FOREWORD

This manual contains an introductory description on the SUZUKI VZ800 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, difference 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 VZ800 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.

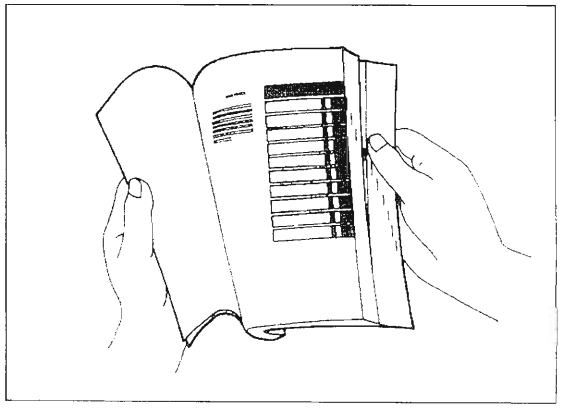
GROUP INDEX

SUZUKI MOTOR CORPORATION

HOW TO USE THIS MANUAL

TO LOCATE WHAT YOU ARE LOOKING FOR:

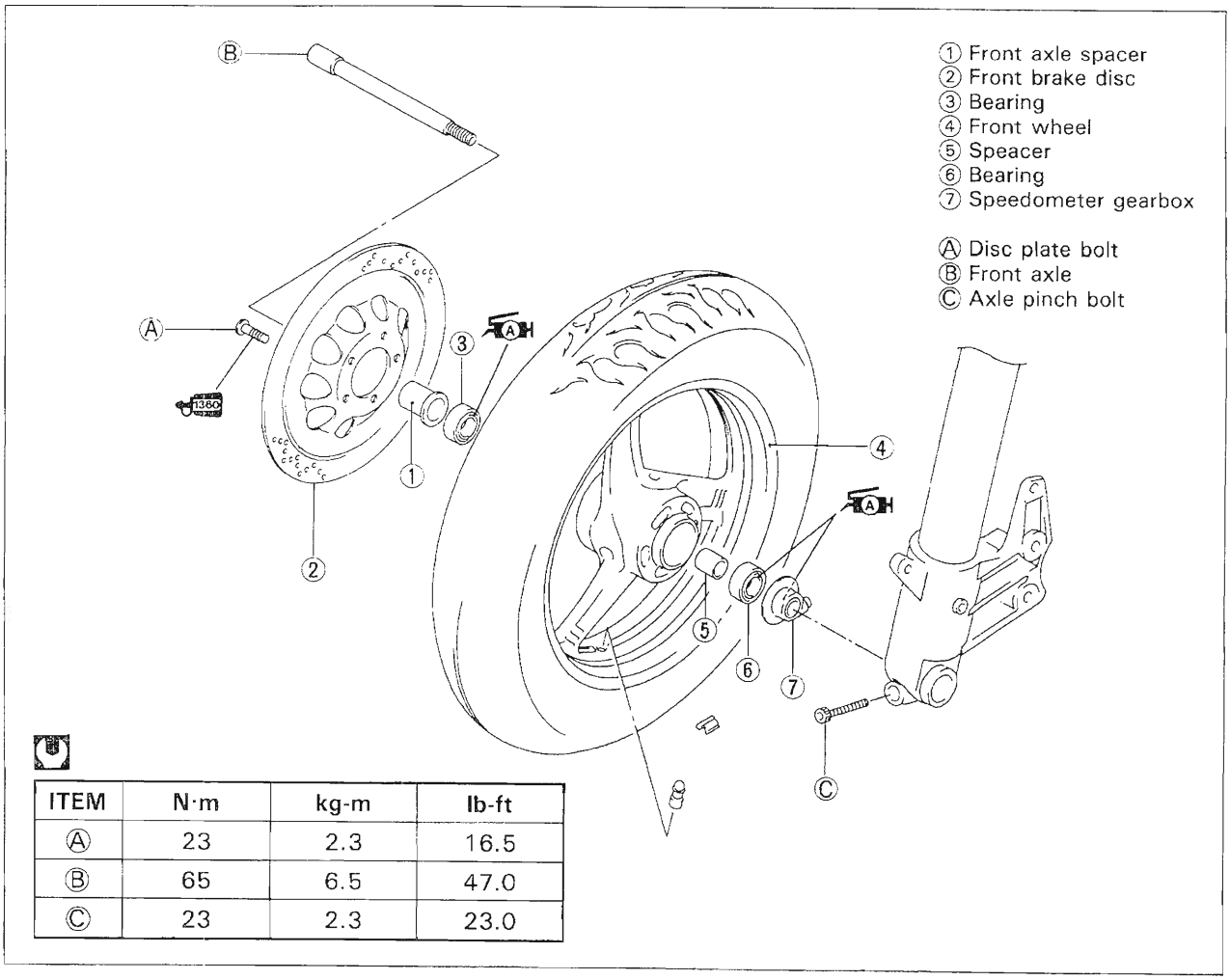
1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help you find the item and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



ITEM	N·m	kg-m	lb-ft
Ⓐ	23	2.3	16.5
Ⓑ	65	6.5	47.0
Ⓒ	23	2.3	23.0

SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control is required. Data beside it indicates specified torque.		Apply or use brake fluid.
	Apply oil. Use engine oil unless otherwise specified.		Measure in voltage range.
	Apply SUZUKI SUPER GREASE "A". 99000-25030		Measure in current range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in resistance range.
	Apply SUZUKI BOND "1207B". 99104-31140		Measure in continuity test range.
	Apply SUZUKI BOND "1216". 99000-31160		Measure in diode test range.
	Apply THREAD LOCK "1342". 99000-32050		Use special tool.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Use engine coolant.
	Apply THREAD LOCK SUPER "1360". 99000-32130		Use fork oil. 99000-99044-15G

GENERAL INFORMATION

1

CONTENTS

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

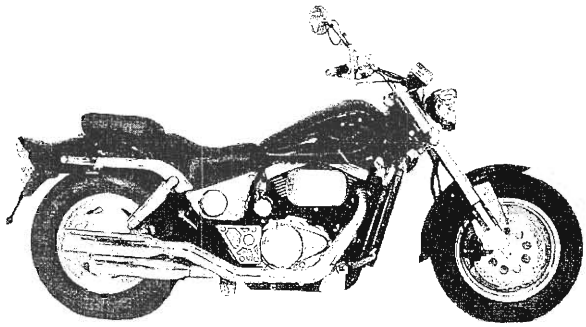
* **Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the motorcycle.**
* **When 2 or more persons work together, pay attention to the safety of each other.**
* **When it is necessary to run the engine indoors, make sure that exhaust 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 VZ800V ('97-MODEL)



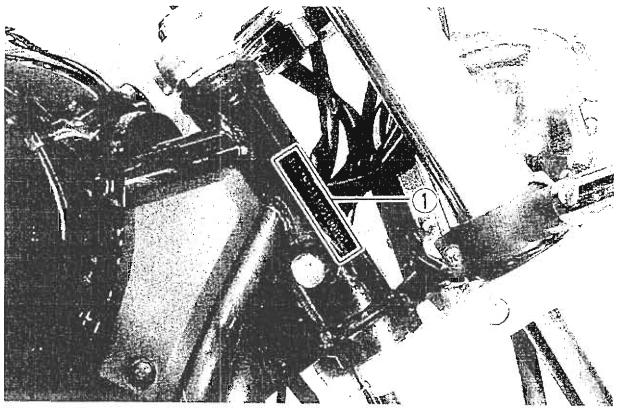
RIGHT SIDE

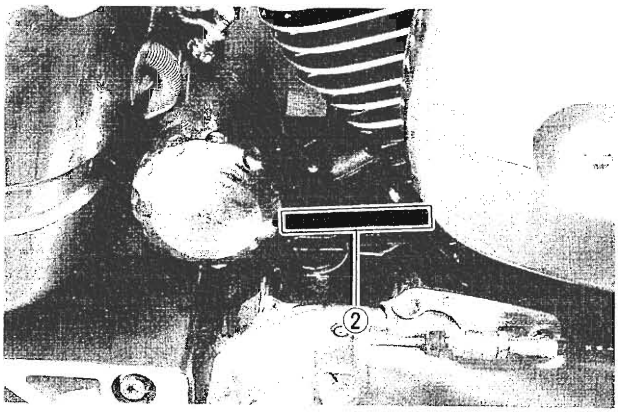
LEFT SIDE

*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.





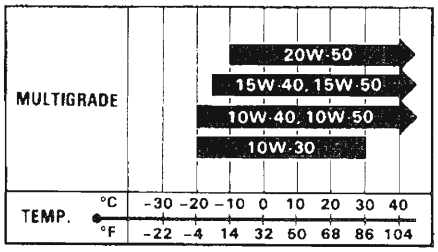
FUEL, OIL AND ENGINE COOLANT RECOMMENDATION

FUEL

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 (Methly 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.

ENGINE OIL

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.



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 #15

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): 1 460 ml (1.5/1.3 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.

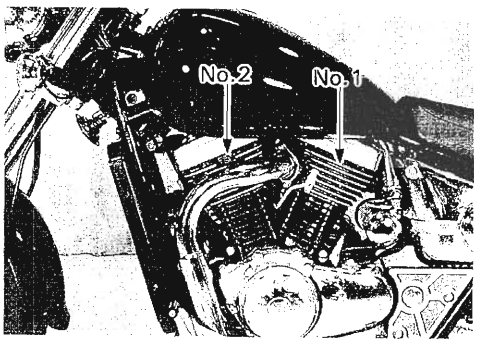
- Keep to these break-in throttle opening limits:

Initial 800 km (500 miles): Less than 1/2 throttle
Up to 1 600 km (1 000 miles): Less than 3/4 throttle

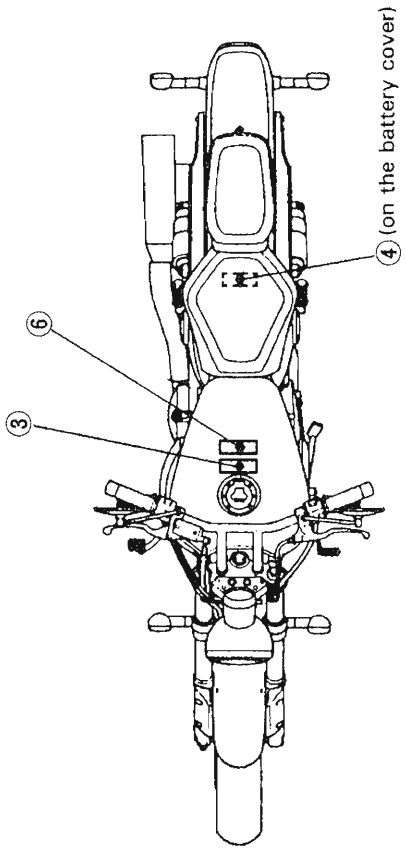
- Upon reaching an odometer reading of 1 600 km (1 000 miles) you can subject the motorcycle to full throttle operation.

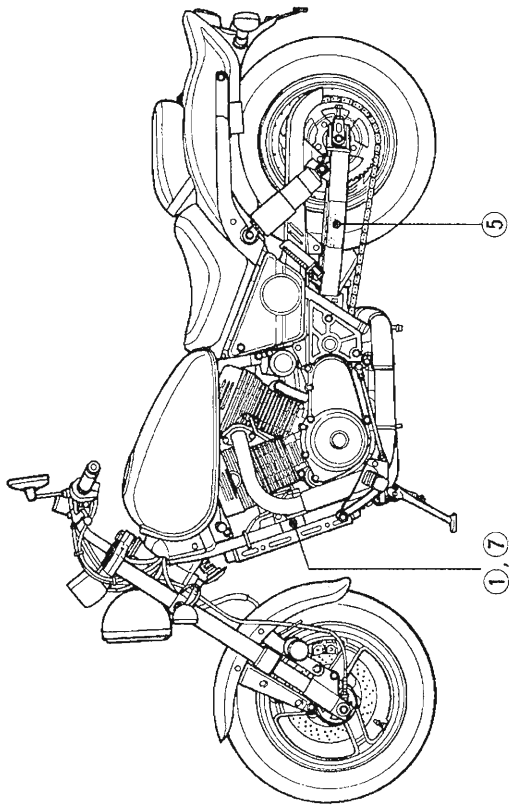
CYLINDER IDENTIFICATION

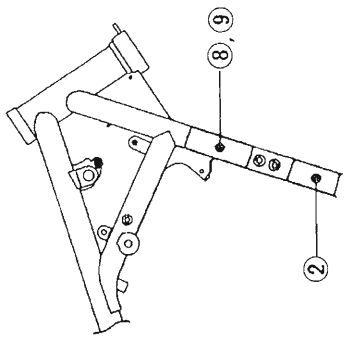
The two cylinders of this engine are identified as No.1 and No.2 cylinder, as counted from rear to front (as viewed by the rider on the seat).



INFORMATION LABELS







①	Noise label (For E-03,24,33,34)
②	Information label (For E-03,28,33)
③	Fuel caution label (For E-02,24)
④	Manual notice label (For E-03,33)
⑤	Tire pressure label
⑥	Warning safety label
⑦	ICES Canada label (For E-28)
⑧	ID label (Except for E-03,28,33)
⑨	Safety label (For E-03,28,33)

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 405 mm (94.7 in)	E-17,18,22,25
	2 365 mm (93.1 in)	Others
Overall width	750 mm (29.5 in)	
Overall height	1 110 mm (43.7 in)	
Wheelbase	1 645 mm (64.8 in)	
Ground clearance	135 mm (5.3 in)	
Seat height	700 mm (27.6 in)	
Dry mass	207 kg (456 lbs)	

ENGINE

Type	Four-stroke, Water-cooled, OHC, 45-degree V-twin
Number of cylinders	2
Bore	83.0 mm (3.268 in)
Stroke	74.4 mm (3.169 in)
Piston displacement	805 cm^3 (49.1 cu. in)
Carburetor	MIKUNI BDS36SS ..... front MIKUNI BS36SS ..... rear
Air cleaner	Non-woven fabric element
Starter system	Electric starter
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	1.886 (83/44)
Final reduction ratio	3.200 (48/15)
Gear ratios, Low	2.461 (32/13)
2nd	1.578 (30/19)
3rd	1.200 (24/20)
4th	0.956 (22/23)
Top	0.800 (20/25)
Drive chain	DID 50VA_2, 116 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm, coil spring, oil damped, spring pre-load 5-way adjustable
Steering angle	40° (right & left)
Caster	35°
Trail	146 mm (5.7 in)
Turning radius	3.1 m (9.9 ft)
Front brake	Disc brake
Rear brake	Internal expanding
Front tire size	130/90-16 67H
Rear tire size	150/90-15 M/C 74H
Front fork stroke	140 mm (5.5 in)
Rear wheel travel	102 mm (4.0 in)

ELECTRICAL

Ignition type	Electronic Ignition (Transistorized)
Ignition timing	5° B.T.D.C. below 1 500 r/min
Spark plug	DPR8EA or X24EPR-U9
Battery	12V 36.0 kC (10 Ah)/10 HR
Generator	Three-phase A.C. Generator
Fuse	30/15/15/15/10/10A
Headlight	12V 60/55W
Position light	12V 4W
Front turn signal light	12V 5/21W ... E-03,28,33 12V 21W ... Others
Rear turn signal light	12V 21W
Tail/Brake light	12V 5/21W
Speedometer light	12V 1.7W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 1.7W
Engine coolant temp. indicator light	12V 1.7W

CAPACITIES

Fuel tank, including reserve	13.0 L (3.4/2.9 US/Imp gal)
reserve	3.0 L (0.8/0.7 US/Imp gal)
Engine oil, oil change	1 700 ml (1.8/1.5 US/Imp qt)
with filter change	2 100 ml (2.2/1.8 US/Imp qt)
overhaul	2 500 ml (2.6/2.2 US/Imp qt)
Engine coolant, including reserve	1 460 ml (1.5/1.3 US/Imp qt)
Front fork oil (each leg)	838 ml (28.3/29.5 US/Imp oz)

These specifications are subject to change without notice.

COUNTRY OR AREA

The series of symbols on the left stand for the countries and areas on the right.

SYMBOL	COUNTRY or AREA
E-02	U.K.
E-03	U.S.A.
E-04	France
E-15	Finland
E-16	Norway
E-17	Sweden
E-18	Switzerland
E-21	Belgium
E-22	Germany
E-24	Australia
E-25	Netherlands
E-26	Denmark
E-28	Canada
E-33	California (U.S.A.)
E-34	Italy
E-37	Brazil
E-39	Austria
E-53	Spain

E-15,16 and 26 countries are included in E-17.
E-21 and 53 countries are included in E-34.
E-39 country is included in E-18.

PERIODIC MAINTENANCE

CONTENTS

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		—	I	R	I	R
Valve clearance		I	—	I	—	I
Spark plug		—	I	R	I	R
Engine oil		R	R	R	R	R
Engine oil filter		R	—	—	R	—
Fuel hose		—	I	I	I	I
		Replace every 4 years				
Engine idle rpm		I	I	I	I	I
Throttle cable play		I	I	I	I	I
Carburetor synchronization		*I	—	I	—	I
Clutch		—	I	I	I	I
Radiator hose		—	I	I	I	I
Engine coolant		Change every 2 years				
Drive chain		I	I	I	I	I
		Clean and lubricate every 1 000 km (600 miles)				
Brake		I	I	I	I	I
Brake fluid		—	I	I	I	I
		Replace every 2 years				
Brake hose		—	I	I	I	I
		Replace every 4 years				
Tire		—	I	I	I	I
Steering		I	—	I	—	I
Front fork		—	—	I	—	I
Rear suspension		—	—	I	—	I
Exhaust pipe bolts		T	—	T	—	T
Evaporative emission control system (California model only)		—	—	I	—	I
		Replace vapor hose every 4 years				
PAIR (Air supply) system (California model only)		—	—	I	—	I
Chassis bolts and nuts		T	T	T	T	T

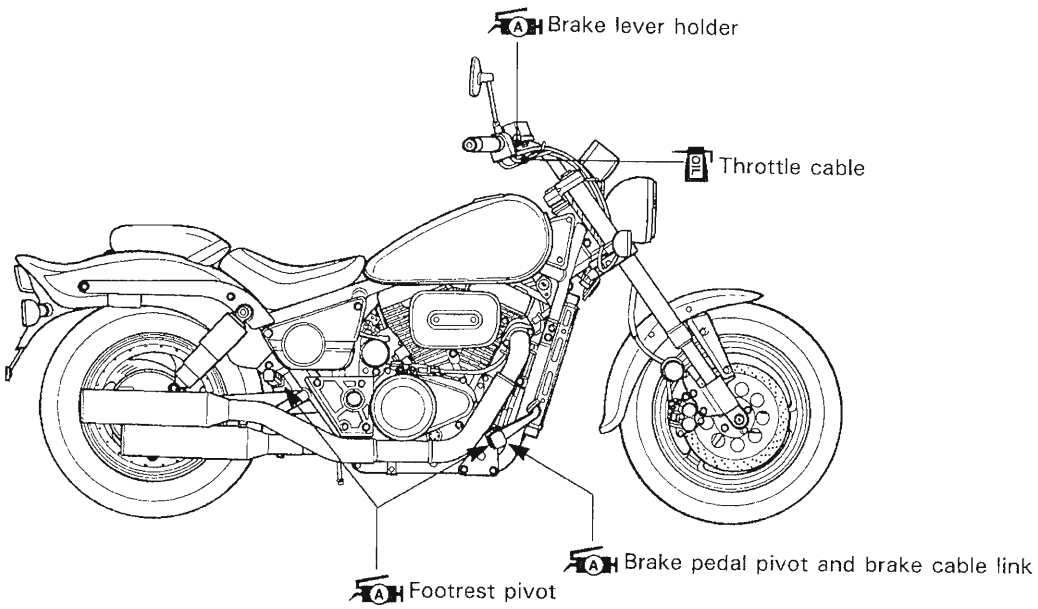
I = Inspection and adjust, clean, lubricate or replace as necessary
C = Clean R = Replace T = Tighten

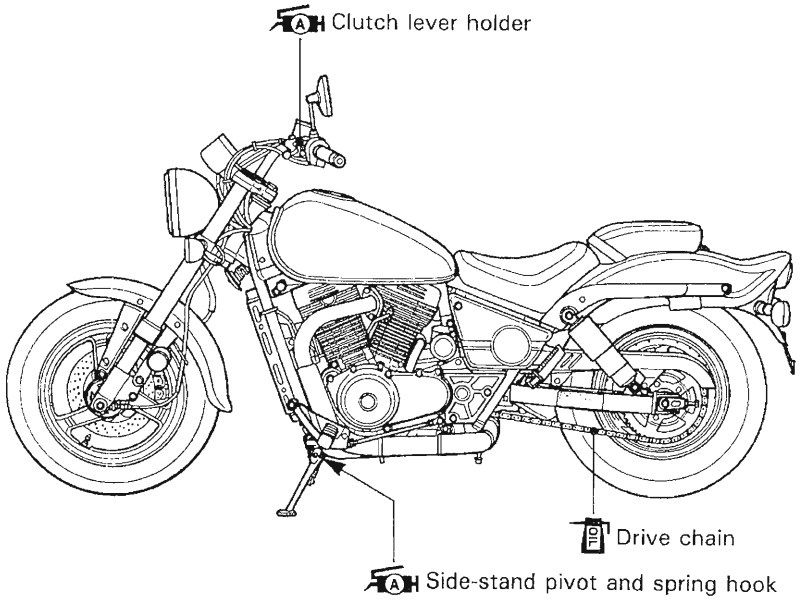
Asterisk mark (*) indicates the California model only.

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:

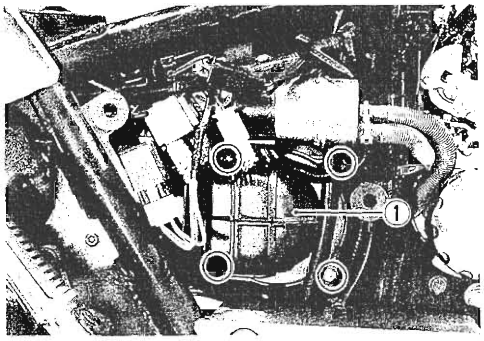
* *Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.*
* *Lubricate exposed parts which are subject to rust, with a rust preventative spray whenever the motorcycle has been operated under wet or rainy conditions.*

MAINTENANCE AND TUNE-UP PROCEDURES

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

AIR CLEANER

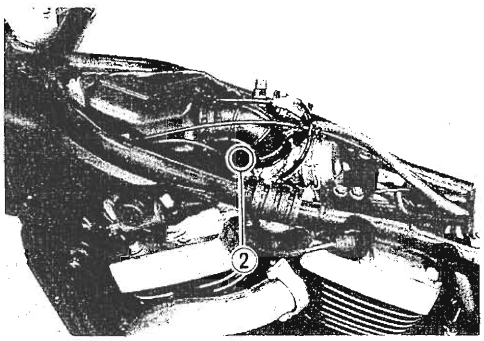
Inspect Every 6 000 km (4 000 miles, 6 months) and Replace Every 12 000 km (7 500 miles, 12 months).



- Remove frame covers, fuel tank and steering head covers. (Refer to pages 4-4 and 6-1.)

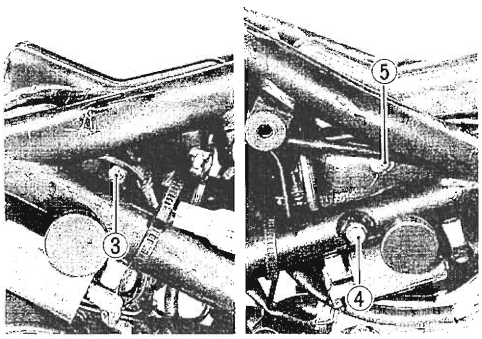
No.1 AIR CLEANER ELEMENT REMOVAL

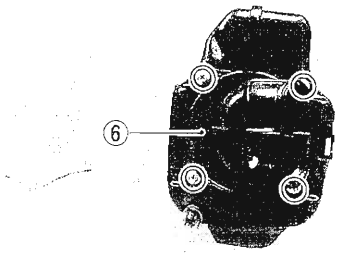
- Remove the air cleaner element ① by removing the screws.



No.2 AIR CLEANER ELEMENT REMOVAL

- Loosen the air cleaner clamp screw ②.
- Remove the air cleaner mounting bolts (③, ④).
- Remove the throttle cable clamp screw ⑤.
- Remove the air cleaner.
- Remove the air cleaner element ⑥ by removing the screws.



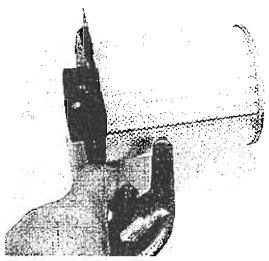


AIR CLEANER ELEMENT CLEANING

- Carefully use an air hose to blow the dust from the air cleaner elements outside.

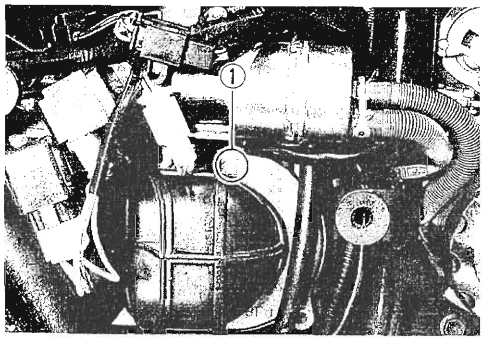
⚠ CAUTION

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



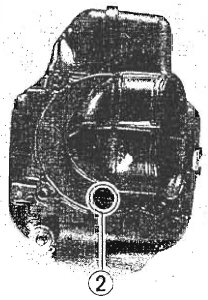
AIR CLEANER ELEMENT REMOUNTING

- Reinstall the cleaned elements or new ones in reverse order of removal.
- Face the arrow mark ① on the element to the upper when installing the No.1 air cleaner element.
- Face the arrow mark ② on the element to the lower when installing the No.2 air cleaner element.



⚠ CAUTION

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



VALVE CLEARANCE

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

Valve clearance also must be checked and adjusted when:
(1) the valve mechanism is serviced, and
(2) the camshaft are disturbed by removing them for servicing.

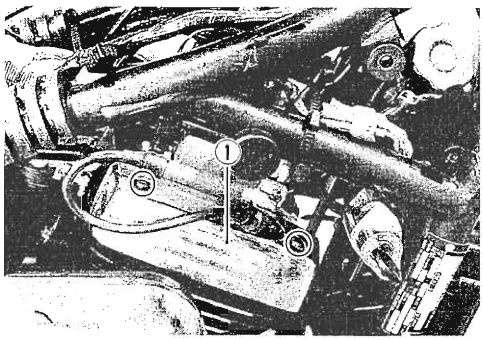
Excessive valve clearance results in valve noise and insufficient valve clearance results in valve damage and reduced power. Check and adjust the clearance to the specification.

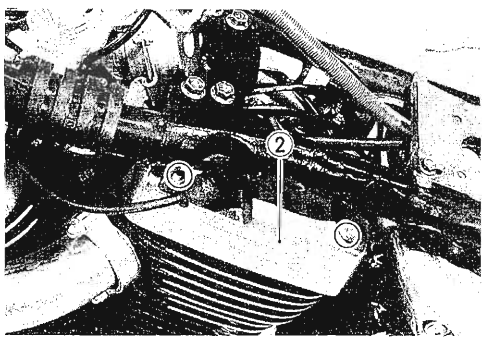
Valve clearance (when cold): IN. & EX. 0.08—0.13 mm (0.003—0.005 in)

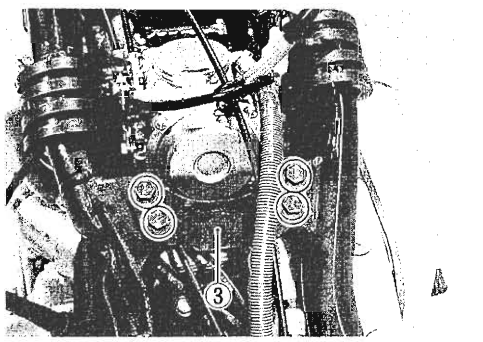
NOTE:

* *The clearance specification is for COLD state.*

* *Both intake and exhaust valves must be checked and adjusted when the piston is at Top Dead Center (TDC) of the compression stroke.*

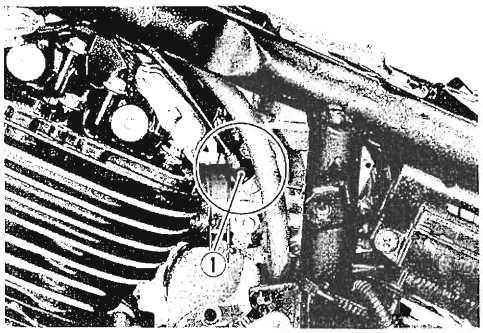






- Remove the fuel tank and frame covers. (Refer to pages 4-4 and 6-1.)
- Remove the No.2 air cleaner. (Refer to page 2-3.)
- Disconnect the spark plug caps.
- Remove the cylinder head cover caps (①, ②).
- Remove the frame bracket ③.

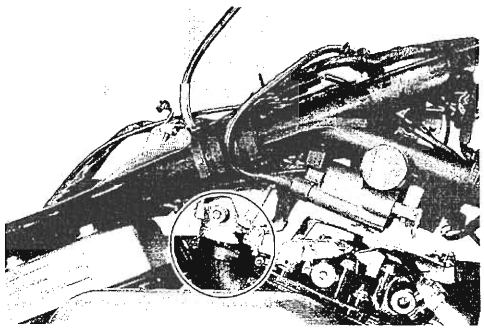
- Remove the starter cable ① from the No.1 carburetor.



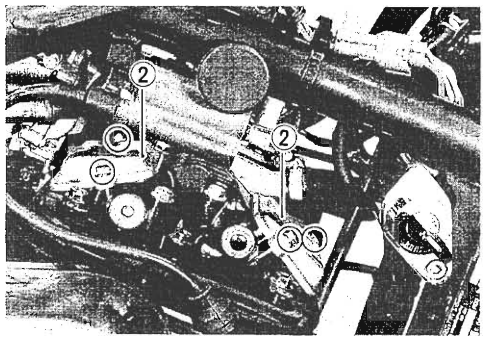
- Disconnect the No.2 carburetor from the intake pipe and then put it on the intake pipe.

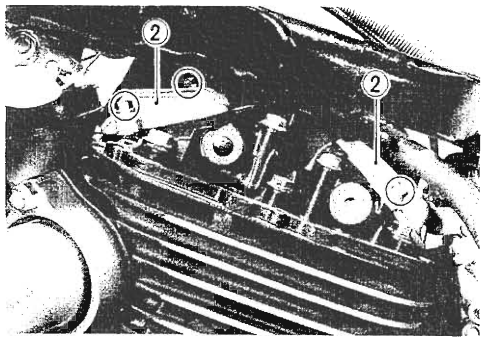
⚠ CAUTION

Do not pull strongly when disconnecting the carburetor to keep the balance of two carburetors.

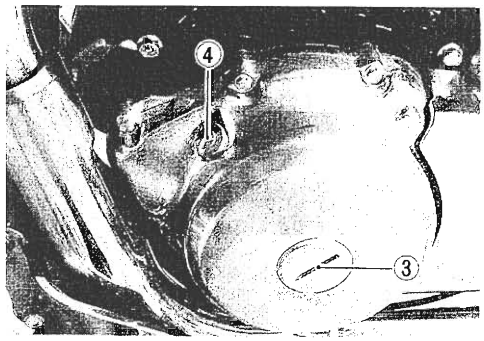


- Remove all the inspection caps ②.
- Remove all the spark plugs.

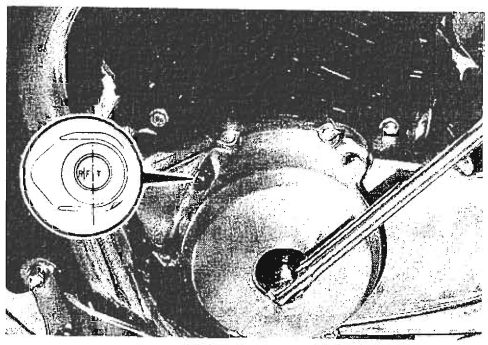




- Remove the generator cover plug ③ and the timing inspection plug ④.

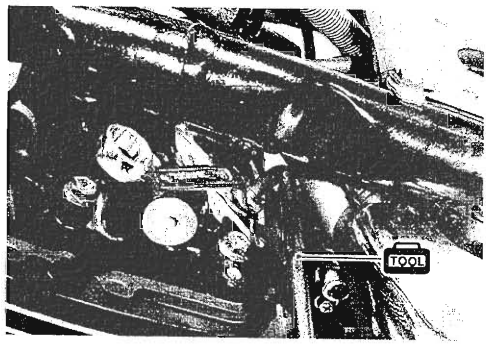


- Rotate the generator rotor to set the No.1 engine's piston at TDC of the compression stroke. (Rotate the rotor until the "R I F I T" line on the rotor is aligned with the center of hole on the generator cover.)



- To inspect the No.1 engine's valve clearance, insert the thickness gauge to the clearance between the valve stem end and the adjusting screw on the rocker arms.

TOOL 09900-20806: Thickness gauge

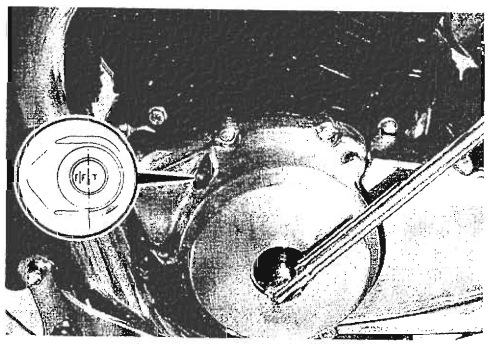


- If the clearance is out of the specification, bring it into the specified range by using the special tool.

TOOL 09917-10410: Valve adjust driver

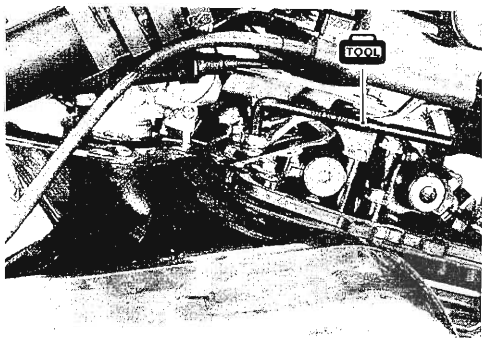
⚠ CAUTION

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

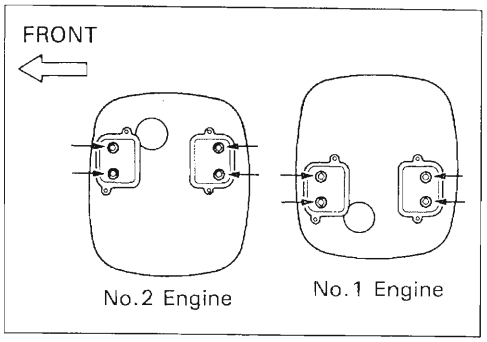


- Rotate the generator rotor 450 degrees (1-¼ turns) and align the "F I F I T" line on the rotor with the center of hole on the generator cover.

Inspect the No.2 engine's valve clearance as the same manner above.

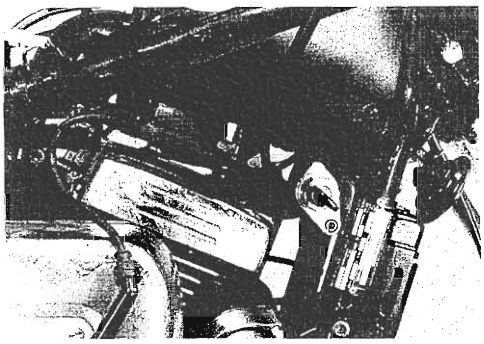


NOTE:
Use the thickness gauge from the arrow marks as shown in the illustration.



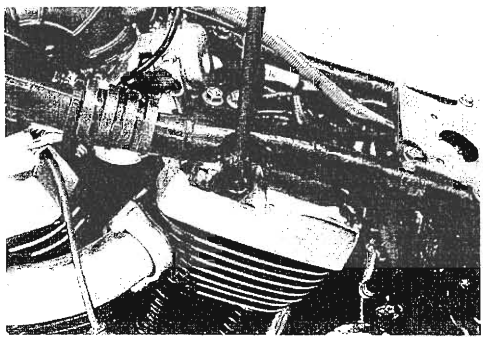
SPARK PLUG

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



- Remove the spark plugs with spark plug wrench.

TOOL **09930-10141: Socket wrench**
09930-14530: Universal joint
09914-24510: T-handle



- 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	NIPPONDENSO
Hotter type	DPR7EA-9	X22EPR-U9
Standard	**DPR8EA-9**	**X24EPR-U9**
Colder type	DPR9EA-9	X27EPR-U9

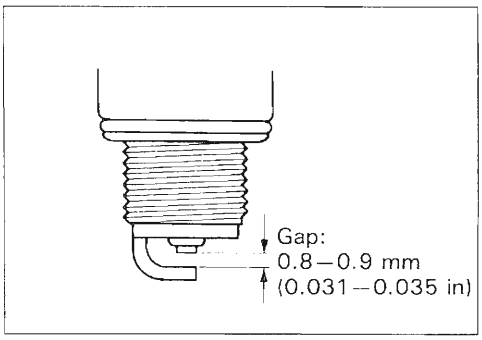
NOTE:
"R" type spark plug has a resistor located at the center electrode to prevent radio noise.

- 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.

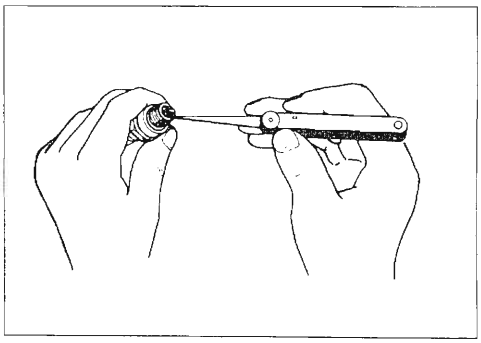
- Measure the plug gap with a thickness gauge if it is correct. If not, adjust it to the following gap.

TOOL **09900-20803: Thickness gauge**

Standard
Spark plug gap: 0.8—0.9 mm (0.031—0.035 in)



- 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.

ENGINE OIL AND OIL FILTER

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

(OIL FILTER)
Replace Initially at 1 000 km (600 miles, 1 months) and Every 18 000 km (1 100 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.

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain the oil by removing the drain plug ① and filler cap ② .
- Remove the oil filter ③ by using the oil filter wrench Ⓐ.
- 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 Ⓐ.

TOOL **09915-40610: Oil filter wrench**

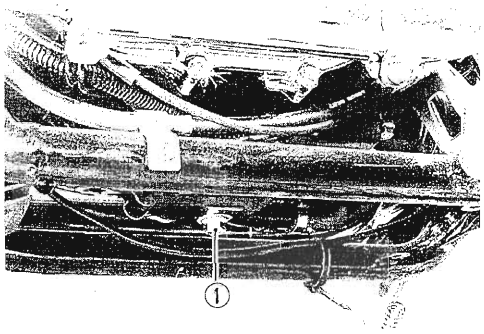
NOTE:
To properly tighten the filter, use the special tool. Never tighten the filter by hand.

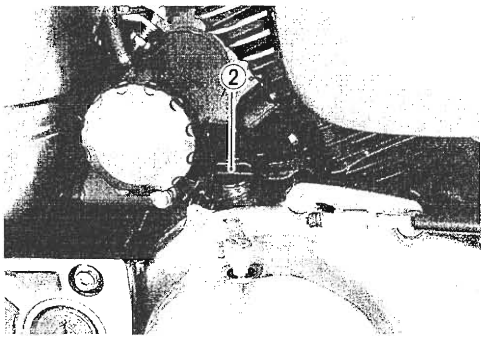
- Fit the drain plug ① securely, and pour fresh oil through the oil filler. The engine will hold about 2.1 L (2.2/1.8 US/Imp qt) of oil. Use an API classification of SF or SG oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ④ . If the level is below the lower line, add oil to that level.

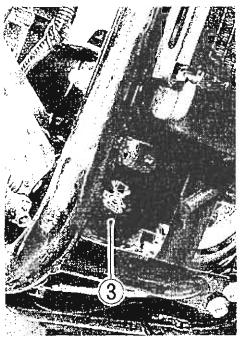
Necessary amount of engine oil
Oil change: 1.7 L (1.8/1.5 US/Imp qt)
Filter change: 2.1 L (2.2/1.8 US/Imp qt)
Overhaul engine: 2.5 L (2.6/2.2 US/Imp qt)

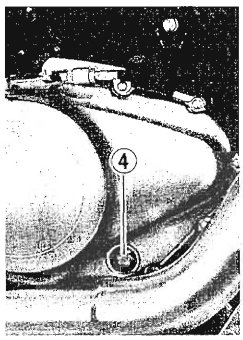
⚠ CAUTION

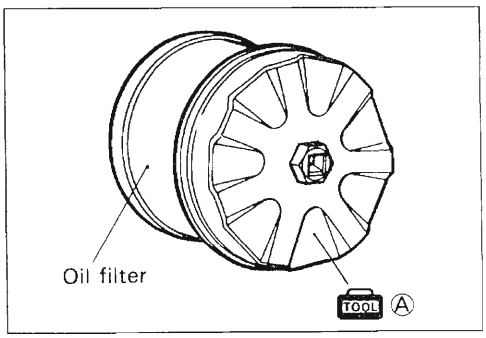
Use SUZUKI MOTORCYCLE GENUINE OIL FILTER only, since the other make's genuine filters and after-market parts may differ in thread specifications (thread diameter and pitch), filtering performance and durability, which could cause engine damage or oil leaks. Suzuki automobile genuine oil filter is also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

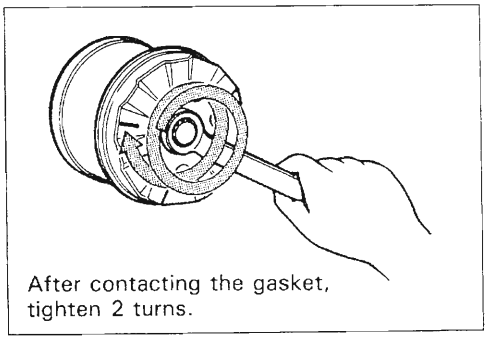




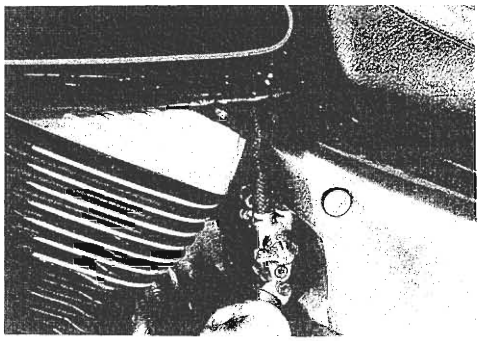







After contacting the gasket, tighten 2 turns.

FUEL HOSE



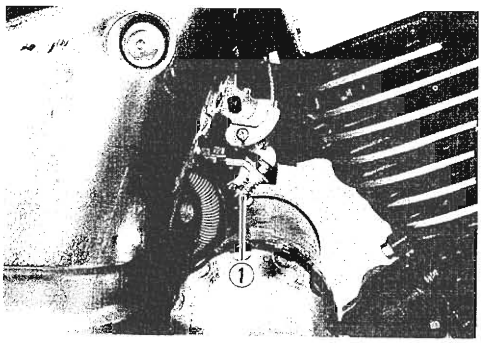
Inspect Every 6 000 km (4 000 miles, 6 months) thereafter. Replace Every 4 years.

Inspect the fuel hose for damage and fuel leakage. If any defects are found, the fuel hose must be replaced.

CARBURETOR

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

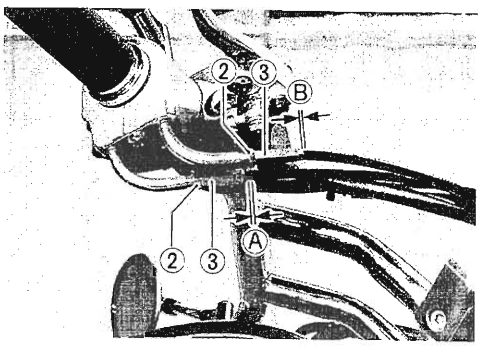
ENGINE IDLE RPM (Idle adjustment)



NOTE:
The engine idling speed should be adjusted when the engine is hot.

- Connect a tachometer.
- Start up the engine and set its speed at idle speed by turning throttle stop screw ① .

Engine idle speed: 1 200 ± 100 r/min



Returning cable play Ⓐ

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

- Loosen the lock nut ② and turn the adjuster ③ in or out until the specified play is obtained.
- Tighten the lock nut ② while holding the adjuster.

Pulling cable play Ⓑ

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

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

⚠ WARNING

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

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) there after.
(Other models)
Inspect Every 12 000 km (7 500 miles, 12 months).

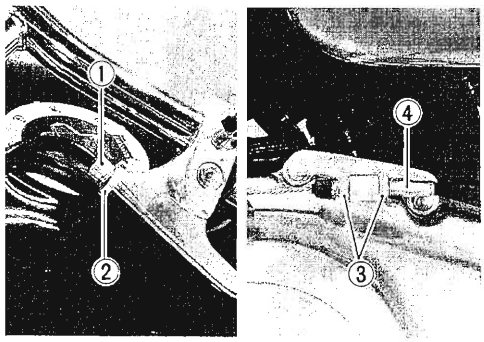
(Refer to page 4-28.)

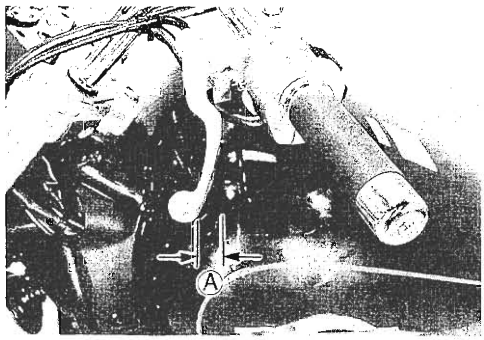
CLUTCH

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

- Turn in the adjuster ① all the way into the clutch lever after loosening the lock nut ②.
- Loosen the lock nuts ③, and adjust the clutch cable ④ to obtain 10—15 mm (0.4—0.6 in) of free play Ⓐ at the clutch lever end.
- Tighten the lock nuts (②, ③).

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





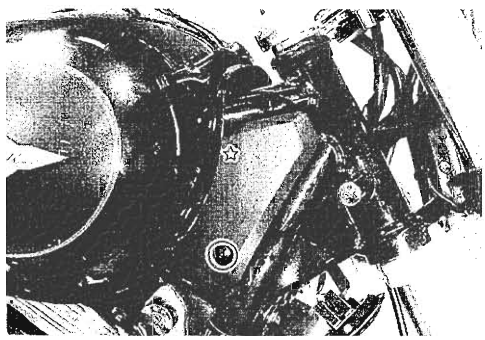
ENGINE COOLANT

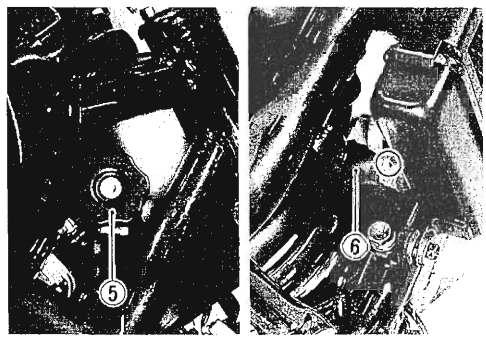
Change engine coolant Every 2 years.

- Remove the right steering head cover.
- Remove the radiator cap ⑤.
- Drain coolant by disconnecting the radiator hose ⑥.

⚠ 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 vomitting and call physician immediately!**



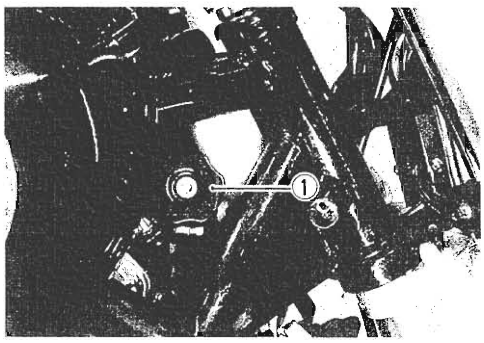


☆: hooked part

- Flush the radiator with fresh water if necessary.
- Connect the radiator hose and tighten it with clamp.
- Pour the specified coolant up to the radiator inlet.

