .



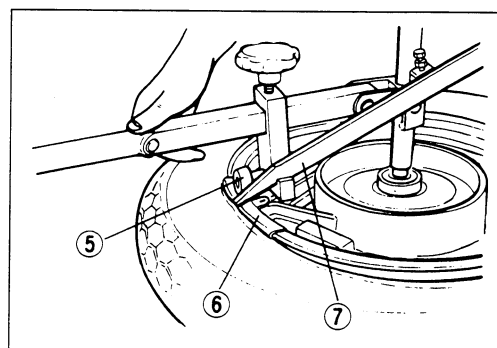
- Attach the operation arm ③ to the center shaft.



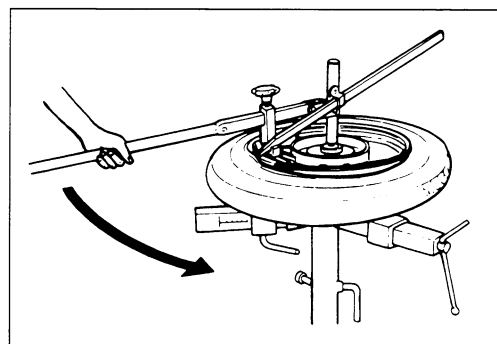
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



- Install the rim guide roller ⑤ .
- Install the rim protector ⑥ , and raise the bead with the tire lever ⑦ .



- Set the tire lever against the operation arm, and rotate the lever around the rim. Repeat this procedure to remove the other bead from the rim.

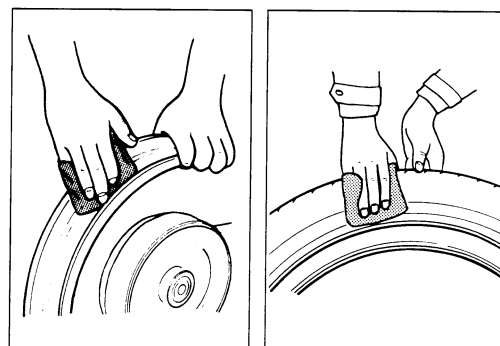


## INSPECTION

### WHEEL

Wipe off any rubber substance or rust from the wheel, and inspect the wheel rim. If any one of the following items is observed, replace it with a new wheel.

- \* A distortion or crack.
- \* Any scratches or flaws in the bead seating area.
- \* Wheel runout (Axial & Radial) of more than 2.0 mm (0.08 in).



### TIRE

Thoroughly inspect the removed tire, and if any one of the following items is observed, do not repair the tire. Replace with a new one.

- \* A puncture or a split whose total length or diameter exceeds 6.0 mm (0.24 in).
- \* A scratch or split at the side wall.
- \* Tread depth less than 1.6 mm (0.06 in) in the front tire and less than 2.0 mm (0.08 in) in the rear tire.

### 09900-20805: Tire depth gauge

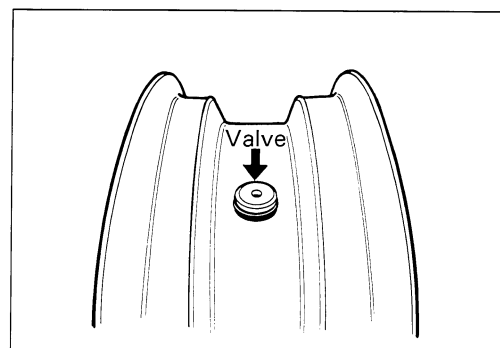
- \* Ply separation.
- \* Tread separation.
- \* Tread wear is extraordinarily deformed or distributed around the tire.
- \* Scratches at the bead.
- \* Cord is cut.
- \* Damage from skidding (flat spots).
- \* Abnormality in the inner liner.

### NOTE:

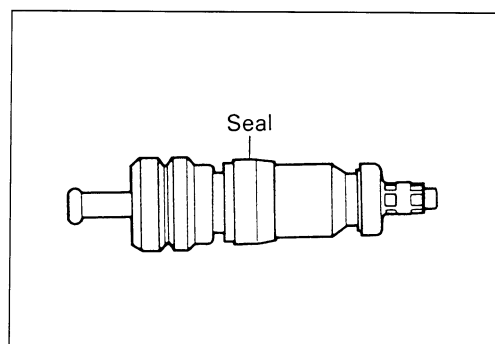
*When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.*

### VALVE INSPECTION

Inspect the valve after the tire is removed from the rim, and replace with a new valve if the seal rubber has any splits or scratches.



Inspect the removed valve core and replace with the new one if the seal is abnormally deformed or worn.

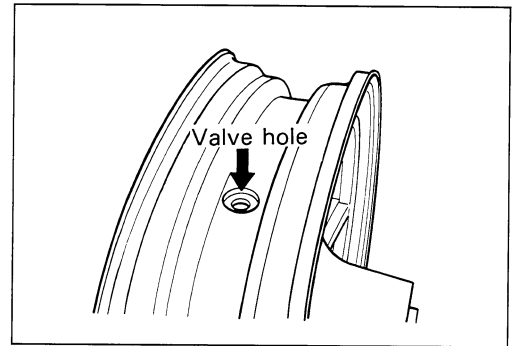


## VALVE INSTALLATION

Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

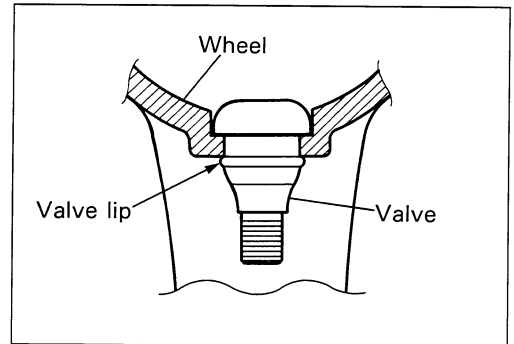
### NOTE:

*To properly install the valve into the valve hole, apply a special tire lubricant or neutral soapy liquid to the valve.*



### CAUTION:

Be careful not to damage the threads and lip of valve.

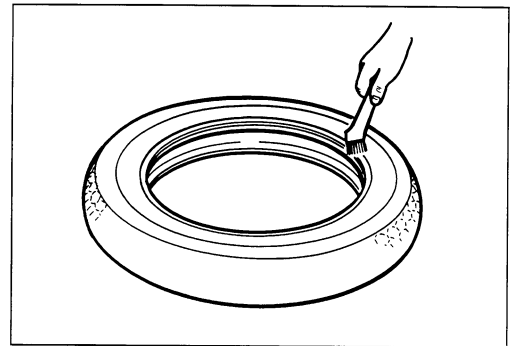


## TIRE MOUNTING

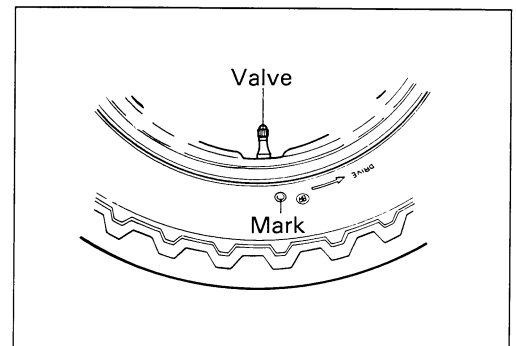
- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

### CAUTION:

Never apply grease, oil or gasoline to the tire bead.



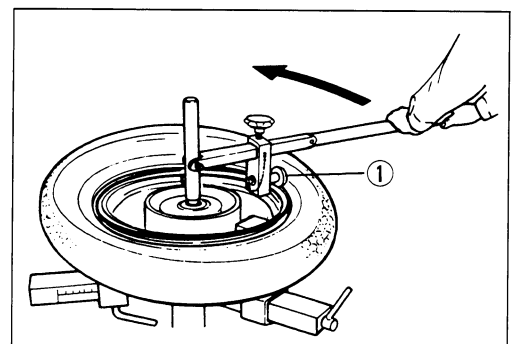
- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing mark of the tire with the valve as shown.



- Set the bead pushing roller ①.
- Rotate the operation arm around the rim to mount the bead completely. Do the bottom bead first, then the upper bead.
- Remove the wheel from the tire changer, and install the valve core in the valve stem.

### NOTE:

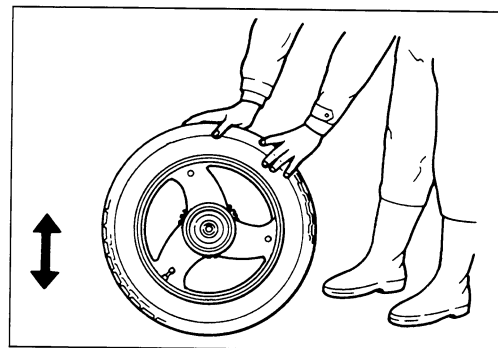
*Before installing the valve core, inspect the core.*



- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.

**NOTE:**

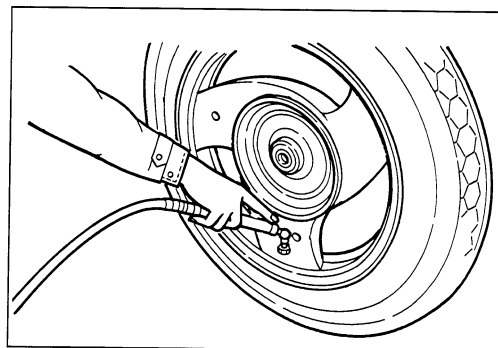
*Before inflating, confirm that the balance mark lines up with the valve stem.*



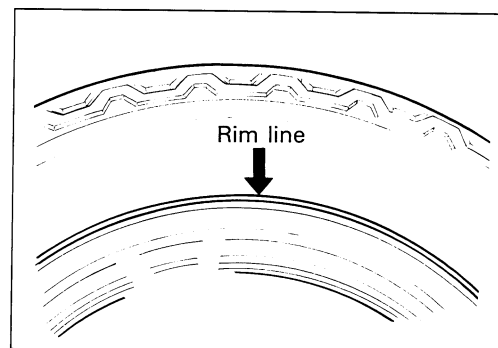
- Pump up the tire with air.

**WARNING:**

**Do not inflate the tire to more than 400 kPa (4.0 kg/cm<sup>2</sup>, 56 psi). The tire could burst with sufficient force to cause severe injury. Never stand directly over the tire while inflating it.**

**NOTE:**

*Check the “rim line” cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and wheel rim varies, this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the bead for both sides. Coat the bead with lubricant, and try again.*



- After tire is properly seated to the wheel rim, adjust the air-pressure to the recommended pressure. Correct the wheel balance if necessary.

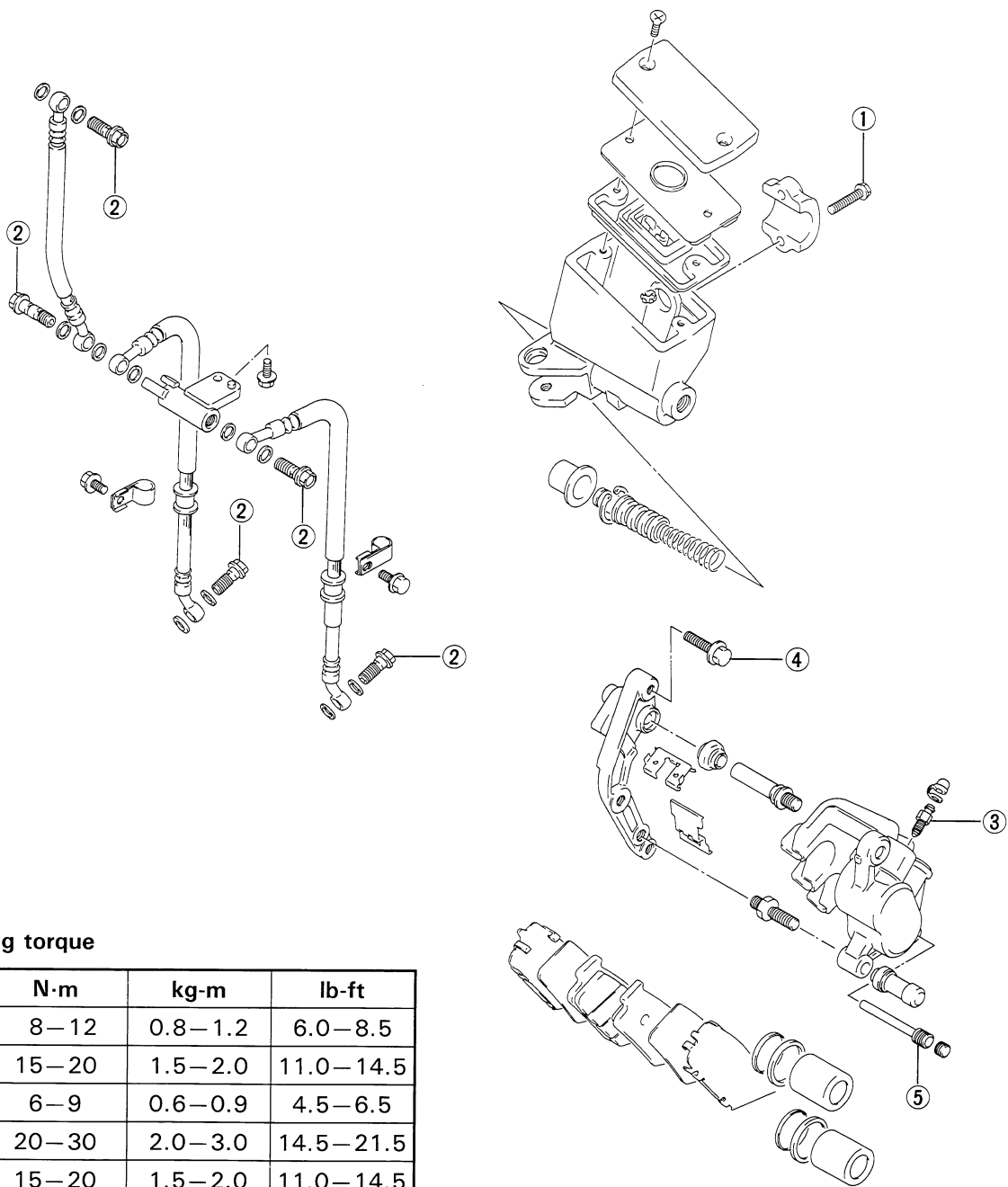
**WARNING:**

- \* Do not run a repaired tire more than 50 km/h (30 mph) within 24 hours after tire repairing, since the patch may not be completely cured.
- \* Do not exceed 130 km/h (80 mph) with a repaired tire.

**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	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	41

## FRONT BRAKE

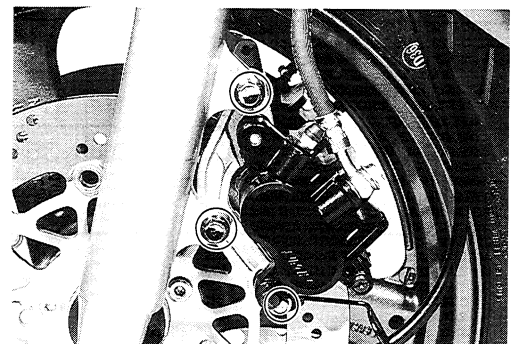


### Tightening torque

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	6—9	0.6—0.9	4.5—6.5
④	20—30	2.0—3.0	14.5—21.5
⑤	15—20	1.5—2.0	11.0—14.5

## BRAKE PAD REPLACEMENT

1. Remove the caliper by removing the mounting bolts and speedometer cable guide bolt (for left caliper).

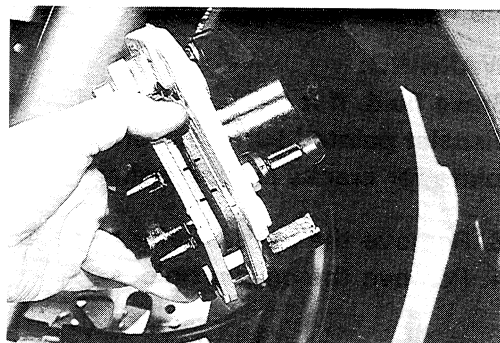
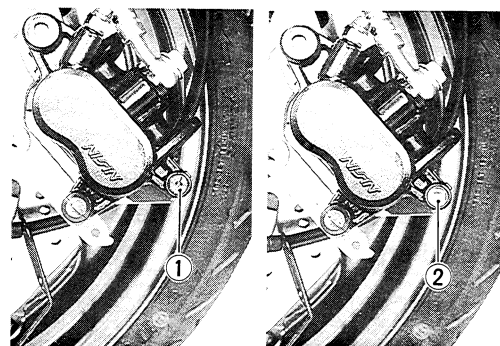




2. Remove the brake pad mounting bolt cap ① .
3. Remove the brake pads by removing the pad mounting bolt ② .

**CAUTION:**

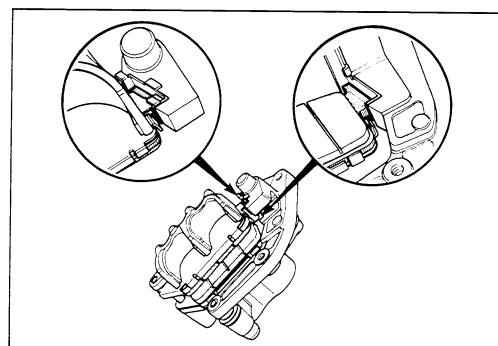
- \* Do not operate the brake lever while dismounting the pads.
- \* Replace the brake pads as a set, otherwise braking performance will be adversely affected.



4. Remount the new pads.

**WARNING:**

**Make sure that the pads are properly engaged with the guide plate as shown in the photo.**

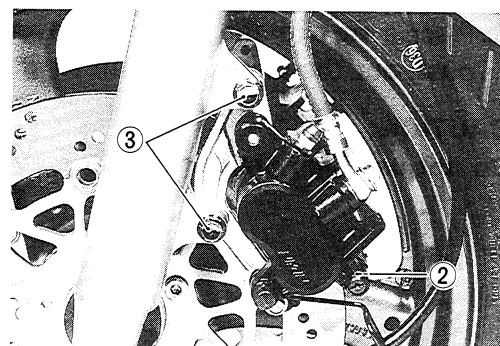


5. Tighten the pads mounting bolt ② to the specified torque.

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

6. Tighten the caliper mounting bolts ③ to the specified torque.

**Tightening torque: 20–30 N·m**  
(2.0–3.0 kg-m, 14.5–21.5 lb-ft)



## CALIPER REMOVAL AND DISASSEMBLY

1. Disconnect the brake hose from the caliper by removing the union bolt and catch the brake fluid in a suitable receptacle.
2. Remove the brake caliper by removing the caliper mounting bolts and speedometer cable guide bolt (for left caliper).

### CAUTION:

Never reuse the brake fluid left over from previous servicing and stored for long periods.

### WARNING:

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

3. Remove the pads. (Refer to page 7-18.)
4. Remove the caliper holder ① .

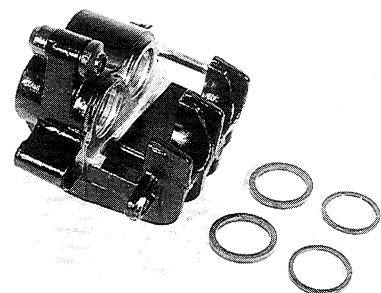
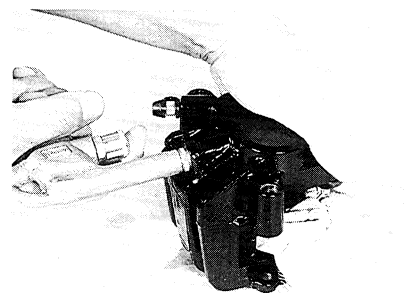
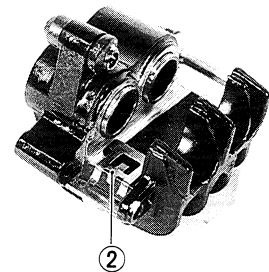
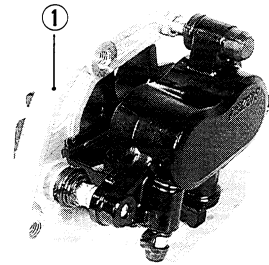
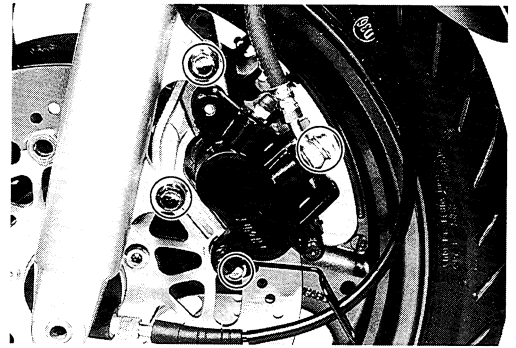
5. Remove the spring ② .

6. Place a rag over the piston to prevent its popping out and push out the piston with an air gun.

### CAUTION:

Do not use high pressure air to prevent piston damage.

7. Remove the dust seals and piston seals.



## CALIPER INSPECTION

### CALIPER

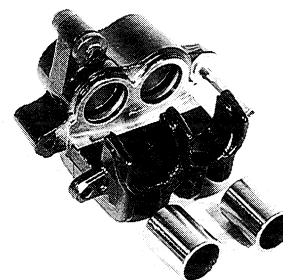
Inspect the caliper cylinder wall for nicks, scratches or other damage.

### PISTON

Inspect the piston surface for any scratches or other damage.

### RUBBER PARTS

The removed rubber parts should be replaced with new ones.



## CALIPER REASSEMBLY AND REMOUNTING

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

### 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.

### 99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4

### CALIPER BOLTS

- Tighten each bolt to the specified torque.

#### Tightening torque

#### Front brake caliper

mounting bolt ①: 20–30 N·m  
(2.0–3.0 kg-m, 14.5–21.5 lb-ft)

Pads mounting  
bolt ② : 15–20 N·m  
(1.5–2.0 kg-m, 11.0–14.5 lb-ft)

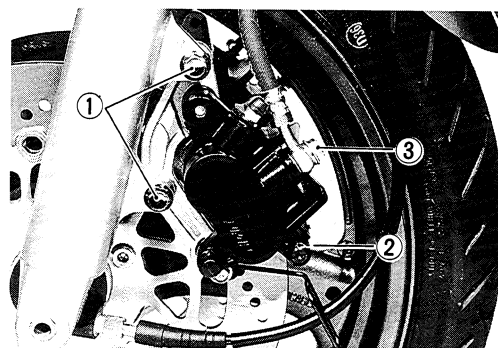
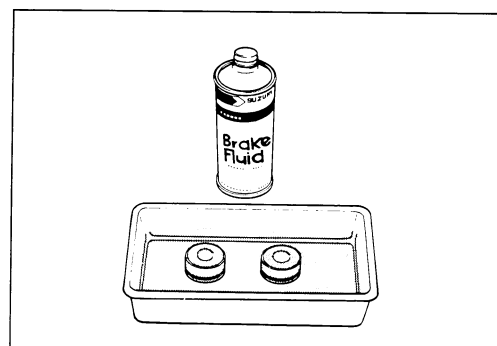
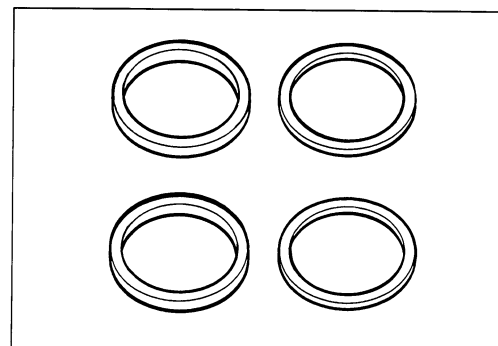
Brake hose  
union bolt ③ : 15–20 N·m  
(1.5–2.0 kg-m, 11.0–14.5 lb-ft)

### CAUTION:

Bleed air from the system after reassembling the caliper.  
(Refer to page 2-16.)

### NOTE:

Before remounting the caliper, push the piston all the way into the caliper.



## DISC SERVICING

- Remove the front and rear wheels. (Refer to pages 7-7 and 7-41.)
- Remove the disc. (Refer to pages 7-8 and 7-43.)
- Install the disc. (Refer to pages 7-9 and 7-45.)

## DISC INSPECTION

Using a micrometer, check the disc for wear, its thickness can be checked with disc and wheel in place. The service limits for the thickness of the discs are shown below.

**09900-20205: Micrometer (0—25 mm)**

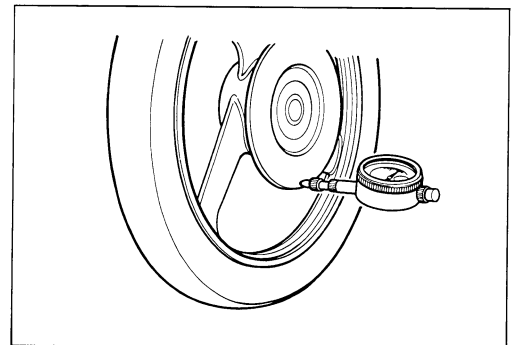
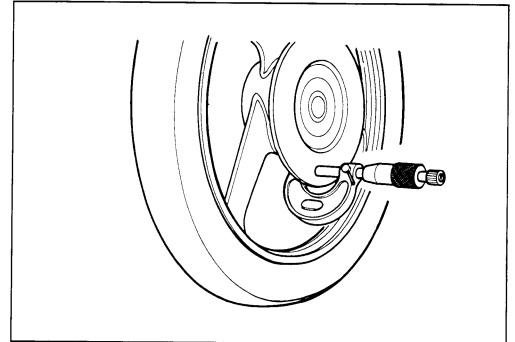
**Service Limit (Front): 4.0 mm (0.16 in)**  
**(Rear) : 4.5 mm (0.18 in)**

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

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

**09900-20701: Magnetic stand**

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

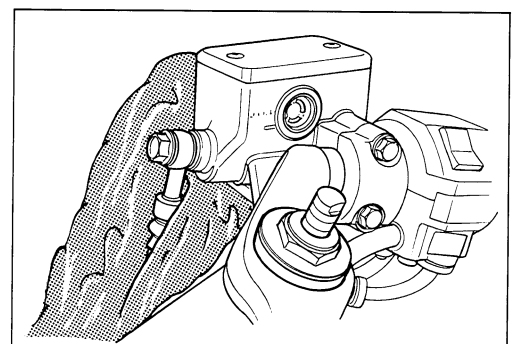
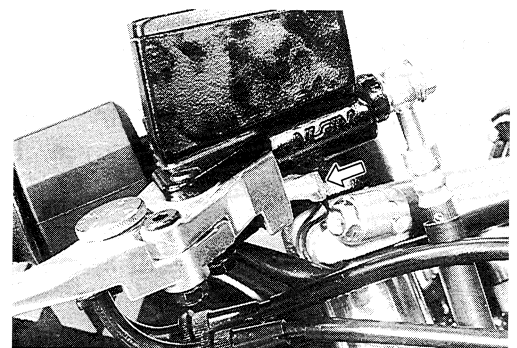


## MASTER CYLINDER REMOVAL AND DISASSEMBLY

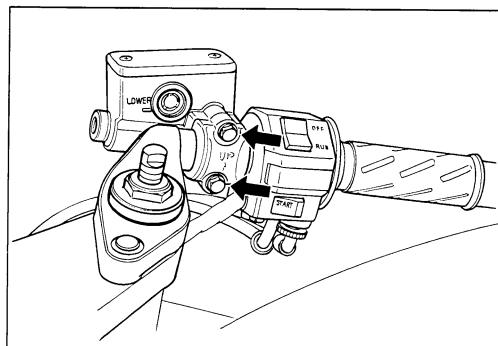
1. Disconnect the front brake light switch lead wires.
2. Place a rag underneath the union bolt on the master cylinder to catch any spilled drops of brake fluid. Remove the union bolt and disconnect the brake hose/master cylinder joint.

### CAUTION:

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



3. Remove the master cylinder assembly.

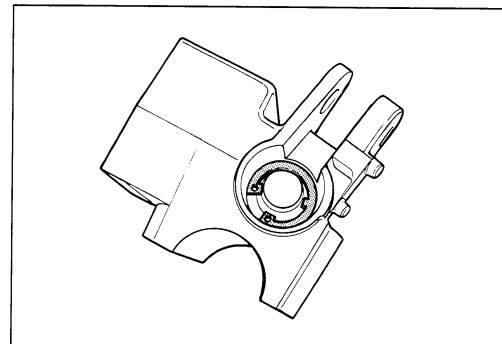


4. Remove the front brake lever, reservoir cap and diaphragm.

5. Drain brake fluid.

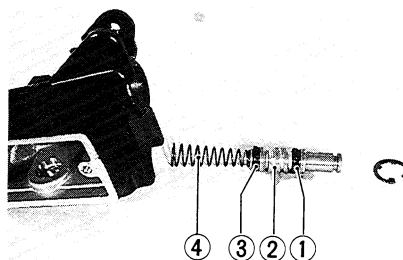
6. Remove the dust seal, then remove the circlip by using the special tool.

**09900-06108: Snap ring pliers**



7. Remove the piston/secondary cup, primary cup and spring.

- ① Secondary cup
- ② Piston
- ③ Primary cup
- ④ Return spring

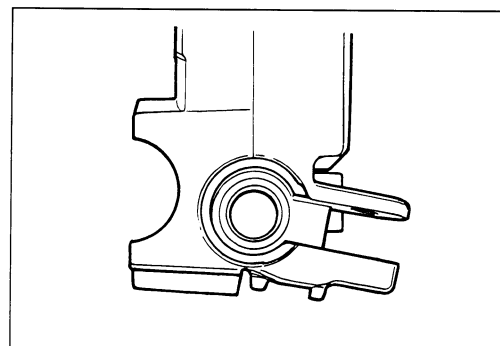


## MASTER CYLINDER INSPECTION

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

Inspect the piston surface for any scratches or other damage.

Inspect the primary cup, secondary cup and dust seal for wear or damage.



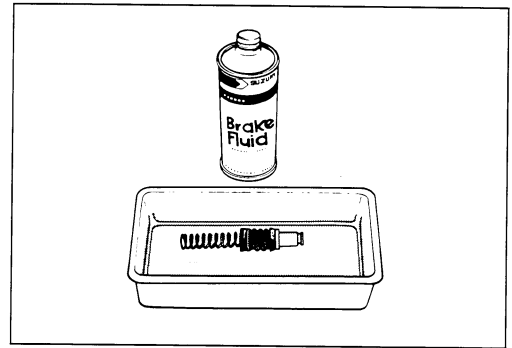
## MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

### CAUTION:

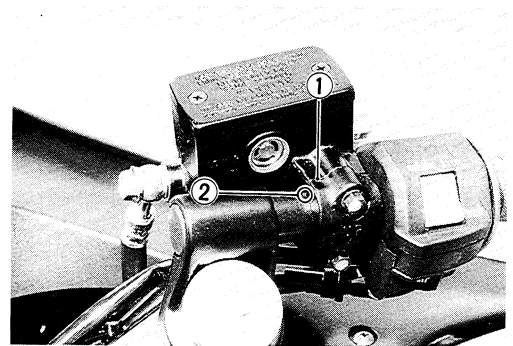
- \* Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- \* Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.

99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4



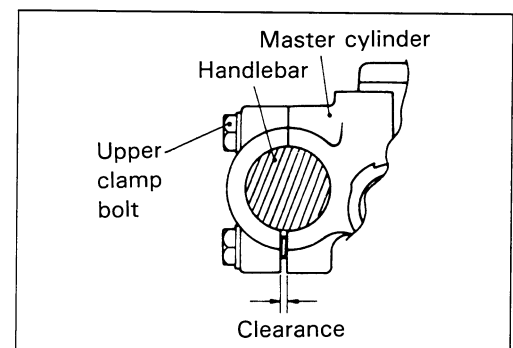
- When remounting the master cylinder on the handlebar, align the master cylinder holder's mating surface ① with punched mark ② on the handlebar and tighten the upper clamp bolt first as shown.

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



### CAUTION:

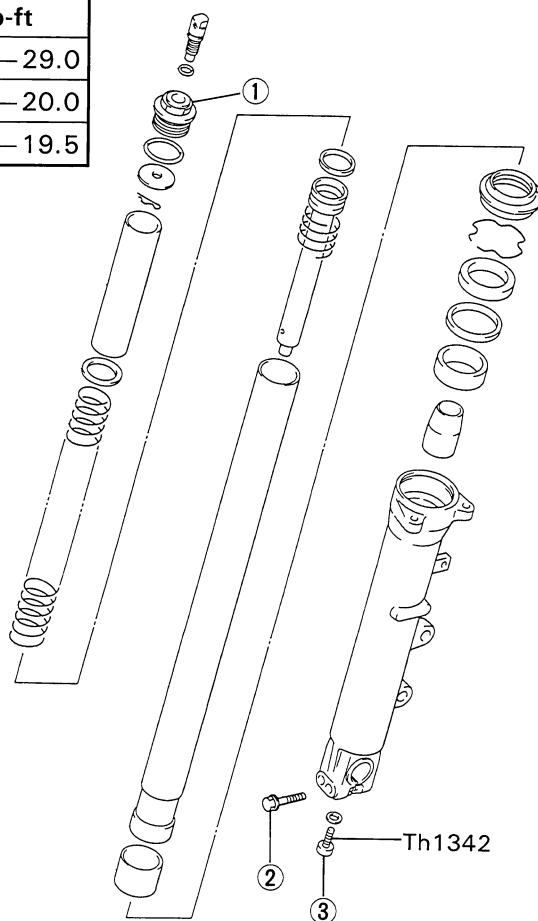
Bleed air from the system after reassembling master cylinder.  
(Refer to page 2-16.)



## FRONT FORK

### Tightening torque

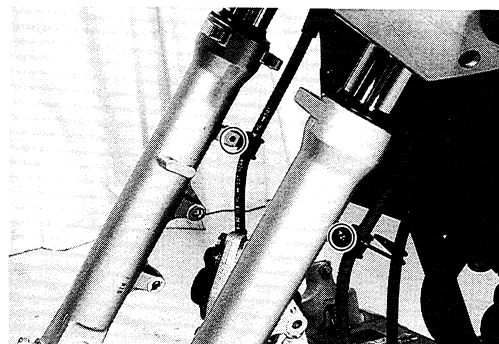
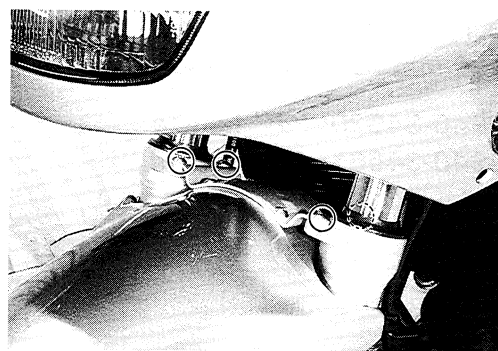
ITEM	N·m	kg-m	lb-ft
①	30—40	3.0—4.0	21.5—29.0
②	18—28	1.8—2.8	13.0—20.0
③	18—27	1.8—2.7	13.0—19.5



Th1342: Apply THREAD LOCK "1342".

## REMOVAL AND DISASSEMBLY

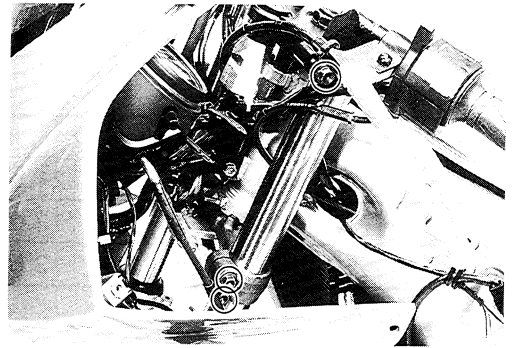
1. Remove the cowling. (Refer to page 7-2.)
2. Remove the front wheel. (Refer to page 7-7.)
3. Remove the front fender brace with front fender by removing the fender brace mounting bolts.
4. Remove the brake hose clamps from the front fork.



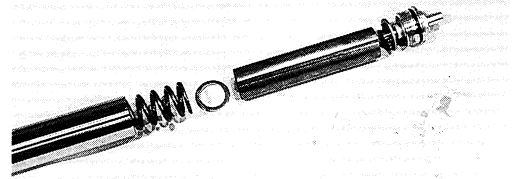
6. Remove the front fork after loosening the front fork upper and lower clamp bolts.

**NOTE:**

*Slightly loosen the front fork cap bolt to facilitate later disassembly before loosening the front fork lower clamp bolts.*

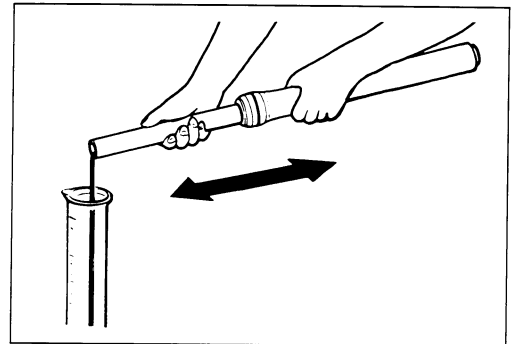


7. Remove the fork cap bolt, spacer, washer and spring.



8. Invert the fork and stroke it several times to let out fork oil.

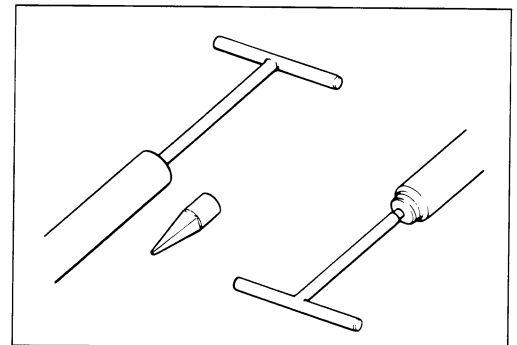
Under the inverted condition of front fork, drain oil to hold it for few minutes.



9. Remove the damper rod bolt with the special tools and 6-mm hexagon wrench.

**09940-34520: "T" handle**

**09940-34561: Attachment "D"**

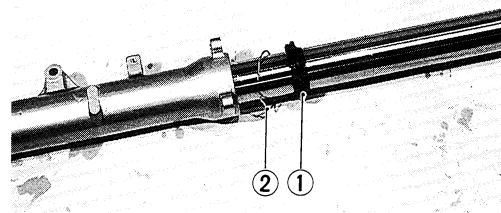


10. Remove the damper rod with spring.





11. Remove the dust seal ① and stopper ring ②.



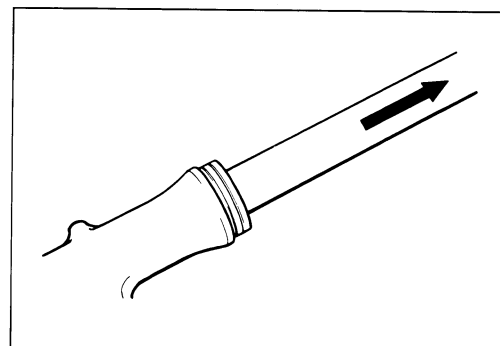
12. Remove the oil seal by slowly pulling out the inner tube.

**NOTE:**

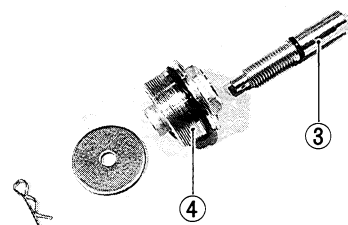
*Be careful not to damage the inside of the tube.*

**CAUTION:**

The outer tube and inner tube "ANTI-FRICTION" metals must be replaced along with oil seal and dust seal, when assembling the front fork.



13. Remove the spring adjuster ③ from the fork cap ④ by removing the clip.

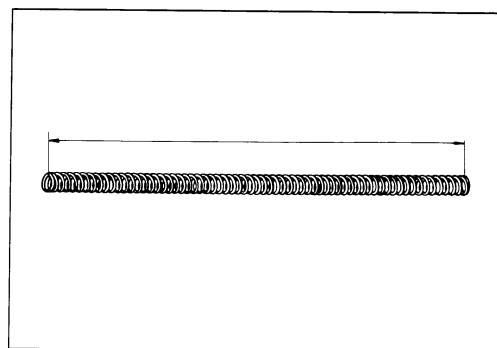


## INSPECTION

### FORK SPRING

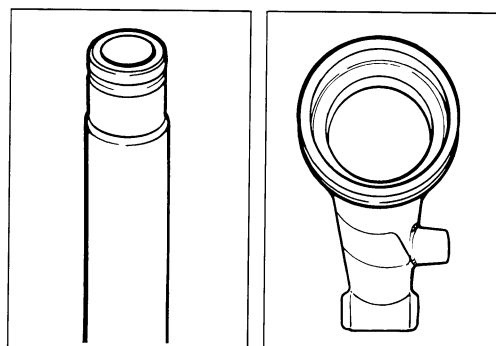
Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

**Service Limit: 390 mm (15.4 in)**



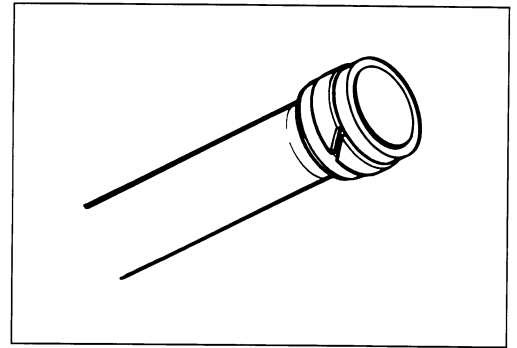
### INNER AND OUTER TUBE

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



**DAMPER ROD RING**

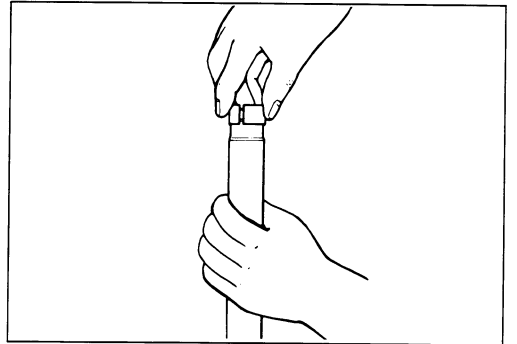
Inspect the damper rod ring for wear or damage.

**REASSEMBLY AND REMOUNTING**

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

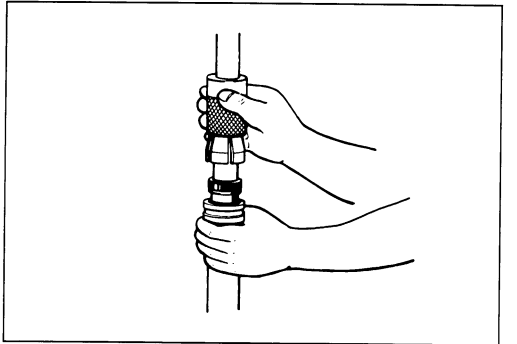
**TUBE METALS AND SEALS**

- Hold the inner tube vertically and clean the metal groove and install the ANTI-FRICTION metal by hand as shown.
- Install the outer tube metal ①, washer ② and oil seal ③ with the special tool.

**09940-50113: Front fork oil seal installer****CAUTION:**

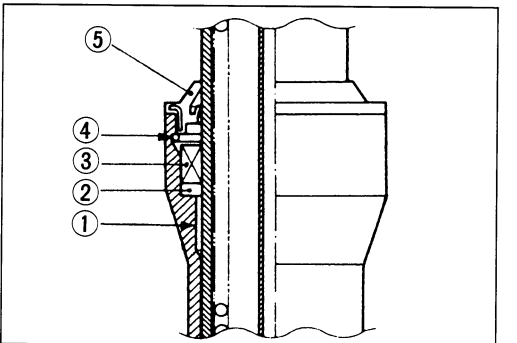
Use special care to prevent damage to the "Teflon" coated surface of the Anti-friction inner tube metal when mounting it.

- Install the oil seal stopper ring ④.

**CAUTION:**

Make sure that the oil seal stopper ring fitted securely.

- Install the dust seal ⑤.

**DAMPER ROD BOLT**

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

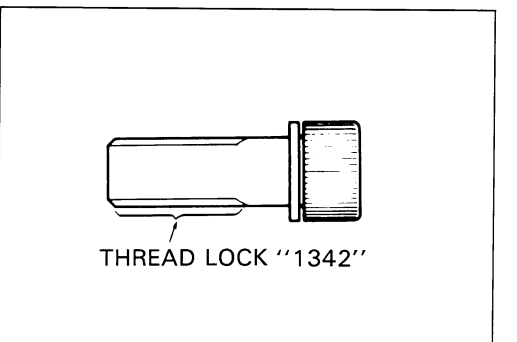
**99000-32050: THREAD LOCK "1342"**

Tightening torque: 18–27 N·m

(1.8–2.7 kg-m, 13.0–19.5 lb-ft)

09940-34520: "T" handle

09940-34561: Attachment "D"



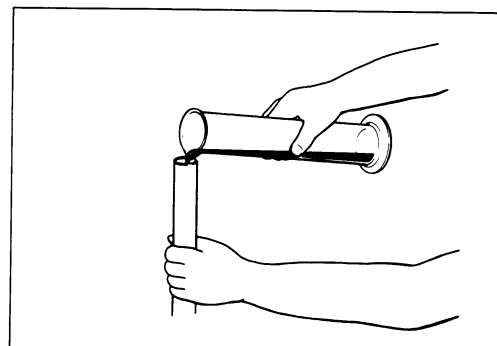
**FORK OIL**

- Pour specified fork oil into the inner tube.

**Fork oil type:** Fork oil #10

**99000-99044-10G: SUZUKI FORK OIL #10**

**Capacity (each leg):** 503 ml (17.0/17.7 US/lmp oz)



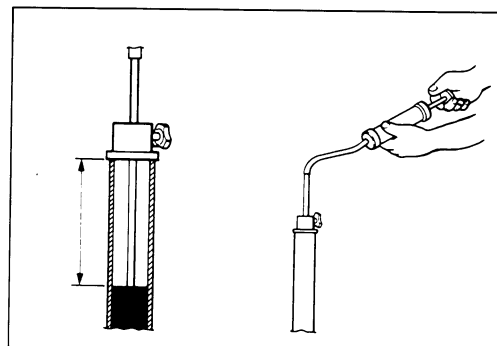
- Hold the front fork vertical and adjust the fork oil level with the special tool.

