

**SUZUKI**

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***GSX-R600***

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**SERVICE MANUAL**  
**1997-2000**

## FOREWORD

This manual contains an introductory description on the SUZUKI GSX-R600 and procedures for its inspection/service and overhaul of its main components. Other information considered as generally known is not included.

Read the GENERAL INFORMATION section to familiarize yourself with the motorcycle and its maintenance. Use this section as well as other sections to use as a guide for proper inspection and service.

This manual will help you know the motorcycle better so that you can assure your customers of fast and reliable service.

- \* This manual has been prepared on the basis of the latest specifications at the time of publication. If modifications have been made since then, differences may exist between the content of this manual and the actual motorcycle.
- \* Illustrations in this manual are used to show the basic principles of operation and work procedures. They may not represent the actual motorcycle exactly in detail.
- \* This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI motorcycles. If you do not have the proper knowledge and tools, ask your authorized SUZUKI motorcycle dealer to help you.

### **▲ WARNING**

Inexperienced mechanics or mechanics without the proper tools and equipment may not be able to properly perform the services described in this manual. Improper repair may result in injury to the mechanic and may render the motorcycle unsafe for the rider and passenger.

## IMPORTANT

All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service GSX-R600 in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

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

## GROUP INDEX

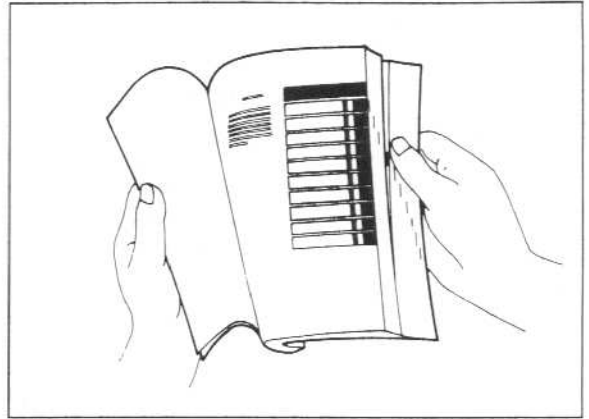
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**SUZUKI MOTOR CORPORATION**  
Motorcycle Service Department

## HOW TO USE THIS MANUAL

### TO LOCATE WHAT YOU ARE LOOKING FOR:

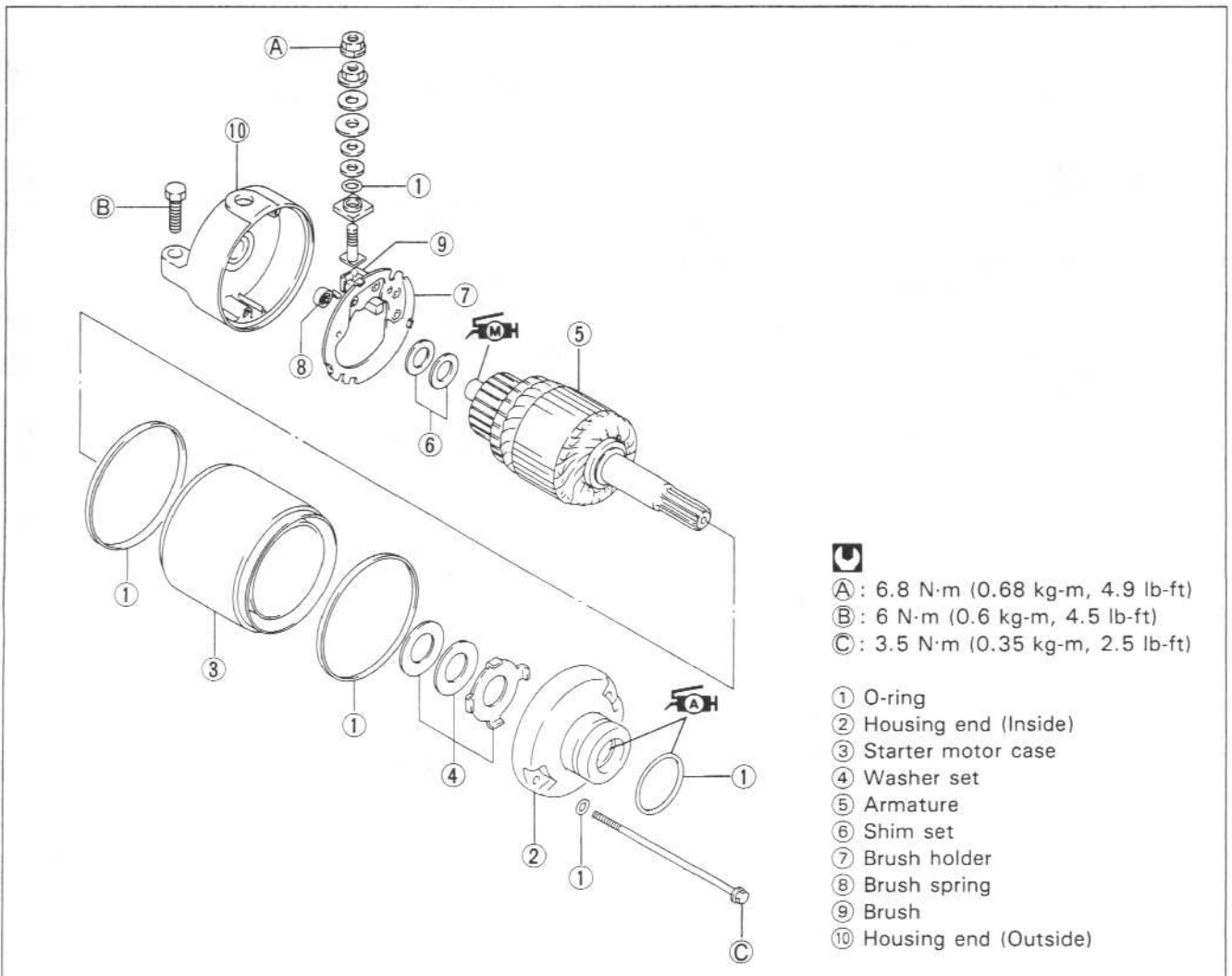
1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help find the item and page you need.



## COMPONENT PARTS AND WORK TO BE DONE

Under the name of each system or unit, is its exploded view. Work instructions and other service information such as the tightening torque, lubricating points and locking agent points, are provided.

Example: Starter motor






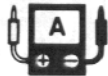













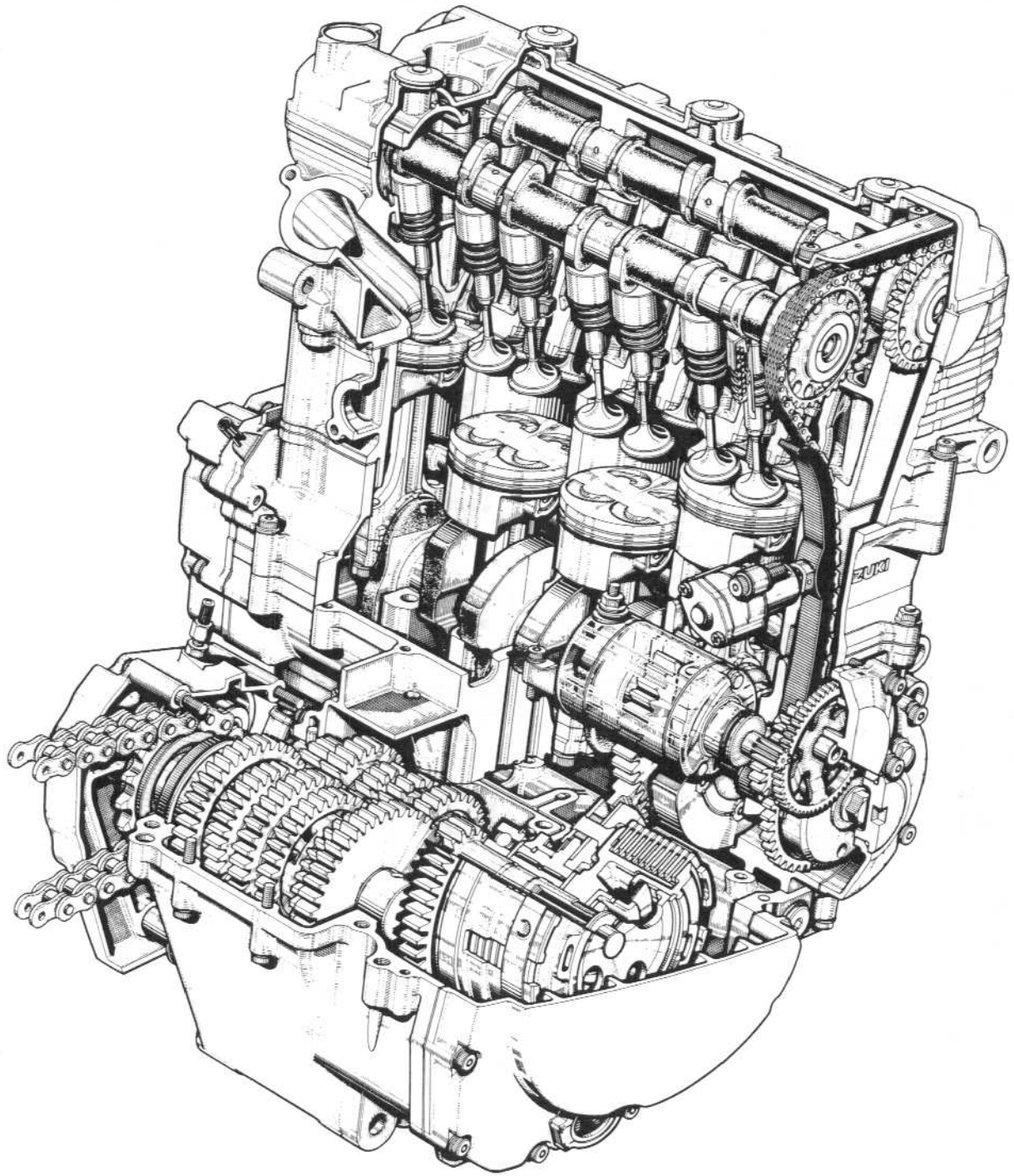
- A: 6.8 N·m (0.68 kg-m, 4.9 lb-ft)  
B: 6 N·m (0.6 kg-m, 4.5 lb-ft)  
C: 3.5 N·m (0.35 kg-m, 2.5 lb-ft)

- ① O-ring
- ② Housing end (Inside)
- ③ Starter motor case
- ④ Washer set
- ⑤ Armature
- ⑥ Shim set
- ⑦ Brush holder
- ⑧ Brush spring
- ⑨ Brush
- ⑩ Housing end (Outside)

## SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing and meaning associated with them respectively.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Measure in voltage range.
	Apply oil. Use engine oil unless otherwise specified.		Measure in resistance range.
	Apply SUZUKI SUPER GREASE "A". 99000-25030		Measure in current range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in diode test range
	Apply SUZUKI BOND "1207B" 99104-31140		Measure in continuity test range.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Use special tool.
	Apply THREAD LOCK "1342" 99000-32050		Use engine coolant.
	Apply THREAD LOCK SUPER "1360". 99000-32130		Use fork oil. 99000-99044-10G
	Apply or use brake fluid.		



# GENERAL INFORMATION

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## WARNING/CAUTION/NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol and the words WARNING, CAUTION and NOTE have special meanings. Pay special attention to the messages highlighted by these signal words.

### **⚠ WARNING**

Indicates a potential hazard that could result in death or injury.

### **⚠ CAUTION**

Indicates a potential hazard that could result in motorcycle damage.

### *NOTE:*

*Indicates special information to make maintenance easier or instructions clearer.*

Please note, however, that the warnings and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the motorcycle. In addition to the WARNINGS and CAUTIONS stated, you must use good judgement and basic mechanical safety principles. If you are unsure about how to perform a particular service operation, ask a more experienced mechanic for advice.

## GENERAL PRECAUTIONS

### **⚠ WARNING**

- Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the motorcycle.
- When 2 or more persons work together, pay attention to the safety of each other.
- When it is necessary to run the engine indoors, make sure that exhaust gas is forced outdoors.
- When working with toxic or flammable materials, make sure that the area you work in is well-ventilated and that you follow all of the material manufacturer's instructions.
- Never use gasoline as a cleaning solvent.
- To avoid getting burned, do not touch the engine, engine oil, radiator and exhaust system until they have cooled.
- After servicing the fuel, oil, water, exhaust or brake systems, check all lines and fittings related to the system for leaks.

**▲ CAUTION**

- If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
- When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
- Be sure to use special tools when instructed.
- Make sure that all parts used in reassembly are clean. Lubricate them when specified.
- Use the specified lubricant, bond, or sealant.
- When removing the battery, disconnect the negative cable first and then the positive cable. When reconnecting the battery, connect the positive cable first and then the negative cable, and replace the terminal cover on the positive terminal.
- When performing service to electrical parts, if the service procedures not require use of battery power, disconnect the negative cable the battery.
- When tightening the cylinder head and case bolts and nuts, tighten the larger sizes first. Always tighten the bolts and nuts from the inside working out, in a crisscross manner.
- Whenever you remove oil seals, gaskets, packing, O-rings, locking washers, self-locking nuts, cotter pins, circlips and certain other parts as specified, be sure to replace them with new ones. Also, before installing these new parts, be sure to remove any left over material from the mating surfaces.
- Never reuse a circlip. When installing a new circlip, take care not to expand the end gap larger than required to slip the circlip over the shaft. After installing a circlip, always ensure that it is completely seated in its groove and securely fitted.
- Use a torque wrench to tighten fasteners to the specified torque. Wipe off grease and oil if a thread is smeared with them.
- After reassembling, check parts for tightness and proper operation.

- To protect the environment, do not unlawfully dispose of used motor oil, engine coolant and other fluids: batteries, and tires.
- To protect Earth's natural resources, properly dispose of used motorcycle and parts.



## SUZUKI GSX-R600V ('97-MODEL)



RIGHT SIDE

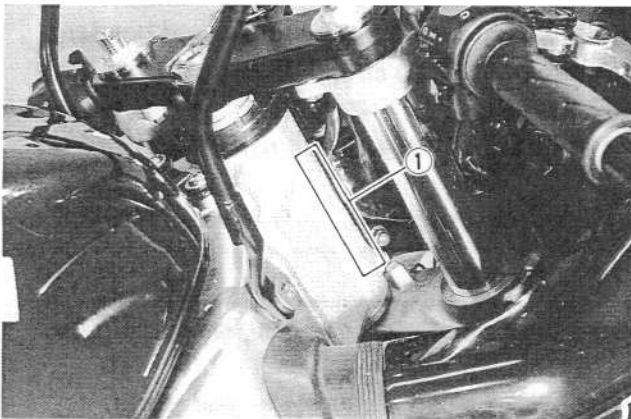


LEFT SIDE

\*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 rear side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.



### FUEL, OIL AND ENGINE COOLANT RECOMMENDATION

#### 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 the fuel contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present in it.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol-free unleaded gasoline.
6. Failure to follow these guideline could possibly void applicable warranty coverage. Check with your fuel supplier to make 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)

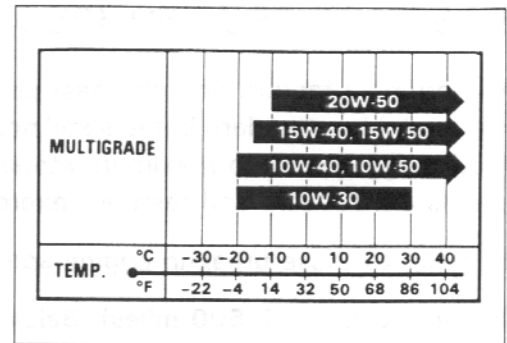
Gasoline used should be graded 85–95 octane (Research Method) or higher. An unleaded gasoline type is recommended.

**ENGINE OIL (For U.S.A. model)**

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

**ENGINE OIL (For the other models)**

Use a premium quality 4-stroke motor oil to ensure longer service life of your motorcycle. Use only oils which are rated SF or SG under the API service classification. The recommended viscosity is SAE 10W-40. If an SAE 10W-40 motor oil is not available, select an alternative according to the right chart.

**BRAKE FLUID**

Specification and classification: DOT 4

**⚠ 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.

**LIQUID AMOUNT OF WATER/ENGINE COOLANT**

Solution capacity (total): 2 550 ml (2.7/2.2 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 6 500 r/min**

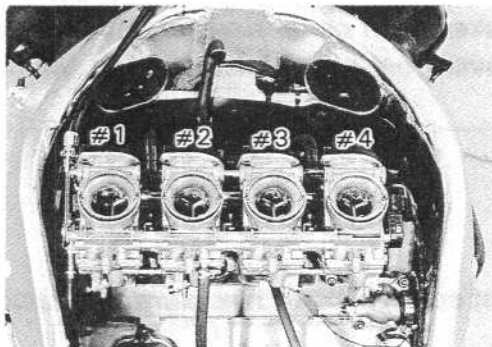
**Up to 1 600 km (1000 miles): Below 10 000 r/min**

**Over 1 600 km (1000 miles): Below 13 400 r/min**

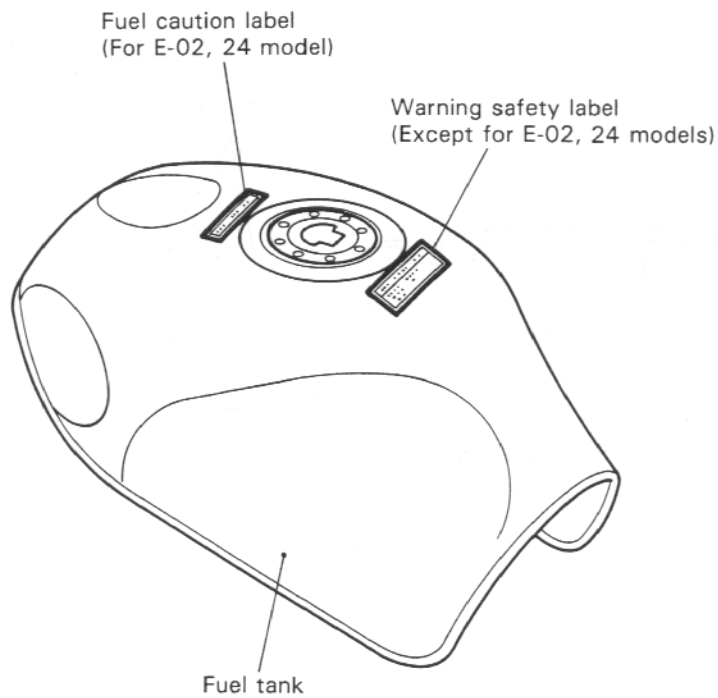
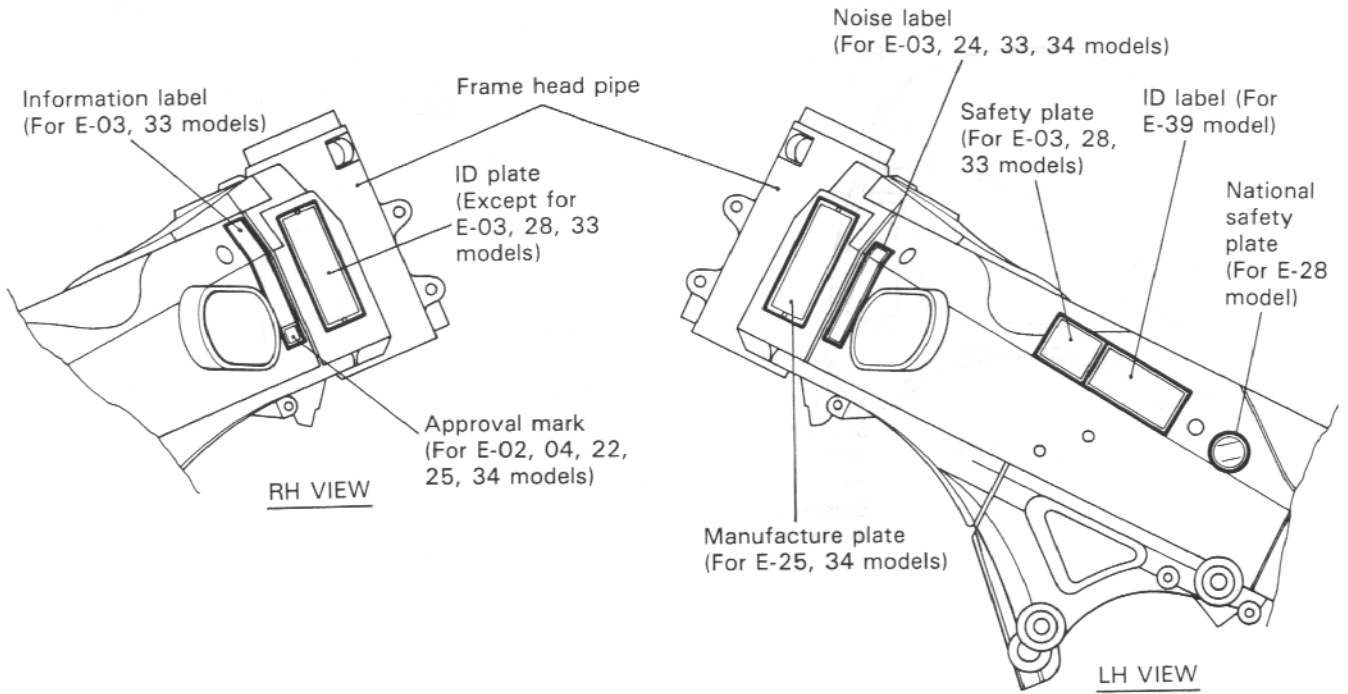
- Upon reaching an odometer reading of 1 600 km (1 000 miles) you can subject the motorcycle to full throttle operation. However, do not exceed 13 400 r/min at any time.

## CYLINDER IDENTIFICATION

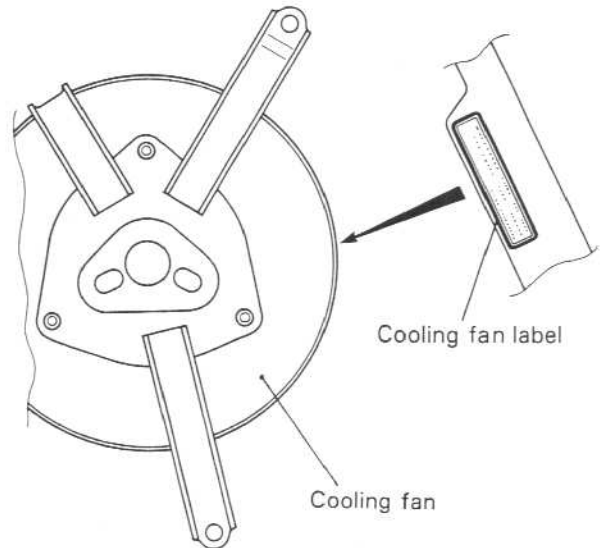
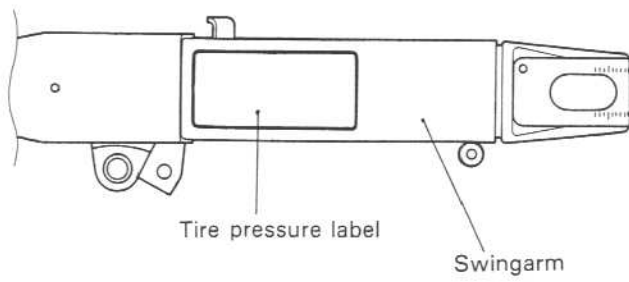
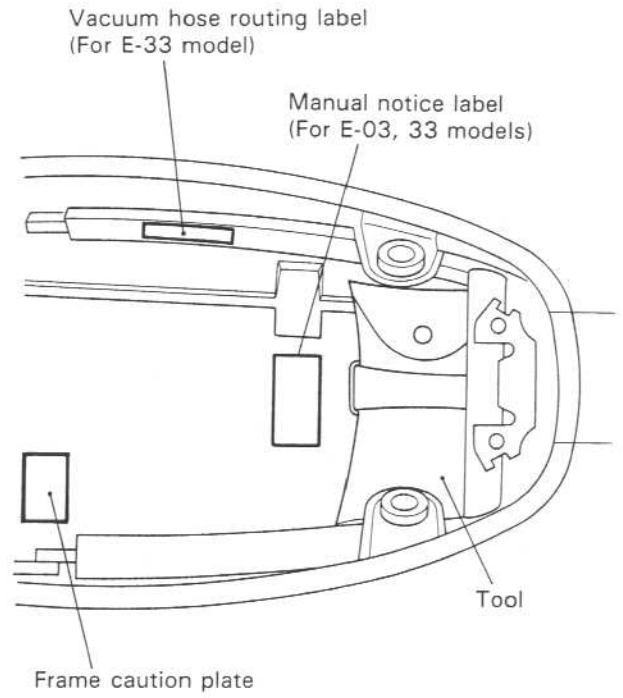
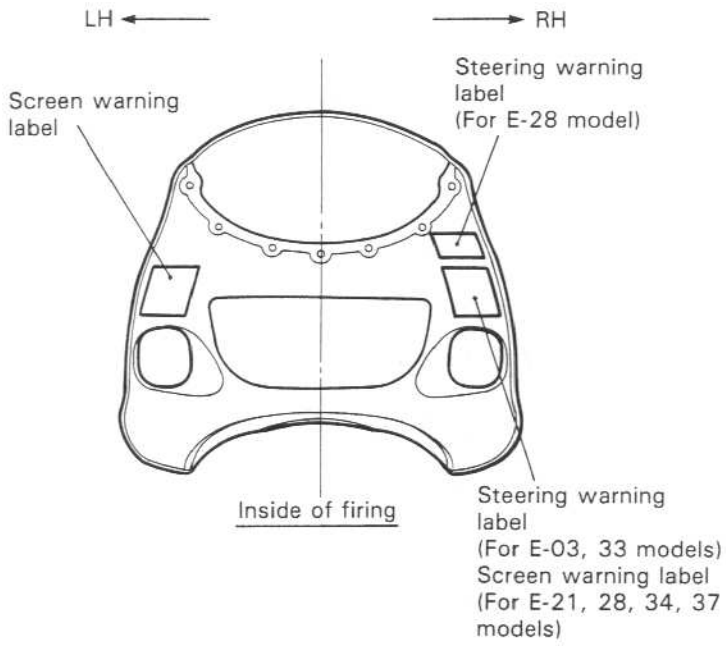
The four cylinders of this engine are identified as No.1, No.2, No.3 and No.4 cylinder, as counted from left to right (as viewed by the rider on the seat).



# INFORMATION LABELS



1-7 GENERAL INFORMATION



## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length .....	2 100 mm (82.7 in) .....	For E-18,22,24,39 models
	2 065 mm (81.3 in) .....	For other models
Overall width .....	720 mm (28.3 in)	
Overall height .....	1 135 mm (44.7 in)	
Wheelbase .....	1 390 mm (54.7 in)	
Ground clearance .....	130 mm ( 5.1 in)	
Seat height .....	830 mm (32.7 in)	
Dry mass .....	175 kg (386 lbs) .....	For E-18,33,39 models
	174 kg (384 lbs) .....	For other models

### ENGINE

Type .....	Four-stroke, Liquid-cooled, DOHC, TSCC
Number of cylinders .....	4
Tappet clearance, IN .....	0.10—0.20 mm (0.004—0.008 in)
EX .....	0.20—0.30 mm (0.008—0.012 in)
Bore .....	65.5 mm (2.579 in)
Stroke .....	44.5 mm (1.752 in)
Piston displacement .....	600 cm <sup>3</sup> (36.6 cu. in)
Compression ratio .....	12.0 : 1
Carburetor .....	MIKUNI BDSR36
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 .....	1.756 (72/41)
Gear ratios, Low .....	2.866 (43/15)
2nd .....	2.058 (35/17)
3rd .....	1.650 (33/20)
4th .....	1.428 (30/21)
5th .....	1.285 (27/21)
Top .....	1.181 (26/22)
Final reduction ratio .....	2.812 (45/16)
Drive chain .....	RK525SMOZ <sub>2</sub> , 108 links

**CHASSIS**

Front suspension .....	Telescopic, coil spring, oil damped, spring pre-load fully adjustable, rebound damping force fully adjustable.
Rear suspension .....	Link type system, gas/oil damped, coil spring, spring pre-road fully adjustable, rebound damping force and compression damping force fully adjustable.
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	133 mm (5.2 in)
Steering angle .....	30° (right & left)
Caster .....	24°
Trail .....	96 mm (3.8 in)
Turning radius .....	3.1 m (10.2 ft)
Front brake .....	Disc brake, twin, hydraulically operated
Rear brake .....	Disc brake, hydraulically operated
Front tire size .....	120/70 ZR17 (58W), tubeless
Rear tire size .....	180/55 ZR17 (73W), tubeless

**ELECTRICAL**

Ignition type .....	Electronic ignition (CDI)
Ignition timing .....	5° B.T.D.C. at 1 500 r/min
Spark plug .....	N.G.K. CR9E, NIPPONDENSO U27ESR-N
Battery .....	12V 28.8 kC (8 Ah)/10HR
Generator .....	Three-phase A.C. Generator
Main fuse .....	30A
Fuse .....	15/15/10/15/10A
Headlight .....	12V 55/50W × 2 ..... E-02,03,24,28,33 models 12V 55W + 12V 55W ..... For other models
Turn signal light .....	12V 21W
Front position light .....	12V 5W ..... Except for E-03,24,28,33 models
Tail/Brake light .....	12V 5/21W × 2
Speedometer light .....	12V 1.7W
Tachometer light .....	12V 1.7W
Neutral indicator light .....	12V 1.7W
High beam indicator light .....	12V 1.7W
Turn signal indicator light .....	12V 1.7W
Fuel indicator light .....	12V 1.7W

**CAPACITIES**

Fuel tank, including reserve .....	18.0 L (4.8/4.0 US/Imp gal)
Engine oil, oil change .....	2 600 ml (2.7/2.3 US/Imp qt)
with filter change .....	2 800 ml (3.0/2.5 US/Imp qt)
overhaul .....	3 500 ml (3.7/3.1 US/Imp qt)
Coolant .....	2 550 ml (2.7/2.2 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-03	U.S.A. (except California)
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-33	California (U.S.A.)
E-34	Italy
E-37	Brazil
E-39	Austria
E-53	Spain

E-21 and 53 countries are included in E-34.

E-15 and 16 countries are included in E-17.





# PERIODIC MAINTENANCE

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## PERIODIC MAINTENANCE SCHEDULE

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

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 however, it is not necessary for ensuring emission level compliance.*

### PERIODIC MAINTENANCE CHART

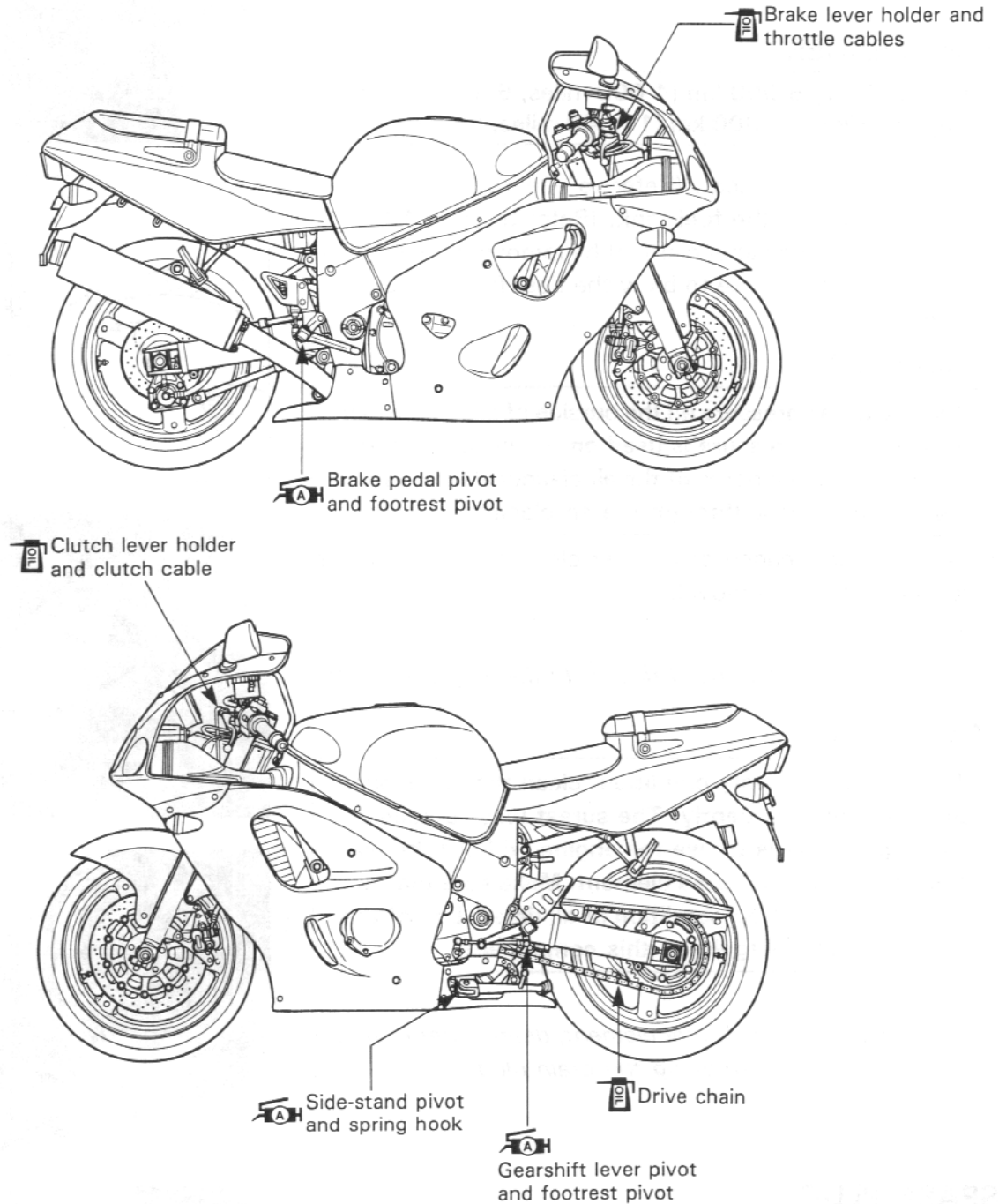
Item	Interval	km	1 000	6 000	12 000	18 000	24 000
		miles	600	4 000	7 500	11 000	15 000
		months	1	6	12	18	24
Air cleaner element		—	I	I	R	I	
Spark plugs		—	I	R	I	R	
Tappet clearance		—	—	—	—	I	
Fuel hose (Evap hose ..... California model only)		—	I	I	I	I	
		Replace every four years.					
Engine oil		R	R	R	R	R	
Engine oil filter		R	—	—	R	—	
Engine idle speed		I	I	I	I	I	
Throttle cable play		I	I	I	I	I	
Carburetor synchronization		—	—	I	—	I	
Clutch		—	I	I	I	I	
Radiator hose		—	I	I	I	I	
Engine coolant		Replace every two years.					
Drive chain		I	I	I	I	I	
		Clean and lubricate every 1 000 km (600 miles).					
Brakes		I	I	I	I	I	
Brake hose		—	I	I	I	I	
		Replace every four years.					
Brake fluid		—	I	I	I	I	
		Replace every two years.					
Tires		—	I	I	I	I	
Steering		I	—	I	—	I	
Front forks		—	—	I	—	I	
Rear suspension		—	—	I	—	I	
Exhaust pipe bolts and muffler bolts		T	—	T	—	T	
Chassis bolts and nuts		T	T	T	T	T	

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



### 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.

### AIR CLEANER

Inspect Every 6 000 km (4 000 miles, 6 months) and Replace Every 18 000 km (11 000 miles, 18 months).

- Remove the front seat. (Refer to page 6-3.)
- Lift and support the fuel tank. (Refer to page 4-2.)
- 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 outside of the air cleaner element. If air pressure is used on the inside, 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.

#### NOTE:

Be careful not to drop the O-ring ① to the air cleaner box.

#### ⚠ 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!

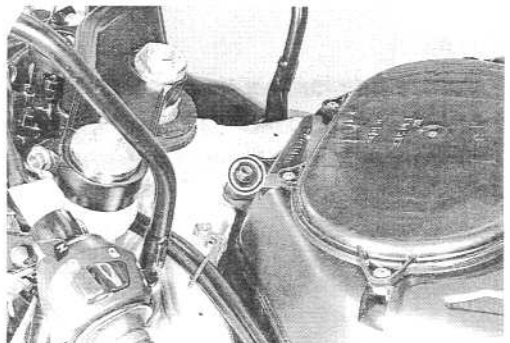
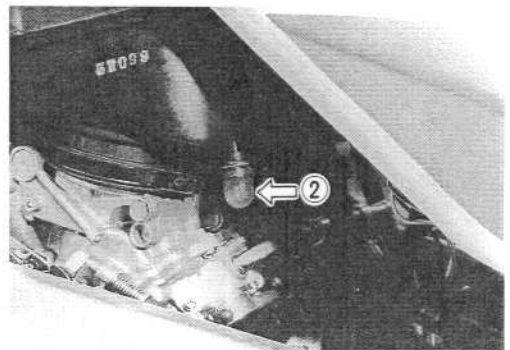
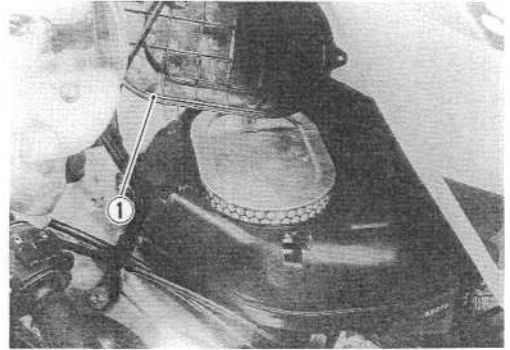
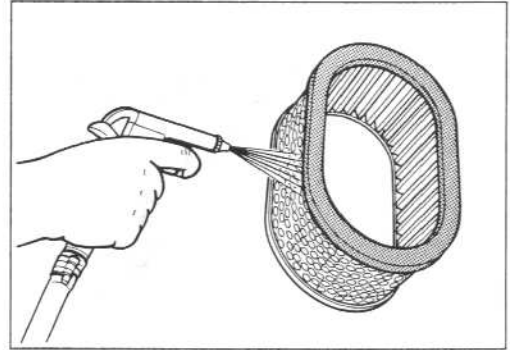
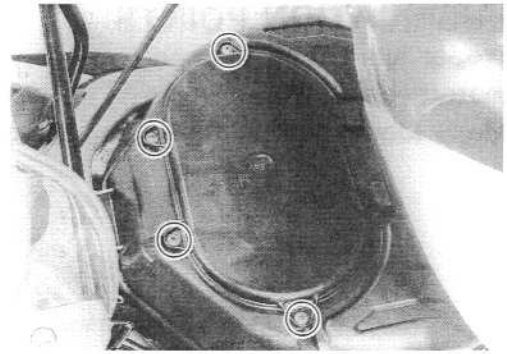
#### NOTE:

When cleaning the air cleaner element, drain water from the air cleaner drain by removing the drain plug ②.

### SPARK PLUG

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

- Remove the front seat. (Refer to page 6-3.)
- Lift and support the fuel tank. (Refer to page 4-2.)
- Remove the air cleaner box. (Refer to page 4-14.)



- Disconnect all the lead wire couplers from each ignition coil/spark plug cap.
- Remove all the ignition coil/spark plug caps.
- Remove the spark plugs with the spark plug wrench.

**TOOL** 09930-10121: Socket wrench set

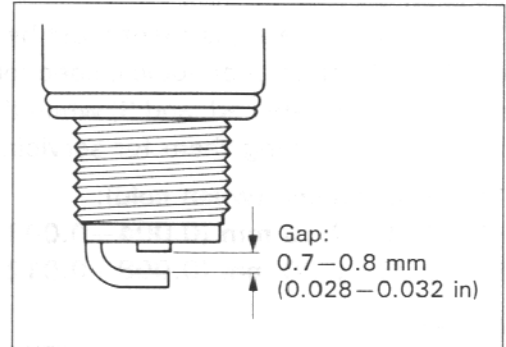
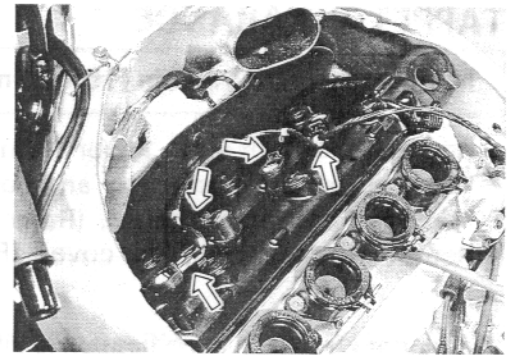
**HEAT RANGE**

- Check to see the heat range of the plug.  
If the electrode of the plug is wet appearing or dark color, replace the plug with hotter type one. If it is white or glazed appearing, replace the plug with colder type one.

	NGK	ND
Hotter type	CR8E	U24ESR-N
Standard	CR9E	U27ESR-N
Colder type	CR10E	U31ESR-N

**NOTE:**

"R" type spark plug has a resistor located at the center electrode to prevent radio noise.



**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.

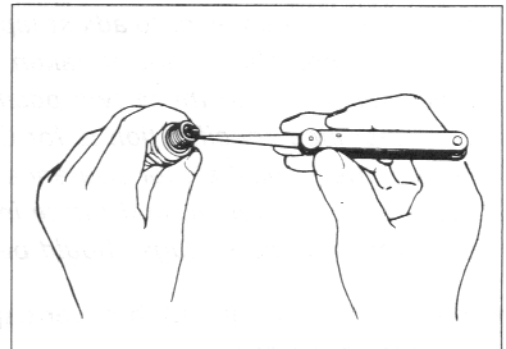
**SPARK PLUG GAP**

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

**TOOL** 09900-20803: Thickness gauge

**Standard**

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



**ELECTRODES 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.

**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.

**CAUTION**

To prevent damaging the cylinder head, hand-tighten the spark plug before using a wrench to tighten to the specified torque.

- Install the spark plugs to the cylinder head with a hand-tighten, and tighten them to the specified torque.

**U** Spark plug: 12 N·m (1.2 kg·m, 8.5 lb·ft)

## TAPPET CLEARANCE

Inspect Every 24 000 km (15 000 miles, 24 months).

- Remove the front seat, lower fairing assembly and fuel tank. (Refer to pages 6-2, -3 and 4-2.)
- Remove the air cleaner box and carburetors. (Refer to pages 4-14 and -15.)
- Remove all the spark plugs. (Refer to page 2-4.)
- Remove the cylinder head cover. (Refer to page 3A-1.)

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)**

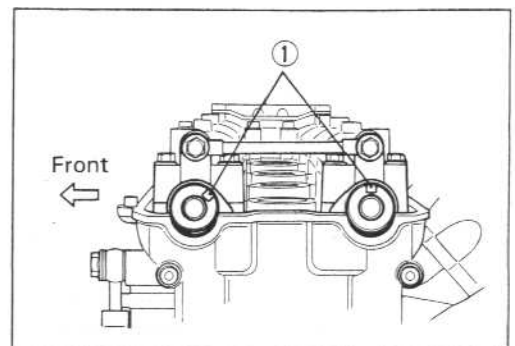
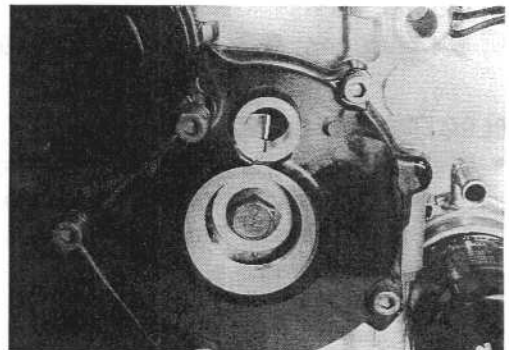
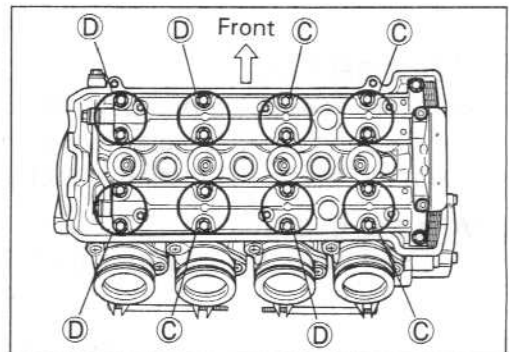
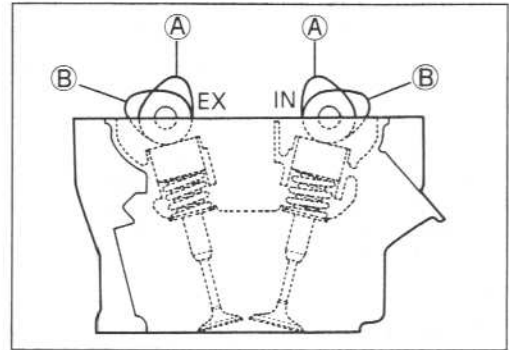
**EX.: 0.20–0.30 mm (0.008–0.012 in)**

**NOTE:**

- \* The cam must be at positions, **A** or **B**, 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 14-mm wrench, and rotate in the normal running direction. All spark plugs should be removed.

- Remove the starter clutch cover cap and the valve timing inspection cap.
- Turn the crankshaft to bring the "TOP" line on the starter clutch to the index mark of valve timing inspection hole and also to bring the notches **①** in the left ends of both camshafts (Ex and In) to the positions shown. In this condition, read the tappet clearance at the valves **C** (In and Ex of No.4 cylinder, Ex of No.3 and In of No.2).
- Use a thickness gauge between the tappet and the cam. If the clearance is out of specification, bring it into the specified range.

**TOOL** 09900-20803: Thickness gauge



- Turn the crankshaft 360° (one rotation) to bring the "TOP" line on the starter clutch to the index mark of valve timing inspection hole and also to bring the notches ① to the positions shown.
- Read the clearance at the remaining valves ④ and adjust the clearance if necessary.

Cam Position	Notch ① position	
	Exhaust Camshaft	Intake Camshaft
③	←Front ③	←Front ④
④	←Front ③	←Front ④

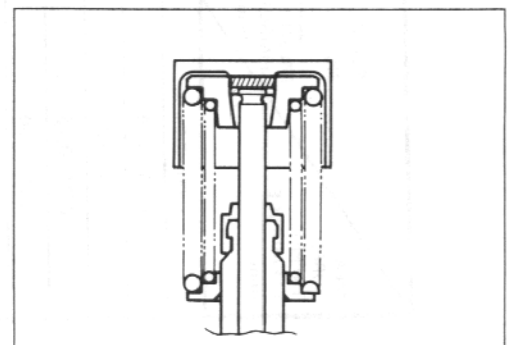
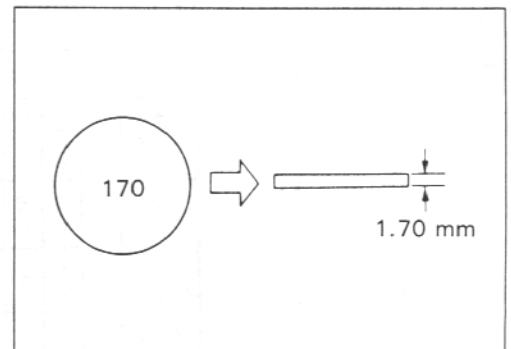
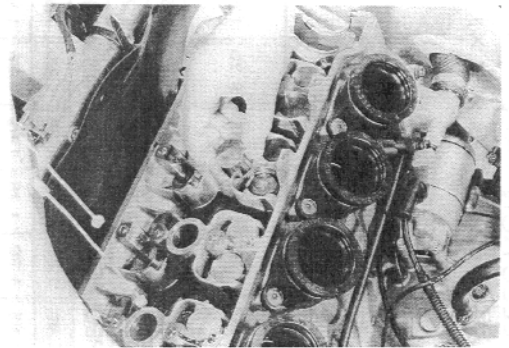
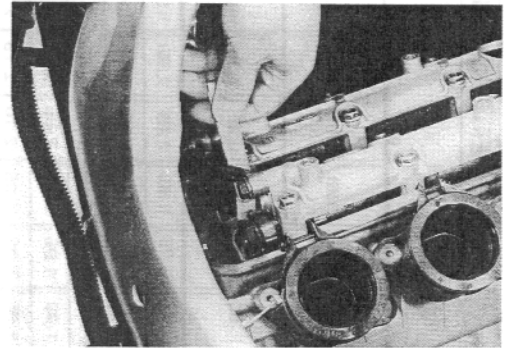
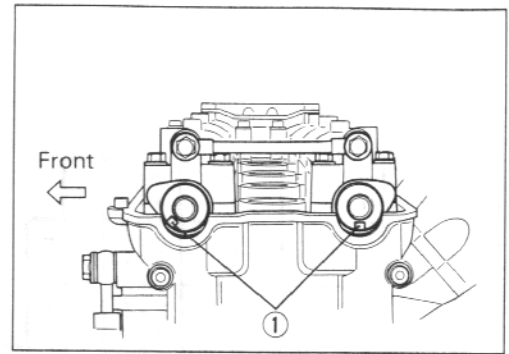
**TAPPET CLEARANCE ADJUSTMENT**

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 3A-1.)
- Remove the tappet and shim by fingers or magnetic hand. (Refer to page 3A-7.)
- 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 (Pages 2-7 and -8) 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.
- Tighten the head cover bolts to the specified torque. (Refer to page 3A-19.)





(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	SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																				
		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.00-0.04		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		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
0.10-0.20		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
0.21-0.25		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		
0.26-0.30		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			
0.31-0.35		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		1.45	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		1.50	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		1.55	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		1.60	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		1.65	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		1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20										
0.66-0.70		1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20											
0.71-0.75		1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20												
0.76-0.80		1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20													
0.81-0.85		1.90	1.95	2.00	2.05	2.10	2.15	2.20														
0.86-0.90		1.95	2.00	2.05	2.10	2.15	2.20															
0.91-0.95		2.00	2.05	2.10	2.15	2.20																
0.96-1.00		2.05	2.10	2.15	2.20																	
1.01-1.05		2.10	2.15	2.20																		
1.06-1.10		2.15	2.20																			
1.11-1.15		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 0.23 mm  
Present shim size 1.70 mm  
Shim size to be used 1.80 mm

(EXHAUST SIDE)

TAPPET SHIM SET NO. (12800-05820)

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

MEA-SURED TAPPET CLEARANCE (mm)	SUFFIX NO.	SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																			
		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.05-0.09	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
0.10-0.14	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
0.15-0.19	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
0.20-0.30	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
0.31-0.35	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	2.20	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	2.20	2.20	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	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	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	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.81-0.85	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.86-0.90	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.91-0.95	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.96-1.00	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.01-1.05	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.06-1.10	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.11-1.15	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.16-1.20	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.21-1.25	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	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 mm  
Present shim size 1.70 mm  
Shim size to be used 1.80 mm

### FUEL HOSE (EVAP HOSE ... California model only)

Inspect Every 6 000 km (4 000 miles, 6 months).  
Replace Every 4 years.

Inspect the fuel hose for damage and fuel leakage. If any defects are found, the fuel hose must be replaced. (Refer to chapter 9 for EMISSION CONTROL INFORMATION.)

### ENGINE OIL AND OIL FILTER

#### (ENGINE OIL)

Replace Initially at 1 000 km (600 miles, 1 month) and  
Every 6 000 km (4 000 miles, 6 months) thereafter.

#### (OIL FILTER)

Replace Initially at 1 000 km (600 miles, 1 month) and  
Every 18 000 km (11 000 miles, 18 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.

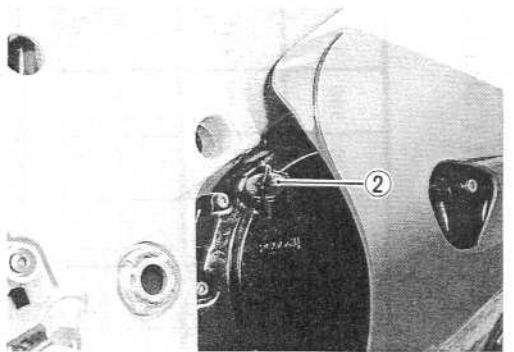
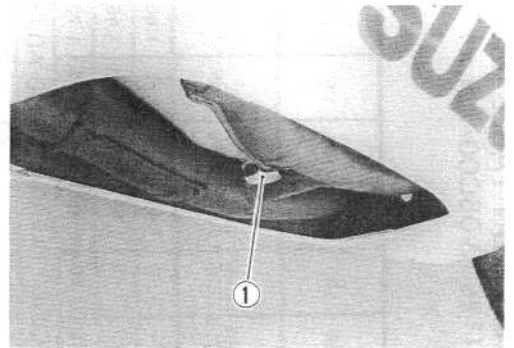
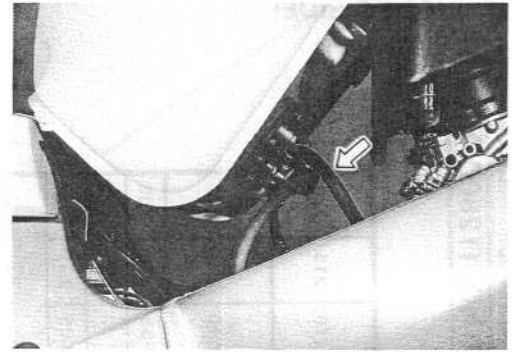
### ENGINE OIL REPLACEMENT

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain oil by removing the drain plug ① and filler cap ② .

- Fit the drain plug ① securely, and pour fresh oil through the oil filler. The engine will hold about 2.6 L (2.7 US qt) of oil. Use an API classification of SF or SG oil with SAE 10W/40 viscosity.


#### Oil drain plug: 28 N·m (2.8 kg-m, 20.0 lb-ft)

- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ③ . If the level is below mark "F", add oil to that level.



## OIL FILTER REPLACEMENT

- Drain engine oil in the same manner of engine oil replacement procedure.
- Remove the right side lower fairing. (Refer to page 6-2.)
- Remove the oil filter by using the oil filter wrench. (Special tool)
- 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)

 **09915-40610: Oil filter wrench**

### NOTE:

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

- Pour fresh engine oil and check the oil level in the same manner of engine oil replacement procedure.

## NECESSARY AMOUNT OF ENGINE OIL

Oil change: 2.6 L (2.7/2.3 US/Imp qt)

Filter change: 2.8 L (3.0/2.5 US/Imp qt)

Overhaul engine: 3.5 L (3.7/3.1 US/Imp 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.

## ENGINE IDLE SPEED

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) thereafter.

### NOTE:

Make this adjustment when the engine is hot.

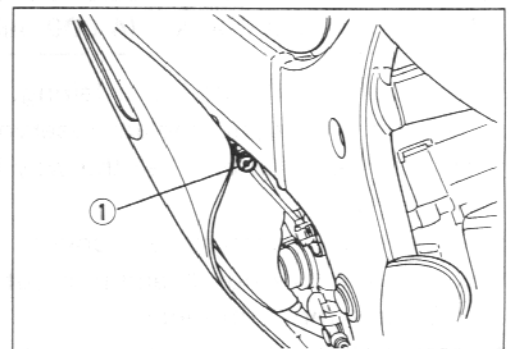
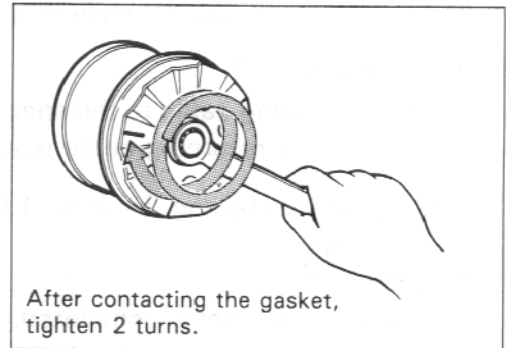
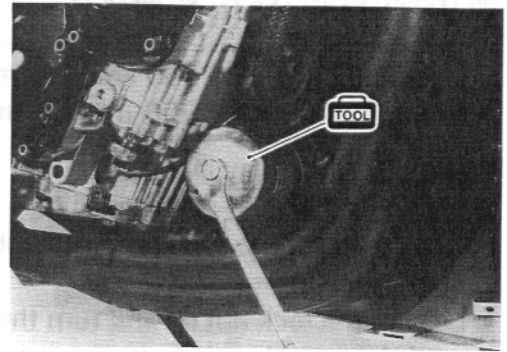
- Connect a tachometer.
- Start up the engine and set its speed to the specified range by turning the throttle stop screw ①.

### Engine idle speed:

1 300 ± 100 r/min ... for E-03,28,33,39 models

1 300  $\pm$   $\begin{smallmatrix} 100 \\ 50 \end{smallmatrix}$  r/min ... for E-18 model

1 200 ± 100 r/min ... for the other models



## THROTTLE CABLE PLAY

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) therefore.

### Returning cable play **A**

There should be 0.5–1.0 mm (0.02–0.04 in) play **A** 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.

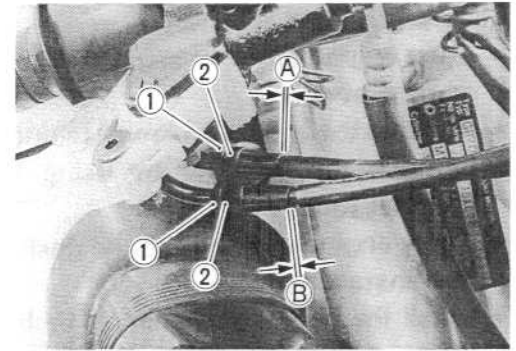
### Pulling cable play **B**

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

Throttle cable play (**A** and **B**): 0.5–1.0 mm (0.02–0.04 in)

### **▲ WARNING**

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



## CARBURETOR SYNCHRONIZATION

Inspect Every 12 000 km (7 500 miles, 12 months).

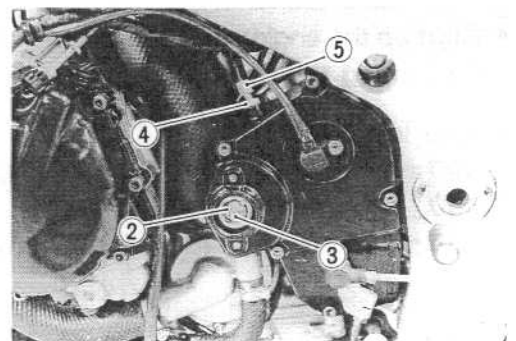
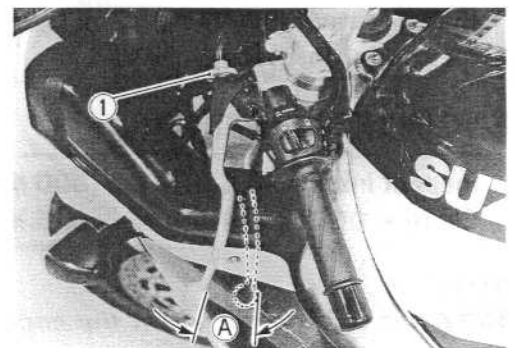
(Refer to page 4-28.)

## CLUTCH

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

- Remove the left side lower fairing. (Refer to page 6-2.)
- Remove the engine coolant reservoir tank.
- Turn in the adjuster **1** all the way into the clutch lever assembly.
- Remove the clutch release cover.
- Loosen the lock nut **2** and turn out the adjusting screw **3** two or three rotations.
- From that position, slowly turn in the adjusting screw **3** to feel resistance.
- From this position, turn out the adjusting screw **3** ¼ rotations, and tighten the lock nut **2**.
- Loosen the lock nut **4**, and turn the cable adjuster **5** to obtain 10–15 mm (0.4–0.6 in) of free play **A** at the clutch lever end.
- Tighten the lock nuts **4**.

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



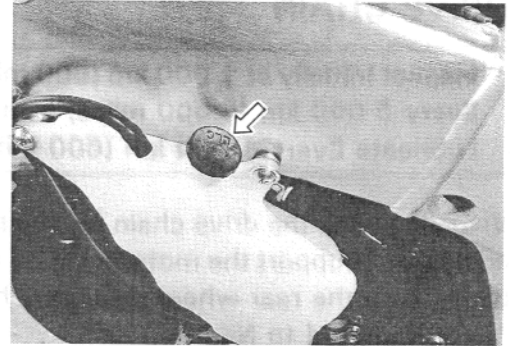
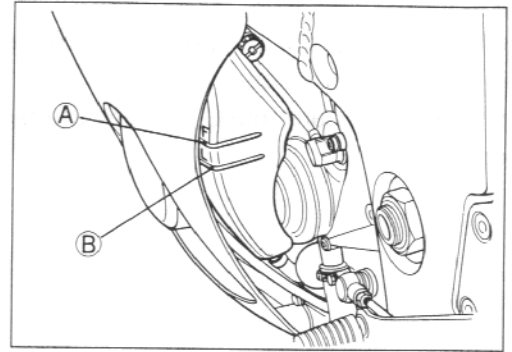
## COOLING SYSTEM

Inspect Every 6 000 km (4 000 miles, 6 months).  
Replace engine coolant Every 2 years.

### ENGINE COOLANT LEVEL CHECK

- Keep the motorcycle upright.
- Check the engine coolant level by observing the full and lower lines on the engine coolant reservoir.
- If the level is below the lower line, remove the left side lower fairing (Refer to page 6-2.) and add engine coolant to the full line from the engine coolant reservoir filler.

Ⓐ Full line      Ⓑ Lower line

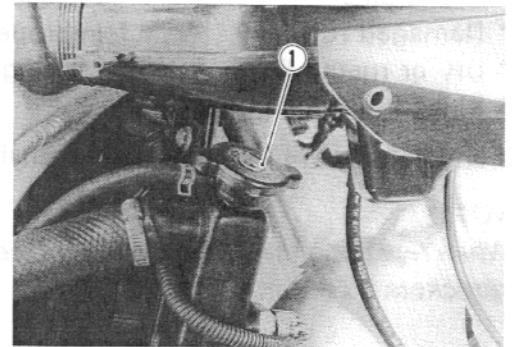


### ENGINE COOLANT CHANGE

- Remove the lower fairing assembly. (Refer to page 6-2.)
- Remove the radiator cap ① and disconnect the water hose ② from the water pump, then 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!

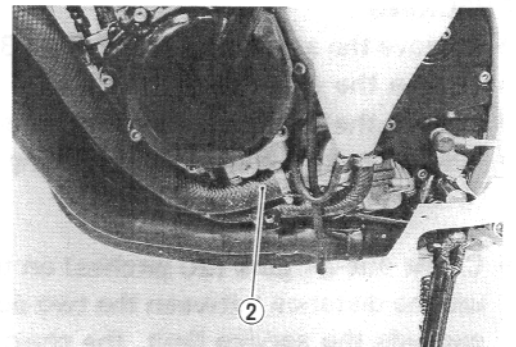


- Flush the radiator with fresh water if necessary.
- Connect the water hose ② securely.
- Pour the specified engine coolant up to the radiator inlet.

#### NOTE:

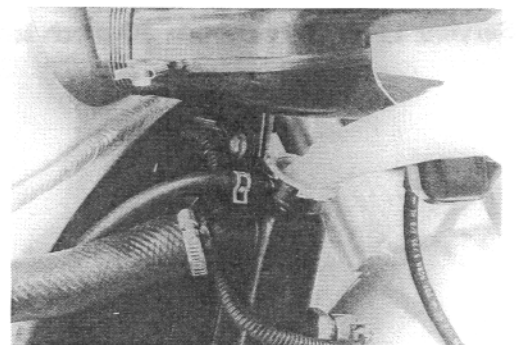
For engine coolant information, refer to page 5-4.

- 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.

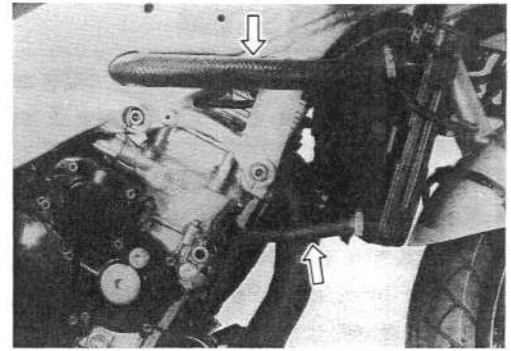


**ILLU** Engine coolant capacity:  
2 550 ml (2.7/2.2 US/lmp qt)

**RADIATOR HOSES**

Check to see the radiator hoses for crack, damage or engine coolant leakage.

If any defects are found, replace the radiator hoses with new ones.



**DRIVE CHAIN**

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) thereafter. Lubricate Every 1 000 km (600 miles).

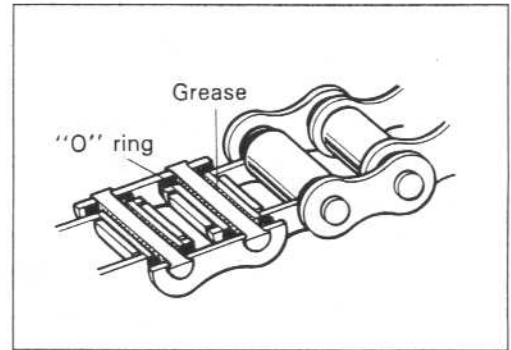
Visually check the drive chain for the possible defects listed below. (Support the motorcycle by a jack and a wooden block, turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

- \* 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:**

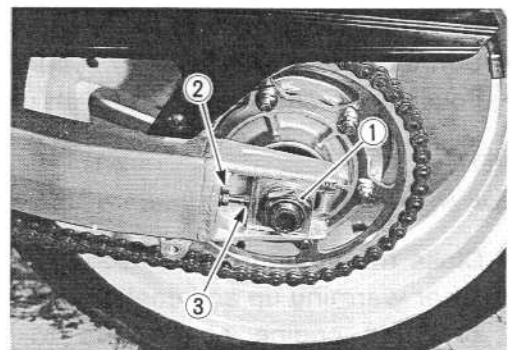
When replacing the drive chain, replace the drive chain and sprockets as a set.



**CHECKING**

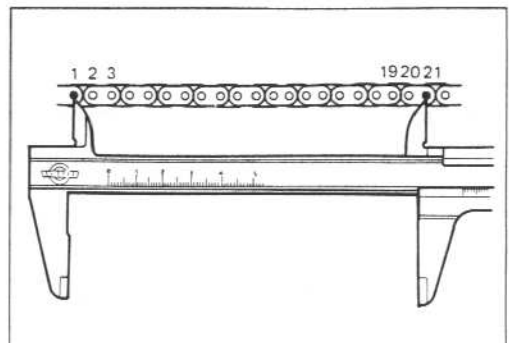
- Remove the axle cotter pin. (For E-03, 28 and 33 models)
- Loosen the axle nut ① .
- Loosen the chain adjuster lock nuts ②.
- Tense the drive chain fully by turning both chain adjusters ③ .

- 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 (3) until the chain has 20–30 mm (0.8–1.2 in) of slack in the middle between engine and rear sprockets. The mark (4) 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 adjuster lock nuts (2) securely.

 **Rear axle nut: 100 N·m (10 kg-m, 72.5 lb-ft)**

**CLEANING AND LUBRICATING**

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

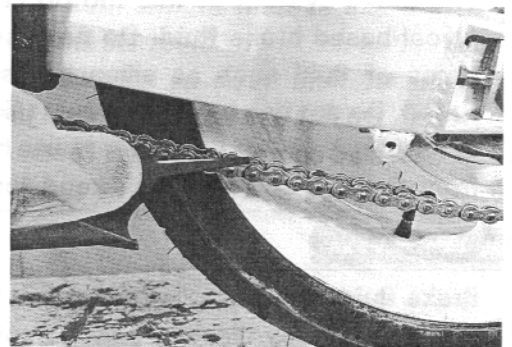
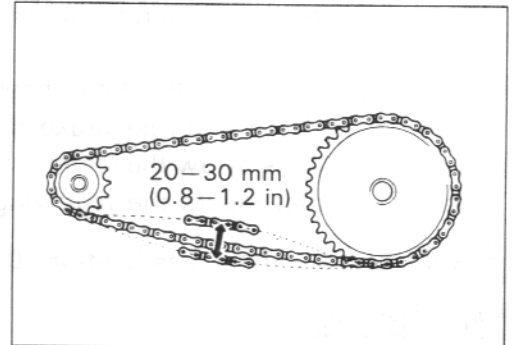
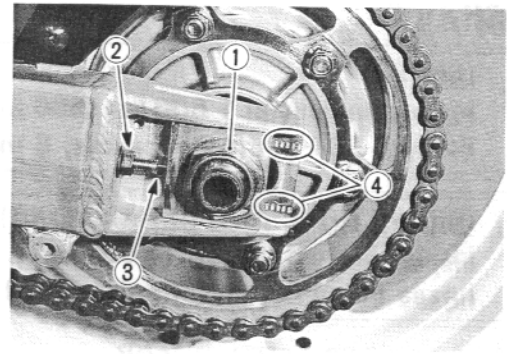
**CAUTION**

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 is TAKASAGO RK525SMOZ<sub>2</sub>. SUZUKI recommends that this standard drive chain should be used for the replacement.





## BRAKE

### (BRAKE)

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) thereafter.

### (BRAKE HOSE AND BRAKE FLUID)

Inspect Every 6 000 km (4 000 miles, 6 months). Replace hoses Every 4 years. Replace fluid Every 2 years.

### BRAKE FLUID LEVEL CHECK

- 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.

**BF** Specification and Classification: DOT 4

### ⚠ 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.

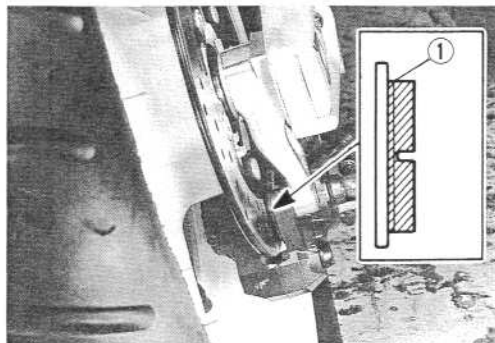
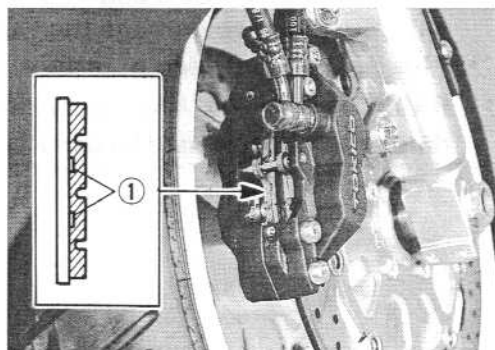
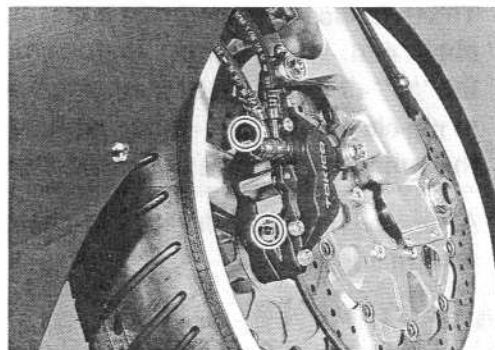
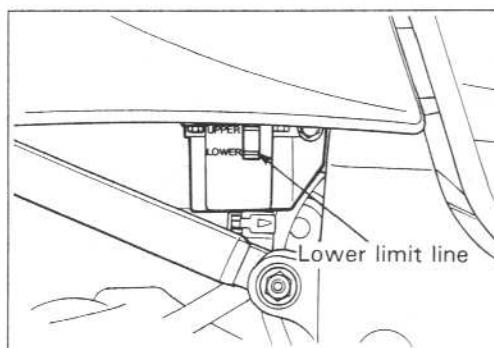
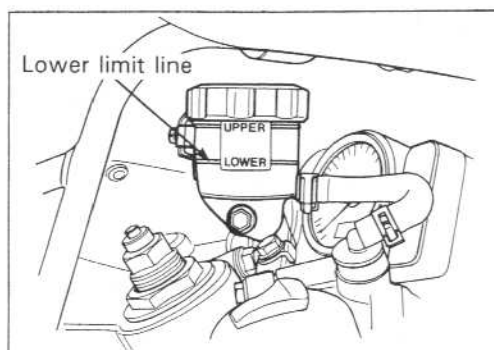
### BRAKE PADS

- Remove the brake pad spring by removing bolts (Front brake).

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 6-44 and -52.)

### ⚠ CAUTION


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

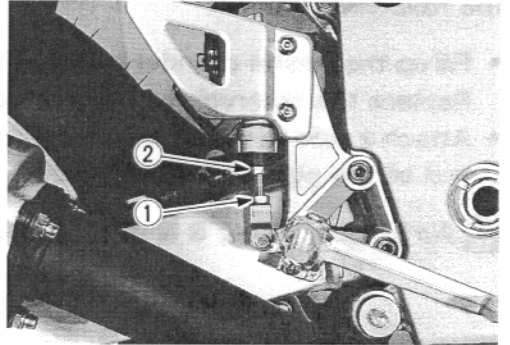
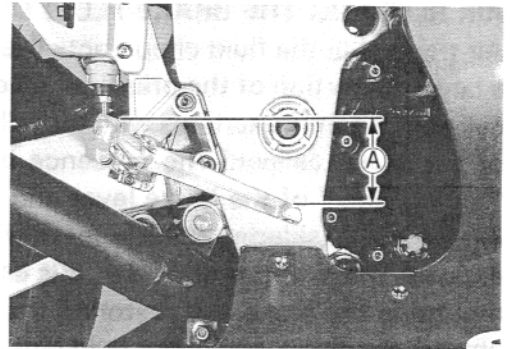


**BRAKE PEDAL HEIGHT**

- Loosen the lock nut ① and rotate the push rod ② to locate brake pedal 55 mm (2.2 in) A below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

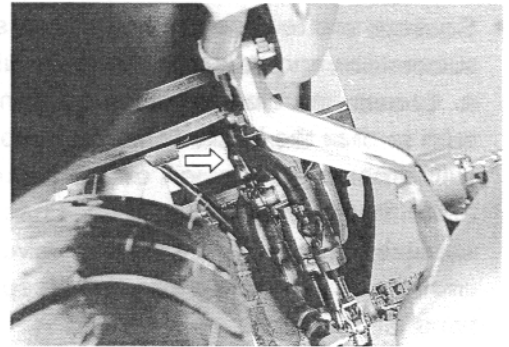
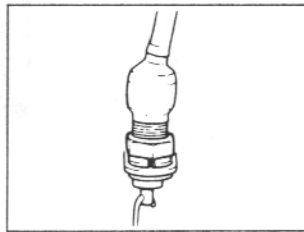
Brake pedal height A : 55 mm (2.2 in)

 Rear brake master cylinder rod lock nut ①:  
18 N·m (1.8 kg-m, 13.0 lb-ft)



**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 air bleeder valve, and insert the free end of the pipe into a receptacle.

 **Air bleeder valve: 8 N·m (0.8 kg-m, 6.0 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:**

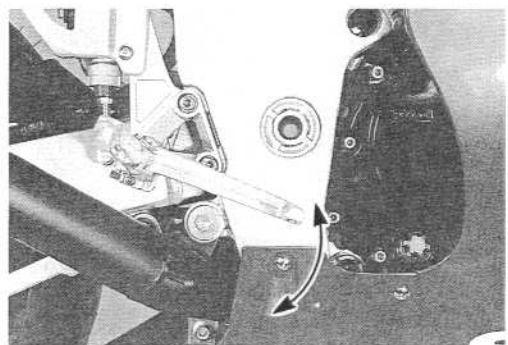
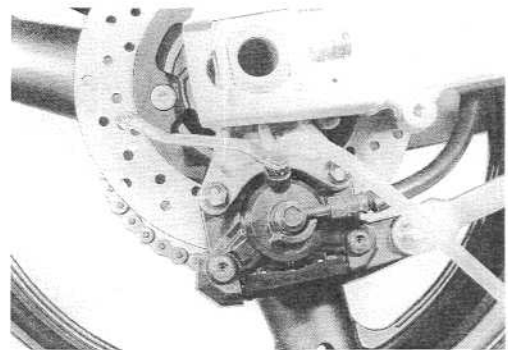
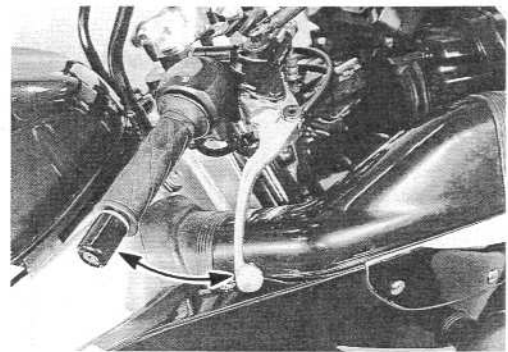
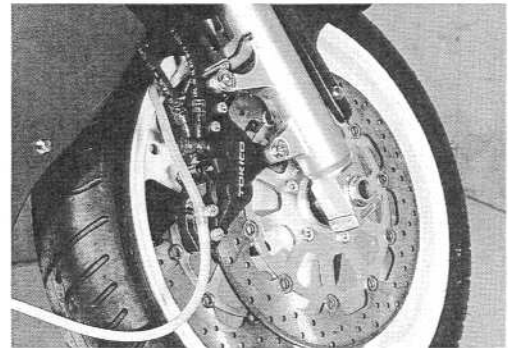
*Replenish the brake fluid in the reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.*

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir with brake fluid to the "UPPER" line.

**CAUTION**

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

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



## TIRE

Inspect Every 6 000 km (4 000 miles, 6 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	250	2.50	36

**▲ CAUTION**

The standard tire fitted on this motorcycle is 120/70 ZR17 (58W) for front and 180/55 ZR17 (73W) for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a **SUZUKI Genuine Tire**.

### TIRE TYPE

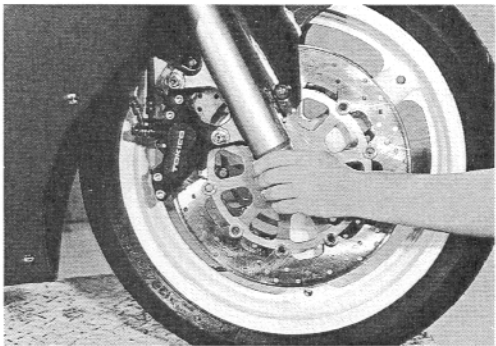
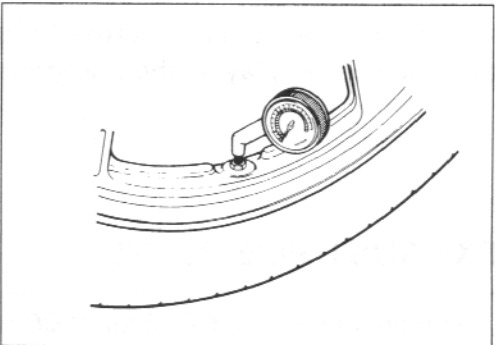
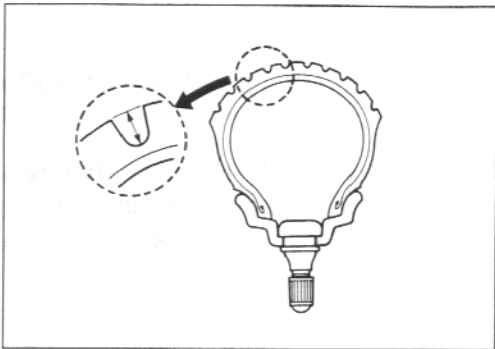
DUNLOP (front ... D204FT, rear ... D204N)

PIRELLI (front ... MTR01s, rear ... MTR02s)

## STEERING

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 12 000 km (7 500 miles, 12 months) thereafter.

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 steering stem while grasping the lower fork tubes by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, and pull forward. If play is found, perform steering bearing adjustment as described in page 6-26 of this manual.



## FRONT FORK

Inspect Every 12 000 km (7 500 miles, 12 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 pages 6-11 through -20.)

## REAR SUSPENSION

Inspect Every 12 000 km (7 500 miles, 12 months).

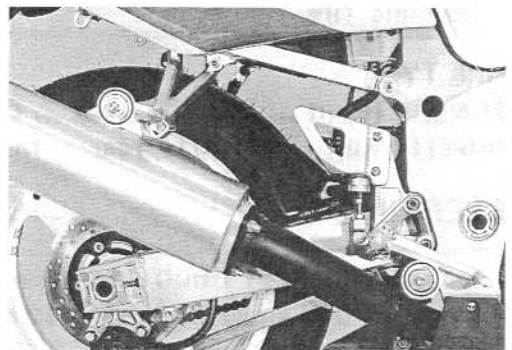
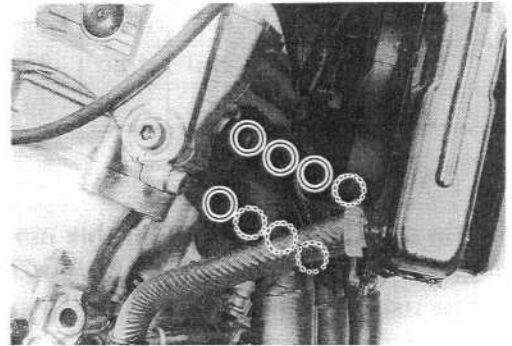
Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

## EXHAUST PIPE BOLTS

Tighten initially at 1 000 km (600 miles, 1 month) and Every 12 000 km (7 500 miles, 12 months) thereafter.

- Remove the lower fairing assembly. (Refer to pages 6-2 and -3.)
- Remove the radiator mounting bolts.
- Tighten the exhaust pipe clamp bolts and muffler mounting bolts to the specified torque with a torque wrench.

 Exhaust pipe clamp bolt  
& Muffler mounting bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

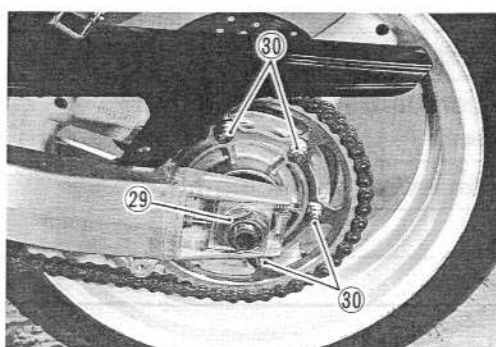
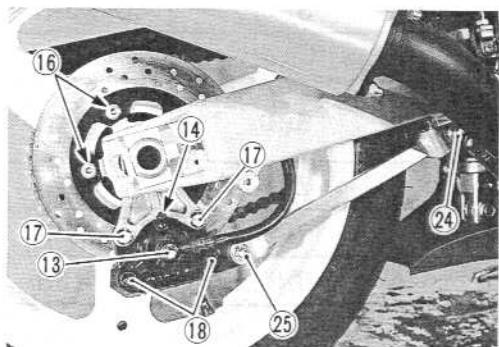
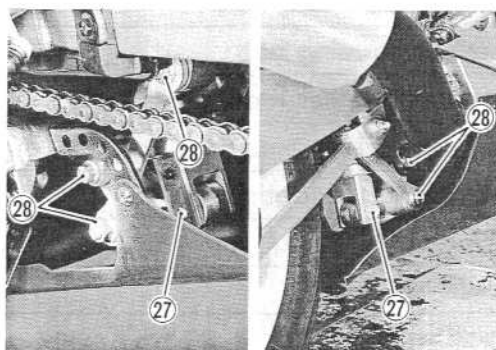
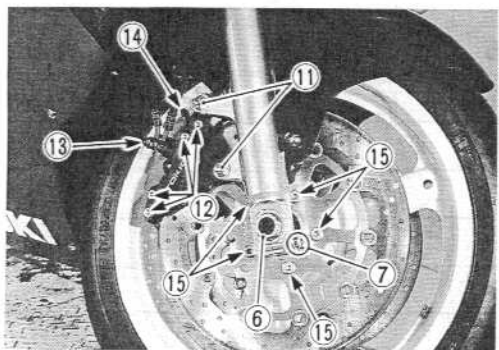
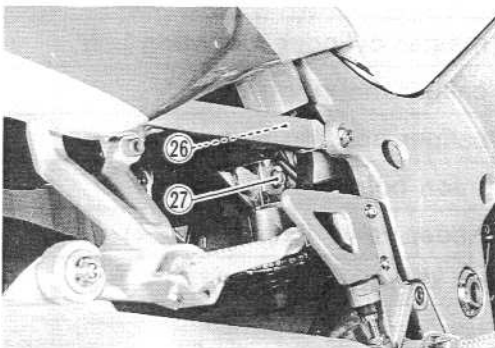
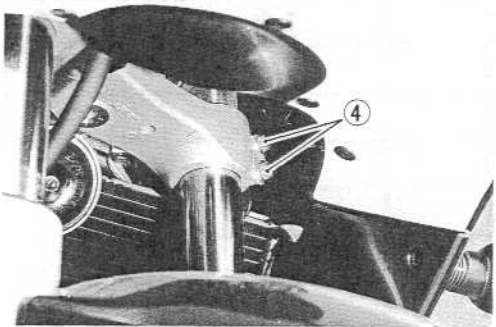
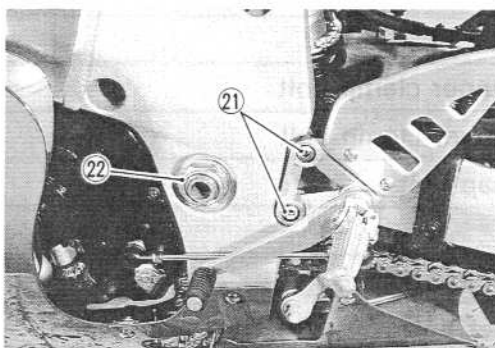
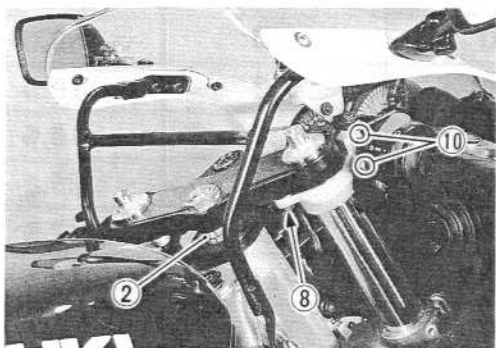
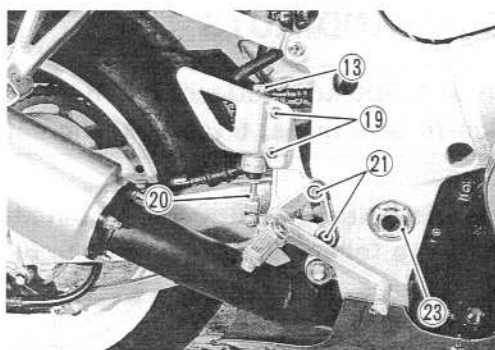
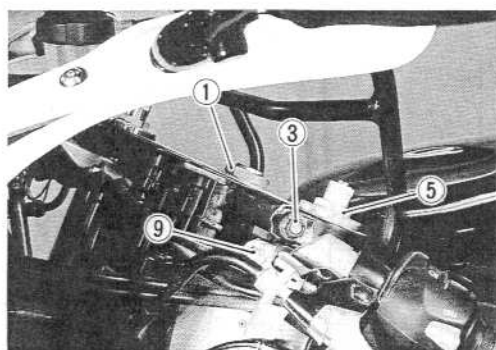


## CHASSIS BOLTS AND NUTS

Tighten Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) thereafter.

Check that all chassis bolts and nuts are tightened to their specified torque. (Refer to page 2-21 for the locations of the following nuts and bolts on the motorcycle.)

Item	N·m	kg-m	lb-ft
① Steering stem head nut	90	9.0	65.0
② Steering stem lock nut	80	8.0	58.0
③ Front fork upper clamp bolt	23	2.3	16.5
④ Front fork lower clamp bolt	23	2.3	16.5
⑤ Front fork cap bolt	35	3.5	25.5
⑥ Front axle	100	10.0	72.5
⑦ Front axle pinch bolt	23	2.3	16.5
⑧ Handlebar set bolt	10	1.0	7.0
⑨ Handlebar clamp bolt	23	2.3	16.5
⑩ Front brake master cylinder mounting bolt	10	1.0	7.0
⑪ Front brake caliper mounting bolt	39	3.9	28.0
⑫ Front brake caliper housing bolt	23	2.3	16.5
⑬ Brake hose union bolt (Front & Rear)	23	2.3	16.5
⑭ Caliper air bleeder valve (Front & Rear)	8	0.8	6.0
⑮ Brake disc bolt (Front)	23	2.3	16.5
⑯ Brake disc bolt (Rear)	35	3.5	25.5
⑰ Rear brake caliper mounting bolt	26	2.6	19.0
⑱ Rear brake caliper housing bolt	33	3.3	24.0
⑲ Rear brake master cylinder mounting bolt	10	1.0	7.0
⑳ Rear brake master cylinder rod lock nut	18	1.8	13.0
㉑ Front footrest bracket mounting bolt	23	2.3	16.5
㉒ Swingarm pivot nut	100	10.0	72.5
㉓ Swingarm pivot lock nut	90	9.0	65.0
㉔ Torque link bolt and nut (front)	28	2.8	20.0
㉕ Torque link bolt and nut (Rear)	35	3.5	25.5
㉖ Rear suspension bracket nut	115	11.5	83.0
㉗ Rear shock absorber mounting bolt/nut (Upper & Lower)	50	5.0	36.0
㉘ Rear cushion lever/rod mounting nut	78	7.8	56.5
㉙ Rear axle nut	100	10.0	72.5
㉚ Rear sprocket nut	60	6.0	43.5



## 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
1 100–1 500 kPa (11–15 kg/cm <sup>2</sup> ) (156–213 psi)	900 kPa (9 kg/cm <sup>2</sup> ) (128 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 900 kPa (9 kg/cm<sup>2</sup>, 128 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 1 100 kPa (11 kg/cm<sup>2</sup>, 156 psi) even when they measure more than 900 kPa (9 kg/cm<sup>2</sup>, 128 psi).

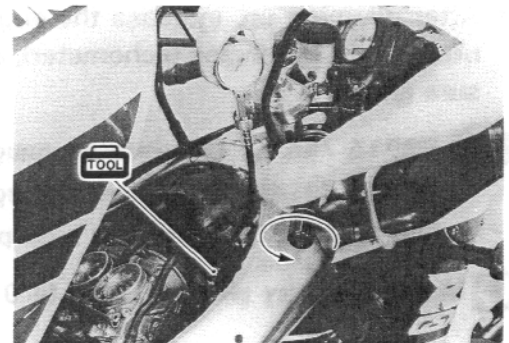
## COMPRESSION TEST PROCEDURE

### 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 seat. (Refer to page 6-3.)
- Lift and support the fuel tank. (Refer to page 4-2.)
- Remove the air cleaner box. (Refer to page 4-14.)
- Remove all the spark plugs. (Refer to page 2-4.)
- 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.



**TOOL** 09915-64510: Compression gauge  
09913-10750: Adaptor



## OIL PRESSURE CHECK

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

### OIL PRESSURE SPECIFICATION

<p><b>Above 200 kPa (2.0 kg/cm<sup>2</sup>, 28 psi)</b>  <b>Below 500 kPa (5.0 kg/cm<sup>2</sup>, 71 psi)</b></p>	<p><b>at 3 000 r/min., Oil temp. at 60°C (140°F)</b></p>
---	--

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 high viscosity
- \* Clogged oil passage way
- \* Combination of above items

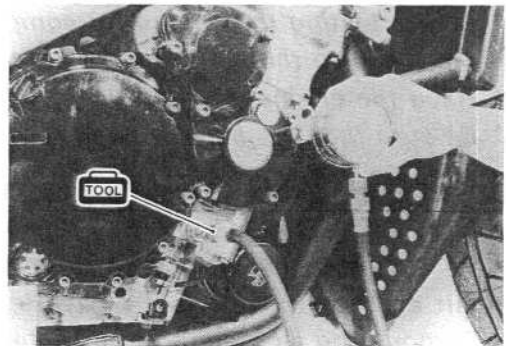
## OIL PRESSURE TEST PROCEDURE

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 right side lower fairing. (Refer to page 6-2).
- Remove the main oil gallery plug.
- Install the oil pressure gauge with attachment in the position shown in the figure.
- Warm up the engine as follows:  
 Summer 10 min. at 2 000 r/min.  
 Winter 20 min. at 2 000 r/min.
- After warming up, increase the engine speed to 3 000 r/min. (with the engine tachometer), and read the oil pressure gauge.

-  **09915-74510: Oil pressure gauge**
- 09915-74540: Oil pressure gauge attachment**
- 09915-77330: Meter (for high pressure)**

-  **Main oil gallery plug: 40 N·m (4.0 kg-m, 29.0 lb-ft)**



# ENGINE

## CONTENTS

<b>ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE .....</b>	<b>3- 1</b>
<b>ENGINE REMOVAL AND INSTALLATION .....</b>	<b>3- 2</b>

**3**

**CAMSHAFT/CYLINDER HEAD**

**3A**

**CYLINDER/PISTON**

**3B**

**CLUTCH**

**3C**

**ENGINE LUBRICATION SYSTEM**

**3D**

**STARTER SYSTEM/SIGNAL GENERATOR**

**3E**

**GENERATOR**

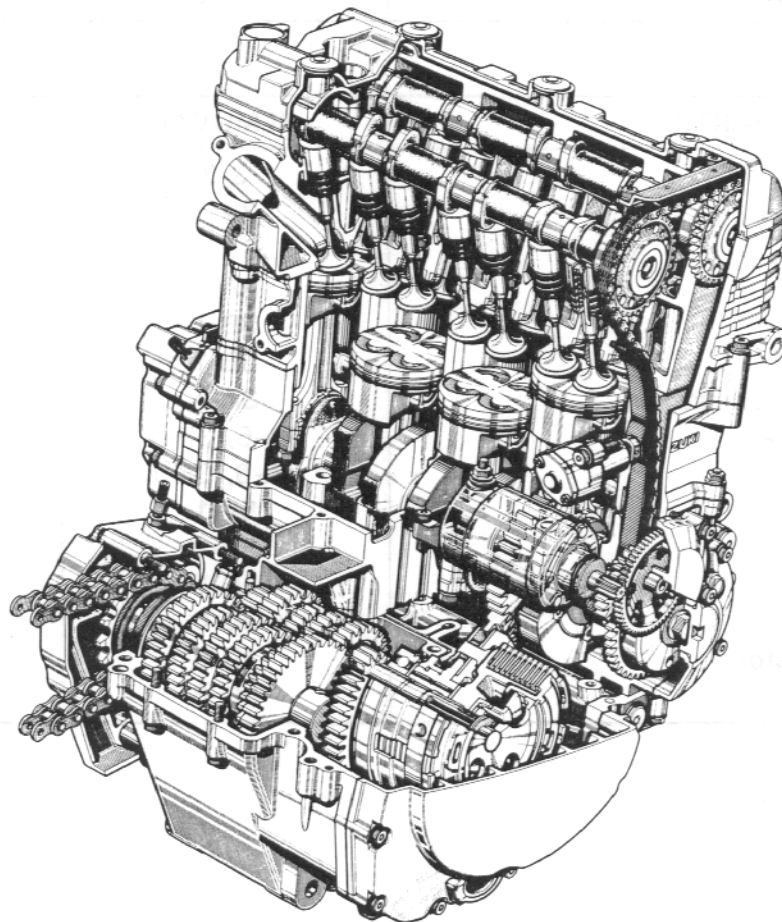
**3F**

**GEARSHIFT LINKAGE**

**3G**

**CRANKCASE/TRANSMISSION/CRANKSHAFT/CONROD**

**3H**



## 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 LEFT SIDE

PARTS	REMOVAL	INSTALLATION
Gearshift lever	3-5	3-10, 3G-0
Engine sprocket cover	3-5	3-10
Speedometer sensor	3-5	3-10
Engine sprocket and drive chain	3-5	3-10
Neutral indicator switch body	3H-5	3H-5
Water pump	5-13	5-15
Generator	3F-1	3F-2

### ENGINE RIGHT SIDE

PARTS	REMOVAL	INSTALLATION
Clutch	3C-1	3C-4
Primary driven gear	3C-2	3C-4
Oil pump drive and driven gear	3D-1	3D-3
Oil pump	3D-1	3D-2
Gearshift linkage	3G-1	3G-2
Starter clutch	3E-1	3E-3
Starter motor	3E-5	3E-5
Signal generator	3E-2	3E-3
Oil pressure switch	3D-8	3D-8

### ENGINE CENTER

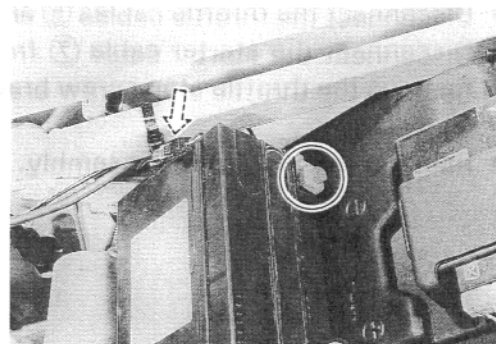
PARTS	REMOVAL	INSTALLATION
Carburetors	3-3	3-9
Cylinder head cover	3A-1	3A-19
Camshafts	3A-1	3A-15
Cylinder head	3A-2	3A-14
Cylinder	3B-1	3B-6
Pistons	3B-1	3B-5
Cam chain tension adjuster	3A-1	3A-18
Cam chain tensioner	3A-6, 3H-4	3A-7
Cam chain guide	3A-6, 3B-1	3A-14, 3A-18
Thermostat	5-11	5-12
Oil filter	3D-4	3D-4
Oil cooler	3D-5	3D-5
Oil pan	3D-6	3D-7
Oil pressure regulator	3D-6	3D-7
Oil sump filter	3D-6	3D-7

## ENGINE REMOVAL AND INSTALLATION

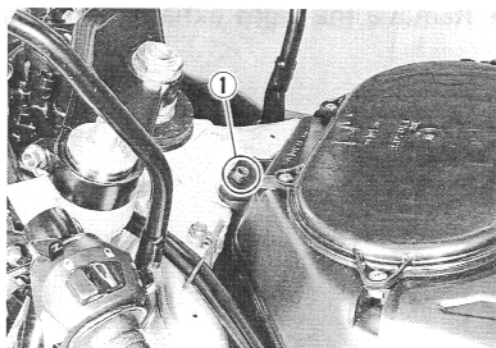
### ENGINE REMOVAL

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.

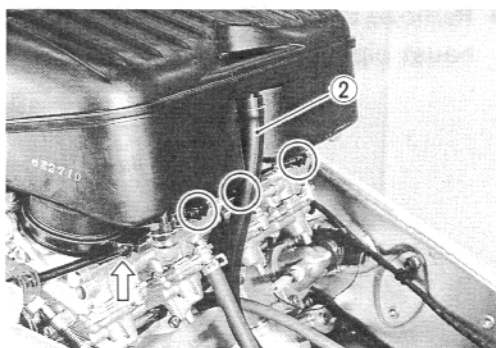
- Remove the oil drain plug to drain out engine oil.
- Remove the rear and front seats.
- Remove the fuel tank. (See page 4-2.)
- Remove the lower fairing assembly and under fairing. (See page 6-2.)
- Disconnect the battery ⊖ lead wire terminal and battery ⊖ lead wire coupler.



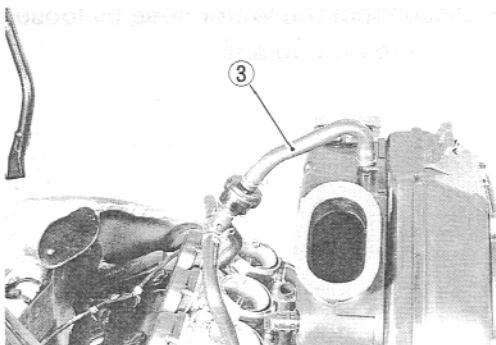
- Remove the air cleaner box mounting bolt ①.



- Loosen the respective carburetor clamp screws at air cleaner box side as shown.
- Disconnect the crankcase breather hose ②.

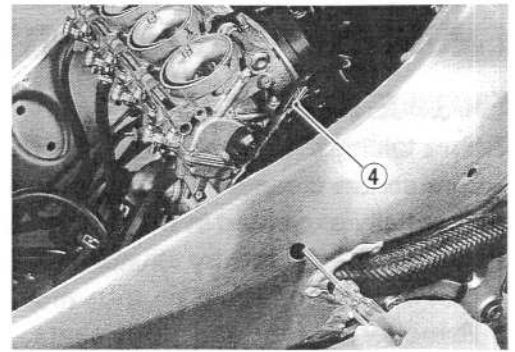


- Disconnect the carburetor air vent hose ③ and remove the air cleaner box.

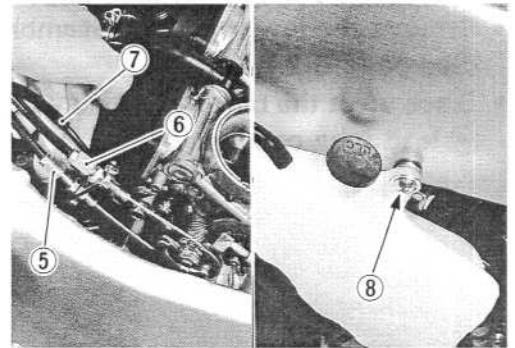


### 3-3 ENGINE

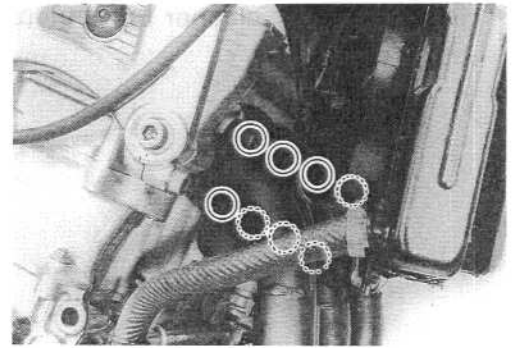
- Loosen the respective carburetor clamp screws at engine side as shown.
- Disconnect the throttle position sensor lead wire coupler ④.



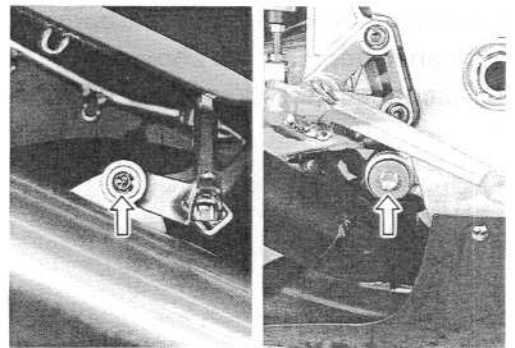
- Disconnect the throttle cables ⑤ and ⑥ from their drum.
- Disconnect the starter cable ⑦ from the carburetor.
- Remove the throttle stop screw bracket mounting screw ⑧.
- Remove the carburetor assembly.



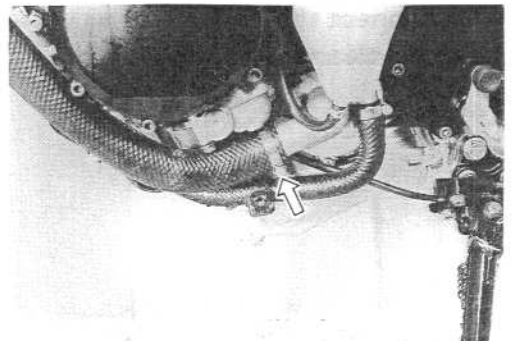
- Remove the eight exhaust pipe clamp bolts.



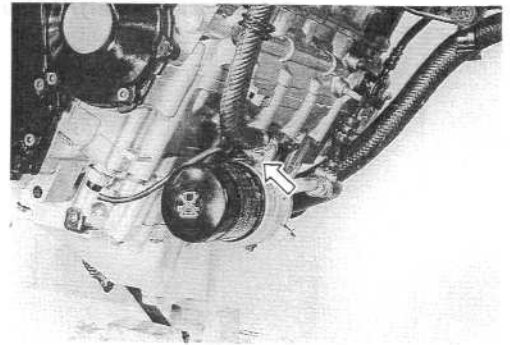
- Remove the muffler mounting bolts, then remove the exhaust pipe/muffler assembly.



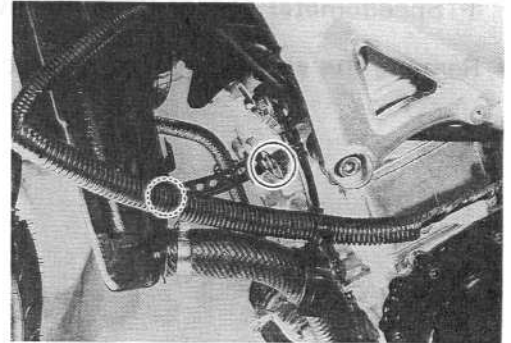
- Disconnect the water hose by loosening its clamp to drain out engine coolant.



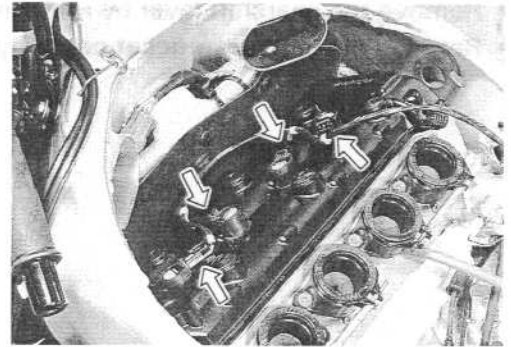
- Loosen the water hose clamp and disconnect the water hose from the oil cooler.



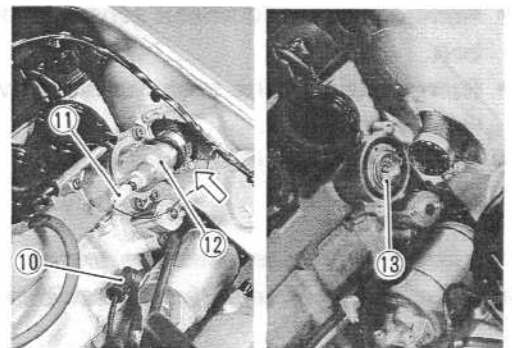
- Remove the radiator bracket bolts.



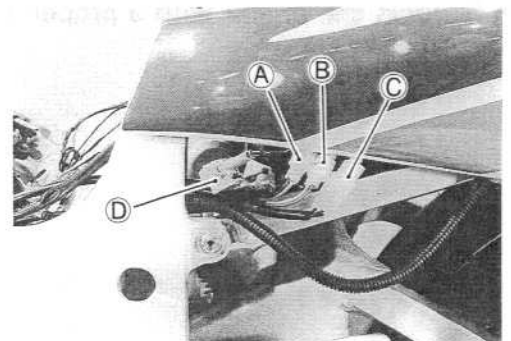
- Disconnect all the lead wire couplers from each ignition coil/spark plug cap.
- Remove all the ignition coil/spark plug caps.



- Disconnect the starter motor lead wire ⑩.
- Disconnect the water temperature gauge lead wire ⑪.
- Remove the thermostat cover ⑫ by removing the bolts and loosening the water hose clamp.
- Remove the thermostat ⑬.

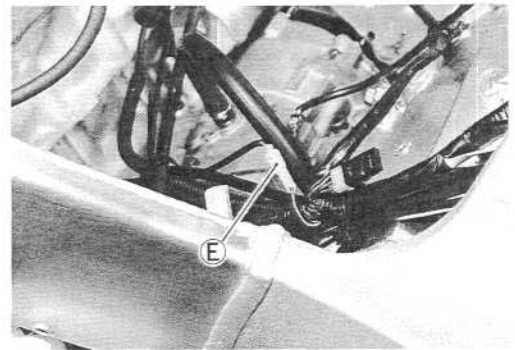


- Disconnect the various lead wires.
  - Ⓐ Signal generator (Black & Green 2P)
  - Ⓑ Gear position switch (Blue & Pink 2P)
  - Ⓒ Generator (Black 3P)
  - Ⓓ Side-stand switch (Green & Black/White 2P)



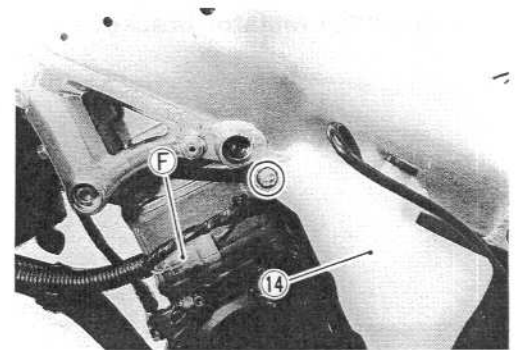
### 3-5 ENGINE

Ⓔ Oil pressure switch (Green/Yellow 1P)

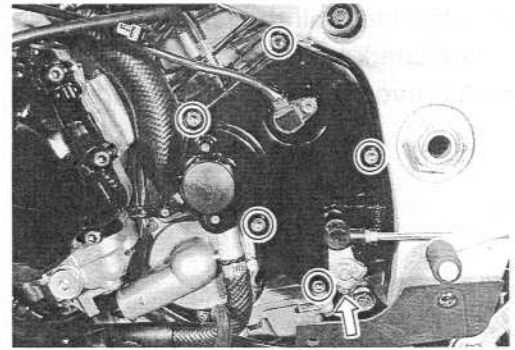


Ⓕ Speedometer sensor (Red, Yellow & Black 3P)

- Remove the engine coolant reservoir tank 14.



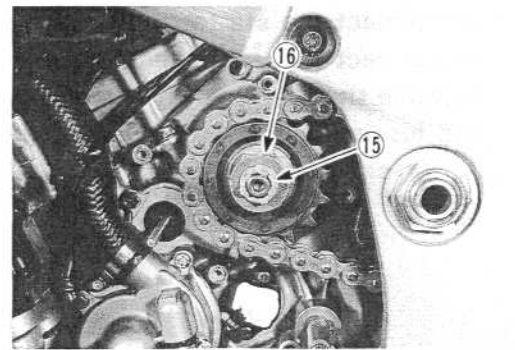
- Remove the gearshift lever by removing its mounting bolt.
- Remove the engine sprocket cover by removing the bolts.



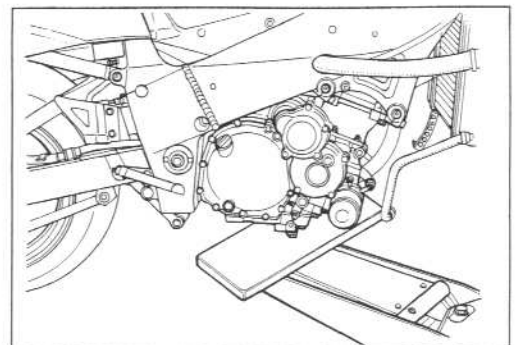
- Remove the speedometer sensor rotor 15 by removing the bolt.
- Remove the engine sprocket nut 16 while depressing the rear brake pedal.
- Remove the engine sprocket.

#### NOTE:

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

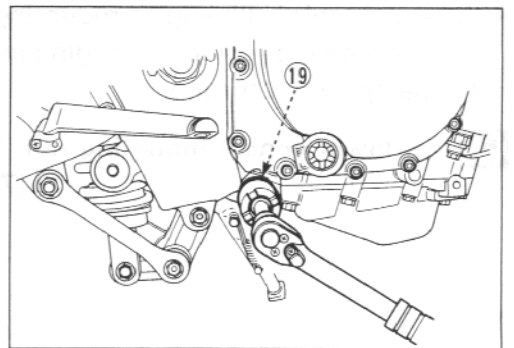
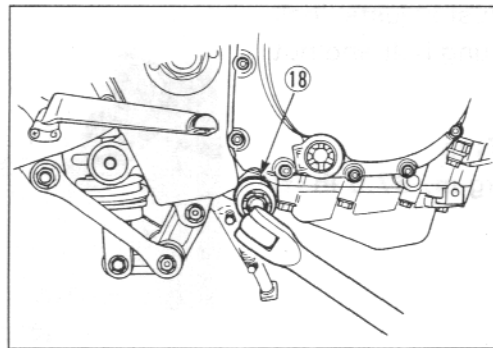
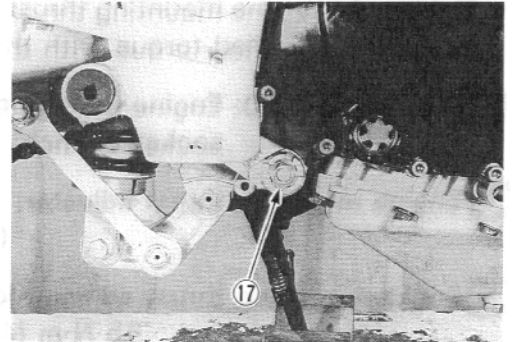
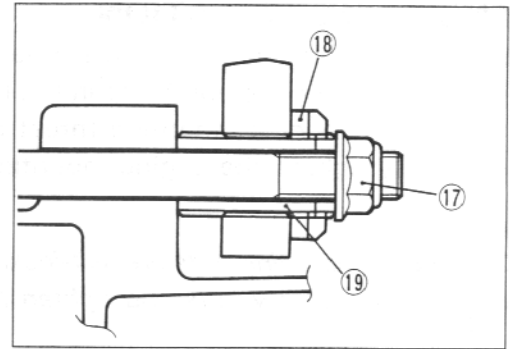


- Support the engine with a proper engine jack.

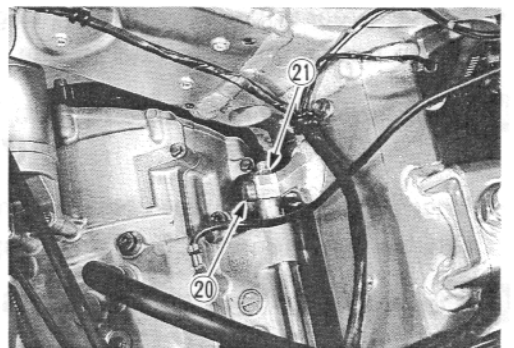


- Remove the rear lower engine mounting nut (17).
- Remove the engine mounting thrust adjuster lock nut (18) with the special tool and loosen the engine mounting thrust adjuster (19) fully with the special tool.

**TOOL** 09940-14980: Engine mounting thrust adjuster socket wrench



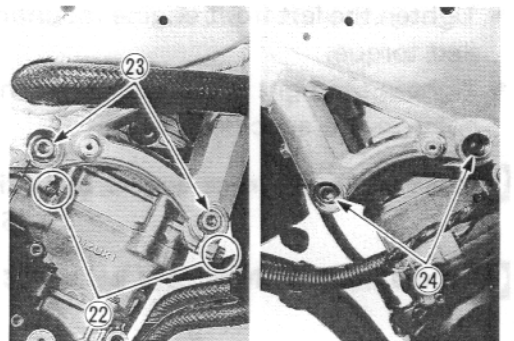
- After loosening the pinch bolt (20), remove the rear upper engine mounting nut (21).



- After loosening the pinch bolts (22), remove the right front engine mounting bolts (23).
- Remove the left front engine mounting bolts (24).
- Remove the two long engine mounting bolts and spacer.
- Gradually lower the engine assembly.

**CAUTION**

Be careful not to damage the frame and engine when removing the engine from the frame.





## ENGINE INSTALLATION

Install the engine in the reverse order of engine removal.

- Carefully align the bolt holes in the frame and engine then insert the two long bolts from left side. Install the engine mounting thrust adjuster, spacers, bolts and nuts properly.
- Loosely tighten the engine mounting bolts and nuts.

### 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.*

- Tighten the engine mounting thrust adjuster and its lock nut to the specified torque with the special tool.

**TOOL** 09940-14980: Engine mounting thrust adjuster socket wrench

**U** Engine mounting thrust adjuster: 10 N·m  
(1.0 kg-m, 7.0 lb-ft)

**U** Engine mounting thrust adjuster lock nut: 45 N·m (4.5 kg-m, 32.5 lb-ft)

- After tightening the engine mounting thrust adjuster lock nut, tighten the rear lower engine mounting bolt and nut to the specified torque.

**U** Rear lower engine mounting nut: 79 N·m  
(7.9 kg-m, 57.0 lb-ft)

- Push the rear upper engine mounting bolt fully and tighten the nut to the specified torque.

**U** Rear upper engine mounting nut: 79 N·m  
(7.9 kg-m, 57.0 lb-ft)

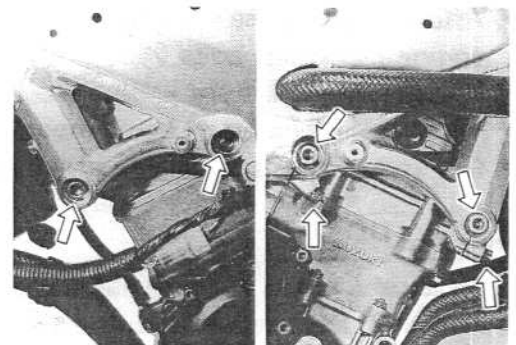
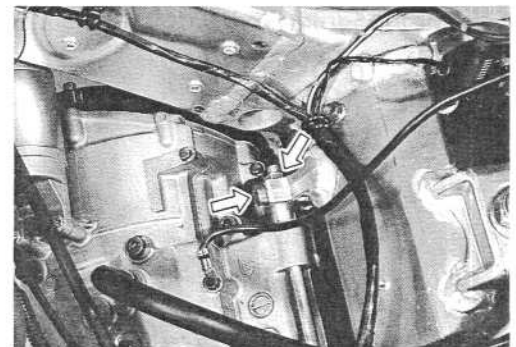
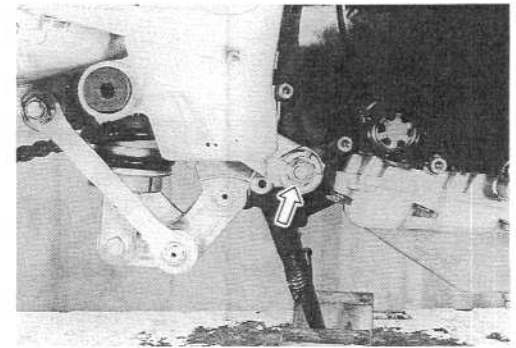
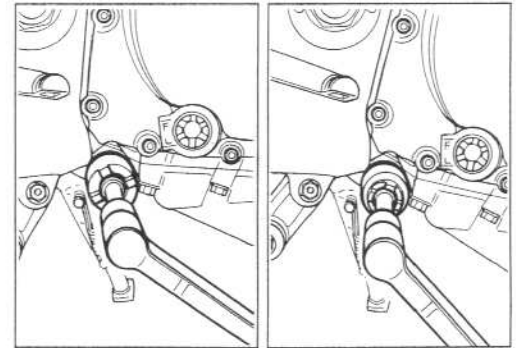
- After tightening the rear upper engine mounting bolt and nut, tighten the pinch bolt to the specified torque.

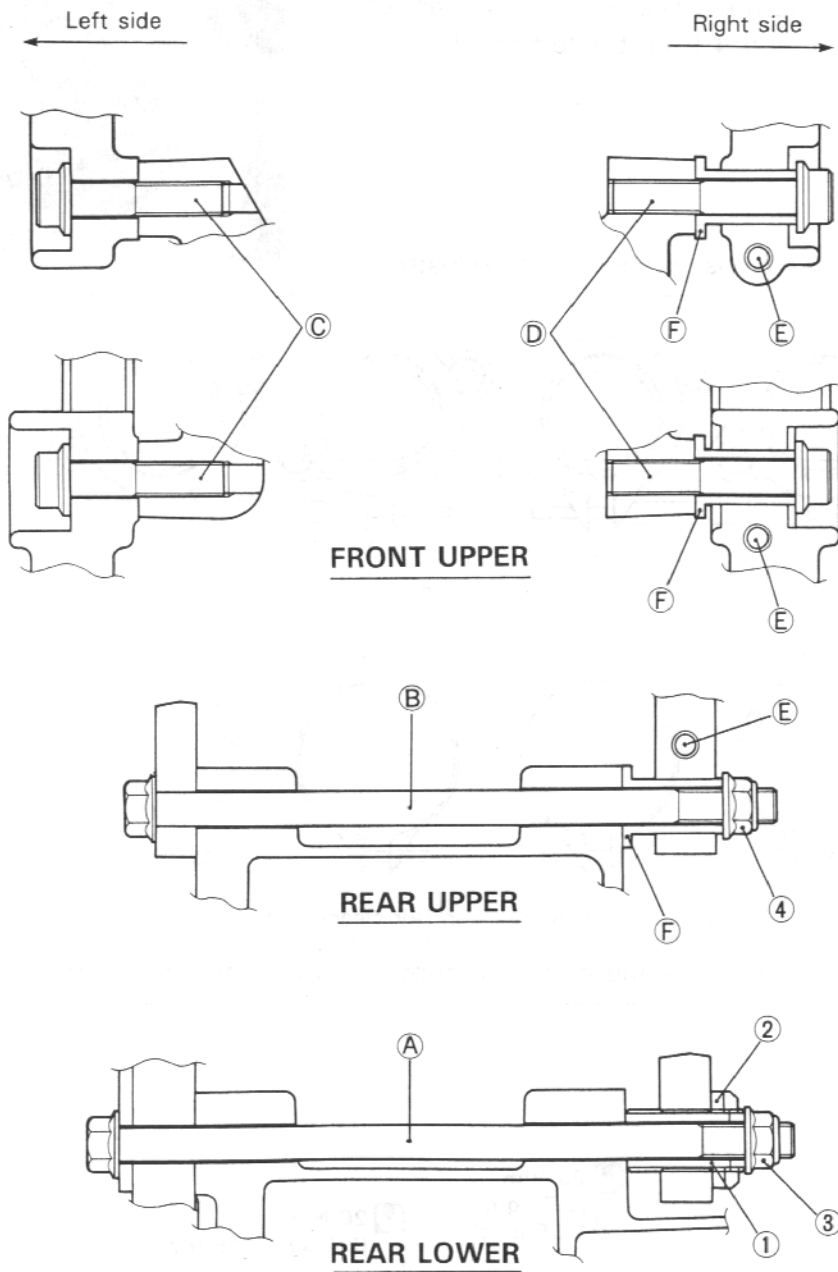
**U** Pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

- Tighten the left front engine mounting bolts to the specified torque.
- Tighten the right front engine mounting bolts and pinch bolts to the specified torque.

**U** Left and right front engine mounting bolt: 55 N·m  
(5.5 kg-m, 40.0 lb-ft)

**U** Pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)





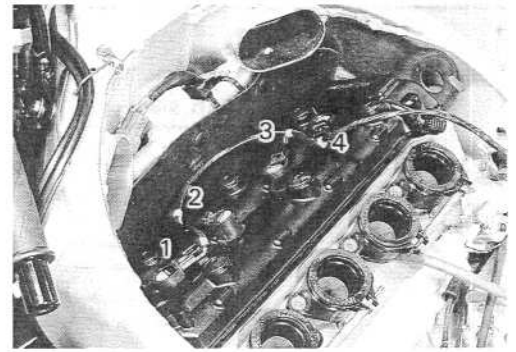
ITEM	N·m	kg-m	lb-ft
①	10	1.0	7.0
②	45	4.5	32.5
③, ④	79	7.9	57.0
⑤, ⑥	55	5.5	40.0
⑦	23	2.3	16.5

**LENGTH**

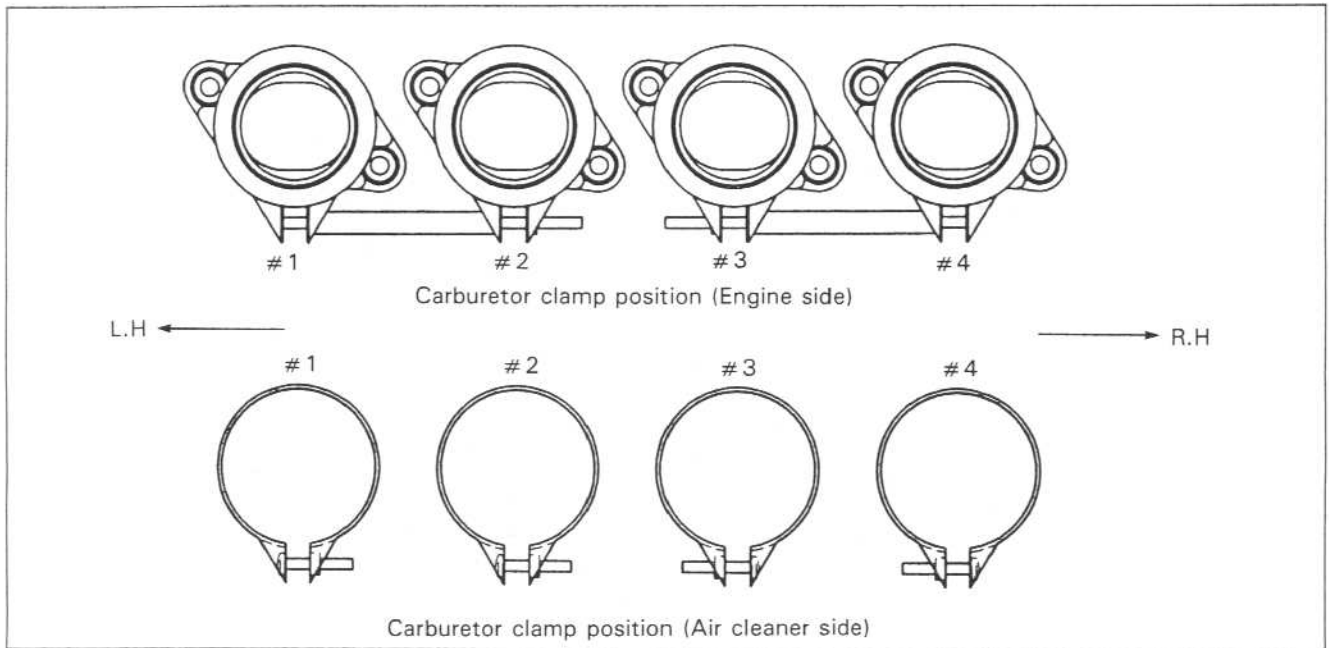
Bolt ①	205 mm (8.1 in)
Bolt ②	185 mm (7.3 in)
Bolt ③	45 mm (1.8 in)
Bolt ④	55 mm (2.2 in)
Bolt ⑤	30 mm (1.1 in)
Spacer ⑥	30.5 mm (1.2 in)

### 3-9 ENGINE

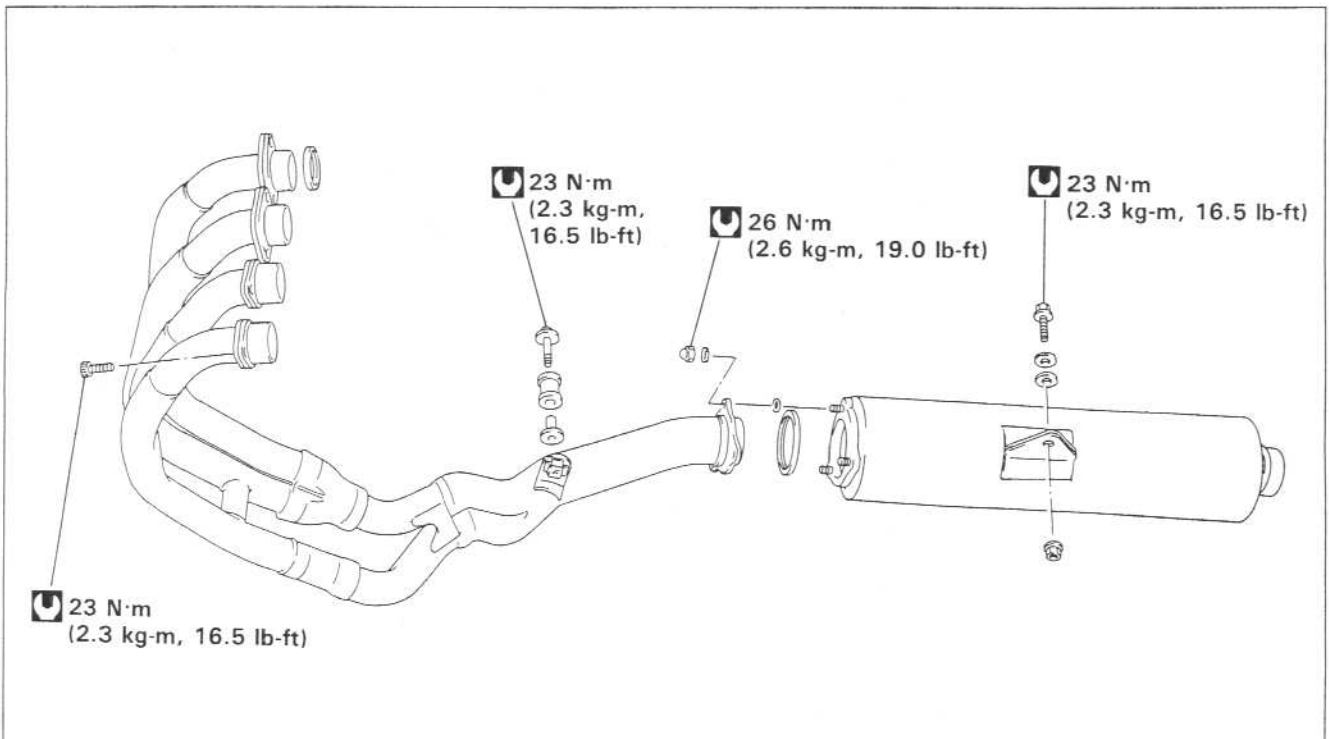
- Replace all the ignition coil/spark plug caps on the spark plugs and connect their lead wire couplers respectively markings correspond to the cylinder numbers arranged in the order of 1, 2, 3, and 4 from the left hand.



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



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

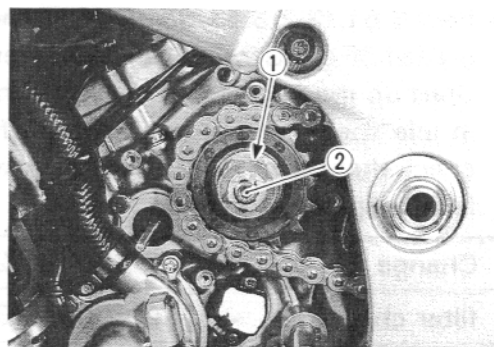


- Tighten the engine sprocket nut ① to the specified torque while depressing the rear brake pedal.

**U Engine sprocket nut: 120 N·m (12 kg-m, 87 lb-ft)**

- Tighten the speedometer sensor rotor bolt ② to the specified torque.

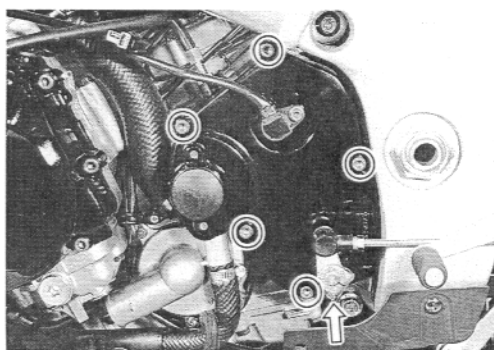
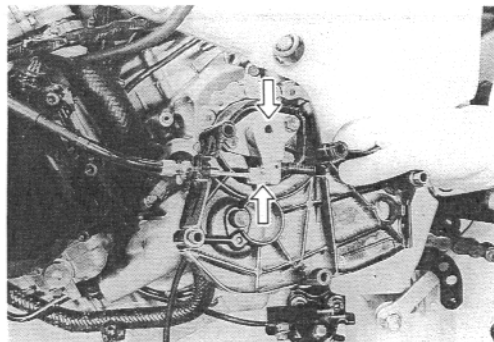
**U Speedometer sensor rotor bolt: 13 N·m (1.3 kg-m, 9.5 lb-ft)**



- Before installing the engine sprocket cover, apply a small quantity of SUZUKI SUPER GREASE "A" to the clutch release mechanism.

**AH99000-25010: SUZUKI SUPER GREASE "A"**

- Install the gearshift lever to the gearshift shaft in the correct position. (See page 3G-0.)



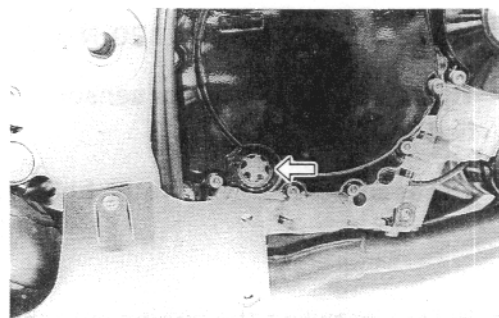
- Tighten the rear axle nut to the specified torque. (See page 8-30.)
- After remounting the engine, route wiring harnesses, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (See pages 8-13 through 22.)
- Adjust the following items to the specification.

	page
* Filling engine coolant.....	2-12
* Throttle cable play.....	2-11
* Idling adjustment.....	2-10
* Balancing carburetors.....	4-28
* Drive chain.....	2-13

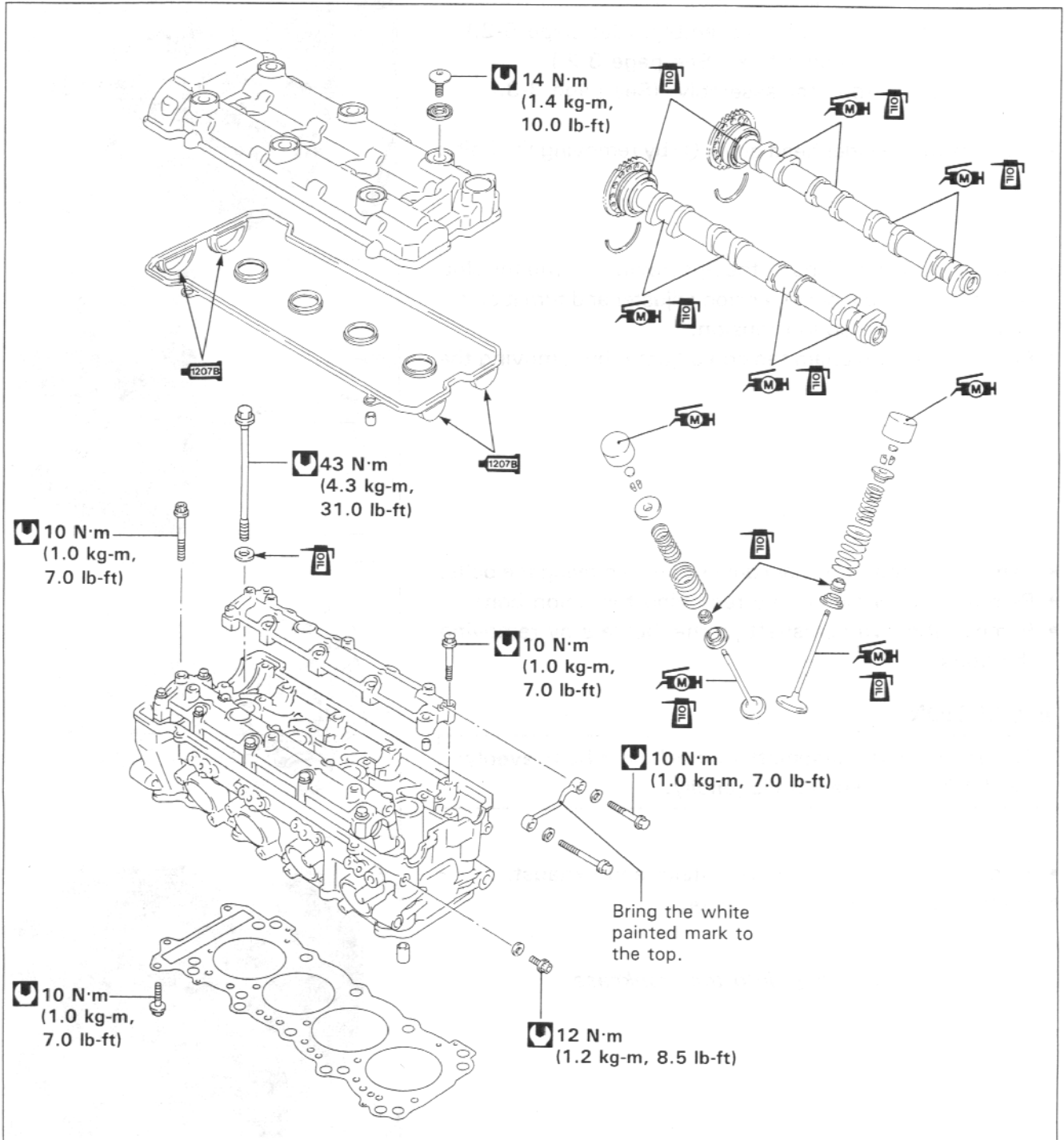
### 3-11 ENGINE

- Pour 3.5 L (3.7/3.1 US/Imp qt) of engine oil SAE 10W/40 graded SF or SG into the engine after overhauling engine.
- Start up the engine and allow it run for several minutes at idle speed. About one minute after stopping engine, check that the oil level remains between the marks of oil level inspection window.

Change	2 600 ml (2.7/2.3 US/Imp qt)
filter change	2 800 ml (3.0/2.5 US/Imp qt)
Overhaul	3 500 ml (3.7/3.1 US/Imp qt)



## CAMSHAFT/CYLINDER HEAD



## CONTENTS

<b>CAMSHAFT REMOVAL</b> .....	<b>3A- 1</b>
<b>CYLINDER HEAD REMOVAL</b> .....	<b>3A- 2</b>
<b>CAMSHAFT/CYLINDER HEAD INSPECTION AND SERVICE</b> .....	<b>3A- 3</b>
<b>CYLINDER HEAD INSTALLATION</b> .....	<b>3A-14</b>
<b>CAMSHAFT INSTALLATION</b> .....	<b>3A-15</b>

## CAMSHAFT REMOVAL

- Remove the fuel tank. (See page 4-2.)
- Remove the lower fairing assembly. (See page 6-2.)
- Remove the air cleaner box. (See page 3-2.)
- Remove the carburetor assembly. (See page 3-3.)
- Remove the cylinder head cover ① by removing the bolts.
- Remove the cap and insert the ⊖ screwdriver into the slotted end of the cam chain tension adjuster and turn it clockwise to lock the spring tension.
- Remove the cam chain tension adjuster by removing the mounting bolts.
- Remove the top cam chain guide ② by removing the bolts.
- Remove the oil pipe ③ by removing the union bolts.
- Remove the two camshaft journal holders by removing the bolts.

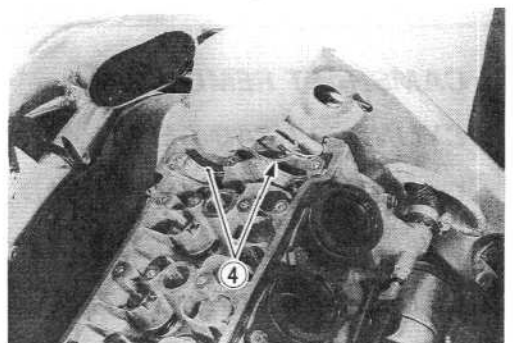
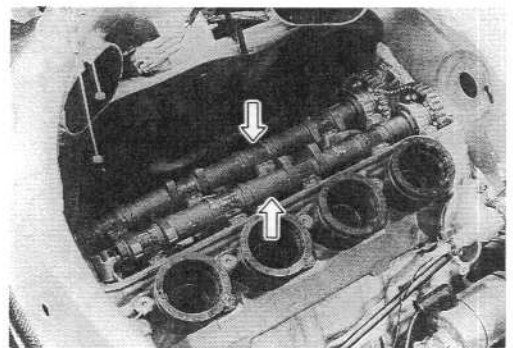
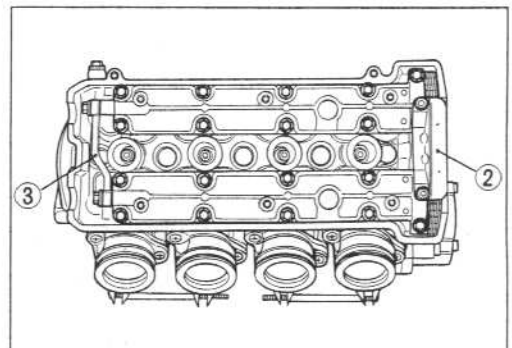
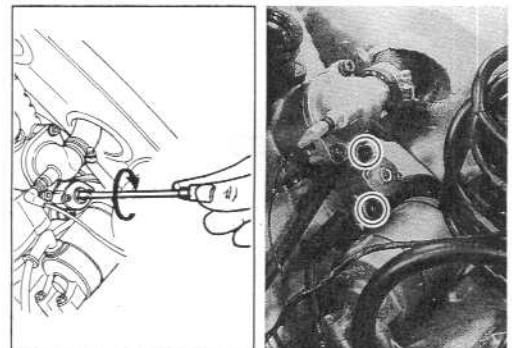
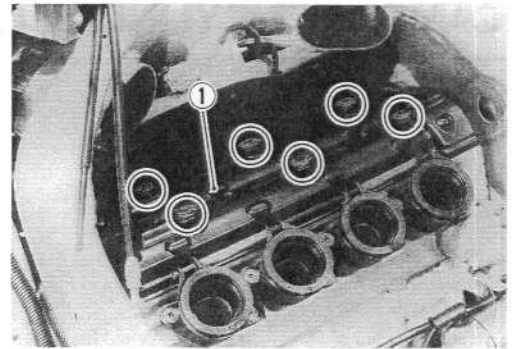
### ⚠ CAUTION

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

- Remove the two camshafts, intake and exhaust.
- Remove the camshaft C-rings ④.

### NOTE:

Do not drop the C-ring ④ into the crankcase.



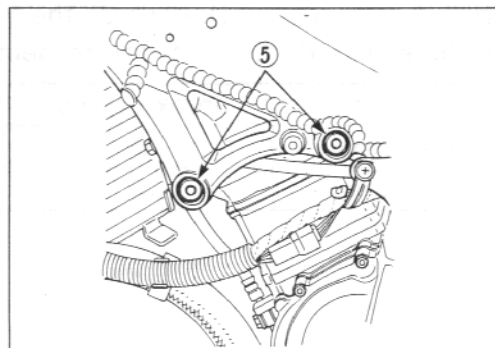
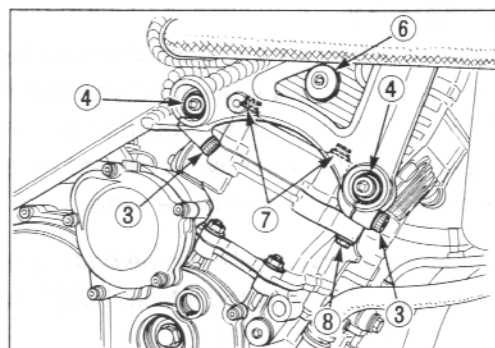
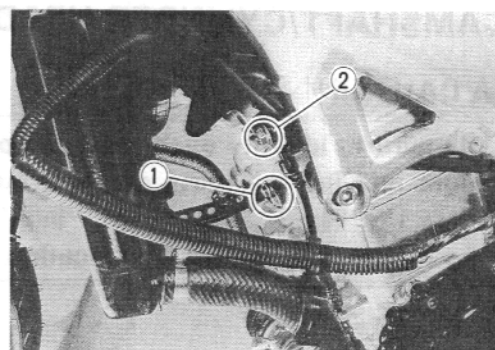
## CYLINDER HEAD REMOVAL

- Remove the camshafts, intake and exhaust. (See page 3A-1.)
- Remove the exhaust pipe/muffler assembly. (See page 3-3.)
- Drain out engine coolant. (See page 3-3.)
- Remove the thermostat cover and thermostat. (See page 3-4.)
- Remove the radiator bracket bolts ① and oil hose union bolt ②.
- Loosen the pinch bolts ③ and remove the right front engine mounting bolts ④.
- Remove the left front engine mounting bolts ⑤.
- Remove the cam chain stopper bolt ⑥.

### NOTE:

Before removing the cam chain stopper bolt ⑥, suspend the cam chain with a piece of wire.

- Remove the 6-mm bolts, ⑦ and ⑧.

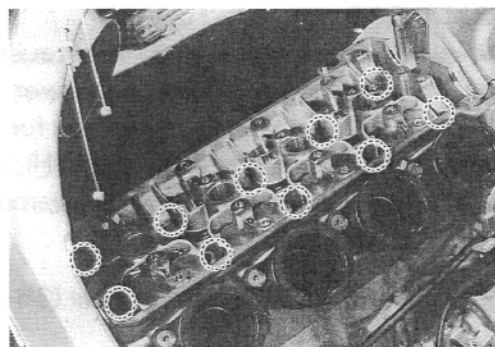


- Remove the 10-mm bolts.
- Remove the cylinder head assembly.

**TOOL** 09911-74520: Long socket 12 mm  
09914-24510: T-handle

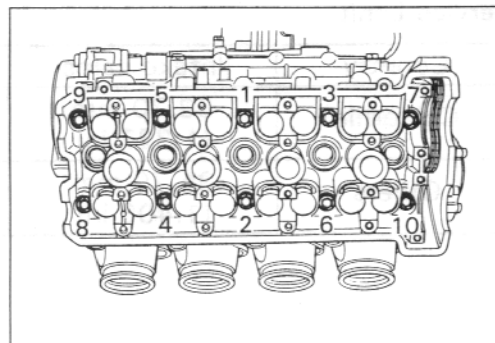
### NOTE:

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.





## CAMSHAFT/CYLINDER HEAD INSPECTION AND 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.

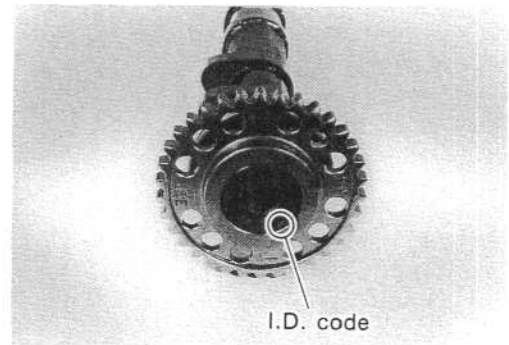
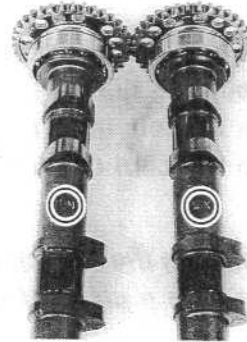
### CAMSHAFT

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, vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.

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

The following each I.D. code on the camshaft is identified by the stamped marks for the respective countries.

Country	Intake cams	Exhaust cams
California	D	C
Others	B	C



### CAM WEAR

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

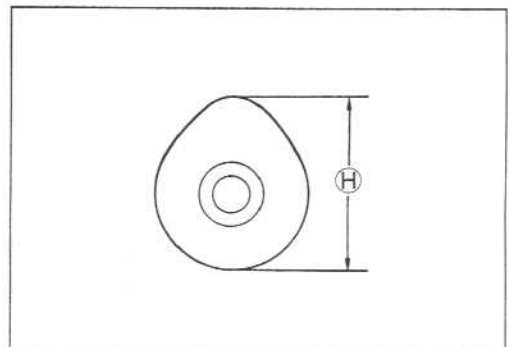
The limit of cam wear is specified for both intake and exhaust cams in terms of cam height  $H$ , which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

**TOOL** 09900-20202: Micrometer (25—50 mm)

Cam height  $H$

Service Limit

Country	Intake cams	Exhaust cams
California	33.70 mm (1.327 in)	35.00 mm (1.378 in)
Others	35.70 mm (1.406 in)	35.00 mm (1.378 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 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 3A-17.)*

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

 **Camshaft holder bolt: 10 N·m (1.0 kg-m, 7.0 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.

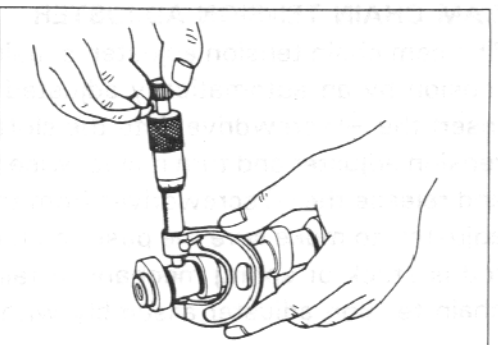
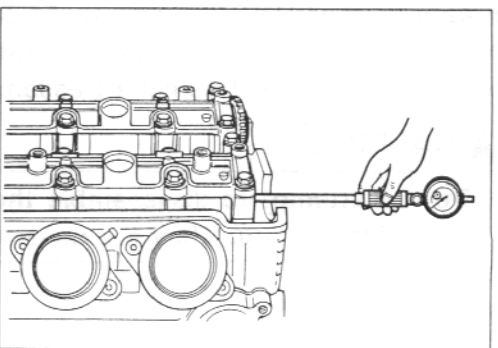
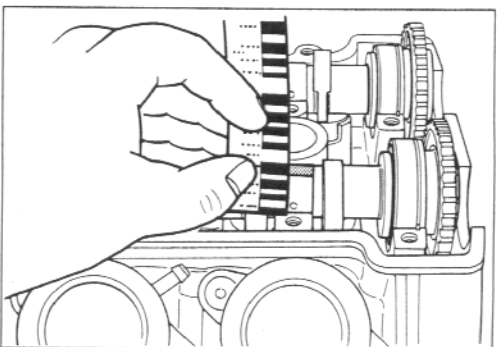
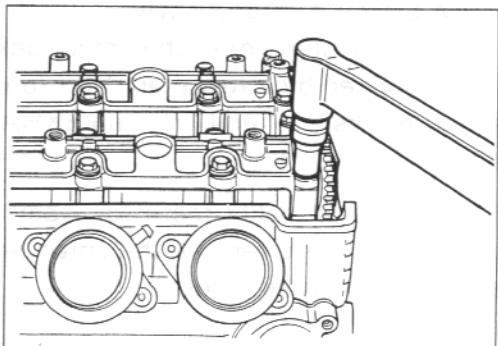
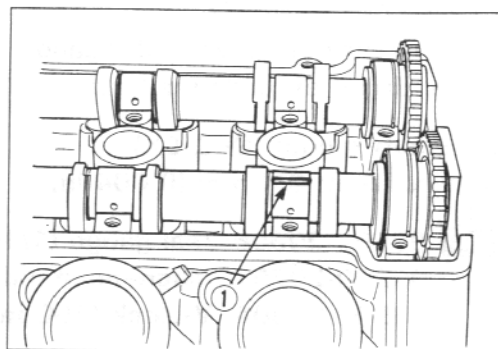
**Standard**

**Journal holder I.D. (IN & EX): 24.012–24.025 mm  
(0.9454–0.9459 in)**

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

**Standard**

**Camshaft journal O.D. (IN & EX): 23.959–23.980 mm  
(0.9433–0.9441 in)**




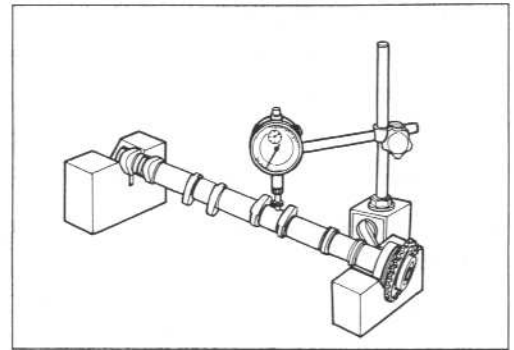
**CAMSHAFT RUNOUT**

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)**

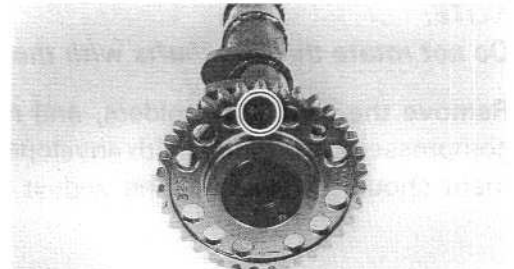
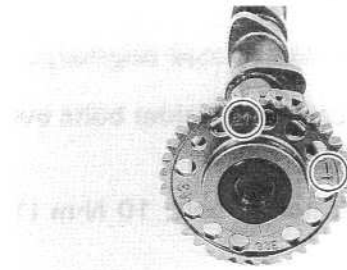
-  **09900-20606: Dial gauge (1/100 mm, 10 mm)**
- 09900-20701: Magnetic stand**
- 09900-21304: V-block (100 mm)**



**CAM SPROCKET/BEARING**

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.

Inspect the sprocket teeth for wear. If they are worn, replace the sprocket/camshaft assembly and cam chain as a set.



Rotate the bearing outer race by fingers to inspect for abnormal play, noise and smooth rotation. If it is unusual, replace the sprocket/camshaft assembly with a new one.

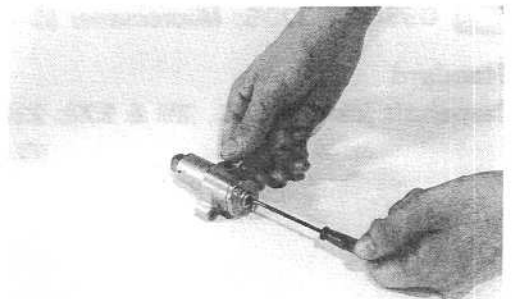
**⚠ CAUTION**

**Do not attempt to disassemble the cam sprocket or right-side bearing. They are unserviceable.**



**CAM CHAIN TENSION ADJUSTER**

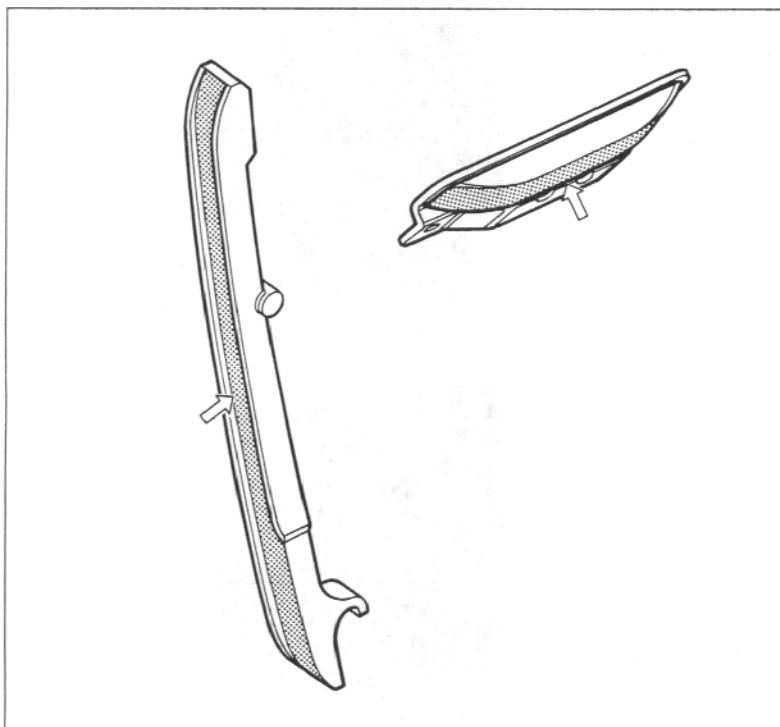
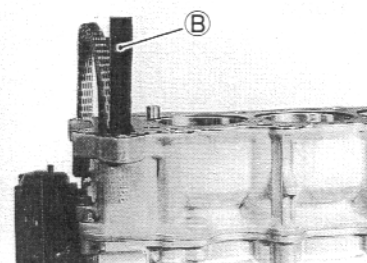
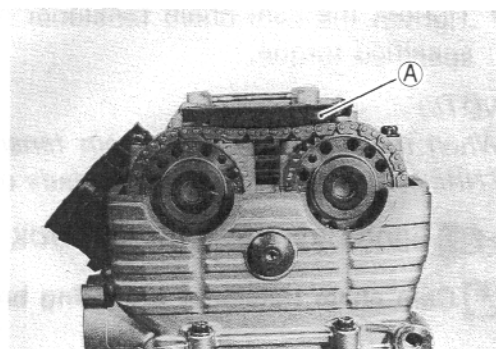
The cam chain tension adjuster is maintained at the proper tension by an automatically adjusted tensioner. Insert the ⊖ screwdriver into the slotted end of cam chain tension adjuster and turn it clockwise to lessen the tension and release the ⊖ screwdriver from the cam chain tension adjuster, to make sure the push rod movement. If the push rod is stuck or spring mechanism failed, replace the cam chain tension adjuster assembly with a new one.