NOTE:
For coolant information, refer to page 5-4.

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



⚠ CAUTION

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

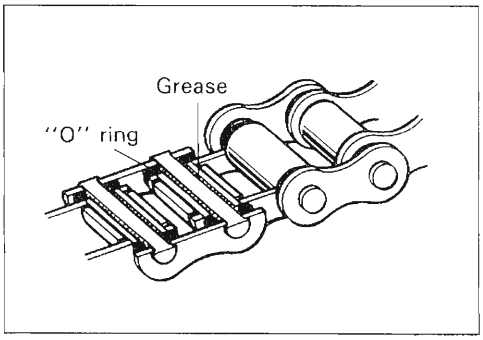
Engine coolant capacity: 1 460 ml (1.5/1.3 US/Imp qt)

DRIVE CHAIN

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) thereafter. Clean and 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
* Damaged rollers
* Dry or rusted links
* Kinked or binding links
* Excessive wear
* Improper chain adjustment
* Missing O-ring seals

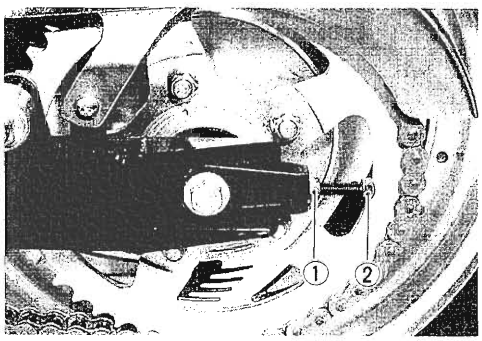


If any defects are found, the drive chain must be replaced.

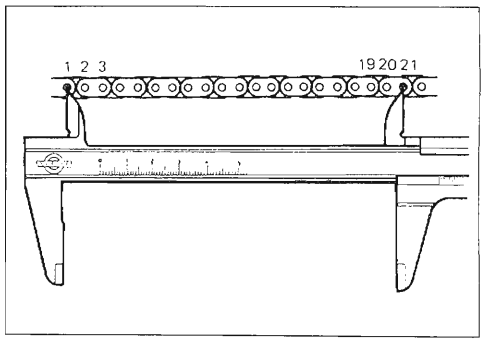
NOTE:
When replacing the drive chain, replace the drive chain and sprockets as a set.

CHECKING

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

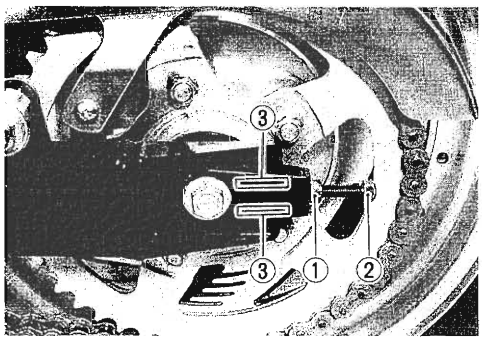


- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.



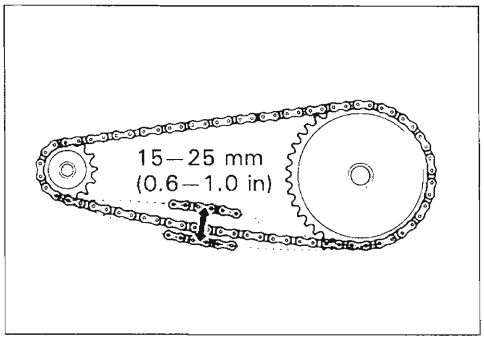
Service Limit (Drive chain 20-pitch length):
319.4 mm (12.6 in)

ADJUSTING



- Loosen or tighten both chain adjusters ② until the chain has 15—25 mm (0.6—1.0 in) of slack in the middle between engine and rear sprockets. The marks ③ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.
- Place the motorcycle on its side-stand for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut securely.
- Tighten both chain adjuster lock nuts ① securely.

Rear axle nut: 65 N·m (6.5 kg-m, 47.0 lb-ft)

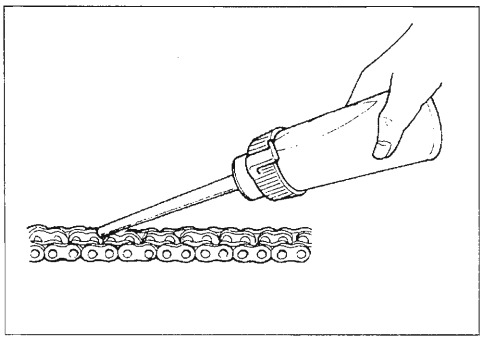


CLEANING AND LUBRICATING

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

⚠ CAUTION

Do not use trichlene, gasoline or any similar fluids: These fluids have too great a dissolving power for this chain and, what is more important, they can damage the "O"-rings (or seals) confining the grease in the bush to pin clearance. Remember, high durability comes from the presence of grease in that clearance.



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

⚠ CAUTION

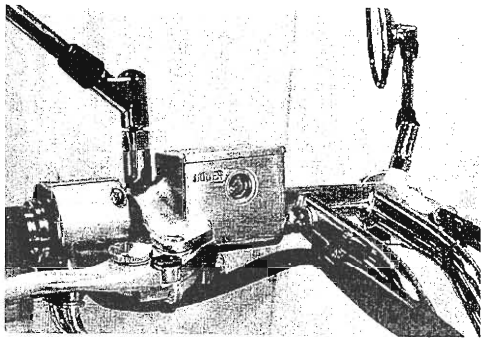
*** Do not use any oil sold commercially as "drive chain oil". Such oil can damage the "O"-rings (or seals).**
*** The standard drive chain is D.I.D. 50VA2. SUZUKI recommends that this standard drive chain should be used for the replacement.**

BRAKE

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

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

FRONT BRAKE



Brake fluid level

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

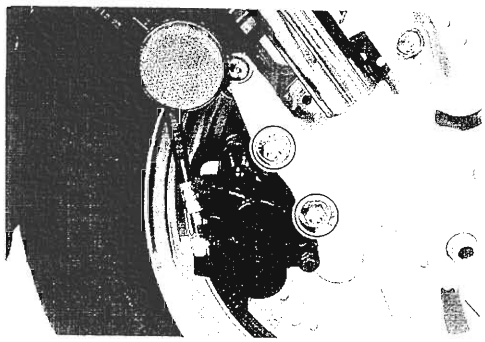
Specification and Classification: DOT 4

⚠ 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

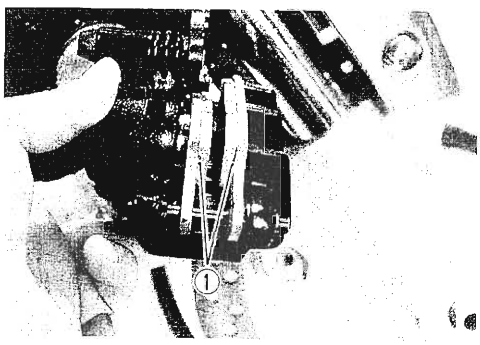
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hoses and hose joints for cracks and oil leakage before riding.



Brake pads

- Remove the brake caliper.

The extent of brake pad wear can be checked by observing the grooved limit ① on the pad. When the wear exceeds the grooved limit, replace the pads with new ones. (Refer to page 6-12.)

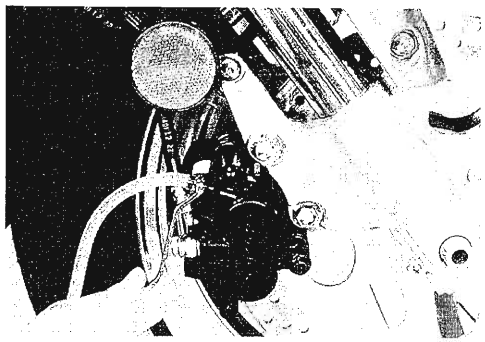


⚠ CAUTION

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

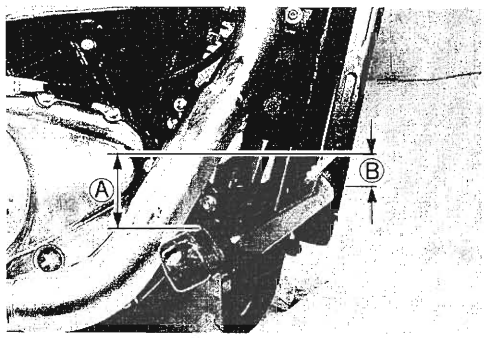
Air bleeding the brake fluid circuit

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 remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:



- Fill up the master cylinder reservoir to the upper end of the inspection window. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper air bleeder valve, and insert the free end of the pipe into a receptacle.
- 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 end of the inspection window.

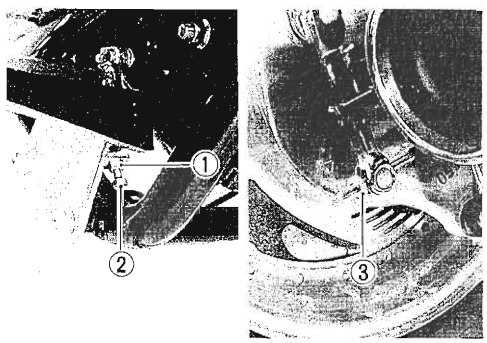
Caliper air bleeder valve: 7.5 N·m (0.75 kg-m, 5.5 lb-ft)

⚠ CAUTION

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

REAR BRAKE

Brake pedal height and free travel

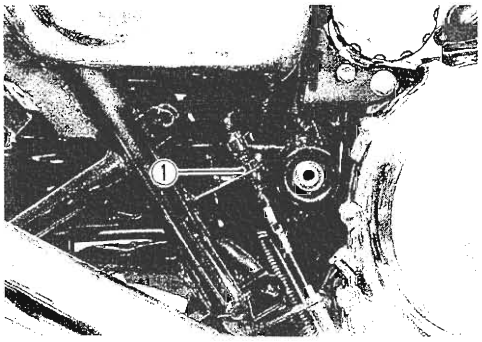


- Loosen the lock nut ① and rotate the adjusting bolt ② to locate the brake pedal height Ⓐ above the footrest as shown in photo. Be sure to tighten the lock nut good and hard after setting the bolt.
- Set the pedal free travel Ⓑ as measured at pedal tip, by repositioning the adjuster nut ③ on the brake cable.

Brake pedal height Ⓐ: 60 mm (2.4 in)
Brake pedal free travel Ⓑ: 20—30 mm (0.8—1.2 in)

Brake light switch

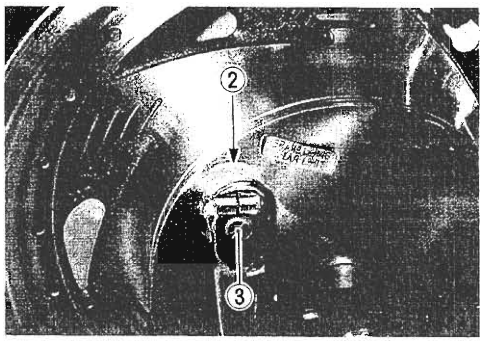
Adjust the rear brake light switch ① so that the brake light will come on just before pressure is felt when the brake pedal is depressed.



Brake shoe wear

This motorcycle is equipped with brake lining wear limit indicator ② on rear brake panel. At the condition of normal lining wear, the extension line of the index mark ③ on brake cam shaft should be within the range embossed on the brake panel with brake on. To check wear of the brake lining, perform the following step.

- First check if the brake system is properly adjusted.
- While operating the brake, check to see that the extension line of the index mark ③ is within the range on the brake panel.
- If the index mark is beyond the range, the brake shoe assembly should be replace with new ones. (Refer to page 6-33.)

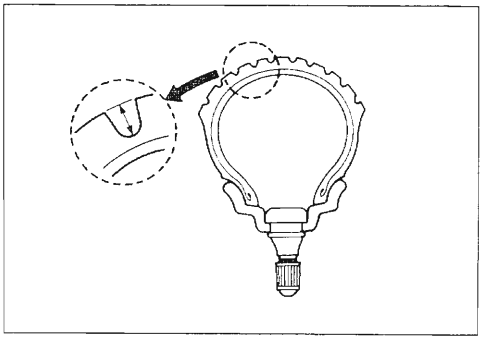


TIRE

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.



09900-20805: Tire depth gauge

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

TIRE PRESSURE

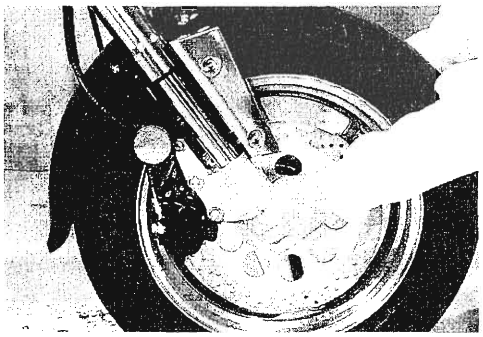
If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result. Cold inflation tire pressure is as follows.

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	200	2.00	29	200	2.00	29
REAR	225	2.25	33	225	2.25	33

⚠ CAUTION

The standard tire fitted on this motorcycle is 130/90-16 67H for front and 150/90-15 M/C 74H for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

STEERING



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

Taper roller type bearings are used on the steering system for better handling. Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork assembly by supporting the motorcycle so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 6-29 of this manual.

FRONT FORK

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

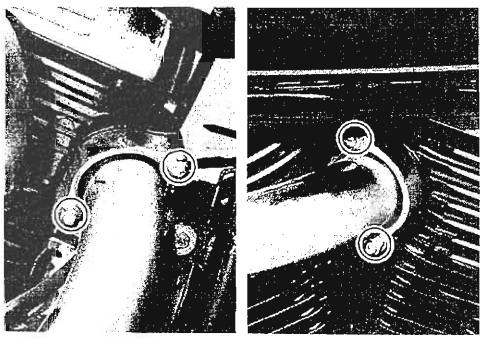
Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (Refer to page 6-19.)

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.

- Tighten the exhaust pipe clamp bolts to the specified torque with torque wrench.

Exhaust pipe clamp bolt: 25 N·m (2.5 kg-m, 18.0 lb-ft)

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 page 9-4.

PAIR (AIR SUPPLY) SYSTEM (California model only)

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

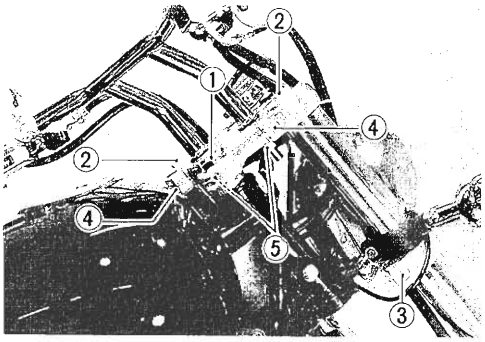
Refer to pages 9-6 and 9-7.

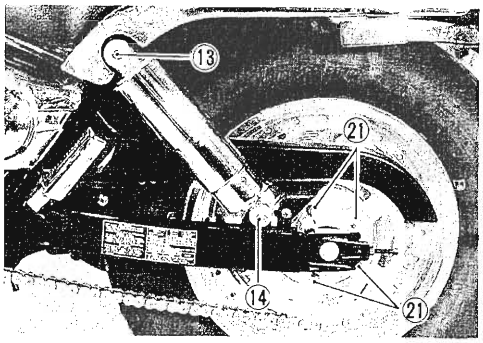
CHASSIS BOLTS AND NUTS

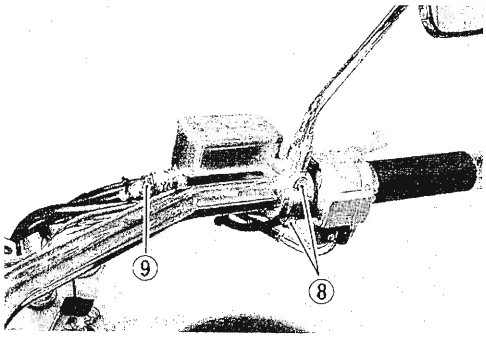
Tighten Initially at 1 000 km (600 miles, 1 months) and Every 6 000 km (4 000 miles, 6 months) thereafter.

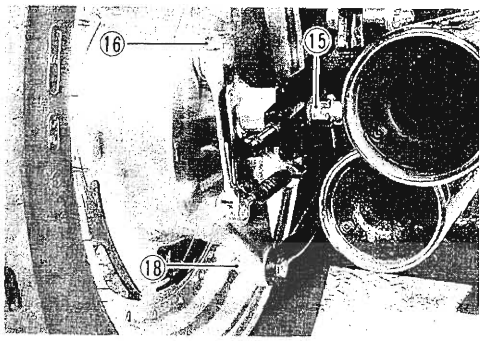
The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-18 for the locations of the following nuts and bolts on the motorcycle.)

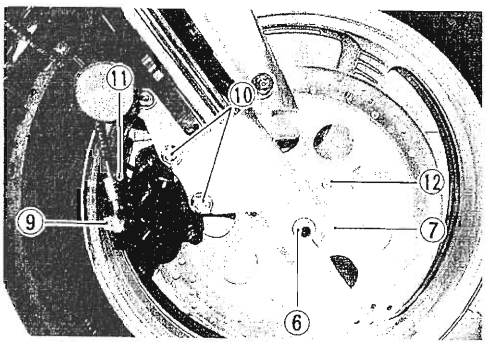
ITEM	N·m	kg-m	lb-ft
① Steering stem head nut	90	9.0	65.0
② Front fork cap bolt	23	2.3	16.5
③ Front fork lower clamp bolt	33	3.3	24.0
④ Front fork upper clamp bolt	23	2.3	16.5
⑤ Handlebar mounting nut	54	5.4	39.0
⑥ Front axle	65	6.5	47.0
⑦ Front axle pinch bolt	23	2.3	16.5
⑧ Front master cylinder mounting bolt	10	1.0	7.0
⑨ Brake hose union bolt	23	2.3	16.5
⑩ Caliper mounting bolt	39	3.9	28.0
⑪ Caliper air bleeder valve	7.5	0.75	5.5
⑫ Brake disc plate bolt	23	2.3	16.5
⑬ Rear shock absorber fitting bolt (upper)	23	2.3	16.5
⑭ Rear shock absorber fitting nut (lower)	50	5.0	36.0
⑮ Rear axle nut	65	6.5	47.0
⑯ Rear brake cam lever bolt	10	1.0	7.0
⑰ Rear torque link nut (front)	35	3.5	25.5
⑱ Rear torque link nut (rear)	25	2.5	18.0
⑲ Rear swingarm pivot nut	100	10.0	72.5
⑳ Front footrest bolt	39	3.9	28.0
㉑ Rear sprocket nut	60	6.0	43.5

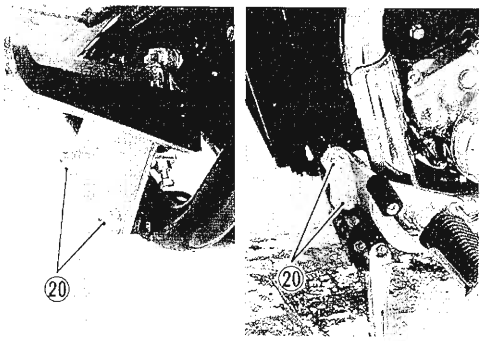

1
2
2
3
4
4
5

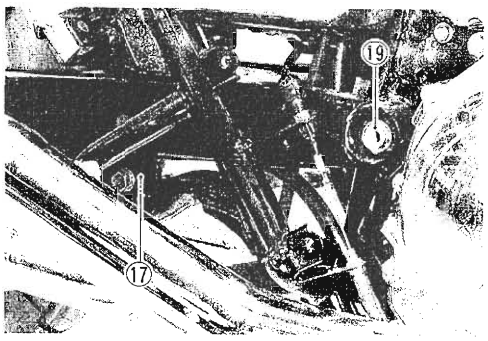

13
14
21
21


8
9


15
16
18


6
7
9
10
11
12


20
20


17
19

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
1 500 kPa 15.0 kg/cm^2 213 psi	1 100 kPa 11.0 kg/cm^2 156 psi	200 kPa 2 kg/cm^2 28 psi

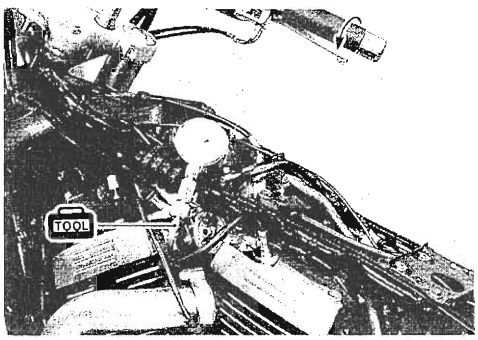
Low compression pressure can indicate any of the following conditions:
* Excessively worn cylinder wall
* Worn-down piston or piston rings
* Piston rings stuck in grooves
* Poor seating of valves
* Ruptured or otherwise defective cylinder head gasket
* Valve clearance out of adjustment
* Starter motor cranks too slowly

Overhaul the engine in the following cases:
* Compression pressure in one of the cylinders is less than 1 100 kPa (11 kg/cm^2, 156 psi).
* Difference in compression pressure between any two cylinders is more than 200 kPa (2 kg/cm^2, 28 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.*

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



Ø **09915-64510: Compression gauge**
09915-63210: Compression gauge adaptor

OIL PRESSURE CHECK

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

OIL PRESSURE SPECIFICATION

Above 450 kPa (4.5 kg/cm², 64 psi) **Below 750 kPa (7.5 kg/cm², 107 psi)**	**at 3 000 r/min., Oil temp. at 60°C (140°F)**

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

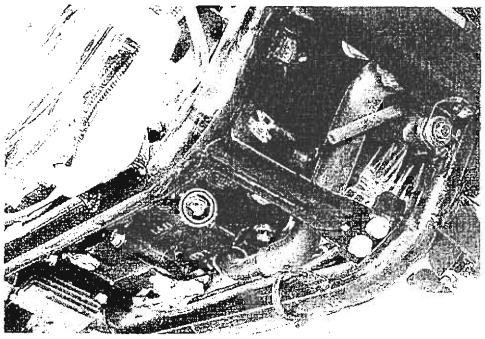
HIGH OIL PRESSURE

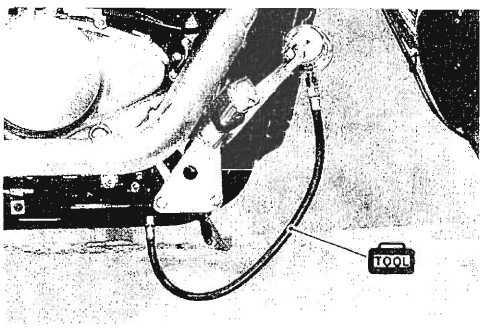
* Used a engine oil which is too high viscosity
* Clogged oil passage way
* Improper installation of the oil filter
* Combination of above items

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 main oil gallery plug.
- Install the oil pressure gauge with adaptor 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 tachometer), and read the oil pressure gauge.





09915-74510: Oil pressure gauge
09915-74531: Oil pressure gauge adaptor
09915-77330: Meter (for high pressure)

ENGINE

3

CONTENTS

ENGINE COMPONENTS REMOVABLE WITH THE ENGINE IN PLACE

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

ENGINE CENTER

PARTS	REMOVAL	INSTALLATION
Radiator	5-5 and -6	5-7
Oil filter	2-8	2-8
Carburetor	4-14 through -17	4-27
Oil pressure switch	3-21	3-55
Starter motor assembly	3-14	3-63

ENGINE RIGHT SIDE

PARTS	REMOVAL	INSTALLATION
Clutch cover	3-17	3-60
Clutch pressure, drive and driven plates	3-17 and -18	3-59
Oil pump driven gear	3-20	3-56
Oil pump assembly	3-20	3-56
Primary drive gear	3-19	3-56
Gearshift shaft	3-20	3-55
Exhaust pipe and muffler	3-4 and -5	3-10
Clutch sleeve hub	3-18	3-57 and -58
Primary driven gear assembly	3-19	3-57

ENGINE LEFT SIDE

PARTS	REMOVAL	INSTALLATION
Gearshift lever	3-4	3-10
Generator cover	3-15	3-61
Generator rotor	3-16	3-61
Generator stator	3-45	3-45
Starter clutch	3-46	3-46
Starter idle gear	3-16	3-61
Signal generator stator	3-45	3-45
Neutral switch	3-15	3-62
Water pump assembly	5-12 and -13	5-16 and -17
Exhaust pipe	3-4	3-10

ENGINE REMOVAL AND REINSTALLATION

ENGINE REMOVAL

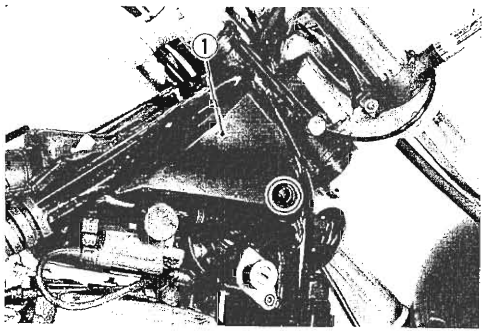
Before taking the engine out of the frame, thoroughly clean the engine with a suitable cleaner. The procedure of engine removal is sequentially explained in the following steps.

- Remove the seat. (Refer to page 6-1.)
- Remove the frame covers. (Refer to page 6-1.)
- Remove the fuel tank. (Refer to page 4-4.)
- Remove the manual box.
- Disconnect the battery ⊖ and ⊕ lead wires from the battery terminals, remove the battery.

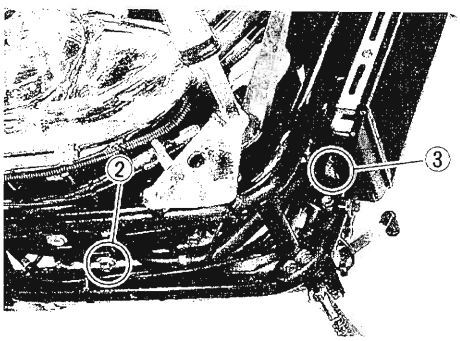
⚠ CAUTION

Be sure to disconnect the ⊖ lead wire first.

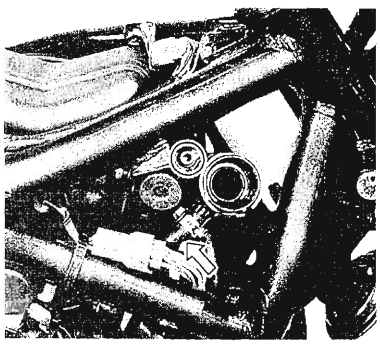
- Remove the frame head covers ①.

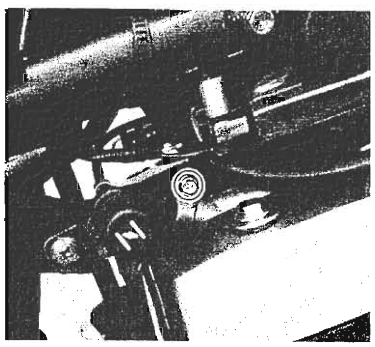


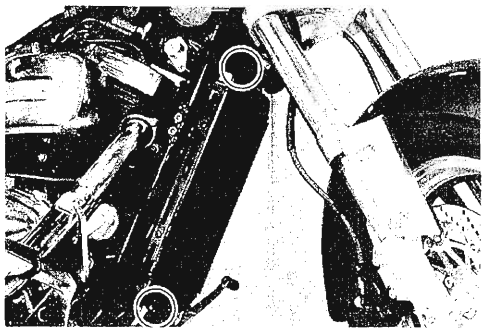
- Remove the oil drain plug ② to drain out engine oil.
- Disconnect the water hose ③ to drain out engine coolant.



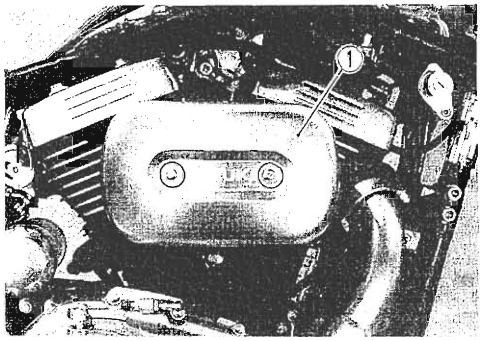
- Remove the radiator. (Refer to pages 5-5 and -6.)



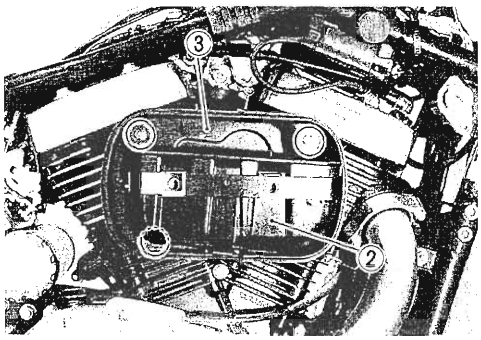




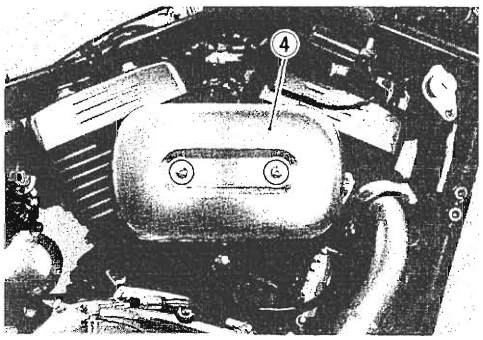
- Remove the box cover ①.



- Remove the box ② and bracket ③.

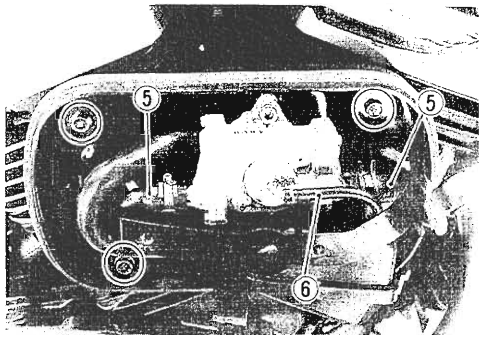


- Remove the PAIR (AIR SUPPLY) system cover ④. (For E-03,18,28 and 33 models)



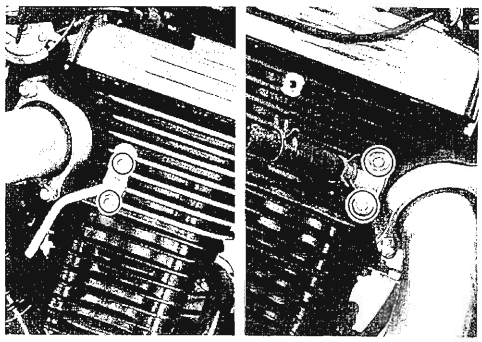
(For E-03,18,28 and 33 models)

- Disconnect the PAIR reed valve hoses ⑤ and PAIR controle valve vacuum hose ⑥.
- Remove the PAIR system bracket.
- Remove the PAIR control valve vacuum hose ⑥ from the intake pipe. (For E-03,18,28 and 33 models)



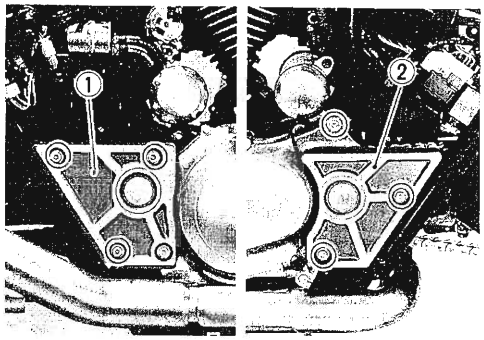
(For E-03,18,28 and 33 models)

- Remove the No.1 and No.2 PAIR air pipe. (For E-03,18,28 and 33 models)

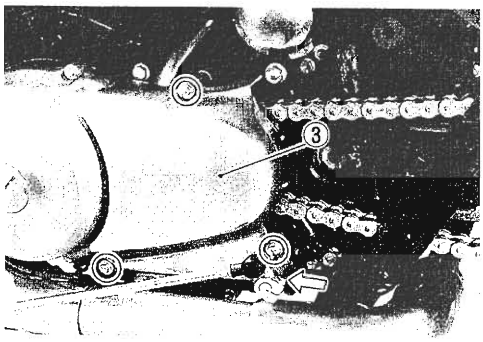


(For E-03,18,28 and 33 models)

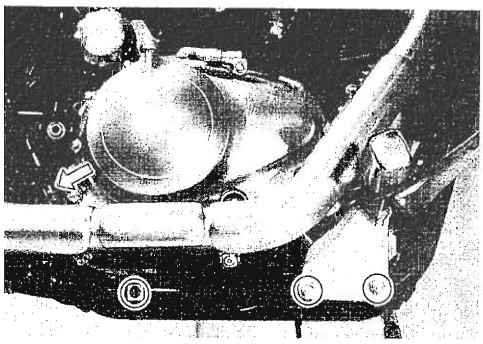
- Remove the swingarm pivot covers ①, ②.

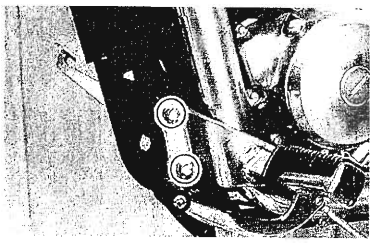


- Remove the engine sprocket cover ③.
- Remove the gearshift lever.

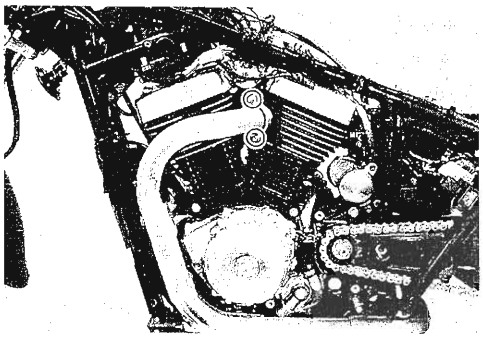


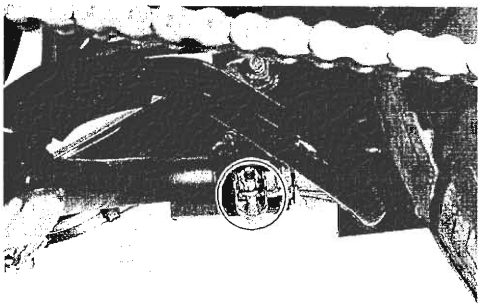
- Remove the left and right front footrest brackets.
- Remove the rear brake cable guide bolt and rear brake light switch cable.

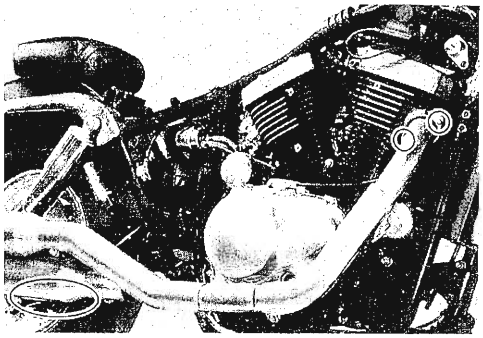




- Remove the exhaust pipes and mufflers, left and right.

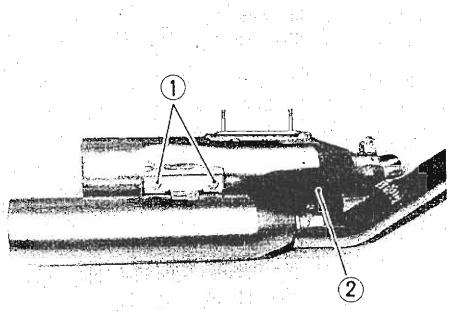




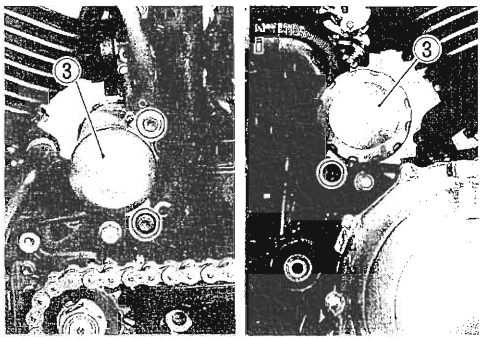


NOTE:

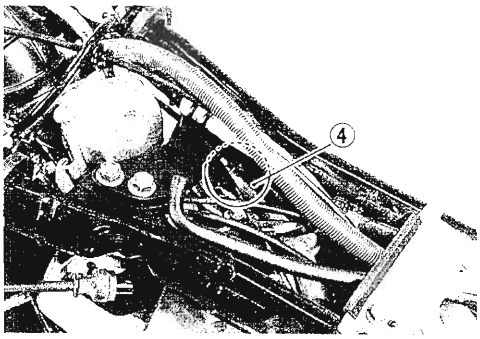
* *When sparating the mufflers, remove the nuts ① and loosen the joint nut ②.*
* *After reassemble the mufflers, lock the joint nut ②.*



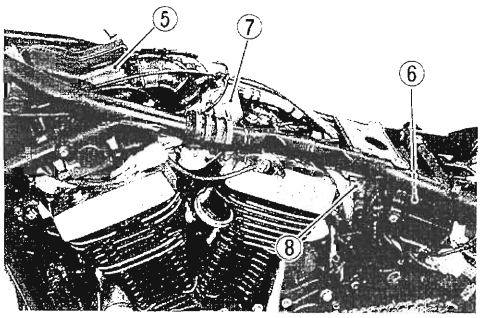
- Remove the tool holder ③.



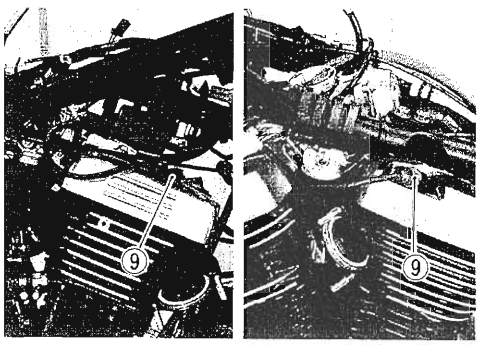
- Disconnect the breather hose ④ from the rear cylinder head.



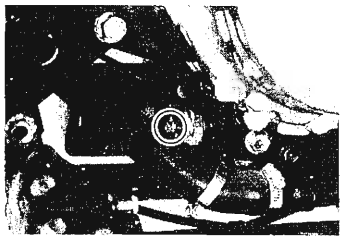
- Remove the front and rear air cleaner boxes ⑤, ⑥. (Refer to pages 4-14 and -15.)
- Remove the front and rear carburetors ⑦, ⑧ by loosening the clamp screws.

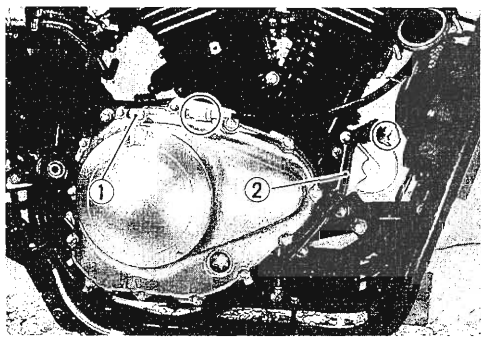


- Remove the spark plug caps ⑨, front and rear.

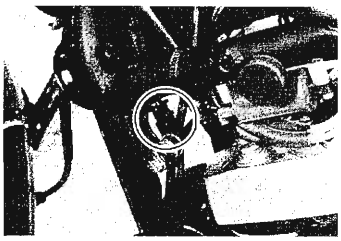


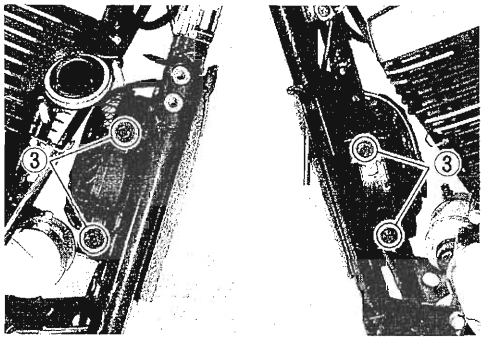
- Remove the clutch release lever ① and clutch cable.
- Remove the starter motor lead wire ② and the oil pressure switch lead wire.



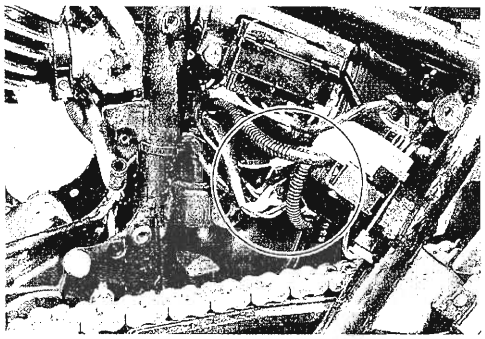


- Remove the cooling fan mounting bolts ③.
- Disconnect the cooling fan lead wire coupler.

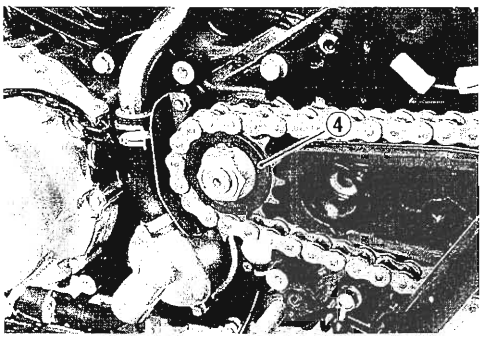




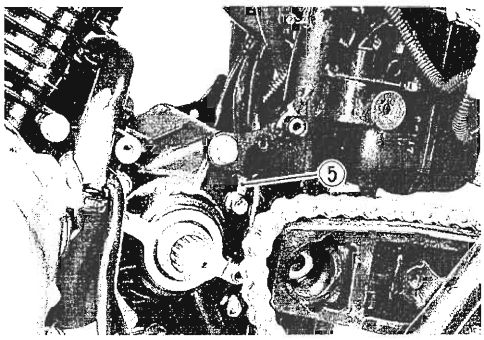
- Disconnect the following lead wires.
  * Generator
  * Signal coil
  * Neutral indicator



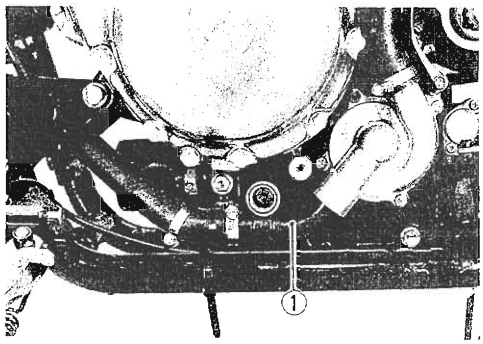
- Flatten the washer and remove the engine sprocket nut.
- Remove the engine sprocket ④.



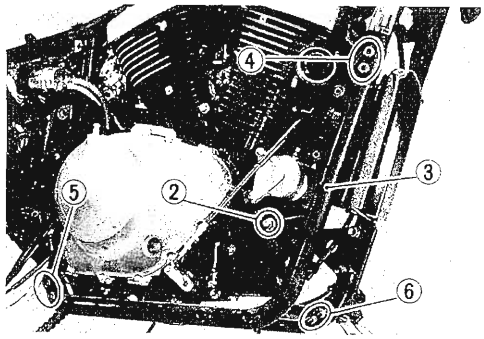
- Remove the ground lead wire ⑤.



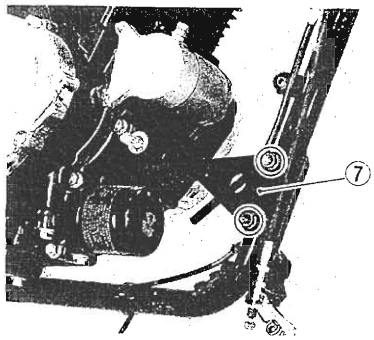
- Remove the water pump inlet pipe ①.



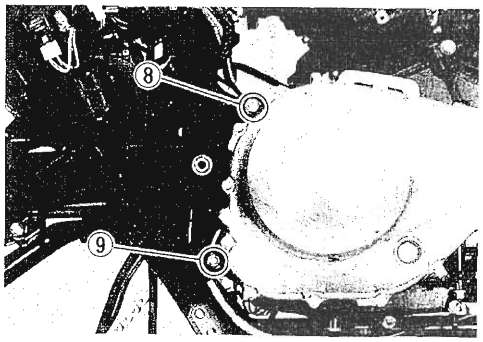
- Remove the engine mounting nut ②.
- Remove the right frame down tube ③ by removing the bolts (④, ⑤ and ⑥).



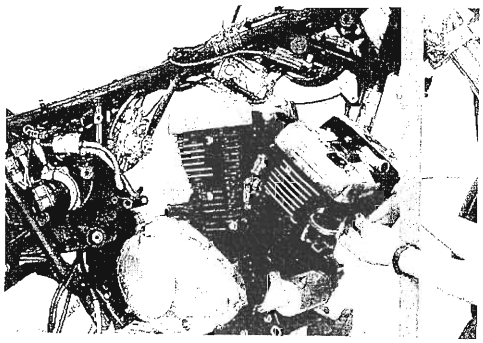
- Remove the engine mounting bracket ⑦.



- Remove the engine mounting bolt ⑧.
- Remove the engine mounting bolt ⑨.



- Support the engine with a proper jack.
- Dismount the engine by pulling slightly forward and to right-side.



⚠ CAUTION

When holding the engine with a jack,
- **avoid applying a jack to the oil filter, or the oil filter may be damaged.**
- **place a wooden piece on a jack, or the oil pan may be damaged.**

ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

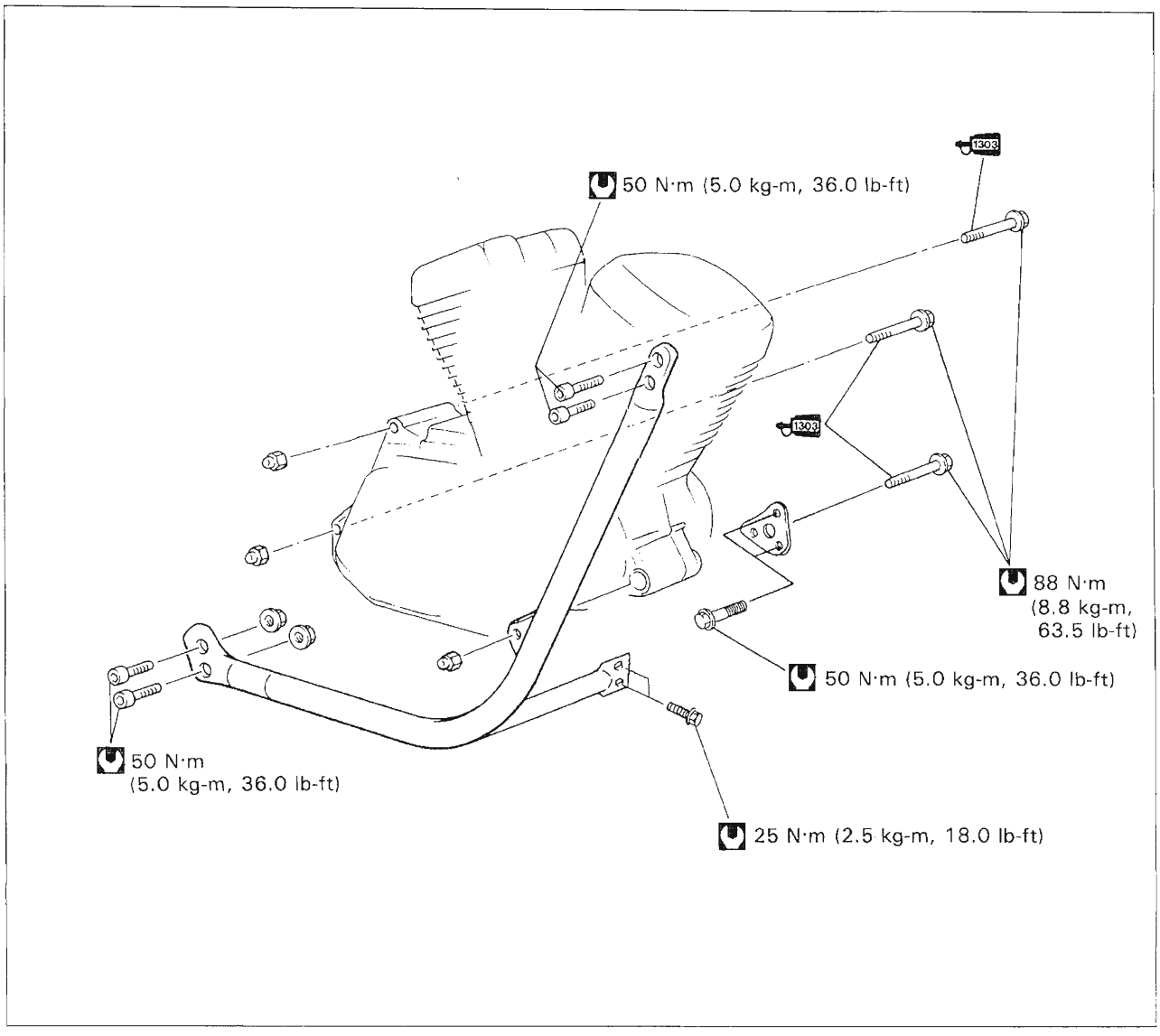
- Install the brackets, bolts and nuts properly, as shown in the following illustration.