**09943-74111: Fork oil level gauge**

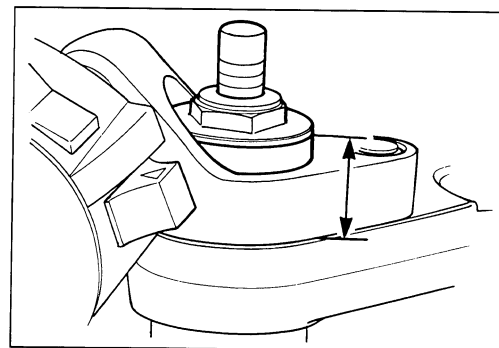
**Oil level:** 92 mm (3.6 in)

**NOTE:**

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

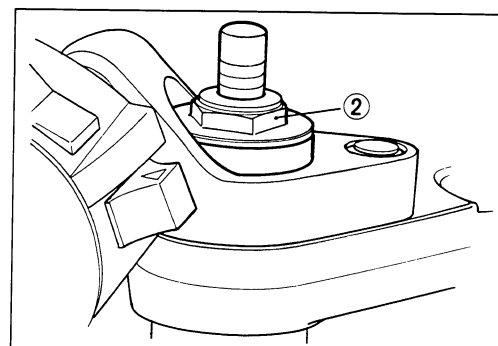
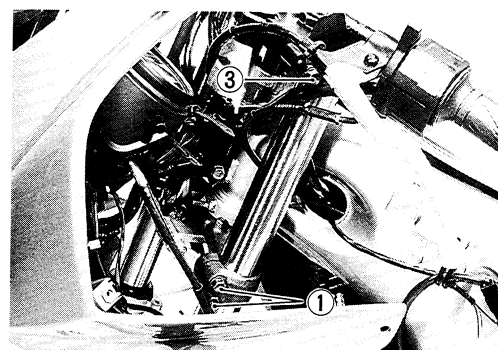


- When remounting the front fork assembly, set the upper surface of the inner tube at 22 mm (0.87 in) height from the upper surface of the steering stem upper bracket.



- Tighten the bolts to the specified torque.

Item	N·m	kg-m	lb-ft
① Fork lower clamp bolt	18–28	1.8–2.8	13.0–20.0
② Fork cap	30–40	3.0–4.0	21.5–29.0
③ Fork upper clamp bolt	18–28	1.8–2.8	13.0–20.0

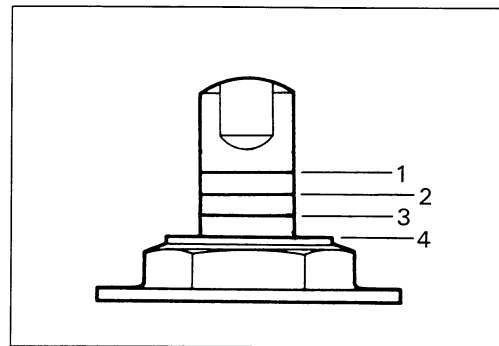


## SUSPENSION SETTING

After installing the front fork, adjust the spring pre-load as follows.

### SPRING PRE-LOAD ADJUSTMENT

There are four grooved lines on the side of the spring adjuster. Position 1 provides the maximum spring pre-load and position 4 provides the minimum spring pre-load.



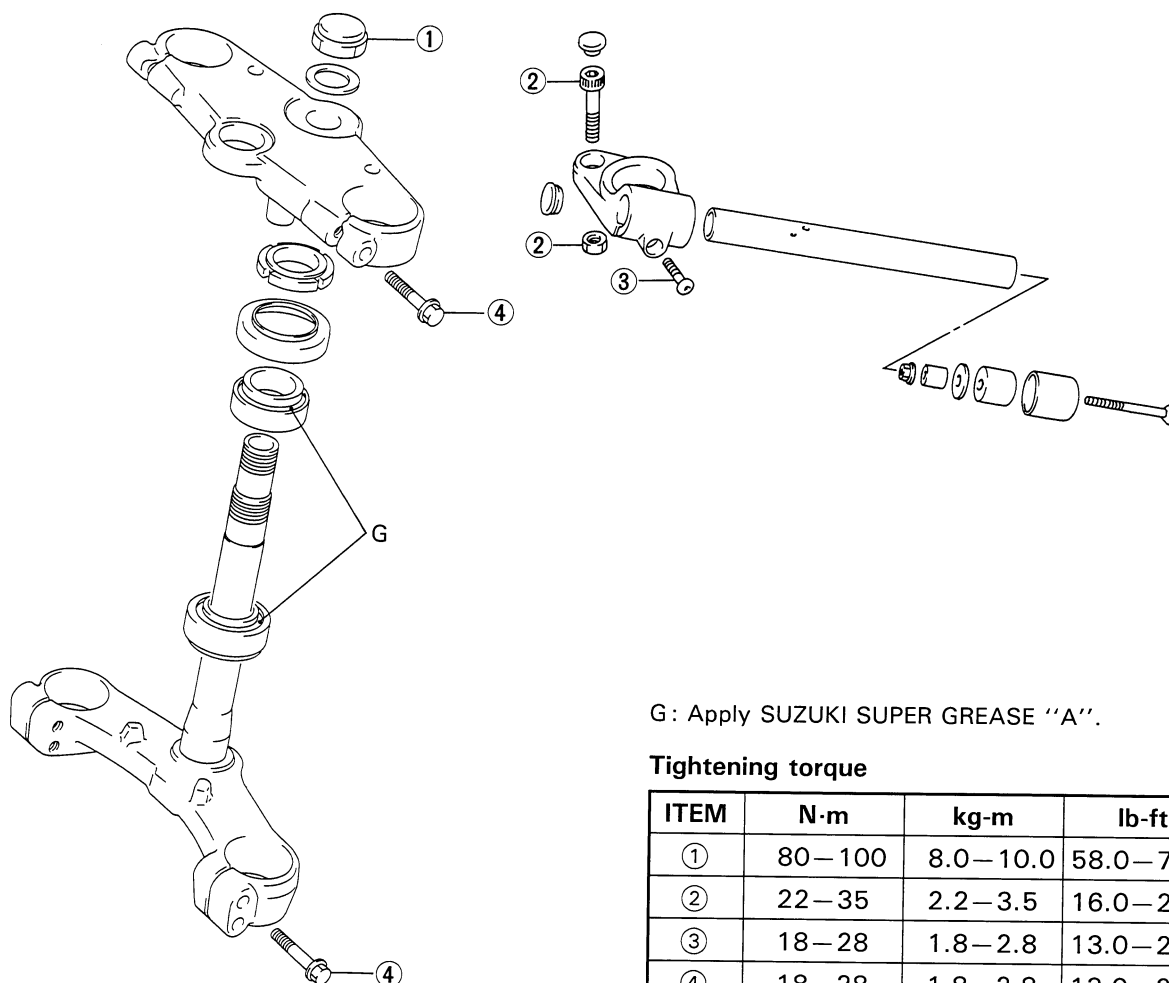
## FRONT SUSPENSION SETTING (STD)

Item	Spring pre-load
Solo riding	3
Dual riding	3

### WARNING:

Be sure to adjust the spring pre-load on both front fork legs equally.

## STEERING



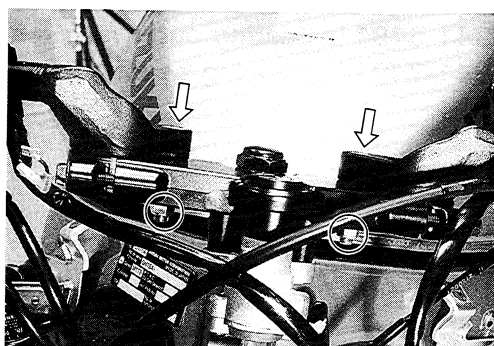
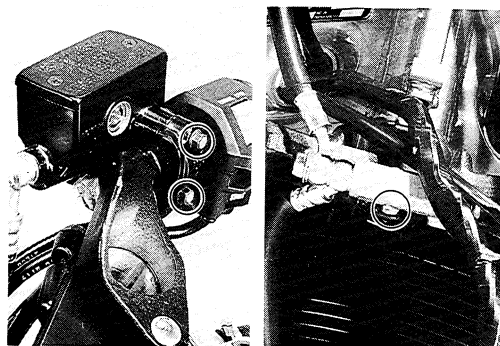
G: Apply SUZUKI SUPER GREASE "A".

### Tightening torque

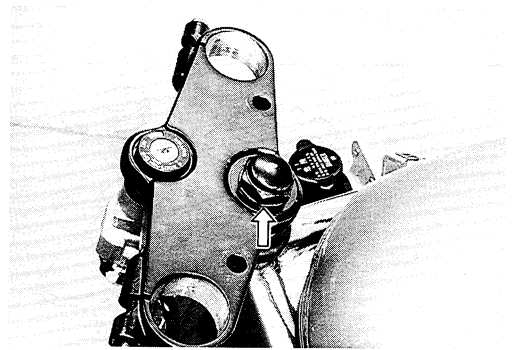
ITEM	N·m	kg-m	lb-ft
①	80—100	8.0—10.0	58.0—72.5
②	22—35	2.2—3.5	16.0—25.5
③	18—28	1.8—2.8	13.0—20.0
④	18—28	1.8—2.8	13.0—20.0

## REMOVAL AND DISASSEMBLY

1. Remove the cowling and cowling brace. (Refer to page 7-2.)
2. Remove the front wheel. (Refer to page 7-7.)
3. Remove the front fork. (Refer to page 7-24.)
4. Remove the front brake master cylinder along with brake hose joint and brake calipers.
5. Remove the handlebar mounting nuts and bolts after removing the bolt caps.



6. Disconnect the ignition switch lead wire coupler.
7. Remove the steering stem upper bracket by removing the nut.



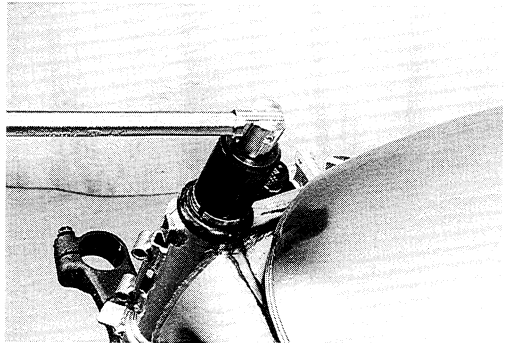
8. Remove the steering stem nut with the special tool.

**09940-14911: Steering stem nut wrench**

9. Draw out the steering stem lower bracket.

**NOTE:**

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

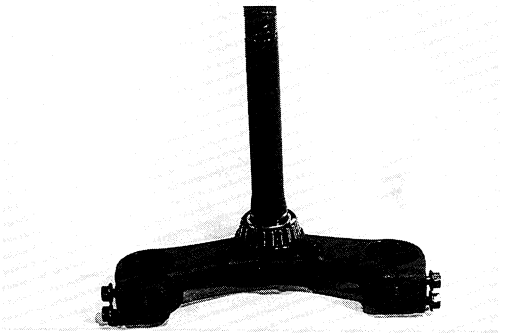


10. Remove the steering stem upper bearing.

## INSPECTION

Inspect the removed parts for the following abnormalities.

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



## DISASSEMBLY

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

**09941-84510: Bearing remover**

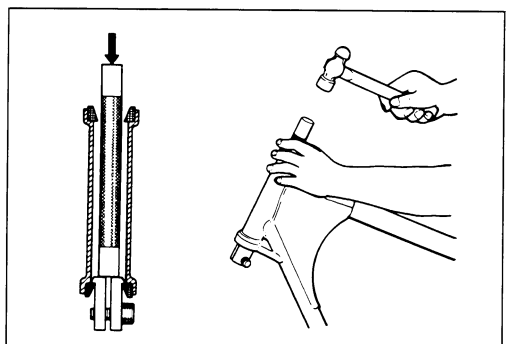
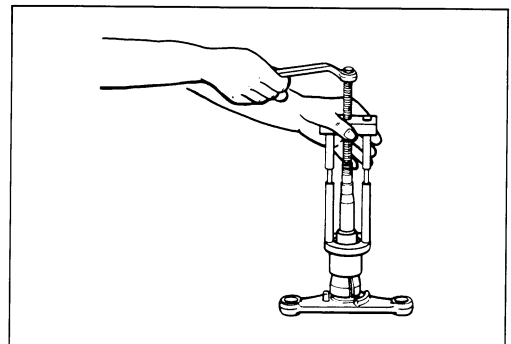
**CAUTION:**

**The removed bearing should be replaced with a new one.**

2. Drive out the steering stem bearing races, upper and lower, by using the special tools.

**09941-54911: Bearing outer race remover**

**09941-74910: Steering bearing installer**



## REASSEMBLY AND REMOUNTING

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

### OUTER RACES

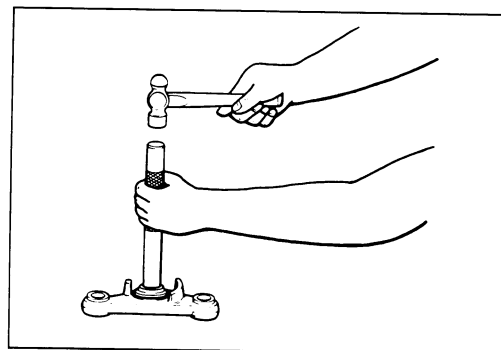
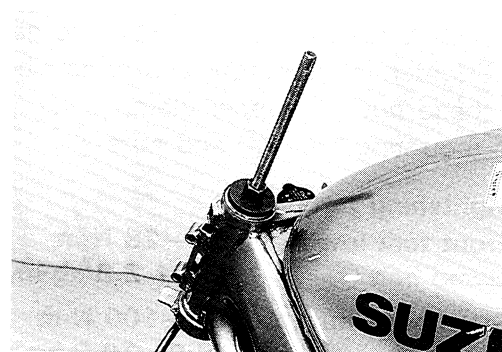
- Press in the upper and lower outer races by using the special tool.

**09941-34513: Steering outer race installer**

### BEARING

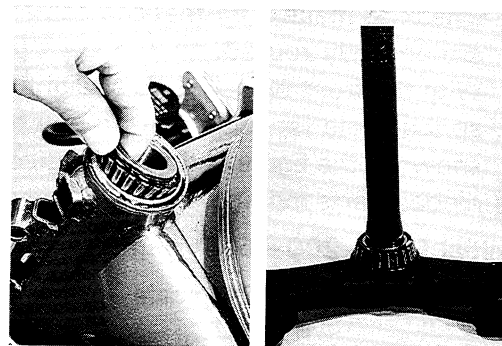
- Place a suitable washer onto the lower bearing and press in the lower bearing by using the special tool.

**09941-74910: Steering bearing installer**



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

**99000-25010: SUZUKI SUPER GREASE "A"**

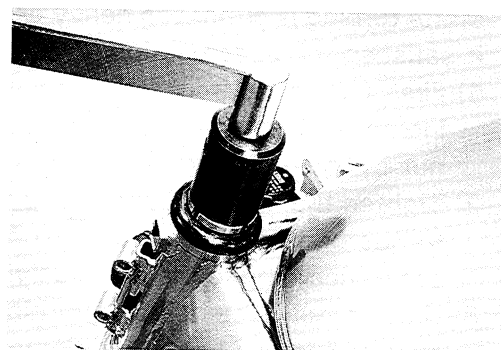


### STEM NUT

- Tighten the steering stem nut to the specified torque.

**09940-14911: Steering stem nut wrench**

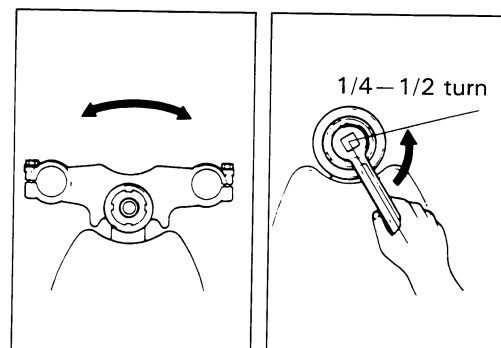
**Tightening torque: 40—50 N·m  
(4.0—5.0 kg-m, 29.0—36.0 lb-ft)**



- Turn the steering stem lower bracket about five or six times to the left and right 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.*



- Install the front forks. (Refer to page 7-29.)
- Tighten the front fork lower clamp bolts ①, steering stem head nut ②, upper clamp bolts ③, handlebar holder mounting bolts ④ and nuts ⑤.

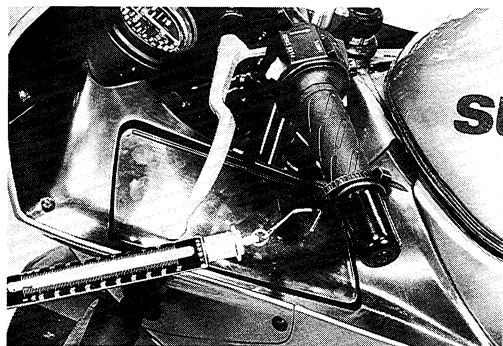
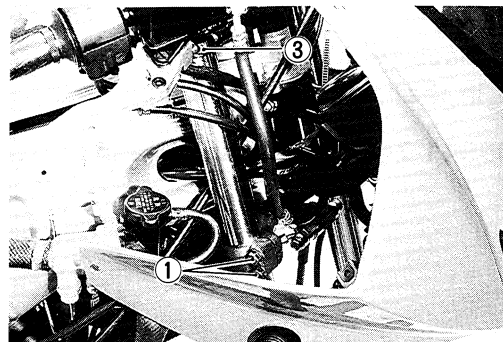
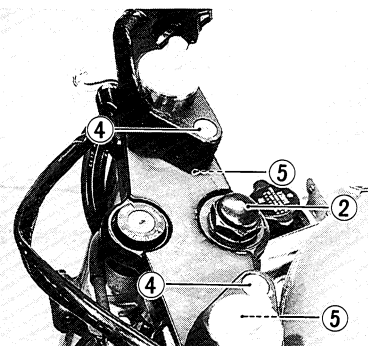
#### Tightening torque

Front fork lower clamp bolt ① : 18–28 N·m  
(1.8–2.8 kg-m, 13.0–20.0 lb-ft)

Stem head nut ② : 80–100 N·m  
(8.0–10.0 kg-m, 58.0–72.5 lb-ft)

Front fork upper clamp bolt ③ : 18–28 N·m  
(1.8–2.8 kg-m, 13.0–20.0 lb-ft)

Handlebar holder mounting bolt ④ and nut ⑤ : 22–35 N·m  
(2.2–3.5 kg-m, 16.0–25.5 lb-ft)



### STEERING TENSION ADJUSTMENT

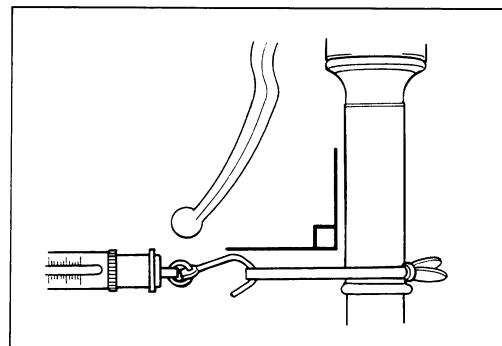
Check the steering movement in the following procedure.

- By supporting the motorcycle with a jack, lift the front wheel until it is off the floor by 20–30 mm (0.8–1.2 in).
- Check to make sure that the cables and wire harnesses are properly routed.
- With the front wheel in the straight ahead state, hitch the spring scale (special tool) on one handlebar grip end as shown in the figure and read the graduation when the handlebar starts moving. Do the same on the other grip end.

Initial force: 200–500 grams

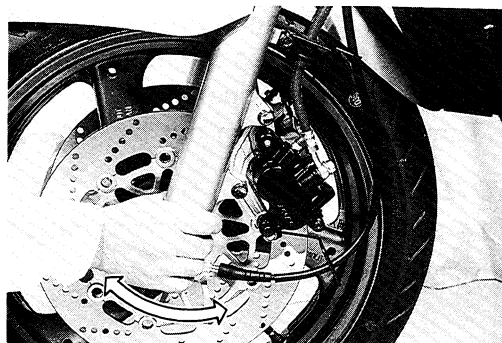
#### 09940-92710: Spring scale

- If the initial force read on the scale when the handlebar starts turning is either too heavy or too light, adjust it till it satisfies the specification.
  - 1) First, loosen the front fork upper clamp bolts and steering stem head nut, and then adjust the steering stem nut by loosening or tightening it.
  - 2) Tighten the head nut and clamp bolts to the specified torque and re-check the initial force with the spring scale according to the previously described procedure.
  - 3) If the initial force is found within the specified range, adjustment has been completed.



#### NOTE:

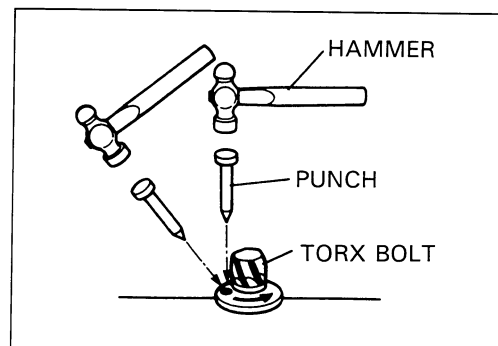
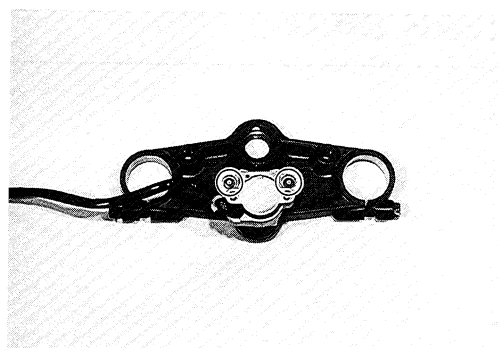
*Hold the front fork legs, move them back and forth and make sure that the steering is not loose.*





## IGNITION SWITCH

- To remove the ignition switch, remove the bolt to detach the ignition switch from the steering stem upper bracket by using a center punch and hammer.



- To install the ignition switch, always use the new special bolt and follow the procedures below:

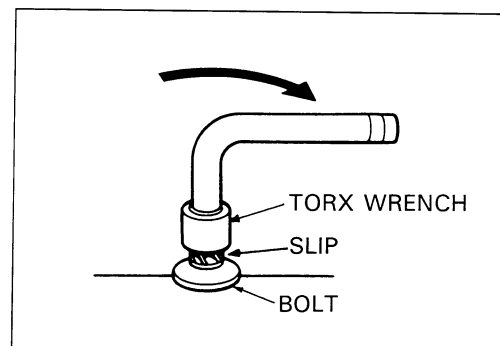
**NOTE:**

*The spare ignition switch comes equipped with the special bolts, however, the bolt is also individually available as a spare part.*

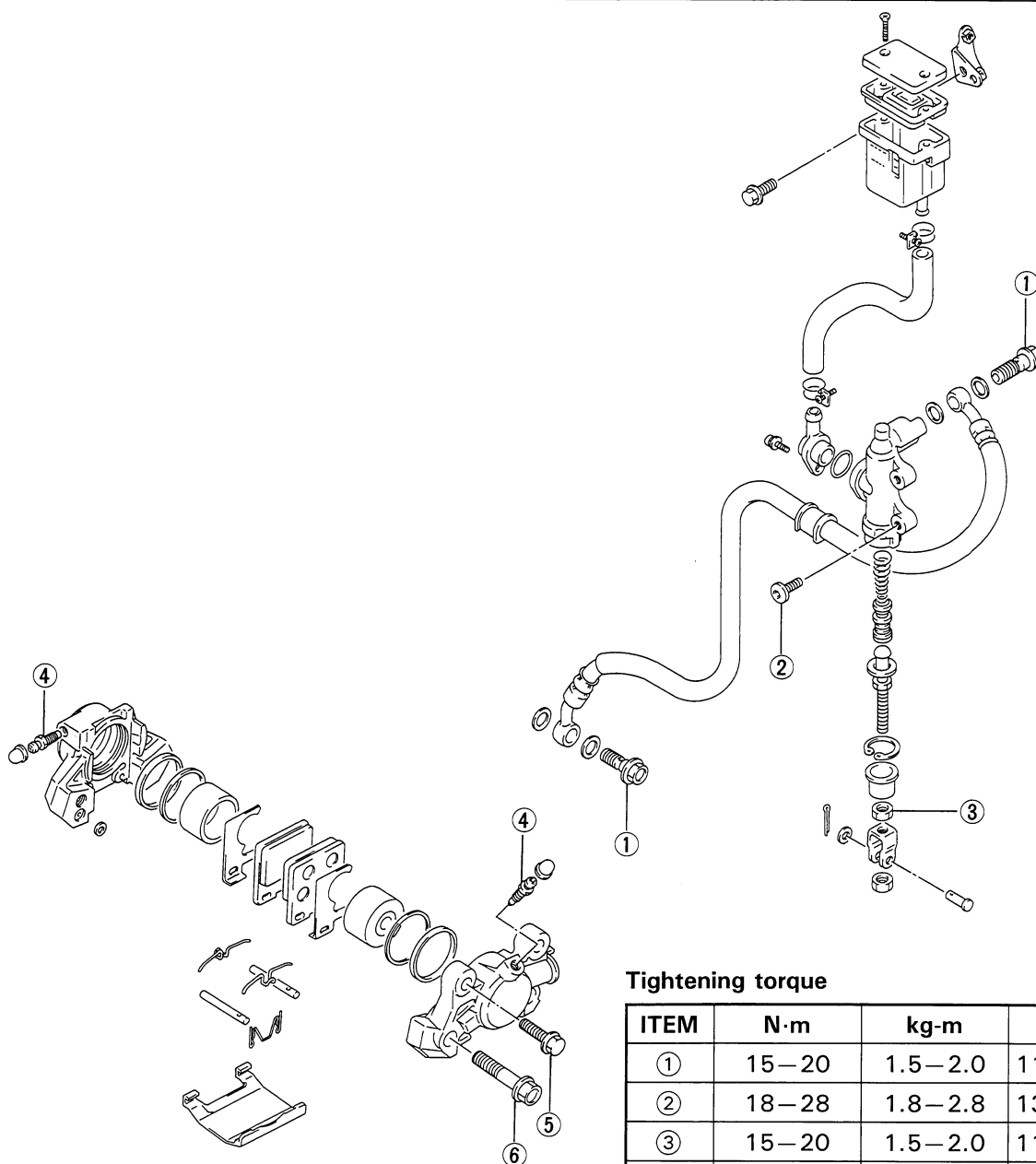
- Using the special bolts, attach the ignition switch on the steering stem upper bracket in place and run in the bolts with the special tool.

**09930-11910: Torx wrench**

- Continue turning the tool until the tool slips from the bolt head or the bolt head breaks off, then the bolt has become tightened to the proper specification.



## REAR BRAKE

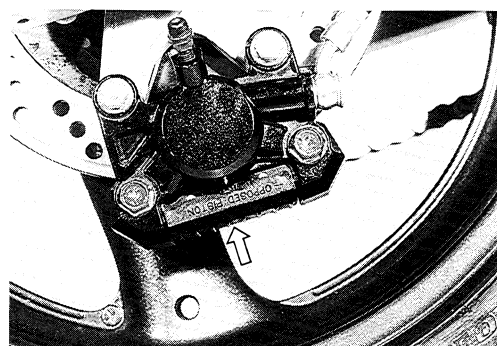


**Tightening torque**

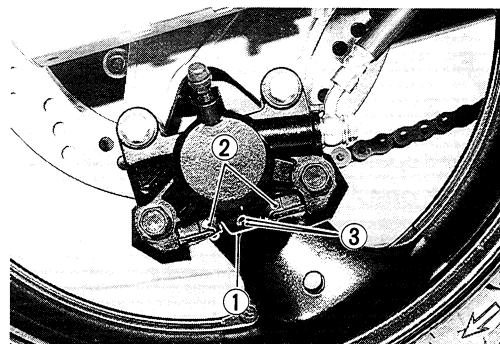
ITEM	N·m	kg-m	lb-ft
①	15—20	1.5—2.0	11.0—14.5
②	18—28	1.8—2.8	13.0—20.0
③	15—20	1.5—2.0	11.0—14.5
④	6—9	0.6—0.9	4.5—6.5
⑤	20—30	2.0—3.0	14.5—21.5
⑥	30—36	3.0—3.6	21.5—26.0

## BRAKE PAD REPLACEMENT

1. Remove the dust cover.



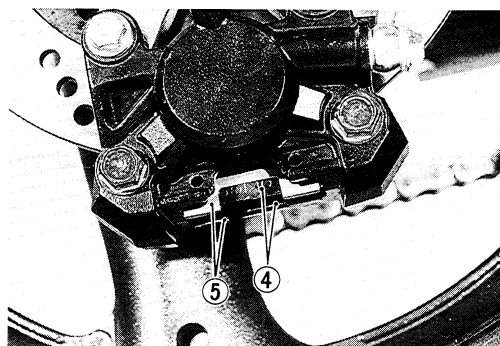
2. Remove the clip ① .
3. Draw out the pins ② and removing the springs ③ .



4. Remove the pads ④ and shims ⑤ .

**CAUTION:**

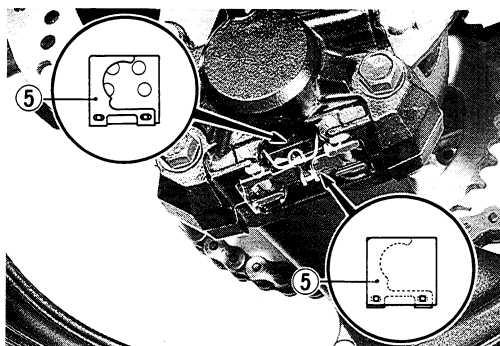
- \* Do not operate the brake pedal while dismounting the pads.
- \* Replace the brake pad as a set, otherwise braking performance will be adversely affected.



5. Remount the new brake pads and fit the springs, pins and clip.

**CAUTION:**

Be sure to install the shims ⑤ properly as shown in the illustration.



## CALIPER REMOVAL AND DISASSEMBLY

1. Remove the union bolt ⑥ and catch the brake fluid in a suitable receptacle.

**CAUTION:**

Never reuse the brake fluid left over from previous servicing and stored for long periods.

**WARNING:**

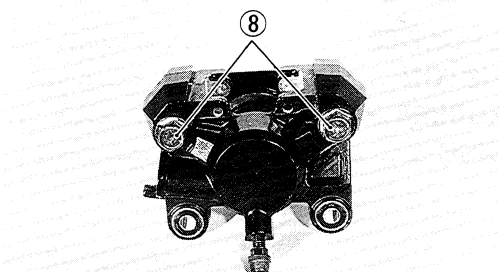
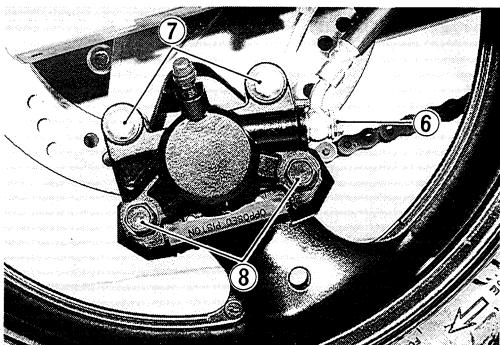
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and oil leakage.

2. Remove the caliper mounting bolts ⑦ .

**NOTE:**

*Slightly loosen the caliper housing bolts ⑧ to facilitate later disassembly before removing the caliper mounting bolts.*

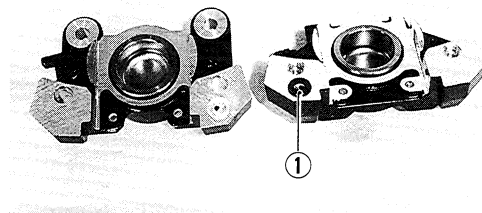
3. Remove the pads.
4. Remove the caliper housing bolts ⑧ .



5. Separate the caliper halves.
6. Remove the O-ring ① .

**NOTE:**

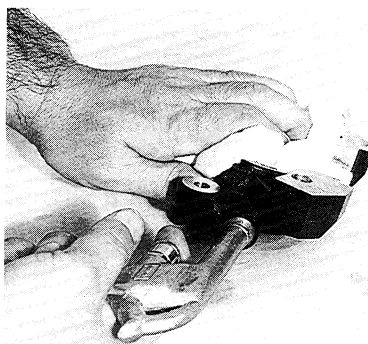
*Once separate the caliper halves, replace the O-ring ① with a new one.*



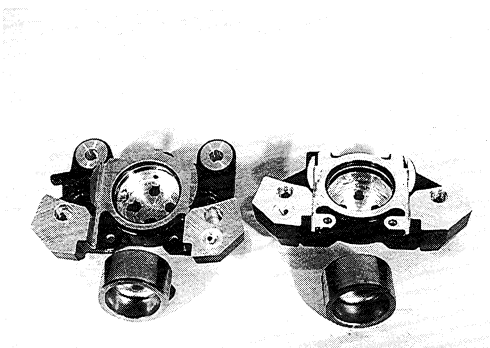
7. Place a rag over the piston to prevent it from popping out and push out the piston by using an air gun.

**CAUTION:**

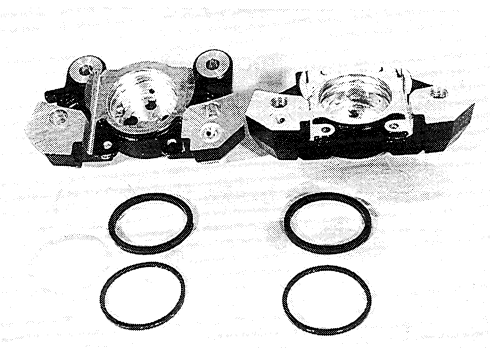
**Do not use high pressure air to prevent piston damage.**



8. Remove the pistons.



9. Remove the dust seals and piston seals.



## CALIPER INSPECTION

CYLINDER .....	Refer to page 7-20.
PISTON .....	Refer to page 7-20.
RUBBER PARTS .....	Refer to page 7-20.
DISC .....	Refer to page 7-21.

## CALIPER REASSEMBLY AND REMOUNTING

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

### 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.

### 99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4

- Tighten each bolt to the specified torque.

#### Tightening torque

##### Rear brake caliper

housing bolt ① : 30–36 N·m  
(3.0–3.6 kg-m, 21.5–26.0 lb-ft)

##### Rear brake caliper

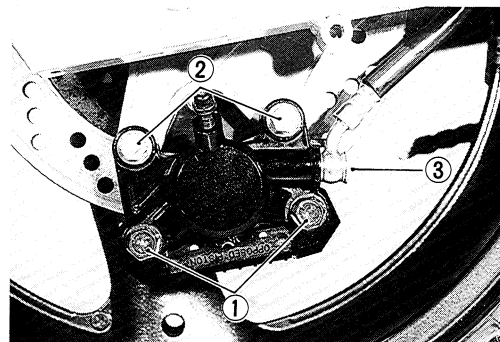
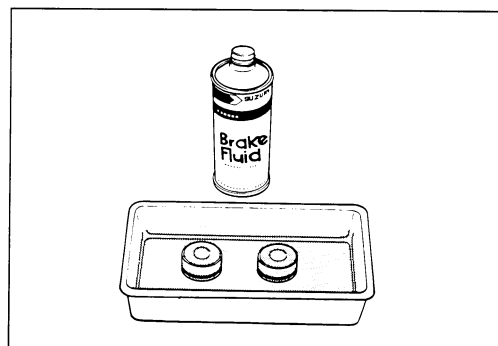
mounting bolt ② : 20–30 N·m  
(2.0–3.0 kg-m, 14.5–21.5 lb-ft)

##### Brake hose

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

### CAUTION:

Bleed air from the system after reassembling the caliper.  
(Refer to page 2-16.)



## MASTER CYLINDER REMOVAL AND DISASSEMBLY

1. Remove both seats.
2. Remove the frame cover. (Refer to page 7-5.)
3. Free the reservoir tank to remove its mounting bolt ④.
4. Loosen the lock nut ⑤.
5. Remove the master cylinder mounting bolts ⑥.

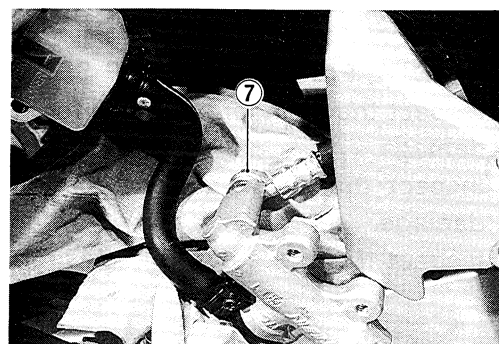
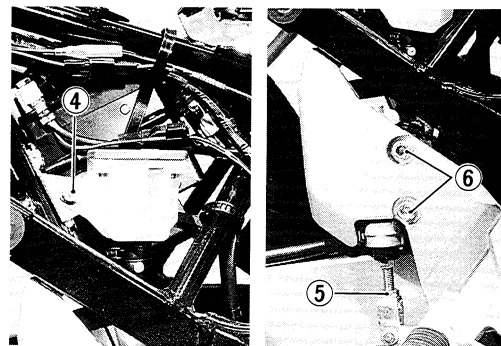
### NOTE:

*Slightly loosen the brake hose union bolt ⑦ to facilitate later disassembly before removing the master cylinder.*

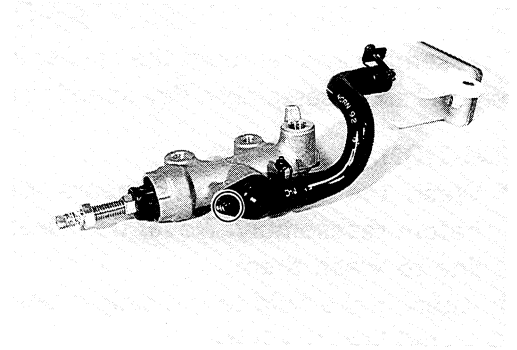
6. Place a cloth underneath the union bolt ⑦ on the master cylinder to catch spilled drops of brake fluid.
7. Loosen the union bolt and disconnect the brake hose from the master cylinder joint.

### NOTE:

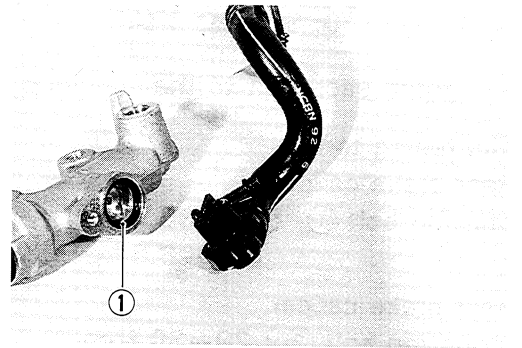
Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.



8. Remove the connector by removing the screw.

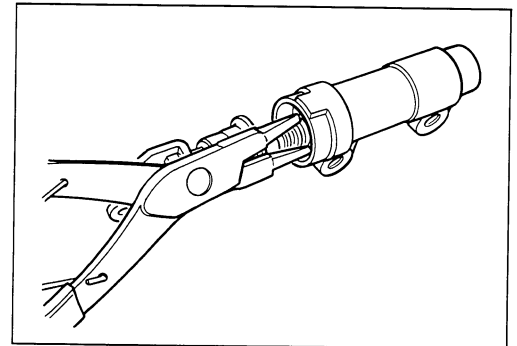


9. Remove the O-ring ①.

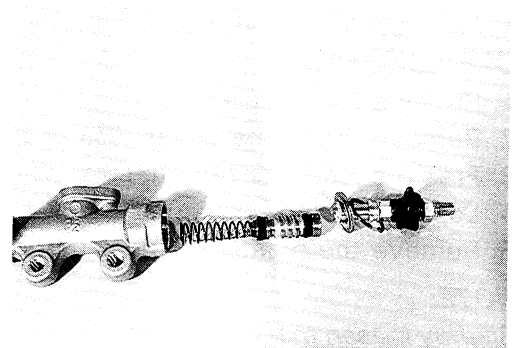


10. Pull out the dust seal then remove the circlip by using the special tool.

**09900-06108: Snap ring pliers**



11. Remove the push rod, piston/primary cup and spring.



## MASTER CYLINDER INSPECTION

### CYLINDER, PISTON AND CUP SET

- Inspect the cylinder bore wall for any scratches or other damage.
- Inspect the piston surface for any scratches or other damage.
- Inspect the cup set and each rubber part for damage.

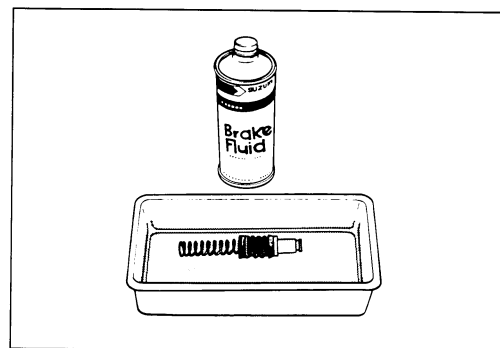
## MASTER CYLINDER REASSEMBLY AND REMOUNTING

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 component to be inserted into the bore.

99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4



### MASTER CYLINDER BOLTS

- Tighten each bolt to the specified torque.

#### Tightening torque

##### Brake hose

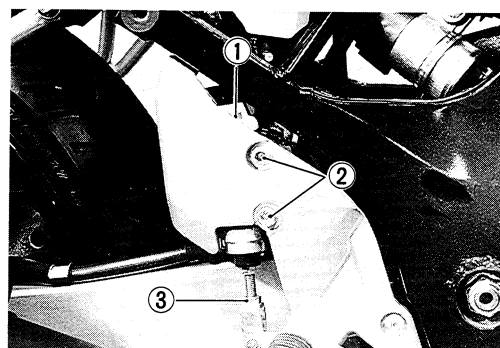
union bolt ①: 15—20 N·m  
(1.5—2.0 kg-m, 11.0—14.5 lb-ft)

##### Master cylinder

mounting bolt ②: 18—28 N·m  
(1.8—2.8 kg-m, 13.0—20.0 lb-ft)

##### Master cylinder

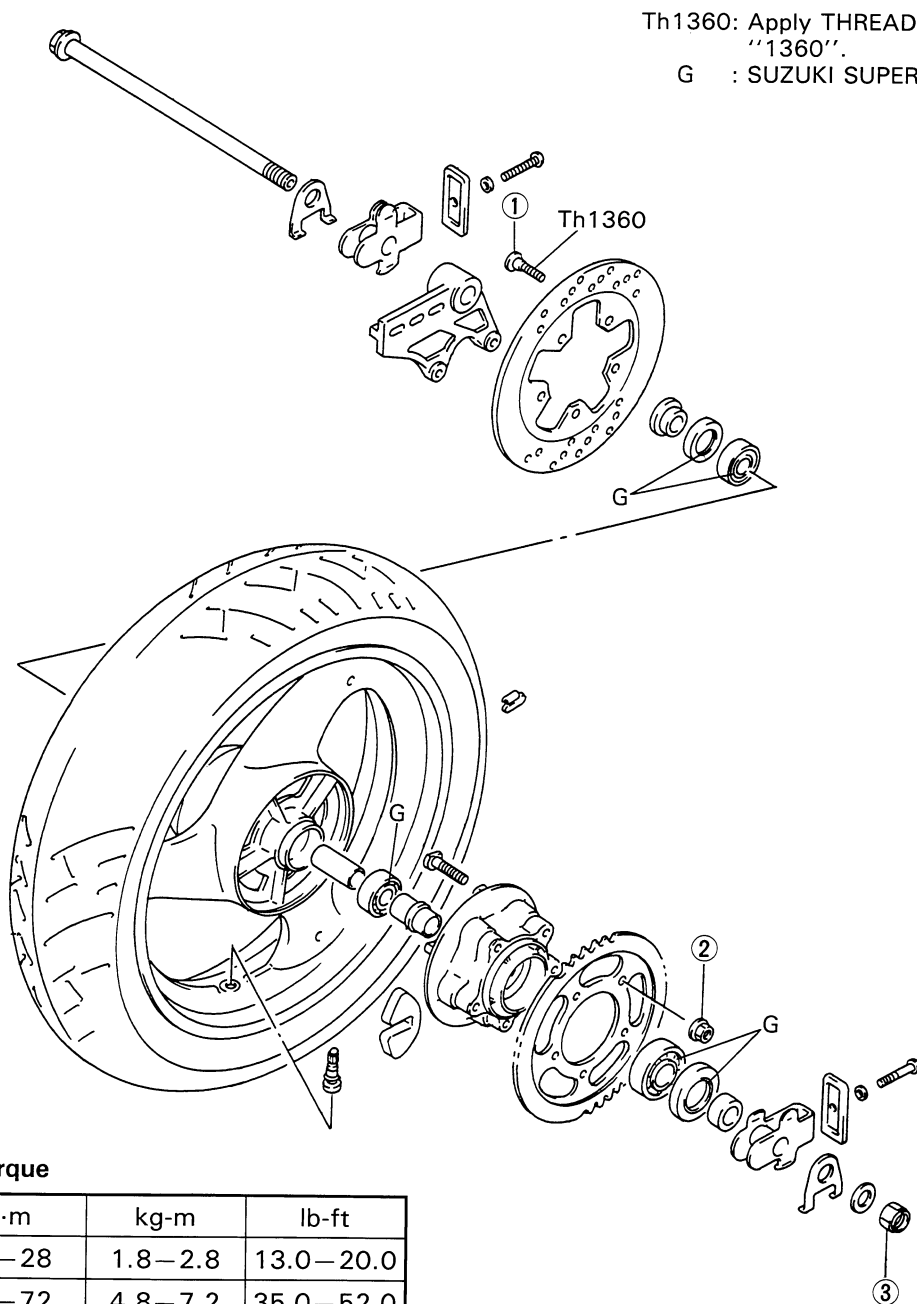
rod lock nut ③: 15—20 N·m  
(1.5—2.0 kg-m, 11.0—14.5 lb-ft)



### CAUTION:

Bleed air from the system after reassembling master cylinder.  
(Refer to page 2-16.)