**CAM CHAIN GUIDE**

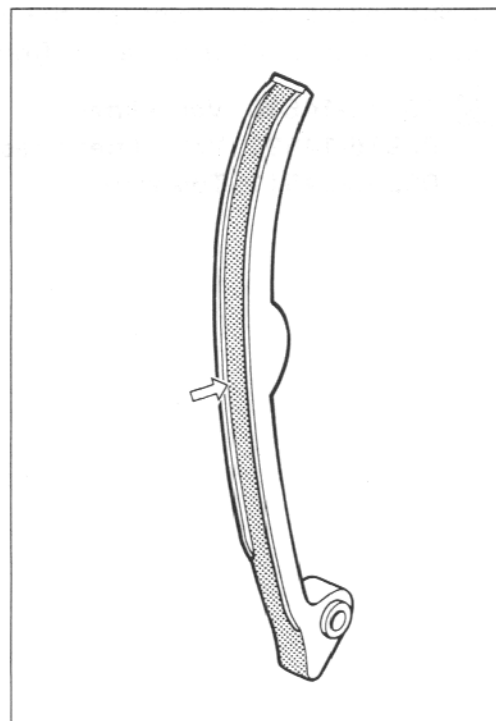
Check the cam chain guide for wear and damage. If it is found to be damaged, replace it with a new one.

- Ⓐ Top cam chain guide
- Ⓑ Front cam chain guide

**CAM CHAIN TENSIONER**

Check the cam chain tensioner for wear and damage. If it is found to be damaged, replace it with a new one.

If it is necessary to replace the cam chain tensioner, remove the starter clutch and intake camshaft. (See pages 3E-1 and 3A-1.)




## 3A-7 ENGINE

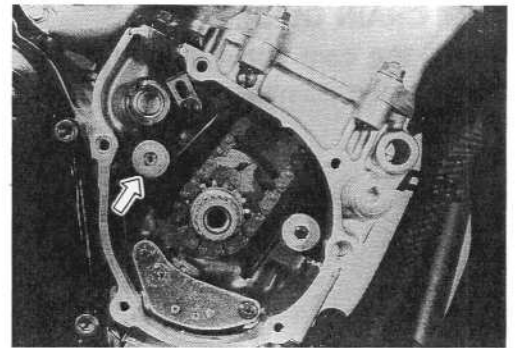
- Tighten the cam chain tensioner mounting bolt to the specified torque.

### NOTE:

When replacing the cam chain tensioner, apply **SUZUKI THREAD LOCK "1342"** to threads of bolt.

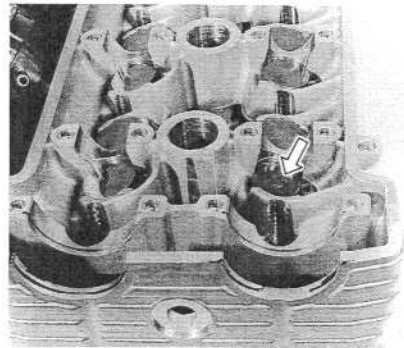
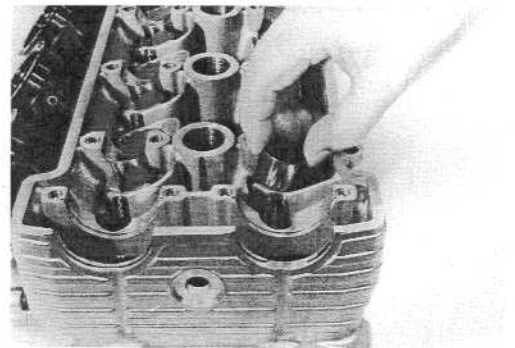
 **99000-32050: THREAD LOCK "1342"**

 **Cam chain tensioner mounting bolt: 10 N·m  
(1.0 kg-m, 7.0 lb-ft)**



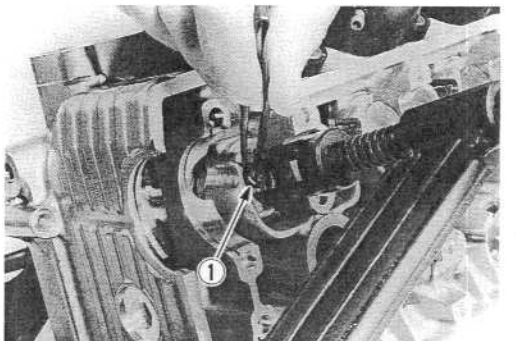
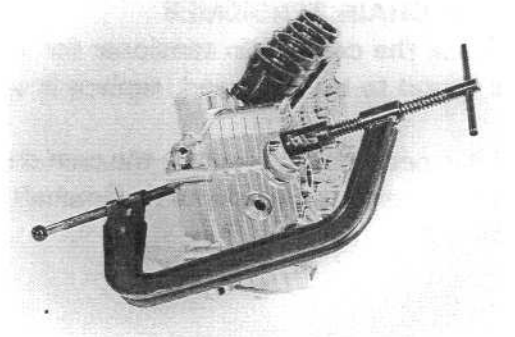
## CYLINDER HEAD

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

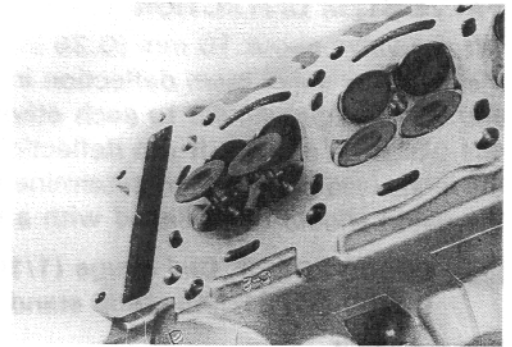


- Using special tools, compress the valve springs and remove the two cotter halves ① from valve stem.

 **09916-14510: Valve lifter**  
**09916-14521: Valve lifter attachment**  
**09916-84511: Tweezers**




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



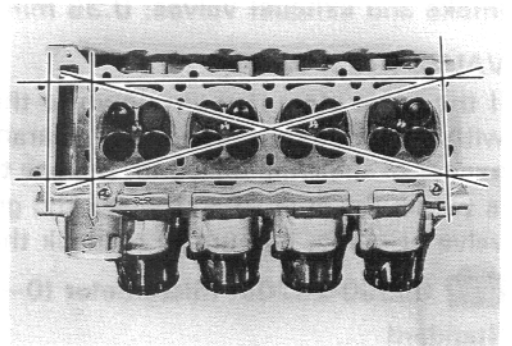
### CYLINDER HEAD DISTORTION

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)**



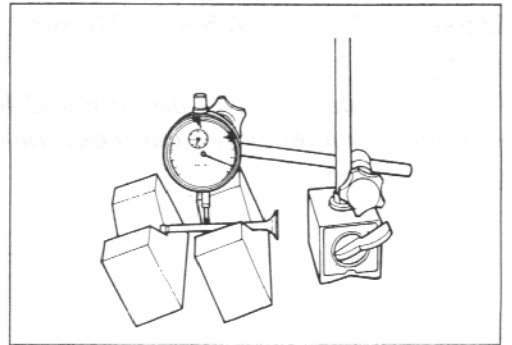
### VALVE STEM RUNOUT

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)**



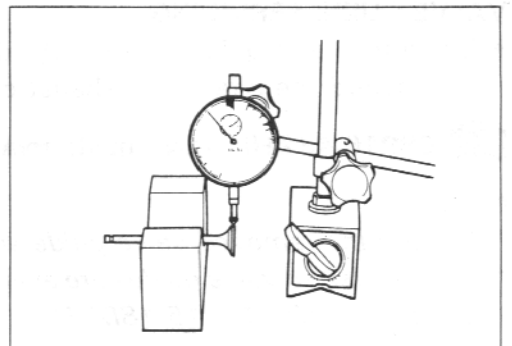
### VALVE HEAD RADIAL RUNOUT

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)**

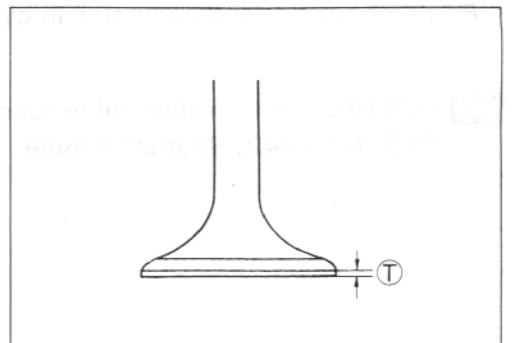


### VALVE FACE WEAR

Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face. The thickness  $\text{T}$  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  $\text{T}$ : 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.

- TOOL** 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.

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

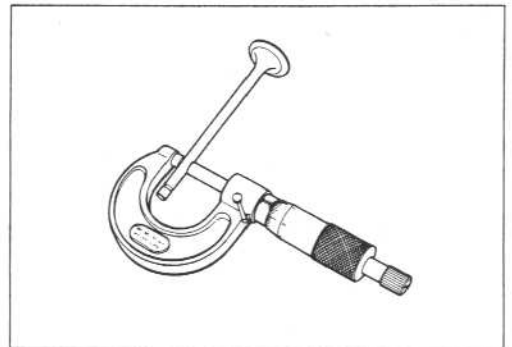
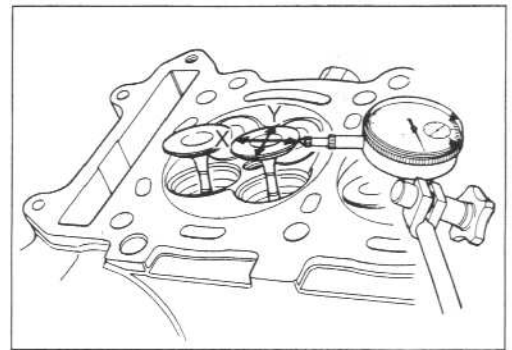
**Standard**

Intake valves : 4.475–4.490 mm (0.1762–0.1768 in)

Exhaust valves: 4.455–4.470 mm (0.1754–0.1760 in)

**NOTE:**

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



**VALVE GUIDE SERVICING**

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

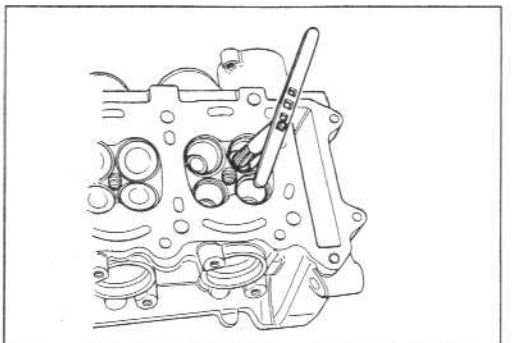
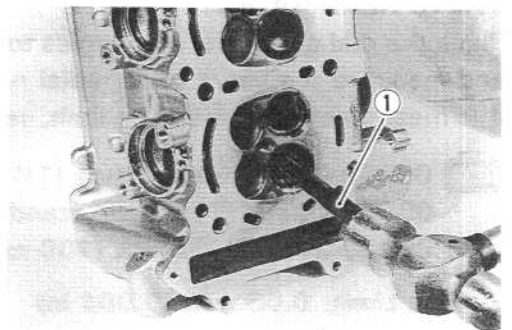
- TOOL** 09916-43210: Valve guide remover/installer

**NOTE:**

- \* Discard the removed valve guide subassemblies.
- \* Only oversized valve guides are available as replacement parts. (Part No. 11115-18D71)

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

- TOOL** 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.

**TOOL** 09916-43210: Valve guide remover/installer  
 09916-53330: 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.

**TOOL** 09916-33210: Valve guide reamer  
 09916-34542: Reamer handle

**NOTE:**

Insert the reamer from the combustion chamber and always turn the reamer handle clockwise.

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

**Standard**

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

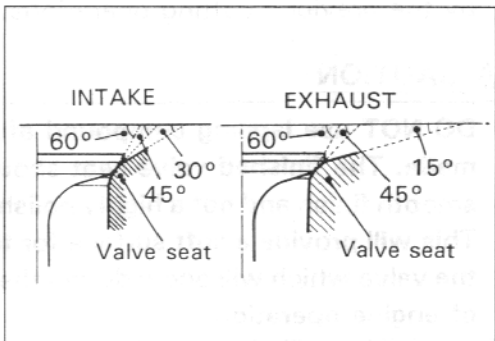
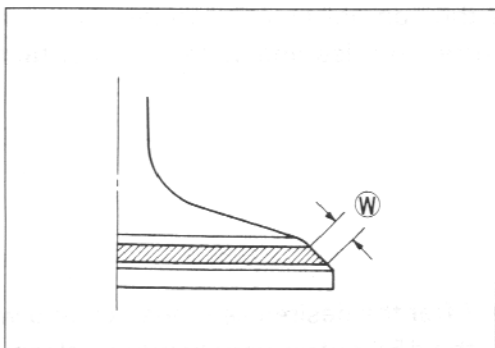
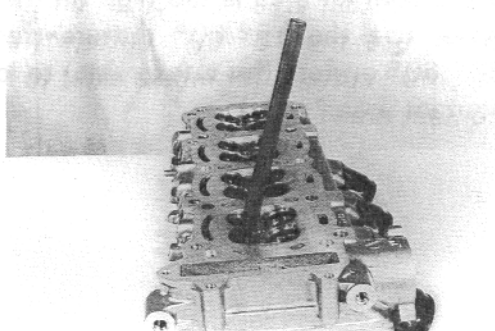
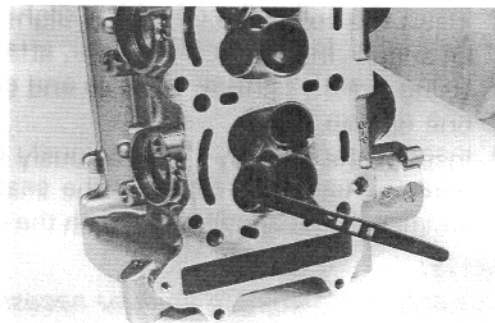
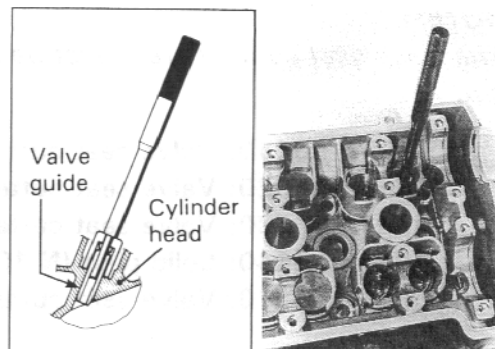
If either requirement is not met, correct the seat by servicing is as follows:

**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	60°	N-111

**TOOL** 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.

- TOOL** 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 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.

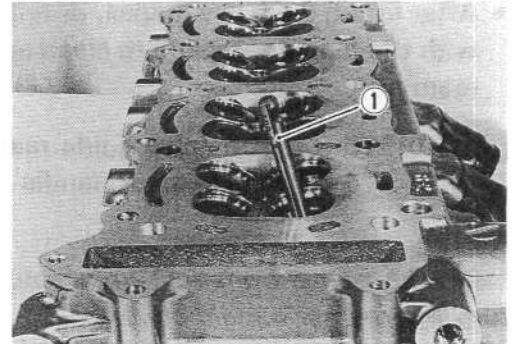
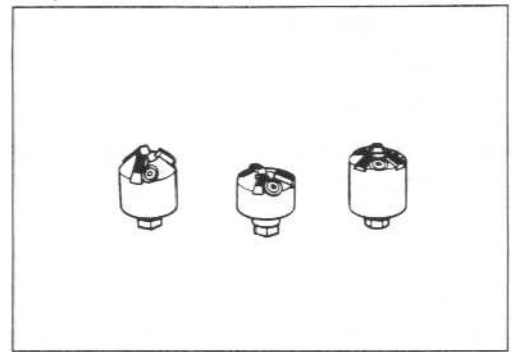
If the contact area is too high on the valve, or if it is too wide, use the 15°/60° cutters (for exhaust side) and 30°/60° cutters (for intake side) to lower and narrow the contact area.

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

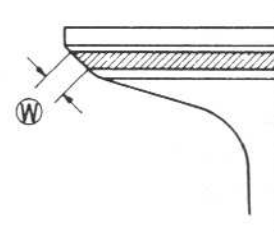
- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations.

**CAUTION**

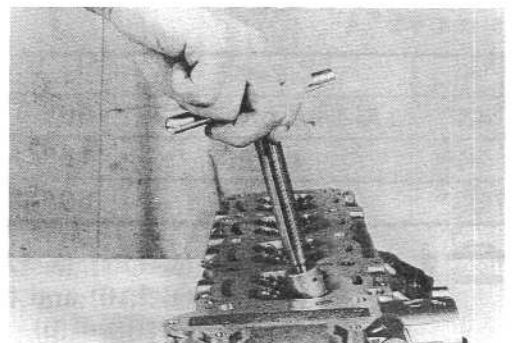
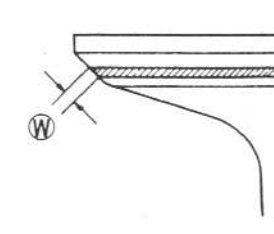
DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.



Contact area too high and too wide on face of valve



Contact area too low and too narrow on face of valve



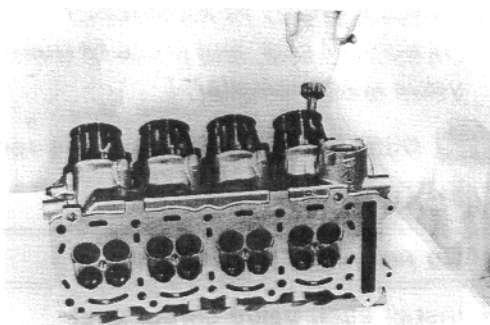
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

### **▲ 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 2-5.)*



### **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 springs for proper strength by measuring their free length and also by the force required to compress them. 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 both the inner and outer springs as a set.

**TOOL** 09900-20102: Vernier calipers

**Valve spring free length (IN & EX)**

**Service limit INNER : 36.8 mm (1.45 in)**

**OUTER: 38.6 mm (1.52 in)**

**Valve spring tension (IN & EX)**

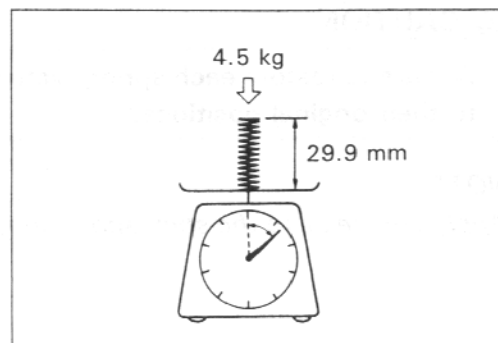
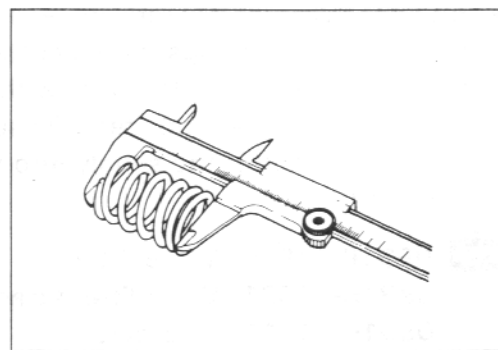
**INNER : 4.5 kg/29.9 mm**

**(9.9 lbs/1.18 in)**

**Standard**

**OUTER: 15.5 kg/33.4 mm**

**(34.2 lbs/1.31 in)**



## CYLINDER HEAD REASSEMBLY

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

**TOOL** 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.

**MH** 99000-25140: SUZUKI MOLY PASTE

- Install the valve springs 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 springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter **1** to wedge in between retainer and stem. Be sure that the rounded lip **2** of the cotter fits snugly into the groove **3** in the stem end.

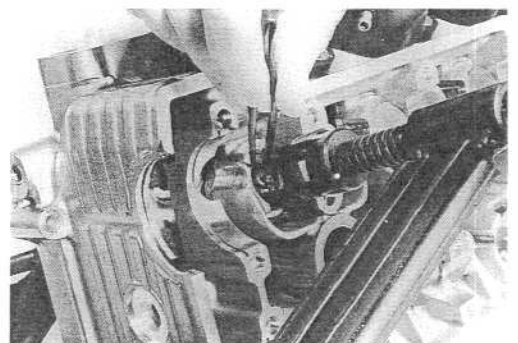
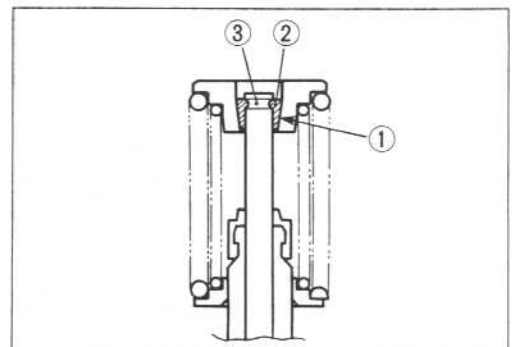
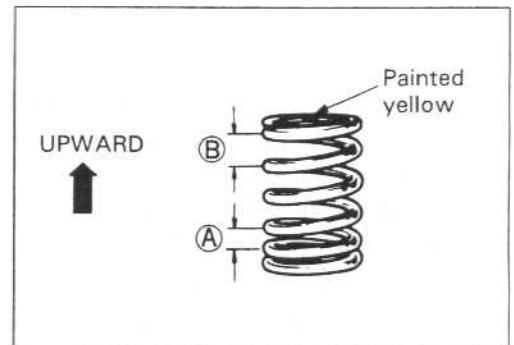
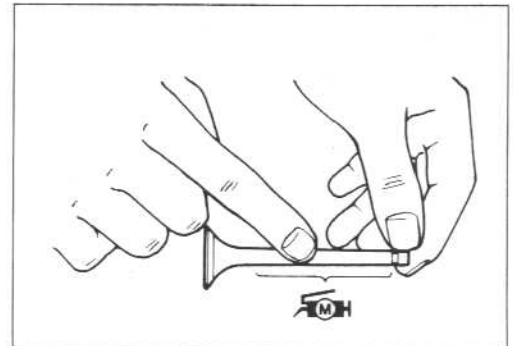
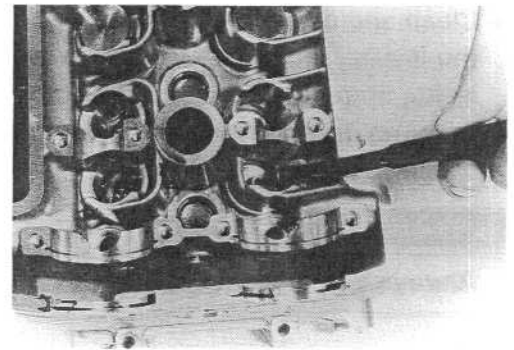
**TOOL** 09916-14510: Valve lifter  
09916-14521: Valve lifter attachment  
09916-84511: Tweezers

**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.



## CYLINDER HEAD INSTALLATION

- 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 10-mm bolts to the specified two-step torque with a torque wrench sequentially in the ascending order of numbers.

**🔧** Cylinder head bolt: Initial 25 N·m (2.5 kg-m, 18.0 lb-ft)  
Final 43 N·m (4.3 kg-m, 31.0 lb-ft)

### NOTE:

Apply engine oil to the cylinder head bolt's washers before installing the cylinder head bolts.

- After firmly tightening the 10-mm bolts, install the 6-mm bolts, Ⓐ and Ⓑ, then tighten them to the specified torque.

**🔧** Cylinder head bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

- Fit a new gasket washer Ⓒ to the cam chain stopper bolt ② and tighten it to the specified torque.

**🔧** Cam chain stopper bolt: 14 N·m (1.4 kg-m, 10.0 lb-ft)

### ⚠ CAUTION

Use a new gasket to prevent oil leakage.

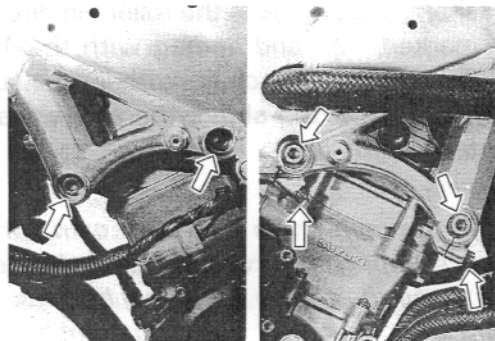
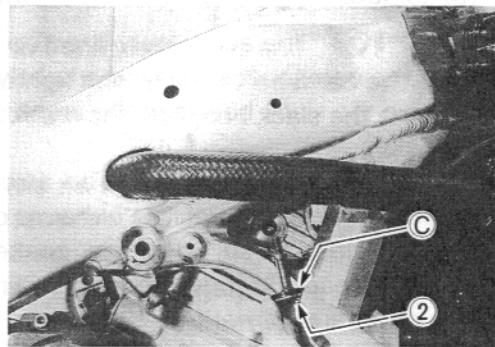
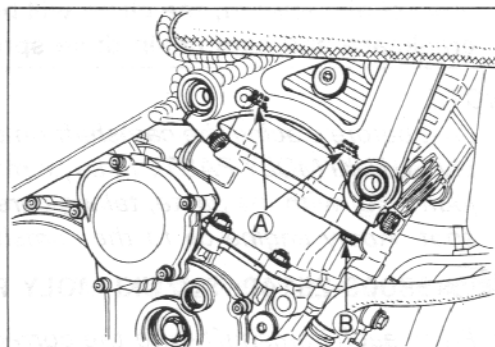
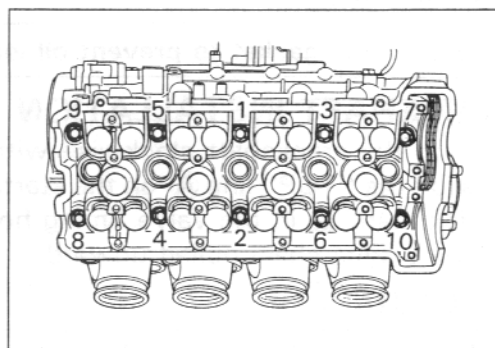
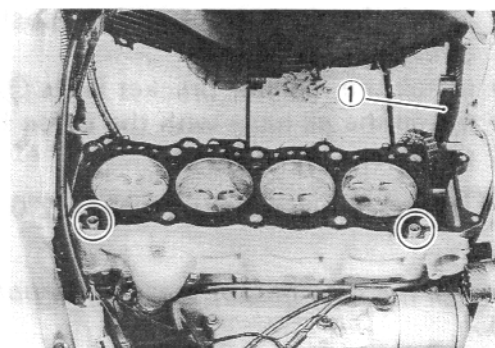
### NOTE:

Apply engine oil to the seal lip on the gasket washer and seal lip side faces cylinder head.

- Tighten the left front engine mounting bolts to the specified torque.
- Tighten the right front engine mounting bolts and pinch bolts to the specified torque.

**🔧** Left and right front engine mounting bolt: 55 N·m  
(5.5 kg-m, 40.0 lb-ft)

**🔧** Pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)



- Install the thermostat and thermostat cover. (See page 5-12.)
- Install the radiator bracket bolts (3) and tighten them.
- Install the oil hose with the union bolt (4) and tighten it to the specified torque.

**Oil hose union bolt: 20 N·m (2.0 kg-m, 14.5 lb-ft)**

**NOTE:**

Install the new gasket washers to both sides of the union bolt.

**CAUTION**

Use a new gasket to prevent oil leakage.

**CAMSHAFT INSTALLATION**

- Turn the crankshaft clockwise with a box wrench and align the "TOP" line (A) on the starter clutch with the index mark (B) in the valve timing hole keeping the camshaft drive chain pulled upward.

**CAUTION**

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

**NOTE:**

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

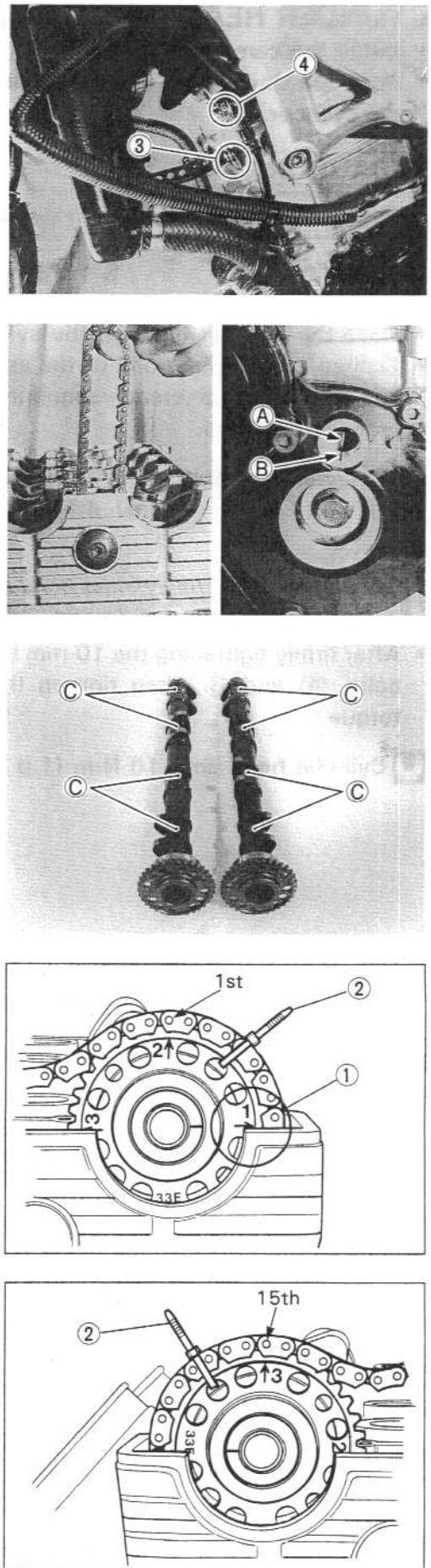
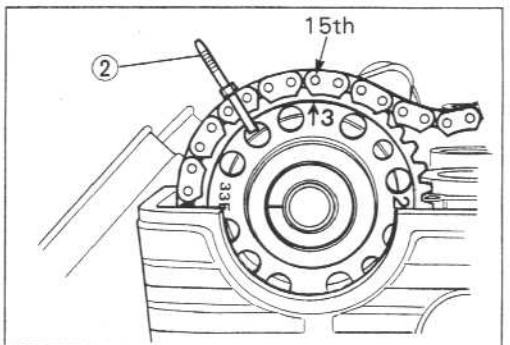
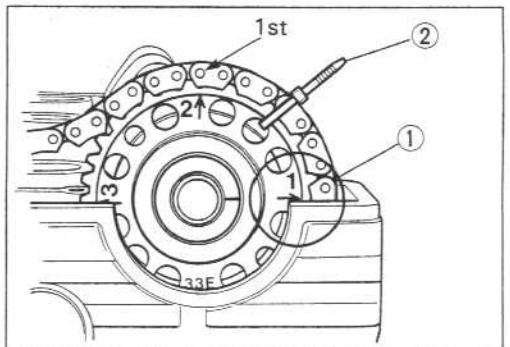
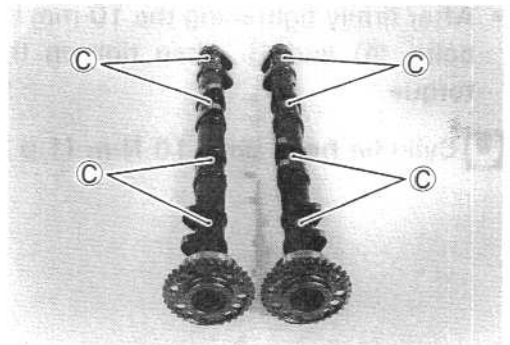
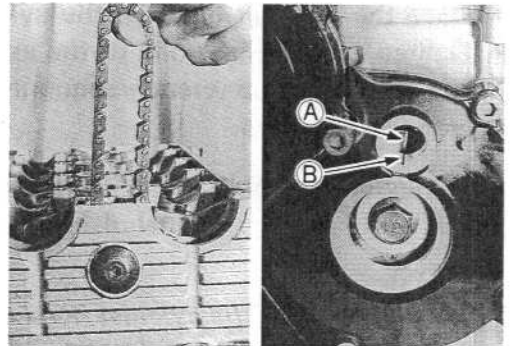
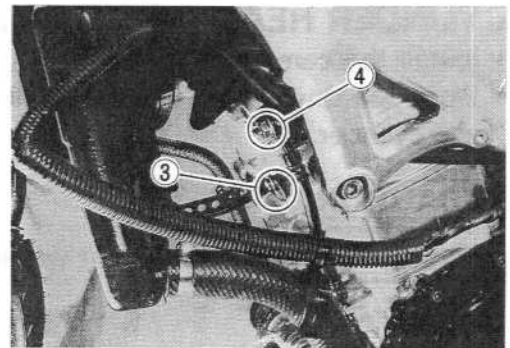
**SUZUKI MOLY PASTE**

\* Place each camshaft onto the correct position. ("EX" is for exhaust side and "IN" is for intake side.)

- With "TOP" line accurately lined up with the index 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 15th roller pin. Engage the cam chain with intake sprocket, locating the 15th pin at the above the arrow marked "3" on the intake sprocket.

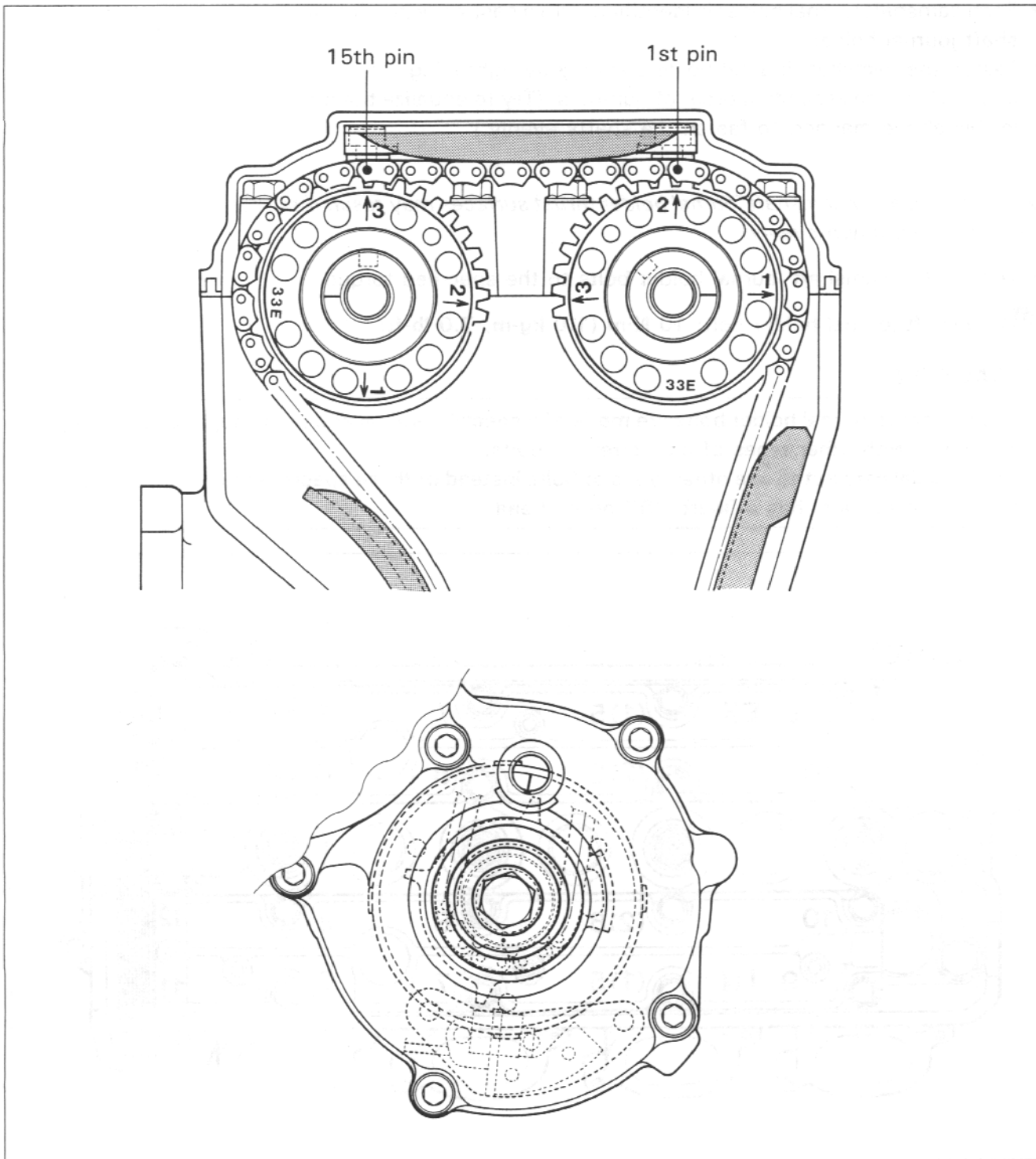
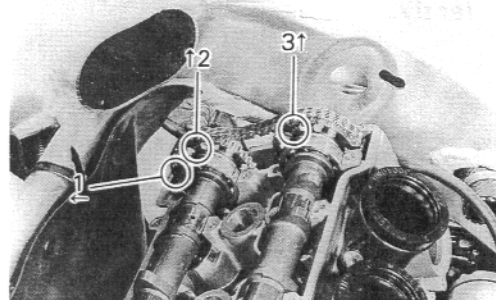
**NOTE:**

Bind the cam chain and each cam sprocket with a proper wire clamp (2) to prevent the cam chain disengagement while installing the camshaft journal holders. Be careful not to disturb the crankshaft until the camshaft journal holders and cam chain tension adjuster are secured.

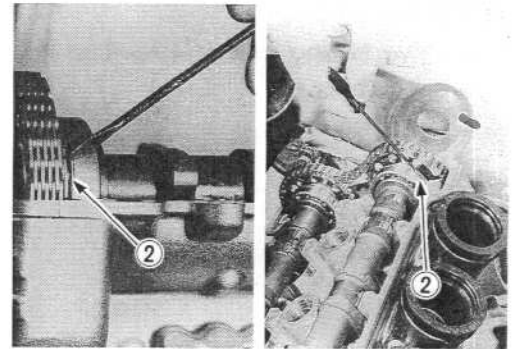


**NOTE:**

The valve timing can be checked from the backside of the cam sprockets.



- Insert the C-rings ② into each camshaft ring groove correctly.



- 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:**

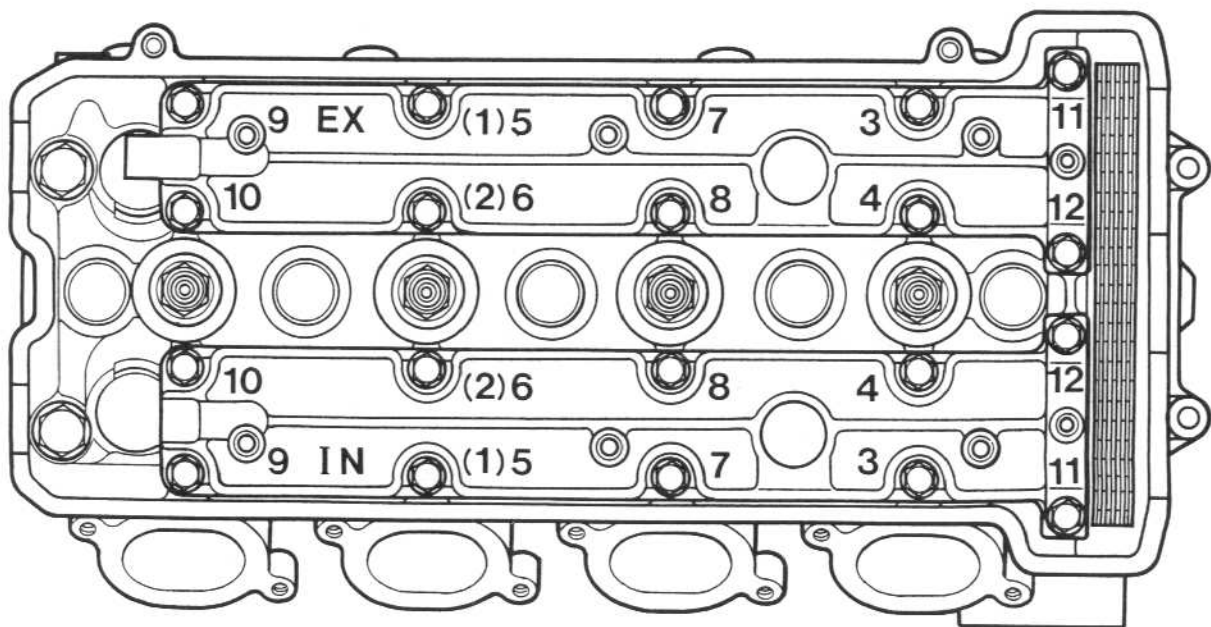
*Damage to head or camshaft journal holder thrust surfaces may result if the camshaft journal holders are not drawn down evenly.*

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

 Camshaft journal holder bolt: 10 N·m (1.0 kg-m, 7.0 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.



- Install the top cam chain guide ① with the bolts and tighten them to the specified torque.

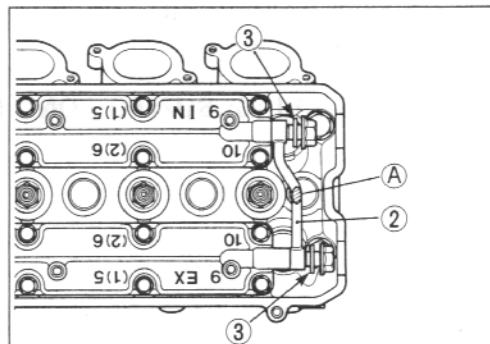
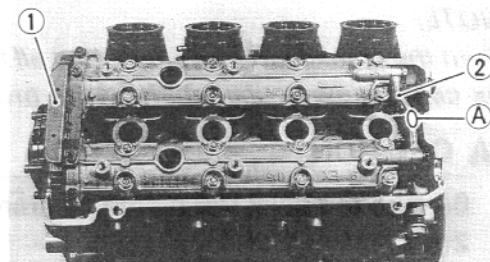
 **Cam chain guide bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)**

- Install the oil pipe ② with the union bolts and tighten them to the specified torque.

**NOTE:**

- \* Install a washer ③ to the union bolt when installing the oil pipe.
- \* Be sure to bring the WHITE painted ④ on the oil pipe to the top when installing it.

 **Oil pipe union bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)**



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

**NOTE:**

- \* Before installing the cam chain tension adjuster, lock the tension spring with a ⊖ screwdriver. (See page 3A-1.)
- \* Before installing the cam chain tension adjuster, turn the crankshaft clockwise to remove the cam chain slack between the crank sprocket and exhaust sprocket.

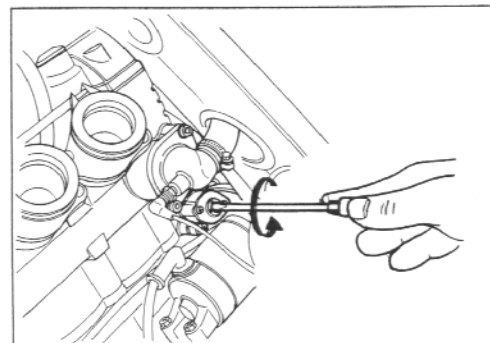
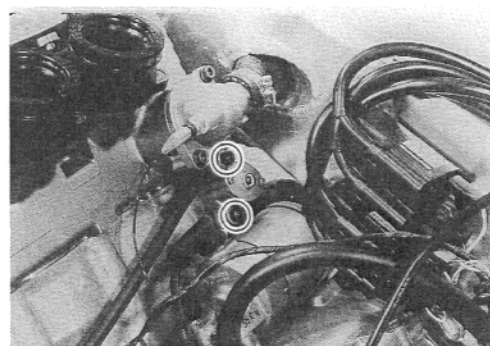
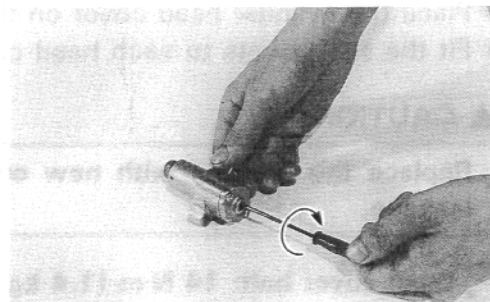
 **Cam chain tension adjuster bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)**

**NOTE:**

After installing the cam chain tension adjuster, turn a ⊖ screwdriver counterclockwise. As the slotted of the cam chain tension adjuster turns, the tension rod is advanced under spring force and pushes the cam chain tension adjuster against the cam chain.

**CAUTION**

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





## 3A-19 ENGINE

- 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 2-5.)


- Apply SUZUKI BOND NO.1207B to the four cam end caps of the gasket as shown.

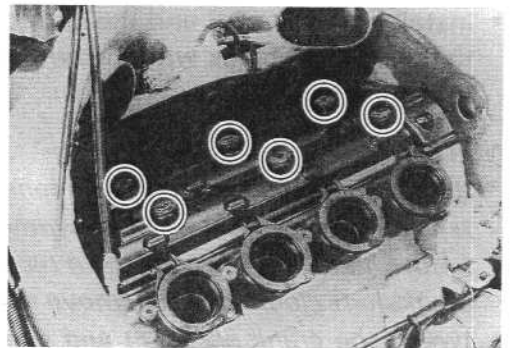
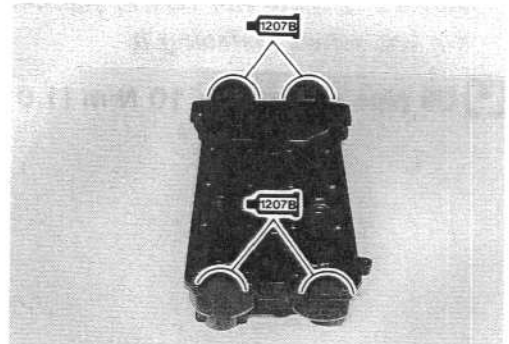
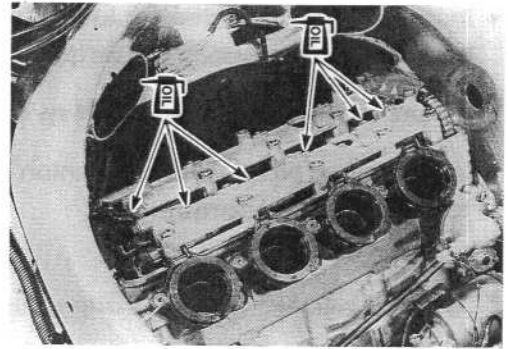
 99104-31140: SUZUKI BOND NO.1207B

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

### ⚠ CAUTION

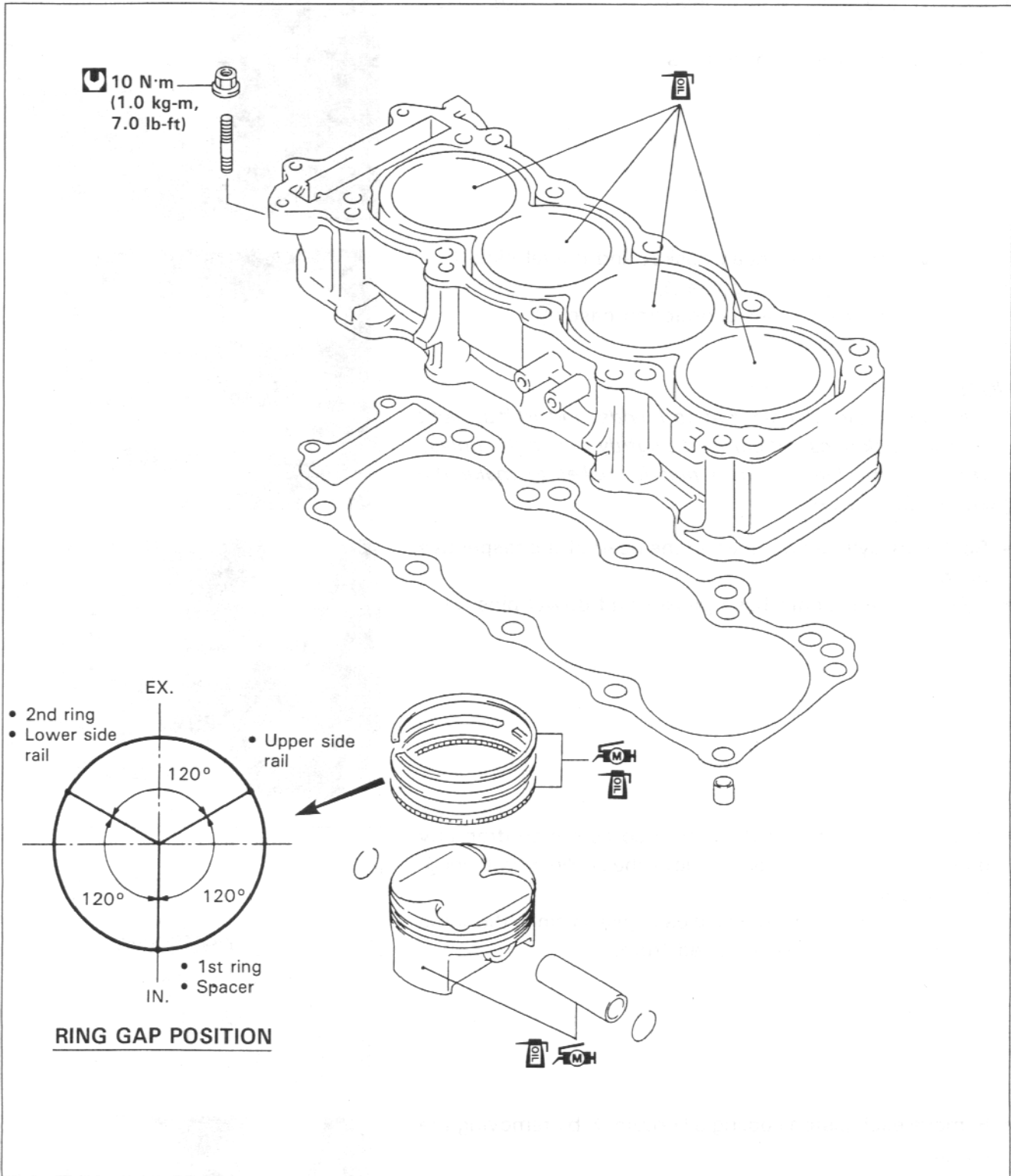
Replace the gaskets with new ones to prevent oil leakage.

 Head cover bolt: 14 N·m (1.4 kg-m, 10.0 lb-ft)



# CYLINDER/PISTON

3B

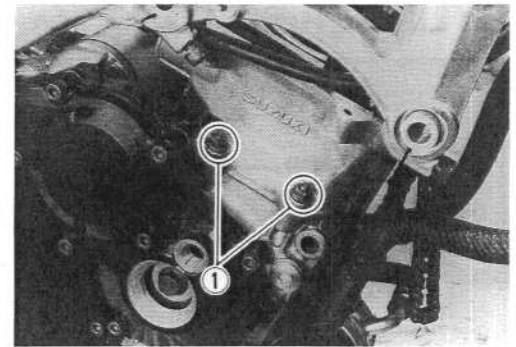


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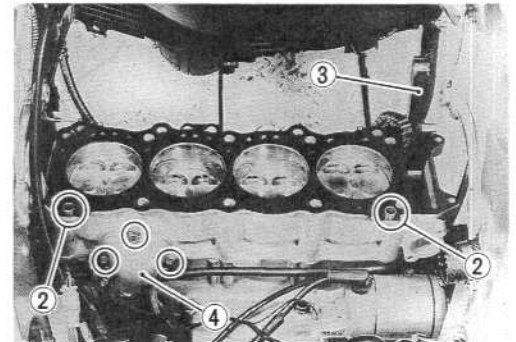
<b>CYLINDER/PISTON REMOVAL</b> .....	<b>3B- 1</b>
<b>CYLINDER/PISTON INSPECTION</b> .....	<b>3B- 2</b>
<b>PISTON/CYLINDER INSTALLATION</b> .....	<b>3B- 4</b>

## CYLINDER/PISTON REMOVAL

- Remove the cylinder head assembly. (See page 3A-2.)
- Remove the cylinder base nuts ①.



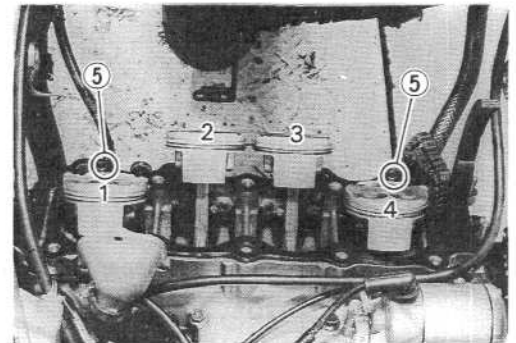
- Remove the cylinder head gasket and dowel pins ②.
- Remove the cam chain guide ③.
- Remove the water inlet conduction case ④.
- Remove the cylinder.



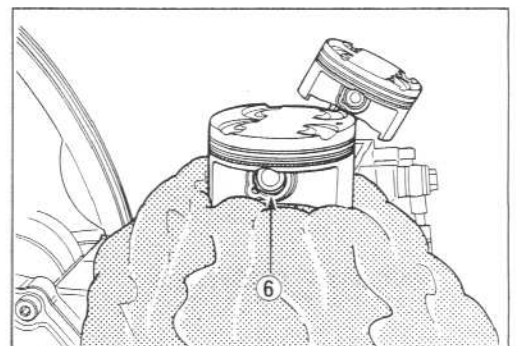
**NOTE:**

*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.
- Remove the cylinder base gasket and dowel pins ⑤.



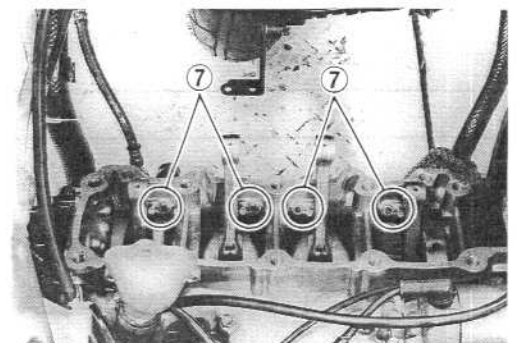
- Place a cloth beneath the piston so as not to drop any parts in the crankcase, and remove the circlip ⑥ with long-nose pliers.
- Draw out the piston pin. Place each piston pin in the same piston as that it was removed from.



- Remove each piston cooling oil nozzle ⑦ by removing the bolts.

**NOTE:**

*Do not drop the bolt into the crankcase.*



## CYLINDER/PISTON INSPECTION

### 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.

**TOOL** 09900-20803: Thickness gauge

#### Cylinder distortion

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

### CYLINDER BORE

Inspect the cylinder wall for any scratches, nicks or other damage. Measure the cylinder bore diameter at six places.

#### Cylinder bore

**Standard: 65.500–65.515 mm (2.5787–2.5793 in)**

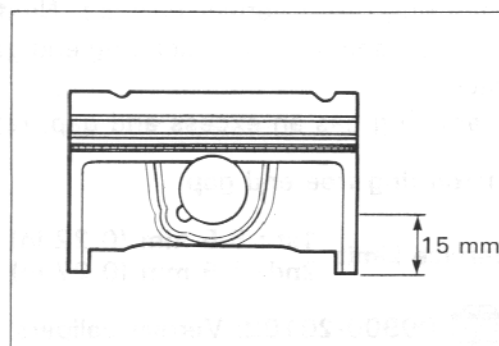
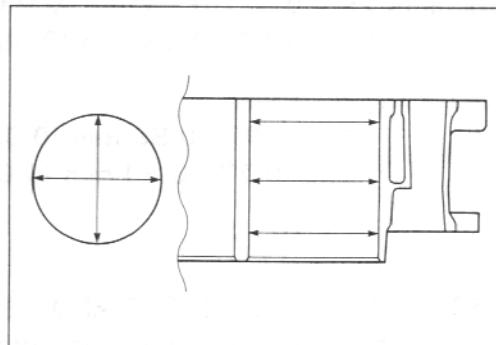
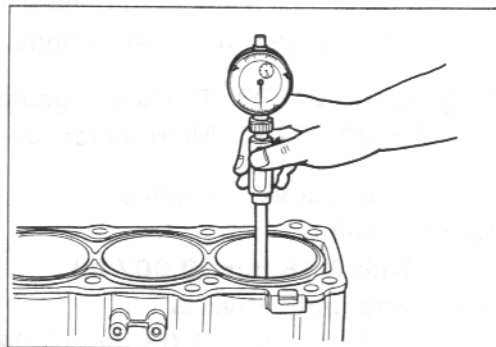
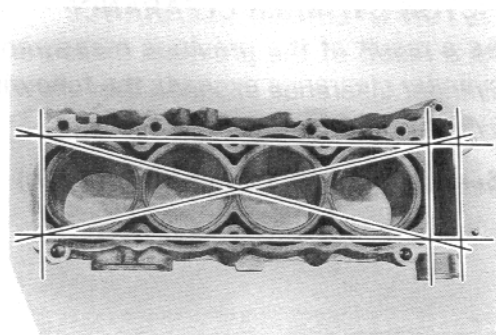
**TOOL** 09900-20508: Cylinder gauge set

### 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: 65.380 mm (2.5740 in)**

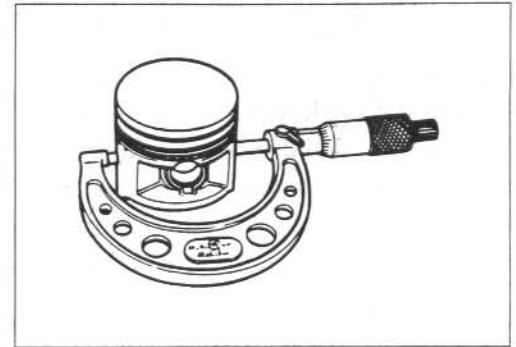
**TOOL** 09900-20203: Micrometer (50–75 mm)



**PISTON-CYLINDER CLEARANCE**

As a result of the previous measurement, if the piston to cylinder clearance exceeds the following limit, replace both cylinder and piston.

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



**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.

- TOOL** 09900-20803: Thickness gauge
- 09900-20205: Micrometer (0–25 mm)

**Piston ring-groove clearance**

**Service Limit**

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

**Piston ring groove width**

**1st : 1.01–1.03 mm (0.040–0.041 in)**

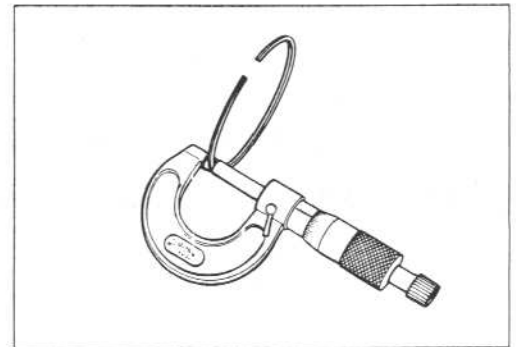
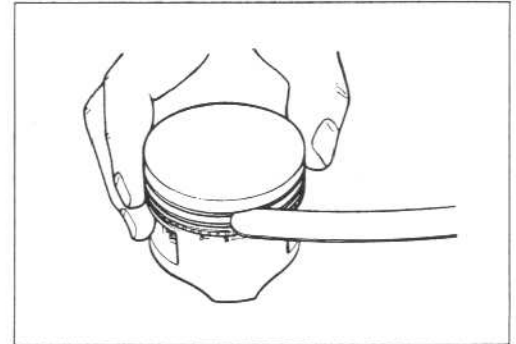
**Standard 2nd: 0.81–0.83 mm (0.032–0.033 in)**

**Oil : 1.51–1.53 mm (0.059–0.060 in)**

**Piston ring thickness**

**Standard 1st: 0.97–0.99 mm (0.038–0.039 in)**

**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**

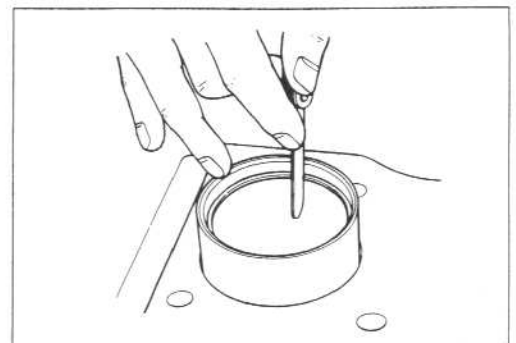
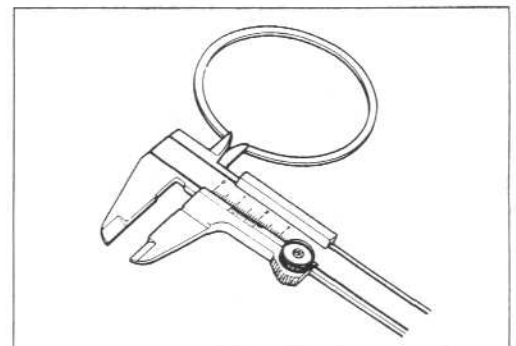
**Service Limit 1st : 5.5 mm (0.22 in)**  
**2nd: 6.9 mm (0.27 in)**

- TOOL** 09900-20102: Vernier calipers

**Piston ring end gap**

**Service Limit 1st : 0.5 mm (0.02 in)**  
**2nd: 0.5 mm (0.02 in)**

- TOOL** 09900-20803: Thickness gauge



### 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: 15.030 mm (0.5917 in)**

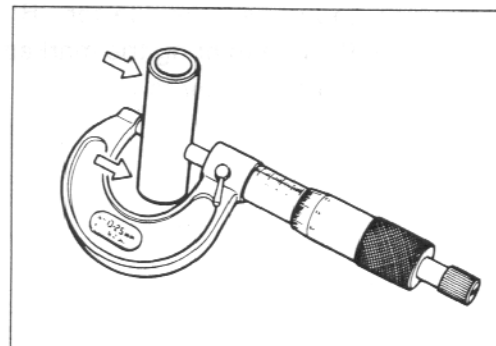
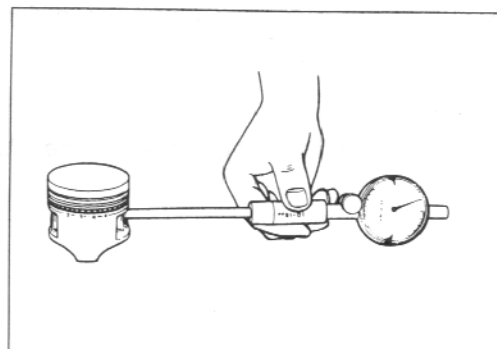
**TOOL** 09900-20602: Dial gauge (1/1000 mm, 1 mm)  
09900-22401: Small bore gauge (10–18 mm)

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

#### Piston pin O.D.

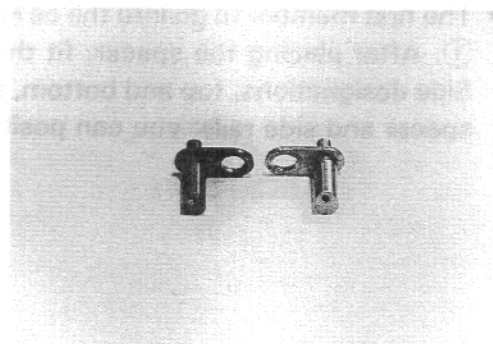
**Service Limit: 14.980 mm (0.5898 in)**

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



### PISTON COOLING OIL NOZZLE

Check the piston cooling oil nozzle for clogging. If it is clogged, clean its oil passage with a proper wire and compressed air.



### PISTON/CYLINDER INSTALLATION

- Fit the new O-rings (A) to each piston cooling oil nozzle as shown.

#### CAUTION

Use a new O-ring to prevent the oil pressure down.

#### NOTE:

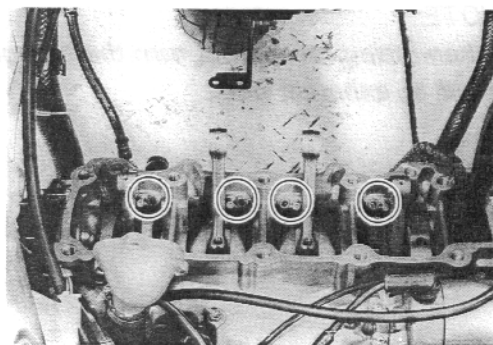
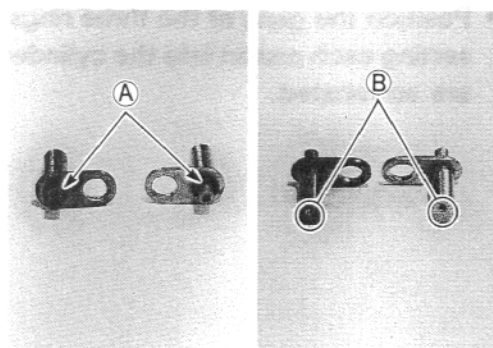
Be sure to face the oil holes (B) on each piston cooling oil nozzle to the top when installing them.

- Install each piston oil cooling nozzle with the bolts.

#### NOTE:

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

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

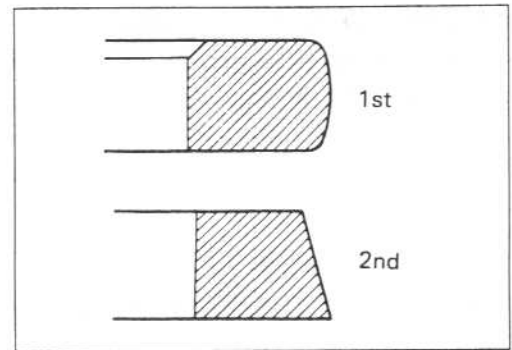


### 3B-5 ENGINE

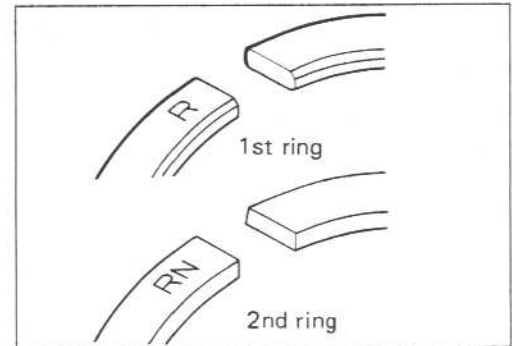
- Install the piston rings in the order of oil ring, 2nd ring and 1st ring.

**NOTE:**

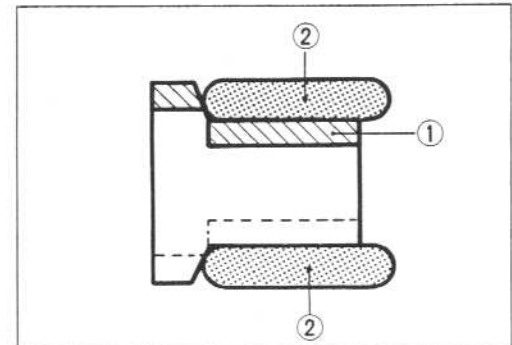
*1st ring and 2nd ring differ in the shape of the ring face.*



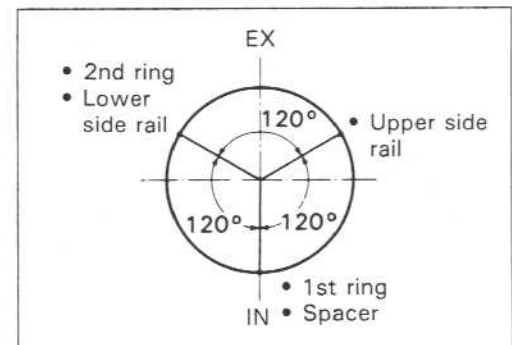
- 1st and 2nd rings have a letter "R" or "RN" marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.



- 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.*



- Have each piston pin moly paste oiled lightly before installing it.

**MH99000-25140: SUZUKI MOLY PASTE**

**NOTE:**

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.

- Place a cloth beneath the piston, and install the circlips.

**CAUTION**

Use a new piston pin circlip ① to prevent circlip failure which will occur with a bent one.

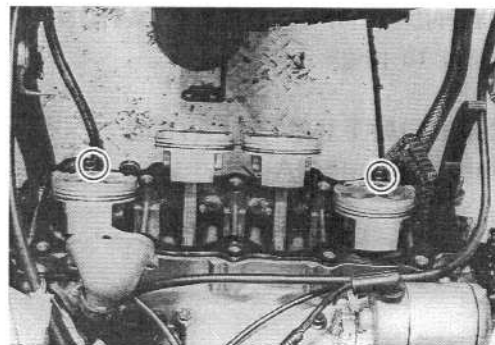
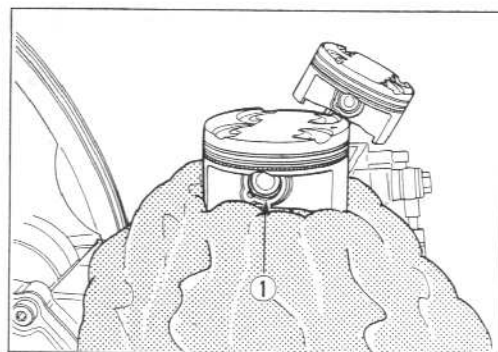
**NOTE:**

End gap of the circlip is not aligned with the cutaway in the piston pin bore.

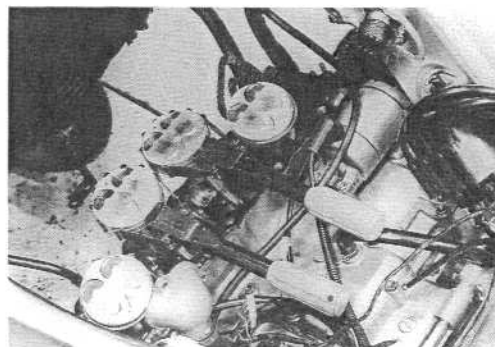
- Place the dowel pins and new cylinder gasket on the crankcase.

**CAUTION**

Use a new gasket to prevent oil leakage.



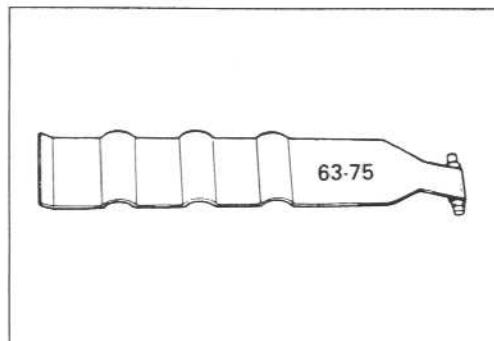
- Before putting on the cylinder block, oil the big and small ends of each conrod and also the sliding surface of each piston.
- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.
- With No.2 and No.3 pistons in place, install No.1 and No.4 pistons, and insert them into the cylinder.



- TOOL** 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.

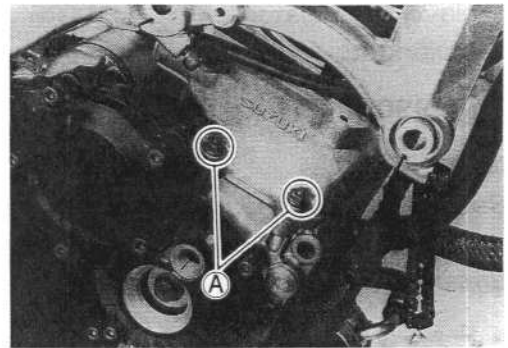




## 3B-7 ENGINE

- Tighten the cylinder base nuts **A** to the specified torque.

**A** Cylinder base nut: 10 N·m (1.0 kg-m, 7.0 lb-ft)

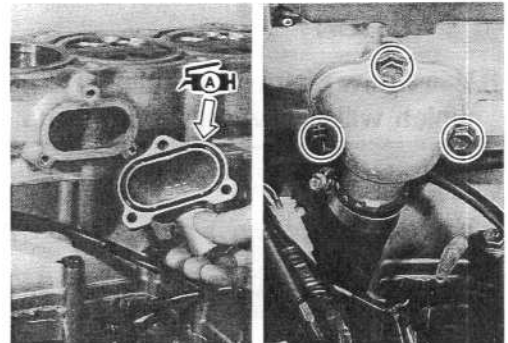


- Apply SUZUKI SUPER GREASE "A" to the rubber seal on the water inlet conduction case.

**AH** 99000-25030: SUZUKI SUPER GREASE "A"

- Tighten the water inlet conduction case bolts to the specified torque.

**A** Water inlet conduction case bolt:  
10 N·m (1.0 kg-m, 7.0 lb-ft)



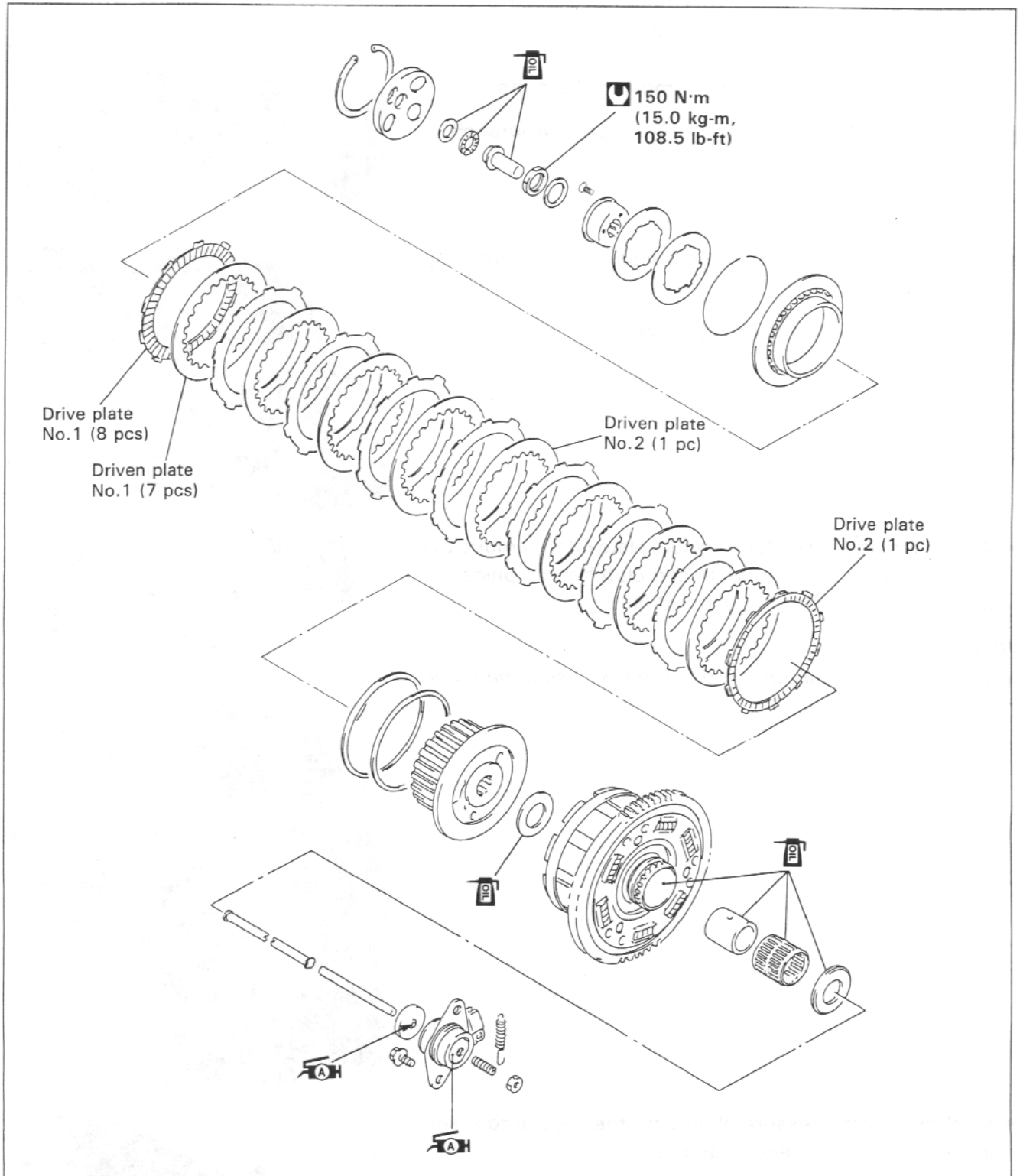
### CYLINDER HEAD INSTALLATION

Refer to page 3A-14.

### CAMSHAFT INSTALLATION

Refer to page 3A-15.

# CLUTCH



3C


## CONTENTS

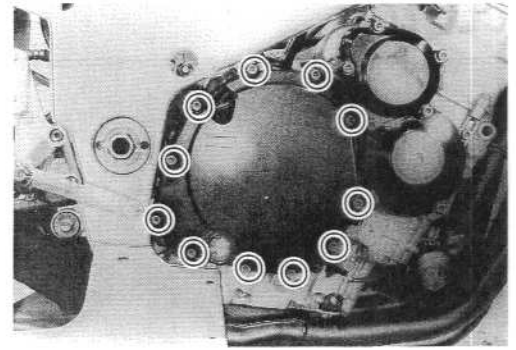
<b>CLUTCH REMOVAL</b> .....	<b>3C- 1</b>
<b>CLUTCH INSPECTION</b> .....	<b>3C- 3</b>
<b>CLUTCH INSTALLATION</b> .....	<b>3C- 4</b>

## CLUTCH REMOVAL

- Remove the lower fairing assembly. (See page 6-2.)
- Drain out engine oil. (See page 2-9.)

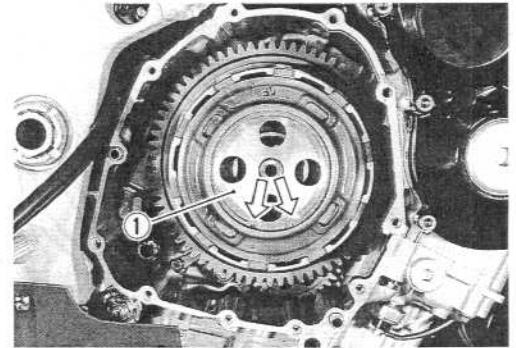
- Remove the clutch cover by removing the bolts.

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



- Remove the clutch pressure plate lifter ① by removing the circlip.

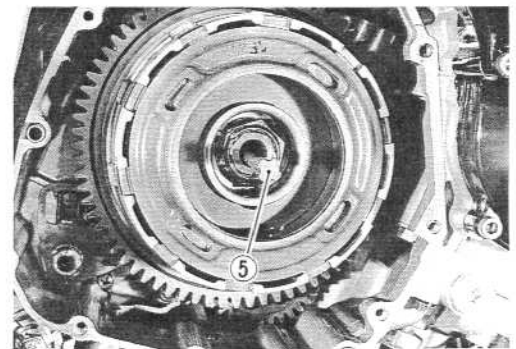
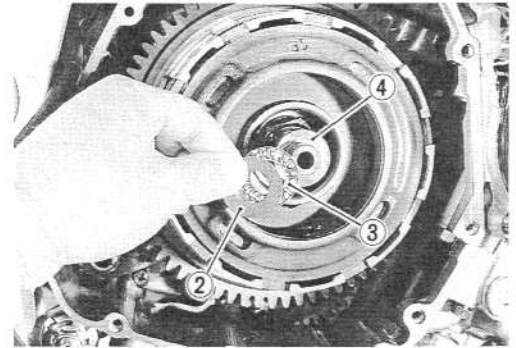
 09900-06108: Snap ring pliers



- After removing the clutch pressure plate lifter, remove the thrust washer ②, bearing ③ and clutch push piece ④, and pull out the clutch push rod ⑤.

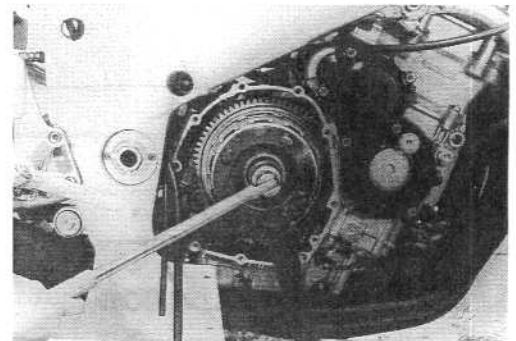
### NOTE:

*If it is difficult to pull out the push rod ⑤, use a magnetic hand or wire.*

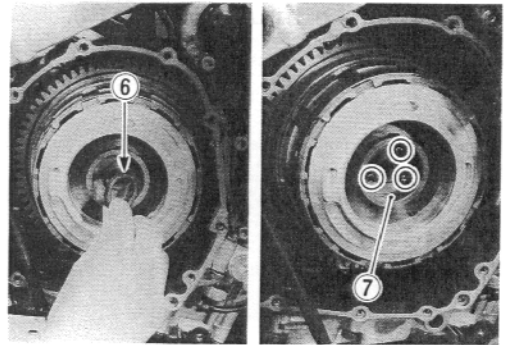


- Hold the clutch pressure plate with the special tool and loosen the clutch sleeve hub nut.

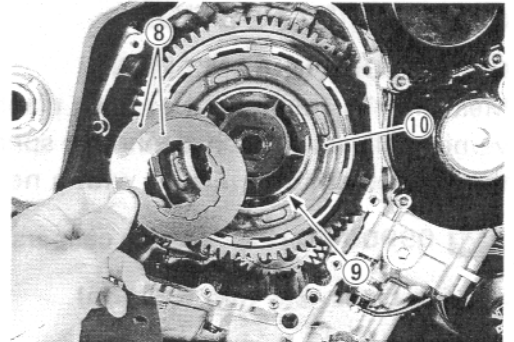
 09920-34820: Clutch pressure plate holder



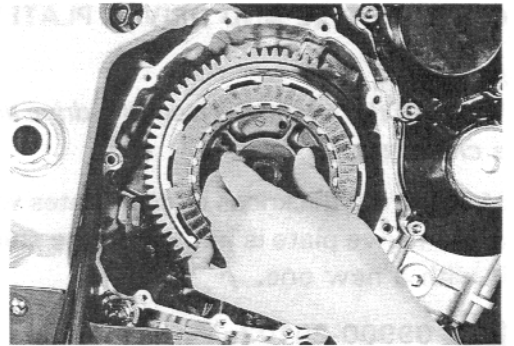
- After removing the clutch sleeve hub nut, remove the lock washer ⑥.
- Remove the clutch diaphragm spring holder ⑦ by removing the screws.



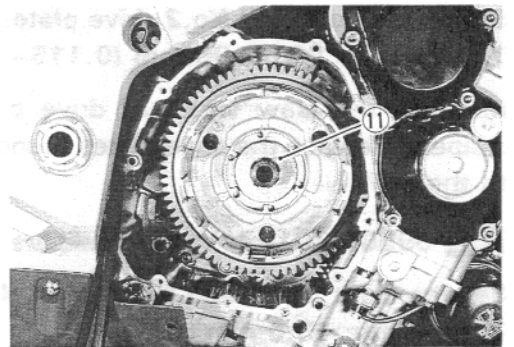
- Remove the clutch diaphragm springs ⑧, clutch diaphragm spring seat ⑨ and clutch pressure plate ⑩.



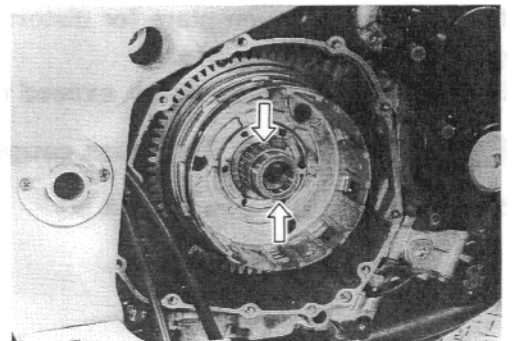
- Remove the clutch drive and driven plates along with the clutch sleeve hub.



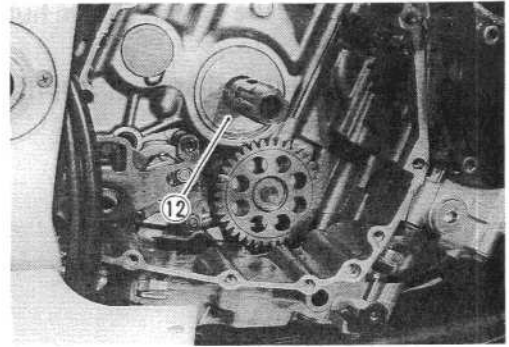
- Remove the thrust washer ⑪.



- 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 oil pump drive gear.



- Remove the thrust washer ⑫.



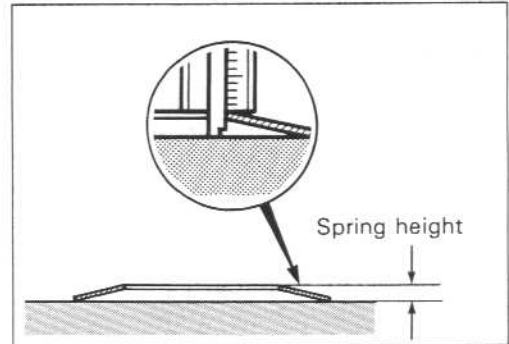
## CLUTCH INSPECTION

### CLUTCH DIAPHRAGM SPRING

Measure the free height of each diaphragm spring with a vernier calipers. If each diaphragm spring height is less than the service limit, replace it with a new one.

**TOOL** 09900-20102: Vernier calipers

**Service Limit: 2.9 mm (0.11 in)**



### CLUTCH DRIVE AND DRIVEN PLATES

**NOTE:**

*Wipe off the engine oil from the drive and driven plates with a clean rag.*

Measure the thickness of drive plates with a vernier calipers. If each drive plate is not within the standard range, replace it with a new one.

**TOOL** 09900-20102: Vernier calipers

**Standard (No.1 and No.2 drive plates)**

**Thickness: 2.92–3.08 mm (0.115–0.121 in)**

Measure the claw width of drive plates with a vernier calipers. Replace the drive plates found to have worn down to the limit.

**TOOL** 09900-20102: Vernier calipers

**Service Limit (No.1 and No.2 drive plates)**

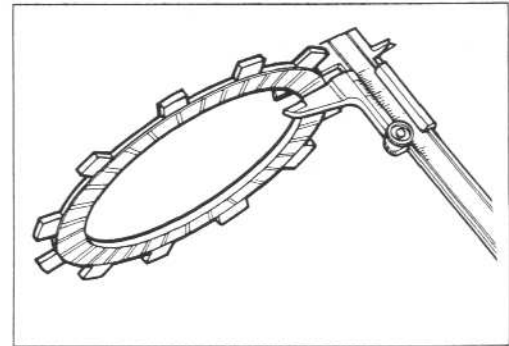
**Claw width: 13.0 mm (0.51 in)**

Measure each driven plate for distortion with a thickness gauge and surface plate.

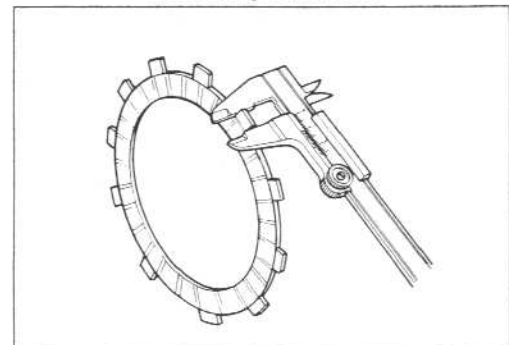
Replace driven plates which exceed the limit.

**TOOL** 09900-20803: Thickness gauge

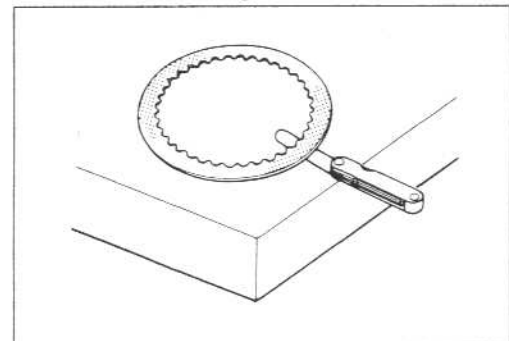
**Service Limit: 0.1 mm (0.004 in)**



Measuring thickness



Measuring claw width

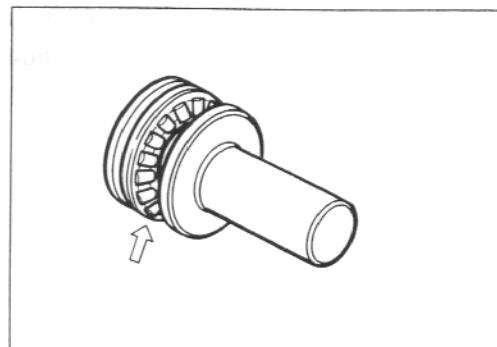


Measuring distortion

## CLUTCH BEARING

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

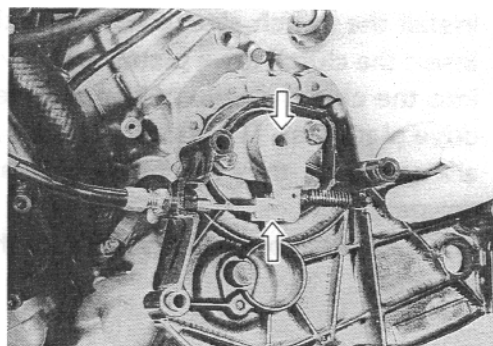
Smooth engagement and disengagement of the clutch depends on the condition of the bearing.



## CLUTCH RELEASE

- Remove the gearshift lever and engine sprocket cover. (See page 3-5.)

Operate the clutch lever by hand to inspect the clutch release for a smooth movement and abnormal noise. If a large resistance is felt to movement, apply a grease or oil to the clutch release.

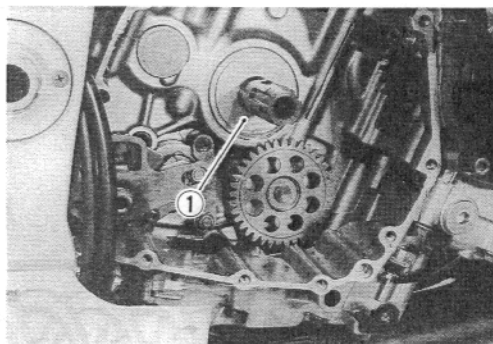


## CLUTCH INSTALLATION

- Install the thrust washer ① onto the countershaft.

### NOTE:

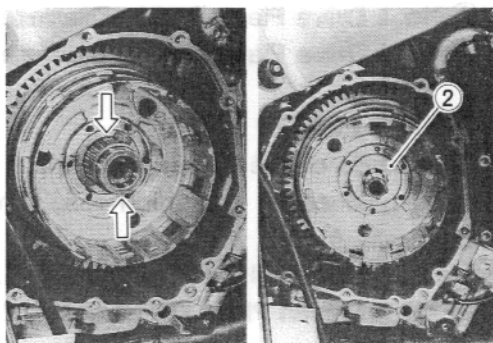
*Flat surface of washer is positioned outside.*



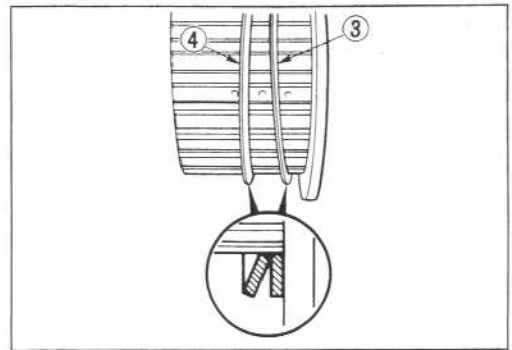
- Install the oil pump drive gear onto the primary driven gear.



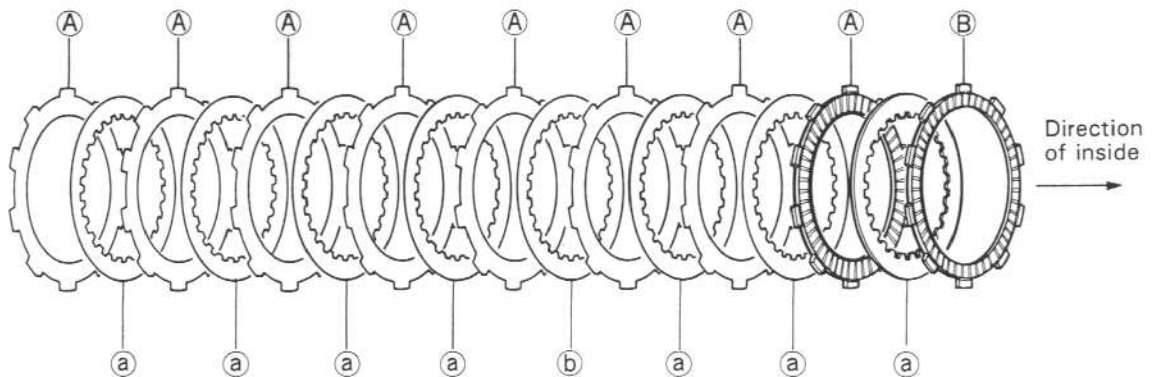
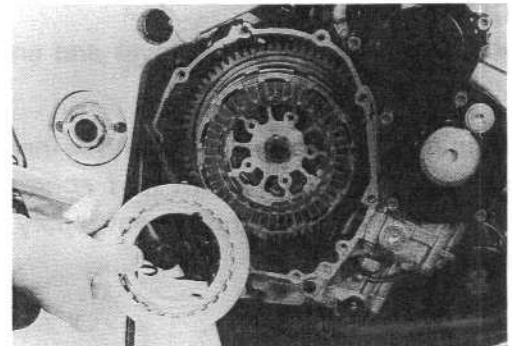
- Install the primary driven gear assembly onto the countershaft, and apply engine oil to the needle bearing and spacer.
- Install the thrust washer ② onto the countershaft.



- Install the spring washer seat ③ and spring washer ④ onto the clutch sleeve hub correctly.



- Install the clutch sleeve hub onto the countershaft.
- Insert the clutch drive plates and driven plates one by one into the clutch sleeve hub in the prescribed order, No.2 drive plate first. (Two kinds of drive plate No.1 and No.2 are equipped, they can be distinguished by the inside diameter.)
- Put the clutch pressure plate onto the clutch sleeve hub securely.



**DRIVE PLATE:**

- Ⓐ No.1 Drive Plate (Inside Diameter): 101 mm (3.98 in) ... 8 pcs
- Ⓑ No.2 Drive Plate (Inside Diameter): 108 mm (4.25 in) ... 1 pc

**DRIVEN PLATE:**

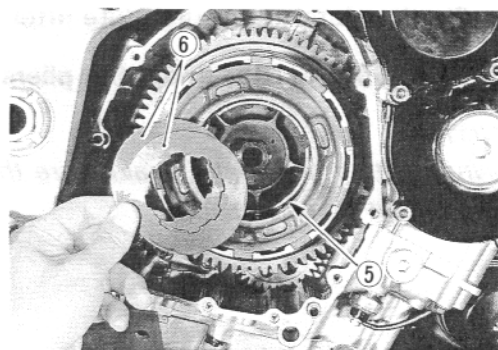
Two kinds of the driven plate No.1 and No.2 are equipped in the clutch system, they can be distinguished by the thickness. (The spare part of the No.2 driven plate is not available individually.)

- Ⓐ No.1 Driven Plate (Thickness): 1.6 mm (0.06 in) ... 7 pcs
- Ⓑ No.2 Driven Plate (Thickness): 2.0 mm (0.08 in) ... 1 pc

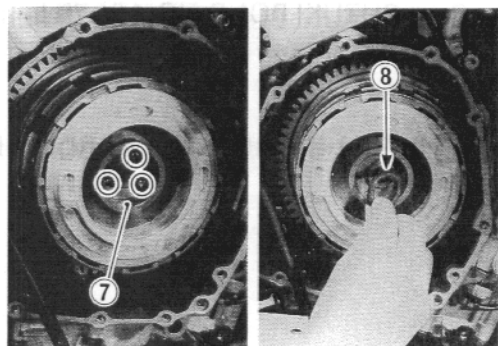
- Put the clutch diaphragm spring seat ⑤ and clutch diaphragm springs ⑥ onto the clutch pressure plate properly.

**NOTE:**

Pay attention to the direction of the clutch diaphragm springs. (See page 3C-8.)



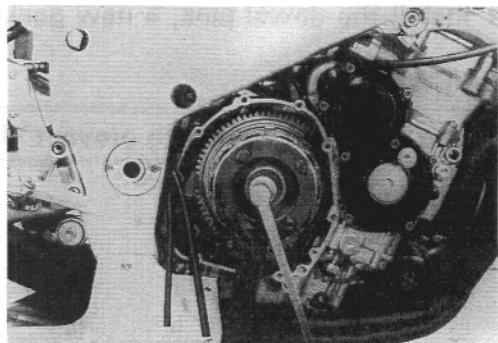
- Install the diaphragm spring holder ⑦ with three screws.
- Install the lock washer ⑧.



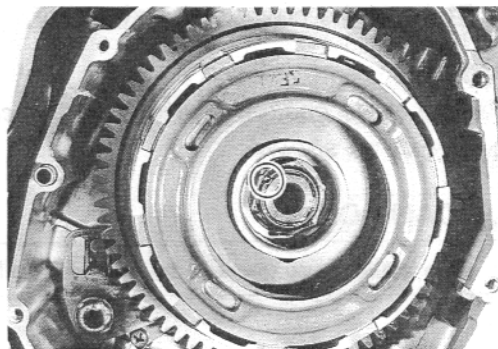
- Tighten the clutch sleeve hub nut to the specified torque by using the torque wrench and clutch pressure plate holder.

**TOOL** 09920-34820: Clutch pressure plate holder

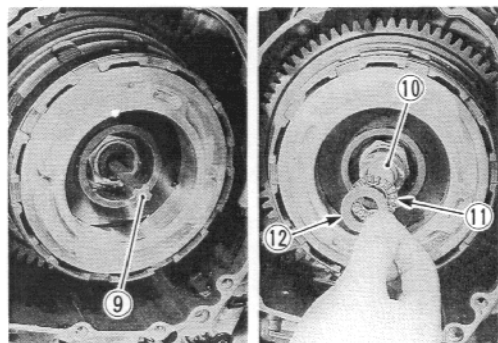
**U** Clutch sleeve hub nut: 150 N·m (15.0 kg-m, 108.5 lb-ft)



- Lock the clutch sleeve hub nut with a center punch.



- Insert the clutch push rod ⑨ into the countershaft.
- Install the clutch push piece ⑩, bearing ⑪ and thrust washer ⑫ to the countershaft.



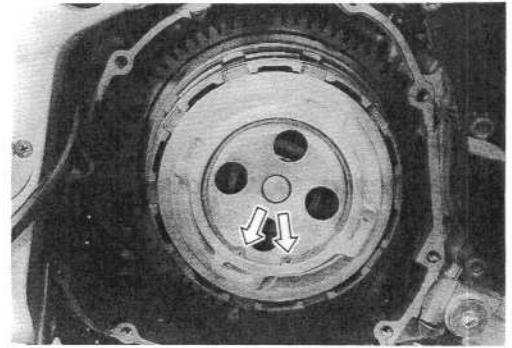


- Fix the clutch pressure plate lifter with the circlip.

**TOOL** 09900-06108: Snap ring pliers

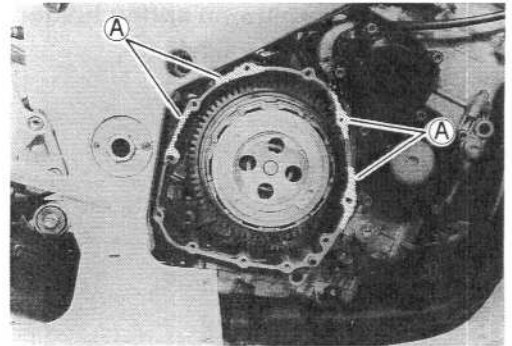
**NOTE:**

When fitting the circlip, make sure that the sharp edge of the circlip faces outside.



- Coat SUZUKI BOND NO. 1207B lightly to the mating surfaces (A) among upper, middle and lower crankcases as shown.

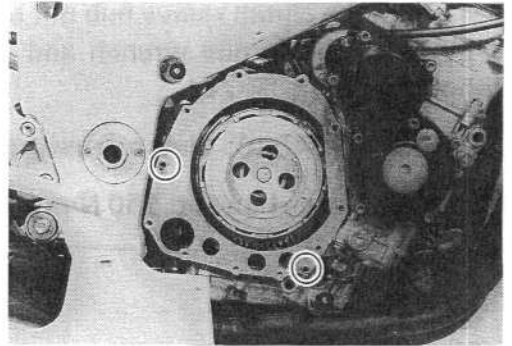
**1207B** 99104-31140: SUZUKI BOND NO.1207B



- Install the dowel pins, a new gasket and clutch cover.

**CAUTION**

Use only new gasket to prevent oil leakage.



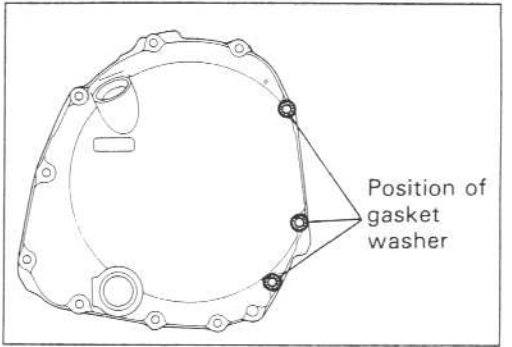
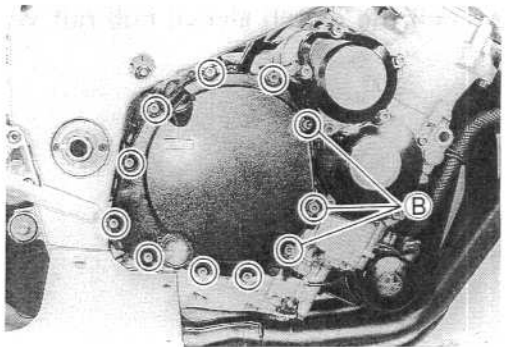
- Tighten the cover bolts securely.

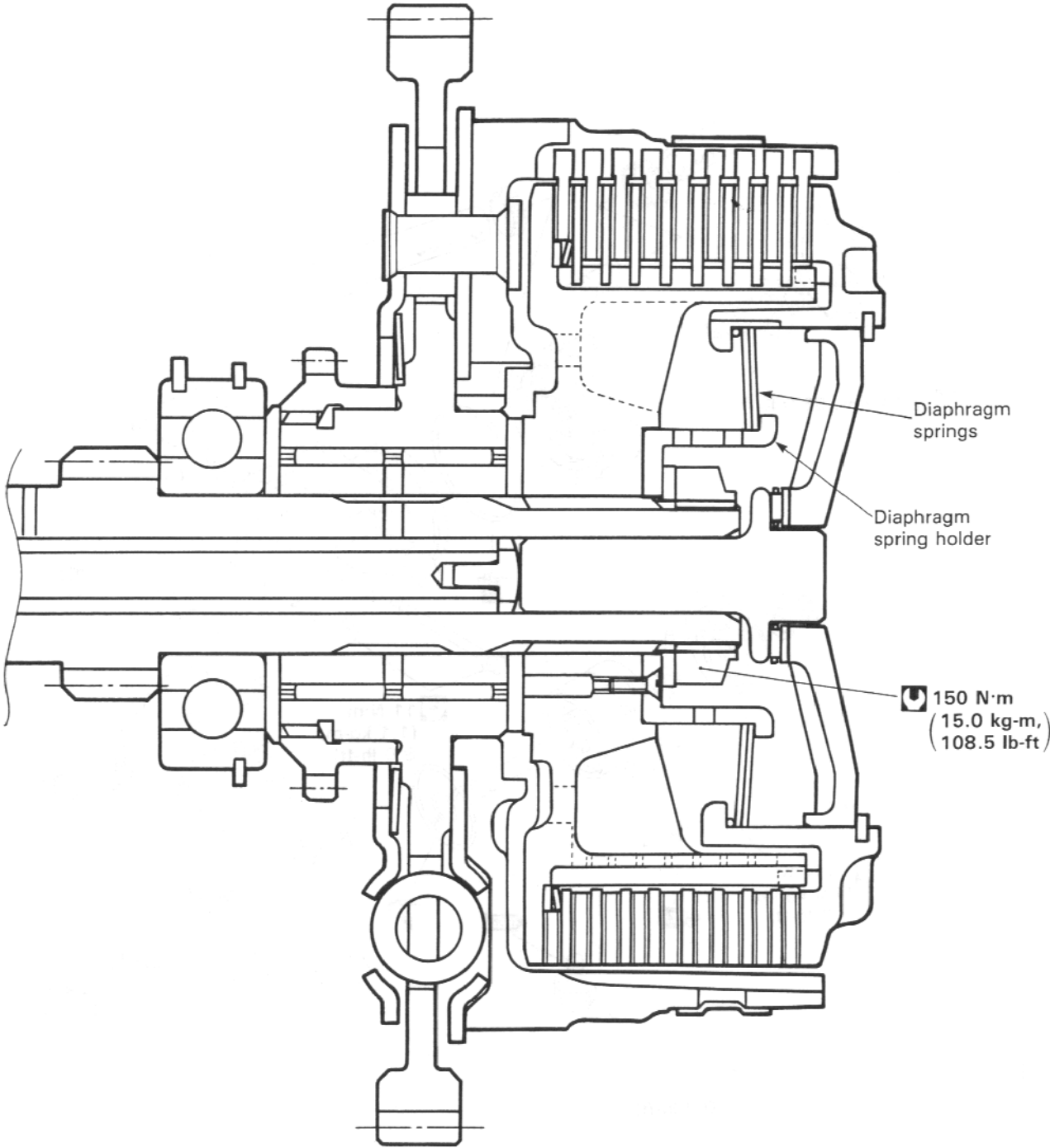
**NOTE:**

Fit the three gasket washers to the clutch cover bolts (B) correctly as shown.

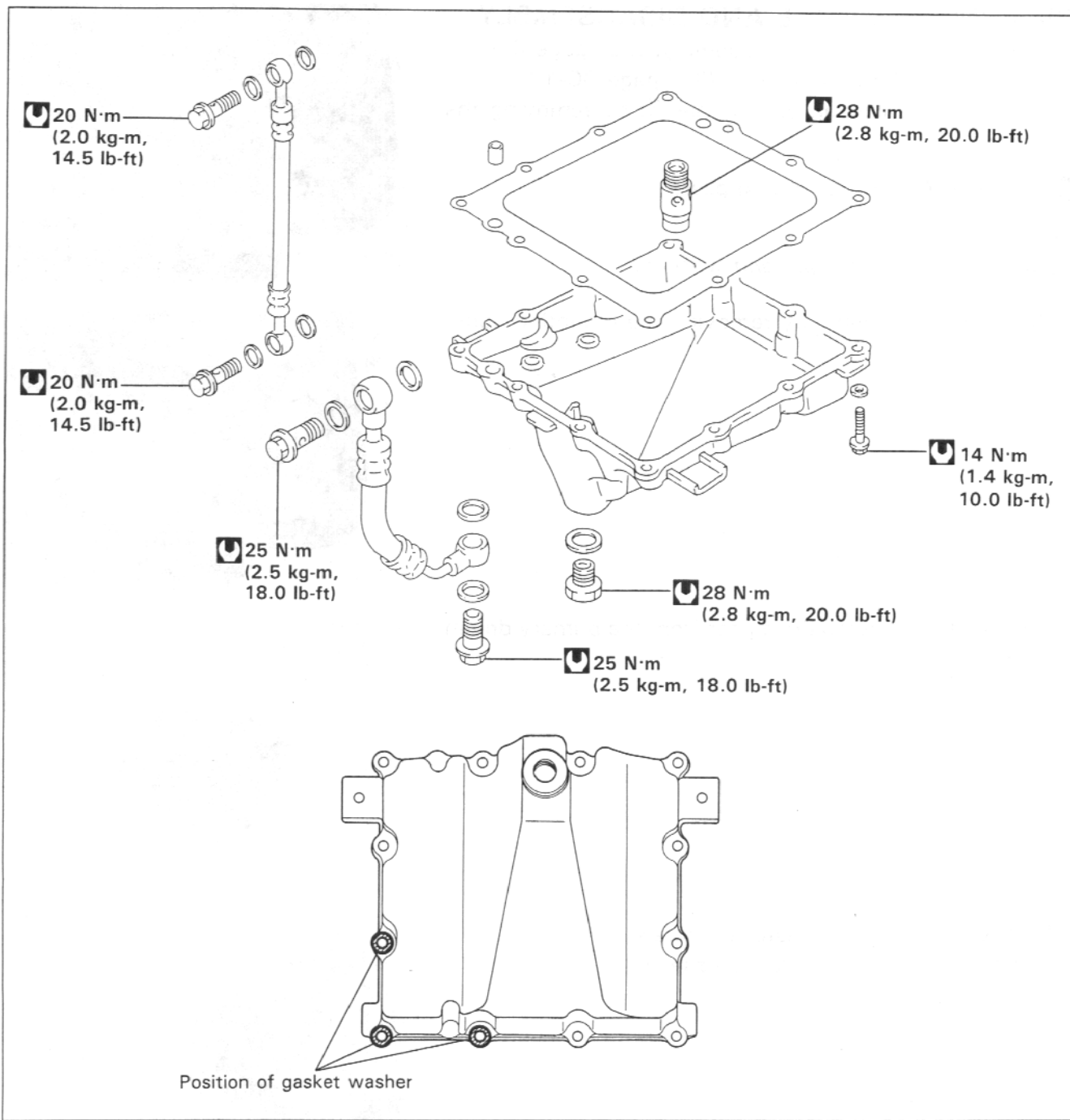
**CAUTION**

Use only new gasket to prevent oil leakage.









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<b>OIL PUMP</b> .....	<b>3D- 1</b>
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<b>OIL PRESSURE SWITCH</b> .....	<b>3D- 8</b>
<b>PISTON COOLING OIL NOZZLE</b> .....	<b>3D- 8</b>
<b>OIL JETS</b> .....	<b>3D- 9</b>

## OIL PUMP REMOVAL AND DISASSEMBLY

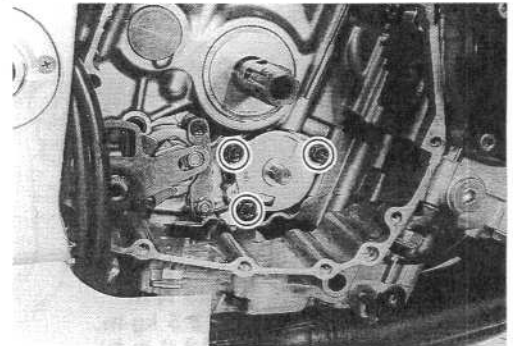
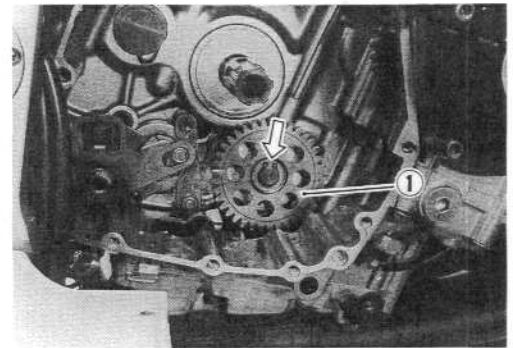
- Remove the lower fairing assembly. (See page 6-2.)
- Remove the clutch assembly. (See page 3C-1.)
- Remove the oil pump driven gear ① by removing the circlip.

**TOOL** 09900-06107: Snap ring pliers

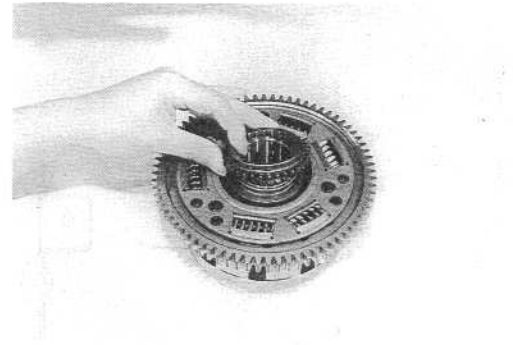
**NOTE:**

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

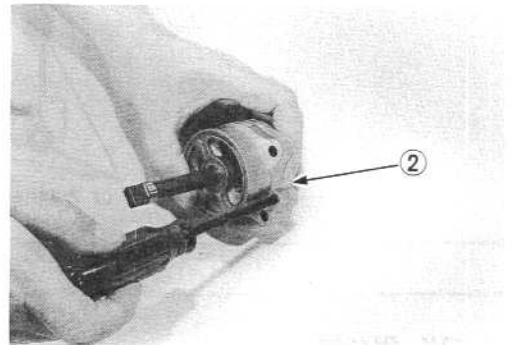
- Remove the oil pump by removing the mounting bolts.



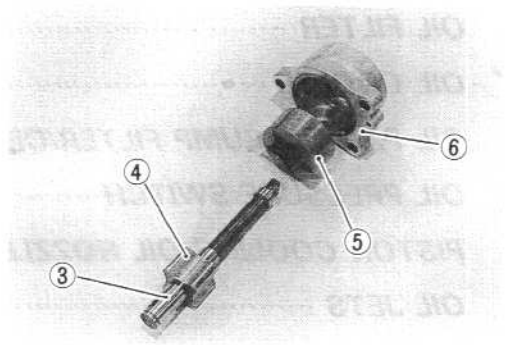
- Remove the oil pump drive gear from the primary driven gear.



- Remove the oil pump fastening screw.
- Remove the oil pump outside case ②.



- Remove the rotor shaft ③, inner rotor ④ and outer rotor ⑤ from the oil pump body ⑥.



## OIL PUMP INSPECTION

Inspect the rotor tip clearance and outer rotor clearance with a thickness gauge.

If the clearance exceeds the service limit, replace the oil pump with a new one.

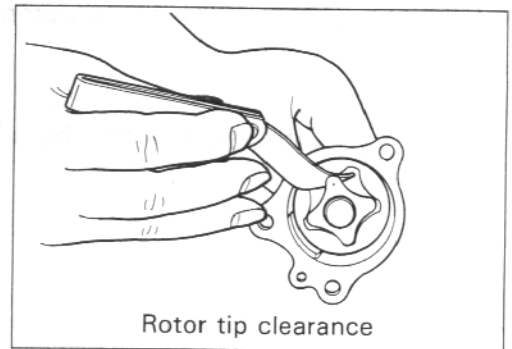
 **09900-20803: Thickness gauge**

**Rotor tip clearance**

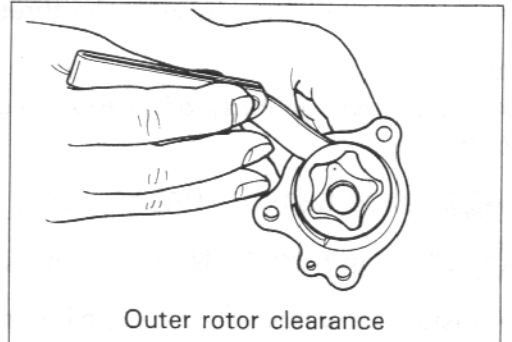
**Service Limit: 0.20 mm (0.008 in)**

**Outer rotor clearance**

**Service Limit: 0.35 mm (0.014 in)**



Rotor tip clearance





Outer rotor clearance

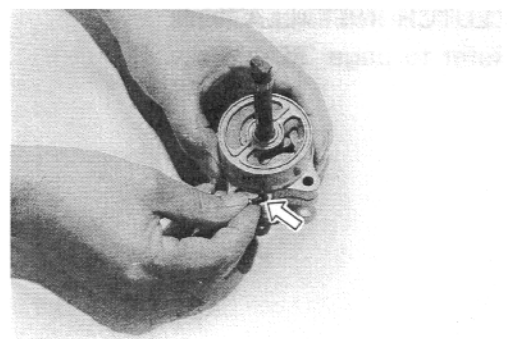
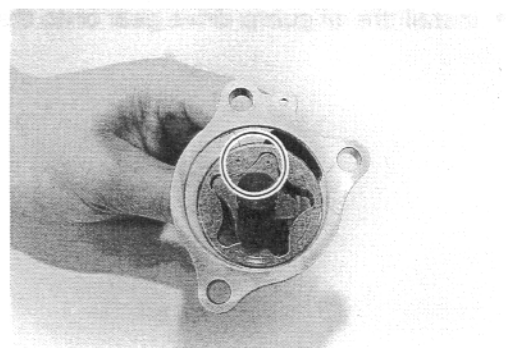
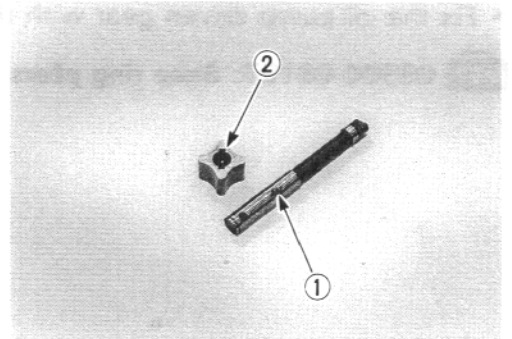
## OIL PUMP REASSEMBLY AND INSTALLATION

### CAUTION

Wash the oil pump with fresh engine oil before reassembly.

- Insert the rotor shaft into the inner rotor by aligning the drive pin  with a slot  in the inner rotor.
- When installing the outer rotor and inner rotor into the oil pump body, be sure to face the punch marks on the inner and outer rotors to the outside.
- Apply a small quantity of THREAD LOCK "1342" to the screw and tighten it.

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

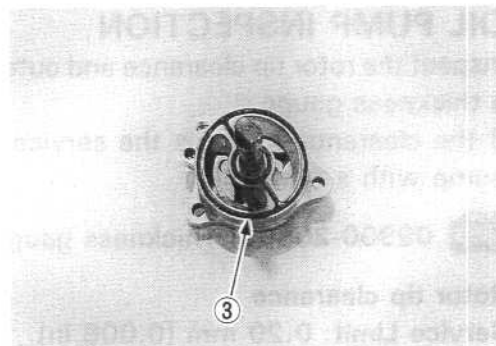


### 3D-3 ENGINE

- Fit a new O-ring ③ to the oil pump body.

#### **CAUTION**

Use a new O-ring to prevent the oil pressure down.




- Tighten the oil pump with the three bolts.

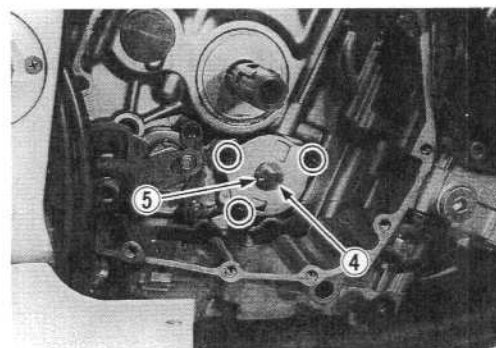
#### NOTE:

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

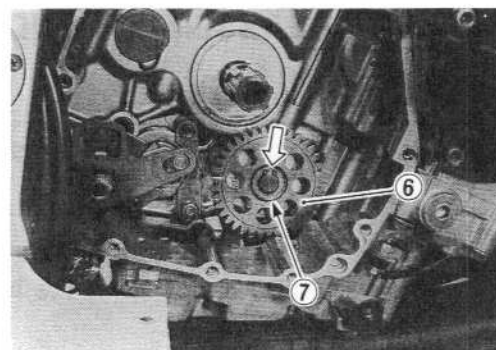
 **99000-32050: THREAD LOCK "1342"**

 **Oil pump bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)**

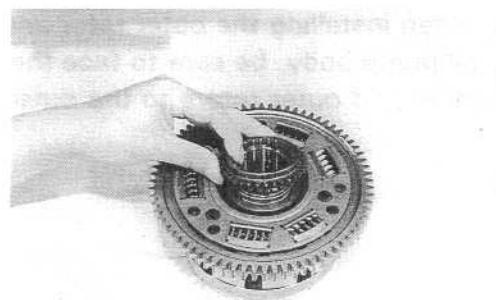
- Install the washer ④, pin ⑤, oil pump driven gear ⑥ and washer ⑦.
- Fix the oil pump driven gear with the circlip.



 **09900-06107: Snap ring pliers**



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




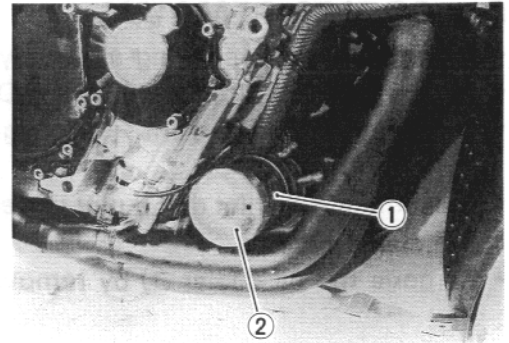
### CLUTCH INSTALLATION

Refer to page 3C-4.

## OIL FILTER REMOVAL

- Remove the lower fairing assembly. (See page 6-2.)
- Place an oil pan below the oil filter and remove the oil filter ① by using the oil filter wrench ②.

 **09915-40610: Oil filter wrench**



## OIL FILTER INSTALLATION

- 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.

 **09915-40610: Oil filter wrench**

### NOTE:

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

### 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.**

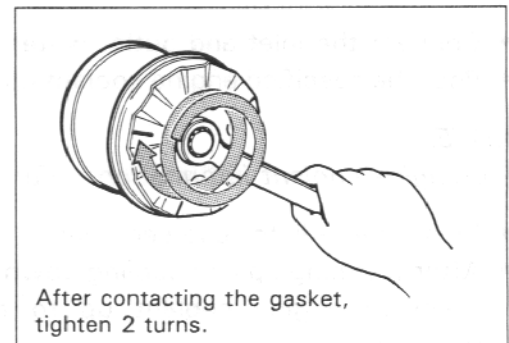
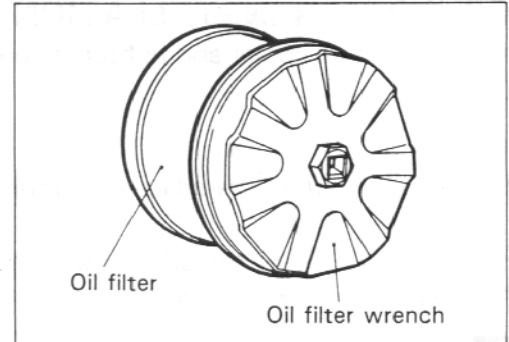
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window. If the level is below mark "F", add oil to the level.

## NECESSARY AMOUNT OF ENGINE OIL

Oil change: 2.6 L (2.7/2.3 US/Imp qt)

Filter change: 2.8 L (3.0/2.5 US/Imp qt)

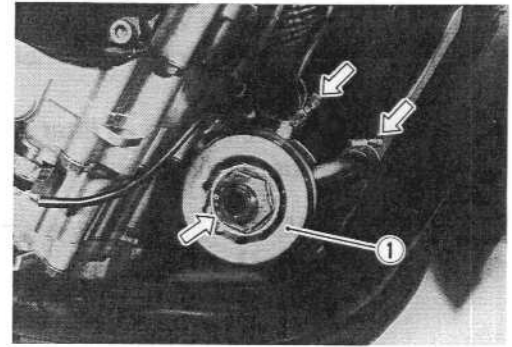
Overhaul engine: 3.5 L (3.7/3.1 US/Imp qt)





## OIL COOLER REMOVAL

- Remove the lower fairing assembly. (See page 6-2.)
- Remove the oil filter. (See page 3D-4.)
- Drain out engine coolant. (See page 3-3.)
- Disconnect the inlet and outlet water hoses by loosening the clamp screws.
- Remove the oil cooler ① by removing its union bolt.



## OIL COOLER INSTALLATION

- Install the oil cooler and tighten its union 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 stopper ② on the oil cooler mounting box.



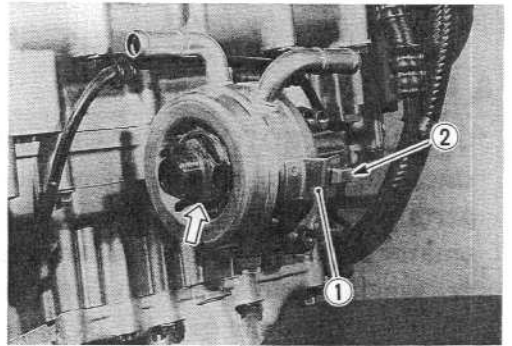
**U** Oil cooler union bolt: 73 N·m (7.3 kg-m, 53.0 lb-ft)

- Connect the inlet and outlet water hoses 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 securely.
- After warming up and cooling down the engine, add the specified engine coolant up to the engine coolant reservoir.



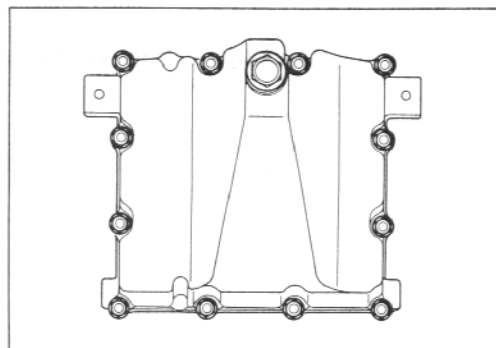
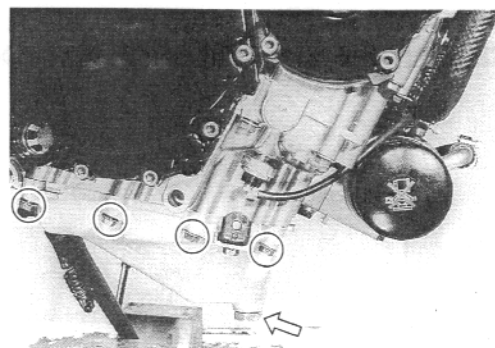
### **A** CAUTION

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

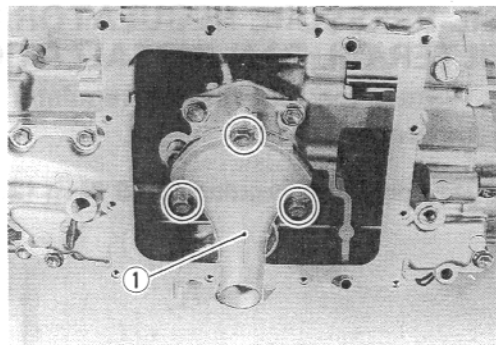
**LLC** Engine coolant capacity: 2 550 ml (2.7/2.2 US/Imp qt)

## OIL PAN/OIL SUMP FILTER/OIL PRESSURE REGULATOR REMOVAL

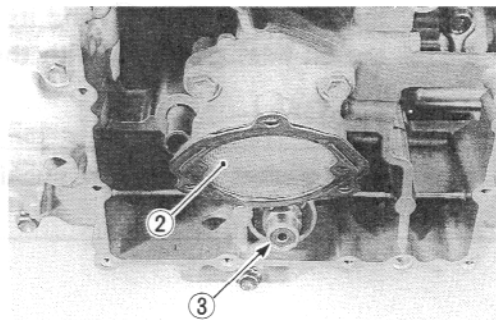
- Remove the lower fairing assembly. (See page 6-2.)
- Drain out engine oil. (See page 2-9.)
- Remove the exhaust pipe/muffler assembly. (See page 3-3.)
- Remove the oil pan by removing the bolts.



- Remove the oil inlet guide ① by removing the bolts.



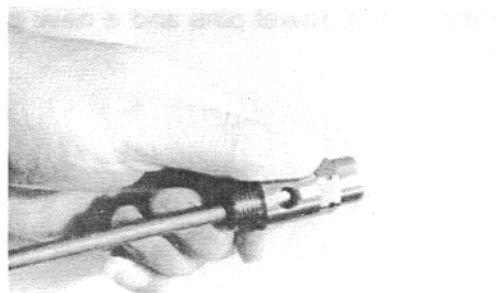
- Remove the oil sump filter ② and its gasket.
- Remove the oil pressure regulator ③.



## INSPECTION AND CLEANING

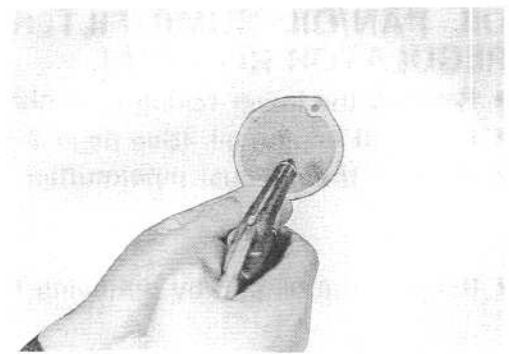
### OIL PRESSURE REGULATOR

Check the operation of the oil pressure regulator by pushing on the piston with a proper bar. If the piston does not operate, replace the oil pressure regulator with a new one.



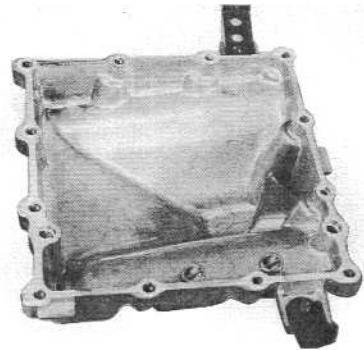
### OIL SUMP FILTER

Clean the oil sump filter with a compressed air.



### OIL PAN

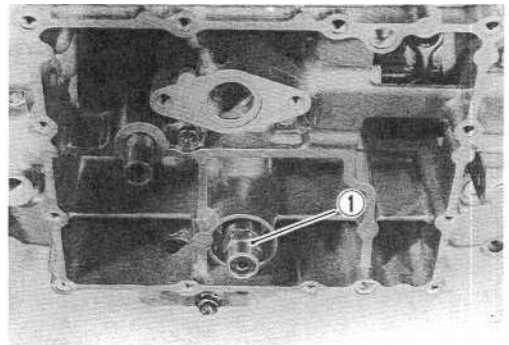
Wash the oil pan with a kerosene.



### OIL PRESSURE REGULATOR/OIL SUMP FILTER/OIL PAN INSTALLATION

- Tighten the oil pressure regulator ① to the specified torque.

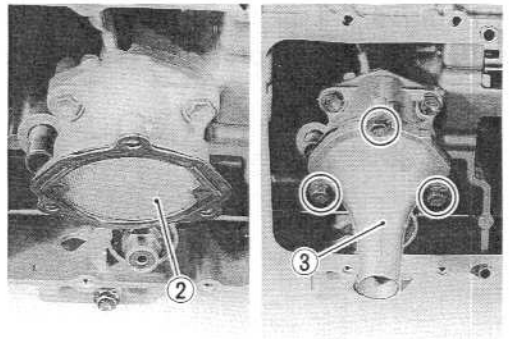
 Oil pressure regulator: 28 N·m (2.8 kg·m, 20.0 lb-ft)



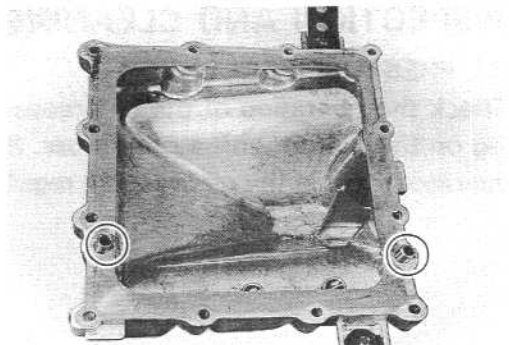
- Install the oil sump filter ② and its gasket.
- Install the oil inlet guide ③ with the bolts.

#### CAUTION

Use a new gasket to prevent sucking dust from the joint.



- Install the dowel pins and a new gasket to the oil pan.



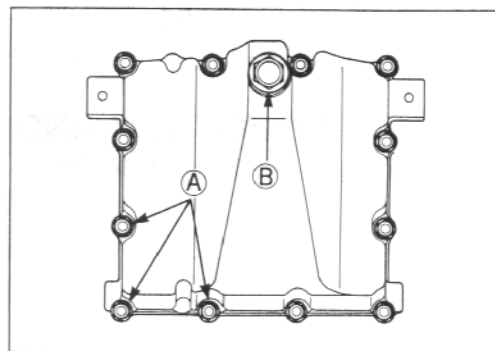
- Fit the new gasket washers to the oil pan bolts (A) correctly, then tighten the oil pan bolts diagonally to the specified torque.

 Oil pan bolt: 14 N·m (1.4 kg-m, 10.0 lb-ft)

### CAUTION

Use a new gasket to prevent oil leakage.

 Oil drain plug (B): 28 N·m (2.8 kg-m, 20.0 lb-ft)

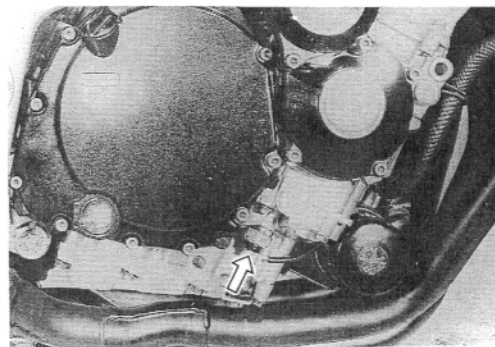


## OIL PRESSURE SWITCH REMOVAL

- Remove the lower fairing assembly. (See page 6-2.)
- Disconnect the oil pressure switch lead wire.
- Remove the oil pressure switch.

## OIL PRESSURE SWITCH INSPECTION

Refer to page 7-38.

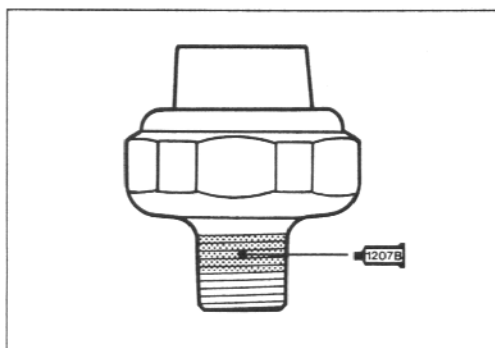


## OIL PRESSURE SWITCH INSTALLATION

- Apply SUZUKI BOND NO.1207B to the thread of the oil pressure switch, then tighten it securely.

 99104-31140: SUZUKI BOND NO.1207B

 Oil pressure switch 14 N·m (1.4 kg-m, 10.0 lb-ft)



## PISTON COOLING OIL NOZZLE REMOVAL

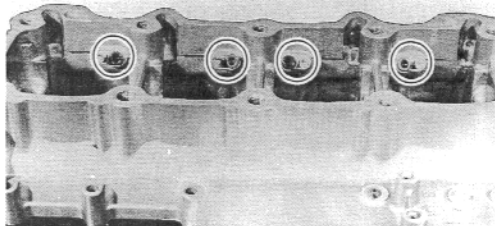
Refer to page 3B-1.

## PISTON COOLING OIL NOZZLE INSPECTION

Refer to page 3B-4.

## PISTON COOLING OIL NOZZLE INSTALLATION

Refer to page 3B-4.

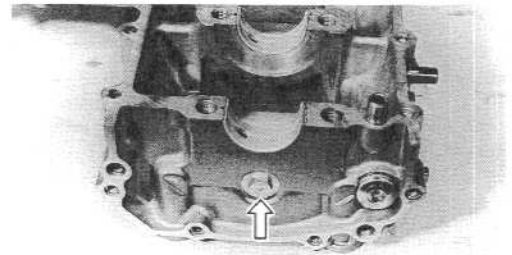
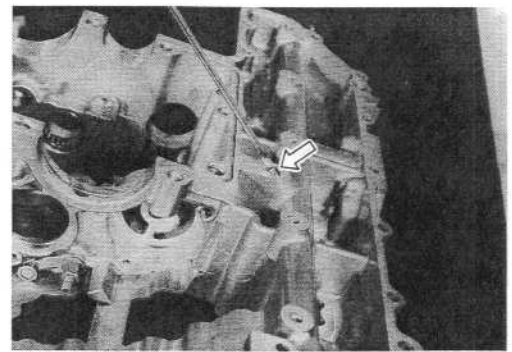


### OIL JETS REMOVAL

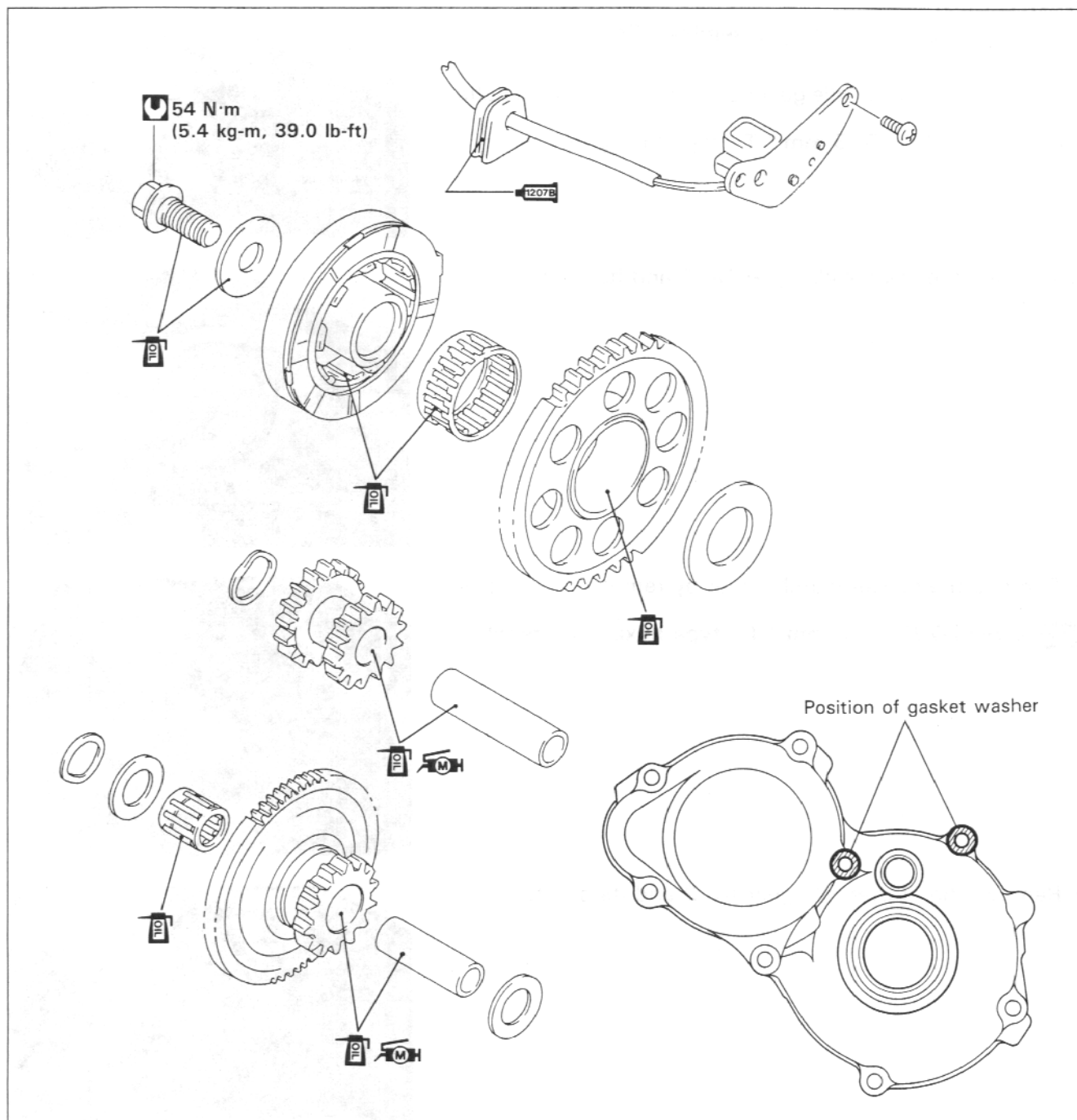
Refer to pages 3H-9 and 3H-20.

### OIL JETS INSPECTION AND INSTALLATION

Refer to pages 3H-16 and 3H-28.



## STARTER SYSTEM/SIGNAL GENERATOR




3E

## CONTENTS

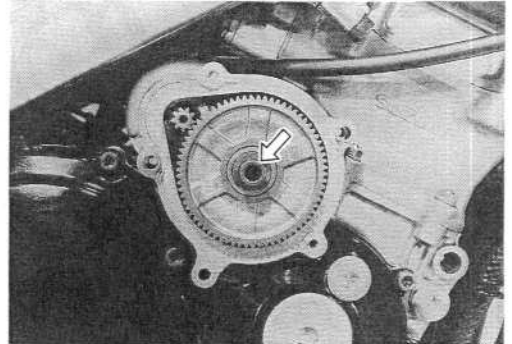
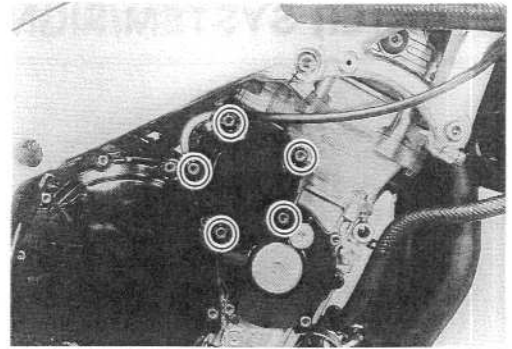
<b>STARTER CLUTCH/SIGNAL GENERATOR REMOVAL</b> .....	<b>3E- 1</b>
<b>STARTER CLUTCH/SIGNAL GENERATOR INSPECTION</b> .....	<b>3E- 2</b>
<b>SIGNAL GENERATOR/STARTER CLUTCH INSTALLATION</b> .....	<b>3E- 3</b>
<b>STARTER MOTOR REMOVAL</b> .....	<b>3E- 5</b>
<b>STARTER MOTOR INSPECTION</b> .....	<b>3E- 5</b>
<b>STARTER MOTOR INSTALLATION</b> .....	<b>3E- 5</b>

## STARTER CLUTCH/SIGNAL GENERATOR REMOVAL


- Remove the lower fairing assembly. (See page 6-2.)
- Remove the starter idle gear cover by removing the bolts.

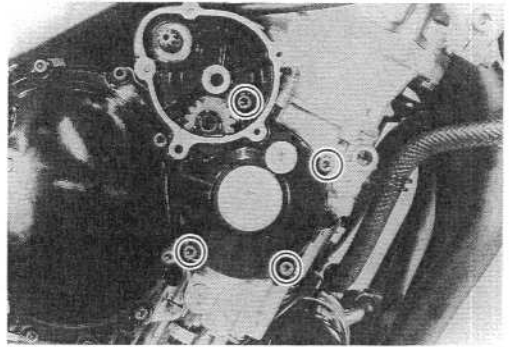
 09911-73730: 5 mm "T" type hexagon wrench

- Remove the starter idle gear No.1 and its shaft.

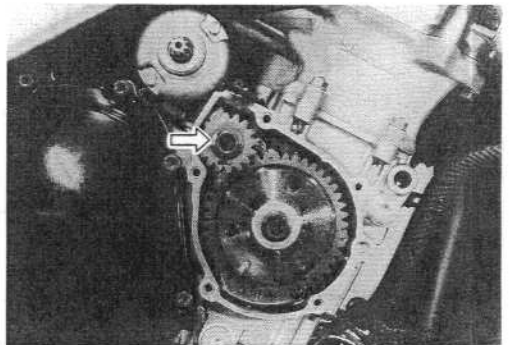


- Remove the starter clutch cover by removing the bolts.

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



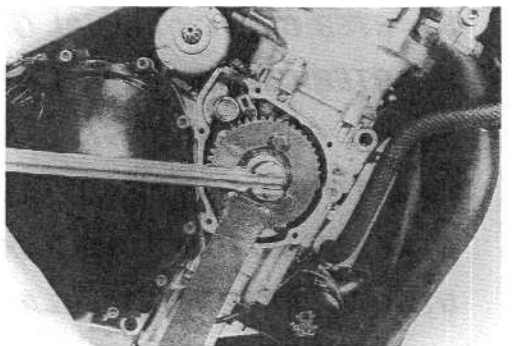
- Remove the starter idle gear No.2 and its shaft.



- Hold the starter clutch with the special tool and remove the starter clutch bolt.

 09920-34830: Starter clutch holder

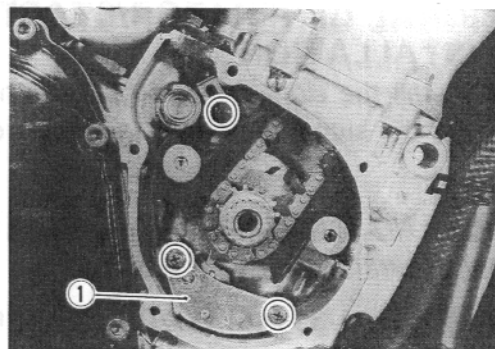
- Remove the starter clutch assembly.



- Remove the signal generator ① by removing its mounting screws and lead wire clamp screw.

**NOTE:**

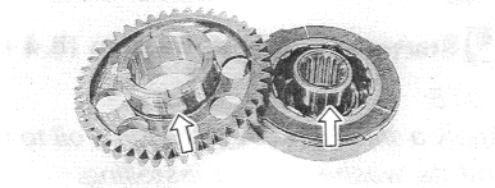
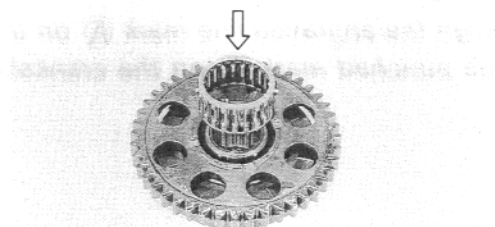
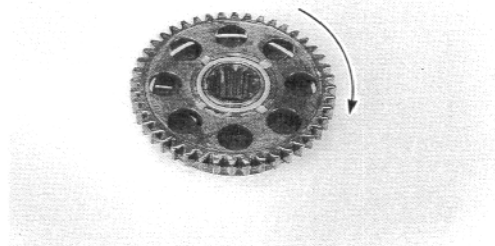
*If it is necessary to remove the cam drive sprocket/signal rotor, remove the camshafts, cam chain guide and cam drive chain. (Refer to page 3H-4.)*



## STARTER CLUTCH/SIGNAL GENERATOR INSPECTION

### STARTER CLUTCH

Install the starter driven gear onto the starter clutch and turn the starter driven gear by hand to inspect the starter clutch for a smooth movement. The gear turns one direction only. If a large resistance is felt to rotation, inspect the starter clutch bearing for damage or inspect the starter clutch contacting surface of the starter driven gear for wear or damage. If they are found to be damaged, replace them with new ones.



### SIGNAL GENERATOR

Refer to pages 7-26 and 27 for signal generator inspection.



## SIGNAL GENERATOR/STARTER CLUTCH INSTALLATION

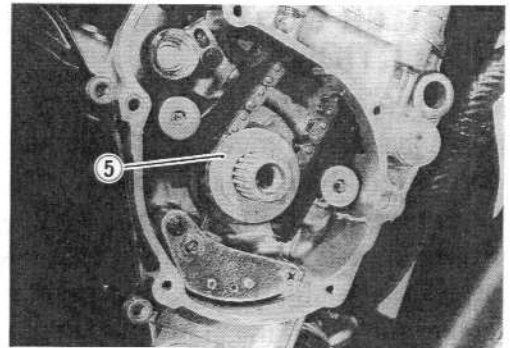
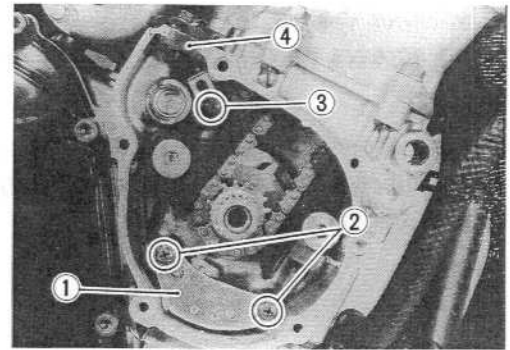
- Install the signal generator ① with two screws ②.
- Fix the signal generator lead wire clamp screw ③.

**NOTE:**

*BOND NO. 1207B should be applied to the groove of the signal generator lead wire grommet ④.*

**1207B 99104-31140: SUZUKI BOND NO.1207B**

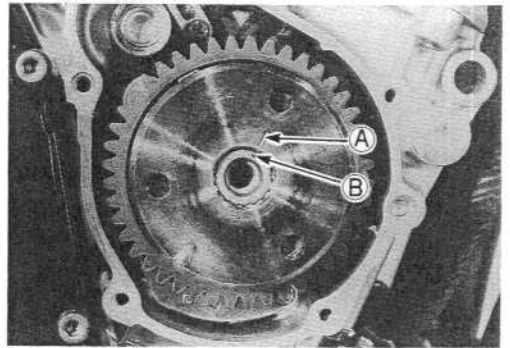
- Install the starter clutch thrust washer ⑤ onto the crankshaft.



- Install the starter clutch assembly onto the crankshaft.

**NOTE:**

*Align the engraved line mark (A) on the starter clutch with the punched mark (B) on the crankshaft.*



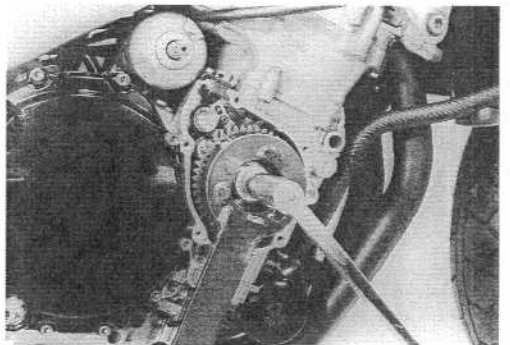
- Tighten the starter clutch bolt to the specified torque with the special tool and torque wrench.

**TOOL 09920-34830: Starter clutch holder**

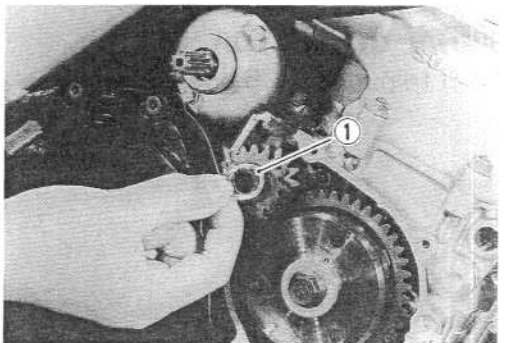
**Starter clutch bolt: 54 N·m (5.4 kg-m, 39.0 lb-ft)**

**NOTE:**

*Apply a small quantity of engine oil to the starter clutch bolt and its washer before installing.*

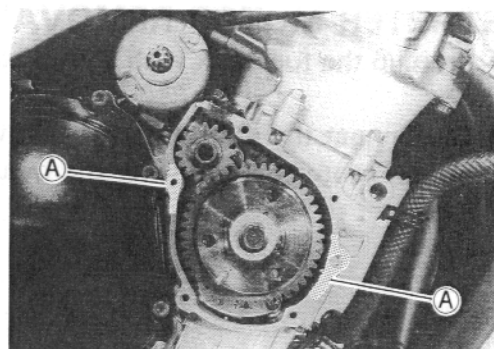


- After installing the starter idle gear No.2 and its shaft, install the wave washer ① onto the shaft.



- Coat SUZUKI BOND NO.1207B lightly to the mating surfaces (A) between upper and middle crankcases as shown.

**1207B** 99104-31140: SUZUKI BOND NO.1207B



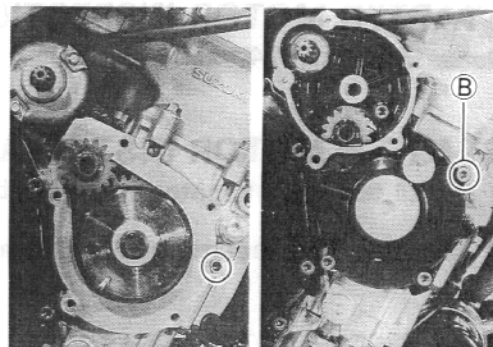
- Install a dowel pin, new gasket and starter clutch cover.
- Tighten the cover bolts securely.

**NOTE:**

Fit a new gasket washer to the starter clutch cover bolt (B) as shown.

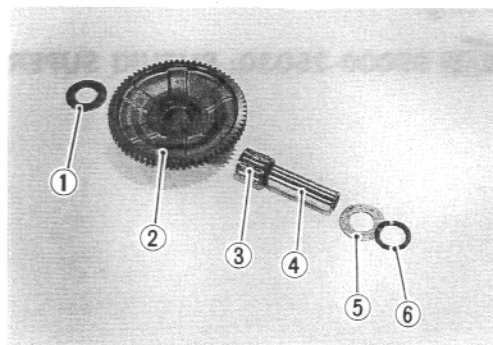
**CAUTION**

Use a new gasket to prevent oil leakage.



- Install the starter idle gear assembly in the prescribed order as shown.

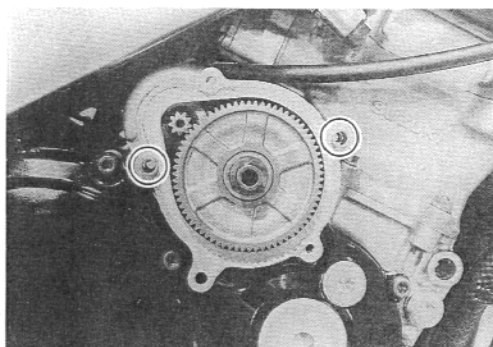
- ① Thrust washer
- ② Starter idle gear No.1
- ③ Bearing
- ④ Shaft
- ⑤ Thrust washer
- ⑥ Wave washer



- Install a dowel pins and new gasket.

**CAUTION**

Use a new gasket to prevent oil leakage.



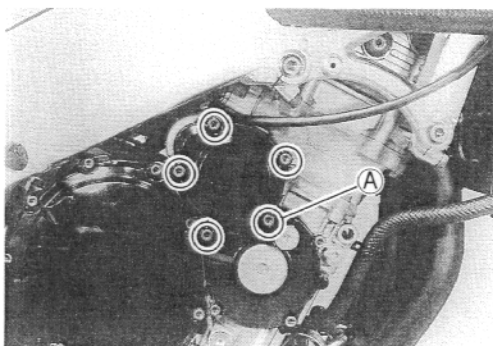
- Install the starter idle gear cover.
- Tighten the cover bolts securely.

**NOTE:**

Fit a new gasket washer to the starter idle gear cover bolt (A) as shown.

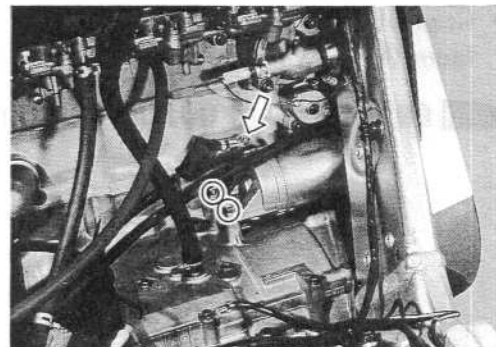
**CAUTION**

Use a new gasket to prevent oil leakage.



## STARTER MOTOR REMOVAL


- Prop up the fuel tank with a prop stay. (See page 7-14.)
- Disconnect the starter motor lead wire and remove the starter motor by removing the mounting bolts.



## STARTER MOTOR INSPECTION

Refer to page 7-14.