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

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

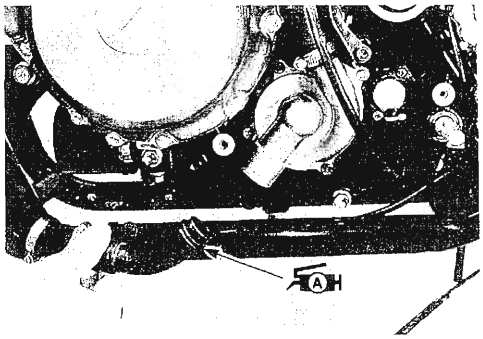
1303 99000-32030: THREAD LOCK SUPER "1303"

- After remounting the engine, route wiring harness, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (Refer to pages 8-12 through -19.)



- Apply grease to the "O-ring", when install the water pump inlet pipe.

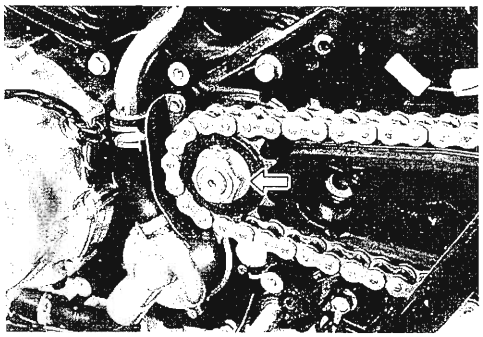
99000-25030: SUZUKI SUPER GREASE "A"



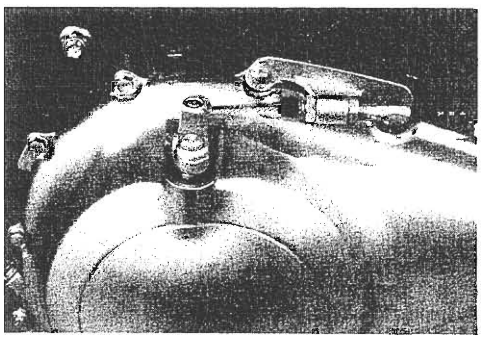
- Tighten the engine sprocket nut to the specified torque.

Engine sprocket nut: 115 N·m (11.5 kg-m, 83.0 lb-ft)

- Bend up the washer to lock the engine sprocket nut.



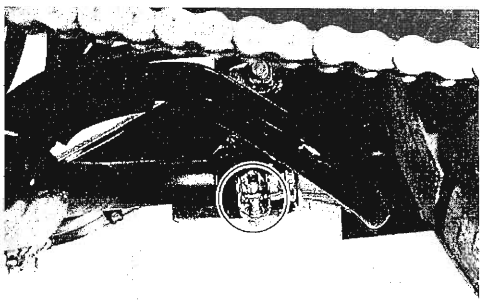
- Install the clutch release lever as shown in the right photograph.



- Be careful not to pull and twist the carburetor cables, while remounting.
- Locate the carburetor clamps correctly. (Refer to page 8-17.)

- Apply gas sealer to the inside and outside of the exhaust pipe/muffler connector.

EXHAUST GAS SEALER: PERMATEX 1372

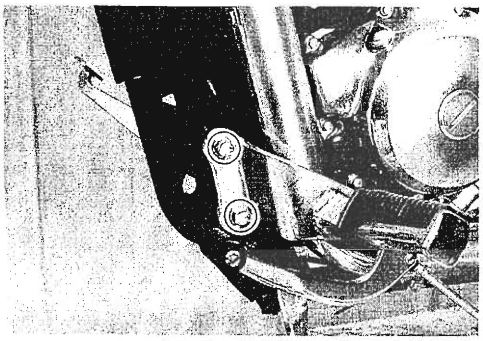


- Tighten the exhaust pipe nut and muffler bolt to the specified torque.

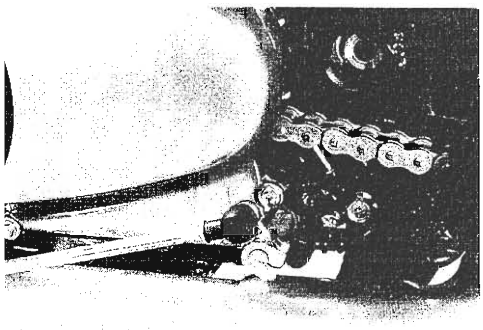
Exhaust pipe nut: 25 N·m (2.5 kg-m, 18.0 lb-ft)
Muffler mounting bolt: 25 N·m (2.5 kg-m, 18.0 lb-ft)

- Tighten the left and right front footrest bracket bolts to the specified torque.

Front footrest bracket bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)



- Install the gearshift lever as shown in the right photograph.



- Adjust the following items to the specification.

Page
* Filling engine coolant ..... 2-10 and -11
* Throttle cable play 2- 9
* Idling adjustment 2- 9
* Balancing carburetors ..... 4-28,-29 and -30
* Rear brake pedal height 2-14

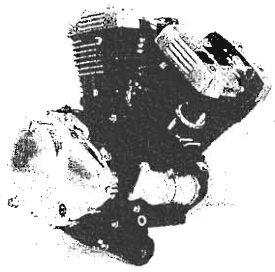
- Pour 2.5 L (2.6/2.2 US/Imp qt) of engine oil SAE 10W/40 graded SF or SG into the engine after overhauling engine.
- Start up the engine and allow it run for several minutes at idle speed. About several minutes after stopping engine, check that the oil level remains between the marks of oil level inspection window.

Change	1 700 ml (1.8/1.5 US/Imp qt)
Filter change	2 100 ml (2.2/1.8 US/Imp qt)
Overhaul	2 500 ml (2.6/2.2 US/Imp qt)

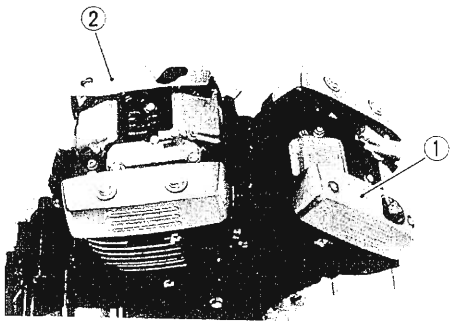
ENGINE DISASSEMBLY

⚠ CAUTION

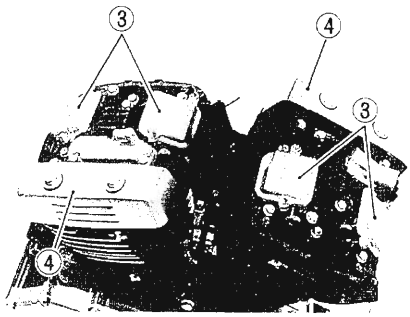
Be sure to identify each removed part such as intake pipe, camshaft, piston, conrod etc. as to its location and lay the parts out in groups so that each will be restored to the original location during assembly.



- Remove the head cover caps ① and ②.

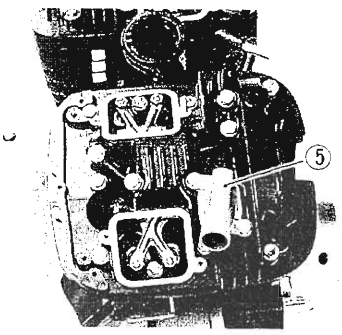


- Remove the valve inspection caps ③.
- Remove the head cover caps ④.



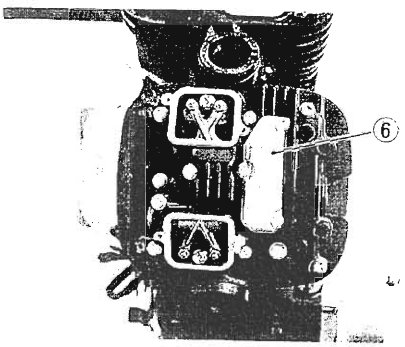
- Remove the water outlet union ⑤ and the cylinder head cover.

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



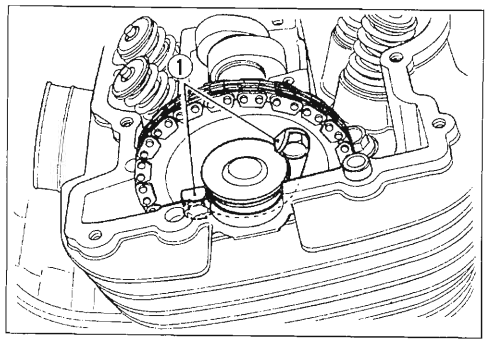
No.2 (FRONT)

- Remove the breather cover ⑥ and the cylinder head cover.

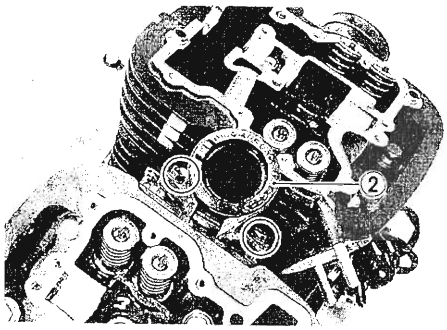


No.1 (REAR)

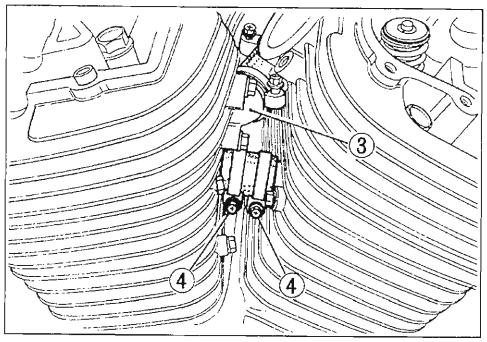
- Flatten the lock washers ① and remove the camshaft sprocket bolts.
- Remove the camshafts and sprockets.



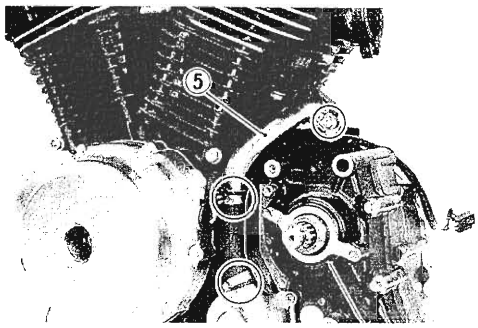
- Remove the front intake pipe ②.



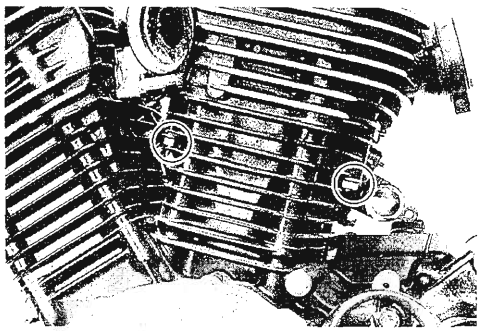
- Remove the water hose union ③.
- Loosen the water hose clamp screws ④.



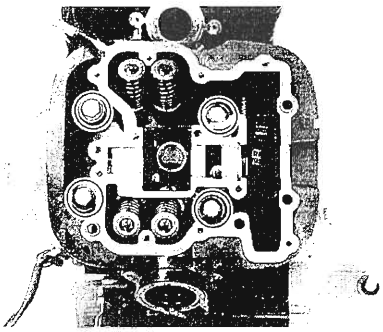
- Remove the water pipe ⑤ and the water hose by removing the water pipe bolts and loosening the water hose clamp screw.



- Remove the No.1 (Rear) cylinder head nuts.

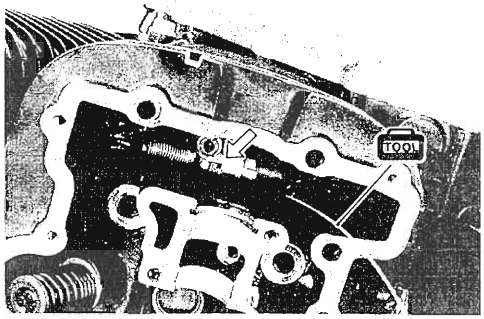


- Remove the No.1 (Rear) cylinder head bolts.

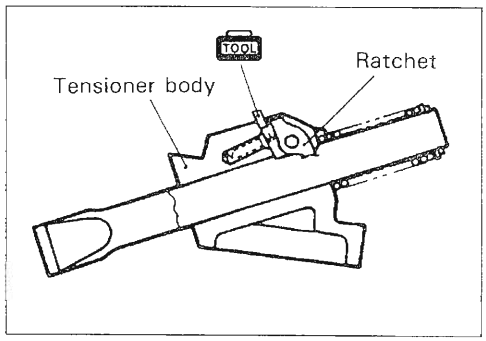


- After releasing the ratchet, push the chain tensioner rod fully to compress the spring and insert a special tool between ratchet and chain tensioner body.

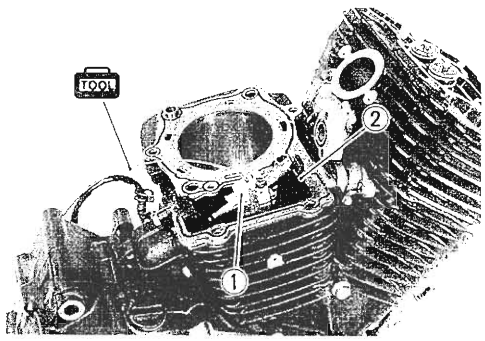
09918-53810: Chain tensioner locking tool



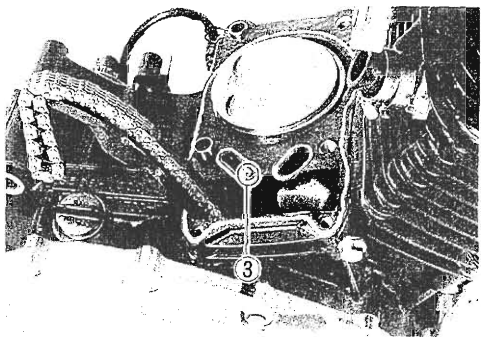
- Separate the No.1 (Rear) cylinder head.



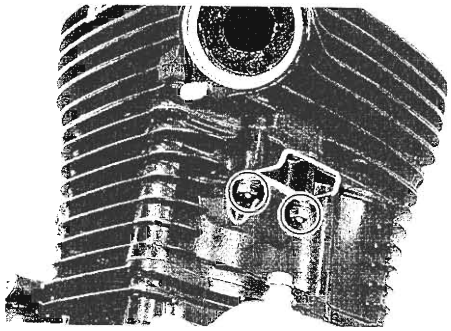
- Remove the cylinder head gasket and dowel pins.
- Remove the chain tensioner ① and the chain tensioner guide ②.
- Remove cylinder.

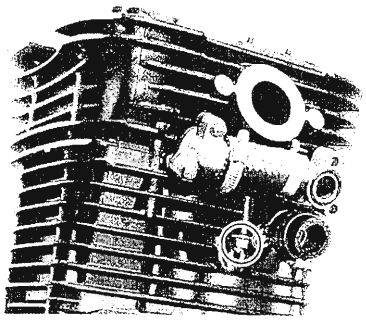


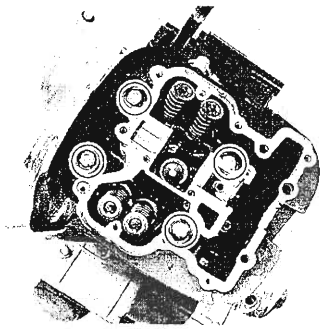
- Remove the cylinder base gasket and dowel pins.
- Remove the oil jet ③.



- Remove the No.2 (Front) cylinder head and cylinder in same manner of No.1 (Rear) cylinder head and cylinder removal.

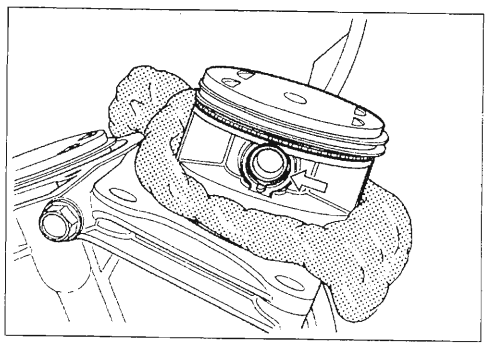




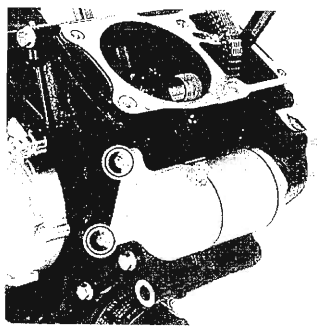


- Place a clean rag over the cylinder base to prevent piston pin circlips from dropping into crankcase. Remove the piston pin circlips with long-nose pliers.
- Drive out the piston pins by using proper drift.

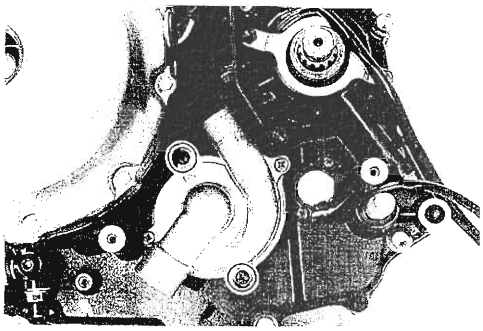
NOTE:
Scribe the cylinder position on the head of the respective pistons.



- Remove the starter motor.

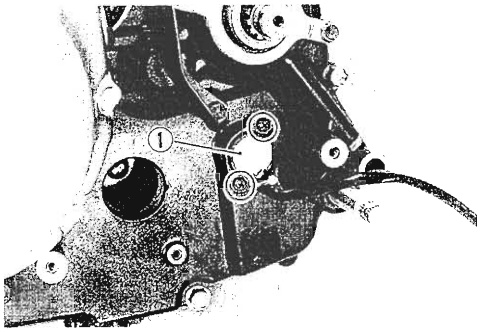


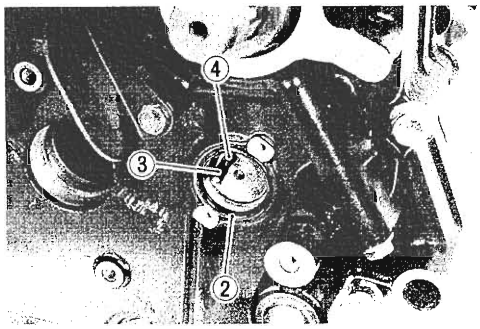
- Remove the water pump.



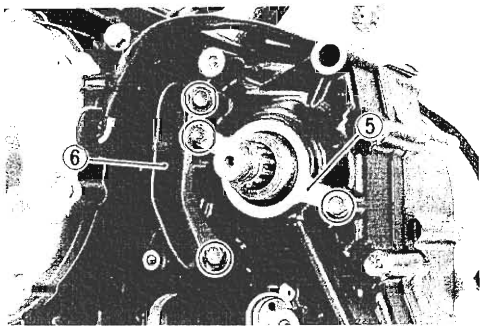
- Remove the neutral switch assembly ①.

NOTE:
Do not lose the "O-ring" ②, the neutral switch contact ③ and its spring ④.

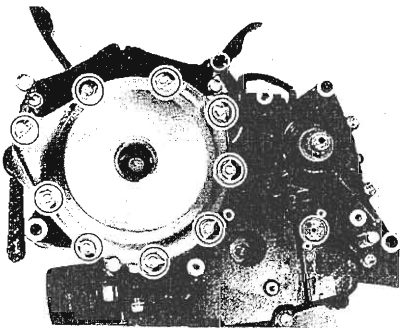




- Remove the drive shaft oil seal retainer ⑤.
- Remove the drive chain guide ⑥.

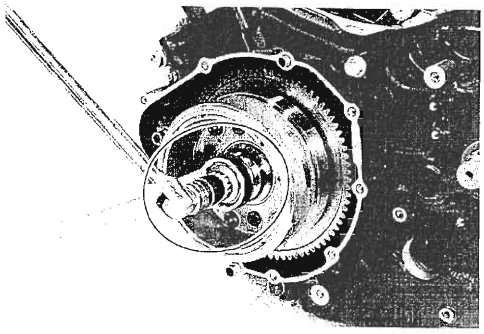


- Remove the generator cover.



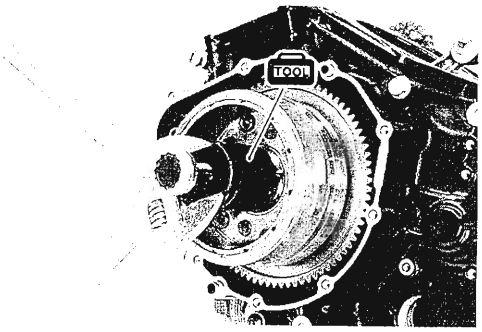
• Loosen the rotor bolt.

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

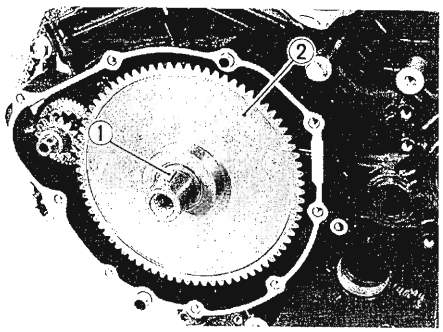


• Remove the rotor by using the special tool.

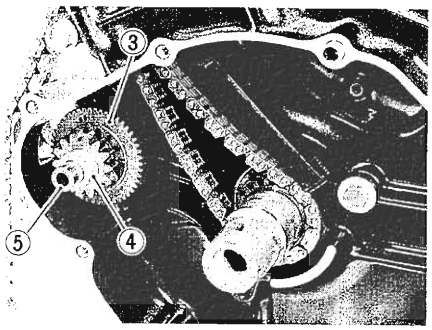
TOOL **09930-34970: Rotor remover**



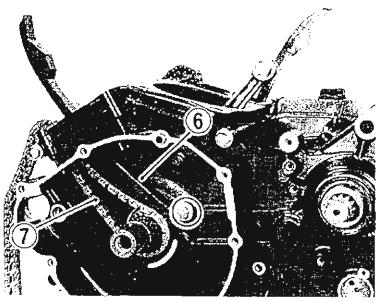
• Remove the key ①.
• Remove the starter driven gear ②.



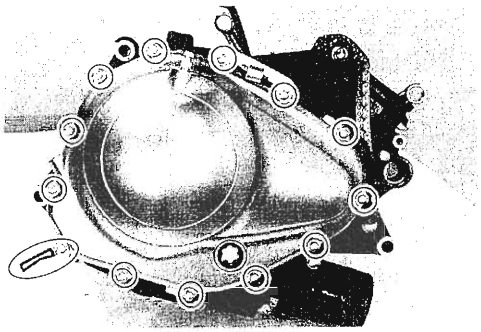
• Remove the starter idle gear ③, spacer ④ and shaft ⑤.



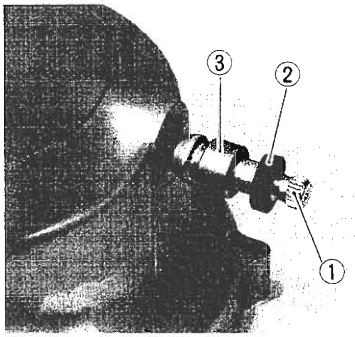
• Remove the cam chain guide ⑥ and cam chain ⑦.



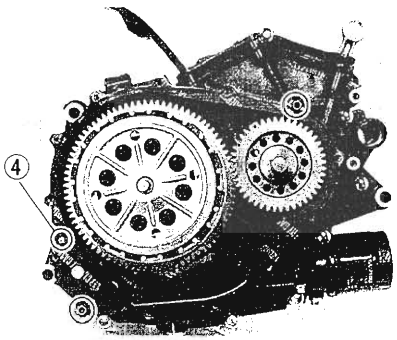
- Remove the clutch cover bolts.
- Remove the clutch cover by tapping with a plastic hammer.



- Remove the clutch release pinion ①, oil seal ② and bearing ③.

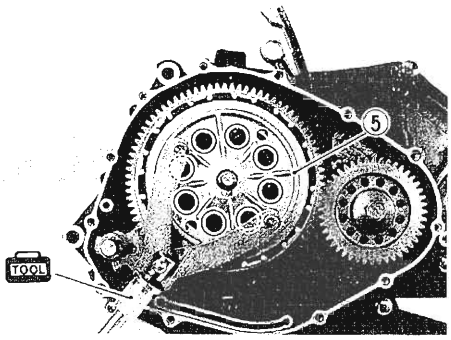


- Remove the oil jet ④.
- Remove the clutch cover gasket and dowel pins.

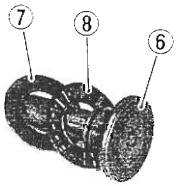


- Remove the clutch spring mounting bolts diagonally.
- Remove the pressure plate ⑤.

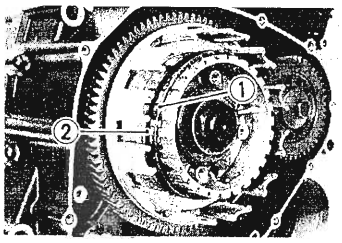
TOOL **09930-40113: Roter holder**

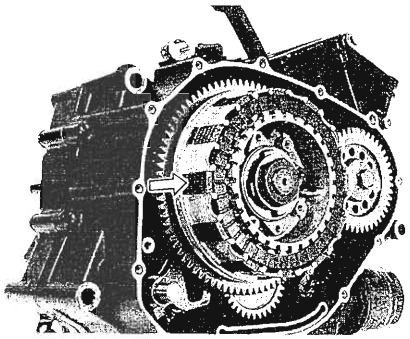


- Remove the clutch release rack ⑥, thrust washer ⑦ and bearing ⑧.



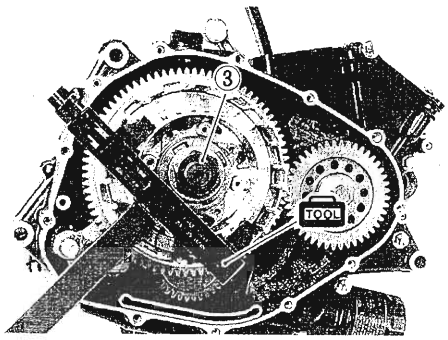
- Remove the clutch drive and driven plates.
- Remove the wave washer ① and the wave washer seat ②.



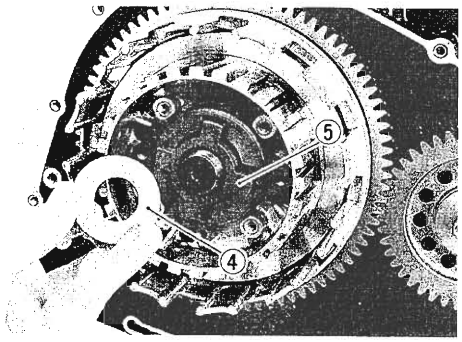


- Remove the clutch sleeve hub nut ③ by using the special tool.

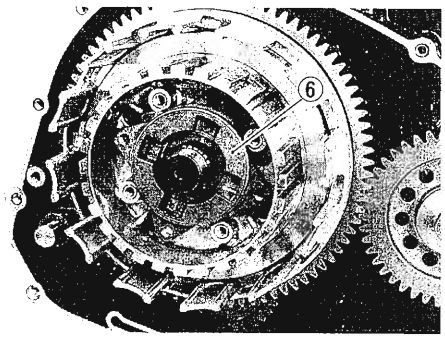
TOOL **09920-53740: Clutch sleeve hub holder**



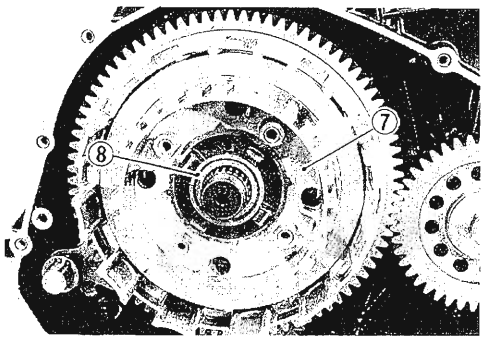
- Remove the washer ④ and No.1 clutch cam ⑤.



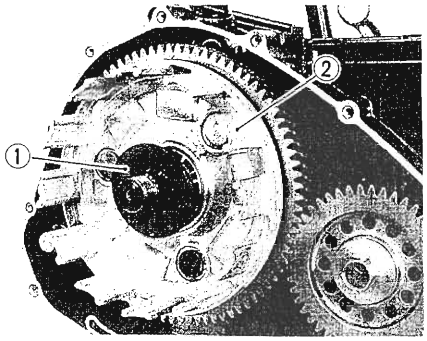
- Remove the No.2 clutch cam ⑥.



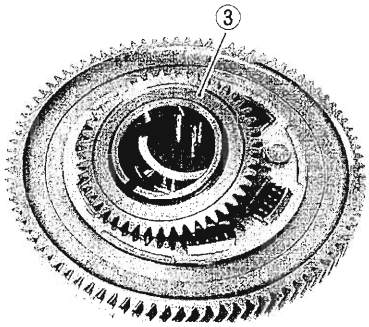
- Remove the clutch sleeve hub ⑦ and spacer ⑧.



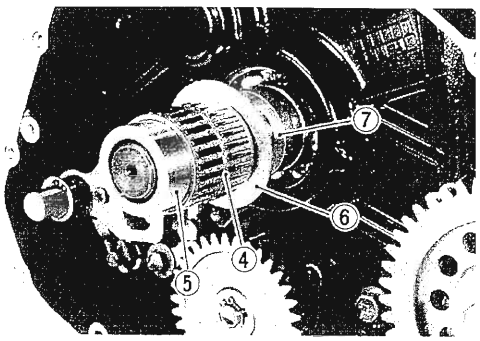
- Remove the thrust washer ①.
- Remove the primary driven gear assembly ② with the oil pump drive gear.



- Remove the oil pump drive gear ③.



- Remove the needle roller bearing ④, collar ⑤, thrust washer ⑥ and spacer ⑦.

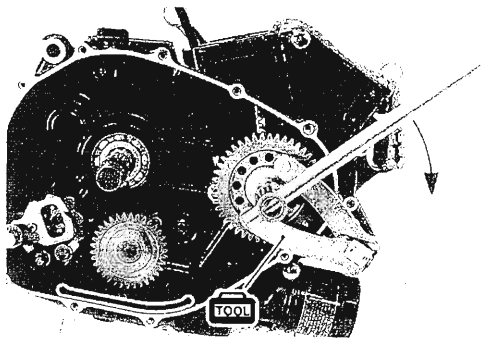


- Remove the primary drive gear bolt while holding the primary drive gear with the special tool and remove the primary drive gear.

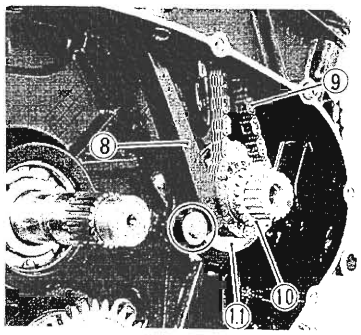
TOOL **09930-40113: Rotor holder**

⚠ CAUTION

This bolt has left-hand thread. Turning it counter-clockwise it may cause damage.

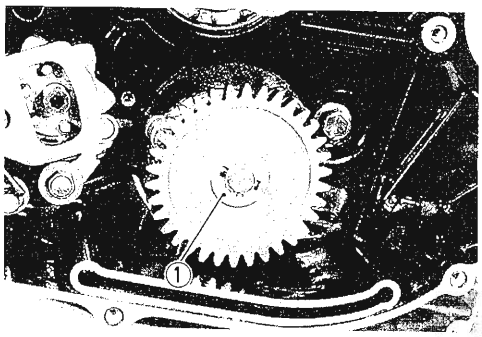


- Remove the cam chain guide ⑧ and cam chain ⑨.
- Remove the camshaft drive sprocket ⑩ and thrust washer ⑪.

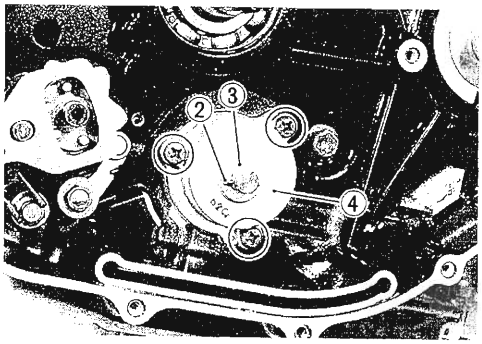


• Remove the oil pump driven gear circlip ①.

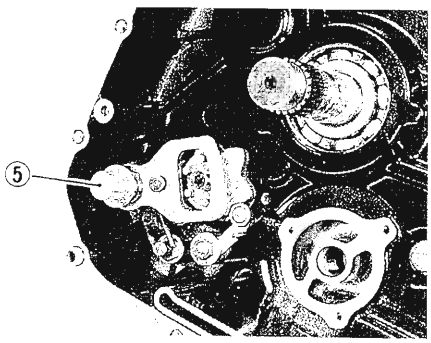
TOOL **09900-06107: Snap ring pliers**



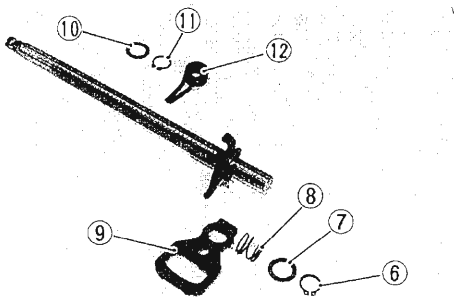
• Remove the pin ② and the washer ③.
• Remove the oil pump ④.



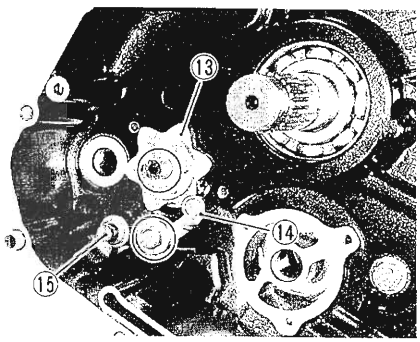
• Remove the gearshift shaft ⑤.



• Remove the following parts from the gearshift shaft.
⑥ Circlip
⑦ Washer
⑧ Spring
⑨ Gearshift arm
⑩ Wahser
⑪ Circlip
⑫ Return spring

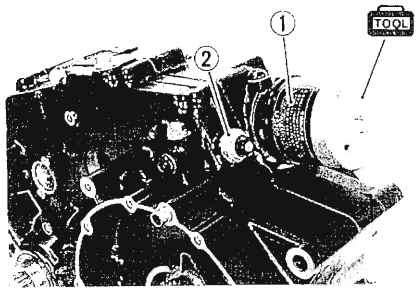


• Remove the gearshift cam stopper plate ⑬.
• Remove the gearshift cam stopper ⑭ with spring.
• Remove the gearshift arm stopper ⑮.



- Remove the oil filter ① by using the special tool.

09915-40610: Oil filter wrench

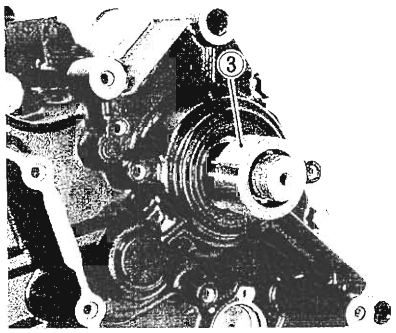


- Remove the oil pressure switch ②.

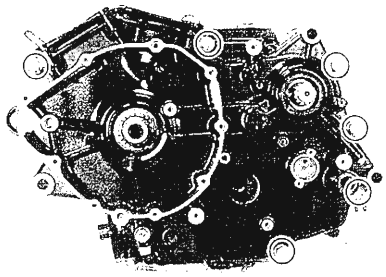
NOTE:
When reinstalling the oil pressure switch, apply the SUZUKI BOND "1207B" to thread part.

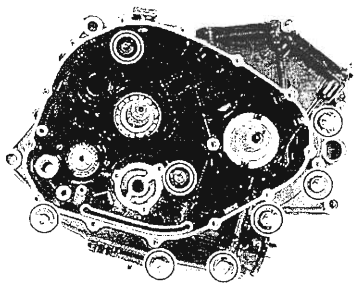
99104-31140: SUZUKI BOND "1207B"

- Remove the drive shaft spacer ③.



- Remove the crankcase securing bolts.

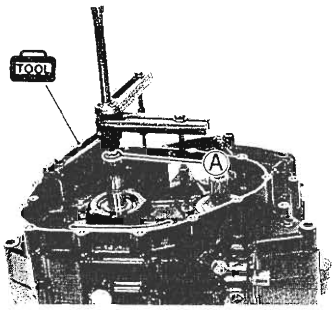




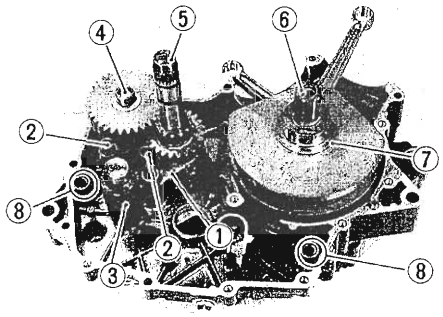
- Separate the crankcase into 2 parts, right and left with a crankcase separating tool.

TOOL 09920-13120: Crankcase separating tool

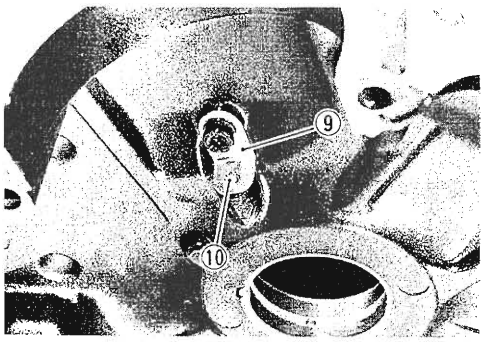
NOTE:
Fit the crankcase separating tool, so that the tool arms parallel the side of the crankcase. The crankshaft and transmission components must remain in the left crankcase half. Put a metal piece Ⓐ or socket tool to protect the end face of the countershaft.



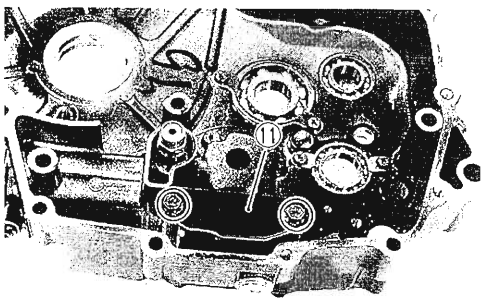
- Remove the gearshift fork shafts ② and gearshift forks ①.
- Remove the gearshift cam ③.
- Remove the driveshaft assembly ④, countershaft assembly ⑤.
- Remove the crankshaft ⑥ and thrust washer ⑦.
- Remove the O-rings ⑧.



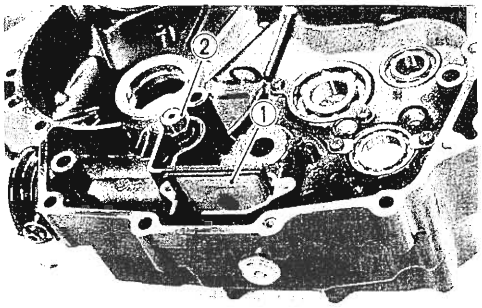
- Remove the oil nozzle retainers ⑨ and oil nozzles ⑩ from the left and right crankcase.



- Remove the oil sump filter stopper ⑪.



- Remove the oil sump filter ①.
- Remove the oil pressure regulator ②.

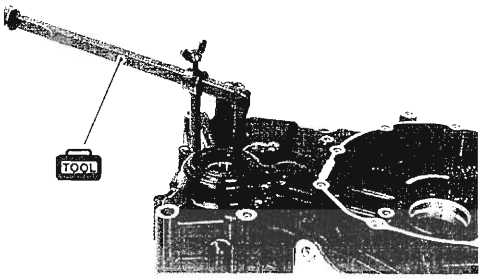


NOTE:
When reinstalling the oil pressure regulator. Tighten it to the specified torque.

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

- Remove the oil seals by using the special tool.

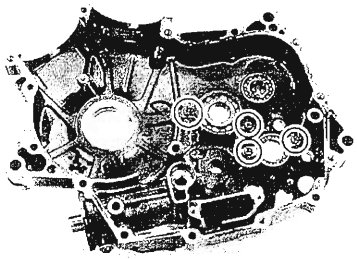
09913-50121: Oil seal remover



- Remove the bearing retainer screws.

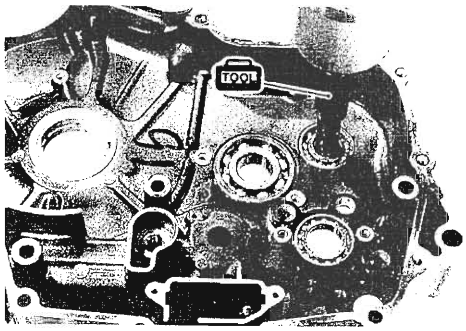
NOTE:
When reinstalling the bearing retainers, apply THREAD LOCK "1342" to the bearing retainer bolts or screws.

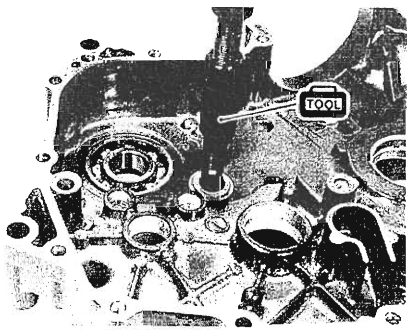
99000-32050: THREAD LOCK "1342"



- Remove the bearings by using the special tools.

09923-73210: Bearing remover
09930-30102: Sliding shaft

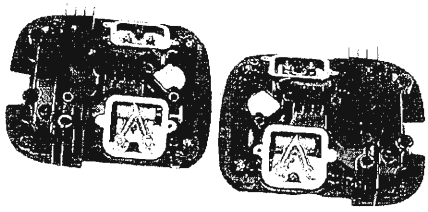




ENGINE COMPONENTS INSPECTION AND SERVICING

CYLINDER HEAD COVER AND ROCKER ARM

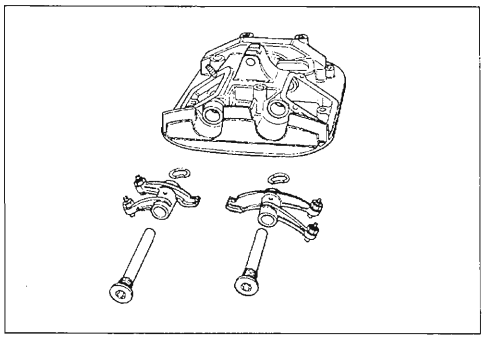
DISASSEMBLY



⚠ CAUTION

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

- Loosen the rocker arm shafts and pull out the rocker arm shafts. (Refer to page 3-25 for reassembly.)



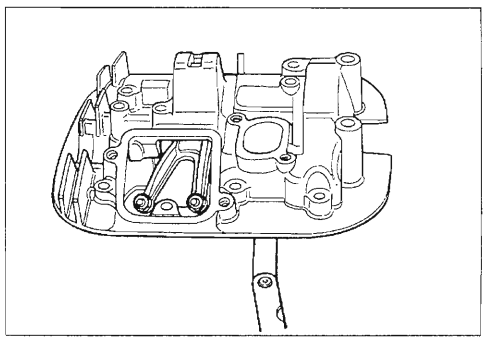
CYLINDER HEAD COVER DISTORTION

After removing sealant (SUZUKI BOND "1216") from the fitting surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a thickness gauge.

Service Limit: 0.05 mm (0.002 in)

TOOL 09900-20803: Thickness gauge

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

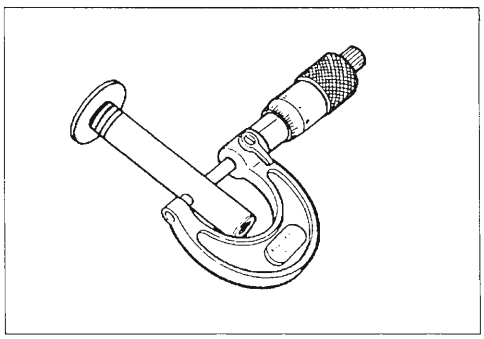


ROCKER ARM SHAFT O.D.

Measure diameter of rocker arm shaft.

Standard: 11.966—11.984 mm (0.4711—0.4718 in)

TOOL 09900-20205: Micrometer (0—25 mm)

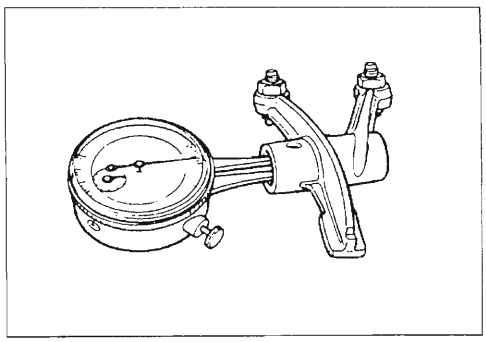


ROCKER ARM I.D.

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

Standard: 12.000—12.018 mm (0.4724—0.4731 in)

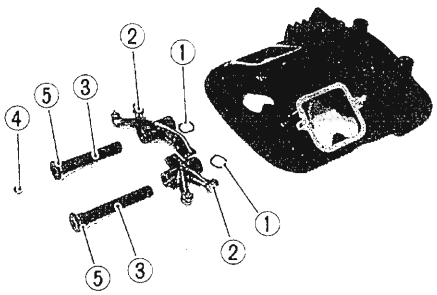
TOOL 09900-20605: Dial calipers



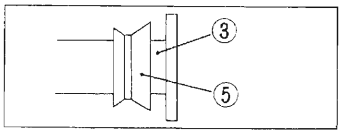
REASSEMBLY

- Apply SUZUKI MOLY PASTE to the rocker arms ② and their shafts ③.

99000-25140: SUZUKI MOLY PASTE



- Install the new gasket ⑤ to the rocker arm shaft as shown in illustration.

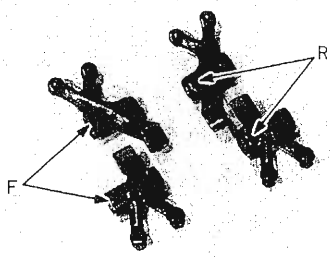


- After inserting the shafts, tighten the shafts.

Rocker arm shaft: 28 N·m (2.8 kg-m, 20.0 lb-ft)

⚠ CAUTION

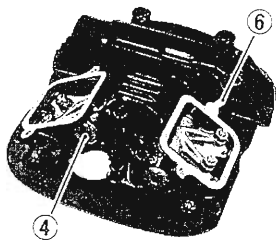
*** Do not forget the wave washer ①.**
*** Use a new gasket on the rocker arm shaft ③ to prevent oil leakage.**



NOTE:
The rocker arms have embossed-letters, "F" or "R", "F" for No.2 (Front) cylinder and "R" for No.1 (Rear) cylinder.