## REAR WHEEL

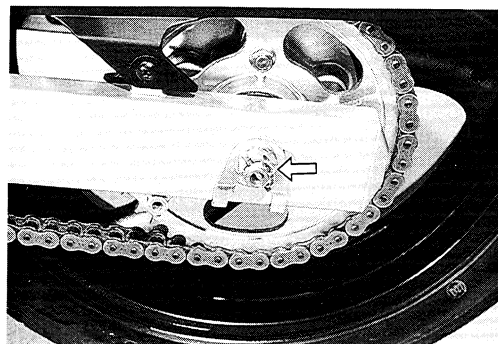


**Tightening torque**

ITEM	N·m	kg-m	lb-ft
①	18—28	1.8—2.8	13.0—20.0
②	48—72	4.8—7.2	35.0—52.0
③	85—115	8.5—11.5	61.5—83.0

## REMOVAL AND DISASSEMBLY

1. Remove the lower cowl of rear. (Refer to page 7-2.)
2. Support the motorcycle with a jack.
3. Remove the axle cotter pin. (For Canada)
4. Remove the axle nut.

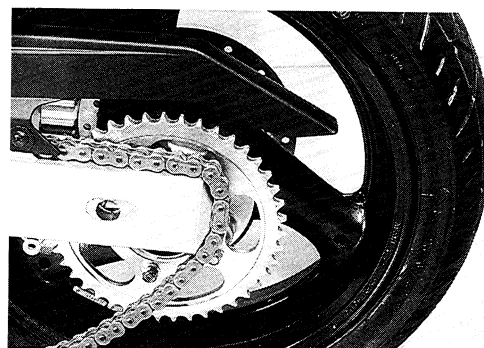




5. Draw out the rear axle shaft.
6. Remove the rear wheel by disengaging the drive chain.

**CAUTION:**

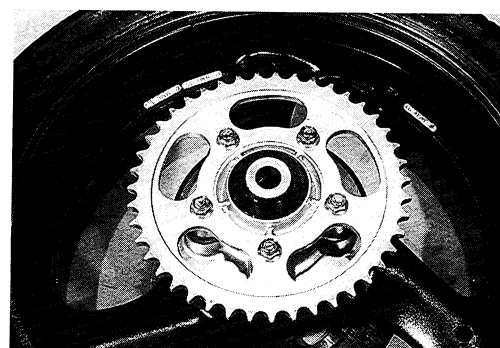
Do not operate the brake pedal while dismounting the brake caliper.



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

**NOTE:**

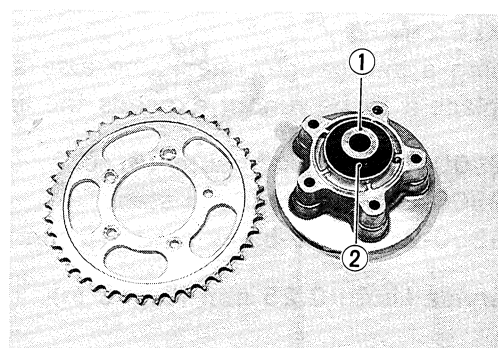
*Slightly loosen the rear sprocket mounting nuts to facilitate later disassembly before separate the mounting drum.*



8. Separate the rear sprocket from the mounting drum.
9. Remove the spacer ① and dust seal ②.

**CAUTION:**

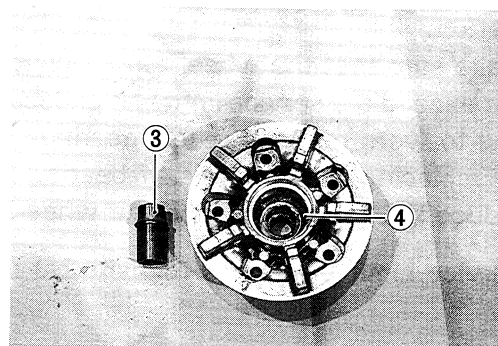
The removed dust seal should be replaced with a new one.



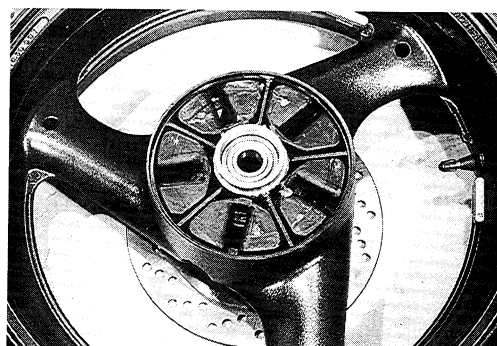
10. Remove the drum retainer ③, draw out the sprocket mounting drum bearing ④ using an appropriate tool.

**CAUTION:**

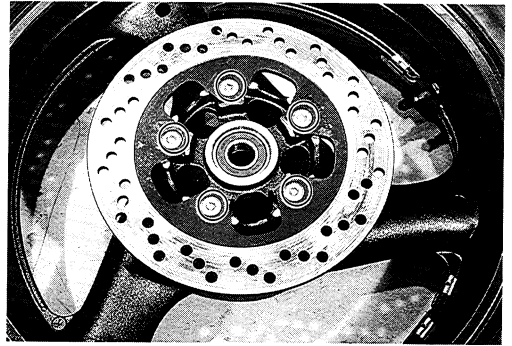
The removed bearing should be replaced with a new one.



11. Remove the cushions.



12. Separate the brake disc from the wheel.



## INSPECTION AND DISASSEMBLY

**TIRE** ..... Refer to page 7-12.

### WHEEL BEARINGS

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

#### CAUTION:

The removed bearings should be replaced with new ones.

### AXLE SHAFT

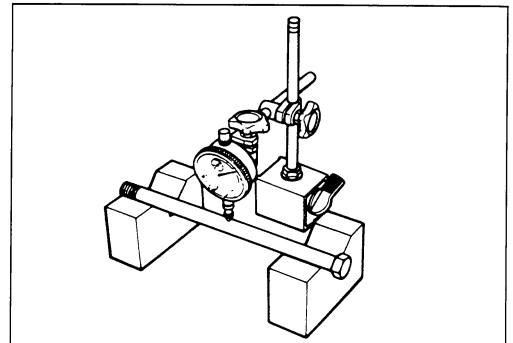
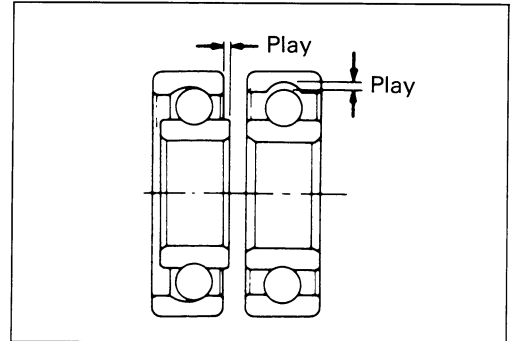
Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

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

**09900-20701: Magnetic stand**

**09900-21304: V-block set (100 mm)**

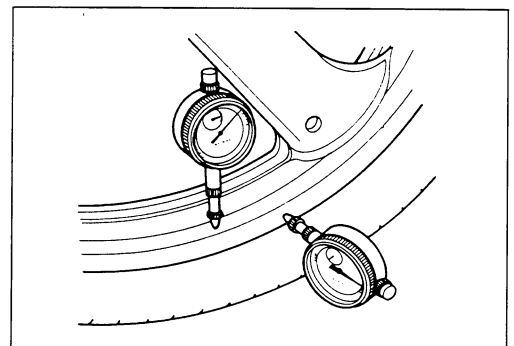
**Service Limit: 0.25 mm (0.010 in)**



### WHEEL

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

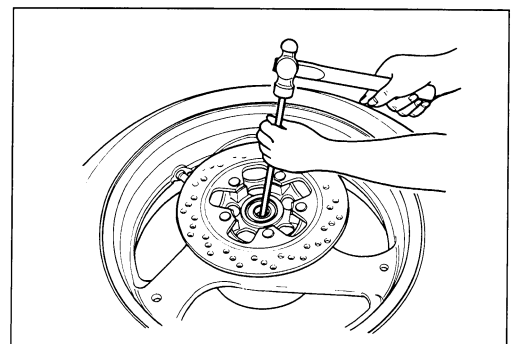
**Service Limit (Axial and Radial): 2.0 mm (0.08 in)**



Drive out the left and right wheel bearings with an appropriate steel bar.

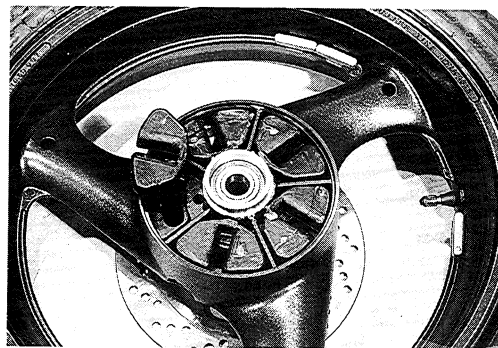
#### CAUTION:

The removed bearings should be replaced with new ones.

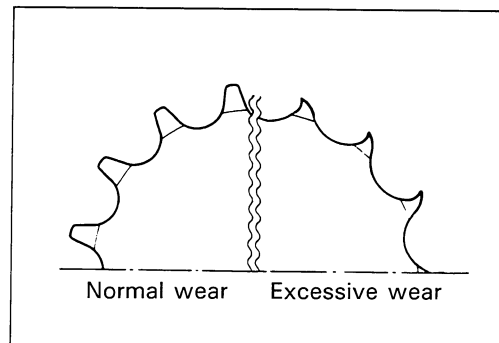


**CUSHION**

Inspect the cushion for wear and damage.

**SPROCKET**

Inspect the sprocket teeth for wear. If they are worn as shown, replace the sprockets and drive chain as a set.

**REASSEMBLY AND REMOUNTING**

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

**WHEEL BEARING**

- Apply grease to the bearings before installing.

**99000-25010: SUZUKI SUPER GREASE "A"**

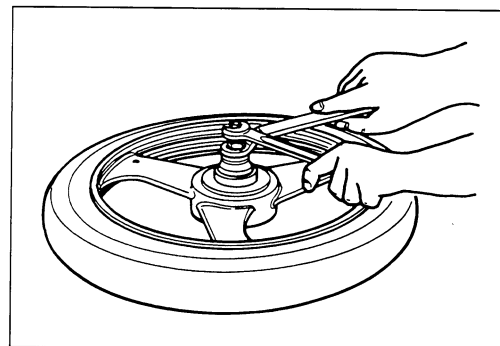


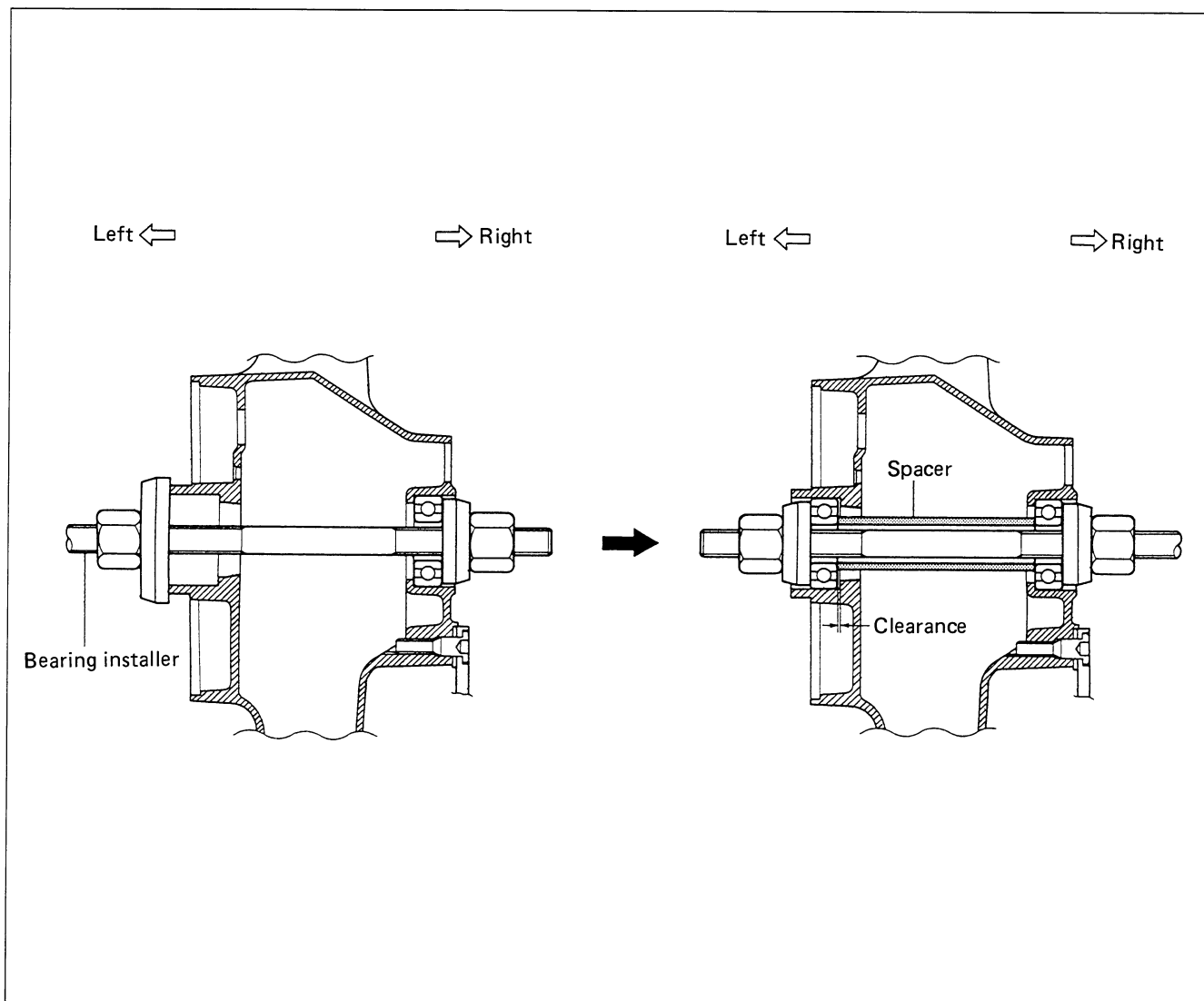
- Install the wheel bearings by using the special tool.

**09941-34513: Bearing installer set**

**NOTE:**

*First install the right wheel bearing, then install the left wheel bearing. The sealed cover on the bearing is positioned outside. Refer to page 7-45 for details.*





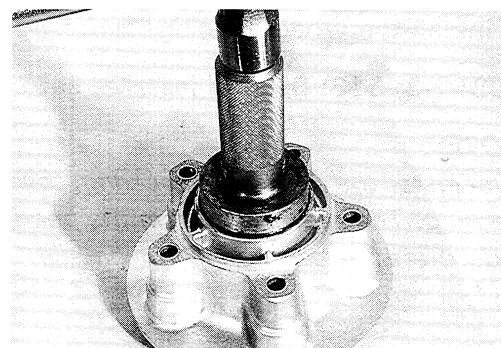
### MOUNTING DRUM BEARING

- Install the bearing by using the bearing installer.

#### 09913-75520: Bearing installer

#### NOTE:

*Apply grease to the bearing and oil seal lip before assembling rear wheel.*



### BRAKE DISC

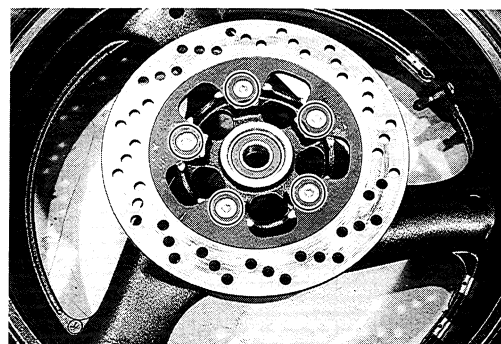
- Apply THREAD LOCK SUPER "1360" to the disc bolts and tighten them to the specified torque.

#### NOTE:

*Make sure that the brake disc is clean and free of any greasy matter.*

#### 99000-32130: THREAD LOCK SUPER "1360"

Brake disc bolt: 18–28 N·m  
(1.8–2.8 kg-m, 13.0–20.0 lb-ft)



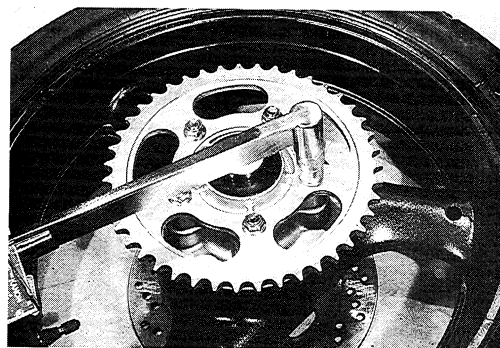
**REAR SPROCKET**

- Tighten the sprocket mounting nuts to the specified torque.

**Rear sprocket nut: 48–72 N·m**  
**(4.8–7.2 kg-m, 35.0–52.0 lb-ft)**

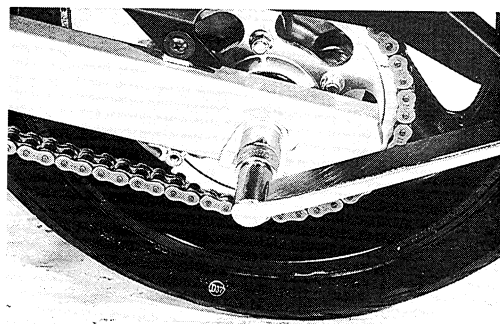
**NOTE:**

*Face the stamped mark on the sprocket to outside.*

**REAR AXLE SHAFT**

- Adjust the chain slack after rear wheel installation. (Refer to page 2-12.)
- Tighten the rear axle nut to the specified torque.
- Tighten both chain adjuster bolts securely.

**Rear axle nut: 85–115 N·m**  
**(8.5–11.5 kg-m, 61.5–83.0 lb-ft)**



85–115 N·m  
 (8.5–11.5 kg-m)  
 61.5–83.0 lb-ft

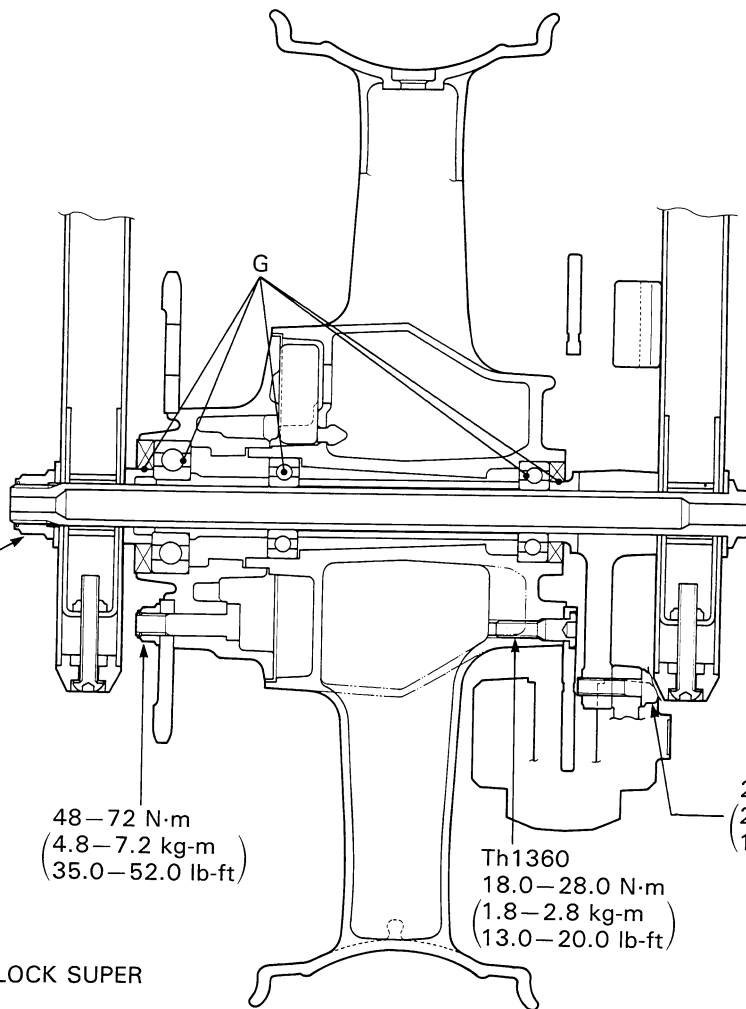
48–72 N·m  
 (4.8–7.2 kg-m)  
 35.0–52.0 lb-ft

Th1360  
 18.0–28.0 N·m  
 (1.8–2.8 kg-m)  
 13.0–20.0 lb-ft

20–30 N·m  
 (2.0–3.0 kg-m)  
 14.5–21.5 lb-ft

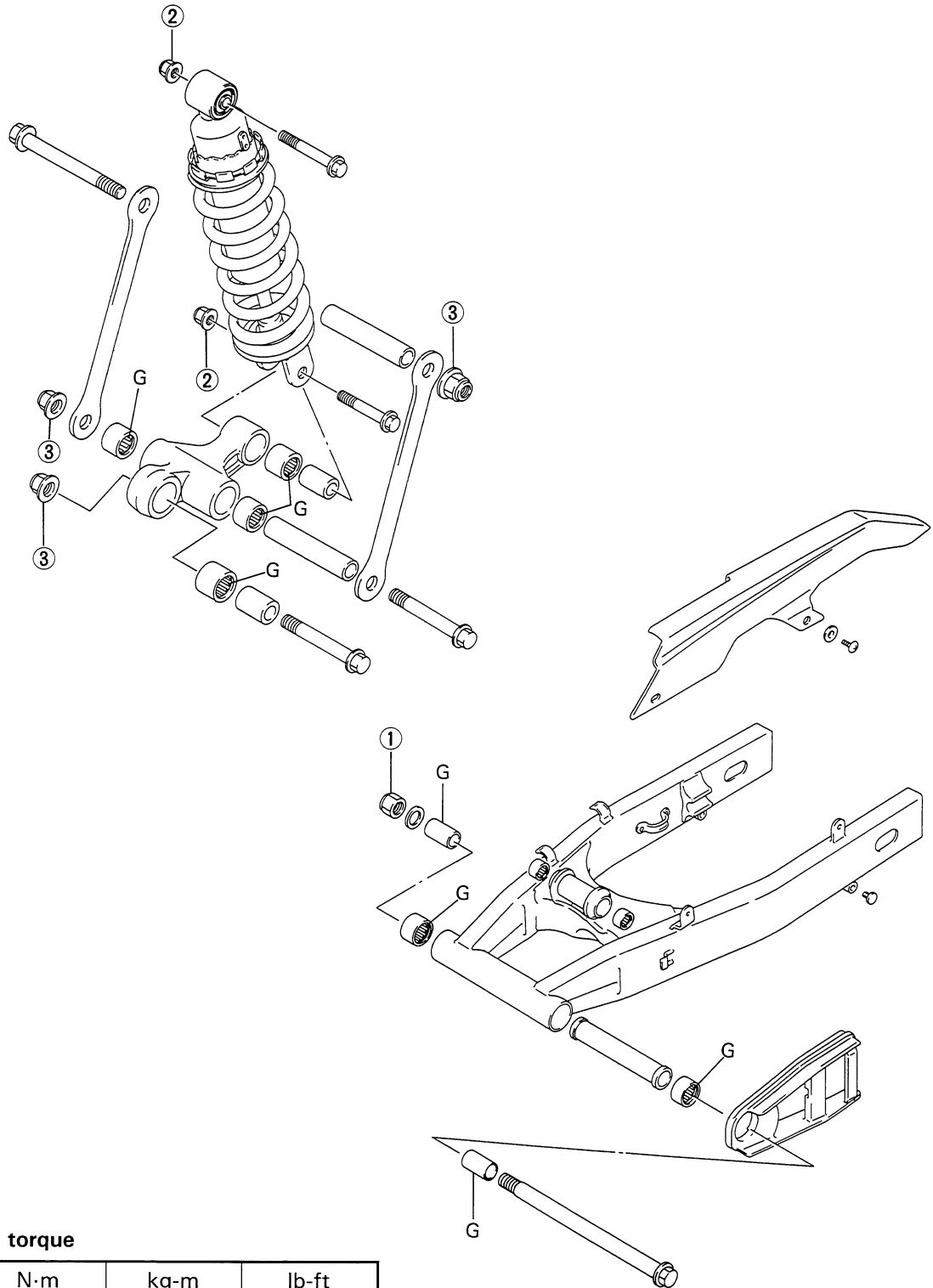
Th1360: Apply THREAD LOCK SUPER "1360".

G : Apply SUZUKI SUPER GREASE "A".



# REAR SUSPENSION

## SWINGARM, SHOCK ABSORBER AND CUSHION LEVER



Tightening torque

ITEM	N·m	kg-m	lb-ft
①	85-115	8.5-11.5	61.5-83.0
②	40-60	4.0-6.0	29.0-43.5
③	70-100	7.0-10.0	50.5-72.5

G : Apply SUZUKI SUPER GREASE "A".

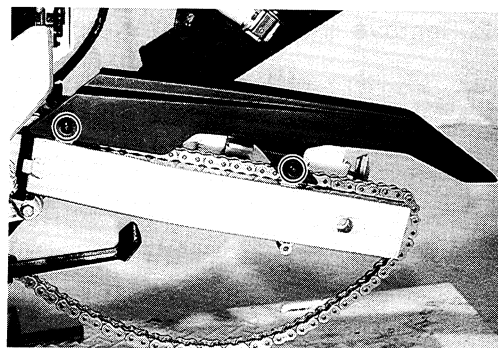
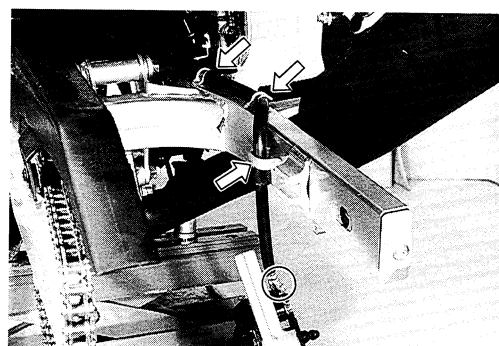
## REMOVAL

1. Remove the seats and frame covers. (Refer to page 7-5.)
2. Remove the rear wheel. (Refer to page 7-41.)
3. Remove the rear brake hose union bolt.

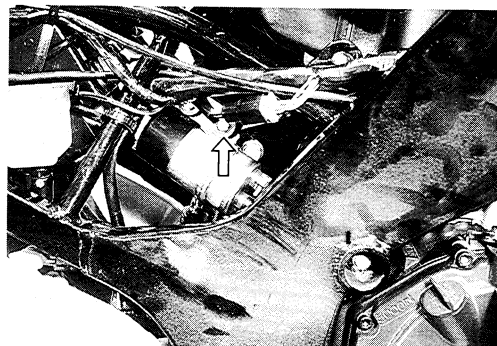
### CAUTION:

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

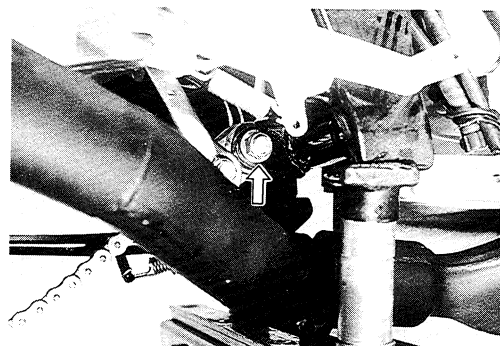
4. Remove the brake hose from the brake hose guides at inside of swingarm.
5. Remove the chain case.



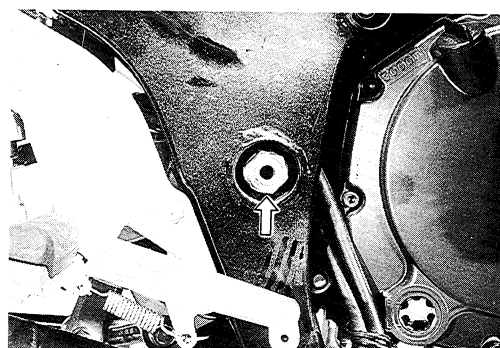
6. Remove the shock absorber upper mounting nut and bolt.



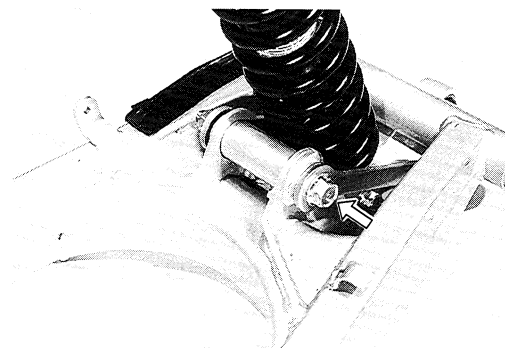
7. Remove the cushion lever mounting nut and bolt.



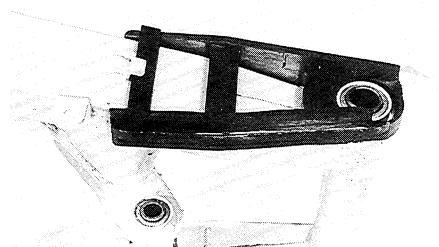
8. Remove the caps.
9. Remove the swingarm pivot shaft by removing the pivot shaft nut.
10. Remove the rear suspension assembly.



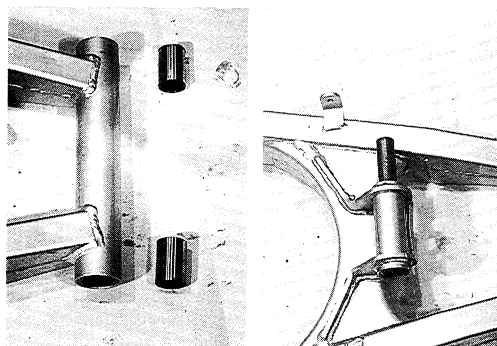
11. Remove the cushion rod mounting nut and bolt.



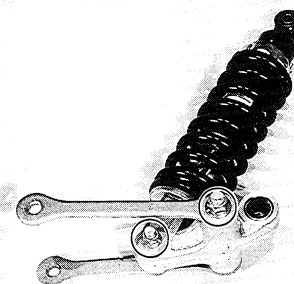
12. Remove the chain buffer.



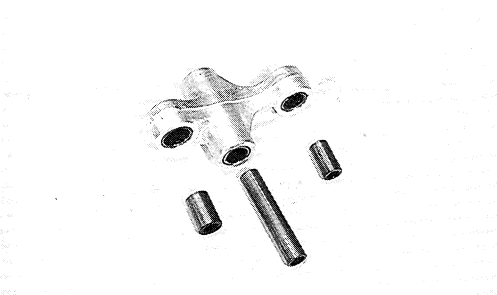
13. Remove the spacers from swingarm.



14. Remove the rear shock absorber and cushion rods.



15. Remove the cushion lever spacers.





## INSPECTION AND DISASSEMBLY

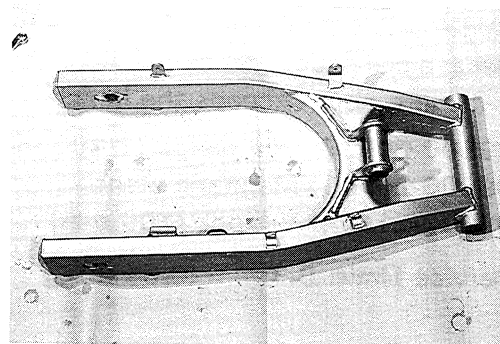
### SWINGARM

Inspect the spacer for any flaws or other damage.

Inspect the swingarm for wear or damage.

Insert the spacer into bearing and check the play to move the spacer up and down.

If excessive play is noted, replace the bearing with a new one.

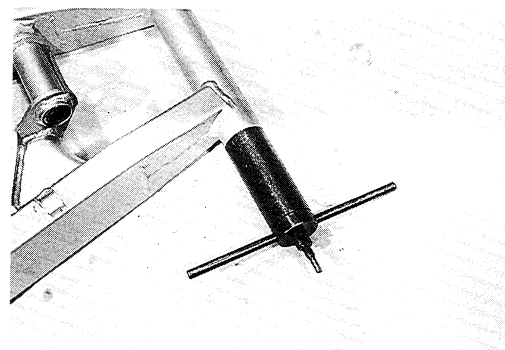


Draw out the swingarm bearings with the special tool.

**09941-44510: Swingarm bearing remover**

#### CAUTION:

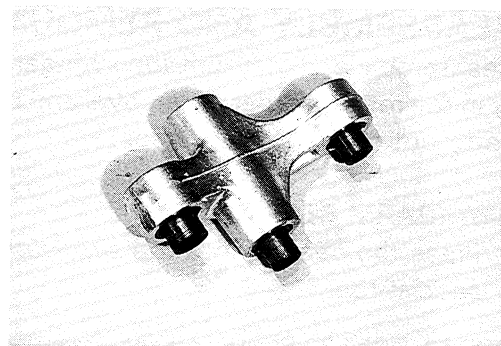
The removed bearings should be replaced with new ones.



### CUSHION LEVER

Inspect the spacer for any flaws or other damage.

Insert the spacer into bearing and check the play to move the spacer up and down. If an excessive play is noted, replace the bearing with a new one.



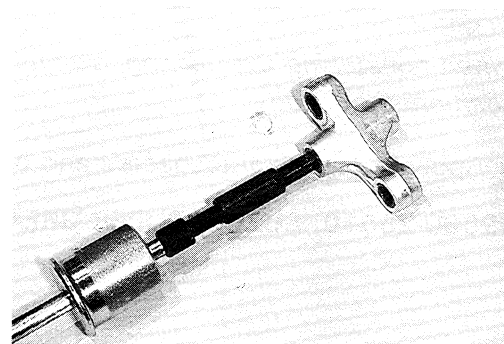
Draw out the bearing with the special tools.

**09923-73210: Bearing puller**

**09930-30102: Sliding shaft**

#### CAUTION:

The removed bearings should be replaced with new ones.

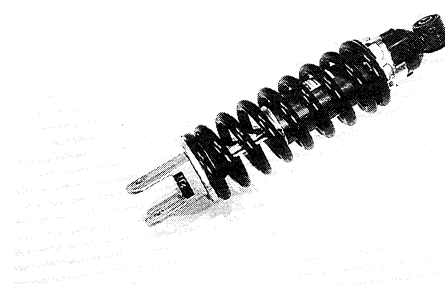


### SHOCK ABSORBER

Inspect the shock absorber body for damage and oil leakage. If any defects are found, replace the shock absorber with new one.

#### CAUTION:

Do not attempt to disassemble the rear shock absorber unit. It is unserviceable.



**SWINGARM PIVOT SHAFT**

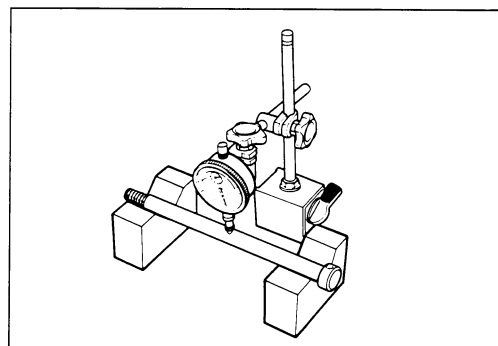
Using a dial gauge, check the pivot shaft runout and replace it if the runout exceeds the limit.

**09900-20606: Dial gauge (1/100 mm, 10 mm)**

**09900-20701: Magnetic stand**

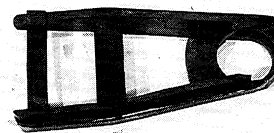
**09900-21304: V-block (100 mm)**

**Service Limit: 0.3 mm (0.01 in)**

**CHAIN BUFFER**

Inspect the chain buffer for wear and damage.

If any defects are found, replace the chain buffer with a new one.

**REASSEMBLY AND REMOUNTING**

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

**SWINGARM BEARING**

- Press the bearing into the swingarm pivot by using the special tool.

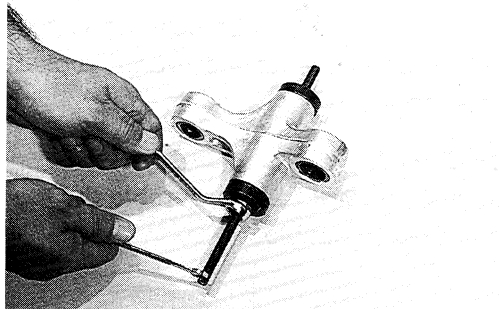
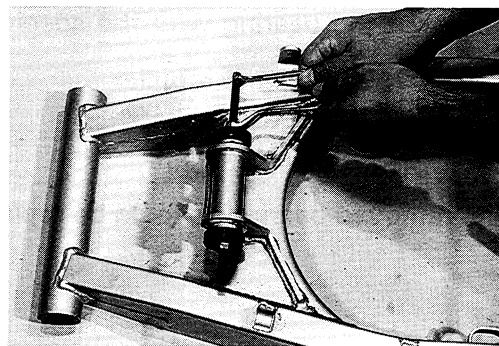
**09941-34513: Steering race installer**

**NOTE:**

*When reinstalling the bearing, stamped mark of bearing is positioned outside.*

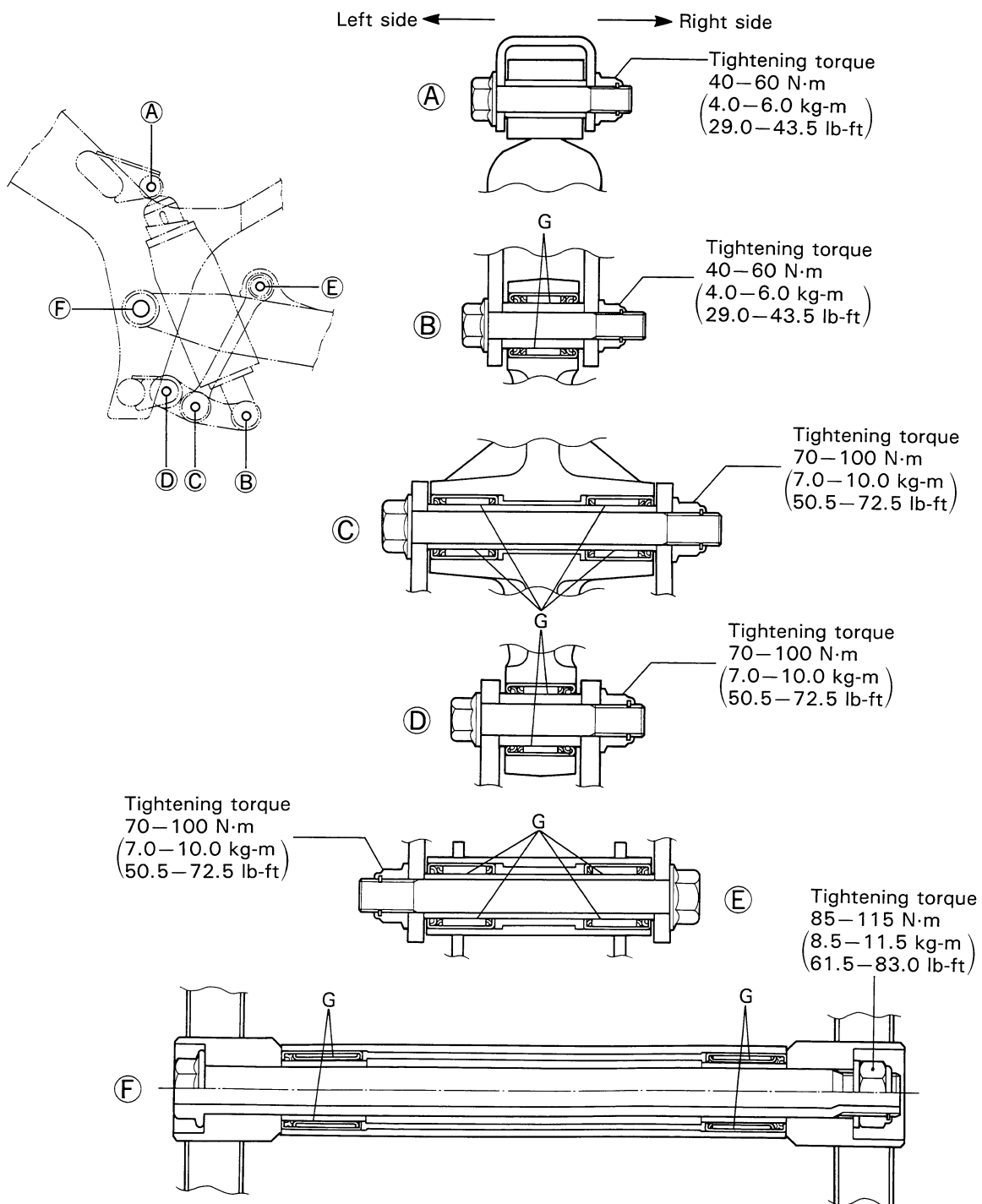
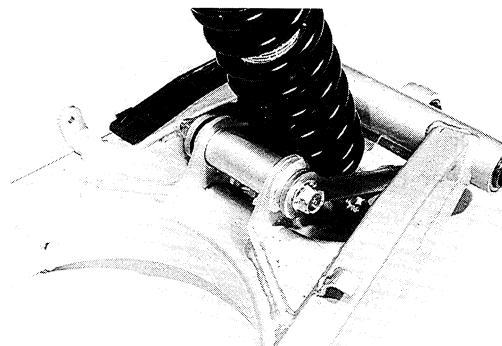
- Apply grease to the spacers and bearings.

**99000-25010: SUZUKI SUPER GREASE "A"**



## REASSEMBLY ONTO FRAME

- First of all assemble the shock absorber, cushion lever and cushion rods onto the swingarm.



G: Apply SUZUKI SUPER GREASE "A".

## FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspension and wheel, the following adjustments are required before driving.

- \* Drive chain
- \* Rear brake
- \* Tire pressure
- \* Chassis bolts and nuts
- \* Shock absorber

## SUSPENSION SETTING

After installing the rear suspension, adjust the spring pre-load and rebound damping force as follows.

### REBOUND DAMPING FORCE ADJUSTMENT

The set position "4" provides the stiffest rebound damping force.

The set position "1" provides the softest rebound damping force.

(STD position: "2")

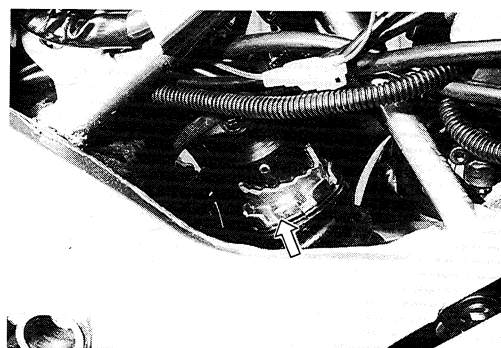


### SPRING PRE-LOAD ADJUSTMENT

The set position "7" provides the stiffest spring pre-load.

The set position "1" provides the softest spring pre-load.