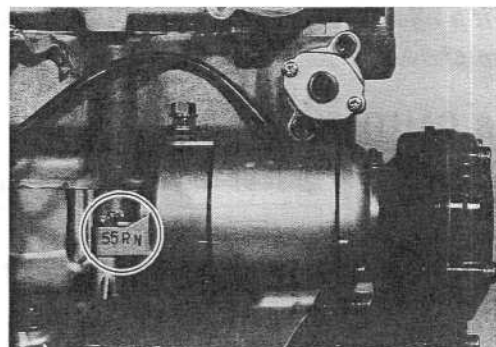
## STARTER MOTOR INSTALLATION

- Install the starter motor with two bolts.
-  Starter motor mounting bolt: 6 N·m (0.6 kg-m, 4.5 lb-ft)

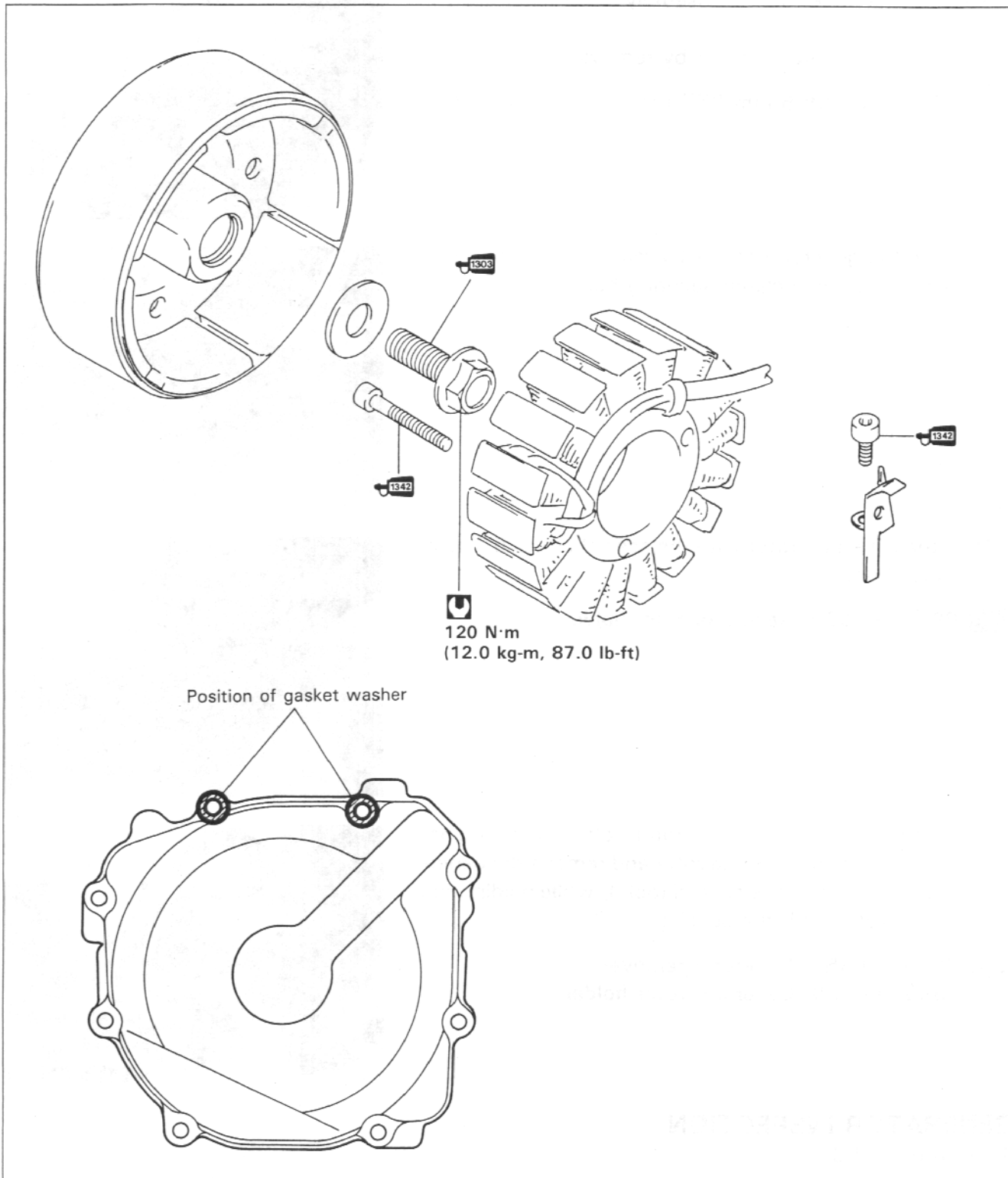
**NOTE:**

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

 99000-25030: *SUZUKI SUPER GREASE "A"*



# GENERATOR



3F

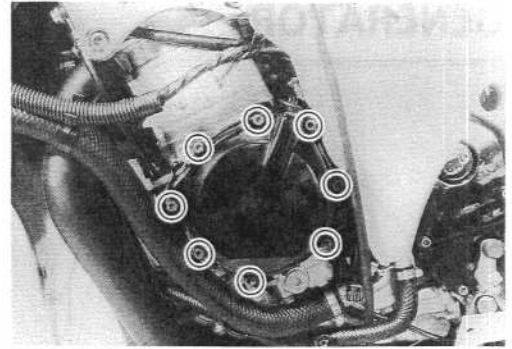
## CONTENTS

<b>GENERATOR REMOVAL</b> .....	<b>3F- 1</b>
<b>GENERATOR INSPECTION</b> .....	<b>3F- 1</b>
<b>GENERATOR INSTALLATION</b> .....	<b>3F- 2</b>

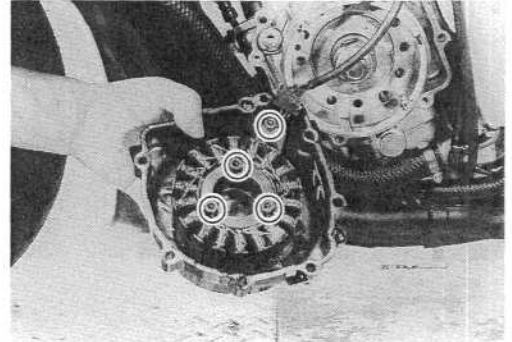
## GENERATOR REMOVAL

- Remove the lower fairing assembly. (See page 6-2.)
- Remove the generator cover by removing the bolts.

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

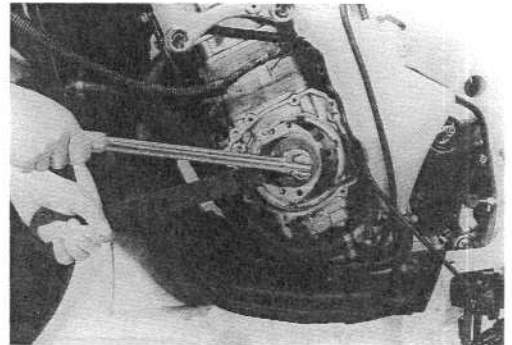


- Remove the generator stator by removing its mounting bolts and lead wire clamp securing bolt.



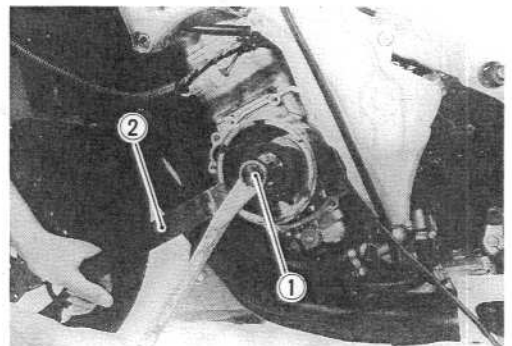
- Hold the generator rotor with the special tool and loosen the rotor bolt.

**TOOL** 09930-44530: Generator rotor holder



- After removing the generator rotor bolt, install the special tool into the boss of the rotor and remove the generator rotor by turning the special tool ① while holding the generator rotor with the special tool ②.

**TOOL** 09930-30450: Generator remover  
09930-44530: Generator rotor holder



## GENERATOR INSPECTION

Refer to page 7-9.

## GENERATOR INSTALLATION

- Degrease the tapered portion of the generator rotor and also the crankshaft. Use nonflammable cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.

### NOTE:

Apply a small quantity of **THREAD LOCK SUPER "1303"** to the generator rotor bolt.

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

- Tighten the generator rotor bolt to the specified torque with the special tool and torque wrench.

 **Generator rotor bolt: 120 N·m (12.0 kg-m, 87 lb-ft)**

 **09930-44530: Generator rotor holder**

- Apply a small quantity of **THREAD LOCK "1342"** to the generator stator mounting bolts and lead wire clamp securing bolt.

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

- Tighten the generator stator mounting bolts and lead wire clamp securing bolt securely.

### NOTE:

**SUZUKI BOND NO. 1207B** should be applied to the groove of the generator lead wire grommet ①.

 **99104-31140: SUZUKI BOND NO.1207B**

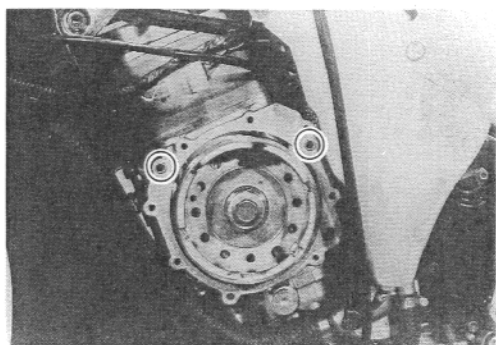
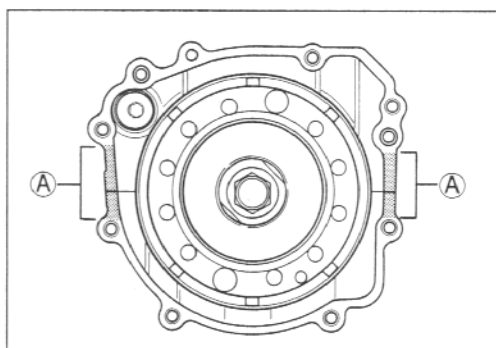
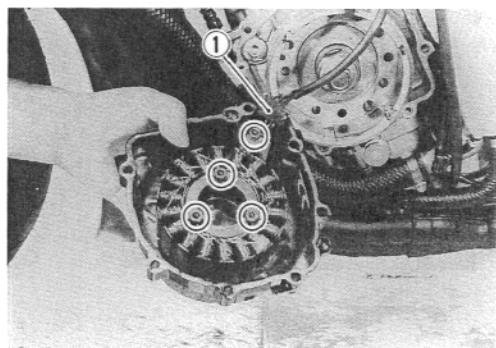
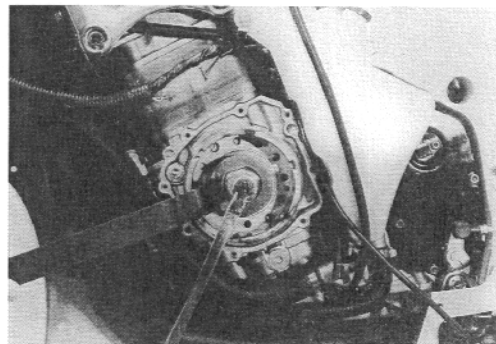
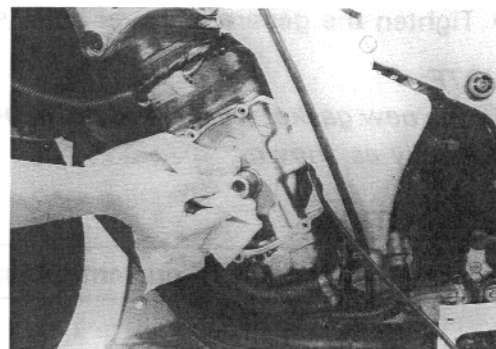
- Coat **SUZUKI BOND NO. 1207B** lightly to the mating surfaces (A) between upper and middle crankcases.

 **99104-31140: SUZUKI BOND NO.1207B**

- Install the dowel pins, a new gasket and generator cover.

### CAUTION

Use a new gasket to prevent oil leakage.



### 3F-3 ENGINE

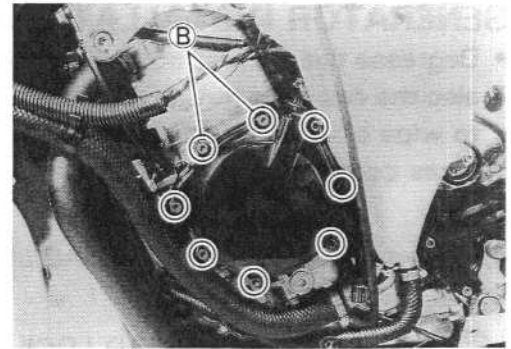
- Tighten the generator cover bolts securely.

**NOTE:**

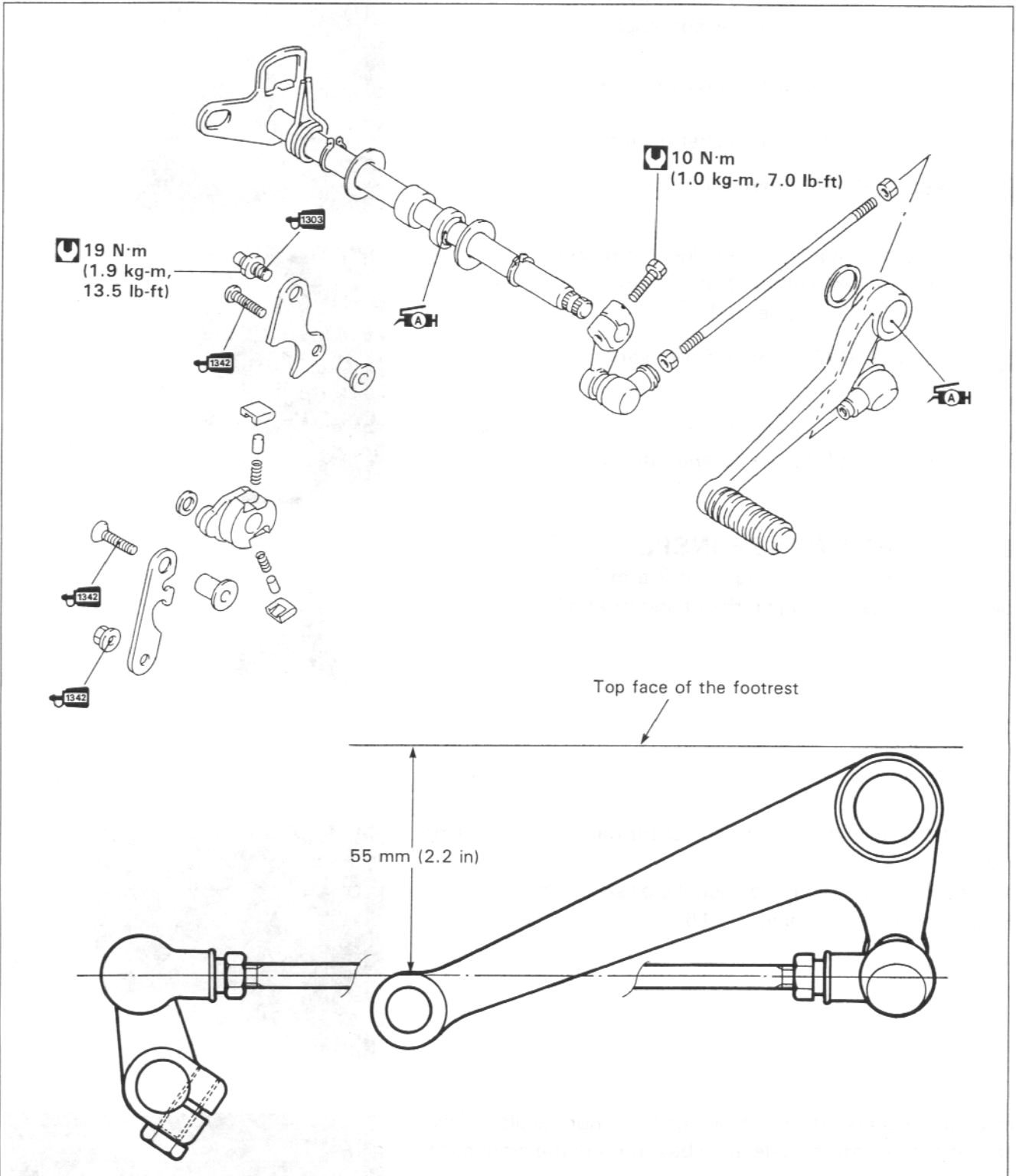
*Fit the new gasket washers to the generator cover bolts ② correctly as shown.*

**⚠ CAUTION**

Use a new gasket to prevent oil leakage.



# GEARSHIFT LINKAGE



**3G**

## CONTENTS

<b>GEARSHIFT LINKAGE REMOVAL</b> .....	<b>3G- 1</b>
<b>GEARSHIFT LINKAGE INSPECTION</b> .....	<b>3G- 1</b>
<b>GEARSHIFT LINKAGE INSTALLATION</b> .....	<b>3G- 2</b>



## GEARSHIFT LINKAGE REMOVAL

- Remove the lower fairing assembly. (See page 6-2.)
- Remove the gearshift lever and engine sprocket cover. (See page 3-5.)
- Remove the clutch assembly. (See page 3C-1.)
- Remove the circlip and washer from the gearshift shaft.

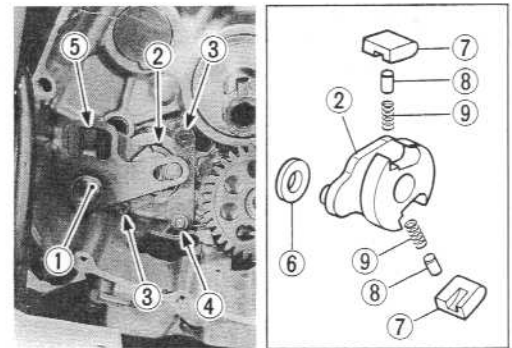
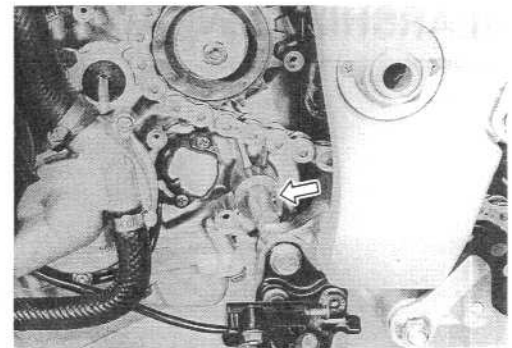
**TOOL** 09900-06107: Snap ring pliers

- 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.

**TOOL** 09900-09004: Impact driver set

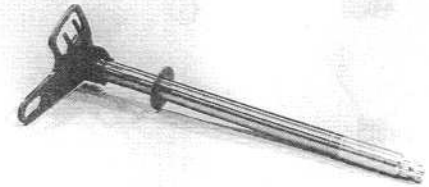
**NOTE:**

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



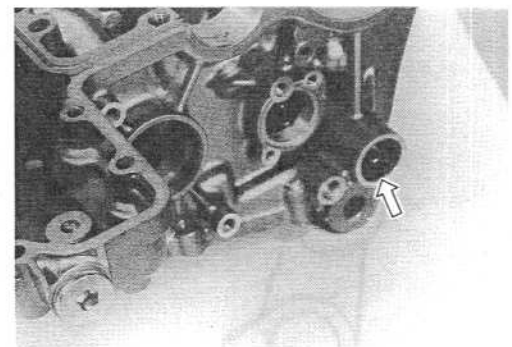
## GEARSHIFT LINKAGE INSPECTION

Check the gearshift shaft/gearshift arm for wear or bend. Check the return spring on the gearshift arm for damage or fatigue.



Inspect the gearshift shaft oil seal for damage or wear on the lip.

If any defects are found, replace the oil seal with a new one. Refer to pages 3H-9 and 3H-16.

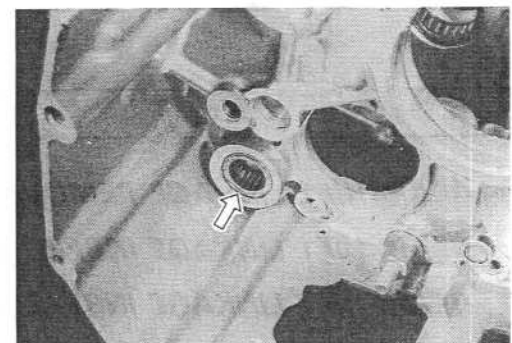


Inspect the gearshift shaft bearings for abnormal play, noise and smooth rotation while each bearing is in the crankcase.

**NOTE:**

If abnormal noise does not occur, it is not necessary to remove the bearing.


Refer to pages 3H-9 and 3H-16.



## GEARSHIFT LINKAGE INSTALLATION


- 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).

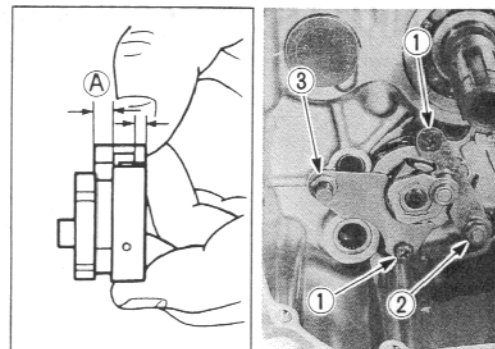
 99000-32050: THREAD LOCK "1342"

 09900-09004: Impact driver set

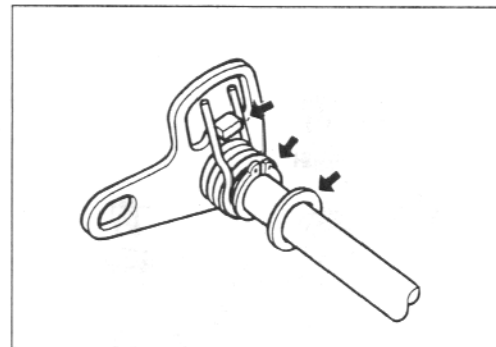
- Apply a small quantity of THREAD LOCK SUPER "1303" to the gearshift arm stopper bolt (3) and tighten it to the specified torque.

 99000-32030: THREAD LOCK SUPER "1303"

 Gearshift arm stopper bolt: 19 N·m  
(1.9 kg-m, 13.5 lb-ft)



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



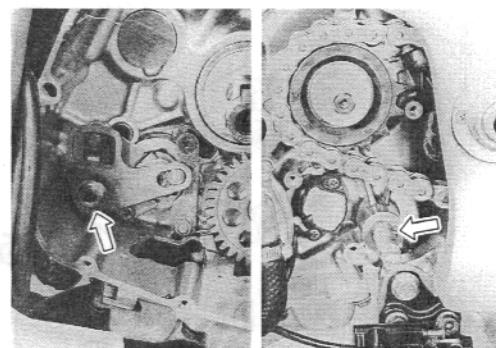
- Install the gearshift shaft/gearshift arm and washer.
- Fix the gearshift shaft with the circlip.

 09900-06107: Snap ring pliers

### CAUTION

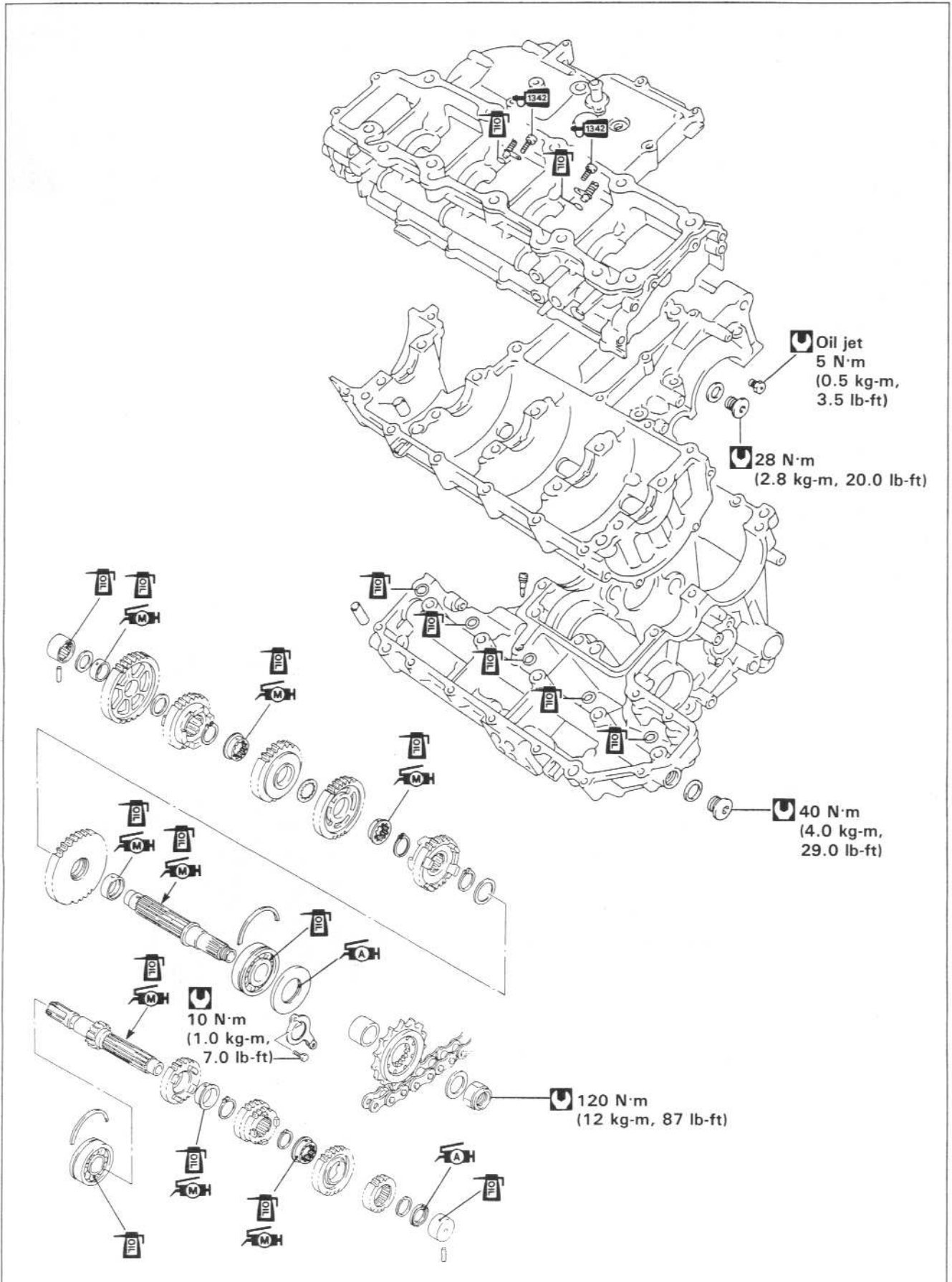
Replace the gearshift shaft oil seal with a new one.

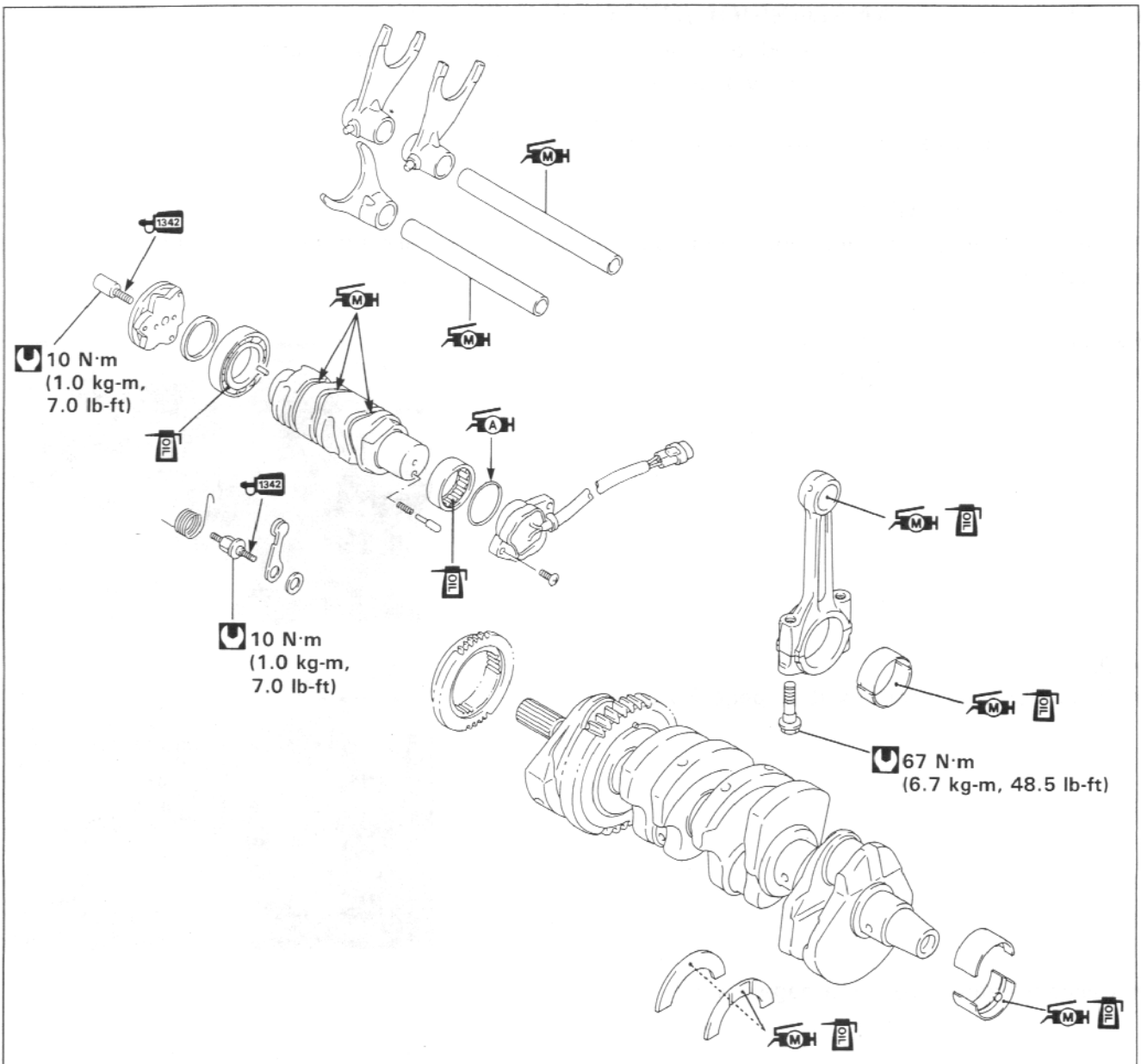
(Refer to pages 3H-9 and 3H-16.)



- Install the gearshift lever to the gearshift shaft in the correct position. (See page 3G-0.)

# CRANKCASE/TRANSMISSION/CRANKSHAFT/CONROD





## CONTENTS

<b>CRANKCASE/TRANSMISSION/CRANKSHAFT/CONROD .....</b>	<b>3H- 1</b>
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<b>ENGINE DISASSEMBLY .....</b>	<b>3H- 1</b>
<b>LOWER CRANKCASE/TRANSMISSION REMOVAL .....</b>	<b>3H- 7</b>
<b>TRANSMISSION INSPECTION AND SERVICE .....</b>	<b>3H-10</b>
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### CARNKCASE/TRANSMISSION/CRANKSHAFT/CONROD

The crankcase must be separated to service the transmission, crankshaft and conrod. These engine components require engine removal for service.

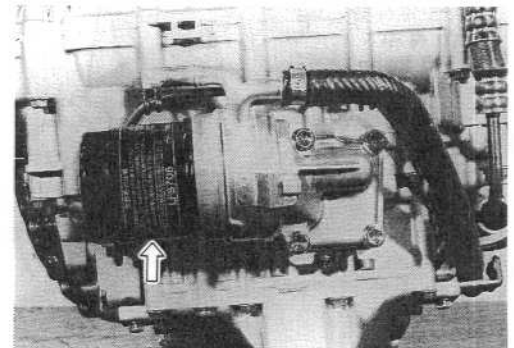
**\*ENGINE REMOVAL**.....See page 3-2.

#### \*ENGINE DISASSEMBLY

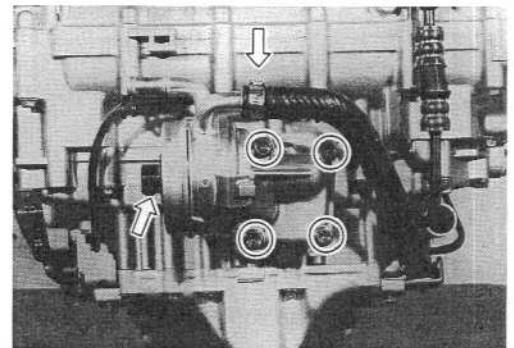
The following engine components must be removed before separating the upper, middle and lower crankcases.

**Remove:**

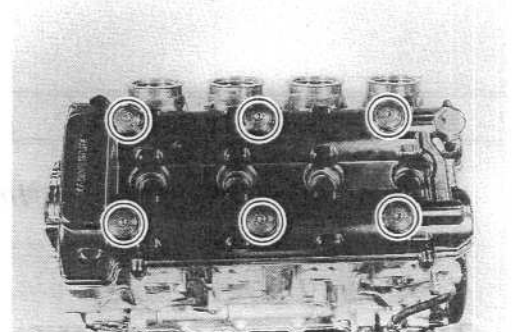
- Oil filter (See page 3D-4.)



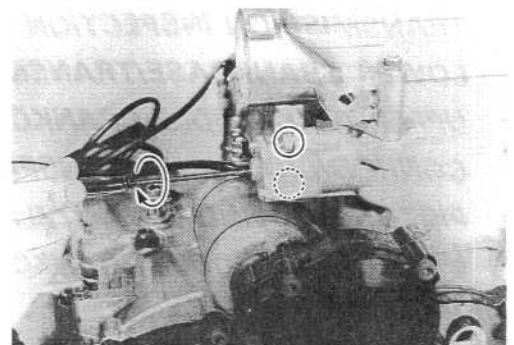
- Oil cooler
- Oil cooler mounting box (See page 3D-5.)



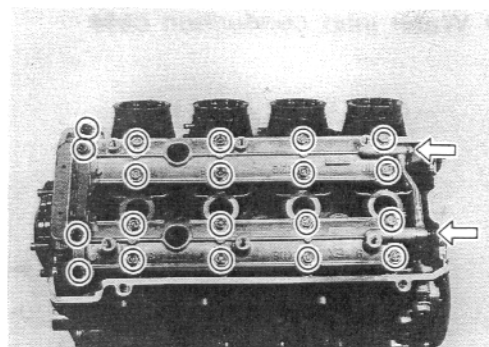
- Cylinder head cover (See page 3A-1.)



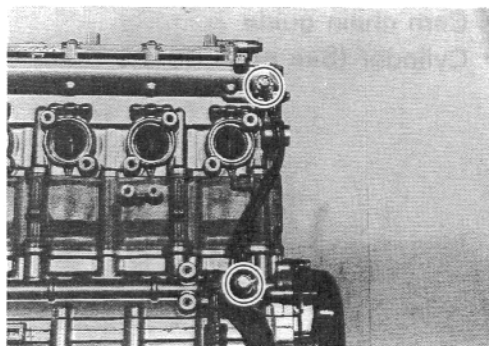
- Cam chain tension adjuster (See page 3A-1.)



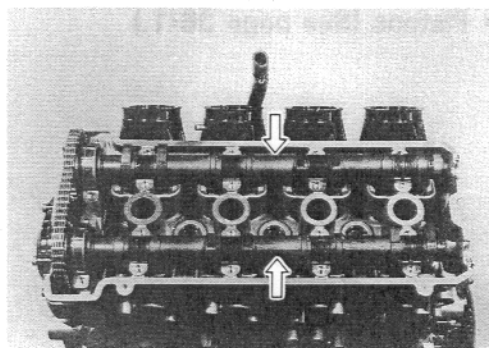
- Top cam chain guide
- Oil pipe
- Camshaft journal holders (See page 3A-1.)



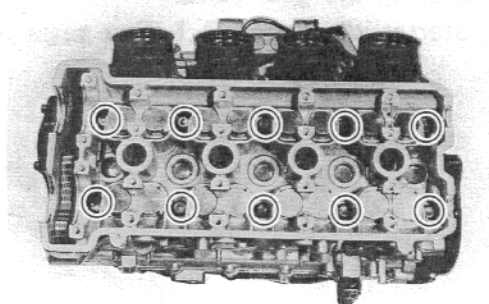
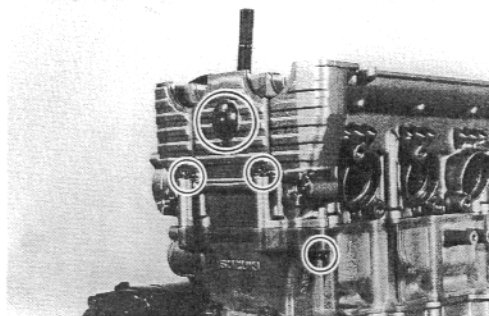
- Oil hose (See page 3A-2.)



- Camshafts (See page 3A-1.)

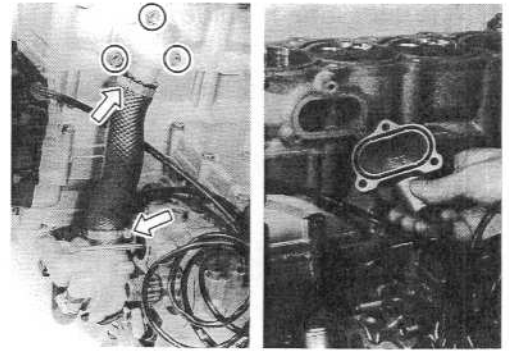


- Cylinder head (See page 3A-1.)

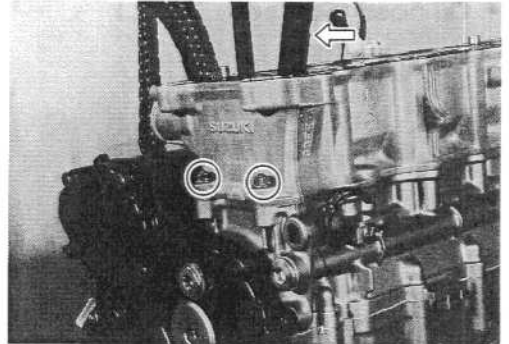


### 3H-3 ENGINE

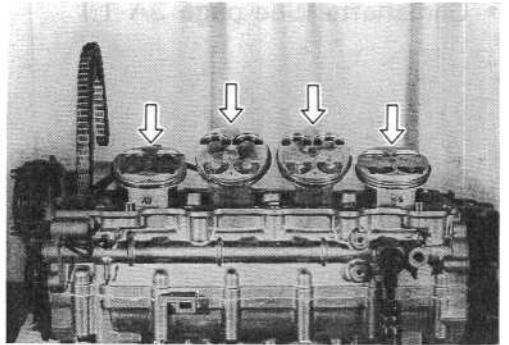
- Water inlet conduction case



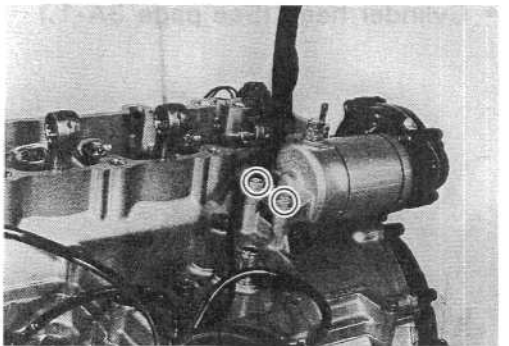
- Cam chain guide
- Cylinder (See page 3B-1.)



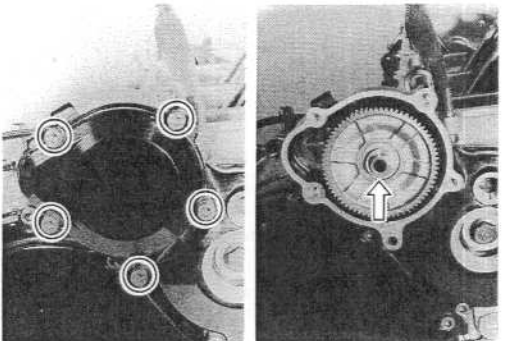
- Pistons (See page 3B-1.)



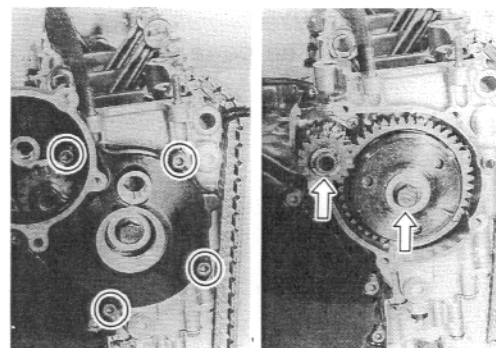
- Starter motor (See page 3E-5.)



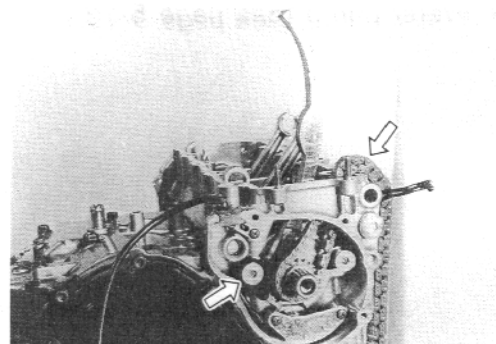
- Starter idle gear cover
- Starter idle gear NO.1 (See page 3E-1.)



- Starter clutch cover
- Starter idle gear NO.2
- Starter clutch (See page 3E-1.)



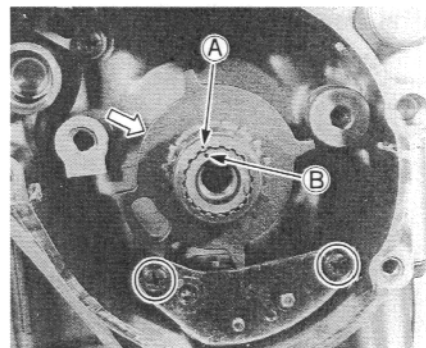
- Cam drive chain
- Cam chain tensioner



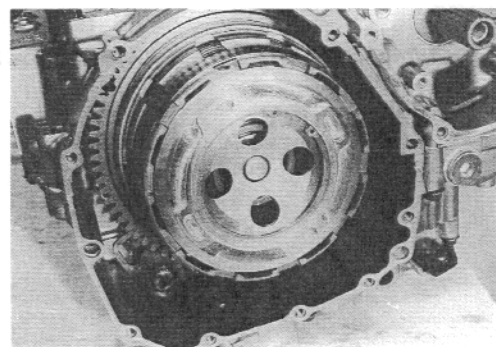
- Signal generator (See page 3E-2.)
- Cam drive sprocket/signal rotor

**NOTE:**

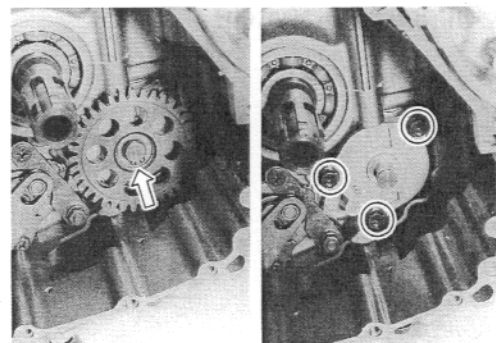
*When installing the cam drive sprocket/signal rotor onto the crankshaft, align the punched mark (A) on the cam drive sprocket/signal rotor with the punched mark (B) on the crankshaft end.*



- Clutch cover
- Clutch assembly (See page 3C-1.)



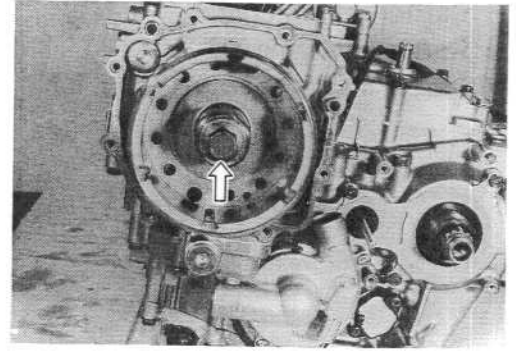
- Oil pump driven gear
- Oil pump (See page 3D-1.)



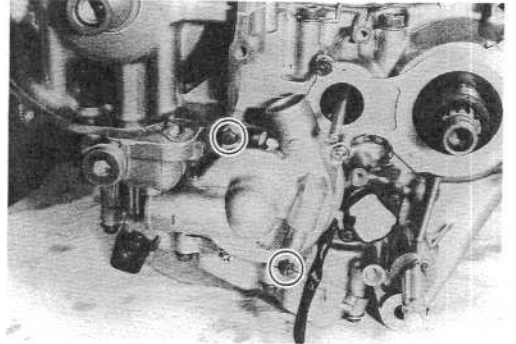


## 3H-5 ENGINE

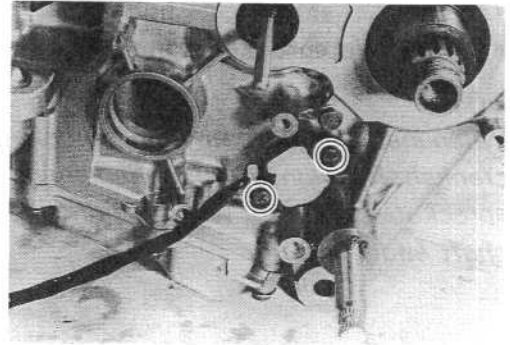
- Generator cover
- Generator (See page 3F-1.)



- Water pump (See page 5-13.)



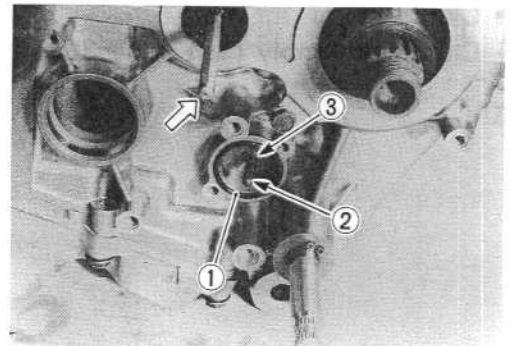
- Neutral position indicator switch



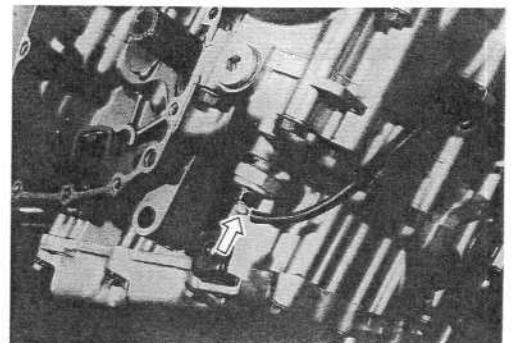
### NOTE:

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

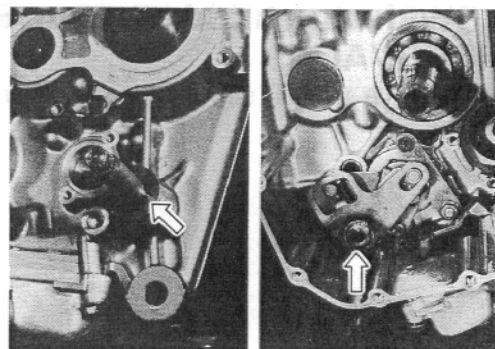
- Clutch push rod



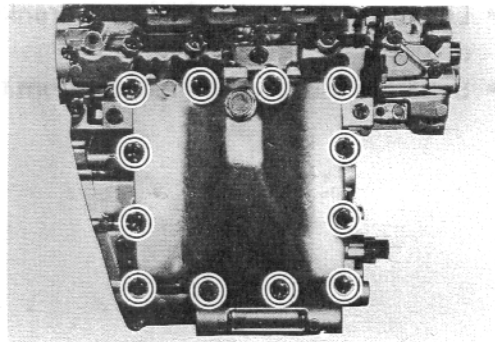
- Oil pressure switch



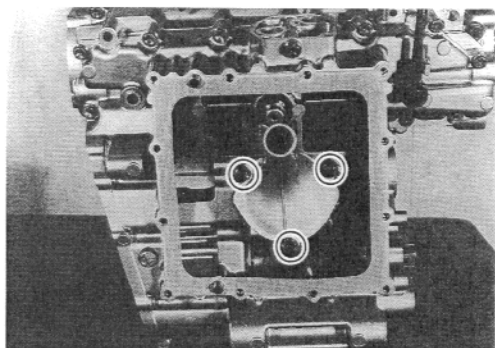
- Gearshift linkage (See page 3G-1.)



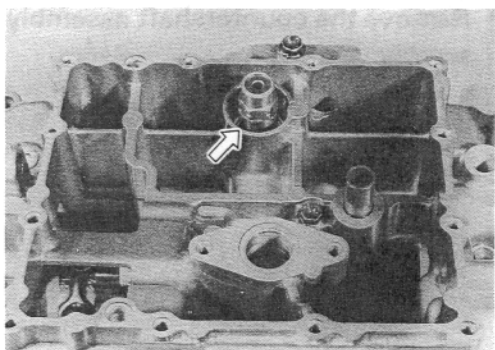
- Oil pan (See page 3D-6.)



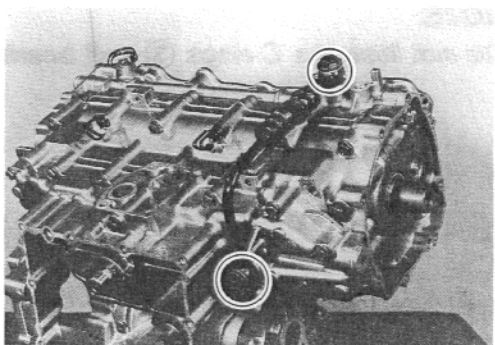
- Oil inlet guide (See page 3D-6.)



- Oil pressure regulator (See page 3D-6.)

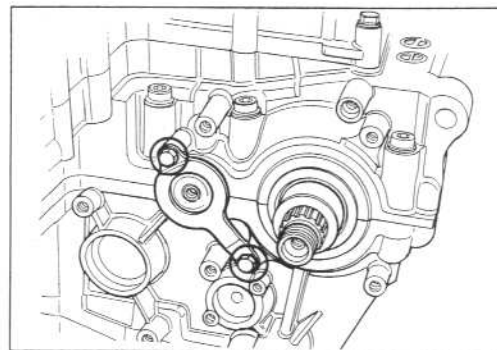


- Oil hose

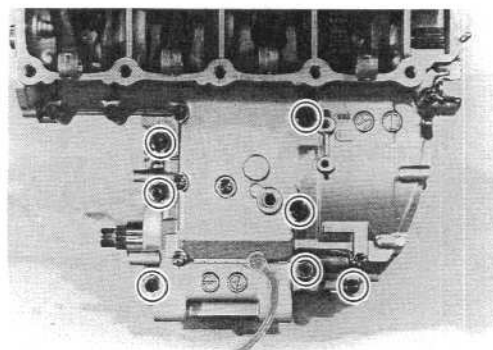
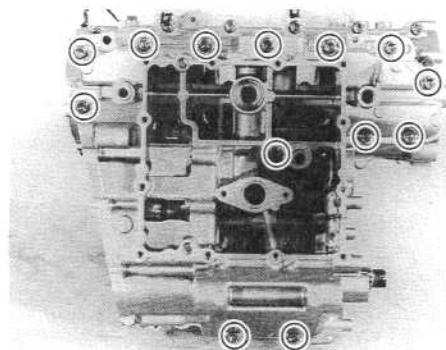


## LOWER CRANKCASE/TRANSMISSION REMOVAL

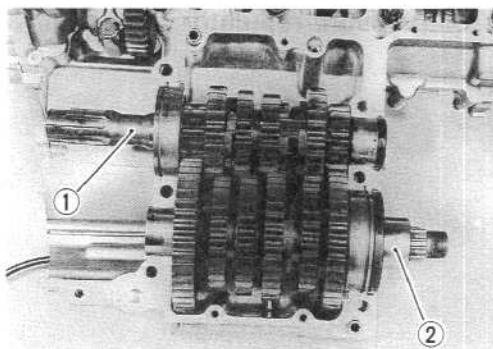
- Remove the oil seal retainer by removing the bolts.



- Loosen and remove the lower crankcase tightening bolts diagonally.
- Separate the lower crankcase from the middle crankcase.

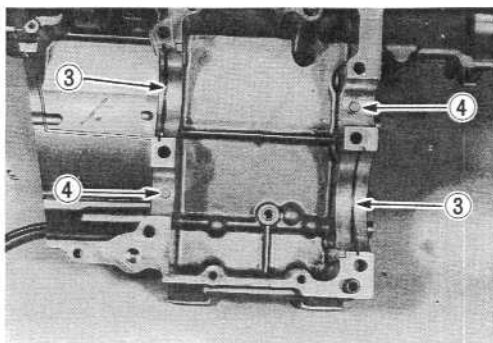


- Remove the countershaft assembly ① and driveshaft assembly ②.

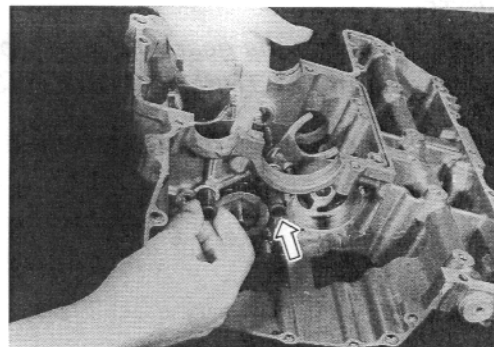


**NOTE:**

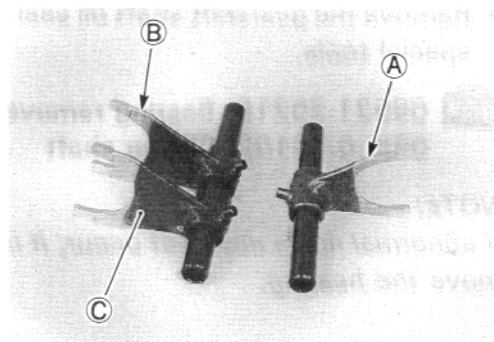
Do not lose the C-rings ③ and bearing pins ④.



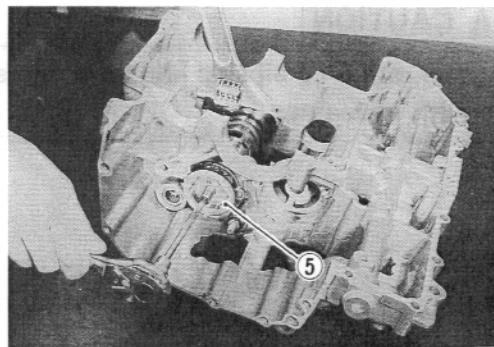
- Hold the gearshift forks by hand while drawing out the gearshift fork shafts from the lower crankcase.



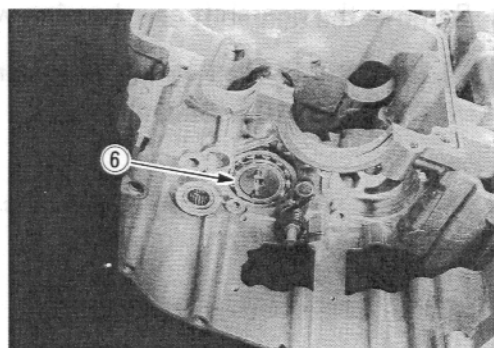
- Ⓐ For 3rd/4th drive gears
- Ⓑ For Top driven gear
- Ⓒ For 5th driven gear



- Remove the gearshift cam stopper plate ⑤ by removing the bolt while holding the gearshift cam with an adjuster wrench.



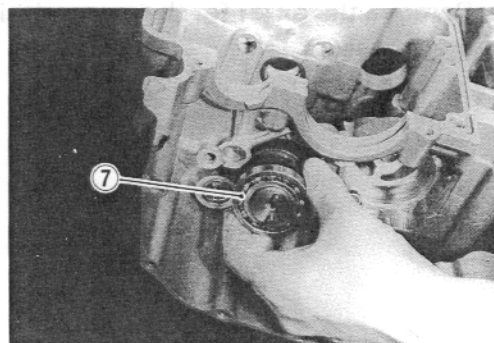
- Remove the washer ⑥.



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

**NOTE:**

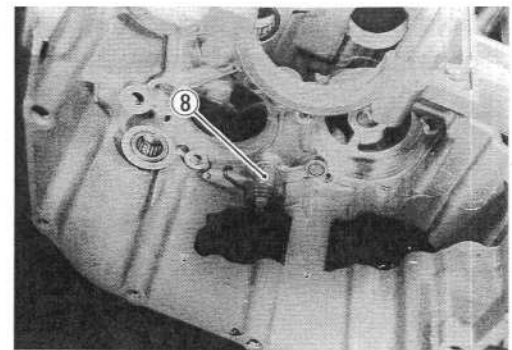
Rotate the bearing ⑦ on the gearshift cam by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.




**NOTE:**

When replacing the gearshift cam stopper bolt ⑧, apply a small quantity of **THREAD LOCK "1342"** to the bolt.

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

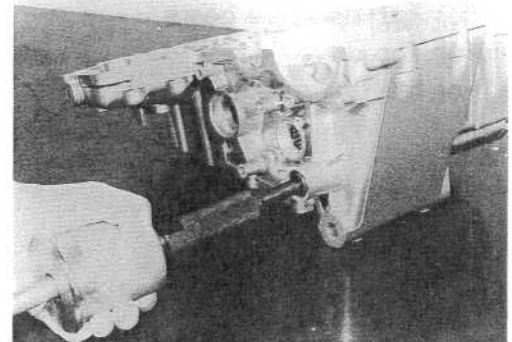


- Remove the gearshift shaft oil seal and bearings with the special tools.

 **09921-20210: Bearing remover**  
**09930-30102: Sliding shaft**

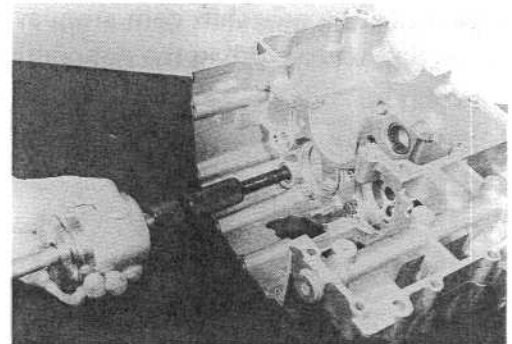
**NOTE:**

If abnormal noise does not occur, it is not necessary to remove the bearing.




**CAUTION**

The removed oil seal and bearings should be replaced with new ones.

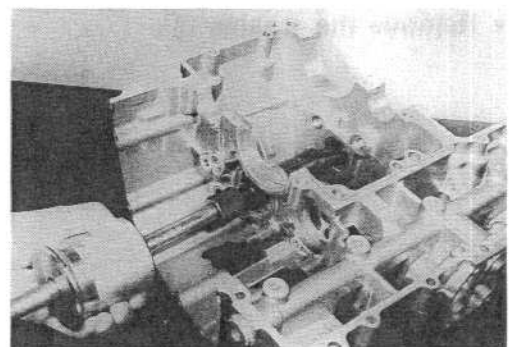


- Remove the gearshift cam bearing with the special tools.

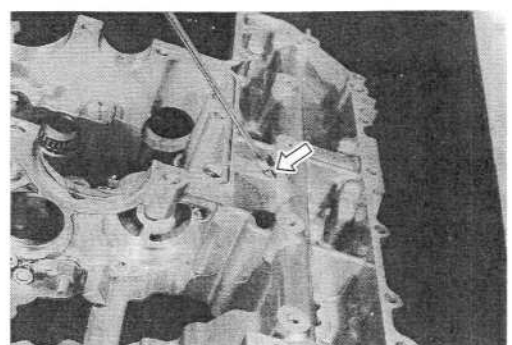
 **09923-74510: Bearing remover**  
**09930-30102: Sliding shaft**

**NOTE:**

If abnormal noise does not occur, it is not necessary to remove the bearing.



- Remove the oil jet for the transmission fixed in the lower crankcase.



## TRANSMISSION INSPECTION AND 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", so that each will be restored to the original location during assembly.

### 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.

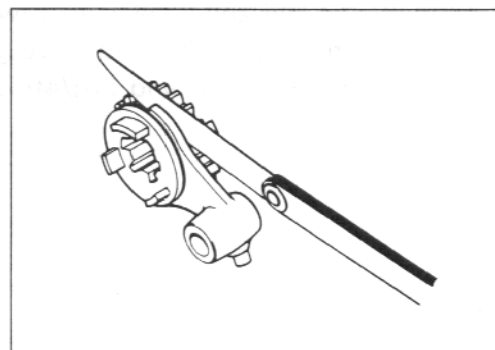
**TOOL** 09900-20803: Thickness gauge  
09900-20102: Vernier calipers

#### Shift fork groove width

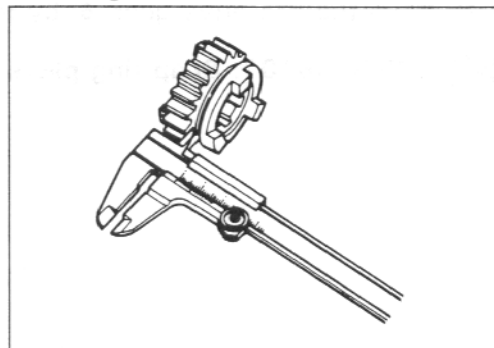
**Standard**: 5.00–5.10 mm (0.197–0.201 in)

#### Shift fork thickness

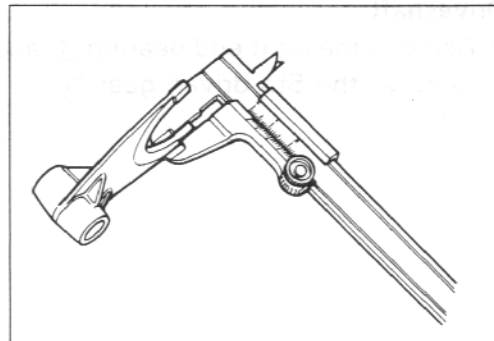
**Standard**: 4.80–4.90 mm (0.189–0.193 in)



Checking clearance



Checking groove width

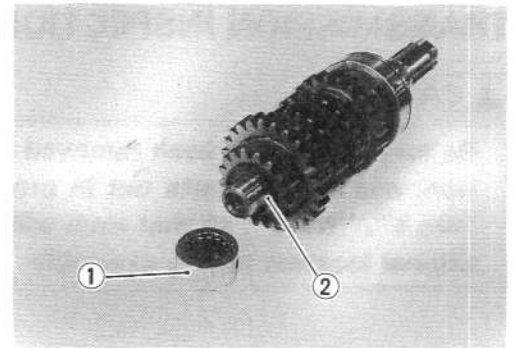


Checking thickness

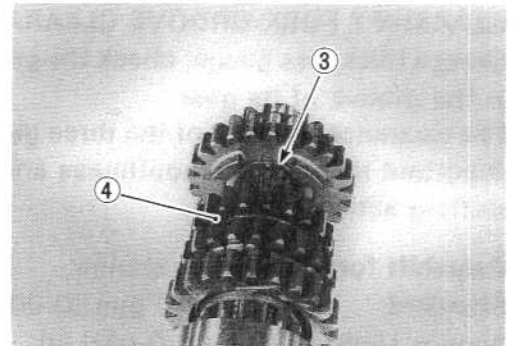
**DISASSEMBLY**

**Countershaft**

- Remove the left end bearing ① and oil seal ②.

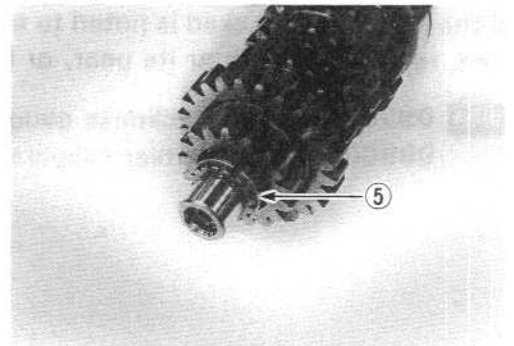


- Remove the top drive gear circlip ③ from its groove and slide toward the 3rd/4th drive gears ④.



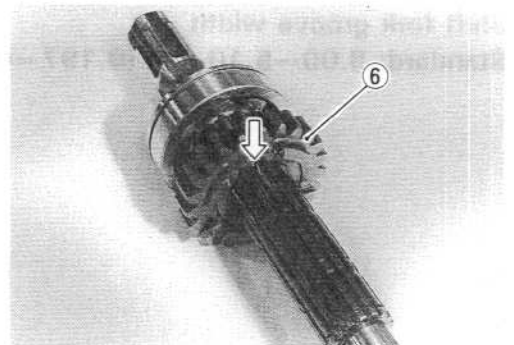
**TOOL** 09900-06107: Snap ring pliers

- Slide the top and 2nd drive gears toward the 3rd/4th drive gears, then remove the 2nd drive gear circlip ⑤.
- Remove the 2nd, top and 3rd/4th drive gears.



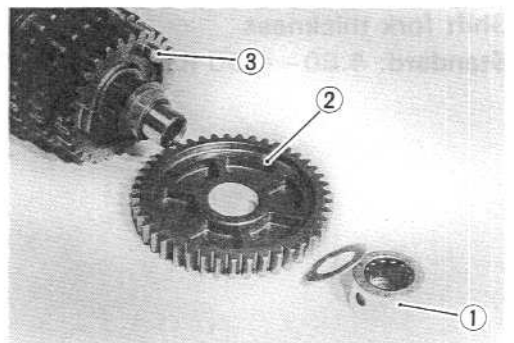
- Remove the 5th drive gear ⑥ by removing the circlip.

**TOOL** 09900-06107: Snap ring pliers




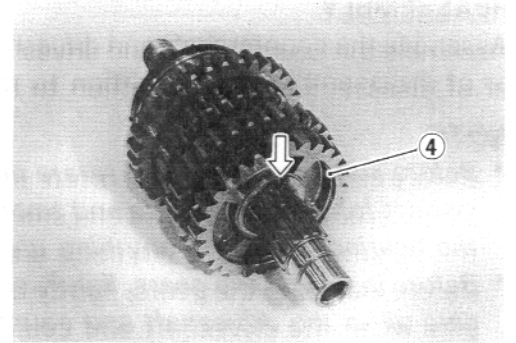
**Driveshaft**

- Remove the right end bearing ① and low driven gear ②.
- Remove the 5th driven gear ③.

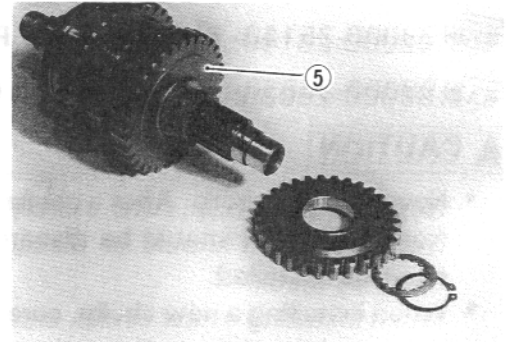


- Remove the 4th driven gear ④ by removing the circlip.

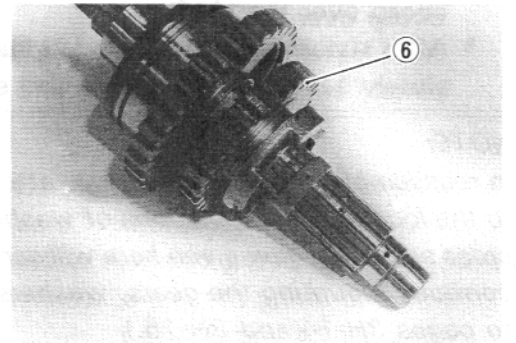
 09900-06107: Snap ring pliers




- Remove the 3rd driven gear ⑤.

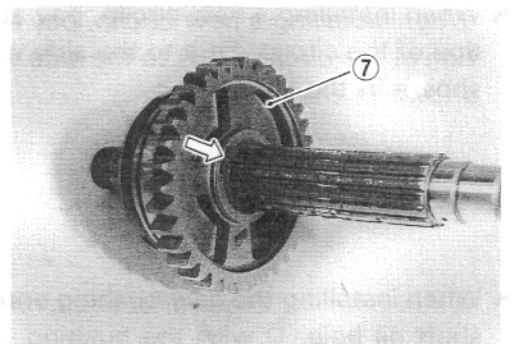


- Remove the top driven gear ⑥.

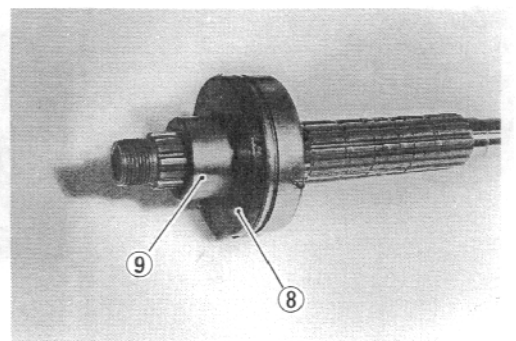


- Remove the 2nd driven gear ⑦ by removing the circlip.

 09900-06107: Snap ring pliers



- Remove the oil seal ⑧ and spacer ⑨.






**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.

 **MH 99000-25140: SUZUKI MOLY PASTE**

 **AH 99000-25030: SUZUKI SUPER GREASE "A"**

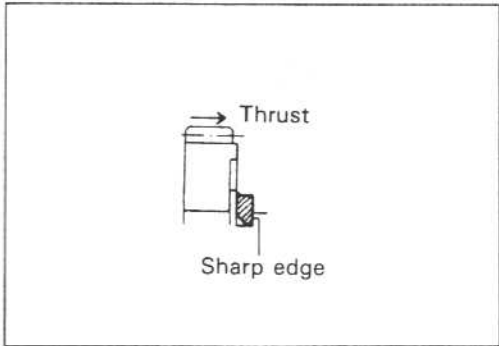
**CAUTION**

- \* 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.

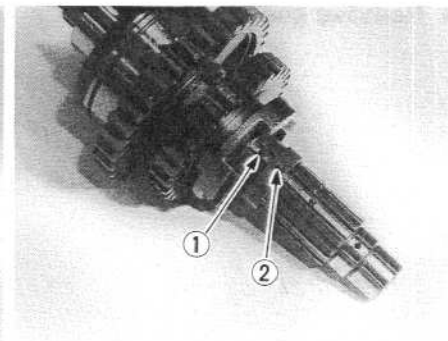
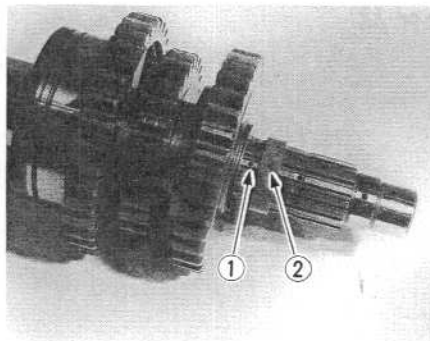
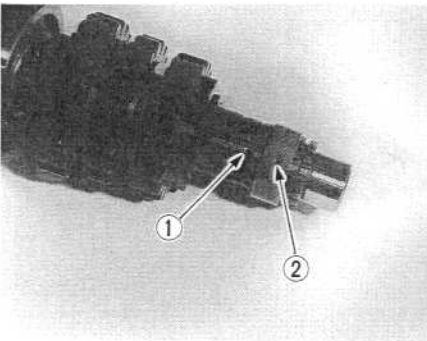
**NOTE:**

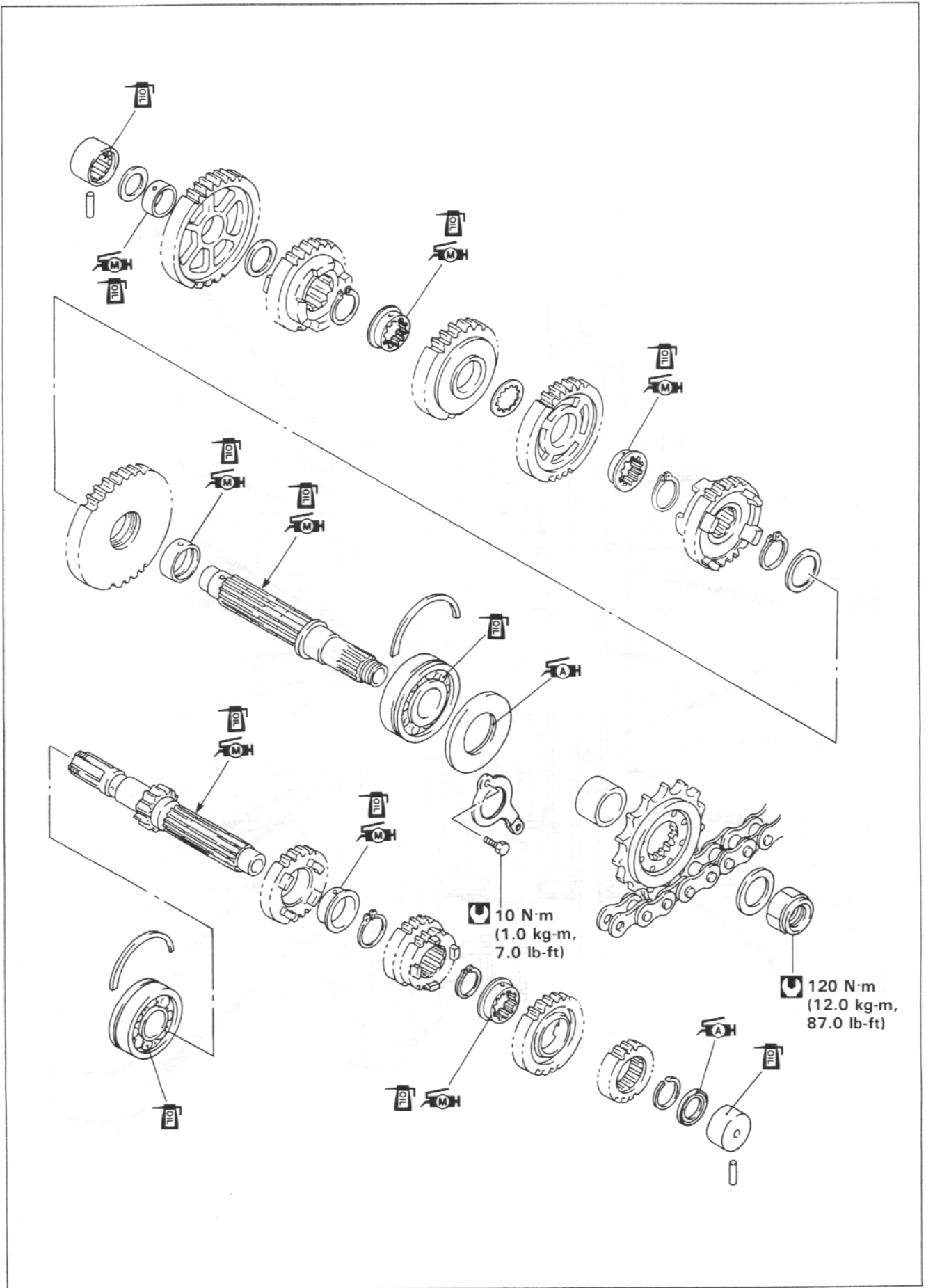
In reassembling the transmission, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips. (Refer to pages 3H-14 and 3H-15.)

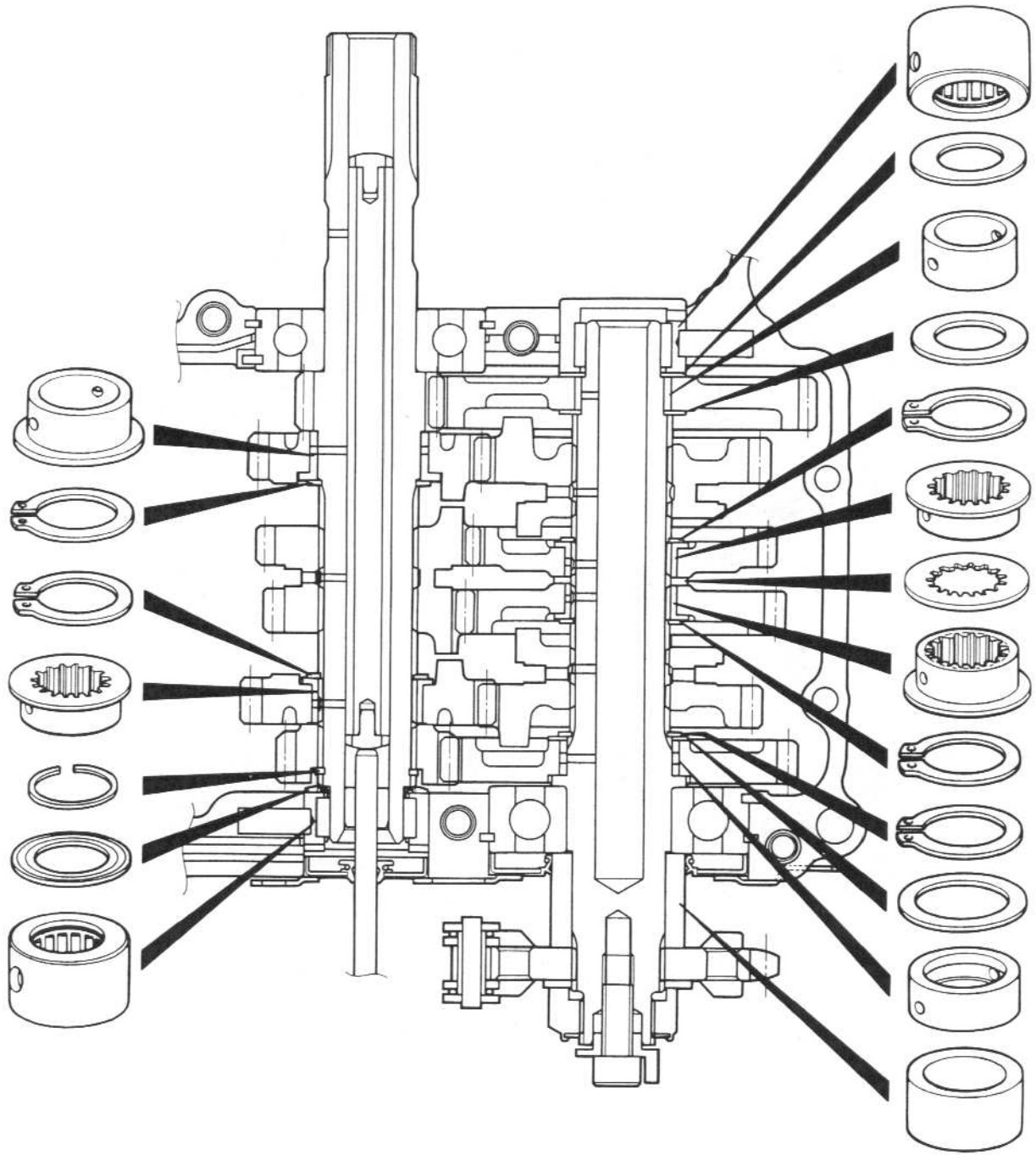
- When installing a new circlip, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in the illustration.



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





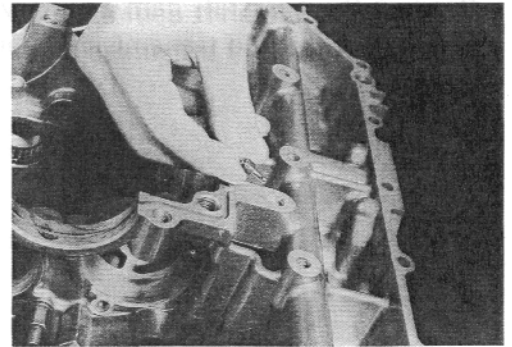


## LOWER CRANKCASE/TRANSMISSION INSTALLATION

- Install the transmission oil jet into the lower crankcase.

### NOTE:

Check the oil jet for clogging. If it is dirty with oil sediment, oil will not flow smoothly. Clean the oil jet with compressed air.

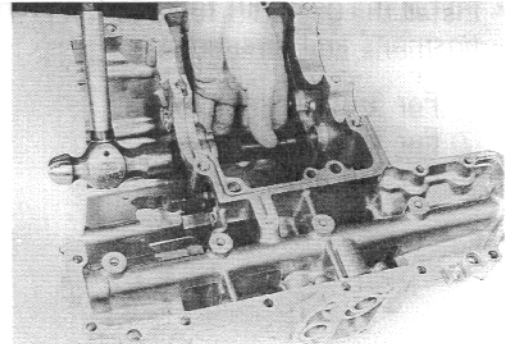


- Install the gearshift cam bearing with the special tool.

**TOOL** 09913-75821: Bearing installer

### CAUTION

The removed bearing should be replaced with a new one.

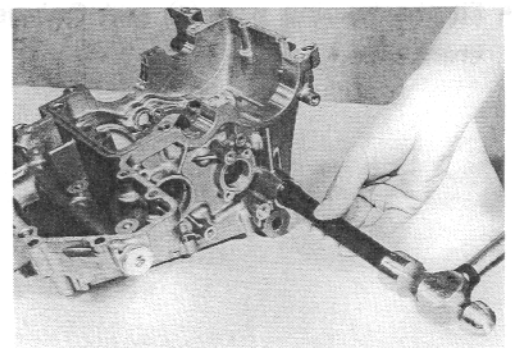
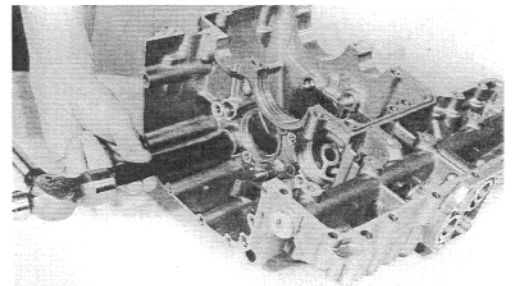


- Install the gearshift shaft bearings, left and right, with the special tool.
- Install the gearshift shaft oil seal with the special tool.

**TOOL** 09943-88211: Bearing installer

### CAUTION

The removed bearings and oil seal should be replaced with new ones.



- Install the gearshift cam related parts.

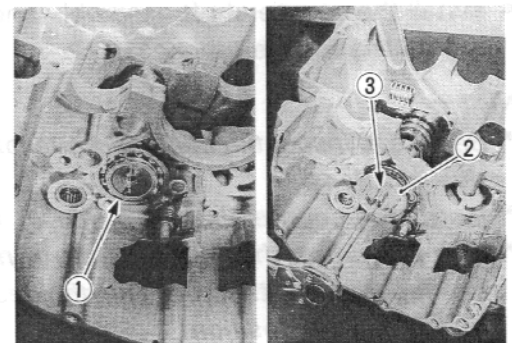
- ① Washer
- ② Gearshift cam stopper plate
- ③ Bolt

### NOTE:

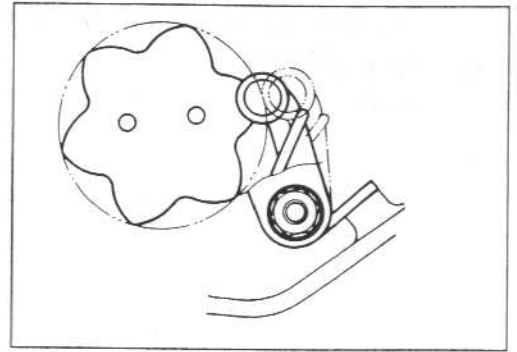
When installing the gearshift cam stopper plate ②, apply a small quantity of THREAD LOCK "1342" to its bolt ③.

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

**U** Bolt ③: 10 N·m (1.0 kg-m, 7.0 lb-ft)

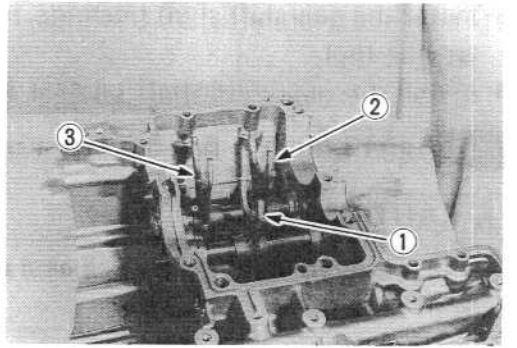
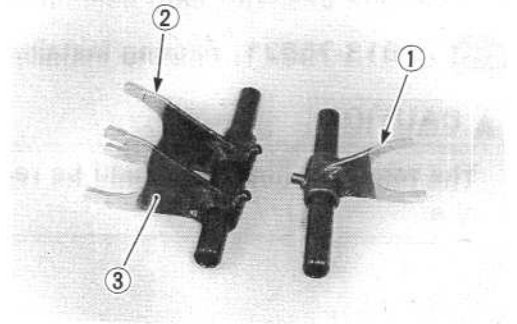


- Position the gearshift cam as shown in Fig. so that the gearshift forks and transmission can be installed easily.

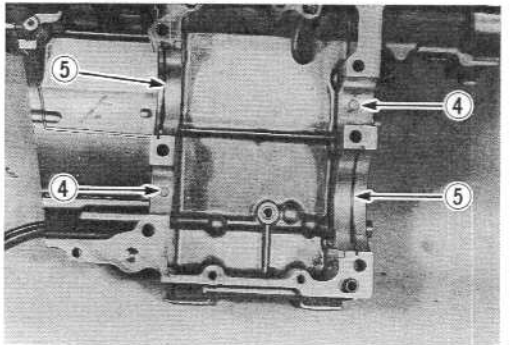


- Install the gearshift forks to the crankcase in the correct positions and directions.

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



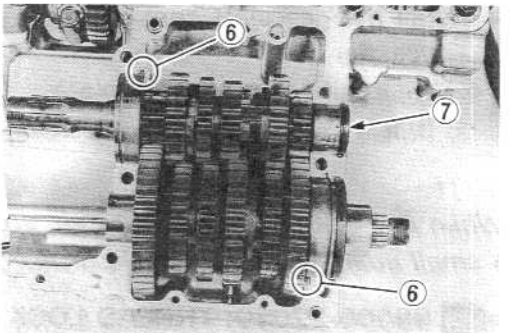
- Fit the bearing pins ④ and C-rings ⑤ on the middle crankcase.



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

**NOTE:**

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



- Clean the mating surfaces of the crankcases before matching the middle and lower ones.
- Install the dowel pins (A) to the middle crankcase.
- Fit the O-rings (B) to the correct positions.

**CAUTION**

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

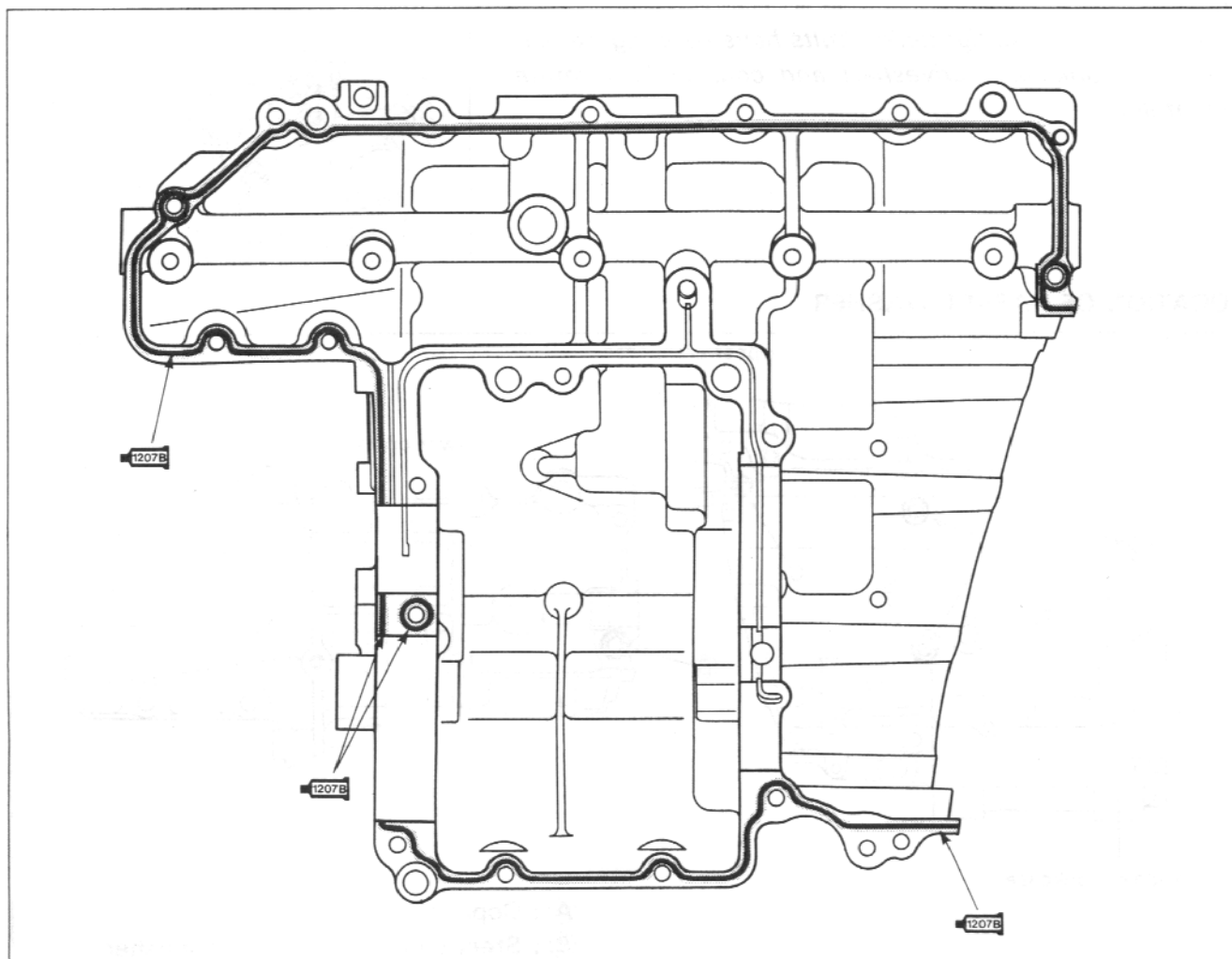
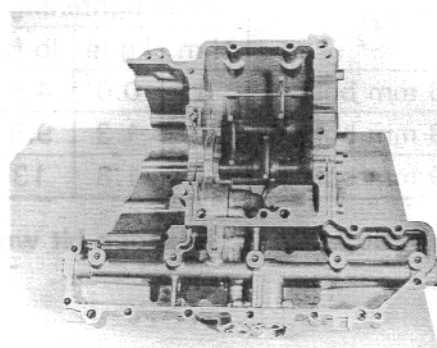
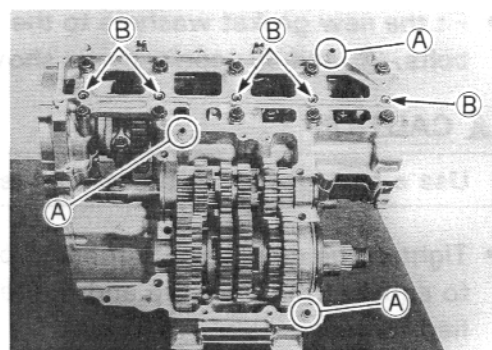
- Apply SUZUKI BOND NO.1207B to the mating surface of the lower crankcase in the following procedure.

**1207B 99104-31140: 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 and oil passage area.
- \* Apply to cornered surface as it forms a comparatively thick film.



### 3H-19 ENGINE

- Fit the new gasket washers to the crankcase tightening bolts, (A) and (B), correctly as shown.

#### **CAUTION**

Use a new gasket to prevent oil leakage.

- Tighten the crankcase tightening bolts a little at a time to equalize the pressure and tighten them to the specified torque.

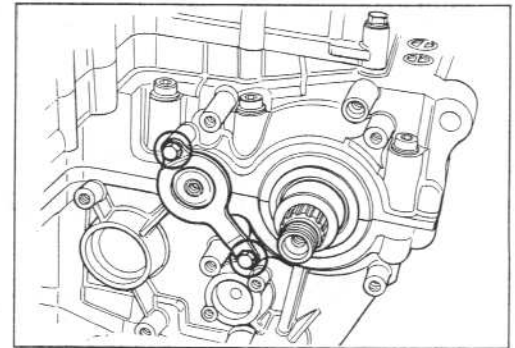
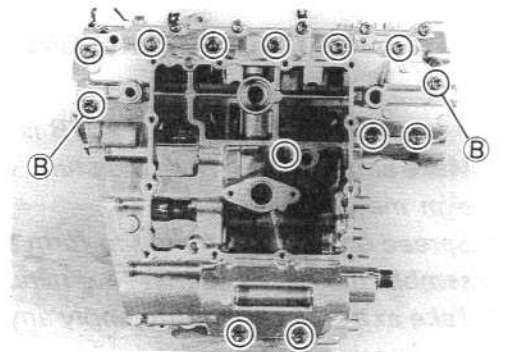
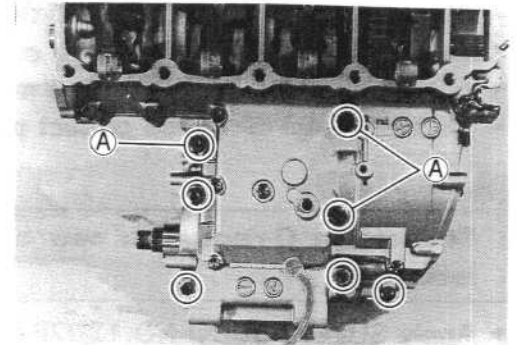
	Initial tightening			Final tightening		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
6 mm bolt	6	0.6	4.5	11	1.1	8.0
8 mm bolt	13	1.3	9.5	24	2.4	17.5
9 mm bolt	18	1.8	13	32	3.2	23.0

**TOOL** 09900-00410: Hexagon bit wrench set

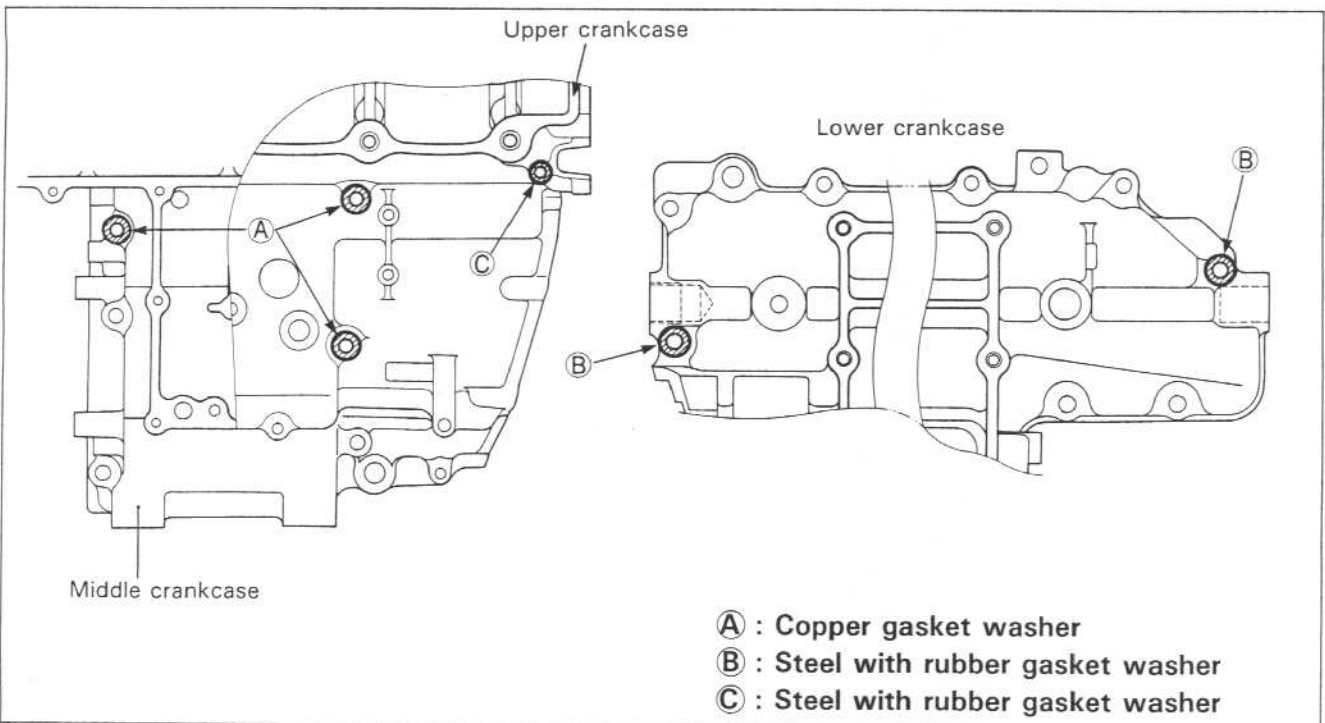
- Install the oil seal retainer with two bolts.

#### NOTE:

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

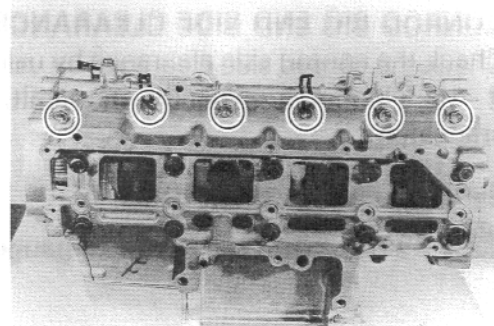
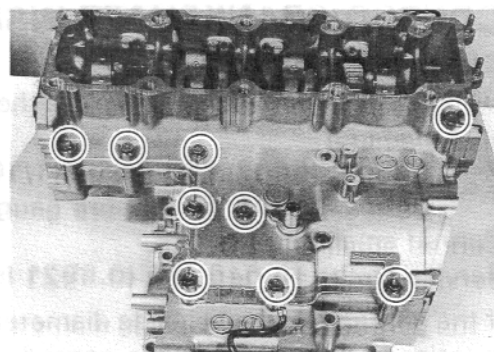


#### LOCATION OF GASKET WASHER



## UPPER AND MIDDLE CRANKCASES/ CRANKSHAFT/CONROD REMOVAL

- Separate the lower crankcase from the middle crankcase. (See page 3H-7.)
- Remove the countershaft assembly and driveshaft assembly. (See page 3H-7.)
- Loosen and remove the crankcase tightening bolts diagonally.



- 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 middle crankcase side with a plastic hammer to separate the upper and middle crankcase halves and then lift the latter.

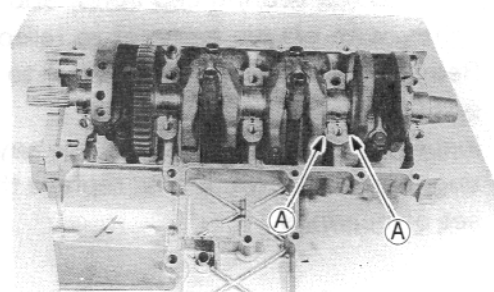
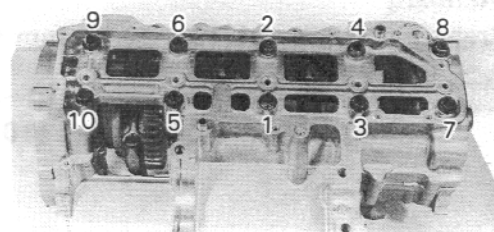
### **CAUTION**

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

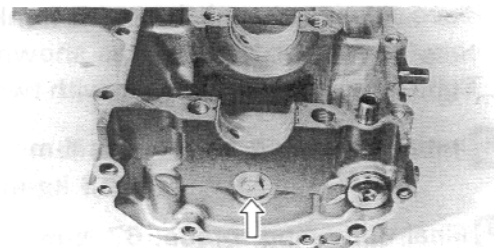
- Remove the crankshaft assembly from the upper crankcase.

### *NOTE:*

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



- Remove the oil jet for the generator fixed on the upper crankcase.





## CONROD/CRANKSHAFT INSPECTION

### CONROD SMALL END I.D.

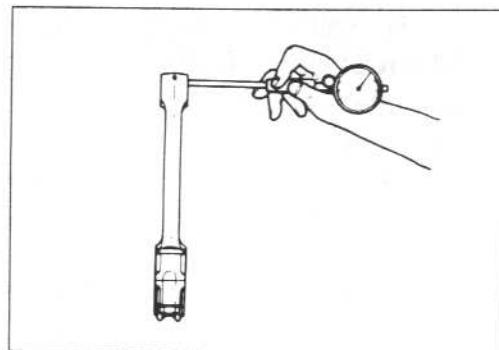
Using a small bore gauge, measure the conrod small end inside diameter.

**TOOL** 09900-20602: Dial gauge (1/1000 mm, 1 mm)  
09900-22401: Small bore gauge (10–18 mm)

Conrod small end I.D.

Service Limit: 15.040 mm (0.5921 in)

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

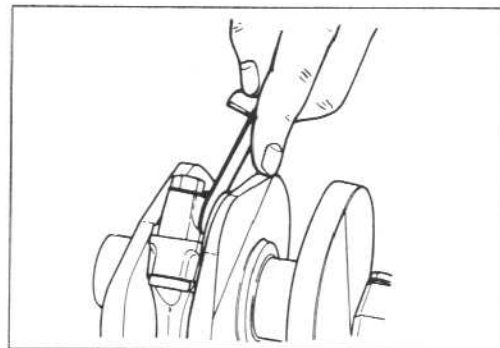


### CONROD BIG END SIDE CLEARANCE

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)

**TOOL** 09900-20803: Thickness gauge



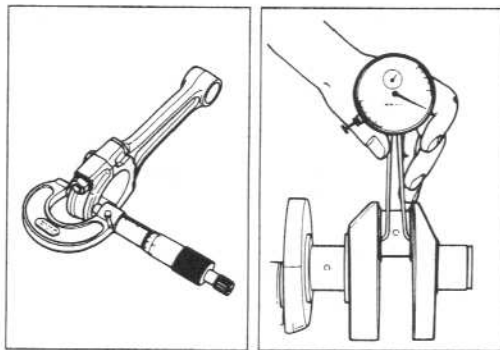
Standard

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

Standard

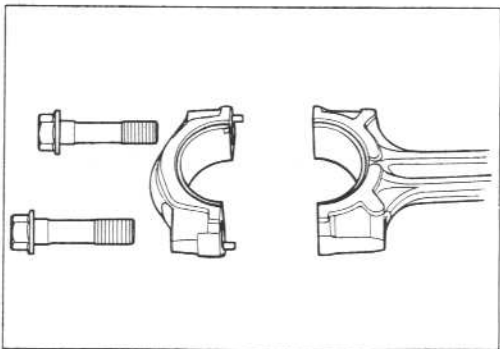
Crank pin width: 21.10–21.15 mm (0.831–0.833 in)

**TOOL** 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.

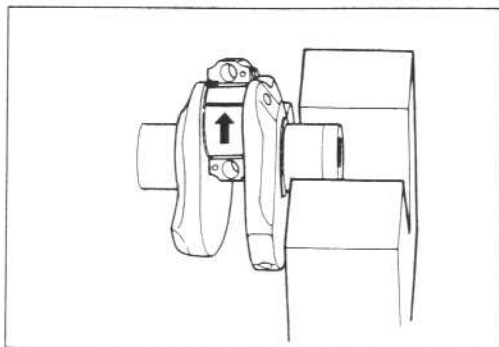


- Place plastigauge axially on the crank pin avoiding the oil hole, at TDC or BDC side as shown.
- Tighten the bearing cap bolts with two-step torque values.

**U** Initial tightening torque: 35 N·m  
(3.5 kg-m, 25.5 lb-ft)

**U** Final tightening torque: 67 N·m  
(6.7 kg-m, 48.5 lb-ft)

**TOOL** 09900-22301: Plastigauge

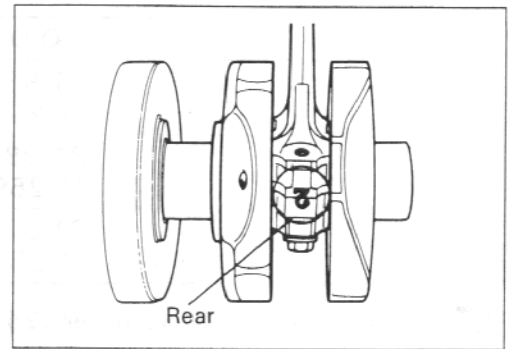


**NOTE:**

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.

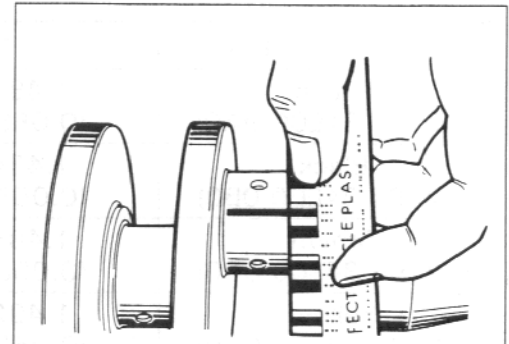


- Remove the caps, and measure the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

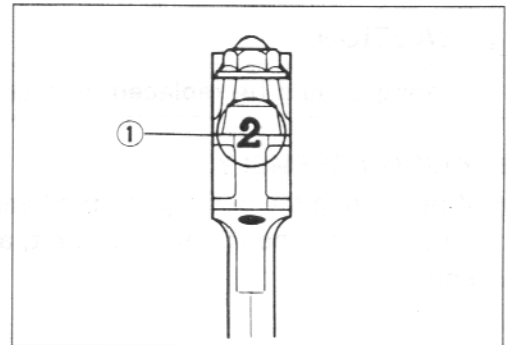
**Crank pin bearing oil clearance**

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

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



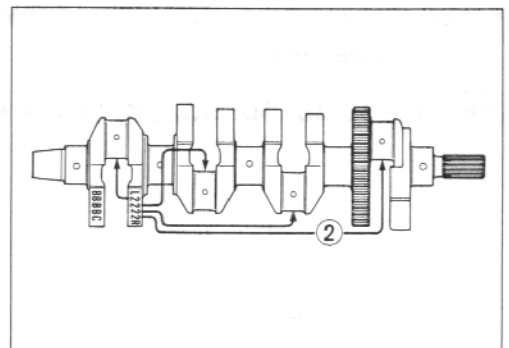
- If oil clearance exceeds the service limit, select the specified bearings from the bearing selection table.
- Check the corresponding conrod I.D. code number ①, "1" or "2".



- 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
Conrod I.D. ①	1	Green	Black	Brown
	2	Black	Brown	Yellow



**Conrod I.D. specification**

Code	I.D. specification
1	35.000–35.008 mm (1.3780–1.3783 in)
2	35.008–35.016 mm (1.3783–1.3786 in)

Crank pin O.D. specification

Code	O.D. specification
1	31.992–32.000 mm (1.2595–1.2598 in)
2	31.984–31.992 mm (1.2592–1.2595 in)
3	31.976–31.984 mm (1.2589–1.2592 in)

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

Bearing thickness

Color (Part No.)	Thickness
Green (12164-34E00-OA0)	1.480–1.484 mm (0.0583–0.0584 in)
Black (12164-34E00-OB0)	1.484–1.488 mm (0.0584–0.0586 in)
Brown (12164-34E00-OC0)	1.488–1.492 mm (0.0586–0.0587 in)
Yellow (12164-34E00-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 and SUZUKI MOLY PASTE to the crank pin and bearing surface.

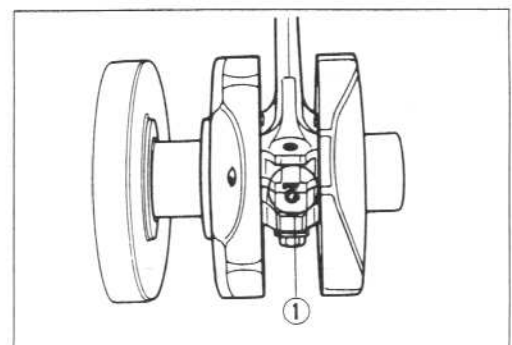
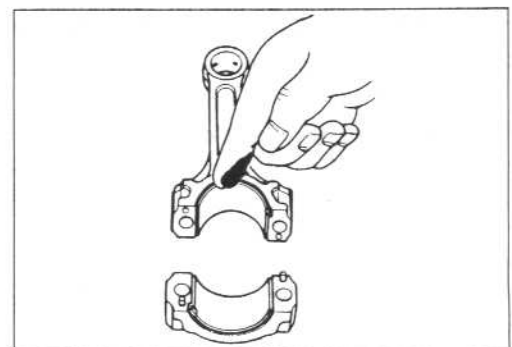
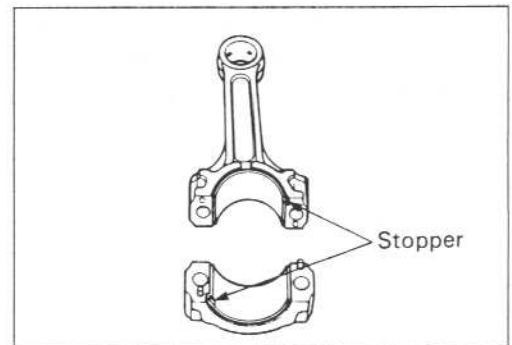
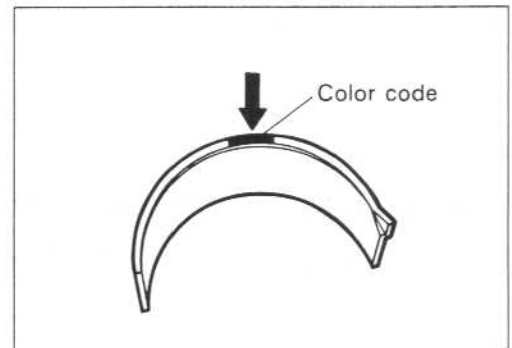
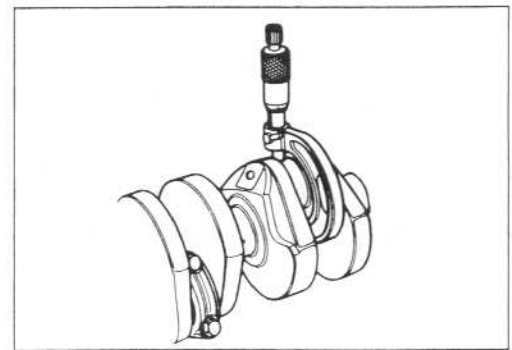
 **099000-25140: SUZUKI MOLY PASTE**

- 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: 35 N·m**  
(3.5 kg-m, 25.5 lb-ft)

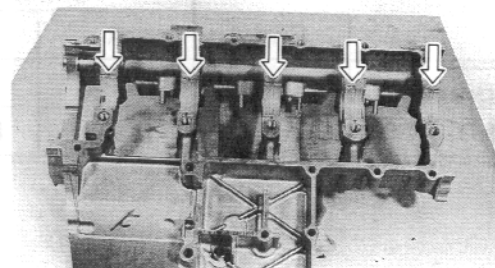
 **Final tightening torque : 67 N·m**  
(6.7 kg-m, 48.5 lb-ft)

- Check the conrod movement for smooth turning.



**CRANKCASE-CRANKSHAFT BEARING SELECTION**

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

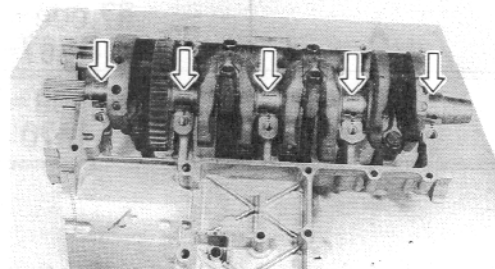


- Place the plastigauge on each crankshaft journal in the usual manner.

**TOOL** 09900-22301: Plastigauge

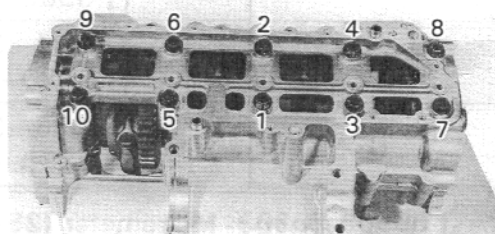
**NOTE:**

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



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

	Initial Tightening	Final Tightening
9 mm bolt	18 N·m 1.8 kg-m 13 lb-ft	32 N·m 3.2 kg-m 23 lb-ft



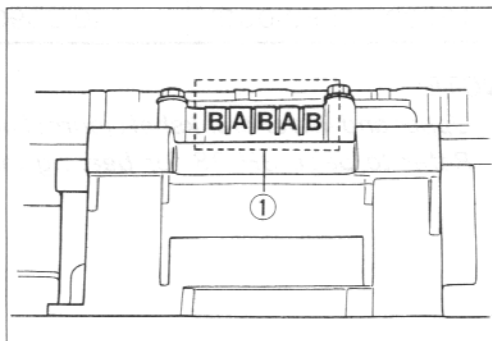
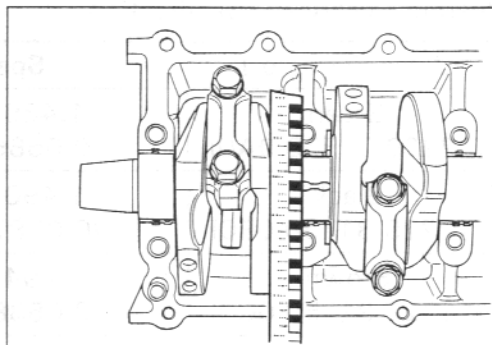
- Remove the middle crankcase, and measure the width of compressed plastigauge in the usual manner.

**Crankshaft journal bearing oil clearance**

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

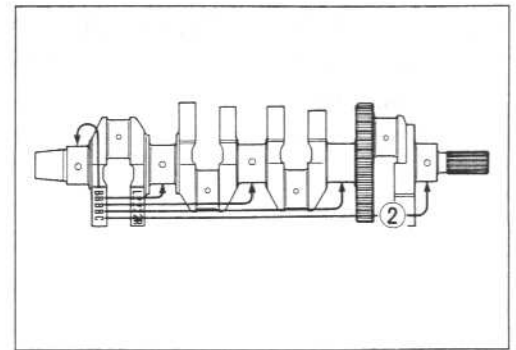
**Service Limit: 0.08 mm (0.0031 in)**

- 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
Crankcase I.D. ①	A	Green	Black	Brown
	B	Black	Brown	Yellow

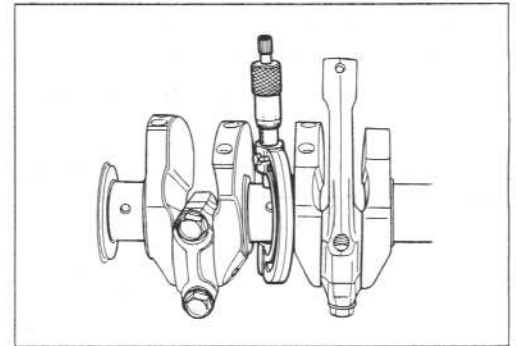


Crankcase I.D. specification

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

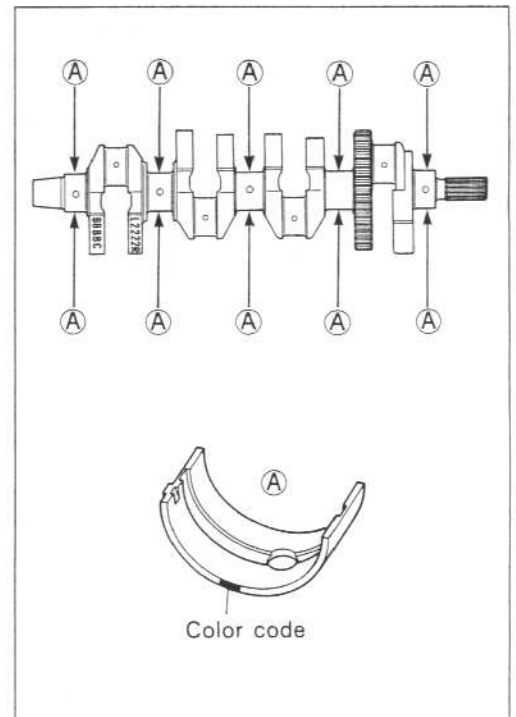
Code	O.D. specification
A	33.992–34.000 mm (1.3383–1.3386 in)
B	33.984–33.992 mm (1.3380–1.3383 in)
C	33.976–33.984 mm (1.3376–1.3380 in)



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

Bearing thickness specification

Color (Part No.)	Specification
Green (12229-31E50-0A0)	1.486–1.490 mm (0.0585–0.0587 in)
Black (12229-31E50-0B0)	1.490–1.494 mm (0.0587–0.0588 in)
Brown (12229-31E50-0C0)	1.494–1.498 mm (0.0588–0.0590 in)
Yellow (12229-31E50-0D0)	1.498–1.502 mm (0.0590–0.0591 in)



NOTE:

- \* Upper and lower crankshaft journal bearings are the same.
- \* Refer to page 3H-28 for bearing installation.



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.

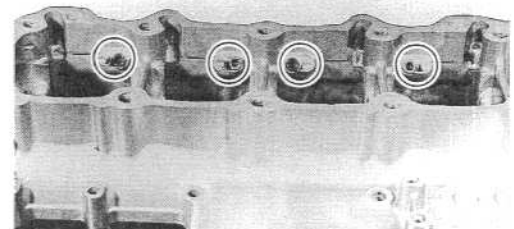
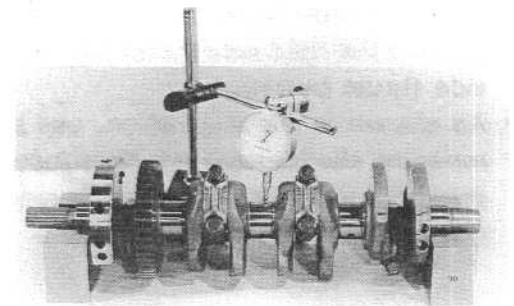
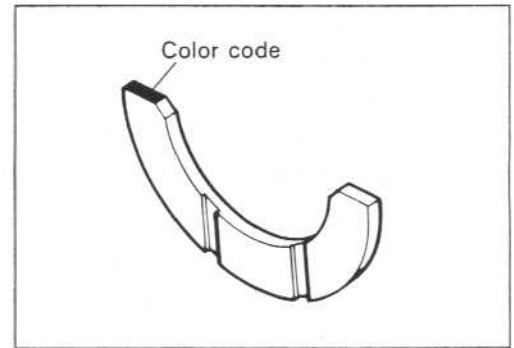
-  **09900-20606: Dial gauge (1/100 mm, 10 mm)**
- 09900-20701: Magnetic stand**
- 09900-21304: V-block (100 mm)**

**Crankshaft runout**

Service Limit: 0.05 mm (0.002 in)

**PISTON COOLING OIL NOZZLE SERVICE**

(Refer to pages 3B-1 and 3B-4 for removal, inspection and installation.)



## UPPER AND MIDDLE CRANKCASES/CRANKSHAFT/CONROD INSTALLATION

- Install the generator oil jet onto the upper crankcase and tighten it to the specified torque.

 Oil jet: 5 N·m (0.5 kg-m, 3.5 lb-ft)

### NOTE:

Check the oil jet for clogging. If it is dirty with oil sediment, oil will not flow smoothly. Clean the oil jet with compressed air.

- When fitting the crankshaft journal bearings to the upper and middle crankcases, be sure to fix the stopper part ① first and press the other end. (Refer to page 3H-25 for bearing specification.)

### CAUTION

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

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

 M99000-25140: SUZUKI MOLY PASTE

- Install the crankshaft to the upper crankcase.
- Insert the right and left-thrust bearings with oil grooved facing the crank web. (Refer to page 3H-27 for thrust bearing specification.)

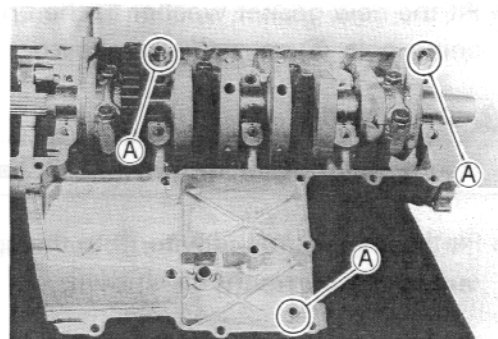
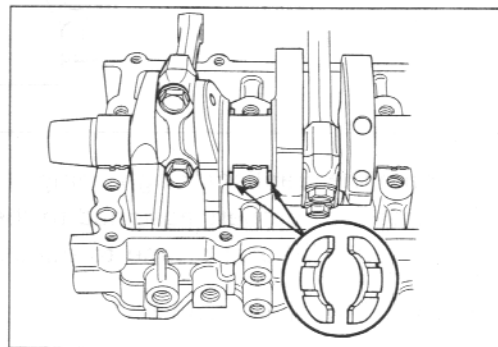
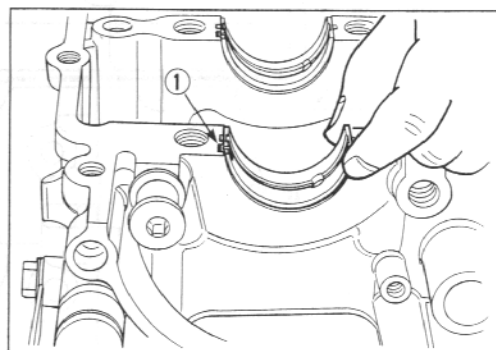
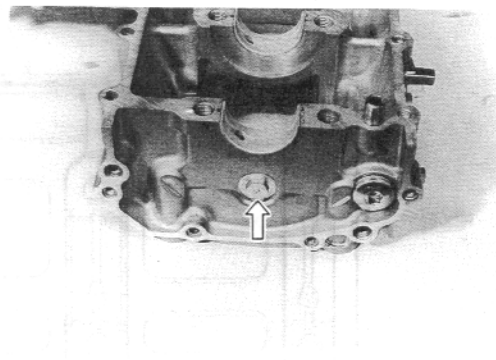
- Clean the mating surfaces of the crankcases before matching the upper and middle ones.
- Install the dowel pins (A) to the upper crankcase.
- Apply SUZUKI BOND NO.1207B to the mating surface of the middle crankcase in the following procedure.

 99104-31140: SUZUKI BOND NO.1207B

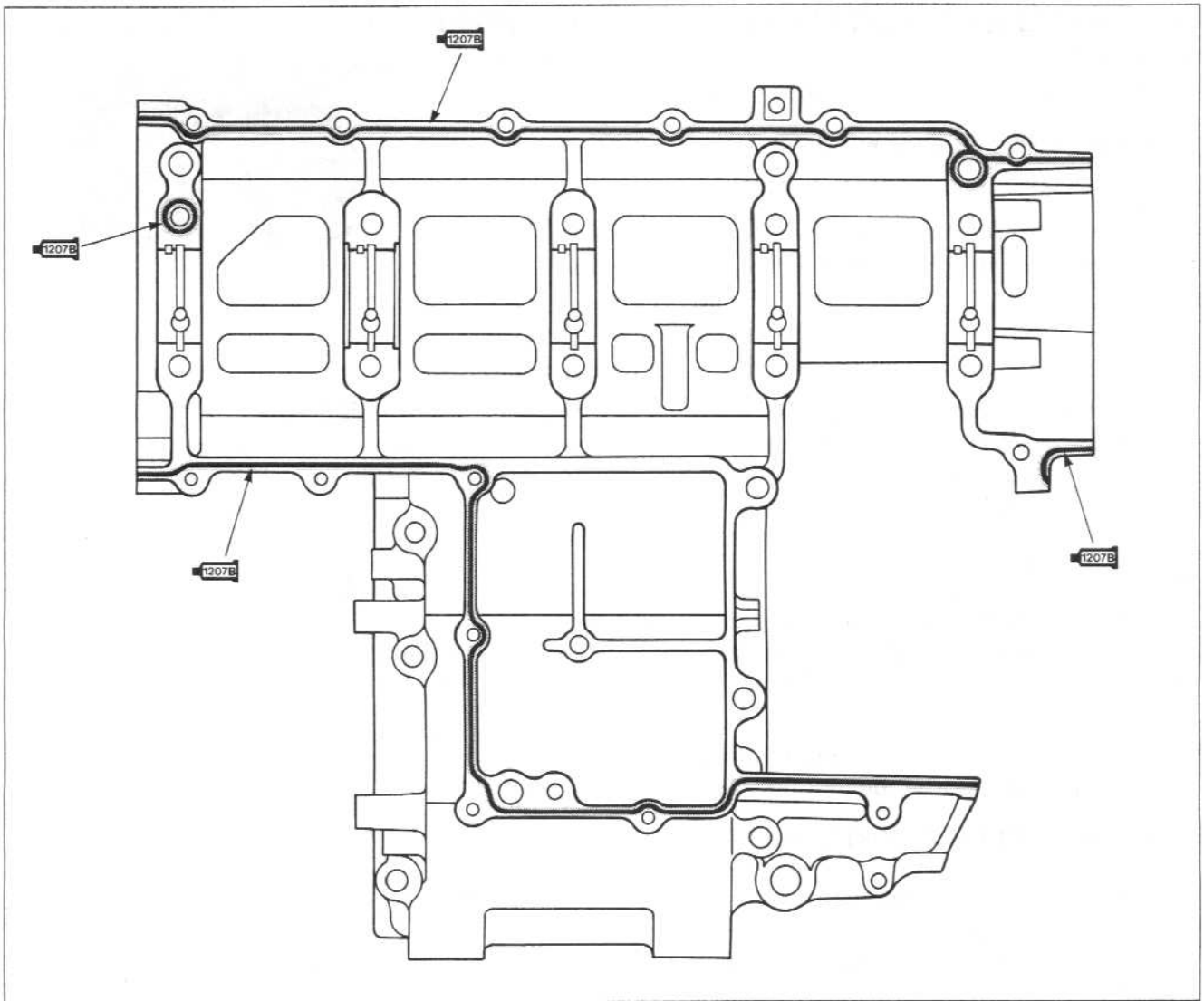
### NOTE:

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 and oil passage area.
- \* Apply to cornered surface as it forms a comparatively thick film.



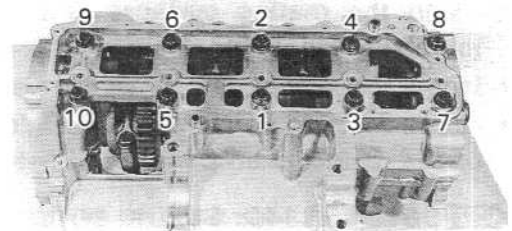




- Tighten the crankshaft tightening 9-mm bolts in ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure.

**🔩 Crankshaft tightening bolt**

Initial tightening			Final tightening		
N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
18	1.8	13	32	3.2	23.0

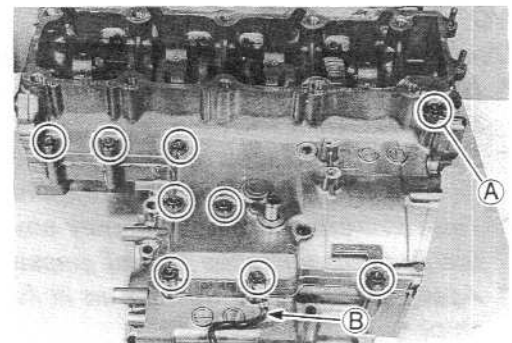


- Fit the new gasket washer to the upper crankcase tightening bolt (A) correctly as shown.

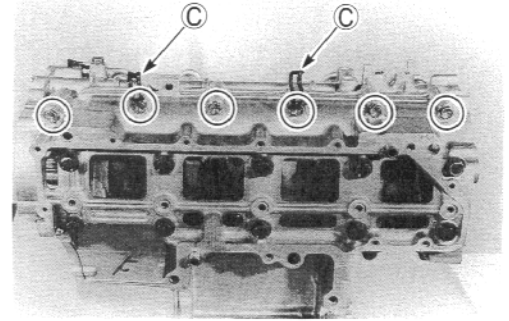
**⚠ CAUTION**

Use a new gasket to prevent oil leakage.

- Fit the engine ground wire (B) to the upper crankcase tightening bolt correctly as shown.



- Fit the lead wire clamps © to the middle crankcase tightening bolts correctly as shown.
- Tighten the crankcase tightening bolts a little at a time to equalize the pressure and tighten them to the specified torque.

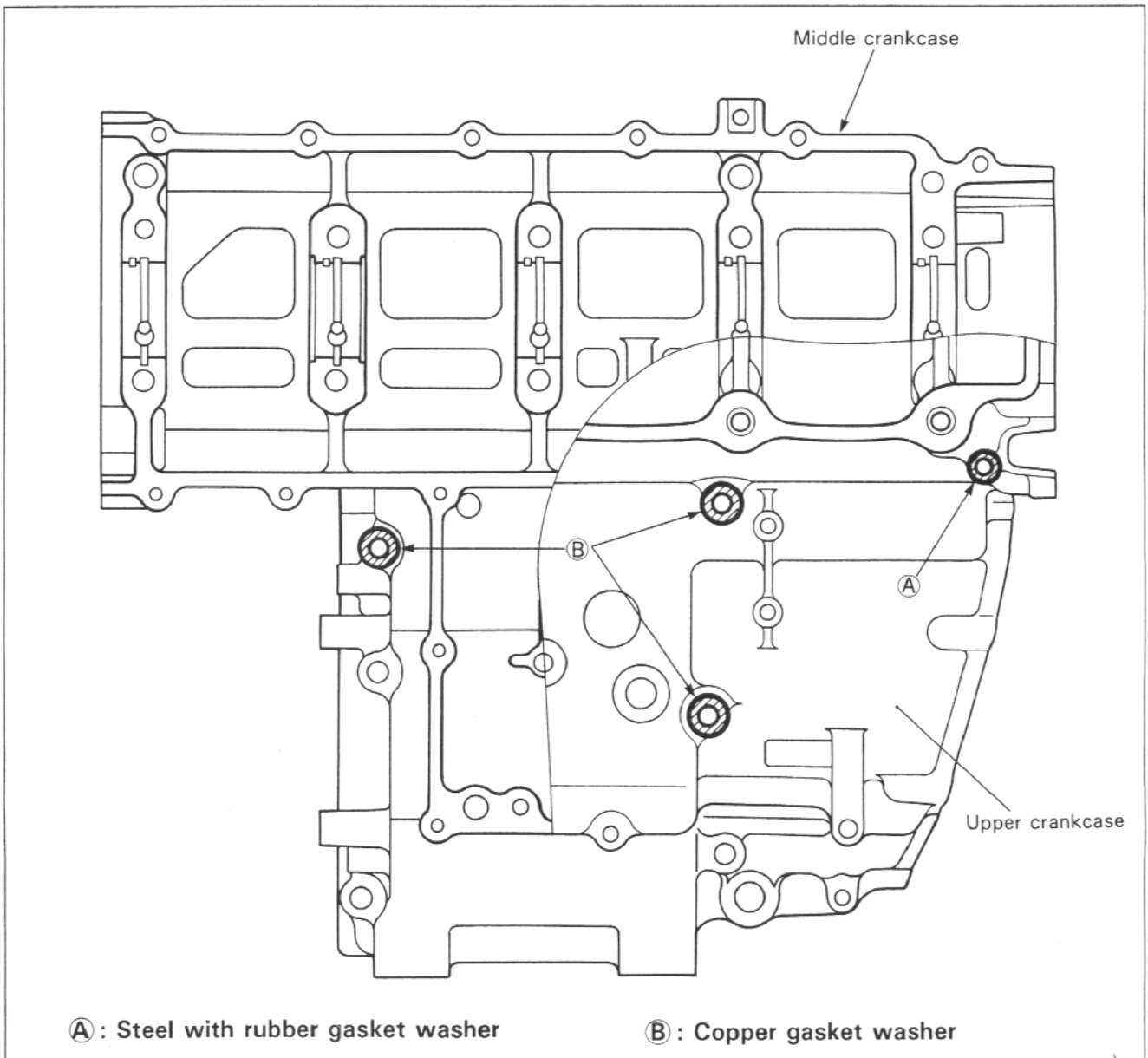


	Initial tightening			Final tightening		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
6 mm bolt	6	0.6	4.5	11	1.1	8.0
8 mm bolt	13	1.3	9.5	24	2.4	17.5
9 mm bolt	18	1.8	13	32	3.2	23.0

**TOOL** 09900-00410: Hexagon wrench set

Refer to page 3H-17 for lower crankcase and transmission installation.

#### LOCATION OF GASKET WASHER





# FUEL AND LUBRICATION SYSTEM

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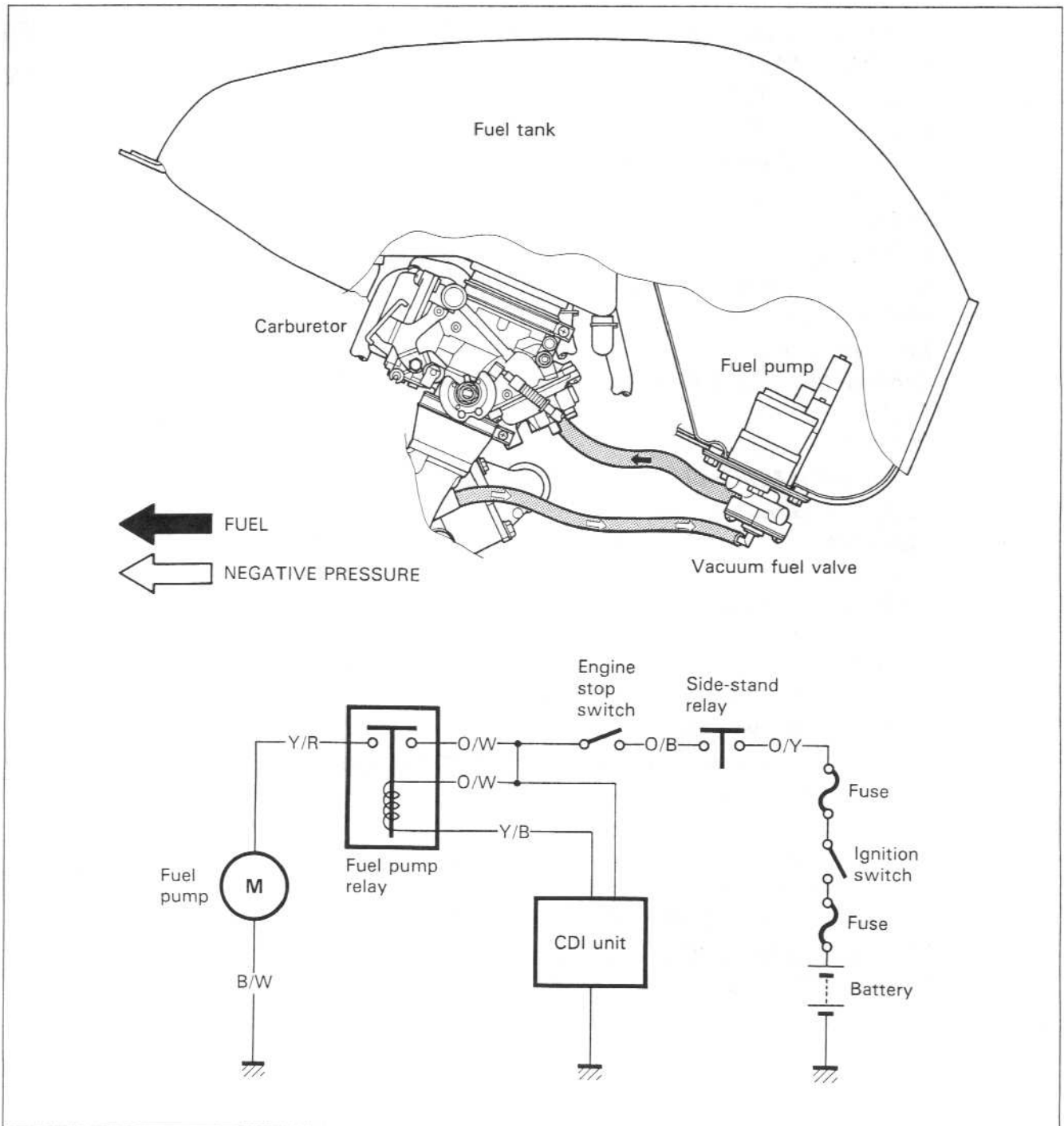
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## FUEL SYSTEM

The fuel system consists of the fuel tank, fuel pump, fuel pump relay, vacuum fuel valve, CDI unit and carburetors.

The fuel pump relay is located behind the left frame cover. The fuel pump located in the fuel tank is an electric-motor type and its electrical energy is supplied from battery which is controlled by the CDI unit and fuel pump relay.

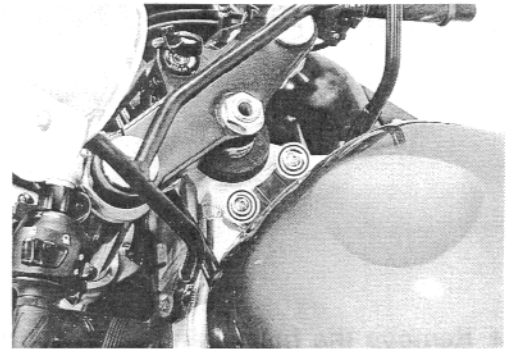
When the engine stop switch "RUN" position and turning the ignition switch ON, the fuel pump operates and applies pressure to fuel (After a few seconds, the fuel pump will stop unless depressing the starter button.). When turning the starter motor by depressing the starter button, a negative pressure is generated in the combustion chamber. This negative pressure draws the vacuum fuel valve diaphragm, (through a passage way in the vacuum hose.) The vacuum fuel valve is then forced to open and allow fuel to flow into the carburetor float chamber.



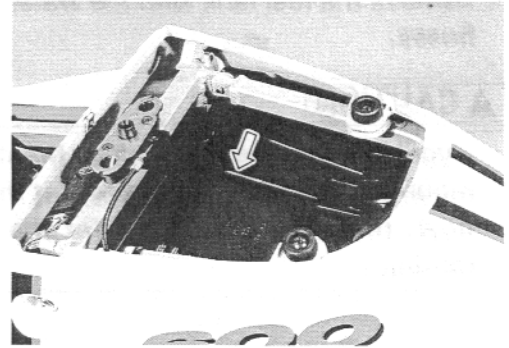
## FUEL TANK

### FUEL TANK LIFT-UP

- Remove the front and the rear seats. (Refer to page 6-3.)
- Remove the fuel tank mounting bolts.



- Take up the fuel tank prop.



- Lift and support the fuel tank with its prop.

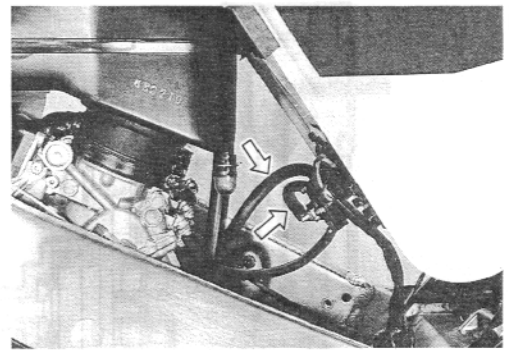


### FUEL TANK REMOVAL

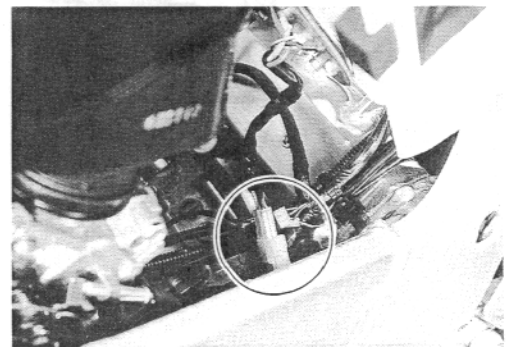
- Remove the front and the rear seats. (Refer to page 6-3.)
- Lift and support the fuel tank with its prop.
- Disconnect the fuel hose and vacuum hose from the vacuum fuel valve.

#### **⚠ WARNING**

Gasoline is highly flammable and explosive. Keep heat, spark and flame away.



- Disconnect the fuel pump lead wire coupler.



## 4-3 FUEL AND LUBRICATION SYSTEM

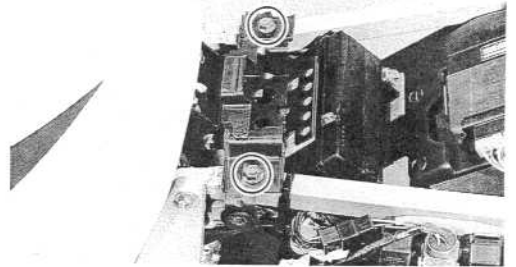
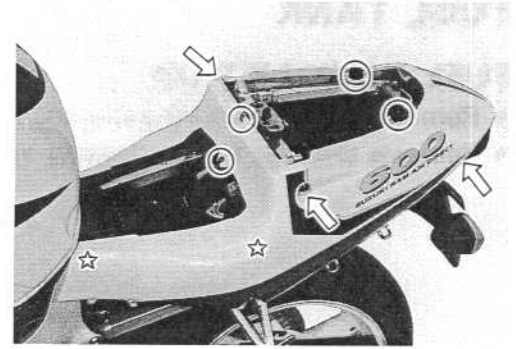
- Remove the frame cover. (Refer to page 6-4.)

☆: hooked part

- Remove the fuel tank bracket bolts.
- Remove the fuel tank with the water drain and air breather hoses.

### ⚠ CAUTION

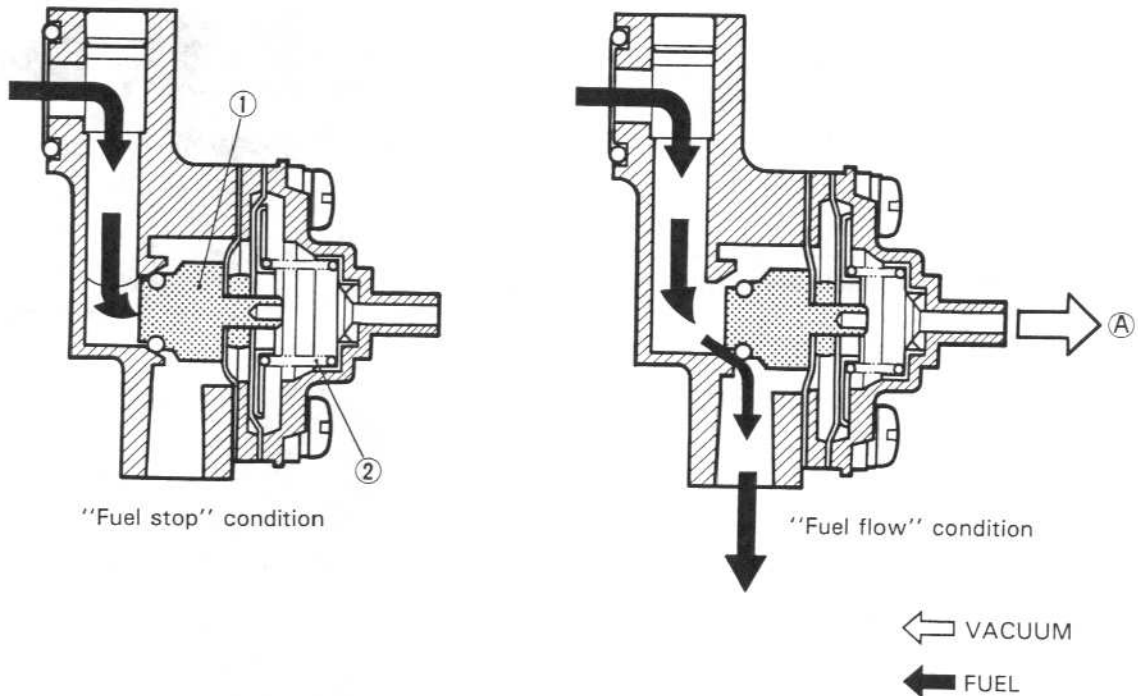
Avoid bending the fuel tank air breather hose when re-mounting the fuel tank to prevent the stoppage of fuel flow. (Refer to page 8-18 for the air breather hose routing.)



## VACUUM FUEL VALVE

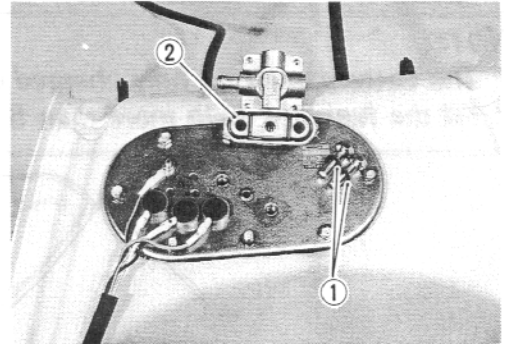
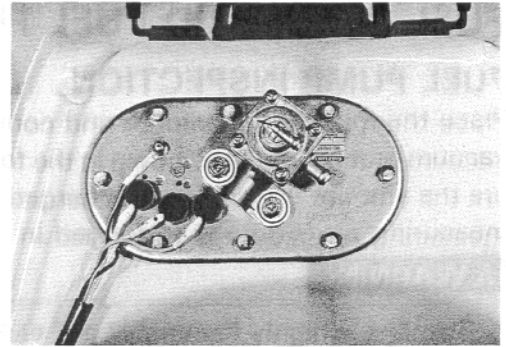
When the engine is not running, the fuel valve ① is kept in the closed position by applying pressure and utilizing the tension of spring ② so that no fuel will flow to the carburetors.

When the engine is cranking, a vacuum (A) is generated in the diaphragm chamber through the vacuum hose which is connected to the intake pipe, and builds up a vacuum (A) which is higher than the tension of spring ② so that the diaphragm is forced to open the fuel valve ① and thus allow the fuel to flow to the carburetors.



## VACUUM FUEL VALVE REMOVAL

- Remove the fuel tank. (Refer to pages 4-2 and -3.)
- Remove the vacuum fuel valve by removing its mounting bolts.



### ⚠ WARNING

- \* Gasoline is very explosive. Extreme care must be taken.
- \* Gaskets ① and O-ring ② must be replaced with new ones to prevent fuel leakage.

## VACUUM FUEL VALVE INSPECTION

Connect the vacuum pump gauge to the vacuum port of the vacuum fuel valve. Apply negative pressure to the vacuum fuel valve and blow the fuel outlet port. If air does not flow out, replace the vacuum fuel valve with a new one.

**TOOL** 09917-47910: Vacuum pump gauge

Negative pressure: 13.3 kPa (0.133 kg/cm<sup>2</sup>, 1.89 psi)

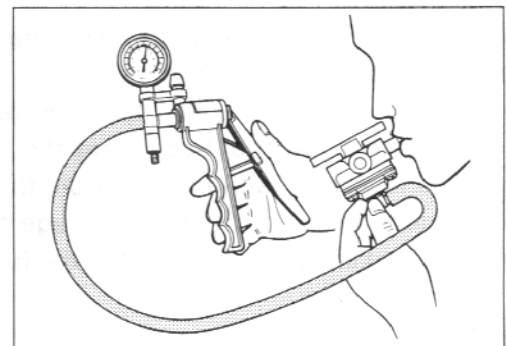
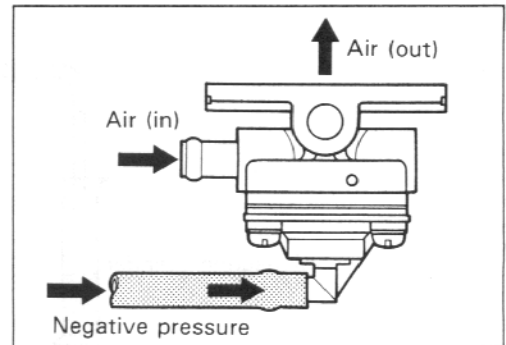
### ⚠ WARNING

Gasoline and gasoline vapor is toxic. A small amount of fuel is remaining in the vacuum fuel valve, when checking it.

Do not swallow the fuel when blowing the fuel outlet port.

### ⚠ CAUTION

Use a hand operated vacuum pump. Avoid applying high negative pressure to prevent the vacuum fuel valve damage.





## FUEL PUMP AND FUEL FILTER

### FUEL PUMP INSPECTION

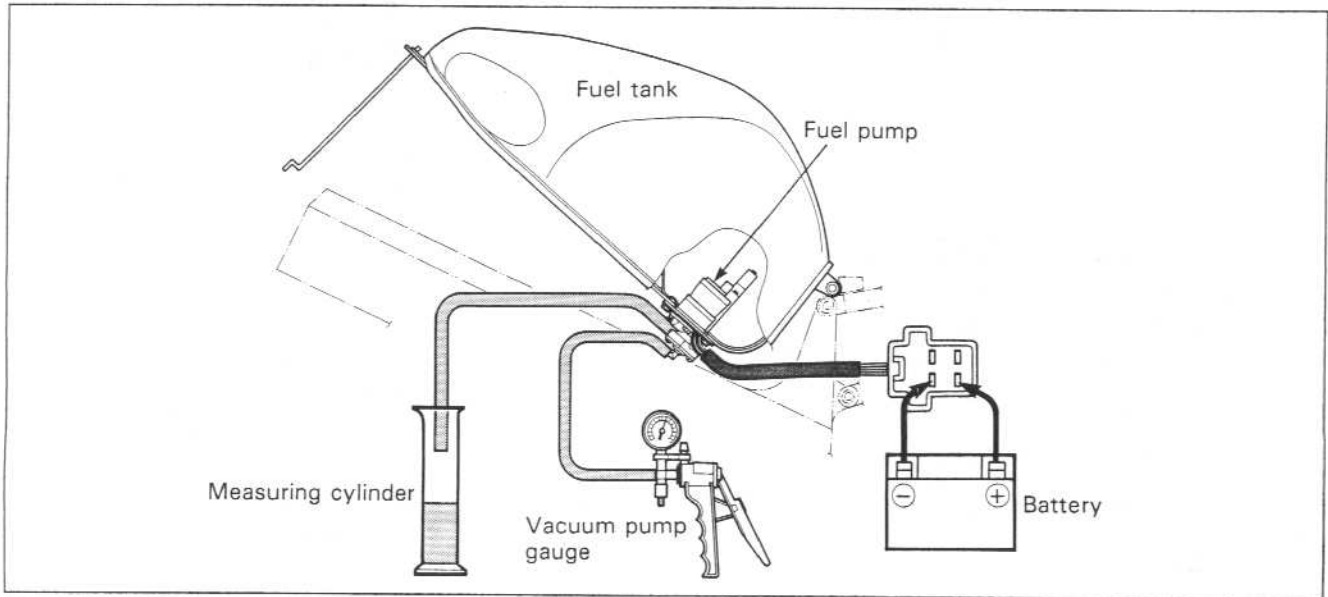
Place the measuring cylinder and connect the battery and vacuum pump gauge as shown in the following figure. Measure the amount of gasoline discharged from fuel pump. The measuring procedure is described in the follow.

**⚠ WARNING**

Gasoline is highly flammable and explosive. Keep heat, sparks and flame away.

**NOTE:**

- \* The battery must be fully charged condition.
- \* Fill the fuel tank with more than 5 liters of gasoline.



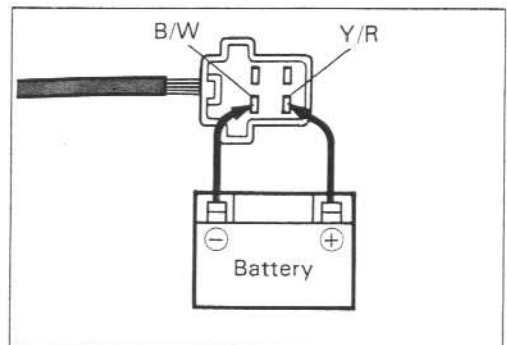
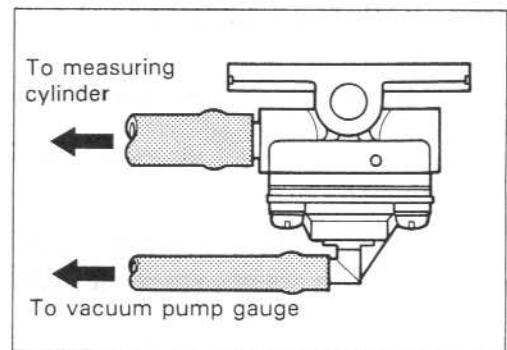
Measure the amount of gasoline discharged from fuel pump in the following procedure.

- Lift and support the fuel tank. (Refer to page 4-2.)
- Disconnect the fuel hose from the carburetor.
- Disconnect the vacuum hose from the vacuum fuel valve.
- Connect the vacuum pump gauge to the vacuum fuel valve and insert the free end of the fuel hose to the measuring cylinder.

**TOOL** 09917-47910: Vacuum pump gauge

- Disconnect the fuel pump lead wire coupler and attach the battery ⊕ terminal to Y/R lead wire and ⊖ terminal to B/W lead wire.

Y/R : Yellow with Red tracer  
 B/W : Black with White tracer



- Then apply negative pressure to the vacuum fuel valve and measure the discharged amount from the fuel pump for 1 minute by using measuring cylinder.

Negative pressure: 13.3 kPa (0.133 kg/cm<sup>2</sup>, 1.89 psi)

Discharged amount: Over 1.0 L/min

(1.06 (US) qt/min, 0.88 (Imp) qt/min)

**▲ CAUTION**

Use a hand operated vacuum pump. Avoid applying high negative pressure to prevent the vacuum fuel valve damage.

If the discharged amount is less than the specified value, check the vacuum fuel valve. (Refer to page 4-4.)

If the vacuum fuel valve is all right, replace the fuel pump assembly with a new one.

**FUEL PUMP AND FUEL FILTER REMOVAL**

- Remove the fuel tank. (Refer to pages 4-2 and -3.)
- Remove the fuel pump assembly by removing its mounting bolts.

**▲ WARNING**

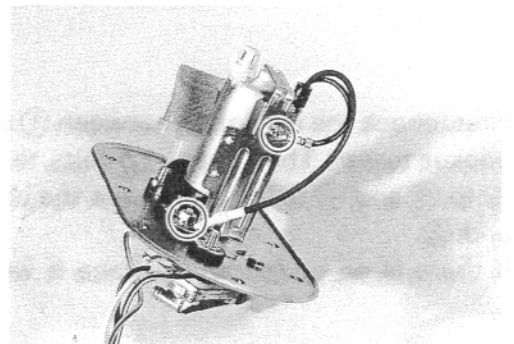
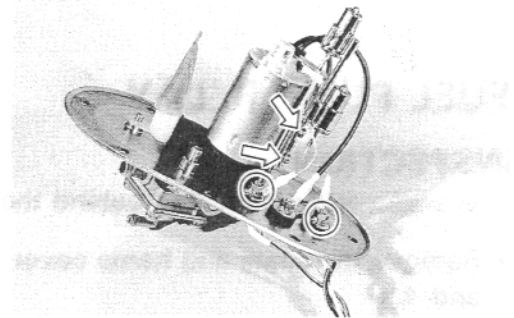
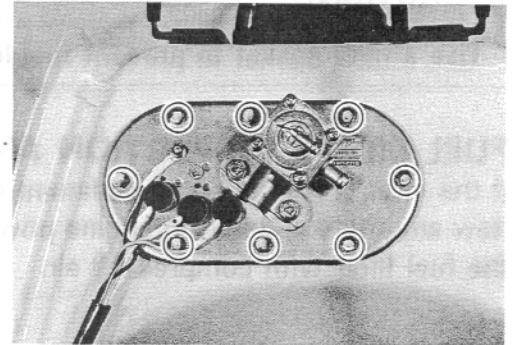
- \* Gasoline is very explosive. Extreme care must be taken.
- \* Gasket must be replaced with a new one to prevent fuel leakage.

- Remove the fuel level indicator switch by disconnecting its lead wires and removing its mounting screws.

*NOTE:*

*When inspecting the fuel level indicator switch, refer to page 7-34.*

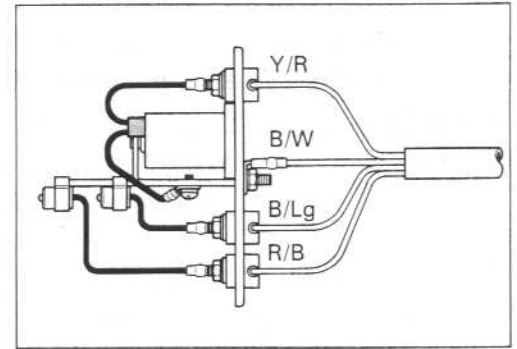
- Remove the fuel pump and fuel filter by disconnecting its lead wires and removing its retainer.



## 4-7 FUEL AND LUBRICATION SYSTEM


### NOTE:

When assembling the fuel pump and fuel level indicator switch, connect the lead wires as shown in the right illustration.



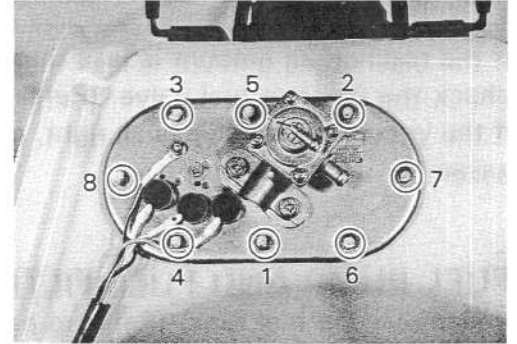
### NOTE:

When installing the fuel pump, lightly tighten all the fuel pump mounting bolts and then tighten them to the specified torque in the ascending order of numbers.

-  Fuel pump mounting bolt : 3 N·m  
(0.3 kg-m, 2.0 lb-ft)

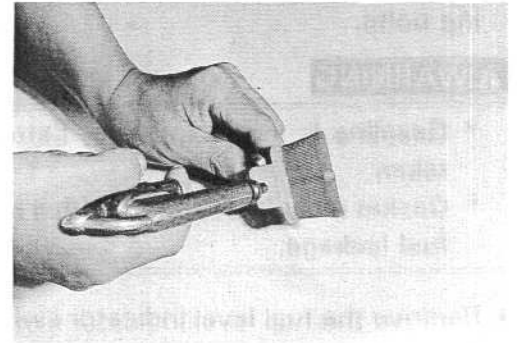
### CAUTION

Use a new gasket to prevent fuel leakage.