- Install the rubber caps ④ to the exhaust rocker arm shaft ends as shown in the photos.

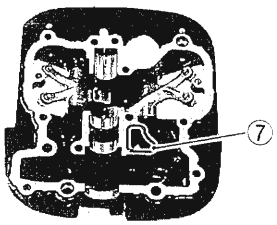
NOTE:
When replacing the No.1 and No.2 cylinder head cover stud bolts ⑥, apply SUZUKI BOND "1216" to the thread of cylinder head cover side.



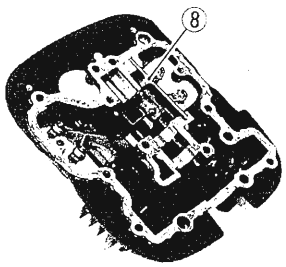
1216 99000-31160: SUZUKI BOND "1216"

- Install the O-ring ⑦ to the No.2 (front) cylinder head cover.
- Apply grease to the O-ring ⑦.

A 99000-25030: SUZUKI SUPER GREASE "A"

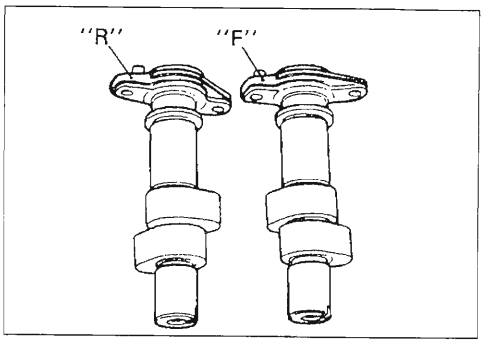


- Install the plate ⑧ to the No.1 (rear) cylinder head cover.



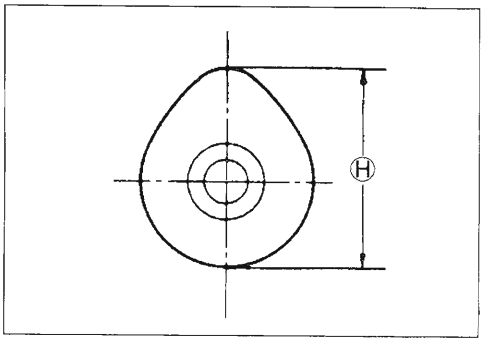
CAMSHAFT

The camshafts should be checked for wear and also for runout of cams and journals if the engine has been noted to produce abnormal noise or vibration or to lack output power. Any of these malconditions could be caused by a worn camshafts.
The camshaft can be distinguished by the embossed-letters, "F" and "R", on the camshaft.
"F" : Front (No. 2) camshaft
"R" : Rear (No. 1) camshaft



CAMSHAFT CAM WEAR

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



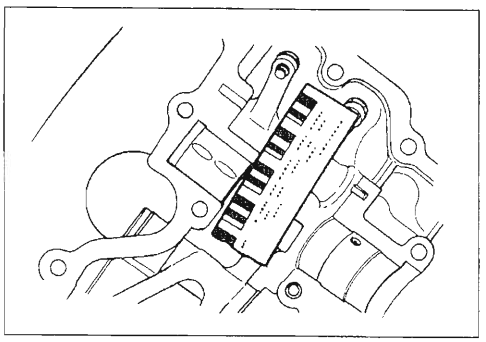
Cam height Ⓗ

Service Limit **Intake cam : 35.660 mm (1.4039 in)**
Exhaust cam: 36.620 mm (1.4417 in)

09900-20202: Micrometer (25—50 mm)

CAMSHAFT JOURNAL WEAR

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



Camshaft journal oil clearance
Service Limit: 0.150 mm (0.0059 in)

09900-22302: Plastigauge

NOTE:
To properly measure the oil clearance with plastigauge, all gasket material must be removed from fitting surfaces of cylinder head and cover. Do not apply SUZUKI BOND "1216" until after the oil clearance has been determined.

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

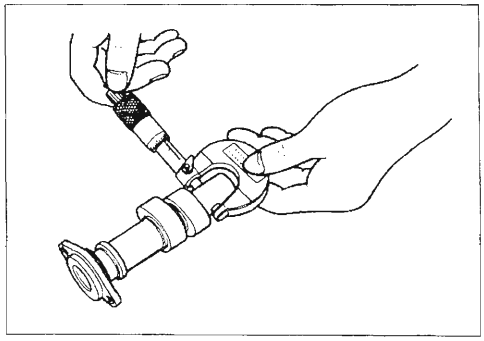
Cylinder head cover bolts
(M6): 11 N·m (1.1 kg-m, 8.0 lb-ft)
(M8): 23 N·m (2.3 kg-m, 16.5 lb-ft)

NOTE:
Do not rotate the camshafts with the plastigauge in place.

Remove the cylinder head cover, and read the width of the compressed plastigauge with envelop scale. This measurement should be taken at the widest part.

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

Camshaft journal O.D. (Sprocket side) 24.959—24.980 mm (0.9826—0.9835 in)
(Other side) 19.959—19.980 mm (0.7858—0.7866 in)

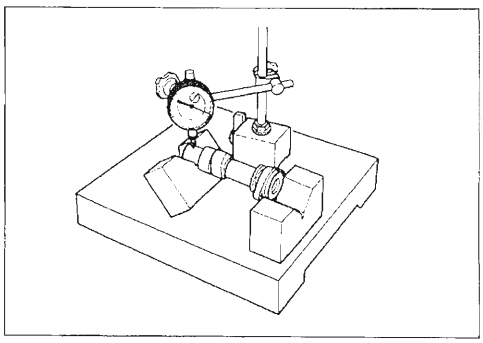


TOOL **09900-20205: Micrometer (0—25 mm)**

CAMSHAFT RUNOUT

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

Camshaft runout (IN. & EX.)
Service Limit: 0.10 mm (0.004 in)

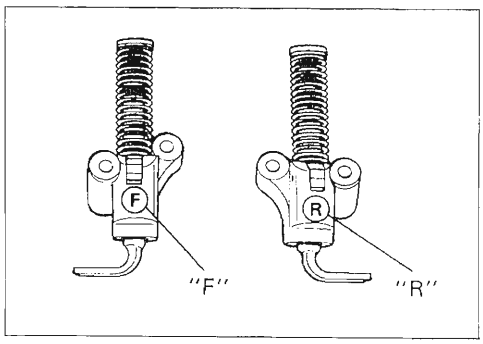


TOOL **09900-20606: Dial gauge (1/100, 10 mm)**
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

CAM CHAIN TENSIONER AND GUIDE

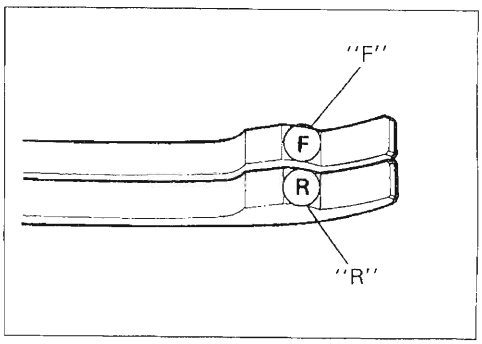
CAM CHAIN TENSIONER

For driving the camshafts, two cam chain tensioners are used on the respective cam drive chains. Unlock the ratchet mechanism, and move the push rod in place to see if it slides smoothly. If any stickiness is noted or ratchet mechanism is faulty, replace the cam chain tensioner assembly with a new one.
The cam chain tensioner can be distinguished by the embossed-letters, "F" and "R", on the cam chain tensioners.
"F" : Front (No. 2) cam chain tensioner
"R" : Rear (No. 1) cam chain tensioner



CAM CHAIN GUIDE

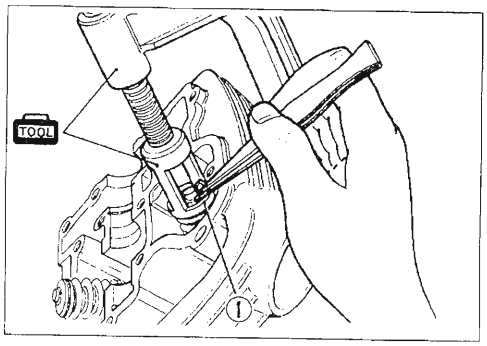
Check the contacting surface of the cam chain guide for wear and damage. If it is found to be damaged, replace it with a new one.
Two kinds of cam chain guide are used on the respective cam drive chains.
"F" : Front (No. 2) cam chain guide
"R" : Rear (No.1) cam chain guide



CYLINDER HEAD, VALVE AND VALVE SPRING

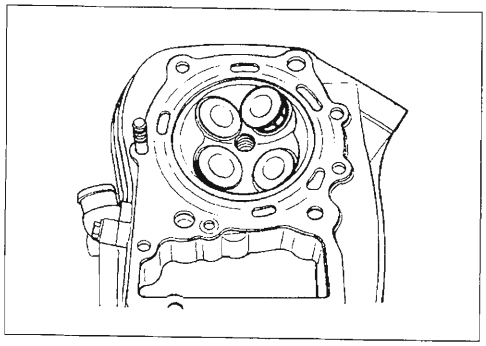
VALVE AND VALVE SPRING DISASSEMBLY

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



TOOL **09916-14510: Valve spring compressor**
09916-14910: Valve spring compressor attachment
09916-84511: Tweezers

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



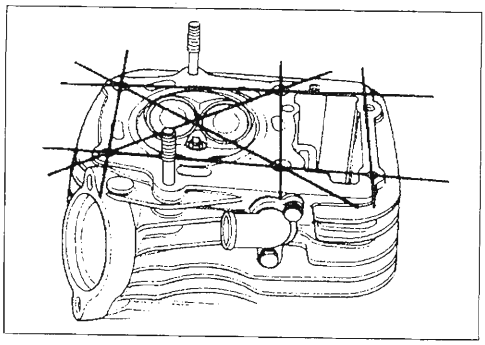
NOTE:
Removal of valves completes ordinary disassembling work. If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing. (Refer to page 3-30.)

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.

Service Limit: 0.05 mm (0.002 in)

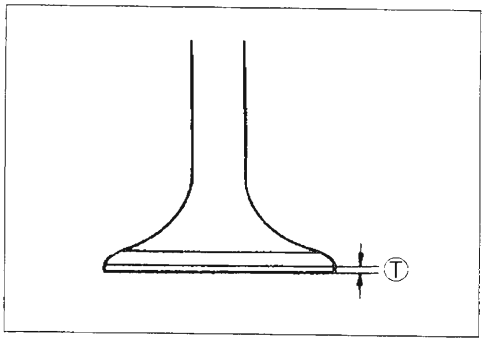


TOOL **09900-20803: Thickness gauge**

VALVE FACE WEAR

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

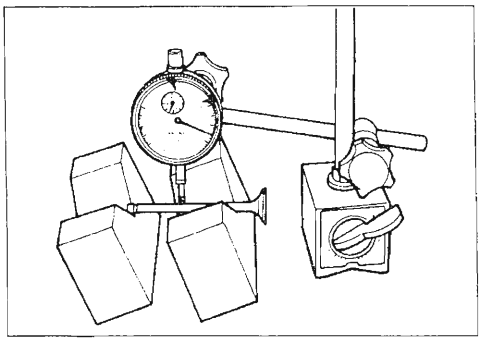
Service Limit Ⓣ: 0.5 mm (0.02 in)



TOOL **09900-20101: Vernier calipers**

VALVE STEM RUNOUT

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

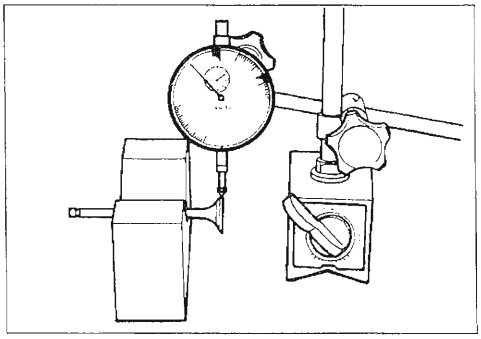


Service Limit: 0.05 mm (0.002 in)

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

VALVE HEAD RADIAL RUNOUT

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

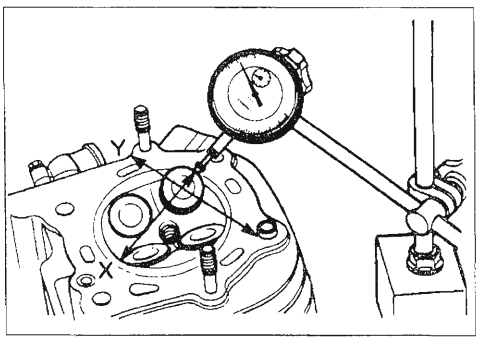


Service Limit: 0.03 mm (0.001 in)

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

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.

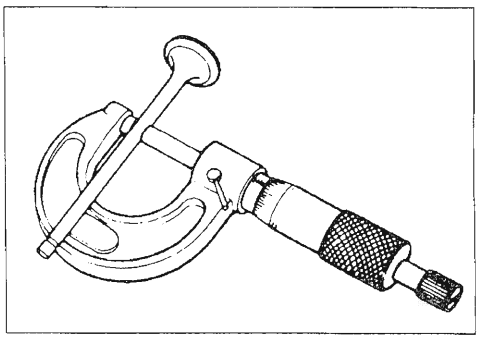


Service Limit
Intake and exhaust valves: 0.35 mm (0.014 in)

TOOL **09900-20606: Dial gauge (1/100 mm)**
09900-20701: Magnetic stand

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 re-check the clearance.

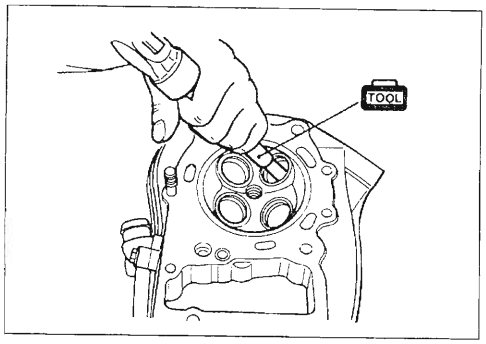


Standard
Valve stem O.D.
IN. : 5.475—5.490 mm (0.2156—0.2161 in)
EX.: 5.455—5.470 mm (0.2148—0.2154 in)

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

VALVE GUIDE SERVICING

- Using the valve guide remover, drive the valve guide out toward the intake or exhaust rocker arm side.



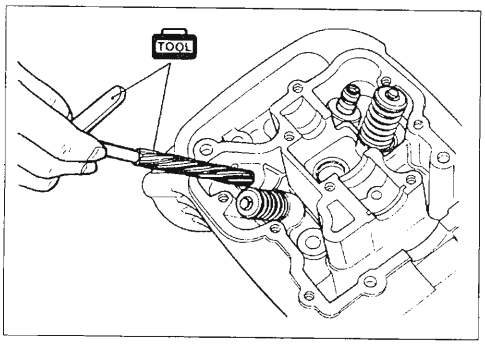
TOOL **09916-44910: Valve guide remover/installer**

NOTE:

* *Discard the removed valve guide subassemblies.*

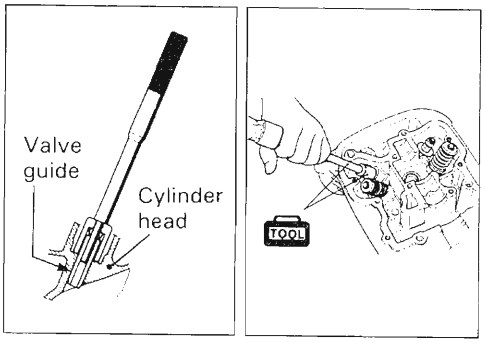
* *Only oversized valve guides are available as replacement parts. (Part No. 11115-38A71)*

- Re-finish the valve guide holes in cylinder head with a 10.8 mm reamer and handle.



TOOL **09916-34580: Valve guide hole reamer**
09916-34541: 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.

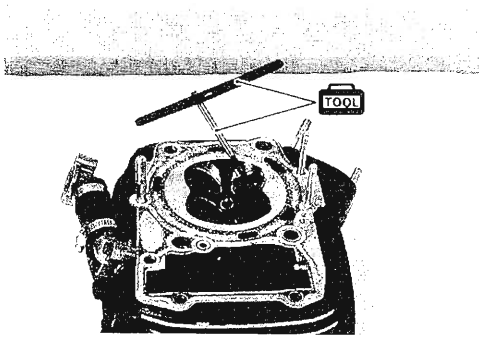


TOOL **09916-44910: Valve guide remover/installer**
09916-44920: Valve guide installer attachment

⚠ CAUTION

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

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

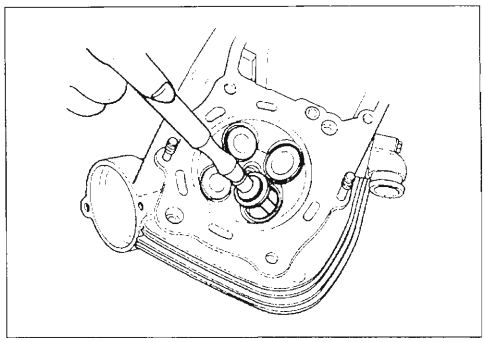


TOOL **09916-34550: Valve guide reamer**
09916-34541: Reamer handle

NOTE:

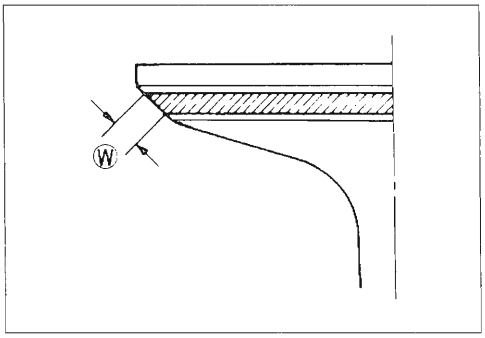
Insert the reamer from the combustion chamber and always turn the reamer handle clockwise.

VALVE SEAT WIDTH



- Coat the valve seat with prussian blue uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.
- The ring-like dye impression left on the valve face must be continuous — without any break. In addition, the width of the dye ring, which is the visualized seat "width", must be within the following specification:

Valve seat width
STD. Ⓦ: 0.9—1.1 mm (0.035—0.043 in)

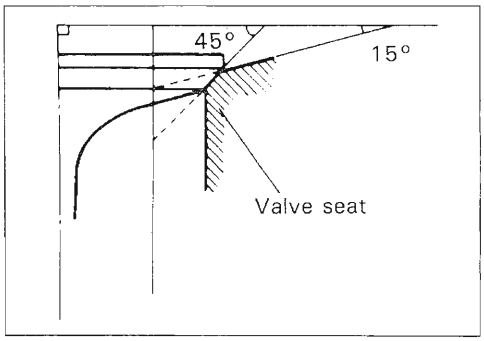


09916-10911: Valve lapper set

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

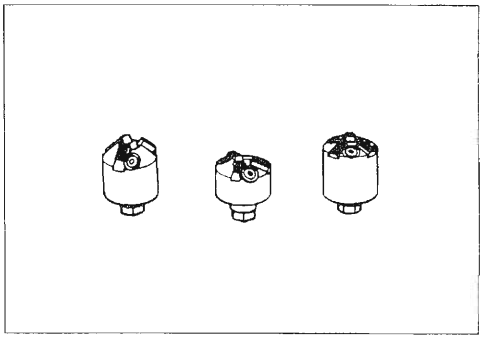
VALVE SEAT SERVICING

The valve seats for both intake and exhaust valves are machined to two different angles. The seat contact surface is cut 45° and the area above the contact surface (closest to the combustion chamber) is cut to 15°.



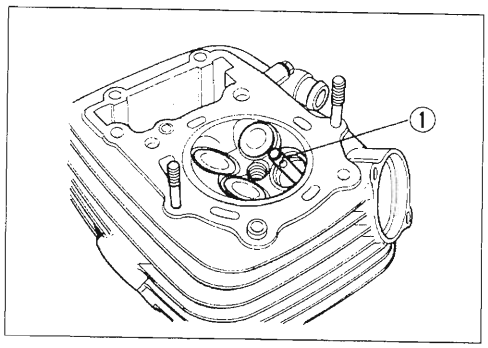
	INTAKE	EXHAUST
15°	N-229	N-116 or N-120
45°	N-229	N-116 or N-122
Solid pilot	N-140-5.5	N-100-5.52
Adapter	——	N-503-1
T-handle	N-503	N-503

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



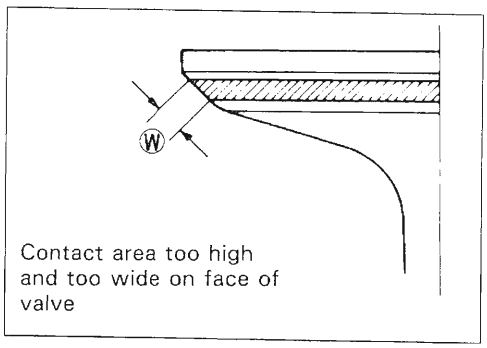
09916-27720: Valve seat cutter (N-229)
09916-20620: Valve seat cutter (N-122)
09916-24480: Solid pilot (N-140-5.5)
09916-21110: Valve seat cutter set (include N-120, N-100-5.52, N-503-1 and N-503)

- 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.



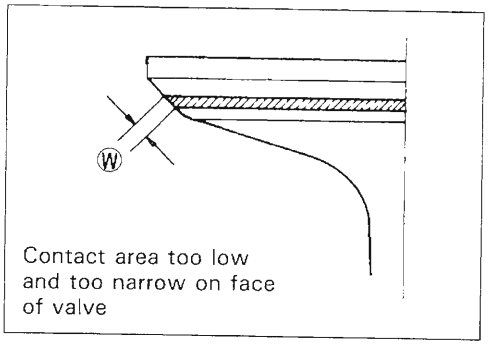
NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the tappet shim replacement.

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



Contact area too high and too wide on face of valve

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

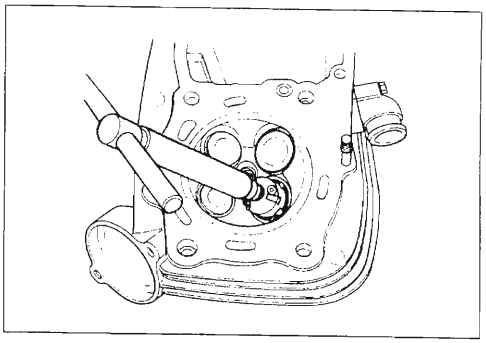


Contact area too low and too narrow on face of valve

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

⚠ CAUTION

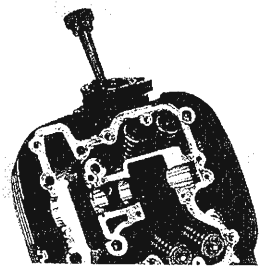
DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.



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

⚠ WARNING

Always use extreme caution when handling gasoline.

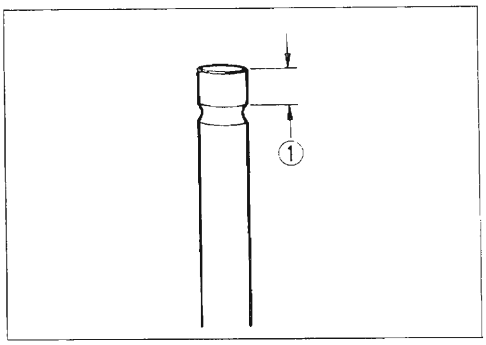


NOTE:
After servicing the valve seats, be sure to check the valve clearance after the cylinder head and head cover have been reinstalled. (See page 2-4, -5 and -6.)

VALVE STEM END CONDITION

Inspect the valve stem end face for pitting and wear. If pitting or wear of the stem end face are present, the valve stem end may be resurfaced, providing that the length ① will not be reduced to less than the service limit. If this length becomes less than the service limit, the valve must be replaced.

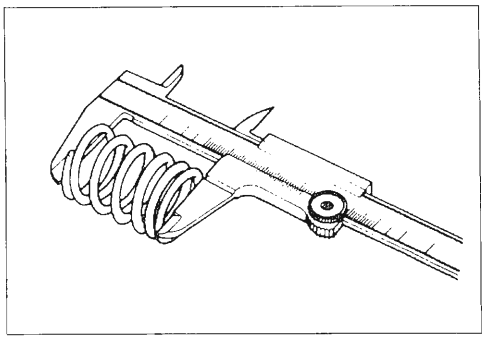
Service Limit: 3.1 mm (0.12 in)



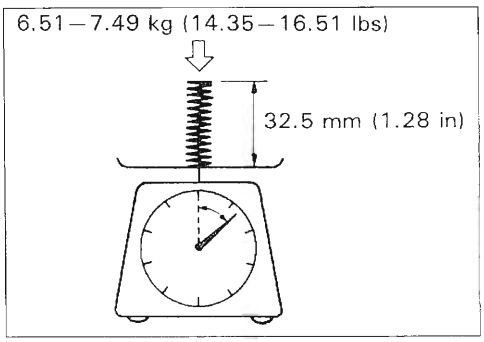
VALVE SPRING

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 **09900-20101: Vernier calipers**



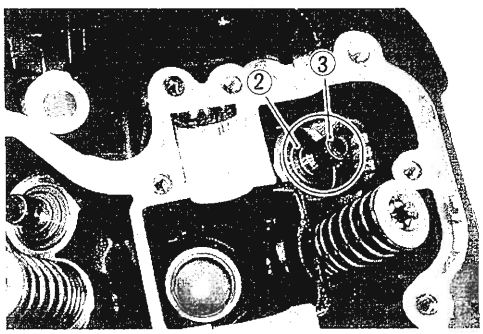
Valve spring free length (IN. & EX.)
Service limit INNER: 38.3 mm (1.51 in)
OUTER: 40.1 mm (1.58 in)

Valve spring tension (IN. & EX.)

Standard	INNER:	6.51—7.49 kg/32.5 mm (14.35—16.51 lbs/1.28 in)
	OUTER:	12.09—13.91 kg/36.0 mm (26.65—30.67 lbs/1.42 in)

VALVE AND VALVE SPRING REASSEMBLY

- Fit the valve spring lower seats ②.
- Oil each oil seal, and press-fit the oil seal ③ into position with the valve guide installer.



TOOL **09916-44910: Valve guide remover/installer**

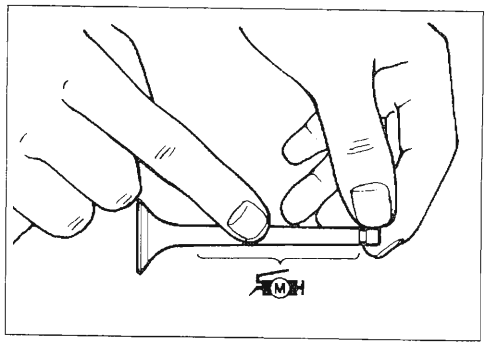
⚠ CAUTION

Do not reuse the oil seal.

VALVE AND VALVE SPRING REASSEMBLY

- 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.

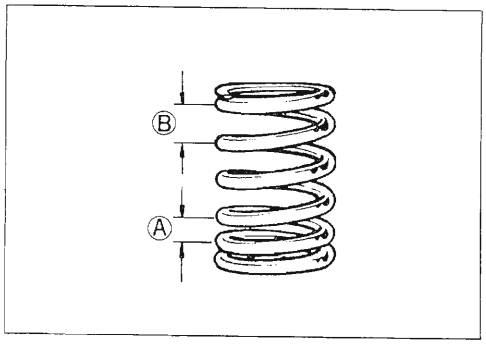
99000-25140: SUZUKI MOLY PASTE



⚠ CAUTION

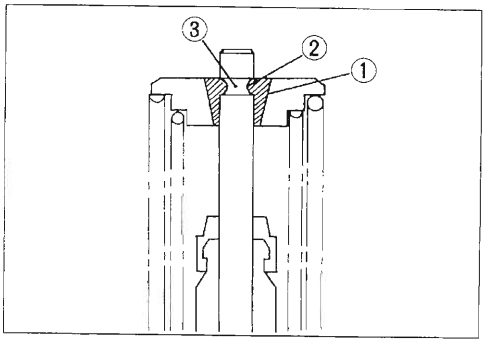
When inserting each valve, take care not to damage the lip of the stem seal.

- Install the valve springs with the small-pitch portion Ⓐ facing cylinder head.
  Ⓑ: Large-pitch portion.



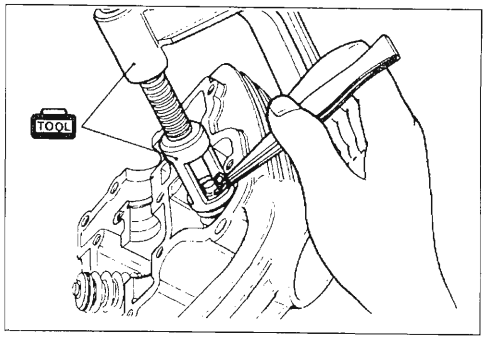
- Put on the valve spring retainer and, using the valve spring compressor, press down the spring, fit the two cotter halves to the stem end, and release the compressor to allow the cotter ① to wedge in between seat and stem. Be sure that the rounded lip ② of the cotter fits snugly into the groove ③ in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

09916-14510: Valve spring compressor
09916-14910: Valve spring compressor attachment
09916-84511: Tweezers



⚠ CAUTION

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



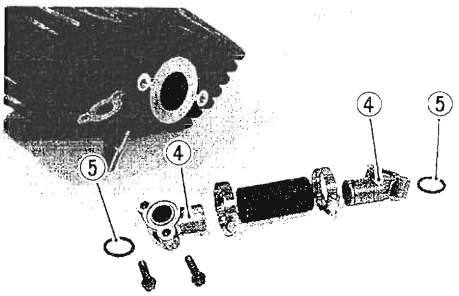
NOTE:

* *When installing the water union ④ to the cylinder head, apply grease to the new O-rings ⑤.*

* *Tighten the water union bolts to the specified torque.*

99000-25030: SUZUKI SUPER GREASE "A"

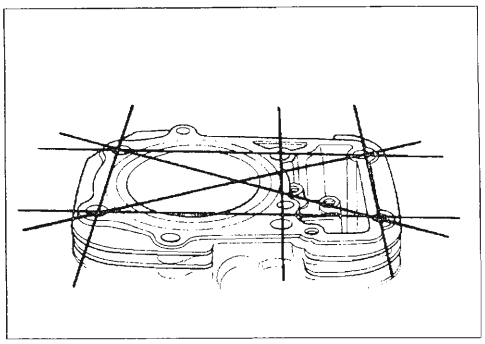
Water union bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



CYLINDER AND PISTON

CYLINDER DISTORTION

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

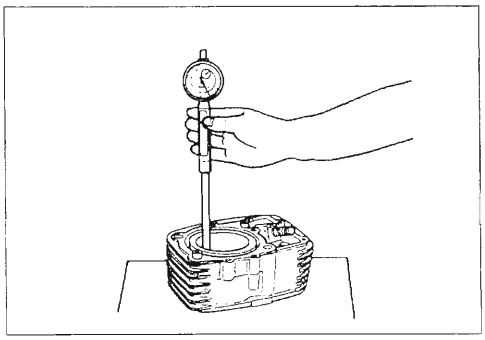


Cylinder distortion
Service Limit: 0.05 mm (0.002 in)

09900-20803: Thickness gauge

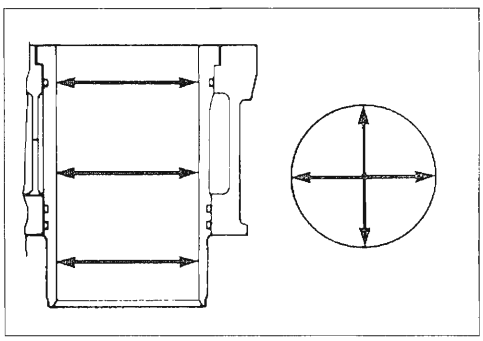
CYLINDER BORE

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



Cylinder bore
Service Limit: 83.085 mm (3.2711 in)

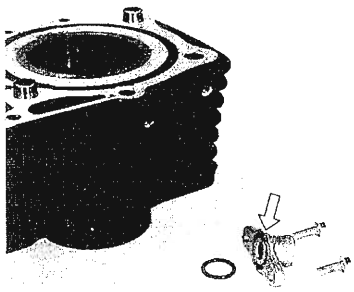
09900-20508: Cylinder gauge set



NOTE:
* *When installing the water union to the cylinder, apply grease to new O-ring.*
* *Tighten water union bolts to the specified torque.*

99000-25030: SUZUKI SUPER GREASE "A"

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



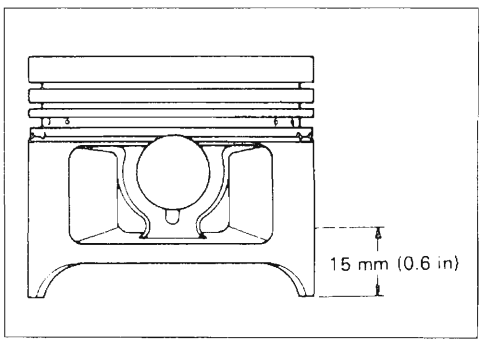
PISTON DIAMETER

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

Piston oversize: 0.5, 1.0 mm

Service Limit: 82.880 mm (3.2630 in)

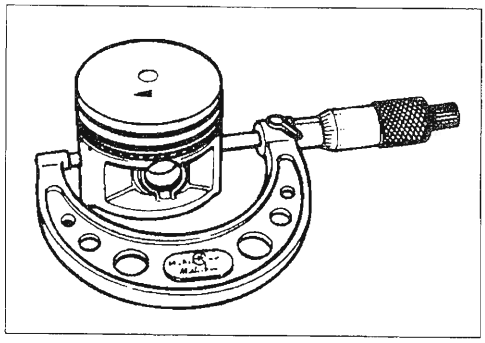
09900-20204: Micrometer (75—100 mm)



PISTON TO CYLINDER CLEARANCE

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

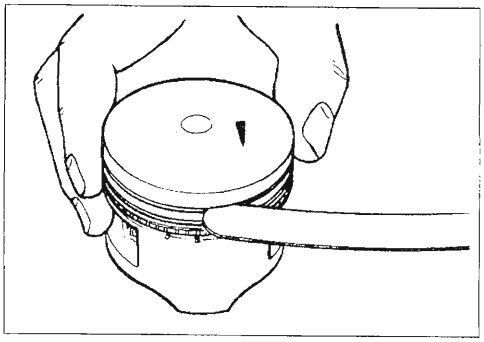
Service Limit: 0.120 mm (0.0047 in)



PISTON RING TO GROOVE CLEARANCE

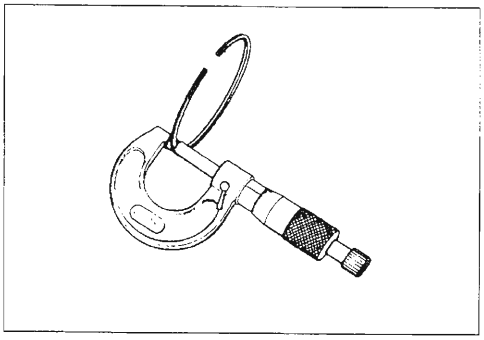
Using a thickness gauge, measure the side clearances of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

Piston ring-groove clearance
Service limit (1st) : 0.18 mm (0.0071 in)
(2nd): 0.15 mm (0.0059 in)



Piston ring groove width
Standard (1st) : 1.01—1.03 mm (0.0398—0.0406 in)
(2nd): 1.21—1.23 mm (0.0476—0.0484 in)
(Oil) : 2.51—2.53 mm (0.0988—0.0996 in)

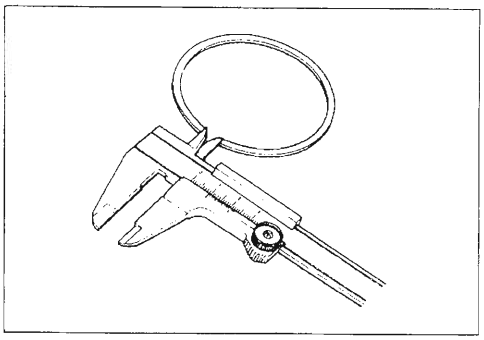
Piston ring thickness
Standard (1st) : 0.970—0.990 mm (0.0382—0.0390 in)
(2nd): 1.170—1.190 mm (0.0461—0.0469 in)



09900-20803: Thickness gauge
09900-20205: Micrometer (0—25 mm)

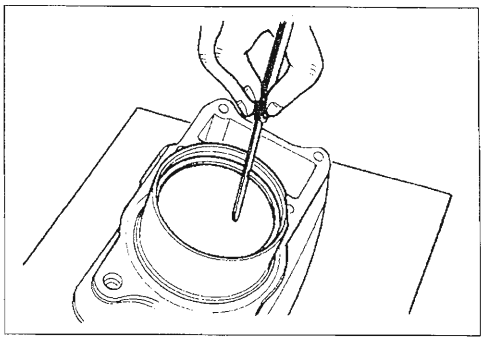
PISTON RING FREE END GAP AND END GAP

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) : 8.40 mm (0.331 in)
(2nd): 9.44 mm (0.372 in)

Piston ring end gap
Service limit (1st) : 0.50 mm (0.020 in)
(2nd): 0.50 mm (0.020 in)



09900-20101: Vernier calipers
09900-20803: Thickness gauge

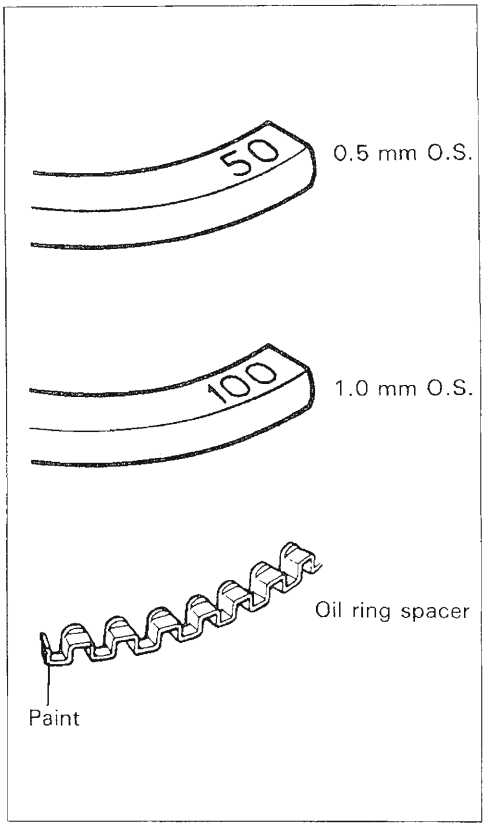
- **Oversize piston ring**
  The following two types of oversize piston rings are used. They bear the following identification numbers.

SIZE	1st	2nd
0.5 mm O.S.	50	50
1.0 mm O.S.	100	100

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

SIZE	COLOR
STD	NIL
0.5 mm O.S.	Painted Red
1.0 mm O.S.	Painted Yellow

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

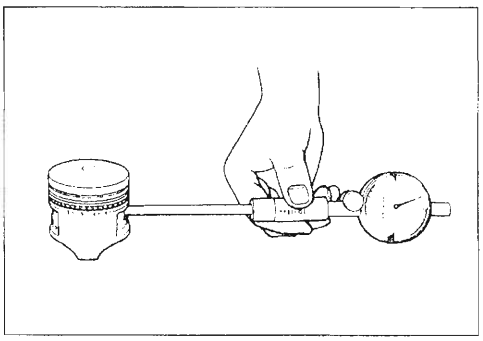


PISTON PIN AND PIN BORE

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

Piston pin bore I.D.
Service Limit: 20.030 mm (0.7886 in)

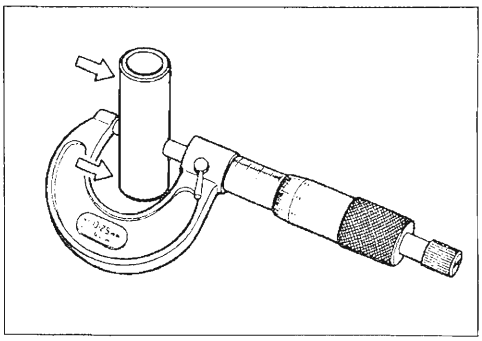
09900-20602: Dial gauge (1/1000 mm, 1 mm)
09900-22403: Small bore gauge (18—35 mm)



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

Piston pin O.D.
Service Limit: 19.980 mm (0.7866 in)

09900-20205: Micrometer (0—25 mm)



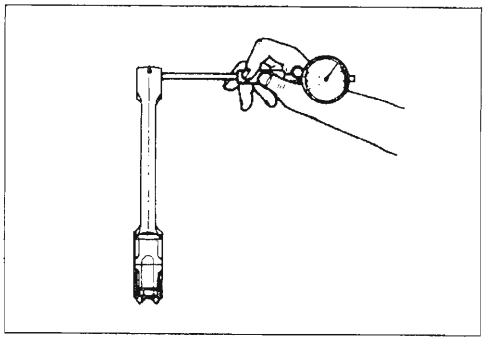
CONROD AND CRANKSHAFT

CONROD SMALL END I.D.

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

Conrod small end I.D.
Service Limit: 20.040 mm (0.7890 in)

09900-20602: Dial gauge (1/1000 mm, 1 mm)
09900-22403: Small bore gauge (18—35 mm)



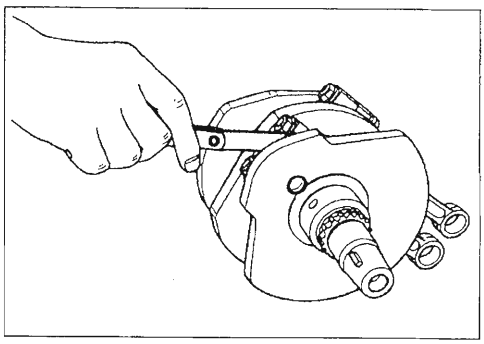
If the conrod small end inside diameter exceeds the above mentioned limit, replace the conrod.

CONROD BIG END THRUST CLEARANCE

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

Service Limit: 0.30 mm (0.012 in)

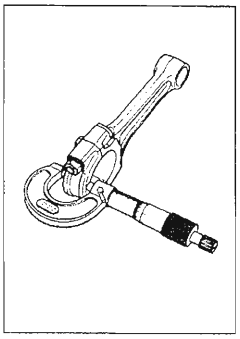
09900-20803: Thickness gauge

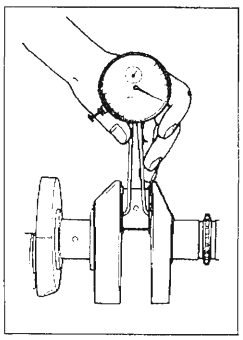


Big end width
Standard: 21.95—22.00 mm (0.864—0.866 in)

Crank pin width
Standard: 22.10—22.15 mm (0.870—0.872 in)

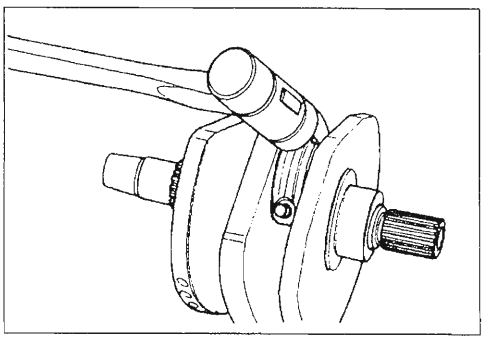
09900-20205: Micrometer (0—25 mm)
09900-20605: Dial calipers (10—34 mm)



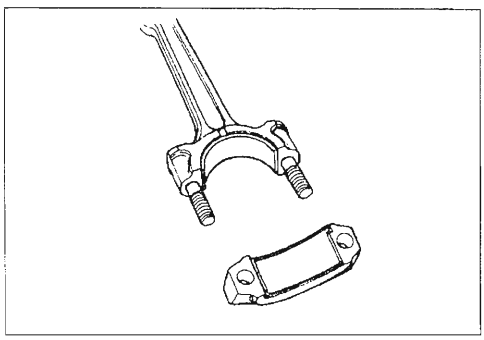


CONROD-CRANK PIN BEARING SELECTION

- Loosen the bearing cap nuts and tap the bolt end 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.



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

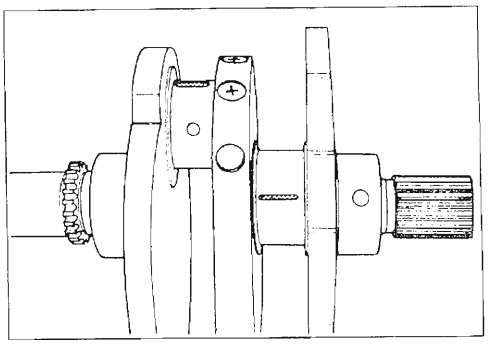
- Place plastigauge axially on the crank pin avoiding the oil hole, at TDC or BDC side as shown.
- Tighten the bearing cap with two-step torque values.

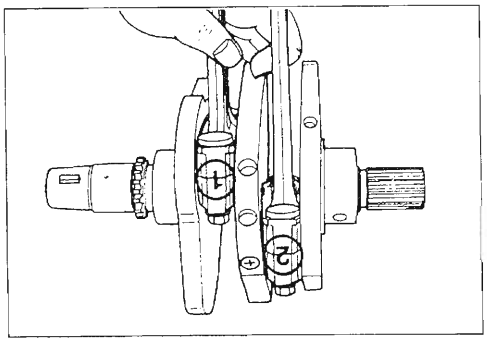
NOTE:
When fitting the bearing cap to crank pin, be sure to discriminate between its two ends, I.D. code side and the other. I.D. code always faces intake valve side.

Conrod nut
Initial tightening torque: 25 N·m (2.5 kg-m, 18.0 lb-ft)
Final tightening torque: 51 N·m (5.1 kg-m, 37.0 lb-ft)

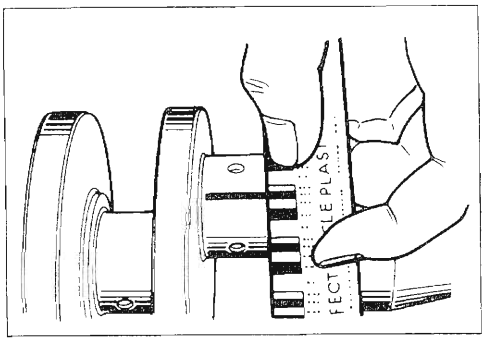
09900-22302: Plastigauge

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



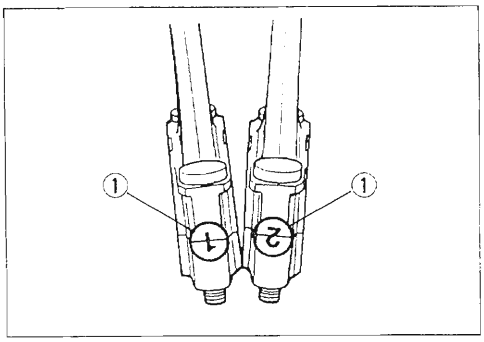


- Remove the caps and measure the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.



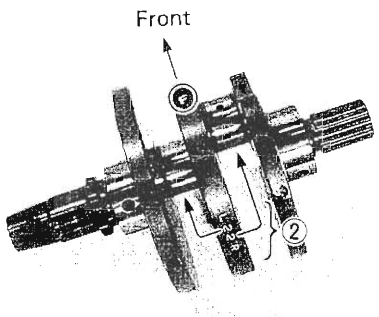
Crank pin bearing oil clearance
Service Limit: 0.080 mm (0.0031 in)

- If oil clearance exceeds the service limit, select the specified bearings from the following table.
- Check the corresponding conrod I.D. code number ① , "1", "2" or "3".
- Check the corresponding crank pin O.D. code number ② , "1", "2" or "3".
- The crank pin O.D. code number ②, "1", "2" or "3" which are stamped on the left crank web.