(STD position: "4")



## REAR SUSPENSION SETTING

Item		Spring set position	Damping force (Rebound)
Solo riding	Softer	3	1
	Standard	4	2
	Stiffer	5	3
Dual riding		5	4

# ***SERVICING INFORMATION***

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<b><i>SERVICE DATA .....</i></b>	<b><i>8-32</i></b>

# TROUBLESHOOTING

## ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	<b>Compression too low</b> <ol style="list-style-type: none"> <li>1. Out of adjustment valve clearance.</li> <li>2. Worn valve guides or poor seating of valves.</li> <li>3. Mistiming valves.</li> <li>4. Excessively worn piston rings.</li> <li>5. Worn-down cylinder bores.</li> <li>6. Too slowly starter motor cranks.</li> <li>7. Poor seating of spark plugs.</li> </ol> <b>Plugs not sparking</b> <ol style="list-style-type: none"> <li>1. Fouled spark plugs.</li> <li>2. Wet spark plugs.</li> <li>3. Defective ignition coil.</li> <li>4. Open or short in high-tension cords.</li> <li>5. Defective signal generator or ignitor unit.</li> </ol> <b>No fuel reaching the carburetors</b> <ol style="list-style-type: none"> <li>1. Clogged fuel tank vent hose.</li> <li>2. Clogged or defective fuel/cook.</li> <li>3. Defective fuel pump or ignitor unit.</li> <li>4. Defective carburetor needle valve.</li> <li>5. Clogged fuel hose or fuel filter.</li> </ol>	Adjust. Repair or replace. Adjust. Replace. Replace or rebore. See electrical section. Retighten.  Clean. Clean and dry. Replace. Replace. Replace.  Clean or replace. Clean or replace. Replace. Replace. Clean or replace.
Engine stalls easily.	<ol style="list-style-type: none"> <li>1. Fouled spark plugs.</li> <li>2. Defective signal generator or ignitor unit.</li> <li>3. Clogged fuel hose.</li> <li>4. Clogged jets in carburetors.</li> <li>5. Out of adjustment valve clearance.</li> </ol>	Clean. Replace. Clean. Clean. Adjust.
Noisy engine.	<b>Excessive valve chatter</b> <ol style="list-style-type: none"> <li>1. Too large valve clearance.</li> <li>2. Weakened or broken valve springs.</li> <li>3. Worn tappet or cam surface.</li> <li>4. Worn and burnt camshaft journal.</li> </ol> <b>Noise seems to come from piston</b> <ol style="list-style-type: none"> <li>1. Worn down pistons or cylinders.</li> <li>2. Fouled with carbon combustion chambers.</li> <li>3. Worn piston pins or piston pin bore.</li> <li>4. Worn piston rings or ring grooves.</li> </ol> <b>Noise seems to come from timing chain</b> <ol style="list-style-type: none"> <li>1. Stretched chain.</li> <li>2. Worn sprockets.</li> <li>3. Not working tension adjuster.</li> </ol> <b>Noise seems to come from clutch</b> <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 clutch release bearing.</li> <li>5. Weakened clutch dampers.</li> </ol>	Adjust. Replace. Replace. Replace.  Replace. Clean. Replace. Replace.  Replace. Replace. Repair or replace.  Replace. Replace. Replace. Replace. Replace the primary driven gear.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	<p><b>Noise seems to come from crankshaft</b></p> <ol style="list-style-type: none"> <li>1. Due to wear rattling bearings.</li> <li>2. Worn and burnt big-end bearings.</li> <li>3. Worn and burnt journal bearings.</li> <li>4. Too large thrust clearance.</li> </ol> <p><b>Noise seems to come from transmission</b></p> <ol style="list-style-type: none"> <li>1. Worn or rubbing gears.</li> <li>2. Badly worn splines.</li> <li>3. Worn or rubbing primary gears.</li> <li>4. Badly worn bearings.</li> </ol> <p><b>Noise seems to come from water pump</b></p> <ol style="list-style-type: none"> <li>1. Too much play on pump shaft bearing.</li> <li>2. Worn or damaged mechanical seal.</li> <li>3. Touches pump case and impeller.</li> </ol>	<p>Replace. Replace. Replace. Replace thrust bearing.</p> <p>Replace. Replace. Replace. Replace.</p> <p>Replace. Replace. Replace.</p>
Slipping clutch.	<ol style="list-style-type: none"> <li>1. Out of adjustment or loss of play clutch control.</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>
Dragging clutch.	<ol style="list-style-type: none"> <li>1. Out of adjustment or too much play clutch control.</li> <li>2. Some clutch springs weakened.</li> <li>3. Distorted pressure plate or clutch plate.</li> </ol>	<p>Adjust. Replace. Replace.</p>
Transmission will not shift.	<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>
Transmission will not shift back.	<ol style="list-style-type: none"> <li>1. Broken return spring on shift shaft.</li> <li>2. Rubbing or stickly shift shaft.</li> <li>3. Distorted or worn gearshift forks.</li> </ol>	<p>Replace. Repair or replace. Replace.</p>
Transmission jumps out of gear.	<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 stopper spring on gearshift stopper.</li> <li>4. Worn gearshift pawl.</li> </ol>	<p>Replace. Replace. Replace. Replace.</p>
Engine idles poorly.	<ol style="list-style-type: none"> <li>1. Out of adjustment valve clearance.</li> <li>2. Poor seating of valves.</li> <li>3. Defective valve guides.</li> <li>4. Worn tappet or cam surface.</li> <li>5. Too wide spark plug gaps.</li> <li>6. Defective ignition coil.</li> <li>7. Defective signal generator or ignitor unit.</li> <li>8. Out of adjustment in carburetors float-chamber fuel level.</li> <li>9. Clogged jets or imbalance of carburetors.</li> <li>10. Defective fuel pump or ignitor unit.</li> </ol>	<p>Adjust. Replace or repair. Replace. Replace. Adjust or replace. Replace. Replace. Adjust.</p> <p>Clean or adjust. Replace.</p>

Complaint	Symptom and possible causes	Remedy
<b>Engine runs poorly in high speed range.</b>	<ol style="list-style-type: none"> <li>1. Weakened valve springs.</li> <li>2. Worn camshafts.</li> <li>3. Valve timing out of adjustment.</li> <li>4. Too narrow spark plug gaps.</li> <li>5. Ignition not advanced sufficiently due to poorly working timing advance circuit.</li> <li>6. Defective ignition coil.</li> <li>7. Defective signal generator or ignitor unit.</li> <li>8. Too low float-chamber fuel level.</li> <li>9. Clogged air cleaner element.</li> <li>10. Clogged fuel hose, resulting in inadequate fuel supply to carburetors.</li> <li>11. Defective fuel pump or ignitor unit.</li> </ol>	<p>Replace. Replace. Adjust. Adjust. Replace ignitor unit.</p> <p>Replace. Replace. Adjust. Clean. Clean and prime.</p> <p>Replace.</p>
<b>Dirty or heavy exhaust smoke.</b>	<ol style="list-style-type: none"> <li>1. Too much engine oil in the engine.</li> <li>2. Worn piston rings or cylinders.</li> <li>3. Worn valve guides.</li> <li>4. Scored or scuffed cylinder walls.</li> <li>5. Worn valves stems.</li> <li>6. Defective stem seal.</li> <li>7. Worn oil ring side rails.</li> </ol>	<p>Check with inspection window drain out excess oil.</p> <p>Replace. Replace. Rebore or replace. Replace. Replace. Replace.</p>
<b>Engine lacks power.</b>	<ol style="list-style-type: none"> <li>1. Loss of valve clearance.</li> <li>2. Weakened valve springs.</li> <li>3. Out of adjustment valve timing.</li> <li>4. Worn piston rings or cylinders.</li> <li>5. Poor seating of valves.</li> <li>6. Fouled spark plug.</li> <li>7. Incorrect spark plug.</li> <li>8. Clogged jets in carburetors.</li> <li>9. Out of adjustment float-chamber fuel level.</li> <li>10. Clogged air cleaner element.</li> <li>11. Loose carburetor balancing screw.</li> <li>12. Sucking air from intake pipe.</li> <li>13. Too much engine oil.</li> <li>14. Defective fuel pump or ignitor unit.</li> </ol>	<p>Adjust. Replace. Adjust. Replace. Repair. Clean or replace. Adjust or replace. Clean. Adjust. Clean. Retighten. Retighten or replace. Drain out excess oil. Replace.</p>
<b>Engine overheats.</b>	<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. Too low in float chambers fuel level.</li> <li>5. Sucking air from intake pipes.</li> <li>6. Use incorrect engine oil.</li> <li>7. Defective cooling system.</li> </ol>	<p>Clean. Add oil. Replace or clean. Adjust. Retighten or replace. Change. See radiator section.</p>



## RADIATOR

Complaint	Symptom and possible causes	Remedy
Engine overheats.	<ol style="list-style-type: none"> <li>1. Not enough cooling water.</li> <li>2. Clogged with dirt or trashes radiator core.</li> <li>3. Erratic thermostat, stuck in closed position.</li> <li>4. Faulty cooling fan.</li> <li>5. Defective thermo-switch.</li> <li>6. Clogged water passage.</li> <li>7. Air trapped in the cooling circuit.</li> <li>8. Defective water pump.</li> <li>9. Use incorrect coolant.</li> </ol>	Add coolant. Clean. Replace. Repair or replace. Replace. Clean. Bleed out air. Replace. Replace.
Engine overcools.	<ol style="list-style-type: none"> <li>1. Erratic thermostat, stuck in full-open position.</li> <li>2. Defective thermo-switch.</li> <li>3. Extremely cold weather.</li> </ol>	Replace. Replace. Put on the radiator cover.

## CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	<ol style="list-style-type: none"> <li>1. Clogged starter jet.</li> <li>2. Clogged starter pipe.</li> <li>3. Air leaking from a joint between starter body and carburetor.</li> <li>4. Air leaking from carburetor's joint or vacuum gauge joint.</li> <li>5. Not operation properly starter plunger.</li> </ol>	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust. Check and adjust.
Idling or low-speed trouble.	<ol style="list-style-type: none"> <li>1. Clogged or loose pilot jet, pilot air jet.</li> <li>2. Air leaking from carburetor's joint, vacuum gauge joint, or starter.</li> <li>3. Clogged pilot outlet or bypass.</li> <li>4. Not fully closed starter plunger.</li> </ol>	Check and clean. Check and adjust. Check and clean. Check and adjust.
Medium-or high speed trouble.	<ol style="list-style-type: none"> <li>1. Clogged main jet or main air jet.</li> <li>2. Clogged needle jet.</li> <li>3. Not operating properly throttle valve.</li> <li>4. Clogged fuel filter.</li> </ol>	Check and clean. Check and clean. Check throttle valve for operation. Check and clean.
Overflow and fuel level fluctuations.	<ol style="list-style-type: none"> <li>1. Worn or damaged needle valve.</li> <li>2. Broken spring in needle valve.</li> <li>3. Not working properly float.</li> <li>4. Foreign matter has adhered to needle valve.</li> <li>5. Too high or low fuel level.</li> <li>6. Defective fuel pump or ignitor unit.</li> </ol>	Replace. Replace. Check and adjust. Clean. Adjust float height. Replace.

## ELECTRICAL

Complaint	Symptom and possible causes	Remedy
<b>No sparking or poor sparking.</b>	<ol style="list-style-type: none"> <li>1. Defective ignition coil.</li> <li>2. Defective spark plugs.</li> <li>3. Defective signal generator or ignitor unit.</li> </ol>	Replace. Replace. Replace.
<b>Spark plug soon become fouled with carbon.</b>	<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. Too cold spark plugs.</li> </ol>	Adjust carburetors. Adjust carburetors. Change. Clean. Replace with hot type plugs.
<b>Spark plugs become fouled too soon.</b>	<ol style="list-style-type: none"> <li>1. Worn piston rings.</li> <li>2. Worn piston or cylinders.</li> <li>3. Excessive clearance of valve stems in valve guides.</li> <li>4. Worn stem oil seal.</li> </ol>	Replace. Replace. Replace. Replace.
<b>Spark plug electrodes overheat or burn.</b>	<ol style="list-style-type: none"> <li>1. Too hot spark plugs.</li> <li>2. Overheated the engine.</li> <li>3. Loose spark plugs.</li> <li>4. Too lean mixture.</li> </ol>	Replace with cold type plugs. Tune up. Retighten. Adjust carburetors.
<b>Generator does not charge.</b>	<ol style="list-style-type: none"> <li>1. Open or short lead wires, or loose lead connections.</li> <li>2. Shorted, grounded or open generator coils.</li> <li>3. Shorted or punctured regulator/rectifiers.</li> </ol>	Repair or replace or retighten. Replace. Replace.
<b>Generator does charge, but charging rate is below the specification.</b>	<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 or generator.</li> <li>3. Defective regulator/rectifier.</li> <li>4. Defective cell plates in the battery.</li> </ol>	Repair or retighten. Replace. Replace. Replace the battery.
<b>Generator overcharges.</b>	<ol style="list-style-type: none"> <li>1. Internal short-circuit in the battery.</li> <li>2. Damaged or defective resistor element in the regulator/rectifier.</li> <li>3. Poorly grounded regulator/rectifier.</li> </ol>	Replace the battery. Replace. Clean and tighten ground connection.
<b>Unstable charging.</b>	<ol style="list-style-type: none"> <li>1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting.</li> <li>2. Internally shorted generator.</li> <li>3. Defective regulator/rectifier.</li> </ol>	Repair or replace. Replace. Replace.
<b>Starter button is not effective.</b>	<ol style="list-style-type: none"> <li>1. Run down battery.</li> <li>2. Defective switch contacts.</li> <li>3. Not seating properly brushes on commutator in starter motor.</li> <li>4. Defective starter relay/starter interlock switch.</li> </ol>	Repair or replace. Replace. Repair or replace. Replace.

## BATTERY

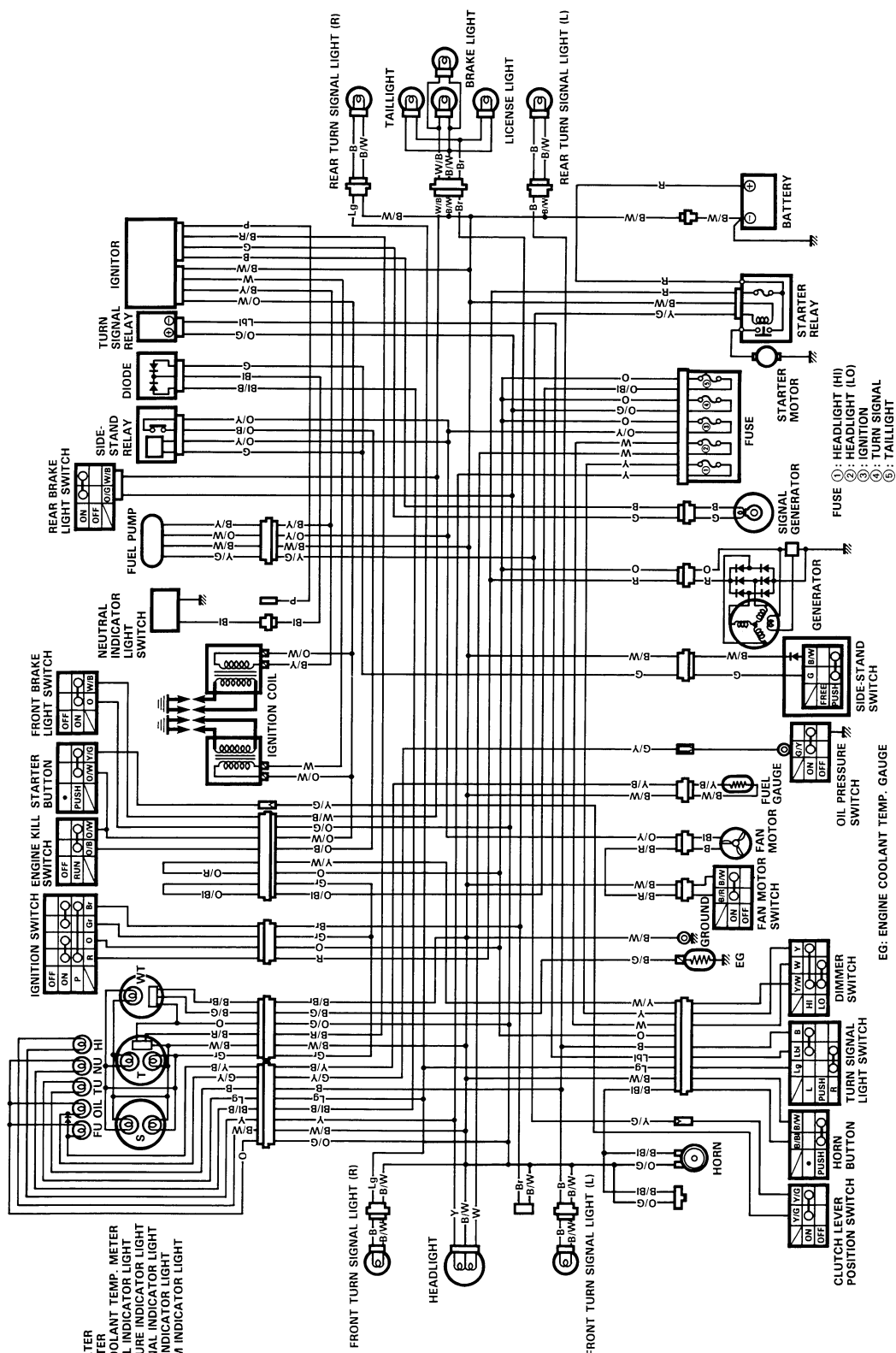
Complaint	Symptom and possible causes	Remedy
<b>“Sulfation”, acidic white powdery substance or spots on surfaces of cell plates.</b>	<ol style="list-style-type: none"> <li>1. Cracked battery case.</li> <li>2. Battery has been left in a run-down condition for a long time.</li> </ol>	<p>Replace the battery. Replace the battery.</p>
<b>Battery runs down quickly.</b>	<ol style="list-style-type: none"> <li>1. Not correct the charging system.</li> <li>2. Cell plates have lost much of their active material as a result of overcharging.</li> <li>3. A short-circuit condition exists within the battery.</li> <li>4. Too low battery voltage.</li> <li>5. Too old battery.</li> </ol>	<p>Check the generator, regulator/rectifier and circuit connections and make necessary adjustments to obtain specified charging operation. Replace the battery, and correct the charging system. Replace the battery. Recharge the battery fully. Replace the battery.</p>
<b>Battery “sulfation”.</b>	<ol style="list-style-type: none"> <li>1. Too low or too high charging rate. (When not in use batteries should be checked at least once a month to avoid sulfation.)</li> <li>2. Left unused the battery for too long in cold climate.</li> </ol>	<p>Replace the battery.  Replace the battery, if badly sulfated.</p>
<b>Battery discharges too rapidly.</b>	Dirty container top and sides.	Clean.

## CHASSIS

Complaint	Symptom and possible causes	Remedy
<b>Heavy steering.</b>	<ol style="list-style-type: none"> <li>1. Overtightened steering stem nut.</li> <li>2. Broken bearing in steering stem.</li> <li>3. Distorted steering stem.</li> <li>4. Not enough pressure in tires.</li> </ol>	Adjust. Replace. Replace. Adjust.
<b>Wobbly handlebars.</b>	<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> </ol>	Replace. Repair or replace. Replace.
<b>Wobbly front wheel.</b>	<ol style="list-style-type: none"> <li>1. Distorted wheel rim.</li> <li>2. Worn front wheel bearings.</li> <li>3. Defective or incorrect tire.</li> <li>4. Loose axle.</li> <li>5. Incorrect front fork oil.</li> </ol>	Replace. Replace. Replace. Retighten. Adjust.
<b>Front suspension too soft.</b>	<ol style="list-style-type: none"> <li>1. Weakened springs.</li> <li>2. Not enough fork oil.</li> </ol>	Replace. Replenish.
<b>Front suspension too stiff.</b>	<ol style="list-style-type: none"> <li>1. Too viscous fork oil.</li> <li>2. Too much fork oil.</li> </ol>	Replace. Drain excess oil.
<b>Noisy front suspension.</b>	<ol style="list-style-type: none"> <li>1. Not enough fork oil.</li> <li>2. Loose bolts on suspension.</li> </ol>	Replenish. Retighten.
<b>Wobbly rear wheel.</b>	<ol style="list-style-type: none"> <li>1. Distorted wheel rim.</li> <li>2. Worn rear wheel bearing 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 suspensions.</li> </ol>	Replace. Replace. Replace. Replace. Retighten.
<b>Rear suspension too soft.</b>	<ol style="list-style-type: none"> <li>1. Weakened shock absorber spring.</li> <li>2. Improperly set rear suspension adjuster.</li> <li>3. Leakage oil of shock absorber.</li> <li>4. Leakage gas of shock absorber.</li> </ol>	Replace. Adjust. Replace. Replace.
<b>Rear suspension too stiff.</b>	<ol style="list-style-type: none"> <li>1. Improperly set rear suspension adjuster.</li> <li>2. Bent shock absorber shaft.</li> <li>3. Bent swingarm.</li> <li>4. Worn swingarm and rear cushion related bearings.</li> </ol>	Adjust. Replace. Replace. Replace.
<b>Noisy rear suspension.</b>	<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>	Retighten. Replace.

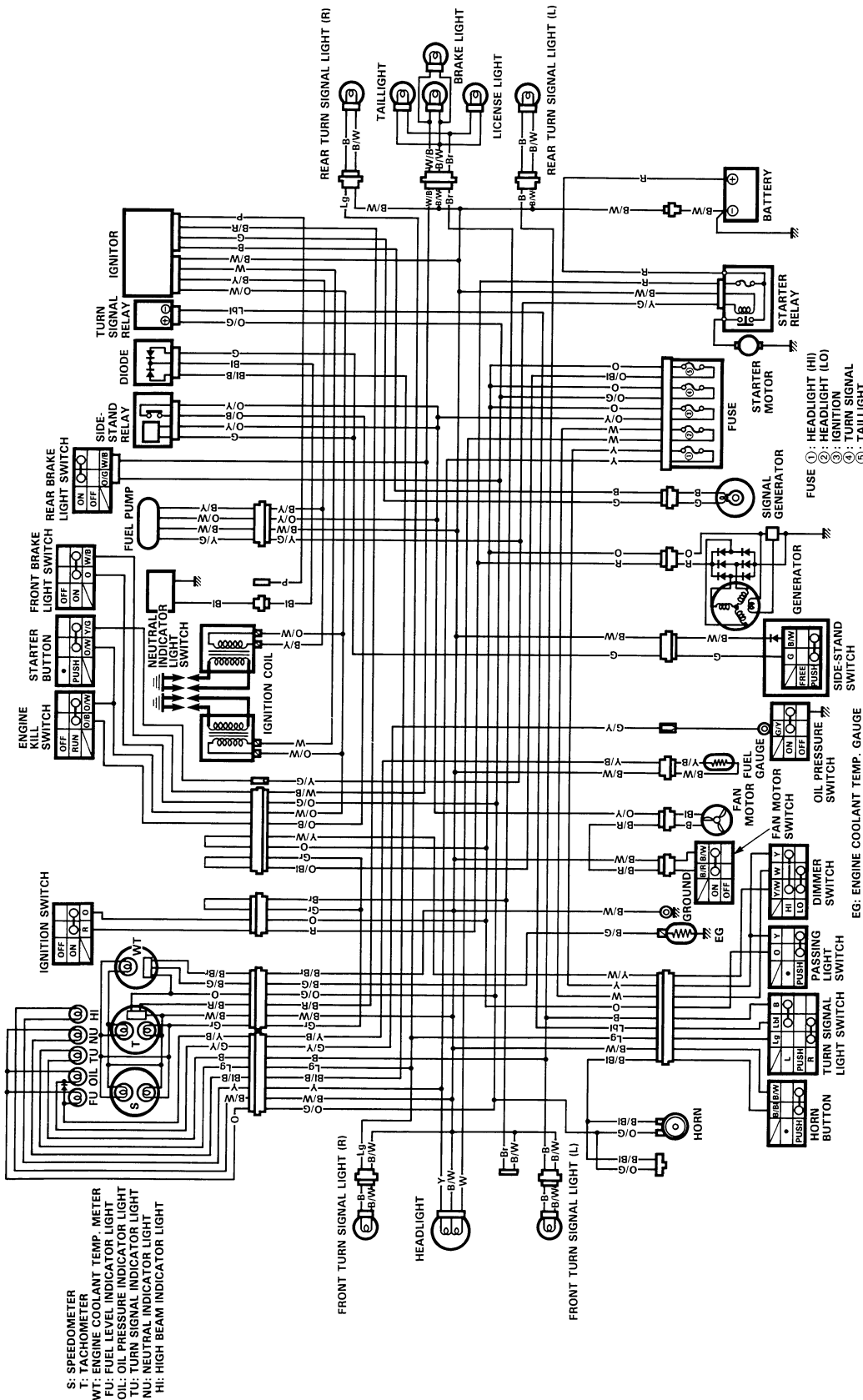
## BRAKES

Complaint	Symptom and possible causes	Remedy
<b>Insufficient brake power.</b>	<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 of engaging surface of pads.</li> <li>4. Worn disc.</li> <li>5. Air in hydraulic system.</li> </ol>	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air.
<b>Brake squeaking.</b>	<ol style="list-style-type: none"> <li>1. Carbon adhesion on pad surface.</li> <li>2. Tilted pad.</li> <li>3. Damaged wheel bearing.</li> <li>4. Loosen front-wheel axle or rear-wheel axle.</li> <li>5. Worn pads.</li> <li>6. Foreign material in brake fluid.</li> <li>7. Clogged return port of master cylinder.</li> </ol>	Repair surface with sandpaper. Modify pad fitting or replace. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
<b>Excessive brake lever stroke.</b>	<ol style="list-style-type: none"> <li>1. Air in 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.
<b>Leakage of brake fluid.</b>	<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.



	Black	Pink	B/W ..	Black with White tracer	O/W ..	Orange with White tracer
P .....		Pink				
R .....	Black	Red	B/Y ...	Black with Yellow tracer	O/Y ..	Orange with Yellow tracer
W .....	Blue	White	Bl/B ..	Blue with Black tracer	W/B ..	White with Black tracer
Y .....	Brown	Yellow	G/Y ..	Green with Yellow tracer	Y/B ...	Yellow with Black tracer
B/Br ..	Green	Black with Brown tracer	O/B ..	Orange with Black tracer	Y/G ..	Yellow with Green tracer
B/G ...	Gray	Black with Green tracer	O/Bl ..	Orange with Blue tracer	Y/W ..	Yellow with White tracer
B/Bl ..	Light blue	Black with Blue tracer	O/G ..	Orange with Green tracer		
B/R ...	Light green	Black with Red tracer	O/R ..	Orange with Red tracer		
O ....	Orange	Black with Red tracer				

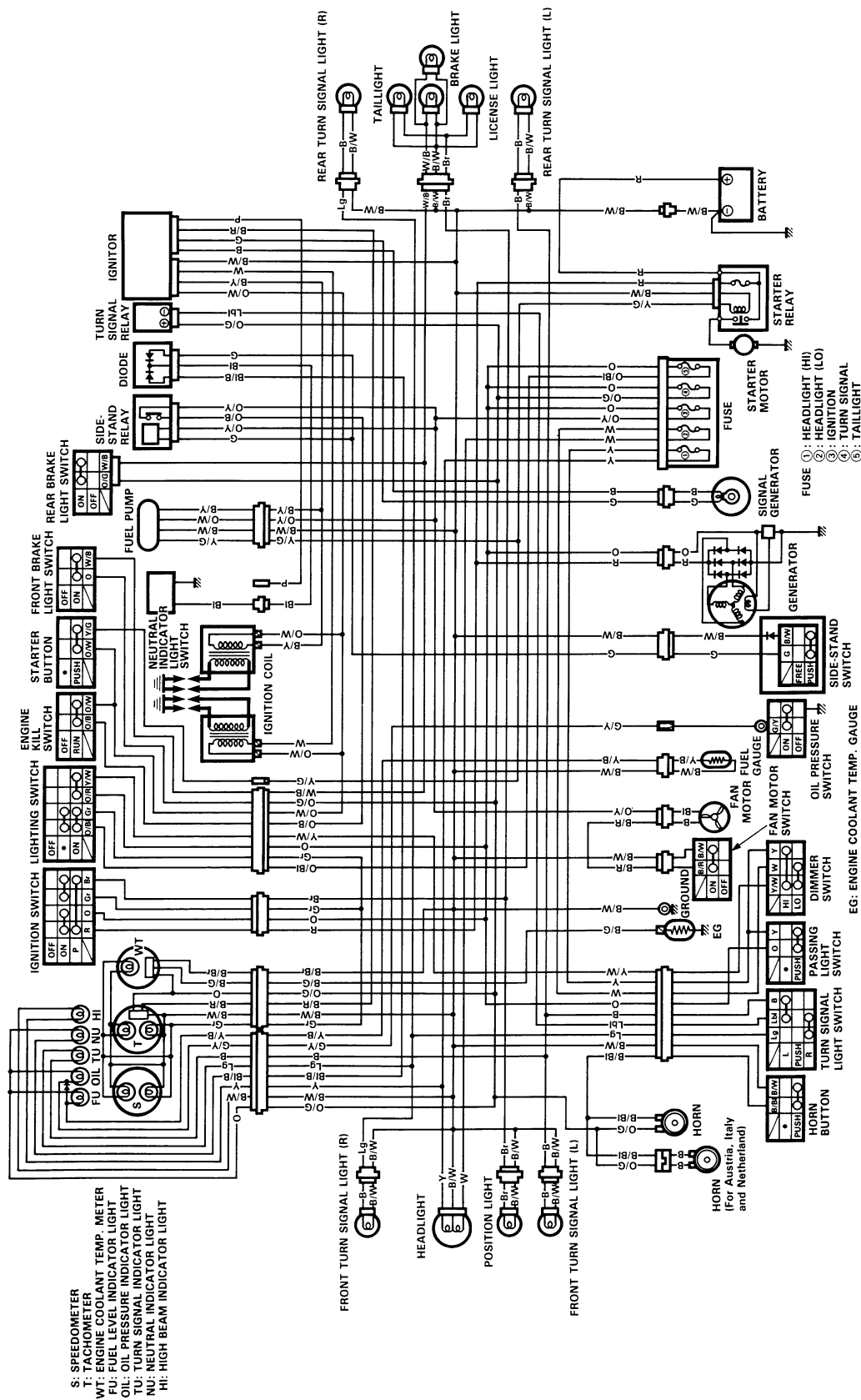
## For Australia



**WIRE COLOR**

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

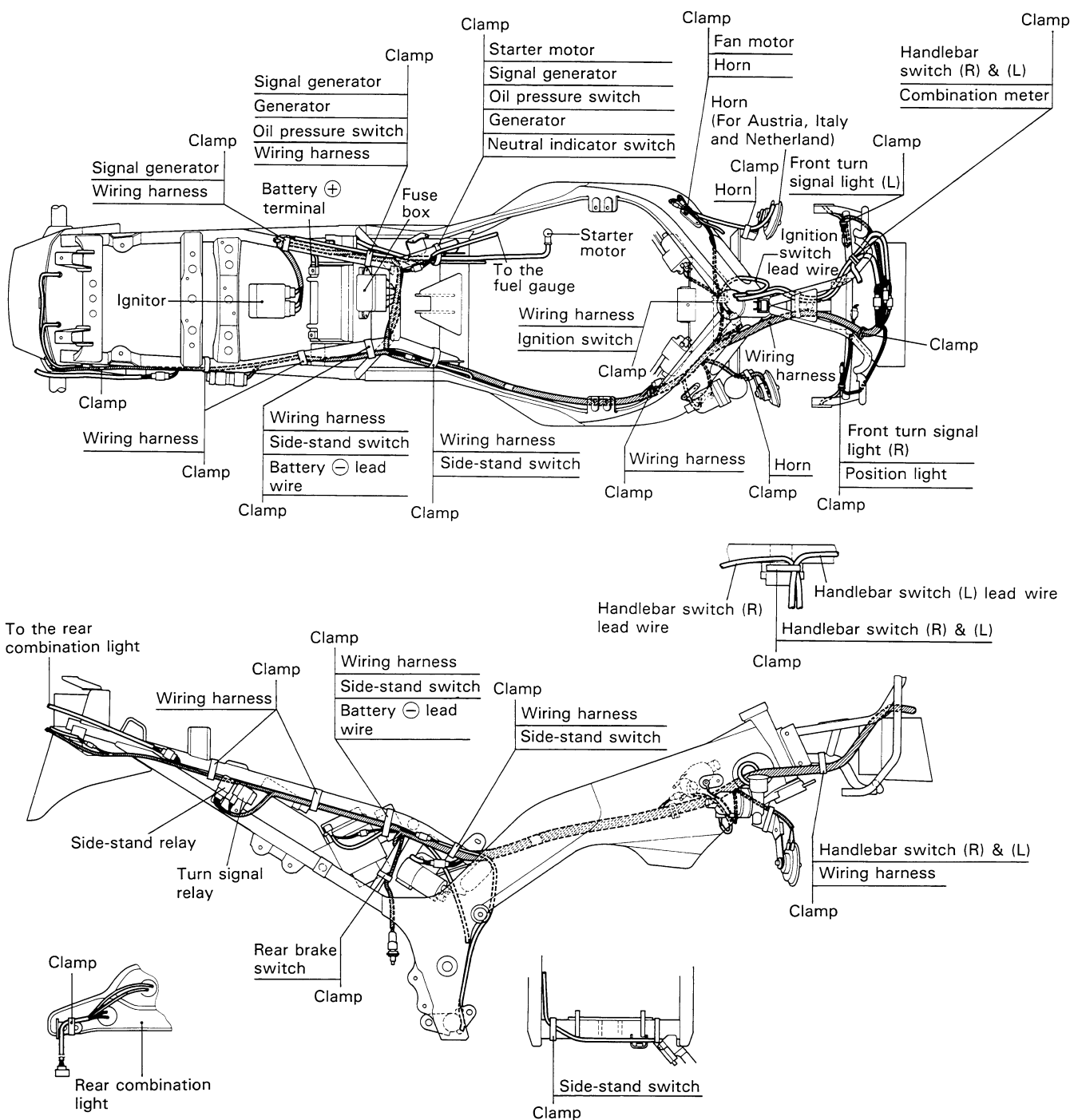
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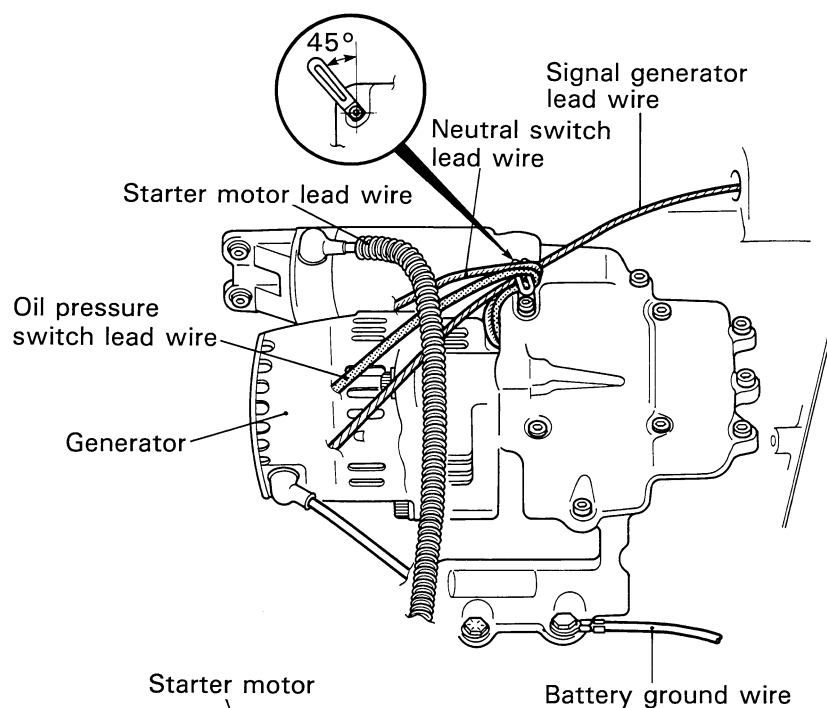


## WIRE COLOR

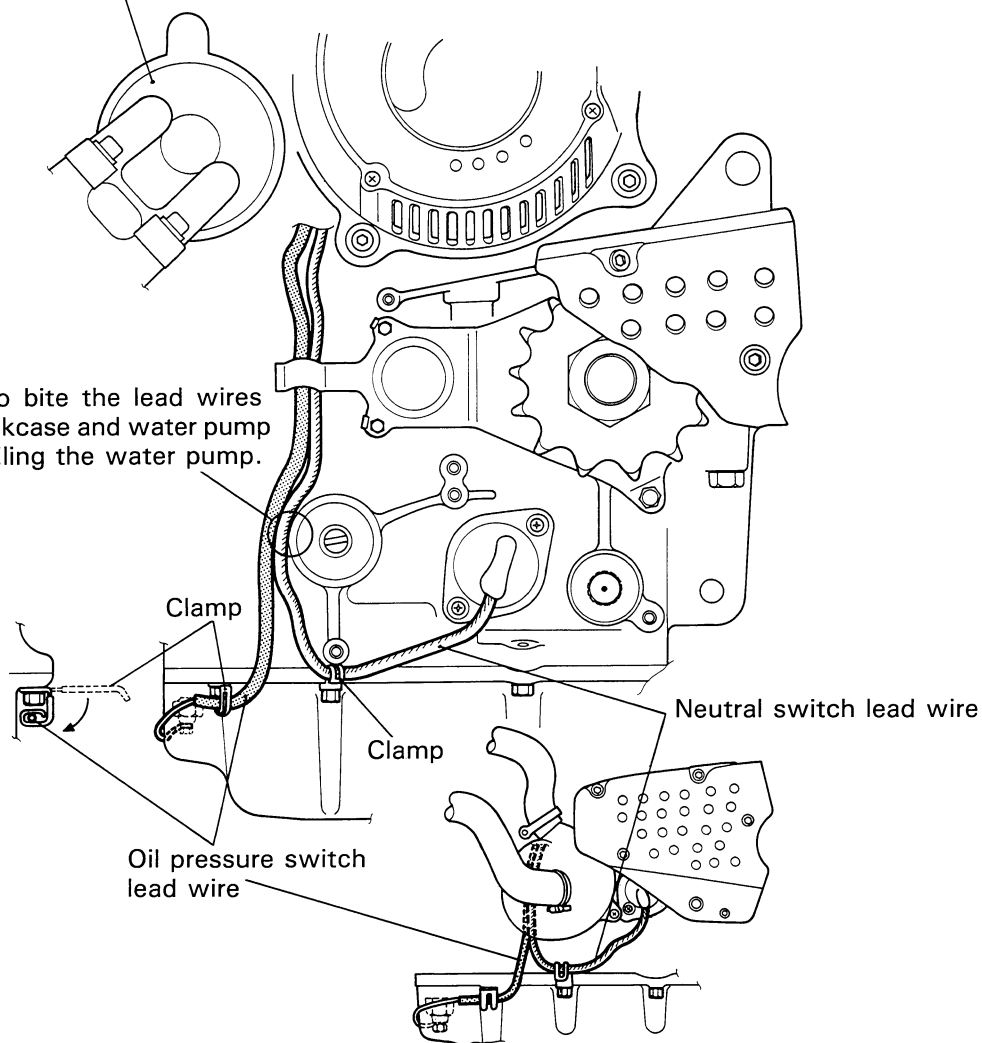
B ....	Black	B/W ..	Black with White tracer	O/W ..	Orange with White tracer
Bl ....	Blue	B/Y ...	Black with Yellow tracer	O/Y ..	Orange with Yellow tracer
Br ....	Brown	Bl/B ..	Blue with Black tracer	W/B ..	White with Black tracer
G ....	Green	G/Y ..	Green with Yellow tracer	Y/B ...	Yellow with Black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



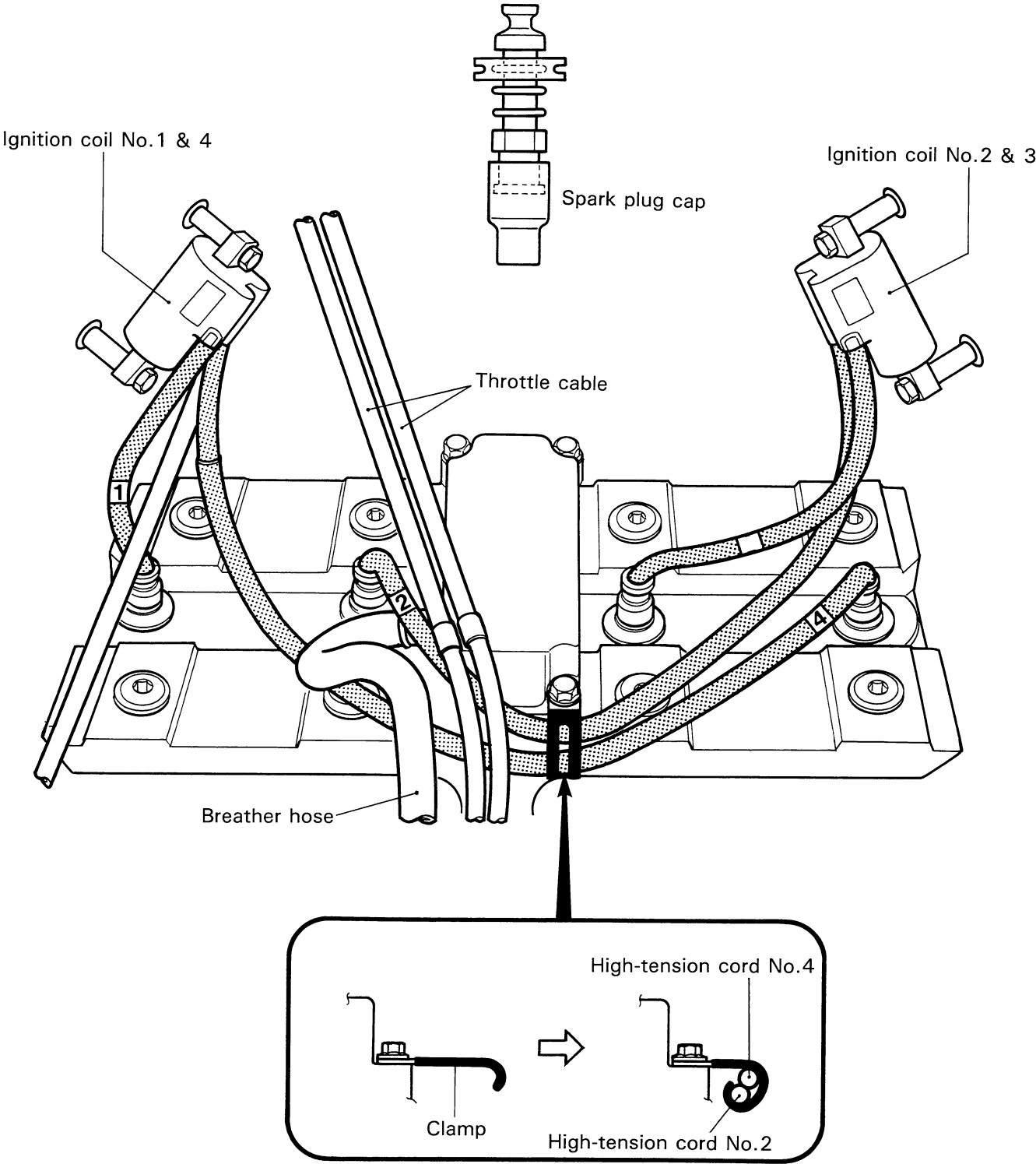




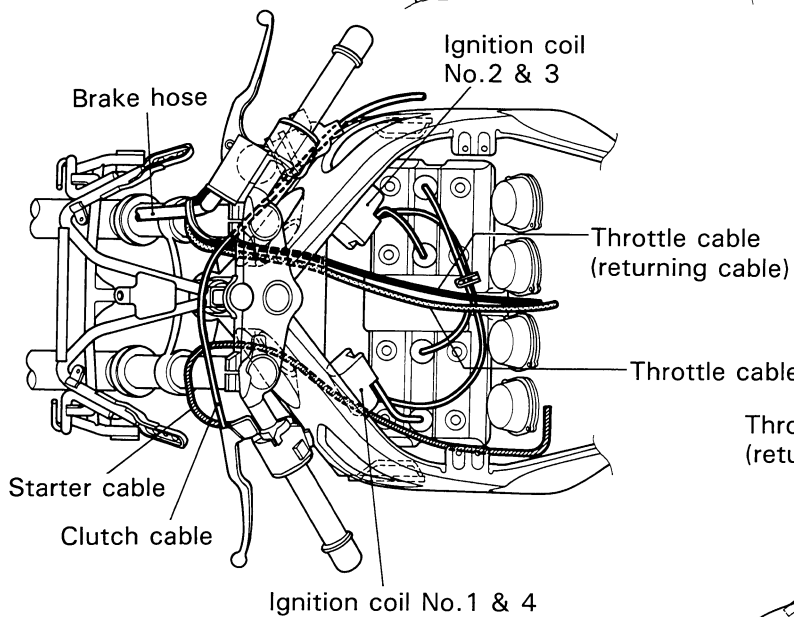
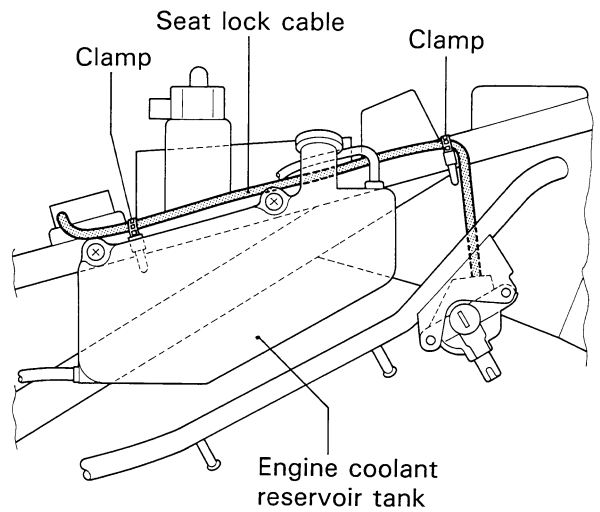
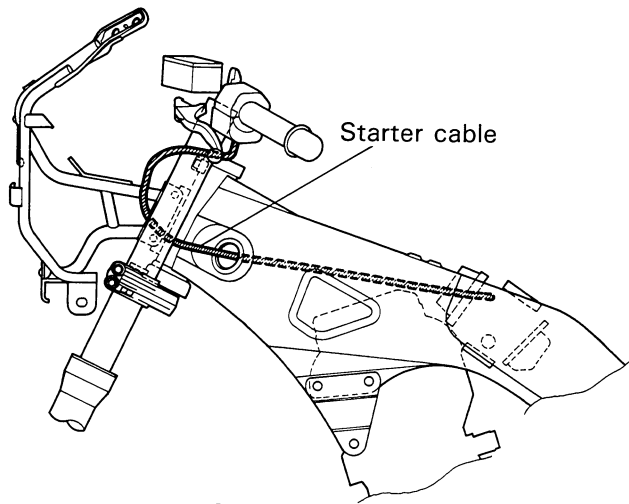
Be careful not to bite the lead wires between the crankcase and water pump case when installing the water pump.