## FUEL FILTER INSPECTION AND CLEANING

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

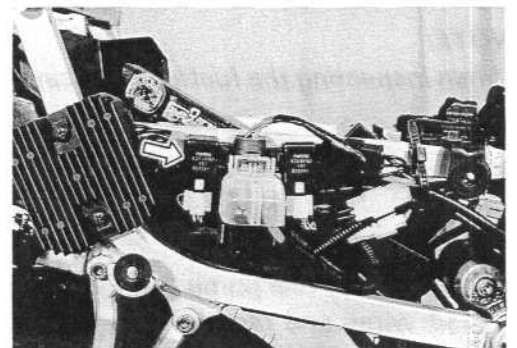


## FUEL PUMP RELAY

### INSPECTION

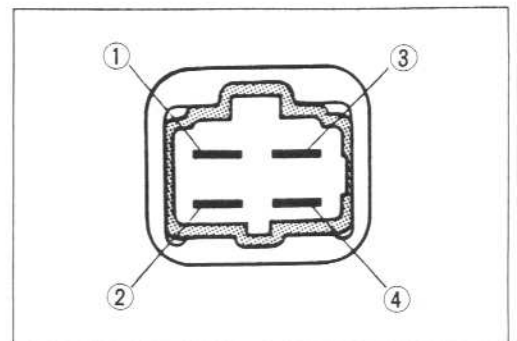
Fuel pump relay is located behind the left frame cover.

- Remove the seats and frame cover. (Refer to pages 6-3 and 4.)
- Remove the fuel pump relay.



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.

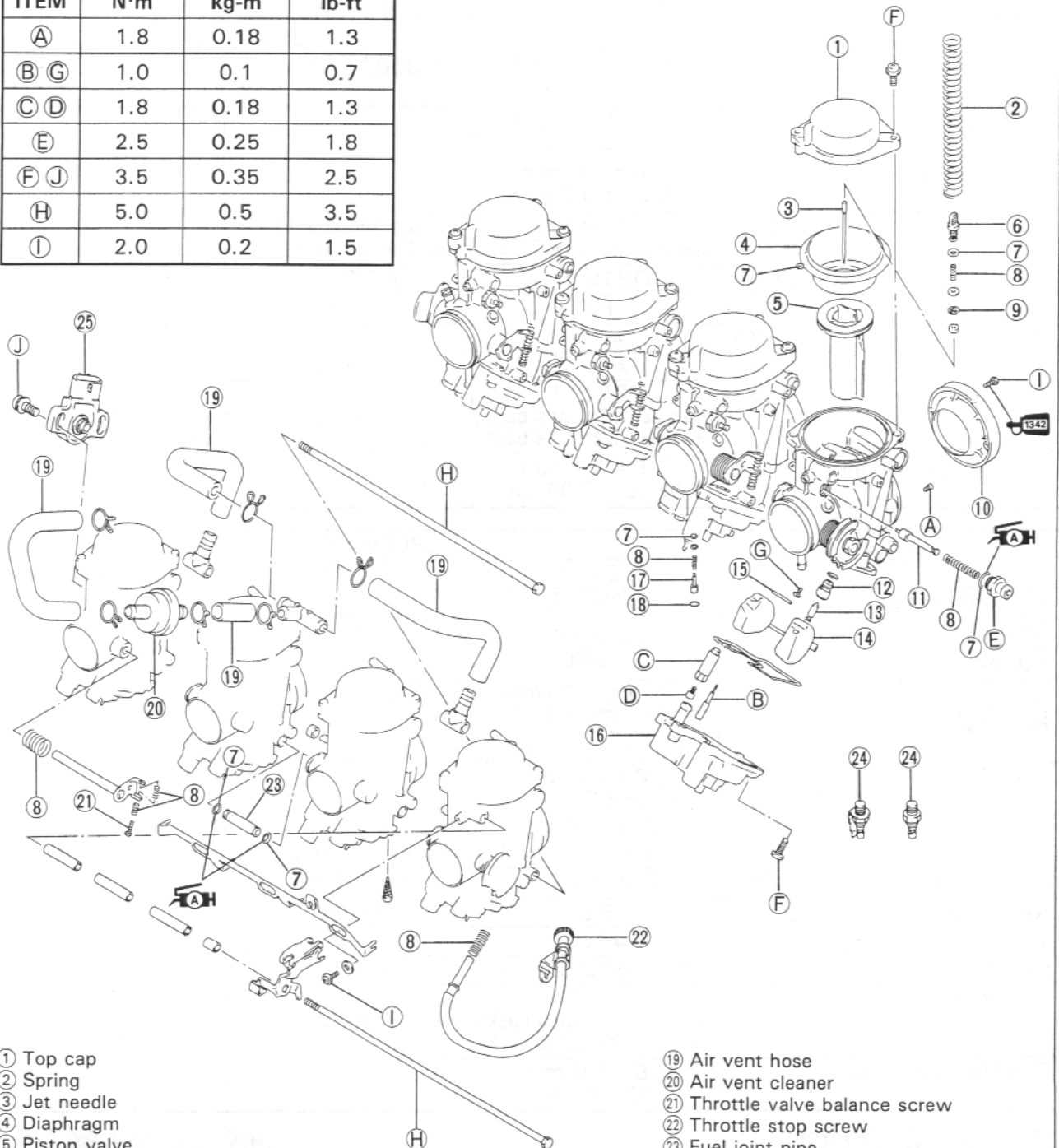
If there is no continuity, replace it with a new one.



# CARBURETOR CONSTRUCTION



ITEM	N·m	kg-m	lb-ft
Ⓐ	1.8	0.18	1.3
Ⓑ Ⓒ	1.0	0.1	0.7
Ⓒ Ⓓ	1.8	0.18	1.3
Ⓔ	2.5	0.25	1.8
Ⓕ Ⓖ	3.5	0.35	2.5
Ⓗ	5.0	0.5	3.5
Ⓘ	2.0	0.2	1.5



- ① Top cap
- ② Spring
- ③ Jet needle
- ④ Diaphragm
- ⑤ Piston valve
- ⑥ Jet needle stopper
- ⑦ O-ring
- ⑧ Spring
- ⑨ E-ring
- ⑩ Funnel
- ⑪ Starter plunger
- ⑫ Valve seat
- ⑬ Needle valve

- ⑭ Float
- ⑮ Float pin
- ⑯ Float chamber
- ⑰ Pilot screw
- ⑱ Plug (For E-03, 18, 28, 33 and 39 models)

- ⑲ Air vent hose
  - ⑳ Air vent cleaner
  - ㉑ Throttle valve balance screw
  - ㉒ Throttle stop screw
  - ㉓ Fuel joint pipe
  - ㉔ Carburetor heater (For E-02 model)
  - ㉕ Throttle position sensor
- Ⓐ Pilot air jet
  - Ⓑ Pilot jet
  - Ⓒ Main jet holder
  - Ⓓ Main jet
  - Ⓗ Carburetor connecting bolt

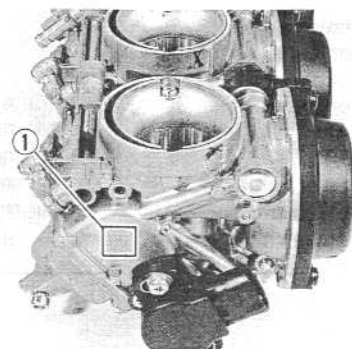
## SPECIFICATIONS

ITEM	SPECIFICATION		
	E-02,04,25,34	E-03,18,28,39	E-17,22
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	34E0	34E1	34E2
Idle r/min.	1 200 ± 100 r/min.	1 300 ± 100 r/min. ... E03,28,39 1 300 <sup>+100</sup> <sub>-50</sub> r/min. ... E18	1 200 ± 100 r/min.
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	No.1: # 125 Nos.2,3 and 4: # 122.5	Nos.1 and 4: # 125 Nos.2 and 3: # 122.5	No.1: # 125 Nos.2,3 and 4: # 122.5
Jet needle (J.N.)	5DH18-52-3	5DH20-53	5DH18-52-3
Needle jet (N.J.)	P-0	P-DM	P-0
Throttle valve (Th.V.)	# 100	←	←
Pilot jet (P.J.)	# 12.5	# 12.5	# 12.5
Pilot screw (P.S.)	PRE-SET (Nos.1 and 4: 3½ turns back) (Nos.2 and 3: 2½ turns back)	PRE-SET	PRE-SET (Nos.1 and 4: 3¼ turns back) (Nos.2 and 3: 2¼ turns back)
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←	←

ITEM	SPECIFICATION		
	E-24	E-33	E-37
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	34E4	34E3	34E5
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min	1 200 ± 100 r/min
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	No.1: # 125 Nos.2,3 and 4: # 122.5	Nos.1 and 4: # 125 Nos.2 and 3: # 122.5	No.1: # 125 Nos.2,3 and 4: # 122.5
Jet needle (J.N.)	5DH18-52-3	5DH20-53	5DH18-52-3
Needle jet (N.J.)	P-0	P-DM	P-0
Throttle valve (Th.V.)	# 100	←	←
Pilot jet (P.J.)	# 12.5	# 12.5	# 12.5
Pilot screw (P.S.)	PRE-SET (Nos.1 and 4: 3¼ turns back) (Nos.2 and 3: 2¼ turns back)	PRE-SET	PRE-SET (Nos.1 and 4: 3½ turns back) (Nos.2 and 3: 2½ turns back)
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←	←

## I.D. NO. LOCATION

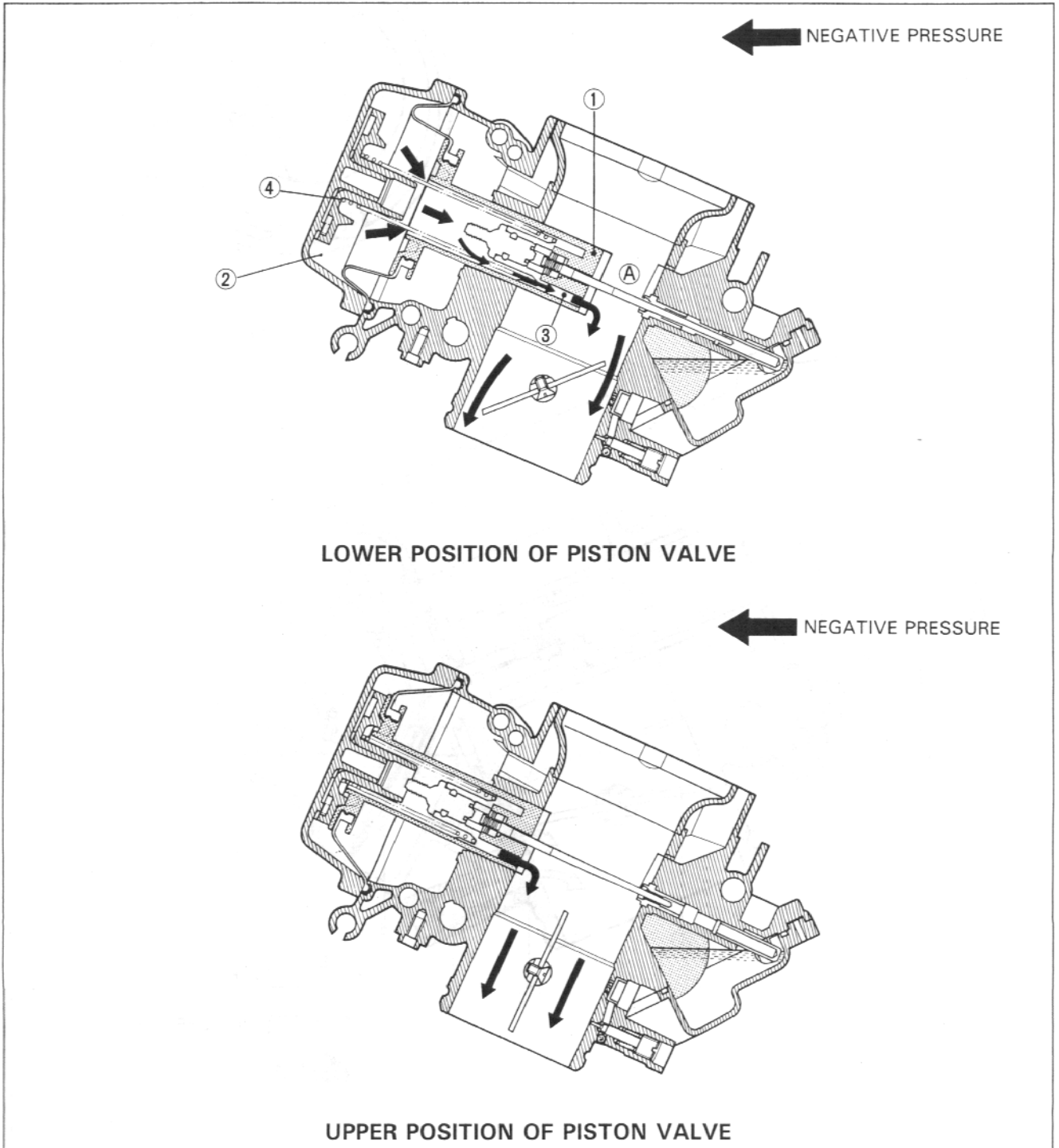
Each carburetor has I.D. Number ① printed on the carburetor body according to its specification.



## DIAPHRAGM AND PISTON OPERATION

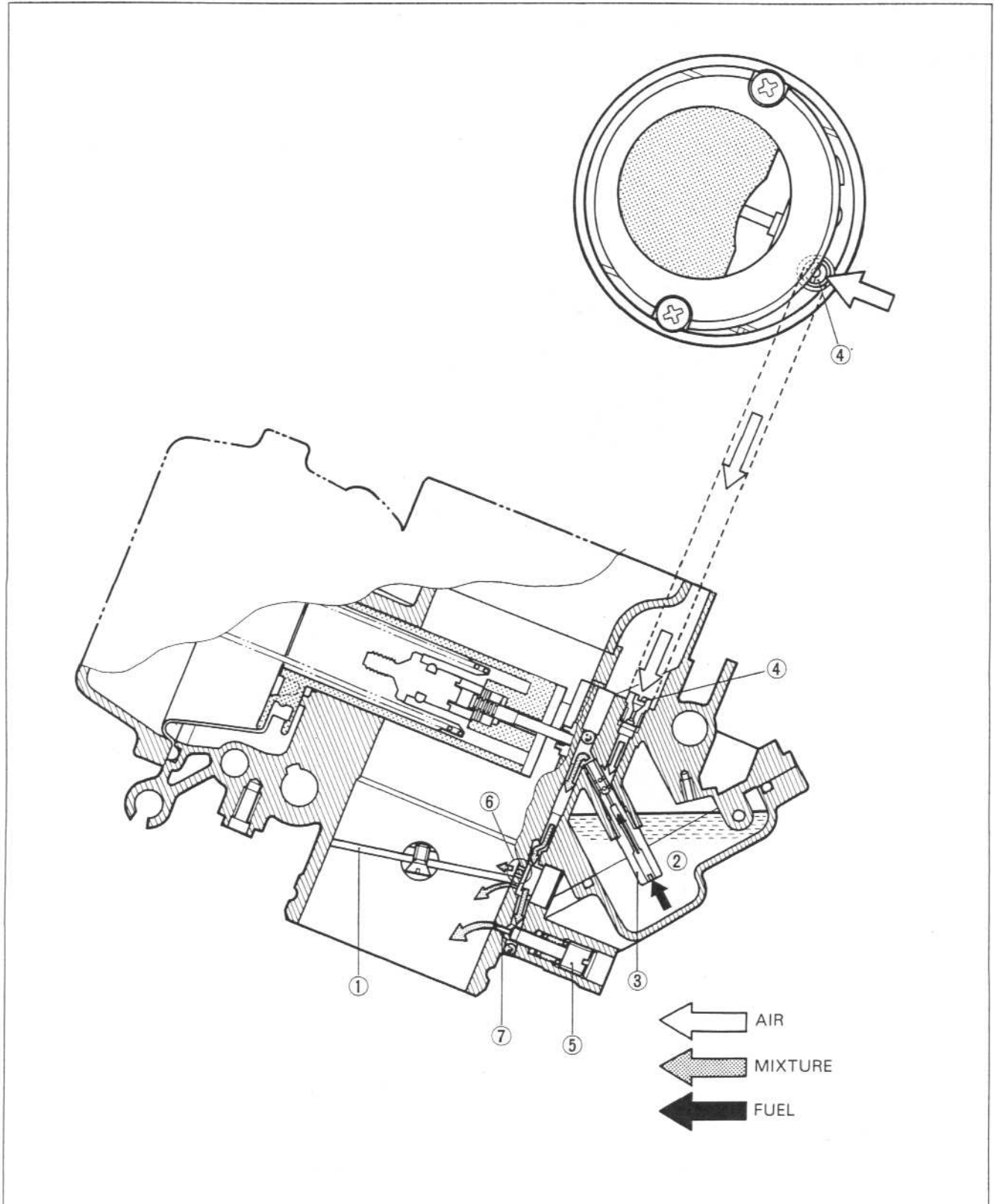
The carburetor is a variable-venturi type. The venturi cross section area of carburetor is increased or decreased automatically by the piston valve ① which moves according to the negative pressure present on the downstream side of the venturi (A). Negative pressure is admitted into the diaphragm chamber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



**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.

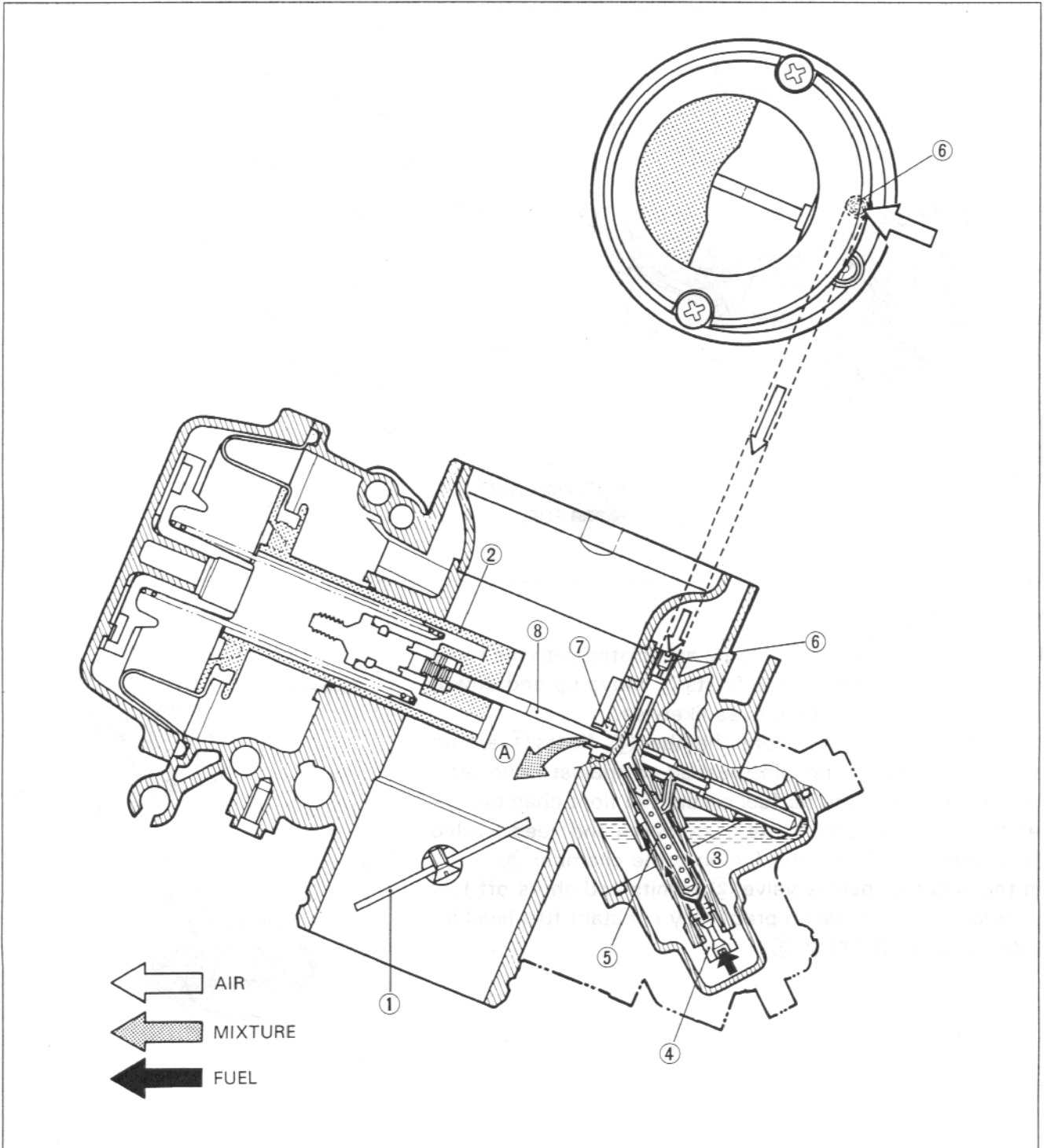


### MAIN SYSTEM

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

Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel passes around main bleed pipe ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion and the emulsified fuel enters needle jet ⑦.

The emulsified fuel then passes through the clearance between needle jet ⑦ and jet needle ⑧, and is discharged into the venturi ①, in which it meets main air stream being drawn by the engine. Mixture proportioning is accomplished in needle jet ⑦; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.



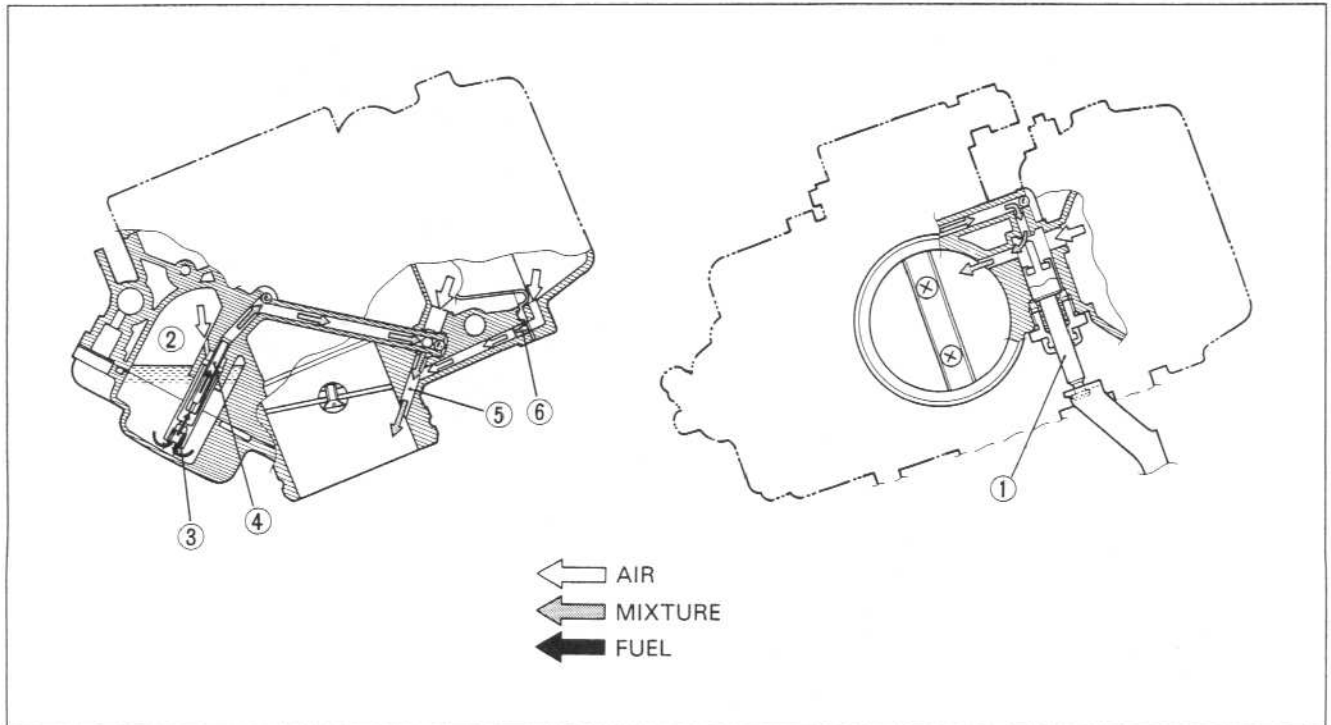


### STARTER (ENRICHENER) SYSTEM

Pulling up the starter plunger 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 ①, in which it mixes again with the air coming from behind diaphragm, and flows starter outlet ⑤, in which it mixes again with air coming through the starter air jet ⑥ from diaphragm chamber. The three 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 ⑤ into the main bore.

**NOTE:**

*An enrichener (starter) is operated almost the same way as a choke.*



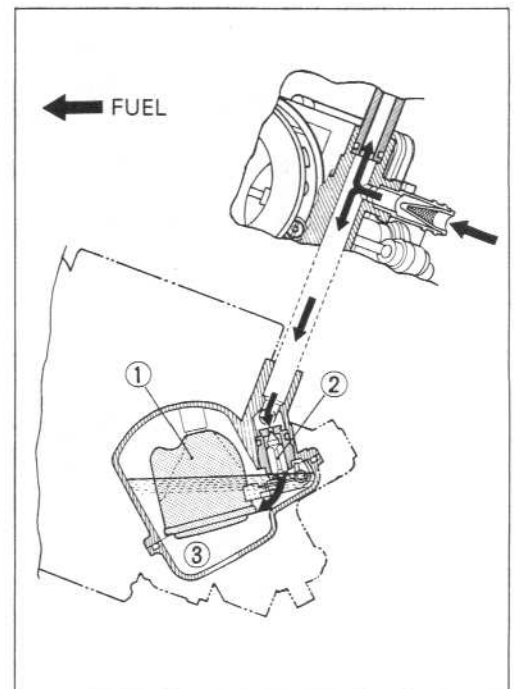
### FLOAT SYSTEM

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.

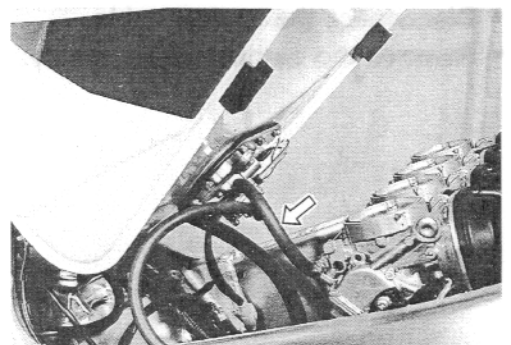
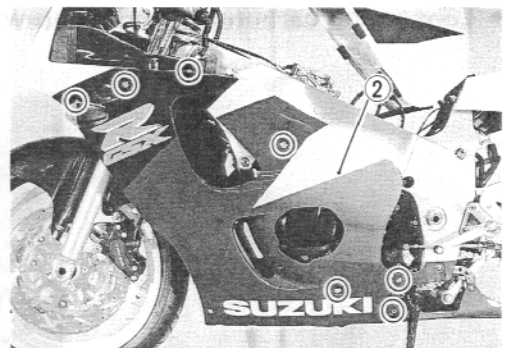
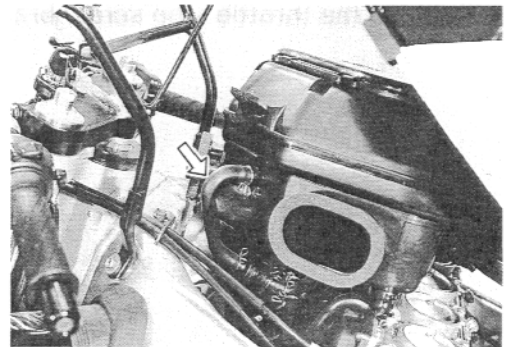
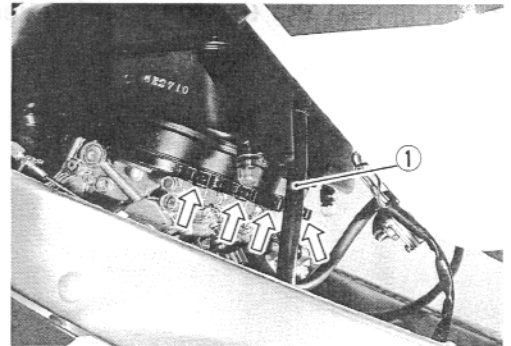
As the fuel level falls, floats ① go down and needle valve ② unseats itself to admit fuel into the chamber ③.

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



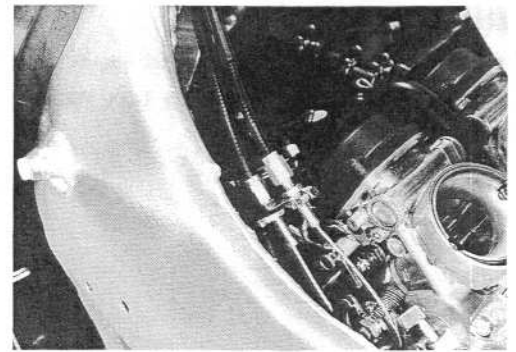
## REMOVAL

- Lift and support the fuel tank. (Refer to page 4-2.)
- Remove the air cleaner box mounting bolt.
- Loosen the carburetor clamp screws at the air cleaner box side.
- Disconnect the crankcase breather hose ①.
- Disconnect the carburetor air vent hose and remove the air cleaner box.
- Remove the left side lower fairing ②. (Refer to page 6-2.)
- Disconnect the fuel hose from the vacuum fuel valve.

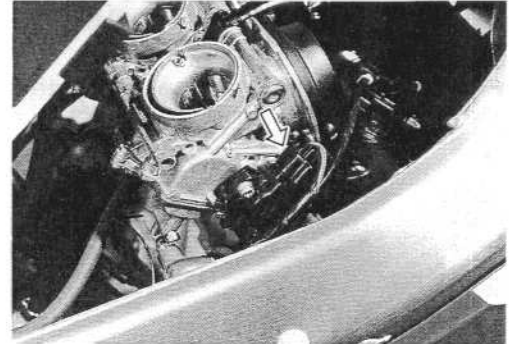


## 4-15 FUEL AND LUBRICATION SYSTEM

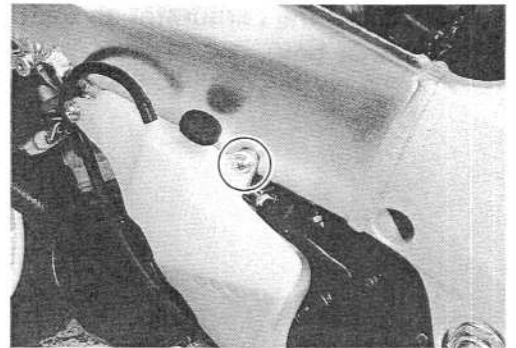
- Disconnect the throttle cables from the carburetor.



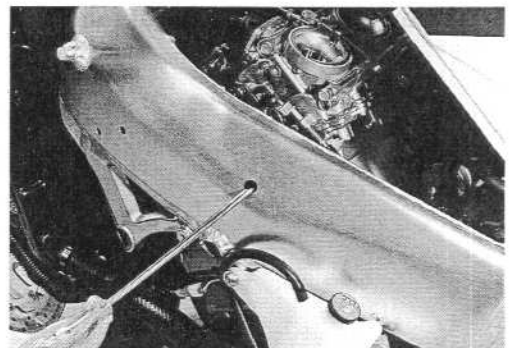
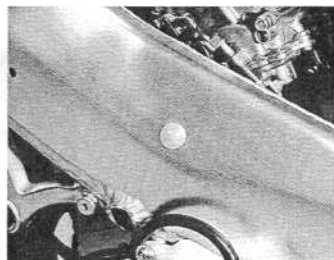
- Disconnect the throttle position sensor coupler.



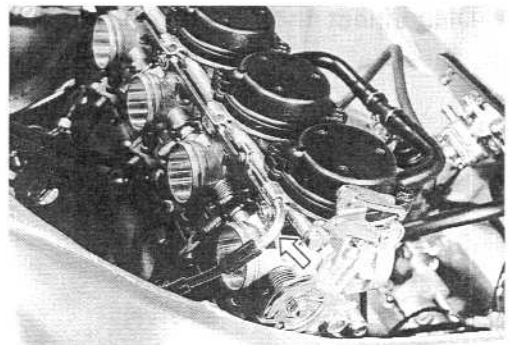
- Remove the throttle stop screw bracket mounting screw.



- Loosen the carburetor clamp screws at the engine side.



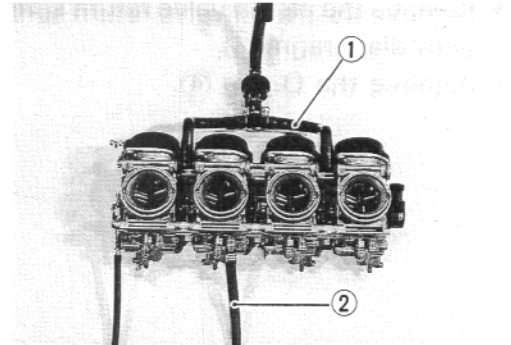
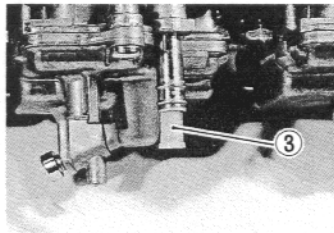
- Disconnect the starter cable.
- Remove the carburetor assembly.



## DISASSEMBLY

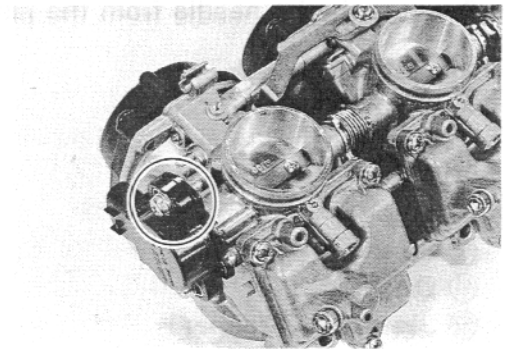
Before disassembly, prepare a clean and well lit work place where carburetor components can be laid out neatly and will not get lost. Study the service manual carburetor diagram and familiarize yourself with component locations and the different fuel circuits and their routing through the carburetor.

- Remove the air vent hoses ① and fuel hose ②.
- Remove the filter ③.

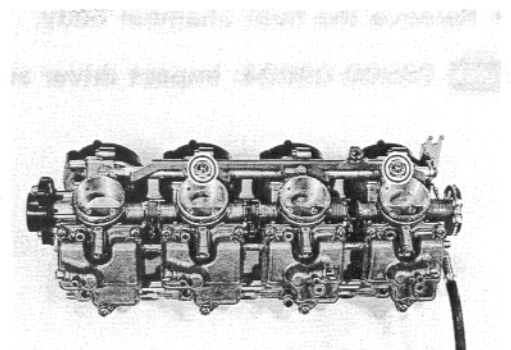


### ⚠ CAUTION

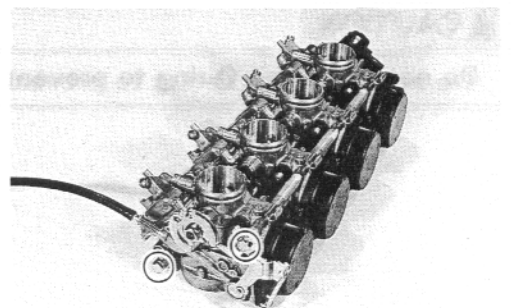
Prior to disassembly, mark with a paint or notch the initial position of the throttle sensor which is PRE-SET accurately at the factory. Avoid removing the throttle position sensor from the carburetor body unless you really need to do so.



- Remove the starter shaft lever.



- Remove the upper and lower carburetor connecting bolts.
- Separate the carburetor assembly.

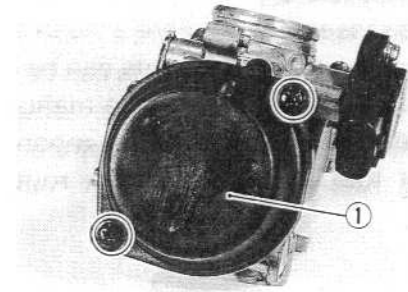


## 4-17 FUEL AND LUBRICATION SYSTEM

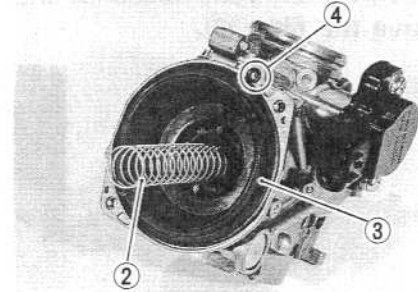
- Remove the carburetor top cap ①.

### ⚠ CAUTION

Do not blow the carburetor body with compressed air, before removing the diaphragm. It may cause a damage to the diaphragm.

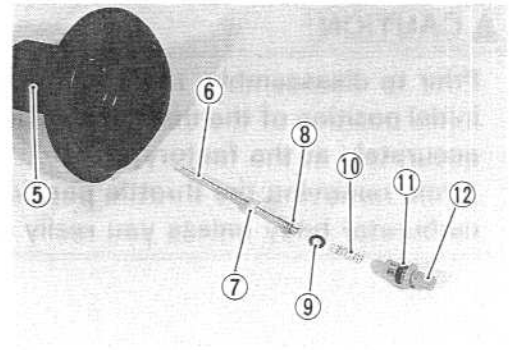


- Remove the piston valve return spring ② and piston valve with diaphragm ③.
- Remove the O-ring ④.



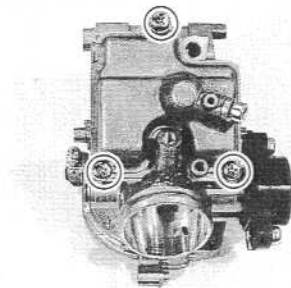
- Remove the jet needle from the piston valve.

- ⑤ Piston valve
- ⑥ Jet needle
- ⑦ Spacer
- ⑧ E-ring
- ⑨ Washer
- ⑩ Spring
- ⑪ O-ring
- ⑫ Jet needle stopper



- Remove the float chamber body.

 **09900-09004: Impact driver set**

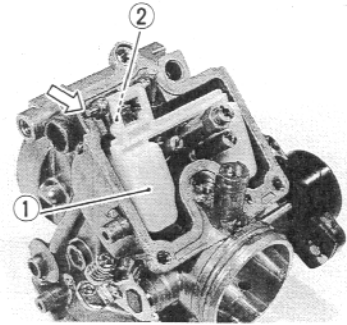


### ⚠ CAUTION

Do not reuse the O-ring to prevent fuel leakage.

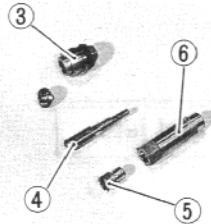


- Remove the float ① with the needle valve ② by removing the float pin.



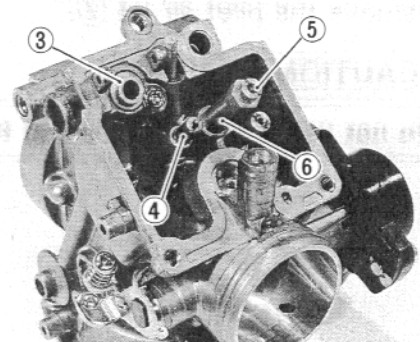
- Remove the following parts.

- ③ Valve seat
- ④ Pilot jet
- ⑤ Main jet
- ⑥ Main jet holder

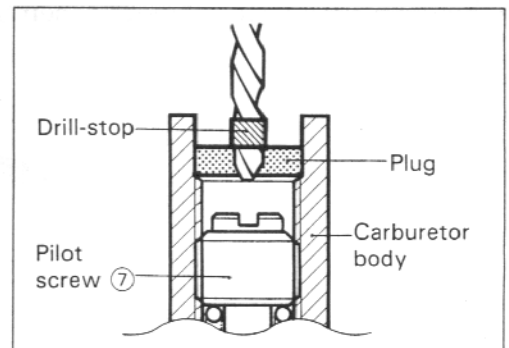


**CAUTION**

Do not use a wire for cleaning the passage, jets and valve seat.



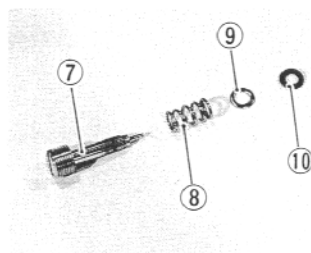
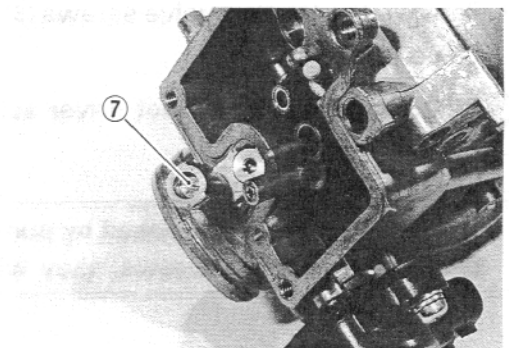
- Use a 1/8" size drill bit with a drill-stop to remove the pilot screw plug. Set the drill-stop 6 mm from the end of the bit to prevent drilling into the pilot screw. Carefully drill through the plug. Thread a self-tapping sheet metal screw into the plug. Pull on the screw head with pliers to remove the plug. Carefully clean any metal shavings from the area. (For E-03, 18, 28, 33 and 39 models)



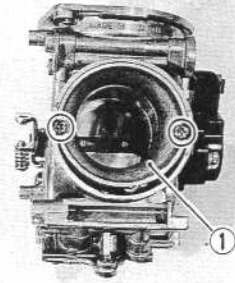
**CAUTION**

Replace the plug with a new one.

- Slowly turn the pilot screw ⑦ in clockwise and count the number of turns until the screw is lightly seated. Make a note of how many turns were made so the screw can be reset correctly after cleaning.
- Remove the pilot screw ⑦ with the spring ⑧, washer ⑨ and O-ring ⑩.



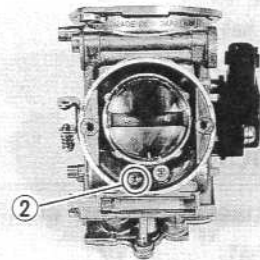
- Remove the funnel ①.



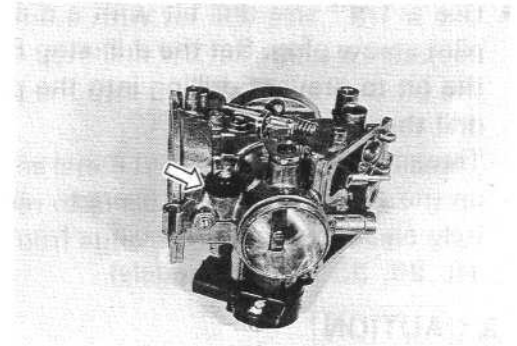
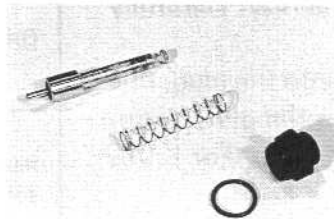
- Remove the pilot air jet ②.

**CAUTION**

Do not use a wire for cleaning the passage and jets.



- Remove the starter plunger assembly.

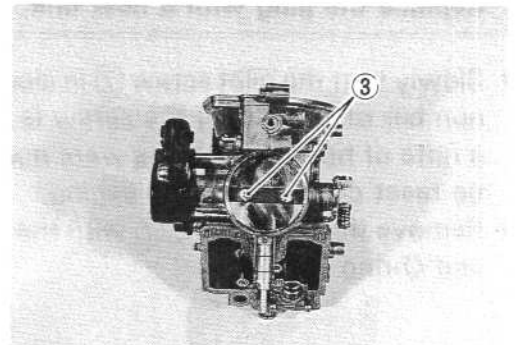


- Remove the throttle valve screws ③ and pull out throttle valve plate.

**TOOL** 09900-09004: Impact driver set

**CAUTION**

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



## CARBURETOR CLEANING

### ⚠ WARNING

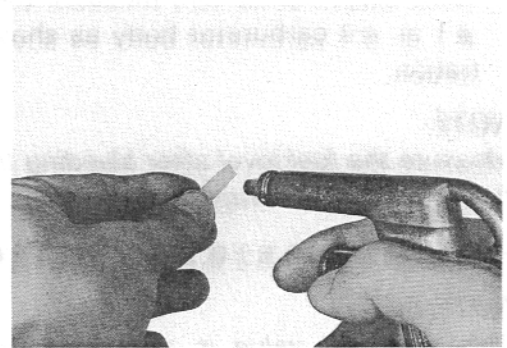
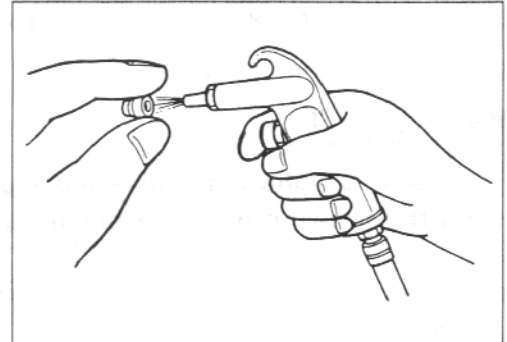
Some carburetor cleaning chemicals, especially dip-type soaking solutions, are very corrosive and must be handled carefully. Always follow the chemical manufacturer's instructions on proper use, handling and storage.

- Clean all jets with a spray-type carburetor cleaner and blow dry with compressed air.
- Clean all circuits of the carburetor thoroughly - not just the perceived problem area. Clean the circuits in the carburetor body with a spray-type cleaner and allow each circuit to soak if necessary to loosen dirt and varnish. Blow the body dry with compressed air.
- Blow the filter with compressed air.

### ⚠ CAUTION

Do not use wire to clean jets or passageways. Wire can damage jets and passageways. If the components cannot be cleaned with a spray cleaner it may be necessary to use a dip-type cleaning solution and allow them to soak. Always follow the chemical manufacturer's instructions for proper use and cleaning of the carburetor components.

- After cleaning, reassemble the carburetor with new seals and gaskets.



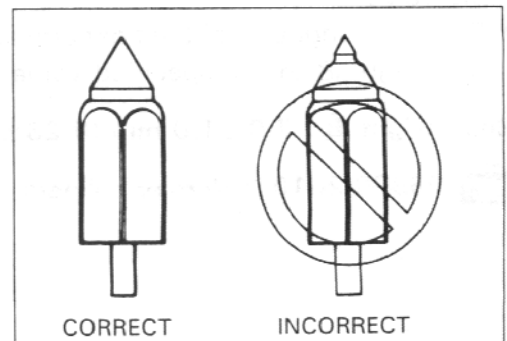
## INSPECTION

Check following items for any damage or clogging.

- |                 |                          |                                 |
|-----------------|--------------------------|---------------------------------|
| * Pilot jet     | * Valve seat             | * Needle jet                    |
| * Main jet      | * Starter jet            | * Main bleed pipe hole          |
| * Main air jet  | * O-rings                | * Float                         |
| * Pilot air jet | * Piston valve diaphragm | * Throttle shaft oil seal       |
| * Needle valve  | * Jet needle             | * Pilot outlet and by-pass hole |

### 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.





**FUEL LEVEL INSPECTION**

- Remove the seat. (Refer to page 6-3.)
- Lift and support the fuel tank. (Refer to page 4-2.)
- Connect the fuel level gauge to the one of four carburetor drain nipples.

**TOOL** 09913-10760: Fuel level gauge

- Keep the motorcycle upright position.

**NOTE:**

When measuring the fuel level, inflate the tires to the specified pressure and do not lift the tires off the ground.

- Loosen the drain screw.

**⚠ WARNING**

Gasoline is highly flammable and explosive. Avoid spilling the gasoline from the fuel level gauge.

- Start up the engine and keep it running at idling for a few minutes.
- While above condition, measure the fuel level **(A)** at the #1 or #4 carburetor body as shown in the right illustration.

**NOTE:**

Measure the fuel level after bleeding the air trapped in the fuel level gauge completely.

Fuel level **(A)**:  $15.5 \pm 0.5$  mm ( $0.61 \pm 0.02$  in)

**NOTE:**

This specified value is determined by the special tool (09913-10760).

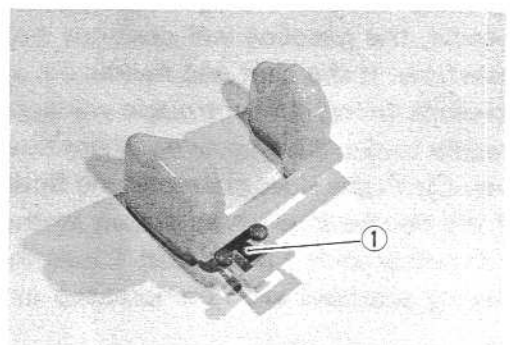
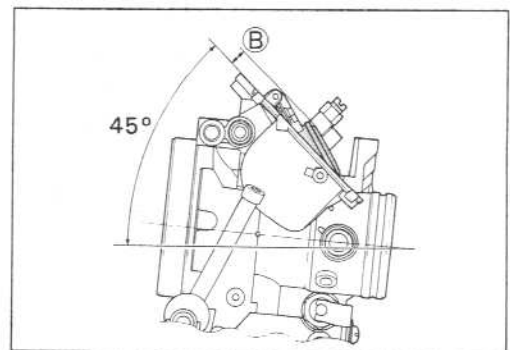
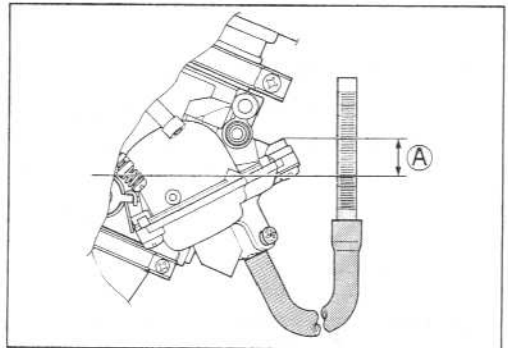
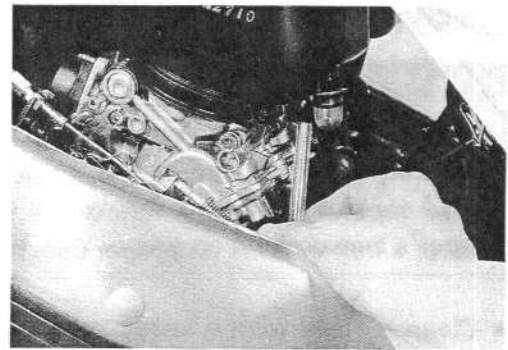
- Adjust the fuel level **(A)** as necessary to bring the float height **(B)** to the specified below.
- Measure the fuel level of each carburetor in the same manner as the above inspection.

**FLOAT HEIGHT ADJUSTMENT**

- Measure the float height **(B)** by using a calipers with the carburetor slanting at an angle of  $45^\circ$  (as shown in the right illustration) and the float arm just contacting the needle valve.
- Bend the tongue **(1)** of the float arm as necessary to bring the height **(B)** to the specified value.

Float height **(B)**:  $7.0 \pm 1.0$  mm ( $0.28 \pm 0.04$  in)

**TOOL** 09900-20102: Vernier calipers



### THROTTLE POSITION SENSOR INSPECTION

Using Multi circuit tester, measure the resistance between the terminals as shown in the right illustration.

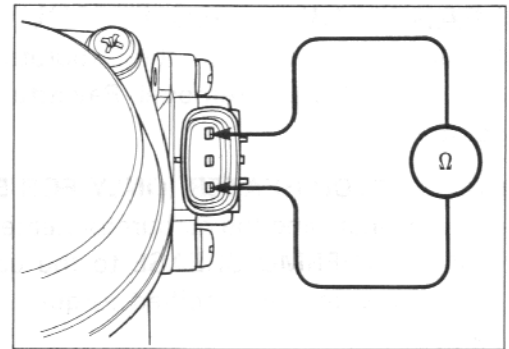
**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Resistance ( $\Omega$ )**

Throttle position sensor resistance: 3.5–6.5 k $\Omega$

**NOTE:**

When making above test, it is not necessary to remove the throttle position sensor.



### CARBURETOR HEATER INSPECTION (ONLY FOR E-02 MODEL)

Check the carburetor heater, which requires following two inspection:

- Disconnect each lead wire going into the respective carburetor heaters.
1. Check each heater coil for open and ohmic resistance with the multi circuit tester.  
The coil is in good condition if the resistance is as follows.

**NOTE:**

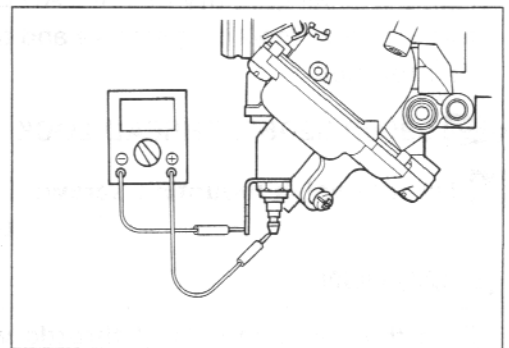
When making this test, be sure that the carburetor heater is in a cold condition.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Resistance ( $\Omega$ )**

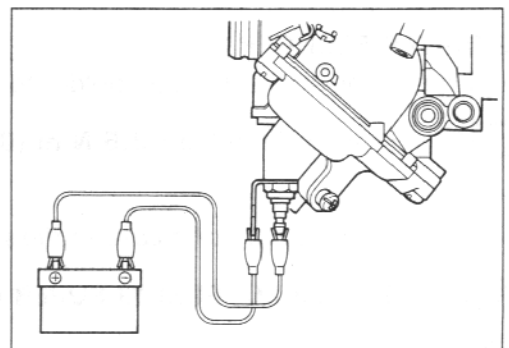
Heater coil resistance  
Standard: 12–18 $\Omega$

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.



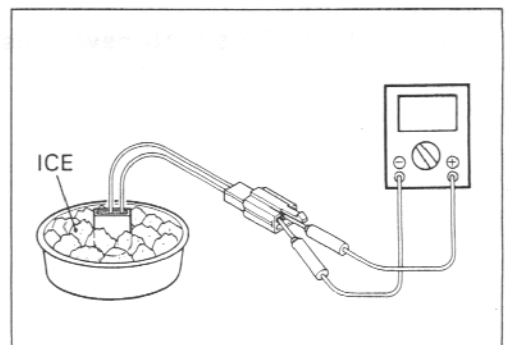
### CARBURETOR THERMO-SWITCH INSPECTION (ONLY FOR E-02 MODEL)

Check the thermo-switch in the following procedure.

- 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 the multi circuit tester.
- If there is no continuity, replace the thermo-switch with a new one.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Continuity test (•)) )**



## REASSEMBLY AND REMOUNTING

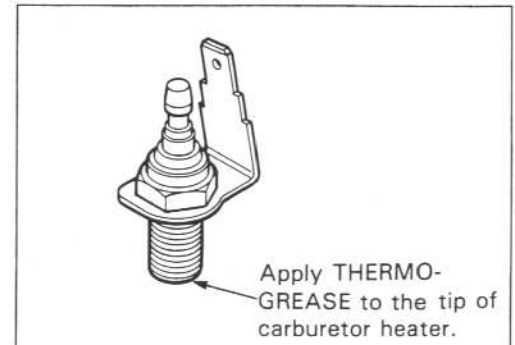
Reassemble and remount the carburetors in the reverse order of disassembly and removal. Pay attention to the following points:

### CARBURETOR HEATER (ONLY FOR E-02 MODEL)

- Before installing the carburetor heater, apply a small quantity of 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)

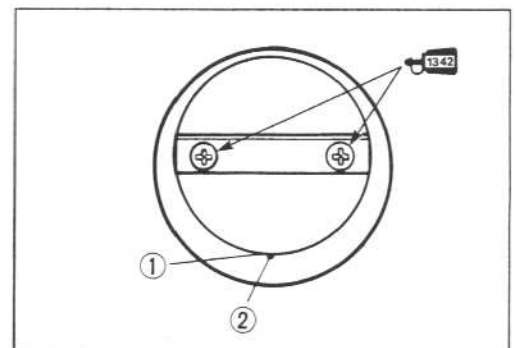


### THROTTLE VALVE

- Set each throttle valve in such a way that its bottom end ① meets the foremost by-pass ②. This is accomplished by turning the throttle stop screw and throttle valve balance screw.
- Apply a small quantity of THREAD LOCK "1342" to the throttle valve mounting screws and tighten it to the specified torque.

 99000-32050: THREAD LOCK "1342"

 Throttle valve mounting screw: 1.0 N·m  
(0.1 kg-m, 0.7 lb-ft)



### CAUTION

Face the stamped side of throttle valve to outside.

### STARTER PLUNGER

- Tighten the starter plunger holder to the specified torque.

 Starter plunger holder: 2.5 N·m (0.25 kg-m, 1.8 lb-ft)

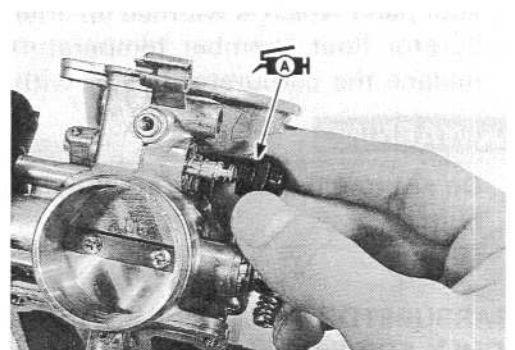
#### NOTE:

Apply a small quantity of grease to the starter plunger O-ring.

 99000-25030: SUZUKI SUPER GREASE "A"

### CAUTION

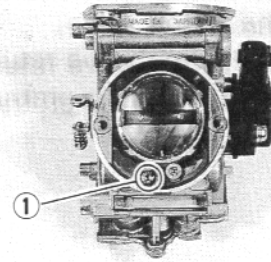
Replace the O-rings with new ones.



**PILOT AIR JET**

- Tighten the pilot air jet ① to the specified torque.

 Pilot air jet ①: 1.8 N·m (0.18 kg-m, 1.3 lb-ft)

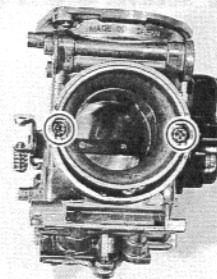


**FUNNEL**

- Apply a small quantity of THREAD LOCK "1342" to the funnel stopper screws and tighten them to the specified torque.

 1342 99000-32050: THREAD LOCK "1342"

 Funnel stopper screw: 2.0 N·m (0.2 kg-m, 1.5 lb-ft)

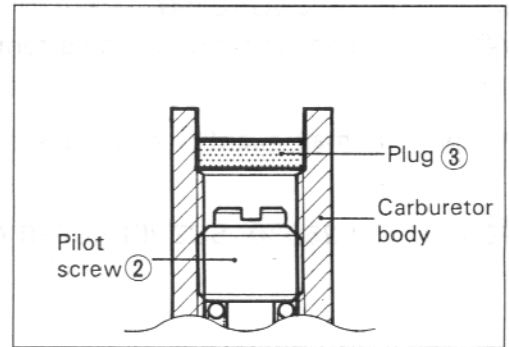


**PILOT SCREW**

- After cleaning, reinstall the pilot screw ② to the original setting by turning the screw in until it lightly seats, and then backing it out the same number of turns counted during disassembly.
- Install new plug ③ by tapping it into place with a punch. (For E-03, 18, 28, 33 and 39 models.)


**CAUTION**

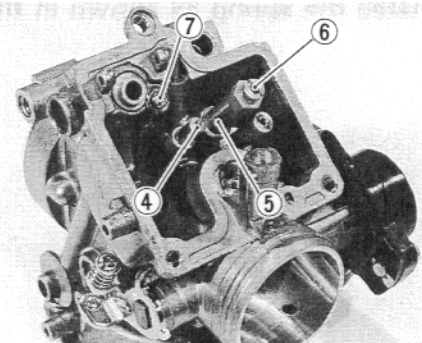
Replace the O-ring with a new one.



**PILOT JET, MAIN JET AND VALVE SEAT**


- Tighten the following parts to the specified torque.

 Pilot jet ④ : 1.0 N·m (0.1 kg-m, 0.7 lb-ft)  
 Main jet holder ⑤ : 1.8 N·m (0.18 kg-m, 1.3 lb-ft)  
 Main jet ⑥ : 1.8 N·m (0.18 kg-m, 1.3 lb-ft)  
 Valve seat retainer ⑦: 1.0 N·m (0.1 kg-m, 0.7 lb-ft)



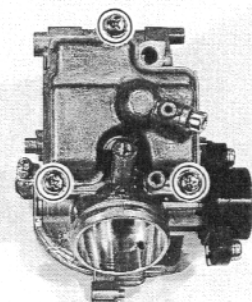
**FLOAT CHAMBER**

- Tighten the float chamber body mounting screws to the specified torque.

 Float chamber body mounting screw: 3.5 N·m (0.35 kg-m, 2.5 lb-ft)

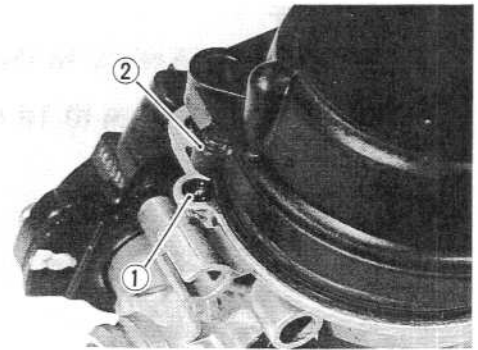
**CAUTION**

Replace the O-ring with a new one.



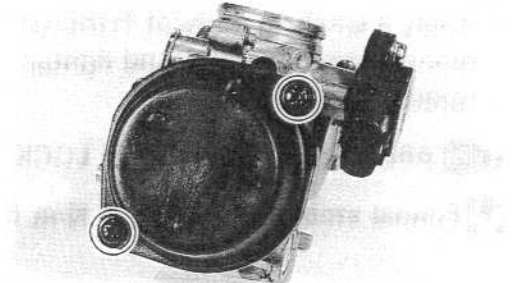
### PISTON VALVE AND CARBURETOR TOP CAP

- Place the O-ring ① to the carburetor properly.
- Install the piston valve.
- Install the piston valve return spring.
- Align the hole with the protrusion ② of the carburetor top cap.



- Tighten the top cap screws to the specified torque.

 Top cap screw: 3.5 N·m (0.35 kg-m, 2.5 lb-ft)

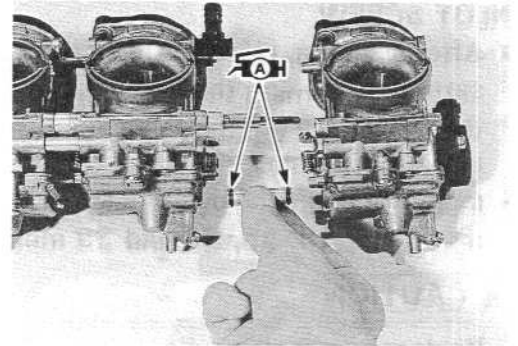


### CARBURETOR ENGAGING

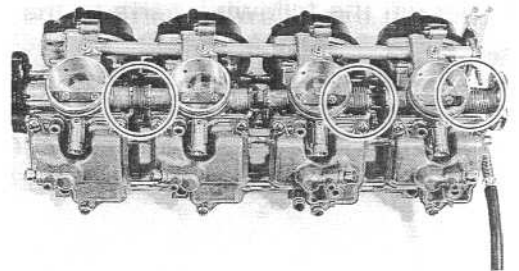
When engaging carburetors, pay attention to the following points:

- Apply a small quantity of grease to the fuel joint pipe O-rings.

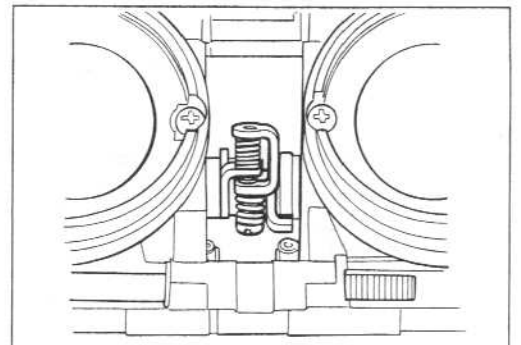
 99000-25030: SUZUKI SUPER GREASE "A"




- Install the spring as shown in the photograph.

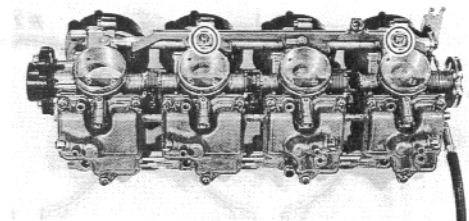
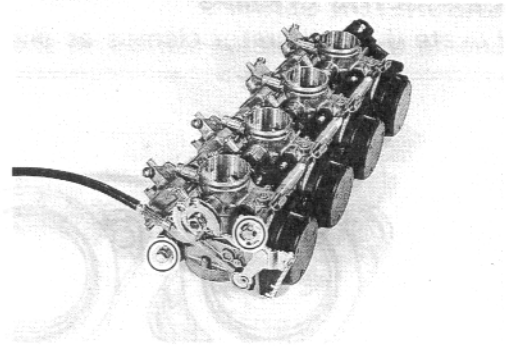


- Position the throttle valve control lever correctly.



- Tighten the carburetor connecting bolts and starter link screws to the specified torque.

-  Carburetor connecting bolt: 5.0 N·m (0.5 kg-m, 3.5 lb-ft)  
 Starter link screw: 2.0 N·m (0.2 kg-m, 1.5 lb-ft)



### THROTTLE POSITION SENSOR POSITIONING

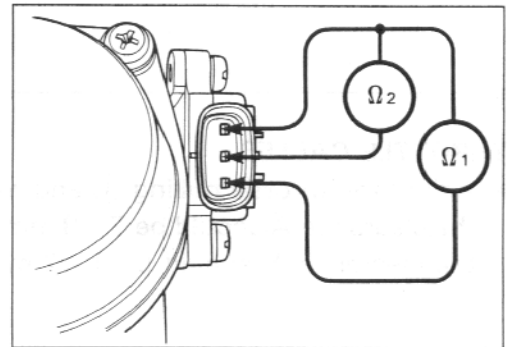
If removing the throttle position sensor from the carburetor body, install it to the exact position mentioned below;

- Measure the resistance  $\Omega_1$  between terminals of the throttle position sensor as shown in the right illustration.

 **09900-25008: Multi circuit tester set**

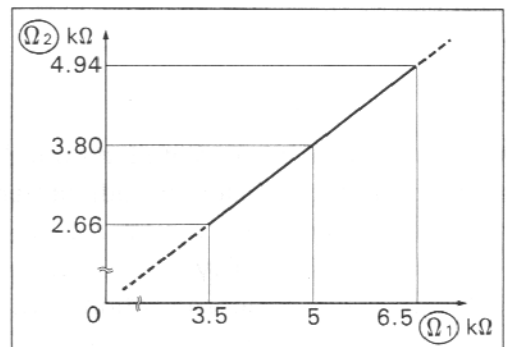
 **Tester knob indication: Resistance ( $\Omega$ )**

Throttle position sensor resistance  $\Omega_1$ : 3.5–6.5 k $\Omega$




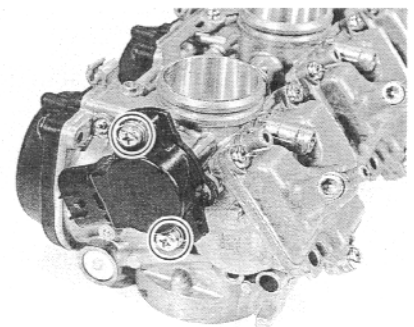
- Measure the resistance  $\Omega_2$  between terminals of the throttle position sensor as shown in the right illustration.
- Open the throttle valve fully by turning the throttle lever.
- Under above condition, see the throttle position sensor angle to have the resistance  $\Omega_2$  as 76% of the resistance  $\Omega_1$ .

For example: When  $\Omega_1$  is 5 k $\Omega$ ,  $\Omega_2$  should be 3.8 k $\Omega$ .



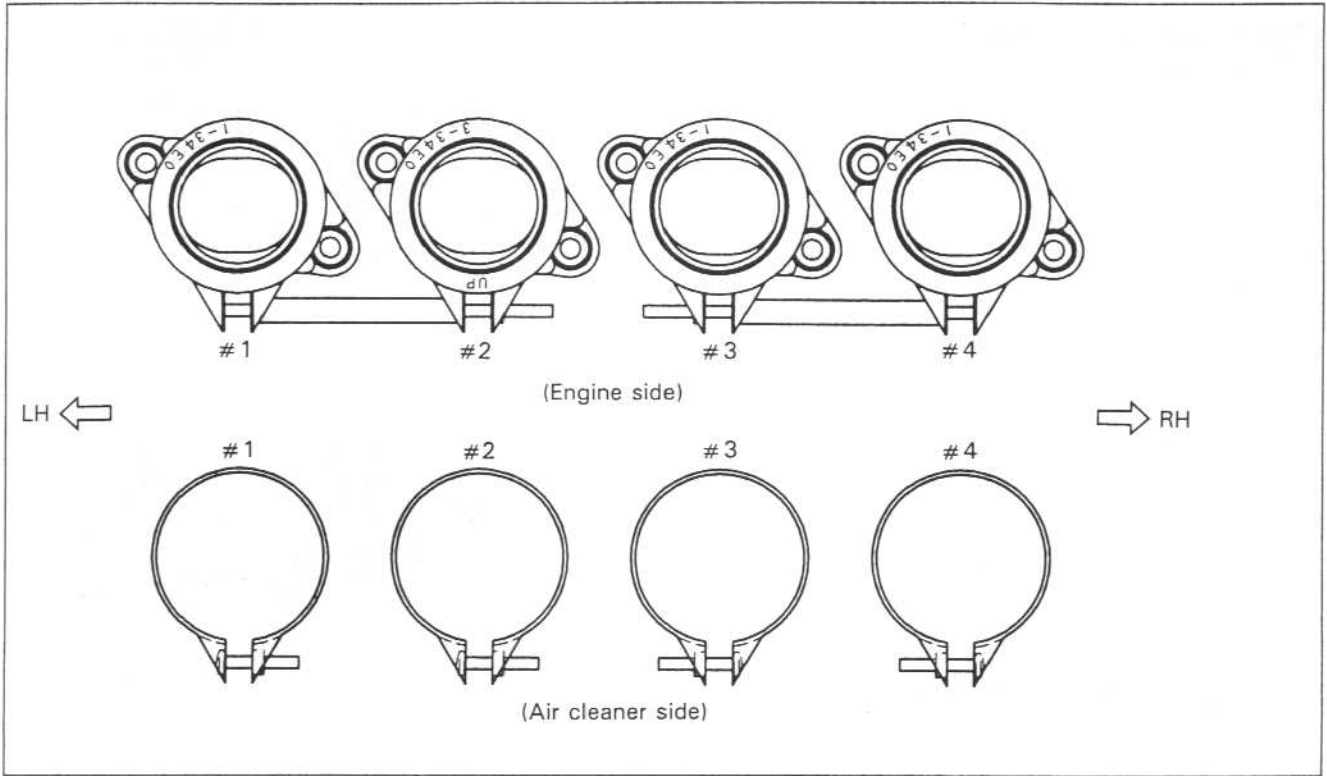
- When reading the above-mentioned resistance as  $\Omega_2$ , tighten the throttle position sensor mounting screws to the specified torque.

-  Throttle position sensor mounting screw: 3.5 N·m (0.35 kg-m, 2.5 lb-ft)



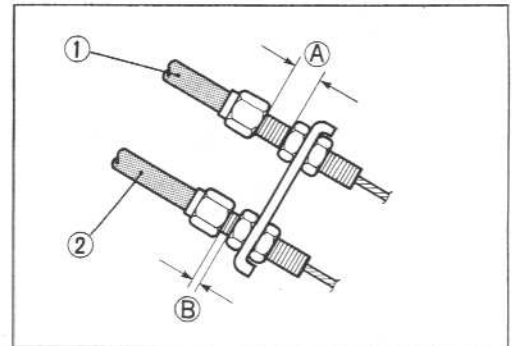
**CABURETOR CLAMPS**

Locate the carburetor clamps as shown in the following illustration.



**THROTTLE CABLES**

- Adjust the throttle pulling ① and returning ② cables to the clearance ① should be 7–8 mm (0.28–0.31 in) and the clearance ② should be 1–2 mm (0.04–0.08 in).



- 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 2-11
  - \* Carburetor synchronization ..... Page 4-28

## CARBURETOR SYNCHRONIZATION

Check and adjust the carburetor synchronization among four carburetors following the procedures below.

- TOOL** 09913-13121: Carburetor balancer  
09915-94511: Attachment

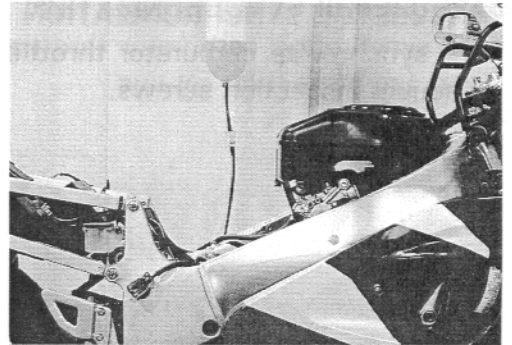
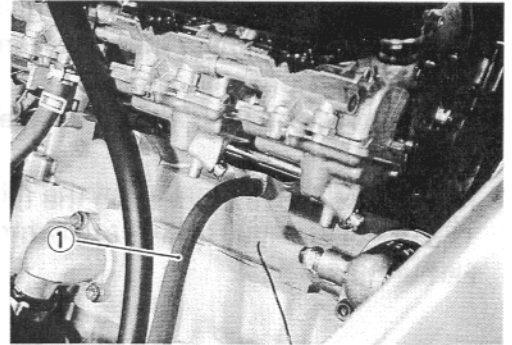
### CALIBRATING EACH GAUGE

- Remove the seats and frame cover. (Refer to pages 6-3 and -4.)
- Remove the fuel tank. (Refer to pages 4-2 and -3.)
- Install the separate fuel tank to supply fuel.
- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.

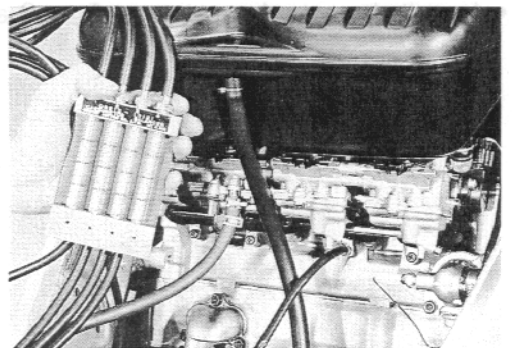
#### NOTE:

*Plug the vacuum hose while warming up the engine.*

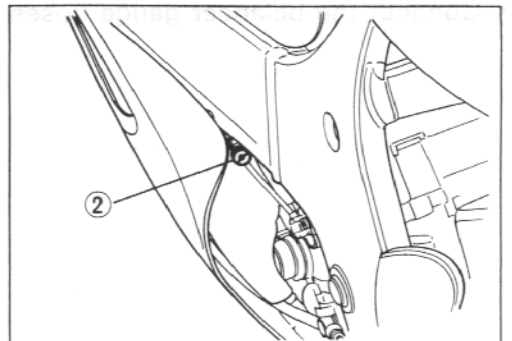
- Disconnect the vacuum hose ① from the #3 cylinder.



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



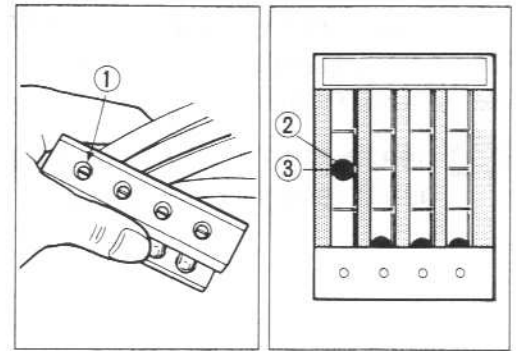
- Start up the engine and keep it running at 1750 r/min by turning throttle stop screw ②.



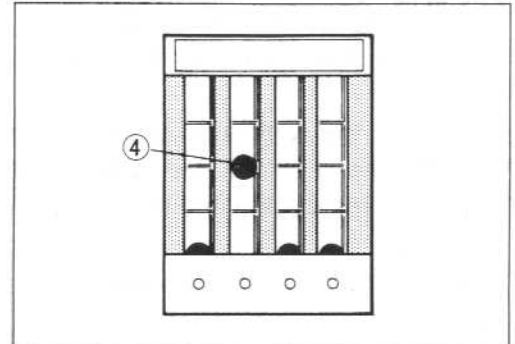


## 4-29 FUEL AND LUBRICATION SYSTEM

- 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.

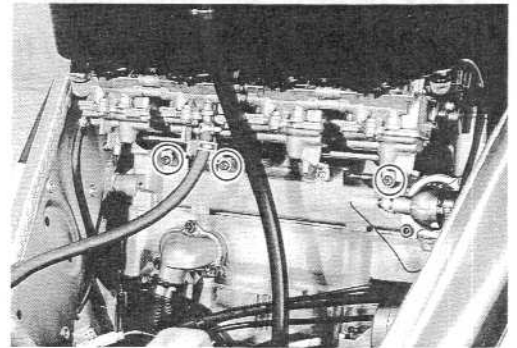


- After making sure that the steel ball stays steady at the center line, disconnect the hose from nipple and connect the next hose to the nipple.
- Turn air screw to bring the other steel ball ④ to the center line.
- Repeat the above process on the third and fourth hoses. The balancer gauge is now ready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

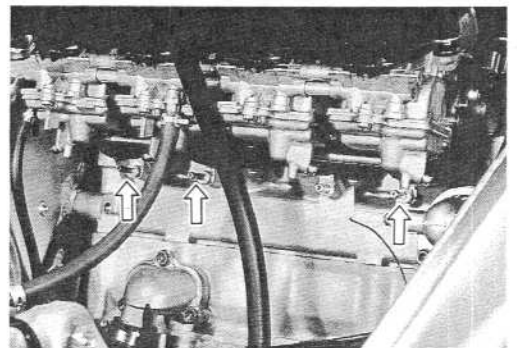


### CARBURETOR SYNCHRONIZATION

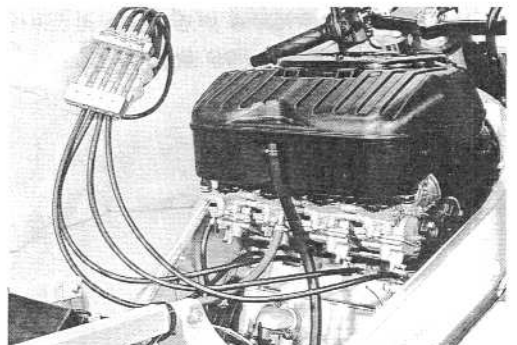
- To synchronize carburetor throttle valves, remove the vacuum inspection screws.



- Install the attachment to # 1, # 2 and # 4 cylinders.



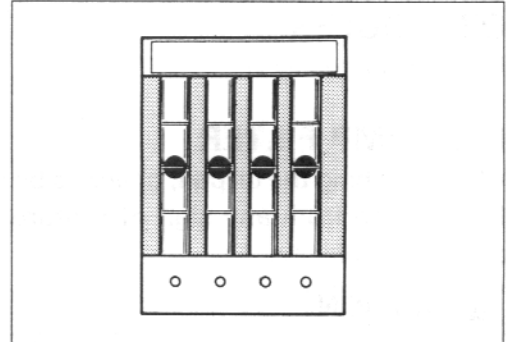
- Connect the balancer gauge hoses respectively.



Adjust the balance of four carburetors as follows:

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

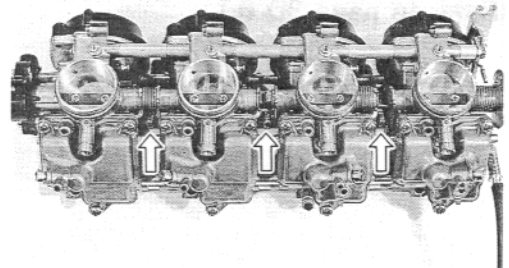
A correctly adjusted carburetor has the steel balls in the Nos. 1 through 4 tubes at the same level.



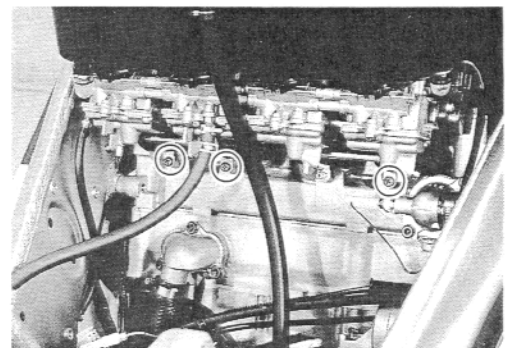
- If the steel balls are not aligned, adjust the throttle valve balance screws properly to align the balls.

**⚠ WARNING**

A hot engine can burn you if you touch the engine. The engine will still be hot for sometime after stopping the engine.



- After completing the carburetor synchronization, remove the carburetor balancer and attachment.
- Reinstall the vacuum inspection screws and vacuum hose respectively.
- Reinstall the air cleaner box onto the carburetor assembly respectively.



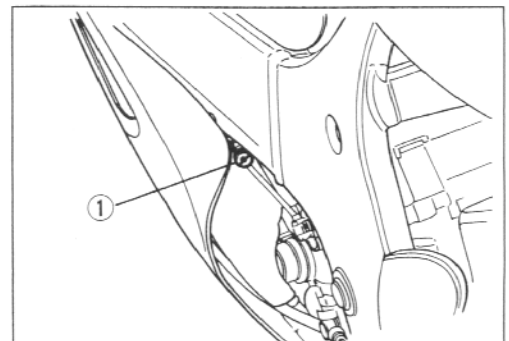
- Adjust the engine idle speed by turning the throttle stop screw ①.

**Engine idle speed**

1 300<sup>+100</sup>/<sub>-50</sub> r/min ... for E-18 model

1 300 ± 100 r/min ... for E-03,28,33 and 39 models

1 200 ± 100 r/min ... for the other models



## LUBRICATION SYSTEM

### OIL PRESSURE AND OIL PRESSURE REGULATOR

Refer to pages 2-23 and 3D-6.

### OIL FILTER

Refer to page 2-10.

### OIL PUMP

Refer to page 3D-1.

### OIL COOLER

Refer to page 3D-5.

### OIL SUMP FILTER

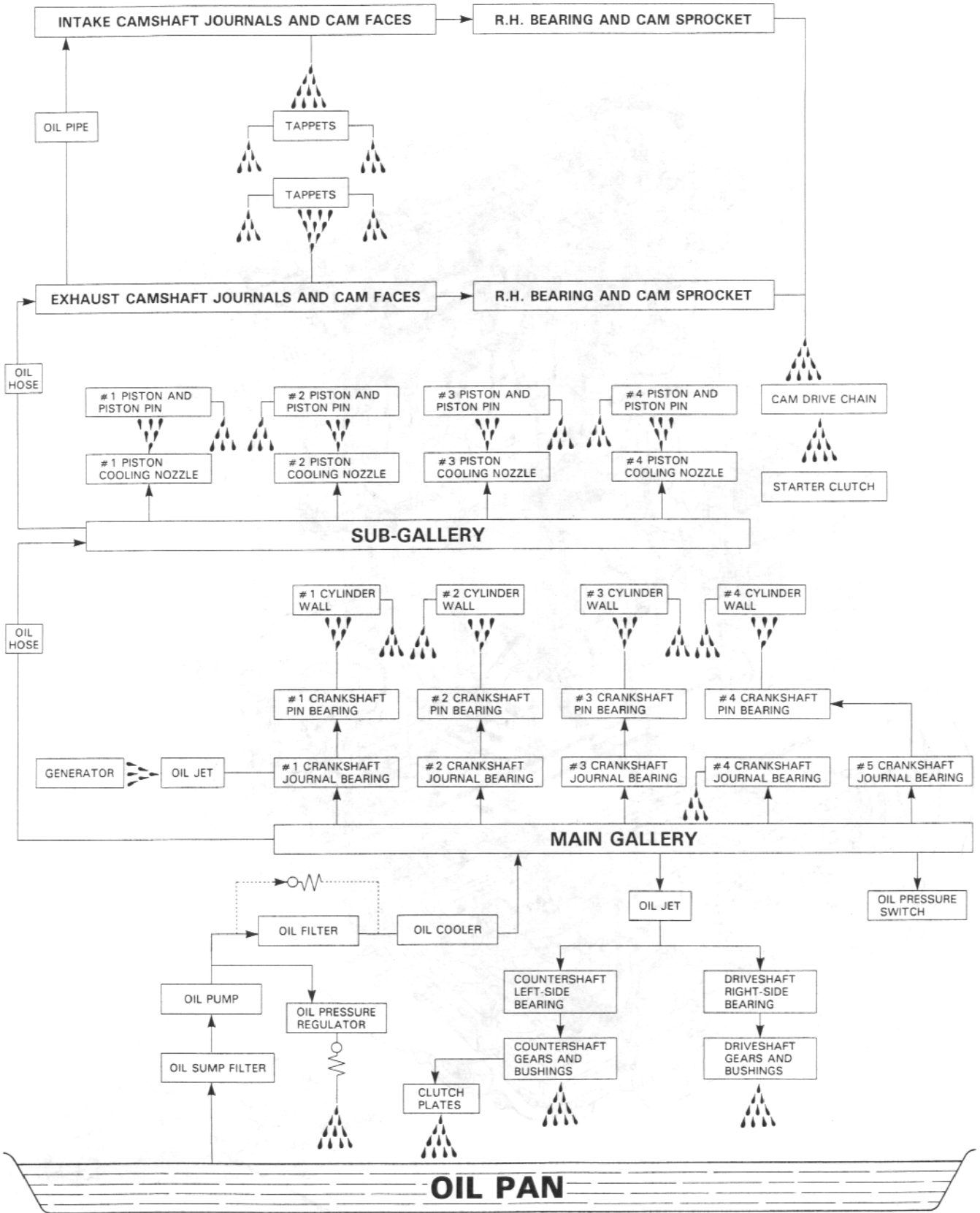
When washing the oil pan, check to be sure that the oil sump filter is free from any sign of rupture, also wash the filter clean periodically.

**▲ CAUTION**

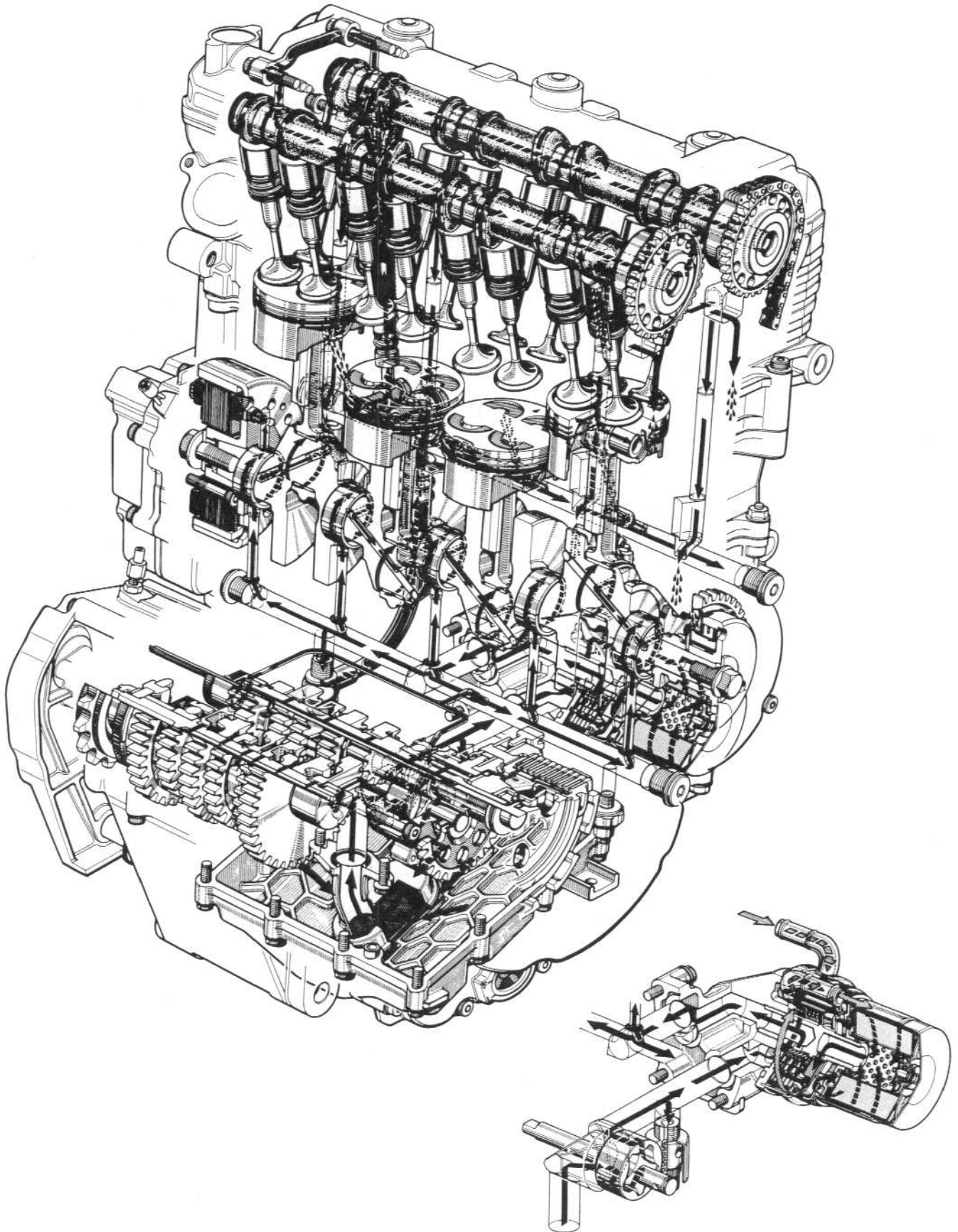
Replace the oil pan gasket with a new one to prevent oil leakage.

(Refer to page 3D-6.)

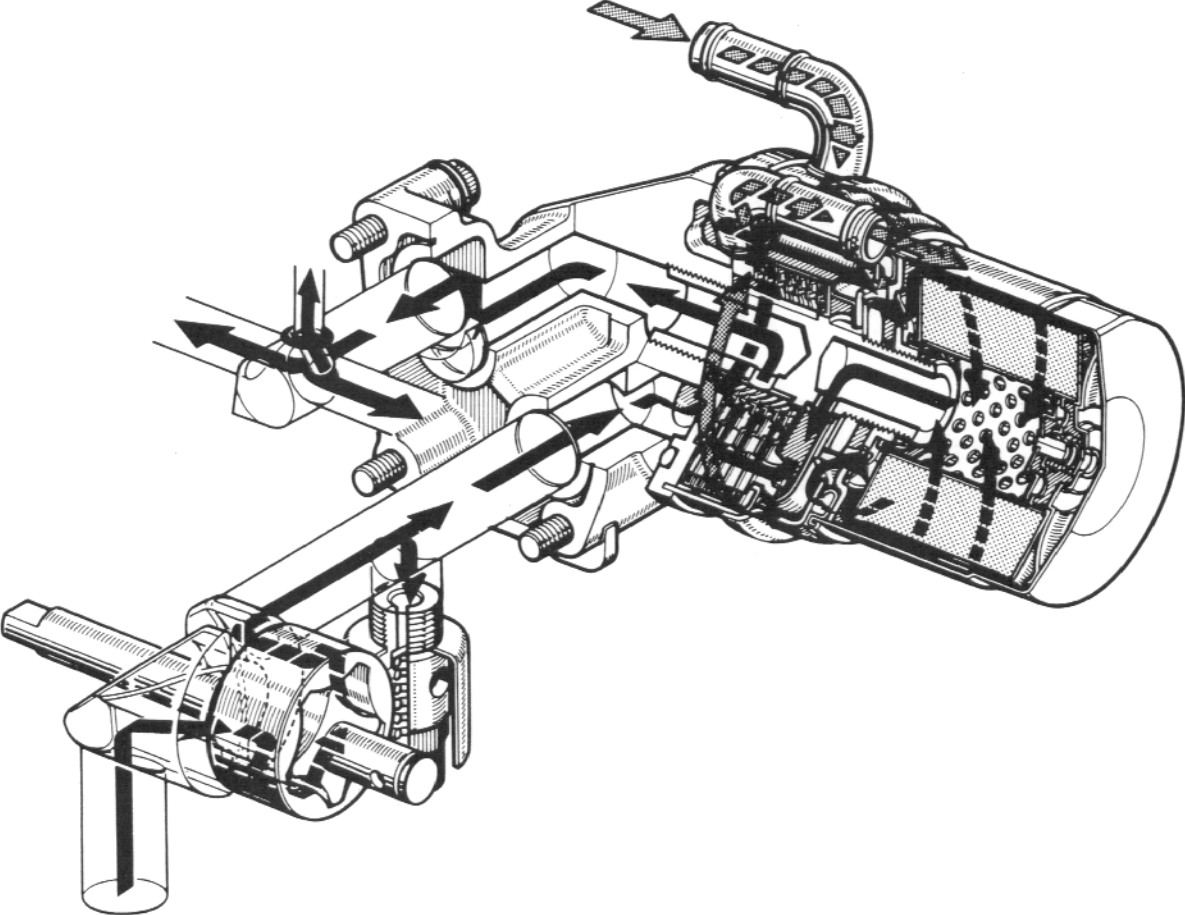
# ENGINE LUBRICATION SYSTEM CHART



ENGINE LUBRICATION SYSTEM



ENGINE OIL COOLING SYSTEM





# COOLING SYSTEM

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## COOLING SYSTEM

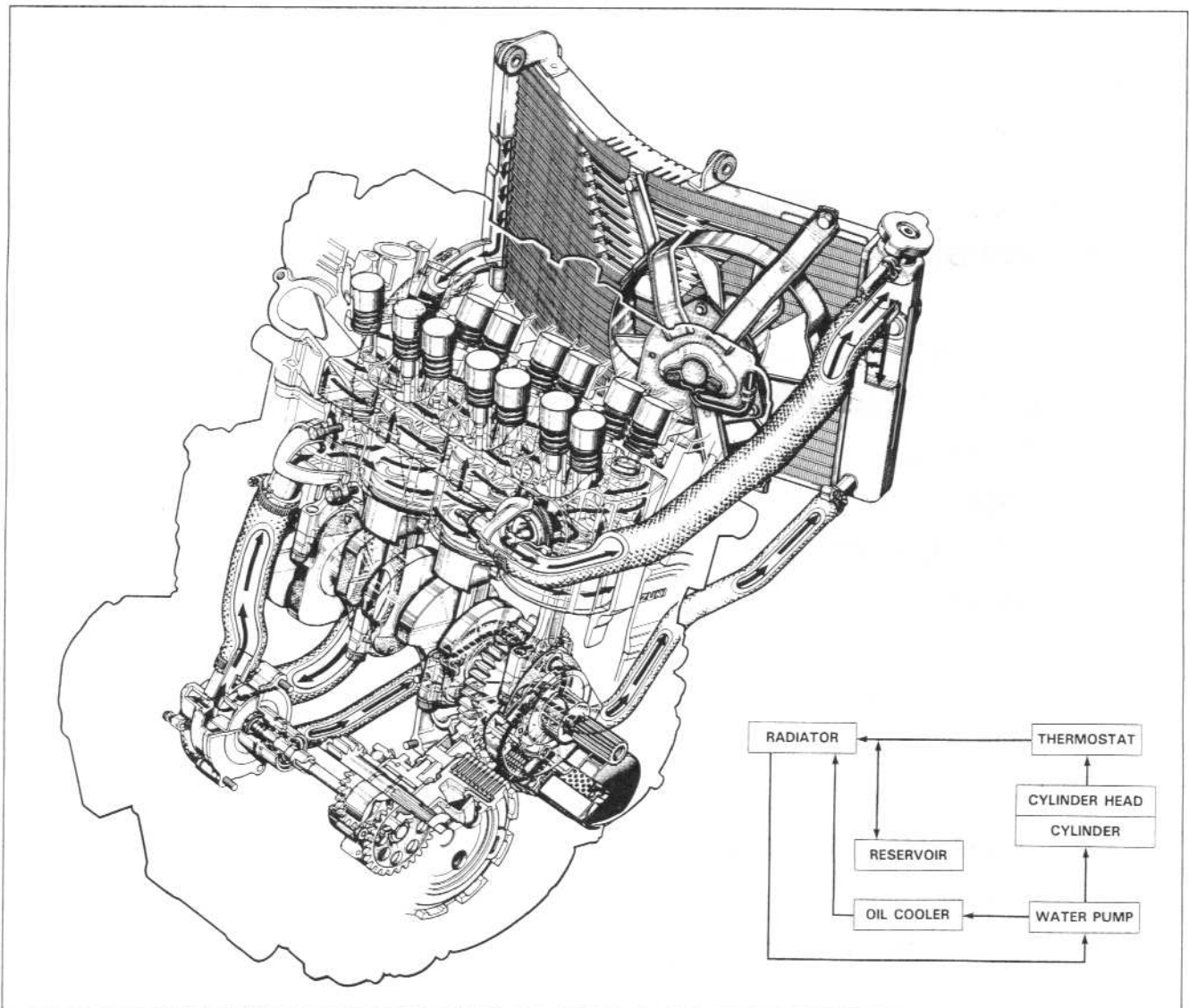
### DESCRIPTION

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.

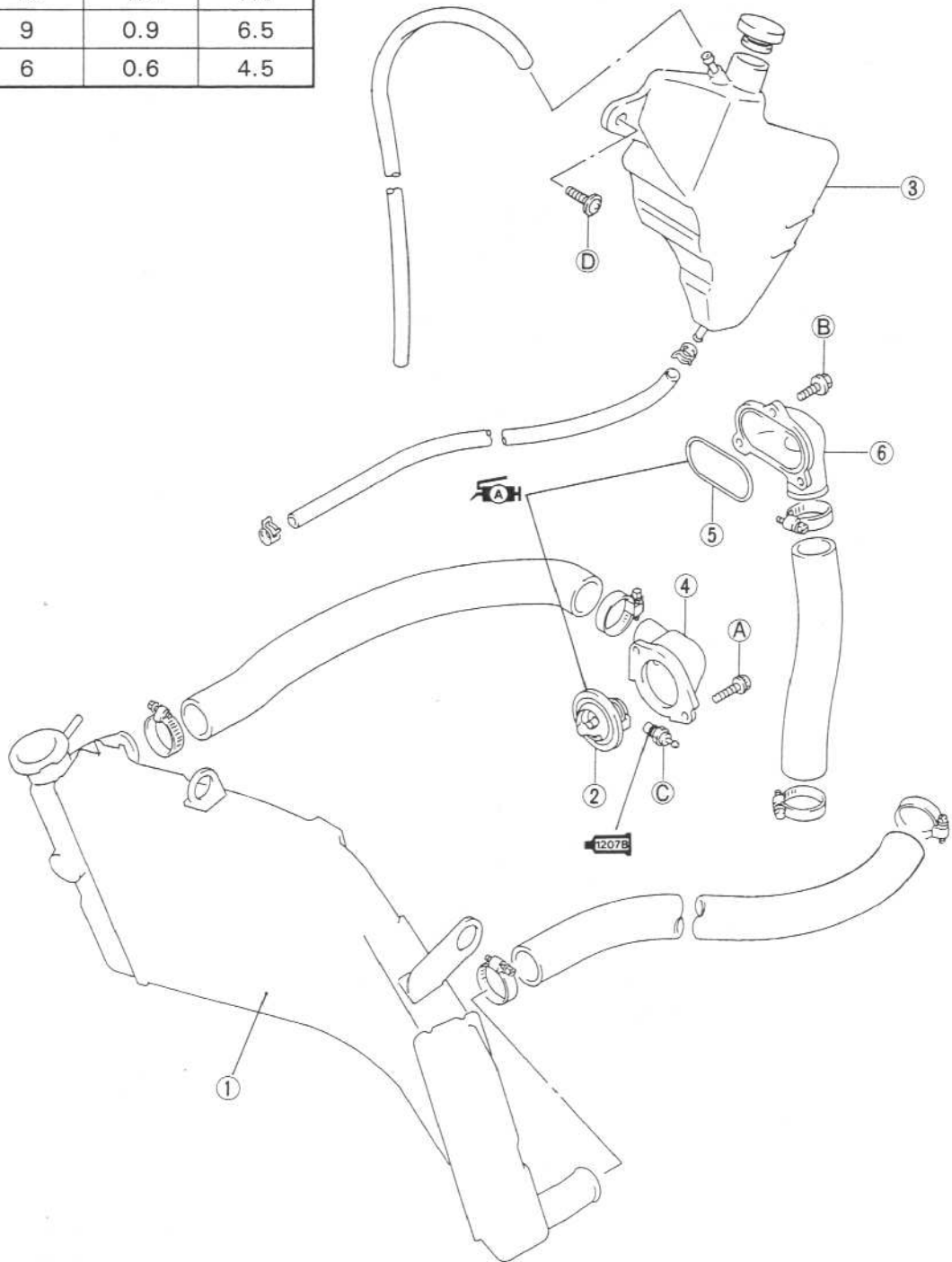
As the coolant temperature rises to about  $76.5^{\circ}\text{C}$  and the thermostat valve unseats, the normal coolant flow is established. At about  $90^{\circ}\text{C}$  of coolant temperature, the thermostat becomes completely open and most of heat is released to the atmosphere through the radiator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



CONSTRUCTION



ITEM	N·m	kg-m	lb-ft
A, B	10	1.0	7.0
C	9	0.9	6.5
D	6	0.6	4.5



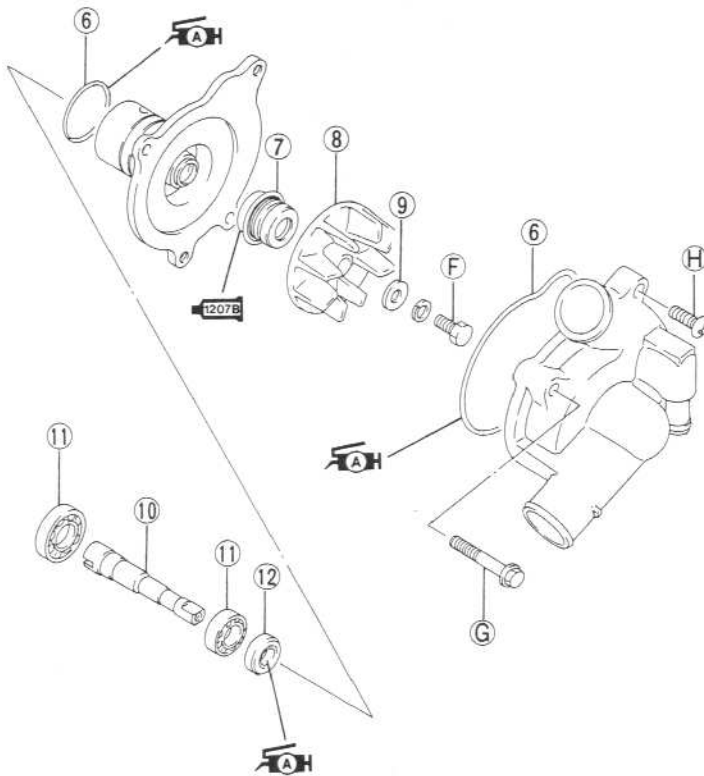
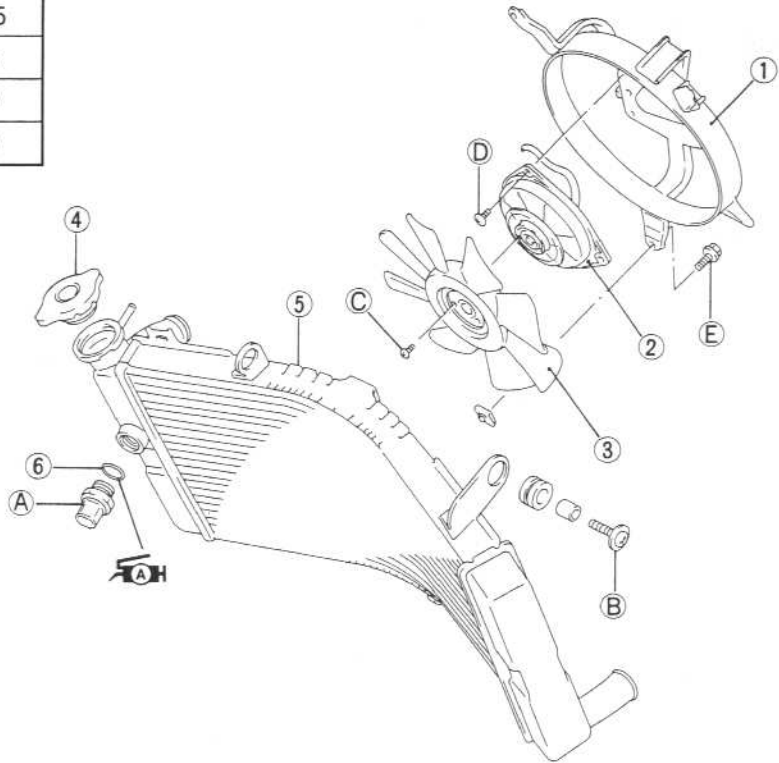
- ① Radiator
- ② Thermostat
- ③ Engine coolant reservoir tank
- ④ Thermostat case
- ⑤ O-ring
- ⑥ Water inlet conduction case
- A Thermostat case bolt
- B Water inlet conduction case bolt
- C Engine coolant temperature gauge
- D Reservoir tank mounting screw



ITEM	N·m	kg-m	lb-ft
A	17	1.7	12.5
B, E	6	0.6	4.5
C	1.5	0.15	1.0
D	3	0.3	2.0

- ① Shroud
- ② Fan motor
- ③ Cooling fan
- ④ Radiator cap
- ⑤ Radiator
- ⑥ O-ring

- A Cooling fan thermo-switch
- B Radiator mounting bolt
- C Cooling fan securing bolt
- D Fan motor mounting bolt
- E Cooling fan mounting bolt



- ⑦ Mechanical seal
- ⑧ Impeller
- ⑨ Water seal
- ⑩ Impeller shaft
- ⑪ Bearing
- ⑫ Oil seal

- F Impeller securing bolt
- G Water pump mounting bolt
- H Water pump cover screw



ITEM	N·m	kg-m	lb-ft
F	8	0.8	6.0
G, H	6	0.6	4.5

## ENGINE COOLANT

At the time of manufacture, the cooling system is filled with a 50 : 50 mixture of distilled water and ethylene glycol anti-freeze. This 50 : 50 mixture will provide the optimum corrosion protection and 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 figure.

### CAUTION

- Use a high quality ethylene glycol base anti-freeze, mixed with distilled water. Do not mix a alcohol base anti-freeze and different brands of anti-freeze.
- Do not put in more than 60% anti-freeze or less than 50%. (Refer to Right figure.)
- Do not use a radiator anti-leak additive.

50% Engine coolant including reserve

Anti-freeze	1 275 ml (1.3/1.1 US/Imp. qt)
Water	1 275 ml (1.3/1.1 US/Imp. qt)

Anti-freeze density	Freezing point
50%	$-31^{\circ}\text{C}$ ( $-24^{\circ}\text{F}$ )
55%	$-40^{\circ}\text{C}$ ( $-40^{\circ}\text{F}$ )
60%	$-55^{\circ}\text{C}$ ( $-67^{\circ}\text{F}$ )

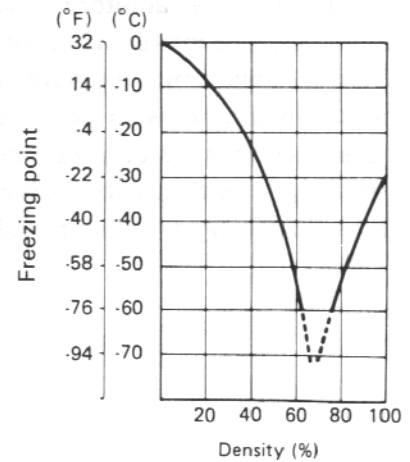


Fig. 1 Engine coolant density-freezing point curve.

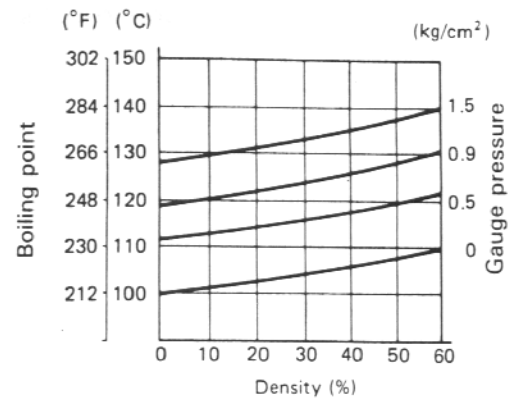


Fig. 2 Engine coolant density-boiling point curve.

### WARNING

- \* You can be injured by scalding fluid or steam if you open the radiator cap when the engine is hot. After the engine cools, wrap a thick cloth around cap and carefully remove the cap by turning it a quarter turn to allow pressure to escape and then turn the cap all the way off.
- \* The engine must be cool before servicing the cooling system.
- \* The coolant is harmful;
  - If it comes in contact with skin or eyes, flush with water.
  - If swallow it accidentally, induce vomiting and call physician immediately.
  - Keep it away from children.

## RADIATOR AND WATER HOSES

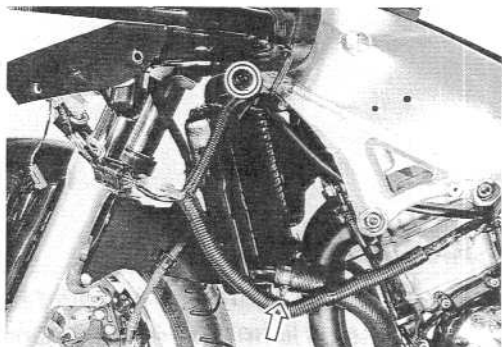
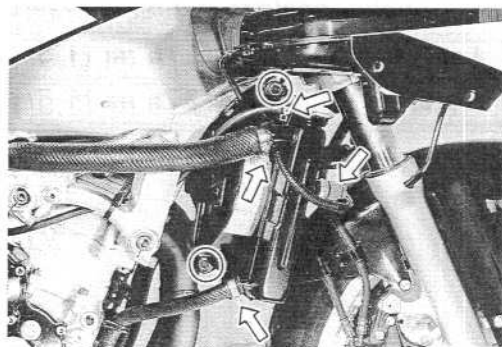
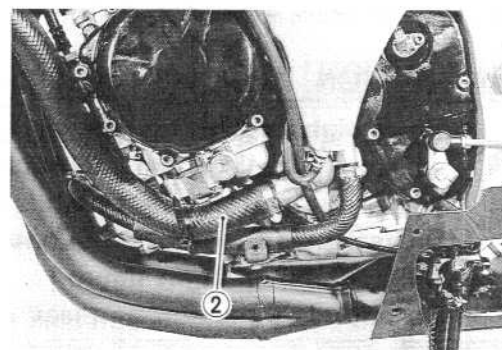
### REMOVAL

- Remove the lower fairing. (Refer to page 6-2.)
- Remove the radiator cap ① and disconnect the water hose ② from the water pump, then drain engine coolant.

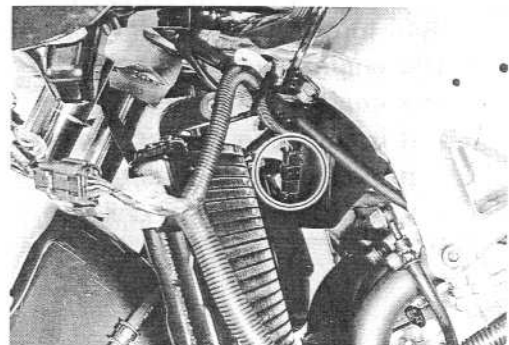
### ⚠ WARNING

- \* 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!

- Disconnect the water hoses from the radiator.
- Disconnect the cooling fan thermo-switch lead wire couplers.
- Remove the radiator mounting bolts.



- Disconnect the cooling fan lead wire couplers.
- Remove the radiator.



## INSPECTION

### COOLING SYSTEM INSPECTION

Before removing the radiator and draining the engine coolant, inspect the cooling system for tightness.

- Remove the right side lower fairing. (Refer to Page 6-2.)
- Remove the radiator cap and connect the tester ① to the filler.
- Give a pressure of about 120 kPa (1.2 kg/cm<sup>2</sup>, 17 psi) 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.

#### ⚠ WARNING

- \* Do not remove the radiator cap when the engine is hot.
- \* When removing the radiator cap tester, put a rag on the filler to prevent spouting of engine coolant.

#### ⚠ CAUTION

Do not exceed the radiator cap release pressure, or the radiator can be damaged.

### RADIATOR CAP INSPECTION

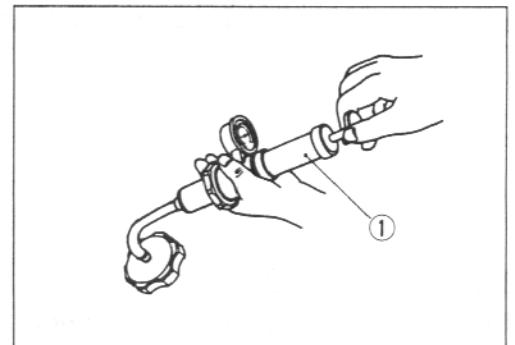
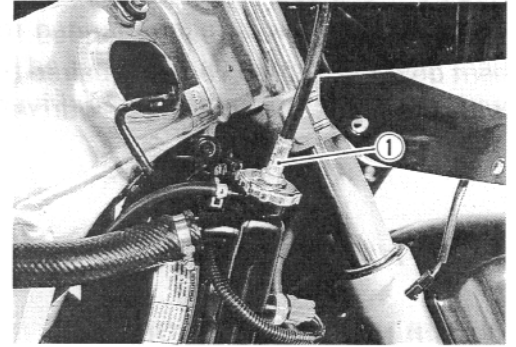
Test the radiator cap for release pressure by using the radiator tester in the following manner.

- 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  $110 \pm 15$  kPa ( $1.1 \pm 0.15$  kg/cm<sup>2</sup>,  $15.6 \pm 2.1$  psi) 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.

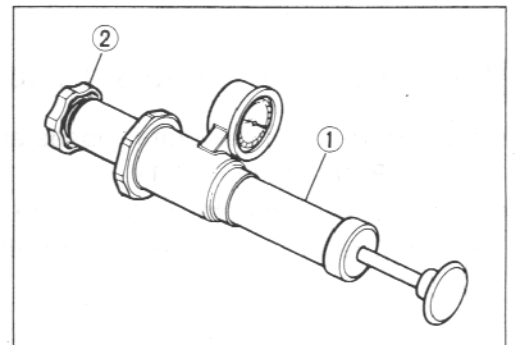
#### Radiator cap valve

release pressure:  $110 \pm 15$  kPa

( $1.1 \pm 0.15$  kg/cm<sup>2</sup>,  $15.6 \pm 2.1$  psi)



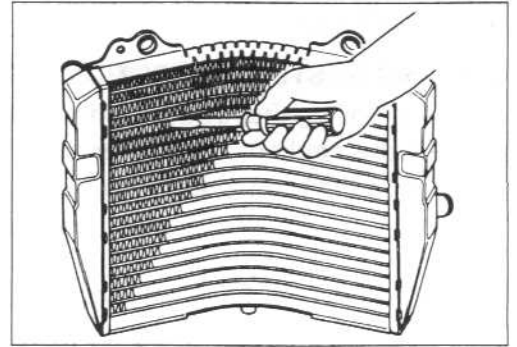
① Radiator cap tester



① Radiator cap tester    ② Radiator cap

### RADIATOR INSPECTION AND CLEANING

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.



### WATER HOSE INSPECTION

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.

### REMountING

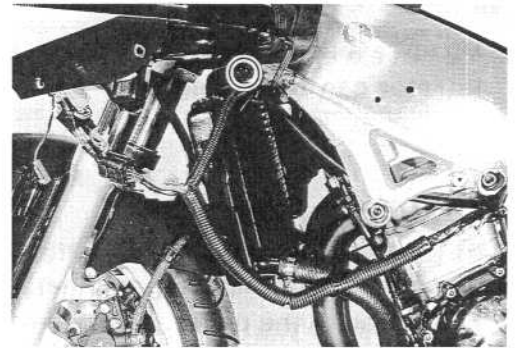
Remount the radiator in the reverse order of its removal procedure. Pay attention to the following points:

#### RADIATOR MOUNTING BOLT

- Tighten the radiator mounting bolts to the specified torque.

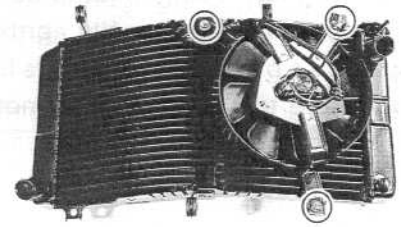
 Radiator mounting bolt: 6 N·m (0.6 kg-m, 4.5 lb-ft)

- Be sure to route the water hoses and radiator overflow hose. (Refer to page 8-19.)
- After remounting the radiator, be sure to add engine coolant: refer to page 2-12 for refilling information.



## COOLING FAN REMOVAL

- Remove the radiator. (Refer to page 5-5.)
- Remove the cooling fan.



## INSPECTION

- Remove the lower fairing. (Refer to page 6-2.)
- Remove the radiator mounting bolts and move the radiator forward.
- Remove the cooling fan lead wire coupler.

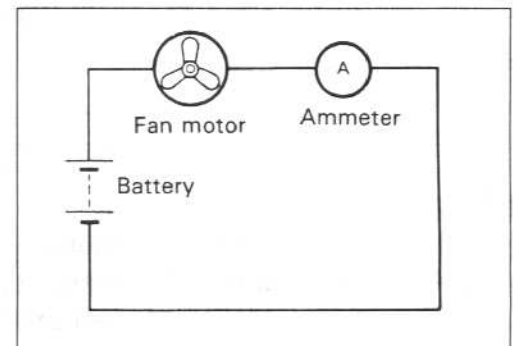
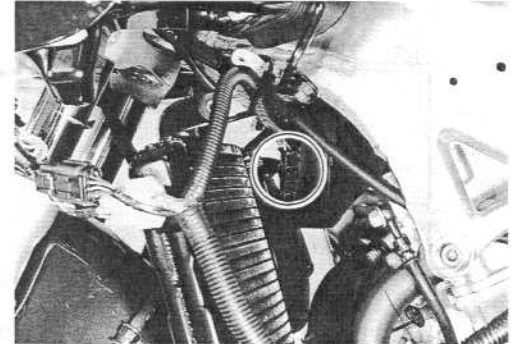
Test the cooling fan motor for load current with an ammeter connected as shown in the illustration.

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.

### NOTE:

*When making above test, it is not necessary to remove the cooling fan.*




## REMountING

Remount the radiator and cooling fan in the reverse order of their removal procedure. Pay attention to the following points:


### COOLING FAN MOUNTING BOLT AND NUT

- Tighten the cooling fan mounting bolt to the specified torque.

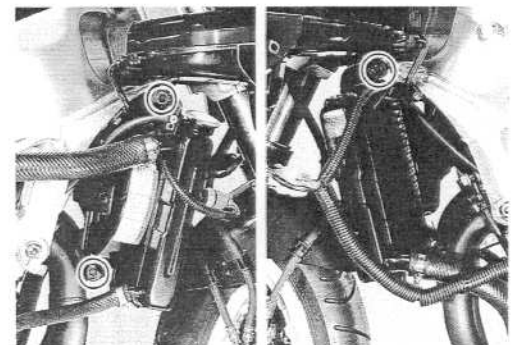
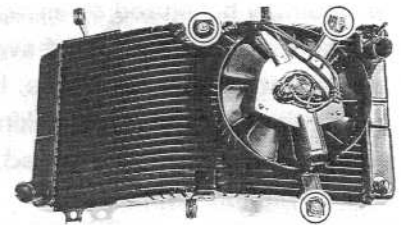
 Cooling fan mounting bolt: 6 N·m (0.6 kg-m, 4.5 lb-ft)

### RADIATOR MOUNTING BOLT

- Tighten the radiator mounting bolts to the specified torque.

 Radiator mounting bolt: 6 N·m (0.6 kg-m, 4.5 lb-ft)

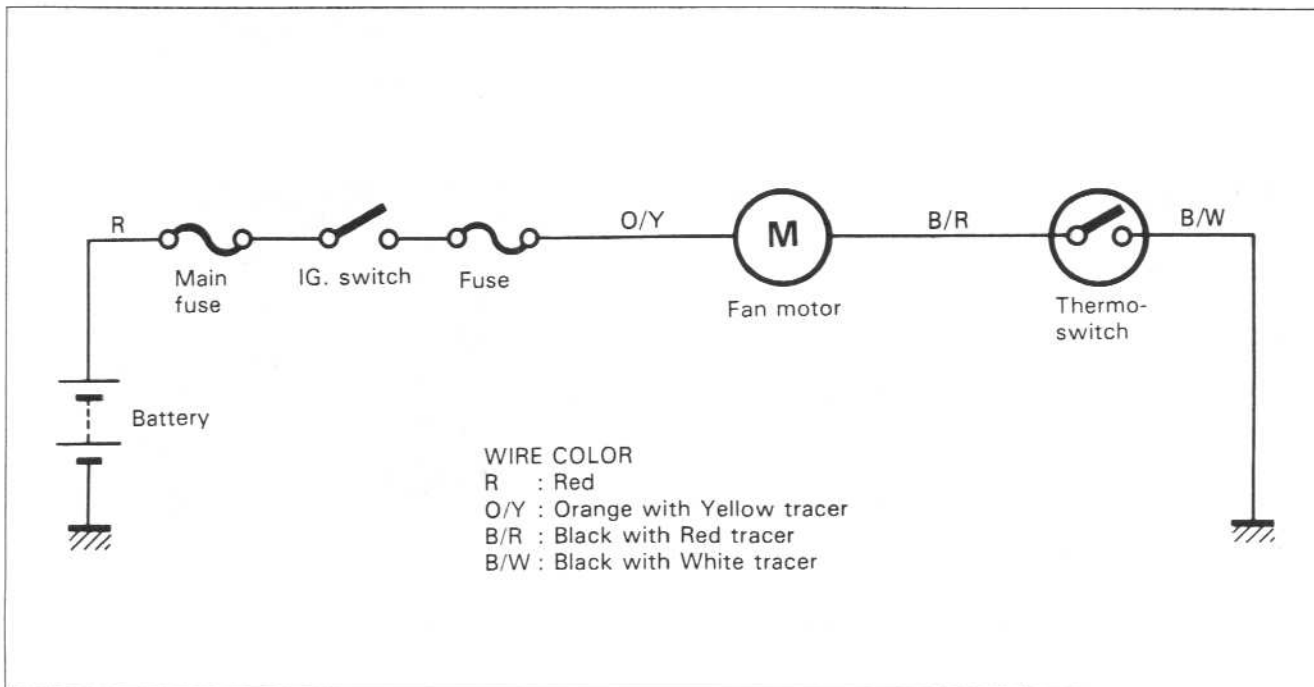
- Be sure to route the water hoses and radiator overflow hose. (Refer to page 8-19.)
- After remounting the radiator, be sure to add engine coolant: refer to page 2-12 for refilling information.





## 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.

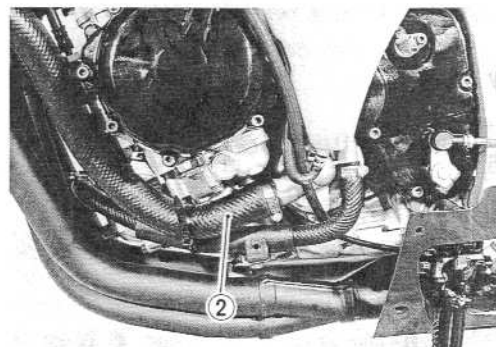
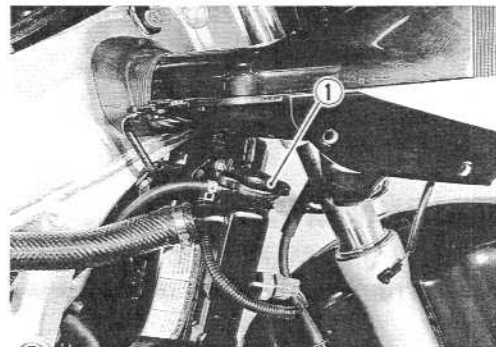


### REMOVAL

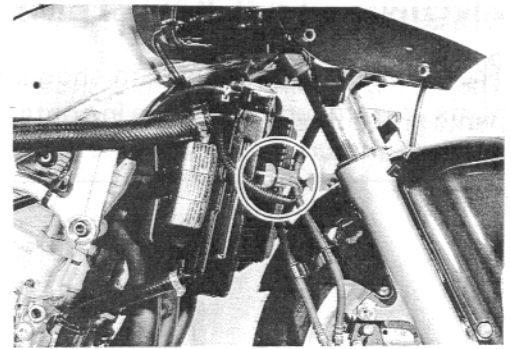
- Remove the lower fairing. (Refer to page 6-2.)
- Remove the radiator cap ① and disconnect the water hose ② from the water pump, then drain engine coolant.

#### ⚠ WARNING

- \* Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- \* Coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If 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!




- Disconnect the cooling fan thermo-switch lead wire coupler.
- Remove the cooling fan thermo-switch.



## INSPECTION

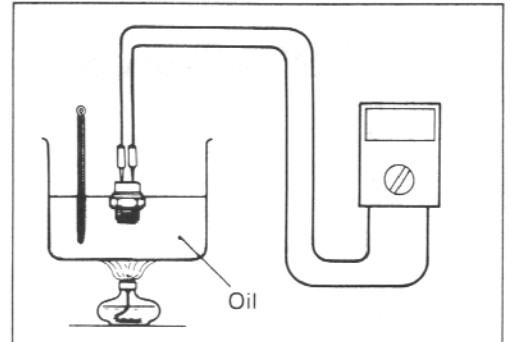
The thermo-switch must be checked for its temperature-initiated closing action at the specification value of 105°C (221°F) by testing it at the bench as shown in the figure. Connect the thermo-switch to a circuit tester and place it in the oil contained in a pan, which is placed on a stove; heat the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

 **09900-25008: Multi circuit tester set**



 **Tester knob indication: Continuity test ( • )) )**

### Thermo-switch specification

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



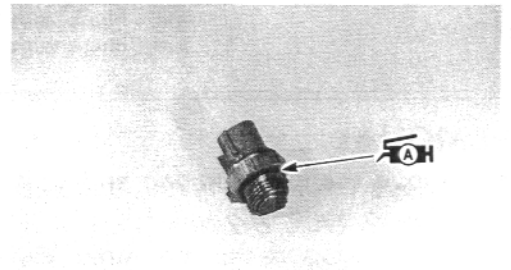
## INSTALLATION

- Apply grease to the O-ring.
-  **099000-25030: SUZUKI SUPER GREASE "A"**
- Tighten the cooling fan thermo-switch to the specified torque.
-  **Cooling fan thermo-switch: 17 N·m  
(1.7 kg-m, 12.5 lb-ft)**

### CAUTION

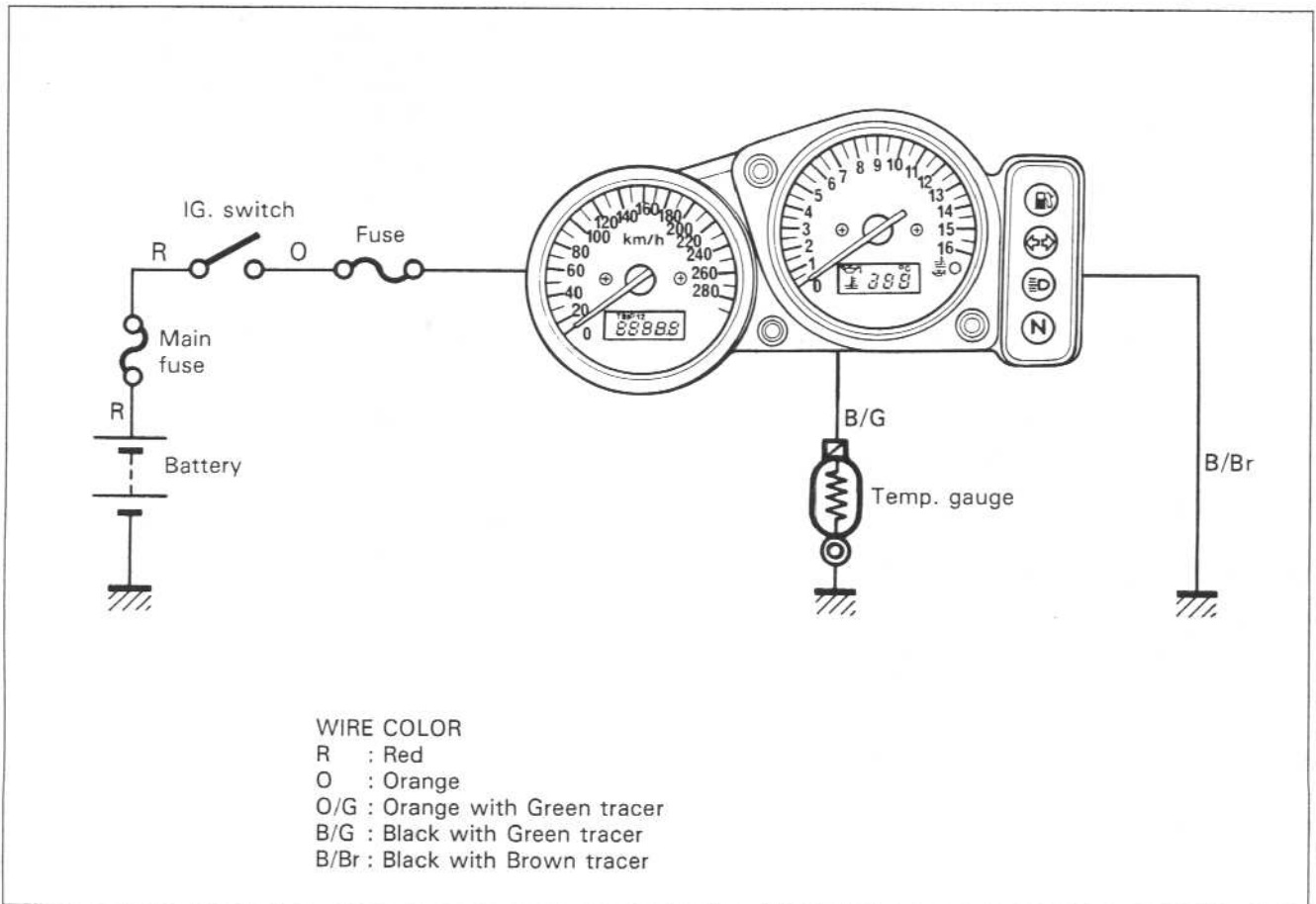
Take special care when handling the thermo-switch.  
It may cause damage if it gets a sharp impact.  
Replace the O-ring with a new one.

- After installing the cooling fan thermo-switch, be sure to add engine coolant: refer to page 2-12 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 coolant; and temperature indicator (engine coolant temperature meter).

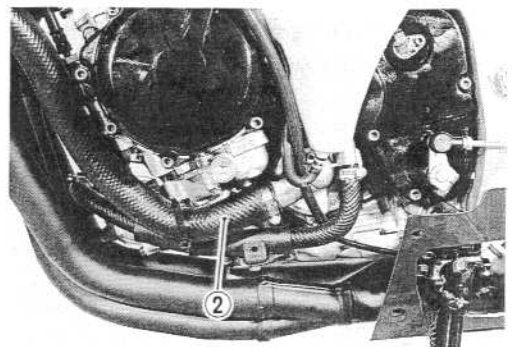
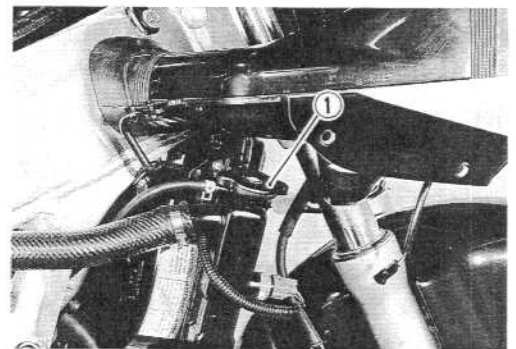


### REMOVAL

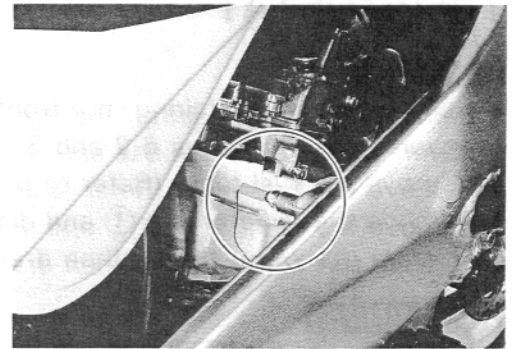
- Remove the lower fairing and seat.  
(Refer to page 6-2 and 3.)
- Lift and support the fuel tank. (Refer to page 4-2.)
- Remove the radiator cap ① and disconnect the water hose ② from the water pump, then drain engine coolant.

### ⚠ WARNING

- \* Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- \* Coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If 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!

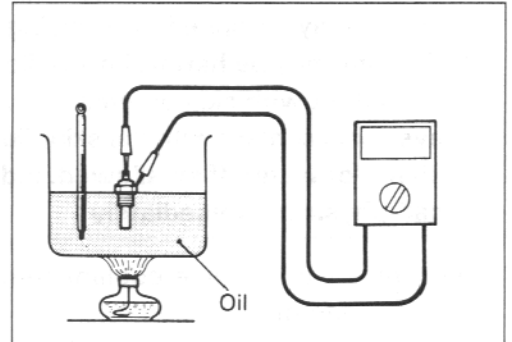


- Disconnect the lead wire connector.
- Remove the engine coolant temperature gauge.



## INSPECTION

Test the temperature gauge sensor 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.



**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Resistance ( $\Omega$ )**

### Temperature gauge specification

Water temperature	Standard resistance
50°C (122°F)	Approx. 9.56 k $\Omega$
100°C (212°F)	Approx. 2.78 k $\Omega$
120°C (248°F)	Approx. 0.69 k $\Omega$
130°C (266°F)	Approx. 0.50 k $\Omega$

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 and indicator, refer to pages 7-32 and -33.

## INSTALLATION

Apply SUZUKI BOND "1207B" to the thread portion of the temperature gauge and tighten it to the specified torque.

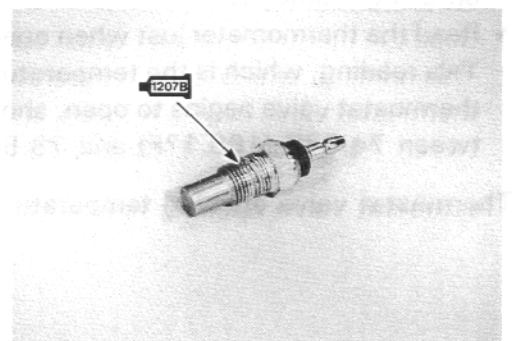
**1207B** 99104-31140: SUZUKI BOND "1207B"

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

### **CAUTION**

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

- After installing the engine coolant temperature gauge, be sure to add engine coolant: refer to page 2-12 for refilling information.



## THERMOSTAT

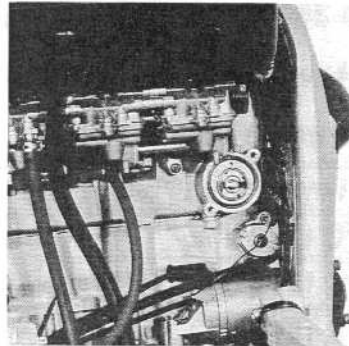
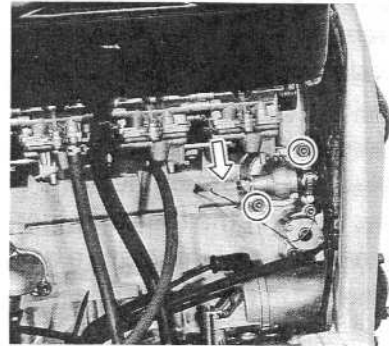
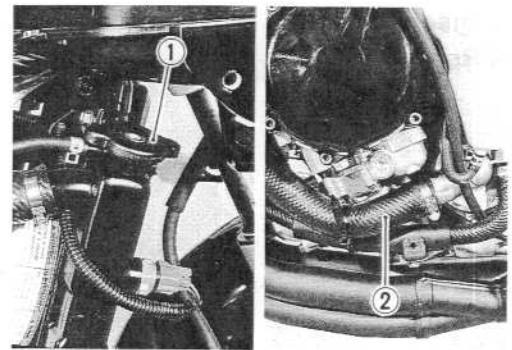
### REMOVAL

- Remove the lower fairing, the front seat and the frame cover. (Refer to pages 6-2 and 3.)
- Remove the fuel tank. (Refer to pages 4-2 and -3.)
- Remove the radiator cap ① and disconnect water hose ② from the water pump, then 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.
- \* Coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If 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!

- Disconnect the engine coolant temperature gauge lead wire connector.
- Remove the thermostat case bolts.
- Remove the thermostat.



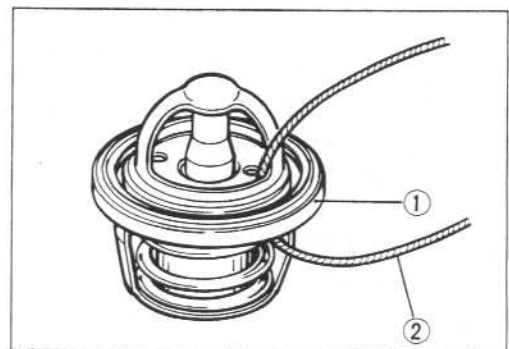
### INSPECTION

Inspect the thermostat pellet for signs of cracking.

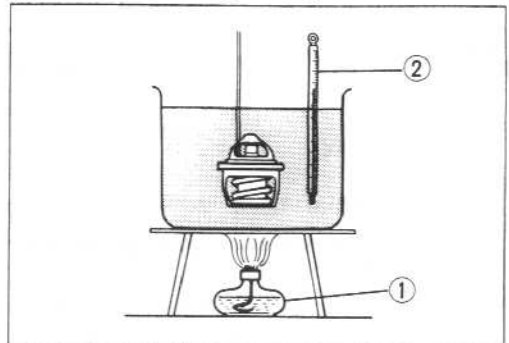
Test the thermostat at the bench for control action, in the following manner.

- 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)**



① Thermostat ② String



① Stove ② Thermometer

- 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.

## INSTALLATION

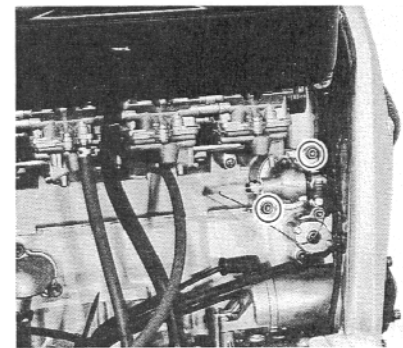
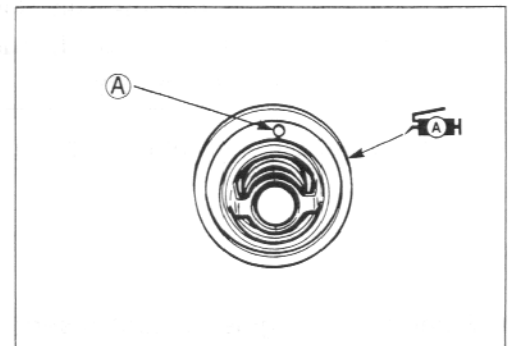
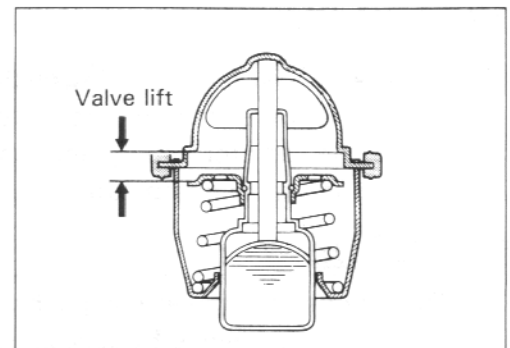
- The air bleeder hole (A) of the thermostat faces upside.
- Apply grease to the rubber seal on the thermostat.

 **AH99000-25030: SUZUKI SUPER GREASE "A"**

- Tighten the thermostat case bolts to the specified torque.

 **Thermostat case bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)**

- After installing the thermostat, be sure to add engine coolant: refer to page 2-12 for refilling information.



## WATER PUMP

### REMOVAL AND DISASSEMBLY

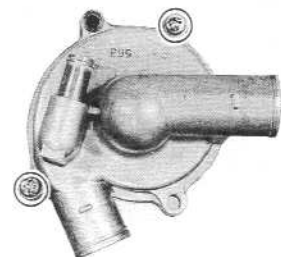
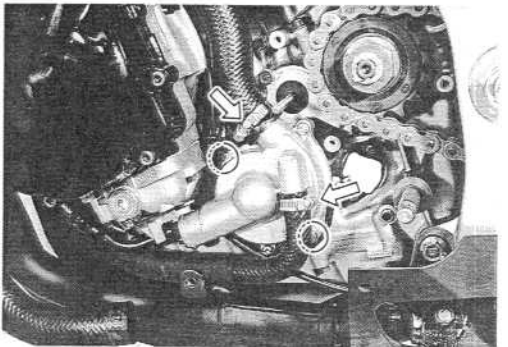
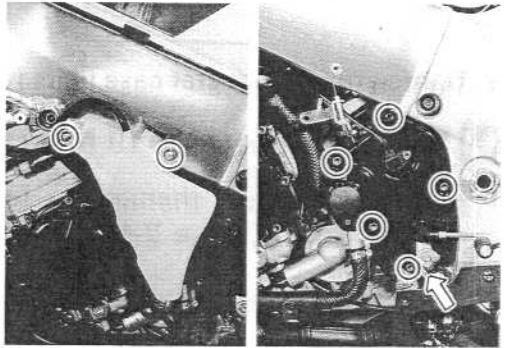
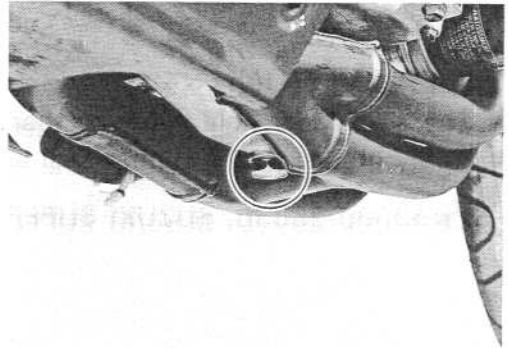
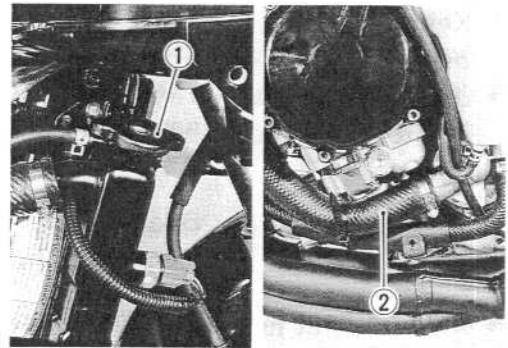
- Remove the lower fairing. (Refer to page 6-2.)
- Remove the radiator cap ① and disconnect water hose ② from the water pump, then drain engine coolant.

#### **⚠ WARNING**

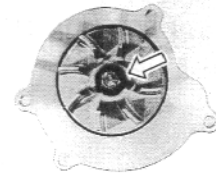
- \* Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- \* Coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If coolant gets into the eyes or in contact with the skin, flush thoroughly with plenty of water. If swallowed,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

- Remove the oil drain plug to drain out engine oil.
- Remove the engine coolant reservoir tank.
- Remove the gearshift lever and engine sprocket cover.
- Disconnect the water hoses.
- Remove the water pump mounting bolt.
- Remove the water pump assembly.

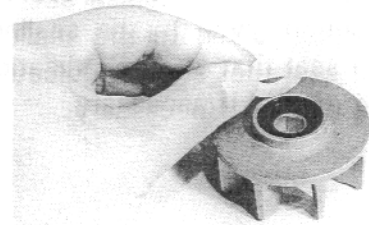
- Remove the water pump cover.



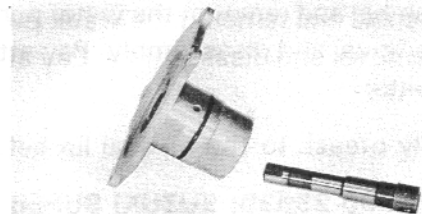
- Remove the impeller securing bolt by holding the impeller shaft with a water pump pliers.



- Remove the mechanical seal ring.



- Remove the impeller shaft.



- Draw out the bearings by using the special tools.

**TOOL** 09921-20200: Bearing remover  
09930-30102: Sliding shaft

**CAUTION**

The removed bearings must be replaced with new ones.

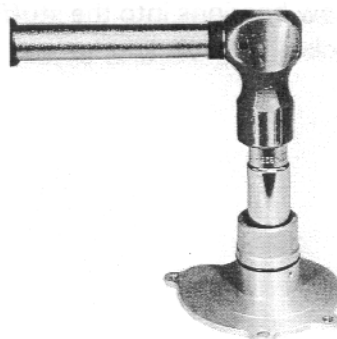
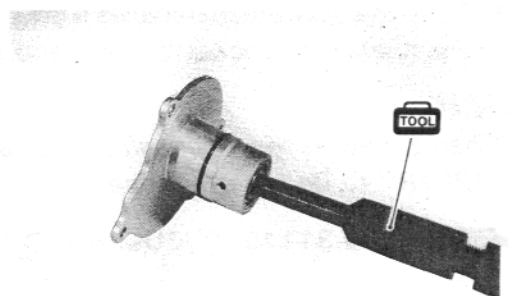
*NOTE:*  
If no abnormal noise, bearing removal is not necessary.

- Drive out the mechanical seal with oil seal by using a suitable size box wrench and so on.

**CAUTION**

The removed mechanical seal and oil seal must be replaced with new ones.

*NOTE:*  
If no water or oil leakage, mechanical seal and oil seal removal is not necessary.

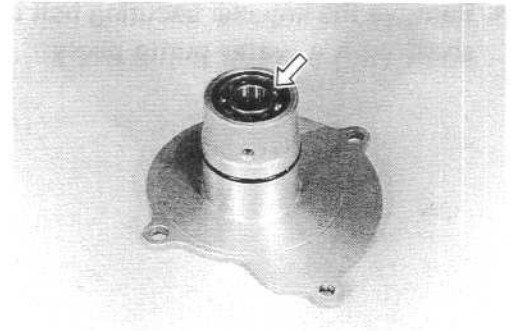




## INSPECTION

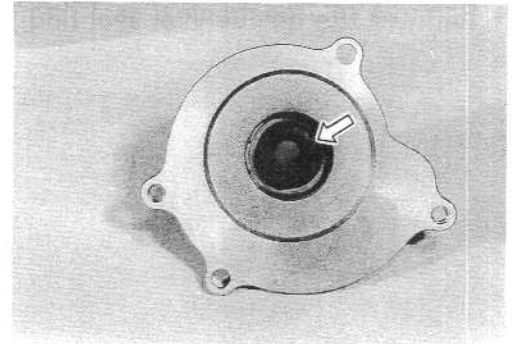
### WATER PUMP BEARING

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 AND INSTALLATION

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

- Apply grease to the oil seal lip before installing.

 **H99000-25030: SUZUKI SUPER GREASE "A"**

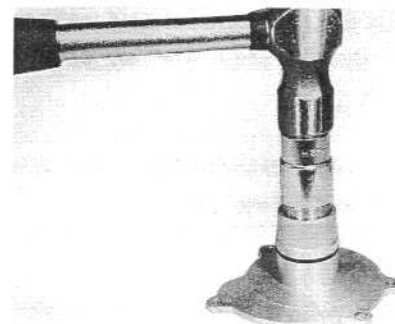
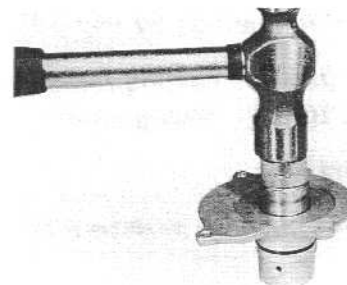
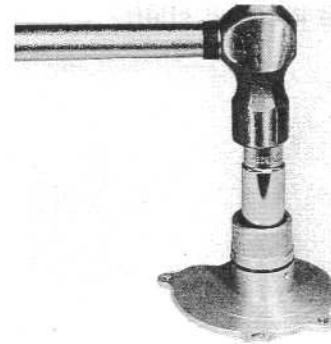
- Press the new oil seal into the stuffing box with a suitable size socket wrench and so on.
- Press the new mechanical seal into the stuffing box with a suitable size socket wrench and so on.

### NOTE:

When installing the mechanical seal, apply **SUZUKI BOND "1207B"** to its outer surface.

 **99104-31140: SUZUKI BOND "1207B"**

- Press the new bearings into the stuffing box with a suitable size socket wrench and so on.



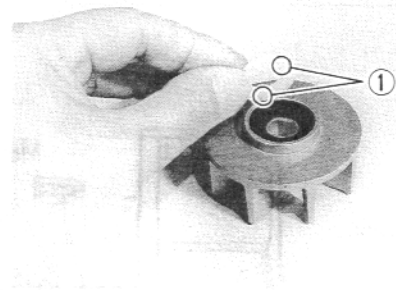
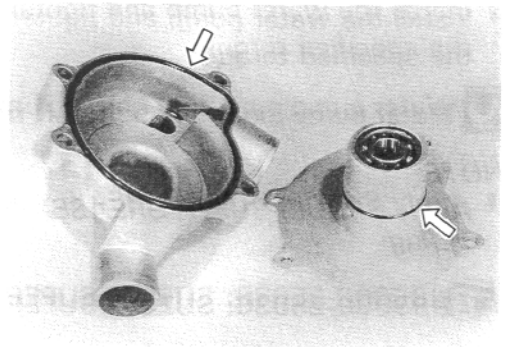
- Replace the O-rings and water seal with new ones when reassembling the water pump.

**NOTE:**

\* Apply *SUZUKI SUPER GREASE "A"* to the O-rings

**FAH99000-25030: SUZUKI SUPER GREASE "A"**

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

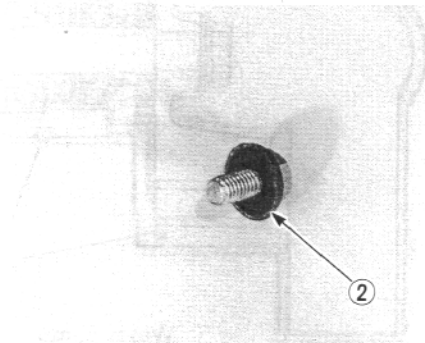


- Tighten the impeller securing bolt to the specified torque.

**U Impeller securing bolt: 8 N·m (0.8 kg-m, 6.0 lb-ft)**

**NOTE:**

The seal lip side ② faces impeller.

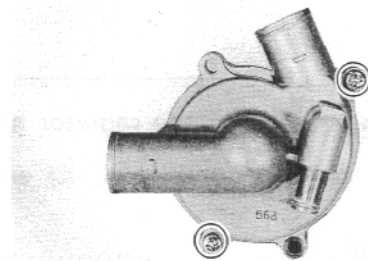


- Tighten the water pump cover screws to the specified torque.

**U Water pump cover screw: 6 N·m (0.6 kg-m, 4.5 lb-ft)**

**NOTE:**

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



## 5-19 COOLING SYSTEM

- Install the water pump and tighten its mounting bolt to the specified torque.

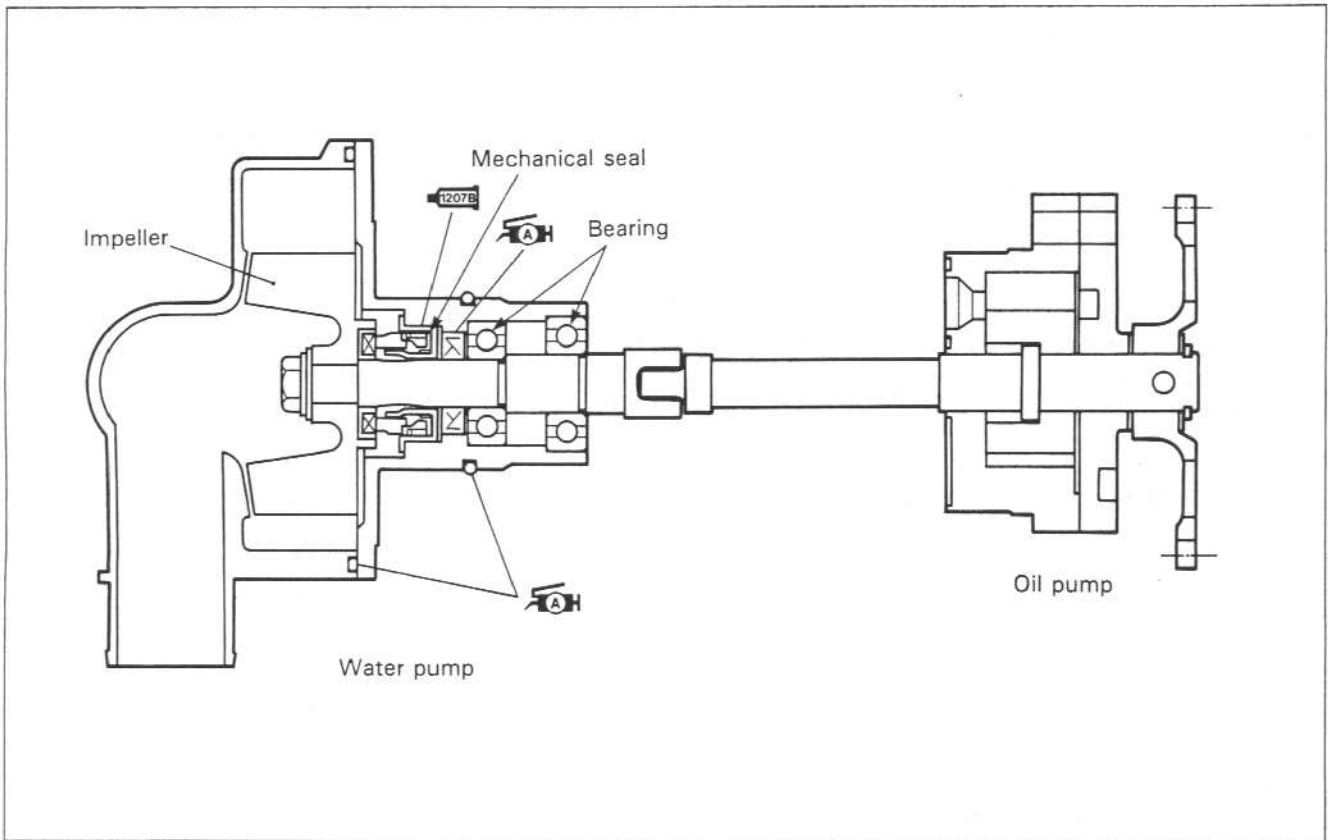
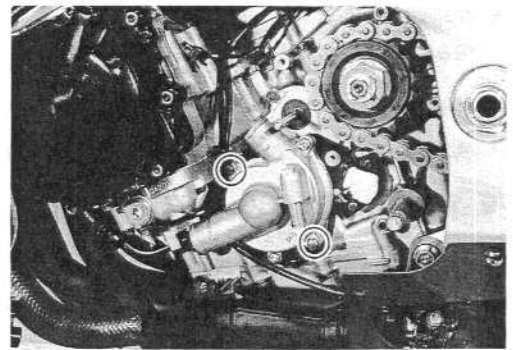
 **Water pump mounting bolt: 6 N·m (0.6 kg-m, 4.5 lb-ft)**

### NOTE:

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

 **H99000-25030: SUZUKI SUPER GREASE "A"**

- \* Set the water pump shaft to the oil pump shaft as shown in the following illustration.



Refer to page 8-19 for the radiator hose routing.

- After all work is completed, fill engine oil and engine coolant.