Bearing selection table

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



Oil clearance
Standard: 0.024—0.042 mm (0.0009—0.0017 in)

Conrod I.D. specification

Code ①	I.D. specification
1	44.000—44.006 mm (1.7323—1.7325 in)
2	44.006—44.012 mm (1.7325—1.7328 in)
3	44.012—44.018 mm (1.7328—1.7330 in)

Crank pin O.D. specification

Code ②	O.D. specification
1	40.994—41.000 mm (1.6139—1.6142 in)
2	40.988—40.994 mm (1.6137—1.6139 in)
3	40.982—40.988 mm (1.6135—1.6137 in)

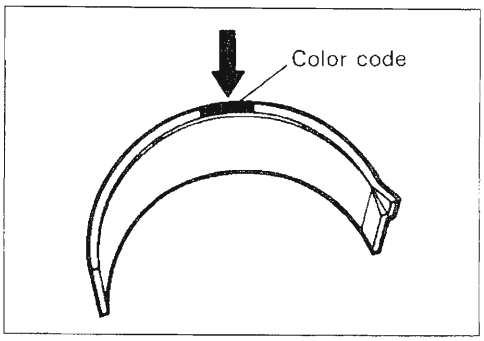
TOOL 09900-20202: Micrometer (25—50 mm)

⚠ CAUTION

Bearing should be replaced as a set.

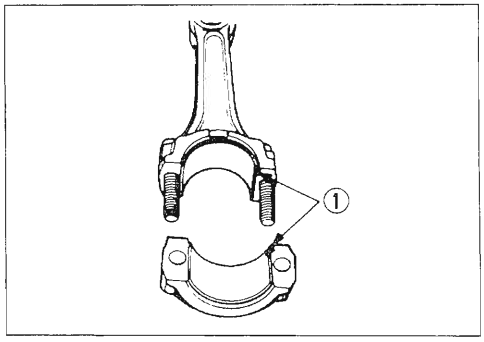
Bearing thickness

Color (Part No.)	Thickness
Green (12164-38E00-0A0)	1.485—1.488 mm (0.0585—0.0586 in)
Black (12164-38E00-0B0)	1.488—1.491 mm (0.0586—0.0587 in)
Brown (12164-38E00-0C0)	1.491—1.494 mm (0.0587—0.0588 in)
Yellow (12164-38E00-0D0)	1.494—1.497 mm (0.0588—0.0589 in)
Blue (12164-38E00-0E0)	1.497—1.500 mm (0.0589—0.0591 in)



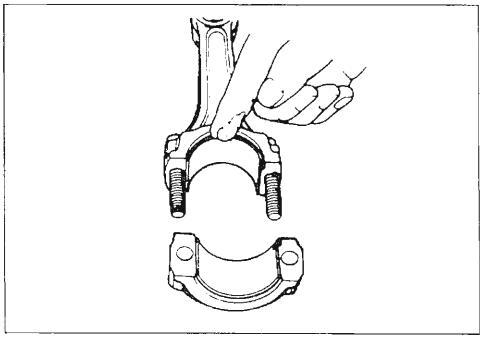
CONROD-CRANK PIN BEARING ASSEMBLY

- When fitting the bearing to the bearing cap and conrod, be sure to fix the stopper part ① first and press in the other end.



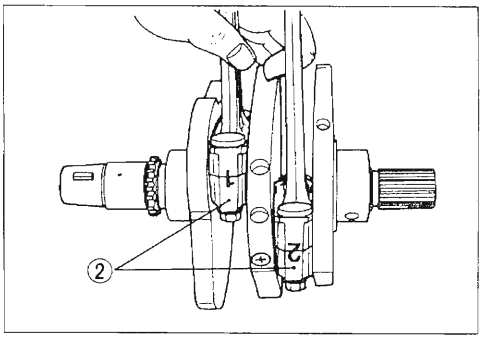
- Apply engine oil or SUZUKI MOLY PASTE to the crank pin and bearing surface.

99000-25140: SUZUKI MOLY PASTE



- When mounting the conrod on the crankshaft, make sure that I.D. code ② of the conrod faces rearward.
- Tighten the conrod fitting nuts with specified torque after applying engine oil to the nut thread.

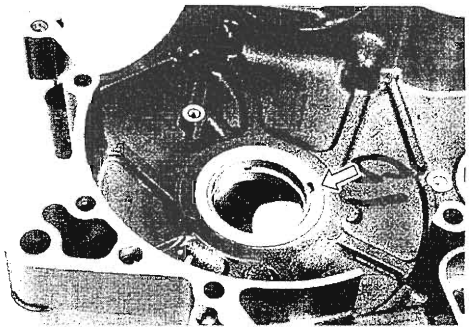
Conrod nut
Initial tightening torque: 25 N·m (2.5 kg-m, 18.0 lb-ft)
Final tightening torque: 51 N·m (5.1 kg-m, 37.0 lb-ft)



- Check the conrod movement for smooth turning.

CRANKCASE-CRANKSHAFT BEARING SELECTION

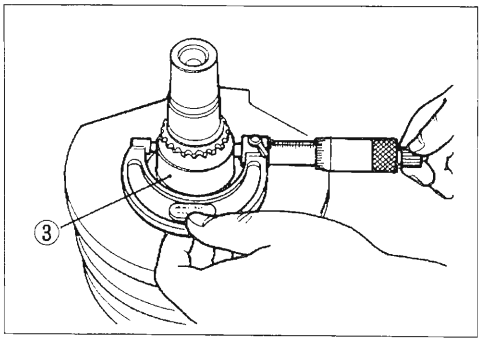
- Inspect the crankshaft and crankshaft journal bearings for any damage.



- Measure the crankshaft journal O.D. ③ by using the special tool.

Crankshaft journal O.D. ③
Standard: 47.965—47.980 mm (1.8884—1.8890 in)

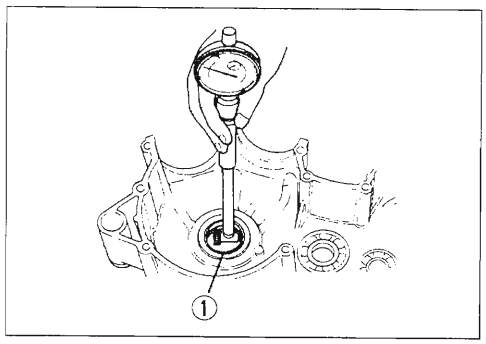
09900-20202: Micrometer (25—50 mm)



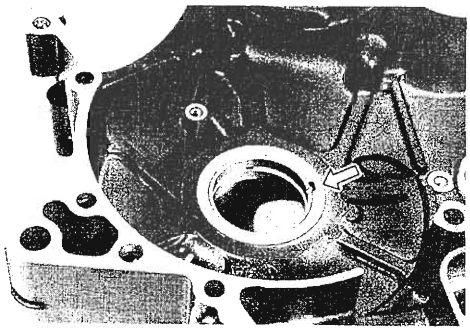
- Measure the crankshaft journal bearing I.D. ① by using the special tool

Crankshaft journal bearing I.D. ①
Standard: 48.000—48.015 mm (1.8898—1.8904 in)

TOOL 09900-20508: Cylinder gauge set



If each crankshaft journal bearing I.D. is not within the standard range, replace them with new ones.



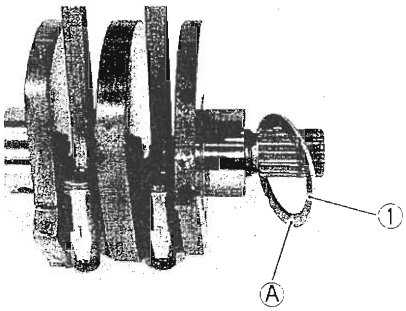
- Remove the crankshaft bearing with taking care not to damage the crankcase journal bearing hole.
- Inspect the journal bearing hole of crankcase for any sign of pitting or flaw.
  If any, repair it with emery paper.
- Install the new journal bearings into the crankcases by hydraulic press.
- Hone the new journal bearings with the specified value by honing machine.

⚠ CAUTION

When honing the new journal bearings, be sure to mate the left and right crankcases.

CRANKSHAFT THRUST CLEARANCE

Install the crankshaft in the right crankcase half after installing the thrust shim on the crankshaft.



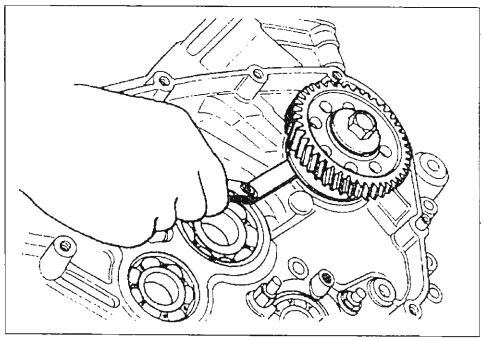
NOTE:
The oil grooved face Ⓐ of thrust shim ① is faced to crankshaft web side.

- Place the thrust washer, camshaft drive sprocket and primary drive gear on the right end of the crankshaft and tighten primary drive gear bolt to the specified torque. (Refer to page 3-56.)

TOOL 09930-40113: Rotor holder

Primary drive gear bolt: 95 N·m (9.5 kg-m, 68.5 lb-ft)

- Use a thickness gauge to measure the thrust clearance between right cankcase and thrust washer.

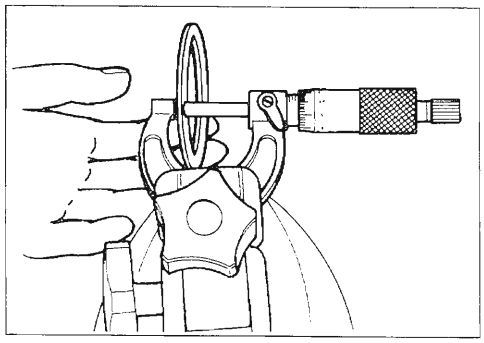


Crankshaft thrust clearance
Standard: 0.05—0.10 mm (0.002—0.004 in)

TOOL 09900-20803: Thickness gauge

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

- Remove the thrust shim, and measure its thickness with a micrometer.
- Change the thrust shim with the other shim if the thrust clearance is incorrect.
- Perform the thrust clearance measurement described above once again.



TOOL 09900-20205: Micrometer (0—25 mm)

Checking to make sure it is within standard

Unit: mm (in)

Part number	Thrust shim thickness
09160-48001	1.925—1.950 (0.0758—0.0768)
09160-48002	1.950—1.975 (0.0768—0.0778)
09160-48003	1.975—2.000 (0.0778—0.0787)
09160-48004	2.000—2.025 (0.0787—0.0797)
09160-48005	2.025—2.050 (0.0797—0.0807)
09160-48006	2.050—2.075 (0.0807—0,0817)
09160-48007	2.075—2.100 (0.0817—0.0827)
09160-48008	2.100—2.125 (0.0827—0.0837)
09160-48009	2.125—2.150 (0.0837—0.0846)
09160-48010	2.150—2.175 (0.0846—0.0856)

CLUTCH

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.

Thickness
Standard (No.1 drive plates): 2.92—3.08 mm (0.115—0.121 in)
(No.2 drive plate): 3.42—3.58 mm (0.135—0.141 in)

09900-20101: Vernier calipers

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

Claw width (No.1 and No.2 drive plates)
Service Limit: 15.1 mm (0.594 in)

09900-20101: Vernier calipers

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

Service Limit: 0.1 mm (0.004 in)

09900-20803: Thickness gauge

CLUTCH SPRING FREE LENGTH

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

Clutch spring free length

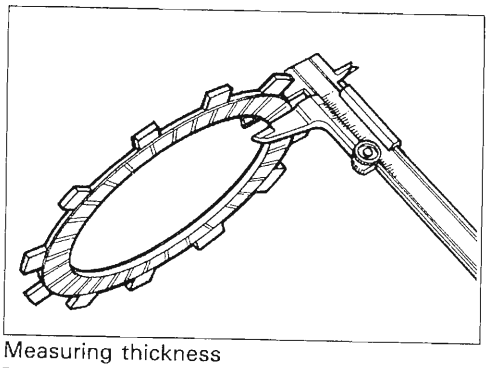
Service Limit (No.1): 24.6 mm (0.97 in)
(No.2): 23.3 mm (0.92 in)

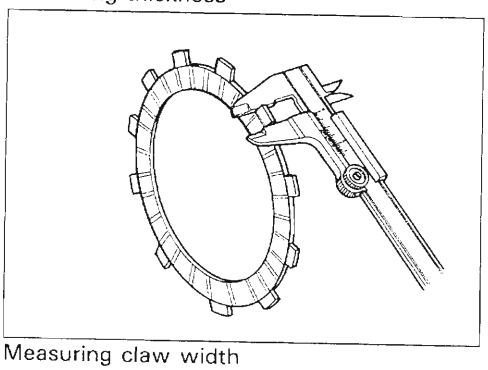
09900-20101: Vernier calipers

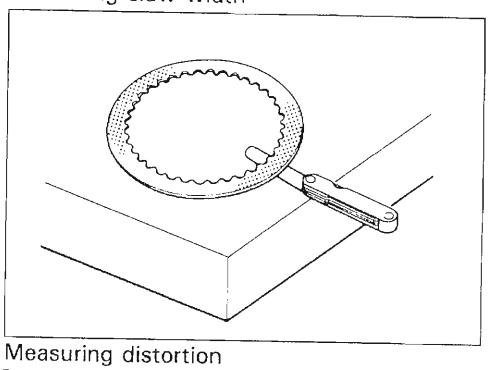
CLUTCH BEARING

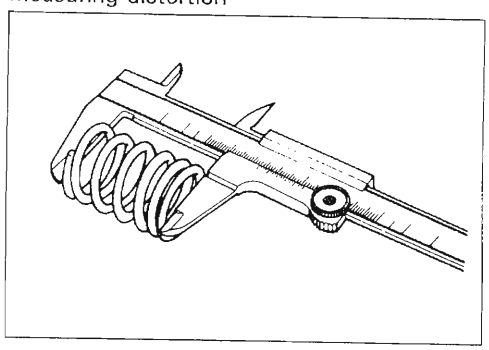
Inspect the clutch release rack bearing for any abnormality, particularly cracks, upon removal from the clutch, to decide whether it can be reused or should be replaced.
Smooth engagement and disengagement of the clutch depends much on the condition of this bearing.

NOTE:
Thrust washer is located between the pressure plate and thrust bearing.


Measuring thickness

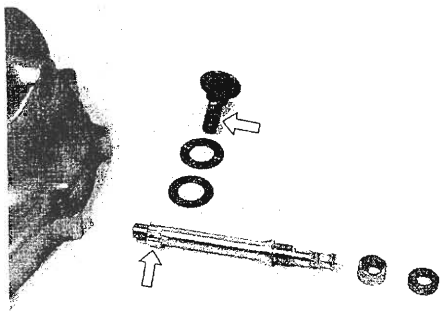

Measuring claw width


Measuring distortion



CLUTCH RELEASE RACK AND PINION

- Inspect the clutch release rack and pinion for wear and damage.
- Inspect the clutch release pinion bearing for any damages.



GENERATOR, SIGNAL GENERATOR AND STARTER CLUTCH

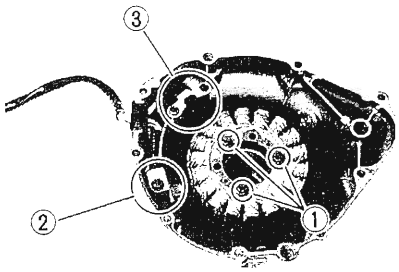
GENERATOR STATOR AND SIGNAL GENERATOR STATOR INSPECTION

Refer to pages 7-8 and -22.

GENERATOR STATOR AND SIGNAL GENERATOR STATOR SERVICING

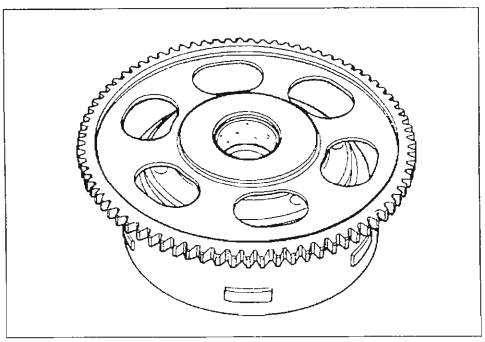
When replacing the generator stator or signal generator stator, tighten the generator stator set bolts ①, clamp bolt ② and signal generator stator set bolt ③ to the specified torque.

Generator stator set bolt ①: 10 N·m (1.0 kg-m, 7.0 lb-ft)
Generator stator clamp bolt ②: 10 N·m (1.0 kg-m, 7.0 lb-ft)
Signal generator stator set bolt ③: 4.5 N·m (0.45 kg-m, 3.5 lb-ft)



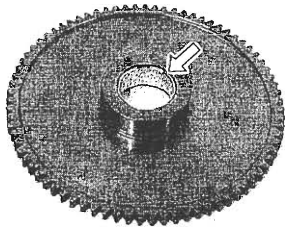
STARTER CLUTCH INSPECTION

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 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.



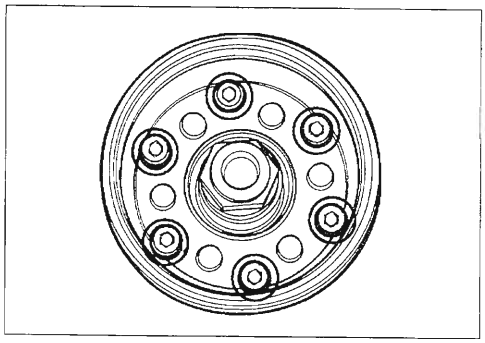
STARTER DRIVEN GEAR BEARING INSPECTION

Inspect the starter driven gear bearing for any damages.

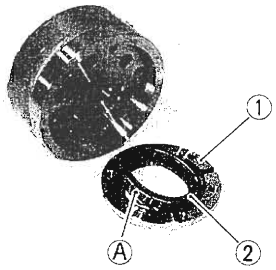


STARTER CLUTCH SERVICING

- Hold the rotor with off-set wrench and remove the starter clutch securing bolts.



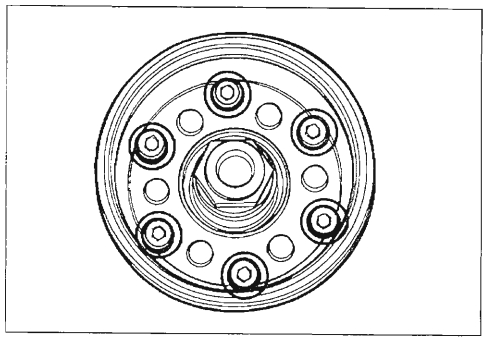
- When fitting the one way clutch ② to the guide ①, position flange side Ⓐ of one way clutch to the rotor side.



- Apply THREAD LOCK SUPER "1303" to the securing bolts and tighten them to the specified torque while holding the rotor with off-set wrench.

1303 99000-32030: THREAD LOCK SUPER "1303"

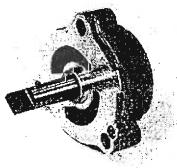
Starter clutch securing bolt: 26 N·m (2.6 kg-m, 19.0 lb-ft)



OIL PUMP

⚠ CAUTION

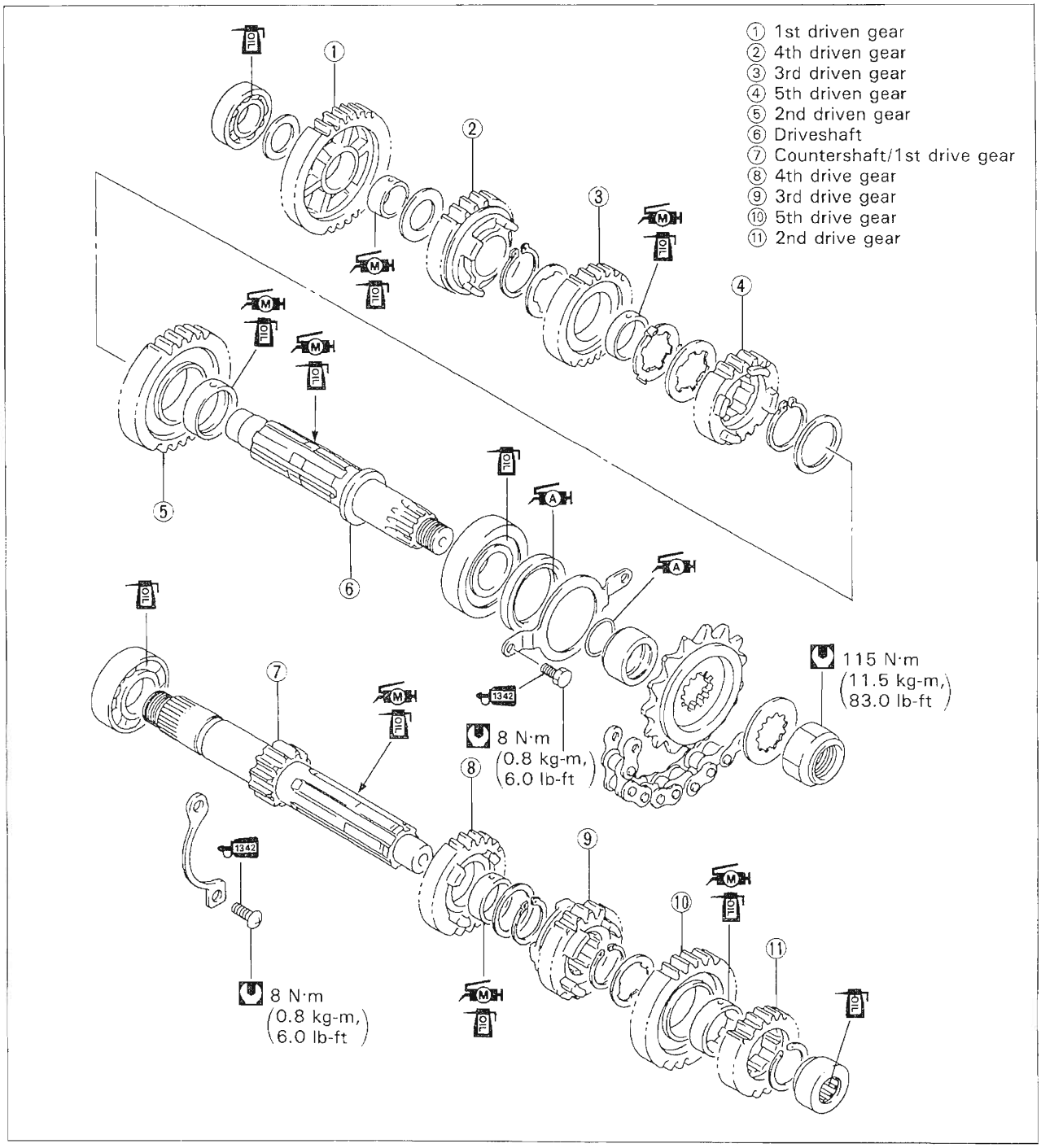
Do not attempt to disassemble the oil pump assembly. The oil pump is available only as an assembly.



TRANSMISSION

DISASSEMBLY

- Disassemble the transmission gears as shown in the illustration.



REASSEMBLY

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

NOTE:
Always use new circlips.

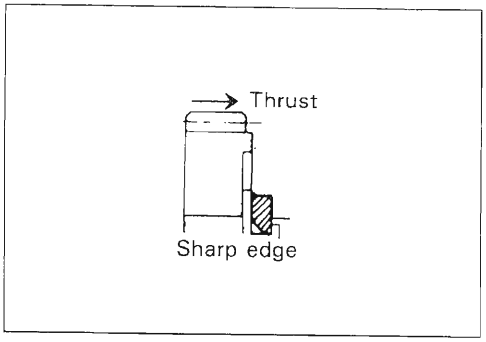
NOTE:
Before installing the gears, coat lightly moly paste or engine oil to the driveshaft and countershaft.

99000-25140: SUZUKI MOLY PASTE

⚠ CAUTION

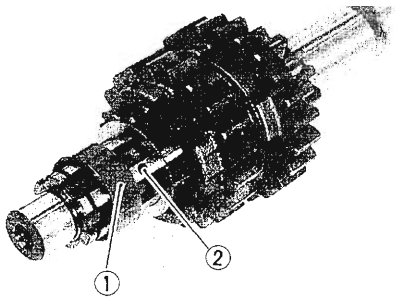
*** Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.**
*** When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.**
*** After installing a circlip,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

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

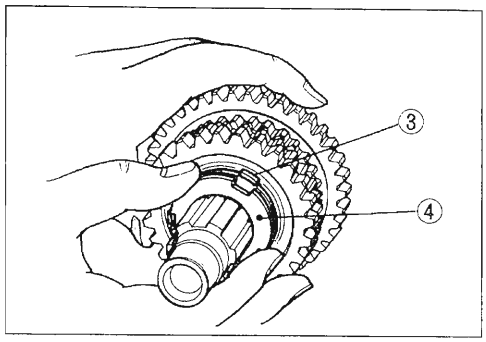


⚠ CAUTION

When installing the top drive gear bushing, align the bushing oil hole ① with the countershaft hole ②.

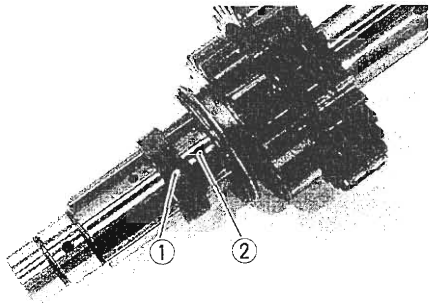


When installing the 3rd driven gear onto the driveshaft, install the lock washer No.2 ③ onto the driveshaft, and turn and fit it into the groove.
Then, fit the lock washer No.1 ④ in the lock washer No.2 ③.

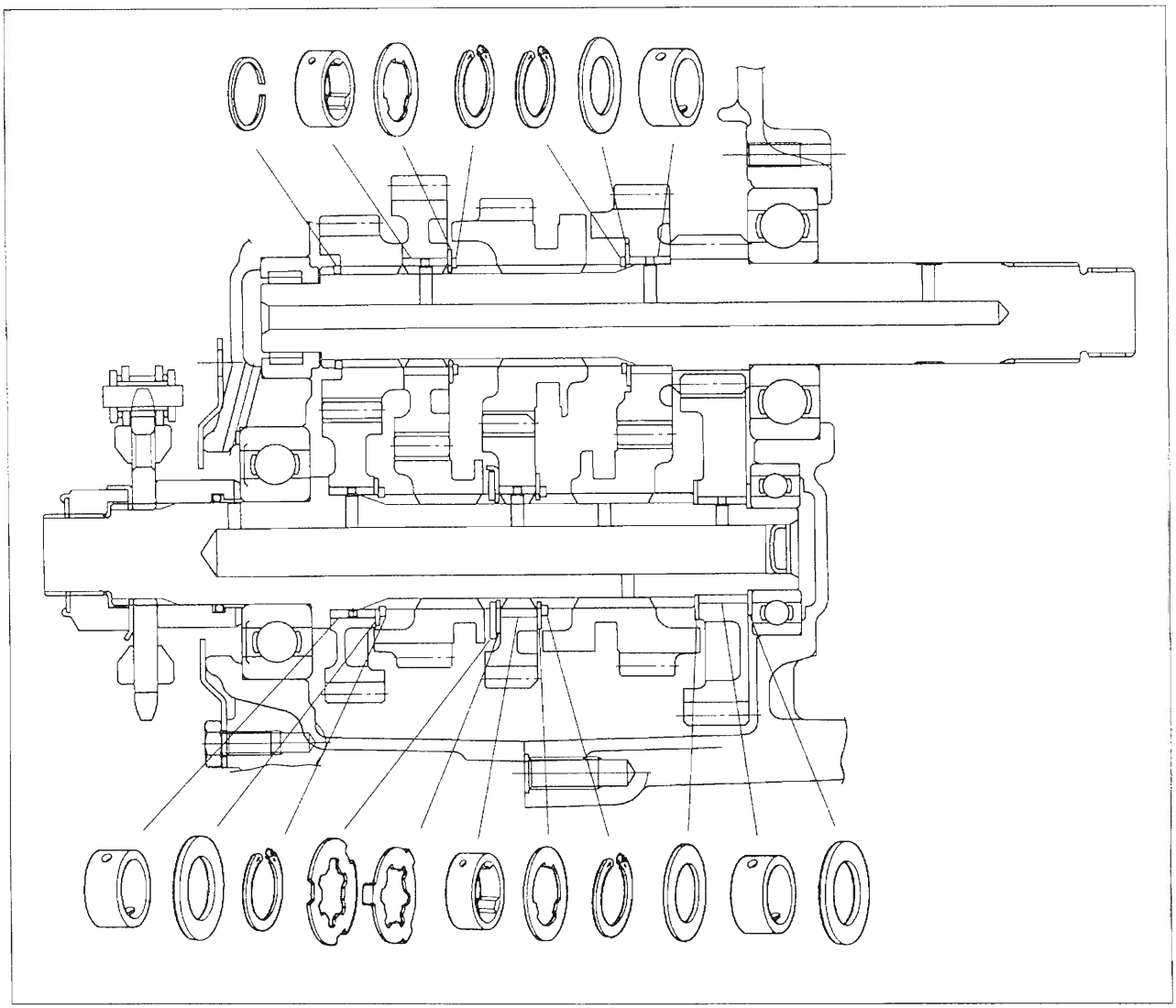


⚠ CAUTION

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



TRANSMISSION GEARS AND RELATED PARTS



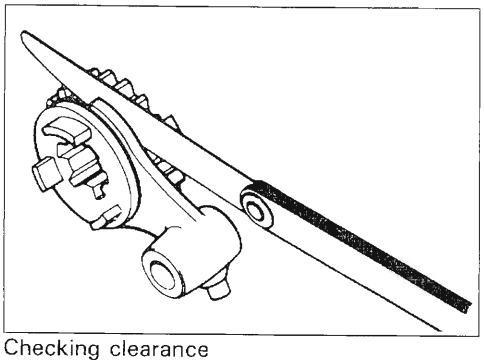
GEAR-SHIFTING FORK

GEAR-SHIFTING FORK CLEARANCE

Using a thickness gauge, check the shifting fork clearance in the groove of its gear.
The clearance for each of the three shifting forks plays an important role in the smoothness and positiveness of shifting action.
If the clearance checked is noted to exceed the limit specified, replace the fork or its gear, or both.

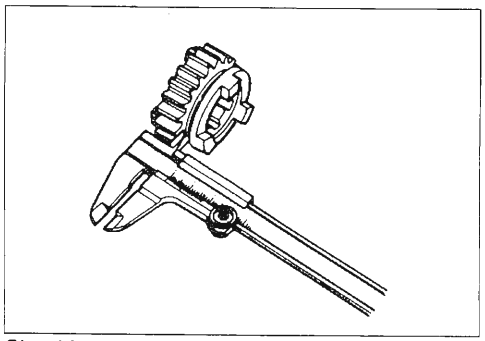
TOOL **09900-20803: Thickness gauge**
09900-20101: Vernier calipers

Shift fork—Groove clearance
Standard: 0.10—0.30 mm (0.004—0.012 in)
Service Limit: 0.50 mm (0.020 in)


Checking clearance

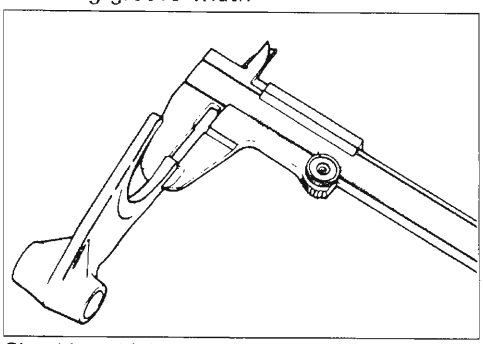
Shift fork groove width

Standard: 5.50—5.60 mm (0.217—0.220 in)


Checking groove width

Shift fork thickness

Standard: 5.30—5.40 mm (0.209—0.213 in)


Checking thickness

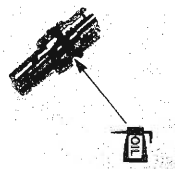
OIL JET AND NOZZLE

Check the all oil jets and nozzles for cogging. If it is clogged, clean its oil passage with a compressed air.

⚠ CAUTION

Use new O-rings to prevent the oil pressure down.

NOTE:
When installing the oil jets and nozzles, apply oil to the O-rings.



ENGINE REASSEMBLY

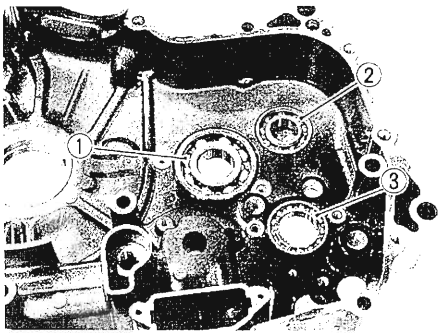
This engine is reassembled by carrying out the steps of disassembly in the reverse order, but there are a number of steps which demand special descriptions or precautionary measures.

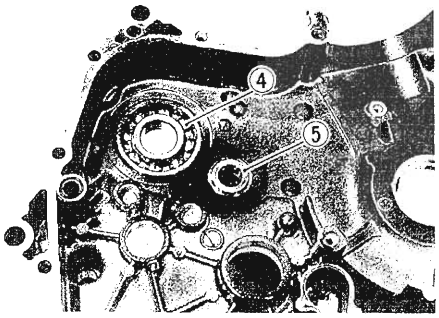
NOTE:
Apply engine oil to each running and sliding part before reassembling.

- Install the bearings to the crankcase by using the special tools.

09913-85210: Bearing installer (① ④)
09913-76010: Bearing installer (② ③ ⑤)

NOTE:
The sealed side of the bearing ④ faces outside.



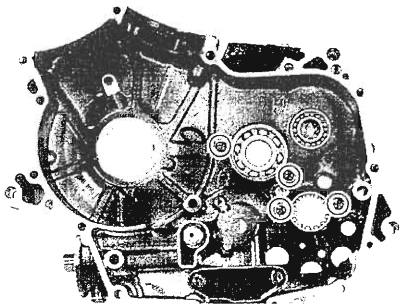


- Install the bearing retainers.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws and tighten them to the specified torque.

99000-32050: THREAD LOCK "1342"

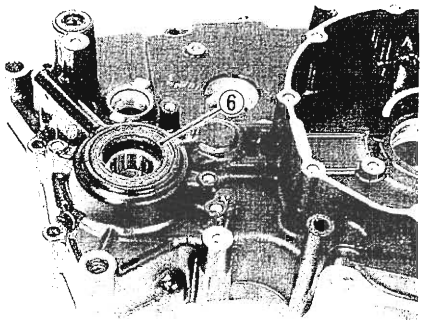
Bearing retainer screw: 8 N·m (0.8 kg-m, 6.0 lb-ft)



- Install the oil seals ⑥ to the crankcase by using the special tool.
- Apply SUZUKI SUPER GREASE "A" to the oil seal lip.

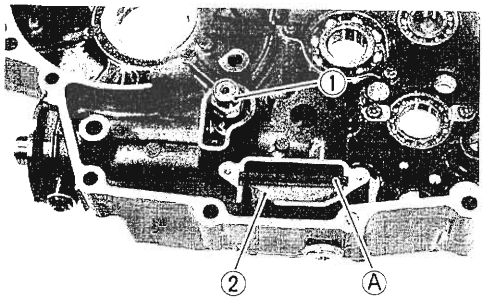
09913-85210: Bearing installer

99000-25030: SUZUKI SUPER GREASE "A"



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

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



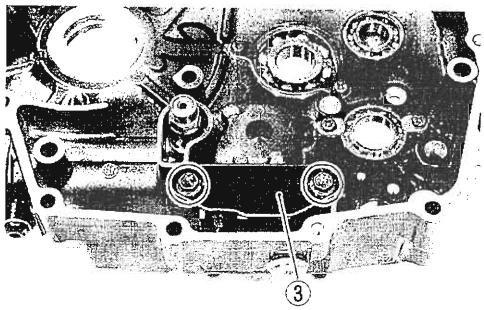
• Install the oil sump filter ② and its cover ③.

NOTE:
The projection Ⓐ of the oil sump filter faces to the bottom.

• Tighten the oil sump filter cover bolts to the specified torque after applying a small quantity of THREAD LOCK "1342".

99000-32050: THREAD LOCK "1342"

Oil sump filter cover bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



• Fit the new O-rings to each oil nozzle.

⚠ CAUTION

Use new O-rings to prevent the oil pressure down.

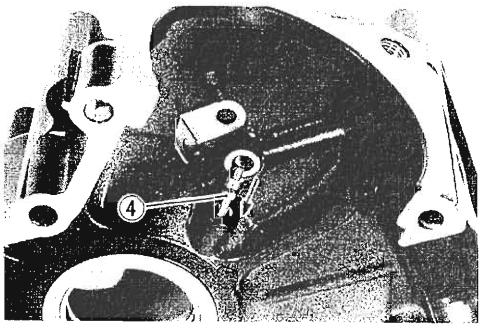
NOTE:
When installing the oil nozzles, apply engine oil to the O-rings.

• Install the oil nozzles ④ to the left and right crankcases.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bolts and tighten them to the specified torque.

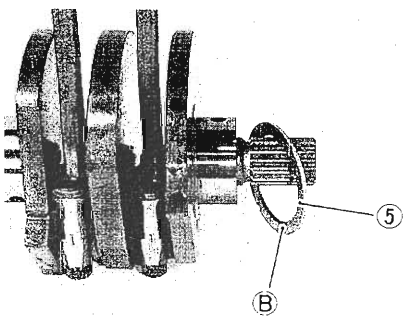
99000-32050: THREAD LOCK "1342"

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

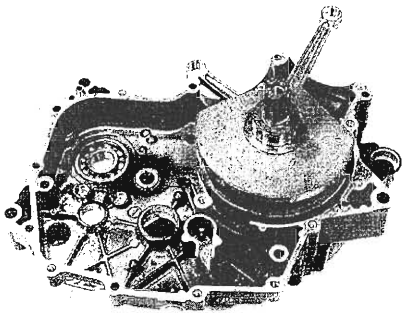


• Install the thrust shim ⑤ on the crankshaft.

NOTE:
* *The oil grooved face Ⓑ of thrust shim ⑤ faces to crankshaft web side.*
* *The thrust shim ⑤ is chosen by the crankshaft thrust clearance. (Refer to page 3-43.)*



- Install the crankshaft into the left crankcase half.



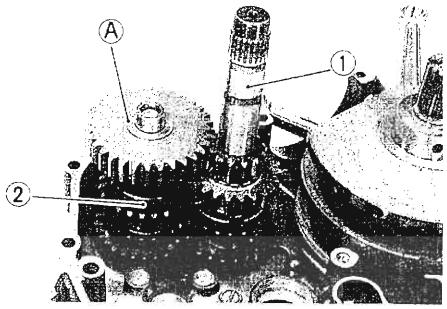
NOTE:
Coat lightly moly paste to the crankshaft journal bearings.

99000-25140: SUZUKI MOLY PASTE

⚠ CAUTION

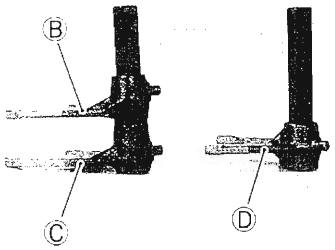
Never strike the crankshaft with a plastic hammer when inserting it into the crankcase. It should be easy to install the crankshaft to left crankcase.

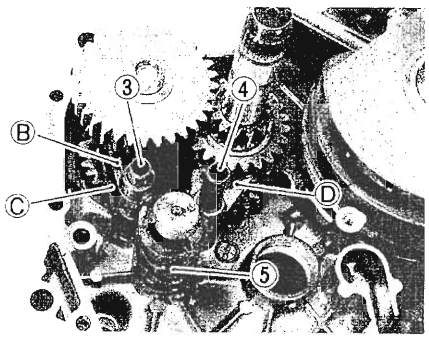
- Install the countershaft assembly ①, driveshaft assembly ② and reduction driven gear.
- Install the washer Ⓐ to the countershaft.



- Install the gearshift forks (Ⓑ, Ⓒ, Ⓓ) gearshift fork shafts (③, ④) and gearshift cam ⑤.

Ⓑ For 4th driven gear
Ⓒ For 5th driven gear
Ⓓ For 3rd drive gear

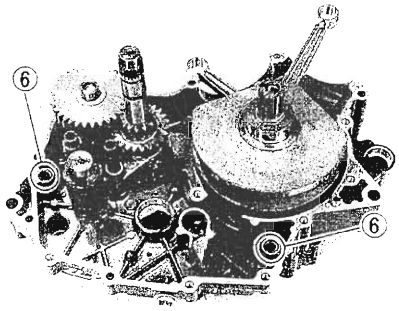




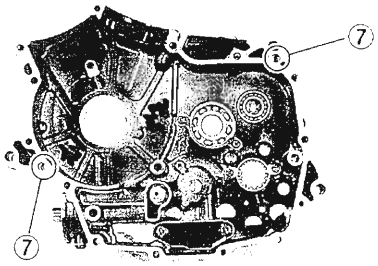
- Install the new O-rings ⑥.

NOTE:
Apply grease to the O-rings.

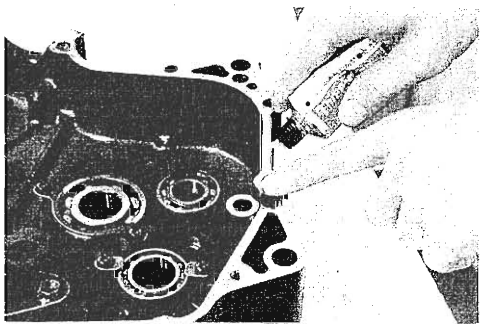
99000-25030: SUZUKI SUPER GREASE "A"



- Clean the mating surfaces of the left and right crankcases.
- Fit the dowel pins ⑦ on the left crankcase.

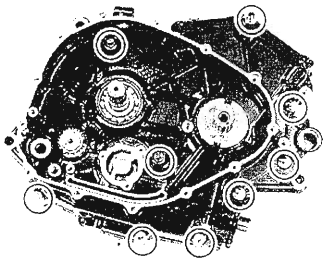


- Apply SUZUKI BOND "1207B" to the mating surface of the right crankcase.



1207B 99104-31140: SUZUKI BOND "1207B"

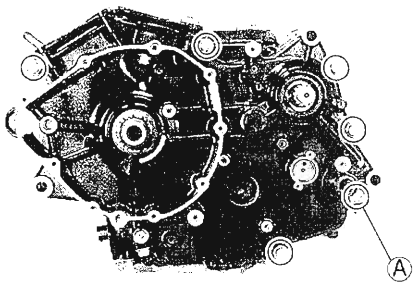
NOTE:
Use of SUZUKI BOND "1207B" is as follows:
* *Make surfaces free from moisture, oil, dust and other foreign materials.*
* *Spread on surfaces thinly to form an even layer, and assemble the crankcases within few minutes.*
* *Take extreme care not to apply any BOND "1207B" to the oil hole, oil groove and bearing.*
* *Apply to distorted surfaces as it forms a comparatively thick film.*



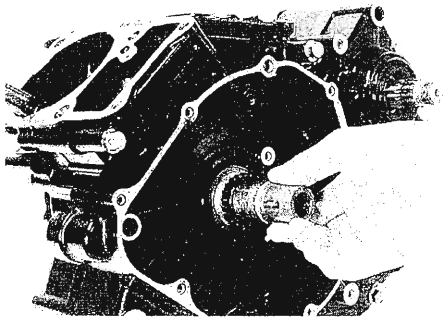
- When securing the right and left crankcases, tighten each bolt a little at a time to equalize the pressure. Tighten all the securing bolts to the specified torque values.

Crankcase bolt: (Initial) 15 N·m (1.5 kg-m, 11.0 lb-ft)
(Final) 22 N·m (2.2 kg-m, 16.0 lb-ft)

NOTE:
Fit the clamp Ⓐ to the correct position as shown in Fig.



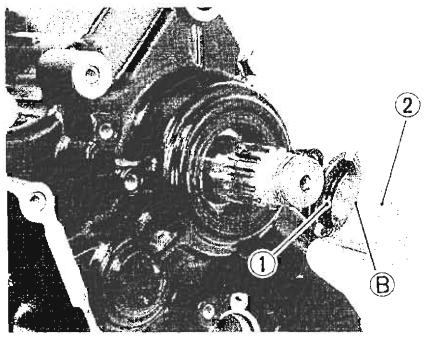
- After the crankcase bolts have been tightened, check if crankshaft, driveshaft and countershaft rotate smoothly.
- If a large resistance is felt to rotation, try to free the shafts by tapping the crankshaft, driveshaft or countershaft with a plastic hammer.



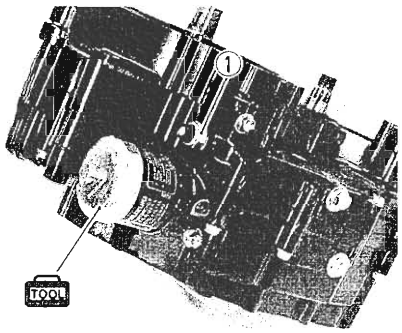
- Install the O-ring ① to the engine sprocket spacer ②.
- Install the engine sprocket spacer ②.

NOTE:
* *The chamfer side Ⓑ of the engine sprocket spacer faces crankcase side.*
* *Apply grease to the oil seal lip and O-ring.*

A 99000-25030: SUZUKI SUPER GREASE "A"



- Apply engine oil lightly to the gasket of the oil filter before installation.
- Install the oil filter turning it by hand until feeling that the filter gasket contacts the mounting surface. Then tighten it 2 turns using the oil filter wrench.



TOOL **09915-40610: Oil filter wrench**

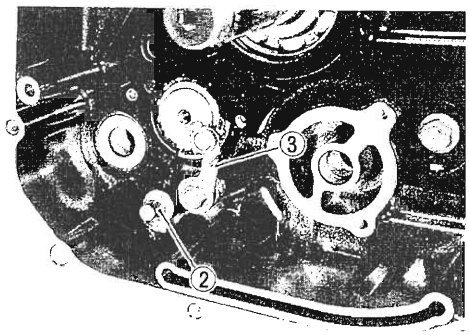
NOTE:
To properly tighten the filter, use the special tool. Never tighten the filter by hand.

- Apply SUZUKI BOND "1207B" to the thread part of the oil pressure switch ① and tighten it to the specified torque.

1207B **99104-31140: SUZUKI BOND "1207B"**

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

- Apply a small quantity of THREAD LOCK SUPER "1303" to the gearshift arm stopper ② and tighten it to the specified torque.



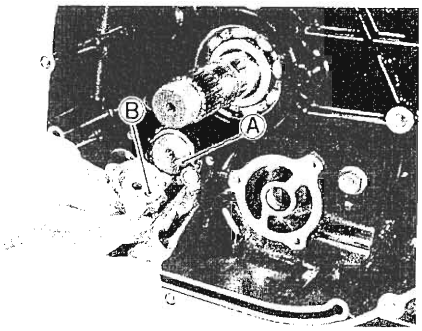
1303 **99000-32030: THREAD LOCK SUPER "1303"**

Gearshift arm stopper: 19 N·m (1.9 kg-m, 14.0 lb-ft)

- Apply a small quantity of THREAD LOCK "1342" to the gearshift cam stopper ③ bolt and tighten it to the specified torque.

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

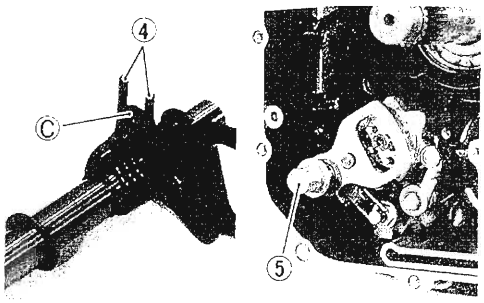
Gearshift cam stopper bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



- Hook the gearshift cam stopper spring.
- Check the neutral position.
- Install the gearshift cam stopper plate after aligning the gearshift cam pins Ⓐ with the gearshift cam stopper plate holes Ⓑ.
- Apply a small quantity of THREAD LOCK "1342" to the gearshift cam stopper plate bolt and tighten it to the specified torque.

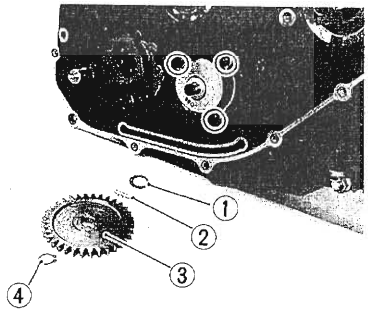
1342 **99000-32050: THREAD LOCK "1342"**

Gearshift cam stopper plate bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



- Install the stopper Ⓒ of the gearshift shaft ⑤ between the return spring ④ properly.
- Install the gearshift shaft ⑤ as shown in the photograph.