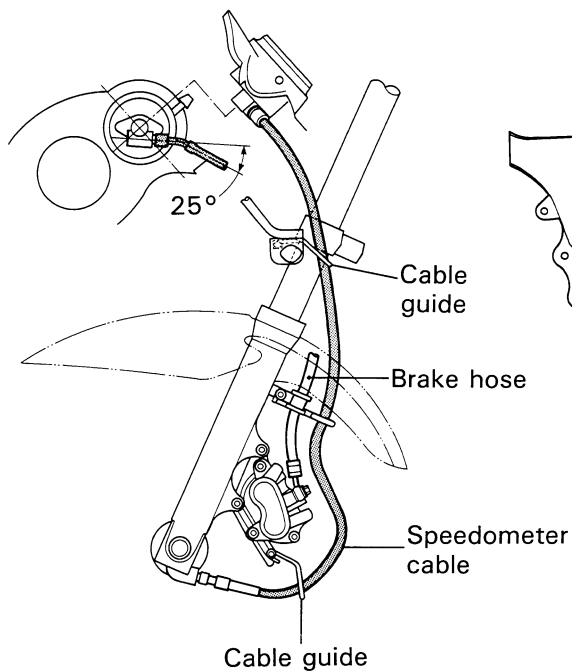
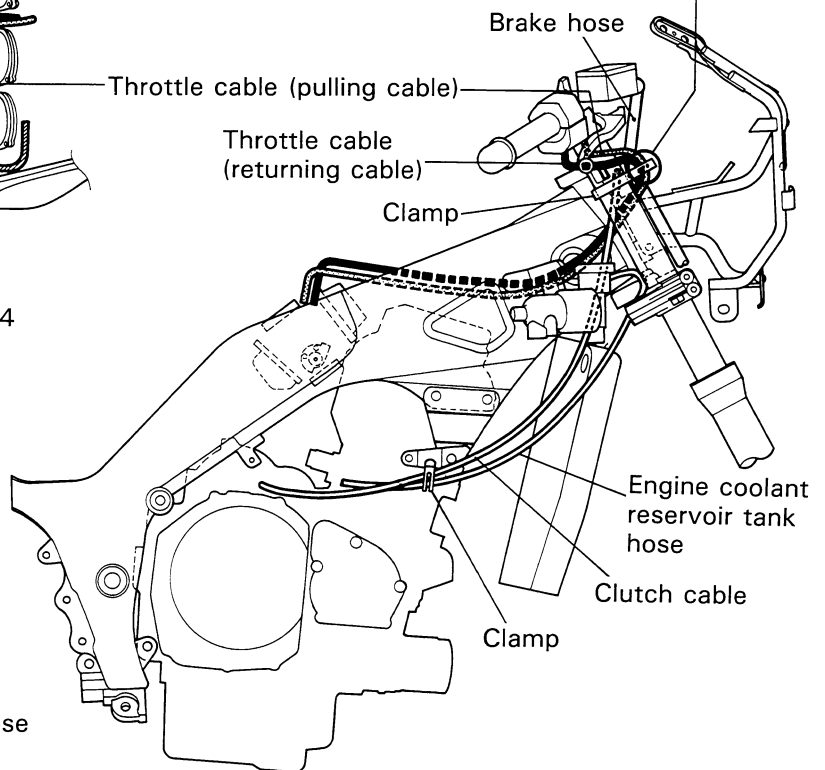
# HIGH-TENSION CORD ROUTING



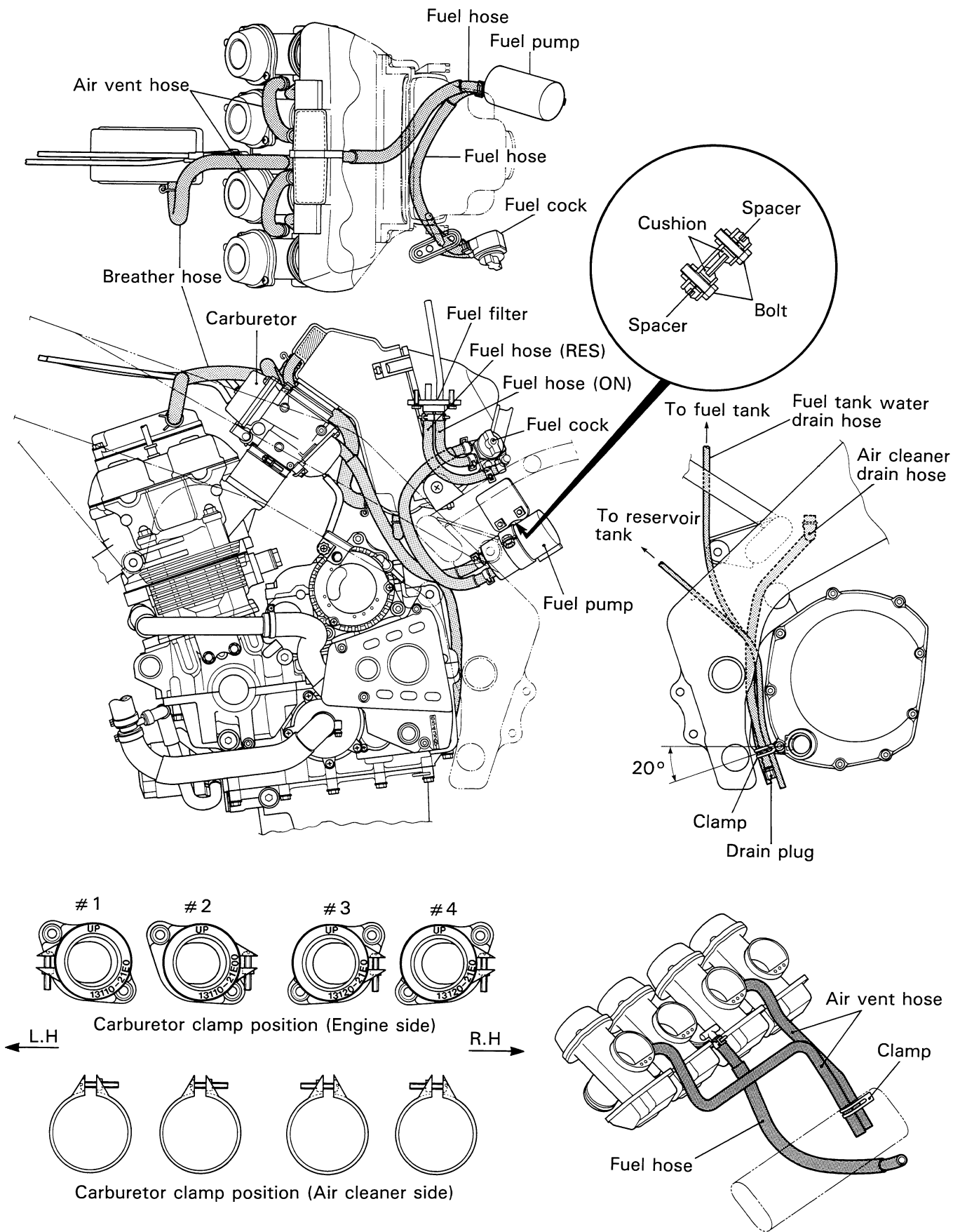
## CABLE ROUTING



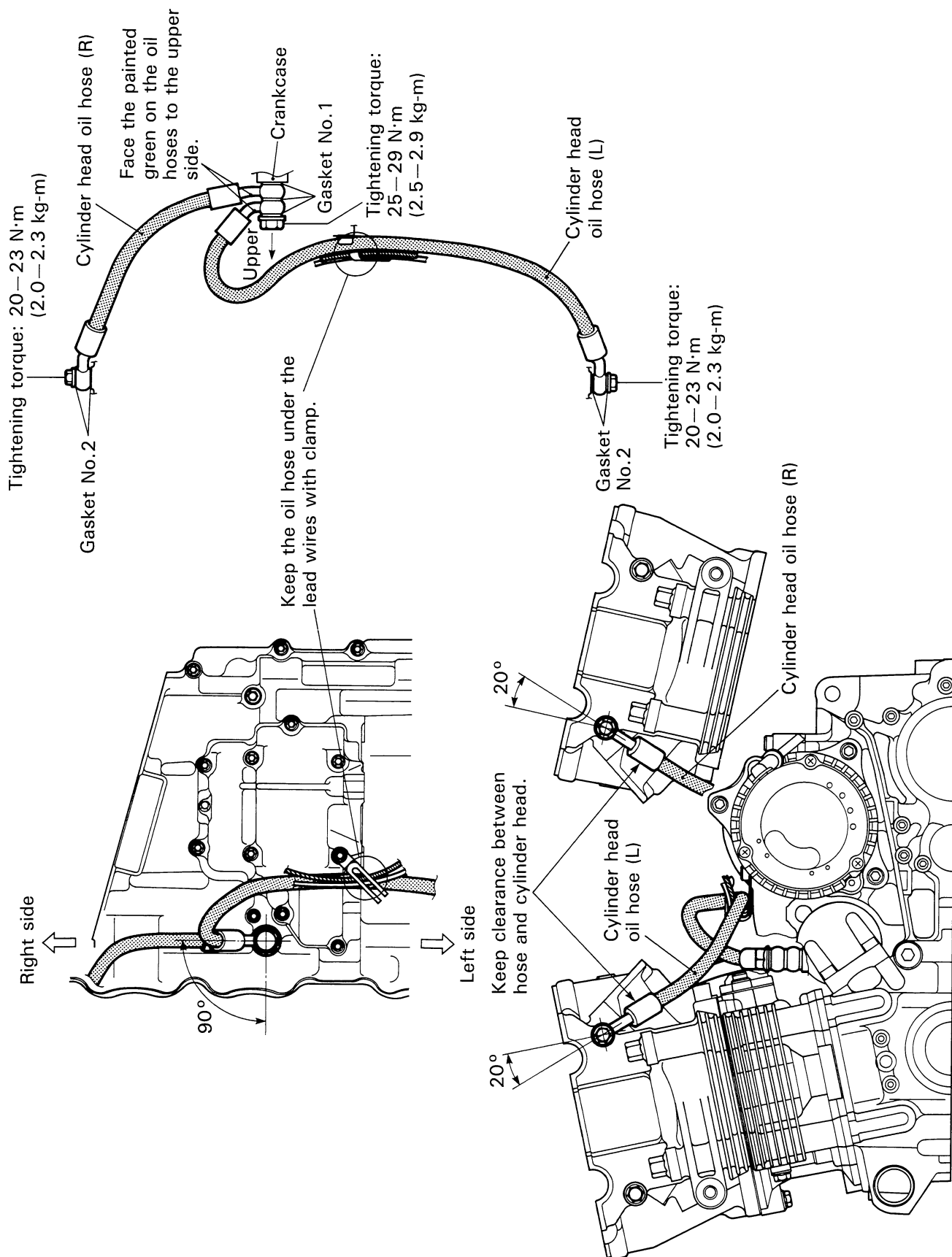
Pass through the throttle cables outside of the brake hose.



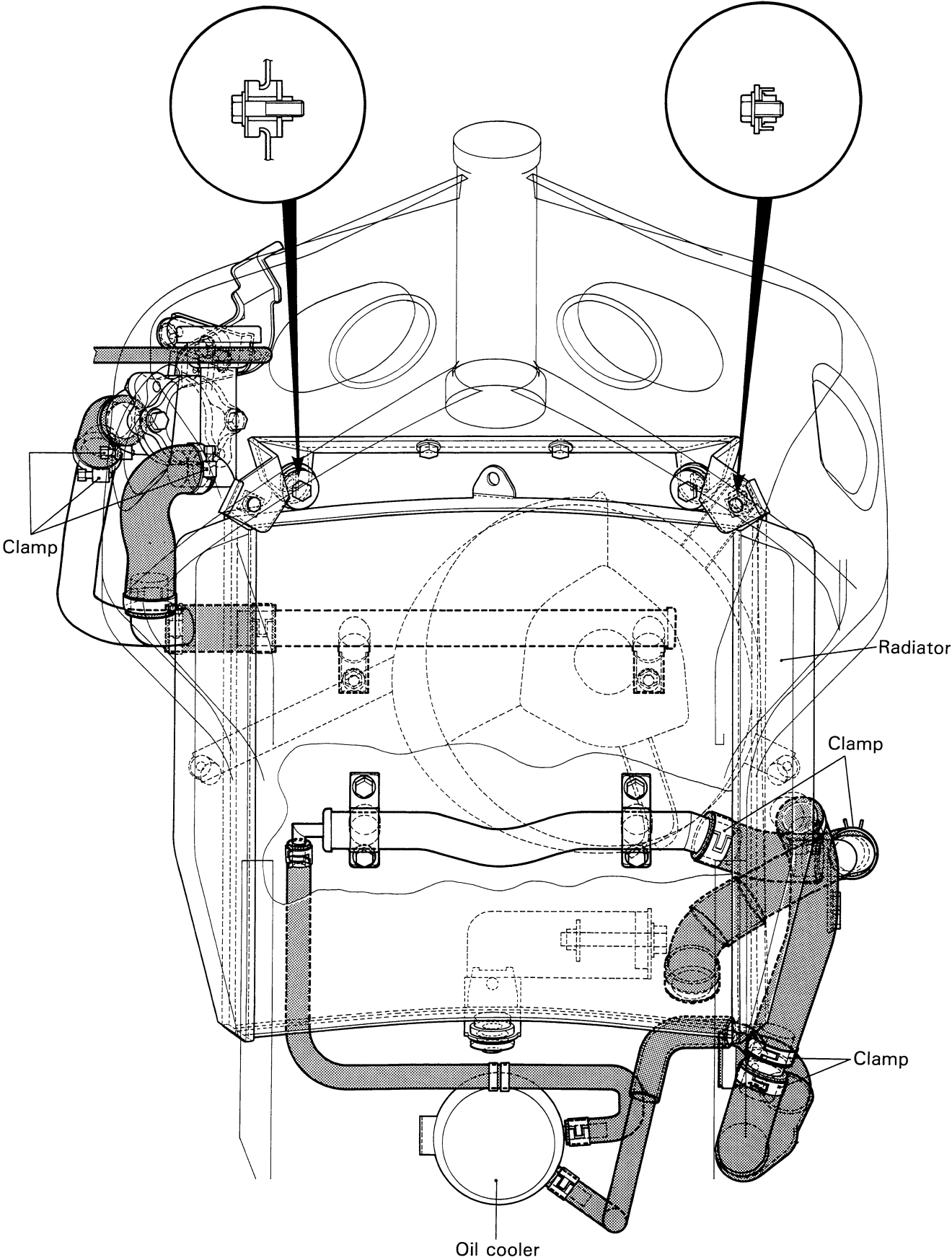
# FUEL SYSTEM HOSE ROUTING

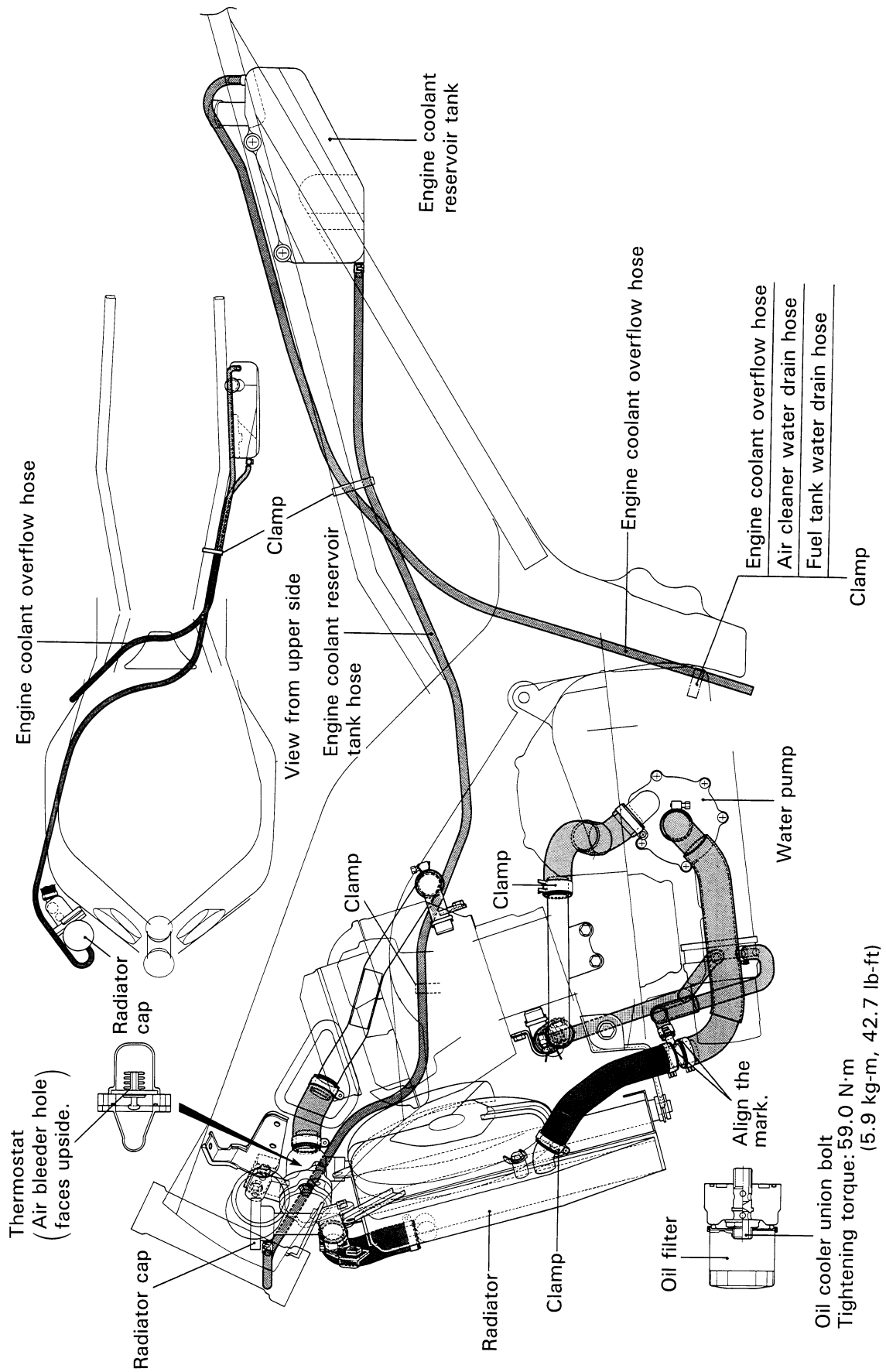


## OIL HOSE ROUTING



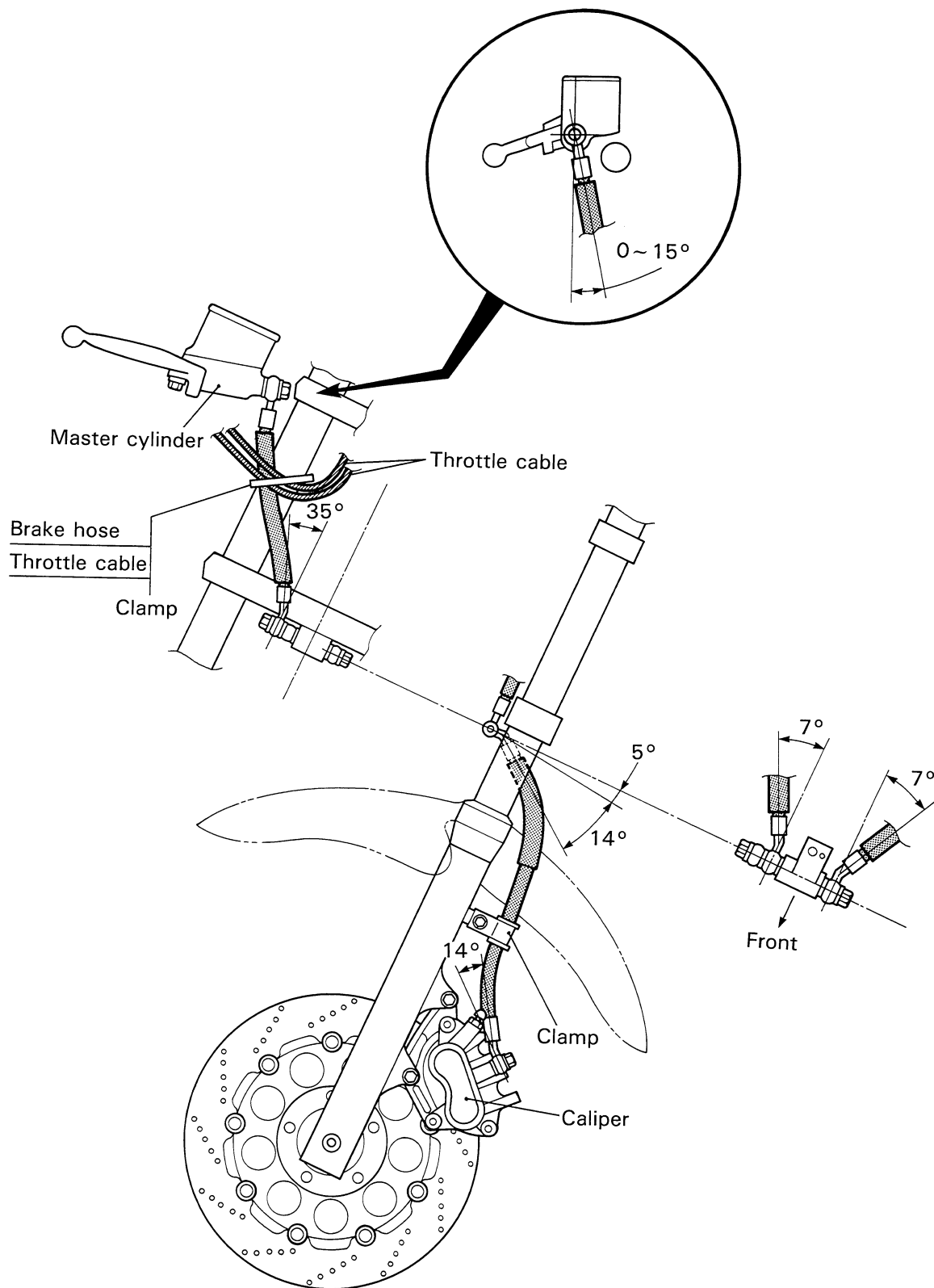
COOLING SYSTEM HOSE ROUTING



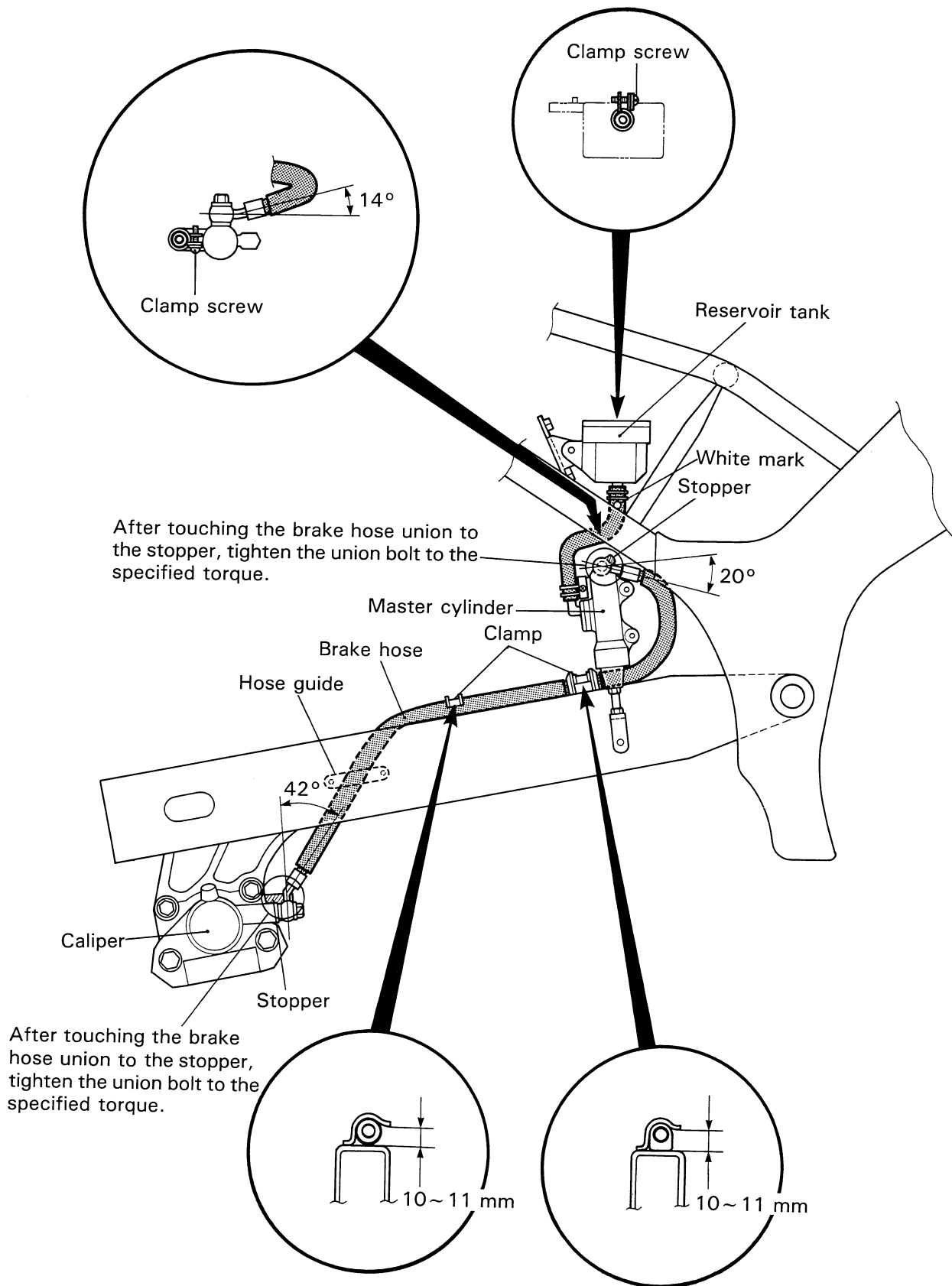




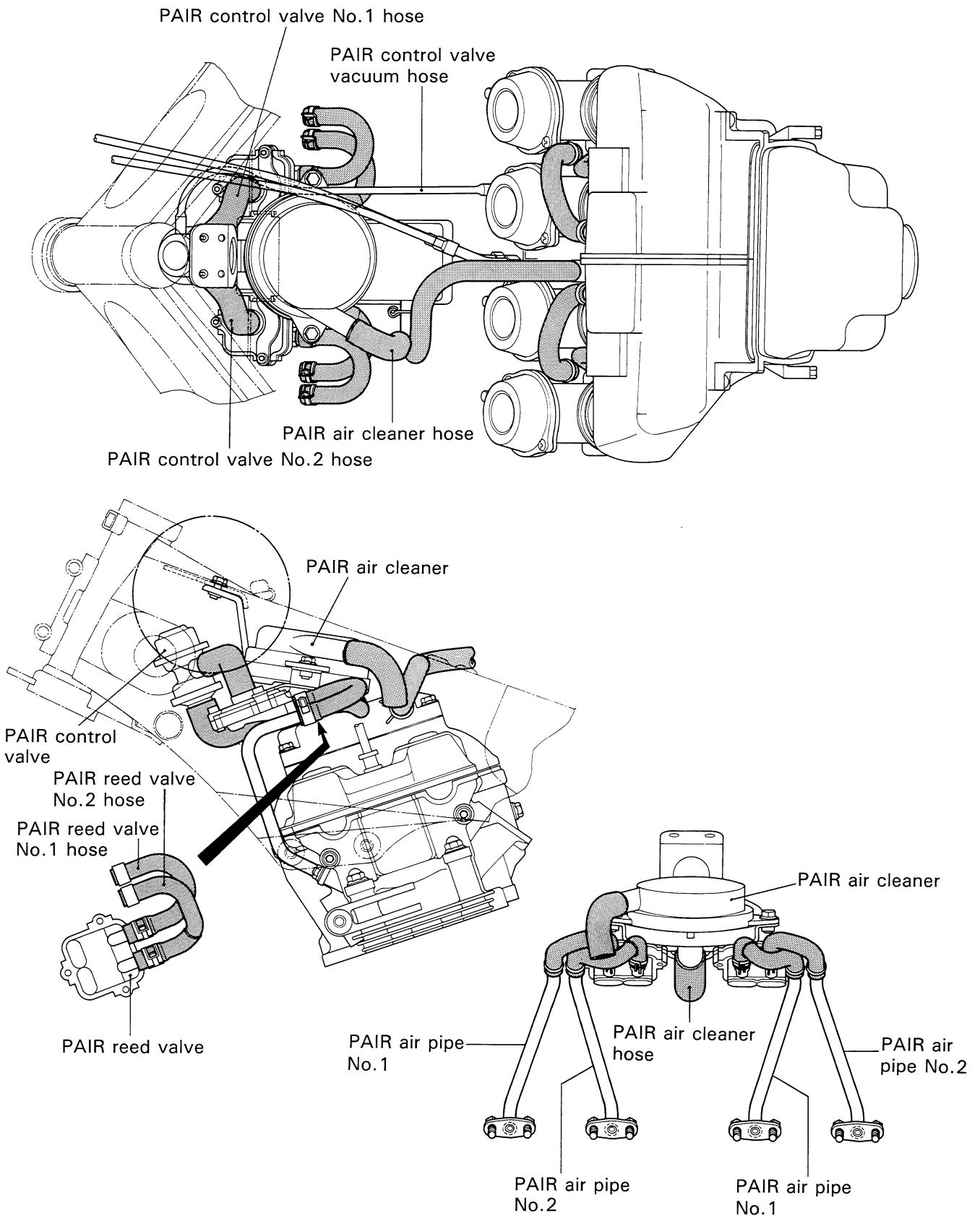
## FRONT BRAKE HOSE ROUTING



## REAR BRAKE HOSE ROUTING

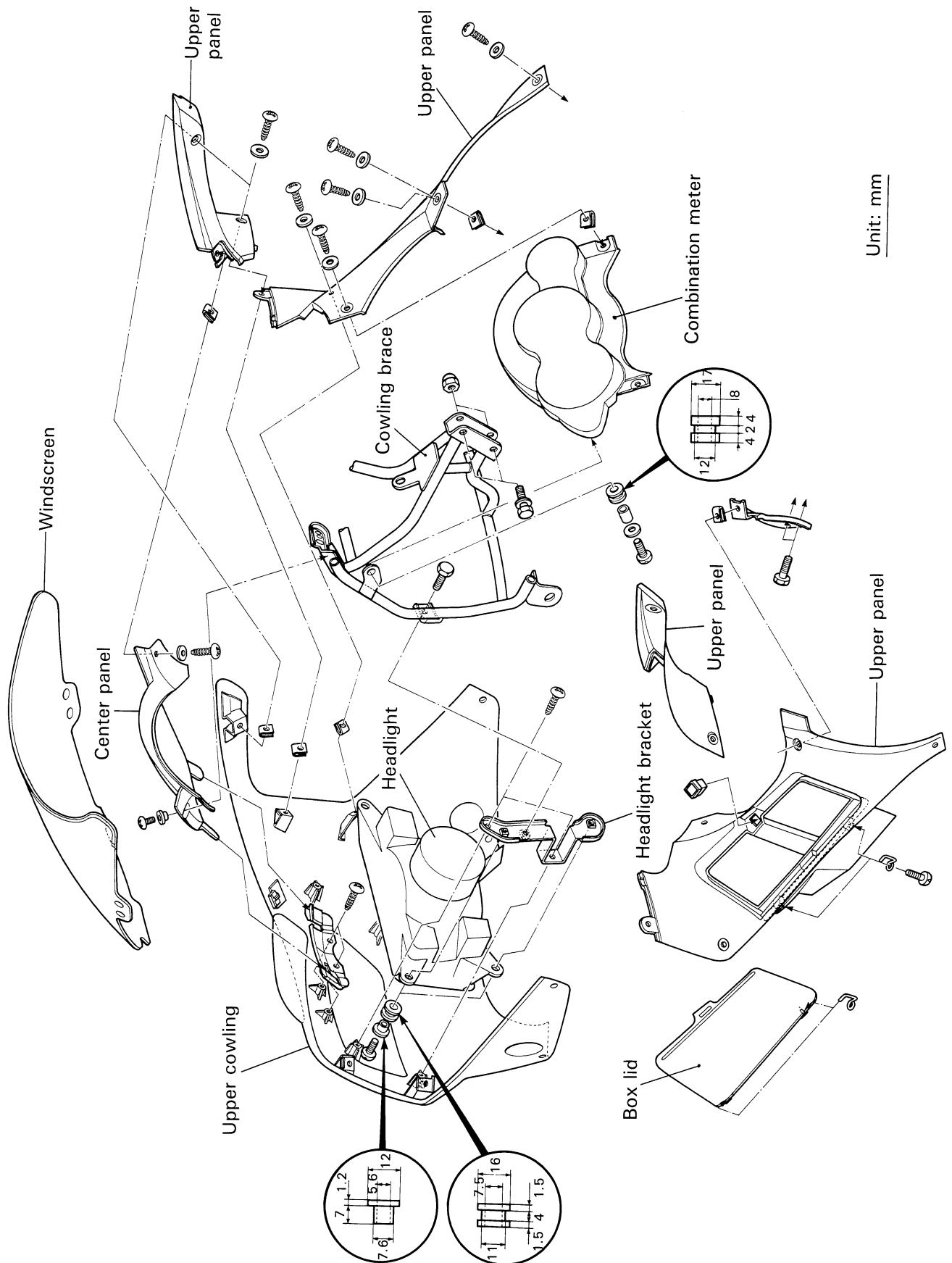


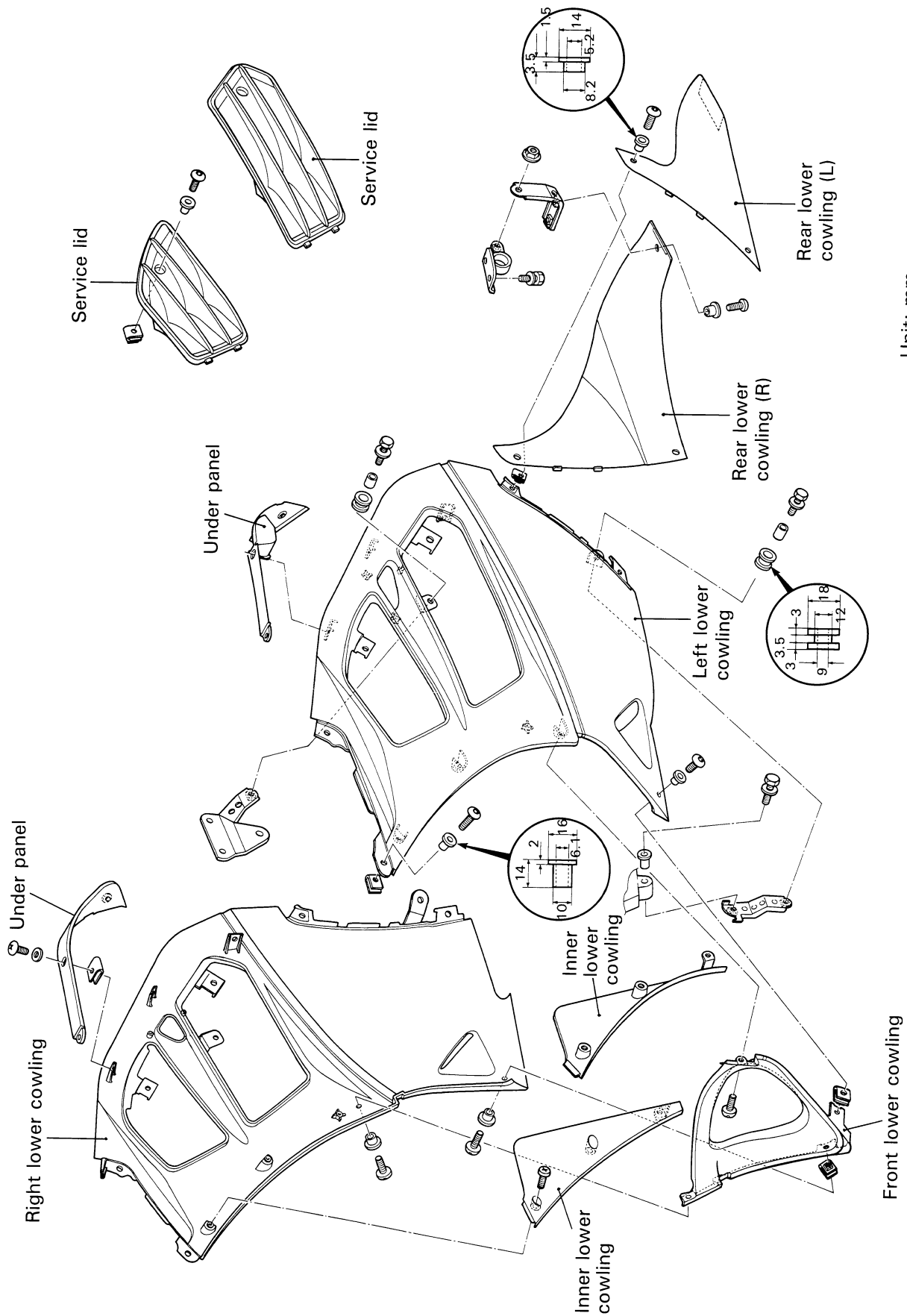
# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING (For Switzerland)



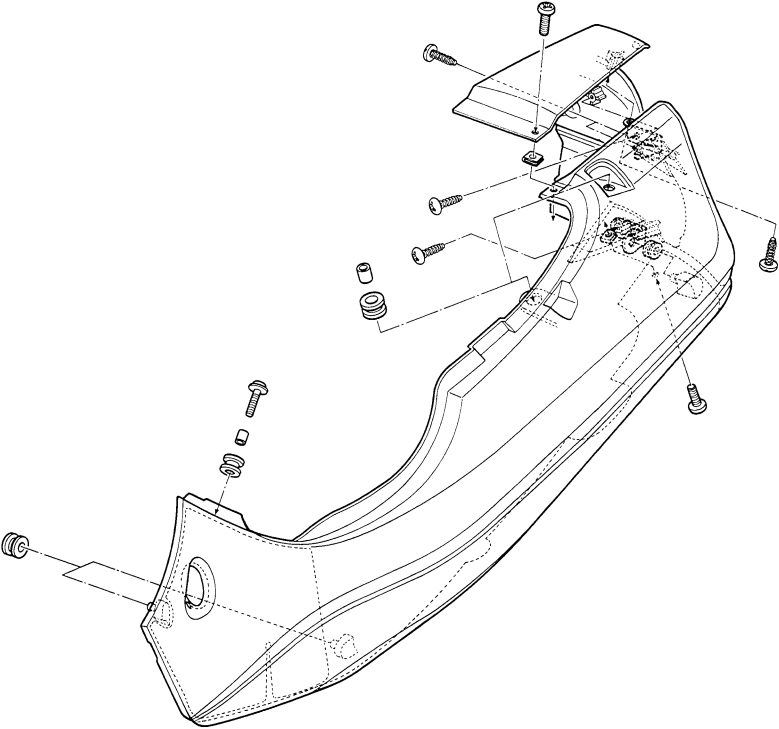
# COWLING AND FRAME COVER SET UP

## COWLING SET UP

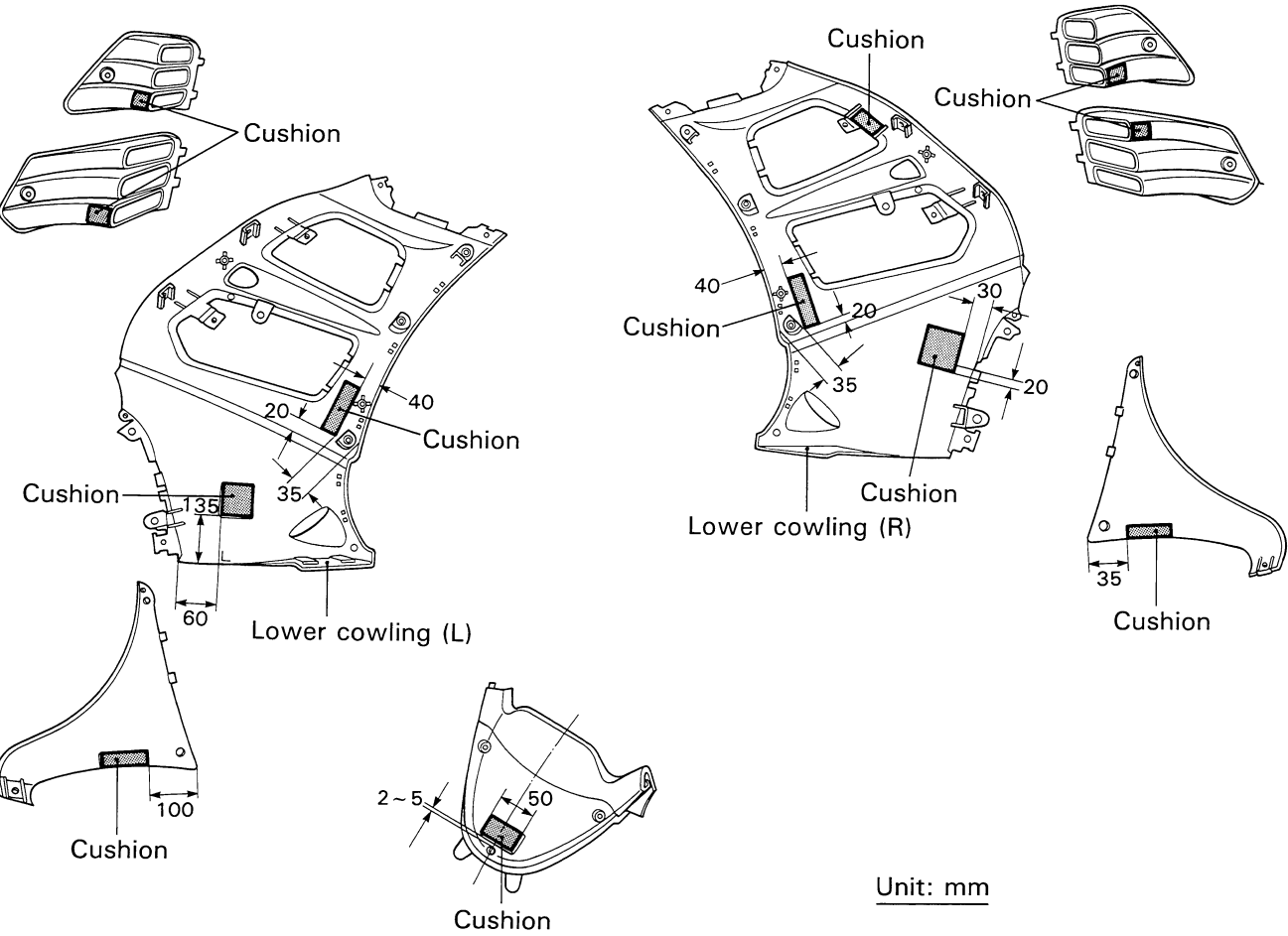




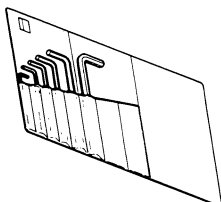
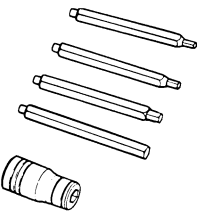
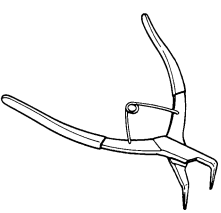
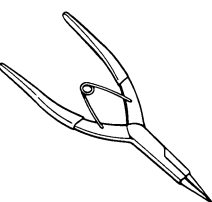
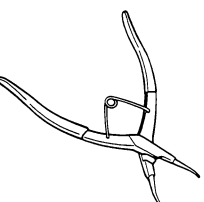
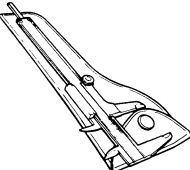
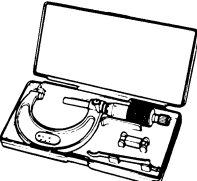
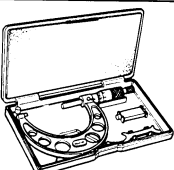


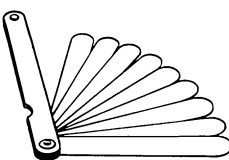
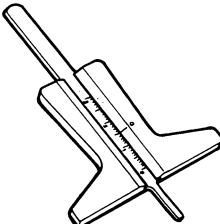
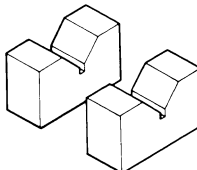
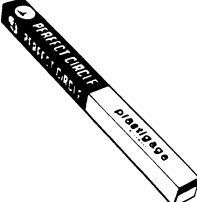
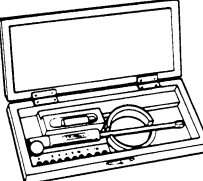

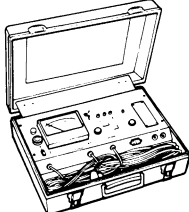
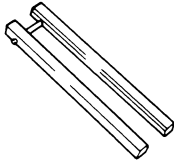
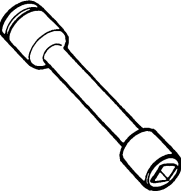
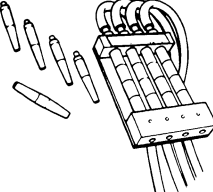
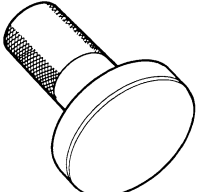
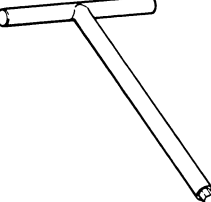
# FRAME COVER SET UP

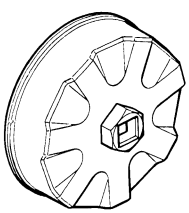
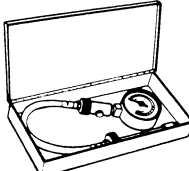
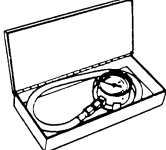
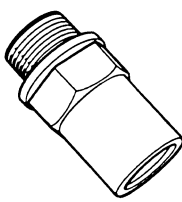
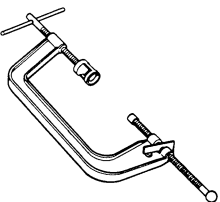
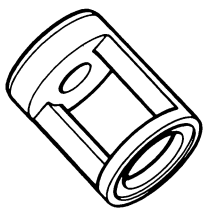
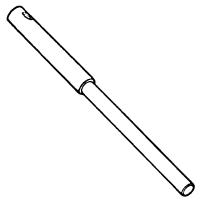
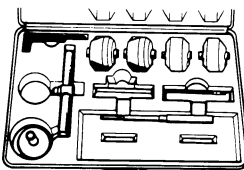
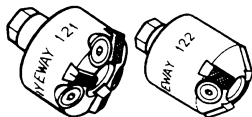
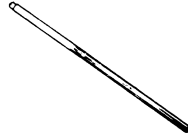



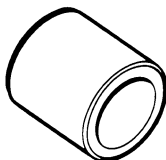
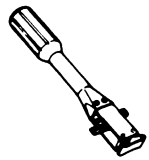
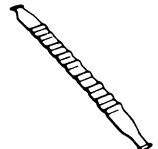
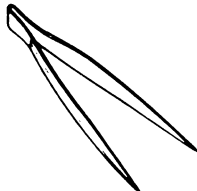
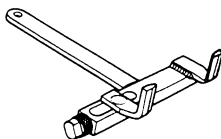

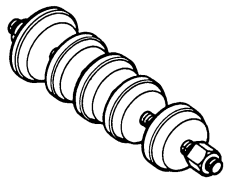
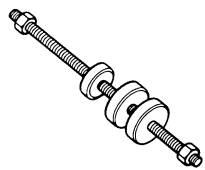
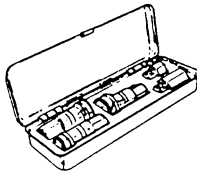
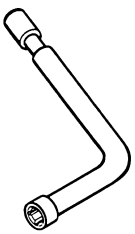

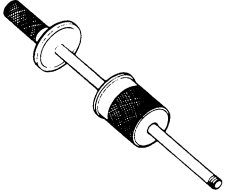
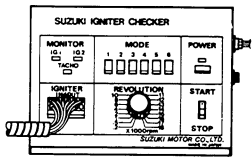
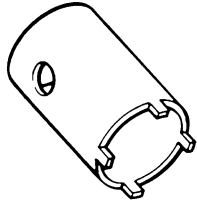
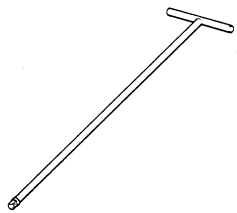
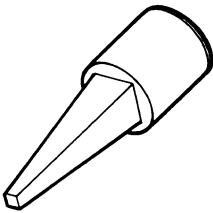
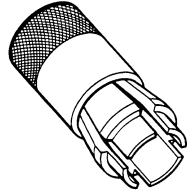