Engine oil ..... Page 2- 9

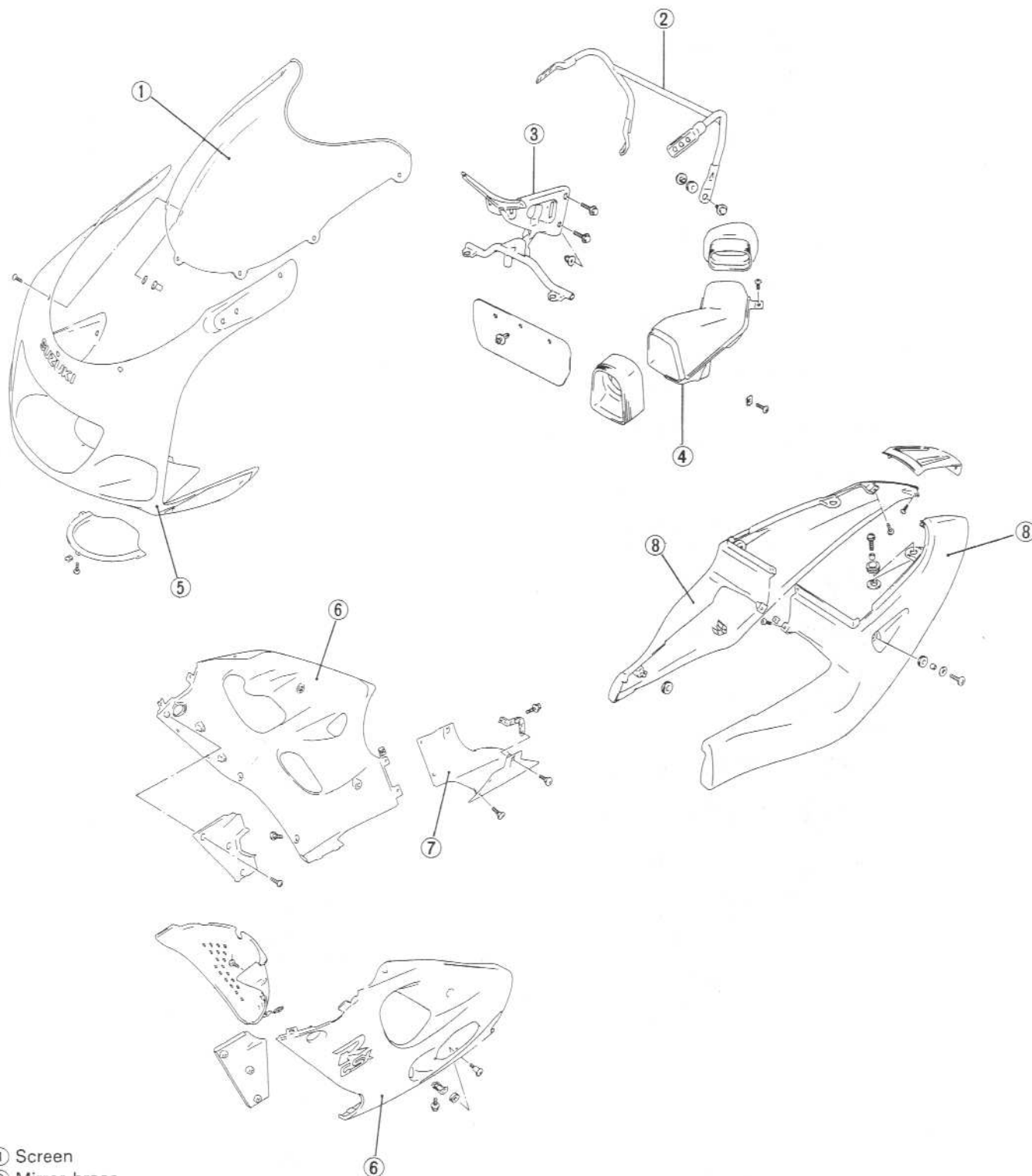
Engine coolant ..... Page 2-12

# CHASSIS

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# EXTERIOR PARTS CONSTRUCTION

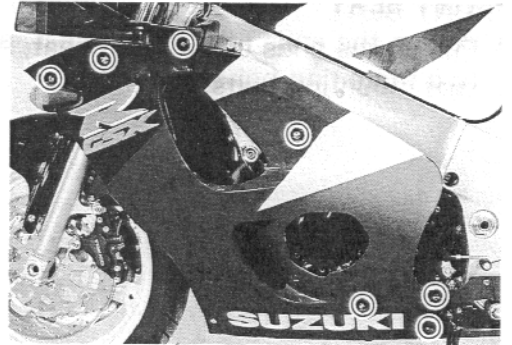
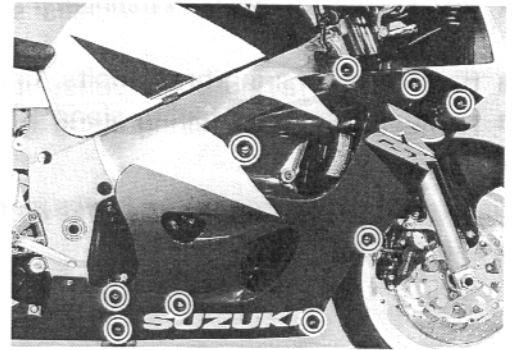


- ① Screen
- ② Mirror brace
- ③ Fairing brace
- ④ Air intake pipe
- ⑤ Upper fairing
- ⑥ Lower fairing
- ⑦ Under fairing
- ⑧ Frame cover

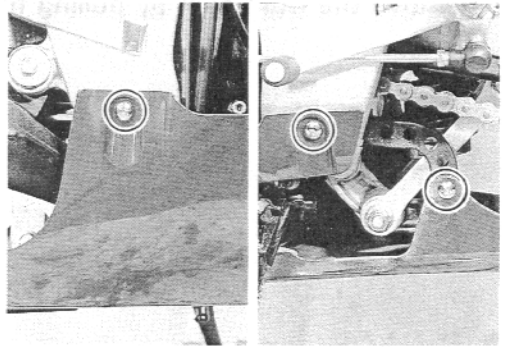
## REMOVAL

### FAIRING

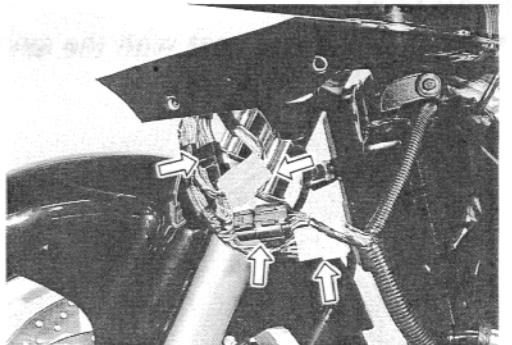
- Remove the lower fairing screws and disconnect the turn signal light lead wire couplers.
- Remove both sides of the lower fairing.



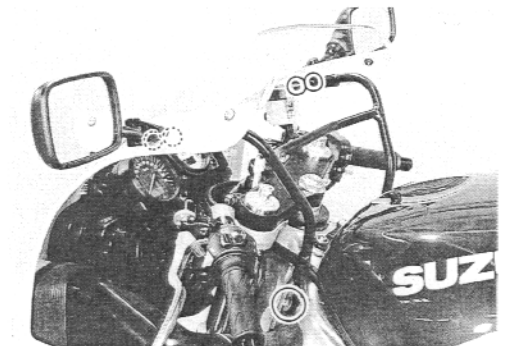
- Remove the under fairing by removing the screws.



- Disconnect the four lead wire couplers under the left air intake pipe.



- Remove the rear view mirrors, left and right.
- Remove the mirror brace by removing its mounting bolts.

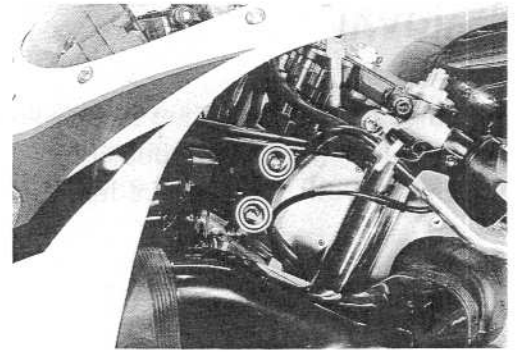


## 6-3 CHASSIS

- Release the left and right handlebar switch lead wires from the fixed clamp.
- Remove the fairing brace bolts, upper and lower.
- Remove the upper fairing along with the fairing brace.

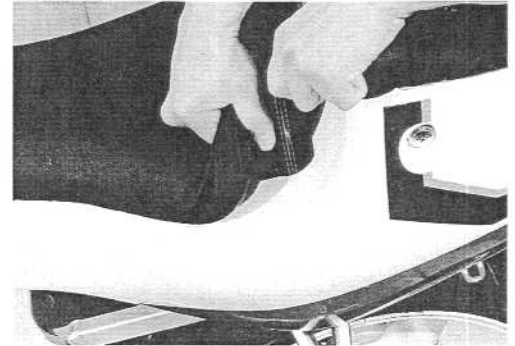
### NOTE:

*Be careful not to drop the air intake pipe when removing the upper fairing.*

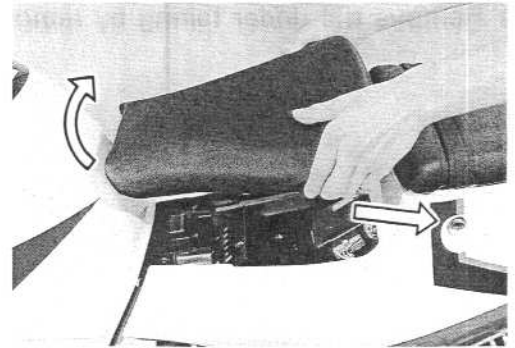


### FRONT SEAT

- Pull up the ends of the front seat, and then remove the two mounting bolts.



- Remove the front seat by pulling the seat back and up.



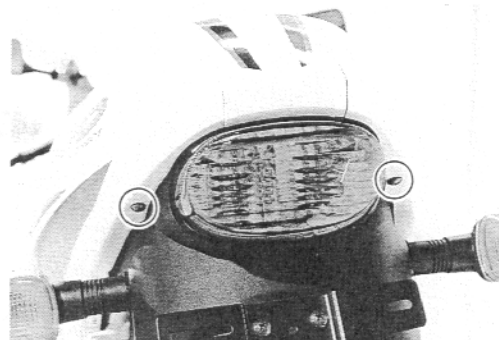
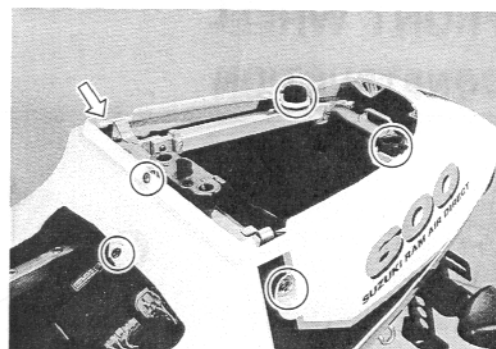
### REAR SEAT

- Remove the rear seat with the ignition key.



**FRAME COVER**

- Remove the seats. (Refer to page 6-3.)
- Remove the frame cover mounting screws.



- Extract the hooked parts of the frame cover, left and right.
- Remove the frame cover.



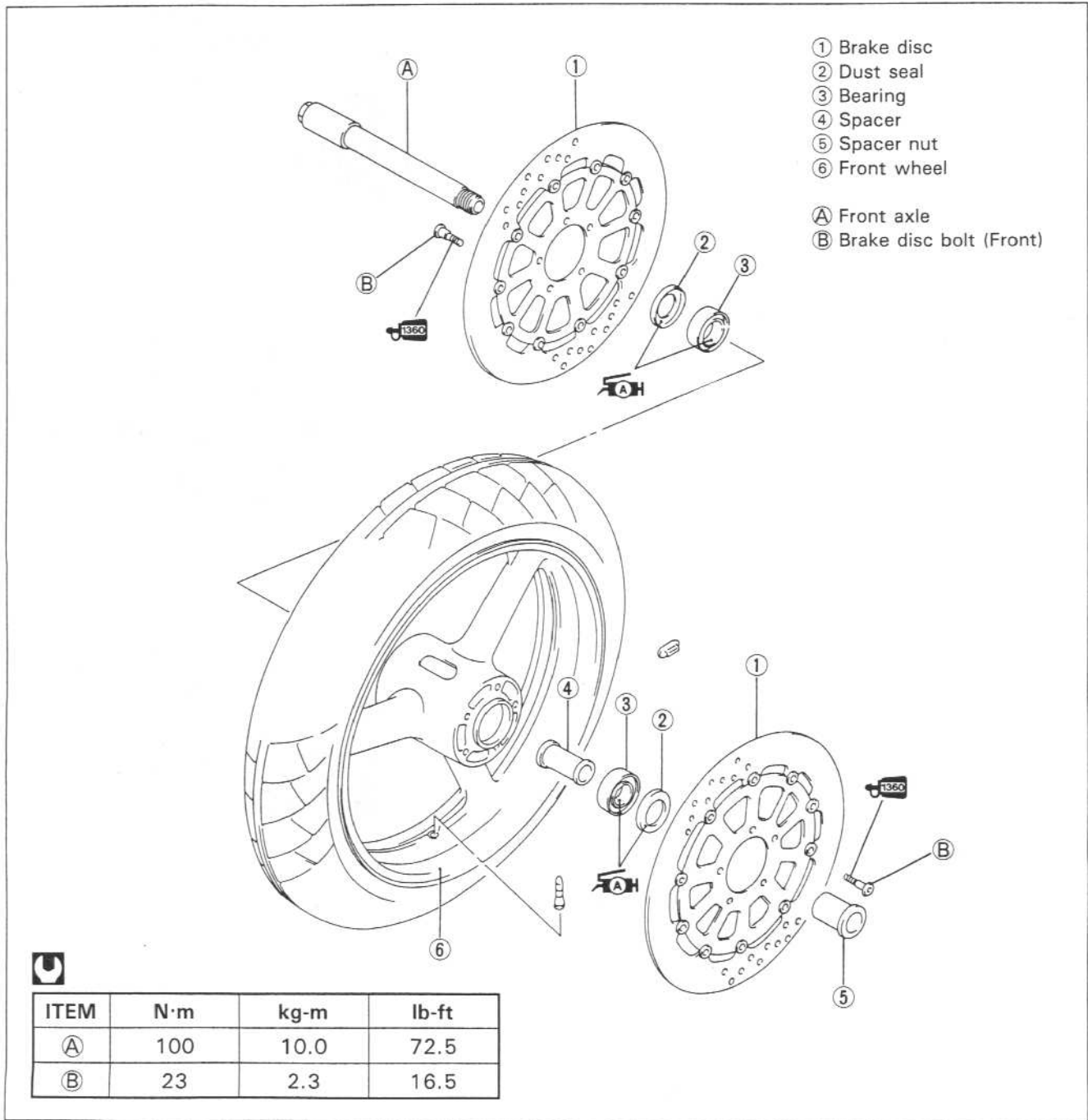
☆ hooked part

**REMOUNTING**

Remount the frame cover, rear seat, front seat and fairing in the reverse order of their removal.



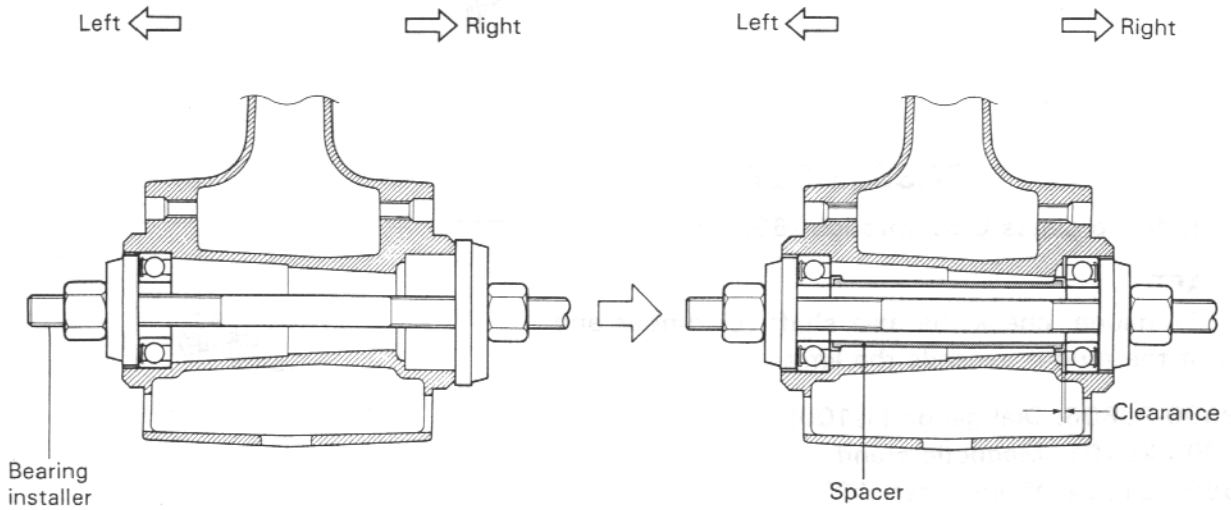
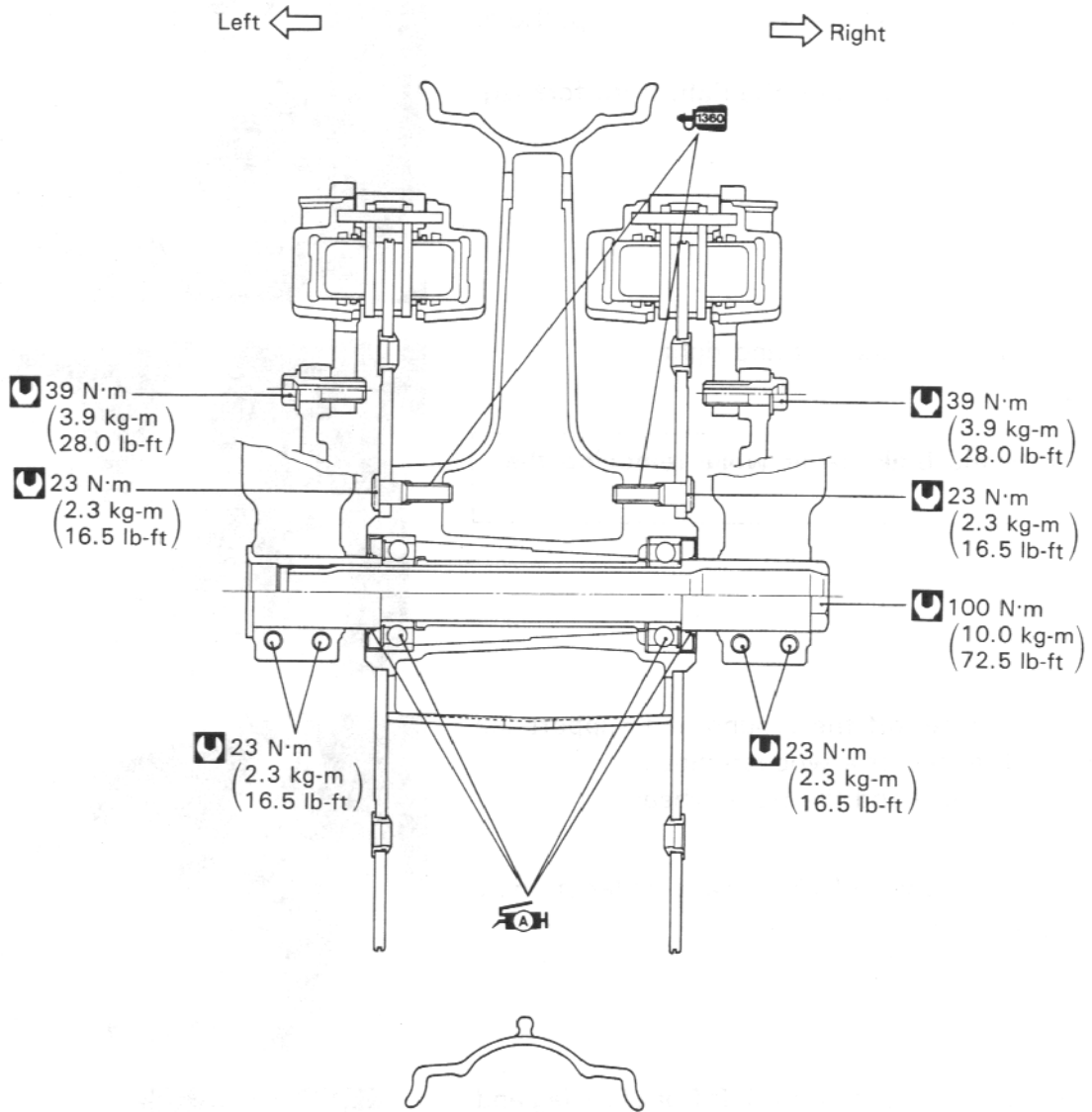
# FRONT WHEEL CONSTRUCTION



## SPECIFICATIONS

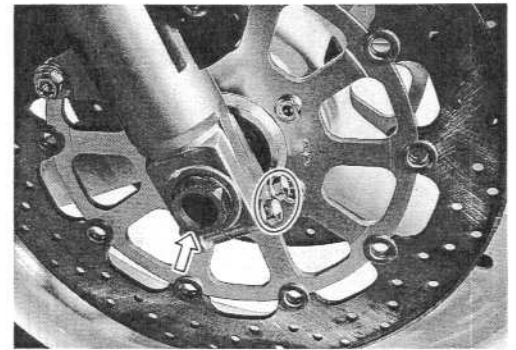
Unit: mm (in)

ITEM	STANDARD		LIMIT
Axle runout	Front	—	0.25 (0.010)
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel rim size	Front	J17 x MT3.50	—
Tire size	Front	120/70 ZR17 (58W)	—



## REMOVAL

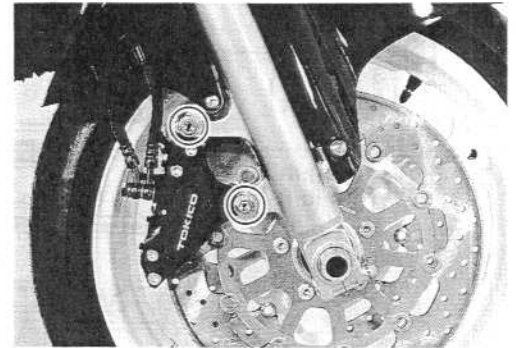
- Remove both sides of the lower fairing to jack up. (Refer to page 6-2.)
- Loosen two axle pinch bolts on the right front fork leg.
- Loosen the front axle.



- Remove the brake calipers, left and right.

### **CAUTION**

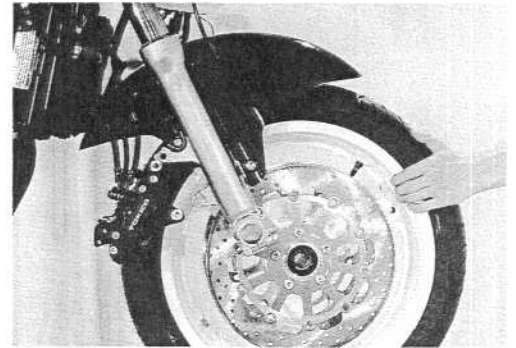
Do not operate the brake lever while removing the calipers.



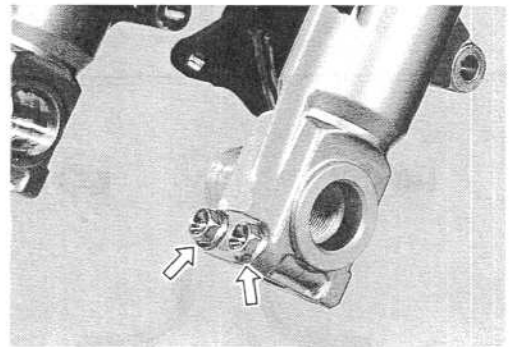
- Raise the front wheel off the ground and support the motorcycle with a jack or a wooden block.
- Remove the front axle and the front wheel.

### NOTE:

After removing the front wheel, fit the calipers temporarily to the original positions.



- Loosen two axle pinch bolts on the left front fork leg and remove the spacer nut.



## INSPECTION AND DISASSEMBLY

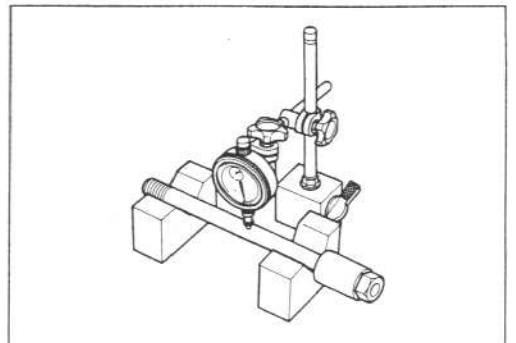
**TIRE** ..... Refer to pages 6-57 through -61.

### AXLE SHAFT

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

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

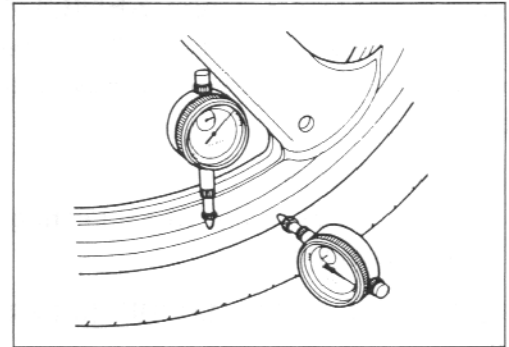
Service Limit (Front and Rear): 0.25 mm (0.010 in)



**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.

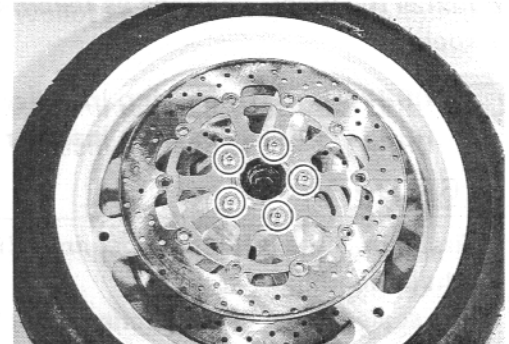
**Service Limit (Axial and Radial, Front and Rear): 2.0 mm (0.08 in)**



**BRAKE DISC**

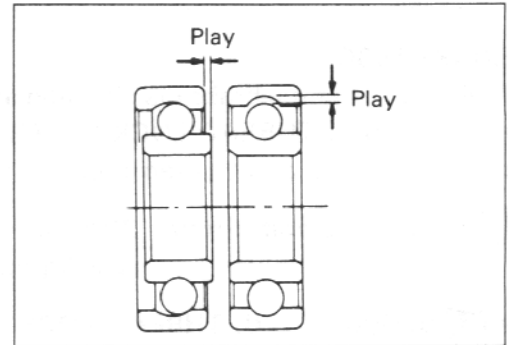
Inspect the brake disc. Replace it if its thickness or runout exceed the limit. (Refer to page 6-48.)

- Remove the brake disc from the front wheel with a hexagon wrench.



**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.

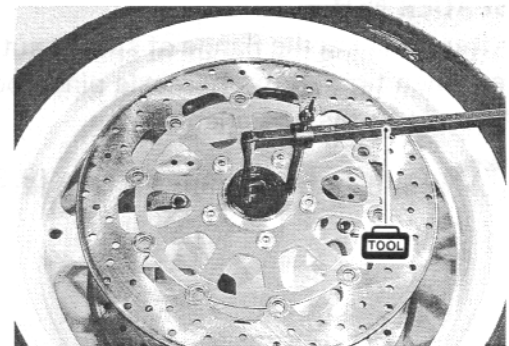


- Remove both side dust seals by using the oil seal remover.

**TOOL** 09913-50121: Oil seal remover

**CAUTION**

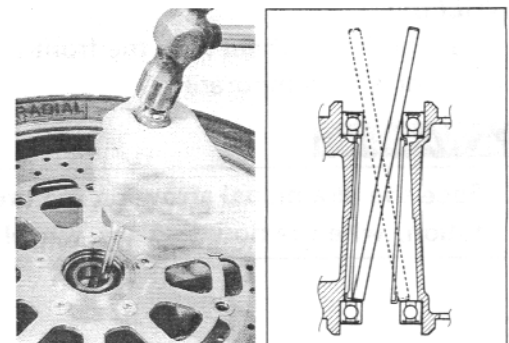
The removed dust seals must be replaced with new ones.



Drive out both side wheel bearings by using a intensified screw driver.

**CAUTION**

The removed bearings must 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 wheel bearing and dust seal lip before installing.

 **99000-25030: SUZUKI SUPER GREASE "A"**

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

 **09924-84510: Bearing installer set**  
**09941-34513: Bearing installer set**

### CAUTION

First install the left wheel bearing, then install the right wheel bearing.  
The sealed cover of the bearing must face outside. Refer to page 6-6 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.

 **Brake disc bolt (Front): 23 N·m**  
**(2.3 kg-m, 16.5 lb-ft)**

 **99000-32130: THREAD LOCK SUPER "1360"**

### SPACER NUT

After touching the flange of spacer nut to the left front fork leg, then tighten the two axle pinch bolts on the left front fork leg to the specified torque.

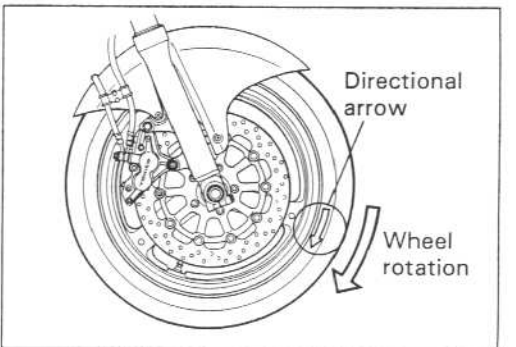
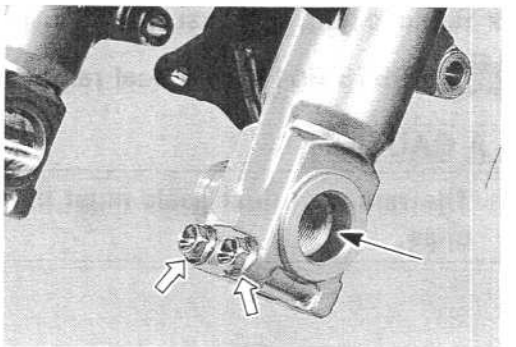
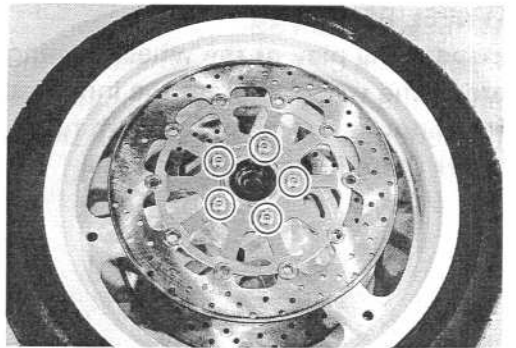
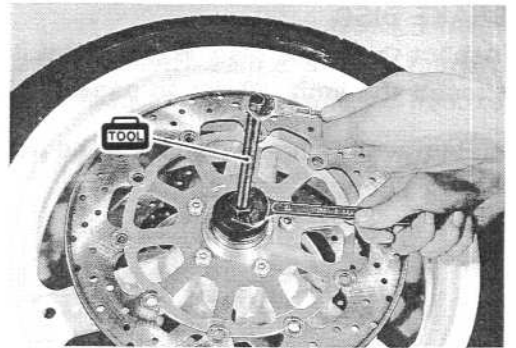
 **Front axle pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**

### WHEEL

Install the front wheel with the front axle and hand-tighten the front axle temporarily.

### WARNING

Face the directional arrow on the tire to the wheel rotation, when remounting the wheel.



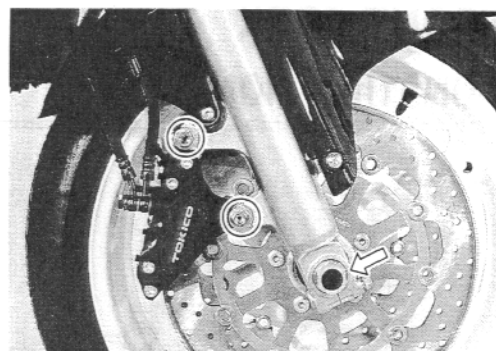
**BRAKE CALIPER**

Tighten the brake caliper mounting bolts to the specified torque.

- 🔧 **Front brake caliper mounting bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)**

**NOTE:**

*Push the pistons all the way into the caliper and remount the calipers.*

**FRONT AXLE**

- Tighten the front axle to the specified torque.

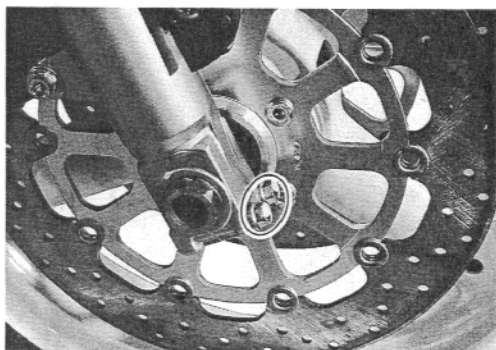
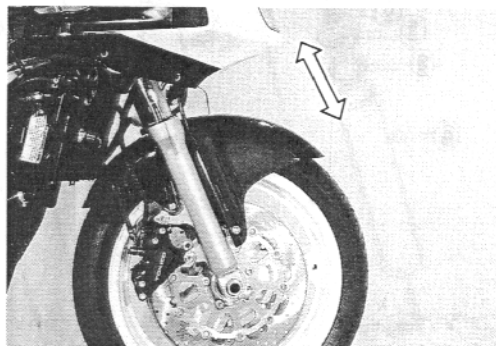
- 🔧 **Front axle: 100 N·m (10.0 kg-m, 72.5 lb-ft)**

- Tighten two axle pinch bolts on the right front fork leg to the specified torque.

- 🔧 **Front axle pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**

**NOTE:**

*Before tightening the two axle pinch bolts on the right front fork leg, move the front fork up and down 4 or 5 times.*



# FRONT FORK CONSTRUCTION

① Spring adjuster bolt  
 ② O-ring  
 ③ Washer  
 ④ Rebound damping force adjuster  
 ⑤ Spring retainer  
 ⑥ Spacer  
 ⑦ Spring  
 ⑧ Washer  
 ⑨ Inner rod/damper rod (cartridge)  
 ⑩ Outer tube  
 ⑪ Anti-friction metal  
 ⑫ Oil seal  
 ⑬ Oil seal stopper ring  
 ⑭ Dust seal  
 ⑮ Inner tube  
 A Front fork cap bolt  
 B Lock nut  
 C Front axle pinch bolt  
 D Damper rod bolt

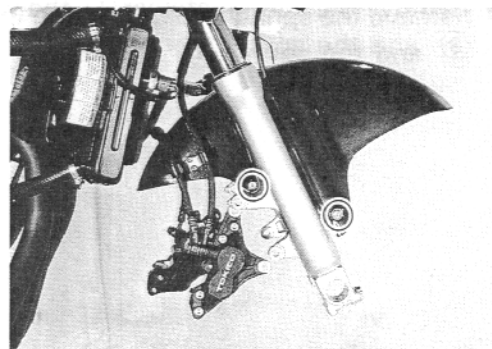
ITEM	N·m	kg-m	lb-ft
A	35	3.5	25.5
B	20	2.0	14.5
C	23	2.3	16.5
D	35	3.5	25.5

## SPECIFICATIONS

ITEM		STANDARD		LIMIT
Front fork stroke		120 mm (4.7 in)		—
Front fork spring free length		—		251 mm (9.9 in)
Front fork oil level		110 mm (4.3 in)		—
Front fork spring adjuster		4th groove from top		—
Front fork damping force adjuster	Rebound	E-03,28,33	At standard position (about 1 1/8 turns out)	—
		Others	At standard position (about 1 turn out)	—
Front fork oil type		Fork oil # 10		—
Front fork oil capacity (each leg)		533 ml (18.0/18.8 US/lmp oz)		—

## REMOVAL AND DISASSEMBLY

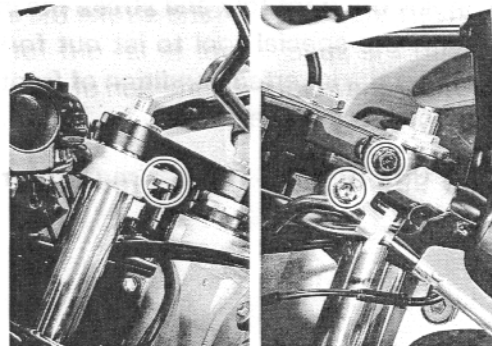
- Remove both sides of the lower fairing. (Refer to page 6-2.)
- Remove the front wheel. (Refer to page 6-7.)
- Disconnect the brake hose from the brake hose guide on the front fender.
- Remove the front fender.



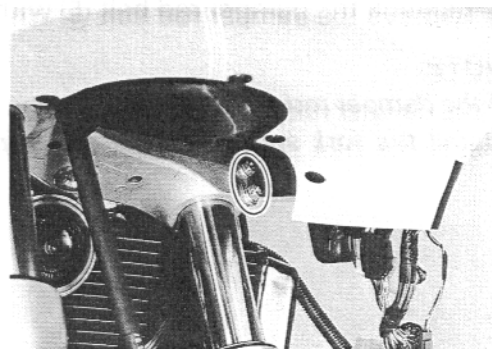
- Loosen the front fork upper clamp bolts, left and right.
- Loosen the handlebar clamp bolts and set bolts, left and right.

### NOTE:

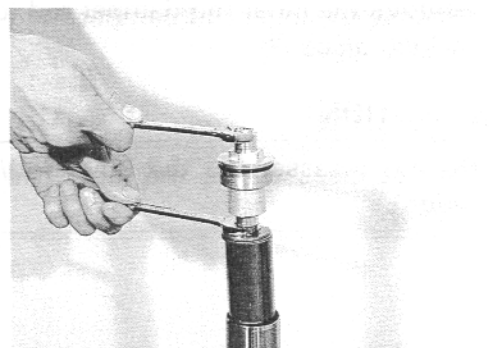
*Slightly loosen the front fork cap bolts before loosening the lower clamp bolts to facilitate later disassembly.*



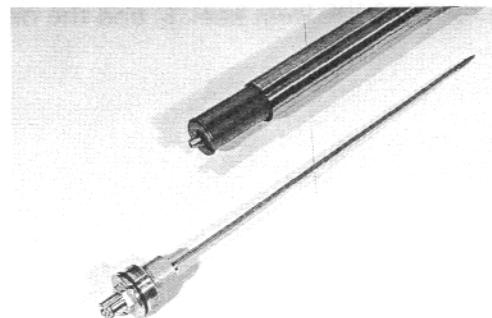
- Loosen the front fork lower clamp bolts, left and right.
- Remove the front forks, left and right.



- Loosen the front fork cap bolt completely.
- Loosen the inner rod lock nut while holding the spring adjuster.



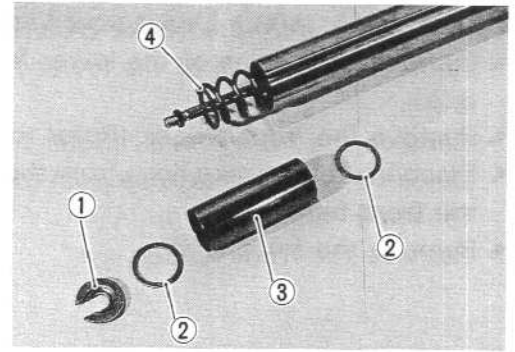
- Remove the front fork cap assembly.





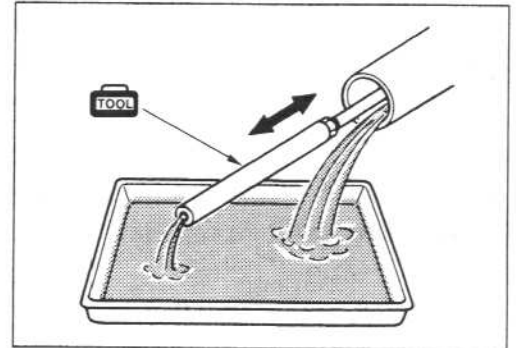
## 6-13 CHASSIS

- Remove the spring retainer ①, the washers ②, the spacer ③ and the spring ④.



- Invert the front fork and stroke the inner rod several times with the special tool to let out fork oil.
- Under the inverted condition of front fork, drain oil to hold it for a few time.

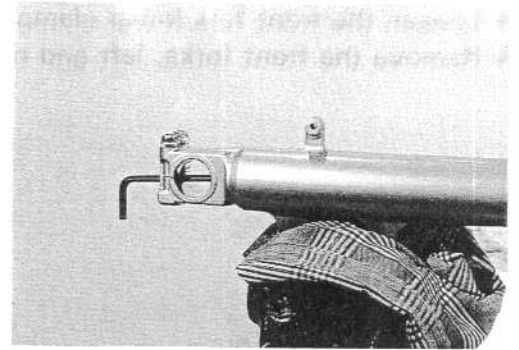
**TOOL** 09940-52841: Inner rod holder



- Remove the damper rod bolt ⑤ with a hexagon wrench.

### NOTE:

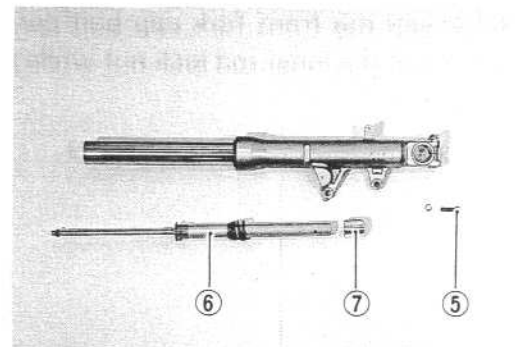
*If the damper rod turns with the damper rod bolt, temporarily install the fork spring, spacer and cap bolt.*



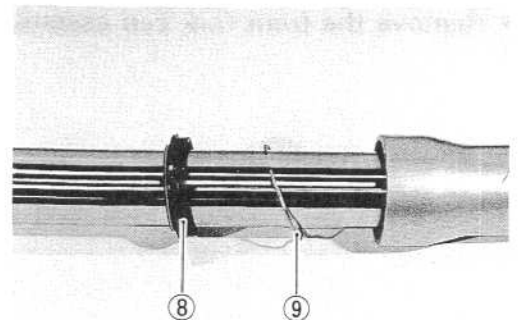
- Remove the inner rod/damper rod (cartridge) ⑥ and the oil lock piece ⑦.

### CAUTION

Do not disassemble the inner rod/damper rod (cartridge).



- Remove the dust seal ⑧ and the oil seal stopper ring ⑨.



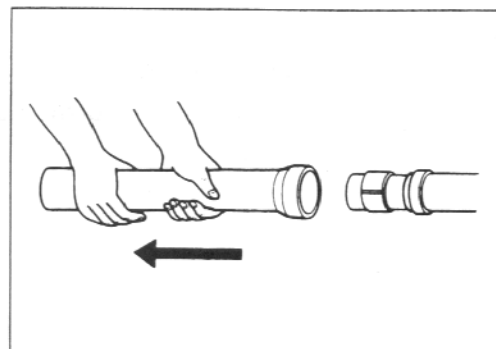
- Extract the outer tube from the inner tube.

**NOTE:**

*Be careful not to damage the inner tube.*

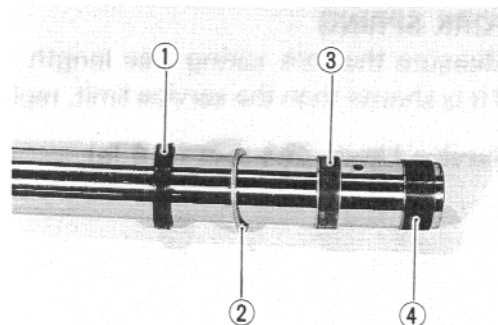
**CAUTION**

The "ANTI-FRICTION" metals, oil seals and dust seals must be replaced with new ones, when reassembling the front forks.

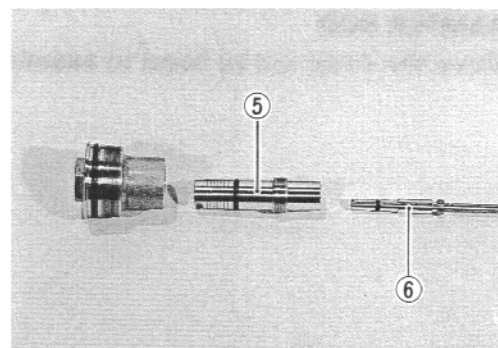


- Remove the following parts.

- ① Oil seal
- ② Oil seal retainer
- ③ Anti-friction metal (Outer tube)
- ④ Anti-friction metal (Inner tube)

**FRONT FORK CAP BOLT DISASSEMBLY**

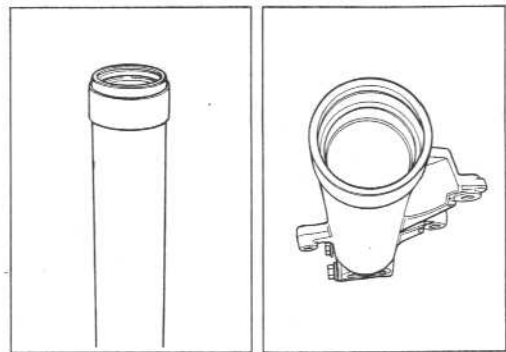
- Remove the spring adjuster ⑤.
- Remove the rebound damping force adjuster ⑥.



## INSPECTION

### INNER AND OUTER TUBES

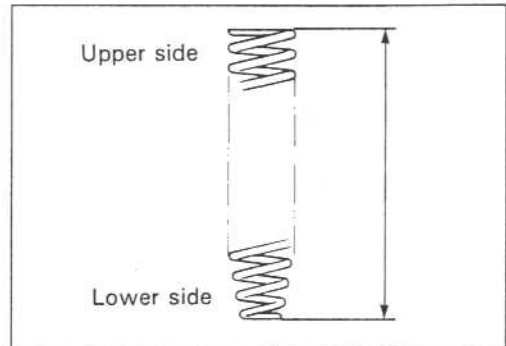
Inspect the inner tube outer surface and outer tube inner surface for scratches.



### FORK SPRING

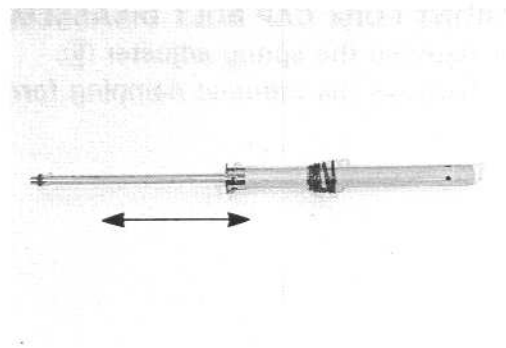
Measure the fork spring free length.  
If it is shorter than the service limit, replace it with a new one.

**Service Limit: 251 mm (9.9 in)**



### DAMPER ROD

Move the inner rod by hand to examine it for smoothness.



## REASSEMBLY AND REMOUNTING

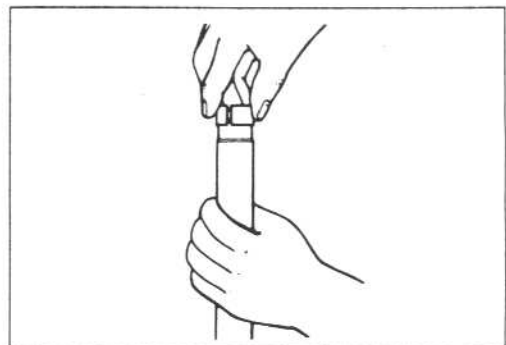
Reassemble and remount the front fork in the reverse order of removal and disassembly. Pay attention to the following points:

### TUBE METALS AND SEALS

- Hold the inner tube vertically and clean the metal groove and install the ANTI-FRICTION metal by hand as shown.

**⚠ CAUTION**

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

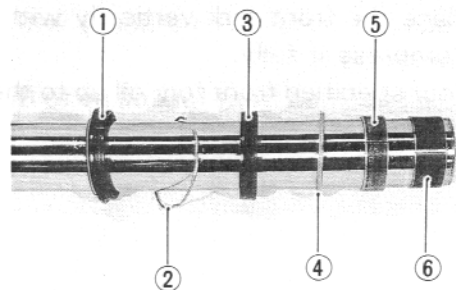


- Apply grease to the oil seal lip lightly before installing it.

**TOOL** 099000-25030: SUZUKI SUPER GREASE "A"

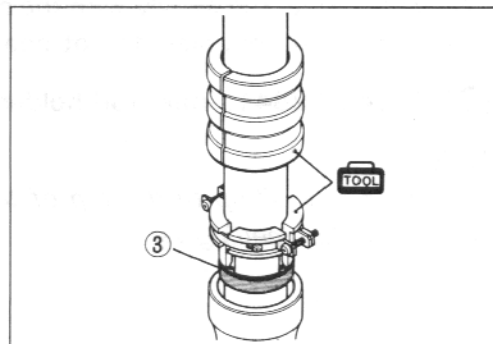
- Install the dust seal, oil seal stopper ring, oil seal, oil seal retainer and anti-friction metal onto the inner tube.

- ① Dust seal
- ② Oil seal stopper ring
- ③ Oil seal
- ④ Oil seal retainer
- ⑤ Anti-friction metal (Outer tube)
- ⑥ Anti-friction metal (Inner tube)



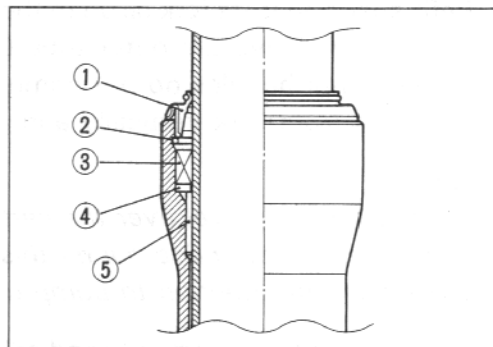
**CAUTION**

- \* Do not use solvents for washing to prevent oil seal damage.
- \* Apply fork oil to the Anti-friction metals, lip of oil seal and dust seal.



- Insert the inner tube into the outer tube and fit the oil seal and dust seal with the special tool.

**TOOL** 09940-52861: Front fork oil seal installer



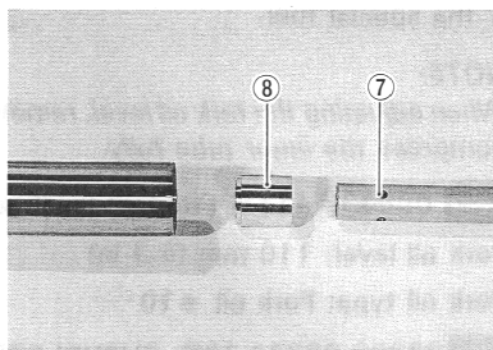
**DAMPER ROD BOLT**

Insert the inner rod/damper rod (cartridge) ⑦ and the oil lock piece ⑧ into the inner tube and tighten the damper rod bolt to the specified torque with a hexagon wrench.

**TOOL** Damper rod bolt: 35 N·m (3.5 kg·m, 25.5 lb-ft)

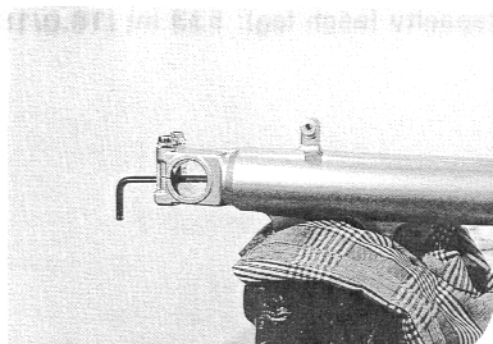
**CAUTION**

Use a new damper rod bolt gasket to prevent oil leakage.



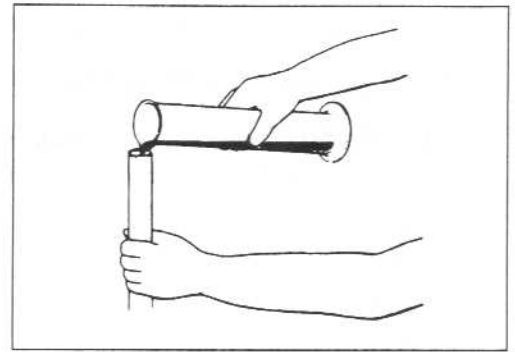
**NOTE:**

If the damper rod turns with the damper rod bolt, temporarily install the fork spring, spacer and cap bolt.



**FORK OIL**

- Place the front fork vertically without spring.
- Compress it fully.
- Pour specified front fork oil up to the top level of the outer tube.

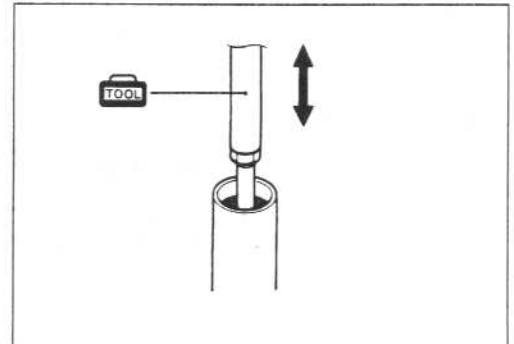


- Move the inner rod slowly with the special tool more than ten times until bubbles do not come out from the oil.

**TOOL** 09940-52841: Inner rod holder

**NOTE:**

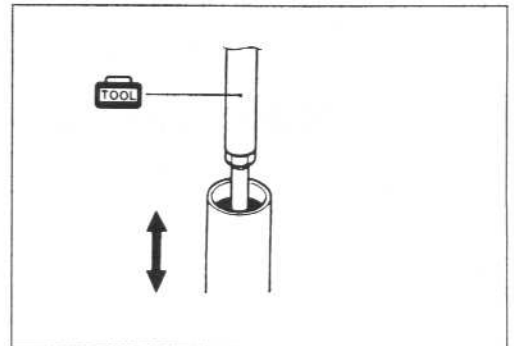
Refill front fork oil up to the top of the outer tube to find bubbles while bleeding air.



- Refill specified front fork oil up to the top level of the outer tube again. Move the outer tube up and down several strokes until bubbles do not come out from the oil.
- Keep the front fork vertically and wait 5–6 minutes.

**NOTE:**

- \* Always keep oil level over the cartridge top end, or air may enter the cartridge during this procedure.
- \* Take extreme attention to pump out air completely.



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

**NOTE:**

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

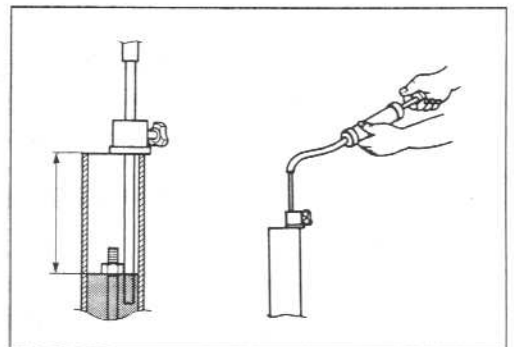
**TOOL** 09943-74111: Front oil level gauge

Fork oil level: 110 mm (4.3 in)

Fork oil type: Fork oil # 10

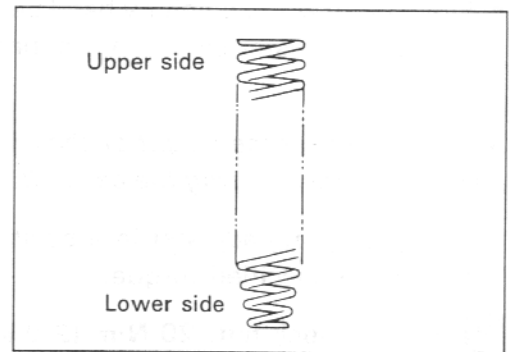
**FORK** 99000-99044-10G: SUZUKI FORK OIL # 10

Capacity (each leg): 533 ml (18.0/18.8 US/Imp oz)



**FORK SPRING**

- Install the fork spring as shown in the illustration.

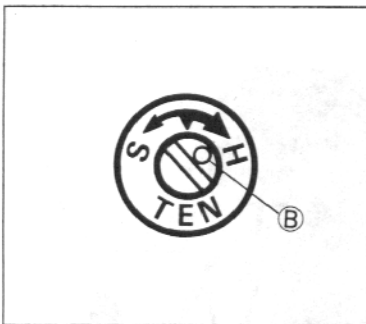
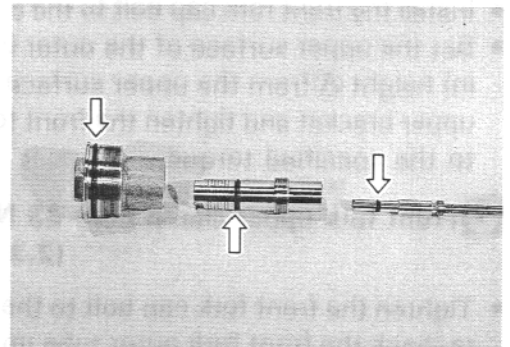


**FRONT FORK CAP BOLT**

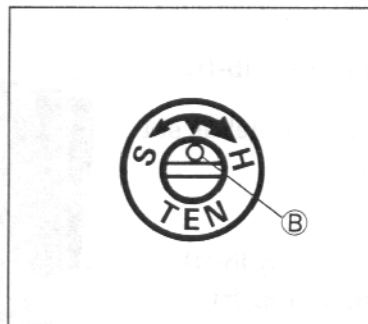
**⚠ CAUTION**

The O-rings removed must be replaced with a new one.

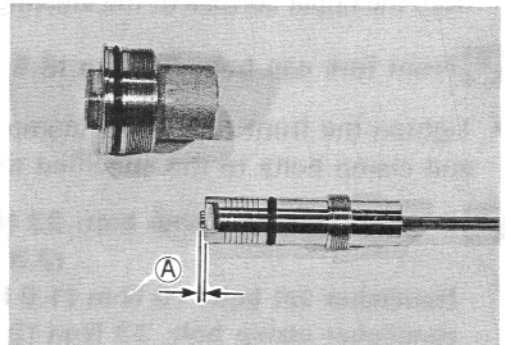
- Adjust the height (A) of the rebound damping force adjuster at about 1.5 mm (0.06 in) and position the punch mark (B) as shown in following illustrations.
- Install the spring adjuster to the cap bolt.



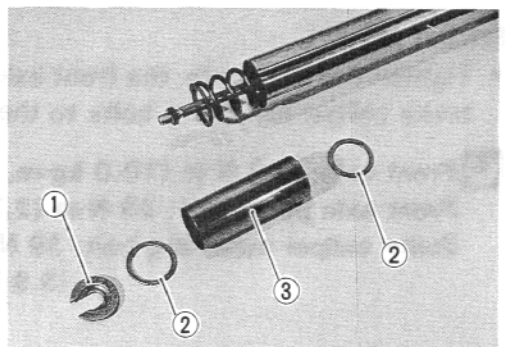
(E-03, 28, 33 models)



(Other models)



- Install the spring retainer (1), the washers (2) and spacer (3).

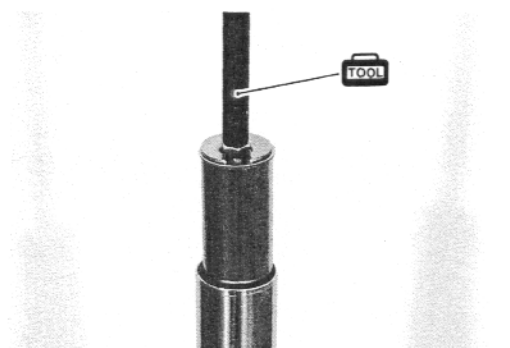


- While holding the inner rod with the special tool, compress the spring and then insert the spring retainer (1) between the lock nut (4) and washer (2).

**NOTE:**

Screw the damping force adjuster lock nut fully on the inner rod threads before installing the cap bolt.

**TOOL** 09940-52841: Inner rod holder



- Slowly turn the cap bolt by hand until the rebound damping force adjuster seats on the inner-rod.

**NOTE**

*Be sure to adjust the height of the rebound damping force adjuster before installing the cap bolt. (Refer to page 6-18.)*

- Hold the spring adjuster in a position. Tighten the lock nut to the specified torque.

**Inner rod lock nut: 20 N·m (2.0 kg-m, 14.5 lb-ft)**

- Install the front fork cap bolt to the outer tube temporarily.
- Set the upper surface of the outer tube at 3.2 mm (0.13 in) height **A** from the upper surface of the steering stem upper bracket and tighten the front fork upper clamp bolts to the specified torque.

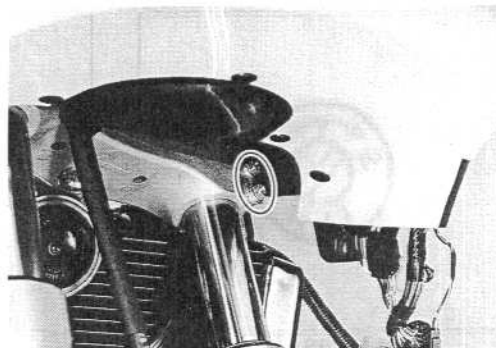
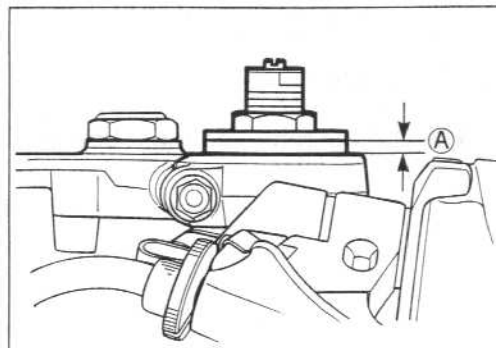
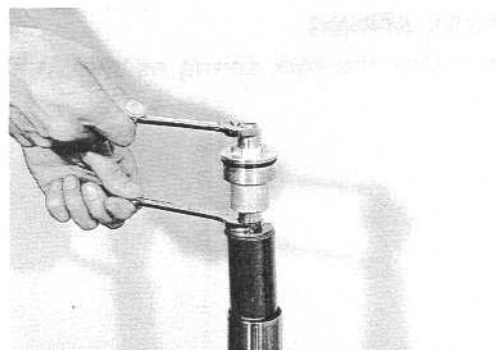
**Front fork upper clamp bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**

- Tighten the front fork cap bolt to the specified torque and recheck the front fork outer tube upper surface height **A** from the upper surface of the steering stem upper bracket.

**Front fork cap bolt: 35 N·m (3.5 kg-m, 25.5 lb-ft)**

- Tighten the front fork lower clamp bolts, handlebar set and clamp bolts to the specified torque.

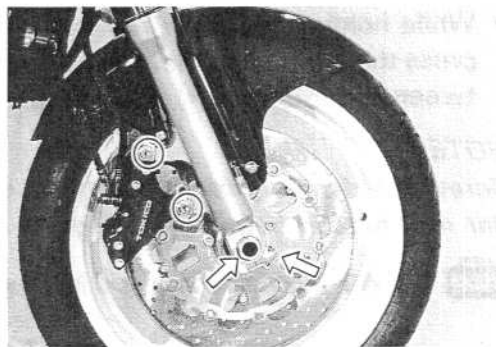
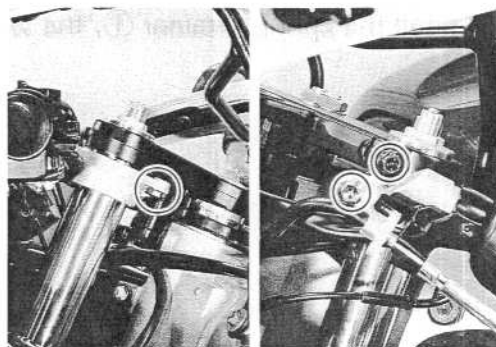
**Front fork lower clamp bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**  
**Handlebar set bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)**  
**Handlebar clamp bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**



**FRONT WHEEL**

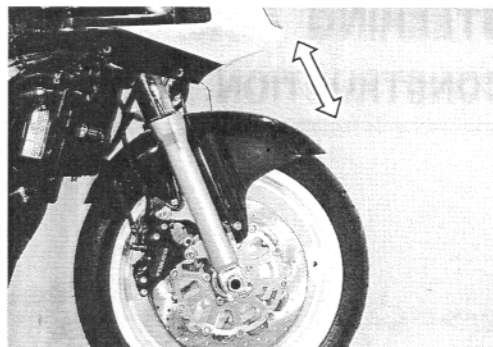
- Tighten the front axle, the front axle pinch bolts and the brake caliper mounting bolts to the specified torque.

**Front axle: 100 N·m (10.0 kg-m, 72.5 lb-ft)**  
**Front axle pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**  
**Brake caliper mounting bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)**



**NOTE:**

Before tightening the two axle pinch bolts on right front fork leg, move the front fork up and down 4 or 5 times.



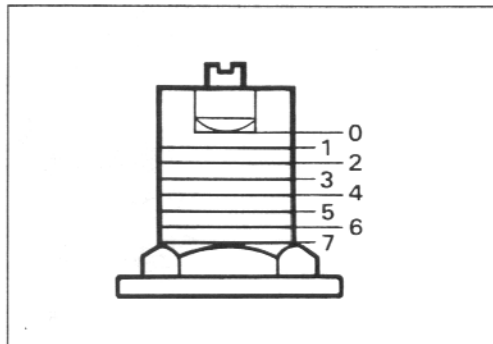
**SUSPENSION SETTING**

After installing the front fork, adjust the spring pre-load and damping force as follows.

**SPRING PRE-LOAD ADJUSTMENT**

There are seven grooved lines on the side of the spring adjuster. Position 0 provides the maximum spring pre-load and position 7 provides the minimum spring pre-load.

**STD position: 4**



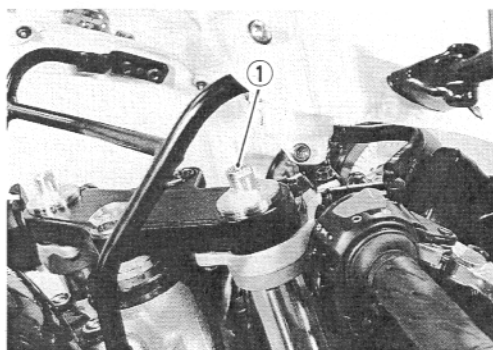
**DAMPING FORCE ADJUSTMENT**

**(Rebound side)**

Fully turn the damping force adjuster ① clockwise. It is at stiffest position and turn it out to standard setting position.

**STD position: 1 1/8 turns out ... E-03,28,33**

**1 turn out ..... Others**



**STANDARD FRONT SUSPENSION SETTING**

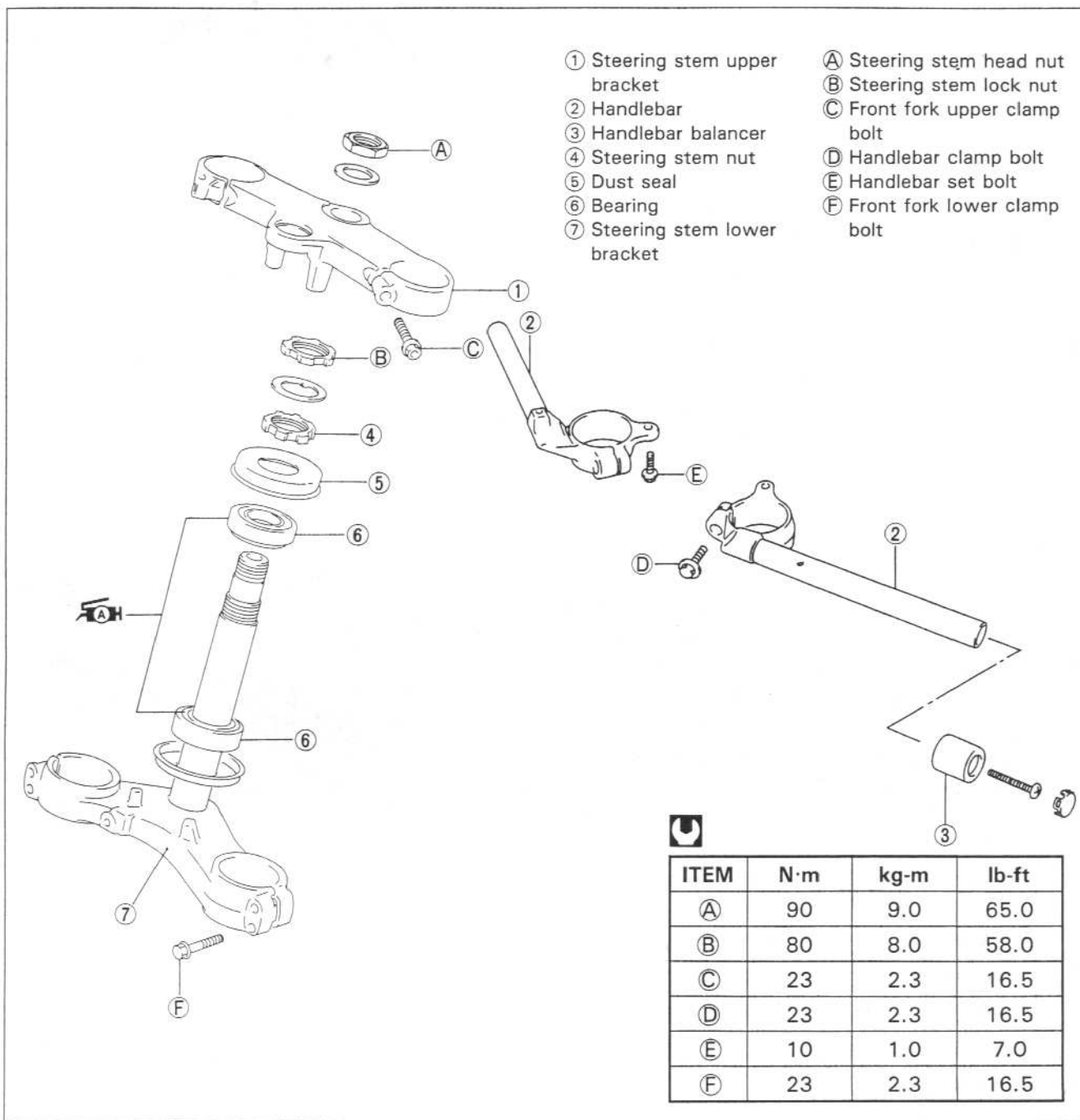
		FRONT		
		Spring pre-load adjuster	Rebound damping force adjuster	
			E-03,28,33 models	Other models
Solo riding	Softer	4	1 1/4 turns out	1 1/4 turns out
	Standard	4	1 1/8 turns out	1 turn out
	Stiffer	4	3/4 turn out	3/4 turn out
Dual riding		4	1 1/8 turns out	1 turn out

**⚠ WARNING**

Be sure to adjust the spring pre-load and damping force on both front fork legs equally.



## STEERING CONSTRUCTION



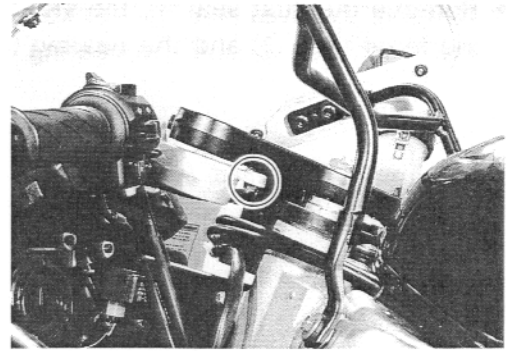
### REMOVAL AND DISASSEMBLY

- Remove both sides of the lower fairing. (Refer to page 6-2.)
- Remove the front wheel. (Refer to page 6-5.)
- Remove the front fork. (Refer to page 6-11.)

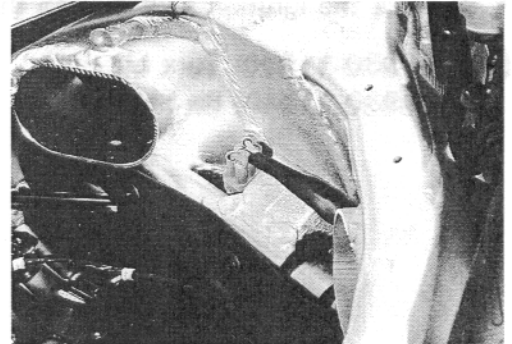
- Remove the left and right handlebars by removing its set bolts.
- Remove the left and right handlebar switch lead wires from the guide.

**NOTE:**

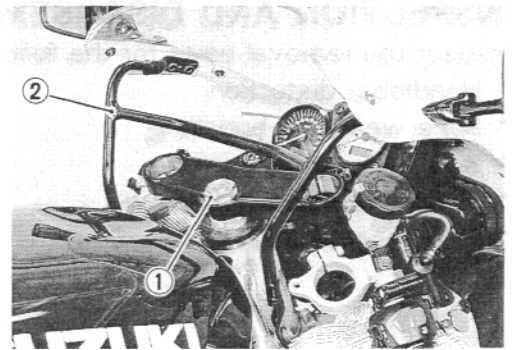
*Place the rags under each handlebar to prevent scratching the upper fairing and the air intake pipes.*



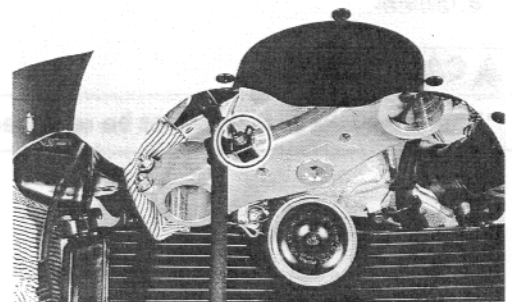
- Lift and support the fuel tank. (Refer to page 4-2.)
- Remove the air cleaner box. (Refer to page 4-14.)
- Disconnect the ignition switch lead wire coupler.
- Remove the ignition switch lead wire clamp.



- Remove the steering stem upper bracket by removing its head nut ①.
- Remove the mirror brace ②.



- Remove the brake hose clamp bolt.



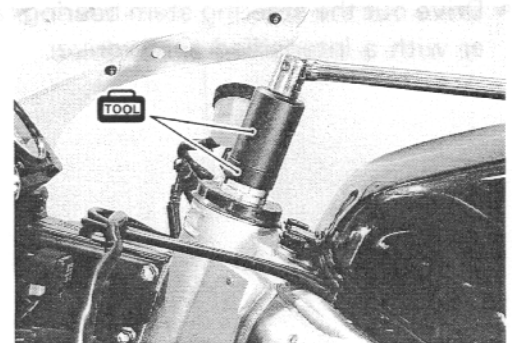
- Remove the steering stem lock nut, the washer and the steering stem nut with the special tools.

**TOOL** 09940-14911: Steering stem nut wrench  
09940-14960: Steering stem nut wrench socket

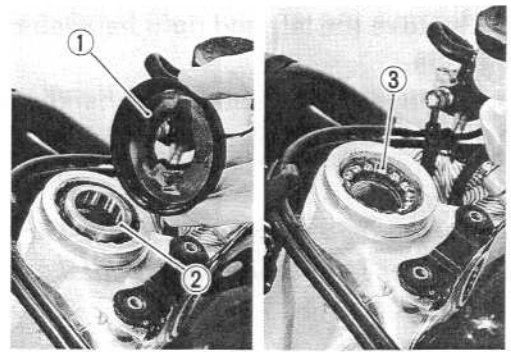
- Draw out the steering stem lower bracket.

**NOTE:**

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

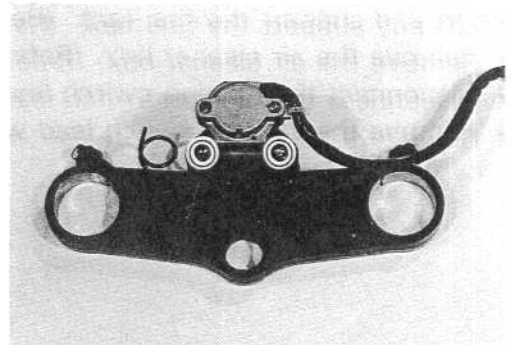


- Remove the dust seal ①, the steering stem upper bearing inner race ② and the bearing ③.



- Remove the ignition switch with the special tool.

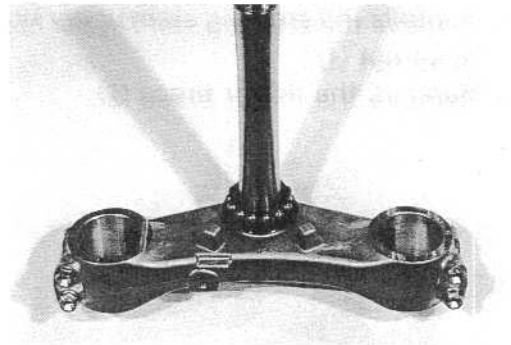
**TOOL** 09930-11920: Torx bit  
09930-11940: Bit holder



### INSPECTION AND DISASSEMBLY

Inspect the removal parts for the following abnormalities.

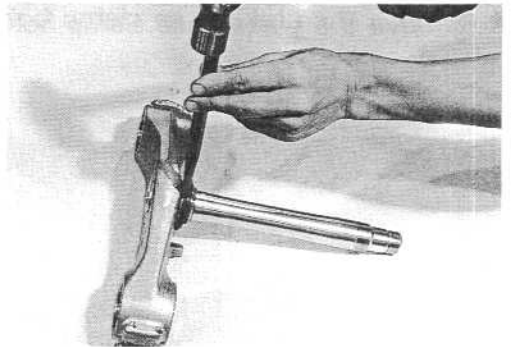
- \* Handlebar distortion
- \* Race wear and brinelling
- \* Bearing wear or damage
- \* Abnormal noise of bearing
- \* Distortion of steering stem



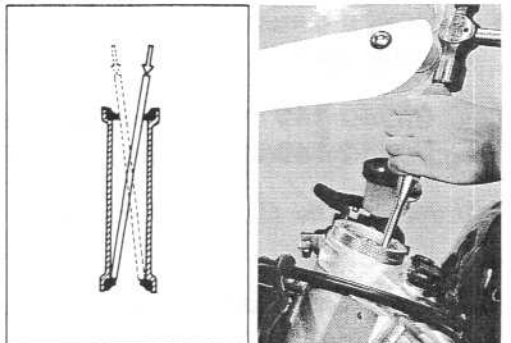
- Remove the steering stem lower bearing inner race with a chisel.

**CAUTION**

The removed bearing must be replaced with a new one.



- Drive out the steering stem bearing races upper and lower with a intensified screwdriver.




## REASSEMBLY AND REMOUNTING

Reassemble and remount the steering stem in the reverse order of removal and disassembly.

Pay attention to the following points:

### OUTER RACE

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

 **09941-34513: Steering outer race installer**  
**09924-84510: Bearing installer**

### INNER RACE

- Press in the lower bearing inner race with the special tool.

 **09925-18010: Steering bearing installer**

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

 **99000-25030: SUZUKI SUPER GREASE "A"**

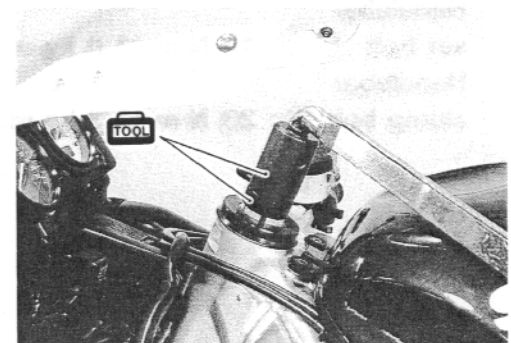
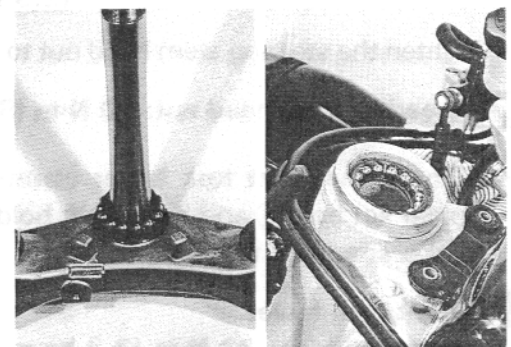
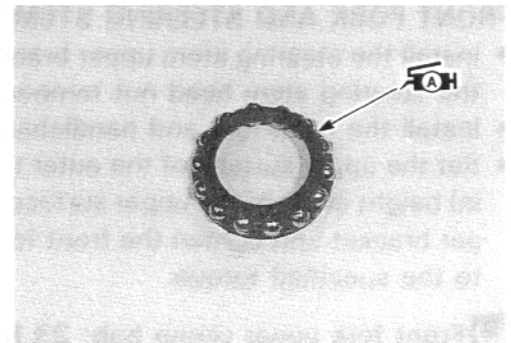
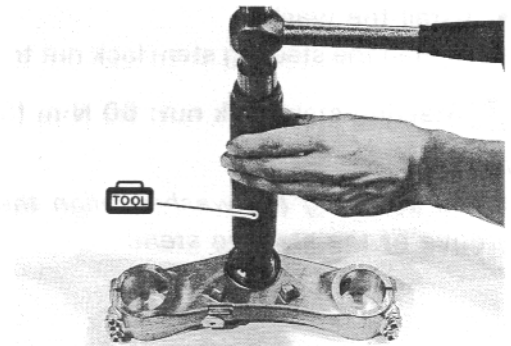
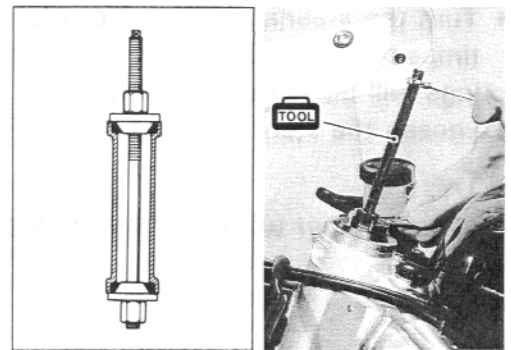
- Install the bearing.

### STEM NUT

- Tighten the steering stem nut to the specified torque.

 **09940-14911: Steering stem nut wrench**  
**09940-14960: Steering stem nut wrench socket**

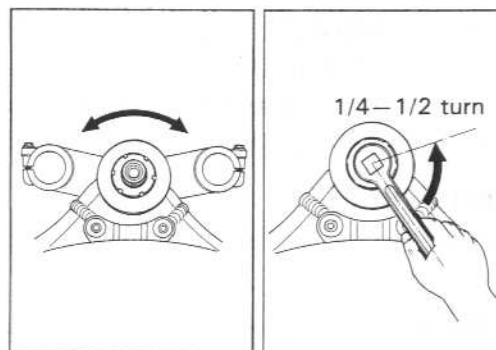
 **Steering stem nut: 45 N·m (4.5 kg-m, 32.5 lb-ft)**



- Turn the steering stem lower bracket about five or six times to the left and right so that the angular ball bearings will be seated properly.
- Loosen the stem nut by 1/4–1/2 turn.

**NOTE:**

*This adjustment will vary from motorcycle to motorcycle.*

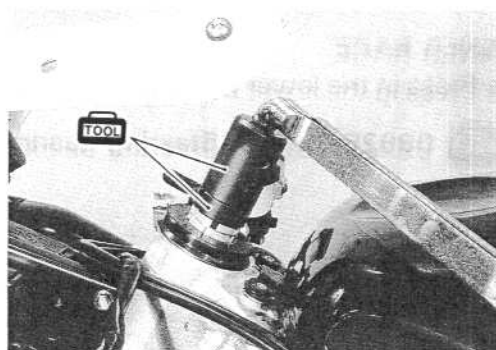


- Install the washer.
- Tighten the steering stem lock nut to the specified torque.

**Steering stem lock nut: 80 N·m (8.0 kg-m, 58.0 lb-ft)**

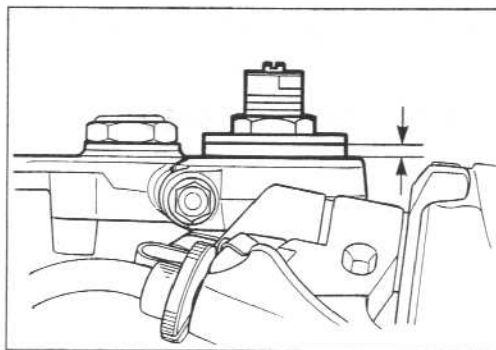
**NOTE:**

*When installing the washer, align the stopper lug to the groove of the steering stem.*



**FRONT FORK AND STEERING STEM UPPER BRACKET**

- Install the steering stem upper bracket and hand-tighten the steering stem head nut temporarily.
- Install the front fork and handlebars temporarily.
- Set the upper surface of the outer tube at 3.2 mm (0.13 in) height **A** from the upper surface of steering stem upper bracket and tighten the front fork upper clamp bolts to the specified torque.

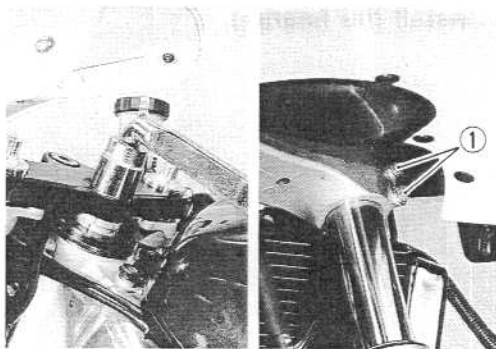


**Front fork upper clamp bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**

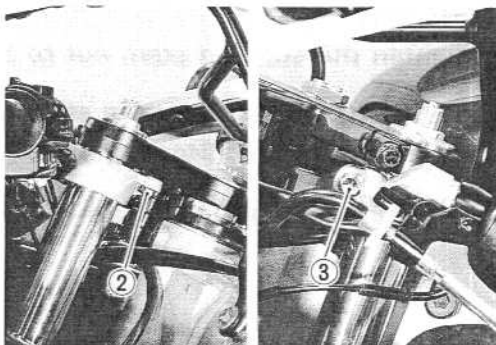
- Tighten the steering stem head nut to the specified torque.

**Steering stem head nut: 90 N·m (9.0 kg-m, 65.0 lb-ft)**

- Tighten the front fork lower clamp bolt **①**, handlebar holder set bolt **②** and handlebar holder mounting bolt **③** to the specified torque.



- **Front fork lower clamp bolt **①** : 23 N·m (2.3 kg-m, 16.5 lb-ft)**
- **Handlebar set bolt **②** : 10 N·m (1.0 kg-m, 7.0 lb-ft)**
- **Handlebar clamp bolt **③** : 23 N·m (2.3 kg-m, 16.5 lb-ft)**



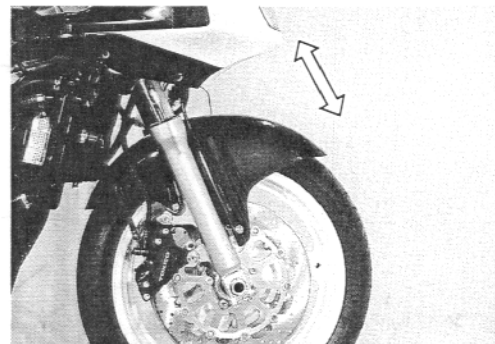
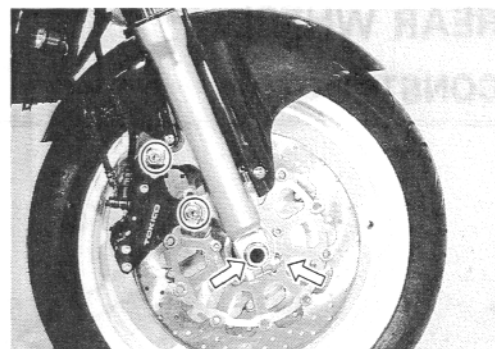
## FRONT WHEEL

- Tighten the front axle, the front axle pinch bolts and the brake caliper mounting bolts to the specified torque.

- U **Front axle: 100 N·m (10.0 kg-m, 72.5 lb-ft)**  
**Front axle pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)**  
**Brake caliper mounting bolt: 39 N·m (3.9 kg-m 28.0 lb-ft)**

### NOTE:

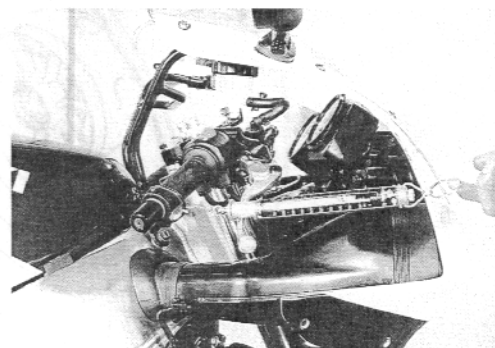
*Before tightening the two axle pinch bolts on the right front fork leg, move the front fork up and down 4 or 5 times.*



## STEERING TENSION ADJUSTMENT

Check the steering movement in the following procedure.

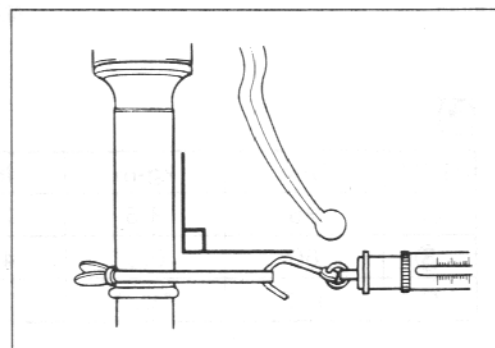
- By supporting the motorcycle with a jack, lift the front wheel until it is off the floor by 20–30 mm (0.8–1.2 in).
- Check to make sure that the cables and wire harnesses are properly routed. (Refer to pages 8-13 through -16.)
- With the front wheel in the straight ahead state, hitch the spring scale (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**

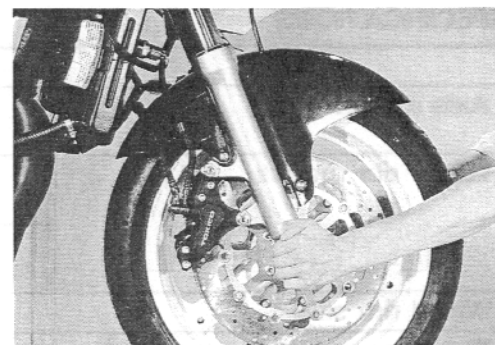
TOOL **09940-92720: Spring scale**

- 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 lower clamp bolts, steering stem head nut, steering stem nut and its lock nut, and then adjust the steering stem nut by loosening or tightening it.
  - 2) Tighten the steering stem lock nut, stem head nut and front fork lower 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.

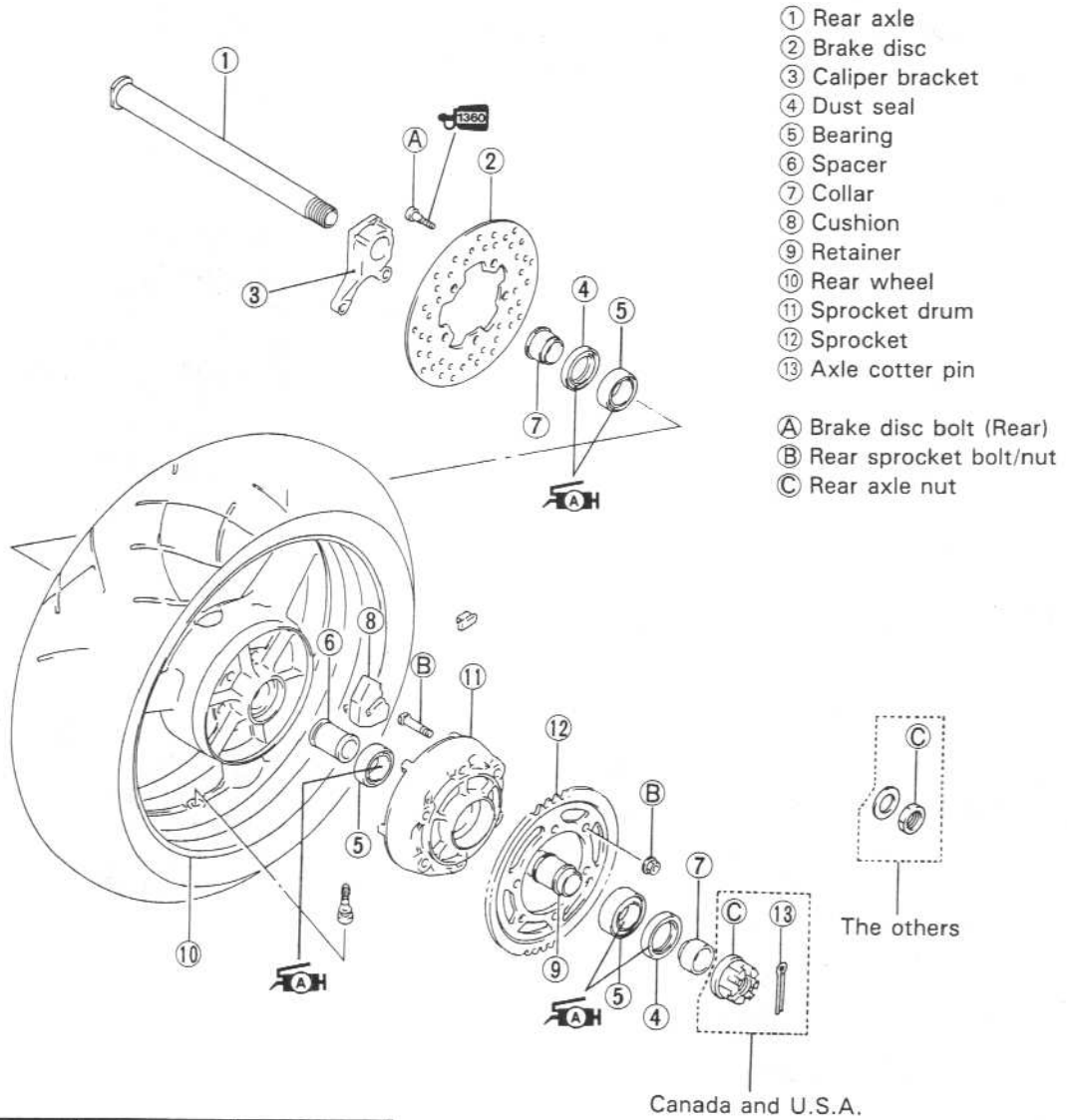


### NOTE:

*Hold the front fork legs, move them back and forth and make sure that the steering is not loose.*



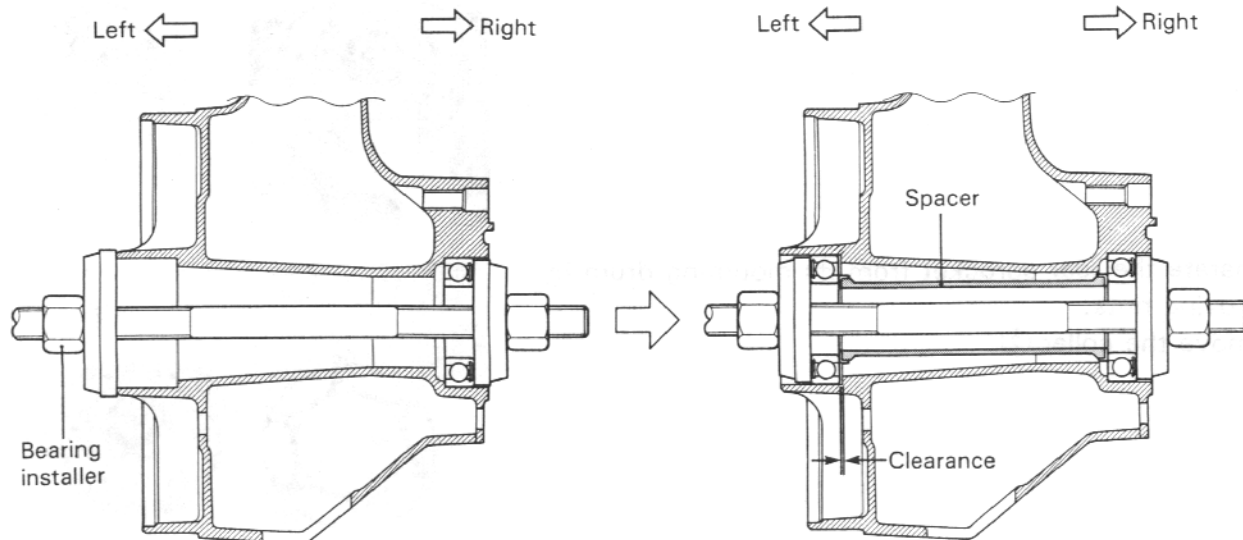
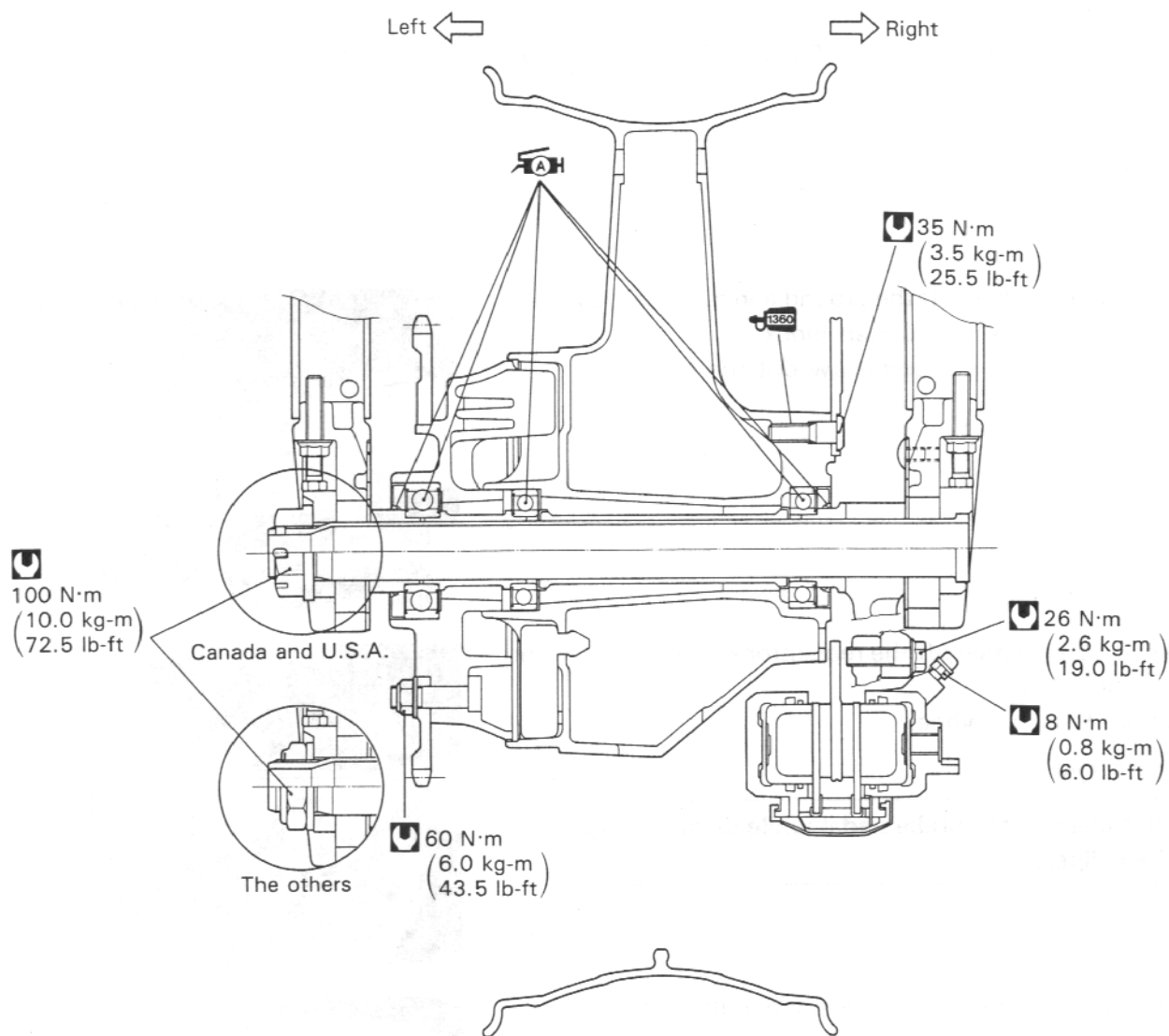
# REAR WHEEL CONSTRUCTION



ITEM	N·m	kg-m	lb-ft
A	35	3.5	25.5
B	60	6.0	43.5
C	100	10.0	72.5

## SPECIFICATIONS

ITEM	STANDARD		LIMIT
Axle runout	Rear	—	0.25 (0.010)
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel rim size	Rear	J17 x MT5.50	—
Tire size	Rear	180/55 ZR17 (73W)	—

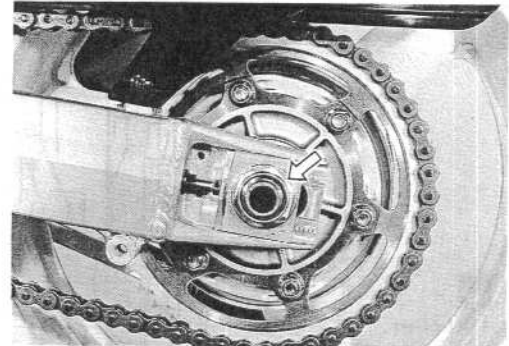




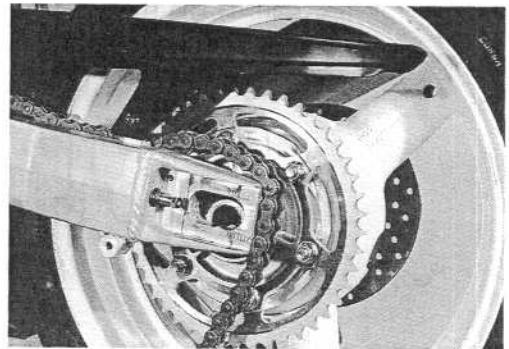
## REMOVAL

- Remove both sides of the lower fairing. (Refer to page 6-2.)
- Remove the axle cotter pin. (For U.S.A. and CANADA models)
- Loosen the axle nut.

- Raise the rear wheel off the ground and support the motorcycle with a jack or wooden block.
- Remove the axle nut and draw out the rear axle.



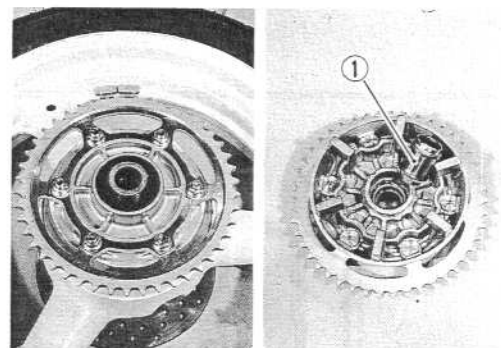
- Take the drive chain off the rear sprocket and remove the rear wheel hub.
- Remove the rear wheel.



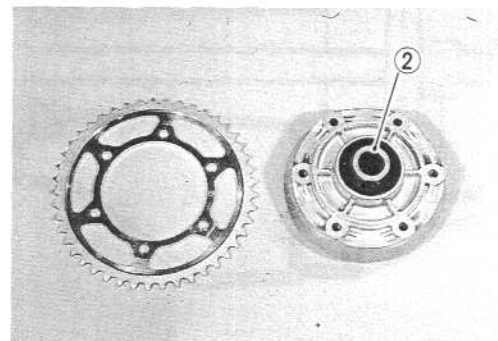
### **CAUTION**

Do not operate the brake pedal while dismantling the brake caliper.

- Draw out the rear sprocket mounting drum from the wheel hub.
- Remove the rear sprocket mounting drum retainer ①.



- Separate the rear sprocket from its mounting drum by removing nuts.
- Remove the collar ②.



## INSPECTION AND DISASSEMBLY

**TIRE** ..... Refer to pages 6-57 through 6-61.

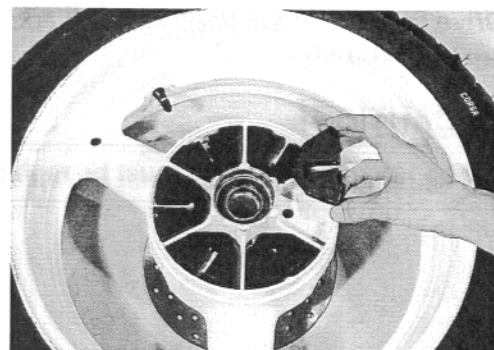
**AXLE SHAFT** ..... Refer to page 6- 7.

**WHEEL** ..... Refer to page 6- 8.

### CUSHION

Inspect the cushion for wear and damage.

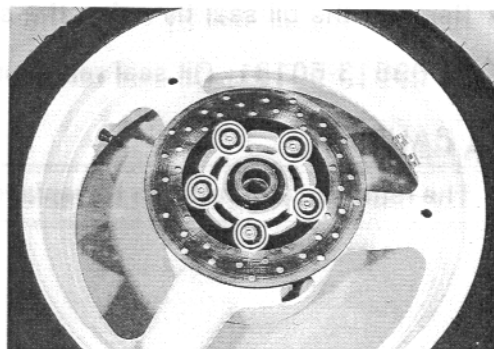
Replace the cushion if there is anything unusual.



### BRAKE DISC

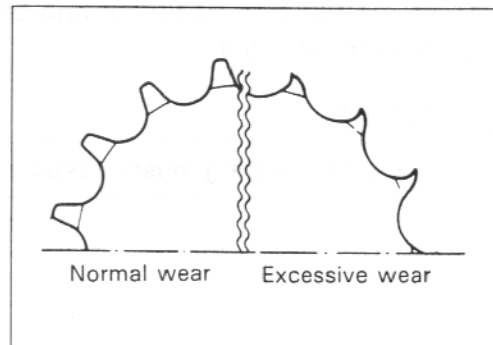
Inspect the brake disc. Replace it if its thickness or runout exceed the limit. (Refer to page 6-48.)

- Remove the brake disc from the rear wheel with a hexagon wrench.



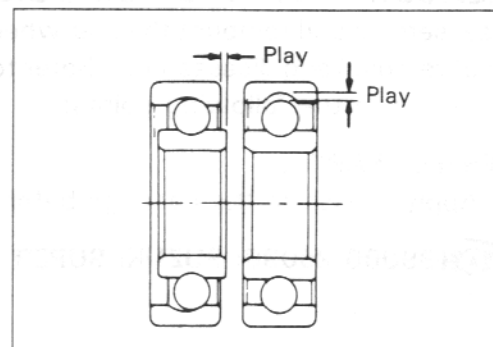
### SPROCKET

Inspect the sprocket teeth for wear. If they are worn as shown, replace the two sprockets and drive chain as a set.



### BEARINGS

Inspect the play of the wheel and sprocket mounting drum 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.

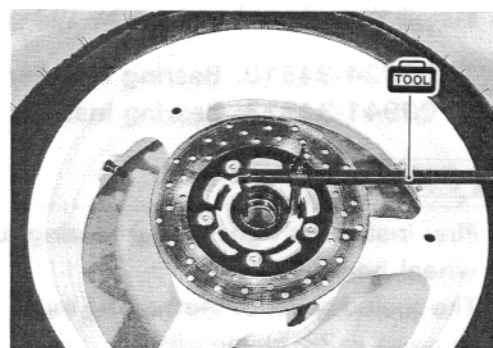


- Remove the collar.
- Remove the oil seal with the special tool.

**TOOL** 09913-50121: Oil seal remover

### CAUTION

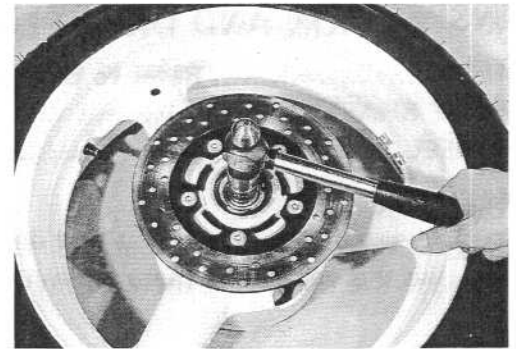
The removed oil seal must be replaced with new ones.



Drive out the wheel bearings, left and right, with a suitable socket wrench.

**CAUTION**

The removed bearings must be replaced with new ones.

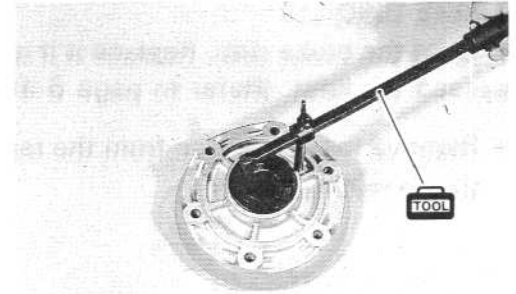


- Remove the oil seal by using the special tool.

**TOOL** 09913-50121: Oil seal remover

**CAUTION**

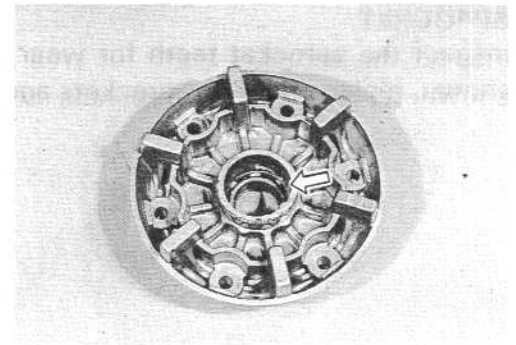
The removed oil seal must be replaced with a new one.



- Drive out the sprocket mounting drum bearing by using an appropriate tool.

**CAUTION**

The removed bearing must be replaced with a new one.



**REASSEMBLY AND REMOUNTING**

Reassemble and remount the rear wheel in the reverse order of removal and disassembly. Refer to page 6-28 and pay attention to the following points:

**WHEEL BEARING**

- Apply grease to the bearings before installing.

**TOOL** 099000-25030: SUZUKI SUPER GREASE "A"

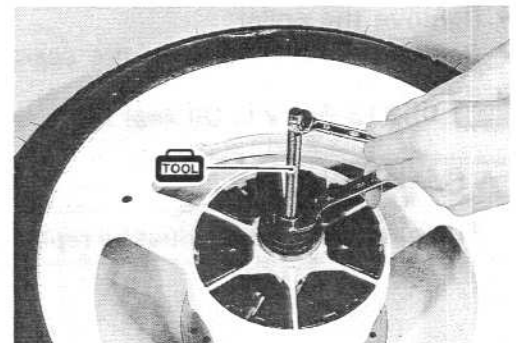


- Install the wheel bearings by using the special tools.

**TOOL** 09924-84510: Bearing installer set  
09941-34513: Bearing installer set

**CAUTION**

First install the right wheel bearing, then install the left wheel bearing.  
The sealed cover of the bearing must face outside. Refer to page 6-28 for details.



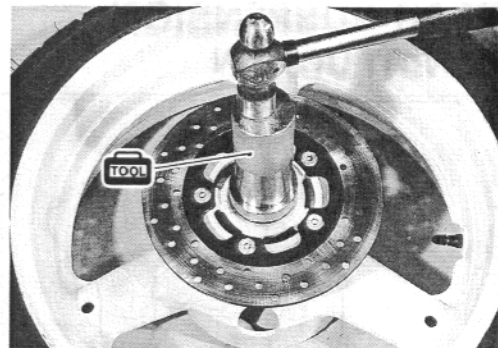
- Install the oil seal by using the special tool.

 **09913-85210: Oil seal installer**

**NOTE:**

*Apply grease to the oil seal lip before assembling rear wheel.*

 **999000-25030: SUZUKI SUPER GREASE "A"**



**SPROCKET MOUNTING DRUM BEARING AND OIL SEAL**

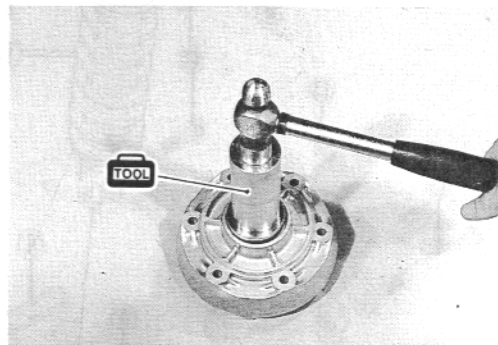
- Install the bearing and the oil seal using the bearing installer.

 **09913-85210: Bearing installer**

**NOTE:**

*Apply grease to the bearing and oil seal lip before assembling rear wheel.*

 **999000-25030: SUZUKI SUPER GREASE "A"**



**BRAKE DISC**

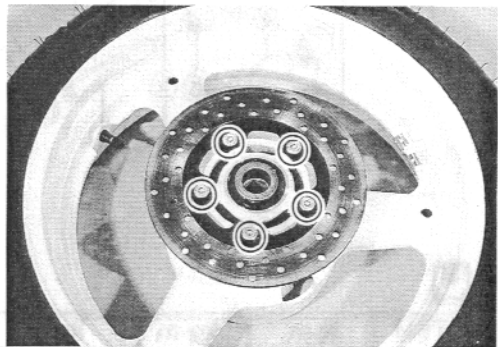
- Apply THREAD LOCK SUPER "1360" to the disc bolts and tighten them to the specified torque.

**NOTE:**

*Make sure that the brake disc is clean and free of any greasy matter.*

 **999000-32130: THREAD LOCK SUPER "1360"**

 **Brake disc bolt (Rear): 35 N·m (3.5 kg-m, 25.5 lb-ft)**



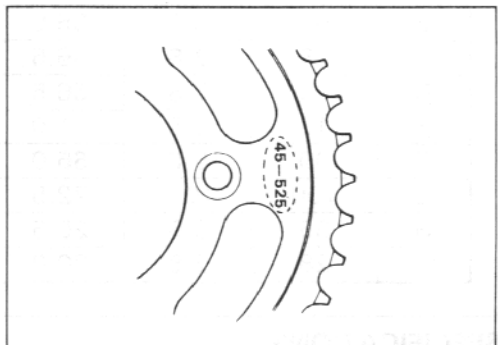
**REAR SPROCKET**

- Tighten the sprocket mounting nuts to the specified torque.

 **Rear sprocket nut: 60 N·m (6.0 kg-m, 43.5 lb-ft)**

**NOTE:**

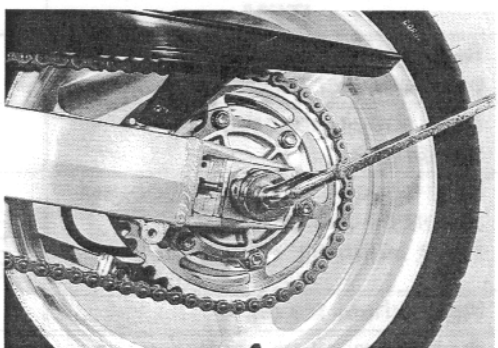
*Face the stamped mark on the sprocket to outside.*



**REAR AXLE SHAFT**

- Adjust the chain slack after rear wheel installation. (Refer to page 2-11.)
- Tighten the rear axle nut to the specified torque.
- Tighten both chain adjuster lock nuts securely.

 **Rear axle nut: 100 N·m (10.0 kg-m, 72.5 lb-ft)**



# REAR SUSPENSION CONSTRUCTION

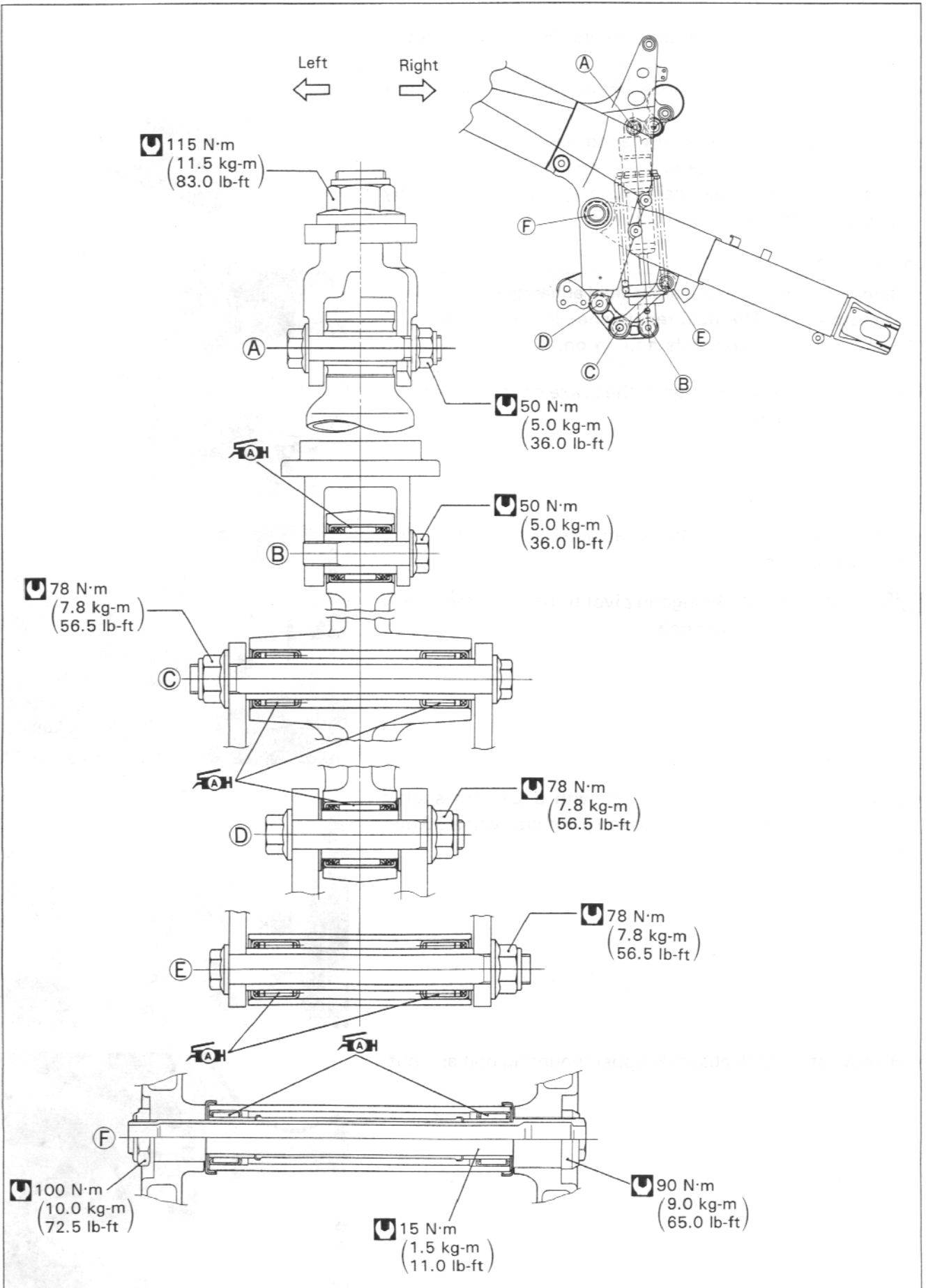
- ① Rear shock absorber
- ② Rear cushion rod
- ③ Rear cushion lever
- ④ Spacer
- ⑤ Bearing
- ⑥ Rear shock absorber bracket
- ⑦ Dust seal
- ⑧ Torque link
- ⑨ Chain cover
- ⑩ Chain buffer
- ⑪ Chain adjuster
- ⑫ Chain adjuster lock nut

- A Rear shock absorber bracket nut
- B Rear shock absorber mounting bolt/nut
- C Rear cushion lever bolt/nut
- D Rear cushion rod bolt/nut
- E Swingarm pivot shaft
- F Swingarm pivot lock nut
- G Swingarm pivot nut
- H Torque link bolt/nut (Rear)
- I Torque link bolt/nut (Front)

ITEM	N·m	kg·m	lb·ft
A	115	11.5	83.0
B	50	5.0	36.0
C	78	7.8	56.5
D	78	7.8	56.5
E	15	1.5	11.0
F	90	9.0	65.0
G	100	10.0	72.5
H	35	3.5	25.5
I	28	2.8	20.0

## SPECIFICATIONS

ITEM		STANDARD		LIMIT
Rear shock absorber gas pressure (N <sub>2</sub> gas)		1 000 kPa (10 kg/cm <sup>2</sup> , 142 psi)		—
Rear shock absorber spring set length		193.9 mm (7.6 in)		—
Rear shock absorber damping force adjuster	Rebound	At punch mark (about 1 1/8 turns out)		—
	Compression	E-03,28,33	At punch mark (about 7/8 turn out)	—
		Others	At punch mark (about 3/4 turn out)	—
Rear wheel travel		133 mm (5.2 in)		—
Swingarm pivot shaft runout		—		0.3 mm (0.01 in)



## REMOVAL

- Remove the seats and frame covers. (Refer to pages 6-3 and -4.)
- Loosen the rear brake hose union bolt and torque link bolt/nut.
- Remove the rear wheel. (Refer to page 6-29.)
- Remove the rear brake hose union bolt.
- Remove the rear brake caliper along with its bracket by removing the torque link bolt/nut.

### ⚠ CAUTION

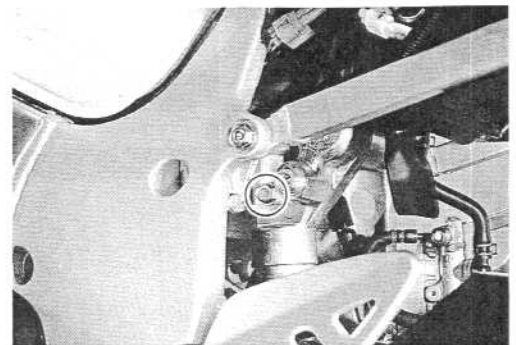
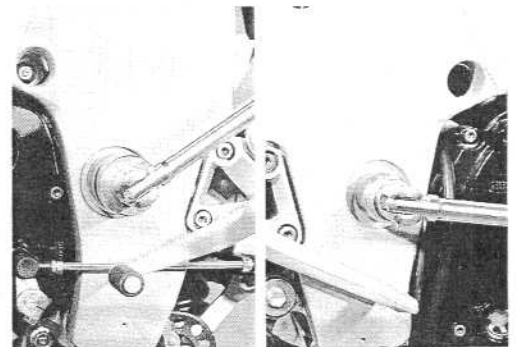
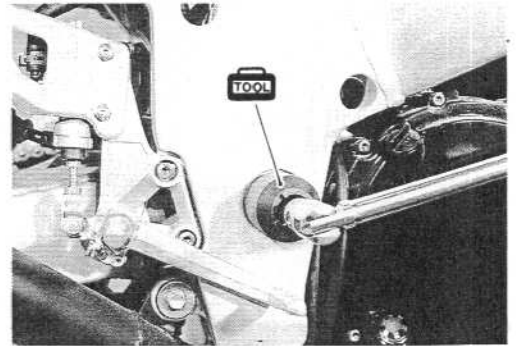
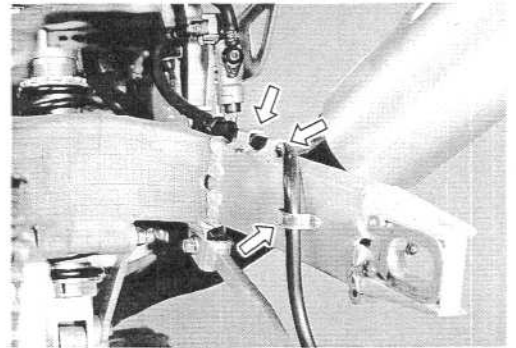
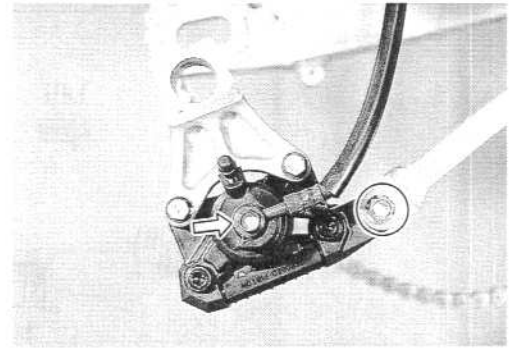
Completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials and so on.

- Remove the brake hose from the brake hose guides at inside of swingarm.
- Remove the swingarm thrust adjuster lock nut by using the special tool.

**TOOL** 09940-14970: Swingarm pivot thrust adjuster socket wrench

- Hold the swingarm pivot shaft with a 27 mm socket wrench and remove the swingarm pivot nut with a 36 mm socket wrench.

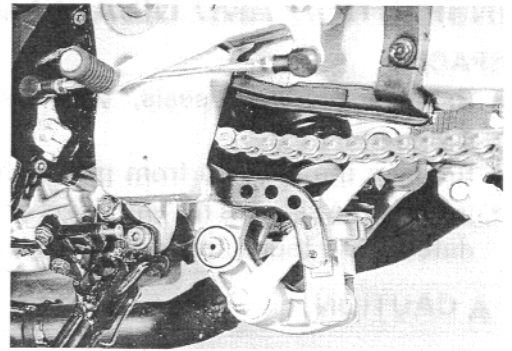
- Remove the shock absorber upper mounting bolt and nut.



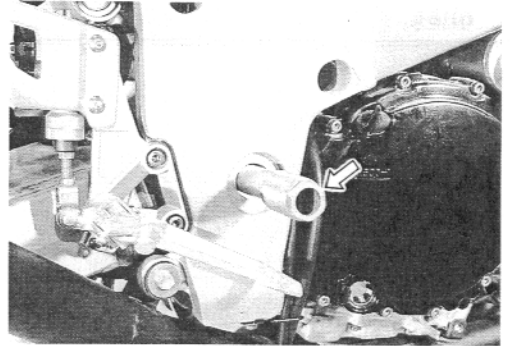
- Remove the cushion lever mounting bolt and nut.

**NOTE:**

*Slightly loosen the torque link nut, the cushion rod nuts and the shock absorber lower mounting nut before removing the swingarm to facilitate later disassembly.*



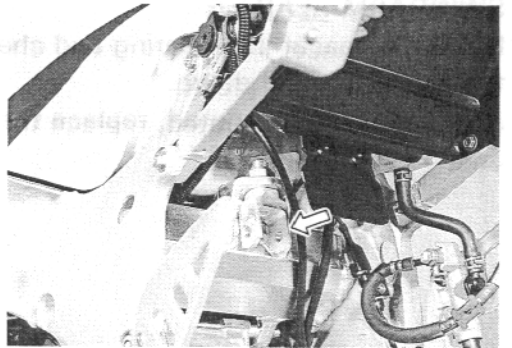
- Remove the swingarm pivot shaft.
- Remove the rear suspension assembly.



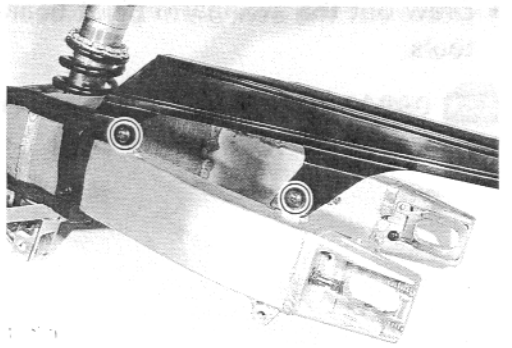
- Remove the rear shock absorber bracket by removing its nut.

**NOTE:**

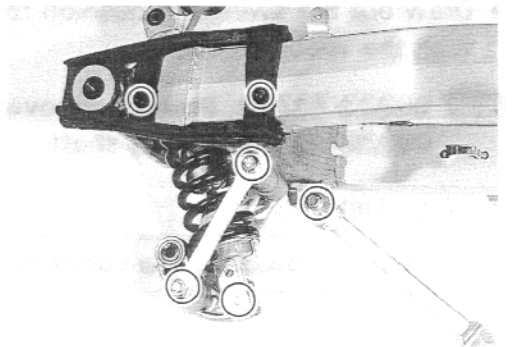
*Remove the rear shock absorber bracket when only replacing it.*



- Remove the chain cover from the swingarm.



- Remove the shock absorber, cushion lever, cushion rod, chain buffer and torque link from the swingarm.





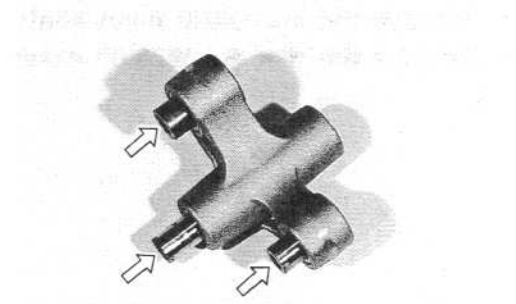
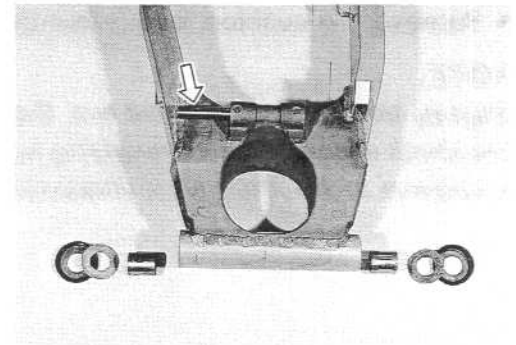
## INSPECTION AND DISASSEMBLY

### SPACER

- Remove the dust seals, washers and spacers from swingarm.
- Remove the spacers from the cushion lever.
- Inspect the spacers for any flaws or other damage. If any defects are found, replace the spacers with new ones.

#### ⚠ CAUTION

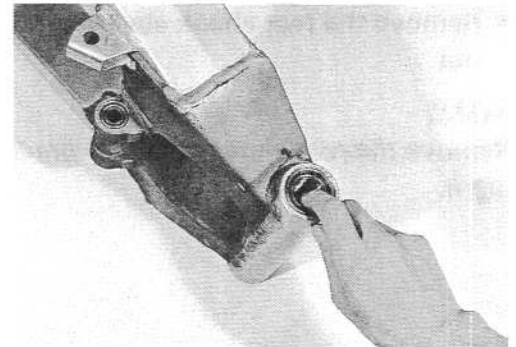
The removed dust seals must be replaced with new ones.



### SWINGARM BEARING

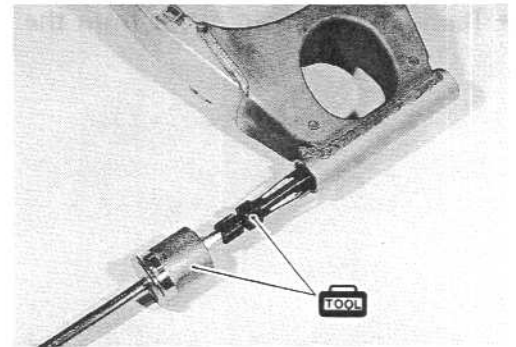
Insert the spacer into bearing and check the play to move the spacer up and down.

If excessive play is noted, replace the bearing with a new one.



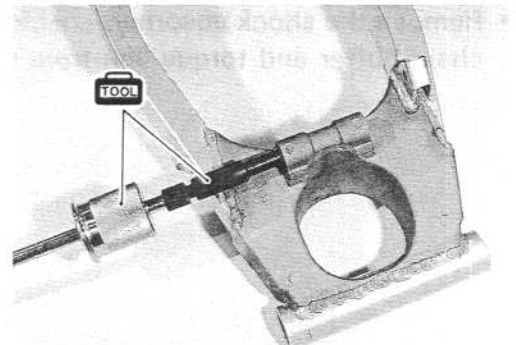
- Draw out the swingarm pivot bearings with the special tools.

**TOOL** 09941-64511: Bearing remover  
09930-30102: Sliding shaft



- Draw out the swingarm cushion rod upper side bearing with the special tools.

**TOOL** 09923-73210: Bearing remover  
09930-30102: Sliding shaft



#### ⚠ CAUTION

The removed bearings must be replaced with new ones.

**CUSHION LEVER BEARING**

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.

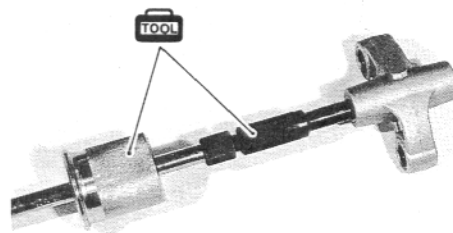


- Draw out the cushion rod lower side and shock absorber lower side bearings with the special tools.

**TOOL** 09923-73210: Bearing remover  
09930-30102: Sliding shaft

**CAUTION**

The removed bearings must be replaced with new ones.

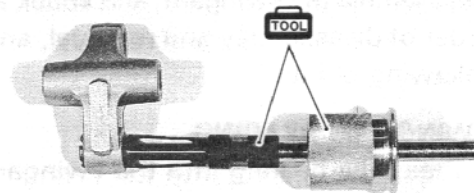


- Draw out the cushion lever mounting bearing with special tools.

**TOOL** 09923-74510: Bearing remover  
09930-30102: Sliding shaft

**CAUTION**

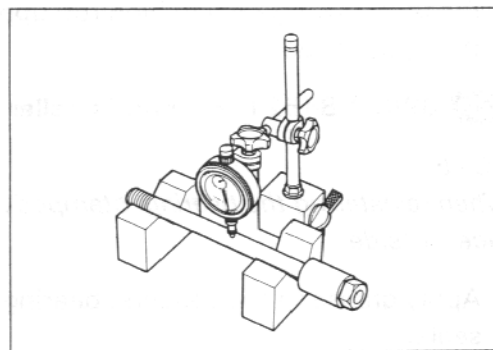
The removed bearings must be replaced with new ones.

**SWINGARM PIVOT SHAFT**

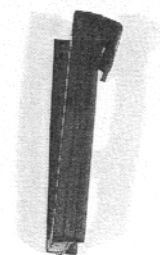
Using a dial gauge, check the pivot shaft runout and replace it if the runout exceeds the limit.

**TOOL** 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.

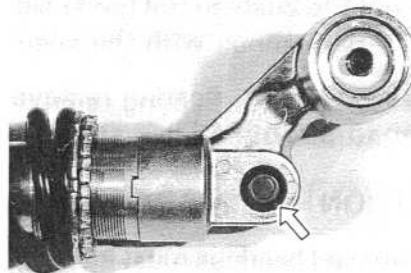
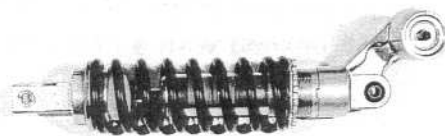


**SHOCK ABSORBER**

Inspect the shock absorber body and bush for damage and oil leakage. If any defects are found, replace the shock absorber with a new one.

**⚠ CAUTION**


Do not attempt to disassemble the rear shock absorber unit. It is unserviceable.

**REASSEMBLY**

Reassemble the swingarm and shock absorber in the reverse order of disassembly and removal, and pay attention to the following points:

**SWINGARM BEARING**

- Press the bearing into the swingarm pivot by using the special tool.

 **09941-34513: Steering race installer**

- Press the swingarm cushion rod upper side bearing with the special tool.

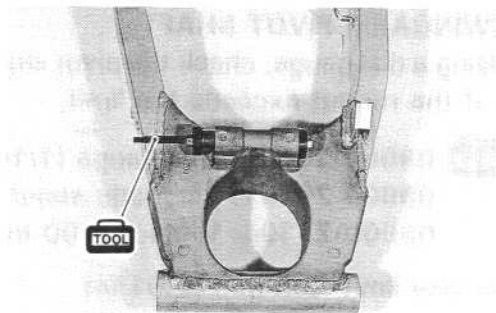
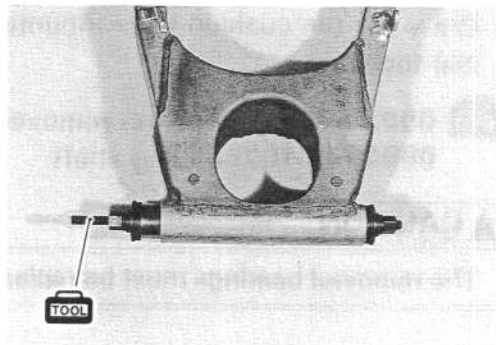
 **09924-84521: Bearing installer**

**NOTE:**

*When reinstalling the bearing, stamped mark of bearing must face outside.*


- Apply grease to the spacers, bearings, washers and dust seals.

 **099000-25030: SUZUKI SUPER GREASE "A"**



**CUSHION LEVER BEARING**

- Press the bearings into the cushion lever with the special tool.

 **09924-84521: Bearing installer**

**NOTE:**

*When installing the bearing, stamped mark of bearing must face outside.*

- Apply grease to the spacers and bearings.


 **099000-25030: SUZUKI SUPER GREASE "A"**

- Assemble the shock absorber, cushion lever and cushion rods onto the swingarm. (Refer to page 6-34.)

 **Shock absorber mounting nut ①:**  
50 N·m (5.0 kg-m, 36.0 lb-ft)

**Cushion rod mounting nut ②:**  
78 N·m (7.8 kg-m, 56.5 lb-ft)

- Tighten the front torque link nut to the specified torque

 **Torque link nut (front) ③: 28 N·m (2.8 kg-m, 20.0 lb-ft)**

**REMountING**

Remount the swingarm and shock absorber in the reverse order of disassembly and removal, and pay attention to the following points.

**REAR SHOCK ABSORBER BRACKET**

- Tighten the rear shock absorber bracket nut to the specified torque.

 **Rear shock absorber bracket nut: 115 N·m**  
(11.5 kg-m, 83.0 lb-ft)

**NOTE:**

*The white mark of rear shock absorber bracket faces the frame side.*

**SWINGARM PIVOT THRUST CLEARANCE ADJUSTMENT**

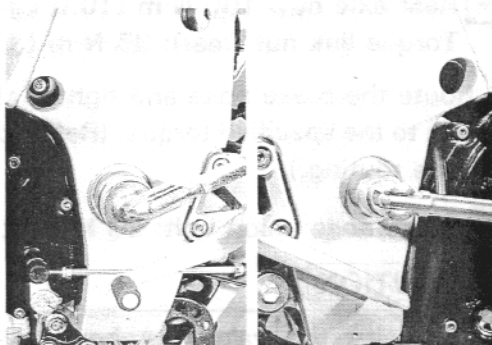
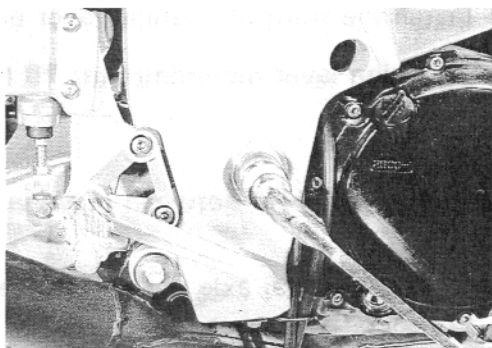
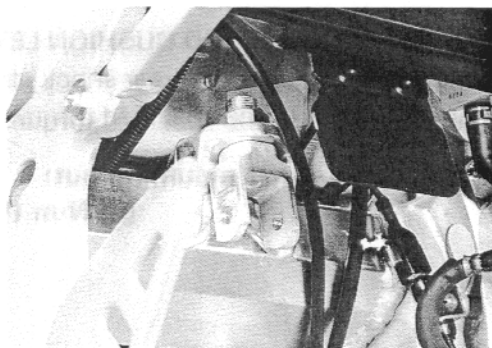
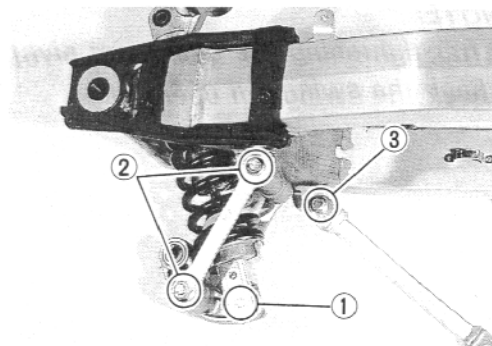
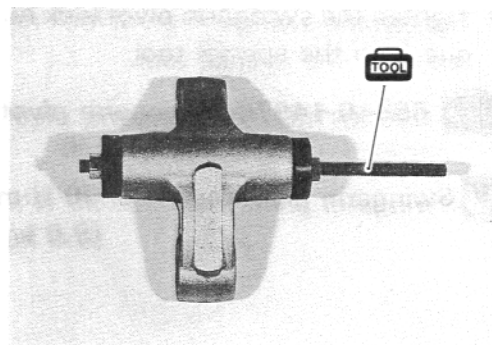
Adjust swingarm pivot thrust clearance as following procedure. (Refer to page 6-34 for the illustration.)

- Insert the swingarm pivot shaft and tighten it to the specified torque.

 **Swingarm pivot shaft: 15 N·m (1.5 kg-m, 11.0 lb-ft)**

- Hold the swingarm pivot shaft with a 27 mm socket wrench and tighten the swingarm pivot nut with a 36 mm socket wrench to the specified torque.

 **Swingarm pivot nut: 100 N·m (10.0 kg-m, 72.5 lb-ft)**



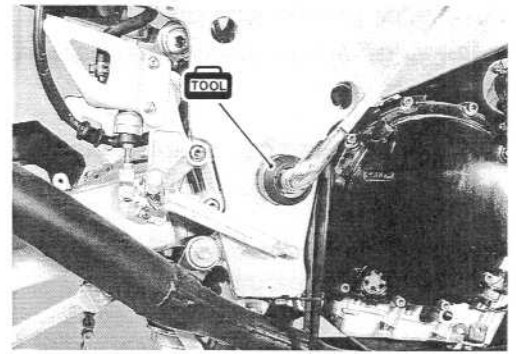
- Tighten the swingarm pivot lock nut to the specified torque with the special tool.

**TOOL** 09940-14970: Swingarm pivot thrust adjuster lock nut wrench

**U** Swingarm pivot lock nut: 90 N·m  
(9.0 kg-m, 65.0 lb-ft)

**NOTE:**

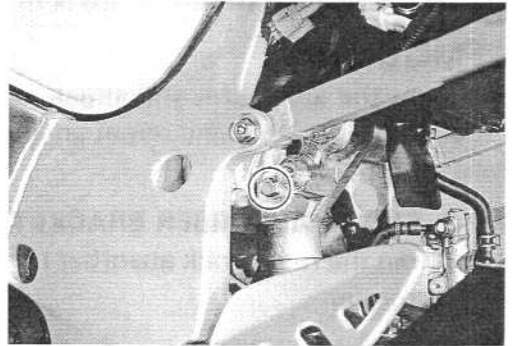
*After tightening the swingarm pivot lock nut, be sure to check the swingarm operation.*



**SHOCK ABSORBER AND CUSHION LEVER MOUNTING NUT**

- Install the upper part of rear shock absorber onto the frame and tighten it to the specified torque. (Refer to page 6-34.)

**U** Shock absorber mounting nut:  
50 N·m (5.0 kg-m, 36.0 lb-ft)

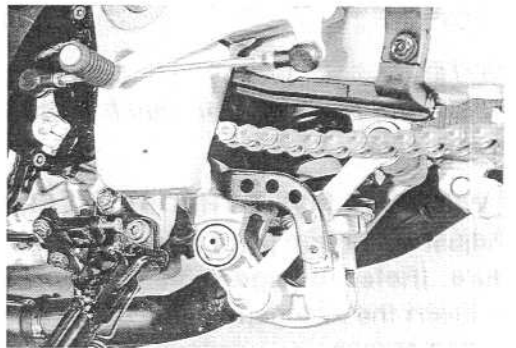


- Install the front of cushion lever onto the frame.

**U** Cushion lever mounting nut: 78 N·m  
(7.8 kg-m, 56.5 lb-ft)

**NOTE:**

*Install the washers between cushion lever and frame.*



- Tighten the rear axle nut and the rear torque link nut to the specified torque.

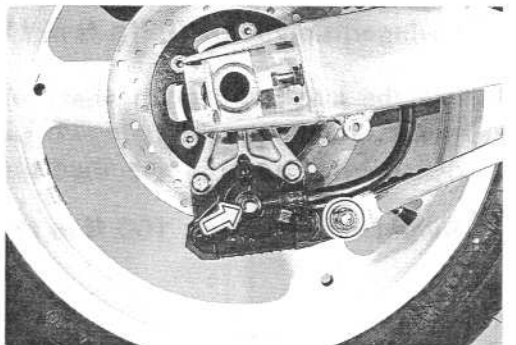
**U** Rear axle nut: 100 N·m (10.0 kg-m, 72.5 lb-ft)  
Torque link nut (rear): 35 N·m (3.5 kg-m, 25.5 lb-ft)

- Route the brake hose and tighten the brake hose union bolt to the specified torque. (Refer to page 8-21 for brake hose routing.)

**U** Brake hose union bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

**CAUTION**

Bleed air in the brake fluid circuit. (Refer to page 2-17.)



## SUSPENSION SETTING

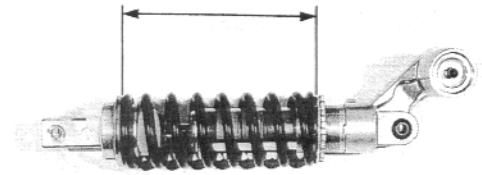
After installing the rear suspension, adjust the spring pre-load and damping force as follows.

### SPRING PRE-LOAD ADJUSTMENT

The set length 188.9 mm provides the maximum spring pre-load.

The set length 198.9 mm provides the minimum spring pre-load.

**STD length: 193.9 mm**



### DAMPING FORCE ADJUSTMENT

**(Rebound side)**

Fully turn the damping force adjuster ① clockwise. It is at stiffest position and turn it out to standard setting position.

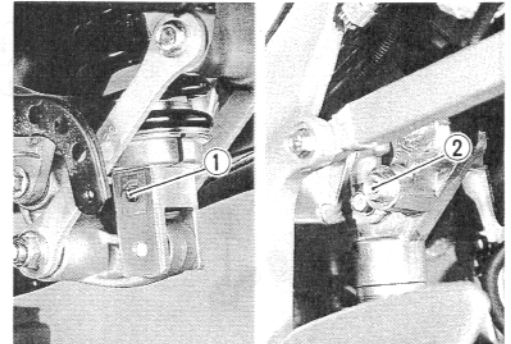
**STD position is 1 1/8 turns out.**

**(Compression side)**

Fully turn the damping force adjuster ② clockwise. It is at stiffest position and turn it out to standard setting position.

**STD position is 7/8 turn out ... E-03,28,33**

**3/4 turn out ... Others**



Rebound side

Compression side

### STANDARD SUSPENSION SETTING

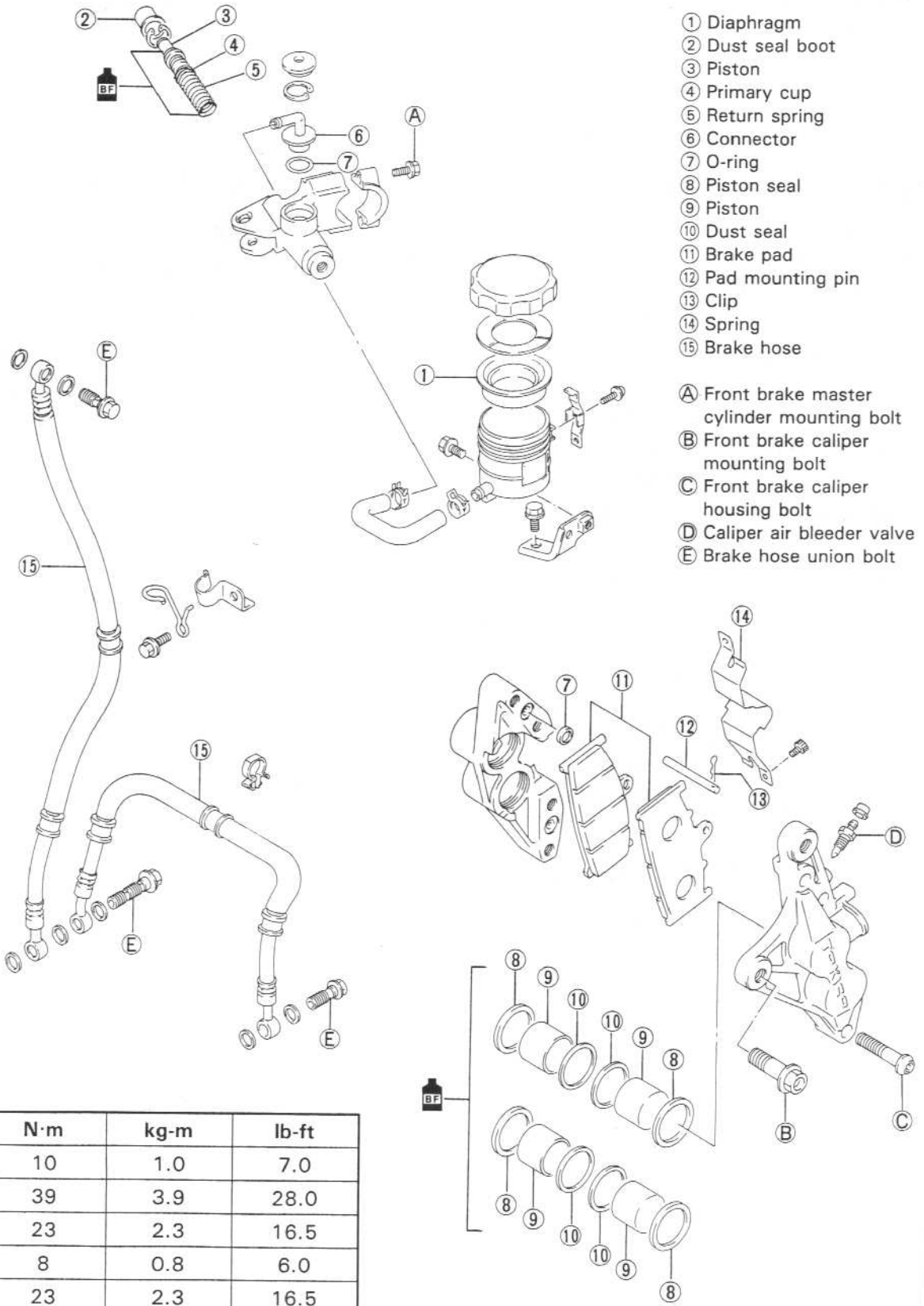
		REAR			
		Spring set length	Rebound damping force adjuster	Compression damping force adjuster	
				E-03,28,33 models	Other models
Solo riding	Softer	195.4 mm (7.7 in)	1 1/4 turns out	1 turn out	1 turn out
	Standard	193.9 mm (7.6 in)	1 1/8 turns out	7/8 turn out	3/4 turn out
	Stiffer	193.9 mm (7.6 in)	3/4 turn out	3/4 turn out	3/4 turn out
Dual riding		193.9 mm (7.6 in)	1 1/8 turns out	7/8 turn out	3/4 turn out

## FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspension and wheel, the following adjustments are required before driving.

- \* Drive chain ..... Page 2-13
- \* Rear brake ..... Page 2-15
- \* Tire pressure ..... Page 2-18
- \* Chassis bolts and nuts ..... Page 2-20

# FRONT BRAKE CONSTRUCTION



**▲ WARNING**

- \* This brake system is filled with a ethylene glycol-based DOT 4 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 reuse brake fluid left over from the last servicing or stored for long periods.
- \* When storing the brake fluid, seal the container completely and keep away from children.
- \* When replenishing brake fluid, take care not to get dust into fluid.
- \* When washing brake components, use fresh brake fluid. Never use cleaning solvent.
- \* A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.

**▲ CAUTION**

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

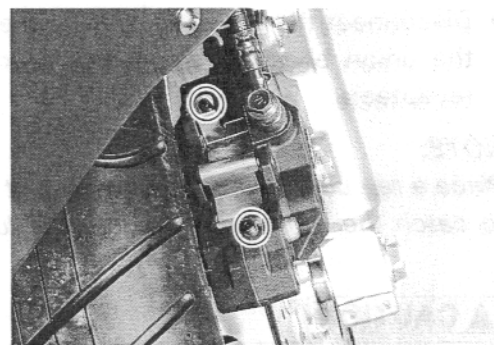
**SPECIFICATIONS**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Brake disc thickness		Front	$4.5 \pm 0.2$ ( $0.177 \pm 0.008$ )	4.0 (0.16)
Brake disc runout		—		0.30 (0.012)
Master cylinder bore		Front	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.		Front	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Leading	Front	27.000 – 27.076 (1.0630 – 1.0660)	—
	Trailing		30.230 – 30.306 (1.1902 – 1.1931)	—
Brake caliper piston diam.	Leading	Front	26.920 – 26.970 (1.0598 – 1.0618)	—
	Trailing		30.150 – 30.200 (1.1870 – 1.1890)	—

**BRAKE PAD REPLACEMENT**

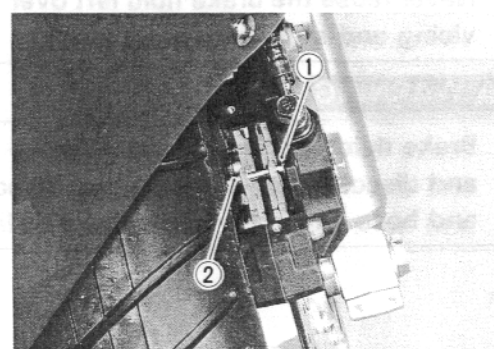
- Remove the brake pad spring by removing bolts.



- Remove the clip ① and the brake pad mounting pin ②.
- Remove the brake pads.

**▲ CAUTION**

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

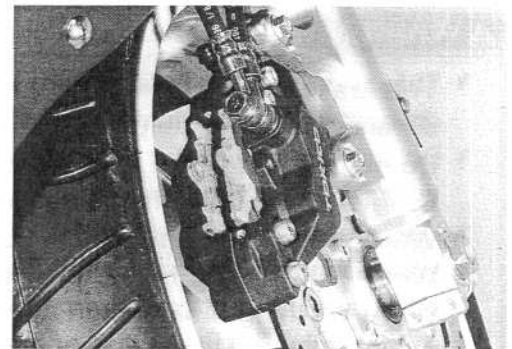




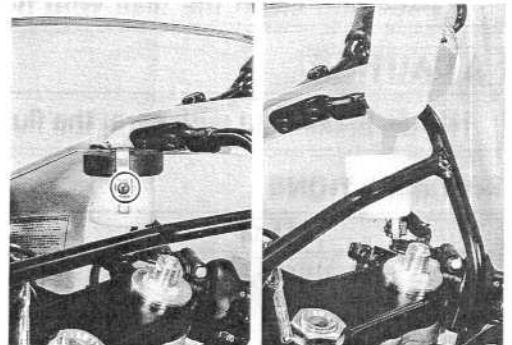
- Install the new pads.

**NOTE:**

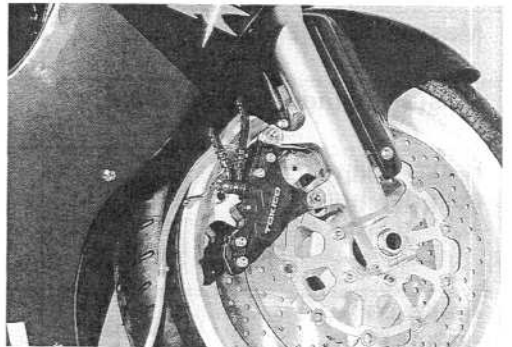
After replacing the brake pads, pump with the brake lever few times to operate the brake correctly and then check the brake fluid level.

**BRAKE FLUID REPLACEMENT**

- Place the motorcycle on a level surface and keep the handlebars straight.
  - Remove the master cylinder reservoir tank cap and diaphragm.
  - Suck up the old brake fluid as much as possible.
  - Fill the reservoir with fresh brake fluid.
- 
- Connect a cleaner hose to the air bleeder valve, and insert the free end of hose into a receptacle.
  - Loosen the bleeder valve and pump the brake lever until no more old brake fluid flows out of the bleeder valve.
  - Close the air bleeder valve, and disconnect a clear hose. Fill the reservoir with fresh brake fluid to the upper end of the inspection window.

**CAUTION**

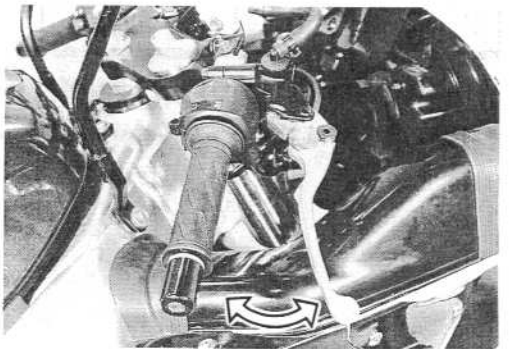
Bleed air in the brake fluid circuit. (Refer to page 2-17.)

**CALIPER REMOVAL AND DISASSEMBLY**

- Disconnect the brake hose from the caliper by removing the union bolt and catch the brake fluid in a suitable receptacle.

**NOTE:**

Place a rag underneath the union bolt on the brake caliper to catch the spilled drops of brake fluid.

**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.

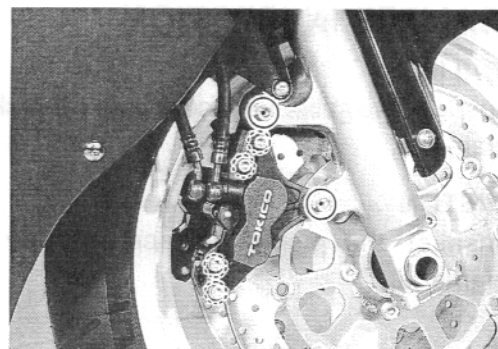


- Remove the caliper mounting bolts and take off the caliper.