- Install the oil pump to the crankcase.
- Apply a small quantity of THREAD LOCK "1342" to the oil pump securing bolts and tighten it to the specified torque.



99000-32050: THREAD LOCK "1342"

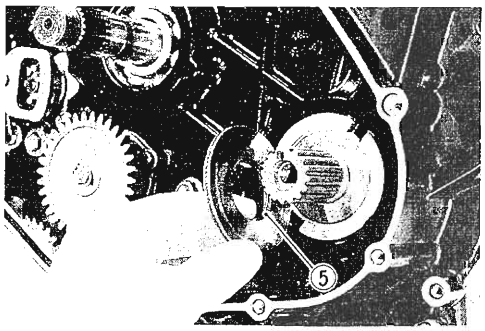
Oil pump bolt: 8 N·m (0.8 kg-m, 6.0 lb-ft)

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

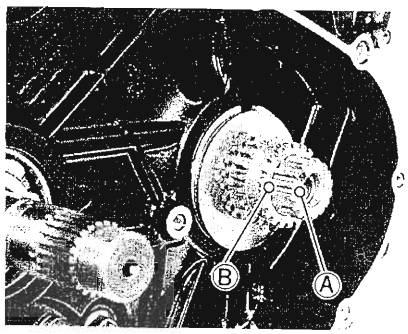
09900-06107: Snap ring pliers

- Install the thrust washer onto the crankshaft.

NOTE:
The chamfer side of thrust washer ⑤ faces crankcase side.



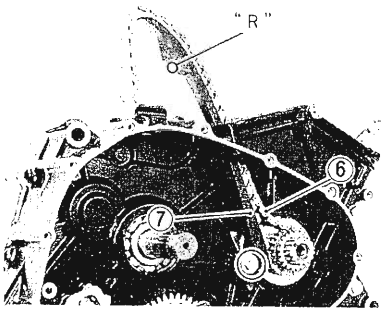
- Align the punch mark Ⓐ on the crankshaft with the punch mark Ⓑ on the camshaft drive sprocket.



- Install the cam chain ⑥ and cam chain guide ⑦ with "R" mark.
- Tighten the cam chain guide set bolt to the specified torque.

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

NOTE:
The cam chain guide can be distinguished by the embossed-letters, "F" and "R", on its back side.

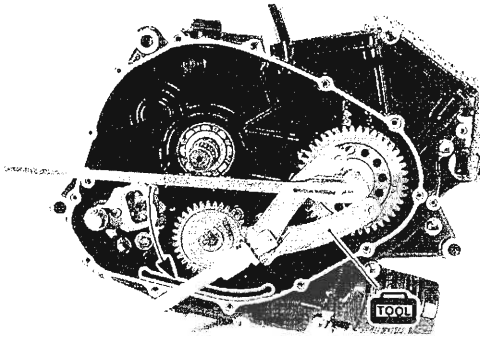


- Tighten the primary drive gear bolt to the specified torque with the special tool.

09930-40113: Rotor holder

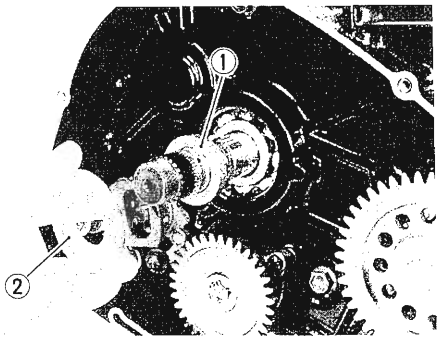
Primary drive gear bolt: 95 N·m (9.5 kg-m, 68.5 lb-ft)

NOTE:
This bolt has left-hand thread.



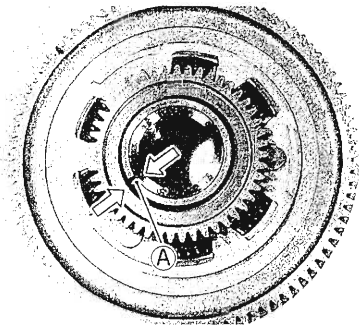
- Install the spacer ① and thrust washer ② onto the countershaft.

NOTE:
The chamfer side of thrust washer ② faces crankcase side.

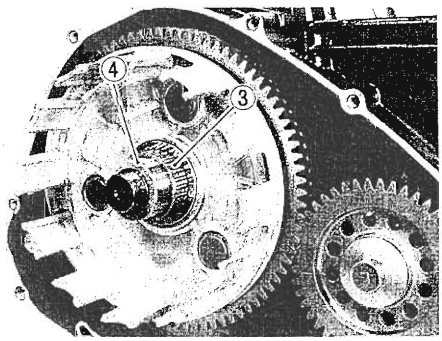


- Install the oil pump drive gear onto the primary driven gear.

NOTE:
When installing the oil pump drive gear, align the pin groove with the pin Ⓐ.

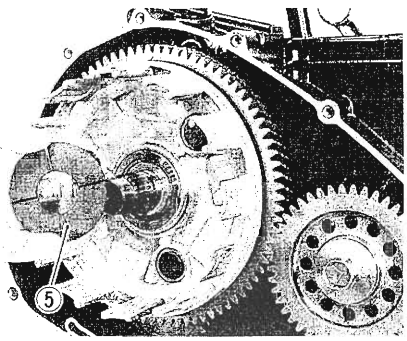


- Apply engine oil to the primary driven gear bearing ③ and collar ④.
- Install the primary driven gear assembly onto the countershaft.

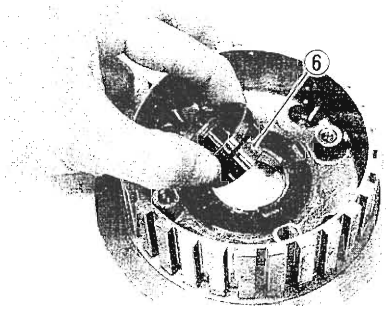


- Install the thrust washer ⑤ onto the countershaft.

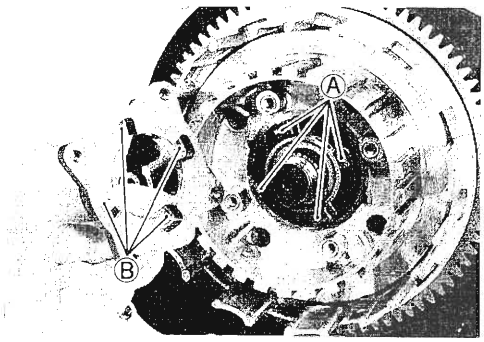
NOTE:
The oil grooved face of the thrust washer ⑤ faces outside (clutch sleeve hub side).



- Install the spacer ⑥ to the clutch sleeve hub as shown in the photograph.
- Install the clutch sleeve hub and spacer onto the countershaft.

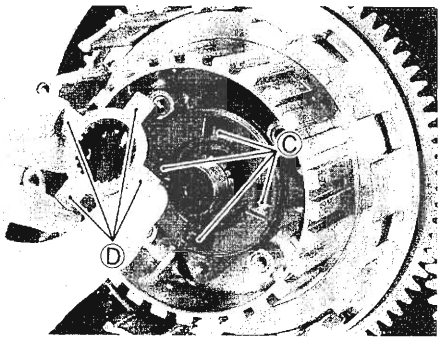


- Install the No.2 clutch cam after engaging the boss Ⓐ of clutch sleeve hub with dog Ⓑ of No.2 clutch cam.



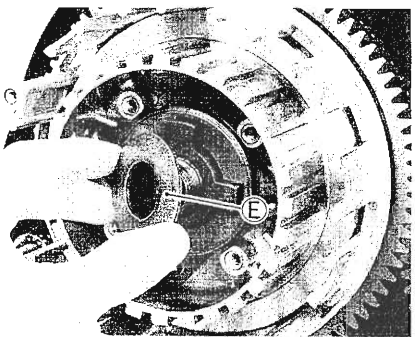
- Install the No.1 clutch cam after engaging the dog Ⓒ of No.2 clutch cam with boss Ⓓ of No.1 clutch cam.

NOTE:
Flat surface of the No.1 clutch cam faces outside.



- Install the washer.

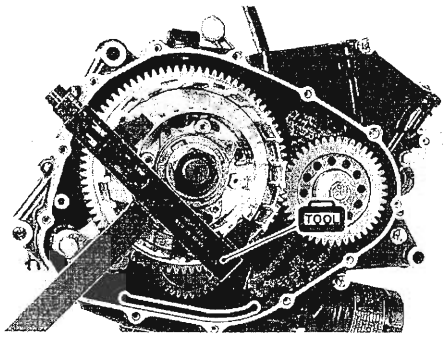
NOTE:
The convex side Ⓔ of the washer faces outside.



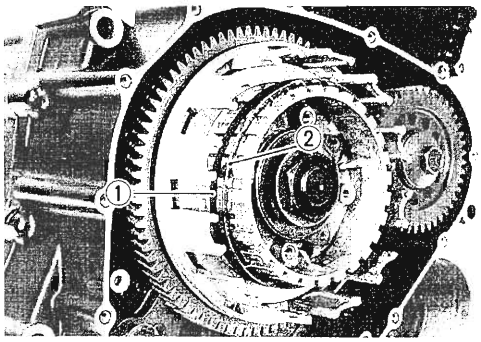
- Tighten the clutch sleeve hub nut to the specified torque by using the special tool.

Clutch sleeve hub nut: 95 N·m (9.5 kg-m, 68.5 lb-ft)

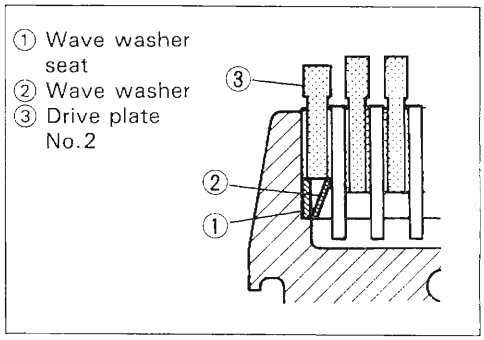
09920-53740: Clutch sleeve hub holder



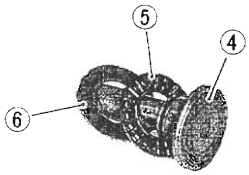
- Install the wave washer seat ①, the wave washer ② and the drive plate No. 2 ③ (thicker plate as shown in the figure) onto the clutch sleeve hub.



NOTE:
Install the clutch drive plate and driven plate one by one into the clutch sleeve hub in the prescribed order, drive plate No.2 first.



- Install the clutch release rack ④, bearing ⑤ and thrust washer ⑥ to the pressure plate.
- Apply engine oil to the bearing.



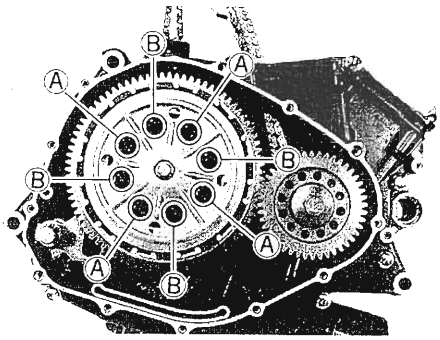
- Put the pressure plate onto the clutch sleeve hub securely.
- Tighten the clutch spring mounting bolts to the specified torque by using the special tool.

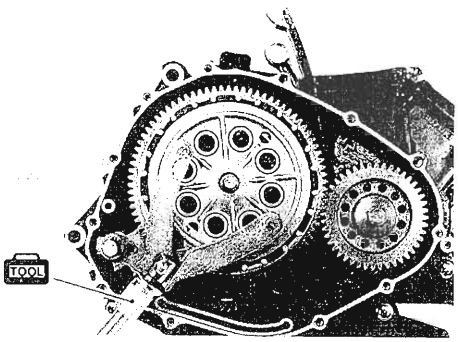
NOTE:
Set "A (No.1)" is used for clutch sleeve hub side.
Set "B (No.2)" is used for No.2 clutch cam side.

"A (No.1)": Bolt L: 40 mm (1.58 in)
Spring L: 25.85 mm (1.018 in) (White paint)
Spacer L: 24 mm (0.95 in)
"B (No.2)": Bolt L: 33 mm (1.30 in)
Spring L: 24.5 mm (0.965 in)
Spacer L: 24 mm (0.95 in)

Clutch spring mounting bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

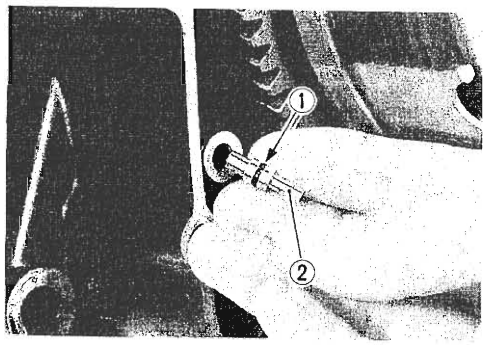
09930-40113: Rotor holder



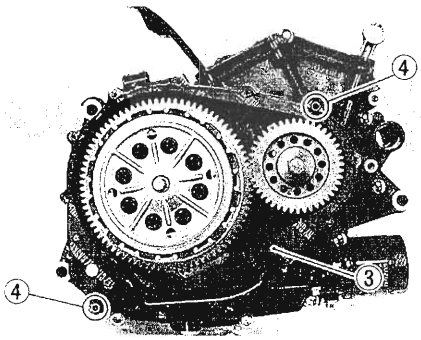


NOTE:
Tighten the clutch spring mounting bolts in the criss-cross manner, tightening them by degrees until they attain a uniform tightness.

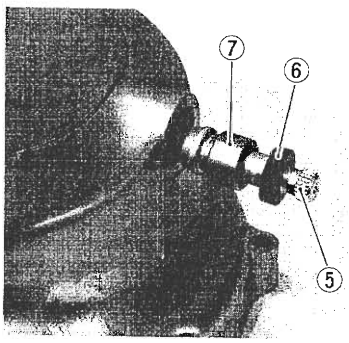
- Apply engine oil to the new O-ring ①.
- Install the oil jet ② as shown in the photograph.



- Install the new clutch cover gasket ③ and dowel pins ④.



- Install the clutch release pinion ⑤, oil seal ⑥ and bearing ⑦.



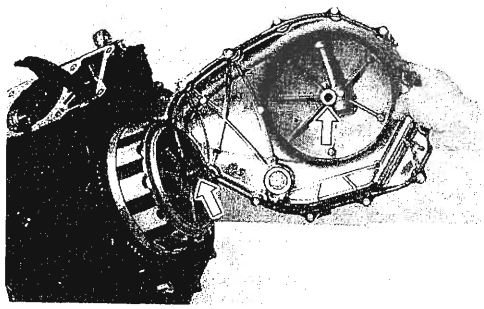
- Align the clutch release rack teeth with the pinion gear.
- Tighten the clutch cover bolts to the specified torque.

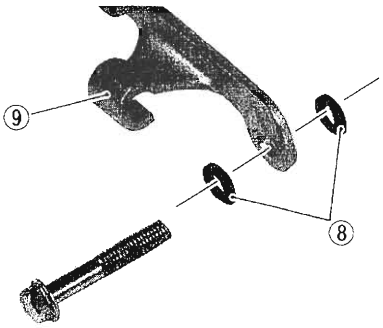
Clutch cover bolt: 11 N·m (1.1 kg-m, 8.0 lb-ft)

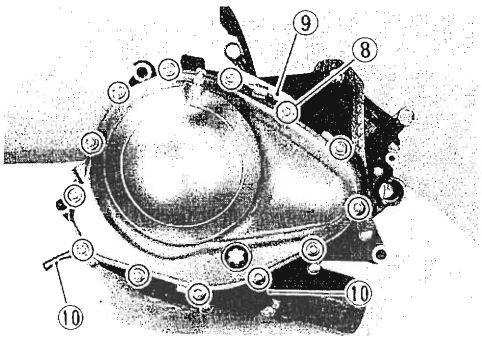
NOTE:
Fit the new gaskets ⑧, clutch cable stopper ⑨ and clamps ⑩ to the correct positions as shown in Fig.

⚠ CAUTION

Use new gaskets to prevent oil leakage.



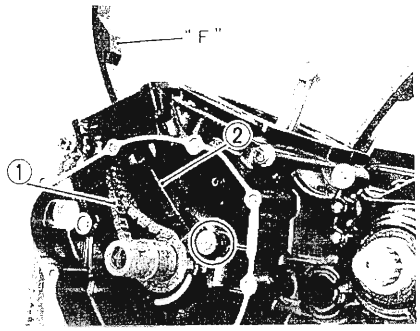




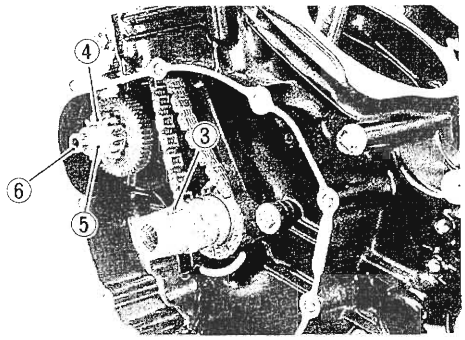
- Install the cam chain ① and cam chain guide ② with "F" mark.
- Tighten the cam chain guide set bolt to the specified torque.

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

NOTE:
The cam chain guide can be distinguished by the embossed-letters, "F" and "R", on its back side.



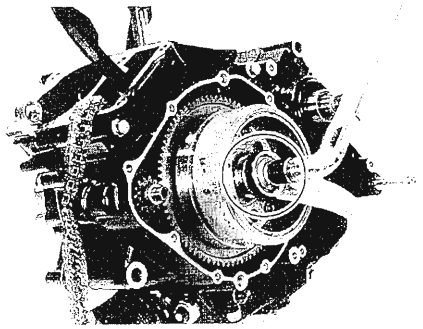
- Fit the key ③ in the key slot on the crankshaft.
- Install the starter idle gear ④, spacer ⑤ and shaft ⑥.



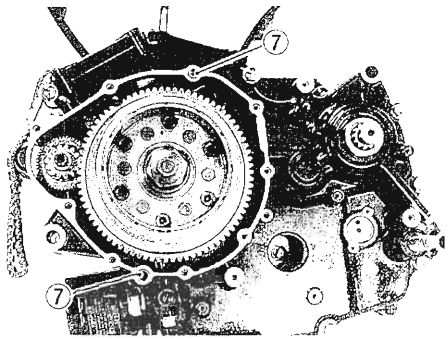
- Degrease the tapered portion of the rotor and also the crankshaft. Use nonflammable cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.
- Install the rotor with the starter driven gear onto the crankshaft.
- Apply THREAD LOCK SUPER "1303" to the rotor bolt and tighten it to the specified torque.

Generator rotor bolt: 160 N·m (16.0 kg-m, 115.5 lb-ft)

99000-32030: THREAD LOCK SUPER "1303"



- Install the new generator cover gasket and dowel pins ⑦.

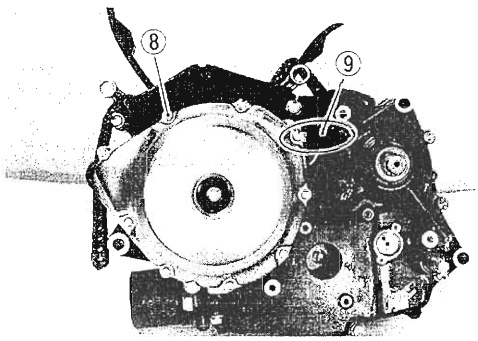


- Install the generaot cover.

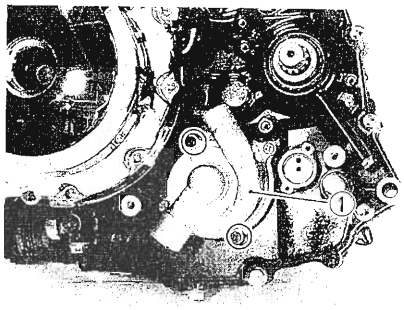
NOTE:
Fit the new gaskets ⑧ and clamp ⑨ to the correct positions as shown in Fig.

⚠ CAUTION

Use new gaskets to prevent oil leakage.



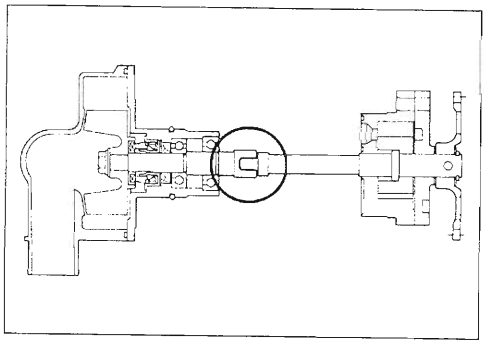
- Install the water pump ① and tighten its mounting bolts to the specified torque.



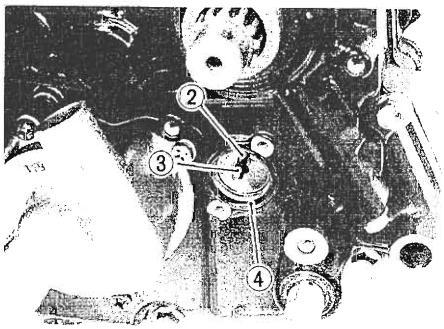
NOTE:
* *Apply grease to the water pump O-ring.*
* *Set the water pump shaft to the oil pump shaft as shown in the illustration.*

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

99000-25030: SUZUKI SUPER GREASE "A"



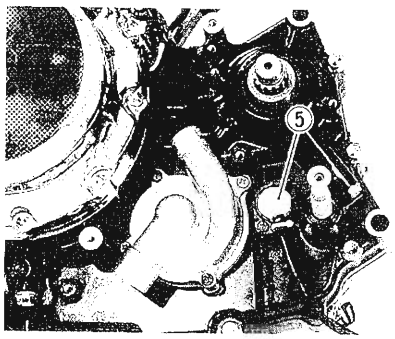
- Install the spring ②, the neutral switch contact ③ and the O-ring ④.



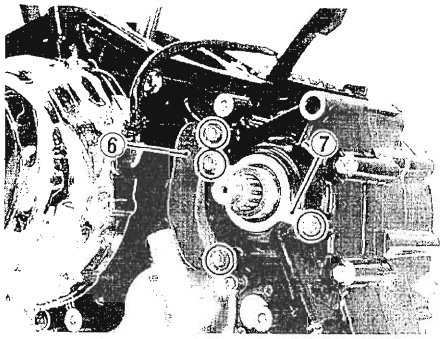
NOTE:
Apply grease to the O-ring.

99000-25030: SUZUKI SUPER GREASE "A"

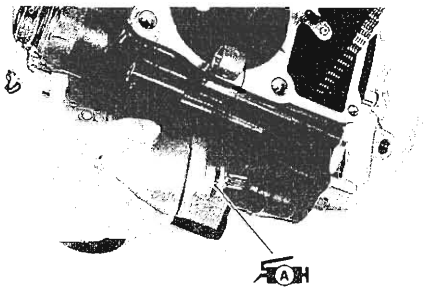
- Install the neutral switch assembly ⑤ as shown in the photograph.



- Install the drive chain guide ⑥.
- Install the drive shaft oil seal retainer ⑦.



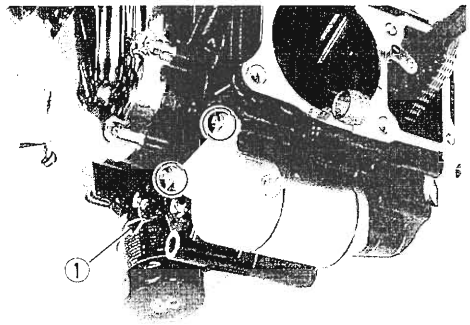
- Install the starter motor and tighten its mounting bolts to the specified torque.



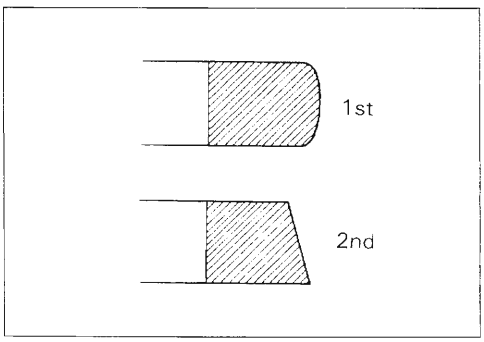
NOTE:
* *Apply grease to the new O-ring.*
* *Place the clamp ① as shown in the photograph.*

Starter motor mounting bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

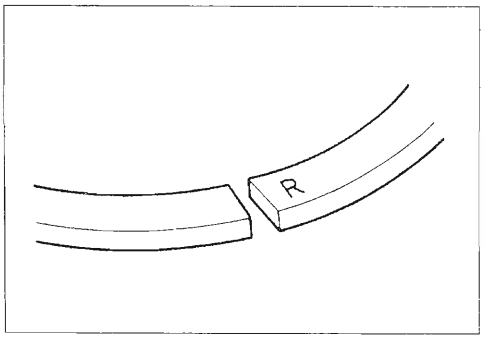
99000-25030: SUZUKI SUPER GREASE "A"



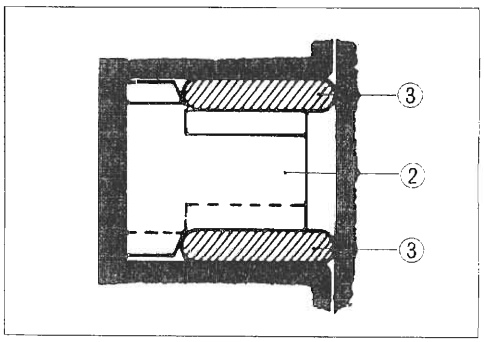
- Install the piston rings in the order of oil ring, 2nd ring and top ring.
- Top ring and 2nd (middle) ring differ in the shape of the ring face, and the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.



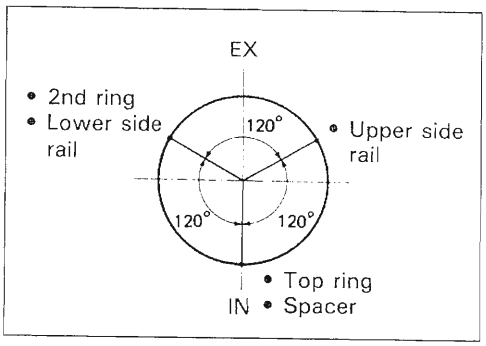
- 2nd (middle) rings have a letter "R" marked on the side. Be sure to bring the marked side to top when fitting them to the piston.



- The first member to go into the ring groove is spacer ②. After placing the spacer, fit the two side rails ③. Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.



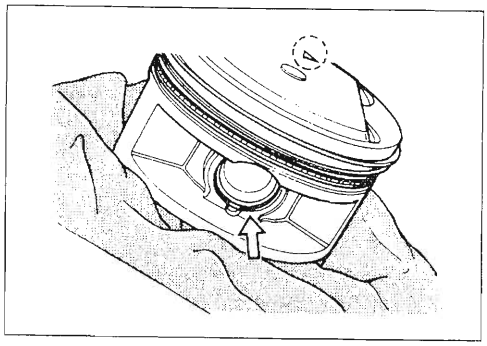
- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



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

99000-25140: SUZUKI MOLY PASTE

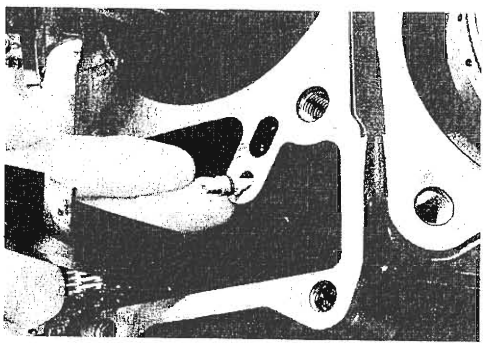
- Place a clean rag over the cylinder base to prevent the piston pin circlips from dropping into the crankcase.
- When installing the piston, the arrow mark on the piston head is located to exhaust side.
- Install the piston pin circlips with long-nose pliers.

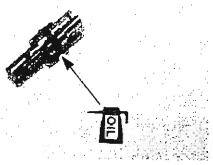


⚠ CAUTION

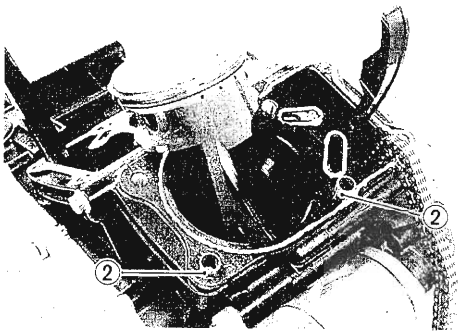
Use new piston pin circlips to prevent circlip failure which will occur with a bent one.

- Apply engine oil to the new O-ring.
- Install the oil jet ① as shown in the photograph.





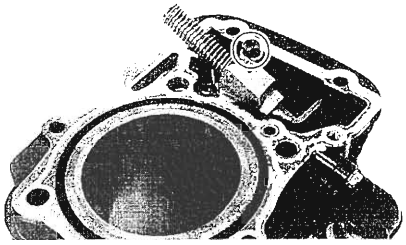
- Apply engine oil to the sliding surface of the piston.
- Fit the dowel pins ② and new gaskets to the crankcase.



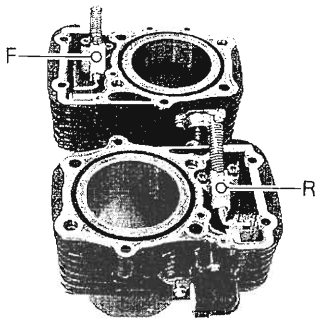
⚠ CAUTION

Use new gaskets to prevent oil leakage.

- Install the cam chain tensioners on each cylinder.



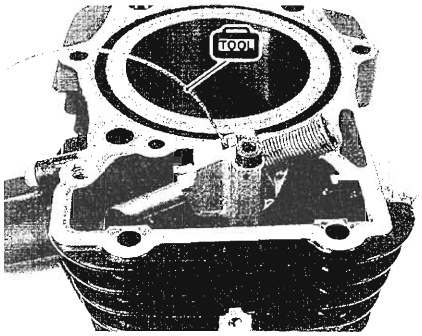
NOTE:
The cam chain tensioner can be distinguished by the embossed-letters, "F" and "R".
"F": Front (No.2 cylinder)
"R": Rear (No.1 cylinder)

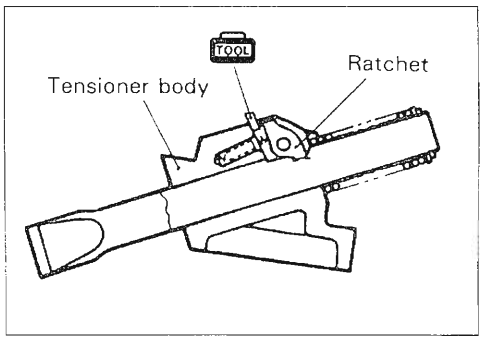


Cam chain tensioner bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

- Compress the chain tensioner spring by releasing ratchet. Insert the special tool between ratchet and chain tensioner body.

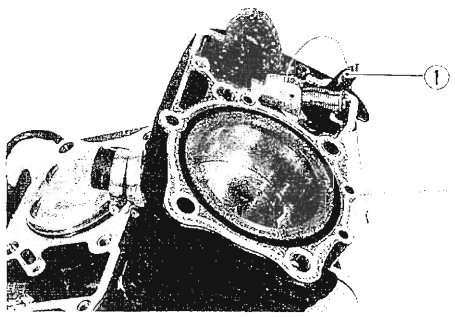
09918-53810: Chain tensioner locking tool



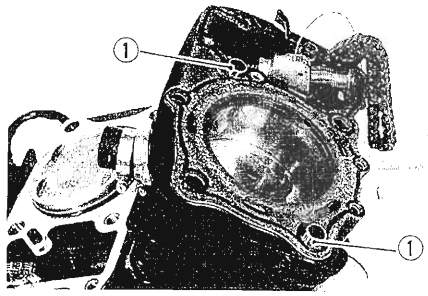


- Hold the No.2 (Front) piston rings in proper position, and insert piston into the No.2 (Front) cylinder.
- Pull the cam chain out of No.2 (Front) cylinder and install the cam chain guide ①.

NOTE:
When mounting the cylinders, keep the camshaft drive chains taut. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.
There is a holder for the bottom end of the cam chain guide cast in the crankcase. Be sure that the cam chain guide is inserted properly.



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

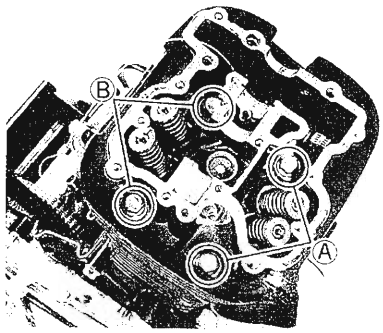


⚠ CAUTION

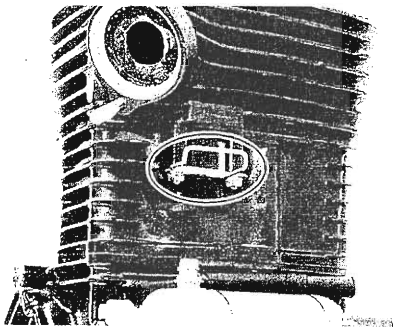
Use a new gasket to prevent gas leakage.

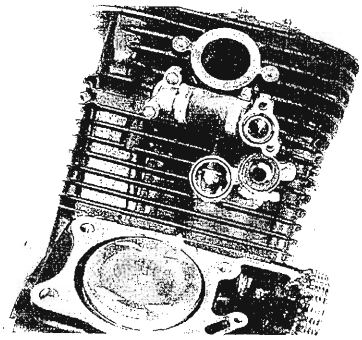
- Tighten the No.2 (Front) cylinder head bolts (long, 10 mm) diagonally to the specified torque.
- Tighten other cylinder head nuts to the specified torque.

NOTE:
The length of the bolt Ⓐ is 165 mm (6.5 in) and bolt Ⓑ is 155 mm (6.1 in).



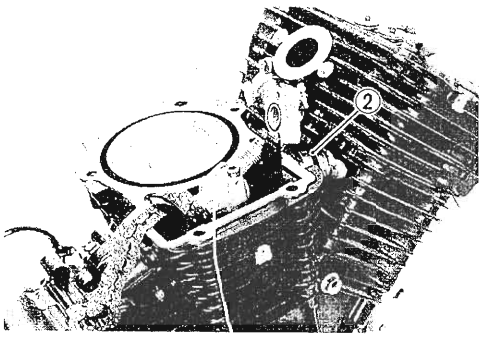
Cylinder head bolt and nut:
(M10): Initial 25 N·m (2.5 kg-m, 18.0 lb-ft)
Final 38 N·m (3.8 kg-m, 27.5 lb-ft)
(M8) : 25 N·m (2.5 kg-m, 18.0 lb-ft)
(M6) : 11 N·m (1.1 kg-m, 8.0 lb-ft)





- Install the No.1 (Rear) cylinder and cylinder head in the same manner of No.2 (Front) cylinder and cylinder head installation.

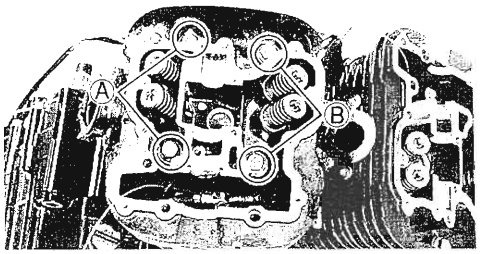
NOTE:
When remounting the No.1 (Rear) cylinder, install the water hose ② and clamps.

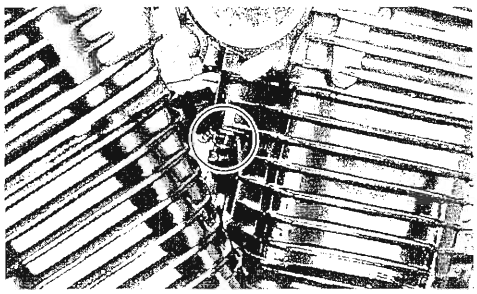


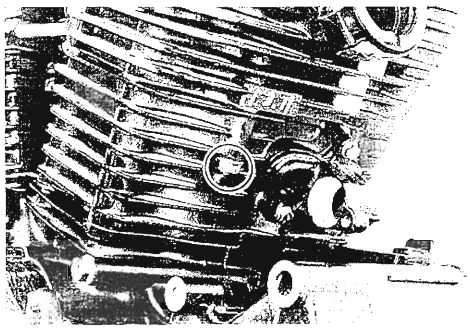
- Tighten the cylinder head bolts (long, 10 mm) diagonally to the specified torque.
- Tighten other cylinder head nuts to the specified torque.

NOTE:
The length of the bolt Ⓐ is 165 mm (6.5 in) and bolt Ⓑ is 155 mm (6.1 in).

Cylinder head bolts and nuts
(M10): Initial 25 N·m (2.5 kg-m, 18.0 lb-ft)
Final 38 N·m (3.8 kg-m, 27.5 lb-ft)
(M8) : 25 N·m (2.5 kg-m, 18.0 lb-ft)





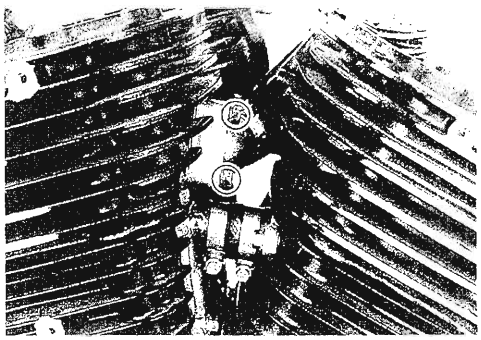


- Tighten the water union bolts to the specified torque.
- Tighten the water hose clamp screws.

Water union bolts: 10 N·m (1.0 kg-m, 7.0 lb-ft)

NOTE:
Apply grease to the new O-ring.

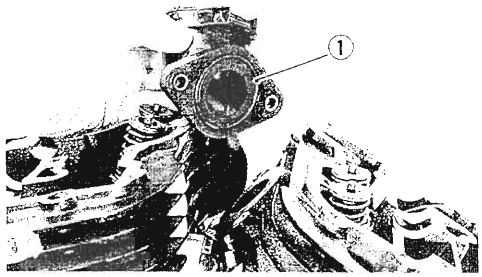
99000-25030: SUZUKI SUPER GREASE "A"



- Install the intake pipe.

NOTE:
Apply grease to the new O-ring ①.

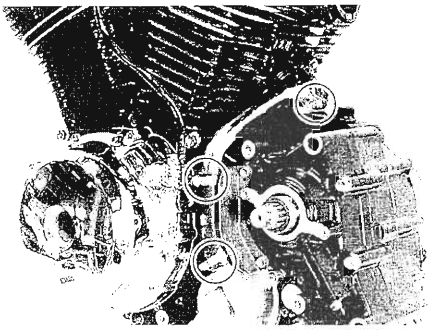
99000-25030: SUZUKI SUPER GREASE "A"



- Install the water pipe and hose.

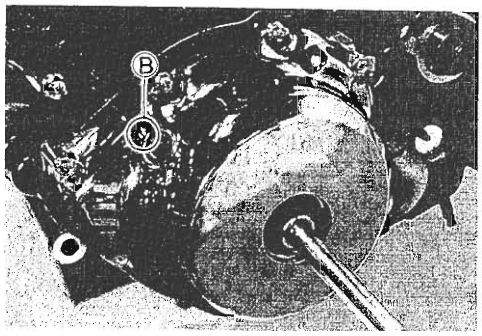
NOTE:
Apply grease to the new O-ring.

99000-25030: SUZUKI SUPER GREASE "A"



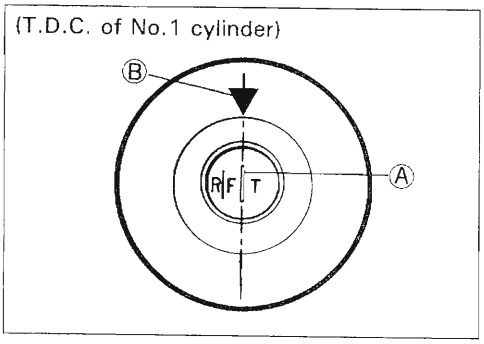
CAMSHAFT TIMING

- Turn the crankshaft counterclockwise with the box wrench and align "T" line Ⓐ on the generator rotor with the index mark Ⓑ on the generator cover keeping the camshaft drive chain pulled upward.



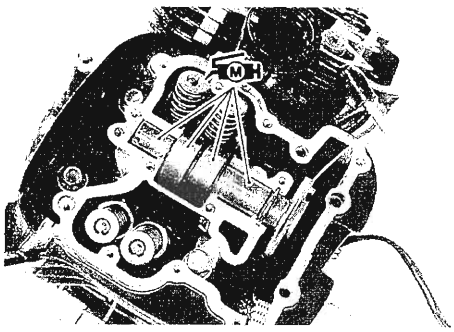
⚠ CAUTION

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



- Apply SUZUKI MOLY PASTE to the cam shaft journals and engine oil to the camshaft journal holders.

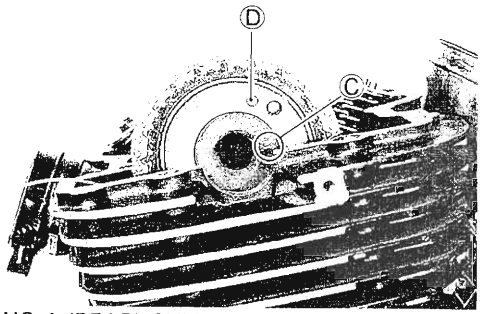
99000-25140: SUZUKI MOLY PASTE



- Place each camshaft onto the correct position. ("R" is for No.1 (Rear) cylinder and "F" is for No.2 (Front) cylinder.)

- Align the arrow marks Ⓒ on the front and rear camshafts so it is parallel with the surface of the cylinder heads.

NOTE:
Arrow marks are located to forward.

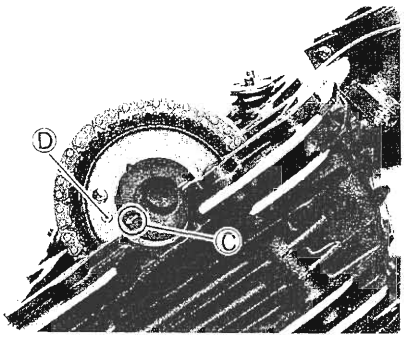


NO.1 (REAR) CYLINDER

- Engage the chains on the cam sprockets with the locating pin holes Ⓓ as shown in the photograph.

NOTE:
Do not rotate the generator rotor while doing this. When the sprocket is not positioned correctly, turn the sprocket.

- Recheck the position of the "T" line Ⓐ on the generator rotor, arrow mark Ⓒ on the No.1 (Rear) camshaft and arrow mark Ⓒ on the No.2 (front) camshaft.



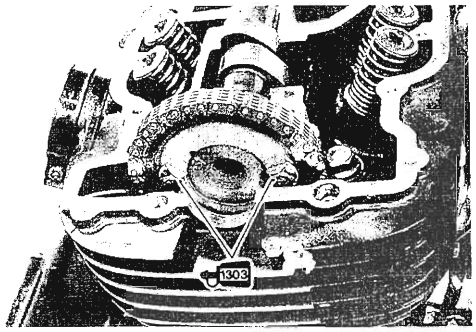
NO.2 (FRONT) CYLINDER

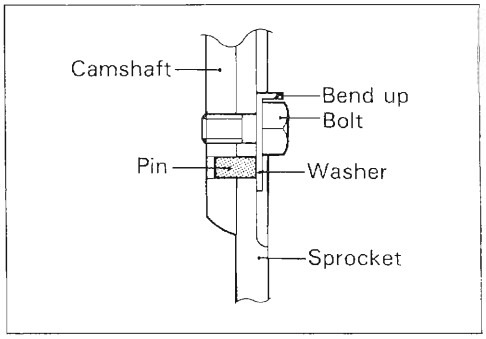
- Install the lock washer so that it is covering the locating pin.
- Apply THREAD LOCK SUPER "1303" to the bolts and tighten them to the specified torque.

Cam chain sprocket bolt: 15 N·m (1.5 kg-m, 11.0 lb-ft)

99000-32030: THREAD LOCK SUPER "1303"

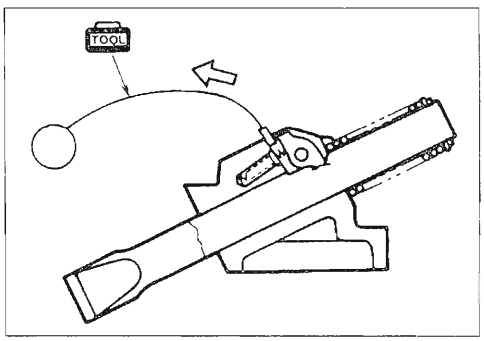
- Bend up the washer tongue positively to lock the bolts.



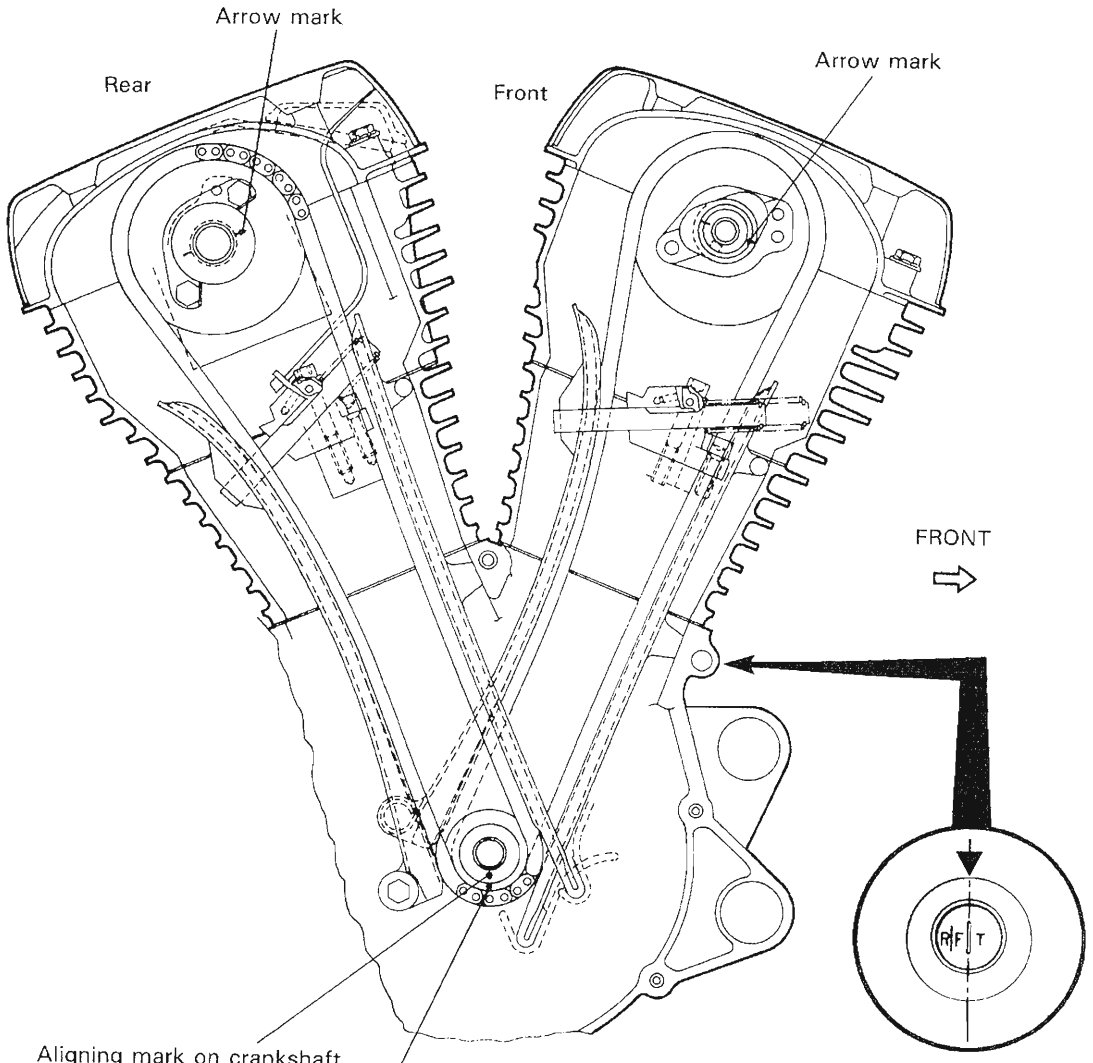


- Remove the cam chain tensioner locking tools.