## LOWER COWLING CUSHION

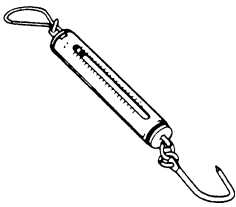
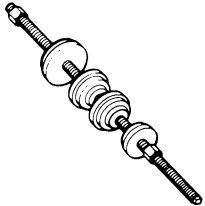
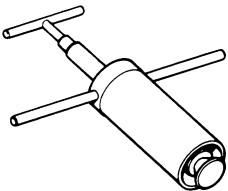
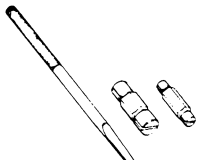
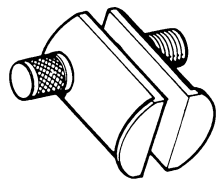

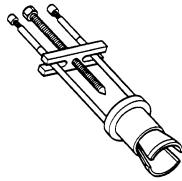
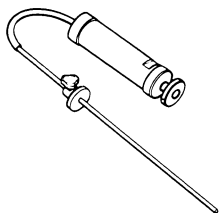
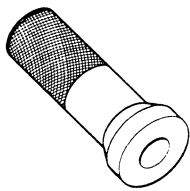


## SPECIAL TOOLS

 <p><b>09900-00401</b> "L" type hexagon wrench set</p>	 <p><b>09900-00410</b> Hexagon wrench set</p>	 <p><b>09900-06105</b> Snap ring pliers</p>	 <p><b>09900-06107</b> Snap ring pliers</p>	 <p><b>09900-06108</b> Snap ring pliers</p>
 <p><b>09900-09003</b> Impact driver set</p>	 <p><b>09900-20102</b> Vernier calipers (1/20 mm, 200 mm)</p>	 <p><b>09900-20202</b> Micrometer (1/100 mm, 25–50 mm)</p>	 <p><b>09900-20203</b> Micrometer (1/100 mm, 50–75 mm)</p>	 <p><b>09900-20205</b> Micrometer (1/1000 mm, 0–25 mm)</p>
 <p><b>09900-20508</b> Cylinder gauge set (1/100 mm, 40–80 mm)</p>	 <p><b>09900-20602</b> Dial gauge (1/1000 mm, 1 mm)</p>	 <p><b>09900-20605</b> Dial calipers (1/100 mm, 10–34 mm)</p>	 <p><b>09900-20606</b> Dial gauge (1/100 mm, 10 mm)</p>	 <p><b>09900-20701</b> Magnetic stand</p>
 <p><b>09900-20803</b> Thickness gauge</p>	 <p><b>09900-20805</b> Tire depth gauge</p>	 <p><b>09900-21304</b> V-block set (100 mm)</p>	 <p><b>09900-22301</b> Plastigauge</p>	 <p><b>09900-22401</b> Small bore gauge (10–18 mm)</p>
 <p><b>09900-25002</b> Pocket tester</p>	 <p><b>09900-28106</b> Electro tester</p>	 <p><b>09910-20116</b> Con-rod holder</p>	 <p><b>09911-73730</b> "T" type hexagon wrench (5 mm)</p>	 <p><b>09911-74520</b> Long socket (12 mm)</p>
 <p><b>09913-13121</b> Carburetor balancer</p>	 <p><b>09913-60910</b> Bearing puller (40–60 mm)</p>	 <p><b>09913-75520</b> Bearing installer</p>	 <p><b>09914-24510</b> T-handle</p>	 <p><b>09914-25811</b> "T" type hexagon wrench (6 mm)</p>

	 09915-64510 Compression gauge 09915-63310 (Adaptor)	 09915-74510 Oil pressure gauge 09915-77330 (for high pressure meter)	 09915-74540 Oil pressure gauge adaptor	 09916-14510 Valve lifter
 09916-14520 Valve lifter attachment	 09916-20640 Solid pilot (N-100-4.5)	 09916-21110 Valve seat cutter set	 See page 3-24. Valve seat cutter head (N-111, 116, 120, 121, 122, 126)	 09916-33210 Valve guide reamer (4.5 mm)
 09916-34542 Valve guide reamer handle	 09916-34580 Valve guide reamer (10.8 mm)	 09916-43210 Valve guide remover/installer	 09916-43230 Attachment	 09916-74521 Piston ring compressor body
 09916-74540 Piston ring compressor band (63—75 mm)	 09916-84511 Tweezers	 09920-53740 Clutch sleeve hub holder	 09923-73210 Bearing puller (17—20 mm)	 09924-84510 Bearing installer set
 09924-84521 Bearing installer	 09930-10121 Spark plug socket wrench set	 09930-11910 Torx wrench	 09930-14530 Universal joint	 09930-30102 Sliding shaft
 09931-94430 Ignitor checker (Digital type)	 09940-14911 Steering stem nut wrench	 09940-34520 "T" handle	 09940-34561 Attachment "D"	 09940-50113 Front fork oil seal installer



 <b>09940-92710</b> Spring scale	 <b>09941-34513</b> Steering outer race installer	 <b>09941-44510</b> Swingarm bearing remover	 <b>09941-50111</b> Bearing remover	 <b>09941-54911</b> Bearing outer race remover
 <b>09941-74910</b> Steering bearing installer	 <b>09941-84510</b> Bearing remover	 <b>09943-74111</b> Front fork oil level gauge	 <b>09951-16080</b> Bearing installer	

**NOTE:**

*When ordering the special tool, please confirm whether it is available or not.*

# TIGHTENING TORQUE

## ENGINE

ITEM	N-m	kg-m	lb-ft
Cylinder head cover bolt	13–15	1.3–1.5	9.5–11.0
Cylinder head bolt [M: 10]	40–45	4.0–4.5	29.0–32.5
Cylinder head bolt [M: 6]	8–12	0.8–1.2	6.0–8.5
Cylinder base nut	7–11	0.7–1.1	5.0–8.0
Camshaft journal holder bolt	8–12	0.8–1.2	6.0–8.5
Cam sprocket bolt	24–26	2.4–2.6	17.5–19.0
Oil hose mounting bolt [Cylinder side]	20–23	2.0–2.3	14.5–16.5
Oil hose mounting bolt [Crankcase side]	25–29	2.5–2.9	18.0–21.0
Cam chain tensioner mounting bolt	6–8	0.6–0.8	4.5–6.0
Cam chain tensioner spring holder bolt	30–40	3.0–4.0	21.5–29.0
Conrod bearing cap bolt	65–68	6.5–6.8	47.0–49.0
Starter clutch bolt	23–28	2.3–2.8	16.5–20.0
Signal generator bolt	23–26	2.3–2.6	16.5–19.0
Crankcase bolt [M: 6]	12–16	1.2–1.6	8.5–16.5
[M: 8] [M: 9]	24–28	2.4–2.8	17.5–20.0
Oil pump mounting bolt	8–12	0.8–1.2	6.0–8.5
Oil drain plug	20–25	2.0–2.5	14.5–18.0
Oil pan bolt	12–16	1.2–1.6	8.5–11.5
Gearshift cam stopper bolt	8–12	0.8–1.2	6.0–8.5
Gearshift cam stopper plate bolt	8–12	0.8–1.2	6.0–8.5
Gearshift arm stopper bolt	15–23	1.5–2.3	11.0–16.5
Clutch sleeve hub nut	80–100	8.0–10.0	58.0–72.5
Clutch spring bolt	11–13	1.1–1.3	8.0–9.5
Exhaust pipe bolt	18–28	1.8–2.8	13.0–20.0
Muffler mounting bolt	18–28	1.8–2.8	13.0–20.0
Engine sprocket nut	100–130	10.0–13.0	72.5–94.0
Engine mounting bolt [L: 30]	50–60	5.0–6.0	36.0–43.5
[L: 140 and 280]	70–88	7.0–8.8	50.5–63.5
Starter clutch shaft nut	80–100	8.0–10.0	58.0–72.5
Generator driven gear nut	40–60	4.0–6.0	29.0–43.5
Generator mounting bolt	21–29	2.1–2.9	15.0–21.0
Oil cooler mounting bolt	53–64	5.3–6.4	38.5–46.5
Oil pressure regulator	25–30	2.5–3.0	18.0–21.5
Oil pressure switch	12–15	1.2–1.5	8.5–11.0
Oil gallery plug [M: 16]	35–45	3.5–4.5	25.5–32.5
[M: 14]	25–30	2.5–3.0	18.0–21.5
[M: 10]	12–18	1.2–1.8	8.5–13.0
Crankcase plug [M: 22]	35–45	3.5–4.5	25.5–32.5
[M: 18]	25–30	2.5–3.0	18.0–21.5
Cooling fan thermo-switch	9–14	0.9–1.4	6.5–10.0

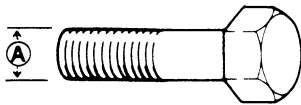
## CHASSIS

ITEM	N·m	kg-m	lb-ft
Steering stem head nut	80–100	8.0–10.0	58.0–72.5
Front fork upper clamp bolt	18–28	1.8–2.8	13.0–20.0
Front fork lower clamp bolt	18–28	1.8–2.8	13.0–20.0
Front fork cap bolt	30–40	3.0–4.0	21.5–29.0
Front fork damper rod bolt	18–27	1.8–2.7	13.0–19.5
Front axle	50–80	5.0–8.0	36.0–58.0
Front axle pinch bolt	18–28	1.8–2.8	13.0–20.0
Handlebar set bolt	18–28	1.8–2.8	13.0–20.0
Handlebar holder mounting bolt and nut	22–35	2.2–3.5	16.0–25.5
Front brake master cylinder mounting bolt	8–12	0.8–1.2	6.0–8.5
Front brake caliper mounting bolt	20–30	2.0–3.0	14.5–21.5
Front brake caliper pad mounting bolt	15–20	1.5–2.0	11.0–14.5
Brake hose union bolt (Front & Rear)	15–20	1.5–2.0	11.0–14.5
Air bleeder valve (Front & Rear)	6–9	0.6–0.9	4.5–6.5
Brake disc bolt (Front & Rear)	18–28	1.8–2.8	13.0–20.0
Front footrest bracket mounting bolt	18–28	1.8–2.8	13.0–20.0
Front footrest nut	42–66	4.2–6.6	30.5–47.5
Swingarm pivot nut	85–115	8.5–11.5	61.5–83.0
Rear shock absorber mounting nut (Upper & Lower)	40–60	4.0–6.0	29.0–43.5
Rear cushion lever/rod mounting nut	70–100	7.0–10.0	50.5–72.5
Rear brake caliper mounting bolt	20–30	2.0–3.0	14.5–21.5
Rear brake caliper housing bolt	30–36	3.0–3.6	21.5–26.0
Rear brake master cylinder mounting bolt	18–28	1.8–2.8	13.0–20.0
Rear brake master cylinder rod lock nut	15–20	1.5–2.0	11.0–14.5
Rear axle nut	85–115	8.5–11.5	61.5–83.0
Rear sprocket nut	48–72	4.8–7.2	35.0–52.0

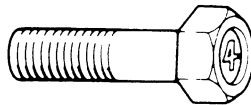
## TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

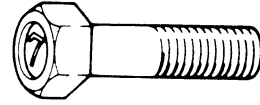
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1.0—2.0	0.1—0.2	0.7—1.5	1.5—3.0	0.15—0.3	1.0—2.0
5	2.0—4.0	0.2—0.4	1.5—3.0	3.0—6.0	0.3—0.6	2.0—4.5
6	4.0—7.0	0.4—0.7	3.0—5.0	8.0—12.0	0.8—1.2	6.0—8.5
8	10.0—16.0	1.0—1.6	7.0—11.5	18.0—28.0	1.8—2.8	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.	25.5 (1.00)		——
	EX.	22.5 (0.89)		——
Valve lift	IN.	E-04 and others	8.3 (0.33)	——
		E-18	6.6 (0.26)	——
	EX.	E-04 and others	7.9 (0.31)	——
		E-18	6.1 (0.24)	——
Tappet clearance (when cold)	IN.	0.10—0.20 (0.004—0.008)		——
	EX.	0.20—0.30 (0.008—0.010)		——
Valve guide to valve stem clearance	IN.	0.020—0.047 (0.0008—0.0019)		——
	EX.	0.030—0.057 (0.0012—0.0022)		——
Valve stem deflection	IN. & EX.	——		0.35 (0.014)
Valve guide I.D.	IN. & EX.	4.500—4.512 (0.1772—0.1776)		——
Valve stem O.D.	IN.	4.465—4.480 (0.1758—0.1764)		——
	EX.	4.455—4.470 (0.1754—0.1760)		——
Valve stem runout	IN. & EX.	——		0.05 (0.002)
Valve head thickness	IN. & EX.	——		0.5 (0.02)
Valve seat width	IN. & EX.	0.9—1.1 (0.035—0.043)		——
Valve head radial runout	IN. & EX.	——		0.03 (0.001)
Valve spring free length (IN. & EX.)	——			43.0 (1.69)
Valve spring tension (IN. & EX.)	18.6—21.4 kg (41.0—47.2 lbs) at length 38 mm (1.5 in)			——

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-04	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
		E-18	34.542—34.598 (1.3599—1.3621)	34.25 (1.348)
		Others	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
	EX.	E-04	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
		E-18	34.122—34.178 (1.3433—1.3456)	33.83 (1.332)
		Others	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0059)	
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	——	
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	——	
Camshaft runout	IN. & EX	——	0.10 (0.004)	
Cam chain 20-pitch length	——			158.0 (6.22)
Cam chain pin (at arrow “3”)	13th pin			——
Cylinder head distortion	——			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000–1 500 kPa (10–15 kg/cm <sup>2</sup> ) (142–213 psi)			800 kPa (8 kg/cm <sup>2</sup> ) (114psi)
Compression pressure difference	—			200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.040–0.060 (0.0016–0.0024)			0.120 (0.0047)
Cylinder bore	65.000–65.015 (2.5591–2.5596)			65.090 (2.5626)
Piston diam.	64.945–64.970 (2.5569–2.5579) Measure at 15 mm (0.6 in) from the skirt end.			64.880 (2.5543)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 7.5 (0.29)	6.0 (0.24)
	2nd	R	Approx. 8.0 (0.31)	6.4 (0.25)
Piston ring end gap	1st		0.25–0.40 (0.010–0.016)	0.5 (0.02)
	2nd		0.25–0.40 (0.010–0.016)	0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	———	0.18 (0.007)
	2nd	———	0.18 (0.007)
Piston ring groove width	1st	0.83–0.85 (0.032–0.033)	———
	2nd	0.82–0.84 (0.032–0.033)	———
	Oil	1.51–1.53 (0.059–0.060)	———
Piston ring thickness	1st	0.77–0.79 (0.030–0.031)	———
	2nd	0.77–0.79 (0.030–0.031)	———
Piston pin bore	16.002–16.008 (0.6210–0.6302)		16.030 (0.6311)
Piston pin O.D.	15.996–16.000 (0.6298–0.6299)		15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.010–16.018 (0.6303–0.6306)		16.040 (0.6315)
Conrod big end side clearance	0.10–0.20 (0.004–0.008)		0.30 (0.010)
Conrod big end width	20.95–21.00 (0.825–0.827)		———
Crank pin width	21.10–21.15 (0.831–0.833)		———
Conrod big end oil clearance	0.032–0.056 (0.0013–0.0022)		0.080 (0.0031)
Crank pin O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft journal oil clearance	0.020–0.044 (0.0008–0.0017)		0.080 (0.0031)
Crankshaft journal O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		———
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	———
	Left side	2.350–2.500 (0.0925–0.0984)	———
Crankshaft runout	———		0.05 (0.002)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.898 (75/43 x 37/34)	———
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm <sup>2</sup> , 43 psi) Below 600 kPa (6.0 kg/cm <sup>2</sup> , 85 psi) at 3 000 r/min.	———

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2–3 (0.08–0.12)	—
Drive plate thickness	2.12–2.28 (0.083–0.090)	1.82 (0.072)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	47.5 (1.87)

**THERMOSTAT + RADIATOR + FAN**

ITEM	STANDARD	LIMIT
Thermostat valve opening temperature	74.5–78.5°C (166.1–173.3°F)	—
Thermostat valve lift	Over 7 mm (0.28 in) at 90°C (194°F)	—
Radiator cap valve opening pressure	110 kPa (1.1 kg/cm <sup>2</sup> , 15.6 psi)	—
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)
	OFF	Approx. 100°C (212°F)
Water temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω
	80°C (176°F)	Approx. 51.9 Ω
	100°C (212°F)	Approx. 27.4 Ω
	120°C (248°F)	Approx. 16.1 Ω

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT
Primary reduction ratio	1.744 (75/43)	—
Final reduction ratio	3.071 (43/14)	—
Gear ratios	Low	3.142 (44/14)
	2nd	2.058 (35/17)
	3rd	1.650 (33/20)
	4th	1.428 (30/21)
	5th	1.260 (29/23)
	Top	1.120 (28/25)
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)	0.50 (0.020)
Shift fork groove width	5.00–5.10 (0.197–0.201)	—
Shift fork thickness	4.80–4.90 (0.189–0.193)	—



ITEM	STANDARD		LIMIT
Drive chain	Type	RK50GSVZ1 or DID50VA7	—
	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	30—40 (1.2—1.6)		—
Gearshift lever height	55 (2.2)		—

## CARBURETOR

ITEM	SPECIFICATION			
	E-02 and others	E-15,22,24	E-18	E-17,22-U type
Carburetor type	MIKUNI BDST36SS	←	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	←	33 mm	36 mm
I.D. No.	21E0	21E1	21E2	21E3
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min	←	←
Float height	6.9 mm (0.27 in)			
Main jet (M.J.)	# 112.5	←	# 110	# 112.5
Main air jet (M.A.J.)	0.6 mm	←	0.7 mm	0.6 mm
Jet needle (J.N.)	5E93-3rd	←	5E93-4th	5E93-3rd
Needle jet (N.J.)	O-9	←	O-8	O-9
Throttle valve (Th.V.)	# 125	←	# 120	# 125
Pilot jet (P.J.)	# 15	←	# 10	# 15
By-pass (B.P.)	0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←
Valve seat (V.S.)	1.5 mm	←	←	←
Starter jet (G.S.)	# 47.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1¼ turns out)	←	PRE-SET (1½ turns out)	PRE-SET (1¼ turns out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

## ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	7° B.T.D.C. below 1 500 r/min.		E-18,22
	13° B.T.D.C. below 1 500 r/min.		Others
Firing order	1-2-4-3		
Spark plug	Type	NGK: CR9E ND: U27ESR-N	
	Gap	0.7—0.8 (0.028—0.032)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	(Black—Green) Approx. 135—200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance	Primary	⊕ tap— ⊖ tap Approx. 2.4—3.2 Ω	Tester range: (x 1 Ω)
	Secondary	Plug cap—Plug cap Approx. 30—40 kΩ	Tester range: (x 1 kΩ)

ITEM			SPECIFICATION		NOTE
Generator			Slip ring O.D.	Limit: 14.0 (0.55)	ND
			Brush length	Limit: 4.5 (0.18)	
Generator Max. output			Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage			Above 13.5 V at 5 000 r/min.		
Starter motor			Commutator under-cut	Limit: 0.2 (0.008)	ND
Starter relay resistance			3—5 Ω		
Battery	Type designation		YTX9-BS		
	Capacity		12 V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.		1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A		
		LO	15 A		
	Turn signal		15 A		
	Ignition		10 A		
	Taillight		10 A		
	Main		30 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION	
		E-24,28	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Taillight		5	←
Brake light		21 x 2	←
Turn signal light		21	←
Tachometer light		1.7 x 2	←
Speedometer light		1.7 x 2	←
Turn signal indicator light		3.4	←
High beam indicator light		3.4	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←
Fuel level indicator light		3.4	←
License light		5	←
Engine coolant temp. meter light		1.7	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Front	4.5 $\pm$ 0.2 (0.177 $\pm$ 0.008)	4.0 (0.16)
	Rear	5.0 $\pm$ 0.2 (0.197 $\pm$ 0.008)	4.5 (0.18)
Brake disc runout (Front & Rear)	—		0.30 (0.012)

ITEM		STANDARD		LIMIT
Master cylinder bore		Front	12.700—12.743 (0.5000—0.5017)	———
		Rear	12.700—12.743 (0.5000—0.5017)	———
Master cylinder piston diam.		Front	12.657—12.684 (0.4983—0.4993)	———
		Rear	12.657—12.684 (0.4983—0.4993)	———
Brake caliper cylinder bore	Leading	Front	25.400—25.450 (1.0000—1.0020)	———
	Trailing		25.400—25.450 (1.0000—1.0020)	———
		Rear	38.180—38.256 (1.5031—1.5061)	———
Brake caliper piston diam.	Leading	Front	25.335—25.368 (0.9974—0.9987)	———
	Trailing		25.335—25.368 (0.9974—0.9987)	———
		Rear	38.098—38.148 (1.5000—1.5019)	———
Wheel rim runout (Front & Rear)		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		120/70 ZR17	———
	Rear		160/60 ZR17	———
Tire tread depth		Front	———	1.6 (0.06)
		Rear	———	2.0 (0.08)

## SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	390 (15.4)	
Front fork oil level	92 (3.6)	———	
Rear wheel travel	130 (5.1)	———	
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	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	41

**FUEL + OIL + ENGINE COOLANT**

ITEM	SPECIFICATION		NOTE
Fuel type	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	17.0 L (4.5/3.7 US/lmp gal)		
reserve	4.0 L (1.1/0.9 US/lmp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	3 000 ml (3.2/2.6 US/lmp qt)	
	Filter change	3 300 ml (3.5/2.9 US/lmp qt)	
	Overhaul	3 900 ml (4.1/3.4 US/lmp qt)	
Front fork oil type	Frok oil # 10		
Front fork oil capacity (each leg)	503 ml (17.0/17.7 US/lmp oz)		
Brake fluid type	DOT 4		
Coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		
Coolant including reserve	2 450 ml (2.6/2.2 US/lmp qt)		

# ***RF600RR ('94-MODEL)***

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SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length .....	2 110 mm (83.1 in) .....	E-02,03,04,21,24,25, 28,33,34,53
	2 160 mm (85.0 in) .....	E-15,17,18,22
Overall width .....	710 mm (28.0 in)	
Overall height .....	1 175 mm (46.3 in)	
Wheelbase .....	1 430 mm (56.3 in)	
Ground clearance .....	120 mm ( 4.7 in)	
Dry mass .....	195 kg (429 lbs)	
	198 kg (436 lbs) ...	E-33 model only

ENGINE

Type .....	Four-stroke, Water-cooled, DOHC, TSCC
Number of cylinders .....	4
Bore .....	65.0 mm (2.559 in)
Stroke .....	45.2 mm (1.780 in)
Piston displacement .....	599 cm <sup>3</sup> (36.6 cu. in)
Carburetor .....	MIKUNI BDST33 ..... For E-18,33 models MIKUNI BDST36 ..... For other markets
Air cleaner .....	Non-woven fabric element
Starter system .....	Electric starter
Lubrication system .....	Wet sump

TRANSMISSION

Clutch .....	Wet multi-plate type
Transmission .....	6-speed constant mesh
Gearshift pattern .....	1-down, 5-up
Primary reduction ratio .....	1.744 (75/43)
Final reduction ratio .....	3.071 (43/14)
Gear ratios, Low .....	3.142 (44/14)
2nd .....	2.058 (35/17)
3rd .....	1.650 (33/20)
4th .....	1.428 (30/21)
5th .....	1.260 (29/23)
Top .....	1.120 (28/25)
Drive chain .....	TAKASAGO RK50GSVZ1, 108 links or DAIDO DID 50VA7, 108 links

## CHASSIS

Front suspension .....	Telescopic, coil spring, oil damped, spring pre-load adjustable.
Rear suspension .....	Link type system, oil damped, coil spring, spring pre-load adjustable and rebound damping force adjustable.
Steering angle .....	30° (right & left)
Caster .....	65°
Trail .....	103 mm (4.1 in)
Turning radius .....	3.2 m (10.5 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Disc brake
Front tire size .....	120/70 ZR17, tubeless
Rear tire size .....	160/60 ZR17, tubeless
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	130 mm (5.1 in)

## ELECTRICAL

Ignition type .....	Electronic Ignition (Fully Transistorized)
Ignition timing .....	13° B.T.D.C. at 1500 r/min ..... For E-02 and others 7° B.T.D.C. at 1500 r/min ..... For E-18,22 models 4° B.T.D.C. at 1500 r/min ..... For E-33 model
Spark plug .....	N.G.K.: CR9E, NIPPONDENSO U27ESR-N
Battery .....	12V 28.8 kC (8 Ah)/10 HR
Generator .....	Three-phase A.C. Generator
Main fuse .....	30A
Fuse .....	15/15/15/10/10A
Headlight .....	12V 60/55W
Turn signal light .....	12V 21W
Parking or city light .....	12V 4W ..... Except for E-24,28 models
Taillight .....	12V 5W
Brake light .....	12V 21W x 2
License plate light .....	12V 5W
Speedometer light .....	12V 1.7W x 2
Tachometer light .....	12V 1.7W x 2
Engine coolant temp. meter light .....	12V 1.7W
Neutral indicator light .....	12V 3.4W
High beam indicator light .....	12V 3.4W
Turn signal indicator light .....	12V 3.4W
Oil pressure indicator light .....	12V 3.4W

## CAPACITIES

Fuel tank, including reserve .....	16.0 L (4.2/3.5 US/Imp gal) ..... For E-33 model 17.0 L (4.5/3.7 US/Imp gal) ..... For the others
Engine oil, oil change .....	3 000 ml (3.2/2.6 US/Imp qt)
with filter change .....	3 300 ml (3.5/2.9 US/Imp qt)
overhaul .....	3 900 ml (4.1/3.4 US/Imp qt)
Front fork oil .....	503 ml (17.0/17.7 US/Imp oz)
Coolant .....	2 450 ml (2.6/2.2 US/Imp qt)

These specifications are subject to change without notice.

# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	25.5 (1.00)	—
	EX.	22.5 (0.89)	—
Valve lift	IN.	E-04 and others	8.3 (0.33)
		E-18	6.6 (0.26)
	EX.	E-04 and others	7.9 (0.31)
		E-18	6.1 (0.24)
Tappet clearance (when cold)	IN.	0.10—0.20 (0.004—0.008)	—
	EX.	0.20—0.30 (0.008—0.010)	—
Valve guide to valve stem clearance	IN.	0.020—0.047 (0.0008—0.0019)	—
	EX.	0.030—0.057 (0.0012—0.0022)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	4.500—4.512 (0.1772—0.1776)	—
Valve stem O.D.	IN.	4.465—4.480 (0.1758—0.1764)	—
	EX.	4.455—4.470 (0.1754—0.1760)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	0.9—1.1 (0.035—0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	—		43.0 (1.69)
Valve spring tension (IN. & EX.)	18.6—21.4 kg (41.0—47.2 lbs) at length 38 mm (1.5 in)		—



**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-04	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
		E-18,33,39	34.542—34.598 (1.3599—1.3621)	34.25 (1.348)
		Others	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
	EX.	E-04	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
		E-18,33,39	34.122—34.178 (1.3433—1.3456)	33.83 (1.332)
		Others	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0059)	
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—	
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—	
Camshaft runout	IN. & EX	—	0.10 (0.004)	
Cam chain pin (at arrow “3”)	13th pin			—
Cylinder head distortion	—			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000–1 500 kPa (10–15 kg/cm <sup>2</sup> ) (142–213 psi)			800 kPa (8 kg/cm <sup>2</sup> ) (114psi)
Compression pressure difference	—			200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.040–0.060 (0.0016–0.0024)			0.120 (0.0047)
Cylinder bore	65.000–65.015 (2.5591–2.5596)			65.090 (2.5626)
Piston diam.	64.945–64.970 (2.5569–2.5579) Measure at 15 mm (0.6 in) from the skirt end.			64.880 (2.5543)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 7.5 (0.29)	6.0 (0.24)
	2nd	R	Approx. 8.0 (0.31)	6.4 (0.25)
Piston ring end gap	1st		0.25–0.40 (0.010–0.016)	0.5 (0.02)
	2nd		0.25–0.40 (0.010–0.016)	0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	———	0.18 (0.007)
	2nd	———	0.18 (0.007)
Piston ring groove width	1st	0.83–0.85 (0.032–0.033)	———
	2nd	0.82–0.84 (0.032–0.033)	———
	Oil	1.51–1.53 (0.059–0.060)	———
Piston ring thickness	1st	0.77–0.79 (0.030–0.031)	———
	2nd	0.77–0.79 (0.030–0.031)	———
Piston pin bore	16.002–16.008 (0.6210–0.6302)		16.030 (0.6311)
Piston pin O.D.	15.996–16.000 (0.6298–0.6299)		15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.010–16.018 (0.6303–0.6306)		16.040 (0.6315)
Conrod big end side clearance	0.10–0.20 (0.004–0.008)		0.30 (0.010)
Conrod big end width	20.95–21.00 (0.825–0.827)		———
Crank pin width	21.10–21.15 (0.831–0.833)		———
Conrod big end oil clearance	0.032–0.056 (0.0013–0.0022)		0.080 (0.0031)
Crank pin O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft journal oil clearance	0.020–0.044 (0.0008–0.0017)		0.080 (0.0031)
Crankshaft journal O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		———
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	———
	Left side	2.350–2.500 (0.0925–0.0984)	———
Crankshaft runout	———		0.05 (0.002)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.898 (75/43 x 37/34)	———
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm <sup>2</sup> , 43 psi) Below 600 kPa (6.0 kg/cm <sup>2</sup> , 85 psi) at 3 000 r/min.	———

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10–15 (0.4–0.6)	—
Drive plate thickness	2.12–2.28 (0.083–0.090)	1.82 (0.072)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	47.5 (1.87)

**THERMOSTAT + RADIATOR + FAN**

ITEM	STANDARD	LIMIT
Thermostat valve opening temperature	74.5–78.5°C (166.1–173.3°F)	—
Thermostat valve lift	Over 7 mm (0.28 in) at 90°C (194°F)	—
Radiator cap valve opening pressure	110 kPa (1.1 kg/cm <sup>2</sup> , 15.6 psi)	—
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)
	OFF	Approx. 100°C (212°F)
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω
	80°C (176°F)	Approx. 51.9 Ω
	100°C (212°F)	Approx. 27.4 Ω
	120°C (248°F)	Approx. 16.1 Ω

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT
Primary reduction ratio	1.744 (75/43)	—
Final reduction ratio	3.071 (43/14)	—
Gear ratios	Low	3.142 (44/14)
	2nd	2.058 (35/17)
	3rd	1.650 (33/20)
	4th	1.428 (30/21)
	5th	1.260 (29/23)
	Top	1.120 (28/25)
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)	0.50 (0.020)
Shift fork groove width	5.00–5.10 (0.197–0.201)	—
Shift fork thickness	4.80–4.90 (0.189–0.193)	—

ITEM	STANDARD		LIMIT
Drive chain	Type	RK50GSVZ1 or DID50VA7	—
	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	30—40 (1.2—1.6)		—
Gearshift lever height	55 (2.2)		—

**CARBURETOR**

ITEM	SPECIFICATION	
	E-03, U.S.A.	E-33, U.S.A. (Calif. model)
Carburetor type	MIKUNI BDST36SS	MIKUNI BDST33SS
Bore size	36 mm	33 mm
I.D. No.	21E4	21E5
Idle r/min.	1 300 ± 100 r/min	1 350 ± 100 r/min
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)	←
Main jet (M.J.)	#112.5	#107.5
Main air jet (M.A.J.)	0.6 mm	←
Jet needle (J.N.)	5E97	5E95
Needle jet (N.J.)	O-9	O-B
Throttle valve (Th.V.)	#120	←
Pilot jet (P.J.)	#15	#10
Starter jet (G.S.)	#47.5	←
Pilot screw (P.S.)	PRE-SET	←
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)	

**CARBURETOR**

ITEM	SPECIFICATION			
	E-02 and others	E-15,22,24	E-18	E-17,22-U type
Carburetor type	MIKUNI BDST36SS	←	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	←	33 mm	36 mm
I.D. No.	21E0	21E1	21E2	21E3
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min	←	←
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)			
Main jet (M.J.)	#112.5	←	#110	#112.5
Main air jet (M.A.J.)	0.6 mm	←	0.7 mm	0.6 mm
Jet needle (J.N.)	5E93-3rd	←	5E93-4th	5E93-3rd
Needle jet (N.J.)	O-9	←	O-8	O-9
Throttle valve (Th.V.)	#125	←	#120	#125
Pilot jet (P.J.)	#15	←	#10	#15
Starter jet (G.S.)	#47.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1¼ turns out)	←	PRE-SET (1½ turns out)	PRE-SET (1¼ turns out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

**ELECTRICAL**

Unit: mm (in)

ITEM			SPCIFICATION		NOTE
Ignition timing			4° B.T.D.C. below 1 500 r/min.		E-33
			7° B.T.D.C. below 1 500 r/min.		E-03,18,22,39
			13° B.T.D.C. below 1 500 r/min.		Others
Firing order			1-2-4-3		
Spark plug			Type	NGK: CR9E ND: U27ESR-N	
			Gap	0.7—0.8 (0.028—0.032)	
Spark performance			Over 8 (0.3) at 1 atm.		
Signal coil resistance			(Black—Green) Approx. 135—200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance			Primary	⊕ tap— ⊖ tap Approx. 2.4—3.2 Ω	Tester range: (x 1 Ω)
			Secondary	Plug cap—Plug cap Approx. 30—40 kΩ	Tester range: (x 1 kΩ)
Generator			Slip ring O.D.	Limit: 14.0 (0.55)	ND
			Brush length	Limit: 4.5 (0.18)	
Generator Max. output			Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage			Above 13.5 V at 5 000 r/min.		
Starter motor			Commutator under-cut	Limit: 0.2 (0.008)	ND
Starter relay resistance			3—5 Ω		
Battery	Type designation		YTX9-BS		
	Capacity		12 V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.		1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A		
		LO	15 A		
	Turn signal		15 A		
	Ignition		10 A		
	Taillight		10 A		
	Main		30 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Taillight		5	←
Brake light		21 x 2	←
Turn signal light		21	←
Tachometer light		1.7 x 2	←
Speedometer light		1.7 x 2	←
Turn signal indicator light		3.4	←
High beam indicator light		3.4	←
Neutral indicator light		3.4	←

Unit: W

ITEM	SPECIFICATION	
	E-03,24,28,33	The others
Oil pressure indicator light	3.4	←
Fuel level indicator light	3.4	←
License light	5	←
Engine coolant temp. meter light	1.7	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Rear brake pedal height		55 (2.2)		—
Brake disc thickness	Front	$4.5 \pm 0.2$ (0.177 $\pm$ 0.008)		4.0 (0.16)
	Rear	$5.0 \pm 0.2$ (0.197 $\pm$ 0.008)		4.5 (0.18)
Brake disc runout (Front & Rear)		—		0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)		—
	Rear	12.700–12.743 (0.5000–0.5017)		—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4993)		—
	Rear	12.657–12.684 (0.4983–0.4993)		—
Brake caliper cylinder bore	Leading	Front	25.400–25.450 (1.0000–1.0020)	—
	Trailing		25.400–25.450 (1.0000–1.0020)	—
		Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Leading	Front	25.335–25.368 (0.9974–0.9987)	—
	Trailing		25.335–25.368 (0.9974–0.9987)	—
		Rear	38.098–38.148 (1.5000–1.5019)	—
Wheel rim runout (Front & Rear)	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		120/70 ZR17	—
	Rear		160/60 ZR17	—
Tire tread depth	Front		—	1.6 (0.06)
	Rear		—	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	390 (15.4)	
Front fork oil level	92 (3.6)	—	
Rear wheel travel	130 (5.1)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

**FUEL + OIL + ENGINE COOLANT**

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 85 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-03,33
	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  reserve	16.0 L (4.2/3.5 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		The others
	4.0 L (1.1/0.9 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	3 000 ml (3.2/2.6 US/Imp qt)	
	Filter change	3 300 ml (3.5/2.9 US/Imp qt)	
	Overhaul	3 900 ml (4.1/3.4 US/Imp qt)	
Front fork oil type	Fork oil # 10		
Front fork oil capacity (each leg)	503 ml (17.0/17.7 US/Imp oz)		
Brake fluid type	DOT 4		
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		
Engine coolant including reserve	2 450 ml (2.6/2.2 US/Imp qt)		

**TIRE PRESSURE [E-03,33 markets]**

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	225	2.25	33	250	2.50	36
REAR	250	2.50	36	290	2.90	42

**TIRE PRESSURE [The other markets]**

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42



# ***RF600RS ('95-MODEL)***

## ***FOREWORD***

*This section describes service data, service specifications and servicing procedures which differ from those of the RF600RR ('94-model).*

***NOTE:***

- *Any differences between RF600RR ('94-model) and RF600RS ('95-model) in specifications and service data are clearly indicated with the asterisk marks (\*)*
- *Please refer to the sections 1 through 9 for details which are not given in this section.*

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## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length .....	2 110 mm (83.1 in) .....	For E-02,03,04,24,25, 28,33,34,53
	2 160 mm (85.0 in) .....	For E-18,22
Overall width .....	710 mm (28.0 in)	
Overall height .....	1 175 mm (46.3 in)	
Wheelbase .....	1 430 mm (56.3 in) .....	For E-03,18,33
	*1 435 mm (56.5 in) .....	For the others
Ground clearance .....	120 mm ( 4.7 in)	
Dry mass .....	195 kg (429 lbs)	
	198 kg (436 lbs) .....	E-33 only

### ENGINE

Type .....	Four-stroke, Water-cooled, DOHC, TSCC
Number of cylinders .....	4
Bore .....	65.0 mm (2.559 in)
Stroke .....	45.2 mm (1.780 in)
Piston displacement .....	599 cm <sup>3</sup> (36.6 cu. in)
Carburetor .....	MIKUNI BDST33 ..... For E-18,33
	MIKUNI BDST36 ..... For the others
Air cleaner .....	Non-woven fabric element
Starter system .....	Electric starter
Lubrication system .....	Wet sump

### TRANSMISSION

Clutch .....	Wet multi-plate type
Transmission .....	6-speed constant mesh
Gearshift pattern .....	1-down, 5-up
Primary reduction ratio .....	1.744 (75/43)
Final reduction ratio .....	3.071 (43/14) ..... For E-03,18,33
	*3.000 (42/14) ..... For the others
Gear ratios, Low .....	3.142 (44/14)
2nd .....	2.058 (35/17)
3rd .....	1.650 (33/20)
4th .....	1.428 (30/21)
5th .....	1.260 (29/23)
Top .....	1.120 (28/25)
Drive chain .....	*TAKASAGO RK50MFOZ1, 108 links

## CHASSIS

Front suspension .....	Telescopic, coil spring, oil damped, spring pre-load adjustable.
Rear suspension .....	Link type system, oil damped, coil spring, spring pre-load adjustable and rebound damping force adjustable.
Steering angle .....	30° (right & left)
Caster .....	65°
Trail .....	103 mm (4.1 in)
Turning radius .....	3.2 m (10.5 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Disc brake
Front tire size .....	120/70 ZR17, tubeless
Rear tire size .....	160/60 ZR17, tubeless
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	130 mm (5.1 in)

## ELECTRICAL

Ignition type .....	Electronic Ignition (Fully Transistorized)
Ignition timing .....	4° B.T.D.C. at 1500 r/min ..... For E-33 *7° B.T.D.C. at 1500 r/min ..... For the others
Spark plug .....	N.G.K.: CR9E, NIPPONDENSO U27ESR-N
Battery .....	12V 28.8 kC (8 Ah)/10 HR
Generator .....	Three-phase A.C. Generator
Main fuse .....	30A
Fuse .....	15/15/15/10/10A
Headlight .....	12V 60/55W
Turn signal light .....	12V 21W x 4
Parking or city light .....	12V 4W ..... Except for E-03,24,28,33
Taillight .....	12V 5W
Brake light .....	12V 21W x 2
License plate light .....	12V 5W
Speedometer light .....	12V 1.7W x 2
Tachometer light .....	12V 1.7W x 2
Engine coolant temp. meter light .....	12V 1.7W
Neutral indicator light .....	12V 3.4W
High beam indicator light .....	12V 3.4W
Turn signal indicator light .....	12V 3.4W
Oil pressure indicator light .....	12V 3.4W
Fuel level indicator light .....	12V 3.4W

## CAPACITIES

Fuel tank, including reserve .....	16.0 L (4.2/3.5 US/Imp gal) ..... For E-33 17.0 L (4.5/3.7 US/Imp gal) ..... For the others
Engine oil, oil change .....	3 000 ml (3.2/2.6 US/Imp qt)
with filter change .....	3 300 ml (3.5/2.9 US/Imp qt)
overhaul .....	3 900 ml (4.1/3.4 US/Imp qt)
Front fork oil .....	503 ml (17.0/17.7 US/Imp oz)
Coolant .....	2 450 ml (2.6/2.2 US/Imp qt)

These specifications are subject to change without notice.