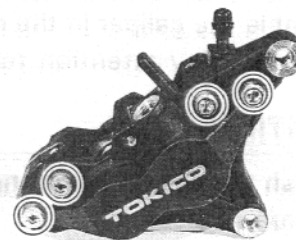
**NOTE:**

*Slightly loosen the caliper housing bolts before removing the caliper mounting bolts to facilitate later disassembly.*

- Remove the brake pads. (Refer to page 6-44.)



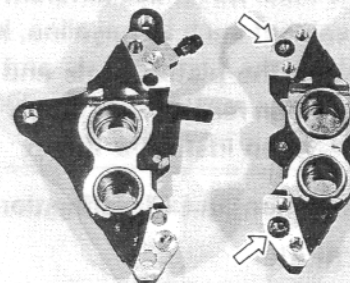
- Separate the caliper halves to remove the caliper housing bolts.



- Remove the O-rings.

**CAUTION**

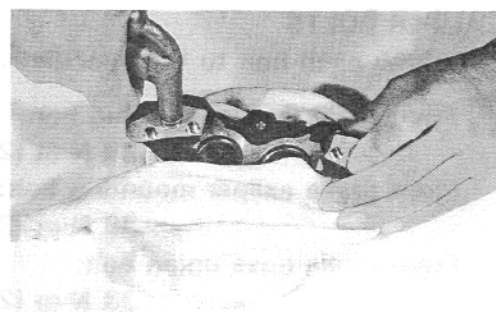
Replace the O-rings with new ones.



- Place a rag over the piston to prevent its popping out and push out the piston with an air gun.

**CAUTION**

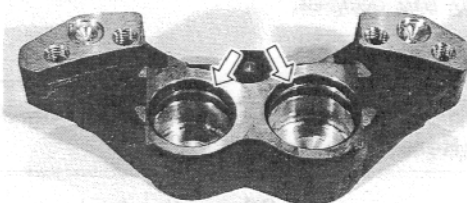
Do not use high pressure air to prevent piston damage.



- Remove the dust seals and piston seals.

**CAUTION**

Do not reuse the dust seals and piston seals to prevent fluid leakage.



## 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.



## 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.
- \* Do not wipe the brake fluid off after washing the components.
- \* When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvent such as gasoline, kerosine or the others.
- \* Replace the piston seals and dust seals with new ones when reassembly. Apply the brake fluid to both seals when installing them.

**BF** Specification and Classification: DOT 4

### PISTON SEAL

- Install the piston seals as shown in the right illustration.

### CALIPER BOLTS

- Tighten each bolt to the specified.

#### **U** Front brake caliper housing bolt:

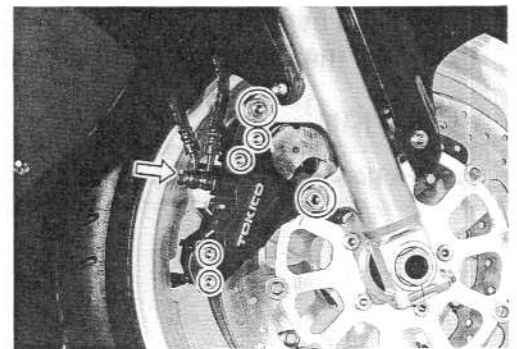
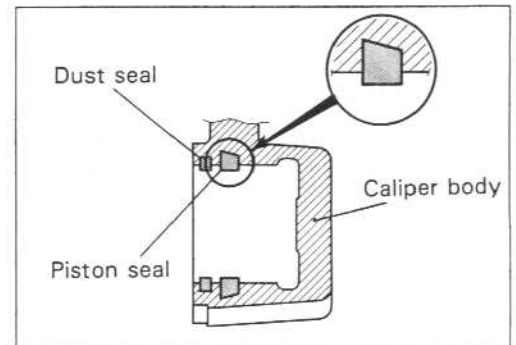
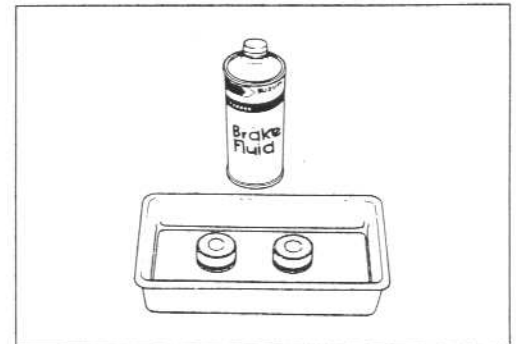
23 N·m (2.3 kg-m, 16.5 lb-ft)

#### Front brake caliper mounting bolt:

39 N·m (3.9 kg-m, 28.0 lb-ft)

#### Front brake hose union bolt:

23 N·m (2.3 kg-m, 16.5 lb-ft)



### NOTE:

Before remounting the caliper, push the piston all the way into the caliper.

### ⚠ CAUTION

Bleed air from the system after reassembling the caliper.  
(Refer to page 2-17.)

Refer to page 8-20 for the brake hose routing.

## DISC SERVICING

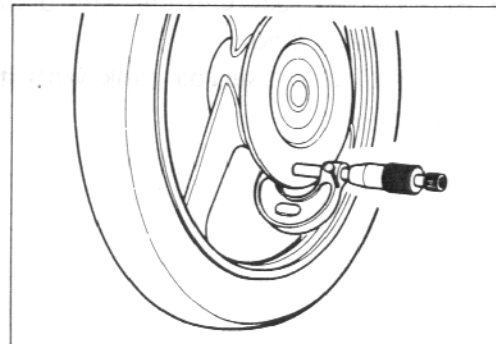
- Remove the wheel. (Refer to pages 6-7 and 29.)
- Remove the disc. (Refer to pages 6-8 and 30.)
- Install the disc. (Refer to pages 6-9 and 32.)

## 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.

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

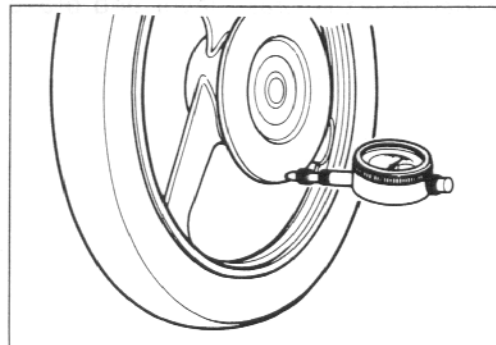
**Service Limit (Front): 4.0 mm (0.16 in)**  
**(Rear) : 4.5 mm (0.18 in)**



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

**TOOL** 09900-20606: Dial gauge (1/100 mm)  
 09900-20701: Magnetic stand

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

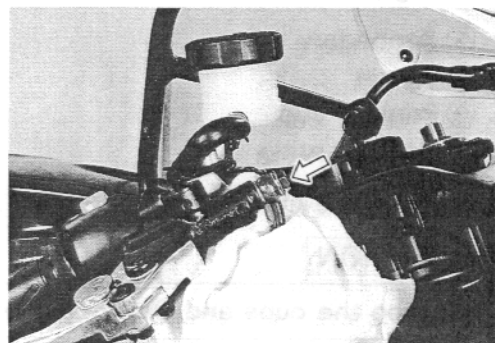
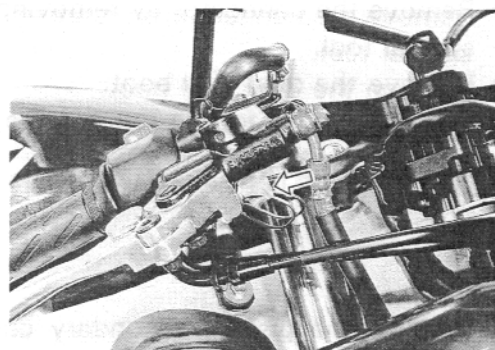


## MASTER CYLINDER REMOVAL AND DISASSEMBLY

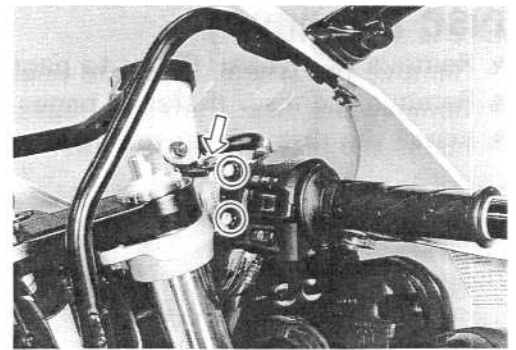
- Remove the front brake light switch lead wires.
- Place a rag underneath the union bolt on the master cylinder to catch any spilled drops of brake fluid. Remove the union bolt.

### CAUTION

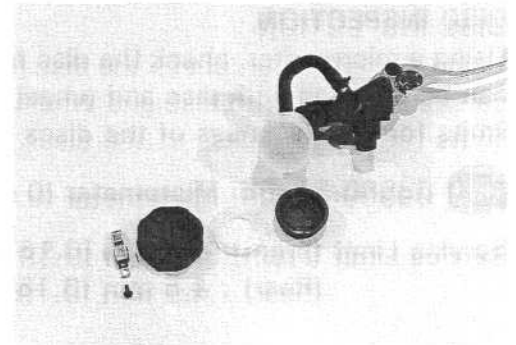
Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.



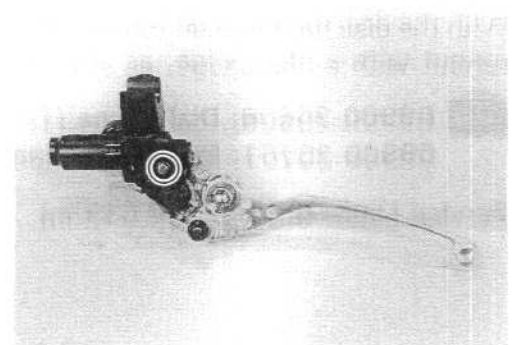
- Remove the master cylinder assembly along with the reservoir tank.



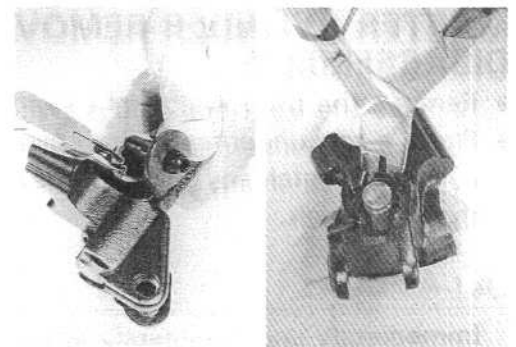
- Remove the reservoir cap and diaphragm.
- Drain brake fluid.
- Separate the reservoir tank with its hose from master cylinder.



- Remove the brake lever and brake light switch.



- Remove the connector by removing the circlip with the special tool.
- Remove the dust seal boot.
- Use the special tool to remove the circlip.

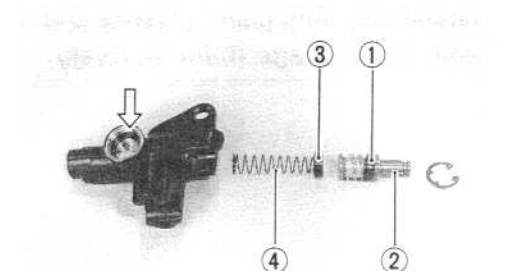


**TOOL** 09900-06108: Snap ring pliers

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

- ① Secondary cup
- ② Piston
- ③ Primary cup
- ④ Return spring

- Remove the O-ring.



**CAUTION**

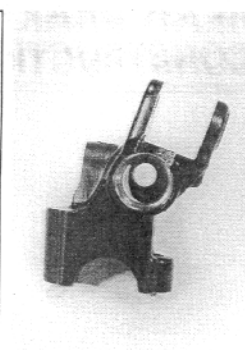
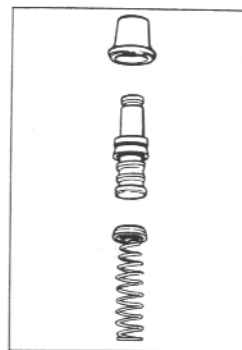
Replace the cups and O-ring with new ones.

## 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.

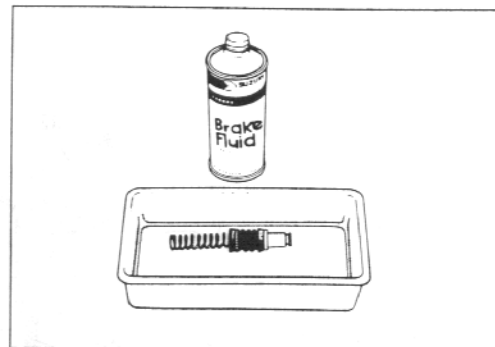


## MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

### ⚠ CAUTION

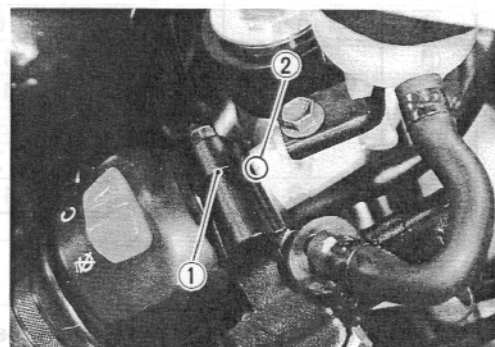
- \* Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- \* Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.



**BF** Specification and Classification: DOT 4

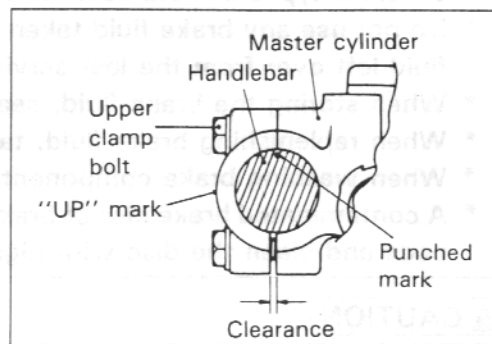
- When remounting the master cylinder on the handlebar, align the master cylinder holder's mating surface ① with punched mark ② on the handlebar and tighten the upper clamp bolt first as shown.

**🔩** Front brake master cylinder mounting bolt:  
10 N·m (1.0 kg-m, 7.0 lb-ft)

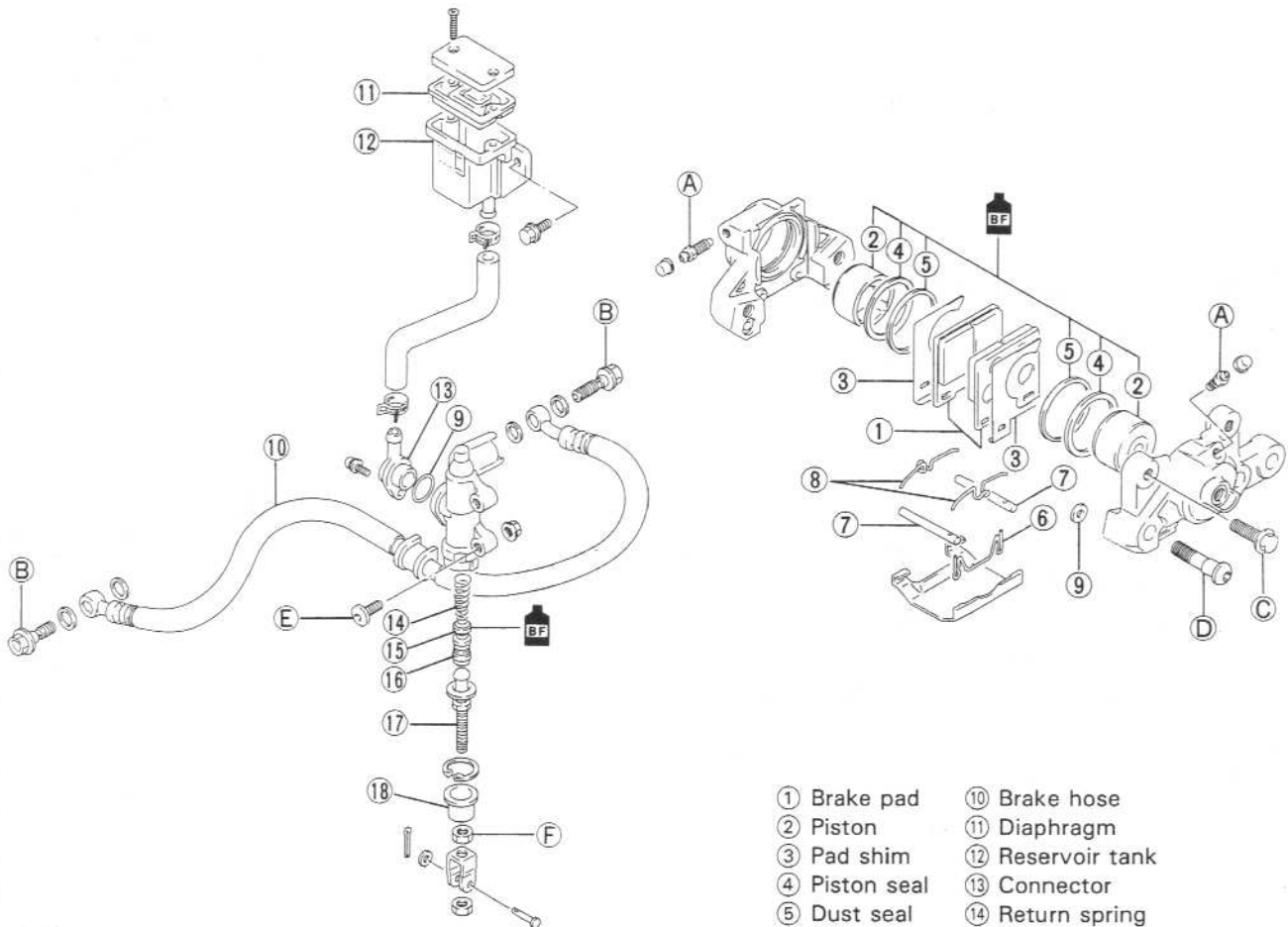


### ⚠ CAUTION

Bleed air from the system after reassembling master cylinder. (Refer to page 2-17.)



## REAR BRAKE CONSTRUCTION



ITEM	N·m	kg·m	lb·ft
(A)	8	0.8	6.0
(B)	23	2.3	16.5
(C)	26	2.6	19.0
(D)	33	3.3	24.0
(E)	10	1.0	7.0
(F)	18	1.8	13.0

- |               |                  |
|---------------|------------------|
| ① Brake pad   | ⑩ Brake hose     |
| ② Piston      | ⑪ Diaphragm      |
| ③ Pad shim    | ⑫ Reservoir tank |
| ④ Piston seal | ⑬ Connector      |
| ⑤ Dust seal   | ⑭ Return spring  |
| ⑥ Clip        | ⑮ Primary cup    |
| ⑦ Pin         | ⑯ Piston         |
| ⑧ Spring      | ⑰ Push rod       |
| ⑨ O-ring      | ⑱ Dust seal boot |
- (A) Caliper air bleeder valve  
 (B) Brake hose union bolt  
 (C) Rear brake caliper mounting bolt  
 (D) Rear brake caliper housing bolt  
 (E) Rear brake master cylinder mounting bolt  
 (F) Rear brake master cylinder rod lock nut

### ⚠ WARNING

- \* This brake system is filled with a ethylene glycol-based DOT 4 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 reuse brake fluid left over from the last servicing or stored for long periods.
- \* When storing the brake fluid, seal the container completely and keep away from children.
- \* When replenishing brake fluid, take care not to get dust into fluid.
- \* When washing brake components, use fresh brake fluid. Never use cleaning solvent.
- \* A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.

### ⚠ CAUTION

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

## SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Rear	5.0±0.2 (0.197±0.008)	4.5 (0.18)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Rear	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Rear	12.657—12.684 (0.4983—0.4994)	—
Brake caliper cylinder bore	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Rear	38.098—38.148 (1.4999—1.5019)	—

## BRAKE PAD REPLACEMENT

- Remove the brake pad cover.

**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.

- Remove the clip (1).
- Draw out the pins (2) and remove the springs (3).
- Remove the pads and shims.

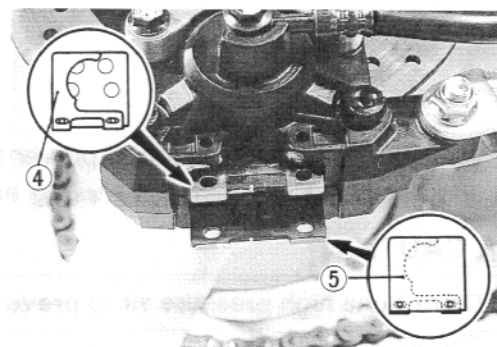
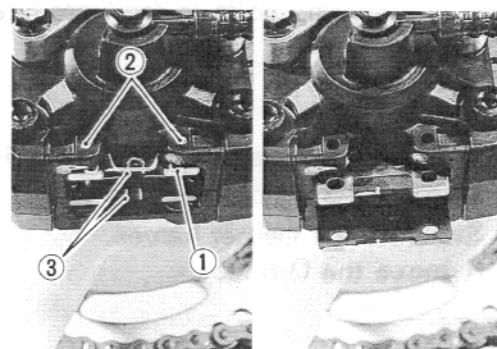
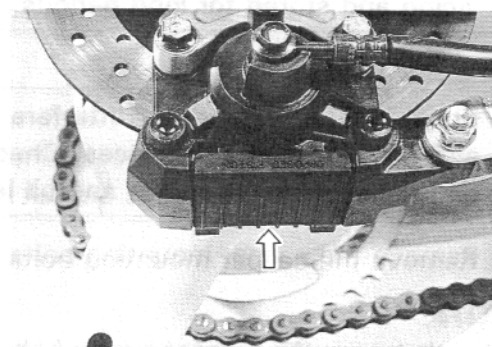
- Remount the new brake pads and shims.

**CAUTION**

Be sure to install the shims (4, 5) properly as shown in the right illustration.

**NOTE:**

After replacing the brake pads, pump with the brake pedal few times to operate the brake correctly and then check the brake fluid level.





## BRAKE FLUID REPLACEMENT

- Remove the seats. (Refer to page 6-3.)
- Remove the frame cover. (Refer to page 6-4.)
- Replace the brake fluid in the same manner of the front brake. (Refer to page 6-45.)

### ⚠ CAUTION

Bleed air in the brake fluid circuit. (Refer to page 2-17.)

## CALIPER REMOVAL AND DISASSEMBLY

- Remove the union bolt 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.

- Remove the caliper mounting bolts and torque link nut.

#### NOTE:

Slightly loosen the caliper housing bolts before removing the caliper mounting bolts to facilitate later disassembly.

- Remove the pads. (Refer to page 6-52.)
- Remove the caliper housing bolts.
- Separate the caliper halves.
- Remove the O-ring.

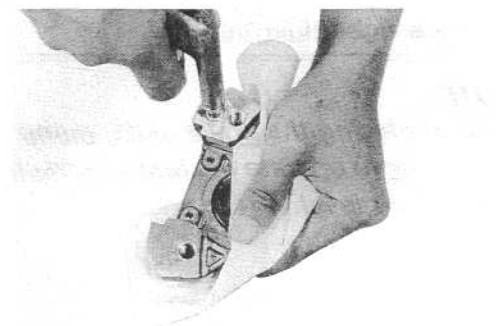
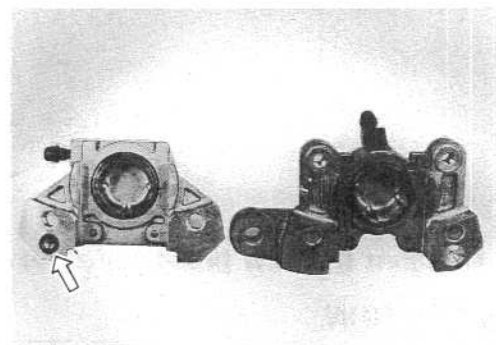
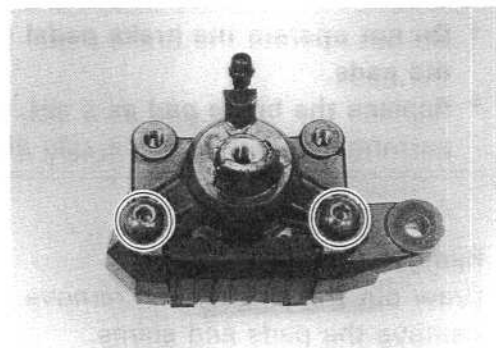
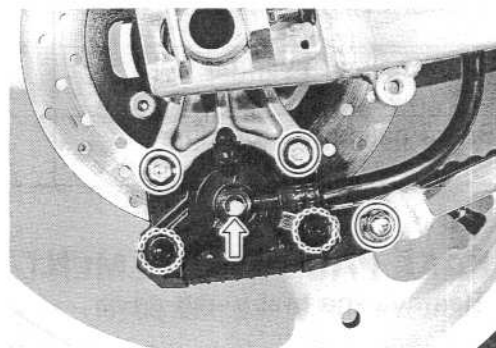
#### NOTE:

Once separate the caliper halves, replace the O-ring with a new one.

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

### ⚠ CAUTION

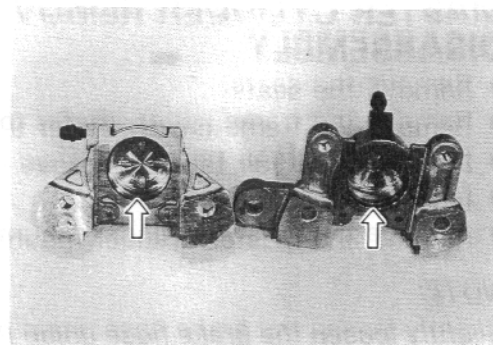
Do not use high pressure air to prevent piston damage.



- Remove the dust seals and piston seals.

**CAUTION**

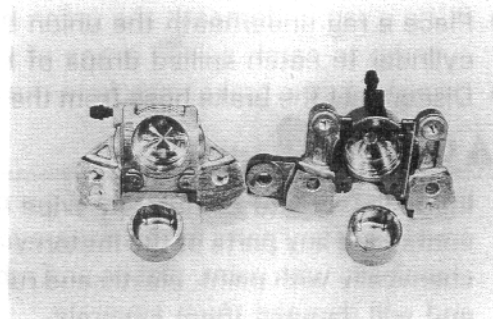
Do not reuse the dust seals and piston seals to prevent fluid leakage.



**CALIPER INSPECTION**

CALIPER ..... Refer to page 6-47.

PISTON ..... Refer to page 6-47.

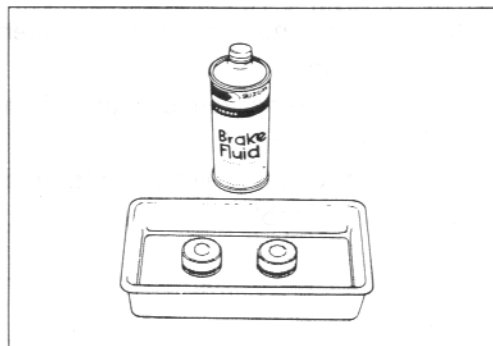


**CALIPER REASSEMBLY AND REMOUNTING**

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.



**BF** Specification and classification: DOT 4

**PISTON SEAL**

- Install the piston seals as shown in the right illustration.

**CALIPER BOLTS**

- Tighten each bolt to the specified torque.

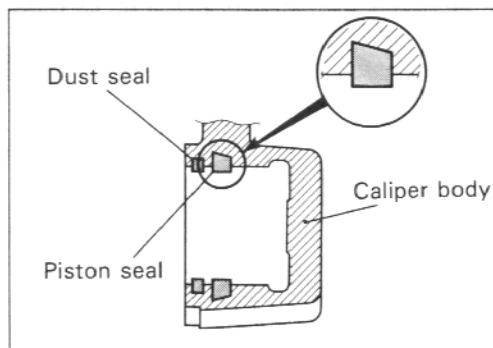
**Rear brake caliper**

housing bolt ① : 33 N·m (3.3 kg-m, 24.0 lb-ft)

Rear brake caliper mounting bolt ② : 26 N·m (2.6 kg-m, 19.0 lb-ft)

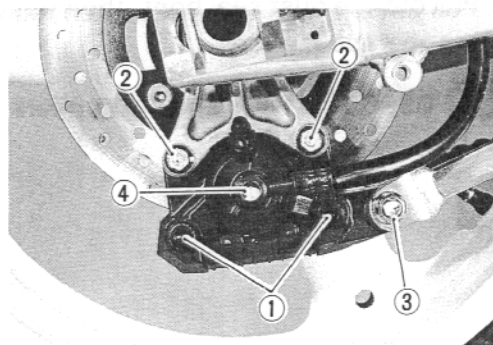
Torque link nut (Rear) ③ : 35 N·m (3.5 kg-m, 25.5 lb-ft)

Brake hose union bolt ④ : 23 N·m (2.3 kg-m, 16.5 lb-ft)



**CAUTION**

Bleed air from the system after reassembling the caliper. (Refer to page 2-17.)



- Refer to page 8-21 for brake hose routing.

## MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the seats.
- Remove the frame cover. (Refer to page 6-4.)
- Free the reservoir tank to remove its mounting bolt ①.
- Loosen the lock nut ③.
- Remove the master cylinder mounting bolts ④.

### NOTE:

*Slightly loosen the brake hose union bolt ② before removing the master cylinder to facilitate later disassembly.*

- Place a rag underneath the union bolt ② on the master cylinder to catch spilled drops of brake fluid.
- Disconnect the brake hose from the master cylinder joint.


### ⚠ CAUTION

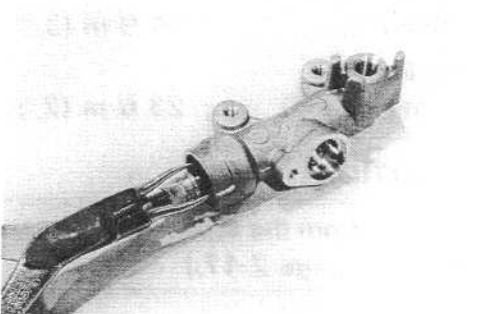
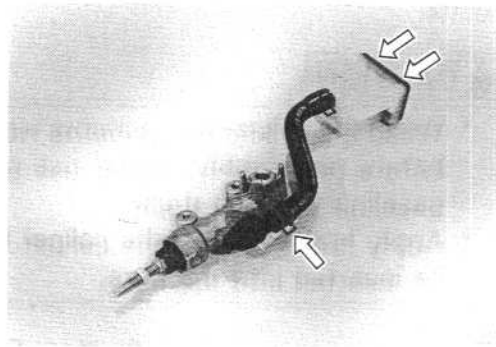
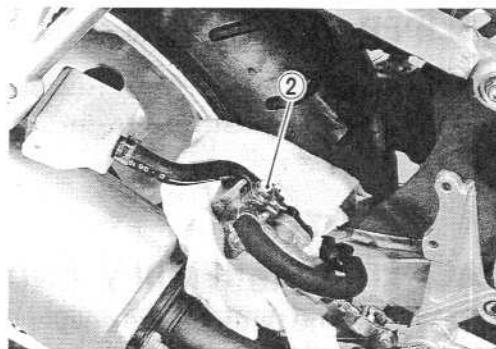
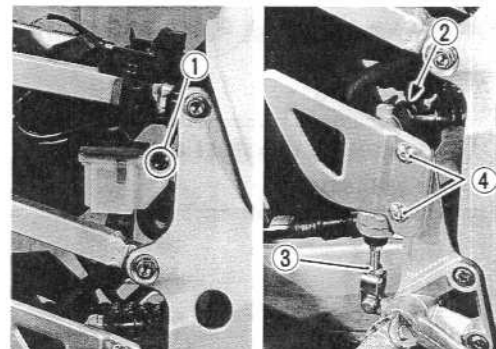
**Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastic and rubber materials, etc. and will damage them severely.**

- Remove the master cylinder assembly along with the reservoir tank.
- Remove the reservoir cap and diaphragm.
- Drain brake fluid.
- Separate the reservoir tank with its hose from the master cylinder assembly.

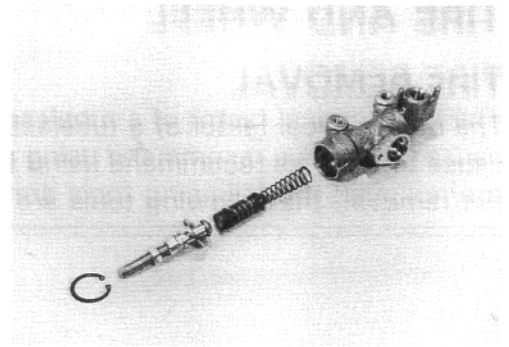
- Remove the connector and O-ring.

- Pull out the dust seal boot, then remove the circlip by using the special tool.

 **09900-06108: Snap ring pliers**



- Remove the push rod, piston/primary cap 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.

## DISC SERVICING

Refer to page 6-48.

## 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.



Specification and Classification: DOT 4

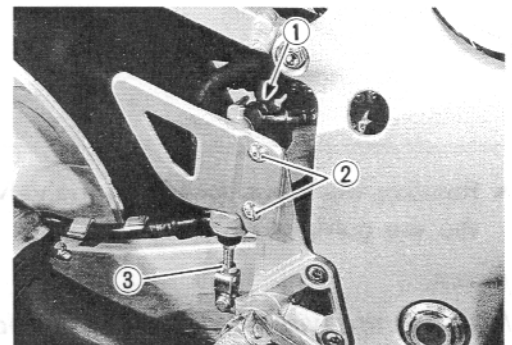
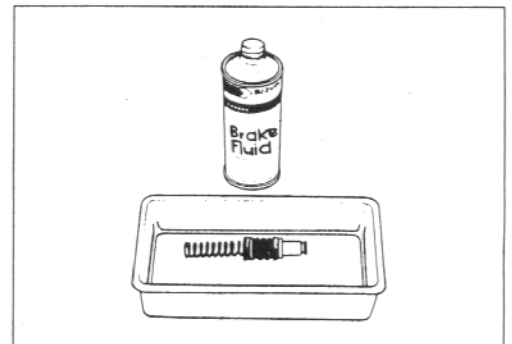
### MASTER CYLINDER BOLTS

- Tighten each bolt to the specified torque.
- 🔧 Brake hose union bolt ①: 23 N·m (2.3 kg-m, 16.5 lb-ft)  
Rear brake master cylinder mounting bolt ②:  
10 N·m (1.0 kg-m, 7.0 lb-ft)
- Rear brake master cylinder rod lock nut ③:  
18 N·m (1.8 kg-m, 13.0 lb-ft)

### ⚠ CAUTION

Bleed air from the system after reassembling master cylinder. (Refer to page 2-17.)

- After installing the rear brake master cylinder, adjust the brake pedal height. (Refer to page 2-16.)



## TIRE AND WHEEL

### TIRE REMOVAL

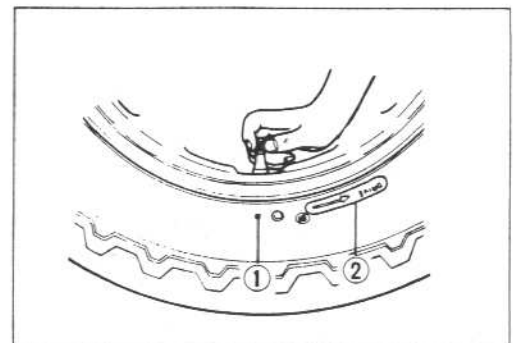
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers. For tire removal, the following tools are required.



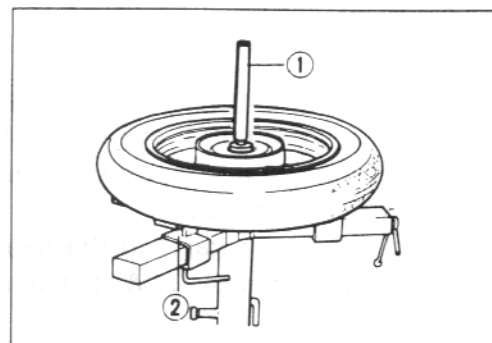
- Remove the valve core from the valve stem, and deflate the tire completely.

**NOTE:**

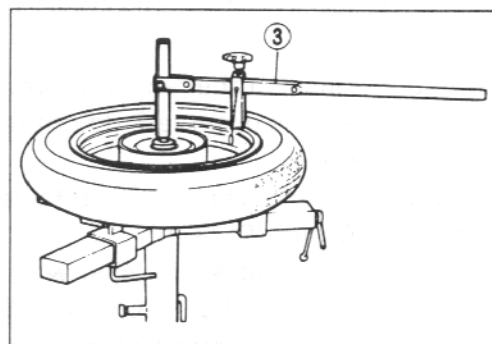
Mark the tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



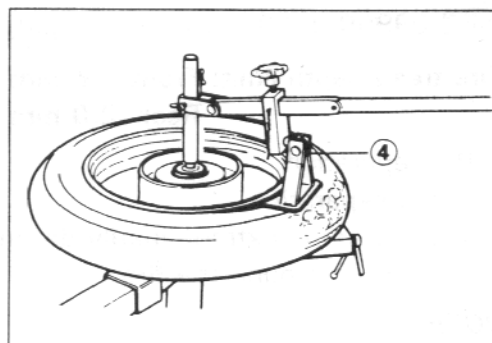
- Place the center shaft ① to the wheel, and fix the wheel with the rim holder ②.



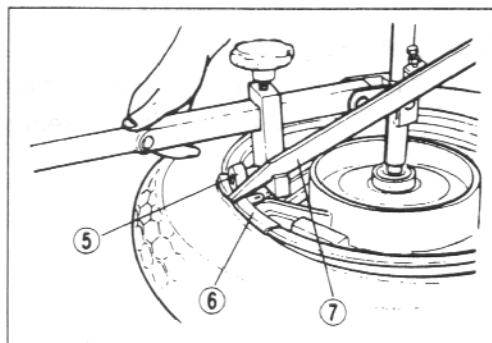
- Attach the operation arm ③ to the center shaft.



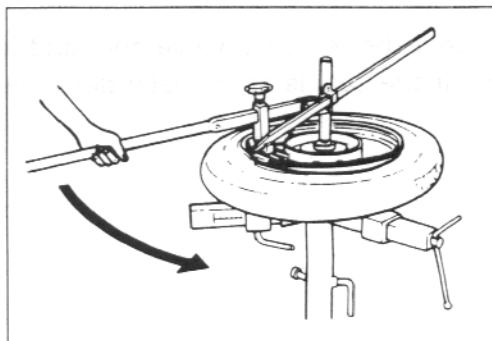
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



- 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 rim runout (Axial & Radial) of more than 2.0 mm (0.08 in).

**Wheel rim runout (Axial and Radial): 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**

**Tire tread depth limit: Front 1.6 mm (0.06 in)**  
**Rear 2.0 mm (0.08 in)**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>* Ply separation.</li> <li>* Tread separation.</li> <li>* Tread wear is extraordinarily deformed or distributed around the tire.</li> </ul> | <ul style="list-style-type: none"> <li>* Scratches at the bead.</li> <li>* Cord is cut.</li> <li>* Damage from skidding (flat spots).</li> <li>* Abnormality in the inner liner.</li> </ul> |
|--|---|

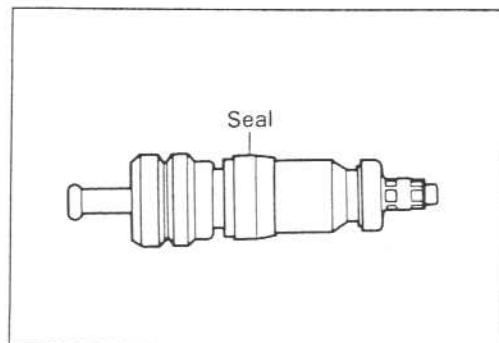
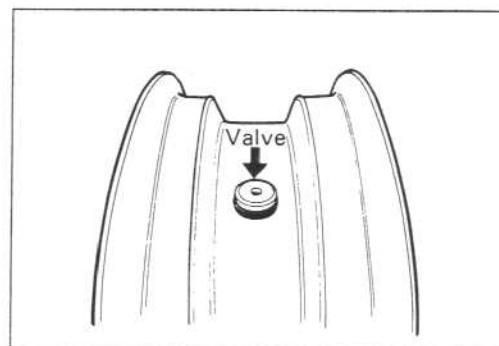
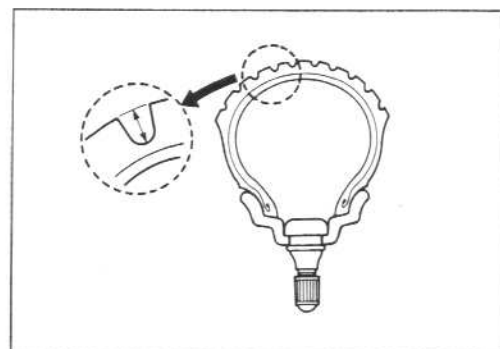
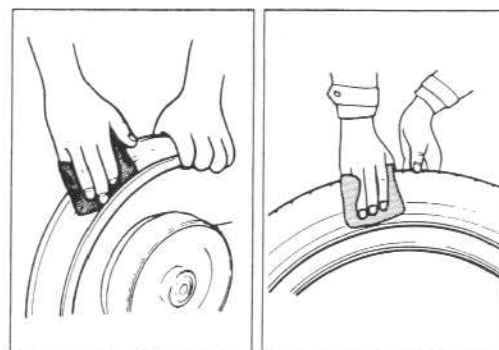
#### NOTE:

*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

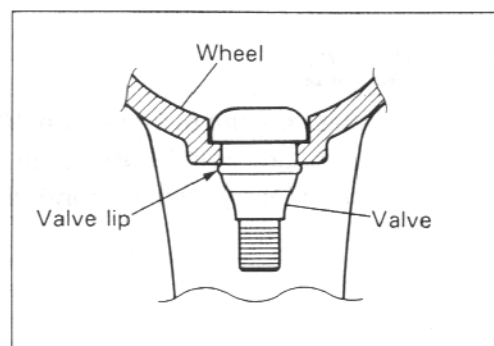
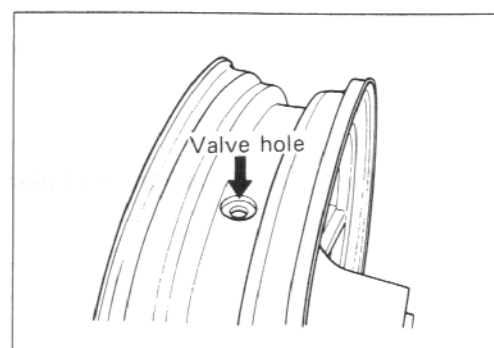
Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

### 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 lip of valve.

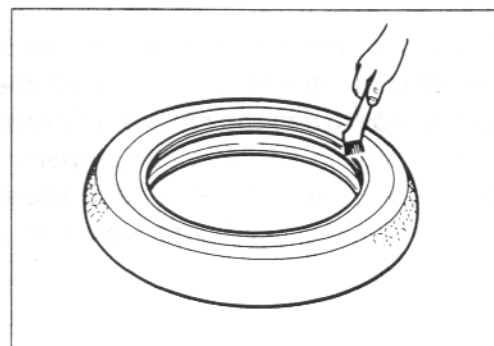


## TIRE INSTALLATION

- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

### ⚠ CAUTION

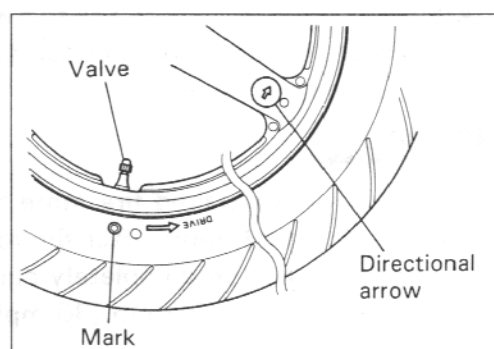
Never apply grease, oil or gasoline to the tire bead.



- When installing the tire, align the balancing mark of the tire with the valve as shown.

### ⚠ CAUTION

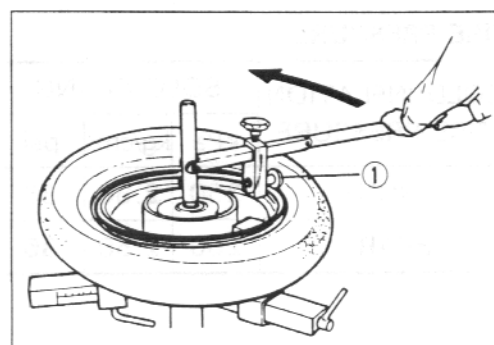
Face the tire directional arrow to the direction of wheel directional arrow, when installing the tire.



- 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.

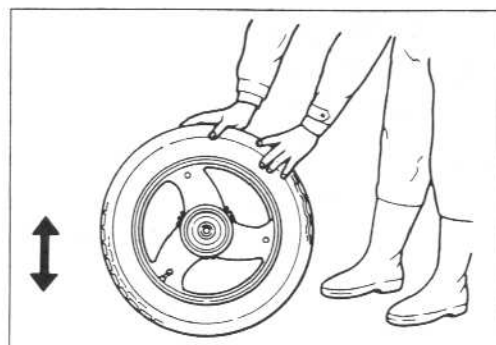




- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.

**NOTE:**

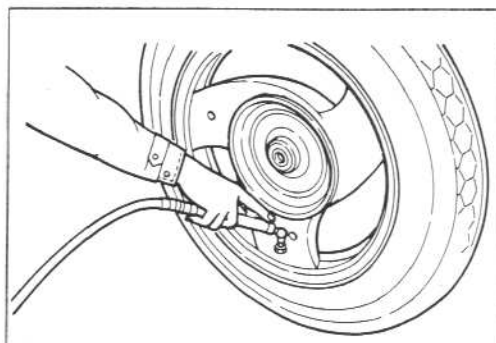
Before inflating, confirm that the balance mark lines up with the valve stem.



- Pump up the tire with air.

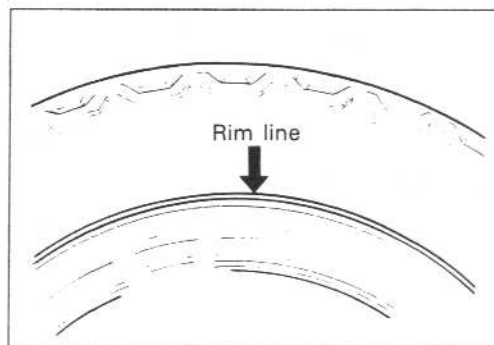
**▲ WARNING**

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	250	2.50	36

# ELECTRICAL SYSTEM

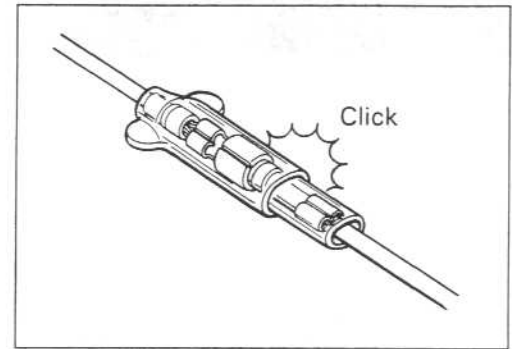
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## CAUTIONS IN SERVICING

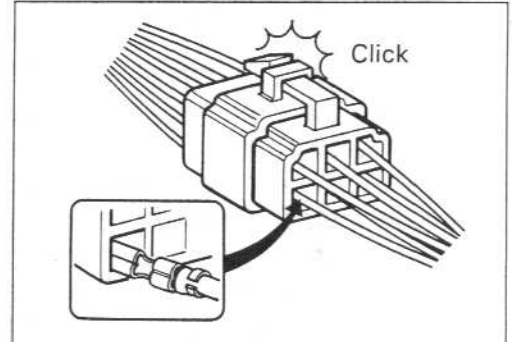
### CONNECTOR

- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.



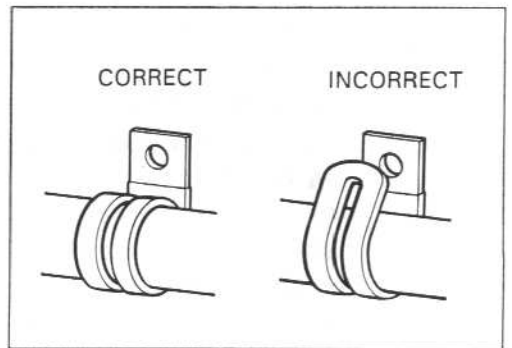
### COUPLER

- With a lock type coupler, be sure to release the lock before disconnecting it and push it in fully till the lock works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler itself and do not pull the lead wires.
- Inspect each terminal on the coupler for being loose or bent.
- Inspect each terminal for corrosion and contamination.



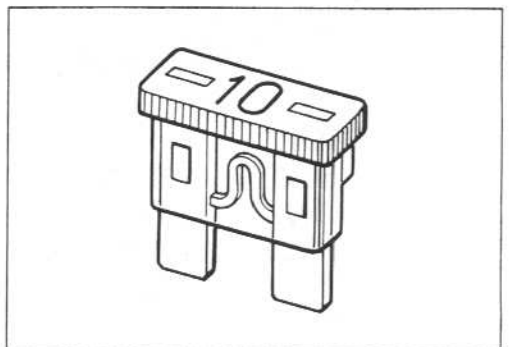
### CLAMP

- Clamp the wire harness at such positions as indicated in "WIRE HARNESS ROUTING". (Refer to page 8-13, -14 and -15.)
- Bend the clamp properly so that the wire harness is clamped securely.
- In clamping the wire harness, use care not to allow it to hang down.
- Do not use wire or any other substitute for the band type clamp.



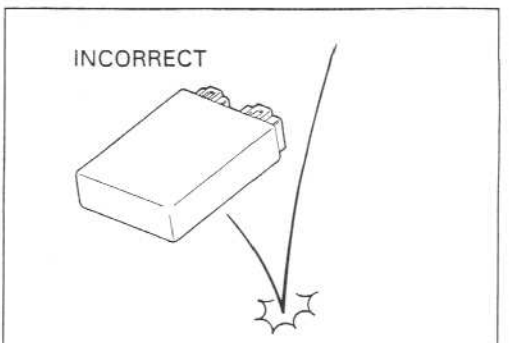
### FUSE

- When a fuse blows, always investigate the cause, correct it and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use wire or any other substitute for the fuse.



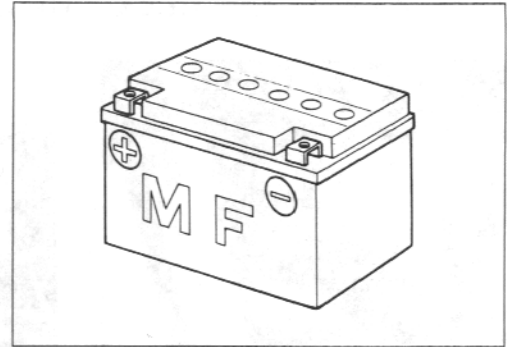
### SEMI-CONDUCTOR EQUIPPED PART

- Be careful not to drop the part with a semi-conductor built in such as ignitor or CDI unit.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.



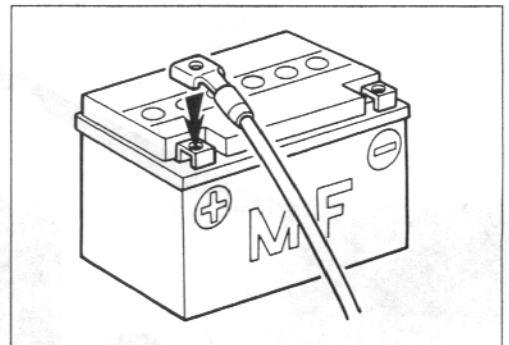
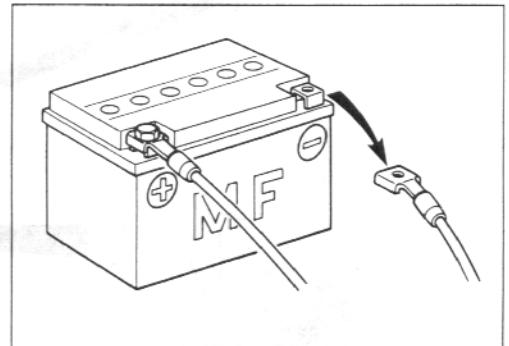
## BATTERY

- The MF battery used in this vehicle does not require maintenance as inspection of electrolyte level and replenishment of water.
- No hydrogen gas is produced during normal charging of the battery, but such gas may be produced when it is overcharged. Therefore, do not bring fire near the battery while it is being charged.
- Note that the charging system for the MF battery is different from that of an ordinary battery. Do not replace with an ordinary battery.



## CONNECTING BATTERY

- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the negative (  $\ominus$  ) terminal first.
- When connecting terminals to the battery, be sure to connect the positive (  $\oplus$  ) terminal first.
- If the terminal is found corroded, remove the battery, pour warm water over it and clean with a wire brush.
- Upon completion of connection, apply grease lightly.
- Put a cover over the positive (  $\oplus$  ) terminal.

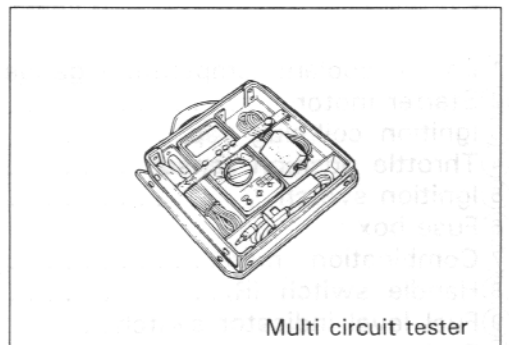


## WIRING PROCEDURE

- Route the wire harness properly according to "WIRE HARNESS ROUTING". (Refer to page 8-13, -14 and -15.)

## USING MULTI CIRCUIT TESTER

- Be sure to use positive (  $\oplus$  ) and negative (  $\ominus$  ) probes of the tester properly. Their false use may cause damage in the tester.
- If the current values are not known, start measuring in the higher range.
- Taking a measurement where voltage is applied in the resistance range may cause damage in the tester. When measuring resistance, check to make sure that no voltage is applied there.
- After using the tester, turn the switch to the OFF position.

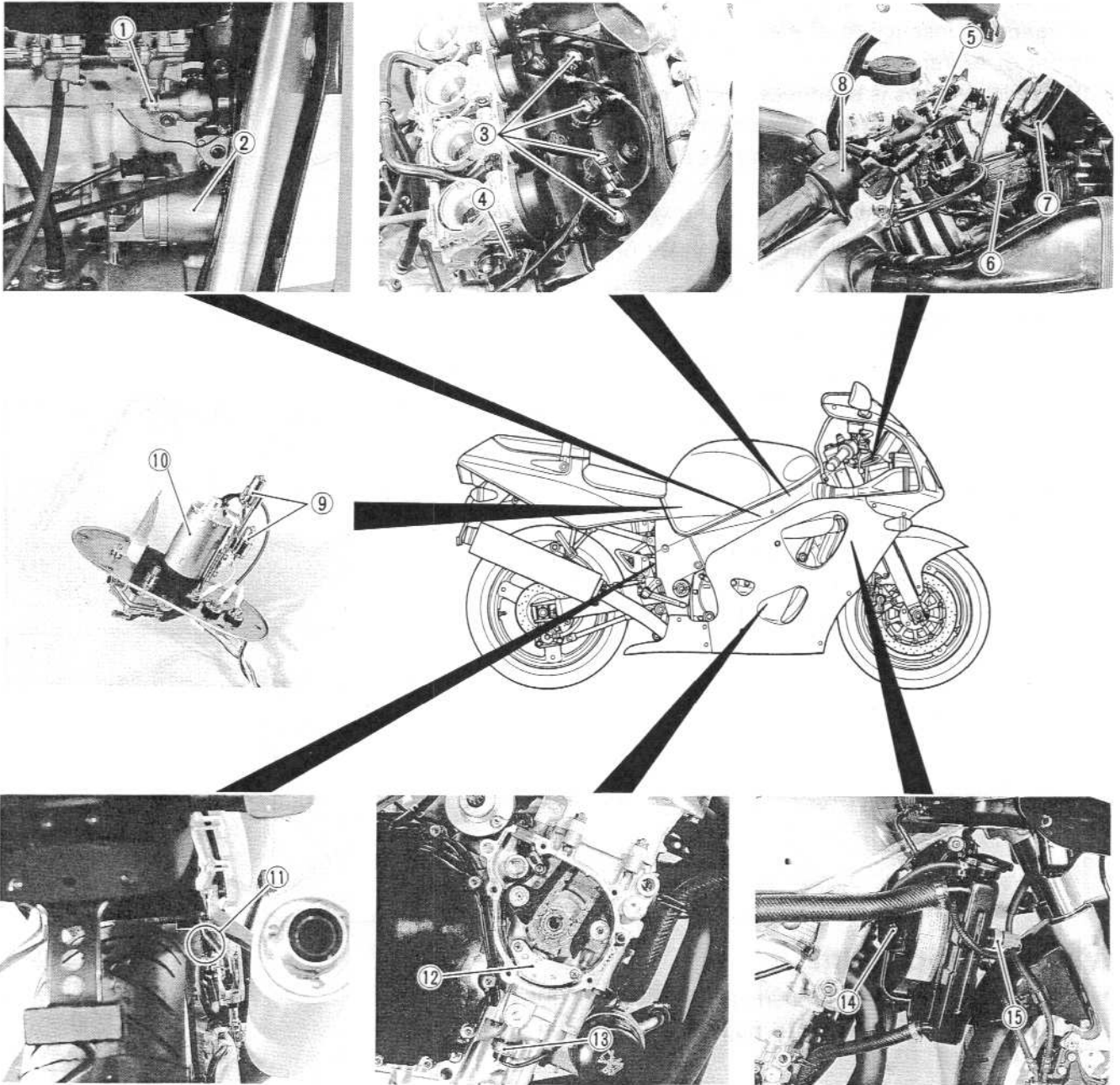


Multi circuit tester

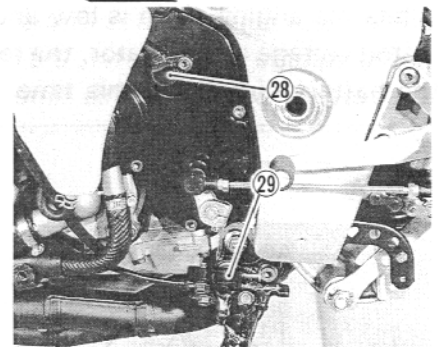
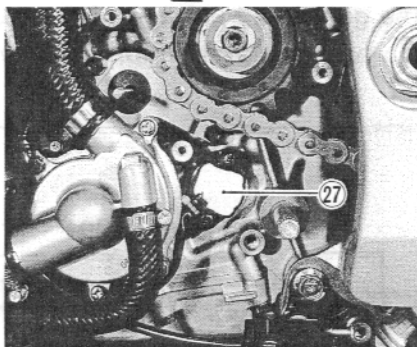
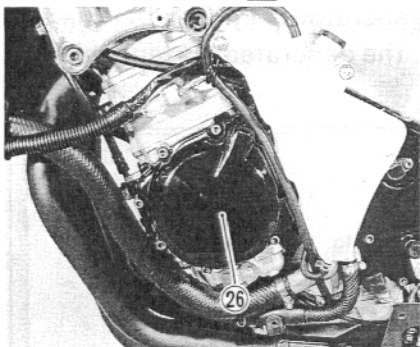
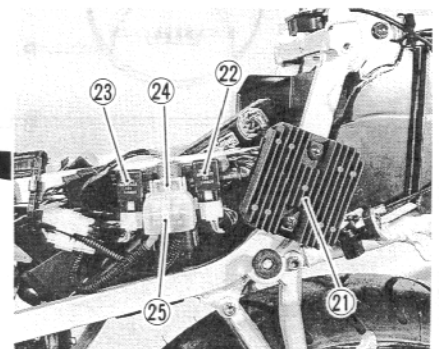
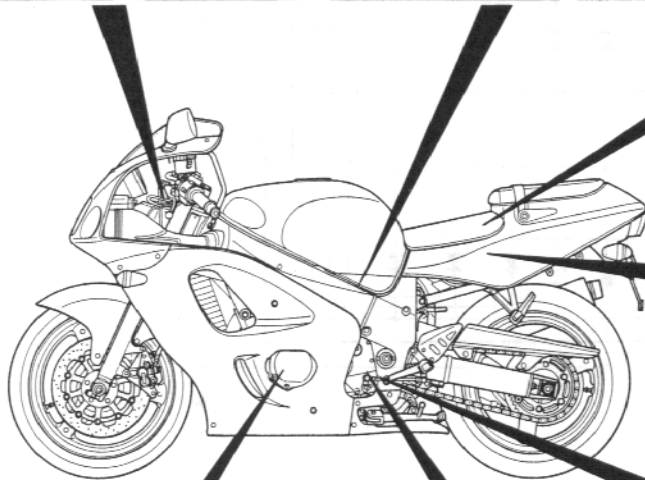
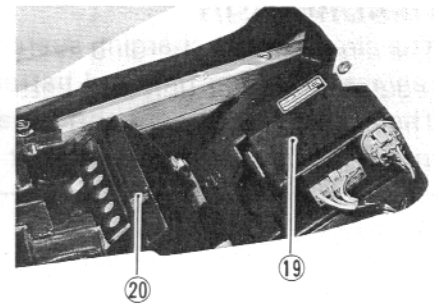
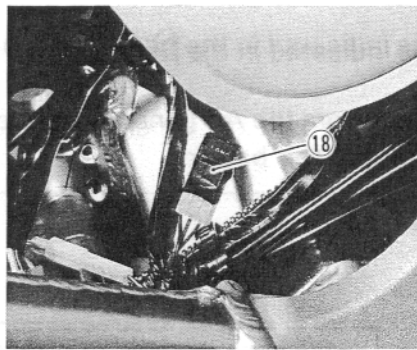
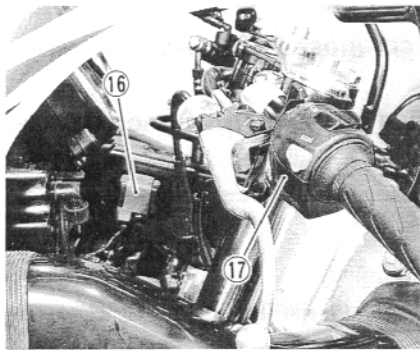
### **CAUTION**

Before using the multi circuit tester, read the instruction manual.

## LOCATION OF ELECTRICAL COMPONENTS



① Engine coolant temperature gauge.....	See page 5-11
② Starter motor.....	7-14 through -16
③ Ignition coil/plug cap.....	7-25
④ Throttle position sensor.....	4-22
⑤ Ignition switch.....	7-38
⑥ Fuse box	
⑦ Combination meter.....	7-30 through -35
⑧ Handle switch (R).....	7-38
⑨ Fuel level indicator switch.....	7-34
⑩ Fuel pump.....	4-5
⑪ Rear brake light switch.....	7-38
⑫ Signal generator.....	7-26 and -27
⑬ Oil pressure switch.....	7-38
⑭ Cooling fan.....	5-8
⑮ Cooling fan thermo-switch.....	5-9 and -10



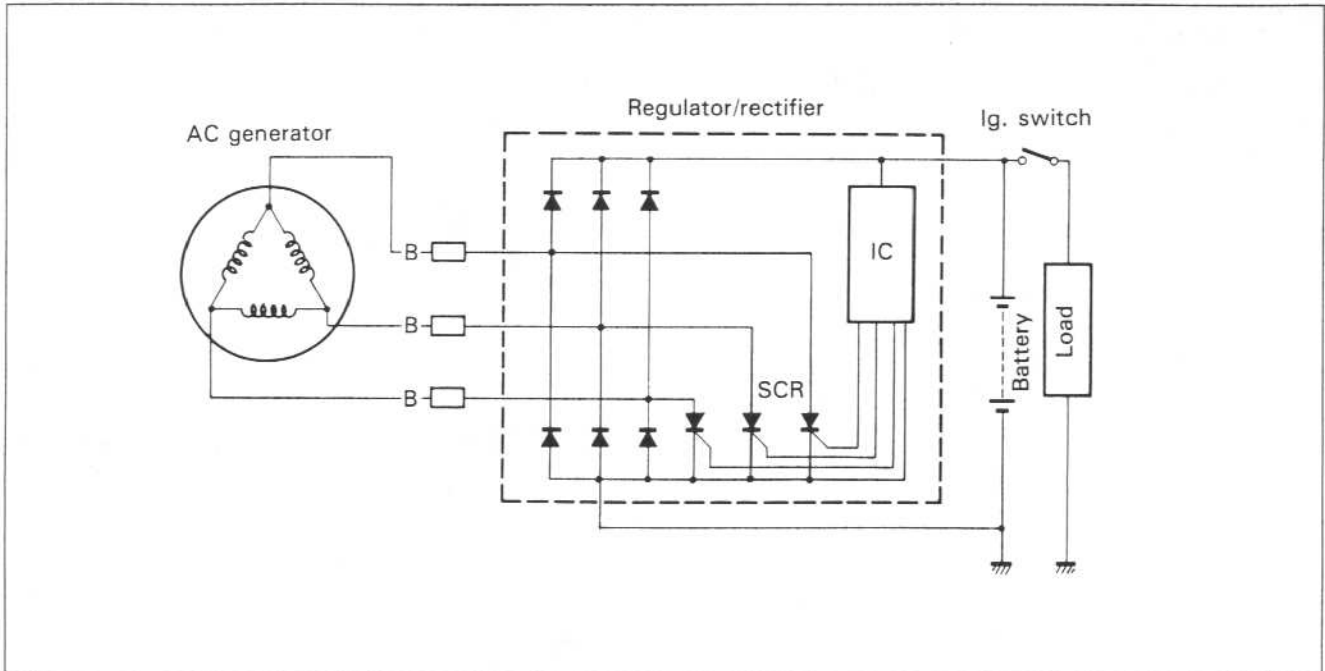
	See page
①⑥ Turn signal relay . . . . .	7-39
①⑦ Handle switch (L) . . . . .	7-38
①⑧ Diode . . . . .	7-18
①⑨ CDI unit . . . . .	7-28 and -29
②⑩ Battery . . . . .	7-39, -40 and -41
②⑪ Regulator/rectifier . . . . .	7-10
②⑫ Fuel pump relay . . . . .	4-7
②⑬ Side-stand relay . . . . .	7-19
②⑭ Main fuse . . . . .	
②⑮ Starter relay . . . . .	7-17
②⑯ Generator . . . . .	7-9
②⑰ Neutral switch . . . . .	7-18
②⑱ Speed sensor . . . . .	7-35
②⑲ Side-stand switch . . . . .	7-19

## CHARGING SYSTEM

### DESCRIPTION

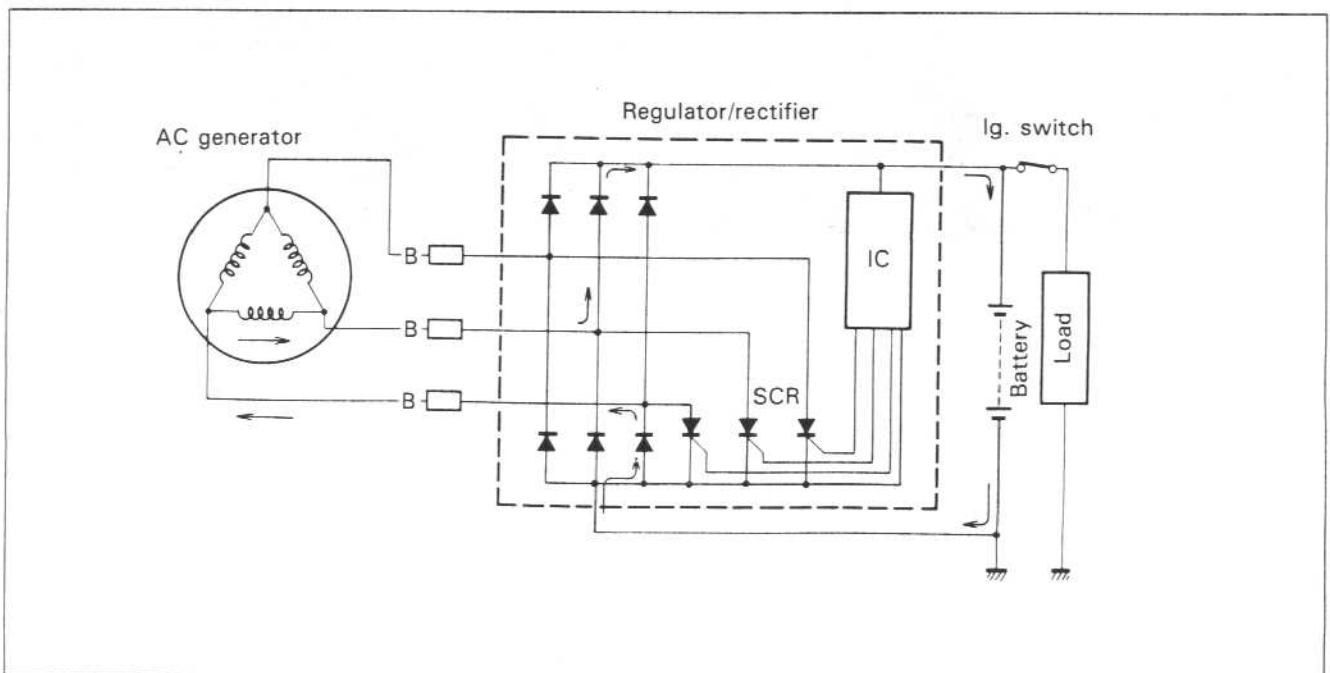
The circuit of the charging system is indicated in the figure, which is composed of an AC generator, regulator/rectifier unit and battery.

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



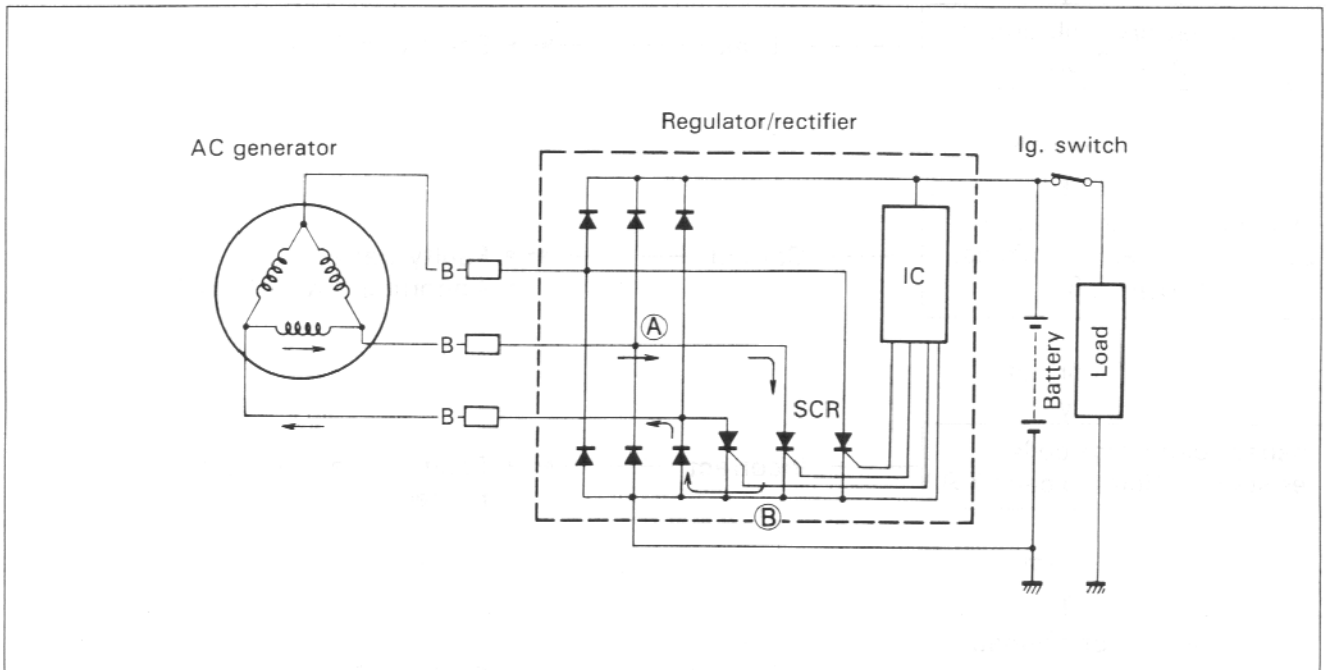
### FUNCTION OF REGULATOR

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



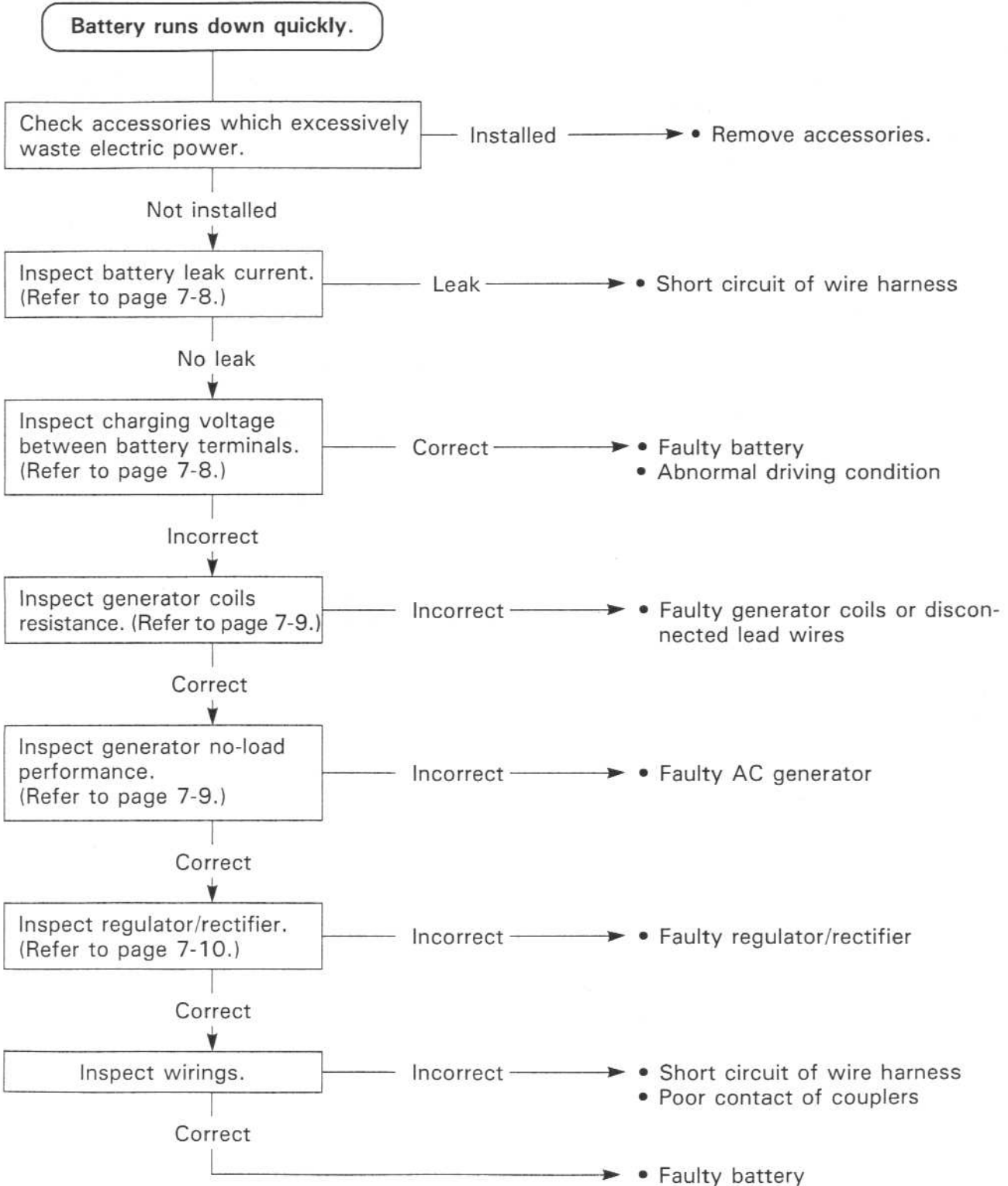
When the engine r/min becomes higher, the generated voltage of the AC generator also becomes higher and the voltage between the battery terminals becomes high accordingly. When it reaches the adjusted voltage of the I.C., (Integrated Circuit) and it is turned "ON", a signal will be sent to the SCR (Thyristor)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

Then, the SCR becomes conductive in the direction from point (A) to point (B). At this time, the current generated from the AC generator gets through the SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC generated from AC generator flows to point (B), the reverse current tends to flow to SCR. Then, the circuit of SCR turns to the OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage and current to the battery constant and protect it from overcharging.





**TROUBLESHOOTING**



**Others**

Battery overcharge	<ul style="list-style-type: none"> <li>• Faulty regulator/rectifier</li> <li>• Faulty battery</li> <li>• Poor contact of generator lead wire coupler</li> </ul>
--------------------	---

## INSPECTION

### BATTERY LEAK CURRENT INSPECTION

- Remove the front seat. (Refer to page 6-3.)
- Turn the ignition switch to the OFF position.
- Disconnect the battery  $\ominus$  lead wire.

Note that leakage is indicated if the tester read over 1mA.

 **09900-25008: Multi circuit tester set**

Battery leak current: Under 1mA

 Tester knob indication: Current (  $\overline{\text{---}}$  20mA)

#### **CAUTION**

- \* Because the leak current might be large, turn the tester to 20A range first when connecting an ammeter.
- \* Do not turn the ignition switch to the ON position when measuring current.
- \* When using the multi circuit tester, follow the instruction manual.

When leakage is found, look for the part where the tester read under 1mA through the couplers and connectors are removed one by one.

### CHARGING OUTPUT INSPECTION


- Remove the front seat. (Refer to page 6-3.)
- Remove the battery  $\oplus$  terminal cover.
- Start the engine and keep it running at 5 000 r/min. with lighting switch turned ON and dimmer switch turned HI position.

Measure the DC voltage between the battery terminals  $\oplus$  and  $\ominus$  with the multi circuit tester. If the tester reads under 13.5V or over 15.0V, inspect the generator coil and regulator/rectifier.

#### NOTE:

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

 **09900-25008: Multi circuit tester set**

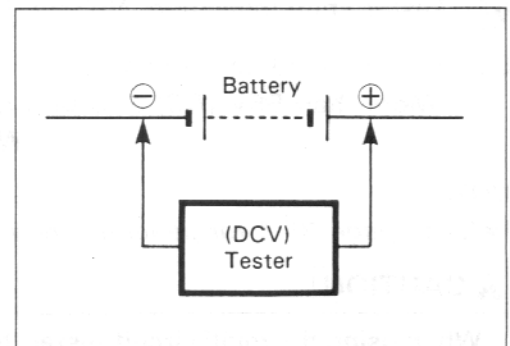
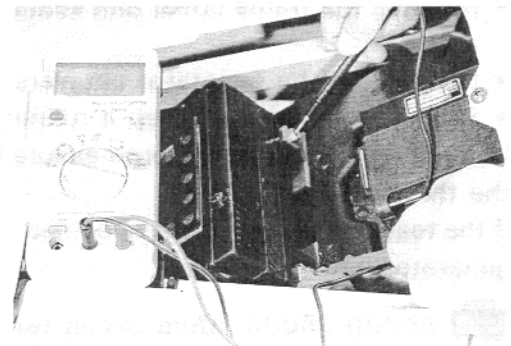
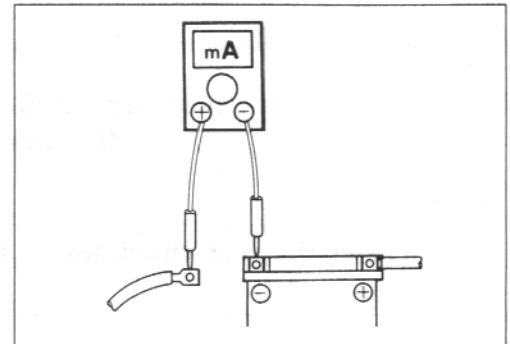
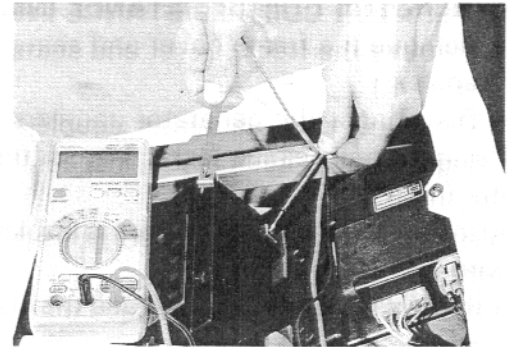
 Tester knob indication: Voltage (  $\overline{\text{---}}$  )

Charging output (Regulated voltage)

Standard: 13.5–15.0V at 5 000 r/min.

#### **CAUTION**

When using the multi circuit tester, follow the instruction manual.



**GENERATOR COIL RESISTANCE INSPECTION**

- Remove the frame cover and seats. (Refer to pages 6-3 and -4.)
- Disconnect the generator couplers ①.

Using the multi circuit tester, inspect the continuity between the three lead wires.

Also check that the stator core is insulated between the lead wire and the ground.

If there is no continuity, replace the stator with a new one.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Resistance ( $\Omega$ )**

**Generator coil resistance: Approx. 0.3  $\Omega$  (Black—Black)  
:  $\infty \Omega$  (Black—Ground)**

**CAUTION**

When using the multi circuit tester, follow the instruction manual.

**NOTE:**

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

**GENERATOR NO-LOAD PERFORMANCE INSPECTION**

- Remove the frame cover and seats. (Refer to pages 6-3 and 4.)
- Disconnect the generator couplers ①.
- Start the engine and keep it running at 5 000 r/min.

Using the multi circuit tester, measure the voltage between the three lead wires.

If the tester reads under the specified value, replace the AC generator with a new one.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Voltage ( $\sim$ )**

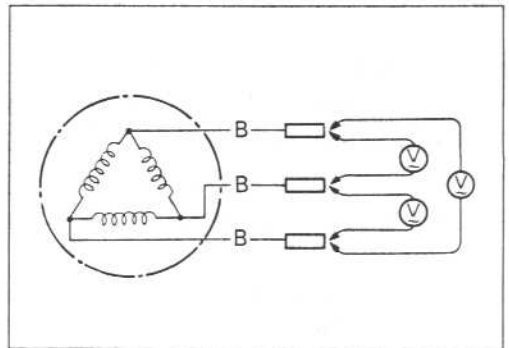
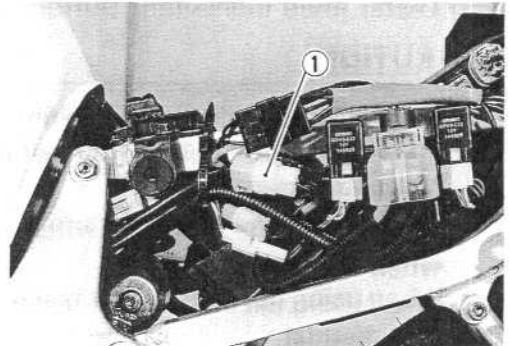
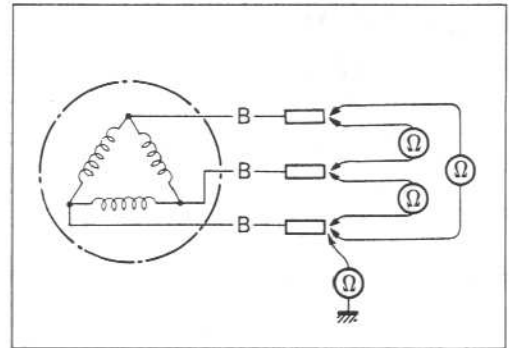
**Generator no-load performance:  
More than 55V (AC) at 5 000 r/min  
(When engine is cold)**

**NOTE:**

Refer to page 3F-1 for generator replacing.

**CAUTION**

When using the multi circuit tester, follow the instruction manual.



**REGULATOR/RECTIFIER (Checking with Multi Circuit Tester)**

- Remove the seats and the frame cover. (Refer to pages 6-3 and -4.)
- Disconnect the regulator/rectifier couplers.

Using the multi circuit tester, measure the voltage between the lead wires in the following table. If the voltage is incorrect, replace the regulator/rectifier.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Diode test (  $\leftarrow \rightarrow$  )**

**CAUTION**

When using the multi circuit tester, follow the instruction manual.

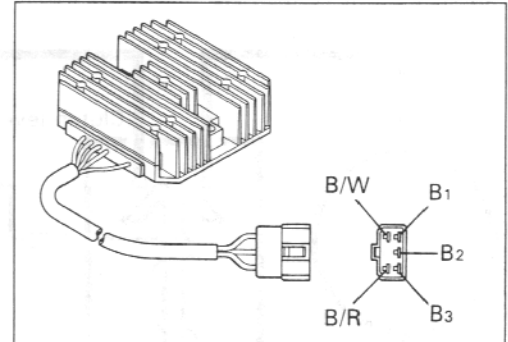
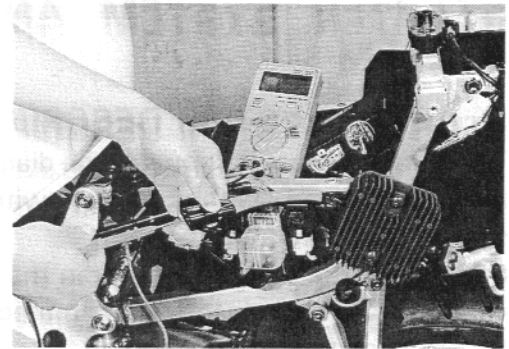
Unit: V

		⊕ Probe of tester to:				
⊖ probe of tester to:	B/R	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B/W	
B/R		0.4~0.7	0.4~0.7	0.4~0.7	0.5~1.2	
B <sub>1</sub>	Approx. 1.5		Approx. 1.5	Approx. 1.5	0.4~0.7	
B <sub>2</sub>	Approx. 1.5	Approx. 1.5		Approx. 1.5	0.4~0.7	
B <sub>3</sub>	Approx. 1.5	Approx. 1.5	Approx. 1.5		0.4~0.7	
B/W	Approx. 1.5	Approx. 1.5	Approx. 1.5	Approx. 1.5		

B: Black, B/R: Black with Red tracer, B/W: Black with White tracer

**NOTE:**

If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

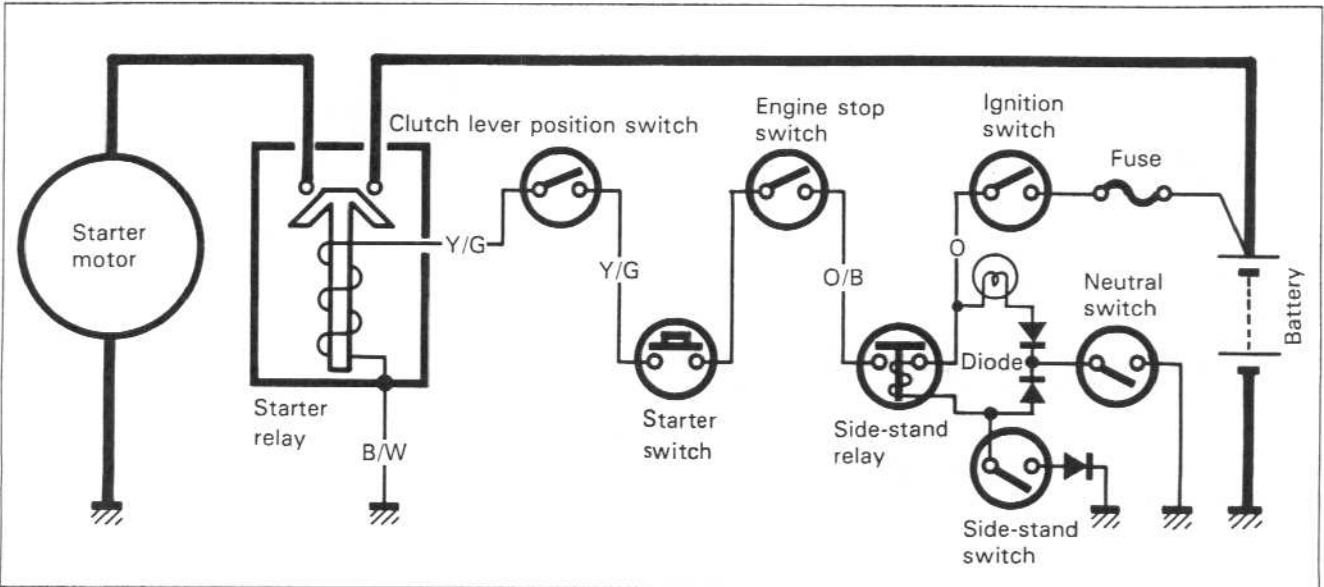


# STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM

## STARTER SYSTEM DESCRIPTION

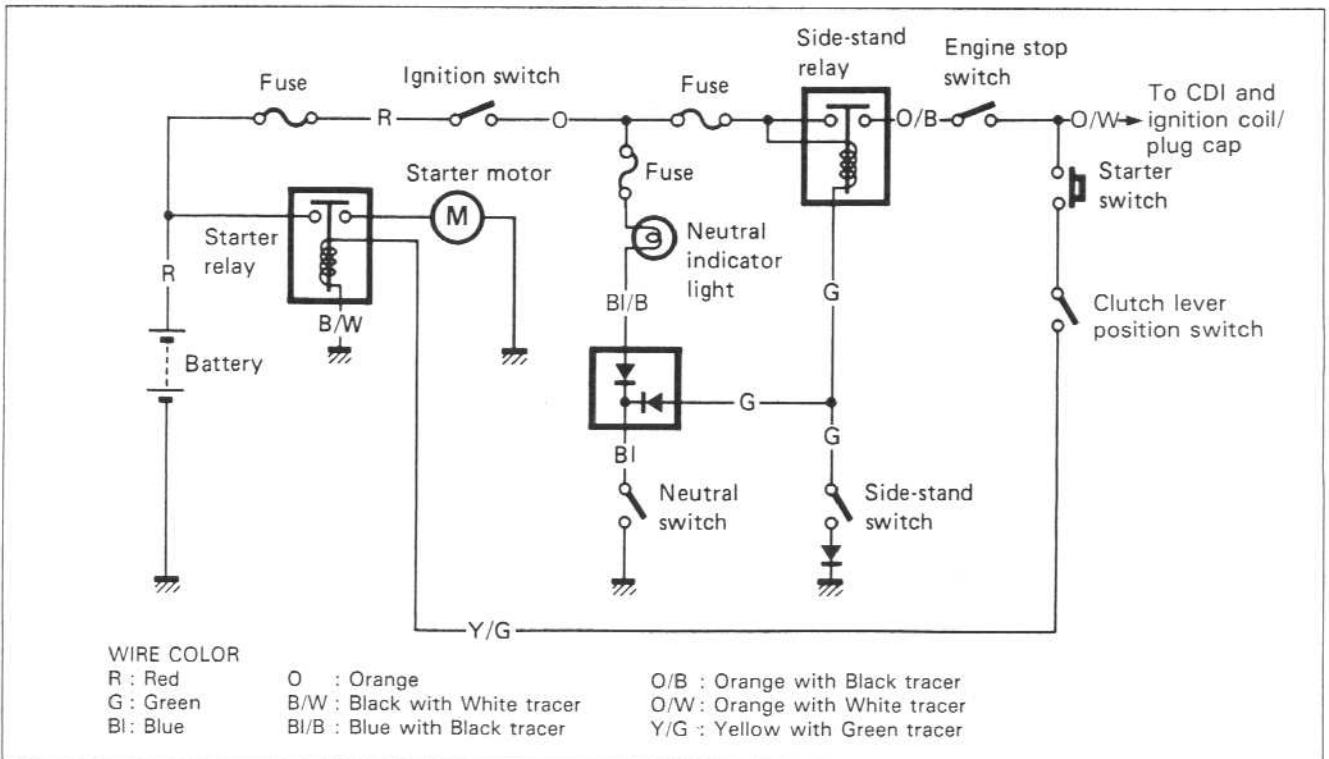
The starter system is shown in the diagram below: namely, the starter motor, starter relay, side-stand relay, side-stand switch, neutral switch, clutch lever position switch, starter switch, engine stop switch, IG switch and battery.

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.



## SIDE-STAND/IGNITION INTERLOCK SYSTEM DESCRIPTION

This side-stand/ignition interlock system is to prevent starting the motorcycle with the side-stand left down. The system is operated by an electric circuit provided between the battery and ignition coil.

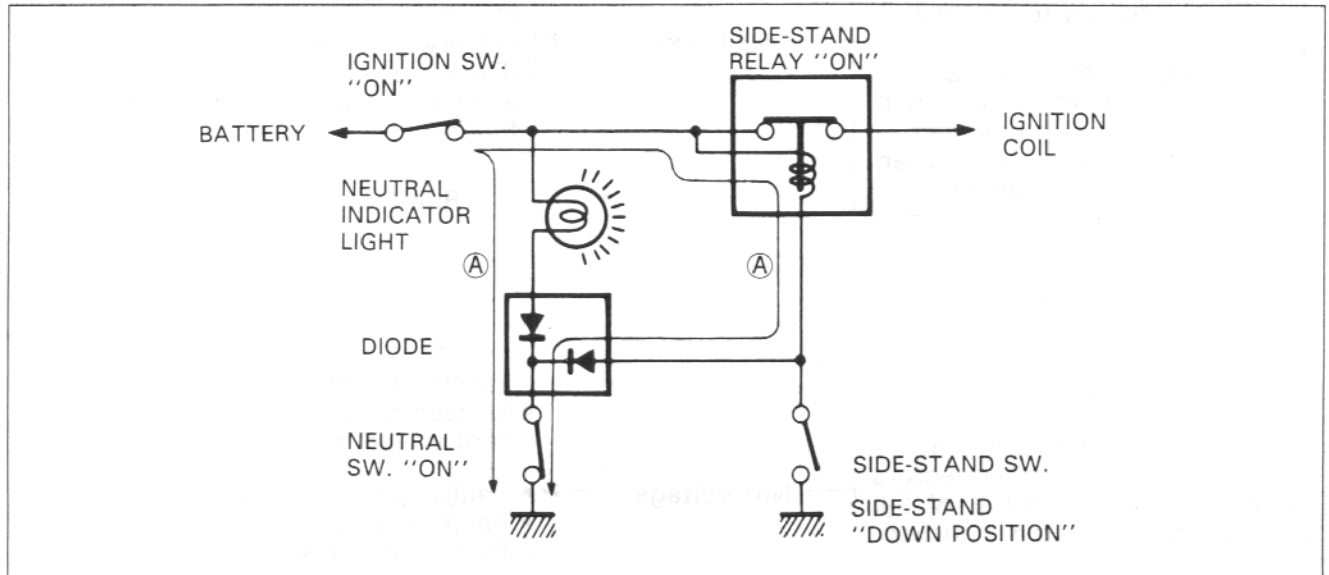


The circuit consists of relay, lamp, diode and switches and decides to live the ignition coil depending on the position of the TRANSMISSION and SIDE-STAND with the neutral and side-stand switches working mutually.

The ignition coil lives only in two situations as follows.

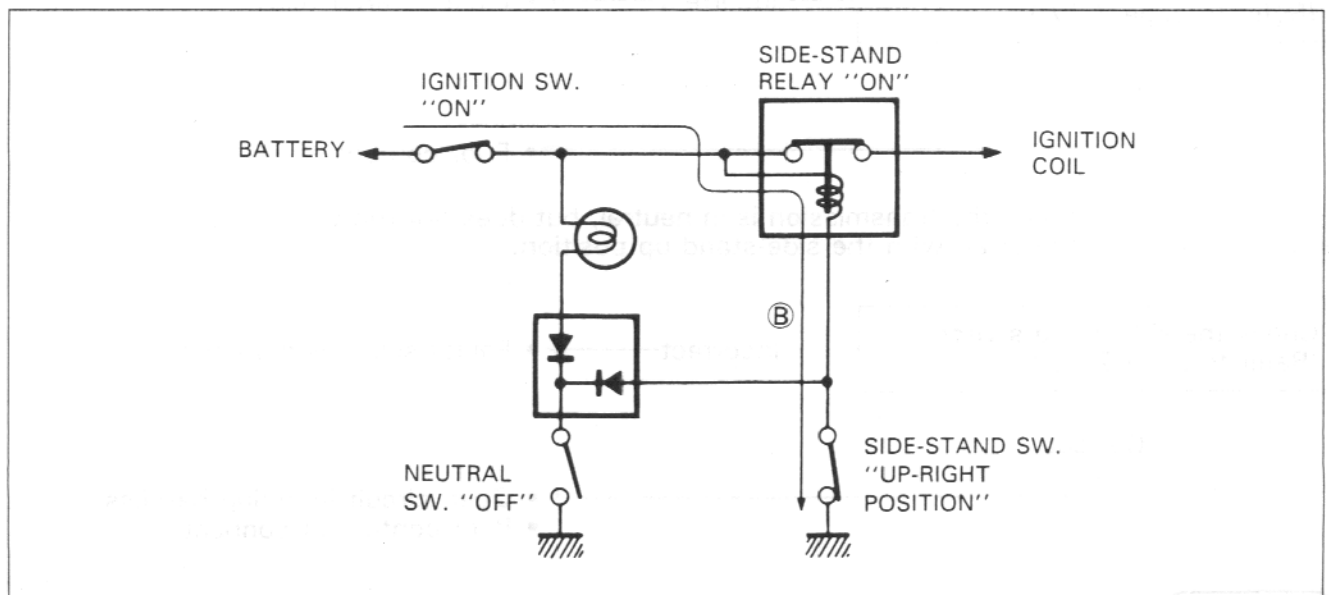
1. Transmission: "NEUTRAL (ON)" Side-stand: "DOWN (OFF)"

The current flow (A) turns "ON" the relay and the ignition coil lives even the side-stand is kept down. This is for warming up the engine.

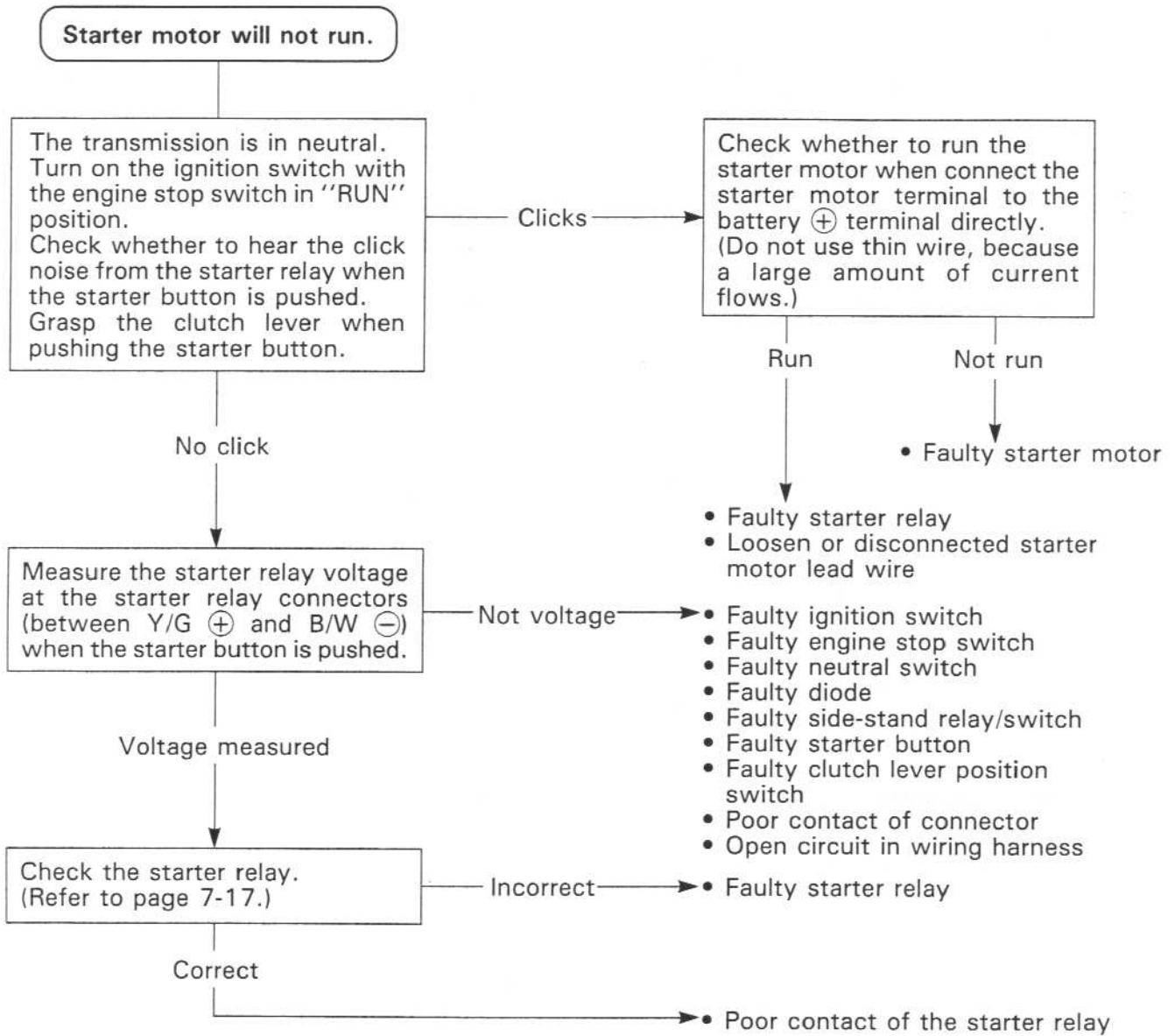


2. Side-stand: "UP-RIGHT (ON)"

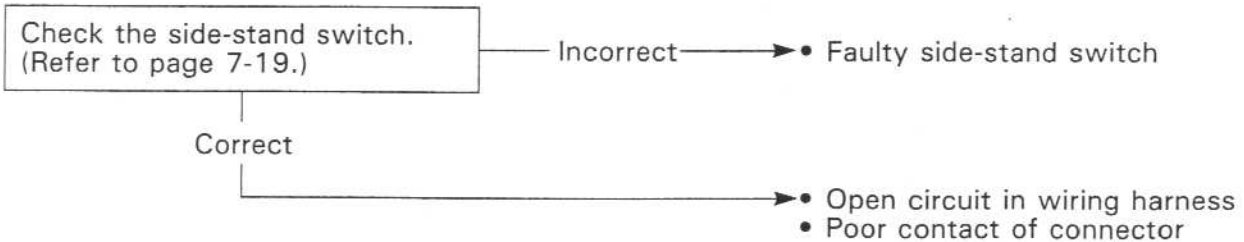
The current flow (B) turns "ON" the relay and the ignition coil lives. The engine can be easily started at any transmission position.



**TROUBLESHOOTING**



Starter motor runs when the transmission is in neutral, but does not run with the transmission in any position except neutral, with the side-stand up position.



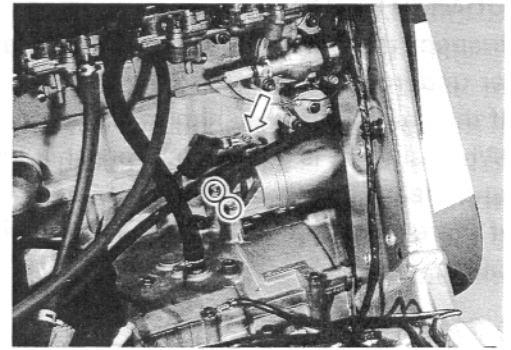
**Others**

Engine does not turn though starter motor runs.	• Faulty starter clutch
---	-------------------------

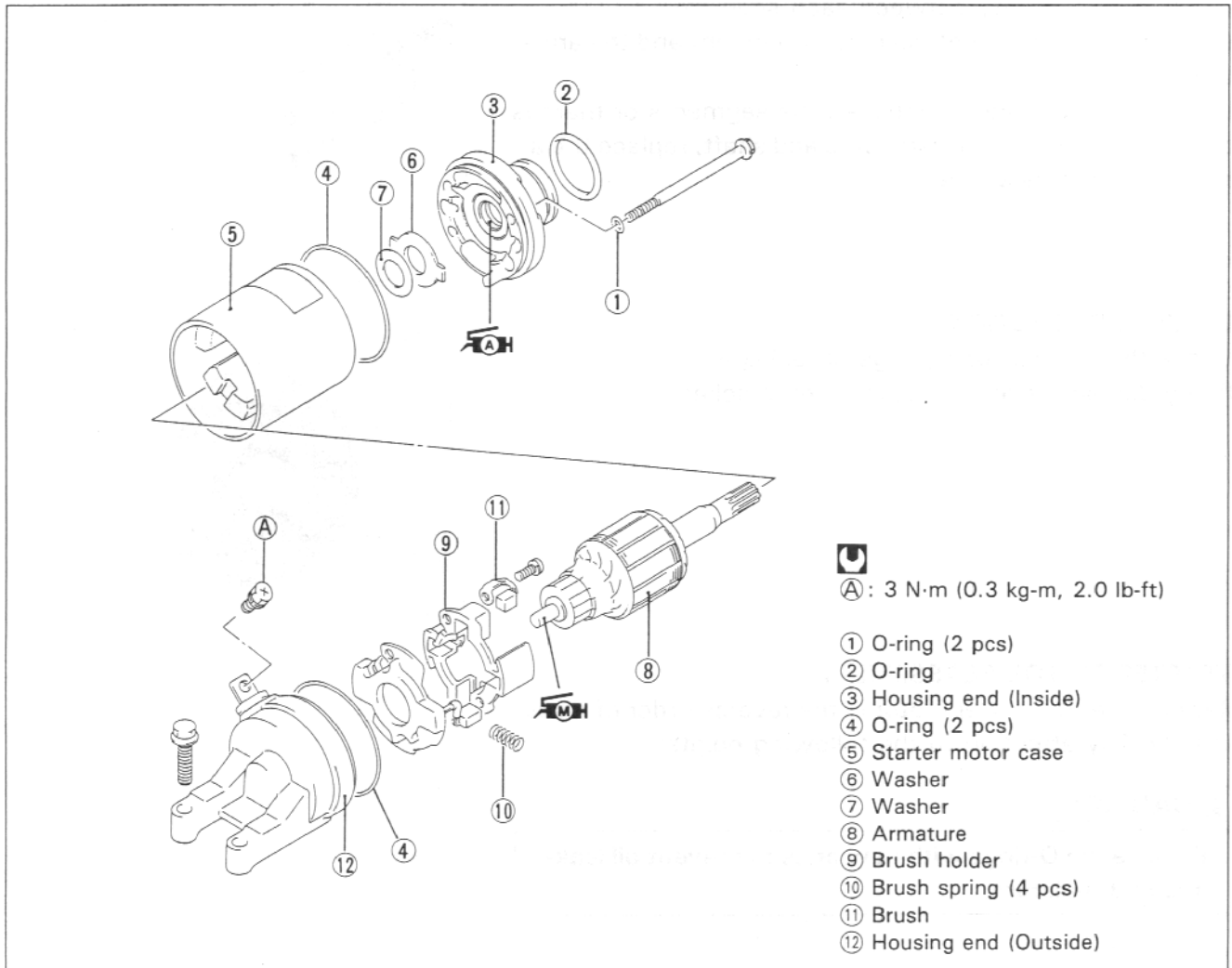
## STARTER MOTOR

### REMOVAL AND DISASSEMBLY

- Remove the front seat. (Refer to page 6-3.)
- Remove the fuel tank. (Refer pages 4-2 and -3.)
- Disconnect the starter motor lead wire and remove the starter motor by removing the mounting bolts.



- Disassemble the starter motor as shown in the illustration.

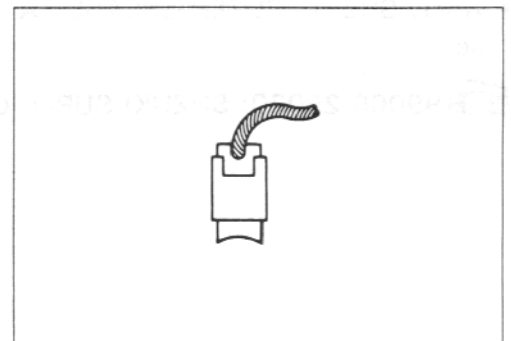


## STARTER MOTOR INSPECTION

### CARBON BRUSH

Inspect the brushed for abnormal wear, crack or smoothness in the brush holder.

If the brush has failed, replace the brush sub assy.



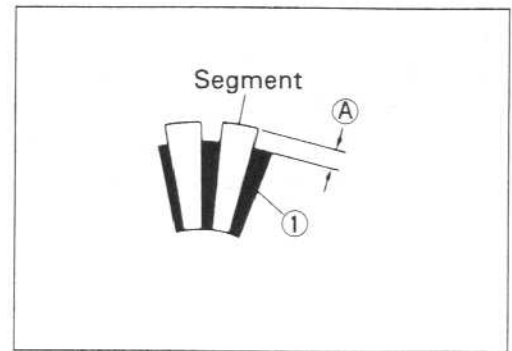


### COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut (A).

If the commutator is abnormally worn, replace the armature. When surface is discolored, polish it with # 400 sand paper and clean it with dry cloth.

If there is no undercut, scrape out the insulator (1) with saw blade.

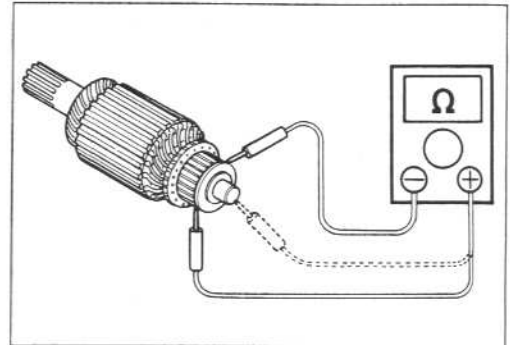


### ARMATURE COIL INSPECTION

Check for continuity between each segment.

Check for continuity between each segment and the armature shaft.

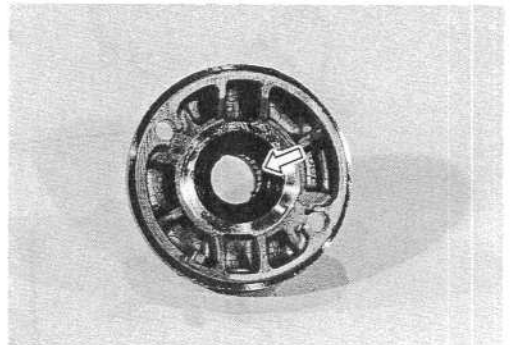
If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.



### OIL SEAL INSPECTION

Check the seal lip for damage or leakage.

If any damage is found, replace the bracket.



### STARTER MOTOR REASSEMBLY

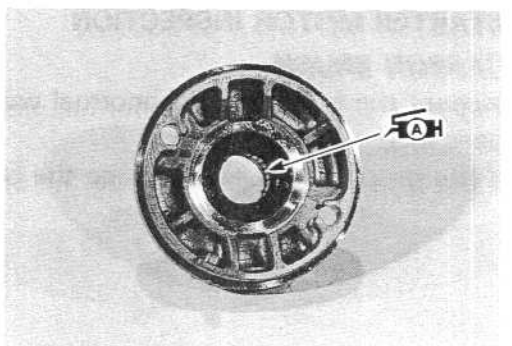
Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

#### ⚠ CAUTION


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

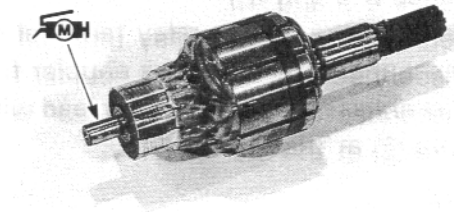
- Apply SUZUKI SUPER GREASE "A" to the lip of the oil seal.

 H99000-25030: SUZUKI SUPER GREASE "A"



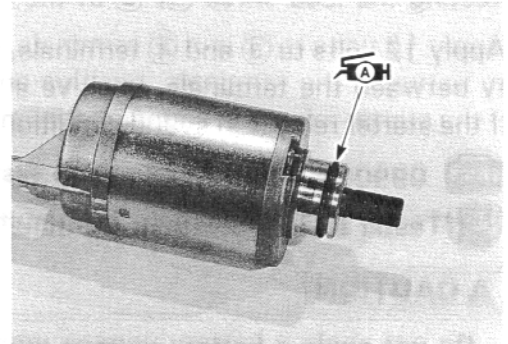
- Apply a small quantity of MOLY PASTE to the armature shaft.

 H99000-25140: SUZUKI MOLY PASTE




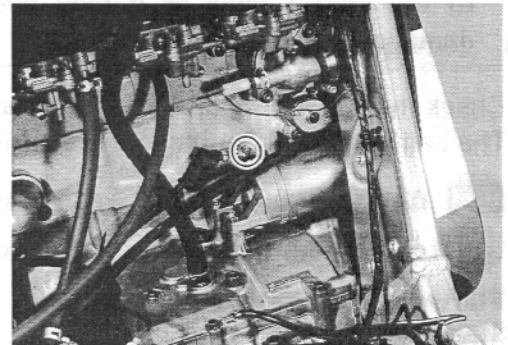
- Apply SUZUKI SUPER GREASE "A" to the O-ring.

 H99000-25030: SUZUKI SUPER GREASE "A"



- Tighten the starter motor mounting bolts and its lead wire nut to the specified torque.

 Starter motor lead wire nut: 3.0 N·m  
(0.3 kg-m, 2.0 lb-ft)



## STARTER RELAY INSPECTION

- Remove the seat and frame cover assembly. (Refer to pages 6-3 and 4.)
- Remove the starter relay terminal cover.
- Disconnect the lead wire coupler from the starter relay.
- Disconnect the starter motor lead wire ① and battery lead wire ② at the starter relay.

**NOTE:**

Disconnect the  $\ominus$  lead wire at the battery before disconnecting the lead wires ①, ② at the starter relay.

Apply 12 volts to ③ and ④ terminals, inspect the continuity between the terminals, positive and negative. If the starter relay is in sound condition, continuity is found.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Continuity test ( • ) )**

**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.

**TOOL** 09900-25008: Multi circuit tester set

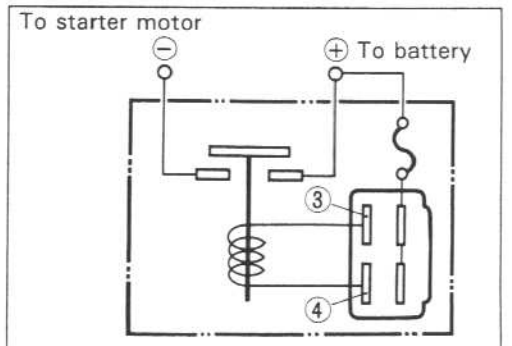
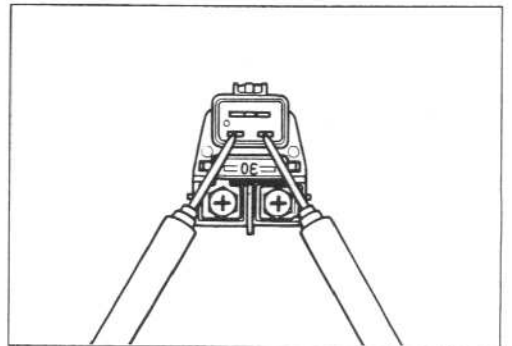
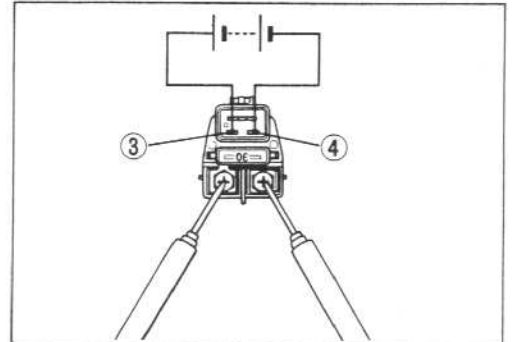
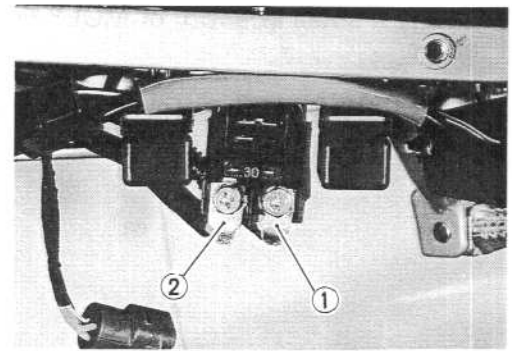
**Tester knob indication: Resistance ( $\Omega$ )**

Starter relay resistance

Standard: 3–5 $\Omega$

**CAUTION**

When using the multi circuit tester, follow the instruction manual.



## SIDE-STAND/IGNITION INTERLOCK SYSTEM PART INSPECTION


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

### DIODE

The diode is located under the fuel tank.

- Lift and support the fuel tank. (Refer to page 4-2.)
- Remove the diode.

Using the multi circuit tester, measure the voltage between the terminals in the following table.

 **09900-25008: Multi circuit tester set**

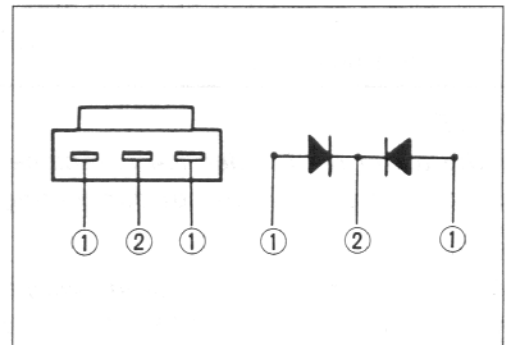
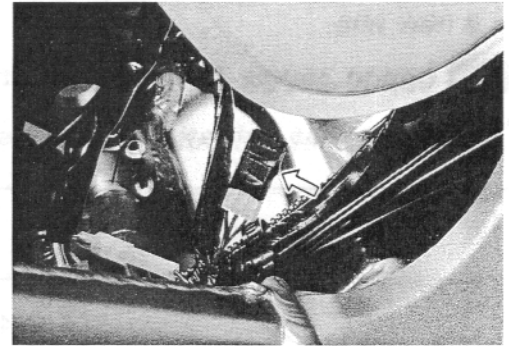
 **Tester knob indication: Diode test (←→)**

Unit: V

		⊕ Probe of tester to:	
		①	②
① Probe of tester to:	①		1.4-1.5
	②	0.4-0.6	

#### NOTE:

If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

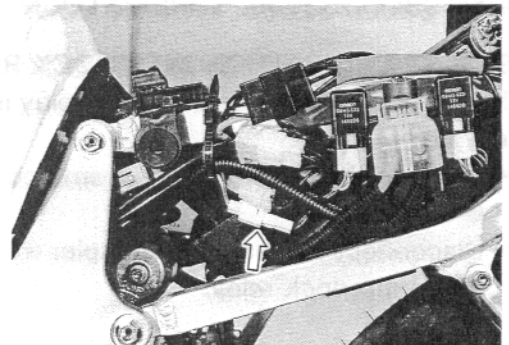


### NEUTRAL SWITCH

The neutral lead wire coupler is located behind the left frame cover.

- Remove the seats and the frame cover. (Refer to pages 6-3 and -4.)
- Disconnect the neutral switch lead wire coupler and check the continuity between Blue terminal and Ground with the transmission in "NEUTRAL".

		Color	Blue	Ground
		Position		
NEUTRAL			○ ————— ○	



**SIDE-STAND SWITCH**

The side-stand switch lead wire coupler is located behind the left frame cover.

- Remove the seats and the frame cover. (Refer to pages 6-3 and -4.)
- Disconnect the lead wire coupler.
- Check the voltage between Green (+) probe) and Black/White (-) probe) with the side-stand switch in Up-right position. If any abnormality is found, replace it with a new one.

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Diode test (+←)**

	Green (+) Probe)	Black/White (-) Probe)
ON (UP-right position)	0.4–0.6 V	
OFF (Down position)	1.4–1.5 V	

**NOTE:**

If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

**NOTE:**

When replacing the side-stand switch, apply small quantity of **THREAD LOCK SUPER "1342"** to its mounting bolts.

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

**SIDE-STAND/IGNITION INTERLOCK RELAY**

The side-stand/ignition interlock relay is located behind the left frame cover.

- Remove the seats and the frame cover. (Refer to pages 6-3 and -4.)
- Disconnect the lead wire coupler from the side-stand/ignition interlock relay.

First, check the insulation between ① and ② terminals with a 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.

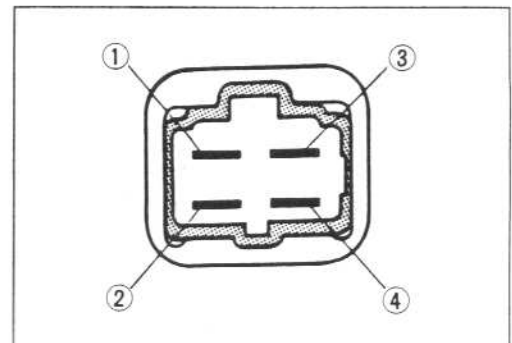
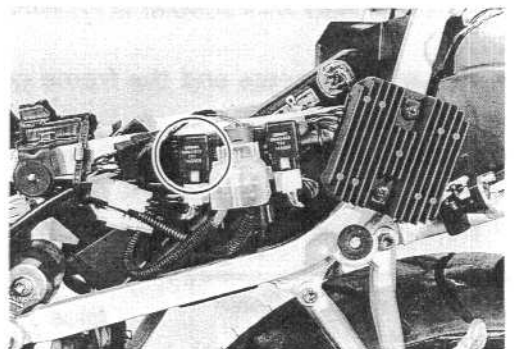
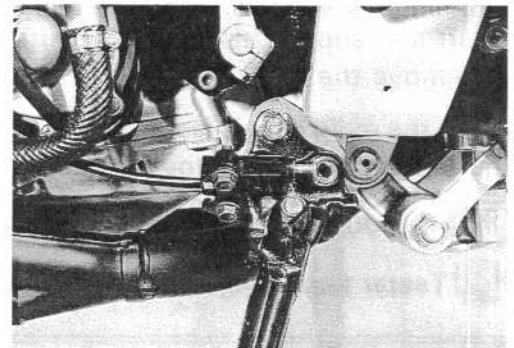


Diagram illustrating the terminal connections for the side-stand/ignition interlock relay.

## IGNITION SYSTEM

### DESCRIPTION

The GSX-R600V ignition system consists of a signal generator, CDI unit (including 8-BIT MICROCOMPUTER and CERAMIC 10MHZ VIBRATOR), throttle position sensor, ignition coils/plug caps and spark plugs. The ignition coils/plug caps are united and connected at the each spark plug directly. Because of this, this ignition system does not need the space for ignition coils and does not drop the secondary voltage by high tension cords.

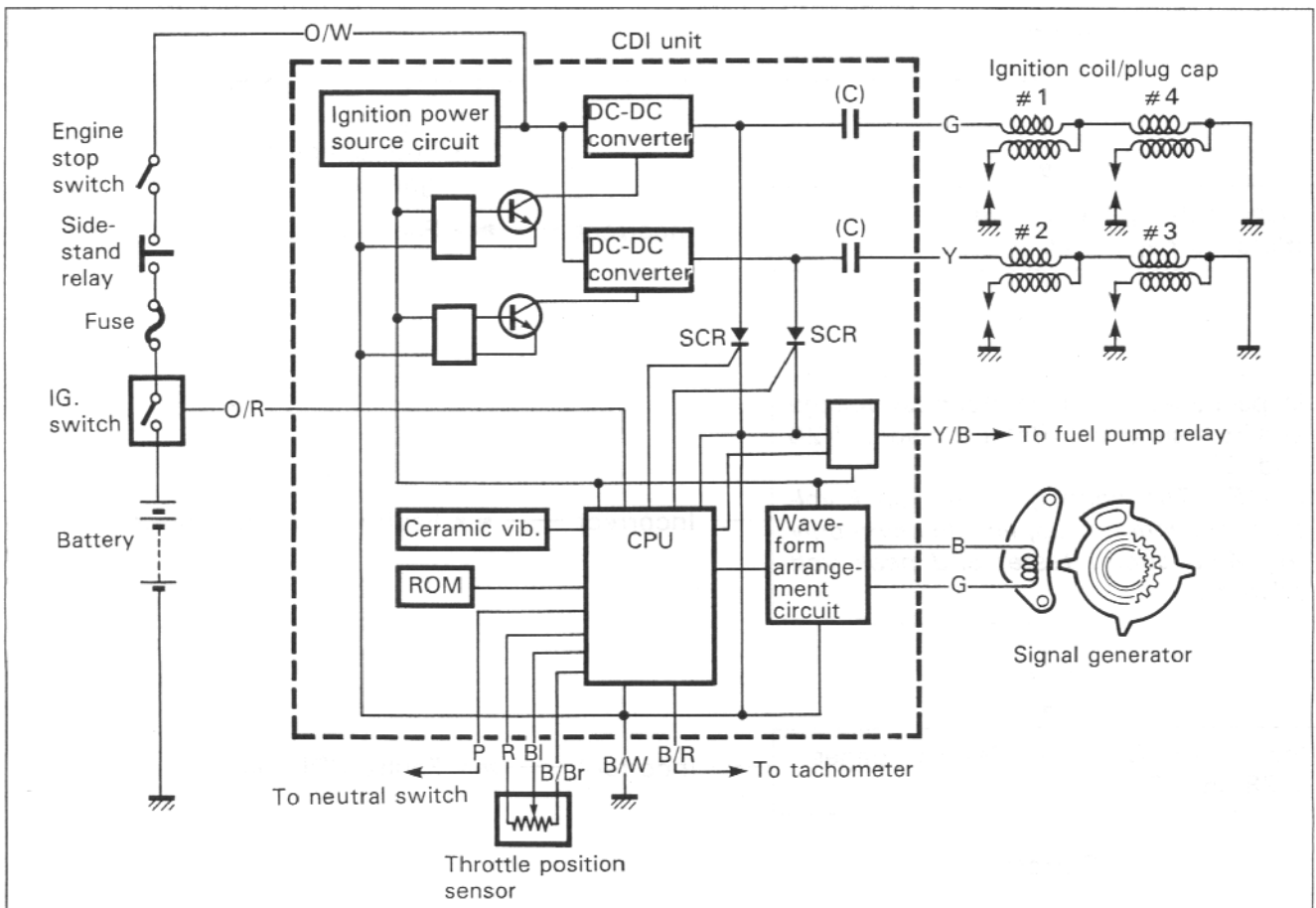
Ignition cut-off circuit is incorporated in the CDI unit to prevent over-running engine. If engine r/min. reaches 13 400 r/min., this circuit cuts off the ignition primary current for all spark plugs.

### ⚠ CAUTION

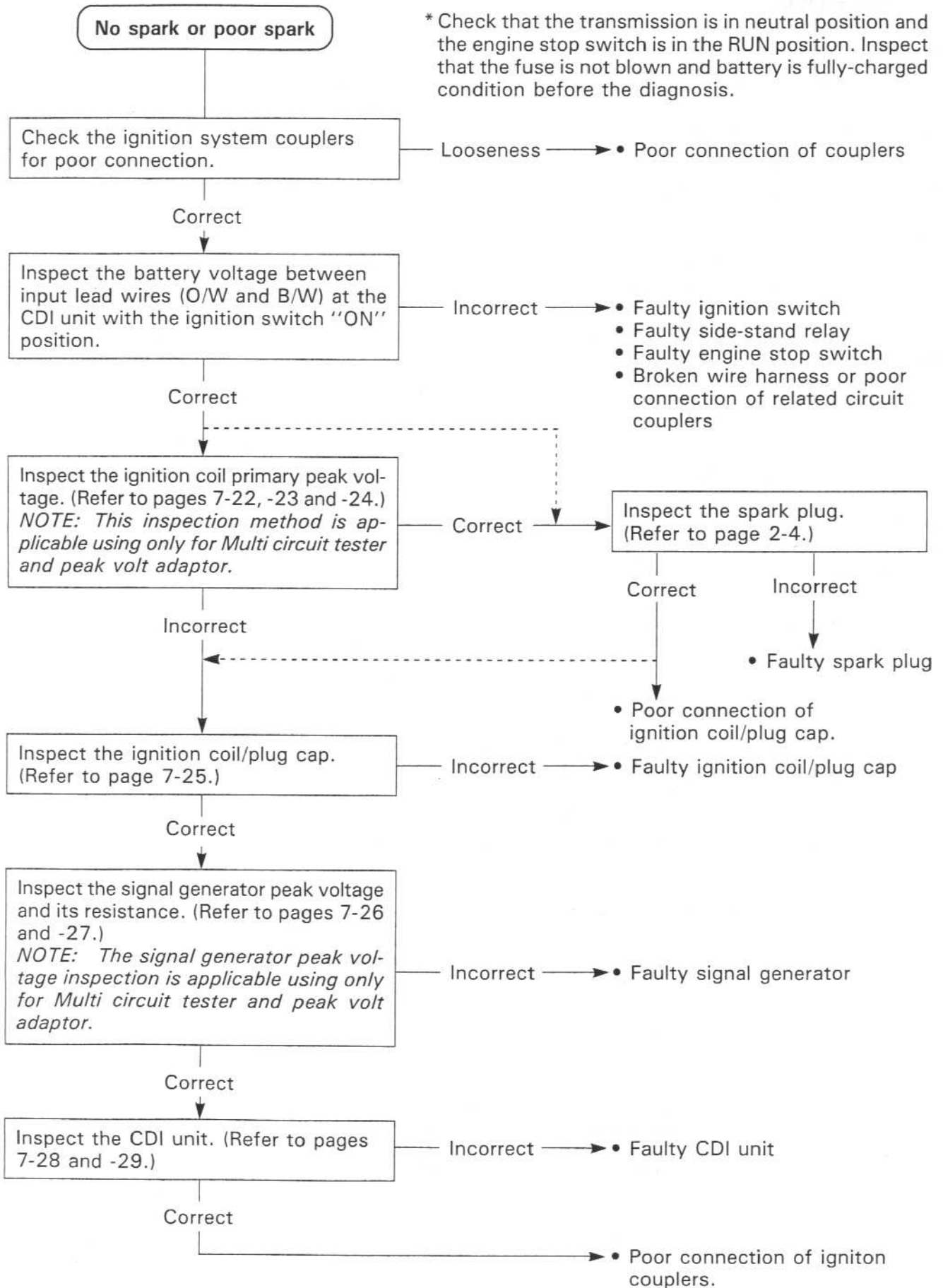
**Engine can run over 13 400 r/min. without load, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 13 400 r/min. at anytime.**

### OPERATION

The DC-DC converters in the CDI unit step up the battery voltage to a higher voltage and charge the capacitors (C). An SCR connected to the capacitor becomes conductive (turns on) when a forward voltage signal is sent to SCR gate allowing the electric energy stored in the capacitor (C) to discharge instantly to the ignition primary coil. This then causes a high voltage to be induced in the secondary coil and a hot spark jumps across the spark plug gap. This ignition timing is controlled by the CPU which calculate and process the signal generator pulses and data stored in "ROM" to form an SCR gate signal. The signal is then sent to the SCR just when the crankshaft has reached the best ignition timing for the current engine revolutions.



**TROUBLESHOOTING**

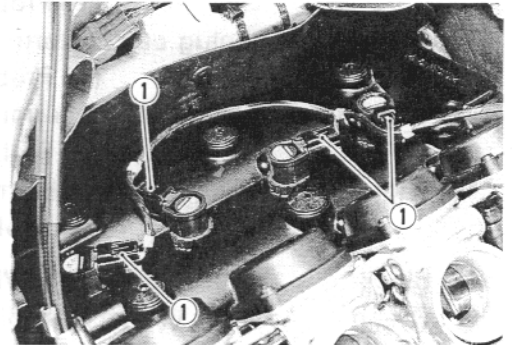


## INSPECTION

### IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the front and rear seats. (Refer to page 6-3.)
- Remove the fuel tank. (Refer to pages 4-2 and -3.)
- Remove the air cleaner box. (Refer to page 4-14.)
- Disconnect all the ignition coil/plug cap lead wire couplers

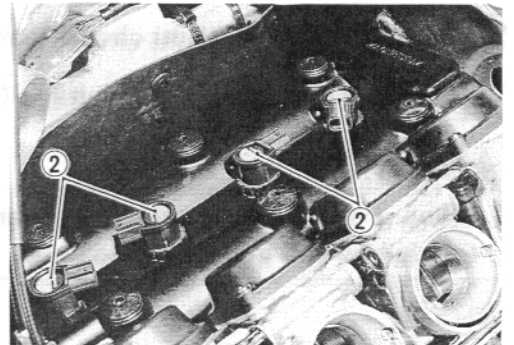
①.



- Remove all the ignition coils/plug caps ②.

#### **CAUTION**

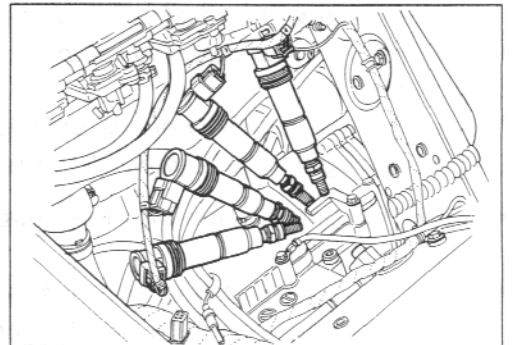
- \* Do not remove the ignition coil/plug cap before disconnecting its lead wire coupler.
- \* Do not pry up the ignition coil/plug cap with a driver or a bar to avoid its damage.
- \* Be careful not to drop the ignition coil/plug cap to prevent the short or open the circuit of its.



- Connect new four spark plugs to the each ignition coil/plug cap.
- Connect all the ignition coil/plug cap lead wire couplers to ignition coil/plug cap, and ground them the crankcase.

#### **CAUTION**

Avoid grounding the spark plugs and supplying the electrical shock to the magnesium parts (cylinder head cover, clutch cover, starter clutch cover, starter idle gear cover and generator cover) to prevent the damage of the magnesium material.



#### NOTE:

Be sure that all couplers and spark plugs are connected properly and the battery used is in fully-charged condition.



Inspect the each ignition coil primary peak voltage on the ignition coil/plug cap coupler in the following procedure.

- Connect the multi circuit tester with peak voltage adaptor as follow.

No.1 ignition coil/plug cap: G terminal—W/Bl terminal  
(⊖ Probe) (⊕ Probe)

No.2 ignition coil/plug cap: Y terminal—B terminal  
(⊖ Probe) (⊕ Probe)

No.3 ignition coil/plug cap: B terminal—B/W terminal  
(⊖ Probe) (⊕ Probe)

No.4 ignition coil/plug cap: W/Bl terminal—B/W terminal  
(⊖ Probe) (⊕ Probe)

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

**TOOL** 09900-25008: Multi circuit tester set

**V** Tester knob indication: Voltage (  $\overline{\text{---}}$  )

**⚠ CAUTION**

When using the multi circuit tester and peak volt adaptor, follow the instruction manual.

**NOTE:**

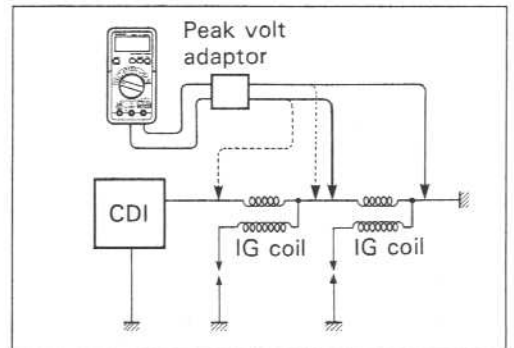
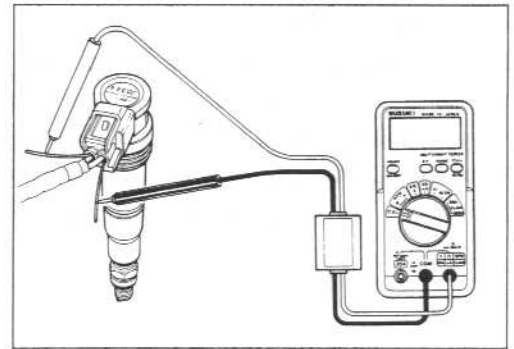
- \* When connecting the multi circuit tester, install the stings (O.D is below 0.5 mm) to the back side of the ignition coil lead wire coupler and connect the probes of tester to them.
- \* Use the sting, its outer diameter is below 0.5 mm, to prevent damaging the rubber of the water proof coupler.
- Shift the transmission into the neutral and turn ignition switch "ON".
- Crank the engine a few seconds with starter motor by depressing starter button and then check the ignition coil primary peak voltage.
- Repeat the above inspection a few times and measure the highest ignition coil primary peak voltage.

**Ignition coil primary peak voltage: More than 100 V**  
(on ignition coil/plug cap coupler)

**⚠ WARNING**

Do not touch the tester probes and spark plugs to prevent an electric shock while testing.

If the peak voltages on the ignition coil/plug cap coupler are lower than the standard values, check the peak voltage on the CDI unit coupler in the following procedure.




While grounding the spark plugs (Refer to page 7-22.), inspect the each ignition coil primary peak voltage on the CDI unit coupler in the following procedure.

- Connect the multi circuit tester with peak volt adaptor as follow.
  - Nos.1 and 4 ignition coil/plug cap: G terminal—Ground (⊖ Probe) (⊕ Probe)
  - Nos.2 and 3 ignition coil/plug cap: Y terminal—Ground (⊖ Probe) (⊕ Probe)

G : Green

Y : Yellow

 **09900-25008: Multi circuit tester set**

 **Tester knob indication: Voltage (  )**

### CAUTION

When using multi circuit tester and peak volt adaptor, follow the instruction manual.

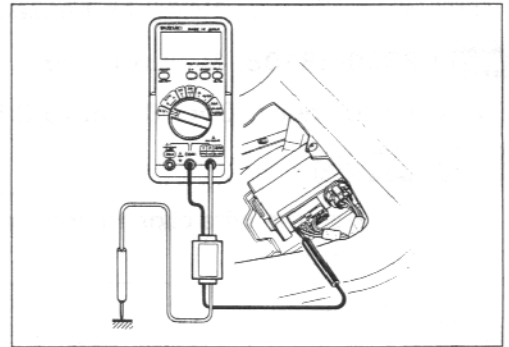
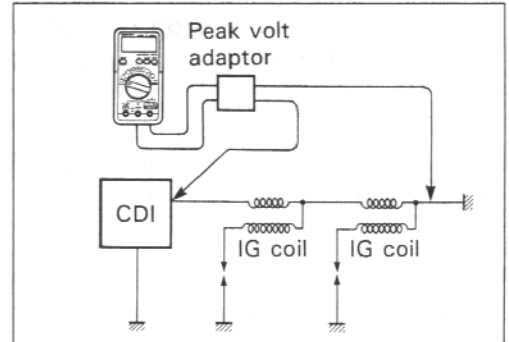
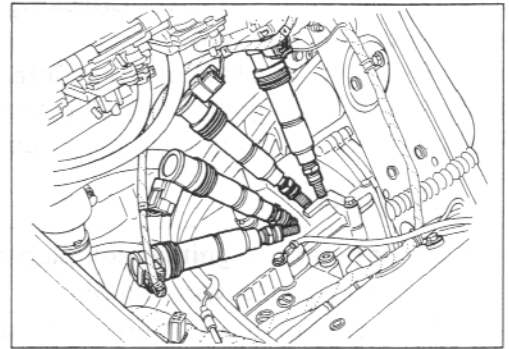
- Shift the transmission into the neutral and turn ignition switch "ON".
- Crank the engine a few seconds with starter motor by depressing starter button and then check the ignition coil primary peak voltage.
- Repeat the above test procedure a few times and measure the highest ignition coil primary peak voltage.

**Ignition coil primary peak voltage: More than 200 V (on CDI unit coupler)**

### WARNING

Do not touch the tester probes and spark plugs to prevent an electric shock while testing.

If they are lower than the standard values, inspect the ignition coil/plug cap, signal generator and CDI unit. (Refer to pages 7-25 through -29.)



**IGNITION COIL/PLUG CAP (Checking with Electro Tester)**

- Remove the fuel tank. (Refer to pages 4-2 and -3.)
- Remove the air cleaner box. (Refer to page 4-14.)
- Disconnect the ignition coil/plug cap lead wire coupler ①.
- Remove the ignition coils/plug cap.

**⚠ CAUTION**

- \* Do not remove ignition coil/plug cap before disconnecting its lead wire coupler.
- \* Do not pry up the ignition coil/plug cap with a screwdriver or a bar to avoid its damage.
- \* Be careful not to drop the ignition coil/plug cap to prevent the short or open the circuit of its.

**NOTE:**

Make sure that the three-needle sparking distance of electro tester is set at 8 mm (0.3 in).

- With the tester, test the ignition coil/plug cap for sparking performance in accordance with the right illustration. If no sparking or orange color sparking occurs in the above conditions, it may be caused by defective coil.

**TOOL** 09900-28108: Electro tester

Spark performance: Over 8 mm (0.3 in)

**⚠ WARNING**

Do not touch the wire clips to prevent an electric shock when testing.

**⚠ CAUTION**

- \* When using the electro tester, follow the instruction manual.
- \* Be careful not to drop the ignition coil/plug cap to prevent the short or open the circuit of its.

**IGNITION COIL/PLUG CAP**

**(Checking with Multi circuit Tester)**

- Check the ignition coil/plug cap for continuity in both primary and secondary windings. If the tester reads are not within the standard values replace the ignition coil/plug cap with a new ones.

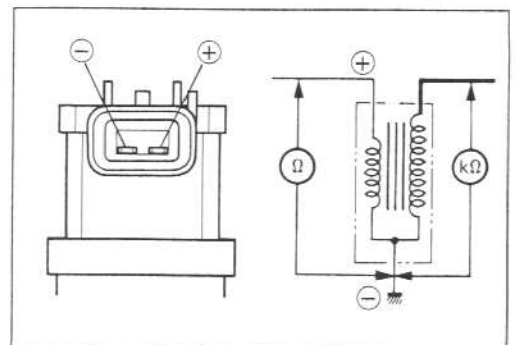
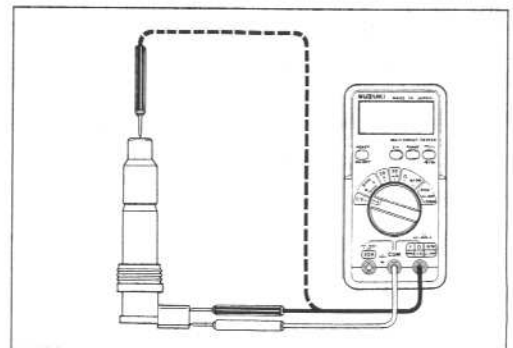
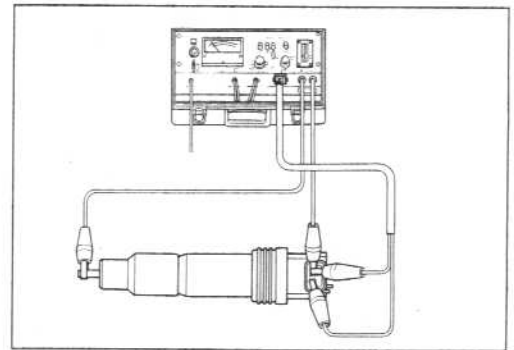
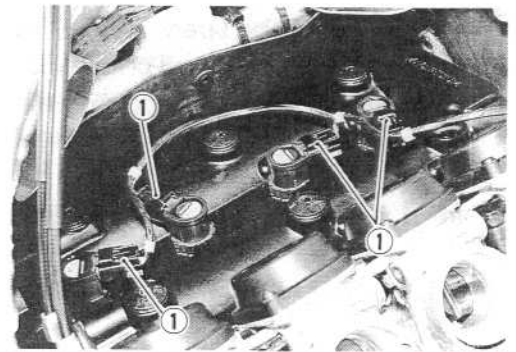
**TOOL** 09900-25008: Multi circuit tester set

**Ω** Tester knob indication: Resistance ( $\Omega$ )

Ignition coil/plug cap resistance

Primary : 0.07–0.11 $\Omega$  (+ tap– $\ominus$  tap)

Secondary: 4.5–6.9 k $\Omega$  (Plug cap– $\ominus$  tap)



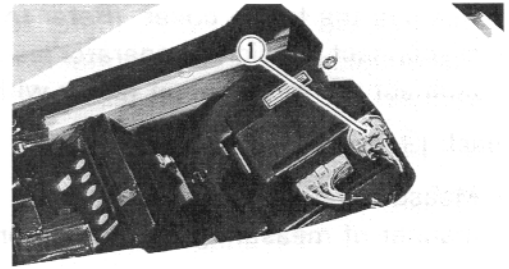
**SIGNAL GENERATOR (Checking with Multi Circuit Tester)**

- Remove the front seat. (Refer to page 6-3.)

**NOTE:**

*Be sure that all couplers are connected properly and the battery used is in fully-charged condition.*

- Disconnect the ignitor lead wire coupler ① at the ignitor unit.




Inspect the signal generator peak voltage between Black and Green lead wires on the ignitor coupler.

- Connect the multi circuit tester with peak volt adaptor as follow.

Black (+ Probe) — Green (− Probe)

 **09900-25008: Multi circuit tester set**

 **Tester knob indication: Voltage (  $\overline{\text{V}}$  )**

**CAUTION**

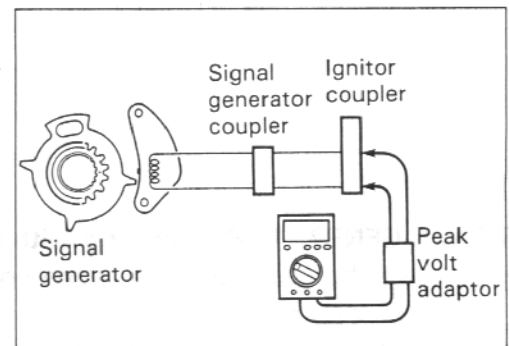
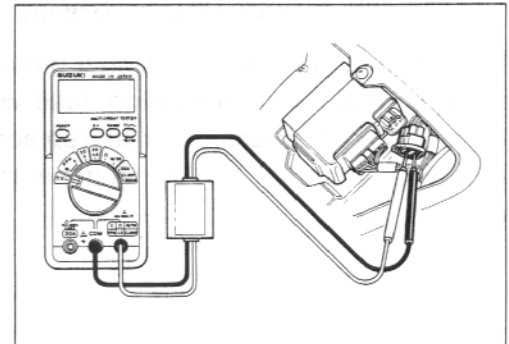
**When using multi circuit tester and peak volt adaptor, follow the instruction manual.**

- Shift the transmission into the neutral and turn ignition switch "ON".
- Crank the engine a few seconds with starter motor by depressing starter button and then check the signal generator peak voltage.
- Repeat the above test procedure a few times and measure the highest signal generator peak voltage.

**Signal generator peak voltage:**

**More than 0.4V (Black—Green)**

If the peak voltage measured on the ignitor lead wire coupler is lower than the standard value, check the peak voltage on the signal generator lead wire coupler in the following procedure.



- Remove the frame cover. (Refer to page 6-4.)
- Disconnect the signal generator lead wire coupler ① and connect the multi circuit tester with peak volt adaptor.

Black (+ Probe) – Green (– Probe)

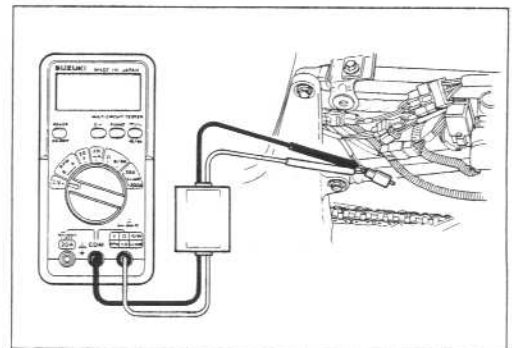
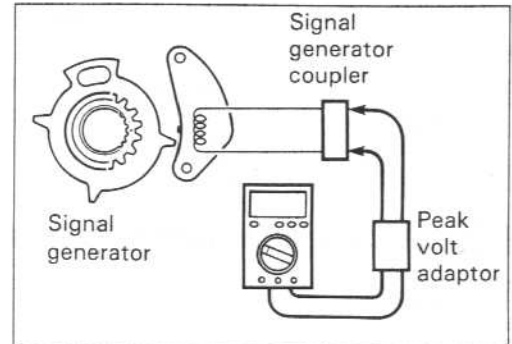
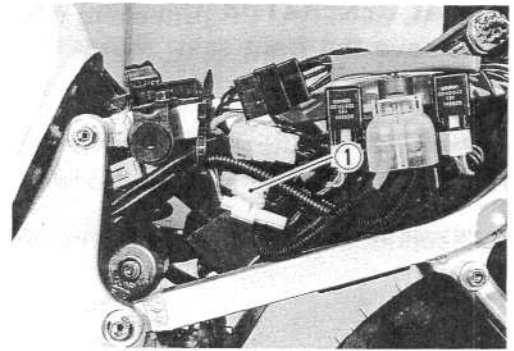
- Measure the signal generator peak voltage in the same manner of measuring on the ignitor lead wire coupler.

 Tester knob indication: Voltage (  $\overline{\text{V}}$  )

Signal generator peak voltage:


More than 0.4V (Black – Green)

If the peak voltage on the signal generator lead wire coupler is normal but on the ignitor lead wire coupler is abnormal, the wire harness must be replaced. If the both peak voltage is abnormal, the signal generator must be replaced and recheck.



**SIGNAL GENERATOR (Checking with multi circuit Tester)**

- Remove the seats and the frame cover and disconnect the lead wire coupler.
- Measure the resistance between lead wires and ground. If the resistance is not specified value, the signal coil must be replaced.

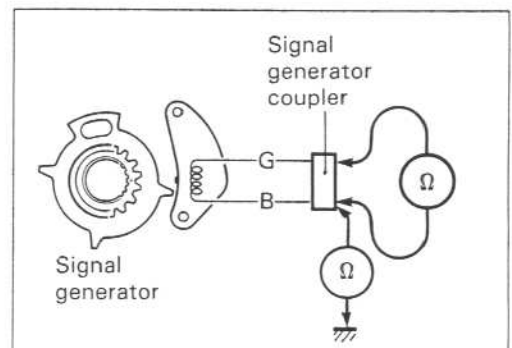
 **09900-25008: Multi circuit tester set**

 Tester knob indication: Resistance ( $\Omega$ )

Signal coil resistance: 50 – 200 $\Omega$  (Black – Green)  
 $\infty \Omega$  (Black – Ground)

*NOTE:*

Refer to page 3H-4 for signal generator replacing.



**CDI UNIT (Checking with Digital Ignitor Checker)**

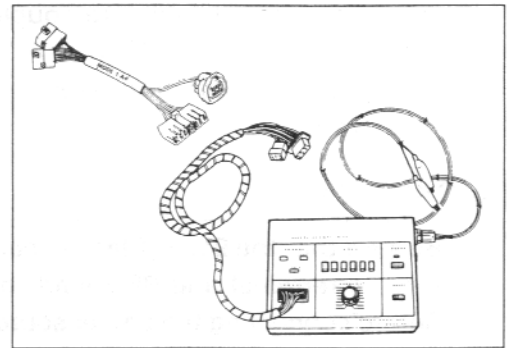
This section explains the checking procedure for the CDI unit using Digital Ignitor Checker (special tool).

With this checker, the CDI unit can be checked either on the machine or off the machine. The following explains the checking procedure on the machine.

**TOOL** 09931-94490: Digital ignitor checker  
09931-61750: Lead wire "MODE 1-A4"

**NOTE:**

- \* In this check, the monitor does not operate.
- \* This checking presupposes that the ignition coils/plug caps and the signal generator coil used for checking are good ones.



- Remove the seat and fuel tank. (Refer to pages 4-2, -3 and 6-2.)
- Remove the air cleaner box. (Refer to page 4-14.)
- Disconnect all the ignition coil/plug cap lead wire couplers ①.
- Remove all the ignition coils/plug caps ② and spark plugs.

**CAUTION**

- \* Do not remove the ignition coil/plug cap before disconnecting its lead wire coupler.
- \* Do not pry up the ignition coil/plug cap with a screwdriver or a bar to avoid its damage.
- \* Be careful not to drop the ignition coil/plug cap to prevent the short or open the circuit of its.

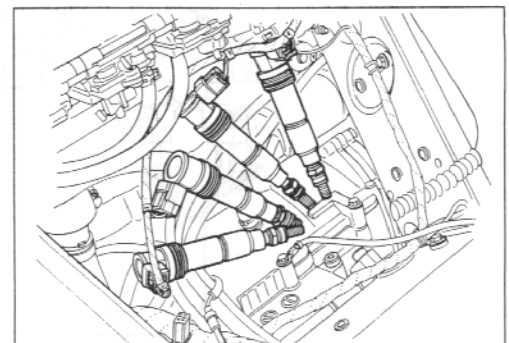
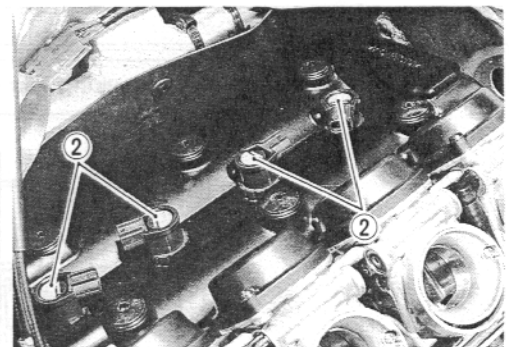
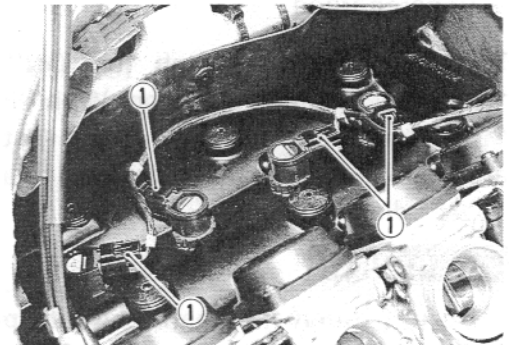
- Connect the four spark plugs to the each ignition coil/plug cap.
- Connect the lead wire couplers to the each ignition coil/plug cap and ground them to the crankcase.

**CAUTION**

Avoid grounding the spark plugs and supplying the electrical shock to the magnesium parts (cylinder head cover, clutch cover, starter clutch cover, starter idle gear cover and generator cover) to prevent the damage of the magnesium material.

**NOTE:**

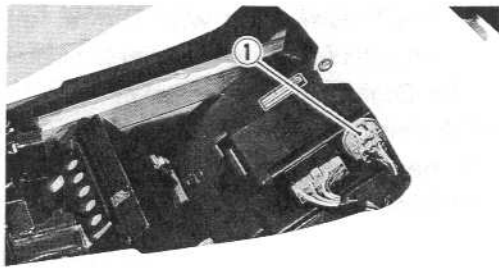
Be sure that all couplers and spark plugs are connected properly.



- Disconnect the CDI lead wire coupler ① at the CDI unit.
- Connect the lead wire "MODE 1-A" ②, lead wire "MODE 1-A4" ③ and power source leads ④ as shown in following illustration.

**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).

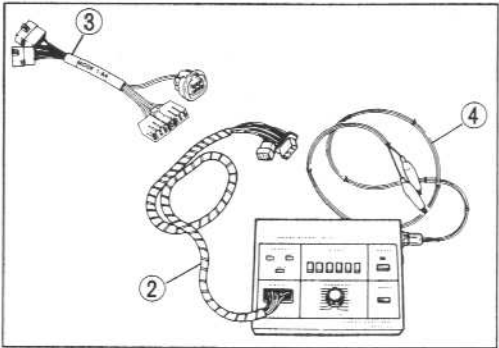


**NOTE:**

Be sure that the battery used is in fully-charged condition.

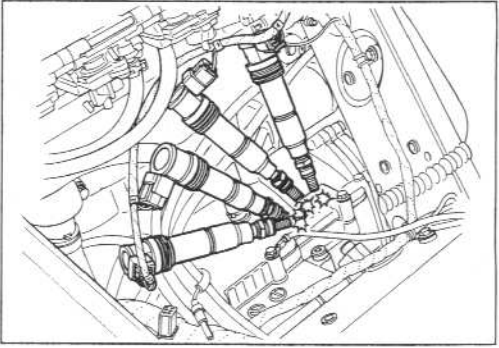
**CHECK PROCEDURE:**

With all the lead wires properly connected, check the CDI unit in the following.