NOTE:
Click sound is heard when the cam chain tensioner is released.

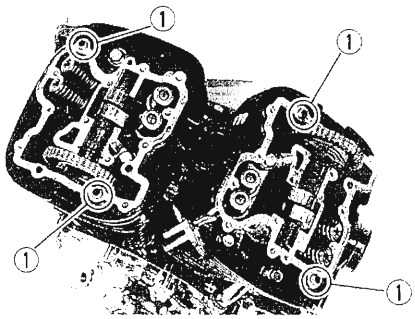


- Turn the crankshaft so that the No.1 (REAR) engine position is positioned at T.D.C.



CAMSHAFT TIMING
Turn the crankshaft so that the rear cylinder is positioned at T.D.C.

- Thoroughly wipe off oil from the mating surfaces of cylinder head and cover.
- Install the two dowel pins ① to the cylinder head side.
- Uniformly apply SUZUKI BOND "1216" to the cylinder head surfaces.

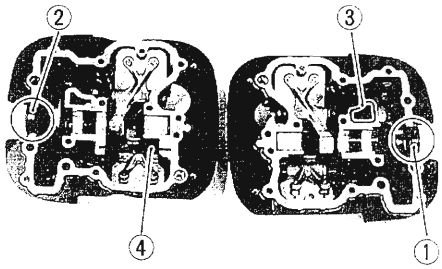


1216 99000-31160: SUZUKI BOND "1216"

NOTE:
Do not apply SUZUKI BOND "1216" to the camshaft journals.

- Install the caps ② to each cylinder head cover.
- Apply grease to the O-ring ③.

A 99000-25030: SUZUKI SUPER GREASE "A"

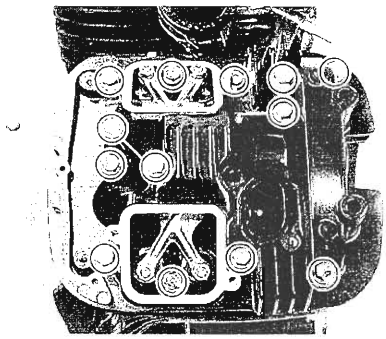


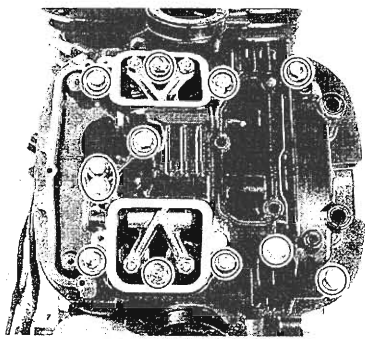
- Install the plate ④.

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

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

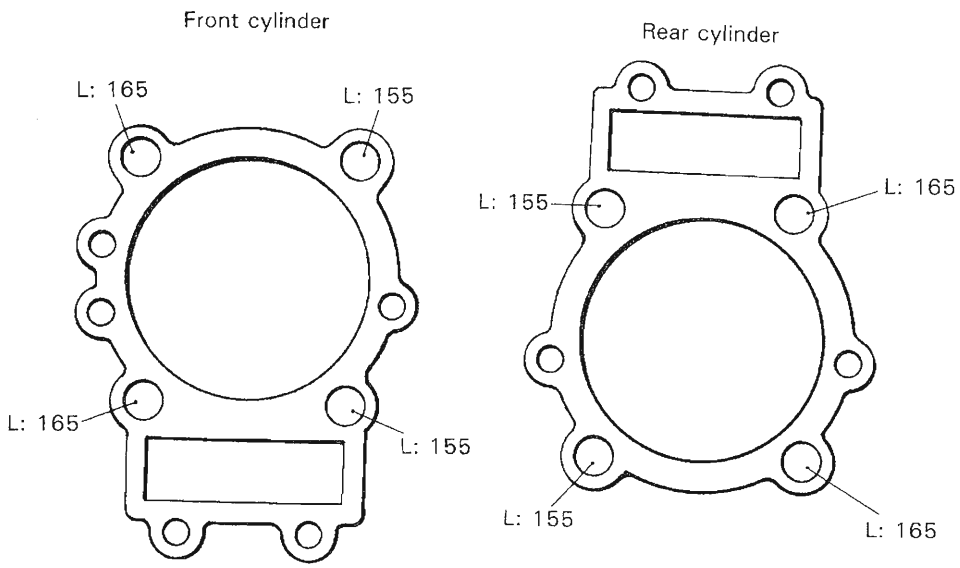
Cylinder head cover bolt:
(M6): 11 N·m (1.1 kg-m, 8.0 lb-ft)
(M8): 23 N·m (2.3 kg-m, 16.5 lb-ft)





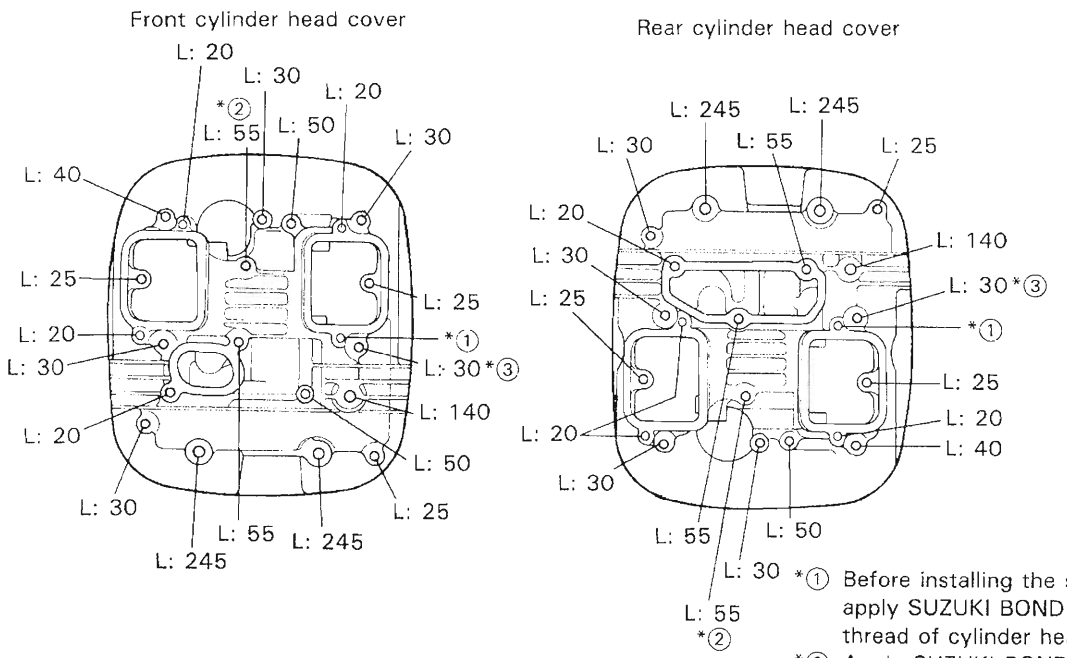
- Check and adjust the valve clearance. (Refer to page 2-4, -5 and -6 for procedures.)

LOCATION OF CYLINDER HEAD BOLT



L: Length
Unit: mm

LOCATION OF CYLINDER HEAD COVER BOLT

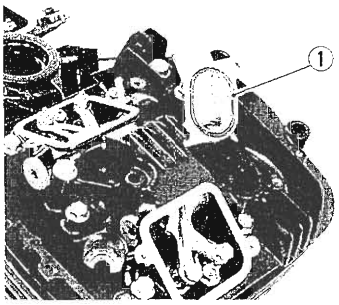


L: Length Unit: mm

*① Before installing the stud bolt, apply SUZUKI BOND "1216" to the thread of cylinder head cover side.
*② Apply SUZUKI BOND "1216" to the thread of bolt.
*③ Allen bolt

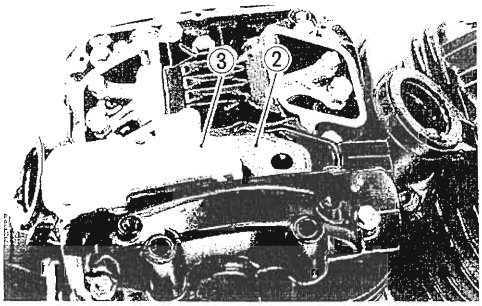
- Apply grease to the new O-ring ①.

99000-25030: SUZUKI SUPER GREASE "A"



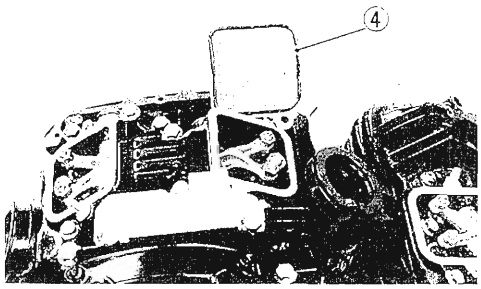
- Install the water outlet union to the No.2 (Front) cylinder head cover.

- Install the gasket ② and the breather cover ③ to the No.1 (Rear) cylinder head cover.



- Apply grease to the new O-rings ④.

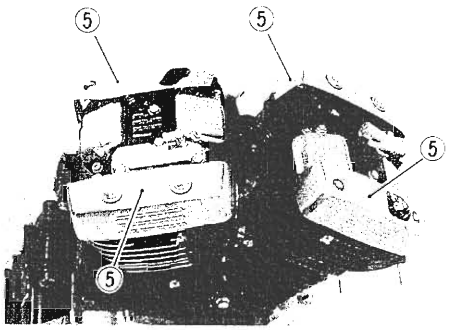
99000-25030: SUZUKI SUPER GREASE "A"



- Install the valve inspection caps.

- Install the generator cover plug and the timing inspection plug.

- Install the head cover caps ⑤.

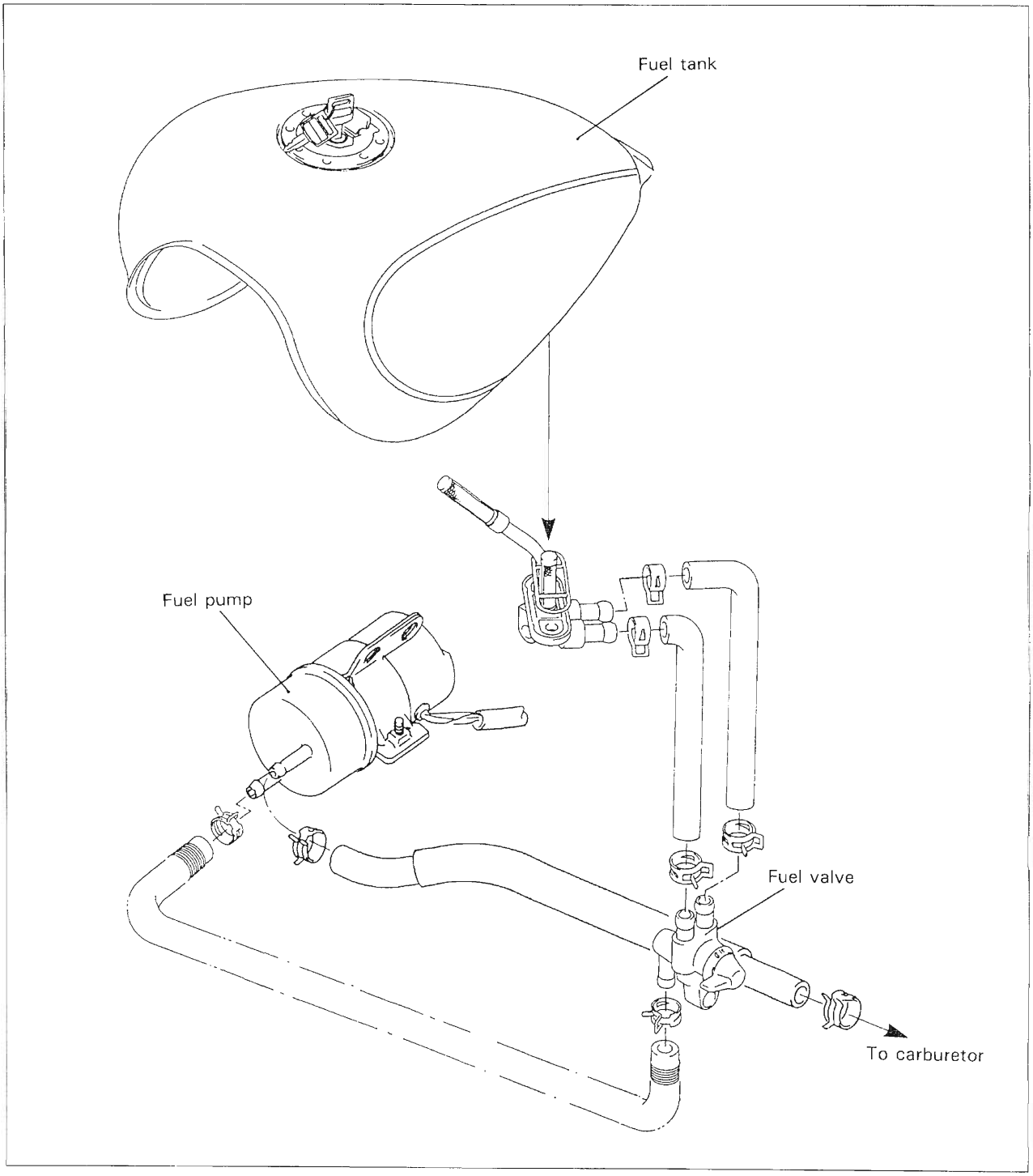


FUEL AND LUBRICATION SYSTEM

CONTENTS

FUEL SYSTEM

As shown in the following figure, the fuel system is composed of the fuel tank, fuel valve, fuel pump, and carburetors. The fuel pump is operated by an electro-magnetic force and its electrical energy is supplied from the battery. The fuel sent under pressure by the fuel pump flows into the float chamber when the float of the carburetor has dropped and the needle valve is open. When the needle valve closes, the pressure of the fuel in the hose connecting the carburetor and the fuel pump increases, and when the set pressure is reached, the operation of the fuel pump is stopped by the fuel pressure to prevent excessive supply.



FUEL PUMP

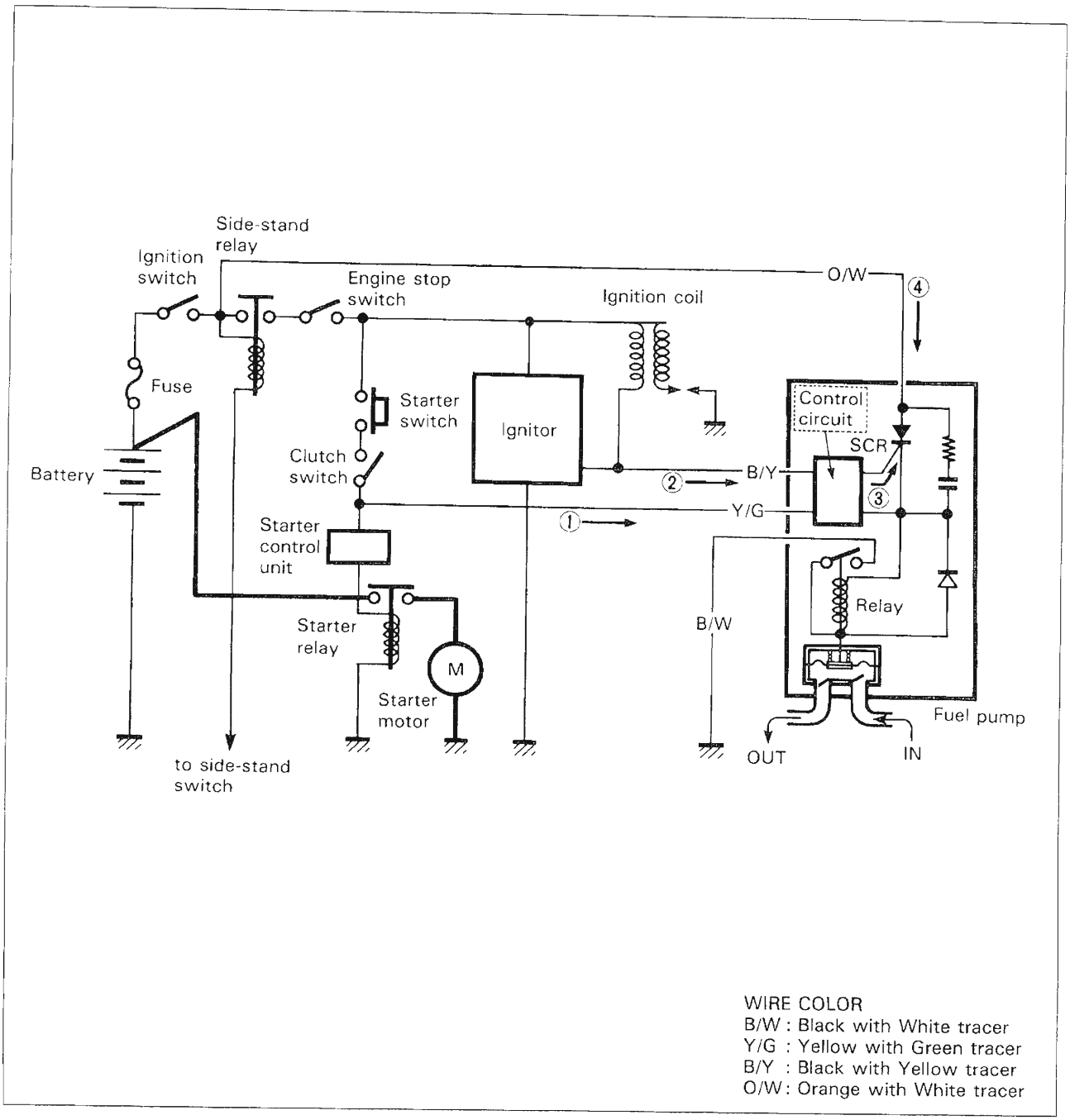
DESCRIPTION

Starting Engine:

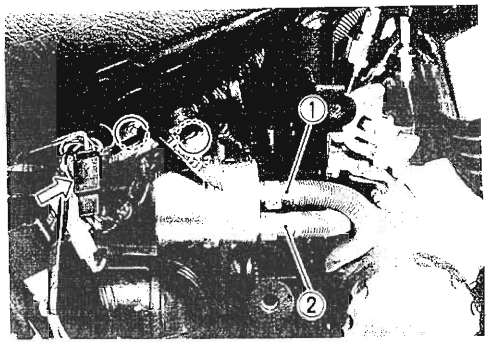
In order to supplement fuel supply when starting the engine by turning the starter switch ON, current ① is sent directly from the battery, thus operating the fuel pump.

After start:

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



FUEL PUMP REMOVAL



- Remove the right frame cover. (Refer to page 6-1.)
- Turn the fuel valve "OFF" position and disconnect the fuel hoses (① and ②) from the fuel pump.
- Disconnect the fuel pump lead wire coupler and remove the fuel pump mounting bolts.

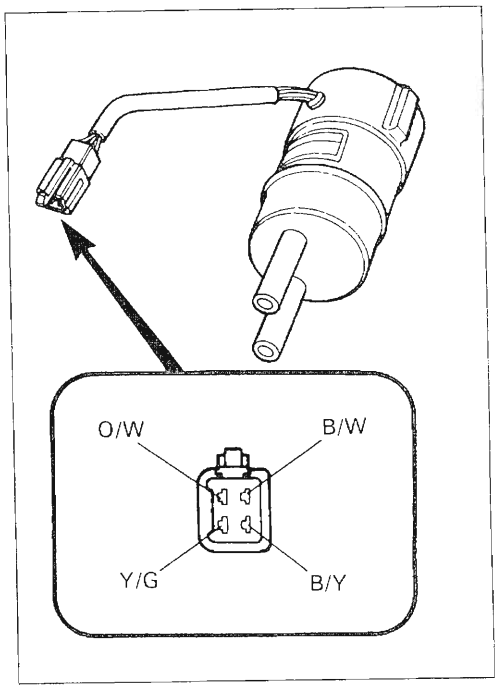
①: Outlet hose
②: Inlet hose

- Remove the fuel pump.

⚠ WARNING

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

FUEL PUMP INSPECTION



- Using the multi circuit tester, measure the voltage between the lead wires in the following table. If the voltage checked is incorrect, replace the fuel pump.

TOOL 09900-25008: Multi circuit set

Tester knob indication: Diode test (⊣◀)

NOTE:
When making above test, it is not necessary to remove the fuel pump.

(Unit: V)

⊖ Probe of tester to:	⊕ Probe of tester to: O/W	Y/G	B/W	B/Y
O/W		1.4—1.67	1.4—1.67	1.4—1.67
Y/G	1.4—1.67		0.94—1.34	1.4—1.67
B/W	1.4—1.67	0.94—1.34		1.4—1.67
B/Y	1.4—1.67	1.18—1.50	1.13—1.50	

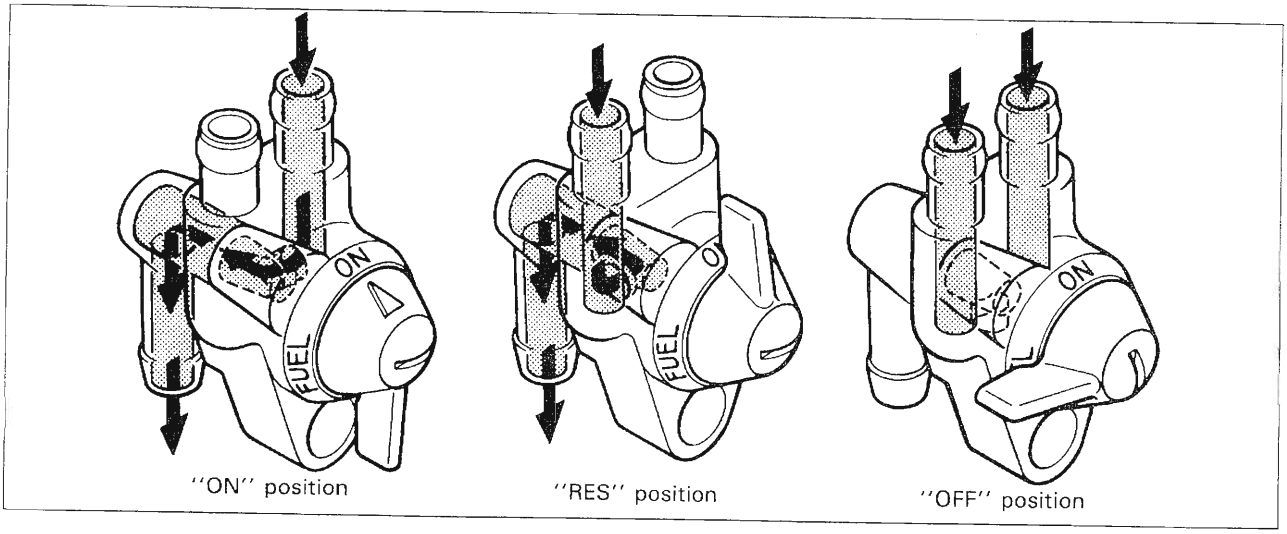
NOTE:
If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

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

FUEL TANK AND FUEL VALVE

FUEL VALVE MECHANISM

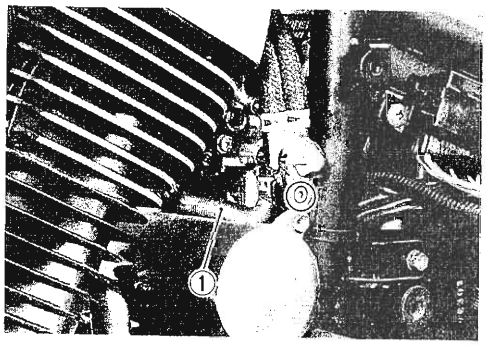
A valve is provided at the top of the fuel valve lever and can switch over to "OFF", "ON" and "RES". With the valve "ON" (normal), the main passage opens. With the valve "OFF", both holes close.



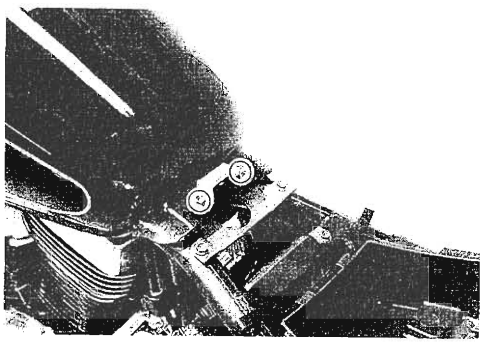
"ON" position "RES" position "OFF" position

FUEL TANK REMOVAL

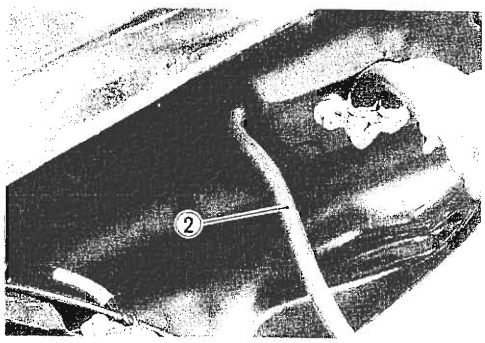
- Remove the frame cover and seat. (Refer to page 6-1.)
- Turn the fuel valve to "OFF" position.
- Remove the fuel valve mounting bolt.
- Disconnect the fuel valve outlet hose ①.



- Remove the fuel tank mounting bolt.



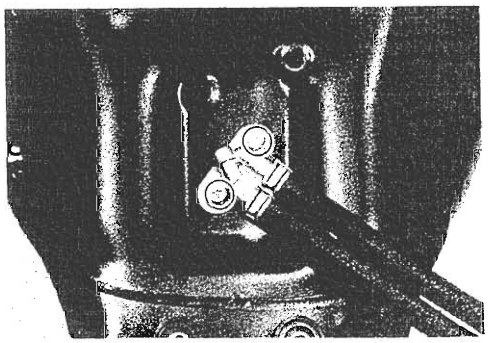
- Disconnect the fuel tank drain hose ②.
- Remove the fuel tank.



⚠ WARNING

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

FUEL FILTER REMOVAL

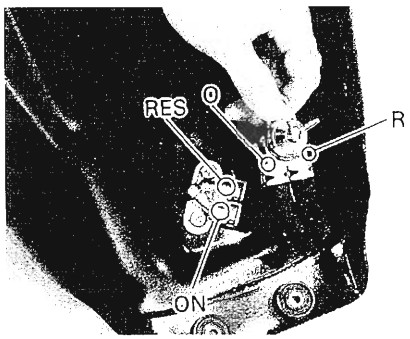


- Remove the fuel filter by removing the bolts.

⚠ WARNING

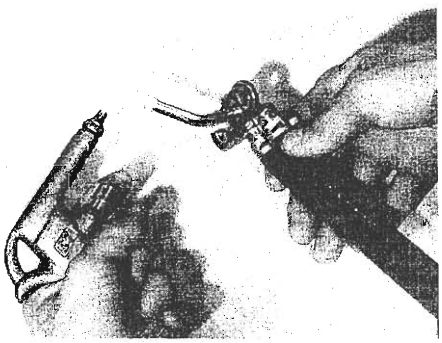
Gasoline is highly flammable and explosive. Keep heat, spark and flame away.
Gaskets and O-ring must be replaced with new ones to prevent fuel leakage.

NOTE:
When installing the fuel valve and the filter, connect the fuel hoses "R" to "RES" and "O" to "ON".



INSPECTION AND CLEANING

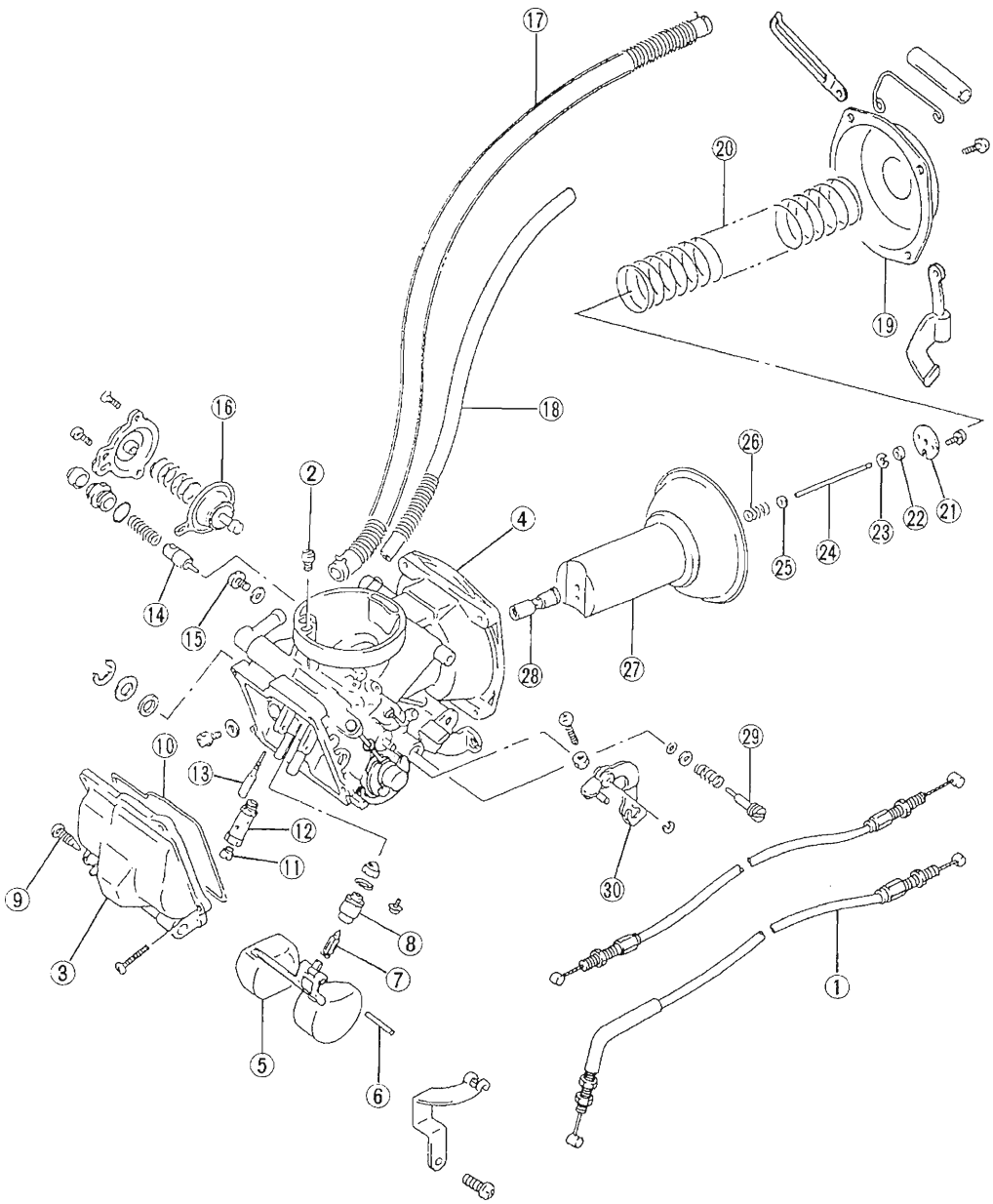
If the fuel filter is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel filter with compressed air.



CARBURETOR

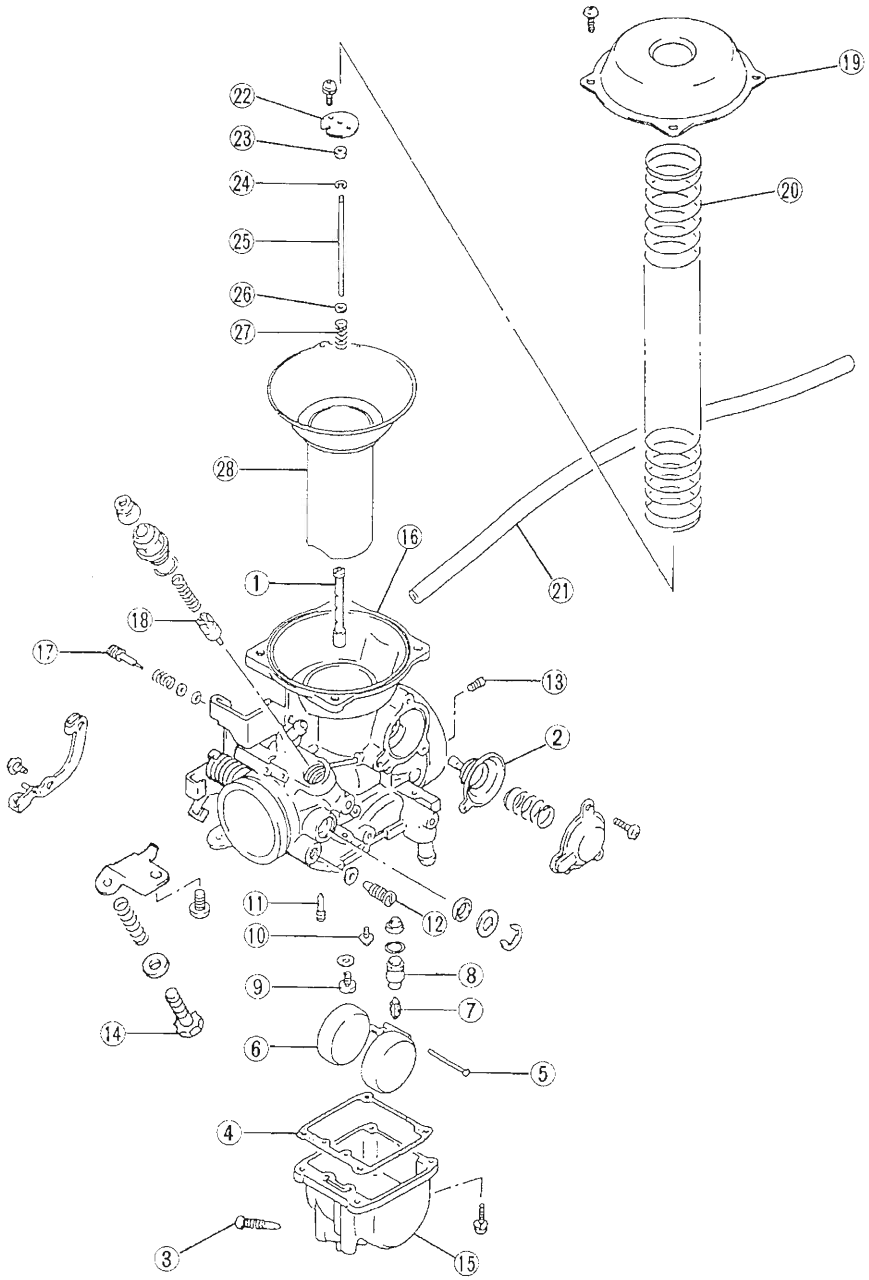
CONSTRUCTION

No.2 (FRONT) CARBURETOR



① Throttle cable
② Pilot air jet
③ Float chamber
④ Carburetor body
⑤ Float
⑥ Float pin
⑦ Needle valve
⑧ Valve seat
⑨ Drain screw
⑩ Seal ring
⑪ Main jet
⑫ Main jet holder
⑬ Pilot jet
⑭ Starter plunger
⑮ Vacuume inspection screw
⑯ Coasting valve
⑰ Fuel hose
⑱ Air vent hose
⑲ Top cap
⑳ Piston valve spring
㉑ Jet needle stopper plate
㉒ Spacer
㉓ E-ring
㉔ Jet needle
㉕ Washer
㉖ Spring
㉗ Piston valve
㉘ Needle jet
㉙ Pilot screw
㉚ Lever

No.1 (REAR) CARBURETOR



① Needle jet
② Coasting valve
③ Drain screw
④ Gasket
⑤ Float pin
⑥ Float
⑦ Needle valve
⑧ Valve seat
⑨ Main jet
⑩ Needle valve seat stopper screw
⑪ Pilot jet
⑫ Vacuum inspection screw
⑬ Pilot air jet
⑭ Throttle stop screw
⑮ Float chamber
⑯ Carburetor body
⑰ Pilot screw
⑱ Starter plunger
⑲ Top cap
⑳ Piston valve spring
㉑ Air vent hose
㉒ Jet needle stopper plate
㉓ Spacer
㉔ E-ring
㉕ Jet needle
㉖ Washer
㉗ Spring
㉘ Piston valve

SPECIFICATION

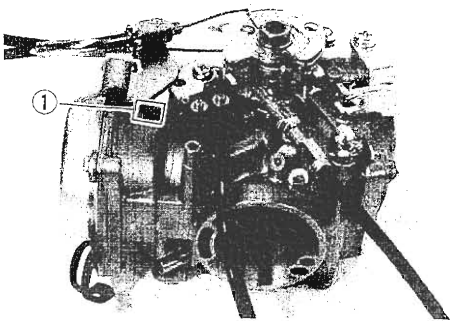
ITEM		SPECIFICATION			
		E-02,04,17,22,24,25,34		E-18	
Carburetor type		BS36SS (Rear)	BDS36SS (Front)	BS36SS (Rear)	BDS36SS (Front)
Bore size		36 mm	←	←	←
I.D. No.		48E6	←	48E9	←
Idle r/min.		1 200 ± 100 r/min	←	1 200 $^{+100}_{-50}$ r/min	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)	7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)	27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-3	5D27-3	5C29-2
Needle jet	(N.J.)	P-3	P-4	P-3	P-4
Throttle valve	(Th.V.)	#115	←	←	←
Pilot jet	(P.J.)	#45	#40	←	←
Pilot screw	(P.S.)	PRE-SET (1 5/8 turns back)	PRE-SET (1 3/4 turns back)	PRE-SET (2 1/4 turns back)	PRE-SET (1 3/4 turns back)
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←	←	←

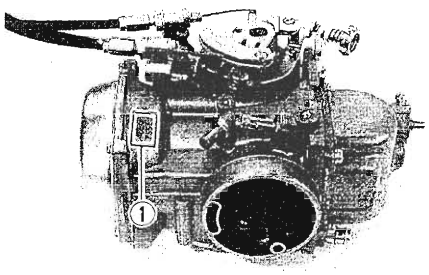
ITEM		SPECIFICATION			
		E-03,28		E-33	
Carburetor type		BS36SS (Rear)	BDS36SS (Front)	BS36SS (Rear)	BDS36SS (Front)
Bore size		36 mm	←	←	←
I.D. No.		48E7	←	48EB	←
Idle r/min.		1200 ± 100 r/min	←	←	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)	7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)	27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90	#100	#90
Jet needle	(J.N.)	5D83	5C43	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←	←	←
Pilot jet	(P.J.)	#45	#40	#45	#40
Pilot screw	(P.S.)	PRE-SET	PRE-SET	PRE-SET	PRE-SET
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←	←	←

ITEM		SPECIFICATION	
		E-37	
Carburetor type		BS36SS (Rear)	BDS36SS (Front)
Bore size		36 mm	←
I.D. No.		48EC	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-3
Needle jet	(N.J.)	P-3	P-4
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	PRE-SET (1⅝ turns back)	PRE-SET (1¾ 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 stamped on the carburetor body according to its specifications.

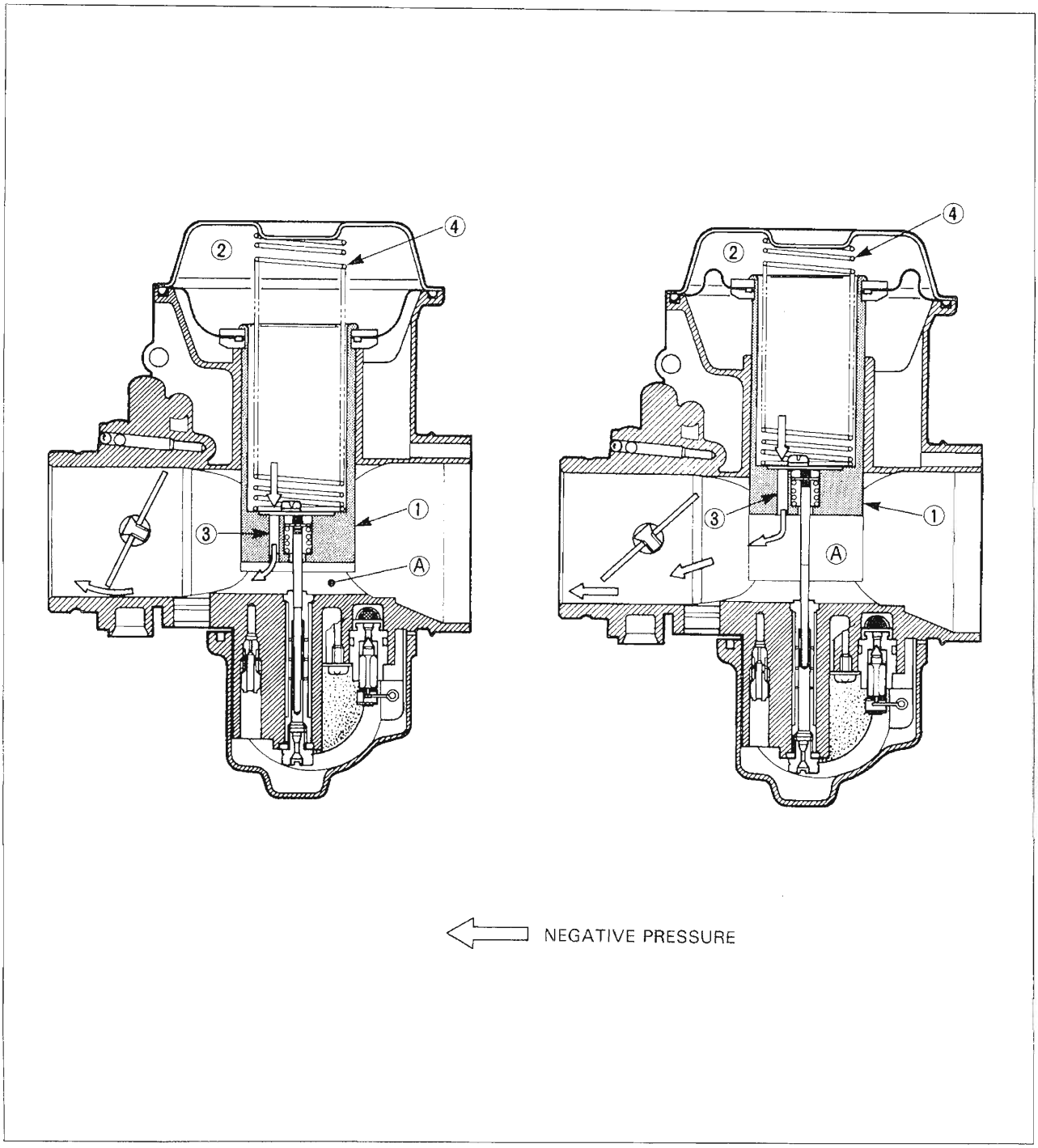




DIAPHRAGM AND PISTON OPERATION

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

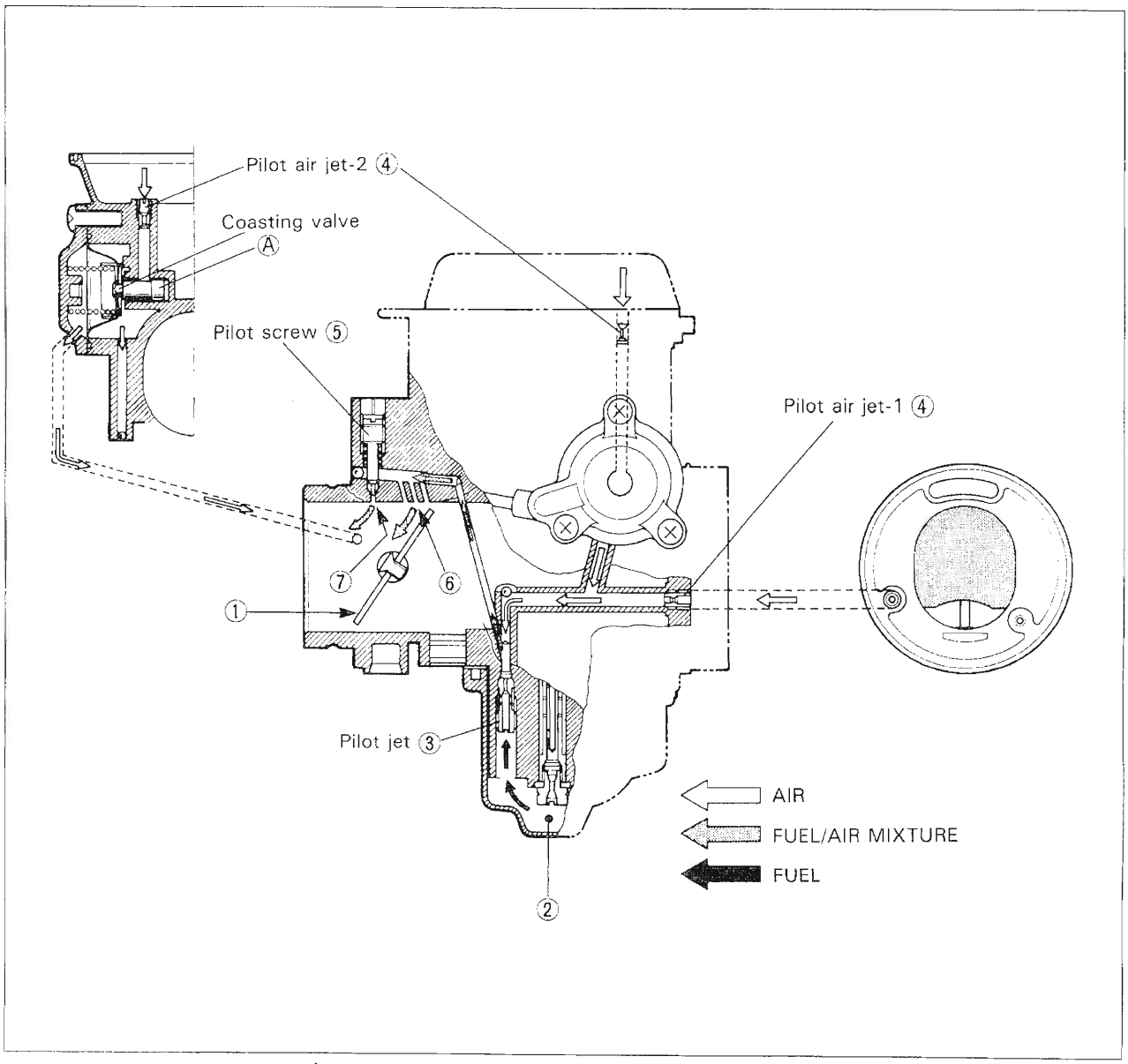


SLOW SYSTEM

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 jets (#1 and #2) 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 by-pass ports ⑥. The remainder is then metered by pilot screw ⑤ and sprayed out into the main bore through pilot outlet ⑦.