**SERVICE DATA****VALVE + GUIDE**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	25.5 (1.00)	——
	EX.	22.5 (0.89)	——
Valve lift	IN.	E-04 and others	8.3 (0.33)
		E-18	6.6 (0.26)
	EX.	E-04 and others	7.9 (0.31)
		E-18	6.1 (0.24)
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	——
	EX.	0.20–0.30 (0.008–0.010)	——
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	——
	EX.	0.030–0.057 (0.0012–0.0022)	——
Valve stem deflection	IN. & EX.	——	0.35 (0.014)
Valve guide I.D.	IN. & EX.	4.500–4.512 (0.1772–0.1776)	——
Valve stem O.D.	IN.	4.465–4.480 (0.1758–0.1764)	——
	EX.	4.455–4.470 (0.1754–0.1760)	——
Valve stem runout	IN. & EX.	——	0.05 (0.002)
Valve head thickness	IN. & EX.	——	0.5 (0.02)
Valve seat width	IN. & EX.	0.9–1.1 (0.035–0.043)	——
Valve head radial runout	IN. & EX.	——	0.03 (0.001)
Valve spring free length (IN. & EX.)	——		43.0 (1.69)
Valve spring tension (IN. & EX.)	18.6–21.4 kg (41.0–47.2 lbs) at length 38 mm (1.5 in)		——

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-04	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
		E-18,33	34.542—34.598 (1.3599—1.3621)	34.25 (1.348)
		Others	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
	EX.	E-04	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
		E-18,33	34.122—34.178 (1.3433—1.3456)	33.83 (1.332)
		Others	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0059)	
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—	
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—	
Camshaft runout	IN. & EX	—	0.10 (0.004)	
Cam chain pin (at arrow “3”)	13th pin			—
Cylinder head distortion	—			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 500 kPa (10—15 kg/cm <sup>2</sup> ) (142—213 psi)			800 kPa (8 kg/cm <sup>2</sup> ) (114psi)
Compression pressure difference	—			200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.040—0.060 (0.0016—0.0024)			0.120 (0.0047)
Cylinder bore	65.000—65.015 (2.5591—2.5596)			65.090 (2.5626)
Piston diam.	64.945—64.970 (2.5569—2.5579) Measure at 15 mm (0.6 in) from the skirt end.			64.880 (2.5543)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 7.5 (0.29)	6.0 (0.24)
	2nd	R	Approx. 8.0 (0.31)	6.4 (0.25)
Piston ring end gap	1st	0.25—0.40 (0.010—0.016)		0.5 (0.02)
	2nd	0.25—0.40 (0.010—0.016)		0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	———	0.18 (0.007)
	2nd	———	0.18 (0.007)
Piston ring groove width	1st	0.83–0.85 (0.032–0.033)	———
	2nd	0.82–0.84 (0.032–0.033)	———
	Oil	1.51–1.53 (0.059–0.060)	———
Piston ring thickness	1st	0.77–0.79 (0.030–0.031)	———
	2nd	0.77–0.79 (0.030–0.031)	———
Piston pin bore	16.002–16.008 (0.6210–0.6302)		16.030 (0.6311)
Piston pin O.D.	15.996–16.000 (0.6298–0.6299)		15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.010–16.018 (0.6303–0.6306)		16.040 (0.6315)
Conrod big end side clearance	0.10–0.20 (0.004–0.008)		0.30 (0.010)
Conrod big end width	20.95–21.00 (0.825–0.827)		———
Crank pin width	21.10–21.15 (0.831–0.833)		———
Conrod big end oil clearance	0.032–0.056 (0.0013–0.0022)		0.080 (0.0031)
Crank pin O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft journal oil clearance	0.020–0.044 (0.0008–0.0017)		0.080 (0.0031)
Crankshaft journal O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		———
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	———
	Left side	2.350–2.500 (0.0925–0.0984)	———
Crankshaft runout	———		0.05 (0.002)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.898 (75/43 x 37/34)	—
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm <sup>2</sup> , 43 psi) Below 600 kPa (6.0 kg/cm <sup>2</sup> , 85 psi) at 3 000 r/min.	—

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10—15 (0.4—0.6)	—
Drive plate thickness	2.12—2.28 (0.083—0.090)	1.82 (0.072)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	47.5 (1.87)

**THERMOSTAT + RADIATOR + FAN**

ITEM		STANDARD	LIMIT
Thermostat valve opening temperature		74.5—78.5°C (166.1—173.3°F)	—
Thermostat valve lift		Over 7 mm (0.28 in) at 90°C (194°F)	—
Radiator cap valve opening pressure		110 kPa (1.1 kg/cm <sup>2</sup> , 15.6 psi)	—
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	—
	80°C (176°F)	Approx. 51.9 Ω	—
	100°C (212°F)	Approx. 27.4 Ω	—
	120°C (248°F)	Approx. 16.1 Ω	—

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.744 (75/43)	—
Final reduction ratio	E-03,18,33	3.071 (43/14)	—
	The others	*3.000 (42/14)	—
Gear ratios	Low	3.142 (44/14)	—
	2nd	2.058 (35/17)	—
	3rd	1.650 (33/20)	—
	4th	1.428 (30/21)	—
	5th	1.260 (29/23)	—
	Top	1.120 (28/25)	—

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10—0.30 (0.004—0.012)		0.50 (0.020)
Shift fork groove width	5.00—5.10 (0.197—0.201)		—
Shift fork thickness	4.80—4.90 (0.189—0.193)		—
Drive chain	Type	*RK50MFOZ1	—
	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	30—40 (1.2—1.6)		—
Gearshift lever height	70 (2.8)		—

## \*CARBURETOR

ITEM	SPECIFICATION		
	E-03, U.S.A.	E-33, U.S.A. (Calif. model)	E-37
Carburetor type	MIKUNI BDST36SS	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	33 mm	36 mm
I.D. No.	21EG	21EH	21EN
Idle r/min.	1 300±100 r/min	1 350±100 r/min	1 200±100 r/min
Float height	6.9±1.0 mm (0.27±0.04 in)		
Main jet (M.J.)	#112.5	#107.5	#112.5
Main air jet (M.A.J.)	0.7 mm	0.6 mm	#1&4: 0.6 mm, #2&3: 1.0 mm
Jet needle (J.N.)	5E97	5E99	5D44-3rd
Needle jet (N.J.)	□-9	□-8	O-9
Throttle valve (Th.V.)	#120	←	#125
Pilot jet (P.J.)	#15	#10	#12.5
Starter jet (G.S.)	#47.5	←	←
Pilot screw (P.S.)	PRE-SET	←	PRE-SET (1-1/2 turns out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)		

## \*CARBURETOR

ITEM	SPECIFICATION			
	E-02 and others	E-22,24	E-18	E-22-U type
Carburetor type	MIKUNI BDST36SS	←	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	←	33 mm	36 mm
I.D. No.	21EF	21EJ	21EL	21EK
Idle r/min.	1 200±100 r/min	1 300±100 r/min	←	←
Float height	6.9±1.0 mm (0.27±0.04 in)			



ITEM	SPECIFICATION			
	E-02 and others	E-22,24	E-18	E-22-U type
Main jet (M.J.)	# 112.5	←	# 110	# 120
Main air jet (M.A.J.)	# 1&4: 0.6 mm, # 2&3: 1.0 mm	←	0.6 mm	0.7 mm
Jet needle (J.N.)	5D44-3rd	←	5E93-4th	5D44-2nd
Needle jet (N.J.)	O-9	←	O-8	←
Throttle valve (Th.V.)	# 125	←	# 120	# 125
Pilot jet (P.J.)	# 12.5	←	# 10	# 12.5
Starter jet (G.S.)	# 47.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1-½ turns out)	PRE-SET (1-¼ turns out)	PRE-SET (1-½ turns out)	PRE-SET (1 turn out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

**ELECTRICAL**

Unit: mm (in)

ITEM			SPECIFICATION		NOTE
Ignition timing			4° B.T.D.C. below 1 500 r/min.		E-33
			*7° B.T.D.C. below 1 500 r/min.		Others
Firing order			1-2-4-3		
Spark plug			Type	NGK: CR9E ND: U27ESR-N	
			Gap	0.7—0.8 (0.028—0.032)	
Spark performance			Over 8 (0.3) at 1 atm.		
Signal coil resistance			(Black—Green) Approx. 135—200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance			Primary	⊕ tap— ⊖ tap Approx. 2.4—3.2 Ω	Tester range: (x 1 Ω)
			Secondary	Plug cap—Plug cap Approx. 30—40 kΩ	Tester range: (x 1 kΩ)
Generator			Slip ring O.D.	Limit: 14.0 (0.55)	ND
			Brush length	Limit: 4.5 (0.18)	
Generator Max. output			Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage			Above 13.5 V at 5 000 r/min.		
Starter motor			Commutator under-cut	Limit: 0.2 (0.008)	ND
Starter relay resistance			3—5 Ω		
Battery	Type designation		YTX9-BS		
	Capacity		12 V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.		1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A		
		LO	15 A		
	Turn signal		15 A		
	Ignition		10 A		
	Taillight		10 A		
	Main		30 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Taillight		5	←
Brake light		21 × 2	←
Turn signal light		21 × 4	←
Tachometer light		1.7 × 2	←
Speedometer light		1.7 × 2	←
Turn signal indicator light		3.4	←
High beam indicator light		3.4	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←
Fuel level indicator light		3.4	←
License light		5	←
Engine coolant temp. meter light		1.7	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Rear brake pedal height		55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)		4.0 (0.16)
	Rear	5.0 ± 0.2 (0.197 ± 0.008)		4.5 (0.18)
Brake disc runout (Front & Rear)		—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)		—
	Rear	12.700—12.743 (0.5000—0.5017)		—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4993)		—
	Rear	12.657—12.684 (0.4983—0.4993)		—
Brake caliper cylinder bore	Leading	Front	25.400—25.450 (1.0000—1.0020)	—
	Trailing		25.400—25.450 (1.0000—1.0020)	—
		Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Leading	Front	25.335—25.368 (0.9974—0.9987)	—
	Trailing		25.335—25.368 (0.9974—0.9987)	—
		Rear	38.098—38.148 (1.5000—1.5019)	—

ITEM	STANDARD		LIMIT
Wheel rim runout (Front & Rear)	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	120/70 ZR17	——
	Rear	160/60 ZR17	——
Tire tread depth	Front	——	1.6 (0.06)
	Rear	——	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	——	
Front fork spring free length	——	390 (15.4)	
Front fork oil level	92 (3.6)	——	
Rear wheel travel	130 (5.1)	——	
Swingarm pivot shaft runout	——	0.3 (0.01)	

**FUEL + OIL + ENGINE COOLANT**

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 85 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-03,33
	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  reserve	16.0 L (4.2/3.5 US/lmp gal)	E-33
	17.0 L (4.5/3.7 US/lmp gal)	The others
	4.0 L (1.1/0.9 US/lmp gal)	

ITEM	SPECIFICATION		NOTE
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	3 000 ml (3.2/2.6 US/lmp qt)	
	Filter change	3 300 ml (3.5/2.9 US/lmp qt)	
	Overhaul	3 900 ml (4.1/3.4 US/lmp qt)	
Front fork oil type	Frok oil # 10		
Front fork oil capacity (each leg)	503 ml (17.0/17.7 US/lmp oz)		
Brake fluid type	DOT 4		
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		
Engine coolant including reserve	2 450 ml (2.6/2.2 US/lmp qt)		

**TIRE PRESSURE [E-03,33 markets]**

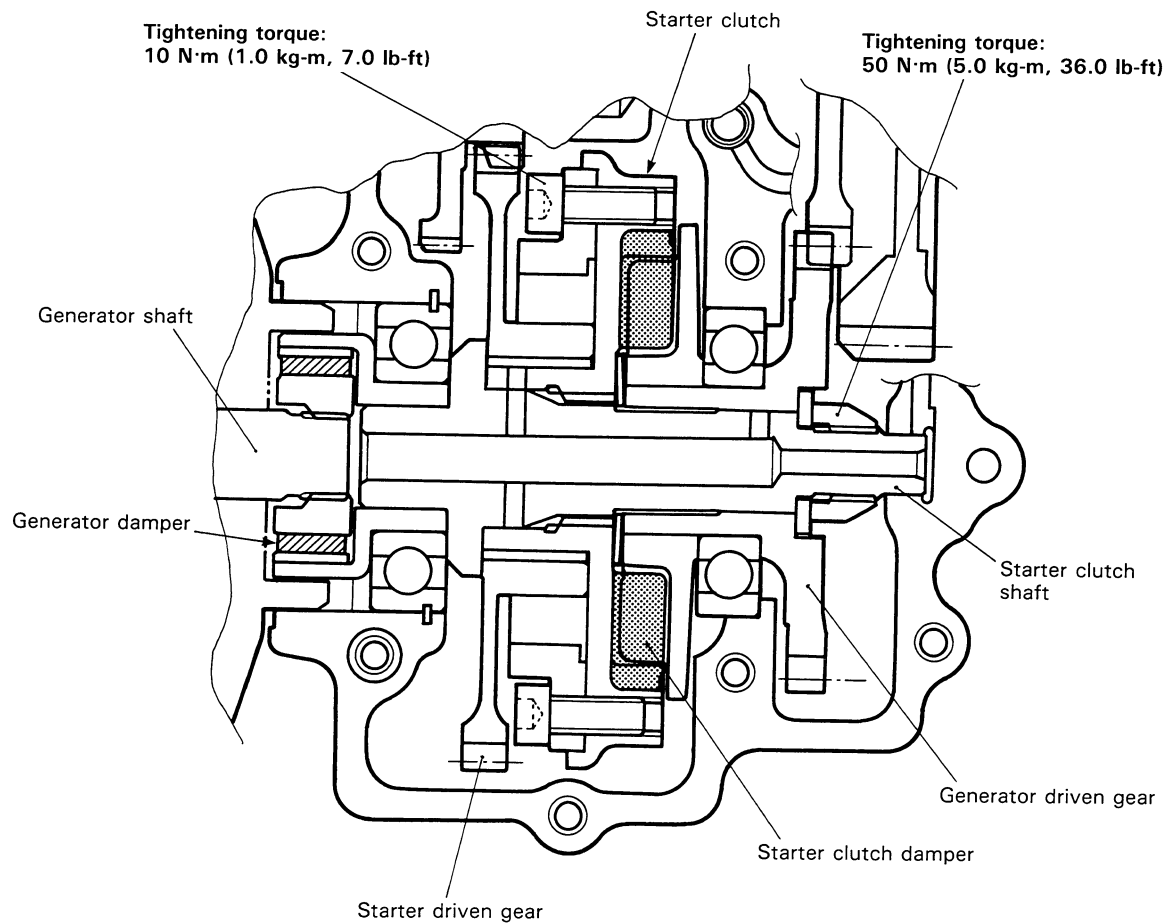
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	225	2.25	33	250	2.50	36
REAR	250	2.50	36	290	2.90	42

**TIRE PRESSURE [The other markets]**

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42

## SERVICE INFORMATION

### STARTER CLUTCH

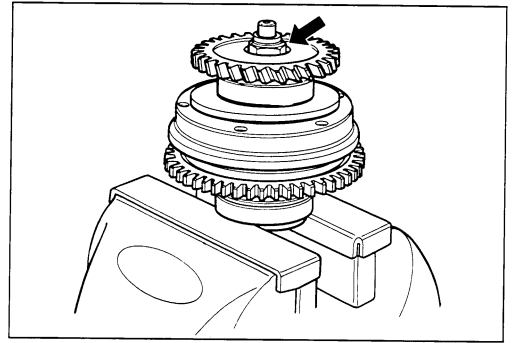


## DISASSEMBLY AND INSPECTION

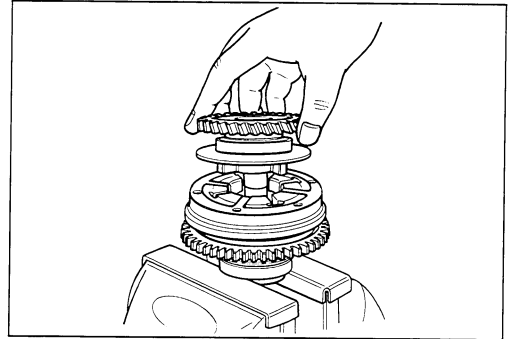
- Hold the starter clutch shaft to use a vise and appropriate pieces of soft metals, and remove the nut as shown in the Fig.

### CAUTION:

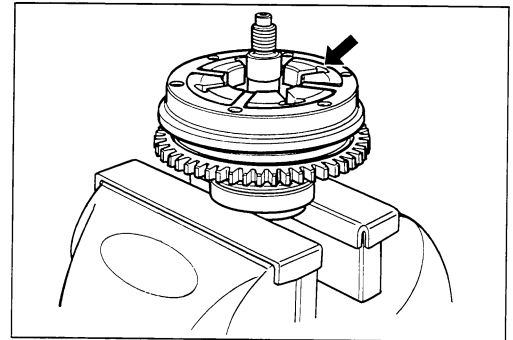
This is a left-hand thread nut.



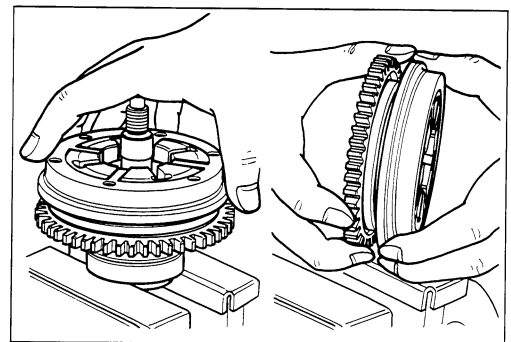
- Remove the generator driven gear assembly.



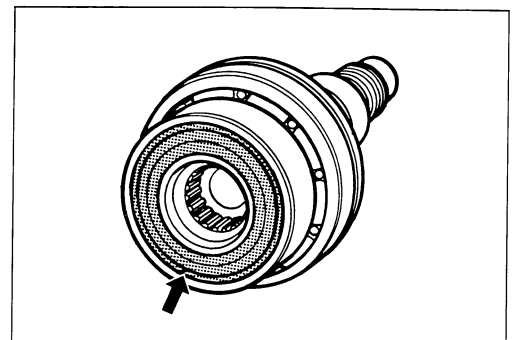
- Inspect the dampers for wear and damage. If any defects are found, replace the dampers as a set.
- Inspect the starter clutch and its contacting surface of the starter driven gear for wear or damage. If they are found to be damaged, replace them with new ones.



- Remove the starter clutch and its driven gear.
- Remove the driven gear from the starter clutch.



- Inspect the generator damper for damage. If any defects are found, replace the damper or starter clutch shaft assembly.



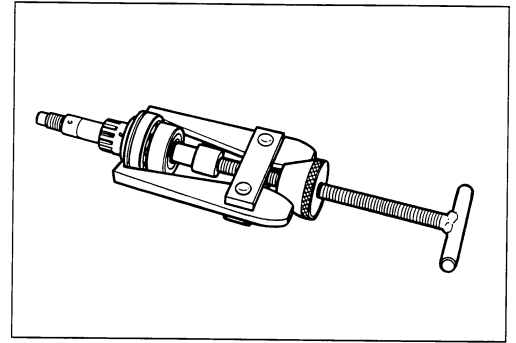
- Remove the bearing and generator damper from the starter clutch shaft with a bearing puller.

**NOTE:**

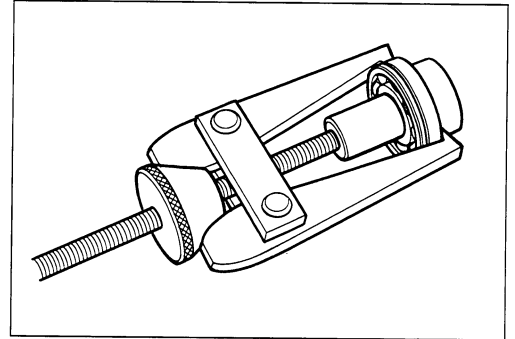
*Before removing the bearing, rotate the outer race by hand to inspect for abnormal noise and smooth rotation.*

**CAUTION:**

The removed bearing should be replaced with a new one.



- Remove the bearing from the generator damper.




**REASSEMBLY**

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

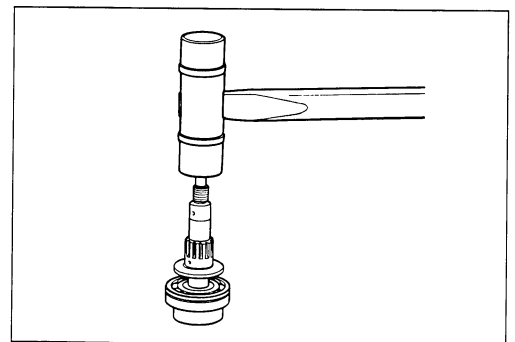
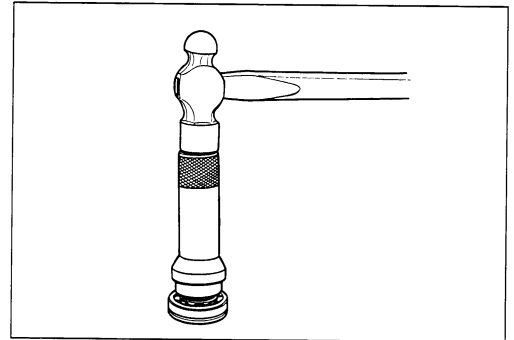
**NOTE:**

*Apply engine oil to each starter clutch part before reassembling.*

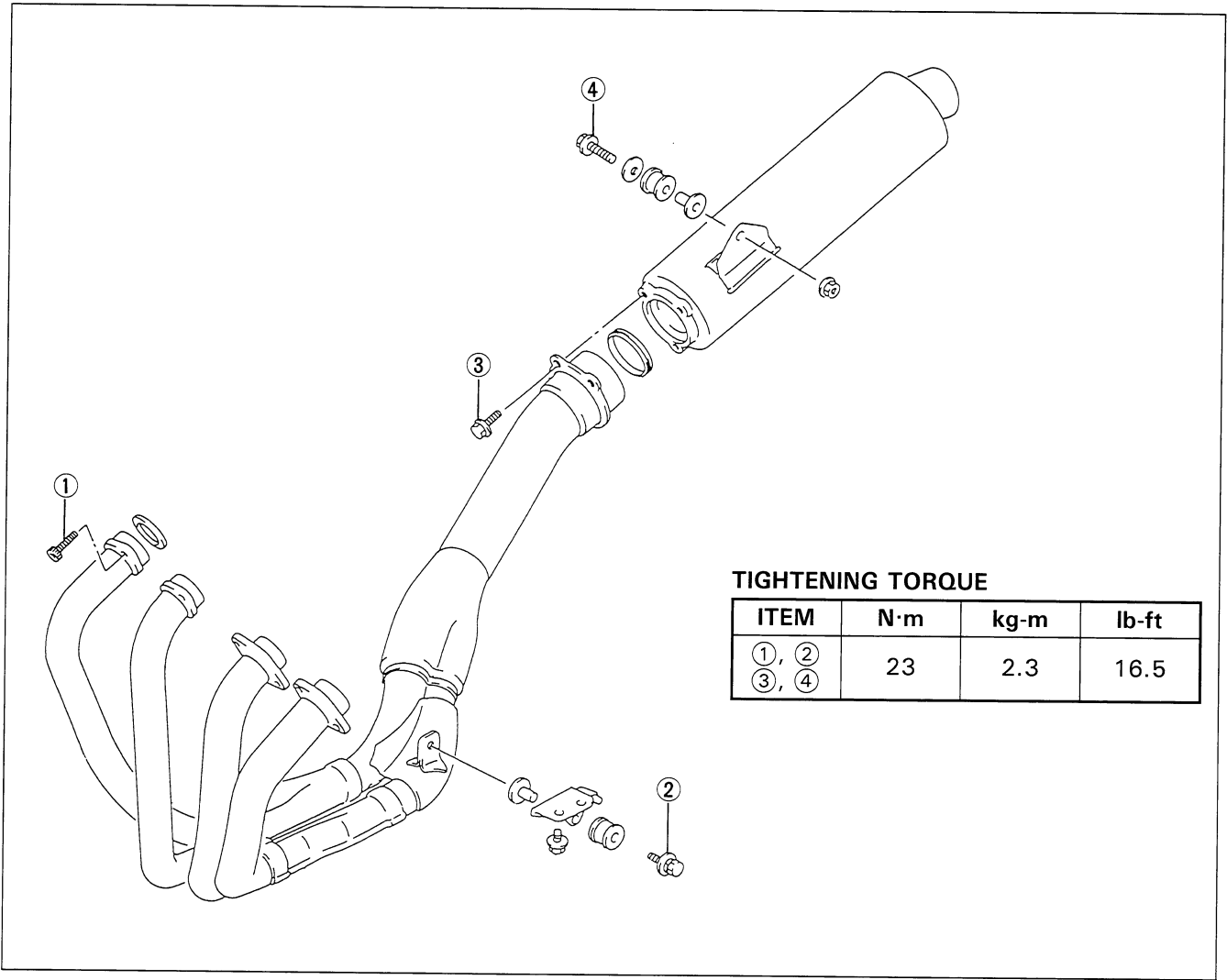
- Install the bearing to the generator damper with a bearing installer.

 **09951-16080: Bearing installer**

- Install the starter clutch shaft into the generator damper by tapping with a plastic mallet.



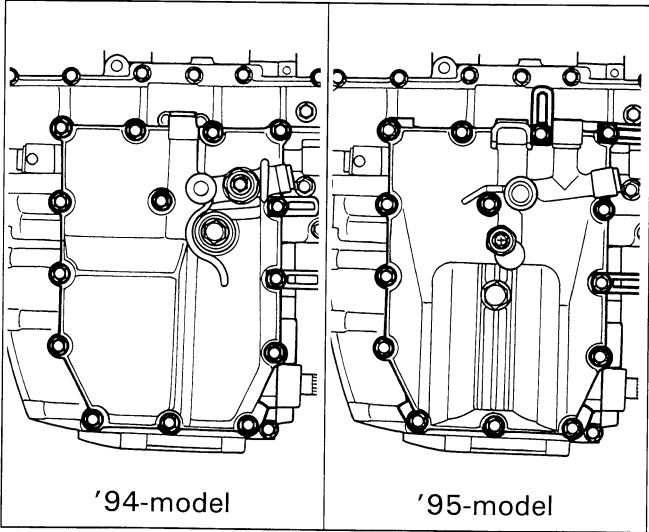
EXHAUST PIPE/MUFFLER MOUNTING



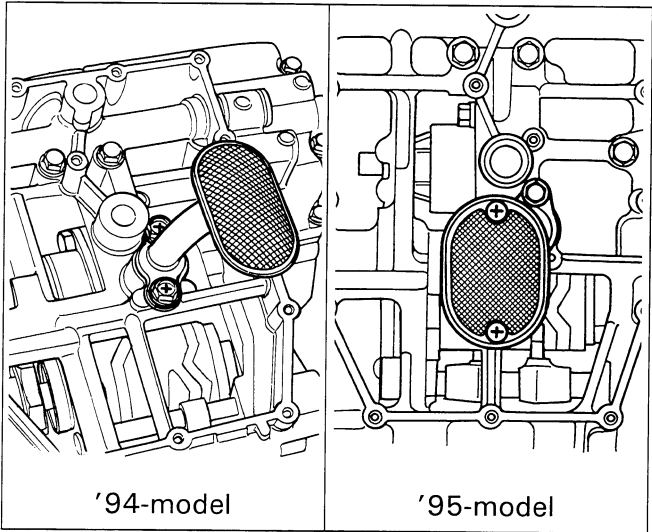
OIL PAN AND OIL SUMP FILTER

The shape of the oil pan has been changed. According to this changed, the shape of the oil sump filter has been changed.

OIL PAN



OIL SUMP FILTER





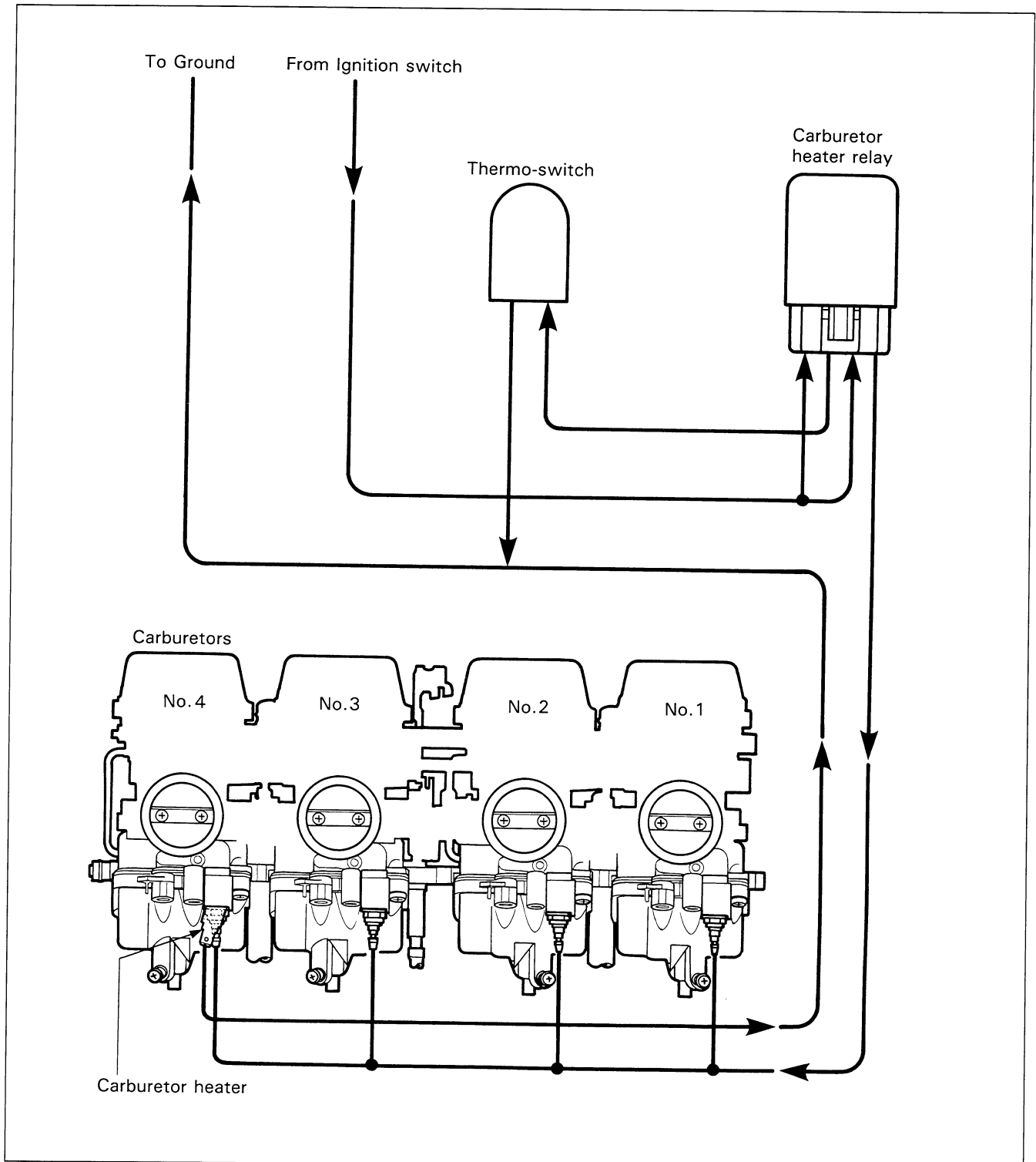
## CARBURETOR

### CARBURETOR HEATER

Electric carburetor heater is equipped beneath the float chamber body.

This device consists of the carburetor heater, the thermo-switch, the carburetor heater relay and wiring. The carburetor heater provides better fuel atomization when the atmospheric temperature is lower than 9°C, that turns the thermo-switch ON automatically.

**Thermo-switch operating temperature: Below 9°C**



## CARBURETOR HEATER INSPECTION

Check the carburetor heater, which requires following two inspection:

- Remove the fuel tank. (Refer to page 4-5 of RF600R SERVICE MANUAL).
- Disconnect each lead wire going into the respective carburetor heaters.

1. Check each heater coil for open and ohmic resistance with a pocket tester.

The coil is in good condition if the resistance is as follows.

### NOTE:

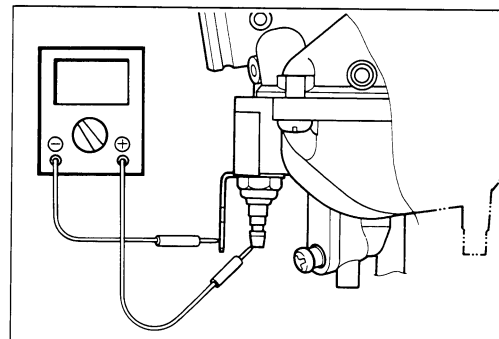
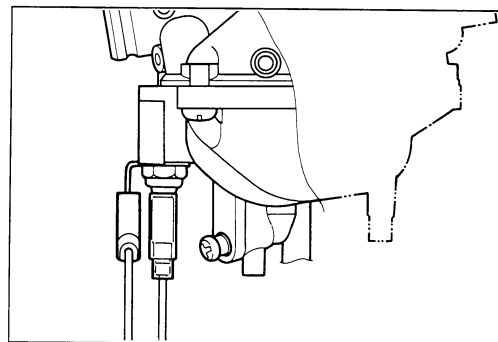
When making this test, be sure that the carburetor heater is in a cold condition.

**TOOL** 09900-25002: Pocket tester

**Tester knob indication:**  $\times 1 \Omega$  range

Heater coil resistance

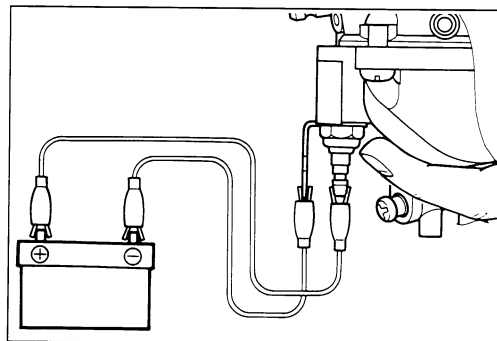
Standard: 12—18  $\Omega$



2. Connect 12V battery to the carburetor heater terminals and check the carburetor float chamber temperature with your hand which is warmed up after 5 minutes. If the carburetor float chamber temperature is not warmed up, replace the carburetor heater with a new one.

### ⚠ WARNING

Do not touch the carburetor heater directly to prevent burn.

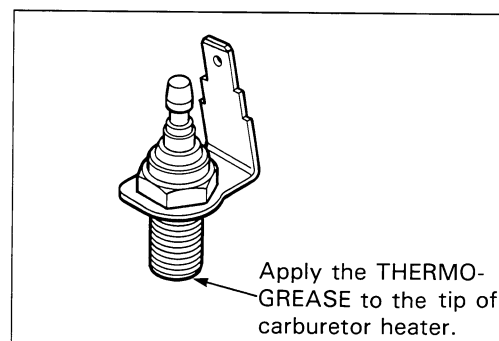


## CARBURETOR HEATER REASSEMBLY

- Before installing the carburetor heater, apply a small quantity of the THERMO-GREASE to the carburetor heater and tighten it to the specified torque.

**99000-59029: THERMO-GREASE**

**Carburetor heater:** 3 N·m (0.3 kg-m, 2.0 lb-ft)




## THERMO-SWITCH INSPECTION

The thermo-switch is located ahead of the fuse box.

- Remove the thermo-switch by disconnecting the lead wire's coupler.
- Immerse the thermo-switch in ice contained in a pan and wait about few minutes, then check the continuity between the lead wires of the thermo-switch with a pocket tester.

If there is no continuity, replace the thermo-switch with a new one.

 **09900-25002: Pocket tester**

 **Tester knob indication :  $\times 1k\Omega$  range**


## CARBURETOR HEATER RELAY INSPECTION

The carburetor heater relay is located right-side of the turn signal relay.

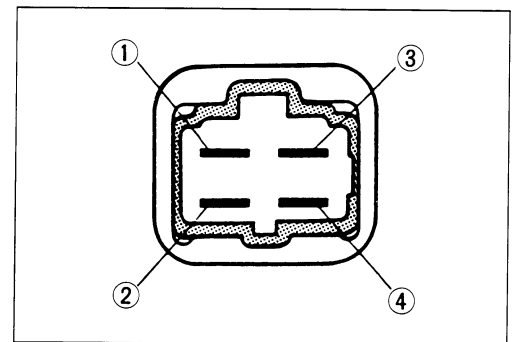
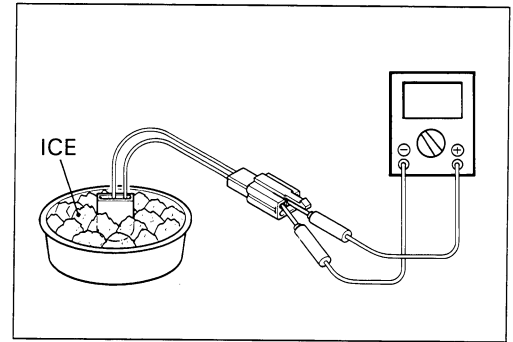
- Remove the carburetor heater relay by disconnecting the lead wire's coupler.

First, check the insulation between ① and ② terminals with a pocket tester. Then, connect 12V battery to ③ and ④ terminals,  $\oplus$  to ③ and  $\ominus$  to ④, and check the continuity between ① and ②.

If there is no continuity, replace it with a new one.


 **09900-25002: Pocket tester**

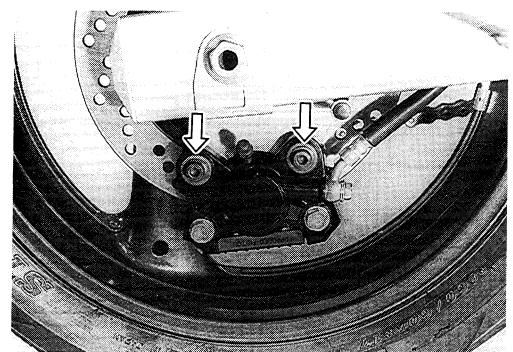
 **Tester knob indication:  $\times 1\Omega$  range**



## REAR BRAKE CALIPER

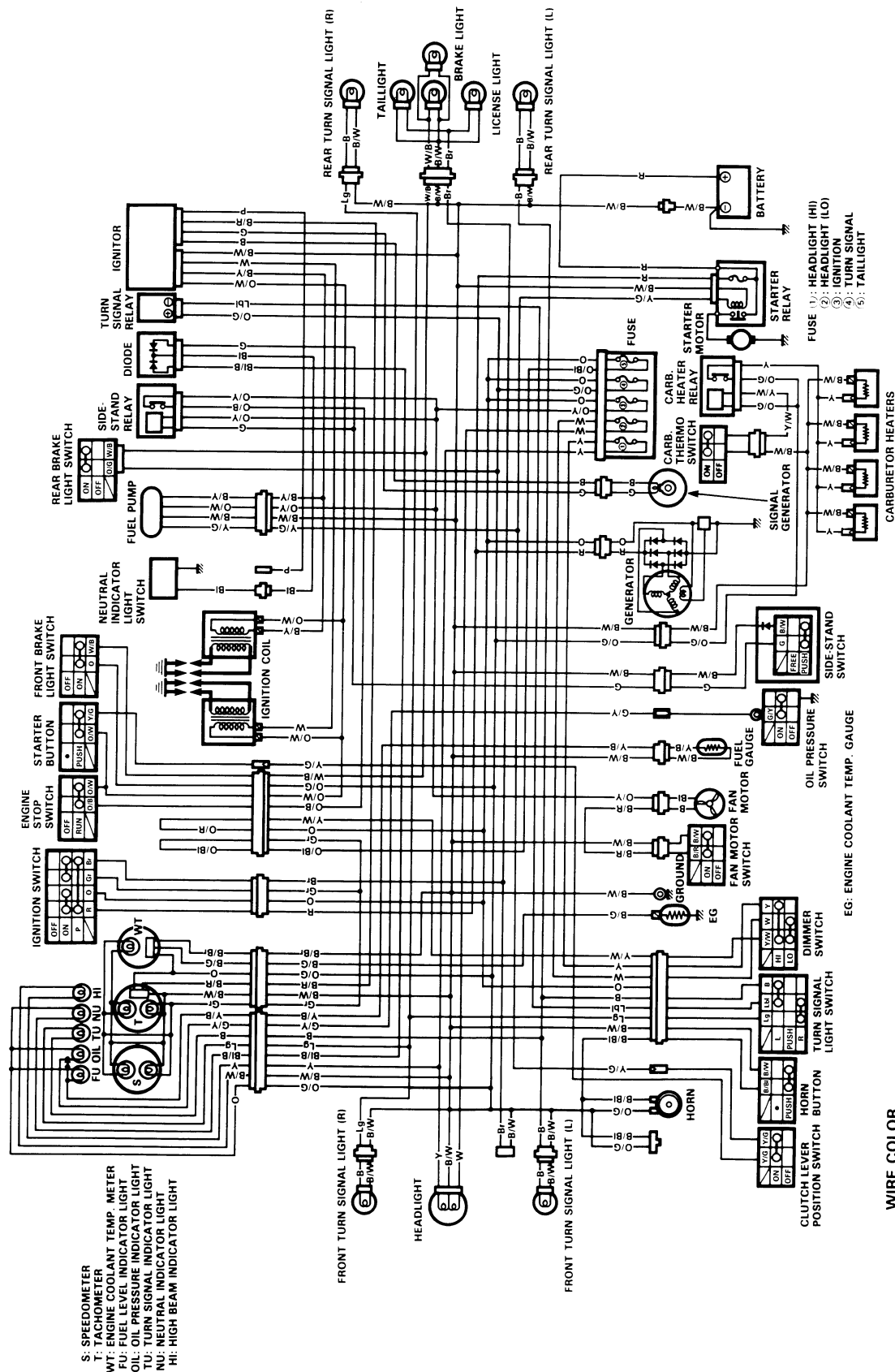
The rear brake caliper mounting has been changed from rigid type to floating type.

 **Caliper mounting bolt: 28—33 N·m  
(2.8—3.3 kg-m, 20.0—24.0 lb-ft)**



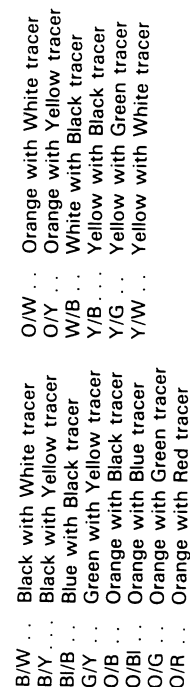
# WIRING DIAGRAM

For Canada



## WIRE COLOR

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

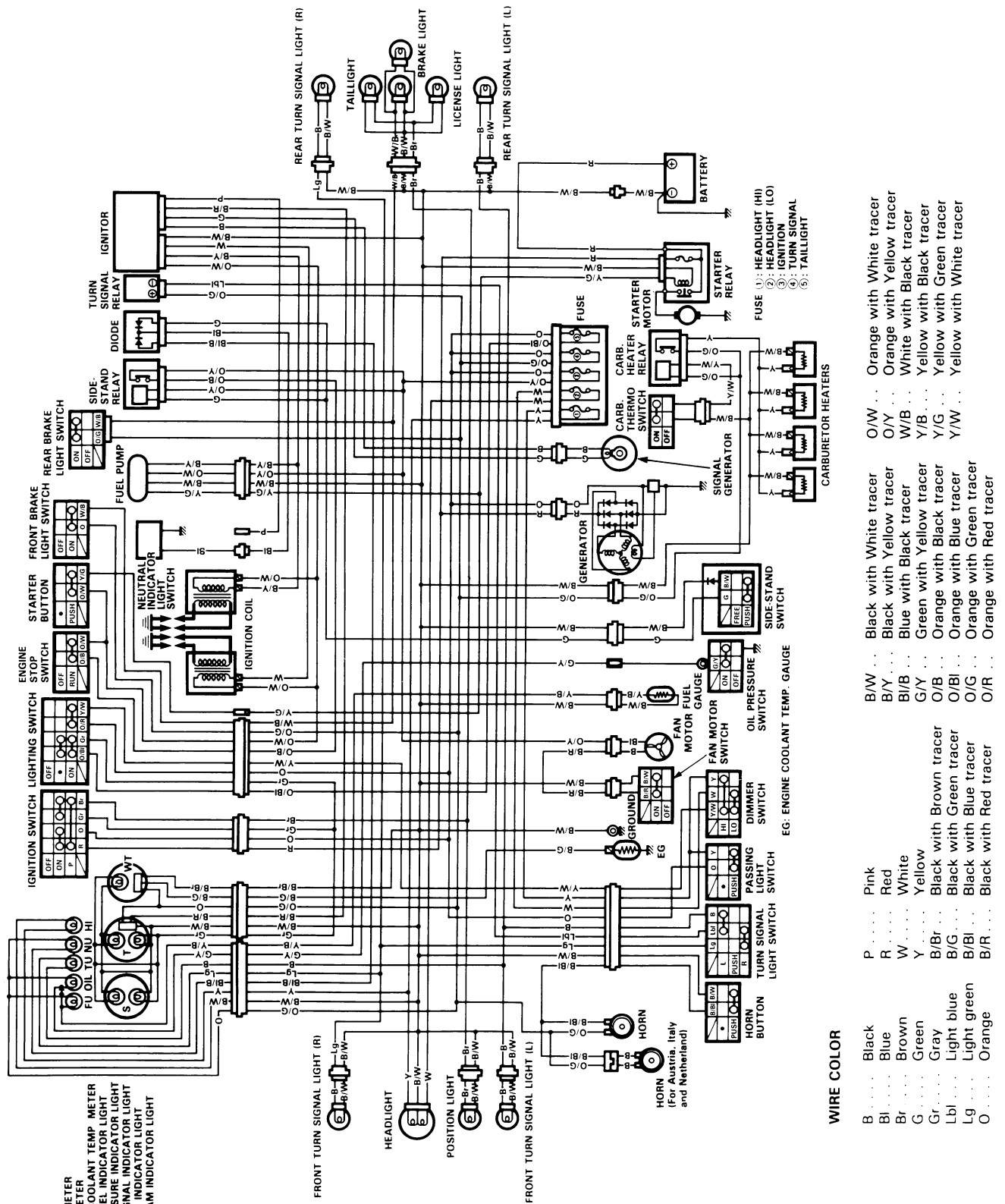


P	R	W	Y	B/Br	B/G	B/Bl	B/R
...	...	...	...	...	...	...	...
Pink	Red	White	Yellow	Black with Brown tracer	Black with Green tracer	Black with Blue tracer	Black with Red tracer

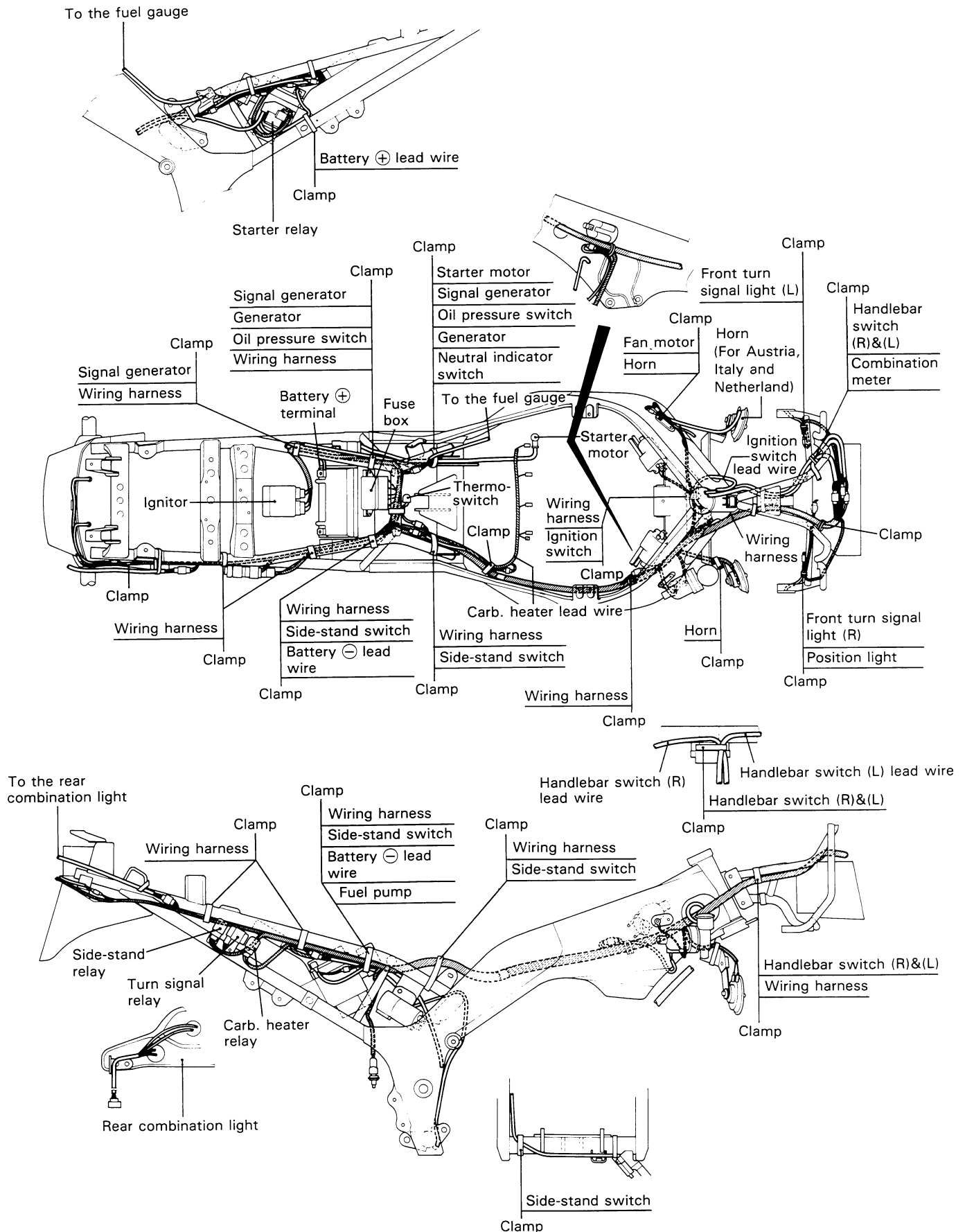
## WIRE COLOR

Black  
Blue  
Brown  
Green  
Gray  
Light blue  
Light green  
Orange

## For the others



# WIRE HARNESS ROUTING



# ***RF600RT ('96-MODEL)***

## ***FOREWORD***

*This section describes service data and service information which differ from those of the RF600RS ('95-model).*

***NOTE:***

- *Any differences between RF600RS ('95-model) and RF600RT ('96-model) in service data are clearly indicated with the asterisk marks (\*)*
- *Please refer to the sections 1 through 10 for details which are not given in this section.*

## ***CONTENTS***

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

Overall length.....	2 160 mm (85.0 in) . . . . . E18, 22
	2 110 mm (83.1 in) . . . . . Others
Overall width.....	710 mm (28.0 in)
Overall height.....	1 175 mm (46.3 in)
Wheelbase.....	1 430 mm (56.3 in)
Ground clearance.....	120 mm ( 4.7 in)
Seat height.....	790 mm (31.1 in)
Dry mass.....	195 kg (429 lbs) . . . . . Others
	198 kg (436 lbs) . . . . . E33

## ENGINE

Type.....	Four-stroke, liquid-cooled, DOHC, TSCC
Valve clearance, IN.....	0.10—0.20 mm (0.004—0.008 in)
EX.....	0.20—0.30 mm (0.008—0.012 in)
Number of cylinders.....	4
Bore.....	65.0 mm (2.559 in)
Stroke.....	45.2 mm (1.780 in)
Piston displacement.....	599 cm <sup>3</sup> (36.6 cu. in)
Corrected compression ratio.....	12.0 : 1
Carburetor.....	BDST33, four . . . E18,33
	BDST36, four . . . Others
Air cleaner.....	Non-woven fabric element
Starter system.....	Starter motor
Lubrication system.....	Wet sump