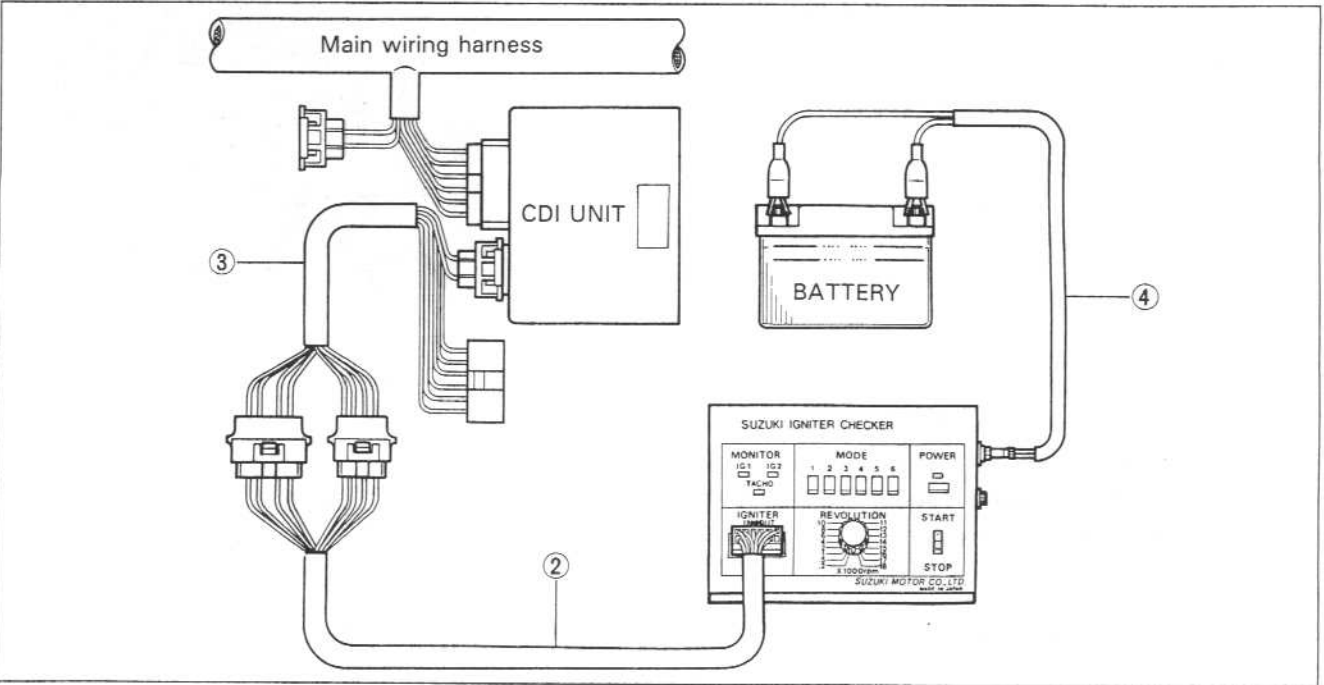
- Depress "MODE 1" button then "POWER" button. This time, "POWER" lamp should come on, if not, battery is undercharged.

Turn the ignition switch to "ON" position and then "START" switch is turned on. With "REVOLUTION" dial is "13" and below position, check that the blue hot sparks are seen at each spark plug gap in relation with "REVOLUTION" dial.



**WARNING**

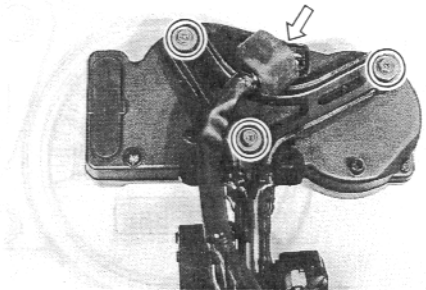
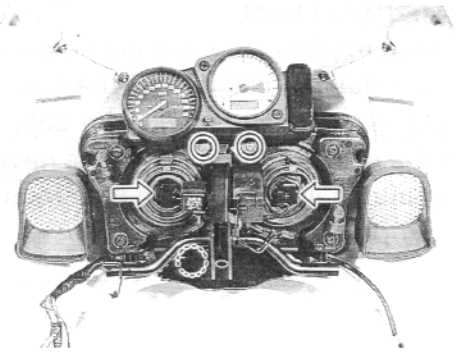
Do not touch the spark plugs to prevent an electric shock while testing.



## COMBINATION METER

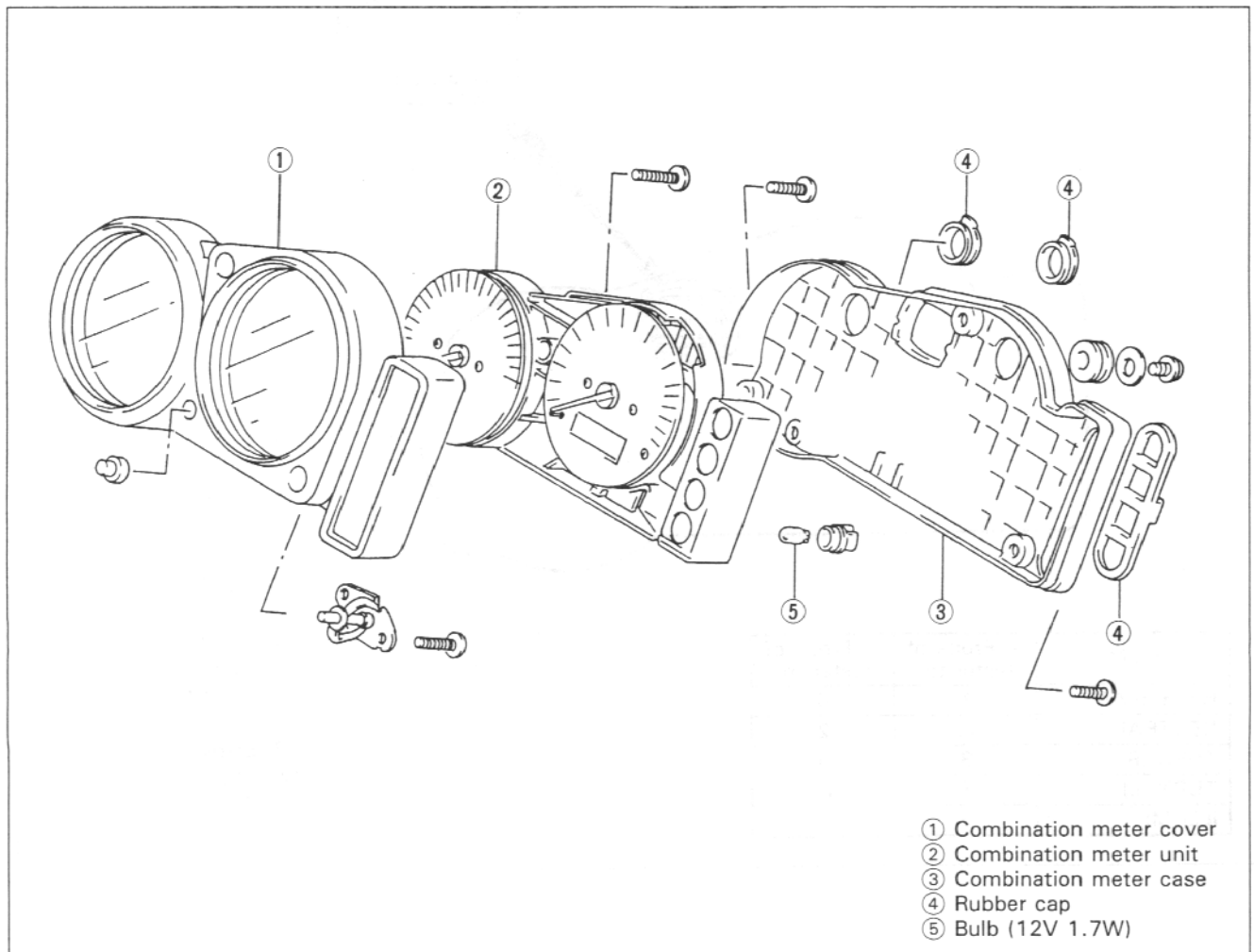
### REMOVAL

- Remove the upper fairing with fairing brace. (Refer to pages 6-2 and -3.)
- Disconnect two sockets.
- Remove the fairing brace by removing screws.
- Disconnect the combination meter lead wire coupler.
- Remove the combination meter by removing its mounting three bolts.



### DISASSEMBLY

- Disassemble the combination meter as follows.

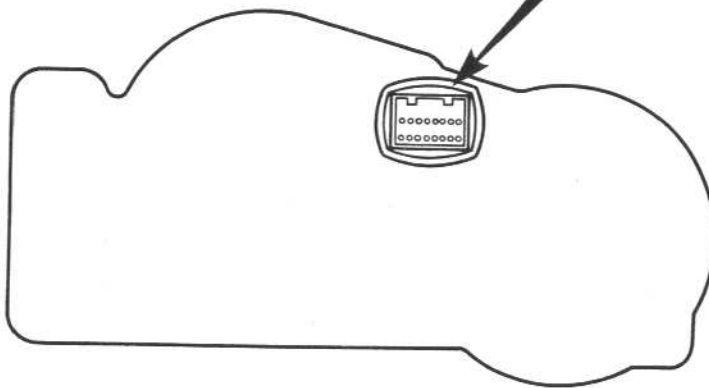
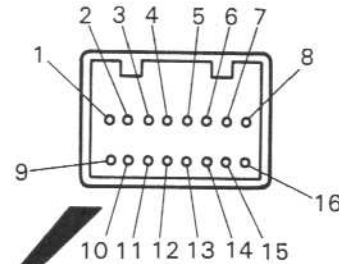
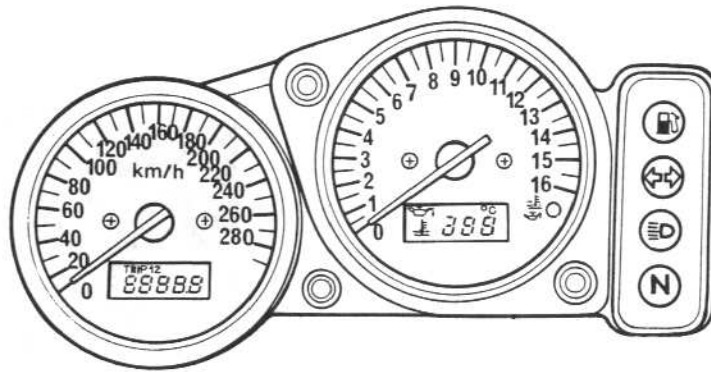




### INSPECTION

Using the tester, check the continuity between terminals in the following diagram. If the continuity measured is incorrect, remove and check the bulb.

If the bulb is failure, install the new bulb and check the continuity again. If the bulb is correct, replace the unit with a new one.

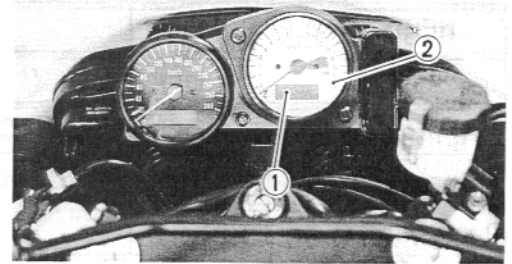


- 1: HIGH BEAM ⊕
- 2: NEUTRAL ⊖
- 3: ILLUMI ⊕
- 4: FUEL A
- 5: FUEL B
- 6: OIL
- 7: TEMP SENSOR
- 8: TEMP ⊖
- 9: TURN (R) ⊕
- 10: TURN (L) ⊕
- 11: TACHO
- 12: IGNITION
- 13: Blank
- 14: SPEED PLUS
- 15: SPEED SENSOR ⊕
- 16: Blank

ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
HIGH BEAM	1	8
NEUTRAL	12	2
TURN (R)	8	9
TURN (L)	8	10
ILLUMI	3	8

## ENGINE COOLANT TEMPERATURE METER AND INDICATOR INSPECTION

The LCD ① (Liquid crystal display) and LED ② (Light Emitting Diode) in the tachometer indicate the engine coolant temperature information. The checking procedure of these system are explained as following four steps:



### First step:

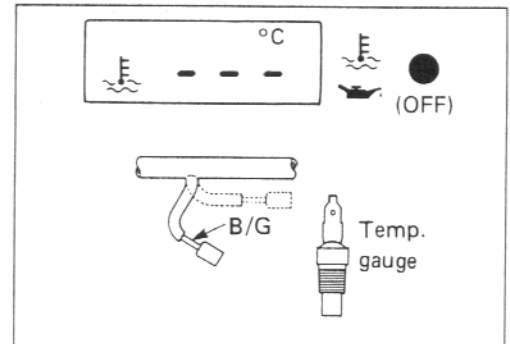
- Lift and support the fuel tank by prop. (Refer to page 4-2.)
- Disconnect the oil pressure switch G/Y lead wire coupler.

**G/Y: Green with Yellow tracer**

- Disconnect the B/G lead wire from the engine coolant temperature gauge.

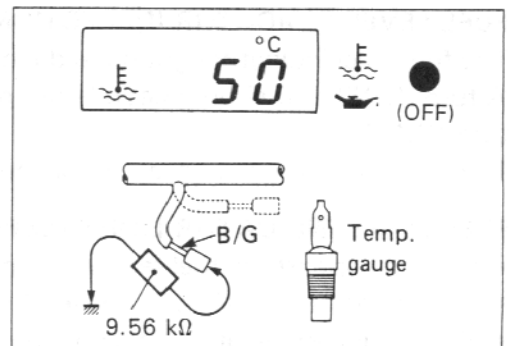
**B/G: Black with Green tracer**

- Turn the ignition switch on, then the LCD should not indicate figure but "---".



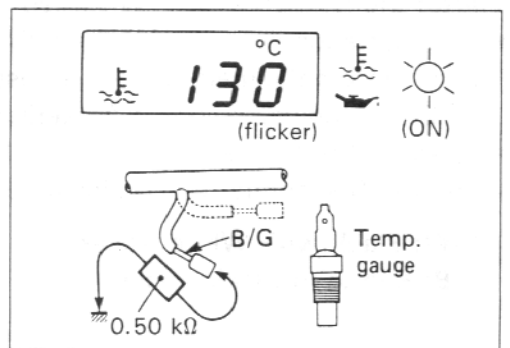
### Second step:

- Connect a approx. 9.56 kΩ resistor between B/G lead coming from the main wiring harness and engine ground, the LED should go out and the LCD should indicate "50"°C ("122"°F).



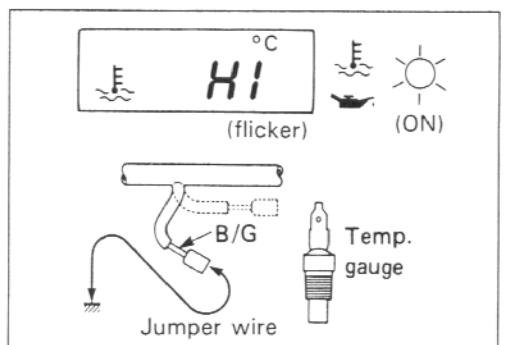
### Third step:

- Change the resistor to approx. 0.50 kΩ, the LED should light and LCD should keep flickering "130"°C ("266"°F).



### Fourth step:

- Connect a jumper wire between B/G lead coming from the main wiring harness and engine ground, the LED should light and the LCD should keep flickering "HI".



The following table shows the relation between resistance, LED and LCD.

RESISTANCE	LED	LCD	
$\infty$	OFF	"----"	ON
Approx. 9.56 k $\Omega$	OFF	"50"°C ("122"°F)	ON
Approx. 0.50 k $\Omega$	ON	"130"°C ("266"°F)	flicker
Less than 0.36 k $\Omega$	ON	"HI"	flicker

If either one or all indications are abnormal, replace the unit with a new one.

For inspecting the engine coolant temperature gauge, refer to pages 5-11 and -12.

**FUEL LEVEL INDICATOR INSPECTION**

The fuel level indicator light should flicker, when its switch (A) turn "ON" and should keep lighting, when its switch (B) turn "ON".

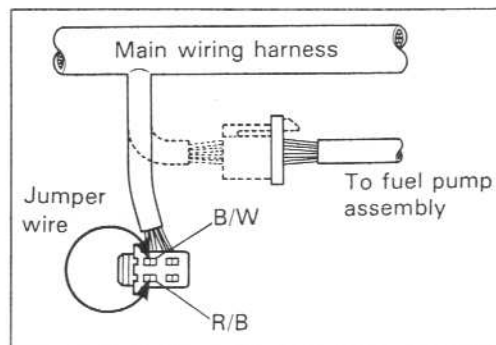
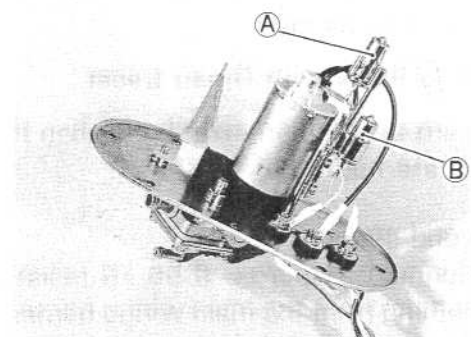
These system inspection are explained as follows.

**FUEL LEVEL INDICATOR LIGHT INSPECTION**

- Lift and support the fuel tank by prop. (Refer to page 4-2.)
- Disconnect the fuel pump assembly lead wire coupler.
- The fuel level indicator light lights up for approx. 3 seconds after the ignition switch is turned on.
- Connect a jumper wire between B/W lead and R/B lead coming from the main wiring harness and check whether fuel level indicator light is flickering.
- Check if the fuel level indicator light will go out within approx. 6 seconds, when disconnecting a jumper wire.

**B/W: Black with White tracer**

**R/B: Red with Black tracer**



- Connect a jumper wire between B/W lead and B/Lg lead coming from the main wiring harness and check whether the fuel level indicator light comes on
- Check if the fuel level indicator light will go out within approx. 6 seconds, when disconnecting a jumper wire.

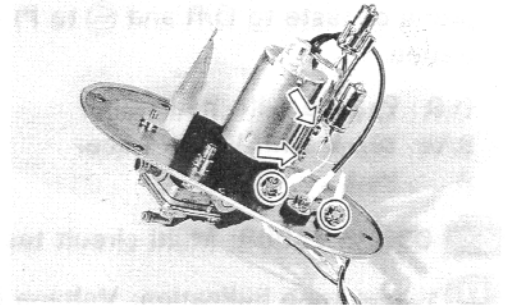
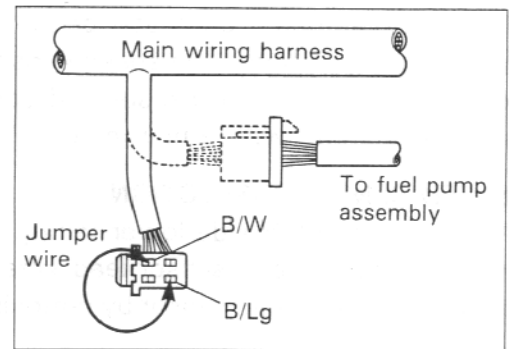
**B/W: Black with White tracer**

**B/Lg: Black with Light green tracer**

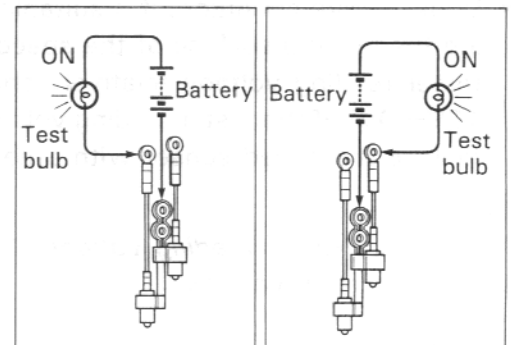
If the fuel level indicator light does not function properly check the bulb. If the bulb is in good condition, replace the unit with a new one.

#### FUEL LEVEL INDICATOR SWITCH INSPECTION

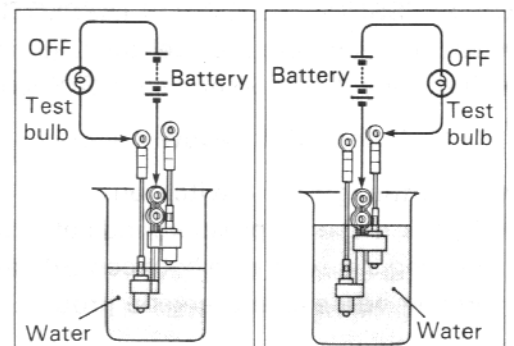
- Remove and disassemble the fuel pump assembly. (Refer to pages 4-6 and -7.)



- Connect 12V battery and test bulb (12V, 3.4W) to the fuel level indicator switch as shown in the right illustrations. The bulb should come on after several seconds if the switch is in good condition.



- When the switch is immersed and stirred in water under the above condition, the bulb should go out. If the bulb remains lit, replace the unit with a new one.



**SPEEDOMETER INSPECTION**

If the speedometer, odometer or tripmeter does not function properly. Inspect the speed sensor and connection of couplers. If the speed sensor and connection is all right, replace the unit with a new one

**SPEED SENSOR INSPECTION**

- Remove the left side lower fairing (Refer to page 6-2.)
- Disconnect speed sensor lead wire coupler.
- Remove the speed sensor by removing its mounting bolt.
- Connect 12V battery (between O/R and B/W), 10 kΩ resistor (between O/R and P) and the multi circuit tester (⊕ probe of teste to O/R and ⊖ to P) as shown right illustration.

- O/R: Orange with Red tracer
- B/W: Black with White tracer
- P : Pink

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Voltage (  $\overline{\text{V}}$  )**

- Under above condition, if a suitable screwdriver touching the pick-up surface of the speed sensor moves, the tester reading voltage relatively changes (0V→12V or 12V→0V). If the tester reading voltage does not change, replace the speed sensor with a new one.

**NOTE:**  
The highest tester reading voltage (12V) while testing is same as battery voltage.

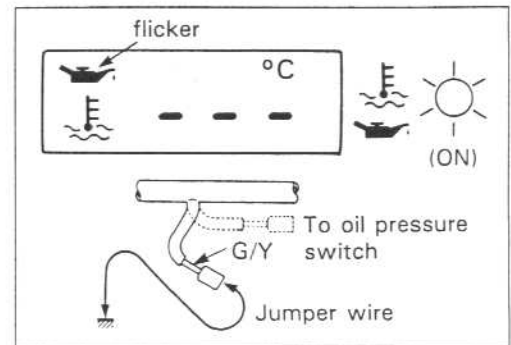
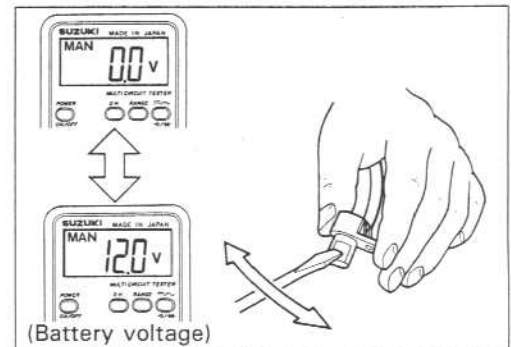
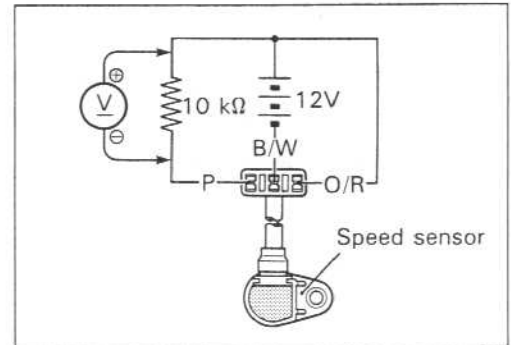
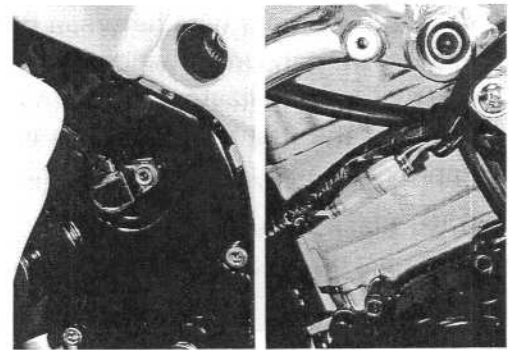
**OIL PRESSURE INDICATOR INSPECTION**

- Lift and support the fuel tank. (Refer to page 4-2.)
- Disconnect the oil pressure G/Y lead wire coupler.

**G/Y: Green with Yellow tracer**

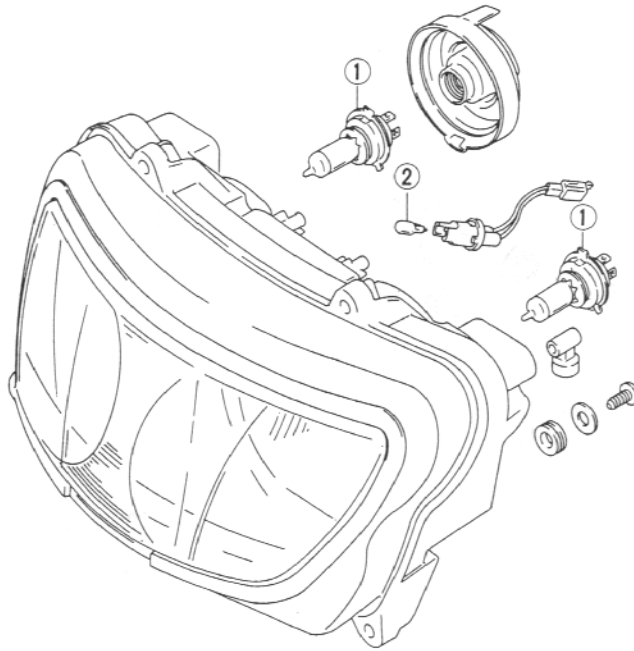
- Turn the ignition switch on.
- Check if the oil pressure indicator will light, when connecting a jumper wire between G/Y lead coming from main wiring harness and engine ground.

If the indicator does not light, replace the unit with a new one after checking connecting couplers.



## LAMPS

### HEADLIGHT



Headlight bulb ①: 12V 55/50W x 2 (For E-02,03,24,28 and 33)  
12V 55W + 12V 55W (For the other models)

Position light bulb ②: 12V 5W (Except for E-03, 24, 28 and 33)

**NOTE:**

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

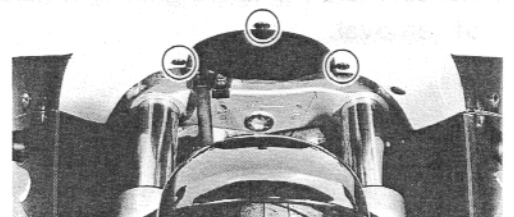
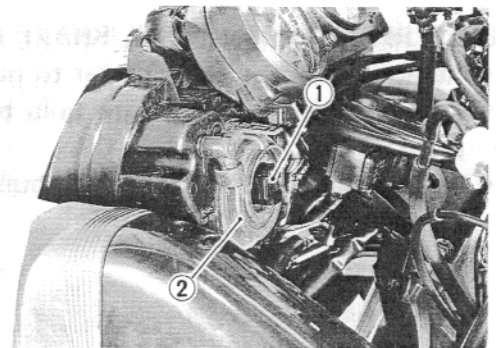
### BULB REPLACEMENT

- Disconnect the socket ① and remove the rubber cap ②.
- Remove the headlight bulb by removing the bulb holder spring.
- Reassemble the headlight bulb in the reverse order of removal.

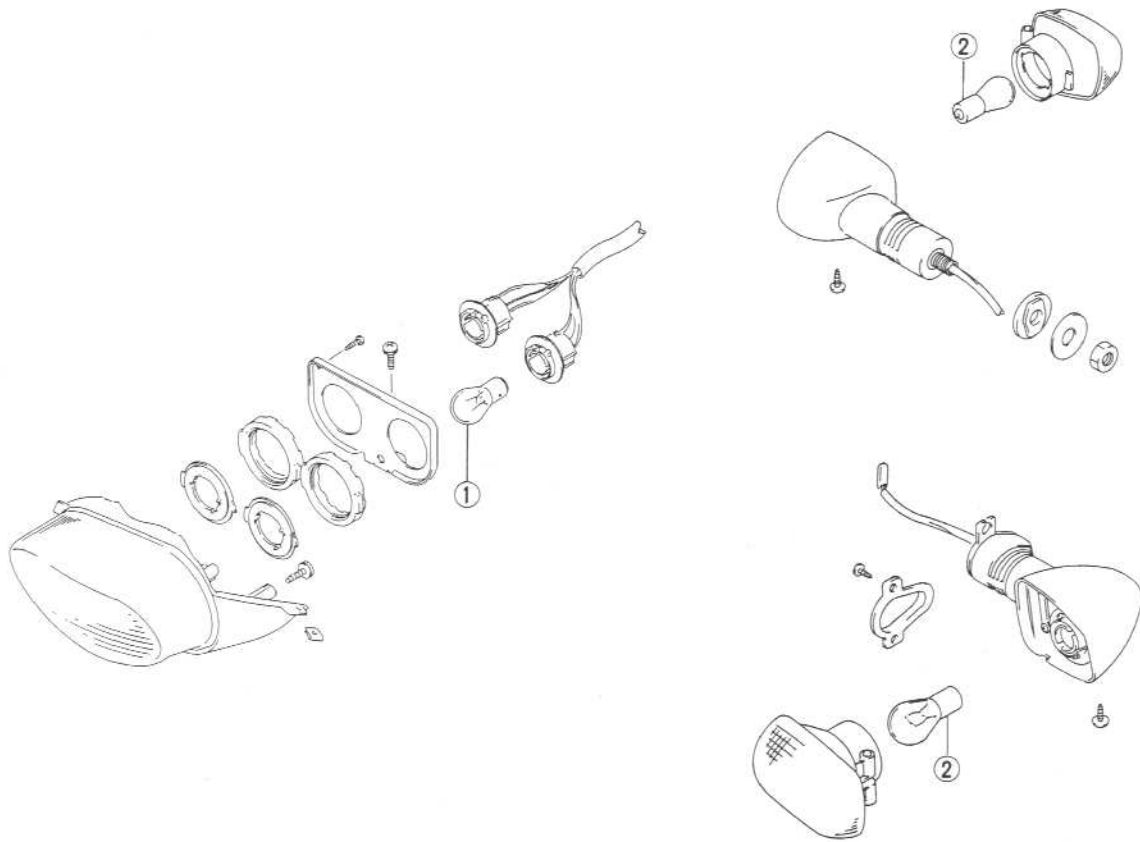
### ⚠ CAUTION

If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol or soapy water to prevent early failure.

- Remove the panel.
- Remove the position light bulb by turning it counter-clockwise.
- Reassemble the position light bulb in the reverse order of removal.



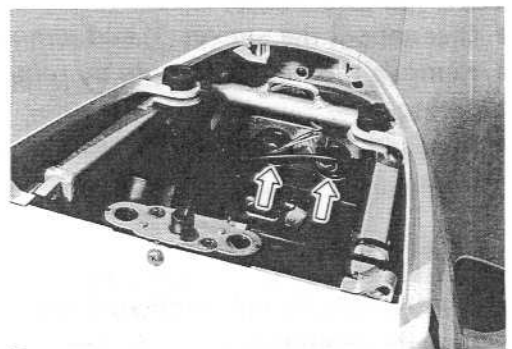
## TAIL/BRAKE AND TURN SIGNAL LIGHT



Tail/Brake light bulb ①: 12V 5/21W x 2  
 Turn signal light bulb ②: 12V 21W

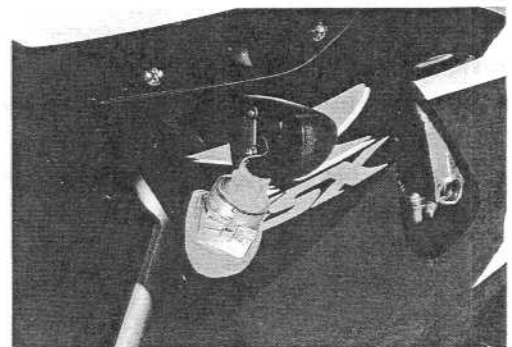
### BULB REPLACEMENT (TAIL/BRAKE LIGHT)

- Remove the rear seat. (Refer to page 6-3.)
- Remove the tail/brake light bulb by turning it counter-clockwise.
- Reassemble the tail/brake light bulb in the reverse order of removal.



### BULB REPLACEMENT (TURN SIGNAL LIGHT)

- Remove the screw and take off the lens.
- Remove the turn signal light bulb by turning it counter-clockwise.
- Reassemble the turn signal light bulb in the reverse order of removal.



## SWITCHES

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

### IGNITION SWITCH

(For Australia)

Position \ Color	R	O	O/Y	B/W
OFF				
ON	○ — ○		○ — ○	

(For Others)

Position \ Color	R	O	Gr	Br	O/Y	B/W
OFF						
ON	○ — ○		○ — ○		○ — ○	
P	○ — ○		○ — ○			

### LIGHTING SWITCH

(Except for Australia, Canada and U.S.A.)

Position \ Color	O/Bl	Gr	O/R	Y/W
OFF				
•	○ — ○			
ON	○ — ○		○ — ○	

### DIMMER SWITCH

Position \ Color	Y/W	W	Y
HI	○ — ○ — ○		
LO	○ — ○		

### TURN SIGNAL SWITCH

Position \ Color	Lg	Lbl	B
L		○ — ○	
PUSH			
R	○ — ○		

### PASSING LIGHT SWITCH

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

Position \ Color	O/R	Y
•		
PUSH	○ — ○	

### ENGINE STOP SWITCH

Position \ Color	O/B	O/W
OFF		
RUN	○ — ○	

### STARTER BUTTON

Position \ Color	O/W	Y/G
•		
PUSH	○ — ○	

### HORN BUTTON

Position \ Color	B/Bl	B/W
•		
PUSH	○ — ○	

### FRONT BRAKE SWITCH

Position \ Color	B	B/R
OFF		
ON	○ — ○	

### REAR BRAKE LIGHT SWITCH

Position \ Color	O/G	W/B
OFF		
ON	○ — ○	

### CLUTCH LEVER POSITION SWITCH

Position \ Color	B/Y	B/Y
OFF		
ON	○ — ○	

### OIL PRESSURE SWITCH

Position \ Color	G/Y	Ground
ON (engine is stopped)	○ — ○	
OFF (engine is running)		

*NOTE: Before inspecting the oil pressure switch, check if the engine oil level is enough. (Refer to page 2-9).*

### WIRE COLOR

B : Black    Lbl: Light blue    R : Red  
 Br : Brown    Lg : Light green    Y : Yellow  
 Gr : Gray    O : Orange    W : White

B/Bl : Black with Blue tracer

B/W : Black with White tracer

B/Y : Black with Yellow tracer

B/R : Black with Red 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/G : Yellow with Green tracer

Y/W : Yellow with White tracer

G/Y : Green with Yellow tracer



## RELAY

### STARTER RELAY

The starter relay is located behind the left frame cover. (Refer to page 7-17 for details.)

### SIDE-STAND RELAY

The side-stand relay is located behind the left frame cover. (Refer to page 7-19 for details.)

### FUEL PUMP RELAY

The fuel pump relay is located behind the left frame cover. (Refer to page 4-7 for details.)

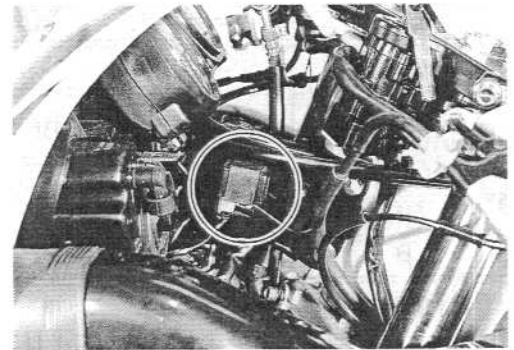
### TURN SIGNAL RELAY

The turn signal relay is located left side of fairing brace. If the turn signal light does not light, inspect the bulb, turn signal switch and circuit connection.

If the bulb, turn signal switch and circuit connection checked are all right, the turn signal relay may be faulty, replace it with a new one.

**NOTE:**

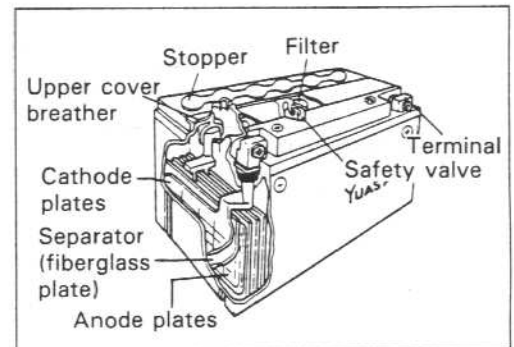
Be sure that the battery used is in fully-charged condition.



## BATTERY

### SPECIFICATIONS

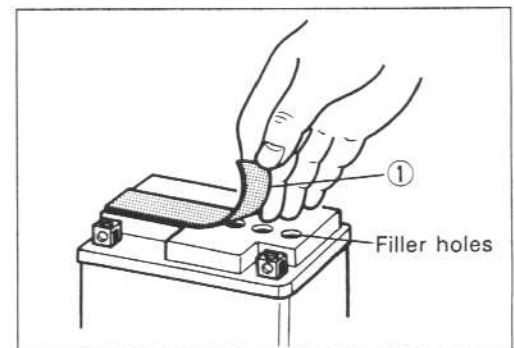
Type designation	FTX9-BS
Capacity	12V, 28.8 kC (8 Ah)/10HR
Standard electrolyte S.G.	1.320 at 20°C (68°F)



### INITIAL CHARGING

**Filling electrolyte**

- Remove the aluminum tape ① sealing the battery electrolyte filler holes.

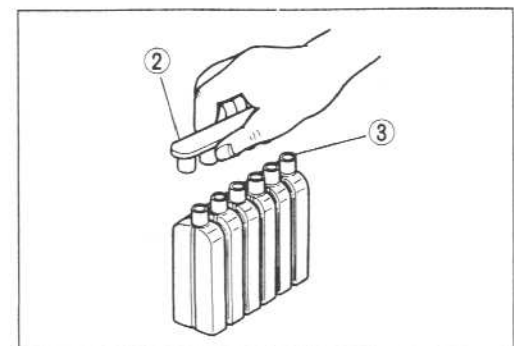


- Remove the caps ②.

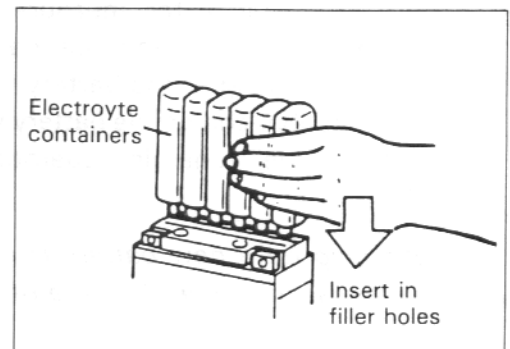
**NOTE:**

\* After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.

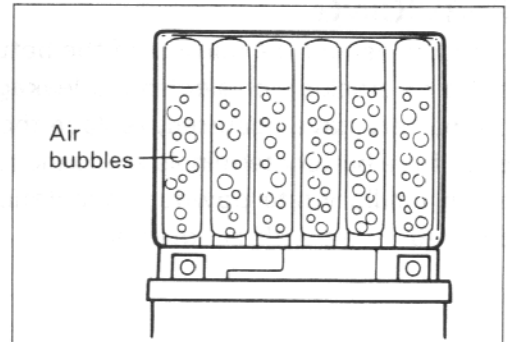
\* Do not remove or pierce the sealed areas ③ of the electrolyte container.



- 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.

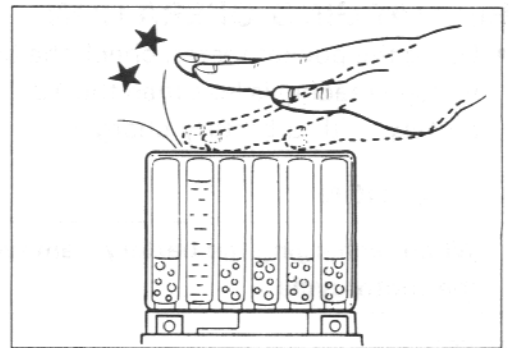


- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.

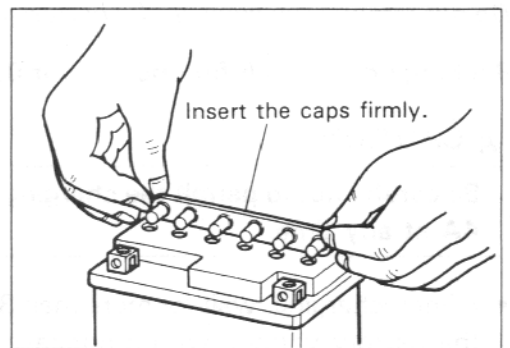
**NOTE:**

*If no air bubbles are coming up from a filler port, tap the bottom of the two or three times.*

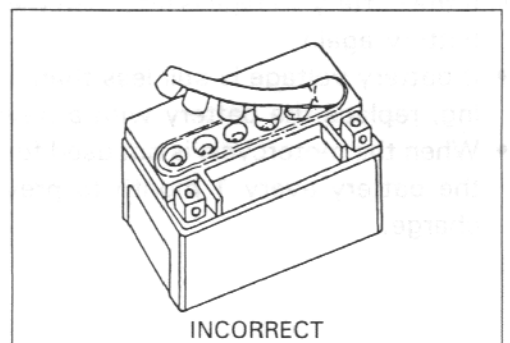
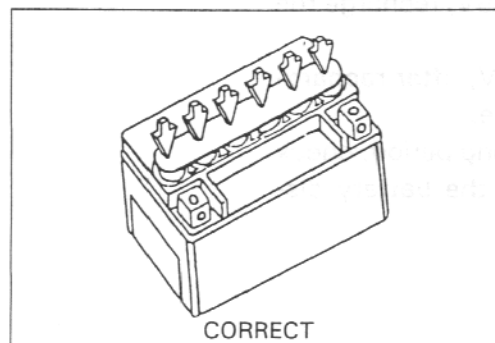
*Never remove the container from the battery.*



- 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**

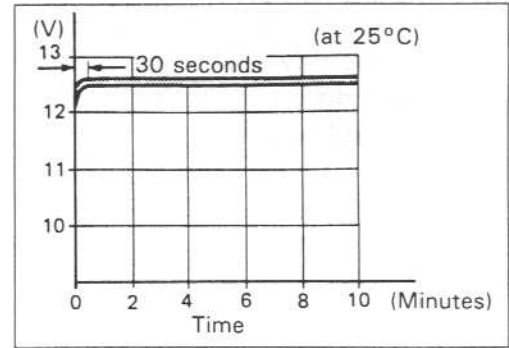
- \* Never use anything except the specified battery.
- \* Once install the caps to the battery; do not remove the caps.



- Using multi circuit 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:**

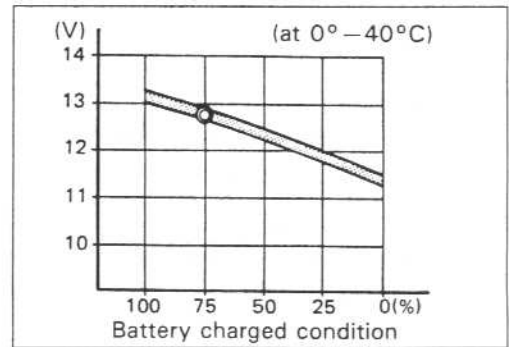
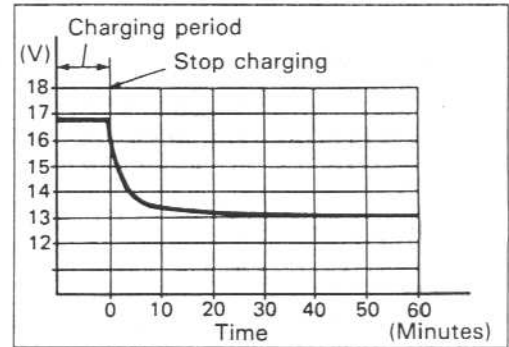
*Do not remove the caps on the battery top while recharging.*

**Recharging time: 4A for one hour or 0.9A for 5–10 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.



# SERVICING INFORMATION

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## TROUBLESHOOTING

## ENGINE

Complaint	Symptom and possible causes	Remedy
<p><b>Engine will not start, or is hard to start.</b></p>	<p><b>Compression too low</b></p> <ol style="list-style-type: none"> <li>1. Out of adjustment tappet 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> <p><b>Plugs not sparking</b></p> <ol style="list-style-type: none"> <li>1. Fouled spark plugs.</li> <li>2. Wet spark plugs.</li> <li>3. Defective ignition coil/plug cap.</li> <li>4. Defective signal generator or CDI unit.</li> </ol> <p><b>No fuel reaching the carburetors</b></p> <ol style="list-style-type: none"> <li>1. Clogged fuel tank air breather hole.</li> <li>2. Clogged or defective vacuum fuel valve.</li> <li>3. Defective fuel pump, fuel pump relay or CDI unit.</li> <li>4. Defective carburetor needle valve.</li> <li>5. Clogged fuel hose or fuel filter.</li> </ol>	<p>Adjust. Repair or replace. Adjust. Replace. Replace. See electrical section. Retighten.</p> <p>Clean. Clean and dry. Replace. Replace.</p> <p>Clean. Clean or replace. Replace. Replace. Clean or replace.</p>
<p><b>Engine stalls easily.</b></p>	<ol style="list-style-type: none"> <li>1. Fouled spark plugs.</li> <li>2. Defective signal generator or CDI unit.</li> <li>3. Clogged fuel hose.</li> <li>4. Clogged jets in carburetors.</li> <li>5. Out of adjustment tappet clearance.</li> </ol>	<p>Clean. Replace. Clean. Clean. Adjust.</p>
<p><b>Noisy engine.</b></p>	<p><b>Excessive valve chatter</b></p> <ol style="list-style-type: none"> <li>1. Too large tappet 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> <p><b>Noise seems to come from piston</b></p> <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> <p><b>Noise seems to come from timing chain</b></p> <ol style="list-style-type: none"> <li>1. Stretched chain.</li> <li>2. Worn sprockets.</li> <li>3. Not working tension adjuster.</li> </ol> <p><b>Noise seems to come from clutch</b></p> <ol style="list-style-type: none"> <li>1. Worn splines of countershaft or hub.</li> <li>2. Worn teeth of clutch plates.</li> <li>3. Distorted clutch plates, driven and drive.</li> <li>4. Worn clutch release bearing.</li> <li>5. Weakened clutch dampers.</li> </ol>	<p>Adjust. Replace. Replace. Replace.</p> <p>Replace. Clean. Replace. Replace.</p> <p>Replace. Replace. Repair or replace.</p> <p>Replace. Replace. Replace. Replace. Replace the primary driven gear.</p>

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 diaphragm 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 loss of play clutch control.</li> <li>2. Diaphragm 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 sticky 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 tappet 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/plug cap.</li> <li>7. Defective signal generator or CDI 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, fuel pump relay or CDI unit.</li> </ol>	<p>Adjust. Replace or repair. Replace. Replace. Adjust or replace. Replace. Replace. Adjust.</p> <p>Clean or adjust. Replace.</p>

### 8-3 SERVICING INFORMATION

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/plug cap.</li> <li>7. Defective signal generator or CDI 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, fuel pump relay or CDI 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. Replace. Replace. Replace. Replace.</p>
<b>Engine lacks power.</b>	<ol style="list-style-type: none"> <li>1. Loss of tappet 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, fuel pump relay or CDI 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.</li> <li>5. Not operation properly starter plunger.</li> <li>6. Air sucking from vacuum plug.</li> </ol>	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust. 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, or starter.</li> <li>3. Clogged pilot outlet or bypass.</li> <li>4. Not fully closed starter plunger.</li> <li>5. Air sucking from vacuum plug.</li> </ol>	Check and clean. Check and adjust. Check and clean. Check and adjust. 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, fuel pump relay or CDI unit.</li> </ol>	Replace. Replace. Check and adjust. Clean. Adjust float height. Replace.



## CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering.	<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.
Wobbly handlebars.	<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.
Wobbly front wheel.	<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, axle nut or axle pinch bolts.</li> <li>5. Incorrect front fork oil level.</li> </ol>	Replace. Replace. Replace. Retighten. Adjust.
Front suspension too soft.	<ol style="list-style-type: none"> <li>1. Weakened springs.</li> <li>2. Not enough fork oil.</li> <li>3. Improperly set front fork spring adjuster.</li> </ol>	Replace. Replenish. Adjust.
Front suspension too stiff.	<ol style="list-style-type: none"> <li>1. Too viscous fork oil.</li> <li>2. Too much fork oil.</li> <li>3. Improperly set front fork spring adjuster.</li> </ol>	Replace. Drain excess oil. Adjust.
Noisy front suspension.	<ol style="list-style-type: none"> <li>1. Not enough fork oil.</li> <li>2. Loose bolts on suspension.</li> </ol>	Replenish. Retighten.
Wobbly rear wheel.	<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.
Rear suspension too soft.	<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.
Rear suspension too stiff.	<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.
Noisy rear suspension.	<ol style="list-style-type: none"> <li>1. Loose nuts or bolts on rear suspension.</li> <li>2. Worn swingarm and rear cushion related bearings.</li> </ol>	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.

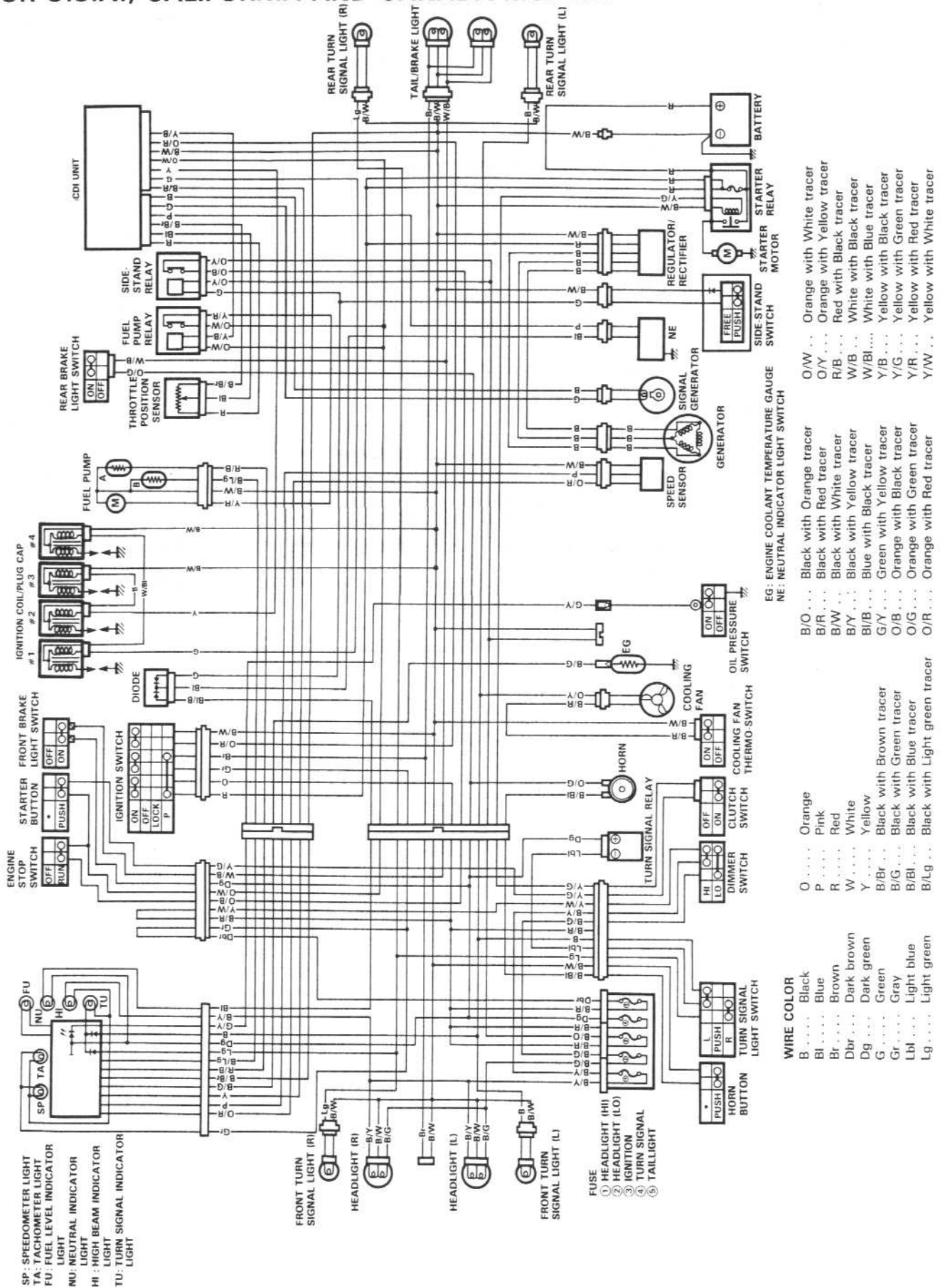
## ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> <li>1. Defective ignition coil/plug cup.</li> <li>2. Defective spark plugs.</li> <li>3. Defective signal generator or CDI unit.</li> </ol>	Replace. Replace. Replace.
Spark plug soon become fouled with carbon.	<ol style="list-style-type: none"> <li>1. Mixture too rich.</li> <li>2. Idling speed set too high.</li> <li>3. Incorrect gasoline.</li> <li>4. Dirty element in air cleaner.</li> <li>5. Too cold spark plugs.</li> </ol>	Adjust carburetors. Adjust carburetors. Change. Clean. Replace with hot type plugs.
Spark plugs become fouled too soon.	<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.
Spark plug electrodes overheat or burn.	<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.
Generator does not charge.	<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.
Generator does charge, but charging rate is below the specification.	<ol style="list-style-type: none"> <li>1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals.</li> <li>2. Grounded or open-circuited stator coils 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.
Generator overcharges.	<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.
Unstable charging.	<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.
Starter button is not effective.	<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.

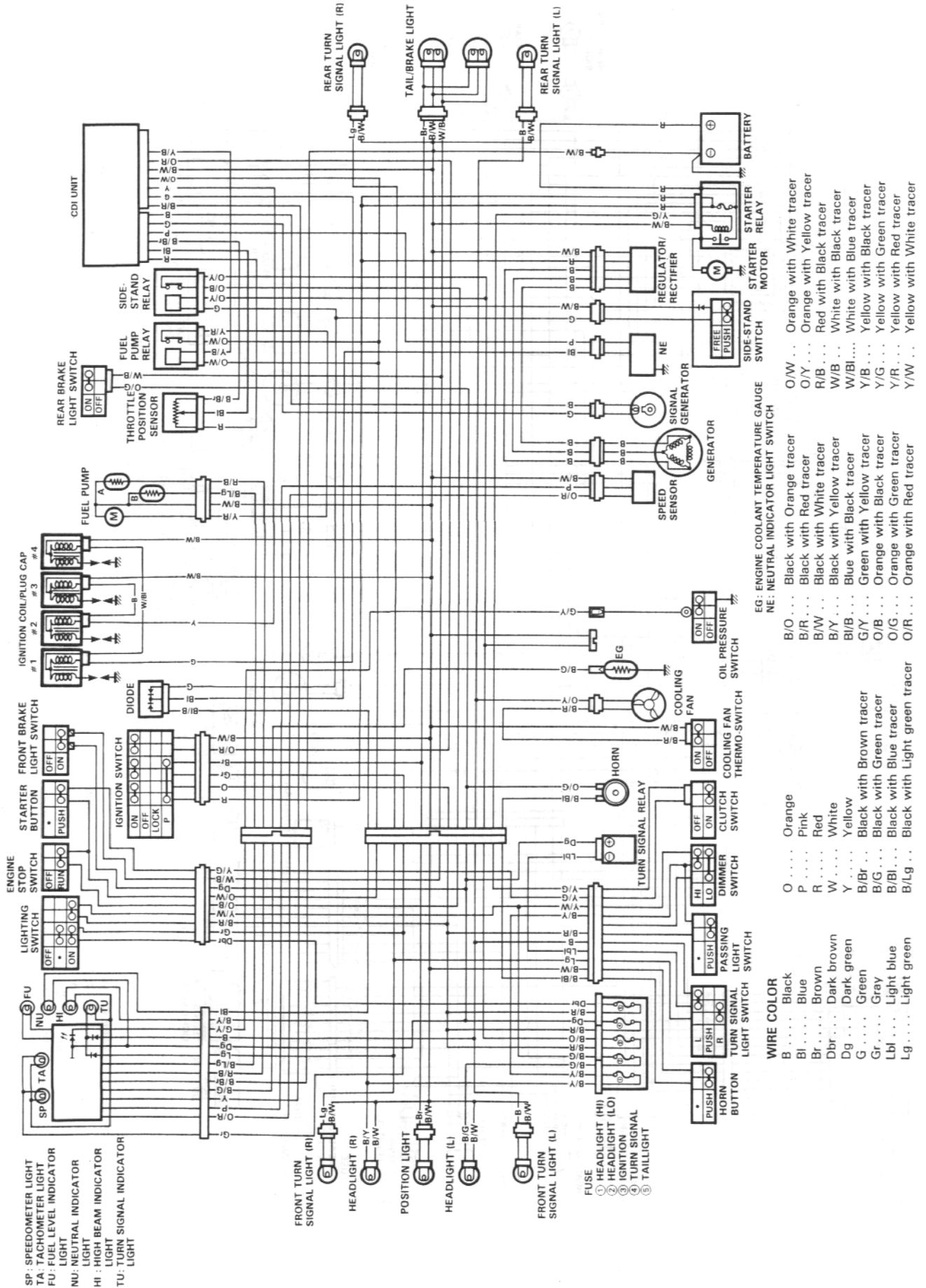
**BATTERY**

Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	<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.</p> <p>Replace the battery.</p>
Battery runs down quickly.	<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.</p> <p>Replace the battery, and correct the charging system.</p> <p>Replace the battery.</p> <p>Recharge the battery fully.</p> <p>Replace the battery.</p>
Battery "sulfation".	<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.</p> <p>Replace the battery, if badly sulfated.</p>
Battery discharges too rapidly.	Dirty container top and sides.	Clean.

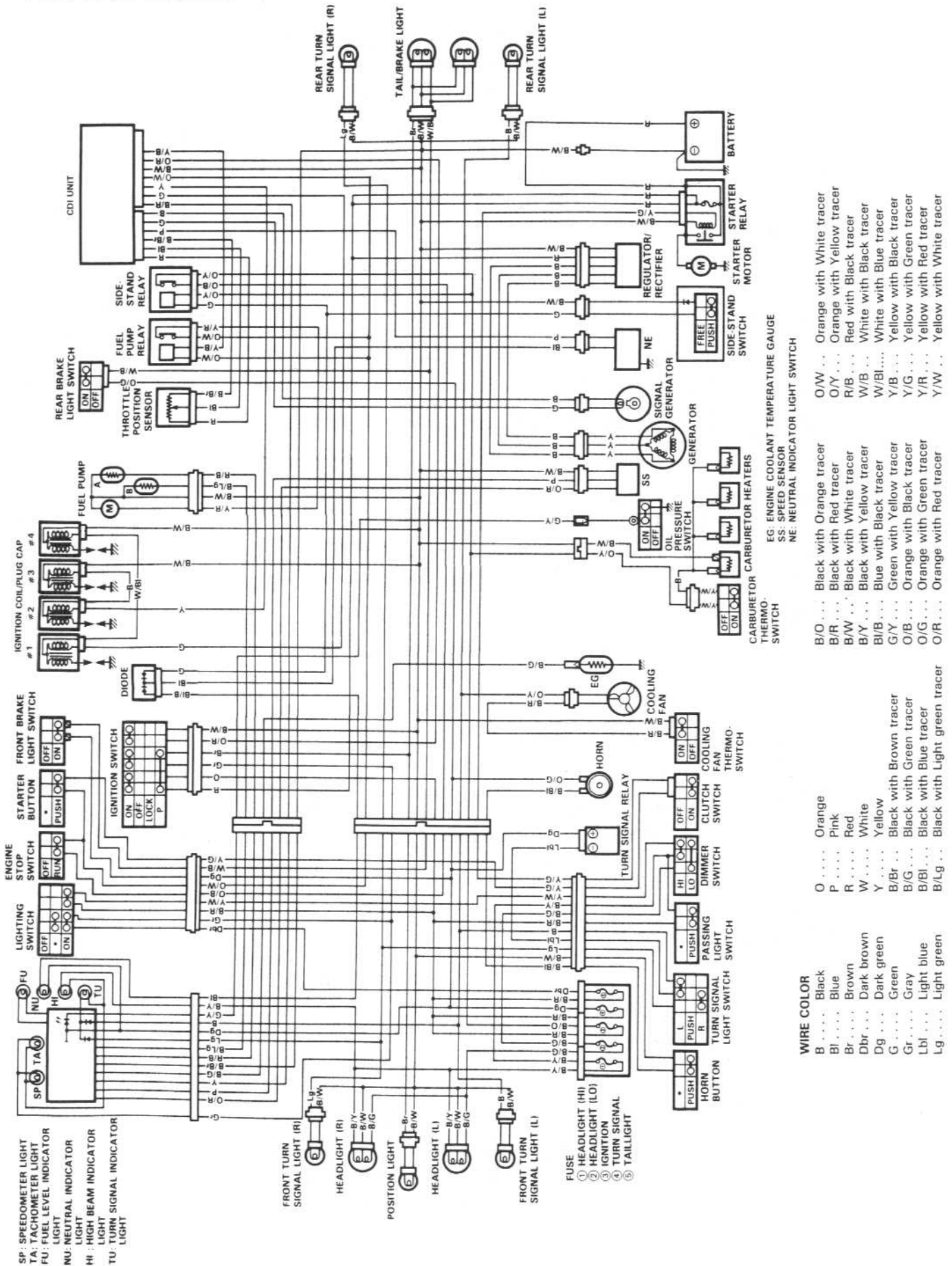
# WIRING DIAGRAM FOR U.S.A., CALIFORNIA AND CANADA MODELS



FOR E-04, 18, 21, 22, 25, 34, 37, 39, AND 53 MODELS



FOR E-02 MODEL



**WIRE COLOR**

B	Black
Bl	Blue
Br	Brown
Dbr	Dark brown
Dg	Dark green
G	Green
Gr	Gray
Lbl	Light blue
Lg	Light green
O	Orange
P	Pink
R	Red
W	White
Y	Yellow
B/B	Black with Black tracer
B/O	Black with Orange 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/G	Orange with Green tracer
O/R	Orange with Red tracer
O/W	Orange with White tracer
R/B	Red with Black tracer
W/B	White with Black tracer
W/Bl	White with Blue tracer
Y/B	Yellow with Black tracer
Y/G	Yellow with Green tracer
Y/R	Yellow with Red tracer
Y/W	Yellow with White tracer

EG: ENGINE COOLANT TEMPERATURE GAUGE  
 SS: SPEED SENSOR  
 NE: NEUTRAL INDICATOR LIGHT SWITCH

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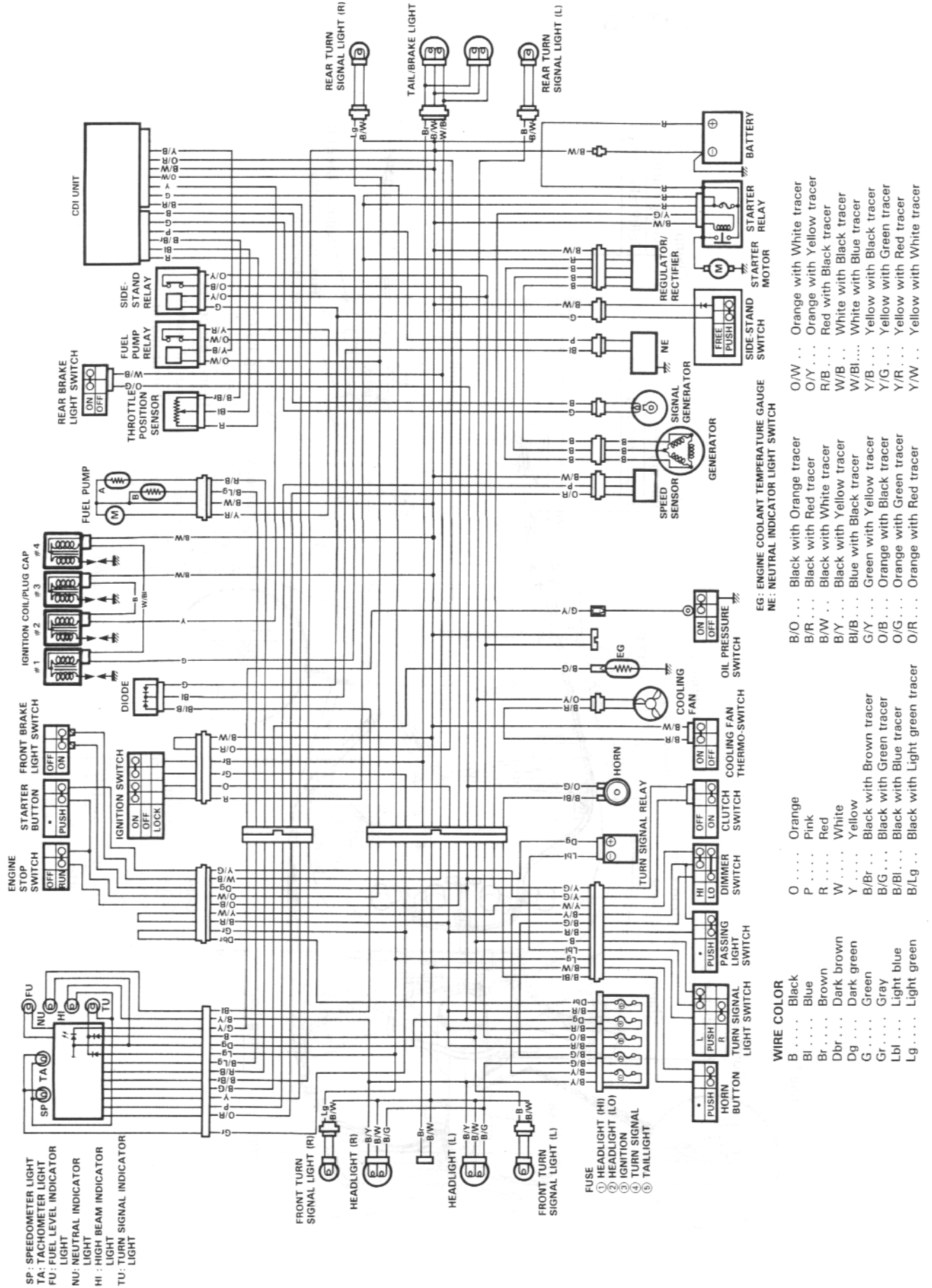
EG: ENGINE COOLANT TEMPERATURE GAUGE  
 SS: SPEED SENSOR  
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EG: ENGINE COOLANT TEMPERATURE GAUGE  
 SS: SPEED SENSOR  
 NE: NEUTRAL INDICATOR LIGHT SWITCH

SP: SPEEDOMETER LIGHT  
 TA: TACHOMETER LIGHT  
 FU: FUEL LEVEL INDICATOR LIGHT  
 NU: NEUTRAL INDICATOR LIGHT  
 HI: HIGH BEAM INDICATOR LIGHT  
 TU: TURN SIGNAL INDICATOR LIGHT

**FUSE**  
 ① HEADLIGHT (HI)  
 ② HEADLIGHT (LO)  
 ③ IGNITION  
 ④ TURN SIGNAL  
 ⑤ TAILLIGHT

FOR E-24 MODEL



SP : SPEEDOMETER LIGHT  
 TA : TACHOMETER LIGHT  
 FU : FUEL LEVEL INDICATOR LIGHT  
 NU : NEUTRAL INDICATOR LIGHT  
 HI : HIGH BEAM INDICATOR LIGHT  
 TU : TURN SIGNAL INDICATOR LIGHT

FUSE  
 ① HEADLIGHT (HI)  
 ② HEADLIGHT (LO)  
 ③ IGNITION  
 ④ TURN SIGNAL  
 ⑤ TAILLIGHT

**WIRE COLOR**  
 B ..... Black  
 Bl ..... Blue  
 Br ..... Brown  
 Dbr ..... Dark brown  
 Dg ..... Dark green  
 G ..... Green  
 Gr ..... Gray  
 Lbl ..... Light blue  
 Lg ..... Light green

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/Lg ..... Black with Light green tracer

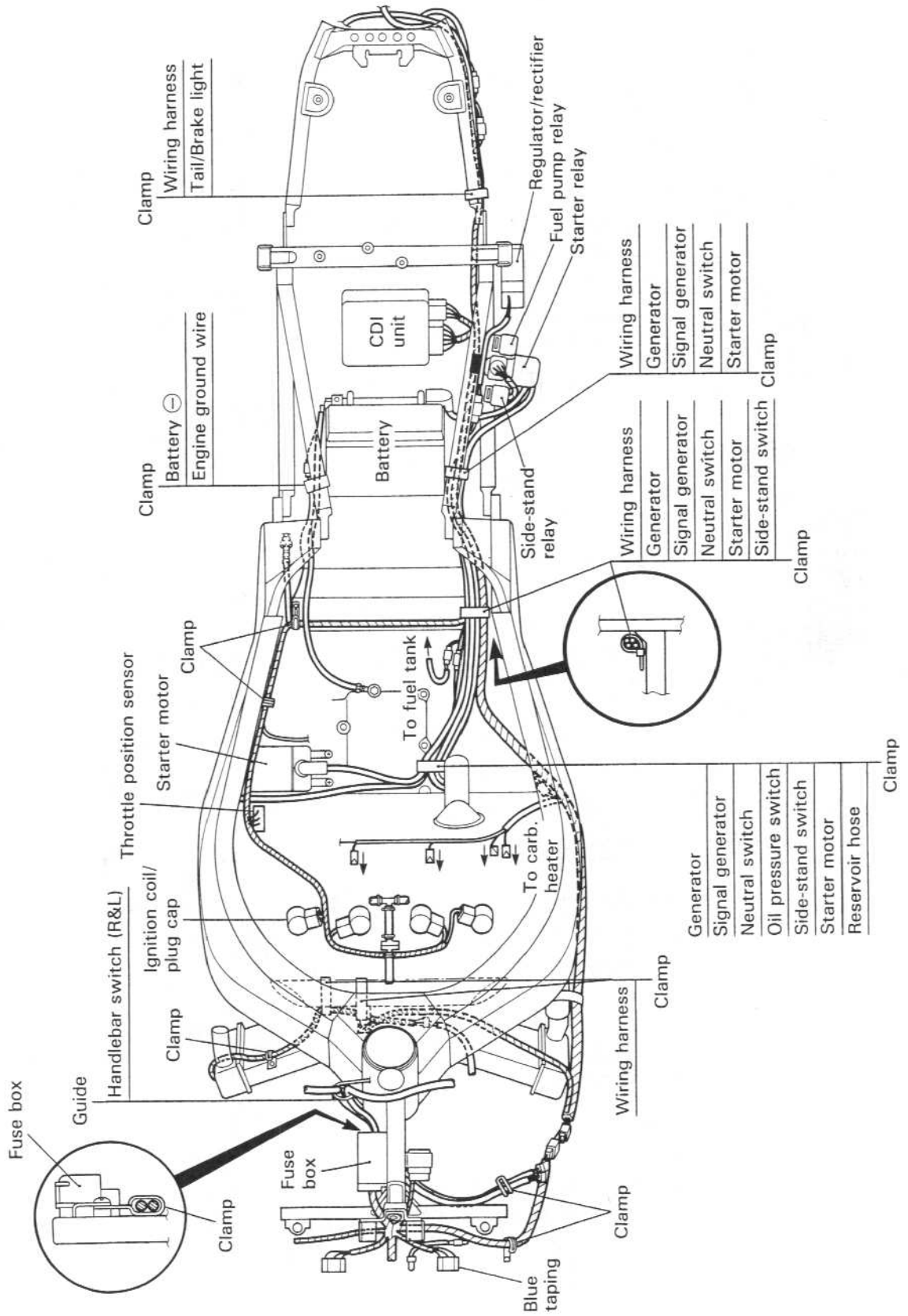
O/W ..... Orange with White tracer  
 O/Y ..... Orange with Yellow tracer  
 R/B ..... Red with Black tracer  
 W/B ..... White with Black tracer  
 W/Bl ..... White with Blue tracer  
 Y/B ..... Yellow with Black tracer  
 Y/G ..... Yellow with Green tracer  
 Y/R ..... Yellow with Red tracer  
 Y/W ..... Yellow with White tracer

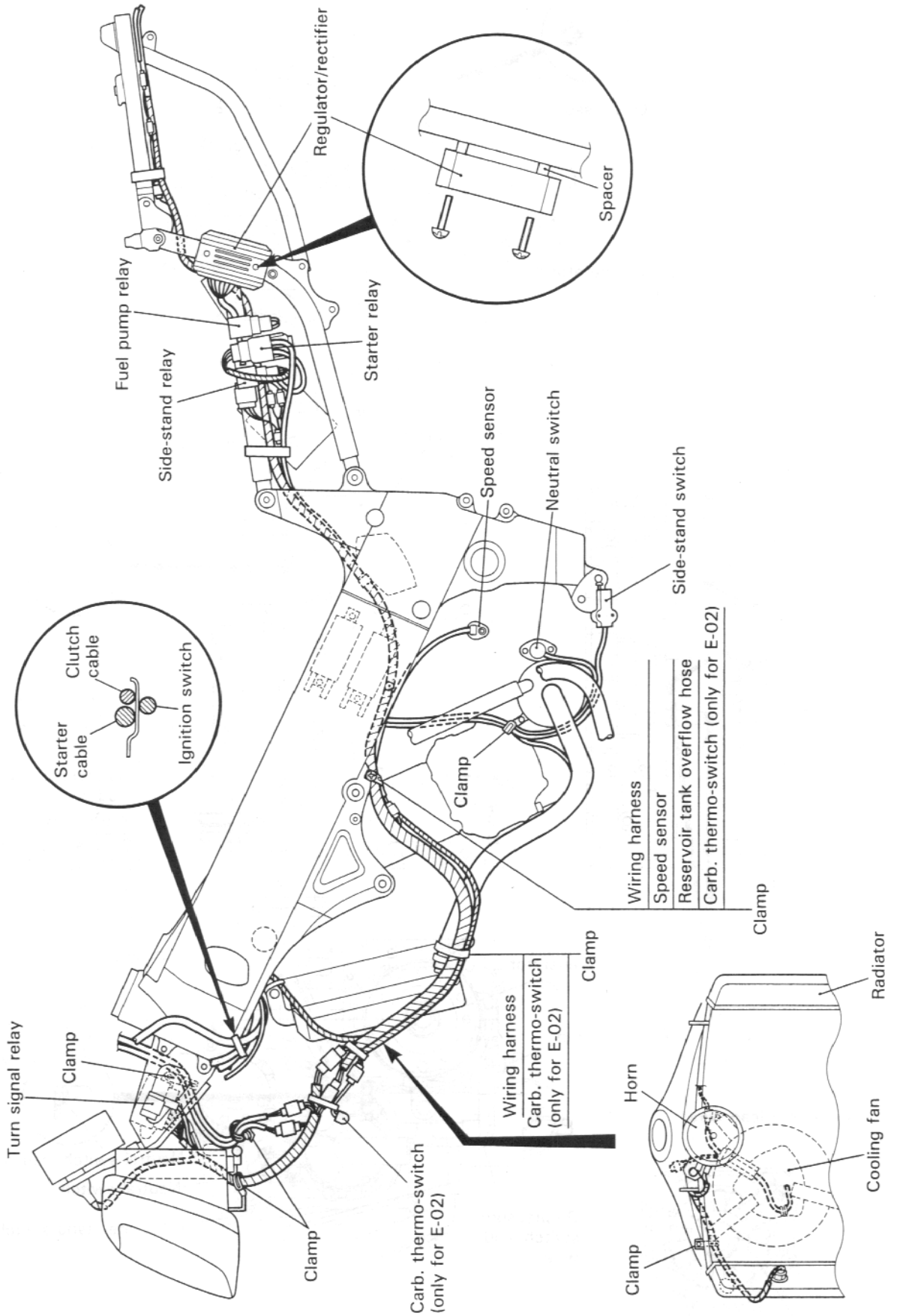
EG : ENGINE COOLANT TEMPERATURE GAUGE  
 NE : NEUTRAL INDICATOR LIGHT SWITCH

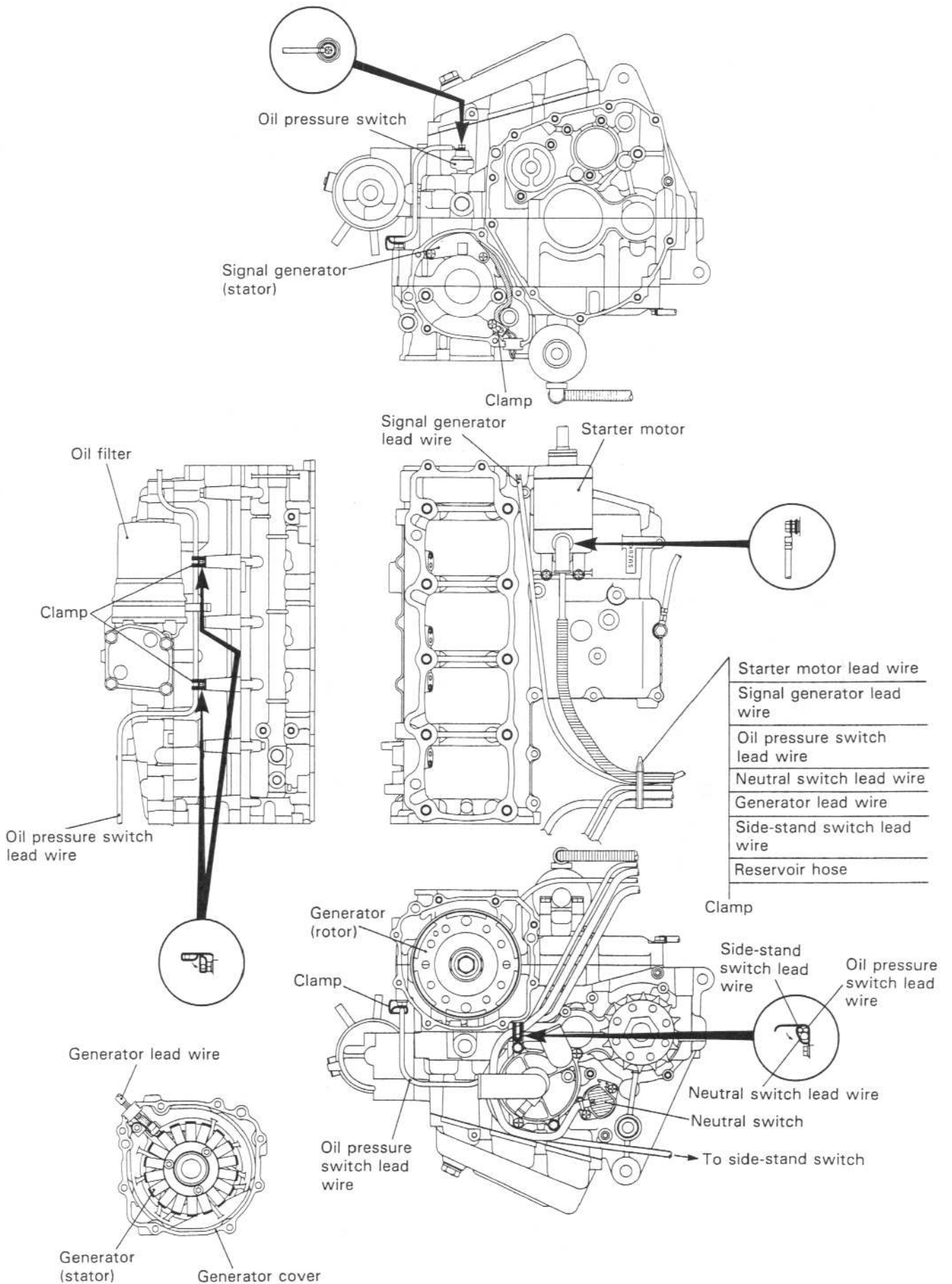


# WIRE HARNESS, CABLE AND HOSE ROUTING

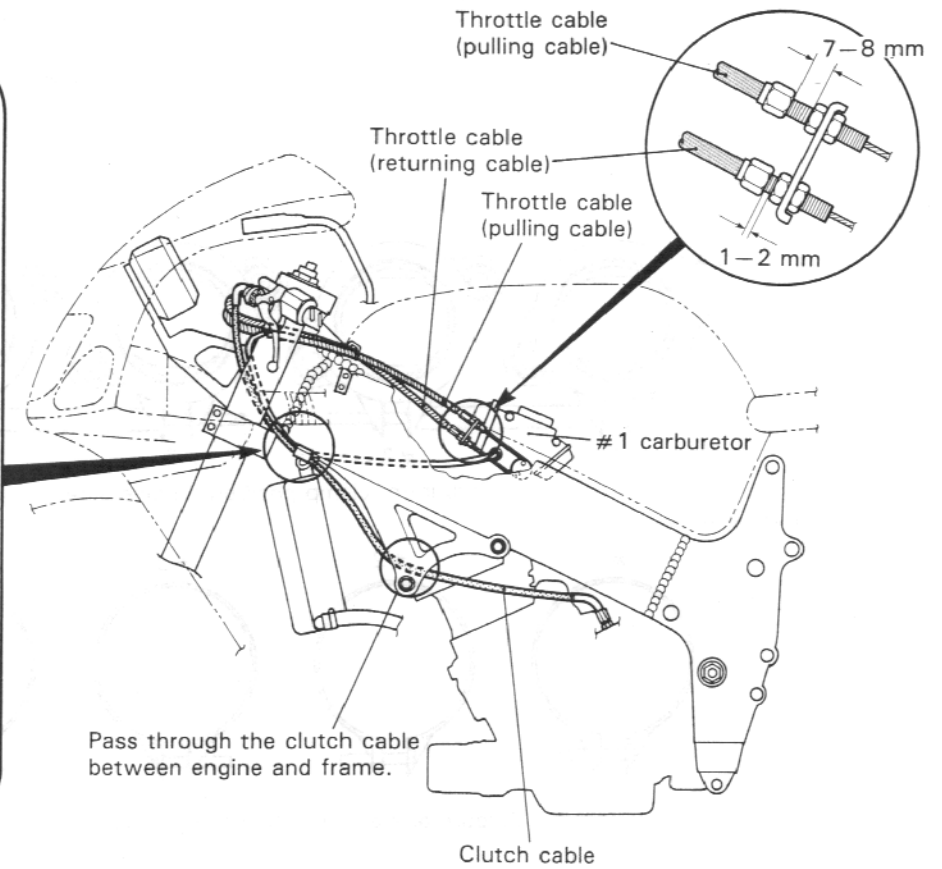
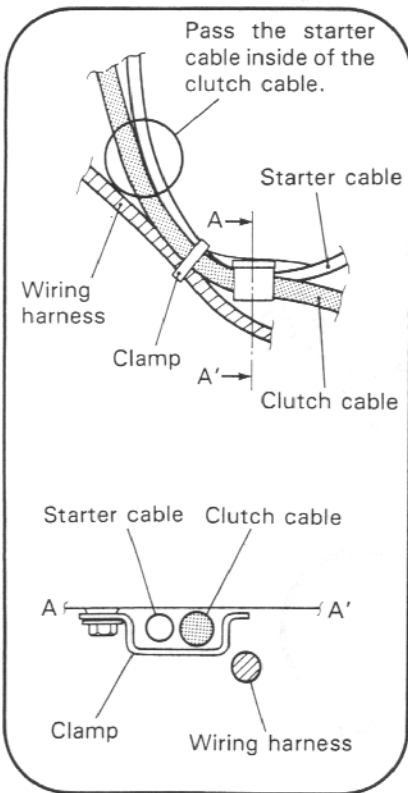
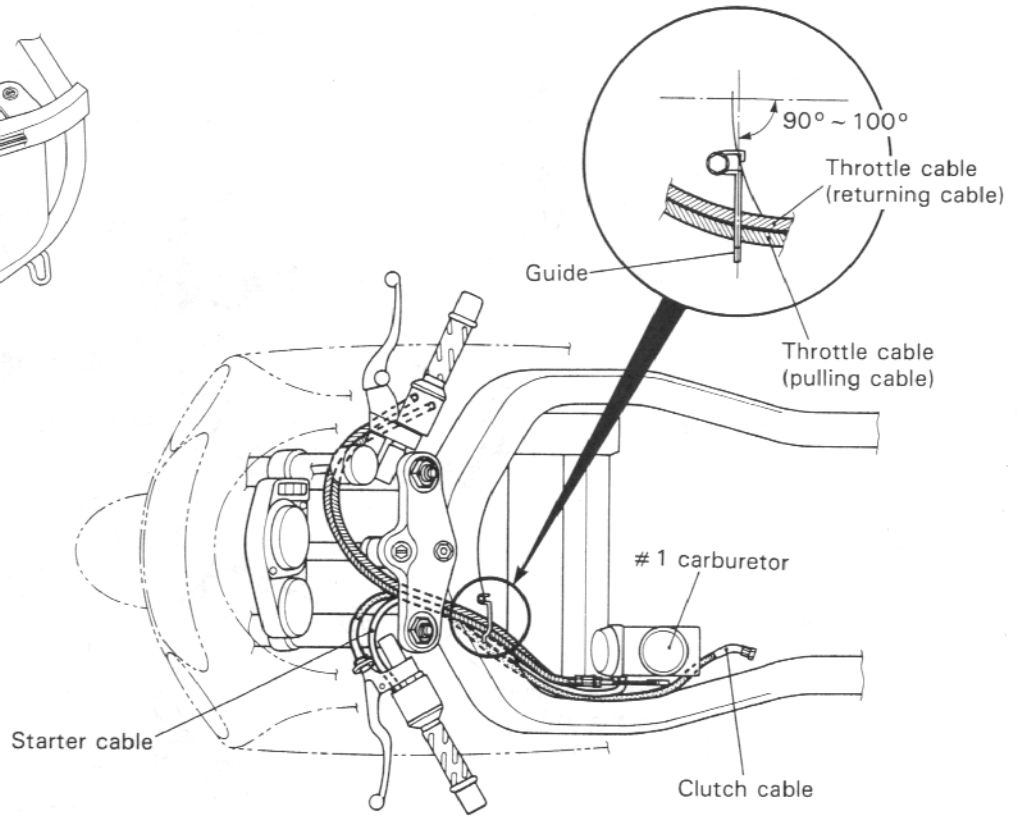
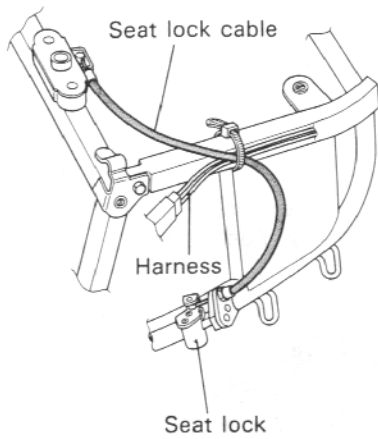
## WIRE HARNESS ROUTING



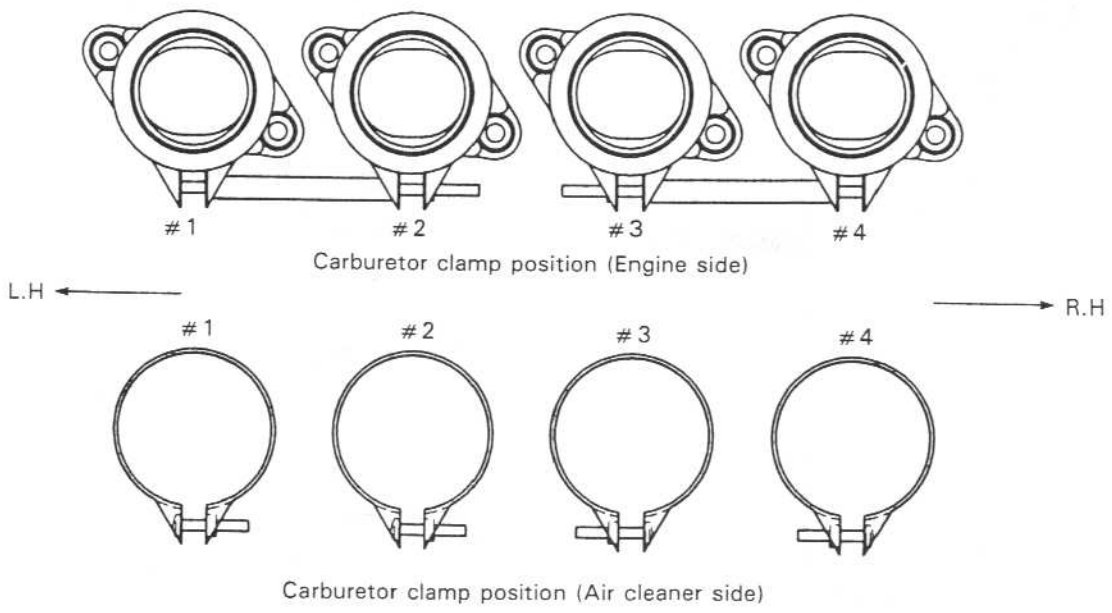
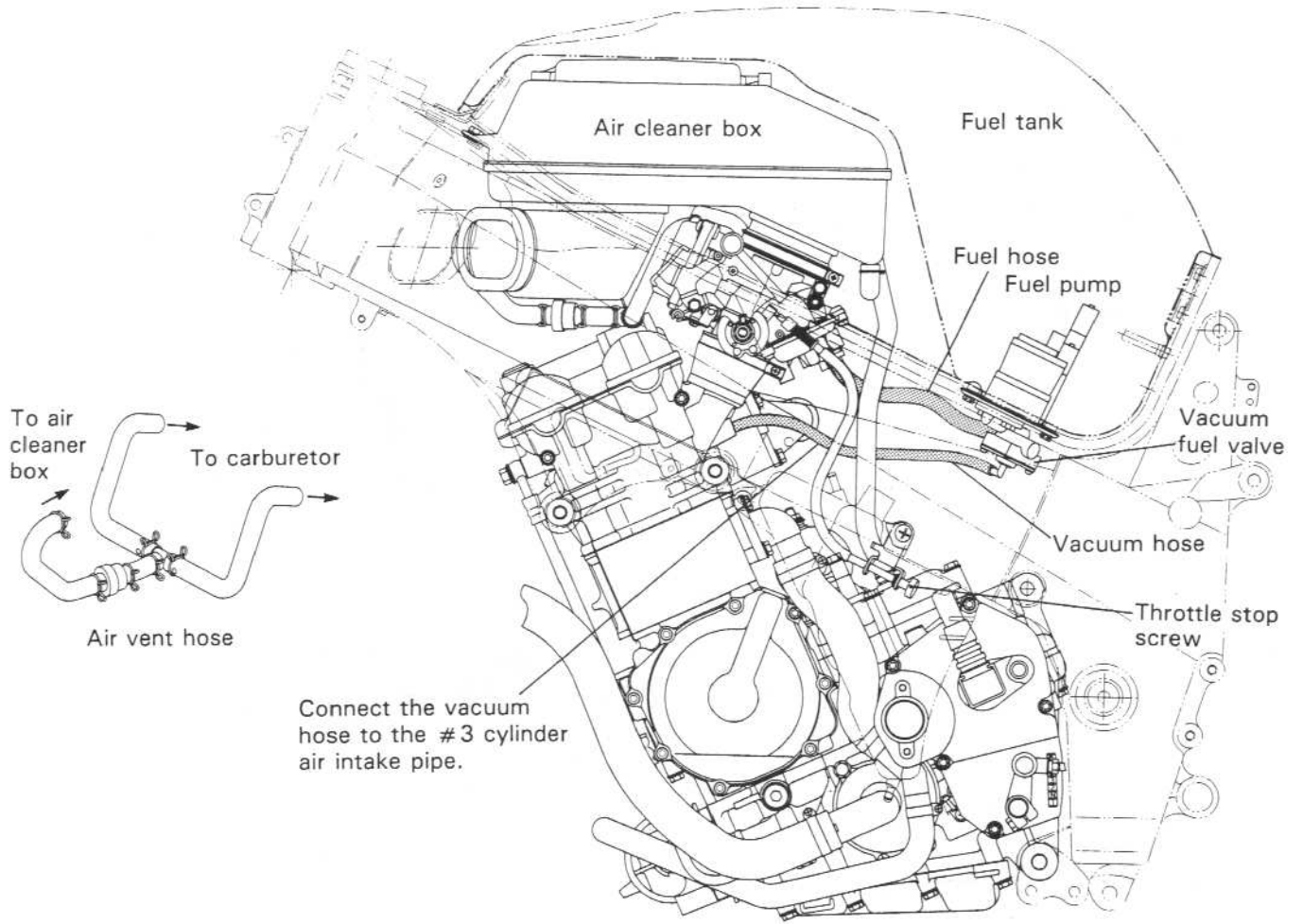




# CABLE ROUTING

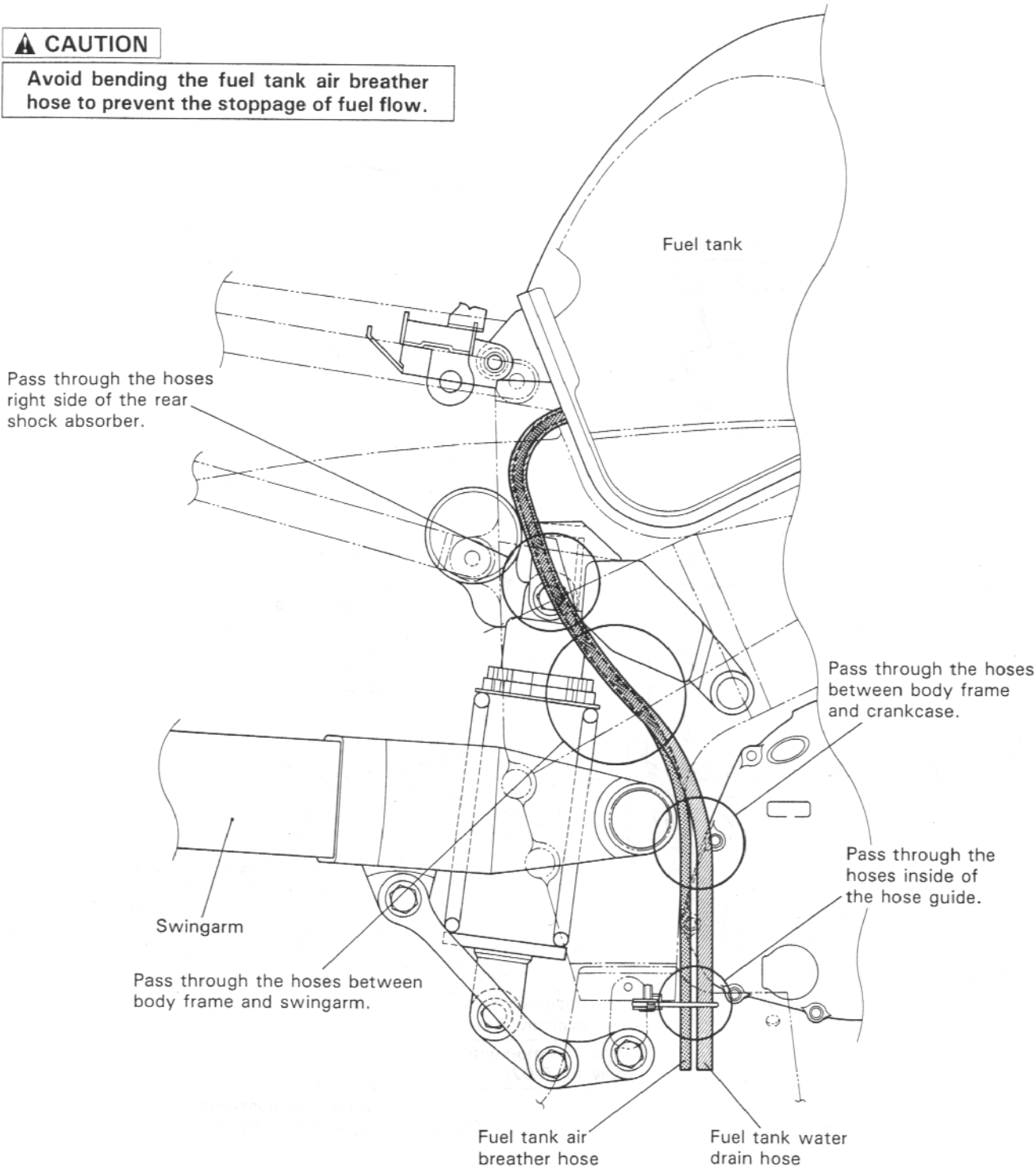


# FUEL SYSTEM HOSE ROUTING

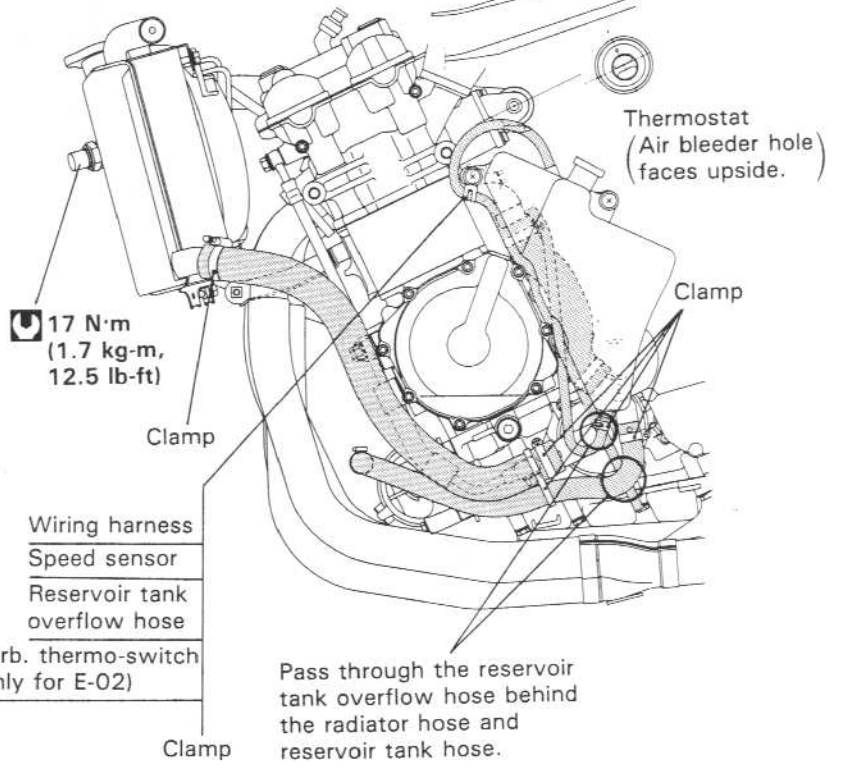
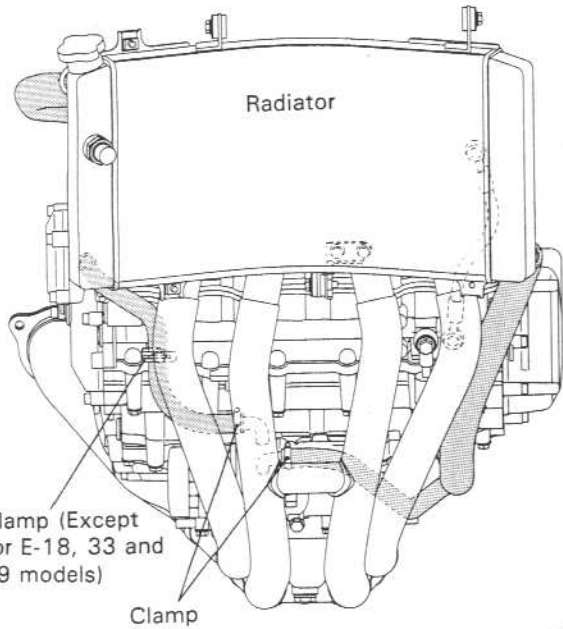
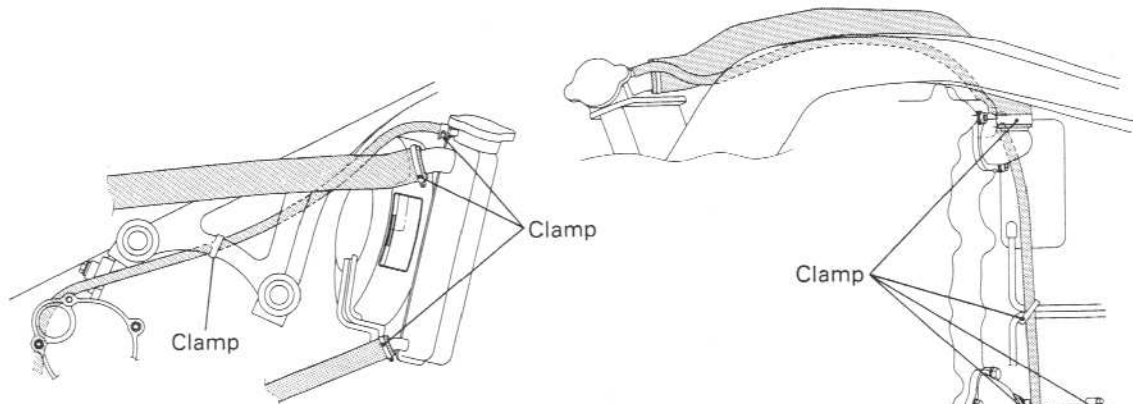


**⚠ CAUTION**

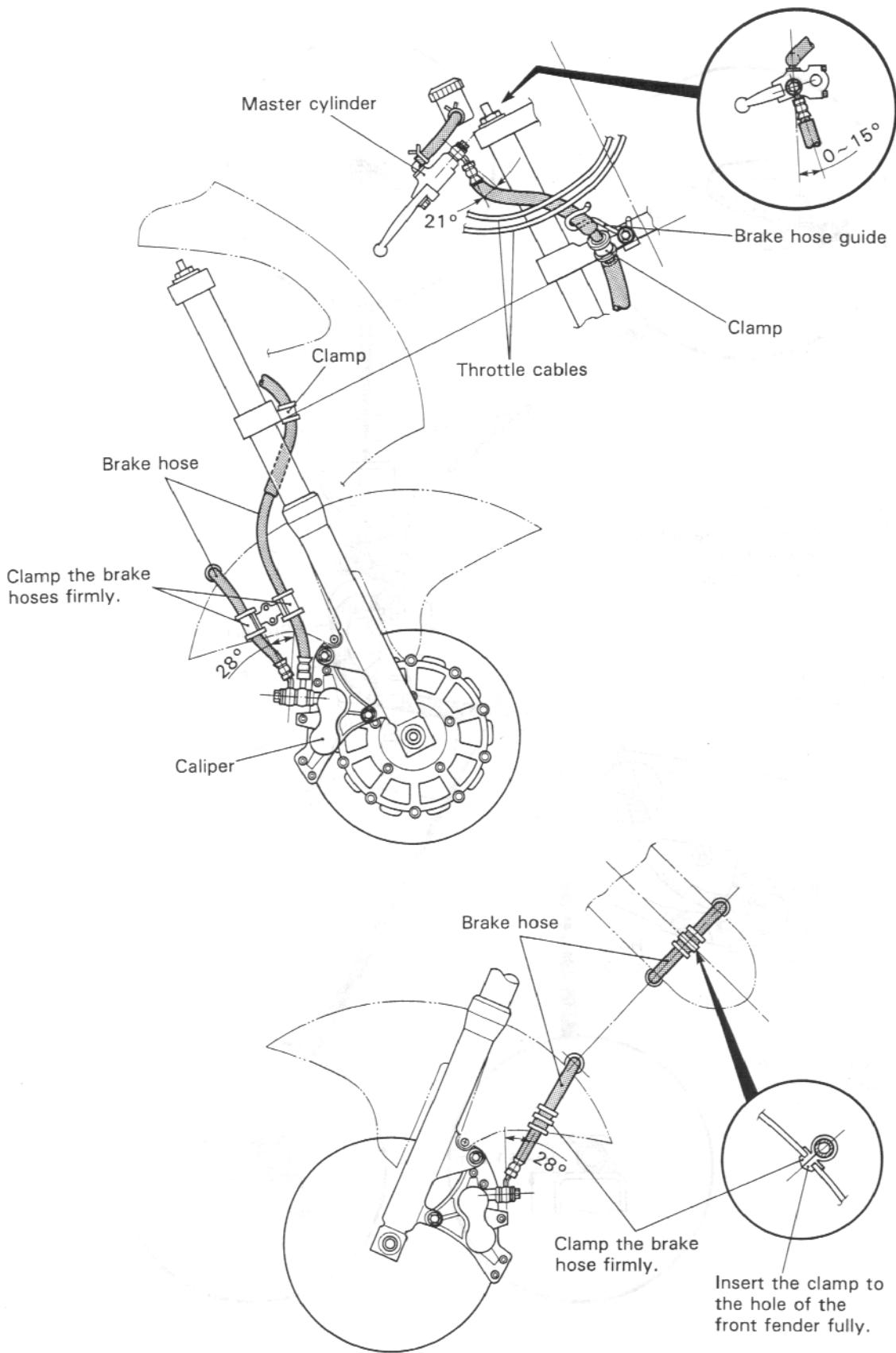
Avoid bending the fuel tank air breather hose to prevent the stoppage of fuel flow.



# COOLING SYSTEM HOSE ROUTING

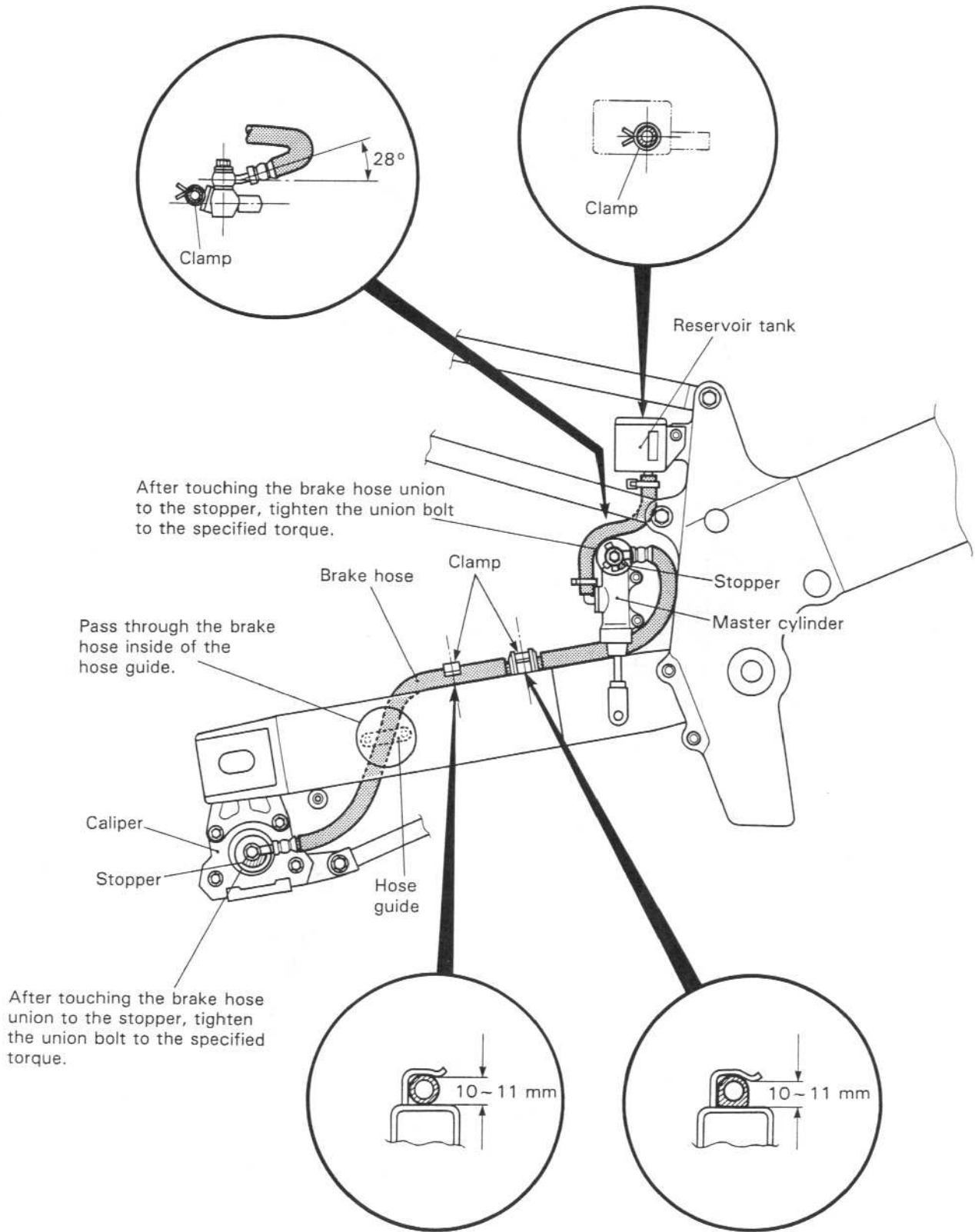


# FRONT BRAKE HOSE ROUTING

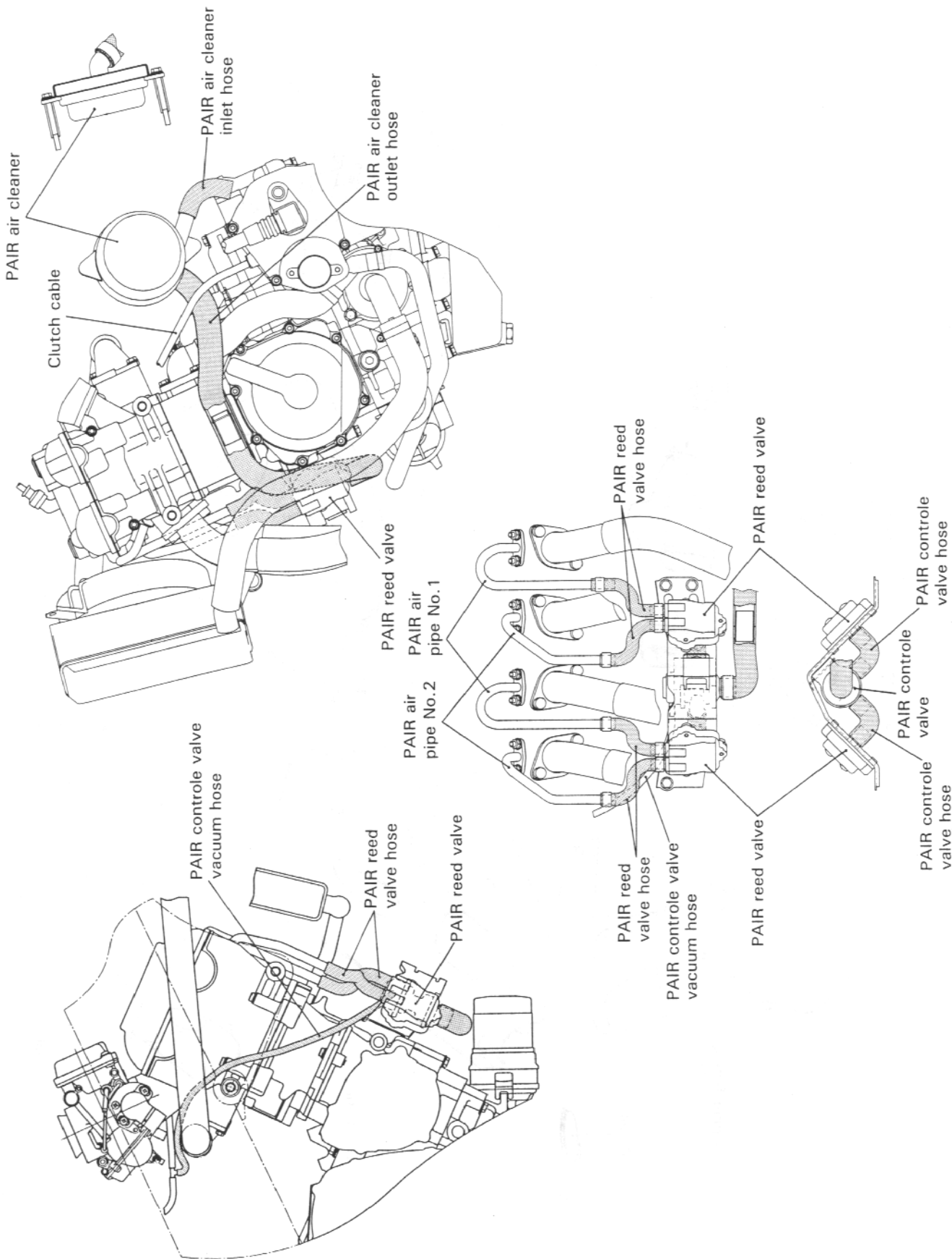




# REAR BRAKE HOSE ROUTING

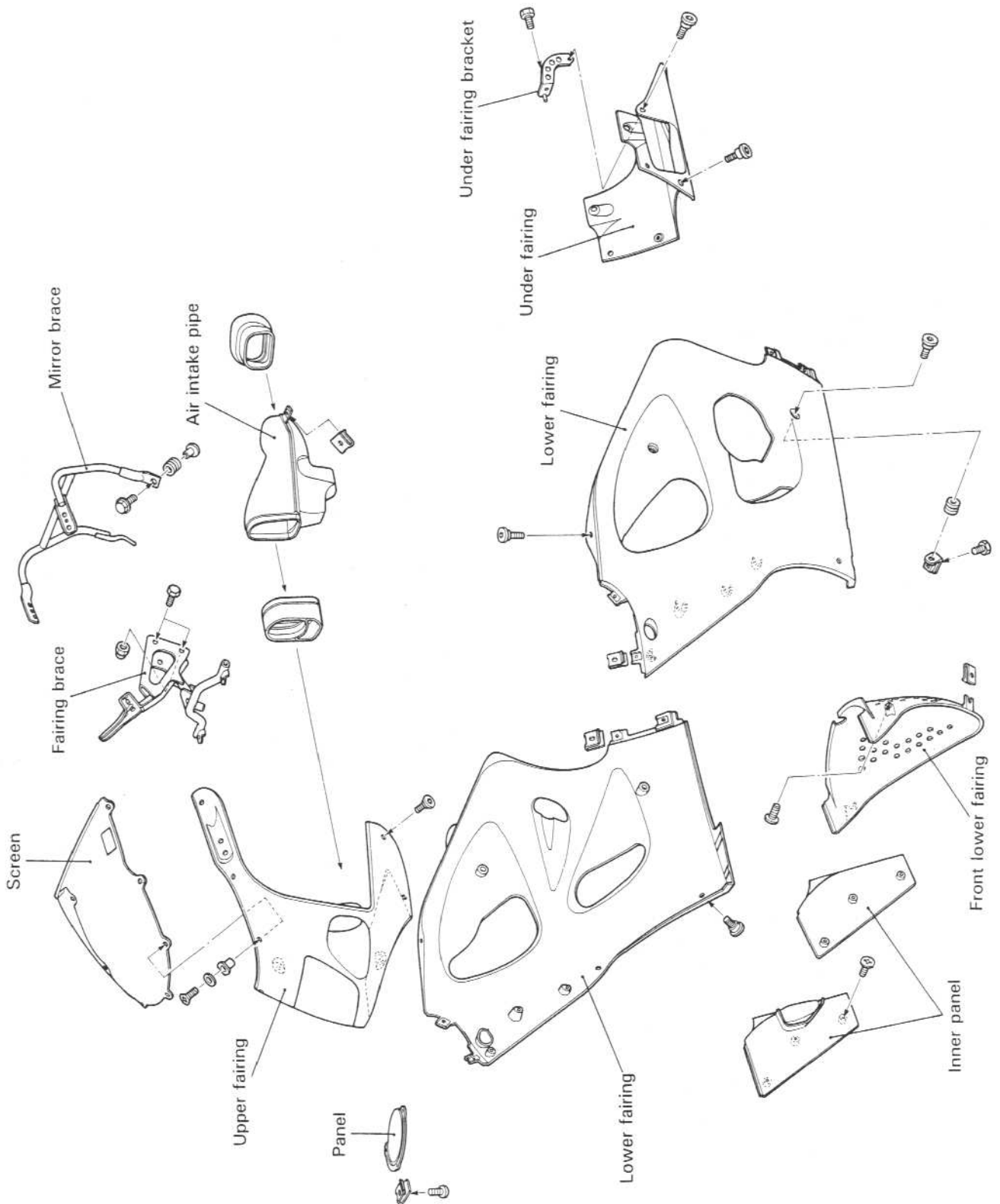


# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING (FOR E-18, 33 and 39 models)

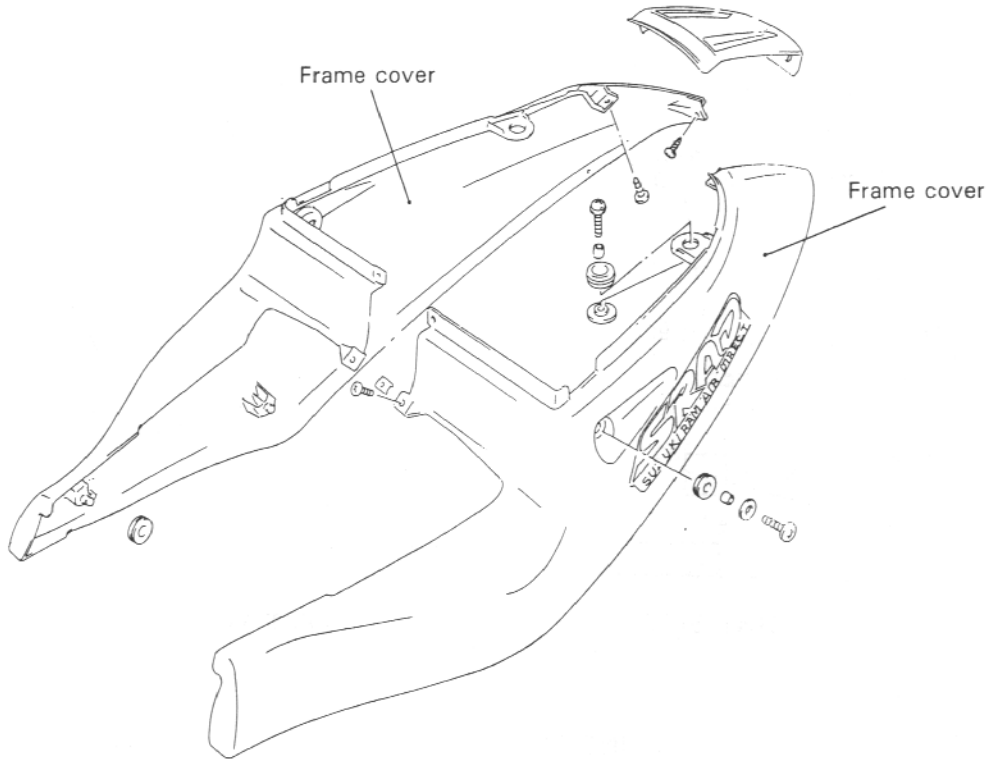


# FAIRING AND FRAME COVER SET UP

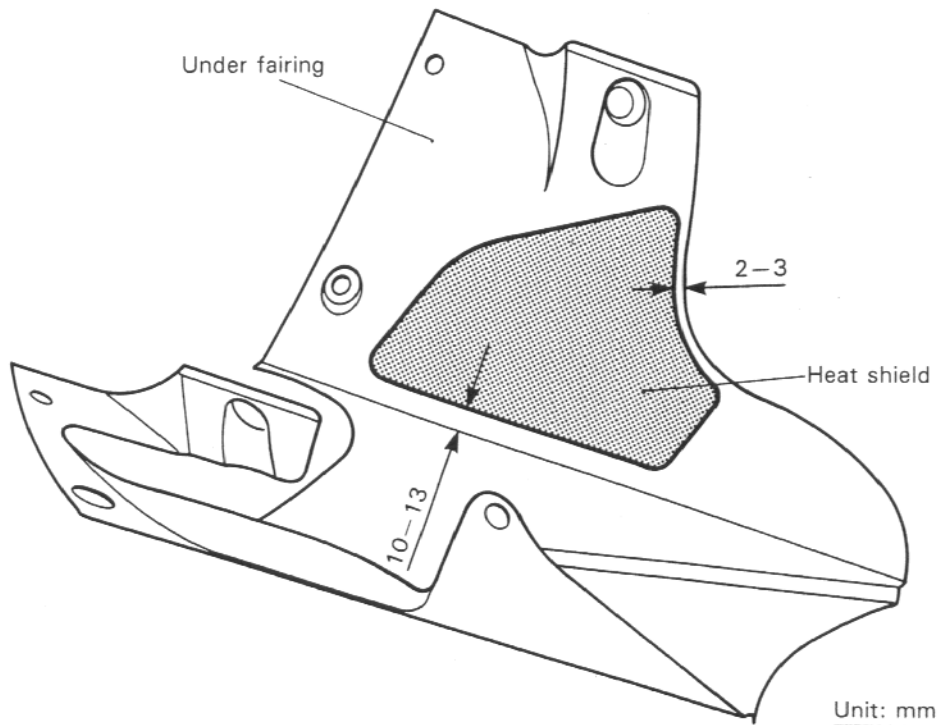
## FAIRING SET UP



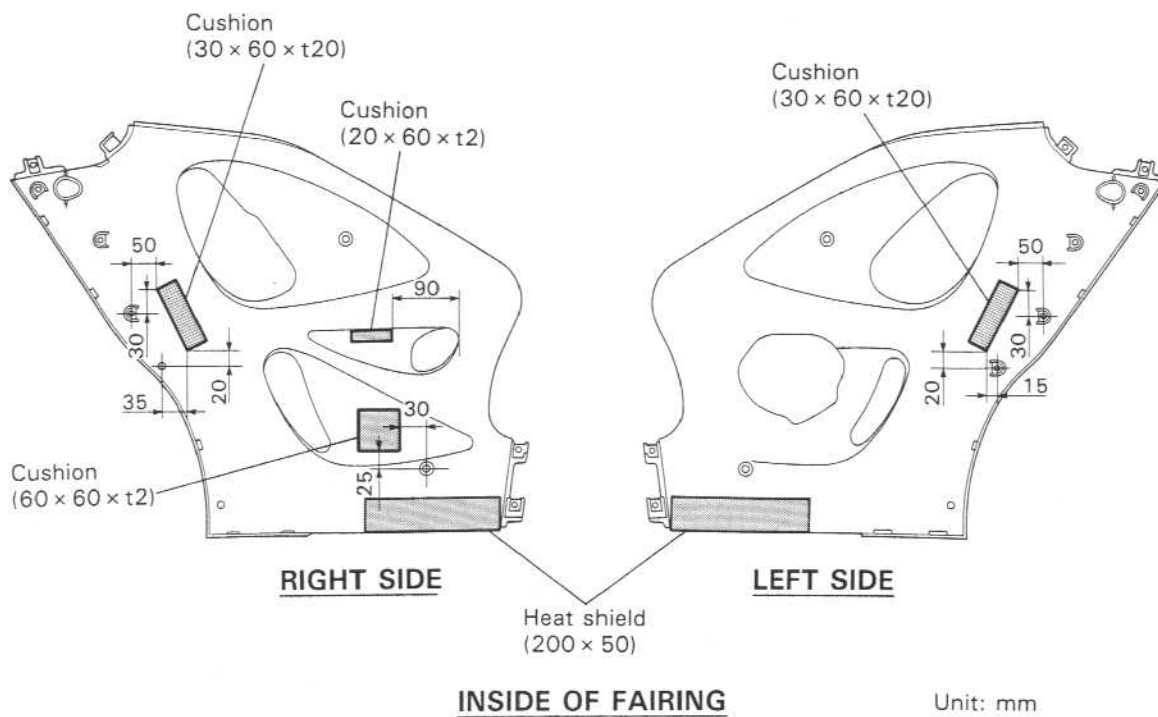
## FRAME COVER SET UP



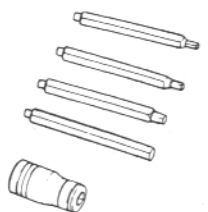
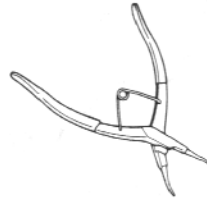
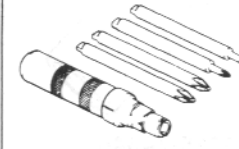
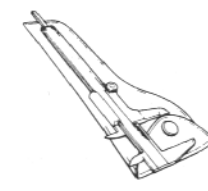
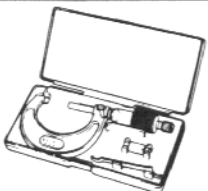




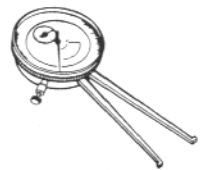

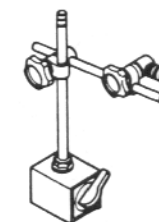
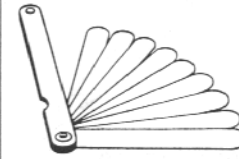

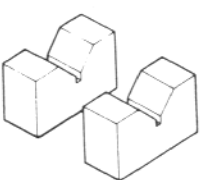


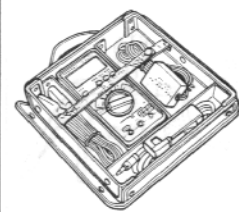

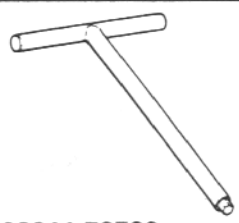
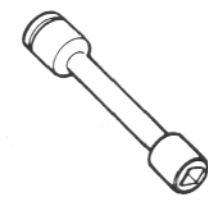
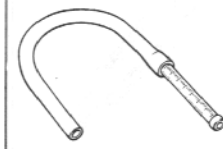
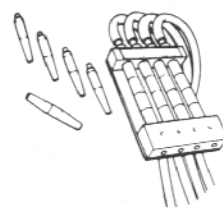

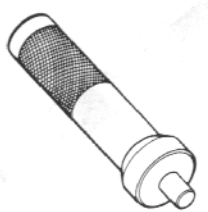
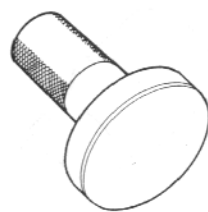



## UNDER FAIRING HEAT SHIELD



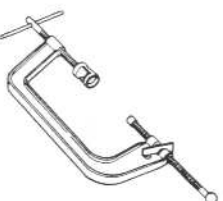
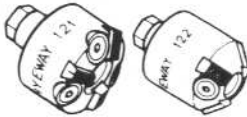












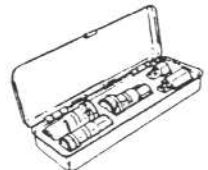



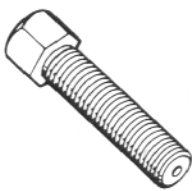

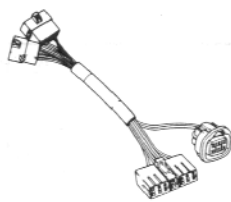
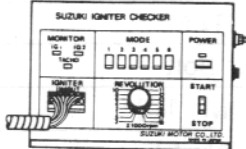

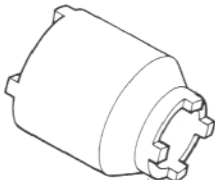
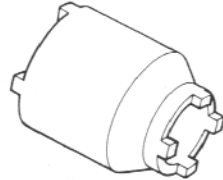

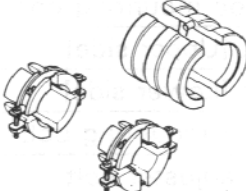

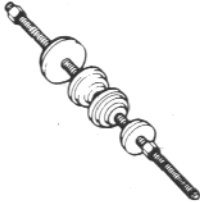

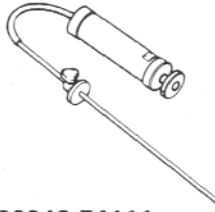
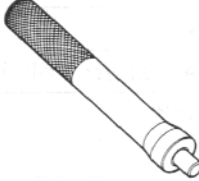
# LOWER FAIRING CUSHION AND HEAT SHIELD



# SPECIAL TOOLS

 <p>09900-00410 Hexagon wrench set</p>	 <p>09900-06107 Snap ring pliers</p>	 <p>09900-06108 Snap ring pliers</p>	 <p>09900-09004 Impact driver set</p>	 <p>09900-20102 Vernier calipers (1/20 mm, 200 mm)</p>
 <p>09900-20202 Micrometer (1/100 mm, 25–50 mm)</p>	 <p>09900-20203 Micrometer (1/100 mm, 50–75 mm)</p>	 <p>09900-20205 Micrometer (1/1000 mm, 0–25 mm)</p>	 <p>09900-20508 Cylinder gauge set (1/100 mm, 40–80 mm)</p>	 <p>09900-20602 Dial gauge (1/1000 mm, 1 mm)</p>
 <p>09900-20605 Dial calipers (1/100 mm, 10–34 mm)</p>	 <p>09900-20606 Dial gauge (1/100 mm, 10 mm)</p>	 <p>09900-20701 Magnetic stand</p>	 <p>09900-20803 Thickness gauge</p>	 <p>09900-20805 Tire depth gauge</p>
 <p>09900-21304 V-block set (100 mm)</p>	 <p>09900-22301 Plastigauge</p>	 <p>09900-22401 Small bore gauge (10–18 mm)</p>	 <p>09900-25008 Multi circuit tester set</p>	 <p>09900-28108 Electro tester</p>
 <p>09911-73730 "T" type hexagon wrench (5 mm)</p>	 <p>09911-74520 Long socket (12 mm)</p>	 <p>09913-10760 Fuel level gauge</p>	 <p>09913-13121 Carburetor balancer</p>	 <p>09913-50121 Oil seal remover</p>
 <p>09913-75821 Bearing installer</p>	 <p>09913-85210 Oil seal/Bearing installer</p>	 <p>09914-24510 T-handle</p>	 <p>09915-40610 Oil filter wrench</p>	 <p>09915-64510 Compression gauge 09913-10750 (Adaptor)</p>

 <p>09915-74510 Oil pressure gauge 09915-77330 (for high pressure meter)</p>	 <p>09915-74540 Oil pressure gauge adaptor</p>	 <p>09915-94511 Carburetor balancer attachment</p>	 <p>09916-14510 Valve lifter</p>	 <p>09916-14521 Valve lifter attachment</p>
 <p>09916-20640 Solid pilot (N-100-4.5)</p>	 <p>09916-21110 Valve seat cutter set</p>	 <p>See page 3A-11. Valve seat cutter head (N-111, 116, 120, 121, 122, 126)</p>	 <p>09916-33210 Valve guide reamer (4.5 mm)</p>	 <p>09916-34542 Valve guide reamer handle</p>
 <p>09916-34580 Valve guide reamer (10.8 mm)</p>	 <p>09916-43210 Valve guide remover/installer</p>	 <p>09916-53330 Attachment</p>	 <p>09916-74521 Piston ring compressor body</p>	 <p>09916-74540 Piston ring compressor band (63-75 mm)</p>
 <p>09916-84511 Tweezers</p>	 <p>09917-47910 Vacuum pump gauge</p>	 <p>09920-34820 Clutch pressure plate holder</p>	 <p>09920-34830 Starter clutch holder</p>	 <p>09921-20200 Bearing remover</p>
 <p>09921-20210 Bearing remover</p>	 <p>09923-73210 Bearing puller (17-20 mm)</p>	 <p>09923-74510 Bearing puller (20-35 mm)</p>	 <p>09924-84510 Bearing installer set</p>	 <p>09924-84521 Bearing installer</p>
 <p>09925-18010 Steering bearing installer</p>	 <p>09930-10121 Spark plug socket wrench set</p>	 <p>09930-11920 Torx bit</p>	 <p>09930-11940 Bit holder</p>	 <p>09930-30102 Sliding shaft</p>

 <p><b>09930-30450</b> Generator remover</p>	 <p><b>09930-44530</b> Generator rotor holder</p>	 <p><b>09931-61750</b> Lead wire "MODE 1-A4"</p>	 <p><b>09931-94490</b> Ignitor checker (Digital type)</p>	 <p><b>09940-14911</b> <b>09940-14960</b> Steering stem nut wrench and socket</p>
 <p><b>09940-14970</b> Swingarm pivot thrust adjuster socket wrench</p>	 <p><b>09940-14980</b> Engine mounting thrust adjuster socket wrench</p>	 <p><b>09940-52841</b> Front fork inner rod holder</p>	 <p><b>09940-52861</b> Front fork oil seal installer</p>	 <p><b>09940-92720</b> Spring scale</p>
 <p><b>09941-34513</b> Steering outer race installer</p>	 <p><b>09941-64511</b> Bearing remover</p>	 <p><b>09943-74111</b> Front fork oil level gauge</p>	 <p><b>09943-88211</b> Bearing installer</p>	

**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	14	1.4	10.0
Cylinder head bolt [M: 10]	43	4.3	31.0
Cylinder head bolt [M: 6]	10	1.0	7.0
Cylinder base nut	10	1.0	7.0
Camshaft journal holder bolt	10	1.0	7.0
Top cam chain guide mounting bolt	10	1.0	7.0
Oil hose union bolt [Upper side]	20	2.0	14.5
Oil hose union bolt [Lower side]	25	2.5	18.0
Cam chain tensioner mounting bolt	10	1.0	7.0
Cam chain tension adjuster bolt	10	1.0	7.0
Conrod bearing cap bolt	67	6.7	48.5
Starter clutch bolt	54	5.4	39.0
Crankcase bolt [M: 6]	11	1.1	8.0
[M: 8]	24	2.4	17.5
Crankcase bolt & Crankshaft bolt [M: 9]	32	3.2	23.0
Oil pump mounting bolt	10	1.0	7.0
Oil drain plug	28	2.8	20.0
Oil pan bolt	14	1.4	10.0
Gearshift cam stopper bolt	10	1.0	7.0
Gearshift cam stopper plate bolt	10	1.0	7.0
Gearshift arm stopper bolt	19	1.9	13.5
Clutch sleeve hub nut	150	15.0	108.5
Exhaust pipe bolt	23	2.3	16.5
Muffler mounting bolt	23	2.3	16.5
Engine sprocket nut	120	12.0	87.0
Speedometer sensor rotor bolt	13	1.3	9.5
Engine mounting bolt [L: 185 and 205]	79	7.9	57.0
[L: 45 and 55]	55	5.5	40.0
Engine mounting thrust adjuster	10	1.0	7.0
Engine mounting thrust adjuster lock nut	45	4.5	32.5
Engine mounting pinch bolt [L: 30]	23	2.3	16.5
Generator rotor bolt	120	12.0	87.0
Oil cooler union bolt	73	7.3	53.0
Oil pressure regulator	28	2.8	20.0
Oil pressure switch	14	1.4	10.0
Oil gallery plug [M: 16]	40	4.0	29.0
[M: 14]	28	2.8	20.0
Starter clutch cover cap	11	1.1	8.0
Valve timing inspection cap	23	2.3	16.5
Cooling fan thermo-switch	17	1.7	12.5
Engine coolant temperature gauge	9	0.9	6.5

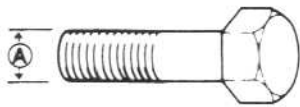
**CHASSIS**

Item	N·m	kg-m	lb-ft
Steering stem head nut	90	9.0	65.0
Steering stem lock nut	80	8.0	58.0
Front fork upper clamp bolt	23	2.3	16.5
Front fork lower clamp bolt	23	2.3	16.5
Front fork cap bolt	35	3.5	25.5
Front axle	100	10.0	72.5
Front axle pinch bolt	23	2.3	16.5
Handlebar set bolt	10	1.0	7.0
Handlebar clamp bolt	23	2.3	16.5
Front brake master cylinder mounting bolt	10	1.0	7.0
Front brake caliper mounting bolt	39	3.9	28.0
Front brake caliper housing bolt	23	2.3	16.5
Brake hose union bolt (Front & Rear)	23	2.3	16.5
Caliper air bleeder valve (Front & Rear)	8	0.8	6.0
Brake disc bolt (Front)	23	2.3	16.5
Brake disc bolt (Rear)	35	3.5	25.5
Rear brake caliper mounting bolt	26	2.6	19.0
Rear brake caliper housing bolt	33	3.3	24.0
Rear brake master cylinder mounting bolt	10	1.0	7.0
Rear brake master cylinder rod lock nut	18	1.8	13.0
Front footrest bracket mounting bolt	23	2.3	16.5
Swingarm pivot nut	100	10.0	72.5
Swingarm pivot lock nut	90	9.0	65.0
Torque link bolt and nut (front)	28	2.8	20.0
Torque link bolt and nut (Rear)	35	3.5	25.5
Rear shock absorber bracket nut	115	11.5	83.0
Rear shock absorber mounting bolt/nut (Upper & Lower)	50	5.0	36.0
Rear cushion lever/rod mounting nut	78	7.8	56.5
Rear axle nut	100	10.0	72.5
Rear sprocket nut	60	6.0	43.5

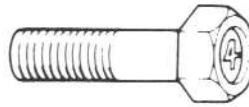
## TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

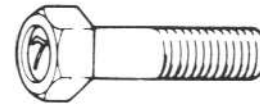
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1.5	0.15	1.0	2	0.2	1.5
5	3	0.3	2.0	5	0.5	3.5
6	6	0.6	4.5	10	1.0	7.0
8	13	1.3	9.5	23	2.3	16.5
10	29	2.9	21.0	50	5.0	36.0
12	45	4.5	32.5	85	8.5	61.5
14	65	6.5	47.0	135	13.5	97.5
16	105	10.5	76.0	210	21.0	152.0
18	160	16.0	115.5	240	24.0	173.5



Conventional bolt



"4" marked bolt



"7" marked bolt

## SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26.5 (1.04)	—
	EX.	22 (0.87)	—
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	—
	EX.	0.20–0.30 (0.008–0.012)	—
Valve guide to valve stem clearance	IN.	0.010–0.037 (0.0004–0.0015)	—
	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.	4.475–4.490 (0.1762–0.1768)	—
	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.)	INNER	—	36.80 (1.45)
	OUTER	—	39.8 (1.57)
Valve spring tension (IN. & EX.)	INNER	4.5 kg (9.9 lbs) at length 29.9 mm (1.18 in)	—
	OUTER	18.3 kg (40.34 lbs) at length 33.4 mm (1.31 in)	—

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Cam height	IN.	E-33	33.992–34.048 (1.3383–1.3405)	33.70 (1.327)
		Others	35.992–36.048 (1.4170–1.4192)	35.70 (1.406)
	EX.	E-33 and others	35.292–35.348 (1.3894–1.3917)	35.00 (1.378)
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.	24.012–24.025 (0.9454–0.9459)	—	
Camshaft journal O.D.	IN. & EX.	23.959–23.980 (0.9433–0.9441)	—	
Camshaft runout	IN. & EX	—	0.10 (0.004)	
Cam chain pin (at arrow "3")	15th pin		—	
Cylinder head distortion	—		0.20 (0.008)	

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Compression pressure	1 100–1 500 kPa (11–15 kg/cm <sup>2</sup> ) (156–213 psi)		900 kPa (9 kg/cm <sup>2</sup> ) (128 psi)
Compression pressure difference	—		200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.025–0.035 (0.0010–0.0014)		—
Cylinder bore	65.500–65.515 (2.5787–2.5793)		Nicks or Scratches
Piston diam.	65.470–65.485 (2.5775–2.5781) Measure at 15 mm (0.6 in) from the skirt end.		65.380 (2.5740)
Cylinder distortion	—		0.20 (0.008)
Piston ring free end gap	1st	Approx. 6.9 (0.27)	5.5 (0.22)
	2nd	Approx. 8.7 (0.34)	6.9 (0.27)
Piston ring end gap	1st	0.10–0.25 (0.004–0.010)	0.5 (0.02)
	2nd	0.10–0.25 (0.004–0.010)	0.5 (0.02)
Piston ring to groove clearance	1st	—	0.18 (0.007)
	2nd	—	0.18 (0.007)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01–1.03 (0.040–0.041)	—
	2nd	0.81–0.83 (0.032–0.033)	—
	Oil	1.51–1.53 (0.059–0.060)	—
Piston ring thickness	1st	0.97–0.99 (0.038–0.039)	—
	2nd	0.77–0.79 (0.030–0.031)	—
Piston pin bore	15.002–15.008 (0.5906–0.5909)		15.030 (0.5917)
Piston pin O.D.	14.993–15.000 (0.5903–0.5906)		14.980 (0.5898)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	15.010–15.018 (0.5909–0.5913)		15.040 (0.5921)
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.	31.976–32.000 (1.2589–1.2598)		—
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	1.911 (72/41 x 37/34)	—
Oil pressure (at 60°C, 140°F)	Above 200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi) Below 500 kPa (5.0 kg/cm <sup>2</sup> , 71 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	2.92–3.08 (0.115–0.121)	—
Drive plate claw width	—	13.0 (0.51)
Clutch release screw	¼ turn back	—
Driven plate distortion	—	0.10 (0.004)
Clutch spring free height	—	2.9 (0.11)

**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	OFF→ON	Approx. 105°C (221°F)	—
	ON→OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 9.56 kΩ	—
	100°C (212°F)	Approx. 2.78 kΩ	—
	120°C (248°F)	Approx. 0.69 kΩ	—
	130°C (266°F)	Approx. 0.50 kΩ	—

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.756 (72/41)	—	
Final reduction ratio	2.812 (45/16)	—	
Gear ratios	Low	2.866 (43/15)	—
	2nd	2.058 (35/17)	—
	3rd	1.650 (33/20)	—
	4th	1.428 (30/21)	—
	5th	1.285 (27/21)	—
	Top	1.181 (26/22)	—
Shift fork to groove clearance	0.1–0.3 (0.004–0.012)	0.50 (0.020)	
Shift fork groove width	5.0–5.1 (0.197–0.201)	—	
Shift fork thickness	4.8–4.9 (0.189–0.193)	—	

ITEM	STANDARD		LIMIT
Drive chain	Type	RK525SMOZ <sub>2</sub>	—
	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	20–30 (0.8–1.2)		—
Gearshift lever height	55 (2.2)		—

**CARBURETOR**

ITEM	SPECIFICATION		
	E-02,04,25,34	E-03,18,28,39	E-17,22
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	34E0	34E1	34E2
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min ... E-03,28,39 1 300 <sup>+100</sup> <sub>-50</sub> r/min ... E-18	1 200 ± 100 r/min
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	No.1: # 125 Nos.2,3&4: # 122.5	Nos.1&4: # 125 Nos.2&3: # 122.5	No.1: # 125 Nos.2,3&4: # 122.5
Jet needle (J.N.)	5DH18-52-3	5DH20-53	5DH18-52-3
Needle jet (N.J.)	P-0	P-0M	P-0
Throttle valve (Th.V.)	# 100	←	←
Pilot jet (P.J.)	# 12.5	# 12.5	# 12.5
Pilot screw (P.S.)	PRE-SET (Nos.1&4: 3-½ turns back) (Nos.2&3: 2-½ turns back)	PRE-SET	PRE-SET (Nos.1&4: 3-¼ turns back) (Nos.2&3: 2-¼ turns back)
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←	←

**CARBURETOR**

ITEM	SPECIFICATION		
	E-33	E-24	E-37
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	34E3	34E4	34E5
Idle r/min.	1 300 ± 100 r/min.	1 200 ± 100 r/min.	←
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	Nos.1&4: # 125 Nos.2&3: # 122.5	No.1: # 125 Nos.2,3&4: # 122.5	←
Jet needle (J.N.)	5DH20-53	5DH18-52-3	←
Needle jet (N.J.)	P-0M	P-0	←



**8-37 SERVICING INFORMATION**

ITEM	SPECIFICATION		
	E-33	E-24	E-37
Throttle valve (Th.V.)	# 100	←	←
Pilot jet (P.J.)	# 12.5	# 12.5	←
Pilot screw (P.S.)	PRE-SET	PRE-SET (Nos.1&4: 3-1/4 turns back) (Nos.2&3: 2-1/4 turns back)	PRE-SET (Nos.1&4: 3-1/2 turns back) (Nos.2&3: 2-1/2 turns back)
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←	←

**ELECTRICAL**

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	5° B.T.D.C. at 1 500 r/min.		
Firing order	1-2-4-3		
Spark plug	Type	NGK: CR9E ND: U27ESR-N	
	Gap	0.7–0.8 (0.028–0.031)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	Approx. 50–200 Ω (B–G)		Tester range: Resistance (Ω)
Ignition coil resistance	Primary	0.07–0.11 Ω (⊕ tap– ⊖ tap)	Tester range: Resistance (Ω)
	Secondary	4.5–6.9 kΩ (Plug cap– ⊖ tap)	Tester range: Resistance (Ω)
Generator coil resistance	Approx 0.3 Ω (B–B)		Tester range: Resistance (Ω)
Generator Max. output	Approx. 378 W at 5 000 r/min.		
Generator no-load voltage (When engine is cold)	More than 55 V (AC) at 5 000 r/min.		
Regulated voltage	13.5–15.0 V at 5 000 r/min.		
Starter relay resistance	3–5 Ω		
Battery	Type designation	FTX9-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	E-04,17,18,22,25,34,37,39	E-02
Headlight	HI	55 x 2	55	55 x 2
	LO	50 x 2	55	50 x 2
Position light			5	←
Tail/Brake light		5/21 x 2	←	←
Turn signal light		21	←	←
Tachometer light		1.7	←	←
Speedometer light		1.7	←	←
Turn signal indicator light		1.7	←	←
High beam indicator light		1.7	←	←
Neutral indicator light		1.7	←	←
Fuel indicator right		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 (0.117 ± 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	14.000 – 14.043 (0.5512 – 0.5529)		—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)		—
Master cylinder piston diam.	Front	13.957 – 13.984 (0.5495 – 0.5506)		—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)		—
Brake caliper cylinder bore	Leading	Front	27.000 – 27.076 (1.0630 – 1.0660)	—
			30.230 – 30.306 (1.1902 – 1.1931)	—
	Trailing	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Leading	Front	26.920 – 26.970 (1.0598 – 1.0618)	—
			30.150 – 30.200 (1.1870 – 1.1890)	—
	Trailing	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—

**8-39 SERVICING INFORMATION**

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 x MT 3.50	—
	Rear	J17 x MT 5.50	—
Tire size	Front	120/70 ZR17 (58W)	—
	Rear	180/55 ZR17 (73W)	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Front fork stroke		120 (4.7)		—
Front fork spring free length		—		251 (9.9)
Front fork oil level		110 (4.3)		—
Front fork spring adjuster		4th groove from top		—
Front fork damping force adjuster	Rebound	E-03,28,33	At standard position (about 1 1/8 turns out)	—
		Others	At standard position (about 1 turn out)	—
Rear shock absorber gas pressure (N <sub>2</sub> gas)		1 000 kPa (10 kg/cm <sup>2</sup> , 142 psi)		—
Rear shock absorber spring set length		193.9 (7.6)		—
Rear shock absorber damping force adjuster	Rebound	At punch mark (about 1 1/8 turns out)		—
		E-03,28,33	At punch mark (about 7/8 turn out)	—
	Compression	Others	At punch mark (about 3/4 turn out)	—
Rear wheel travel		133 (5.2)		—
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	250	2.50	36

## FUEL + OIL + ENGINE COOLANT

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	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	18.0 L (4.8/4.0 US/lmp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/lmp qt)	
	Filter change	2 800 ml (3.0/2.5 US/lmp qt)	
	Overhaul	3 500 ml (3.7/3.1 US/lmp qt)	
Front fork oil type	Frok oil # 10		
Front fork oil capacity (each leg)	533 ml (18.0/18.8 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	2 550 ml (2.7/2.2 US/lmp qt)		



# **EMISSION CONTROL INFORMATION**

## **CONTENTS**

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## EMISSION CONTROL CARBURETOR COMPONENTS

GSX-R600 motorcycles are equipped with precision, manufactured carburetors for emission level control.

These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

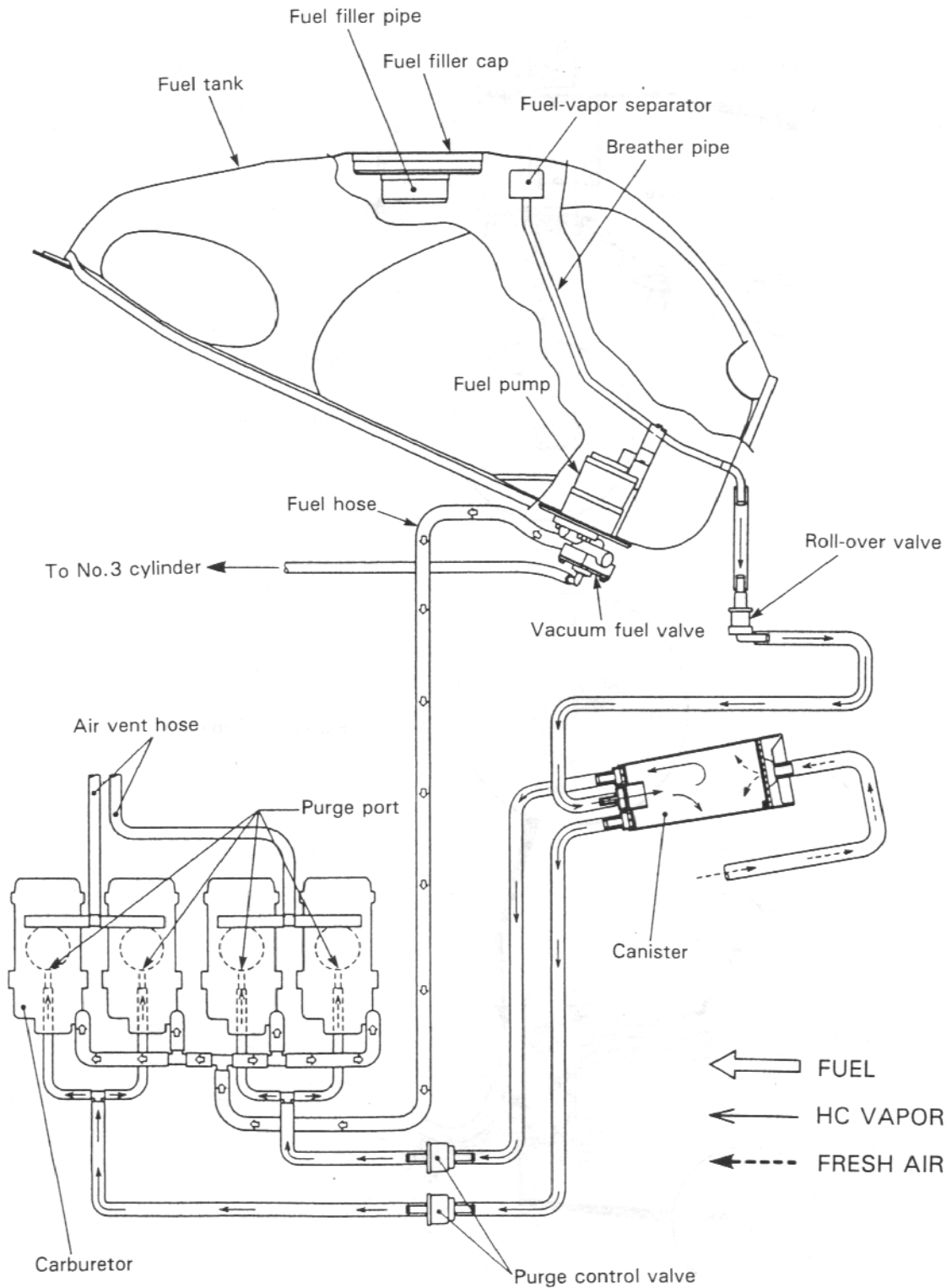
Conventional Figures Used on Standard Tolerance Jet Components	<b>1 2 3 4 5 6 7 8 9 0</b>
Emission Type Figures Used on Close Tolerance Jet Components	<i>1 2 3 4 5 6 7 8 9 0</i>

The carburetor specifications for the emission-controlled GSX-R600 are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
34E3 (California model only)	Nos.1and4: # <i>125</i> Nos.2and3: # <i>122.5</i>	<i>P-0M</i>	5DH20-53	<i>12.5</i>	PRE-SET DO NOT ADJUST
34E1	Nos.1and4: # <i>125</i> Nos.2and3: # <i>122.5</i>	<i>P-0M</i>	5DH20-53	<i>12.5</i>	

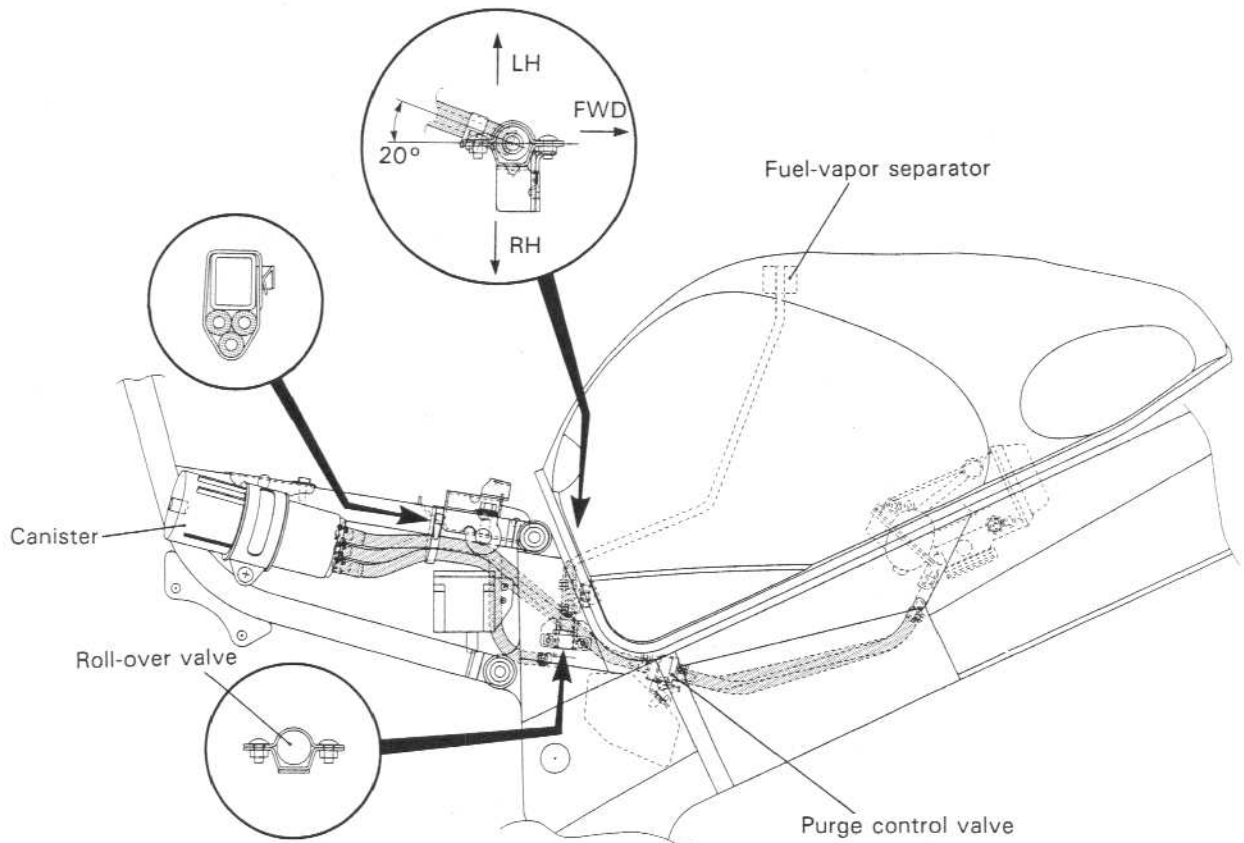
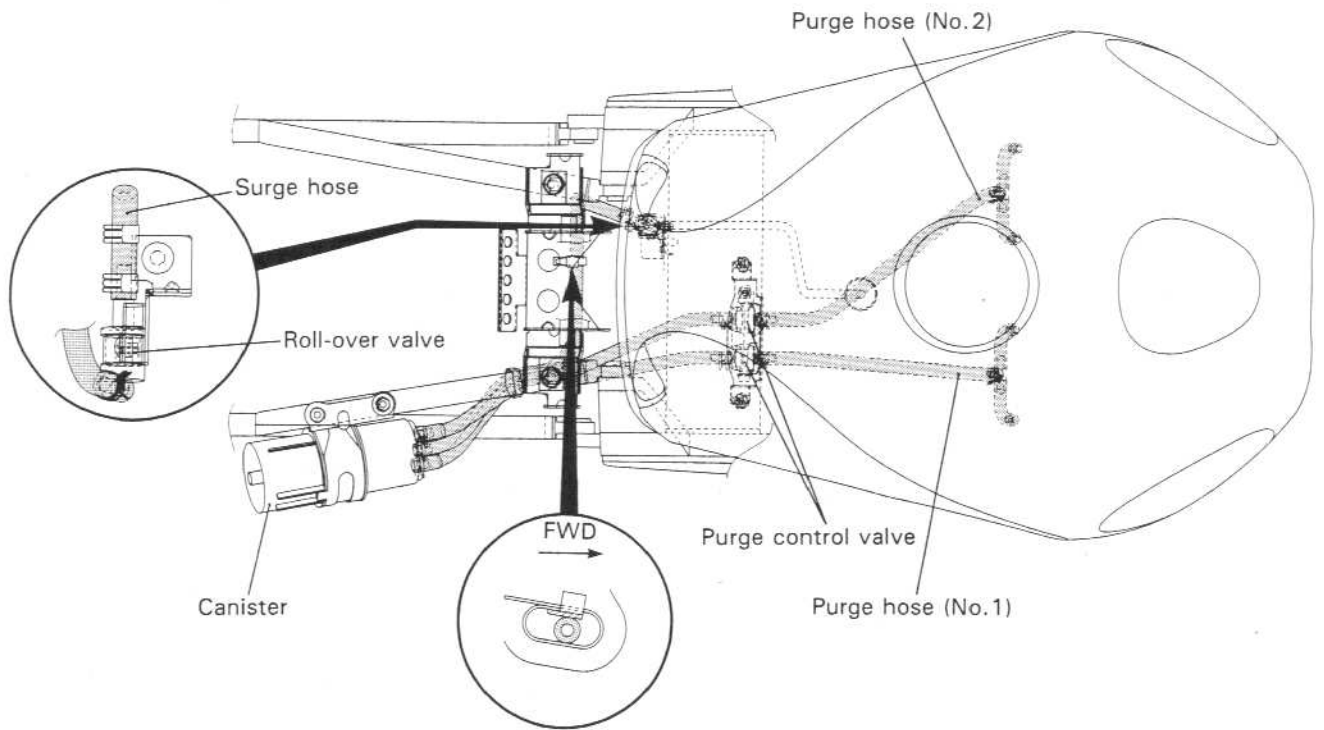
Adjusting, interfering with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If unable to effect repairs, contact the distributors representative for further technical information and assistance.

# EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)





# CANISTER HOSE ROUTING (California model only)



## EVAPORATIVE EMISSION CONTROL SYSTEM INSPECTION (California model only)

- Remove the seats and frame cover. (Refer to pages 6-3 and -4.)
- Remove the fuel tank.

### HOSES

Inspect the hoses for wear or damage.  
Inspect that the hoses are securely connected.

### CANISTER

Inspect the canister for damage of the body.

### PURGE CONTROL VALVE

Inspect the purge control valve for damage of the body.  
Inspect the purge control valve operation as following procedure.

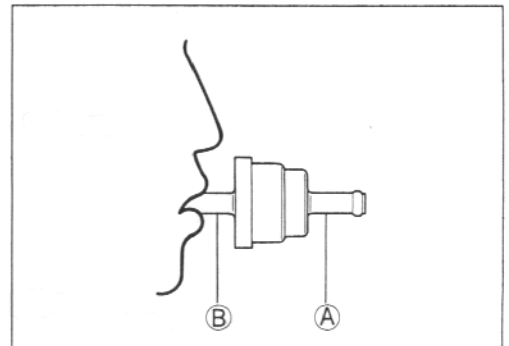
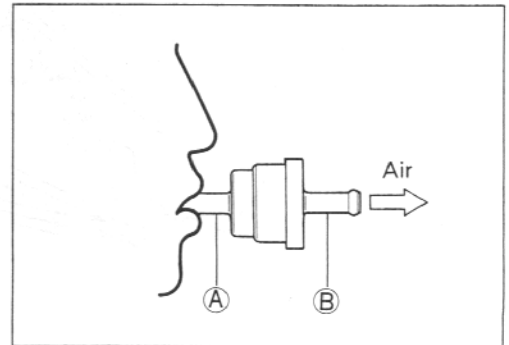
- When air pressure is applied to the purge control valve from the side **(A)**, there should be flow out through the purge control valve.
- When air pressure is applied to the purge control valve from the side **(B)**, there should be no flow through the purge control valve.
- If operation differs from that listed above, the purge control valve must be replaced.

#### **▲ WARNING**

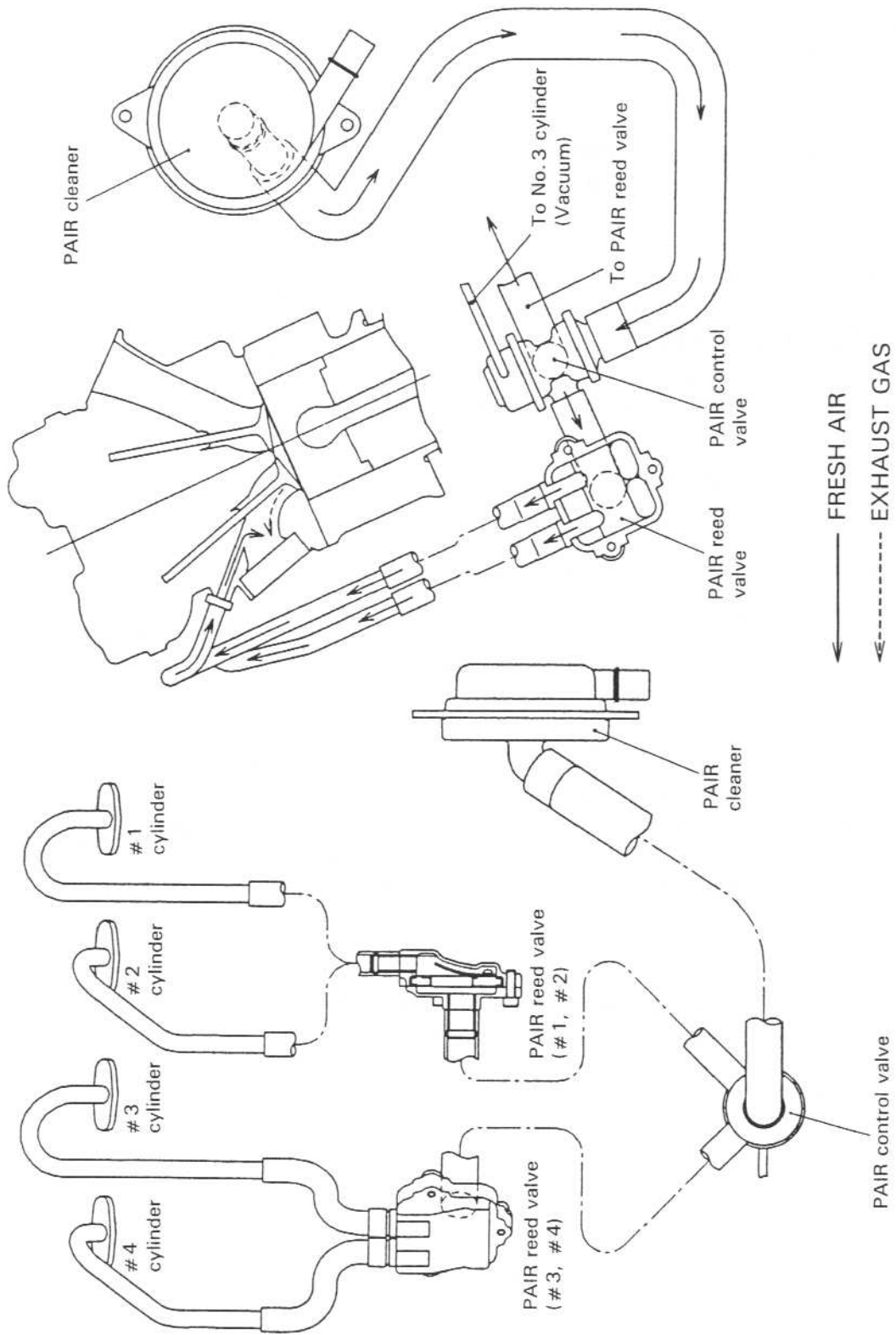
Gasoline and gasoline vapor is toxic. A small amount of fuel is remaining in the purge control valve, when checking it.  
Do not swallow the fuel when blowing the purge control valve.

#### NOTE:

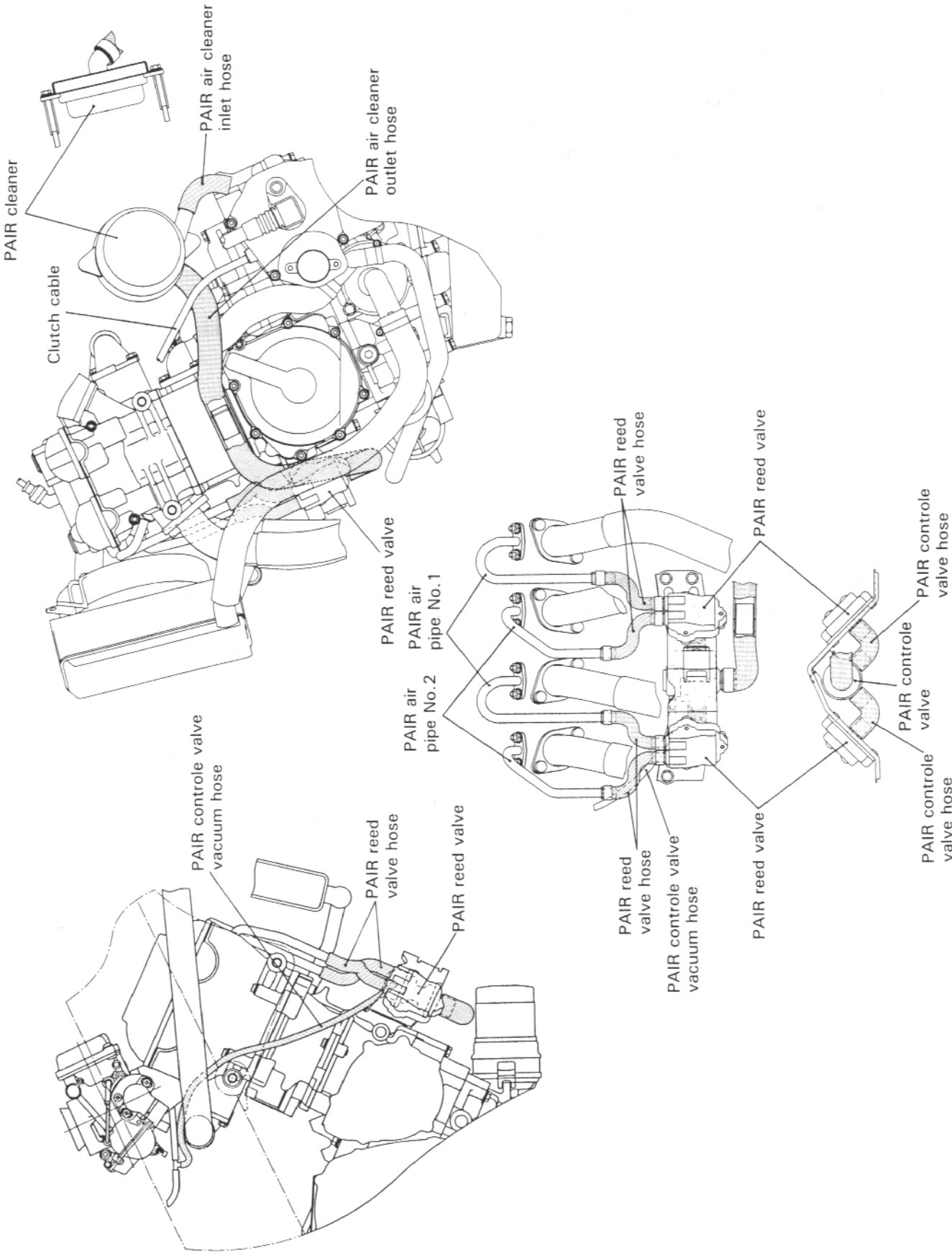
When the purge control valve is connected to the hose, the side **(B)** should be pointed toward the carburetor side, and the side **(A)** should be pointed toward the canister side.



# PAIR (AIR SUPPLY) SYSTEM DIAGRAM (California model only)



# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING (California model only)



## PAIR (AIR SUPPLY) SYSTEM INSPECTION (California model only)

- Remove the seat and the lower fairing. (Refer to pages 6-2 and -3.)
- Remove the fuel tank.

### HOSES AND PIPES

Inspect the hoses and pipes for wear or damage.  
Inspect the hoses and pipes are securely connected.

### PAIR CLEANER

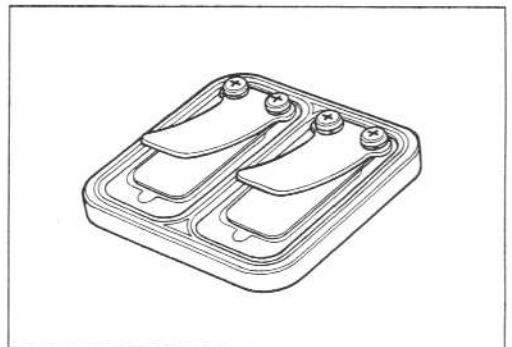
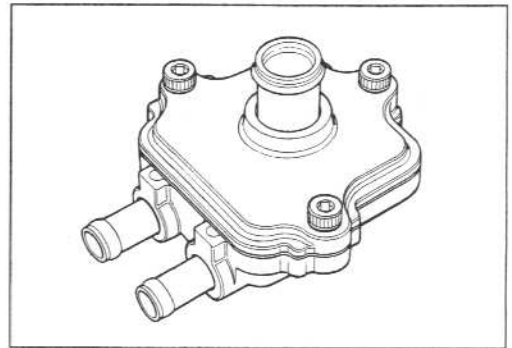
Inspect the PAIR cleaner for damage of the body.

### PAIR REED VALVE

- Remove and separate the PAIR reed valve assembly.
- Remove the reed valve.

Inspect the reed valve.

If the carbon deposit is found in the reed valve, replace the PAIR reed valve assembly with a new one.

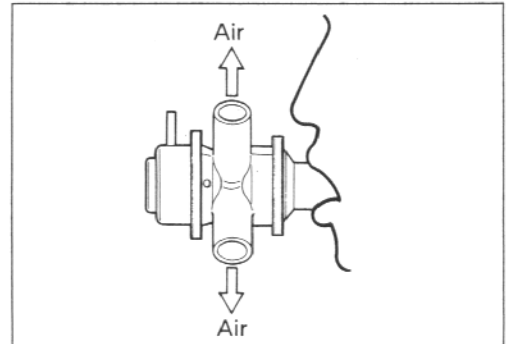
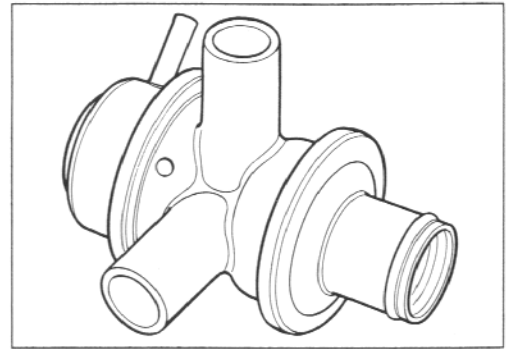


## PAIR CONTROL VALVE

- Remove the PAIR control valve.

Inspect the PAIR control valve for damage of the body. Inspect the PAIR control valve operation as following procedure.

Blow the air inlet port of the control valve as shown in the illustration. If air does not flow out, replace the control valve with a new one.



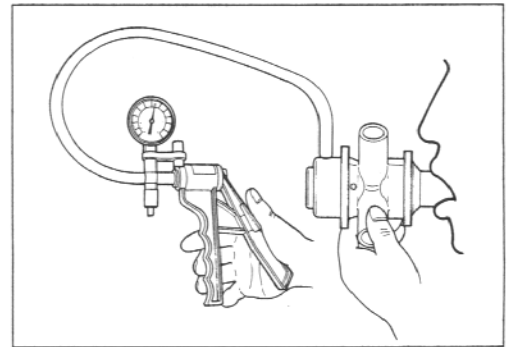
Connect the vacuum pump to the vacuum port of the control valve as shown in the illustration. Apply negative pressure slowly to the control valve and blow the above manner. If air does not become flow out within the specification, the PAIR control valve is normal condition. If the PAIR control valve does not function within the specification, replace it with a new one.

Negative pressure range: 47 – 73 kPa (350 – 550 mmHg)

 09917-47910: Vacuum pump gauge

### CAUTION

Use a hand operated vacuum pump. Avoid applying high negative pressure to prevent the PAIR control valve damage.





# GSX-R600W ('98-MODEL)

## FOREWORD

*This chapter describes service data, service specifications and servicing procedures which differ from those of the GSX-R600V ('97-model).*

**NOTE:**

- Any differences between the GSX-R600V ('97-model) and GSX-R600W ('98-model) in specifications and service data are indicated with an asterisk mark (\*).
- Please refer to the chapters 1 through 9 for details which are not given in this chapter.

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# GENERAL INFORMATION

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## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length .....	2 100 mm (82.7 in) .....	For E-18,22,24,39 models
	2 065 mm (81.3 in) .....	For other models
Overall width .....	720 mm (28.3 in)	
Overall height .....	*1 165 mm (45.9 in)	
Wheelbase .....	*1 385 mm (54.5 in)	
Ground clearance .....	130 mm (5.1 in)	
Seat height .....	830 mm (32.7 in)	
Dry mass .....	175 kg (385 lbs) .....	For E-18,33,39 models
	174 kg (383 lbs) .....	For other models

### ENGINE

Type .....	Four-stroke, Liquid-cooled, DOHC, TSCC
Number of cylinders .....	4
Tappet clearance, IN .....	0.10–0.20 mm (0.004–0.008 in)
EX .....	0.20–0.30 mm (0.008–0.012 in)
Bore .....	65.5 mm (2.579 in)
Stroke .....	44.5 mm (1.752 in)
Piston displacement .....	600 cm <sup>3</sup> (36.6 cu. in)
Compression ratio .....	12.0 : 1
Carburetor .....	MIKUNI BDSR36
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 .....	1.756 (72/41)
Gear ratios, Low .....	2.866 (43/15)
2nd .....	*2.052 (39/19)
3rd .....	1.650 (33/20)
4th .....	1.428 (30/21)
5th .....	1.285 (27/21)
Top .....	1.181 (26/22)
Final reduction ratio .....	*2.875 (46/16)
Drive chain .....	RK525SMOZ <sub>2</sub> , 108 links

**CHASSIS**

Front suspension .....	*Telescopic, coil spring, oil damped, spring pre-load fully adjustable, rebound damping force and compression damping force fully adjustable.
Rear suspension .....	Link type system, gas/oil damped, coil spring, spring pre-road fully adjustable, rebound damping force and compression damping force fully adjustable.
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	133 mm (5.2 in)
Steering angle .....	30° (right & left)
Caster .....	24°
Trail .....	96 mm (3.8 in)
Turning radius .....	3.1 m (10.2 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Disc brake
Front tire size .....	120/70 ZR17 (58W), tubeless
Rear tire size .....	180/55 ZR17 (73W), tubeless

**ELECTRICAL**

Ignition type .....	Electronic ignition (CDI)
Ignition timing .....	5° B.T.D.C. at 1 500 r/min
Spark plug .....	N.G.K. CR9E, DENSO U27ESR-N
Battery .....	12V 28.8 kC (8 Ah)/10HR
Generator .....	Three-phase A.C. Generator
Main fuse .....	30A
Fuse .....	15/15/10/15/10A
Headlight .....	12V 55/50W × 2 ..... E-02,03,24,28,33 models 12V 55W + 12V 55W ..... For other models
Turn signal light .....	12V 21W
Front position light .....	12V 5W ..... Except for E-03,24,28,33 models
Brake light/Taillight .....	12V 21/5W × 2
Speedometer light .....	12V 1.7W
Tachometer light .....	12V 1.7W
Neutral indicator light .....	12V 1.7W
High beam indicator light .....	12V 1.7W
Turn signal indicator light .....	12V 1.7W
Fuel indicator light .....	12V 1.7W

**CAPACITIES**

Fuel tank, including reserve .....	18.0 L (4.8/4.0 US/Imp gal)
Engine oil, oil change .....	2 600 ml (2.7/2.3 US/Imp qt)
with filter change .....	2 800 ml (3.0/2.5 US/Imp qt)
overhaul .....	3 500 ml (3.7/3.1 US/Imp qt)
Coolant .....	2 550 ml (2.7/2.2 US/Imp qt)
Front fork oil (each leg) .....	533 ml (18.0/18.8 US/Imp oz)

Specifications marked with asterisks (\*) are exclusive to GSX-R600W.

These specifications are subject to change without notice.

## COUNTRY AND AREA CODES

The following codes stand for the applicable country(-ies) and area(-s).

CODE	COUNTRY/AREA
E-02	U.K.
E-03	U.S.A. (except California)
E-04	France
E-18	Switzerland
E-22	Germany
E-24	Australia
E-25	Netherlands
E-28	Canada
E-33	California (U.S.A.)
E-34	Italy, Belgium (E-21), Spain (E-53)
E-39	Austria

# PERIODIC MAINTENANCE

## CONTENTS

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<b>PERIODIC MAINTENANCE CHART</b> .....	<b>10-2-1</b>
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## PERIODIC MAINTENANCE SCHEDULE

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

Item	Interval	km	1 000	6 000	12 000	18 000	24 000
		miles	600	4 000	7 500	11 000	15 000
		months	1	6	12	18	24
Air cleaner element			–	I	I	R	I
Spark plugs			–	I	R	I	R
Tappet clearance			–	–	–	–	I
Fuel hoses			–	I	I	I	I
			Replace every four years.				
Engine oil			R	R	R	R	R
Engine oil filter			R	–	–	R	–
Engine idle speed			I	I	I	I	I
Throttle cable play			I	I	I	I	I
*Carburetor synchronization			I (CA. only)	–	I	–	I
*Evaporative emission control system (California model only)			–	–	I	–	I
			Replace vapor hoses every four years.				
*PAIR (AIR SUPPLY) system (California model only)			–	–	I	–	I
Clutch			–	I	I	I	I
Radiator hose			–	I	I	I	I
Engine coolant			Replace every two years.				
Drive chain			I	I	I	I	I
			Clean and lubricate every 1 000 km (600 miles).				
Brakes			I	I	I	I	I
Brake hose			–	I	I	I	I
			Replace every four years.				
Brake fluid			–	I	I	I	I
			Replace every two years.				
Tires			–	I	I	I	I
Steering			I	–	I	–	I
Front forks			–	–	I	–	I
Rear suspension			–	–	I	–	I
Exhaust pipe bolts and muffler bolts			T	–	T	–	T
Chassis bolts and nuts			T	T	T	T	T

**NOTE:** I=Inspect and clean, adjust, replace or lubricate as necessary; R=Replace; T=Tighten

**NOTE:**

\* Item marked with asterisk (\*) is exclusive to GSX-R600W.

\* (California model only) and (CA. only) means that the items or the maintenance interval is to be applied only for the California model.

## MAINTENANCE AND TUNE-UP PROCEDURES

This section describes the servicing procedures for each Periodic Maintenance item which differ from those of the GSX-R600V ('97-model).

For details other than the following items, refer to the section 2 of this manual.

### THROTTLE CABLE PLAY

Inspect initially at 1 000 km (600 miles, 1 month) and every 6 000 km (4 000 miles, 6 months) thereafter.

#### MINOR ADJUSTMENT

Adjust the throttle cable play  $\text{\textcircled{A}}$  with the following three steps.

First step:

- Loosen the lock nut  $\text{\textcircled{3}}$  of the throttle returning cable  $\text{\textcircled{1}}$  and turn in the adjuster  $\text{\textcircled{4}}$  fully into the threads.

Second step:

- Loosen the lock nut  $\text{\textcircled{5}}$  of the throttle pulling cable  $\text{\textcircled{2}}$ .
- Turn the adjuster  $\text{\textcircled{6}}$  in or out until the throttle cable play  $\text{\textcircled{A}}$  should be 2.0–4.0 mm (0.08–0.16 in) at the throttle grip.
- Tighten the lock nut  $\text{\textcircled{5}}$  while holding the adjuster  $\text{\textcircled{6}}$ .

Third step:

- While holding the throttle grip at the fully closed position, slowly turn out the adjuster  $\text{\textcircled{4}}$  of the throttle returning cable  $\text{\textcircled{1}}$  to feel resistance.
- Tighten the lock nut  $\text{\textcircled{3}}$  while holding the adjuster  $\text{\textcircled{4}}$ .

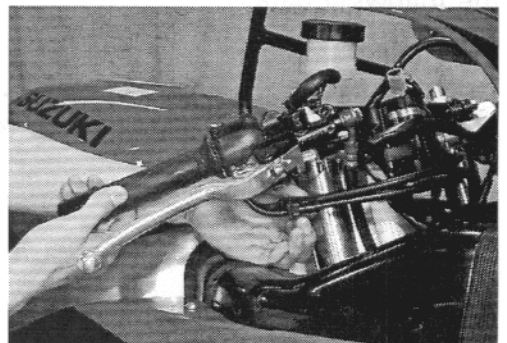
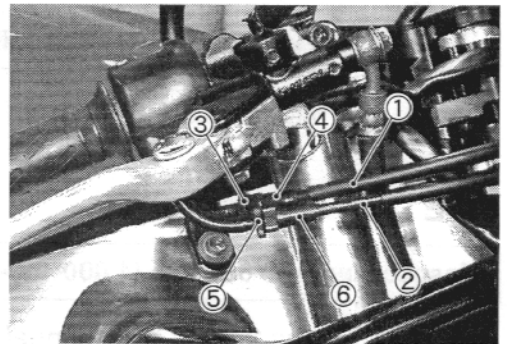
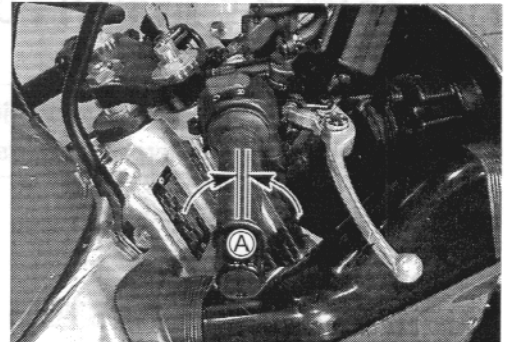
Throttle cable play  $\text{\textcircled{A}}$ : 2.0–4.0 mm (0.08–0.16 in)

#### **⚠ 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.

#### NOTE:

Major adjustment can be made by the throttle body side adjuster. Refer to the page 4-27 of this manual for details.





## **CARBURETOR SYNCHRONIZATION**

(California model only)

Inspect initially at 1 000 km (600 miles, 1 month) and every 12 000 km (7 500 miles, 12 months) thereafter.

(Other model)

Inspect every 12 000 km (7 500 miles, 12 months).

Refer to the pages 4-28 to 4-30 of this manual for details.

## **EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)**

Inspect every 12 000 km (7 500 miles, 12 months).

Replace vapor hoses every 4 years.

Refer to the pages 9-2 to 9-4 of this manual for details.

## **PAIR (AIR SUPPLY) SYSTEM (California model only)**

Inspect every 12 000 km (7 500 miles, 12 months).

Refer to the pages 10-9-1 to 10-9-3.

## **TIRE**

Inspect every 6 000 km (4 000 miles, 6 months).

Refer to the page 2-18 of this manual for details other than the following data.

### **TIRE TYPE**

DUNLOP (Front ..... \*D207FL, rear ..... \*D207L)

PIRELLI (Front ..... \*MTRO1s corsa, rear ..... \*MTRO2s corsa)

# ENGINE

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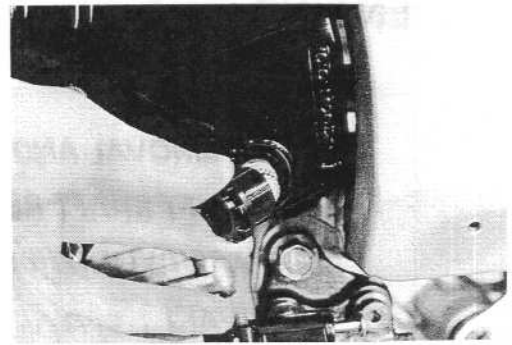
## ENGINE REMOVAL AND INSTALLATION

### GEARSHIFT SHAFT BUSHING

When installing the bushing onto the gearshift shaft, clean it and gearshift shaft.

**NOTE:**

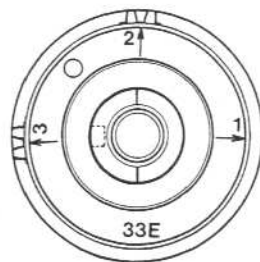
*It is not necessary to apply grease to the bushing and gearshift shaft.*



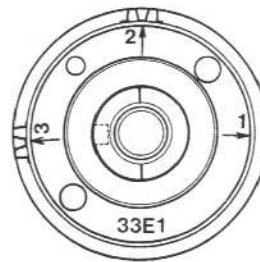
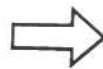
## CAMSHAFT/CYLINDER HEAD

### CAMSHAFT

**3A**



'97-MODEL



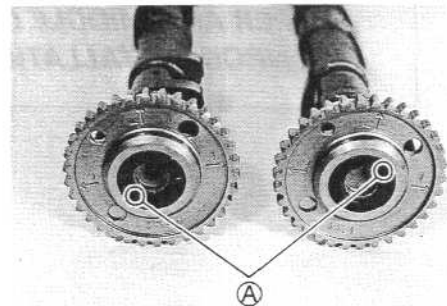
'98-MODEL

*NOTE: When installing this type camshafts, use the cam chain holder set (09921-31810) to prevent the cam chain disengagement.*

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

The following each I.D. code (A) on the camshaft is identified by the stamped marks.

Country	Intake cams	Exhaust cams
California	D	J
Others	H	J

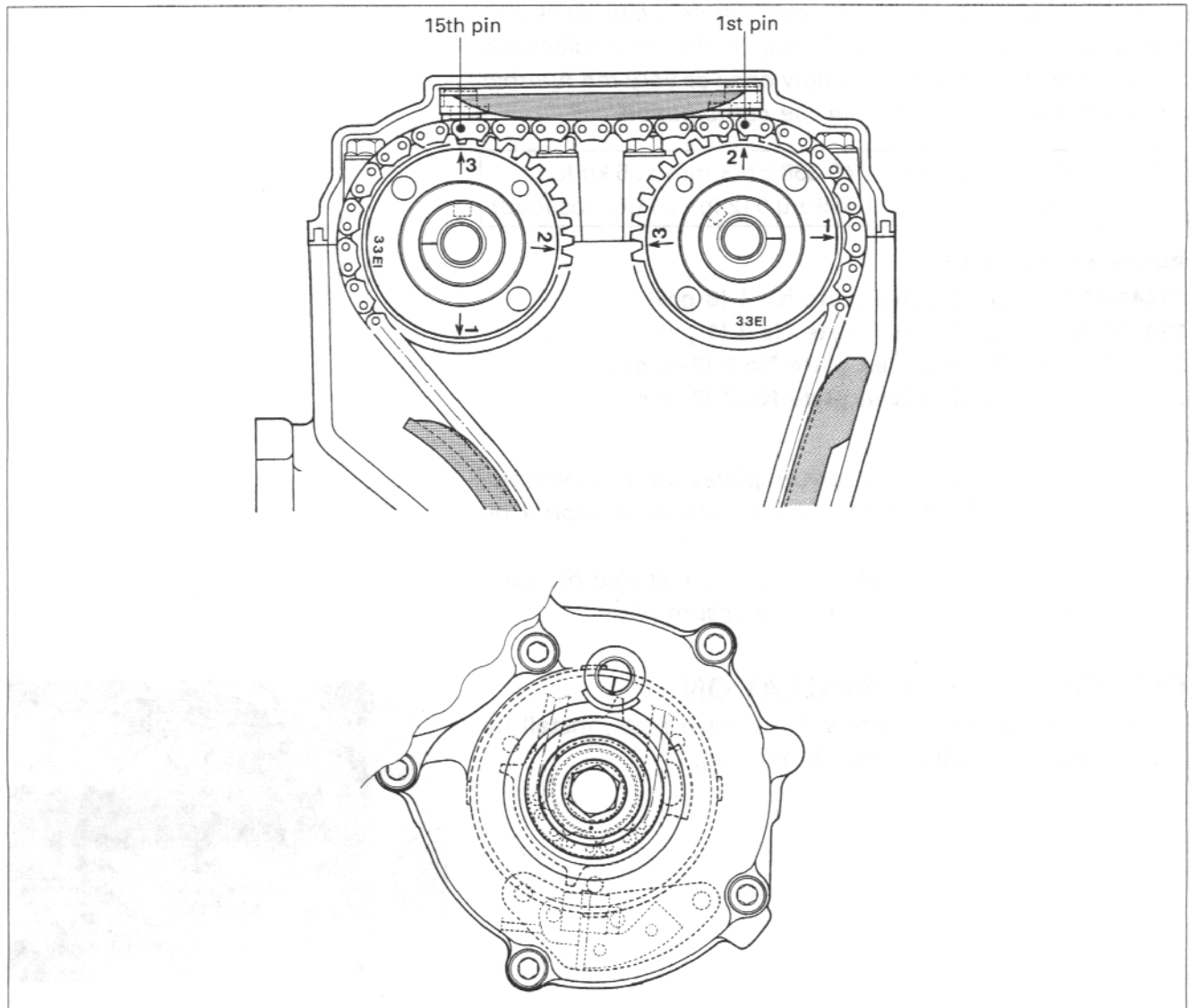
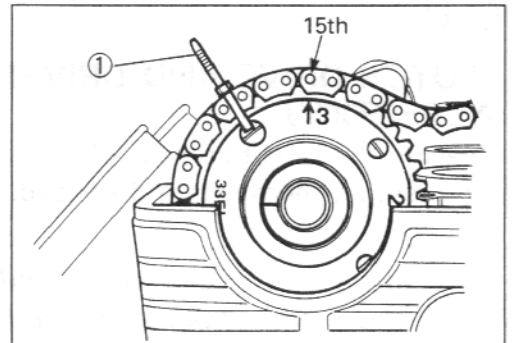
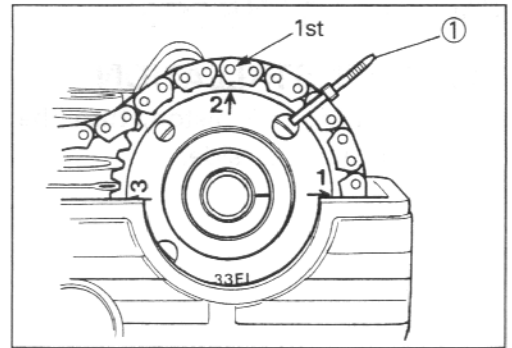


## CAMSHAFT/CYLINDER HEAD INSTALLATION

For details other than the following, refer to the section 3A of this manual.

### NOTE:

Bind the cam chain and each cam sprocket with a proper wire clamp ① to prevent the cam chain disengagement while installing the camshaft journal holders. Be careful not to disturb the crankshaft until the camshaft journal holders and cam chain tension adjuster are secured.

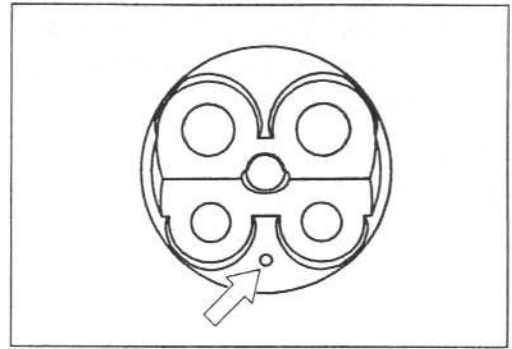


## CYLINDER/PISTON

3B

### PISTON INSTALLATION

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



## CLUTCH

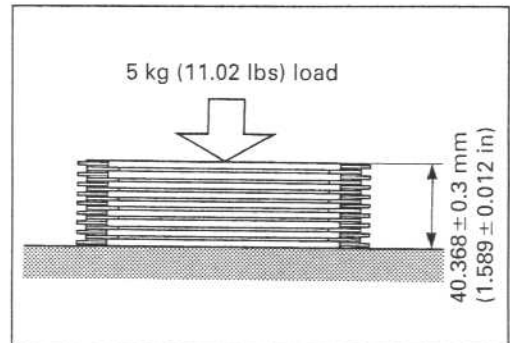
3C

### CLUTCH DRIVE AND DRIVEN PLATES INSPECTION

Measure the total thickness of drive and driven plates by compressing them with a 5 kg load.

**NOTE:**

Wipe off the engine oil from the drive and driven plates with a clean rag and put them one by one on the surface plate. If the total thickness of drive and driven plates is not within specification, measure each drive plate thickness and driven plate distortion. To adjust the total thickness, replace the clutch plates with new ones or vary the number of clutch driven plate No.2 in the combination.



Total thickness of drive and driven plates	40.368 ± 0.3 mm at 5 kg load (1.589 ± 0.012 in at 11.02 lbs load)
--	--

### PARTS SUPPLY DATA

21441-31E50: Clutch drive plate No.1 (8 pcs)

21442-31E20: Clutch drive plate No.2 (1 pc)

21451-31E00: Clutch driven plate No.1 (5-8 pcs)

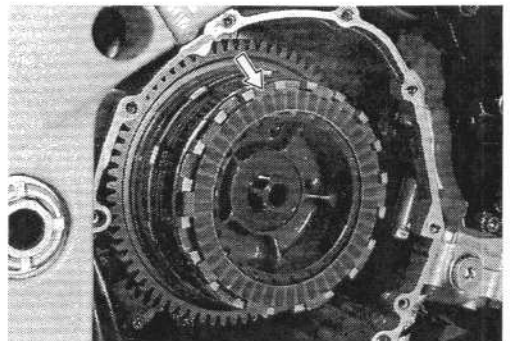
21451-31E10: Clutch driven plate No.2 (3-0 pcs)

**NOTE:**

- \* The No.1 and No.2 clutch driven plates are 8 in number. The number of the clutch driven plate No.2 should be used within 3 pcs.
- \* The clutch driven plate No.2 should be installed between third to sixth position from the pressure plate.

### CLUTCH PLATES INSTALLATION

When installing the outermost No.1 drive plate, install its claw to the other slits of clutch housing.

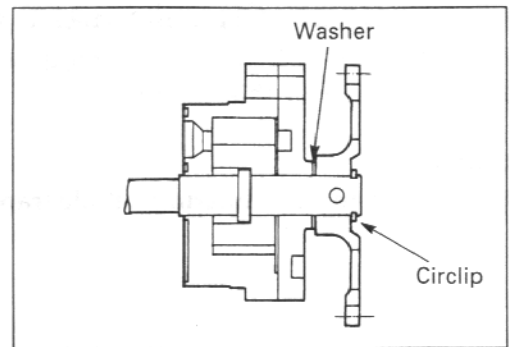


## ENGINE LUBRICATION SYSTEM

**3D**

### OIL PUMP INSTALLATION

- Install the oil pump driven gear washer at the position as shown.



## STARTER SYSTEM/SIGNAL GENERATOR

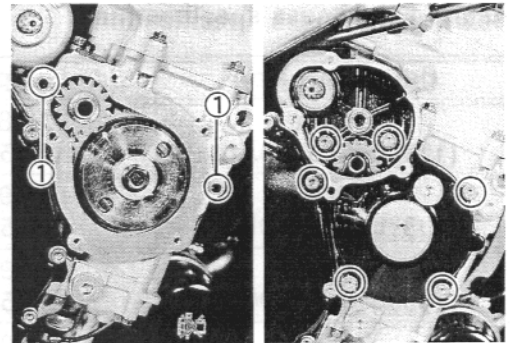
**3E**

### STARTER CLUTCH COVER INSTALLATION

- When installing the starter clutch cover, install the dowel pins ① as shown and tighten its bolts securely.

**▲ CAUTION**

Use a new gasket to prevent oil leakage.



## CRANKCASE/TRANSMISSION/ CRANKSHAFT/CONROD

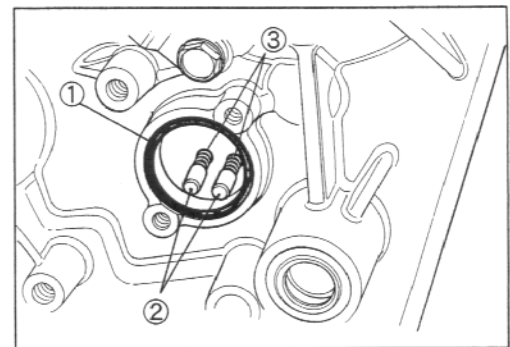
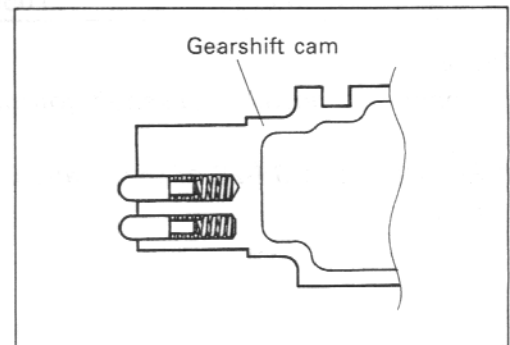
**3H**

### NEUTRAL POSITION INDICATOR SWITCH INSTALLATION

- Before installing the neutral position indicator switch, install the O-ring ①, switch contacts ② and springs ③ as shown.

**▲ CAUTION**

Use a new O-ring ① to prevent oil leakage.


**NOTE:**

Apply grease to the O-ring.

**FAH** 99000-25030: SUZUKI SUPER GREASE "A"

## CRANKCASE-CRANKSHAFT BEARING SELECTION

For details other than the following data, refer to the pages 3H-24 and -25 of this manual.

### Standard

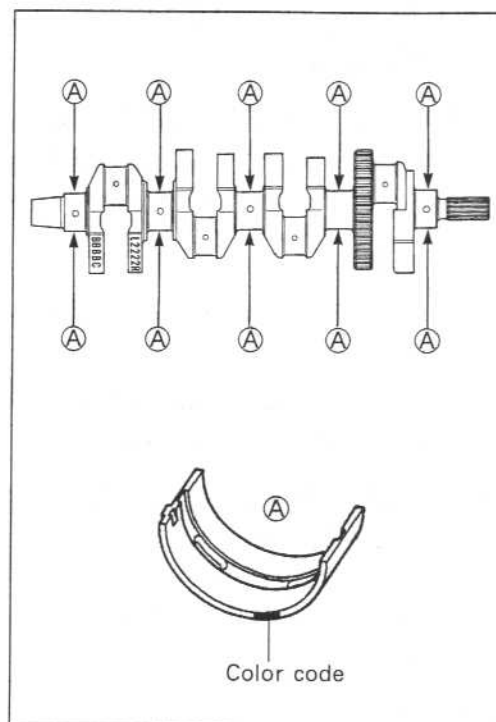
Crankshaft journal bearing oil clearance: 0.016–0.040 mm (0.0006–0.0016 in)

### Bearing thickness specification

Color (Part No.)	Specification
Green (12229-34E00-0A0)	1.488–1.492 mm (0.0586–0.0587 in)
Black (12229-34E00-0B0)	1.492–1.496 mm (0.0587–0.0589 in)
Brown (12229-34E00-0C0)	1.496–1.500 mm (0.0589–0.0591 in)
Yellow (12229-34E00-0D0)	1.500–1.504 mm (0.0591–0.0592 in)

### NOTE:

- \* Upper and lower crankshaft journal bearings are the same.
- \* Refer to page 3H-28 of this manual for bearing installation.

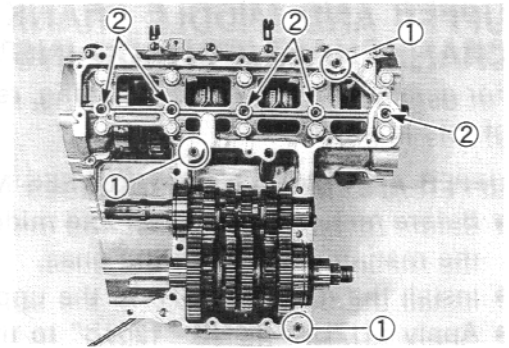


## LOWER CRANKCASE/TRANSMISSION INSTALLATION

For details other than the following, refer to the section 3H of this manual.

### LOWER AND MIDDLE CRANKCASES MATCHING

- Before matching the middle and lower crankcases, clean the mating surfaces of the ones.
- Install the dowel pins ① to the middle crankcase.
- Fit the O-rings ② to the correct positions.



### ▲ CAUTION

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

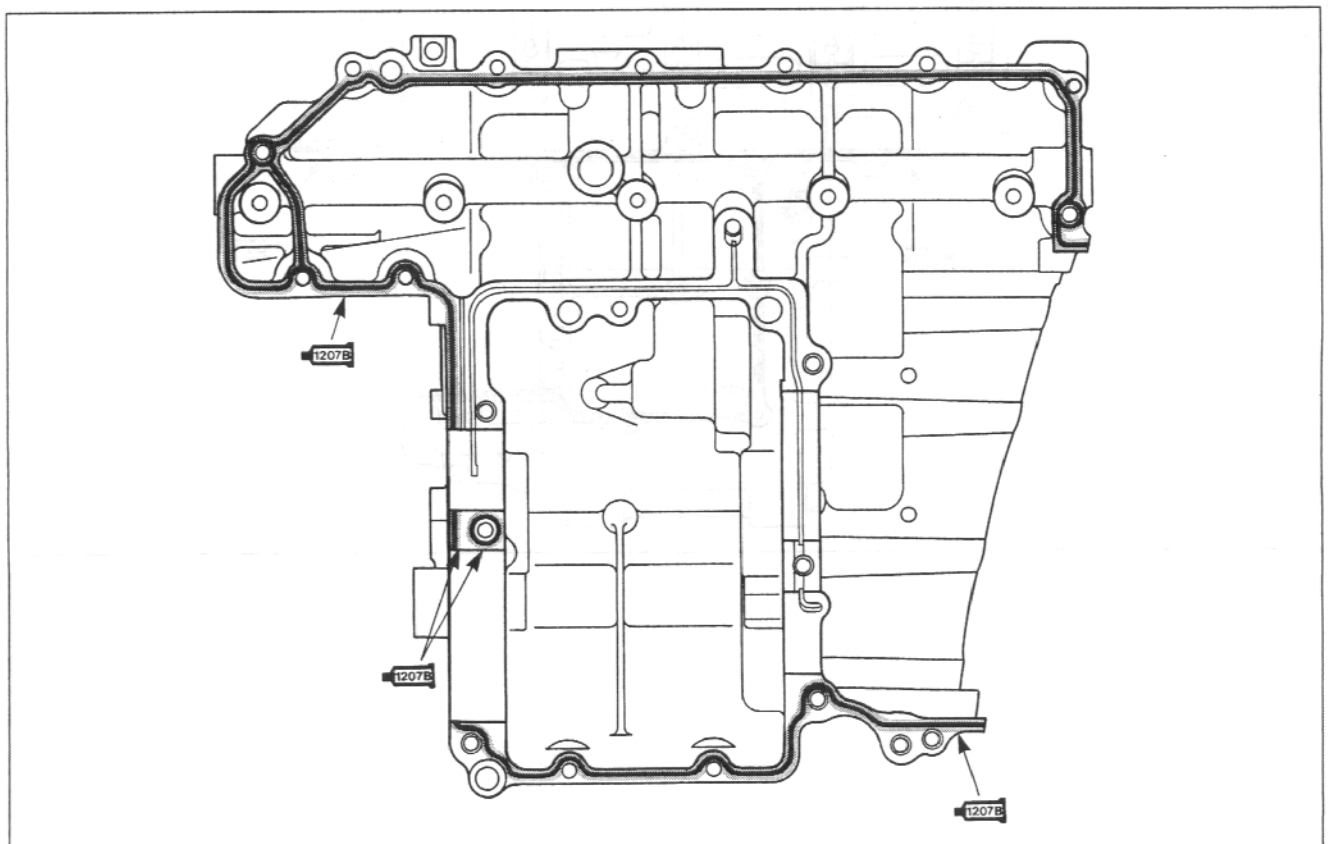
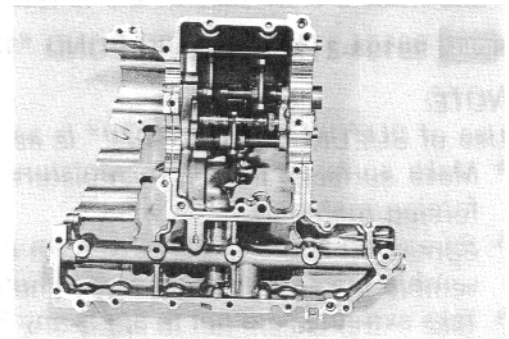
- Apply SUZUKI BOND "1207B" to the mating surface of the lower crankcase in the following procedure.

**1207B** 99104-31140: SUZUKI BOND "1207B"

#### NOTE:

Use of SUZUKI BOND "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 "1207B" to the bearing surfaces and oil passage area.
- \* Apply to cornered surface as it forms a comparatively thick film.





## UPPER AND MIDDLE CRANKCASES/ CRANKSHAFT/CONROD INSTALLATION

For details other than the following, refer to the section 3H of this manual.

### UPPER AND MIDDLE CRANKCASES MATCHING

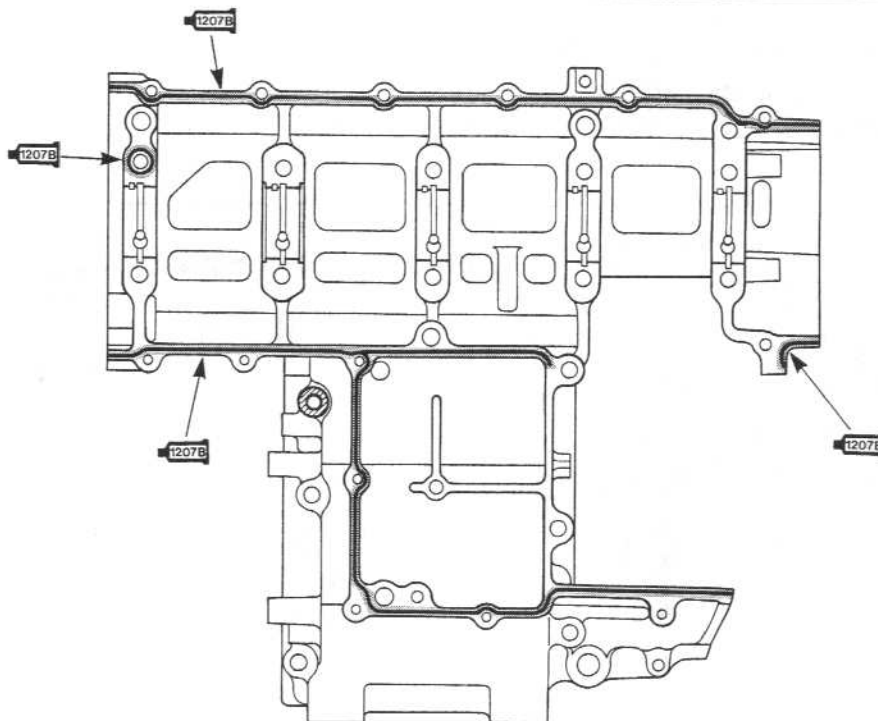
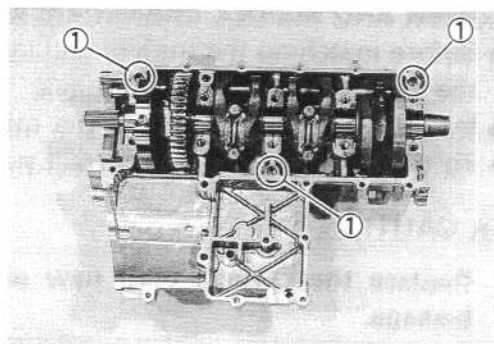
- Before matching the upper and middle crankcases, clean the mating surfaces of the ones.
- Install the dowel pins ① to the upper crankcase.
- Apply SUZUKI BOND "1207B" to the mating surface of the middle crankcase in the following procedure.

**1207B** 99104-31140: SUZUKI BOND "1207B"

#### NOTE:

Use of SUZUKI BOND "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 "1207B" to the bearing surfaces and oil passage area.
- \* Apply to cornered surface as it forms a comparatively thick film.



# FUEL AND LUBRICATION SYSTEM

## CONTENTS

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<b>SOLENOID VALVE INSPECTION</b> .....	<b>10-4-2</b>
<b>SOLENOID VALVE VOLTAGE INSPECTION</b> .....	<b>10-4-2</b>
<b>FUNNEL INSTALLATION</b> .....	<b>10-4-3</b>
<b>SOLENOID VALVE INSTALLATION</b> .....	<b>10-4-3</b>

## CARBURETOR

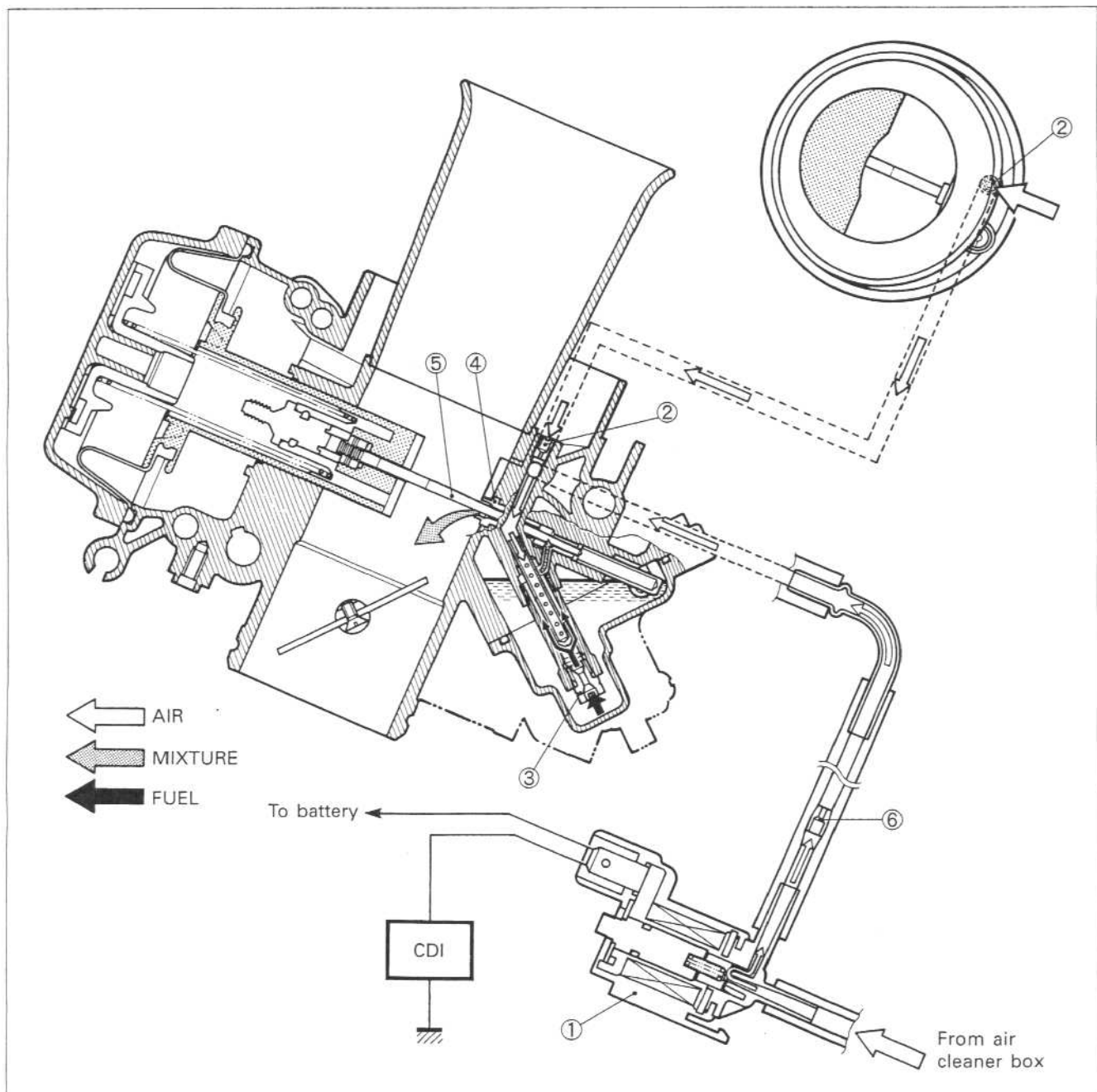
### MAIN AIR CONTROL SYSTEM

This system admits an extra charge of air into the air/fuel mixture during main system operation resulting in a leaner mixture.

When the main system is operating (with the solenoid valve ① closed), air passes only through the main air jet ② and then mixes with the fuel from the main jet ③. This mixture then passes through the clearance between the needle jet ④ and jet needle ⑤ and discharges into the venturi.

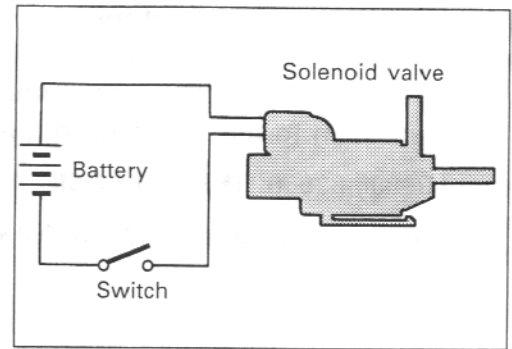
Pulses from the signal generator are sent to the CDI unit informing it of the engine speed and then the CDI unit opens or closes the solenoid valve accordingly. When the solenoid valve is open, additional air flows from the air cleaner, through the jet ⑥ in the main air control system's hose and then into the carburetor's main air passage. This increase in air causes a leaner air/fuel mixture than when the solenoid valve is closed.

Therefore, according to the engine speed, the best air/fuel mixture is obtained.



### SOLENOID VALVE INSPECTION

- Connect lead wires from the battery (12V) to the terminals in the solenoid valve coupler.
- Check the solenoid valve operation by turning the switch to ON and OFF.
- If clicks is found, it is in sound condition.



### SOLENOID VALVE VOLTAGE INSPECTION

Check the solenoid valve (for No.1 and No.4) voltage as follows.

- Connect the multi circuit tester as shown in the right illustration.

O/W                      Lg  
 (⊕ probe)              (⊖ probe)

O/W: Orange with white tracer

Lg : Light green

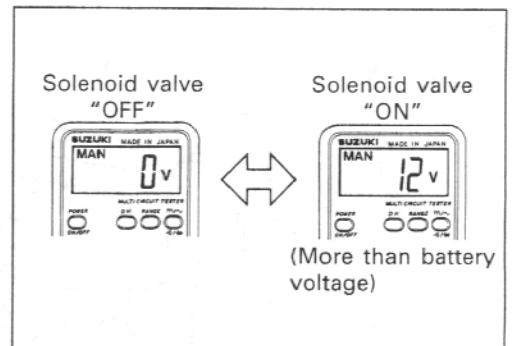
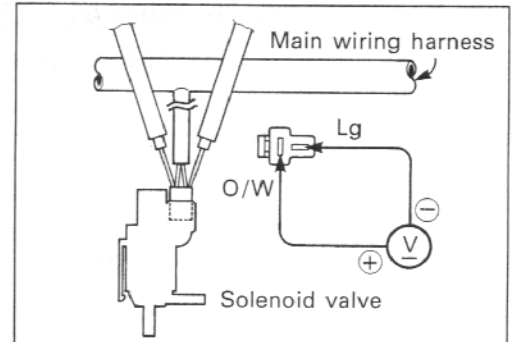
**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Voltage (  $\overline{\text{V}}$  )**

- Start up the engine and rise its speed by throttle.
- When the engine runs at the following speed, check the solenoid valve operation by tester reading.  
 If the solenoid valve does not work properly, check the connection of the couplers or replace the CDI unit.

**NOTE:**

The highest tester reading voltage while testing is more than the battery voltage.



Solenoid valve (for No.1 and No.4)	Engine speed (r/min) at:
ON	Approx. 2700
OFF	Approx. 4200
ON	Approx. 5700
OFF	Approx. 8800

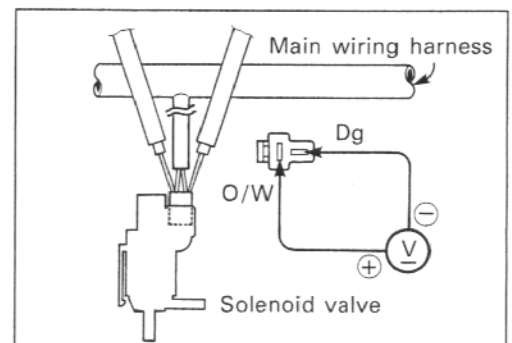
Check the solenoid valve (for No.2 and No.3) voltage in the same manner as the solenoid valve (for No.1 and No.4) voltage checking procedure.

O/W                      Dg  
 (⊕ probe)              (⊖ probe)

O/W: Orange with white tracer

Dg : Dark green


Solenoid valve (for No.2 and No.3)	Engine speed (r/min) at:
ON	Approx. 2700
OFF	Approx. 5000
ON	Approx. 7300
OFF	Approx. 10000

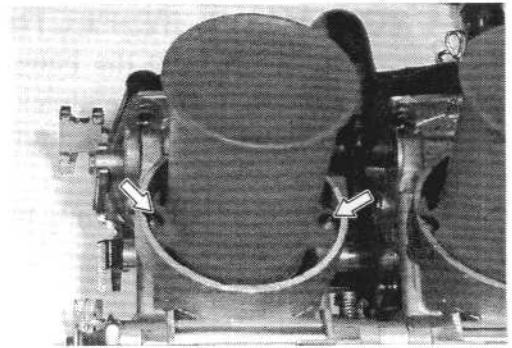


## FUNNEL INSTALLATION

- When installing the funnel, apply a small quantity of THREAD LOCK "1342" to the funnel stopper screw and tighten them to the specified torque.

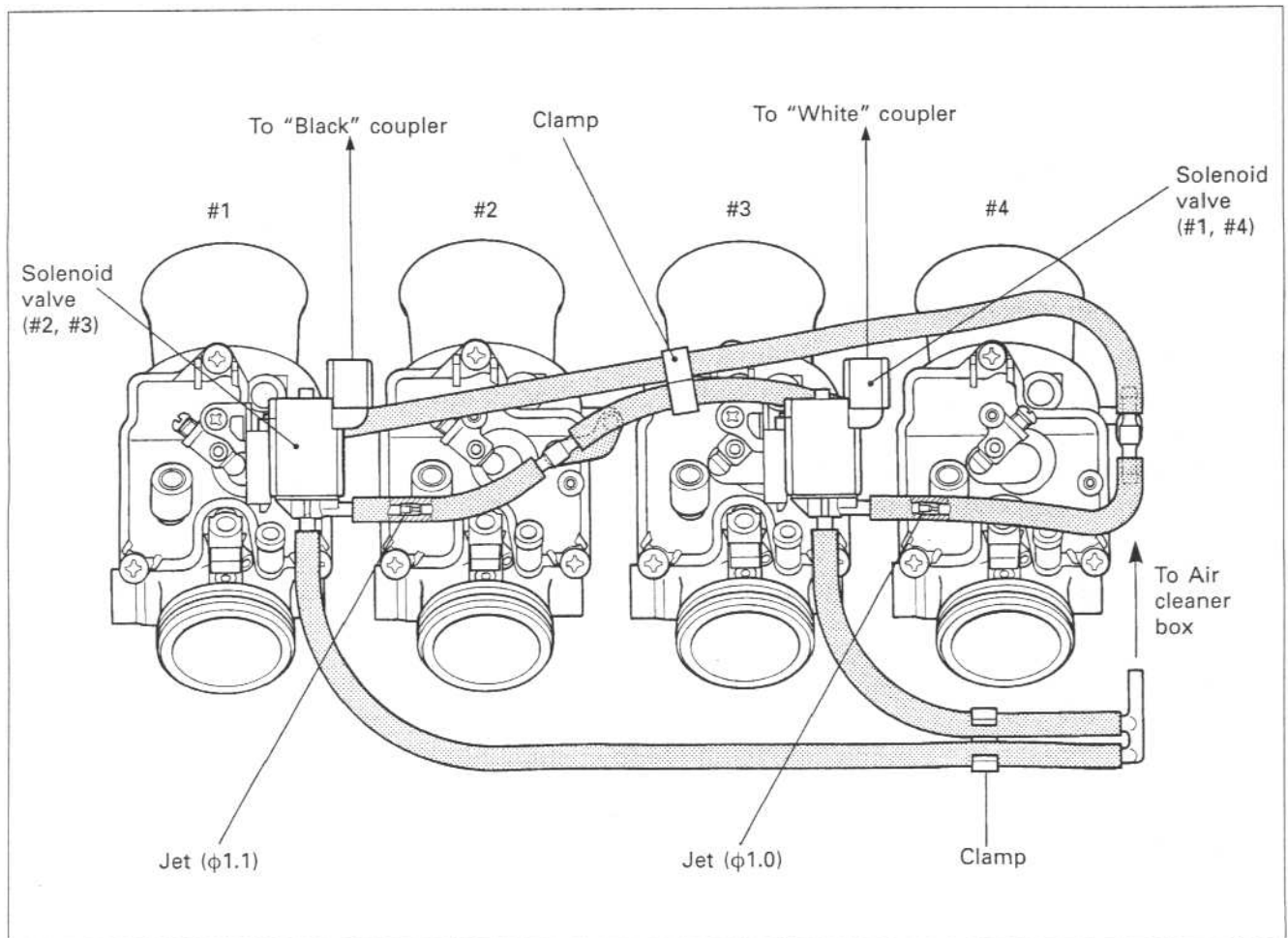
 99000-32050: THREAD LOCK "1342"

 Funnel stopper screw: 2 N·m (0.2 kg-m, 1.5 lb-ft)



## SOLENOID VALVE INSTALLATION

Install the solenoid valve and the jets as shown in the following illustration.



# CHASSIS

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<b>SUSPENSION SETTING .....</b>	<b>10-6-2</b>

## FRONT FORK

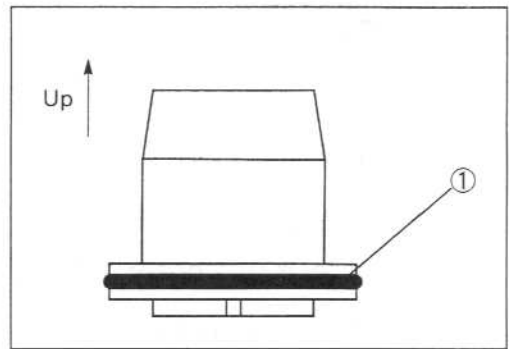
### REASSEMBLY

#### OIL LOCK PIECE

- When installing the oil lock piece, face the taper side up.

#### ⚠ CAUTION

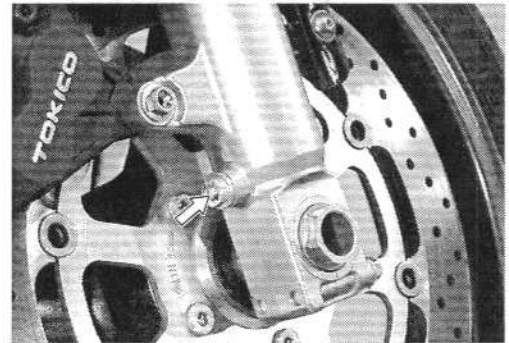
Use a new O-ring ① to prevent oil leakage.



#### COMPRESSION DAMPING FORCE ADJUSTER

- When installing the compression damping force adjuster, tighten it to the specified torque.

 Compression damping force adjuster: 18 N·m  
(1.8 kg-m, 13.0 lb-ft)



## SUSPENSION SETTING

### SPRING PRE-LOAD ADJUSTMENT

There are seven grooved lines on the side of the spring adjuster. Position 0 provides the maximum spring pre-load and position 7 provides the minimum spring pre-load. (STD position: 4)

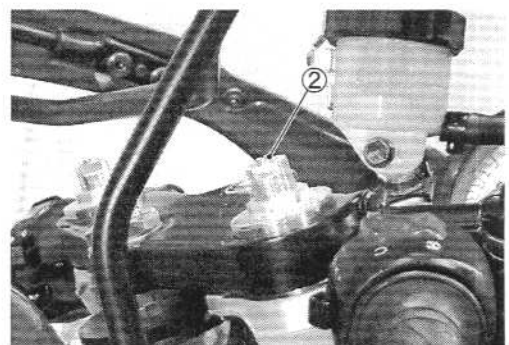
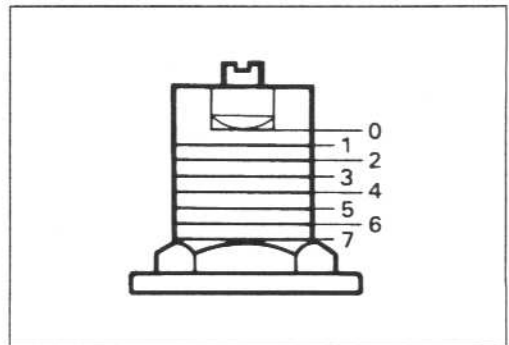
### DAMPING FORCE ADJUSTMENT

#### (Rebound side)

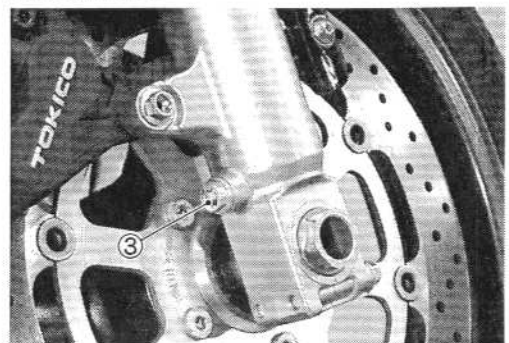
Fully turn the damping force adjuster ② clockwise. It is at stiffest position and turn it out to standard setting position. (STD position: 1-1/8 turns out)

#### (Compression side)

Fully turn the damping force adjuster ③ clockwise. It is at stiffest position and turn it out to standard setting position. (STD position: 1 turn out)



Rebound side



Compression side

### FRONT SUSPENSION SETTING TABLE

		FRONT FORK		
		Spring pre-load adjuster	Damping force adjuster	
			Rebound	Compression
Solo riding	Softer	4	1-1/4 turns out	1-1/8 turns out
	Standard	4	1-1/8 turns out	1 turn out
	Stiffer	4	1 turn out	7/8 turn out
Dual riding		4	1-1/8 turns out	1 turn out

#### ⚠ WARNING

Be sure to adjust the spring pre-load and damping force on both front fork legs equally.

## REAR SUSPENSION

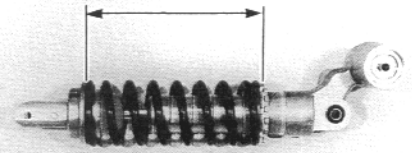
### SUSPENSION SETTING

#### SPRING PRE-LOAD ADJUSTMENT

The set length 190.4 mm (7.5 in) provides the maximum spring pre-load.

The set length 200.4 mm (7.9 in) provides the minimum spring pre-load.

STD length: 195.4 mm (7.7 in)



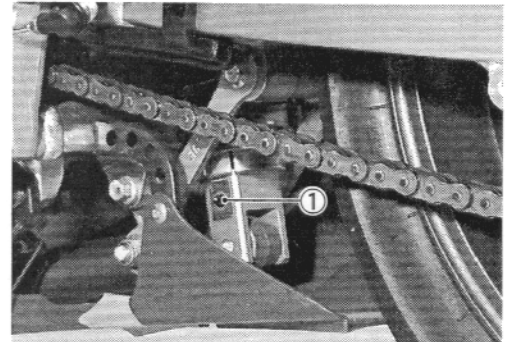
#### DAMPING FORCE ADJUSTMENT

##### (Rebound side)

Fully turn the damping force adjuster ① clockwise. It is at stiffest position and turn it out to standard setting position. (STD position is 1 turn out.)

##### (Compression side)

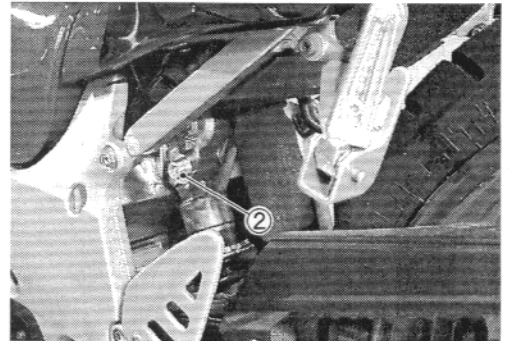
Fully turn the damping force adjuster ② clockwise. It is at stiffest position and turn it out to standard setting position. (STD position is 1-<sup>3</sup>/<sub>8</sub> turns out.)



Rebound side

#### REAR SUSPENSION SETTING TABLE

		REAR SHOCK ABSORBER		
		Spring set length	Damping force adjuster	
			Rebound	Compression
Solo riding	Softer	195.4 mm (7.7 in)	1- <sup>1</sup> / <sub>8</sub> turns out	1- <sup>5</sup> / <sub>8</sub> turns out
	Standard	195.4 mm (7.7 in)	1 turn out	1- <sup>3</sup> / <sub>8</sub> turns out
	Stiffer	195.4 mm (7.7 in)	<sup>7</sup> / <sub>8</sub> turn out	1- <sup>1</sup> / <sub>8</sub> turns out
Dual riding		195.4 mm (7.7 in)	1 turn out	1- <sup>3</sup> / <sub>8</sub> turns out



Compression side





# ELECTRICAL SYSTEM

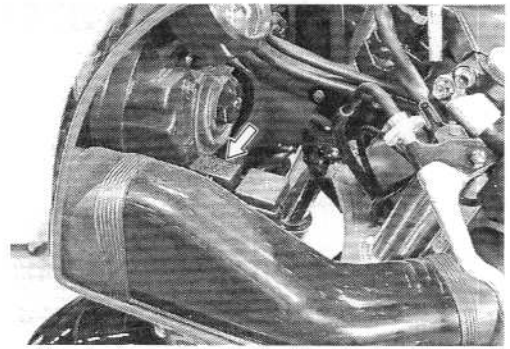
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## RELAY

### TURN SIGNAL/SIDE-STAND RELAY

The turn signal relay is combined with the side-stand relay and diode which is located at the left air intake duct.



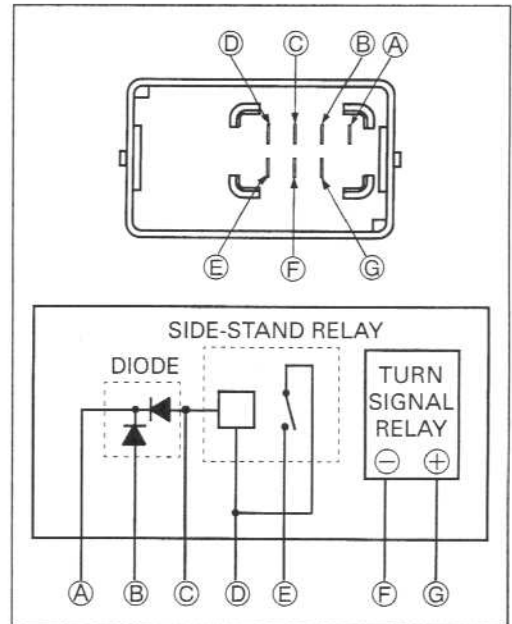
### TURN SIGNAL RELAY OPERATION CHECK

If the turn signal light does not light, inspect the bulb, turn signal switch and circuit connection.

If the bulb, turn signal switch and circuit connection checked are all right, the turn signal relay may be faulty, replace turn signal/side-stand relay with a new one.

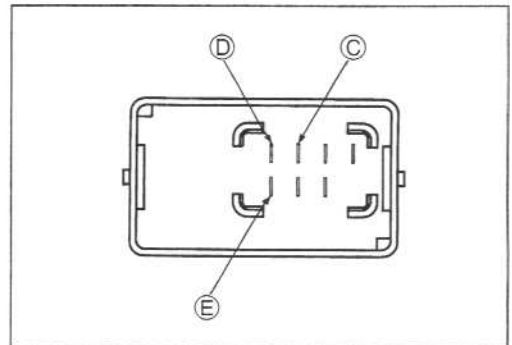
**NOTE:**

Be sure that the battery used is in fully-charged condition.



### SIDE-STAND RELAY INSPECTION

First, check the insulation between ④ and ⑤ terminals with a tester. Then apply 12 volts to ④ and ③ terminals, ⊕ to ④ and ⊖ to ③, and check the continuity between ④ and ⑤. If there is no continuity, replace turn signal/side-stand relay with a new one.



### DIODE INSPECTION

Using a multi circuit tester, measure the voltage between the terminals in the following table.

Unit: V

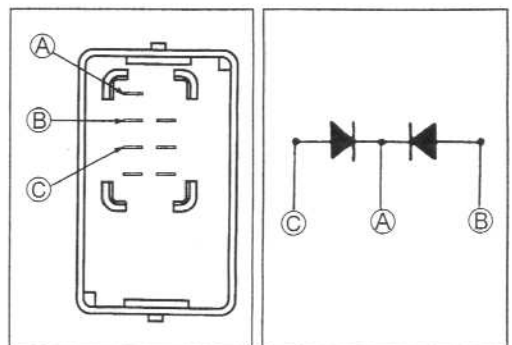
⊖ Probe of tester to:	⊕ Probe of tester to:	
	③, ②	④
③, ②	1.4-1.5	
④	0.4-0.6	

**TOOL** 09900-25008: Multi circuit tester set

**Tester knob indication: Diode test ( →← )**

**NOTE:**

If the tester reads under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.



# SERVICING INFORMATION

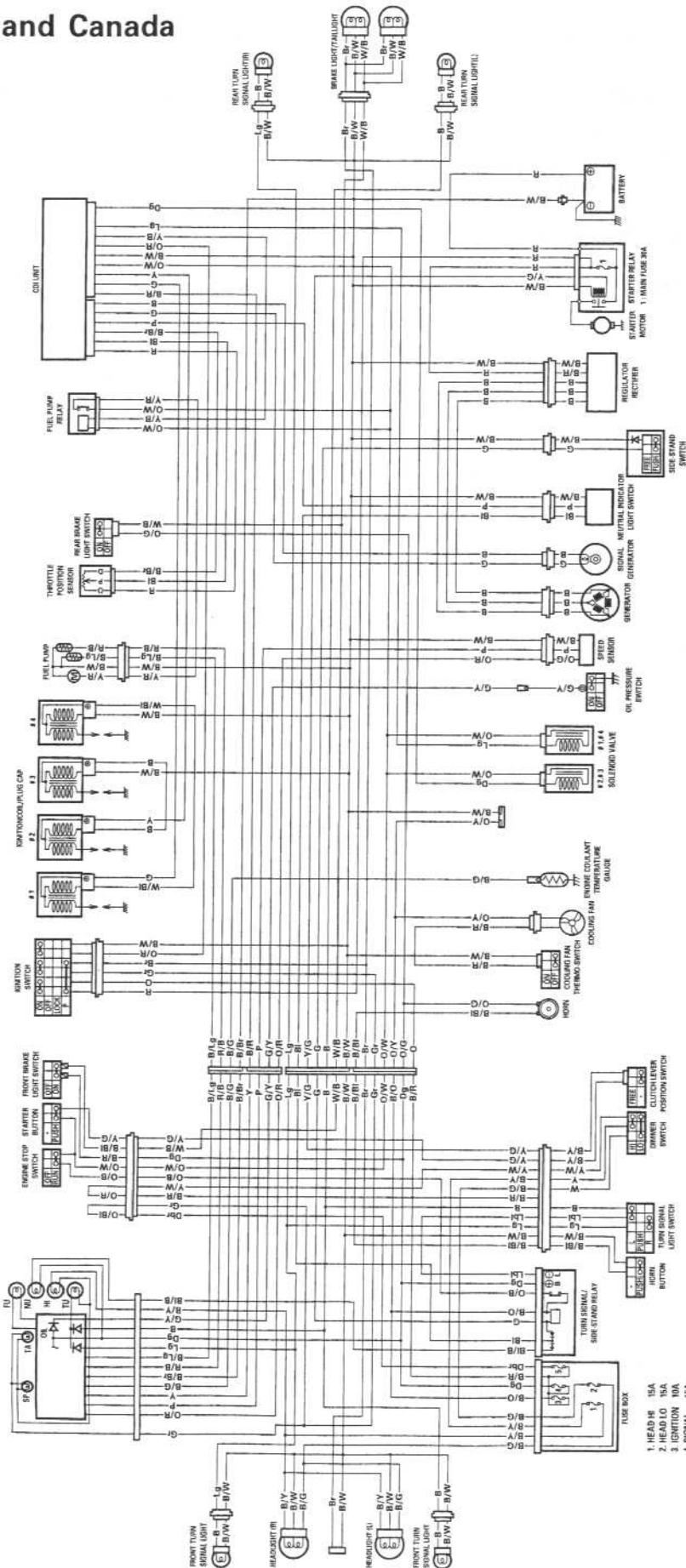
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# WIRING DIAGRAM

For U.S.A. and Canada models

- SP: SPEEDOMETER LIGHT
- TA: TACHOMETER LIGHT
- TL: TAIL LEVEL INDICATOR LIGHT
- TR: TAIL REVERSE INDICATOR LIGHT
- HL: HEAD BEAM INDICATOR LIGHT
- HT: HIGH BEAM INDICATOR LIGHT
- TU: TURN SIGNAL (IND)

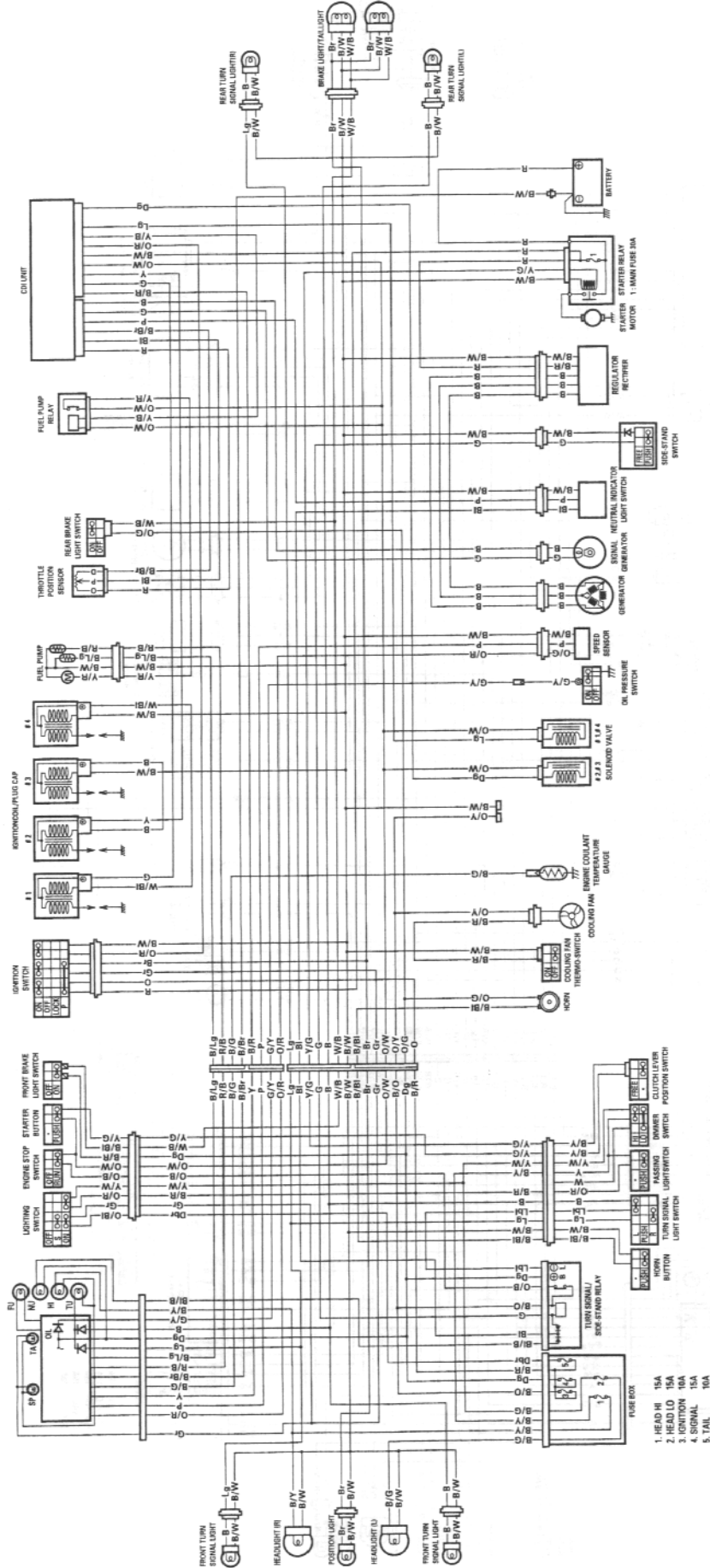


- WIRE COLORS**
- B ..... Black
  - Bl ..... Blue
  - Br ..... Brown
  - Brn ..... Dark brown
  - D ..... Dark green
  - G ..... Green
  - Gr ..... Gray
  - Lbl ..... Light blue
  - Lg ..... Light green
  - P ..... Purple
  - R ..... Red
  - Y ..... Yellow
- WIRE COLOR TRACERS**
- OR ..... Orange with Red tracer
  - OW ..... Orange with White tracer
  - OY ..... Orange with Yellow tracer
  - RB ..... Red with Black tracer
  - RW ..... Red with White tracer
  - RY ..... Red with Yellow tracer
  - WB ..... White with Black tracer
  - WY ..... White with Yellow tracer
  - YB ..... Yellow with Black tracer
  - YG ..... Yellow with Green tracer
  - YR ..... Yellow with Red tracer
  - YW ..... Yellow with White tracer
- WIRE COLOR TRACERS (continued)**
- RBl ..... Black with Blue tracer
  - RBr ..... Black with Brown tracer
  - BG ..... Black with Green tracer
  - Bk ..... Black with Light green tracer
  - OR ..... Black with Orange tracer
  - OR ..... Black with White tracer
  - BY ..... Black with Yellow tracer
  - Bg ..... Blue with Black tracer
  - Bg ..... Blue with Yellow tracer
  - Gr ..... Green with Black tracer
  - OBl ..... Orange with Blue tracer
  - OY ..... Orange with Yellow tracer

- 1 HEADLAMP
- 2 HEADLAMP
- 3 IGNITION
- 4 SIGNAL
- 5 TAIL

For E-04, -18, -22, -25, -34, and -39 models

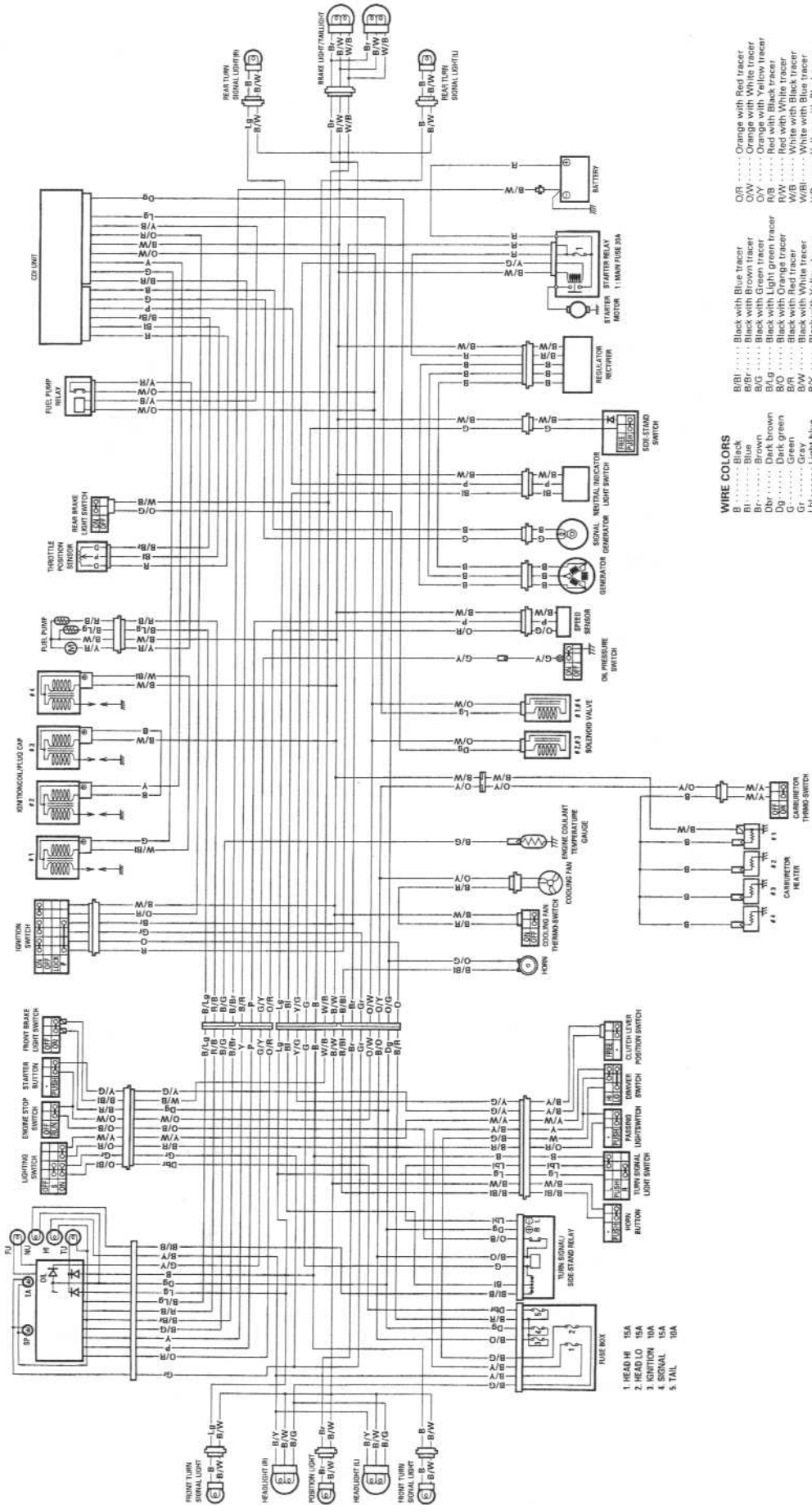
SP: SPEEDOMETER LIGHT  
 TA: TACHOMETER LIGHT  
 FU: FUEL LEVEL INDICATOR LIGHT  
 NU: NEUTRAL INDICATOR LIGHT  
 HI: HIGH BEAM INDICATOR LIGHT  
 TI: TURN SIGNAL IND



- WIRE COLORS**
- B ..... Black
  - Bl ..... Blue
  - Br ..... Brown
  - Dbp ..... Dark brown
  - Dg ..... Dark green
  - G ..... Gray
  - Lbl ..... Light blue
  - Lg ..... Light green
  - Or ..... Orange
  - P ..... Pink
  - R ..... Red
  - Y ..... Yellow
- O/R ..... Orange with Red tracer
  - O/W ..... Orange with White tracer
  - O/Y ..... Orange with Yellow tracer
  - R/W ..... Red with White tracer
  - R/Y ..... Red with Yellow tracer
  - W/B ..... White with Black tracer
  - W/Bl ..... White with Blue tracer
  - W/Br ..... White with Brown tracer
  - W/Dg ..... White with Dark green tracer
  - W/G ..... White with Green tracer
  - W/Lg ..... White with Light green tracer
  - W/Y ..... White with Yellow tracer
  - Y/B ..... Yellow with Black tracer
  - Y/Bl ..... Yellow with Blue tracer
  - Y/Br ..... Yellow with Brown tracer
  - Y/Dg ..... Yellow with Dark green tracer
  - Y/G ..... Yellow with Green tracer
  - Y/Lg ..... Yellow with Light green tracer
  - Y/Or ..... Yellow with Orange tracer
  - Y/P ..... Yellow with Pink tracer
  - Y/R ..... Yellow with Red tracer
  - Y/W ..... Yellow with White tracer

For E-02 model

SP: SPEEDOMETER LIGHT  
 TA: TACHOMETER LIGHT  
 TB: TURN SIGNAL LIGHT  
 TC: NEUTRAL INDICATOR LIGHT  
 TD: HIGH BEAM INDICATOR LIGHT  
 TE: TURN SIGNAL IND



- WIRE COLORS**
- B ..... Black
  - Br ..... Black with Brown Tracer
  - Bn ..... Brown
  - Bd ..... Dark brown
  - G ..... Green
  - Gt ..... Gray
  - Bl ..... Blue
  - Lg ..... Light green
  - O ..... Orange
  - P ..... Pink
  - R ..... Red
  - Y ..... Yellow
  - OR ..... Orange with Red tracer
  - OW ..... Orange with White tracer
  - OY ..... Orange with Yellow tracer
  - RB ..... Red with Black tracer
  - RW ..... Red with White tracer
  - WB ..... White with Black tracer
  - WB ..... White with Blue tracer
  - YG ..... Yellow with Green tracer
  - YR ..... Yellow with Red tracer
  - VW ..... Yellow with White tracer
  - BBl ..... Black with Blue Tracer
  - BBr ..... Black with Brown Tracer
  - Bn ..... Black with Yellow Tracer
  - BBlg ..... Black with Light green tracer
  - BBr ..... Black with Red tracer
  - BW ..... Black with White tracer
  - BBl ..... Black with Blue tracer
  - BBl ..... Black with Yellow tracer
  - BBl ..... Black with Green tracer
  - OBl ..... Orange with Black tracer
  - OBl ..... Orange with Green tracer

1. HEAD HI 15A
2. HEAD LO 15A
3. IGNITION 10A
4. SIGNAL 15A
5. TAIL 10A

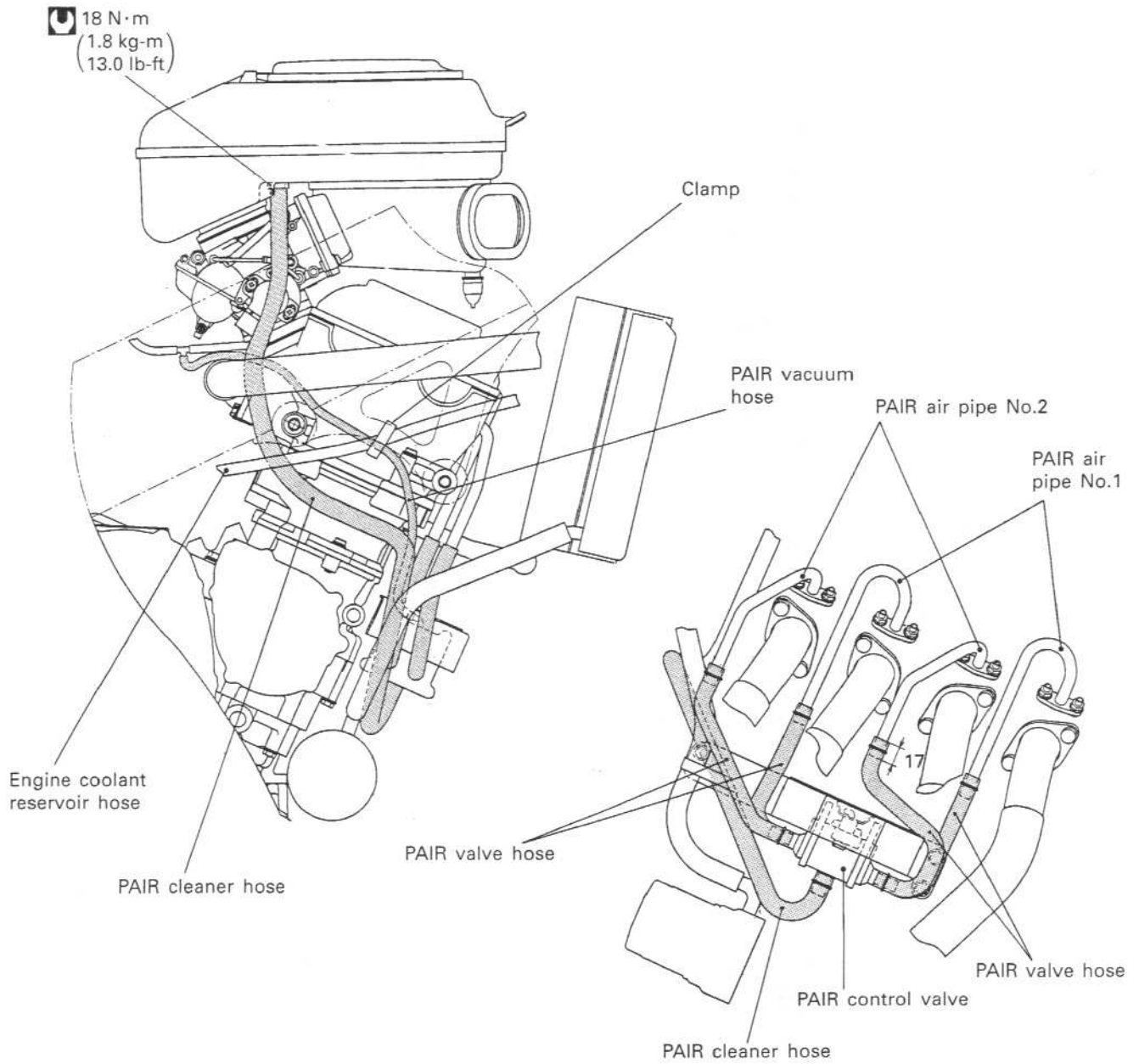








# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING (FOR E-18, -33 AND -39 MODELS)



**SERVICE DATA****VALVE + GUIDE**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26.5 (1.04)	——
	EX.	22 (0.87)	——
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	——
	EX.	0.20–0.30 (0.008–0.012)	——
Valve guide to valve stem clearance	IN.	0.010–0.037 (0.0004–0.0015)	——
	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.	4.475–4.490 (0.1762–0.1768)	——
	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.)	INNER	——	36.80 (1.45)
	OUTER	——	39.80 (1.57)
Valve spring tension (IN. & EX.)	INNER	4.5 kg (9.9 lbs) at length 29.9 mm (1.18 in)	——
	OUTER	18.3 kg (40.34 lbs) at length 33.4 mm (1.31 in)	——

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-33	*33.980–34.048 (1.3378–1.3405)	*33.68 (1.326)
		Others	*36.660–36.728 (1.4433–1.4460)	*36.36 (1.431)
	EX.	E-33 and others	*34.780–34.848 (1.3693–1.3720)	*34.48 (1.357)
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.	24.012–24.025 (0.9454–0.9459)		—
Camshaft journal O.D.	IN. & EX.	23.959–23.980 (0.9433–0.9441)		—
Camshaft runout	IN. & EX.	—		0.10 (0.004)
Cam chain pin (at arrow "3")	15th pin			—
Cylinder head cover distortion	—			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Compression pressure	1 100–1 500 kPa (11–15 kg/cm <sup>2</sup> ) (156–213 psi)		900 kPa (9 kg/cm <sup>2</sup> ) (128 psi)
Compression pressure difference	—		200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.025–0.035 (0.0010–0.0014)		—
Cylinder bore	65.500–65.515 (2.5787–2.5793)		Nicks or Scratches
Piston diam.	65.470–65.485 (2.5775–2.5781) Measure at 15 mm (0.6 in) from the skirt end.		65.380 (2.5740)
Cylinder distortion	—		0.20 (0.008)
Piston ring free end gap	1st	*Approx. 6.2 (0.24)	*4.9 (0.19)
	2nd	*Approx. 8.0 (0.31)	*6.4 (0.25)
Piston ring end gap	1st	0.10–0.25 (0.004–0.010)	0.5 (0.02)
	2nd	0.10–0.25 (0.004–0.010)	0.5 (0.02)
Piston ring to groove clearance	1st	—	0.18 (0.007)
	2nd	—	0.18 (0.007)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01–1.03 (0.040–0.041)	—
	2nd	0.81–0.83 (0.032–0.033)	—
	Oil	1.51–1.53 (0.059–0.060)	—
Piston ring thickness	1st	0.97–0.99 (0.038–0.039)	—
	2nd	0.77–0.79 (0.030–0.031)	—
Piston pin bore	15.002–15.008 (0.5906–0.5909)		15.030 (0.5917)
Piston pin O.D.	*14.995–15.000 (0.5904–0.5906)		14.980 (0.5898)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	15.010–15.018 (0.5909–0.5913)		15.040 (0.5921)
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.	31.976–32.000 (1.2589–1.2598)		—
Crankshaft journal oil clearance	*0.016–0.040 (0.0006–0.0016)		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	1.911 (72/41 × 37/34)	—
Oil pressure (at 60°C, 140°F)	Above 200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi) Below 500 kPa (5.0 kg/cm <sup>2</sup> , 71 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	2.92–3.08 (0.115–0.121)	—
Drive plate claw width	13.7–13.8 (0.539–0.543)	12.9 (0.51)
Clutch release screw	1/4 turn back	—
Driven plate distortion	—	0.10 (0.004)
Clutch spring free height	—	2.9 (0.11)

**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	OFF→ON	Approx. 105°C (221°F)	—
	ON→OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 9.56 kΩ	—
	100°C (212°F)	Approx. 2.78 kΩ	—
	120°C (248°F)	Approx. 0.69 kΩ	—
	130°C (266°F)	Approx. 0.50 kΩ	—

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.756 (72/41)	—	
Final reduction ratio	*2.875 (46/16)	—	
Gear ratios	Low	2.866 (43/15)	—
	2nd	*2.052 (39/19)	—
	3rd	1.650 (33/20)	—
	4th	1.428 (30/21)	—
	5th	1.285 (27/21)	—
	Top	1.181 (26/22)	—
Shift fork to groove clearance	0.1–0.3 (0.004–0.012)	0.50 (0.020)	
Shift fork groove width	5.0–5.1 (0.197–0.201)	—	
Shift fork thickness	4.8–4.9 (0.189–0.193)	—	

ITEM	STANDARD		LIMIT
	Type	RK525SMOZ <sub>2</sub>	
Drive chain	Links	108 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	20–30 (0.8–1.2)		—
Gearshift lever height	55 (2.2)		—

## CARBURETOR

ITEM	SPECIFICATION		
	E-02,25,34	E-03,18,28,39	E-04,17,22
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	*34E6	*34E7	*34E8
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min ... E-03,28,39 1 300 + 100 r/min – 50 ... E-18	1 200 ± 100 r/min
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	*Nos.1&4: #135 *Nos.2&3: #132.5	*Nos.1&4: #135 *Nos.2&3: #132.5	*Nos.1&4: #135 *Nos.2&3: #132.5
Jet needle (J.N.)	*5DHZ31-3	*5DHZ32	*5DZ25-3
Needle jet (N.J.)	P-0	P-0M	P-0
Throttle valve (Th.V.)	#100	←	←
Pilot jet (P.J.)	#12.5	#12.5	#12.5
Pilot screw (P.S.)	*PRE-SET Nos.1&4: 3 turns back Nos.2&3: 2-3/4 turns back	*PRE-SET	*PRE-SET Nos.1&4: 2-1/2 turns back Nos.2&3: 2 turns back
Throttle cable play	2.0–4.0 mm (0.08–0.16 in)	←	←

## CARBURETOR

ITEM	SPECIFICATION	
	E-33	E-24
Carburetor type	BDSR36	←
Bore size	36.5 mm	←
I.D. No.	*34E9	*34EA
Idle r/min.	1 300 ± 100 r/min.	1 200 ± 100 r/min.
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←
Main jet (M.J.)	*Nos.1&4: #135 *Nos.2&3: #132.5	*Nos.1&4: #135 *Nos.2&3: #132.5
Jet needle (J.N.)	5DH20-53	5DHZ31-3
Needle jet (N.J.)	P-0M	P-0



ITEM	SPECIFICATION	
	E-33	E-24
Throttle valve (Th.V.)	#100	←
Pilot jet (P.J.)	#12.5	#12.5
Pilot screw (P.S.)	PRE-SET	*PRE-SET Nos.1&4: 3 turns back Nos.2&3: 2-3/4 turns back
Throttle cable play	2.0-4.0 mm (0.08-0.16 in)	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 500 r/min.		
Firing order		1-2-4-3		
Spark plug	Type	NGK: CR9E DENSO: U27ESR-N		
	Gap	0.7-0.8 (0.028-0.031)		
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		Approx. 50-200 Ω (B-G)		Tester range: Resistance (Ω)
Ignition coil resistance	Primary	0.07-0.11 Ω (⊕ tap-⊖ tap)		Tester range: Resistance (Ω)
	Secondary	4.5-6.9 kΩ (Plug cap-⊖ tap)		Tester range: Resistance (Ω)
Generator coil resistance		Approx 0.3 Ω (B-B)		Tester range: Resistance (Ω)
Generator Max. output		Approx. 380W at 5 000 r/min.		
Generator no-load voltage (When engine is cold)		More than 55V (AC) at 5 000 r/min.		
Regulated voltage		13.5-15.0V at 5 000 r/min.		
Starter relay resistance		3-5 Ω		
Battery	Type designation	FTX9-BS		
	Capacity	12V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.	1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15A	
		LO	15A	
	Turn signal	15A		
	Ignition	10A		
	Taillight	10A		
	Main	30A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION		
		E-03,24,28,33	E-04,18,22,25,34,39	E-02
Headlight	HI	55 × 2	55	55 × 2
	LO	50 × 2	55	50 × 2
Position light			5	←
Brake light/Taillight		21/5 × 2	←	←
Turn signal light		21	←	←
Tachometer light		1.7	←	←
Speedometer light		1.7	←	←
Turn signal indicator light		1.7	←	←
High beam indicator light		1.7	←	←
Neutral indicator light		1.7	←	←
Fuel indicator light		1.7	←	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Rear brake pedal height		55 (2.2)		—
Brake disc thickness	Front	*5.0 ± 0.2 (0.197 ± 0.008)		*4.5 (0.18)
	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	14.000–14.043 (0.5512–0.5529)		—
	Rear	12.700–12.743 (0.5000–0.5017)		—
Master cylinder piston diam.	Front	13.957–13.984 (0.5495–0.5506)		—
	Rear	12.657–12.684 (0.4983–0.4994)		—
Brake caliper cylinder bore	Leading	Front	27.000–27.076 (1.0630–1.0660)	—
			Trailing	30.230–30.306 (1.1902–1.1931)
		Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Leading	Front	26.920–26.970 (1.0598–1.0618)	—
			Trailing	30.150–30.200 (1.1870–1.1890)
		Rear	38.098–38.148 (1.4999–1.5019)	—

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	17 × MT 3.50	——
	Rear	17 × MT 5.50	——
Tire size	Front	120/70 ZR17 (58W)	——
	Rear	180/55 ZR17 (73W)	——
Tire tread depth	Front	——	1.6 (0.06)
	Rear	——	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Front fork stroke	120 (4.7)		——
Front fork spring free length	*266.6 (10.5)		*261 (10.3)
Front fork oil level	110 (4.3)		——
Front fork spring adjuster	4th groove from top		——
Front fork damping force adjuster	Rebound	*At standard position (1 <sup>1</sup> / <sub>8</sub> turns out)	——
	Compression	*At standard position (1 turn out)	——
Rear shock absorber gas pressure (N <sub>2</sub> gas)	1 000 kPa (10 kg/cm <sup>2</sup> , 142 psi)		——
Rear shock absorber spring set length	*195.4 (7.7)		——
Rear shock absorber damping force adjuster	Rebound	*At punch mark (1 turn out)	——
	Compression	*At punch mark (1- <sup>3</sup> / <sub>8</sub> turns out)	——
Rear wheel travel	133 (5.2)		——
Swingarm pivot shaft runout	——		0.3 (0.01)

**TIRE PRESSURE**

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

**FUEL + OIL + COOLANT**

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 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	18.0 L (4.8/4.0 US/Imp gal)		
Engine oil type	SAE 10W/40, API, SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 800 ml (3.0/2.5 US/Imp qt)	
	Overhaul	3 500 ml (3.7/3.1 US/Imp qt)	
Front fork oil type	SUZUKI FORK OIL SS-08 (#10) or equivalent fork oil		
Front fork oil capacity (each leg)	533 ml (18.0/18.8 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	2 550 ml (2.7/2.2 US/Imp qt)		

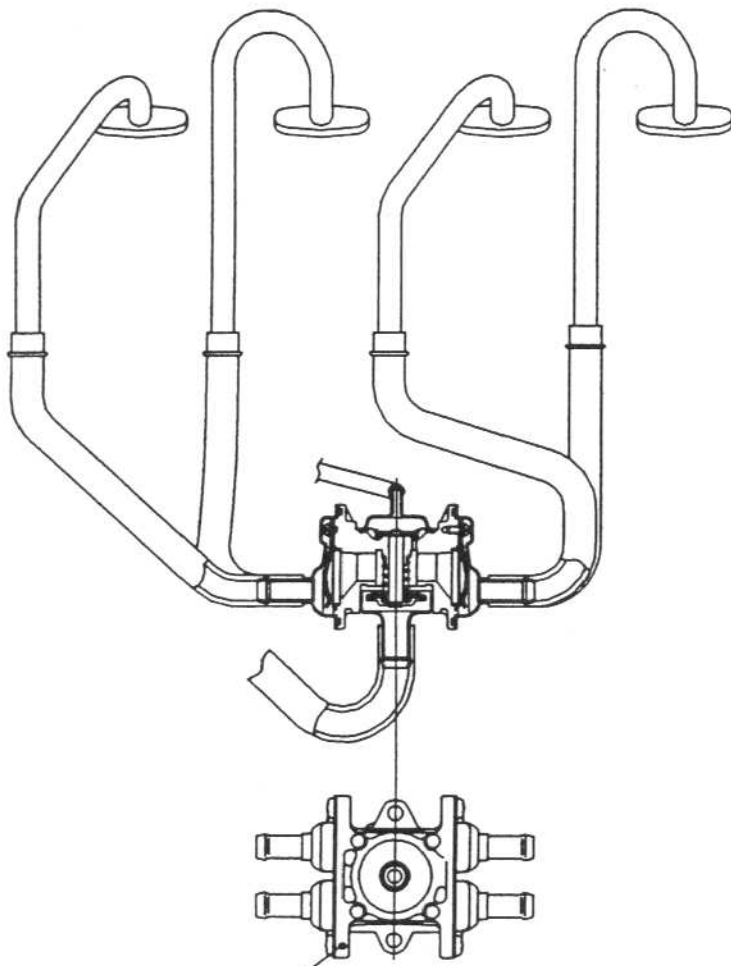


# EMISSION CONTROL INFORMATION

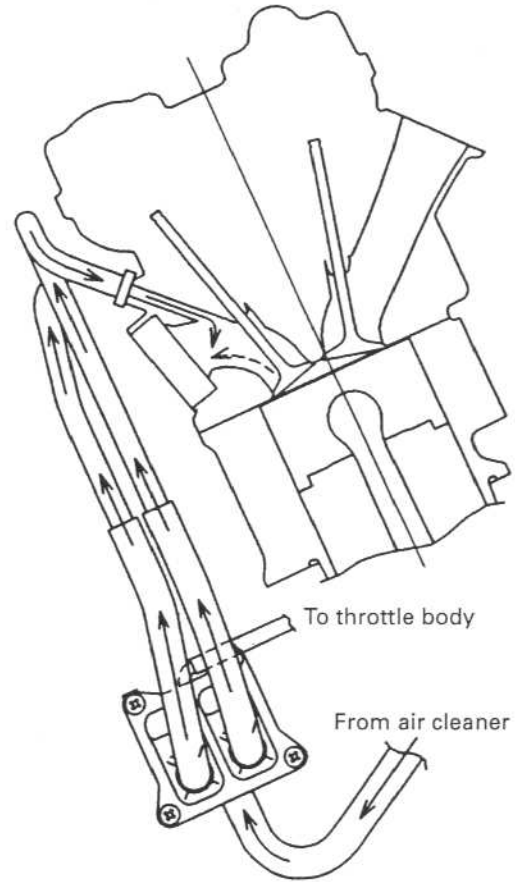
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# PAIR (AIR SUPPLY) SYSTEM DIAGRAM

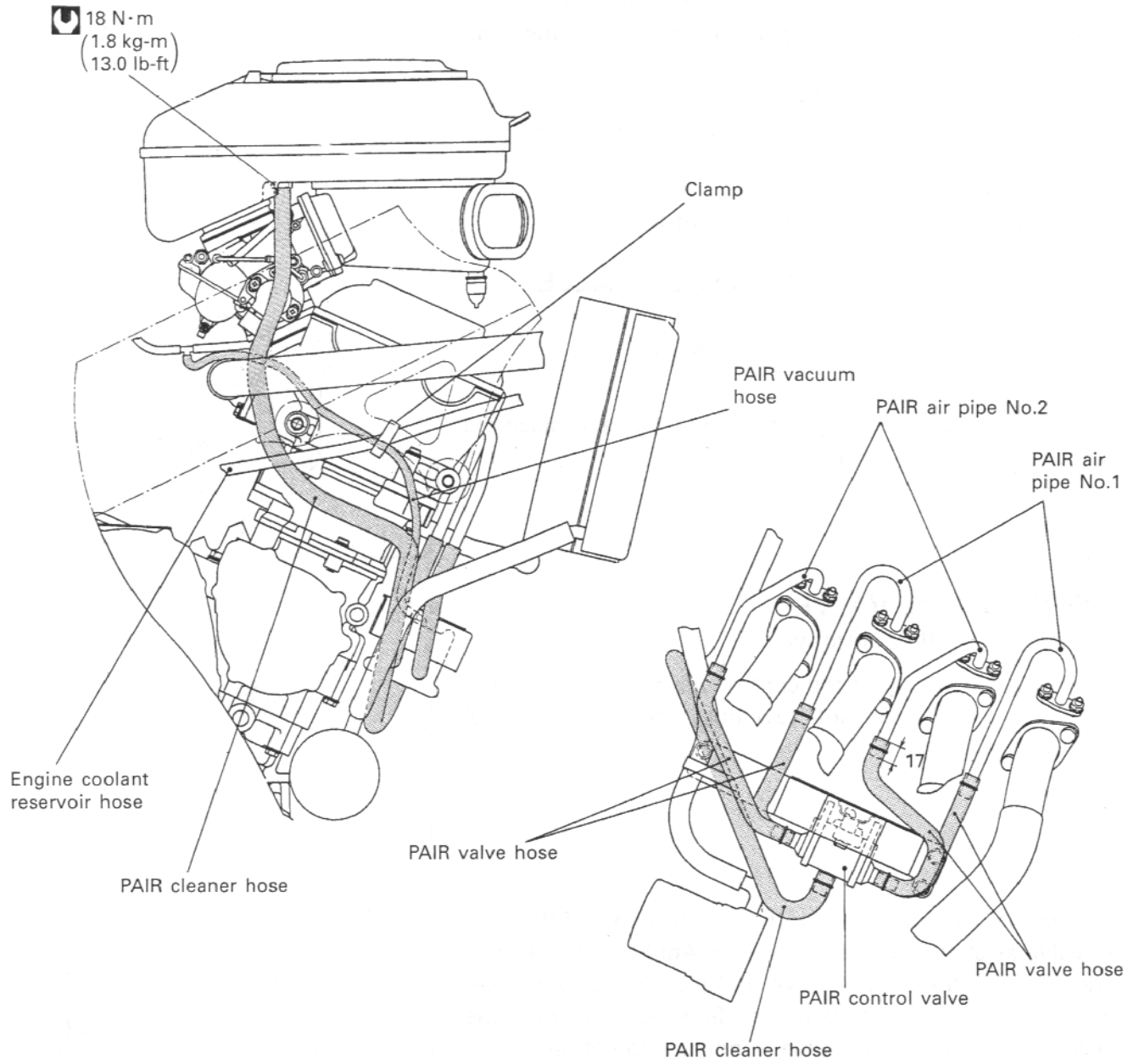


PAIR control valve



← FRESH AIR  
← - - - EXHAUST GAS

# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING





## PAIR (AIR SUPPLY) SYSTEM INSPECTION

- Remove the frame cover.
- Lift and support the fuel tank.

### HOSES AND PIPES

Inspect the hoses and pipes for wear or damage.  
Inspect that the hoses and pipes are securely connected.

### PAIR CONTROL VALVE

Inspect the PAIR control valve for damage of the body.

### PAIR CLEANER

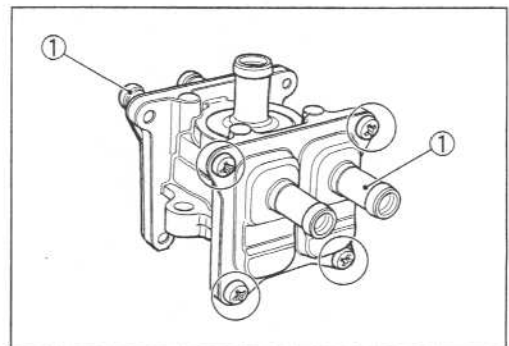
Inspect the PAIR cleaner for damage of the body.

### REED VALVE OF PAIR CONTROL VALVE

- Remove the PAIR control valve.
- Remove the both reed valve covers ①.

Inspect the reed valves.

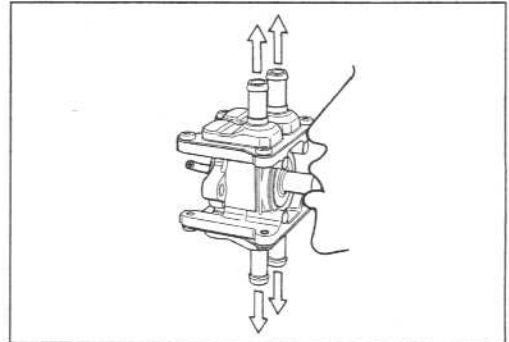
If the carbon deposit is found in the reed valve, replace the PAIR control valve with a new one.



### PAIR CONTROL VALVE

- Remove the PAIR control valve.

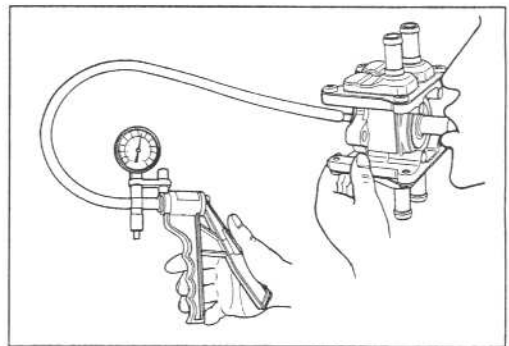
Blow the air inlet port of the control valve as shown in the illustration. If air does not flow out, replace the control valve with a new one.



Connect the vacuum pump to the vacuum port of the control valve as shown in the illustration. Apply negative pressure slowly to the control valve and blow the above manner. If air does not become flow out within the specification, the control valve is normal condition. If the control valve does not function within the specification, replace the control valve with a new one.

Negative pressure range: 36–60 kPa (270–450 mmHg)

 09917-47910: Vacuum pump gauge



#### CAUTION

Use a hand operated vacuum pump to prevent the control valve damage.

# GSX-R600X ('99-MODEL)

## FOREWORD

This chapter describes service data, service specifications and servicing procedures which differ from those of the GSX-R600W ('98-model).

**NOTE:**

- Any differences between the GSX-R600W ('98-model) and GSX-R600X ('99-model) in specifications and service data are indicated with an asterisk mark (\*).
- Please refer to the sections 1 through 10 for details which are not given in this chapter.

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## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length	2 100 mm (82.7 in) .....	For E-18,22,24,39 models
	2 065 mm (81.3 in) .....	For other models
Overall width	720 mm (28.3 in)	
Overall height	1 165 mm (45.9 in)	
Wheelbase	1 385 mm (54.5 in)	
Ground clearance	130 mm (5.1 in)	
Seat height	830 mm (32.7 in)	
Dry mass	175 kg (385 lbs) .....	For E-18,33,39 models
	174 kg (383 lbs) .....	For other models

### ENGINE

Type	Four-stroke, Liquid-cooled, DOHC, TSCC
Number of cylinders	4
Tappet clearance, IN	0.10–0.20 mm (0.004–0.008 in)
EX	0.20–0.30 mm (0.008–0.012 in)
Bore	65.5 mm (2.579 in)
Stroke	44.5 mm (1.752 in)
Piston displacement	600 cm <sup>3</sup> (36.6 cu. in)
Compression ratio	12.0 : 1
Carburetor	MIKUNI BDSR36
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	1.756 (72/41)
Gear ratios, Low	2.866 (43/15)
2nd	2.052 (39/19)
3rd	1.650 (33/20)
4th	1.428 (30/21)
5th	1.285 (27/21)
Top	1.181 (26/22)
Final reduction ratio	2.875 (46/16)
Drive chain	RK525SMOZ <sub>2</sub> , 108 links

**CHASSIS**

Front suspension .....	Telescopic, coil spring, oil damped, spring pre-load fully adjustable, rebound damping force and compression damping force fully adjustable.
Rear suspension .....	Link type system, gas/oil damped, coil spring, spring pre-road fully adjustable, rebound damping force and compression damping force fully adjustable.
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	133 mm (5.2 in)
Steering angle .....	30° (right & left)
Caster .....	24°
Trail .....	96 mm (3.8 in)
Turning radius .....	3.1 m (10.2 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Disc brake
Front tire size .....	120/70 ZR17 (58W), tubeless
Rear tire size .....	180/55 ZR17 (73W), tubeless

**ELECTRICAL**

Ignition type .....	Electronic ignition (CDI)
Ignition timing .....	5° B.T.D.C. at 1 300 r/min *4° B.T.D.C. at 1 300 r/min ..... E-03,24,28,33 models
Spark plug .....	N.G.K. CR9E, DENSO U27ESR-N
Battery .....	12V 28.8 kC (8 Ah)/10HR
Generator .....	Three-phase A.C. Generator
Main fuse .....	30A
Fuse .....	15/15/10/15/10A
Headlight .....	12V 55/50W × 2 ..... E-02,03,24,28,33 models 12V 55W + 12V 55W ..... For other models
Turn signal light .....	12V 21W
Front position light .....	12V 5W ..... Except for E-03,24,28,33 models
Brake light/Taillight .....	12V 21/5W × 2
Speedometer light .....	12V 1.7W
Tachometer light .....	12V 1.7W
Neutral indicator light .....	12V 1.7W
High beam indicator light .....	12V 1.7W
Turn signal indicator light .....	12V 1.7W
Fuel indicator light .....	12V 1.7W

**CAPACITIES**

Fuel tank, including reserve .....	18.0 L (4.8/4.0 US/Imp gal)
Engine oil, oil change .....	2 600 ml (2.7/2.3 US/Imp qt)
with filter change .....	2 800 ml (3.0/2.5 US/Imp qt)
overhaul .....	3 500 ml (3.7/3.1 US/Imp qt)
Coolant .....	2 550 ml (2.7/2.2 US/Imp qt)
Front fork oil (each leg) .....	533 ml (18.0/18.8 US/Imp oz)

Specifications marked with asterisks (\*) are exclusive to GSX-R600X.

These specifications are subject to change without notice.

**SERVICE DATA****VALVE + GUIDE**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26.5 (1.04)	——
	EX.	22 (0.87)	——
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	——
	EX.	0.20–0.30 (0.008–0.012)	——
Valve guide to valve stem clearance	IN.	0.010–0.037 (0.0004–0.0015)	——
	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.	4.475–4.490 (0.1762–0.1768)	——
	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.)	INNER	——	36.80 (1.45)
	OUTER	——	39.80 (1.57)
Valve spring tension (IN. & EX.)	INNER	4.5 kg (9.9 lbs) at length 29.9 mm (1.18 in)	——
	OUTER	18.3 kg (40.34 lbs) at length 33.4 mm (1.31 in)	——

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	IN.	E-33	33.980–34.048 (1.3378–1.3405)	33.68 (1.326)
		Others	36.660–36.728 (1.4433–1.4460)	36.36 (1.431)
	EX.	E-33 and others	34.780–34.848 (1.3693–1.3720)	34.48 (1.357)
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.	24.012–24.025 (0.9454–0.9459)		—
Camshaft journal O.D.	IN. & EX.	23.959–23.980 (0.9433–0.9441)		—
Camshaft runout	IN. & EX.	—		0.10 (0.004)
Cam chain pin (at arrow "3")	15th pin			—
Cylinder head cover distortion	—			0.20 (0.008)

**CYLINDER + PISTON + PISTON RING**

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 100–1 500 kPa (11–15 kg/cm <sup>2</sup> ) (156–213 psi)			900 kPa (9 kg/cm <sup>2</sup> ) (128 psi)
Compression pressure difference	—			200 kPa (2 kg/cm <sup>2</sup> ) (28 psi)
Piston to cylinder clearance	0.025–0.035 (0.0010–0.0014)			—
Cylinder bore	65.500–65.515 (2.5787–2.5793)			Nicks or Scratches
Piston diam.	65.470–65.485 (2.5775–2.5781) Measure at 15 mm (0.6 in) from the skirt end.			65.380 (2.5740)
Cylinder distortion	—			0.20 (0.008)
Piston ring free end gap	1st	R	*Approx. 5.4 (0.21)	*4.3 (0.17)
	2nd	RN	*Approx. 5.9 (0.23)	*4.7 (0.19)
Piston ring end gap	1st	*0.08–0.20 (0.003–0.008)		0.5 (0.02)
	2nd	0.10–0.25 (0.004–0.010)		0.5 (0.02)
Piston ring to groove clearance	1st	—		0.18 (0.007)
	2nd	—		0.18 (0.007)

ITEM	STANDARD			LIMIT
Piston ring groove width	1st	1st	1.01–1.03 (0.040–0.041)	—
	2nd	2nd	0.81–0.83 (0.032–0.033)	—
	Oil	Oil	1.51–1.53 (0.059–0.060)	—
Piston ring thickness	1st	1st	0.97–0.99 (0.038–0.039)	—
	2nd	2nd	0.77–0.79 (0.030–0.031)	—
Piston pin bore	15.002–15.008 (0.5906–0.5909)			15.030 (0.5917)
Piston pin O.D.	14.995–15.000 (0.5904–0.5906)			14.980 (0.5898)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	15.010–15.018 (0.5909–0.5913)		15.040 (0.5921)
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.	31.976–32.000 (1.2589–1.2598)		—
Crankshaft journal oil clearance	0.016–0.040 (0.0006–0.0016)		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	1.911 (72/41 × 37/34)	—
Oil pressure (at 60°C, 140°F)	Above 200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi) Below 500 kPa (5.0 kg/cm <sup>2</sup> , 71 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	2.92–3.08 (0.115–0.121)	—
Drive plate claw width	13.7–13.8 (0.539–0.543)	12.9 (0.51)
Clutch release screw	$\frac{1}{4}$ turn back	—
Driven plate distortion	—	0.10 (0.004)
Clutch spring free height	—	2.9 (0.11)

**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	OFF→ON	Approx. 105°C (221°F)	—
	ON→OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 9.56 kΩ	—
	100°C (212°F)	Approx. 2.78 kΩ	—
	120°C (248°F)	Approx. 0.69 kΩ	—
	130°C (266°F)	Approx. 0.50 kΩ	—

**TRANSMISSION + DRIVE CHAIN**

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.756 (72/41)	—	
Final reduction ratio	2.875 (46/16)	—	
Gear ratios	Low	2.866 (43/15)	—
	2nd	2.052 (39/19)	—
	3rd	1.650 (33/20)	—
	4th	1.428 (30/21)	—
	5th	1.285 (27/21)	—
	Top	1.181 (26/22)	—
Shift fork to groove clearance	0.1–0.3 (0.004–0.012)	0.50 (0.020)	
Shift fork groove width	5.0–5.1 (0.197–0.201)	—	
Shift fork thickness	4.8–4.9 (0.189–0.193)	—	



ITEM	STANDARD		LIMIT
	Drive chain	Type	
Links		108 links, ENDLESS	—
20-pitch length		—	319.4 (12.6)
Drive chain slack	20–30 (0.8–1.2)		—
Gearshift lever height	55 (2.2)		—

## CARBURETOR

ITEM	SPECIFICATION		
	E-02,25,34	E-18,39	E-04,22
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	34E6	34E7	34E8
Idle r/min.	1 200 ± 100 r/min	1 300 ± 100 r/min ... E-03,28,39 1 300 ± 100 r/min – 50 ... E-18	1 200 ± 100 r/min
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	Nos.1&4: #135 Nos.2&3: #132.5	Nos.1&4: #135 Nos.2&3: #132.5	Nos.1&4: #135 Nos.2&3: #132.5
Jet needle (J.N.)	5DHZ31-3	5DHZ32	5DZ25-3
Needle jet (N.J.)	P-0	P-0M	P-0
Throttle valve (Th.V.)	#100	←	←
Pilot jet (P.J.)	#12.5	#12.5	#12.5
Pilot screw (P.S.)	PRE-SET Nos.1&4: 3 turns back Nos.2&3: 2-¾ turns back	PRE-SET Nos.1&4: 4 turns back Nos.2&3: 3-½ turns back	PRE-SET Nos.1&4: 2-½ turns back Nos.2&3: 2 turns back
Throttle cable play	2.0–4.0 mm (0.08–0.16 in)	←	←

## CARBURETOR

ITEM	SPECIFICATION		
	E-33	E-03,28	E-24
Carburetor type	BDSR36	←	←
Bore size	36.5 mm	←	←
I.D. No.	*34EE	*34EC	*34EF
Idle r/min.	1 300 ± 100 r/min.	←	*1 300 ± 100 r/min.
Fuel level	15.5 ± 0.5 mm (0.61 ± 0.02 in)	←	←
Float height	7.0 ± 1.0 mm (0.28 ± 0.04 in)	←	←
Main jet (M.J.)	*Nos.1&4: #132.5 *Nos.2&3: #130	*←	*Nos.1&4: #132.5 *Nos.2&3: #130
Jet needle (J.N.)	5DH20-53	←	*←
Needle jet (N.J.)	P-0M	←	P-0

ITEM	SPECIFICATION		
	E-33	E-03,28	E-24
Throttle valve (Th.V.)	#100	←	←
Pilot jet (P.J.)	#12.5	←	#12.5
Pilot screw (P.S.)	PRE-SET	*PRE-SET Nos.1&4: 4 turns back Nos.2&3: 3-1/2 turns back	*PRE-SET Nos.1&4: 4 turns back Nos.2&3: 3-1/2 turns back
Throttle cable play	2.0-4.0 mm (0.08-0.16 in)	←	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 300 r/min.		
		*4° B.T.D.C. at 1 300 r/min.		E-03,24,28,33
Firing order		1·2·4·3		
Spark plug		Type	NGK: CR9E DENSO: U27ESR-N	
		Gap	0.7-0.8 (0.028-0.031)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		Approx. 50-200 Ω (B-G)		Tester range: Resistance (Ω)
Ignition coil resistance		Primary	0.07-0.11 Ω (⊕ tap-⊖ tap)	Tester range: Resistance (Ω)
		Secondary	4.5-6.9 kΩ (Plug cap-⊖ tap)	Tester range: Resistance (Ω)
Generator coil resistance		Approx 0.3 Ω (B-B)		Tester range: Resistance (Ω)
Generator Max. output		Approx. 380W at 5 000 r/min.		
Generator no-load voltage (When engine is cold)		More than 55V (AC) at 5 000 r/min.		
Regulated voltage		13.5-15.0V at 5 000 r/min.		
Starter relay resistance		3-5 Ω		
Battery	Type designation	FTX9-BS		
	Capacity	12V 28.8 kC (8 Ah)/10 HR		
	Standard electrolyte S.G.	1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15A	
		LO	15A	
	Turn signal	15A		
	Ignition	10A		
	Taillight	10A		
	Main	30A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION		
		E-03,24,28,33	E-04,18,22,25,34,39	E-02
Headlight	HI	55 × 2	55	55 × 2
	LO	50 × 2	55	50 × 2
Position light			5	←
Brake light/Taillight		21/5 × 2	←	←
Turn signal light		21	←	←
Tachometer light		1.7	←	←
Speedometer light		1.7	←	←
Turn signal indicator light		1.7	←	←
High beam indicator light		1.7	←	←
Neutral indicator light		1.7	←	←
Fuel indicator light		1.7	←	←

**BRAKE + WHEEL**

Unit: mm (in)

ITEM		STANDARD		LIMIT
Rear brake pedal height		55 (2.2)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.197 ± 0.008)		4.5 (0.18)
	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	14.000–14.043 (0.5512–0.5529)		—
	Rear	12.700–12.743 (0.5000–0.5017)		—
Master cylinder piston diam.	Front	13.957–13.984 (0.5495–0.5506)		—
	Rear	12.657–12.684 (0.4983–0.4994)		—
Brake caliper cylinder bore	Leading	Front	27.000–27.076 (1.0630–1.0660)	—
			Trailing	30.230–30.306 (1.1902–1.1931)
		Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Leading	Front	26.920–26.970 (1.0598–1.0618)	—
			Trailing	30.150–30.200 (1.1870–1.1890)
		Rear	38.098–38.148 (1.4999–1.5019)	—

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	17 × MT 3.50	———
	Rear	17 × MT 5.50	———
Tire size	Front	120/70 ZR17 (58W)	———
	Rear	180/55 ZR17 (73W)	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

**SUSPENSION**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Front fork stroke	120 (4.7)		———
Front fork spring free length	266.6 (10.5)		261 (10.3)
Front fork oil level	110 (4.3)		———
Front fork spring adjuster	4th groove from top		———
Front fork damping force adjuster	Rebound	At standard position (1 <sup>1</sup> / <sub>8</sub> turns out)	———
	Compression	At standard position (1 turn out)	———
Rear shock absorber gas pressure (N <sub>2</sub> gas)	1 000 kPa (10 kg/cm <sup>2</sup> , 142 psi)		———
Rear shock absorber spring set length	195.4 (7.7)		———
Rear shock absorber damping force adjuster	Rebound	At punch mark (1 turn out)	———
	Compression	At punch mark (1- <sup>3</sup> / <sub>8</sub> turns out)	———
Rear wheel travel	133 (5.2)		———
Swingarm pivot shaft runout	———		0.3 (0.01)

**TIRE PRESSURE**

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

**FUEL + OIL + COOLANT**

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 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 91 octane or higher. An unleaded gasoline is recommended.		The others
Fuel tank including reserve	18.0 L (4.8/4.0 US/lmp gal)		
Engine oil type	SAE 10W/40, API, SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/lmp qt)	
	Filter change	2 800 ml (3.0/2.5 US/lmp qt)	
	Overhaul	3 500 ml (3.7/3.1 US/lmp qt)	
Front fork oil type	SUZUKI FORK OIL SS-08 (#10) or equivalent fork oil		
Front fork oil capacity (each leg)	533 ml (18.0/18.8 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	2 550 ml (2.7/2.2 US/lmp qt)		

# TIGHTENING TORQUE

## ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt	14	1.4	10.0
Cylinder head bolt [M: 10]	43	4.3	31.0
Cylinder head bolt [M: 6]	10	1.0	7.0
Cylinder base nut	10	1.0	7.0
Camshaft journal holder bolt	10	1.0	7.0
Top cam chain guide mounting bolt	10	1.0	7.0
Oil hose union bolt [Upper side]	20	2.0	14.5
Oil hose union bolt [Lower side]	25	2.5	18.0
Cam chain tensioner mounting bolt	10	1.0	7.0
Cam chain tension adjuster bolt	10	1.0	7.0
Conrod bearing cap bolt	67	6.7	48.5
Starter clutch bolt	54	5.4	39.0
Crankcase bolt [M: 6]	11	1.1	8.0
[M: 8]	24	2.4	17.5
Crankcase bolt & Crankshaft bolt [M: 9]	32	3.2	23.0
Oil pump mounting bolt	10	1.0	7.0
Oil drain plug	28	2.8	20.0
Oil pan bolt	14	1.4	10.0
Gearshift cam stopper bolt	10	1.0	7.0
Gearshift cam stopper plate bolt	10	1.0	7.0
Gearshift arm stopper bolt	19	1.9	13.5
Clutch sleeve hub nut	150	15.0	108.5
Exhaust pipe bolt	23	2.3	16.5
Muffler mounting bolt	23	2.3	16.5
Engine sprocket nut	120	12.0	87.0
Speedometer sensor rotor bolt	13	1.3	9.5
Engine mounting bolt [L: 185 and 205]	79	7.9	57.0
[L: 45 and 55]	55	5.5	40.0
Engine mounting thrust adjuster	10	1.0	7.0
Engine mounting thrust adjuster lock nut	45	4.5	32.5
Engine mounting pinch bolt [L: 30]	23	2.3	16.5
Generator rotor bolt	120	12.0	87.0
Oil cooler union bolt	*70	*7.0	*50.5
Oil pressure regulator	28	2.8	20.0
Oil pressure switch	14	1.4	10.0
Oil gallery plug [M: 16]	40	4.0	29.0
[M: 14]	28	2.8	20.0
Starter clutch cover cap	11	1.1	8.0
Valve timing inspection cap	23	2.3	16.5
Cooling fan thermo-switch	17	1.7	12.5
Engine coolant temperature sensor	9	0.9	6.5

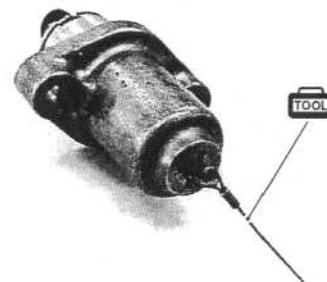
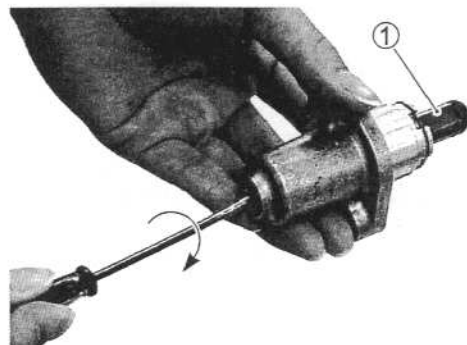
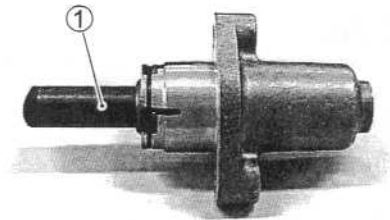
## CAM CHAIN TENSION ADJUSTER

The cam chain tension adjuster has been changed. Before installing the cam chain tension adjuster, shorten the push rod ① and hold it using the new special tool.

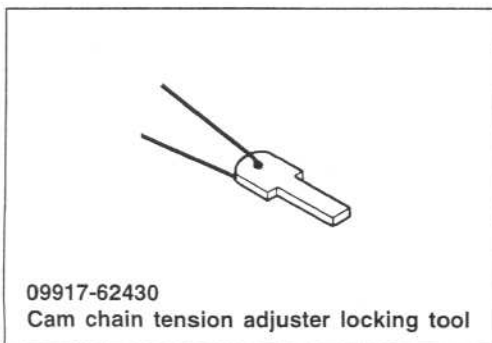
- Remove the cam chain tension adjuster bolt.
- Insert the ⊖ screwdriver into the slot and turn it clockwise to shorten the push rod ①.

- Insert the new special tool to hold the push rod at the shortened position.

 09917-62430: Cam chain tension adjuster locking tool



## SPECIAL TOOL

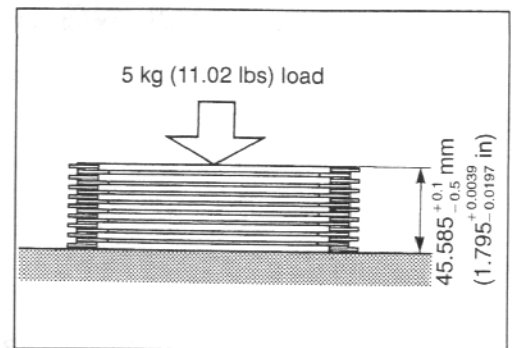


## CLUTCH DRIVE AND DRIVEN PATES INSPECTION

Measure the total thickness of drive and driven plates by compressing them with a 5 kg load.

### NOTE:

Wipe off the engine oil from the drive and driven plates with a clean rag and put them one by one on the surface plate. If the total thickness of drive and driven plates is not within specification, measure each drive plate thickness and driven plate distortion. To adjust the total thickness, replace the clutch plates with new ones or change the clutch driven plate.



Total thickness of drive and driven plates	45.585 <sup>+0.1</sup> <sub>-0.5</sub> mm at 5 kg load (1.795 <sup>+0.0039</sup> <sub>-0.0197</sub> in at 11.02 lbs load)
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### PARTS SUPPLY DATA

21441-31E50: Clutch drive plate No.1 (7 pcs)

21441-31E60: Clutch drive plate No.2 (1 pc)

21442-31E20: Clutch drive plate No.3 (1 pc)

21451-31E20: Clutch driven plate No.1 (7 or 8 pcs): t = 2.3 mm (0.09 in)

21451-31E30: Clutch driven plate No.2 (1 or 0 pc): t = 2.6 mm (0.10 in)

21451-31E10: Clutch driven plate No.3 (1 or 0 pc): t = 2.0 mm (0.08 in)

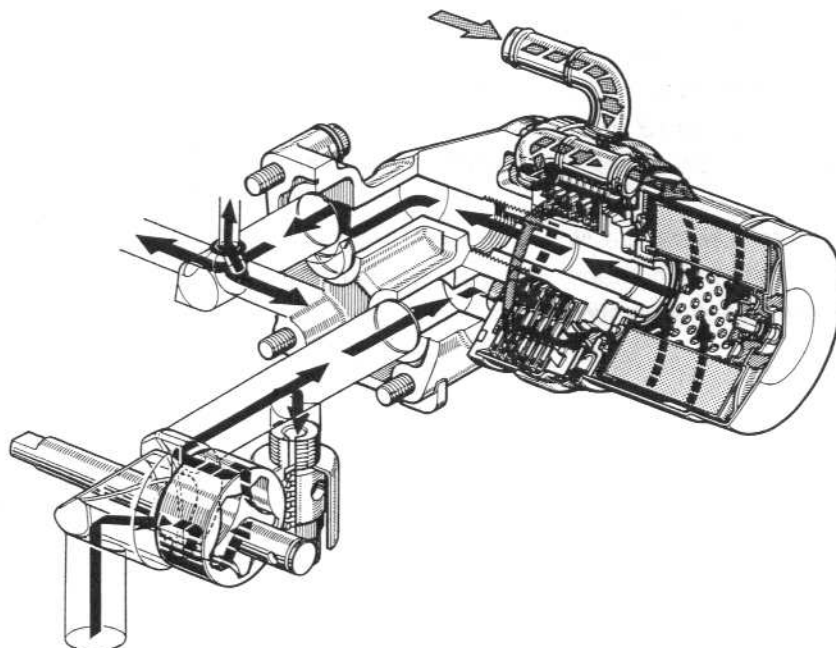
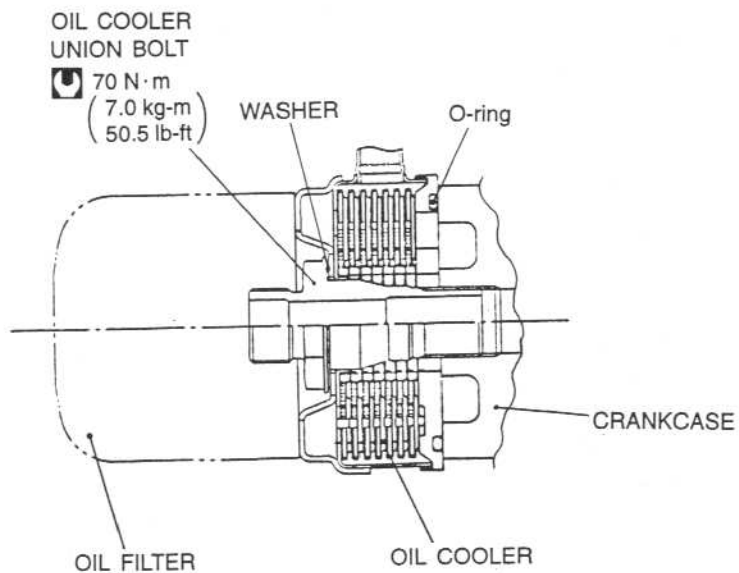
### NOTE:

- \* The clutch driven plates are 8 in number. The clutch driven plate No.2 or No.3 may be used to adjust the total thickness. The clutch driven plates No.1 must be used more than 7.
- \* When using the clutch driven plate No.2, install it at the seventh or eighth position from the pressure plate.
- \* When using the clutch driven plate No.3, install it at the first or second position from the pressure plate.
- \* Install the clutch drive plate No.2 at the outermost position.
- \* Install the clutch drive plate No.3 at the innermost position.
- \* The clutch drive plate No.2 can be distinguished by the green painting mark.
- \* When ordering the clutch drive plate No.2 individually, it can be distinguished by the parts number. Because the clutch drive plate No.2 doesn't have a painting mark when ordering it individually.

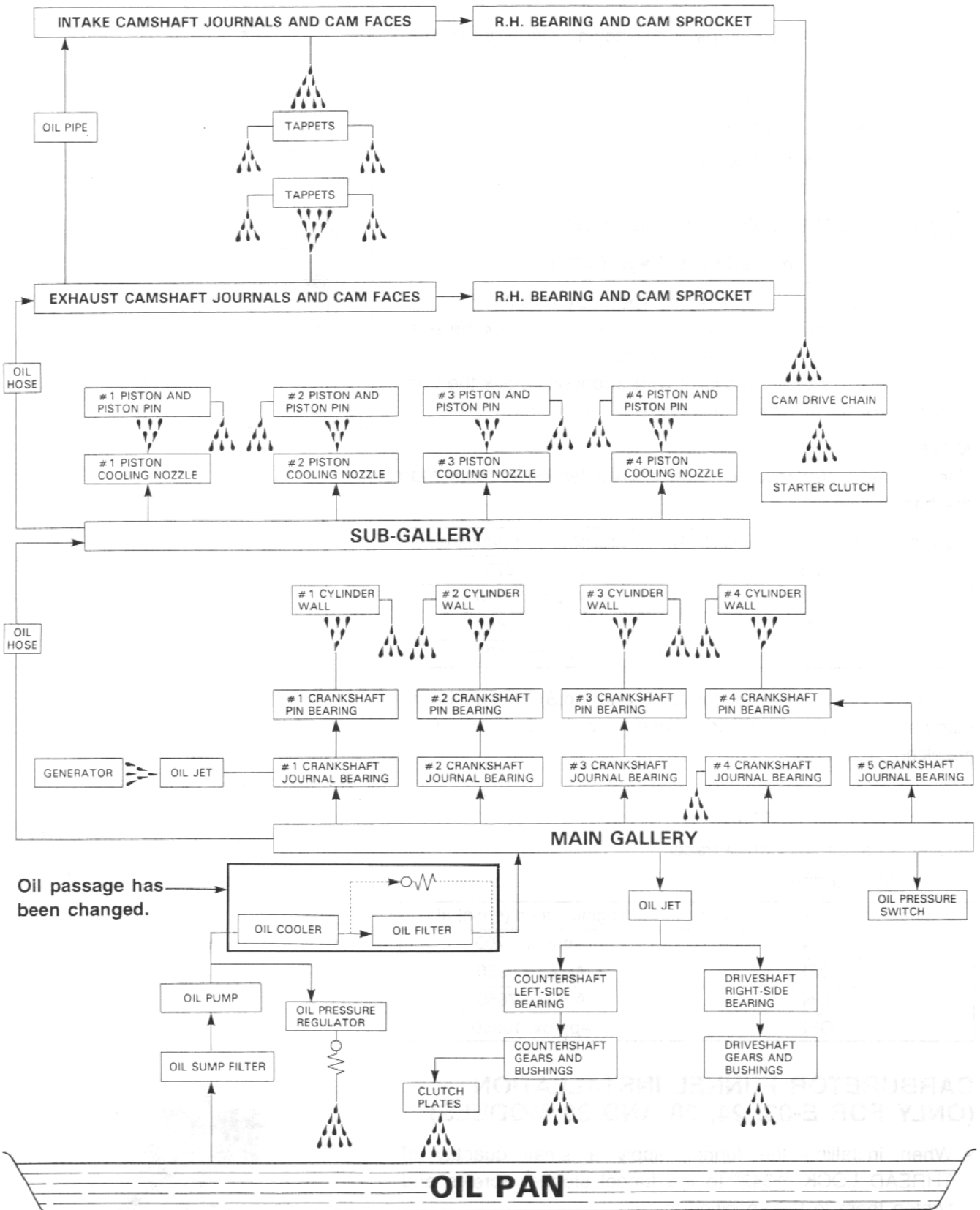


## ENGINE OIL COOLING SYSTEM

The oil cooler has been changed as follows. When installing the oil cooler, tighten its union bolt to the specified torque.



# ENGINE LUBRICATION SYSTEM CHART



## SOLENOID VALVE VOLTAGE INSPECTION (ONLY FOR E-03, 24, 28 AND 33 MODELS)

Check the solenoid valve (for No.1 and No.4) voltage as follows.

- Connect the multi circuit tester as shown in the right illustration.

O/W                      Lg  
(⊕ probe)              (⊖ probe)

O/W: Orange with white tracer

Lg : Light green

 **09900-25008: Multi circuit tester set**

 **Tester knob indication: Voltage (  )**

- Start up the engine and rise its speed by throttle.
- When the engine runs at the following speed, check the solenoid valve operation by tester reading.  
If the solenoid valve does not work properly, check the connection of the couplers or replace the CDI unit.

**NOTE:**

The highest tester reading voltage while testing is more than the battery voltage.

Solenoid valve (for No.1 and No.4)	Engine speed (r/min) at:
ON	Approx. 2700
OFF	*Approx. 4050
ON	*Approx. 5800
OFF	*Approx. 9100

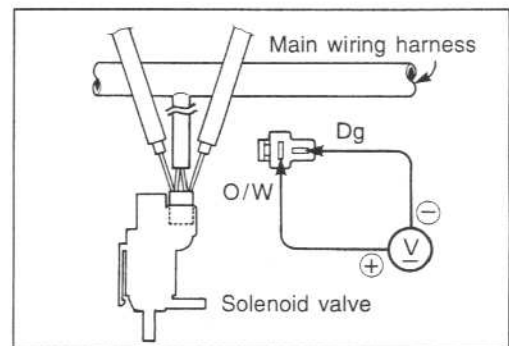
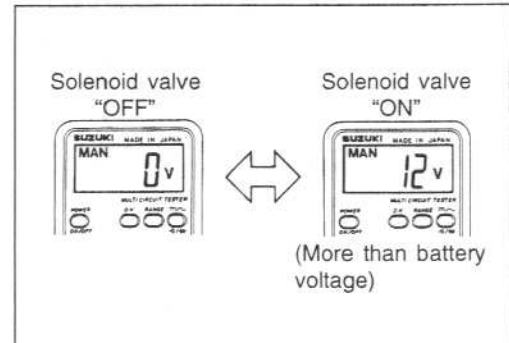
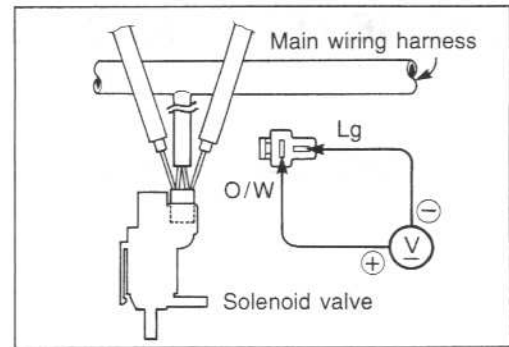
Check the solenoid valve (for No.2 and No.3) voltage in the same manner as the solenoid valve (for No.1 and No.4) voltage checking procedure.

O/W                      Dg  
(⊕ probe)              (⊖ probe)

O/W: Orange with white tracer

Dg : Dark green


Solenoid valve (for No.2 and No.3)	Engine speed (r/min) at:
ON	Approx. 2700
OFF	*Approx. 4950
ON	*Approx. 7650
OFF	*Approx. 10550

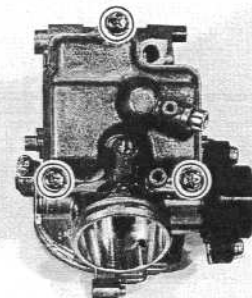


## CARBURETOR FUNNEL INSTALLATION (ONLY FOR E-03, 24, 28 AND 33 MODELS)

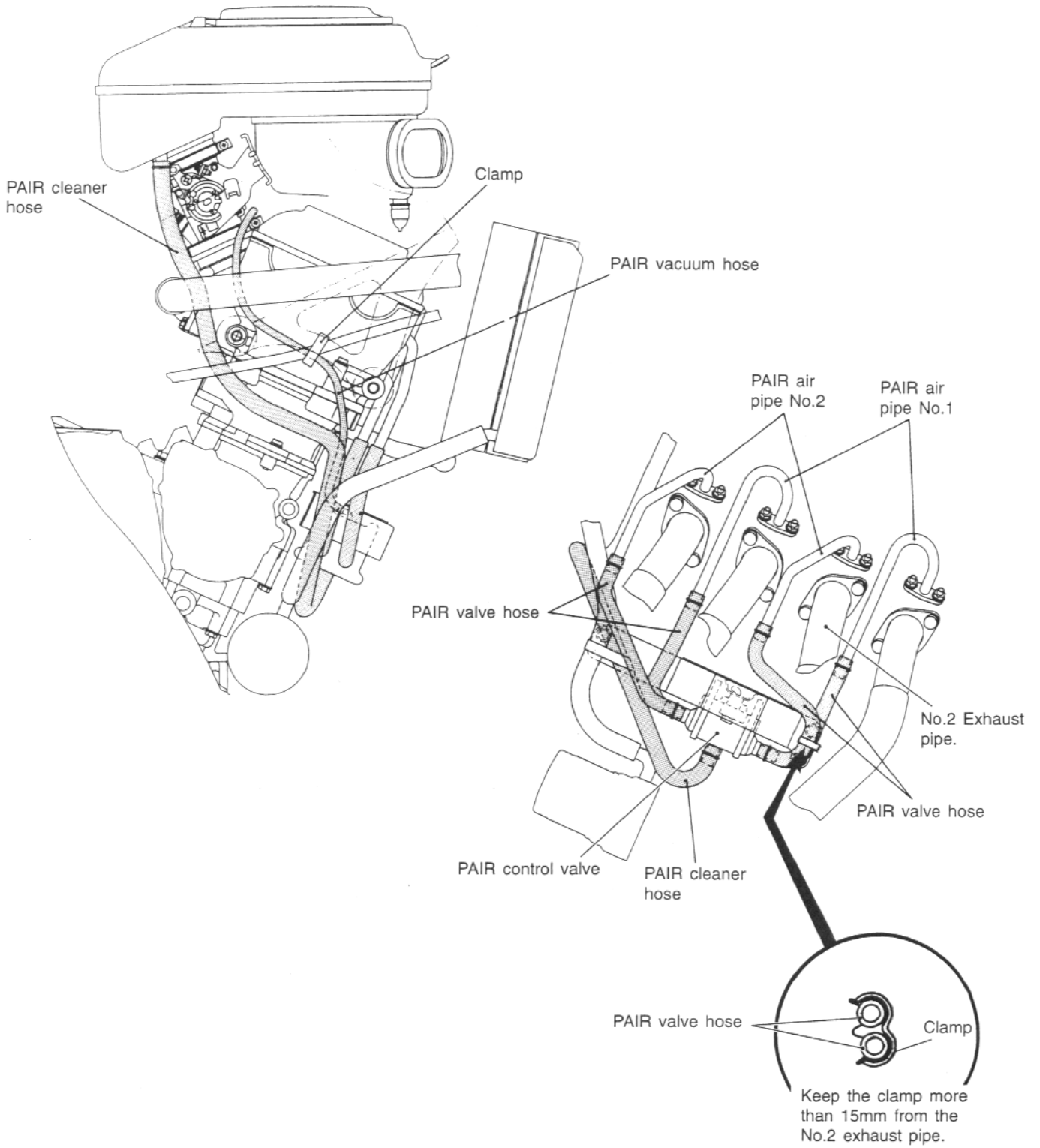
- When installing the funnel, apply a small quantity of THREAD LOCK "1342" to the funnel stopper screws and tighten them to the specified torque.

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

 **Funnel stopper screw: 2 N·m (0.2 kg-m, 1.5 lb-ft)**



# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING (FOR E-03, -18, -28, -33 AND -39 MODELS)



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