## TRANSMISSION

Clutch.....	Wet multi-plate type
Transmission.....	6-speed constant mesh
Gearshift pattern.....	1-down, 5-up
Primary reduction ratio.....	1.744 (75/43)
Gear ratios, Low.....	3.142 (44/14)
2nd.....	2.058 (35/17)
3rd.....	1.650 (33/20)
4th.....	1.428 (30/21)
5th.....	1.260 (29/23)
Top.....	1.120 (28/25)
Final reduction ratio.....	3.071 (43/14) . . . E03, 18, 33
	3.000 (42/14) . . . Others
Drive chain.....	RK50MFOZ1, 108 links

## CHASSIS

Front suspension.....	Telescopic, coil spring, oil damped, spring preload adjustable
Rear suspension.....	Link type, spring preload 7-way adjustable, damping force 4-way adjustable
Front suspension stroke.....	120 mm (4.7 in)
Rear suspension travel.....	130 mm (5.1 in)
Caster.....	65°
Trail.....	103 mm (4.06 in)
Steering angle.....	30°
Turning radius.....	3.2 m (10.5 ft)
Front brake.....	Disk brake, twin, hydraulically operated
Rear brake.....	Disk brake, hydraulically operated
Front tire size.....	120/70ZR17
Rear tire size.....	160/60ZR17

## ELECTRICAL

Ignition type.....	Electronic ignition (Transistorized)
Ignition timing.....	4° B.T.D.C. below 1500 r/min . . . E18,33
	7° B.T.D.C. below 1500 r/min . . . Others
Spark plug.....	NGK CR9E or NIPPONDENSO U27ESR-N
Battery.....	12V 28.8kC (8 Ah)/10 HR
Generator.....	Three-phase A.C. generator
Circuit breaker.....	30A
Fuse.....	15/15/10/15/10A
Headlight.....	12V 60/55W
Position light.....	12V 4W . . . except E24,28
Turn signal light.....	12V 21W x 4
Taillight.....	12V 5W
Brake light.....	12V 21W x 2
License plate light.....	12V 5W
Speedometer light.....	12V 1.7W x 2
Tachometer light.....	12V 1.7W x 2
Neutral indicator light.....	12V 3.4W
High beam indicator light.....	12V 3.4W
Turn signal indicator light.....	12V 3.4W
Oil pressure indicator light.....	12V 3.4W
Fuel indicator light.....	12V 3.4W

## CAPACITIES

Fuel tank, including reserve.....	16.0 L (4.2/3.5 US/lmp gal) . . . E33
	17.0 L (4.5/3.7 US/lmp gal) . . . Others
Reserve.....	4.0 L (1.1/0.9 US/lmp gal)
Engine oil, oil change.....	3 000 ml (3.2/2.6 US/lmp qt)
with filter change.....	3 300 ml (3.5/2.9 US/lmp qt)
overhaul.....	3 900 ml (4.1/3.4 US/lmp qt)
Engine coolant.....	2 450 ml (2.6/2.2 US/lmp qt)
Front fork oil.....	503 ml (17.0/17.7 US/lmp oz)

## SERVICE DATA

### VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD			LIMIT
Valve diam.	IN.	25.5 (1.00)		——
	EX.	22.5 (0.89)		——
Valve lift	IN.	E-04 and others	8.3 (0.33)	——
		E-18	6.6 (0.26)	——
	EX.	E-04 and others	7.9 (0.31)	——
		E-18	6.1 (0.24)	——
Tappet clearance (when cold)	IN.	0.10—0.20 (0.004—0.008)		——
	EX.	0.20—0.30 (0.008—0.010)		——
Valve guide to valve stem clearance	IN.	0.020—0.047 (0.0008—0.0019)		——
	EX.	0.030—0.057 (0.0012—0.0022)		——
Valve stem deflection	IN. & EX.	——		0.35 (0.014)
Valve guide I.D.	IN. & EX.	4.500—4.512 (0.1772—0.1776)		——
Valve stem O.D.	IN.	4.465—4.480 (0.1758—0.1764)		——
	EX.	4.455—4.470 (0.1754—0.1760)		——
Valve stem runout	IN. & EX.	——		0.05 (0.002)
Valve head thickness	IN. & EX.	——		0.5 (0.02)
Valve seat width	IN. & EX.	0.9—1.1 (0.035—0.043)		——
Valve head radial runout	IN. & EX.	——		0.03 (0.001)
Valve spring free length (IN. & EX.)	——			43.0 (1.69)
Valve spring tension (IN. & EX.)	18.6—21.4 kg (41.0—47.2 lbs) at length 38 mm (1.5 in)			——

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-04	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
		E-18,33	34.542—34.598 (1.3599—1.3621)	34.25 (1.348)
		Others	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
	EX.	E-04	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
		E-18,33	34.122—34.178 (1.3433—1.3456)	33.83 (1.332)
		Others	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0059)	
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	——	
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	——	
Camshaft runout	IN. & EX	——	0.10 (0.004)	
Cam chain pin (at arrow “3”)	13th pin			——
Cylinder head distortion	——			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000–1 500 kPa (10–15 kg/cm <sup>2</sup> ) (142–213 psi)			800 kPa (8 kg/cm <sup>2</sup> ) (114psi)
Compression pressure difference	—			200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.040–0.060 (0.0016–0.0024)			0.120 (0.0047)
Cylinder bore	65.000–65.015 (2.5591–2.5596)			65.090 (2.5626)
Piston diam.	64.945–64.970 (2.5569–2.5579) Measure at 15 mm (0.6 in) from the skirt end.			64.880 (2.5543)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 7.5 (0.29)	6.0 (0.24)
	2nd	R	Approx. 8.0 (0.31)	6.4 (0.25)
Piston ring end gap	1st	0.25–0.40 (0.010–0.016)		0.5 (0.02)
	2nd	0.25–0.40 (0.010–0.016)		0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	———	0.18 (0.007)
	2nd	———	0.18 (0.007)
Piston ring groove width	1st	0.83—0.85 (0.032—0.033)	———
	2nd	0.82—0.84 (0.032—0.033)	———
	Oil	1.51—1.53 (0.059—0.060)	———
Piston ring thickness	1st	0.77—0.79 (0.030—0.031)	———
	2nd	0.77—0.79 (0.030—0.031)	———
Piston pin bore	16.002—16.008 (0.6210—0.6302)		16.030 (0.6311)
Piston pin O.D.	15.996—16.000 (0.6298—0.6299)		15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.010—16.018 (0.6303—0.6306)		16.040 (0.6315)
Conrod big end side clearance	0.10—0.20 (0.004—0.008)		0.30 (0.010)
Conrod big end width	20.95—21.00 (0.825—0.827)		———
Crank pin width	21.10—21.15 (0.831—0.833)		———
Conrod big end oil clearance	0.032—0.056 (0.0013—0.0022)		0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)		———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)		0.080 (0.0031)
Crankshaft journal O.D.	33.976—34.000 (1.3376—1.3386)		———
Crankshaft thrust clearance	0.055—0.110 (0.0022—0.0043)		———
Crankshaft thrust bearing thickness	Right side	2.425—2.450 (0.0955—0.0965)	———
	Left side	2.350—2.500 (0.0925—0.0984)	———
Crankshaft runout	———		0.05 (0.002)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.898 (75/43 x 37/34)	—
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm <sup>2</sup> , 43 psi) Below 600 kPa (6.0 kg/cm <sup>2</sup> , 85 psi) at 3 000 r/min.	—

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10–15 (0.4–0.6)	—
Drive plate thickness	2.12–2.28 (0.083–0.090)	1.82 (0.072)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	47.5 (1.87)

**THERMOSTAT + RADIATOR + FAN**

ITEM		STANDARD	LIMIT
Thermostat valve opening temperature		74.5–78.5°C (166.1–173.3°F)	—
Thermostat valve lift		Over 7 mm (0.28 in) at 90°C (194°F)	—
Radiator cap valve opening pressure		110 kPa (1.1 kg/cm <sup>2</sup> , 15.6 psi)	—
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	—
	80°C (176°F)	Approx. 51.9 Ω	—
	100°C (212°F)	Approx. 27.4 Ω	—
	120°C (248°F)	Approx. 16.1 Ω	—

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.744 (75/43)	—
Final reduction ratio	E-03,18,33	3.071 (43/14)	—
	The others	3.000 (42/14)	—
Gear ratios	Low	3.142 (44/14)	—
	2nd	2.058 (35/17)	—
	3rd	1.650 (33/20)	—
	4th	1.428 (30/21)	—
	5th	1.260 (29/23)	—
	Top	1.120 (28/25)	—

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10—0.30 (0.004—0.012)		0.50 (0.020)
Shift fork groove width	5.00—5.10 (0.197—0.201)		—
Shift fork thickness	4.80—4.90 (0.189—0.193)		—
Drive chain	Type	RK50MFOZ1	—
	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	30—40 (1.2—1.6)		—
Gearshift lever height	70 (2.8)		—

## CARBURETOR

ITEM	SPECIFICATION		
	E-03, U.S.A.	E-33, U.S.A. (Calif. model)	E-37
Carburetor type	MIKUNI BDST36SS	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	33 mm	36 mm
I.D. No.	21EG	21EH	21EN
Idle r/min.	1 300 ± 100 r/min	1 350 ± 100 r/min	1 200 ± 100 r/min
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)		
Main jet (M.J.)	#112.5	#107.5	#112.5
Main air jet (M.A.J.)	0.7 mm	0.6 mm	#1&4: 0.6 mm, #2&3: 1.0 mm
Jet needle (J.N.)	5E97	5E99	5D44-3rd
Needle jet (N.J.)	□-9	□-8	O-9
Throttle valve (Th.V.)	#120	←	#125
Pilot jet (P.J.)	#15	#1□	#12.5
Starter jet (G.S.)	#47.5	←	←
Pilot screw (P.S.)	PRE-SET	←	PRE-SET (1-1/2 turns out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)		

## CARBURETOR

ITEM	SPECIFICATION			
	E-02 and others	E-22,24	E-18	E-22-U type
Carburetor type	MIKUNI BDST36SS	←	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	←	33 mm	36 mm
I.D. No.	21EF	21EJ	21EL	21EK
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min	←	←
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)			

ITEM	SPECIFICATION			
	E-02 and others	E-22,24	E-18	E-22-U type
Main jet (M.J.)	# 112.5	←	# 110	# 120
Main air jet (M.A.J.)	#1&4: 0.6 mm, #2&3: 1.0 mm	←	0.6 mm	0.7 mm
Jet needle (J.N.)	5D44-3rd	←	5E93-4th	5D44-2nd
Needle jet (N.J.)	O-9	←	O-8	←
Throttle valve (Th.V.)	# 125	←	# 120	# 125
Pilot jet (P.J.)	# 12.5	←	# 10	# 12.5
Starter jet (G.S.)	# 47.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1-1/2 turns out)	←	←	PRE-SET (1 turn out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

**ELECTRICAL**

Unit: mm (in)

ITEM			SPECIFICATION		NOTE
Ignition timing			4° B.T.D.C. below 1 500 r/min.		E-18,33
			7° B.T.D.C. below 1 500 r/min.		Others
Firing order			1-2-4-3		
Spark plug			Type	NGK: CR9E ND: U27ESR-N	
			Gap	0.7—0.8 (0.028—0.032)	
Spark performance			Over 8 (0.3) at 1 atm.		
Signal coil resistance			(Black—Green) Approx. 135—200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance			Primary	⊕ tap— ⊖ tap Approx. 2.4—3.2 Ω	Tester range: (x 1 Ω)
			Secondary	Plug cap—Plug cap Approx. 30—40 kΩ	Tester range: (x 1 kΩ)
Generator			Slip ring O.D.	Limit: 14.0 (0.55)	ND
			Brush length	Limit: 4.5 (0.18)	
Generator Max. output			Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage			Above 13.5 V at 5 000 r/min.		
Starter motor			Commutator under-cut	Limit: 0.2 (0.008)	ND
Starter relay resistance			3—5 Ω		
Battery	Type designation		YTX9-BS		
	Capacity		12 V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.		1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A		
		LO	15 A		
	Turn signal		15 A		
	Ignition		10 A		
	Taillight		10 A		
	Main		30 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Taillight		5	←
Brake light		21 × 2	←
Turn signal light		21 × 4	←
Tachometer light		1.7 × 2	←
Speedometer light		1.7 × 2	←
Turn signal indicator light		3.4	←
High beam indicator light		3.4	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←
Fuel level indicator light		3.4	←
License light		5	←
Engine coolant temp. meter light		1.7	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Rear brake pedal height		55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)		4.0 (0.16)
	Rear	5.0 ± 0.2 (0.197 ± 0.008)		4.5 (0.18)
Brake disc runout (Front & Rear)		—		0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)		—
	Rear	12.700–12.743 (0.5000–0.5017)		—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4993)		—
	Rear	12.657–12.684 (0.4983–0.4993)		—
Brake caliper cylinder bore	Leading	Front	25.400–25.450 (1.0000–1.0020)	—
	Trailing		25.400–25.450 (1.0000–1.0020)	—
		Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Leading	Front	25.335–25.368 (0.9974–0.9987)	—
	Trailing		25.335–25.368 (0.9974–0.9987)	—
		Rear	38.098–38.148 (1.5000–1.5019)	—



ITEM	STANDARD		LIMIT
Wheel rim runout (Front & Rear)	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	120/70 ZR17	——
	Rear	160/60 ZR17	——
Tire tread depth	Front	——	1.6 (0.06)
	Rear	——	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	——	
Front fork spring free length	——	390 (15.4)	
Front fork oil level	92 (3.6)	——	
Rear wheel travel	130 (5.1)	——	
Swingarm pivot shaft runout	——	0.3 (0.01)	

**FUEL + OIL + ENGINE COOLANT**

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 85 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-03,33
	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	16.0 L (4.2/3.5 US/lmp gal)	E-33
	17.0 L (4.5/3.7 US/lmp gal)	The others
reserve	4.0 L (1.1/0.9 US/lmp gal)	

ITEM	SPECIFICATION		NOTE
Engine oil type	SAE 10W/40, API SE, SF or SG		
Engine oil capacity	Change	3 000 ml (3.2/2.6 US/lmp qt)	
	Filter change	3 300 ml (3.5/2.9 US/lmp qt)	
	Overhaul	3 900 ml (4.1/3.4 US/lmp qt)	
Front fork oil type	Frok oil # 10		
Front fork oil capacity (each leg)	503 ml (17.0/17.7 US/lmp oz)		
Brake fluid type	DOT 4		
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		
Engine coolant including reserve	2 450 ml (2.6/2.2 US/lmp qt)		

### TIRE PRESSURE [E-03,33 markets]

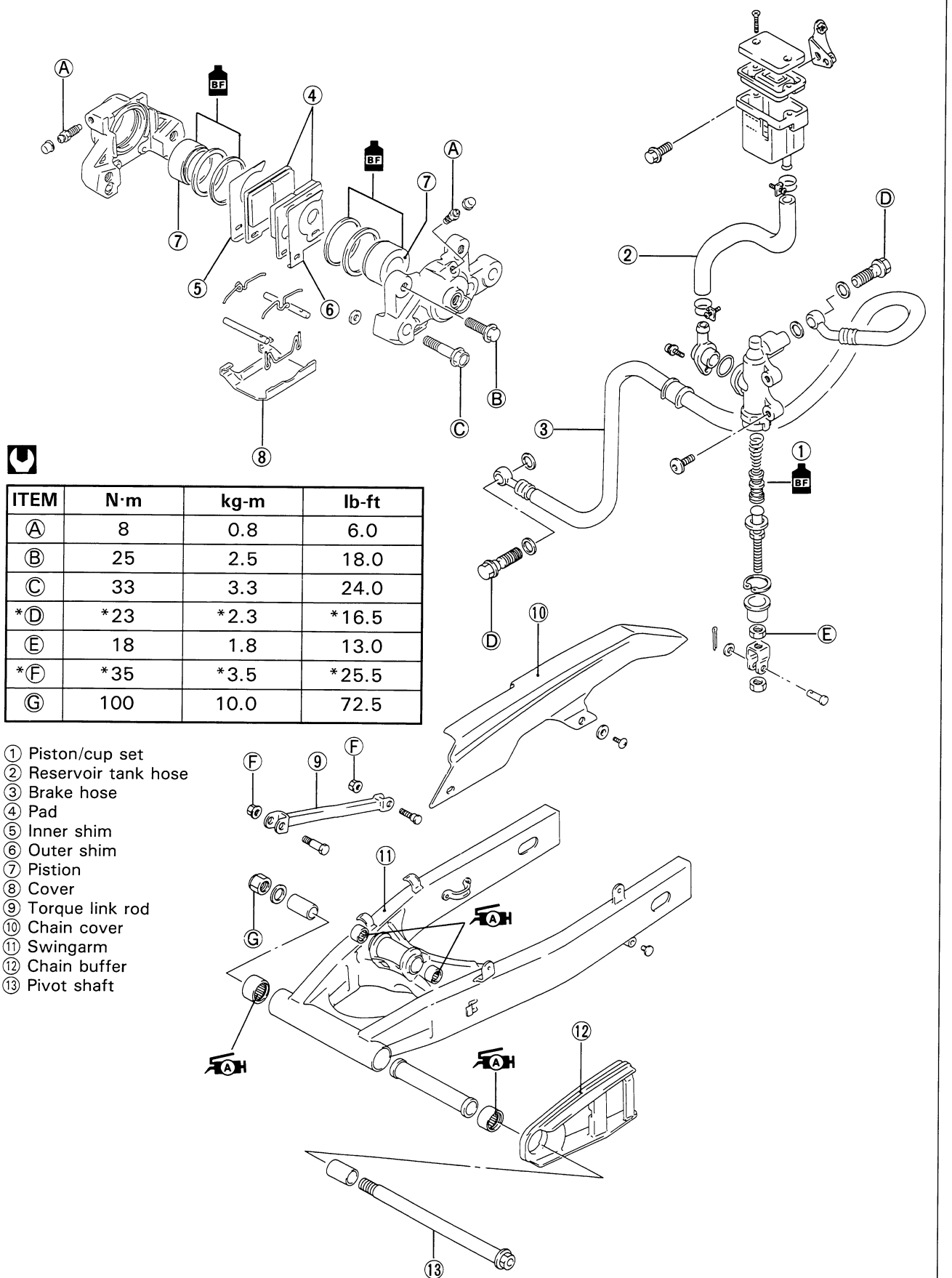
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	225	2.25	33	250	2.50	36
REAR	250	2.50	36	290	2.90	42

### TIRE PRESSURE [The other markets]

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42

# SERVICE INFORMATION

## REAR BRAKE AND TORQUE LINK ROD



# ***RF600RV ('97-MODEL)***

## **FOREWORD**

*This section describes service data and service information which differ from those of the RF600RT ('96-model).*

**NOTE:**

- *Any differences between RF600RT ('96-model) and RF600RV ('97-model) in service data are clearly indicated with the asterisk marks (\*)*
- *Please refer to the sections 1 through 11 for details which are not given in this section.*

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

Overall length	2 160 mm (85.0 in) . . . . . E18, 22
	2 110 mm (83.1 in) . . . . . Others
Overall width	710 mm (28.0 in)
Overall height	1 175 mm (46.3 in)
Wheelbase	1 430 mm (56.3 in)
Ground clearance	120 mm ( 4.7 in)
Seat height	790 mm (31.1 in)
Dry mass	195 kg (429 lbs)

## ENGINE

Type	Four-stroke, liquid-cooled, DOHC, TSCC
Valve clearance, IN	0.10—0.20 mm (0.004—0.008 in)
EX	0.20—0.30 mm (0.008—0.012 in)
Number of cylinders	4
Bore	65.0 mm (2.559 in)
Stroke	45.2 mm (1.780 in)
Displacement	599 cm <sup>3</sup> (36.6 cu. in)
Corrected compression ratio	12.0 : 1
Carburetor	BDST33, four . . . E18
	BDST36, four . . . Others
Air cleaner	Non-woven fabric element
Starter system	Starter motor
Lubrication system	Wet sump

## TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	1.744 (75/43)
Gear ratios, Low	3.142 (44/14)
2nd	2.058 (35/17)
3rd	1.650 (33/20)
4th	1.428 (30/21)
5th	1.260 (29/23)
Top	1.120 (28/25)
Final reduction ratio	3.071 (43/14) . . . E18
	3.000 (42/14) . . . Others
Drive chain	RK50MFOZ1, 108 links

## CHASSIS

Front suspension	Telescopic, coil spring, oil damped, spring preload adjustable
Rear suspension	Link type, spring preload 7-way adjustable, damping force 4-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear suspension travel	130 mm (5.1 in)
Caster	25°
Trail	103 mm (4.06 in)
Steering angle	30°
Turning radius	3.2 m (10.5 ft)
Front brake	Disk brake, twin
Rear brake	Disk brake
Front tire size	120/70ZR17
Rear tire size	160/60ZR17

## ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	4° B.T.D.C. below 1500 r/min . . . E18
	7° B.T.D.C. below 1500 r/min . . . Others
Spark plug	NGK CR9E or NIPPONDENSO U27ESR-N
Battery	12V 28.8kC (8 Ah)/10 HR
Generator	Three-phase A.C. generator
Main fuse	30A
Fuse	15/15/10/15/10A
Headlight	12V 60/55W
Position light	12V 4W . . . except E24
Turn signal light	12V 21W × 4
Taillight	12V 5W
Brake light	12V 21W × 2
License plate light	12V 5W
Speedometer light	12V 1.7W × 2
Tachometer light	12V 1.7W × 2
Neutral indicator light	12V 3.4W
High beam indicator light	12V 3.4W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W
Fuel indicator light	12V 3.4W
Temp. meter light	12V 1.7W

## CAPACITIES

Fuel tank, including reserve	17.0 L (4.5/3.7 US/Imp gal)
Reserve	4.0 L (1.1/0.9 US/Imp gal)
Engine oil, oil change	3 000 ml (3.2/2.6 US/Imp qt)
with filter change	3 300 ml (3.5/2.9 US/Imp qt)
overhaul	3 900 ml (4.1/3.4 US/Imp qt)
Engine coolant	2 450 ml (2.6/2.2 US/Imp qt)
Front fork oil	503 ml (17.0/17.7 US/Imp oz)

# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD			LIMIT
Valve diam.	IN.	25.5 (1.00)		——
	EX.	22.5 (0.89)		——
Valve lift	IN.	E-04 and others	8.3 (0.33)	——
		E-18	6.6 (0.26)	——
	EX.	E-04 and others	7.9 (0.31)	——
		E-18	6.1 (0.24)	——
Tappet clearance (when cold)	IN.	0.10—0.20 (0.004—0.008)		——
	EX.	0.20—0.30 (0.008—0.010)		——
Valve guide to valve stem clearance	IN.	0.020—0.047 (0.0008—0.0019)		——
	EX.	0.030—0.057 (0.0012—0.0022)		——
Valve stem deflection	IN. & EX.	——		0.35 (0.014)
Valve guide I.D.	IN. & EX.	4.500—4.512 (0.1772—0.1776)		——
Valve stem O.D.	IN.	4.465—4.480 (0.1758—0.1764)		——
	EX.	4.455—4.470 (0.1754—0.1760)		——
Valve stem runout	IN. & EX.	——		0.05 (0.002)
Valve head thickness	IN. & EX.	——		0.5 (0.02)
Valve seat width	IN. & EX.	0.9—1.1 (0.035—0.043)		——
Valve head radial runout	IN. & EX.	——		0.03 (0.001)
Valve spring free length (IN. & EX.)	——			43.0 (1.69)
Valve spring tension (IN. & EX.)	18.6—21.4 kg (41.0—47.2 lbs) at length 38 mm (1.5 in)			——

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-04	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
		E-18,33	34.542—34.598 (1.3599—1.3621)	34.25 (1.348)
		Others	36.312—36.368 (1.4296—1.4318)	36.02 (1.418)
	EX.	E-04	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
		E-18,33	34.122—34.178 (1.3433—1.3456)	33.83 (1.332)
		Others	35.902—35.958 (1.4135—1.4157)	35.61 (1.402)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0059)	
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—	
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—	
Camshaft runout	IN. & EX	—	0.10 (0.004)	
Cam chain pin (at arrow “3”)	13th pin			—
Cylinder head distortion	—			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000–1 500 kPa (10–15 kg/cm <sup>2</sup> ) (142–213 psi)			800 kPa (8 kg/cm <sup>2</sup> ) (114psi)
Compression pressure difference	—			200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.040–0.060 (0.0016–0.0024)			0.120 (0.0047)
Cylinder bore	65.000–65.015 (2.5591–2.5596)			65.090 (2.5626)
Piston diam.	64.945–64.970 (2.5569–2.5579) Measure at 15 mm (0.6 in) from the skirt end.			64.880 (2.5543)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 7.5 (0.29)	6.0 (0.24)
	2nd	R	Approx. 8.0 (0.31)	6.4 (0.25)
Piston ring end gap	1st	0.25–0.40 (0.010–0.016)		0.5 (0.02)
	2nd	0.25–0.40 (0.010–0.016)		0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	———	0.18 (0.007)
	2nd	———	0.18 (0.007)
Piston ring groove width	1st	0.83–0.85 (0.032–0.033)	———
	2nd	0.82–0.84 (0.032–0.033)	———
	Oil	1.51–1.53 (0.059–0.060)	———
Piston ring thickness	1st	0.77–0.79 (0.030–0.031)	———
	2nd	0.77–0.79 (0.030–0.031)	———
Piston pin bore	16.002–16.008 (0.6210–0.6302)		16.030 (0.6311)
Piston pin O.D.	15.996–16.000 (0.6298–0.6299)		15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.010–16.018 (0.6303–0.6306)		16.040 (0.6315)
Conrod big end side clearance	0.10–0.20 (0.004–0.008)		0.30 (0.010)
Conrod big end width	20.95–21.00 (0.825–0.827)		———
Crank pin width	21.10–21.15 (0.831–0.833)		———
Conrod big end oil clearance	0.032–0.056 (0.0013–0.0022)		0.080 (0.0031)
Crank pin O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft journal oil clearance	0.020–0.044 (0.0008–0.0017)		0.080 (0.0031)
Crankshaft journal O.D.	33.976–34.000 (1.3376–1.3386)		———
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		———
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	———
	Left side	2.350–2.500 (0.0925–0.0984)	———
Crankshaft runout	———		0.05 (0.002)



**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.898 (75/43 x 37/34)	——
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm <sup>2</sup> , 43 psi) Below 600 kPa (6.0 kg/cm <sup>2</sup> , 85 psi) at 3 000 r/min.	——

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10–15 (0.4–0.6)	——
Drive plate thickness	2.12–2.28 (0.083–0.090)	1.82 (0.072)
Driven plate distortion	——	0.10 (0.004)
Clutch spring free length	——	47.5 (1.87)

**THERMOSTAT + RADIATOR + FAN**

ITEM		STANDARD	LIMIT
Thermostat valve opening temperature		74.5–78.5°C (166.1–173.3°F)	——
Thermostat valve lift		Over 7 mm (0.28 in) at 90°C (194°F)	——
Radiator cap valve opening pressure		110 kPa (1.1 kg/cm <sup>2</sup> , 15.6 psi)	——
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	——
	OFF	Approx. 100°C (212°F)	——
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	——
	80°C (176°F)	Approx. 51.9 Ω	——
	100°C (212°F)	Approx. 27.4 Ω	——
	120°C (248°F)	Approx. 16.1 Ω	——

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.744 (75/43)	——
Final reduction ratio	E-03,18,33	3.071 (43/14)	——
	The others	3.000 (42/14)	——
Gear ratios	Low	3.142 (44/14)	——
	2nd	2.058 (35/17)	——
	3rd	1.650 (33/20)	——
	4th	1.428 (30/21)	——
	5th	1.260 (29/23)	——
	Top	1.120 (28/25)	——

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10—0.30 (0.004—0.012)		0.50 (0.020)
Shift fork groove width	5.00—5.10 (0.197—0.201)		—
Shift fork thickness	4.80—4.90 (0.189—0.193)		—
Drive chain	Type	RK50MFOZ1	—
	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	30—40 (1.2—1.6)		—
Gearshift lever height	70 (2.8)		—

## CARBURETOR

ITEM	SPECIFICATION		
	E-03, U.S.A.	E-33, U.S.A. (Calif. model)	E-37
Carburetor type	MIKUNI BDST36SS	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	33 mm	36 mm
I.D. No.	21EG	21EH	21EN
Idle r/min.	1 300 ± 100 r/min	1 350 ± 100 r/min	1 200 ± 100 r/min
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)		
Main jet (M.J.)	# 112.5	# 107.5	# 112.5
Main air jet (M.A.J.)	0.7 mm	0.6 mm	# 1&4: 0.6 mm, # 2&3: 1.0 mm
Jet needle (J.N.)	5E97	5E99	5D44-3rd
Needle jet (N.J.)	0-9	0-8	0-9
Throttle valve (Th.V.)	# 120	←	# 125
Pilot jet (P.J.)	# 15	# 10	# 12.5
Starter jet (G.S.)	# 47.5	←	←
Pilot screw (P.S.)	PRE-SET	←	PRE-SET (1-1/2 turns out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)		

## CARBURETOR

ITEM	SPECIFICATION			
	E-02 and others	E-22,24	E-18	E-22-U type
Carburetor type	MIKUNI BDST36SS	←	MIKUNI BDST33SS	MIKUNI BDST36SS
Bore size	36 mm	←	33 mm	36 mm
I.D. No.	21EF	21EJ	21EL	21EK
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min	←	←
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)			

ITEM	SPECIFICATION			
	E-02 and others	E-22,24	E-18	E-22-U type
Main jet (M.J.)	# 112.5	←	# 110	# 120
Main air jet (M.A.J.)	# 1&4: 0.6 mm, # 2&3: 1.0 mm	←	0.6 mm	0.7 mm
Jet needle (J.N.)	5D44-3rd	←	5E93-4th	5D44-2nd
Needle jet (N.J.)	O-9	←	O-8	←
Throttle valve (Th.V.)	# 125	←	# 120	# 125
Pilot jet (P.J.)	# 12.5	←	# 10	# 12.5
Starter jet (G.S.)	# 47.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1-1/2 turns out)	←	←	PRE-SET (1 turn out)
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

**ELECTRICAL**

Unit: mm (in)

ITEM			SPECIFICATION		NOTE
Ignition timing			4° B.T.D.C. below 1 500 r/min.		E-33
			7° B.T.D.C. below 1 500 r/min.		Others
Firing order			1-2-4-3		
Spark plug			Type	NGK: CR9E ND: U27ESR-N	
			Gap	0.7—0.8 (0.028—0.032)	
Spark performance			Over 8 (0.3) at 1 atm.		
Signal coil resistance			(Black—Green) Approx. 135—200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance			Primary	⊕ tap— ⊖ tap Approx. 2.4—3.2 Ω	Tester range: (x 1 Ω)
			Secondary	Plug cap—Plug cap Approx. 30—40 kΩ	Tester range: (x 1 kΩ)
Generator			Slip ring O.D.	Limit: 14.0 (0.55)	ND
			Brush length	Limit: 4.5 (0.18)	
Generator Max. output			Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage			Above 13.5 V at 5 000 r/min.		
Starter motor			Commutator under-cut	Limit: 0.2 (0.008)	ND
Starter relay resistance			3—5 Ω		
Battery	Type designation		YTX9-BS		
	Capacity		12 V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.		1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A		
		LO	15 A		
	Turn signal		15 A		
	Ignition		10 A		
	Taillight		10 A		
	Main		30 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Taillight		5	←
Brake light		21 × 2	←
Turn signal light		21 × 4	←
Tachometer light		1.7 × 2	←
Speedometer light		1.7 × 2	←
Turn signal indicator light		3.4	←
High beam indicator light		3.4	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←
Fuel level indicator light		3.4	←
License light		5	←
Engine coolant temp. meter light		1.7	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Rear brake pedal height		55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)		4.0 (0.16)
	Rear	5.0 ± 0.2 (0.197 ± 0.008)		4.5 (0.18)
Brake disc runout (Front & Rear)		—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)		—
	Rear	12.700—12.743 (0.5000—0.5017)		—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4993)		—
	Rear	12.657—12.684 (0.4983—0.4993)		—
Brake caliper cylinder bore	Leading	Front	25.400—25.450 (1.0000—1.0020)	—
	Trailing		25.400—25.450 (1.0000—1.0020)	—
		Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Leading	Front	25.335—25.368 (0.9974—0.9987)	—
	Trailing		25.335—25.368 (0.9974—0.9987)	—
		Rear	38.098—38.148 (1.5000—1.5019)	—

ITEM	STANDARD		LIMIT
Wheel rim runout (Front & Rear)	Axial	——	2.0 (0.08)
	Radial	——	2.0 (0.08)
Wheel axle runout	Front	——	0.25 (0.010)
	Rear	——	0.25 (0.010)
Wheel rim size*	Front	J17 × MT3.50	——
	Rear	J17 × MT4.50	——
Tire size	Front	120/70 ZR17	——
	Rear	160/60 ZR17	——
Tire tread depth	Front	——	1.6 (0.06)
	Rear	——	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	——	
Front fork spring free length	——	390 (15.4)	
Front fork oil level	92 (3.6)	——	
Rear wheel travel	130 (5.1)	——	
Swingarm pivot shaft runout	——	0.3 (0.01)	

**FUEL + OIL + ENGINE COOLANT**

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 85 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-03,33
	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	16.0 L (4.2/3.5 US/Imp gal)	E-33
	17.0 L (4.5/3.7 US/Imp gal)	The others
reserve	4.0 L (1.1/0.9 US/Imp gal)	

ITEM	SPECIFICATION		NOTE
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	3 000 ml (3.2/2.6 US/lmp qt)	
	Filter change	3 300 ml (3.5/2.9 US/lmp qt)	
	Overhaul	3 900 ml (4.1/3.4 US/lmp qt)	
Front fork oil type	Fork oil # 10		
Front fork oil capacity (each leg)	503 ml (17.0/17.7 US/lmp oz)		
Brake fluid type	DOT 4		
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		
Engine coolant including reserve	2 450 ml (2.6/2.2 US/lmp qt)		

### TIRE PRESSURE [E-03,33 markets]

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	225	2.25	33	250	2.50	36
REAR	250	2.50	36	290	2.90	42

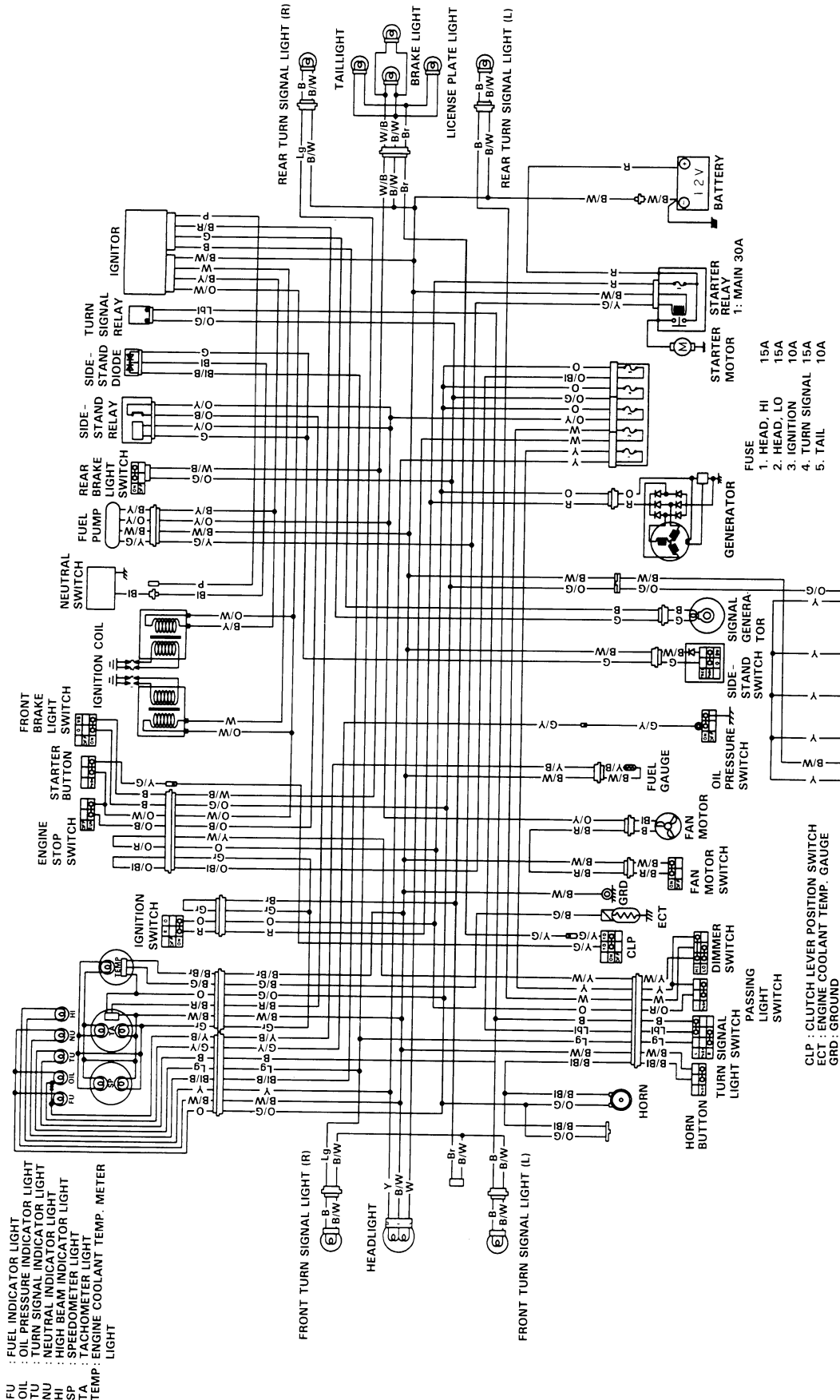
### TIRE PRESSURE [The other markets]

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	psi	kPa	kg/cm <sup>2</sup>	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42

## CLUTCH LEVER POSITION SWITCH (Except for U.S.A. and CANADA)

# WIRING DIAGRAM

## AUSTRALIA MARKET



### WIRE COLOR

B : Black  
Bl : Blue  
Br : Brown  
G : Green  
Gr : Gray  
Lg : Light blue  
O : Orange

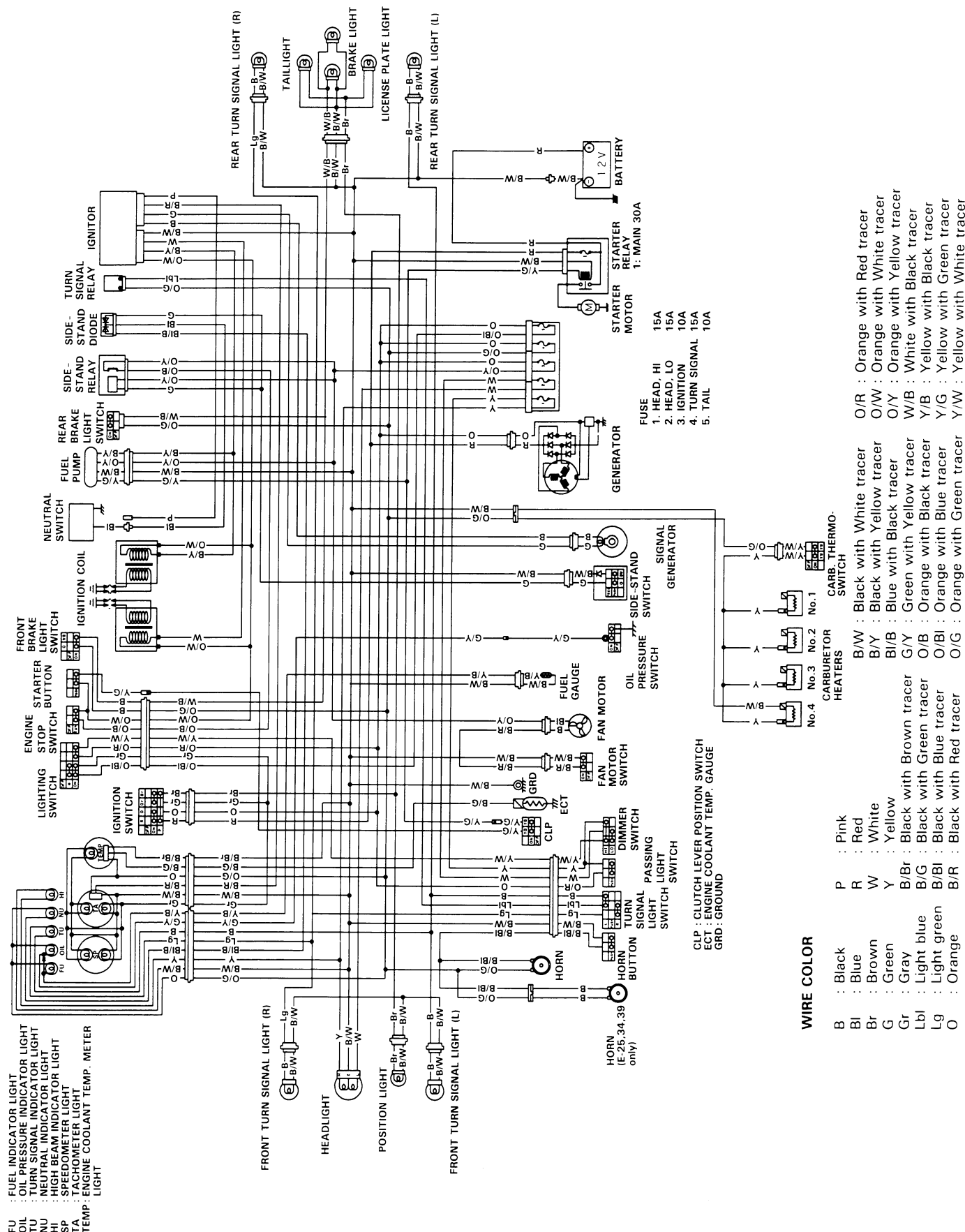
P : Pink  
R : Red  
W : White  
Y : Yellow

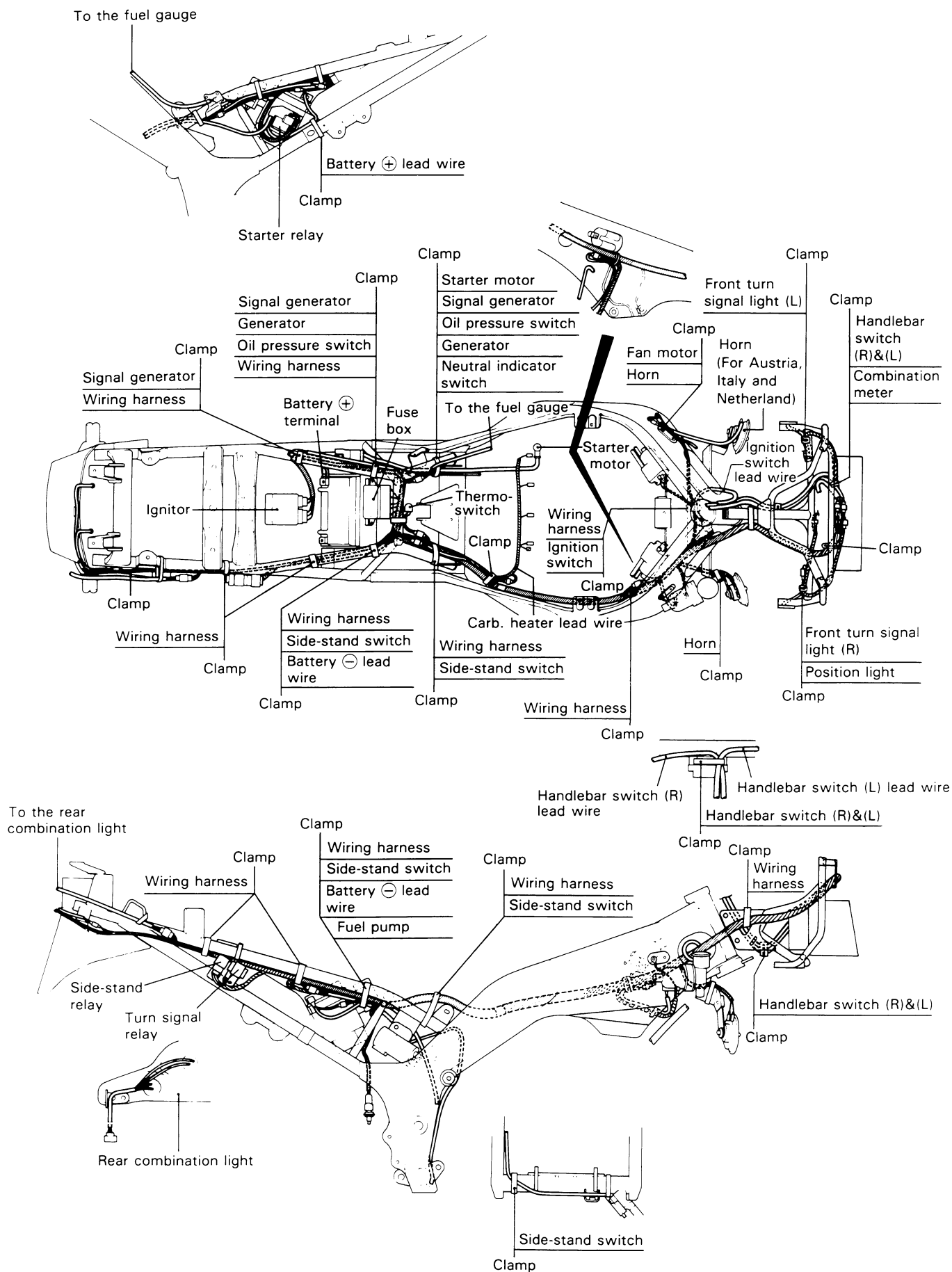
B/Br : Black with Brown tracer  
B/G : Black with Green tracer  
B/Bl : Black with Blue tracer  
B/R : Black with Red tracer

B/W : Black with White tracer  
B/Y : Black with Yellow tracer  
G/Y : Green with Yellow tracer  
O/B : Orange with Black tracer  
O/Bl : Orange with Blue tracer  
O/G : Orange with Green tracer

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







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