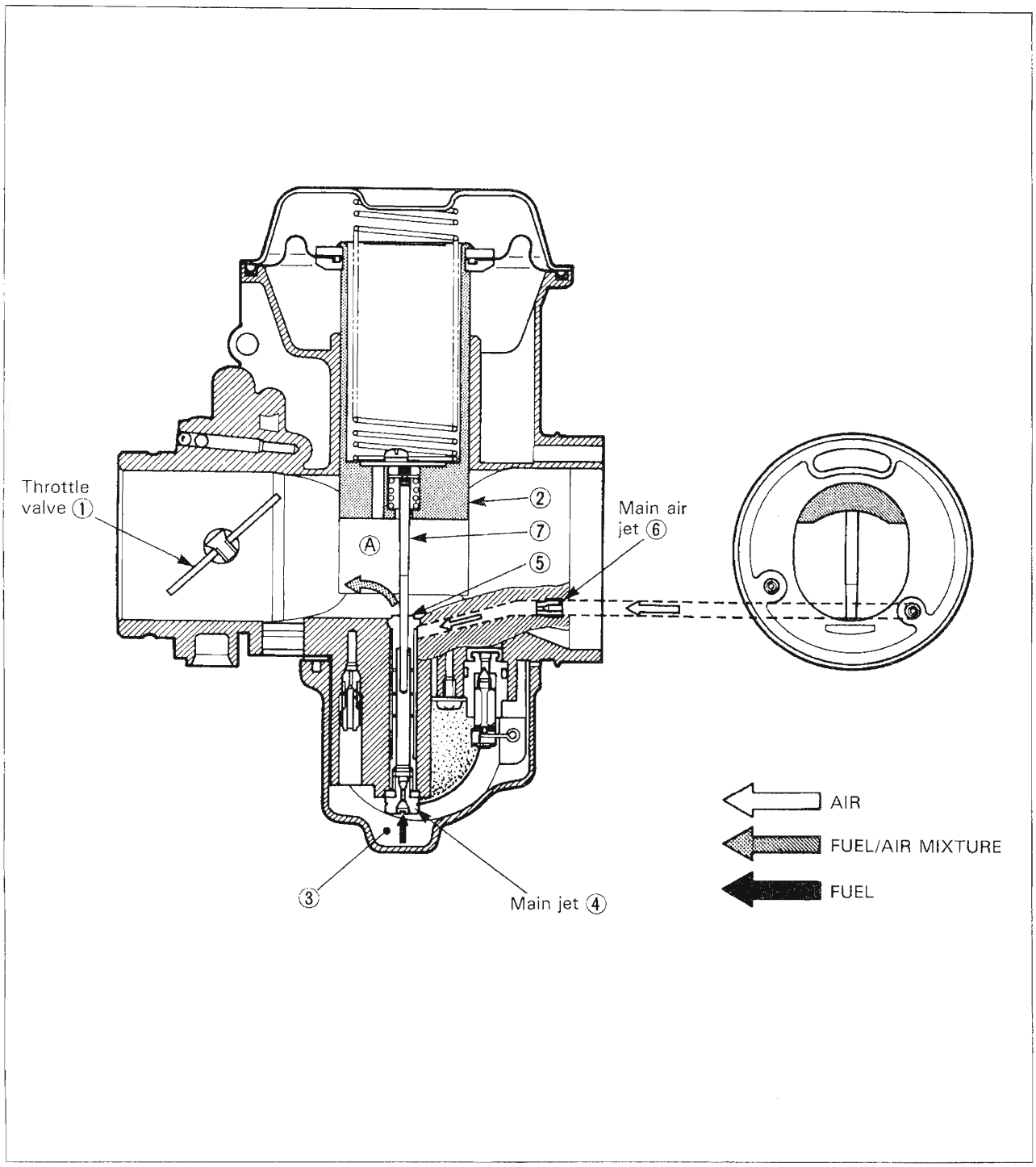
TRANSIENT ENRICHMENT SYSTEM

The transient enrichment system is a device which keeps fuel/air mixture ratio constant in order not to generate unstable combustion when the throttle grip is returned suddenly during high speed driving. For normal operation, joining of the air from upper part of carburetor inlet side to pilot air passage obtains proper fuel/air mixture ratio. But if the throttle valve is suddenly closed, a large negative pressure generated on cylinder side is applied to a diaphragm. The valve Ⓐ which interlocks with the diaphragm closes an air passage, thus, the pressure flows out to the pilot air passage.
This is system to keep the combustion condition constant by varying the fuel/air mixture ratio by controling air flow in the pilot circuit.



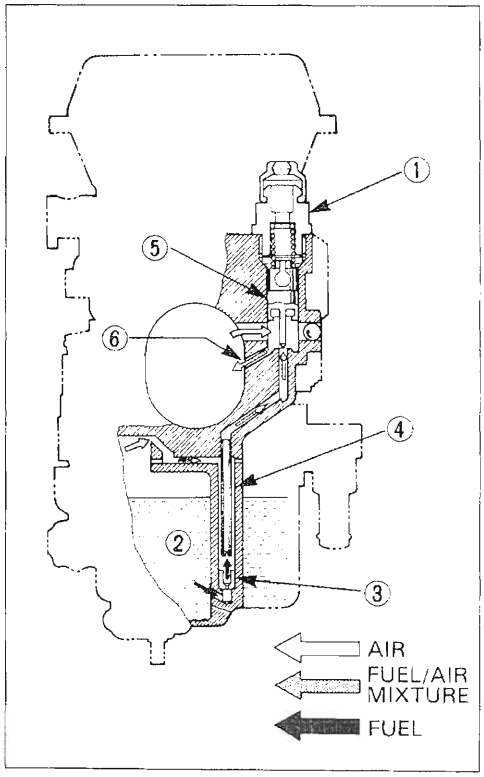
MAIN SYSTEM

As throttle valve ① is opened, engine speed rises, and this increases negative pressure in the venturi Ⓐ. Consequently the piston valve ② moves upward.
Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel enters needle jet ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion.
The emulsified fuel then passes through the clearance between needle jet ⑤ and jet needle ⑦, and is discharged into the venturi Ⓐ, in which it meets main air stream being drawn by the engine.
Mixture proportioning is accomplished in needle jet ⑤; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.



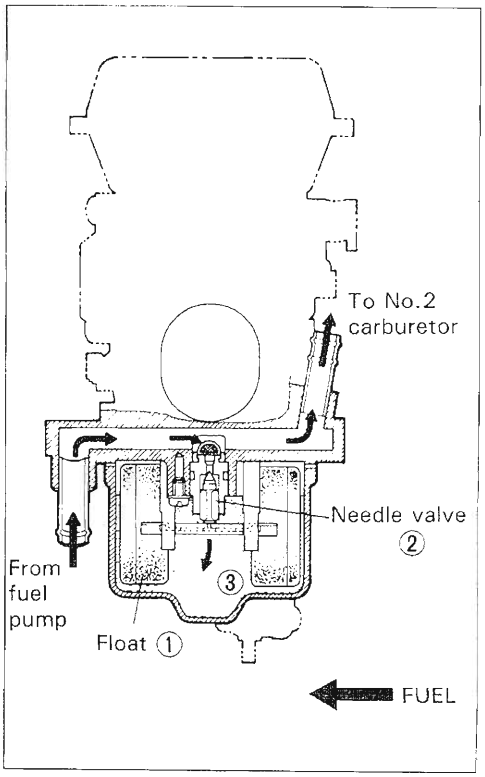
STARTER SYSTEM

Pulling up the starter shaft ① , fuel is drawn into the starter circuit from the float chamber ② .
Starter jet ③ meters this fuel, which then flows into starter pipe ④ and mixes with the air coming from the float chamber ② . The mixture, rich in fuel content, reaches starter plunger ⑤ and mixes again with the air coming through a passage extending from main bore.
The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet ⑥ into the main bore.



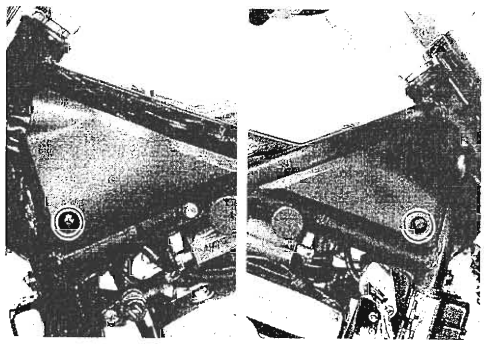
FLOAT SYSTEM

Floats ① and needle valve ② are associated with the same mechanism, so that, as the floats ① move up and down, the needle valve ② too moves likewise.
When fuel level is up in float chamber ③ , floats ① are up and needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters the float chamber ③ .
As the fuel level falls, floats ① go down and needle valve ② unseats itself to admit fuel into the chamber ③ .
In this manner, needle valve ② admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber ③ .

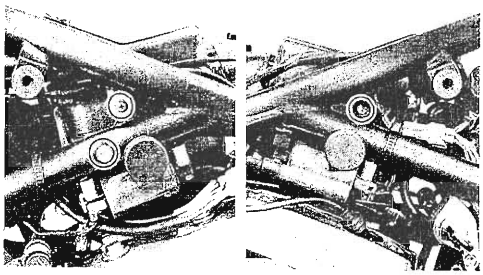


REMOVAL

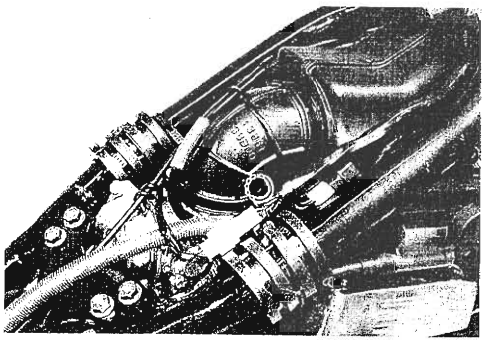
- Remove the seat. (Refer to page 6-1.)
- Remove the frame cover, left and right.
- Remove the fuel tank. (Refer to page 4-4.)
- Remove the frame head cover, left and right.



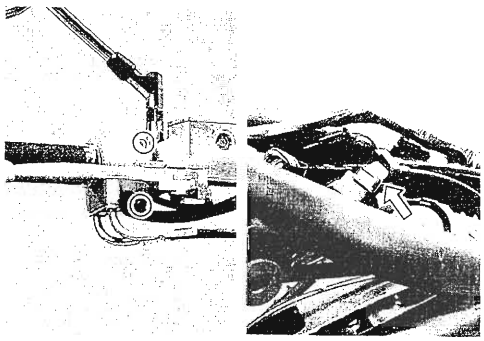
- Remove the throttle cable connector mounting screw.
- Remove the No.2 (Front) air cleaner box mounting bolts.



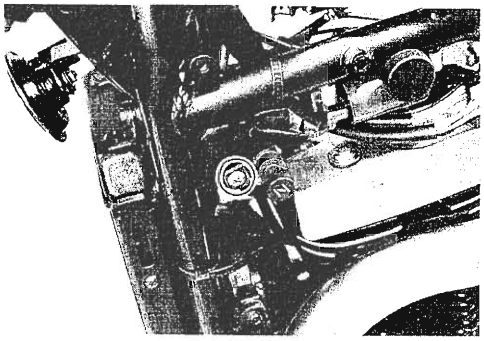
- Loosen the carburetor clamp screw.
- Remove the No.2 (Front) air cleaner box.



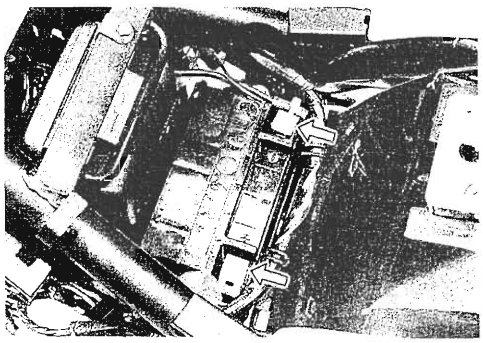
- Separate the right handlebar switch and disconnect the throttle cable.
- Separate the throttle cable connector and disconnect the throttle cables.



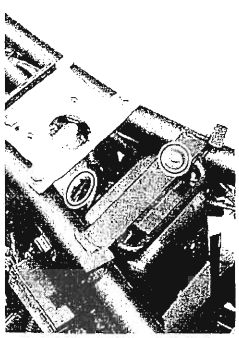
- Remove the choke knob mounting bolt.

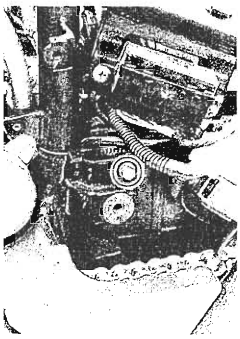


- Remove the munual box.
- Remove the battery.

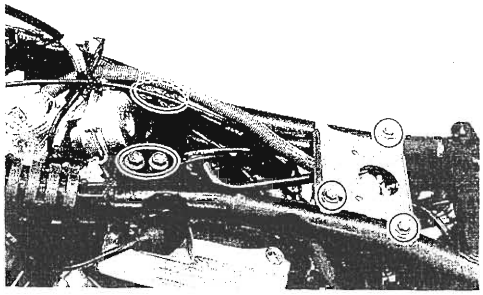


- Loosen the clamp screw.
- Remove the No.1 (Rear) air cleaner box mounting bolts and move the air cleaner box to the rear.

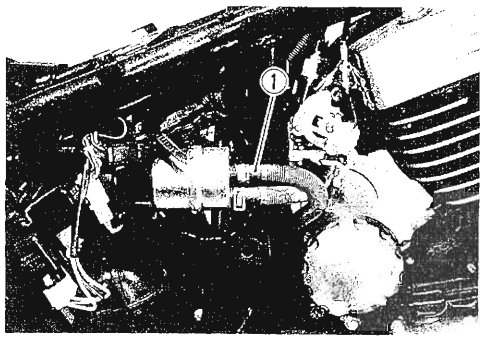




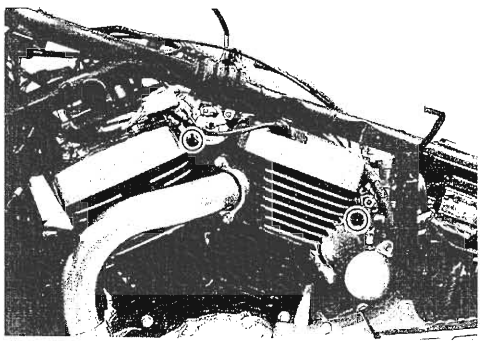
- Remove the frame struct plate and fuel tank mounting bracket.



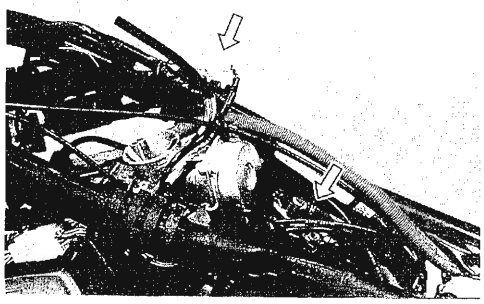
- Disconnect the fuel hose ① from the fuel pump.



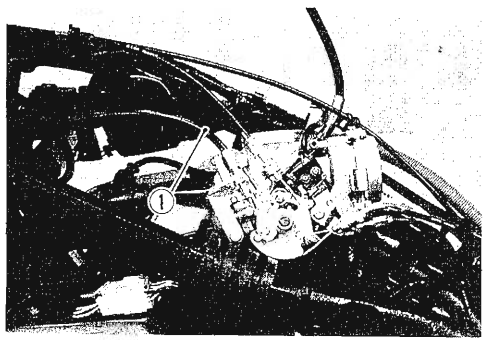
- Loosen the carburetor clamp screws, left and right.



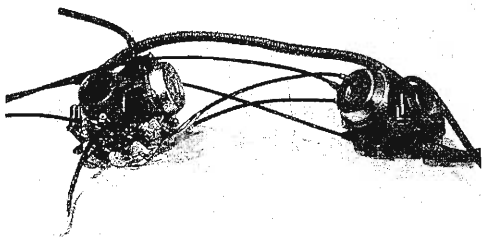
- Disconnect the coupler.
- Disconnect the breather hose from the No.1 (Rear) cylinder head.

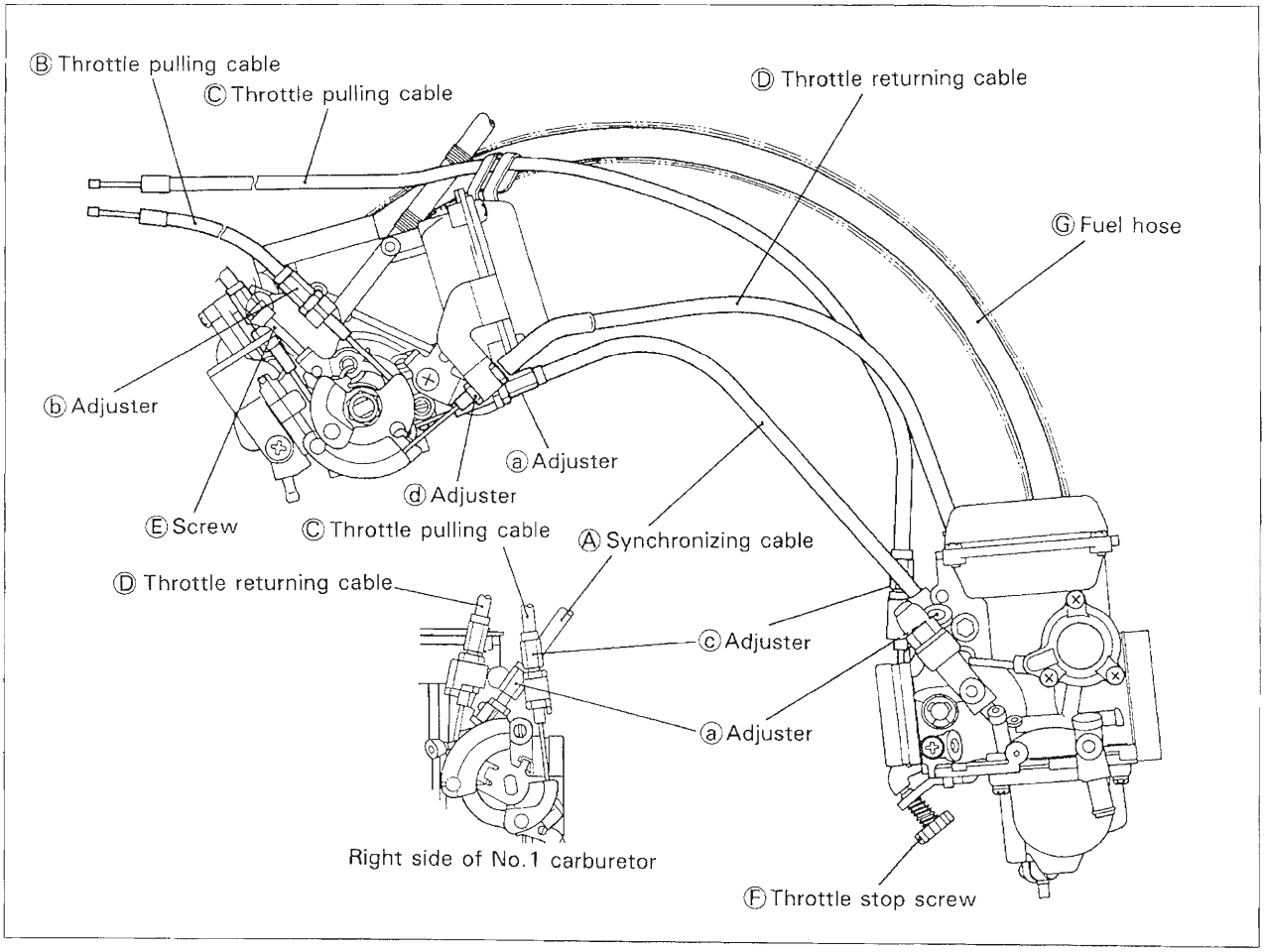


- Remove the throttle returning cable ① from the No.2 (Front) carburetor.



- Remove the No.1 and No.2 carburetors along with the synchronizing cable, throttle cables, air vent hoses and fuel hose attached to the carburetors.





NOTE:
Do not turn the synchronizing cable adjuster ⓐ.
Once removing the synchronizing cable or a carburetor body, it is necessary to balance the two carburetors.

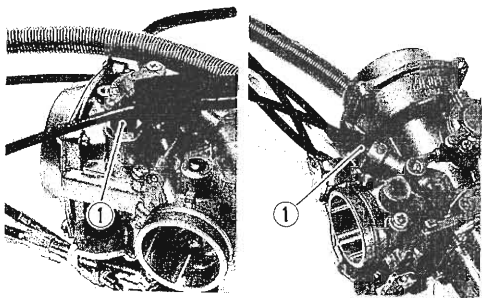
⚠ CAUTION

Do not turn the screw Ⓔ of the No.2 (Front) carburetor.

DISASSEMBLY

Before disassembly, prepare a clean and well lit work place where carburetor components can be laid out nearly 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 starter plunger assemblies ① from the No.1 and No.2 carburetors.

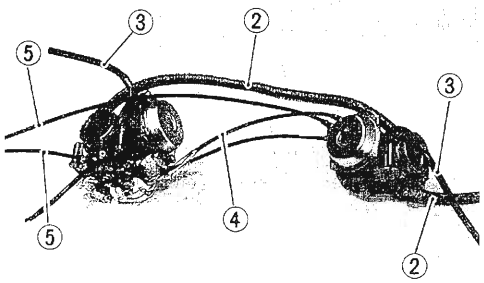


- Remove the fuel hoses ②, air vent hoses ③, throttle returning cable ④ and throttle pulling cables ⑤.

⚠ CAUTION

Do not turn the screw Ⓔ of the No.2 (Front) carburetor.

NOTE:
Once removing the synchronizing cable or carburetor body, it is necessary to balance the two carburetors.

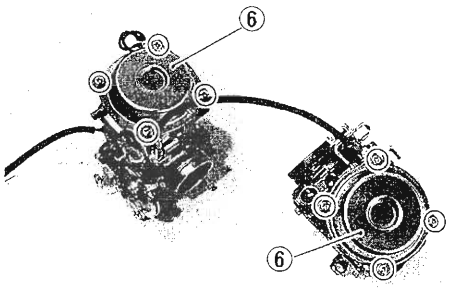


- Remove the carburetor top cap ⑥.

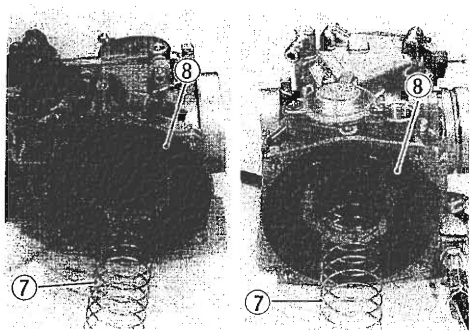
TOOL 09900-09003: Impact driver set

⚠ CAUTION

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

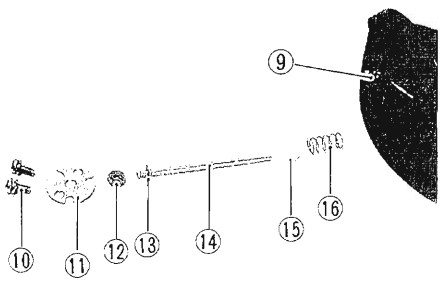


- Remove the piston valve return spring ⑦ and piston valve with diaphragm ⑧.



- Remove the jet needle from the piston valve by removing the screws.

⑨ Piston valve
⑩ Screw
⑪ Jet needle stopper plate
⑫ Spacer
⑬ E-ring
⑭ Jet needle
⑮ Washer
⑯ Spring

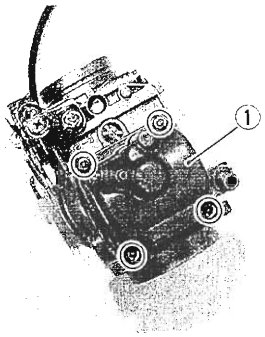


- Remove the float chamber body ①.

TOOL 09900-09003: Impact driver set

⚠ CAUTION

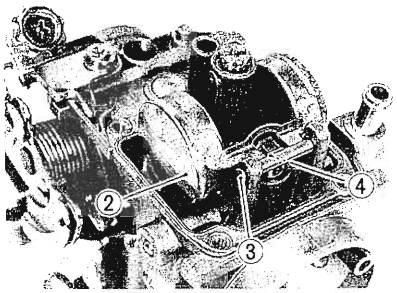
Gasket and O-ring must be replaced with new ones to prevent fuel leakage.



- Remove the float ② with the needle valve ④ by remaining the float pin ③.

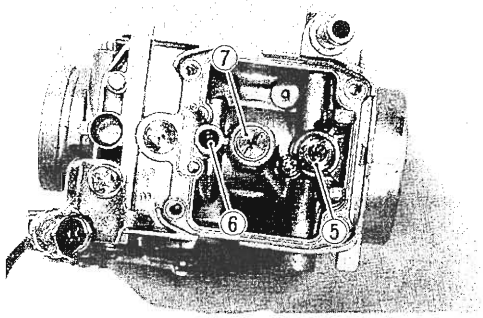
⚠ CAUTION

Do not use a wire for cleaning the valve seat.



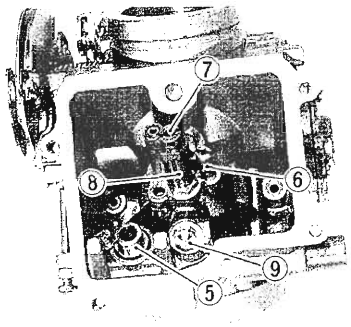
- Remove the following parts.

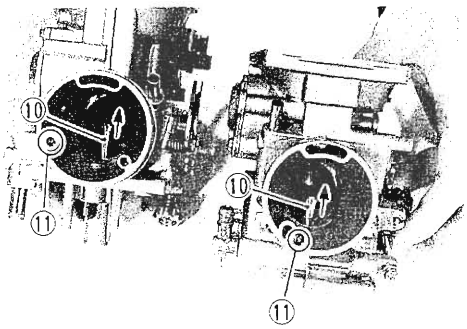
⑤ Valve seat
⑥ Pilot jet
⑦ Main jet
⑧ Main jet holder
⑨ Needle jet securing bolt
⑩ Needle jet
⑪ Pilot air jet



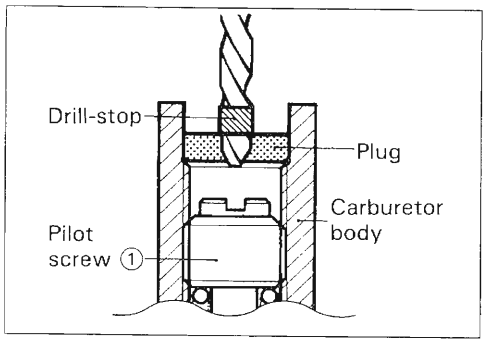
⚠ CAUTION

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





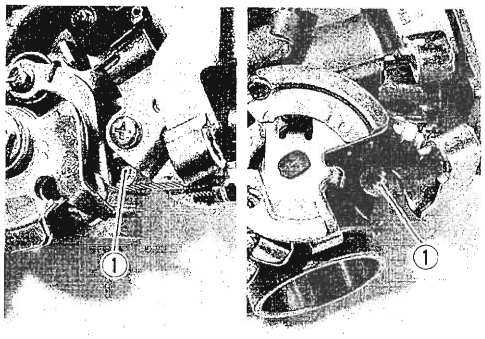
- Use a 1/8'' size drill bit with a drill-stop to remove the pilot screw plug. Set the drill-stop 6 mm from the end of the bit to prevent drilling into the pilot screw. Carefully drill through the plug.
  Thread a self-tapping sheet metal screw into the plug. Pull on the screw head with pliers to remove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



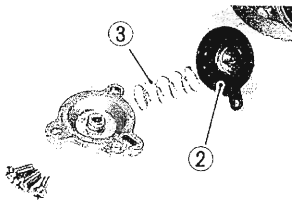
⚠ CAUTION

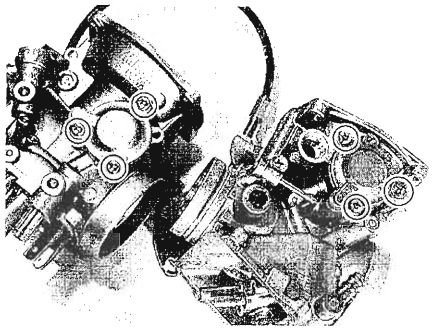
Replace the plug with a new one.

- Slowly turn the pilot screw ① 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 ① with the spring, washer and O-ring.



- Remove the coasting valve ② and spring ③ by removing the screws.

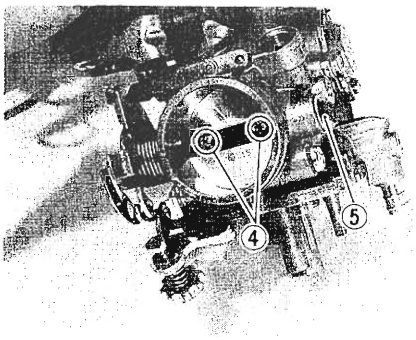




- Remove the throttle valve screws ④, E-ring ⑤ and pull out throttle valve plate.

⚠ CAUTION

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

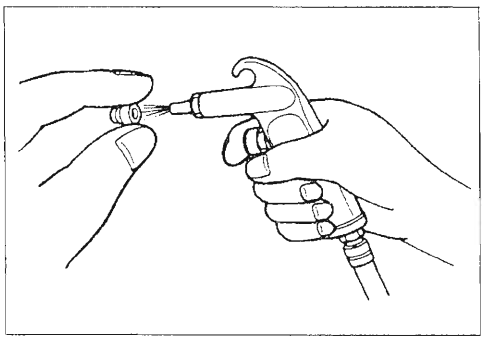


CARBURETOR CLEANING

⚠ 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 strage.

- 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.



⚠ 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.

- Reassemble the carburetor with new seals and gaskets.

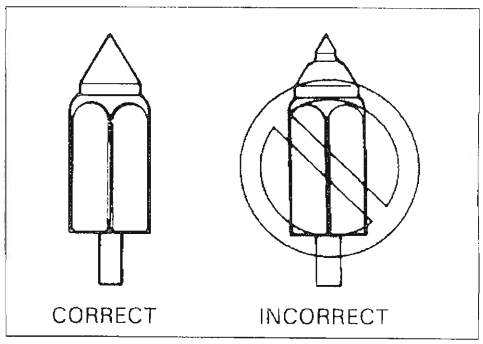
INSPECTION

Check following items for any damage or clogging.

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

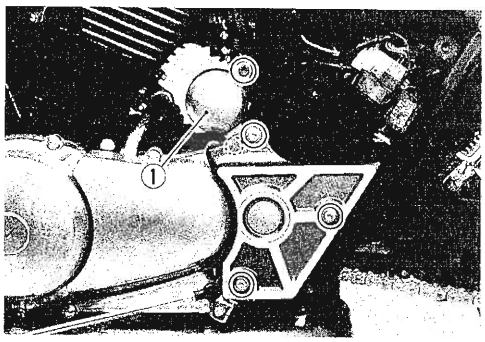
NEEDLE VALVE INSPECTION

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.

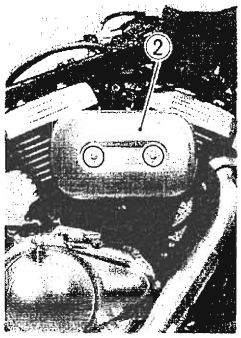


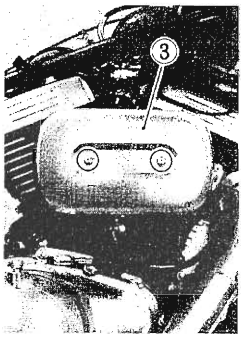
FUEL LEVEL INSPECTION

- Remove the frame cover and seat. (Refer to page 6-1.)
- Remove the fuel tank. (Refer to page 4-4.)
- Remove the engine sprocket cover and tool case ①.



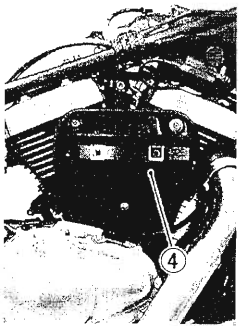
- Remove the box cover ②
- Remove the PAIR cover ③. (For E-03, 18, 28, 33)

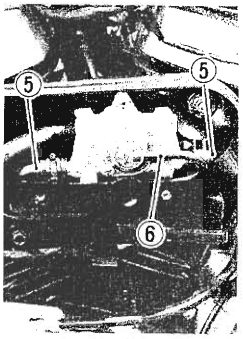




(For E-03,18,28,33)

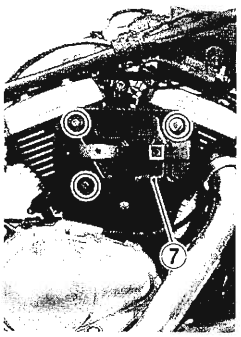
- Remove the box ④.
- Disconnect the PAIR reed valve hoses ⑤ and PAIR control valve vacuum hose ⑥. (For E-03, 18, 28, 33)

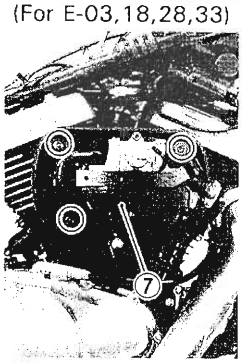




(For E-03,18,28,33)

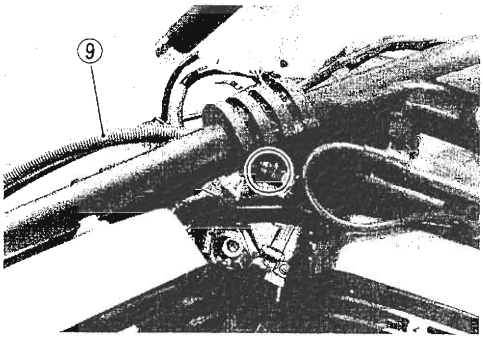
- Remove the bracket ⑦.
- Remove the PAIR system bracket ⑧. (For E-03, 18, 28, 33)





(For E-03,18,28,33)

- Disconnect the fuel hose ⑨ and connect a separate fuel tank to supply fuel.

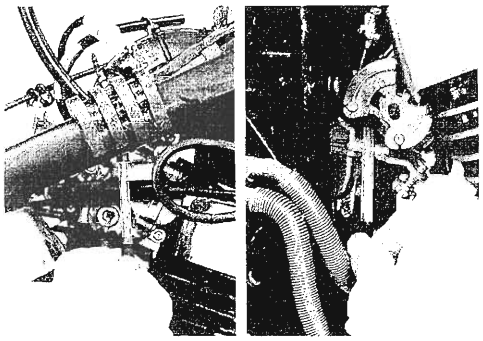


- Connect the fuel level gauge to the one of two carburetor drain nipples.

TOOL **09913-10730: 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.

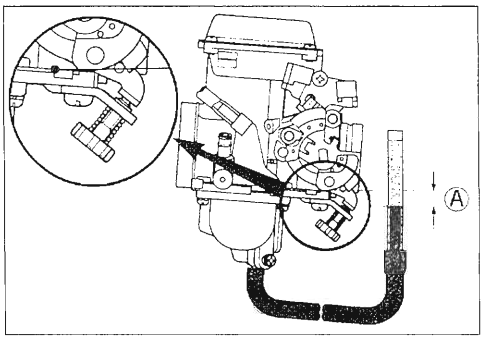


- Loosen the drain screw.

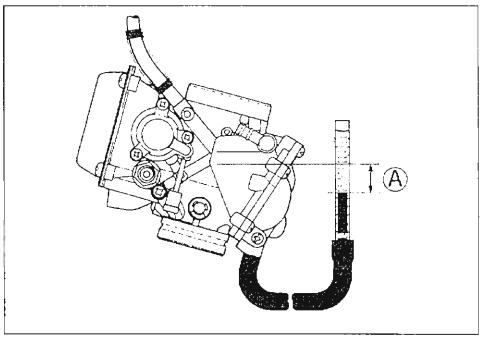
⚠ WARNING

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

- Bleed the air trapped in the fuel level gauge completely.
- While keeping the fuel level gauge vertically, measure the fuel level Ⓐ at the carburetor body as shown in the right illustrations.



No.1 (Rear) Carburetor



No.2 (Front) Carburetor

NOTE:
Move the fuel level gauge downward only when setting its scale at the carburetor body.
If moving the fuel level gauge upward, the fuel level Ⓐ rises from correct level.

Fuel level Ⓐ (No.1): 7.3±0.5 mm (0.29±0.02 in)
(No.2): 15.0±0.5 mm (0.59±0.02 in)

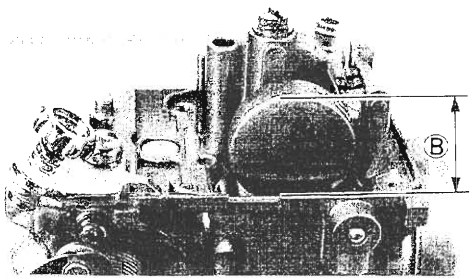
- Adjust the fuel level Ⓐ as necessary to bring the fuel height Ⓑ to the specified below.

FLOAT HEIGHT ADJUSTMENT

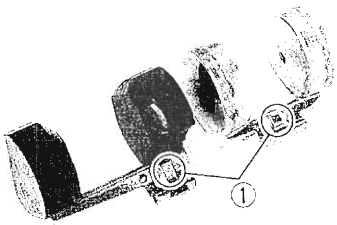
- To check the float height, invert the carburetor body, with the float arm kept free, measure the height Ⓑ while float arm is just in contact with needle valve by using calipers.
- Bend the tongue ① of the float arm as necessary to bring the height Ⓑ to the specified value.

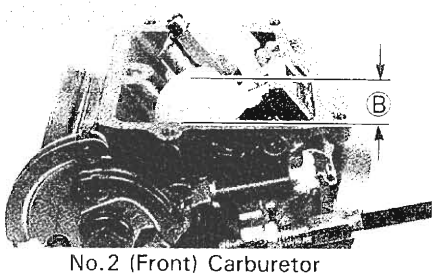
Float height Ⓑ (No.1): 27.7±1.0 mm (1.09±0.04 in)
(No.2): 9.1±1.0 mm (0.36±0.04 in)

TOOL **09900-20101: Vernier calipers**



No.1 (Rear) Carburetor





No.2 (Front) Carburetor

THROTTLE POSITION SWITCH INSPECTION (Except for E-03, 28, 33 models)

- Inspect the throttle position switch for continuity with a tester.

NOTE:
When making above test, it is not necessary to start the engine.

Colar / Position	B	B
ON (Full-throttle)	○	○
OFF		

B: Black

REASSEMBLY AND REMOUNTING

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

THROTTLE VALVE

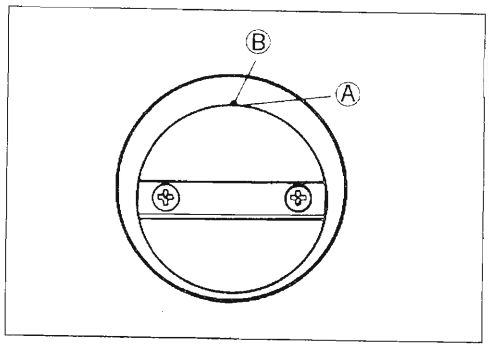
- Set each throttle valve in such a way that its top end Ⓐ meets the foremost by-pass Ⓑ. This is accomplished by turning the throttle stop screw and throttle valve balance screw.
- Apply a small quantity of THREAD LOCK "1342" to the throttle valve mounting screws and tighten it to the specified torque.

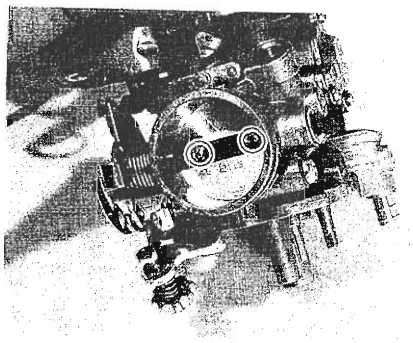
99000-32050: THEAD LOCK "1342"

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.

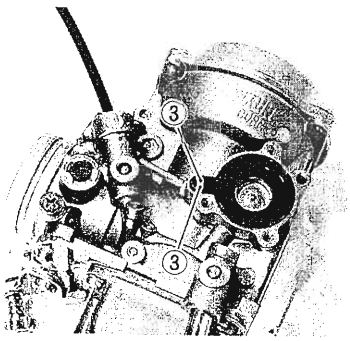




COASTING VALVE

- When installing the coasting valve to the body, align the holes ③.
- Tighten the coasting valve cover mounting screws to the specified torque.

Coasting valve cover mounting screw: 2.0 N·m (0.2 kg-m, 1.5 lb-ft)

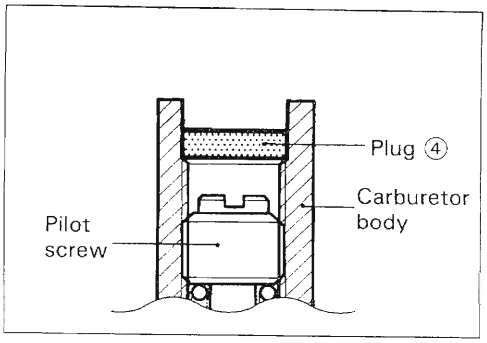


PILOT SCREW

- After cleaning, reinstall the pilot screw 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 ④ by tapping it into place with a punch. (For E-03, 18, 28 and 33 models)

⚠ CAUTION

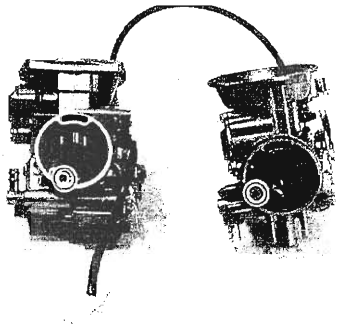
Replace the O-ring with a new one.



PILOT AIR JET

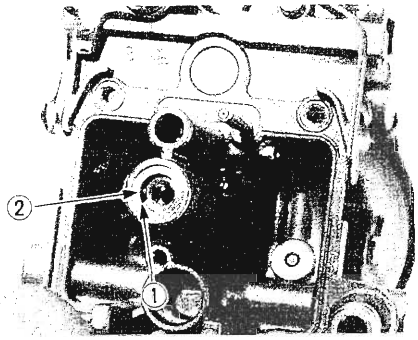
- Tighten the pilot air jet to the specified torque.

Pilot air jet: 0.7 N·m (0.07 kg-m, 0.5 lb-ft)

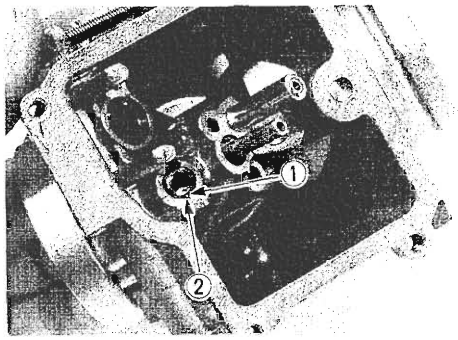


NEEDLE JET

- Align the grooves ① of the needle jet with the pin ② and then install the main jet.



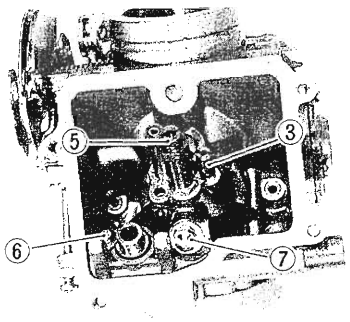
- Align the grooves ① of the needle jet with the pin ② and then install the needle jet securing bolt.

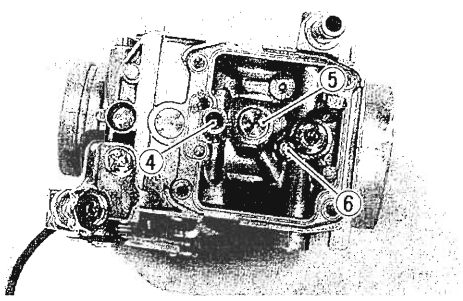


PILOT JET, MAIN JET AND VALVE SEAT

- Tighten the following parts to the specified torque.

Pilot jet ③: 1.0 N·m (0.1 kg-m, 0.7 lb-ft)
Pilot jet ④: 0.8 N·m (0.08 kg-m, 0.6 lb-ft)
Main jet ⑤: 1.8 N·m (0.18 kg-m, 1.3 lb-ft)
Valve seat retainer ⑥: 1.0 N·m (0.1 kg-m, 0.7 lb-ft)
Needle jet securing bolt ⑦: 1.8 N·m (0.18 kg-m, 1.3 lb-ft)

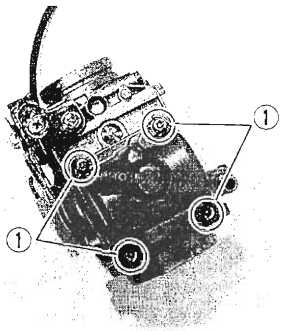




FLOAT CHAMBER

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

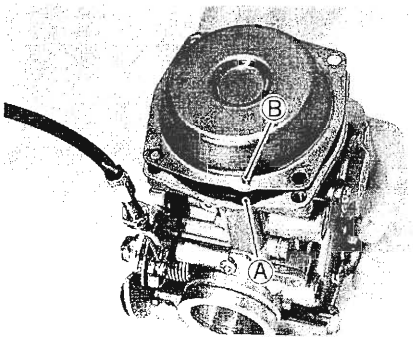
Float chamber body mouting screws ①: 2.0 N·m (0.2 kg-m, 1.4 lb-ft)

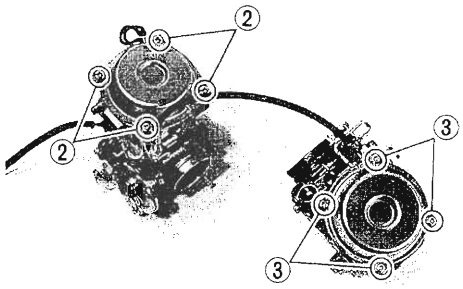


PISTON VALVE AND CARBURETOR TOP CAP

- Place the tab Ⓐ of diaphragm to the No.1 and No.2 carburetors properly.
- Align the hole of diaphragm with the protrusion Ⓑ of the No.2 carburetor top cap.
- Tighten the top cap screws to the specified torque.

Top cap screw ②: 3.5 N·m (0.35 kg-m, 2.5 lb-ft)
Top cap screw ③: 2.0 N·m (0.2 kg-m, 1.4 lb-ft)





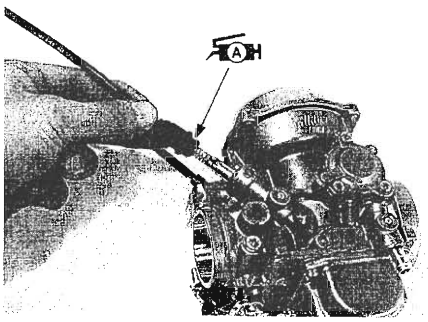
STARTER PLUNGER

- Tighten the starter plunger holder to the specified torque.

Starter plunger holder ④: 2.5 N·m (0.25 kg-m, 1.8 lb-ft)
Starter plunger holder ⑤: 4.0 N·m (0.4 kg-m, 3.0 lb-ft)

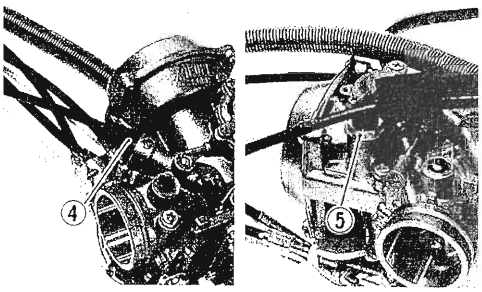
NOTE:
Apply a small quantity of grease to the starter plunger O-ring.

99000-25030: SUZUKI SUPER GREASE "A"



⚠ CAUTION

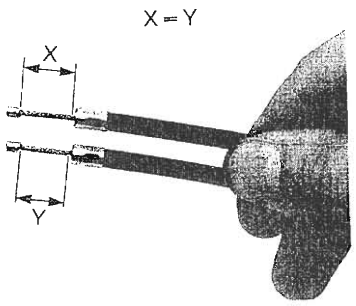
Replace the O-rings with new ones.



THROTTLE CABLES

Pulling cables

- Equalize the throttle pulling cables' inner length at the connector side end by turning the adjuster after loosening the lock nuts.
- Tighten the lock nuts.

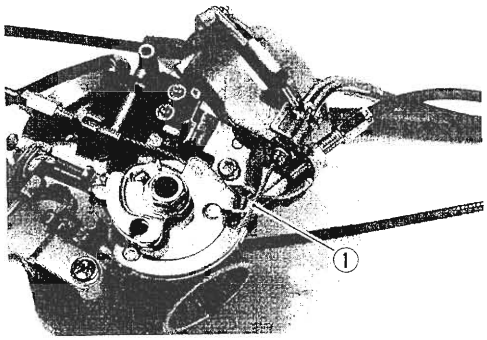


Returning cable

- Adjust the throttle returning inner cable ① to the play should be 1—2 mm (0.04—0.08 in) by turning the adjuster after loosening the lock nut.

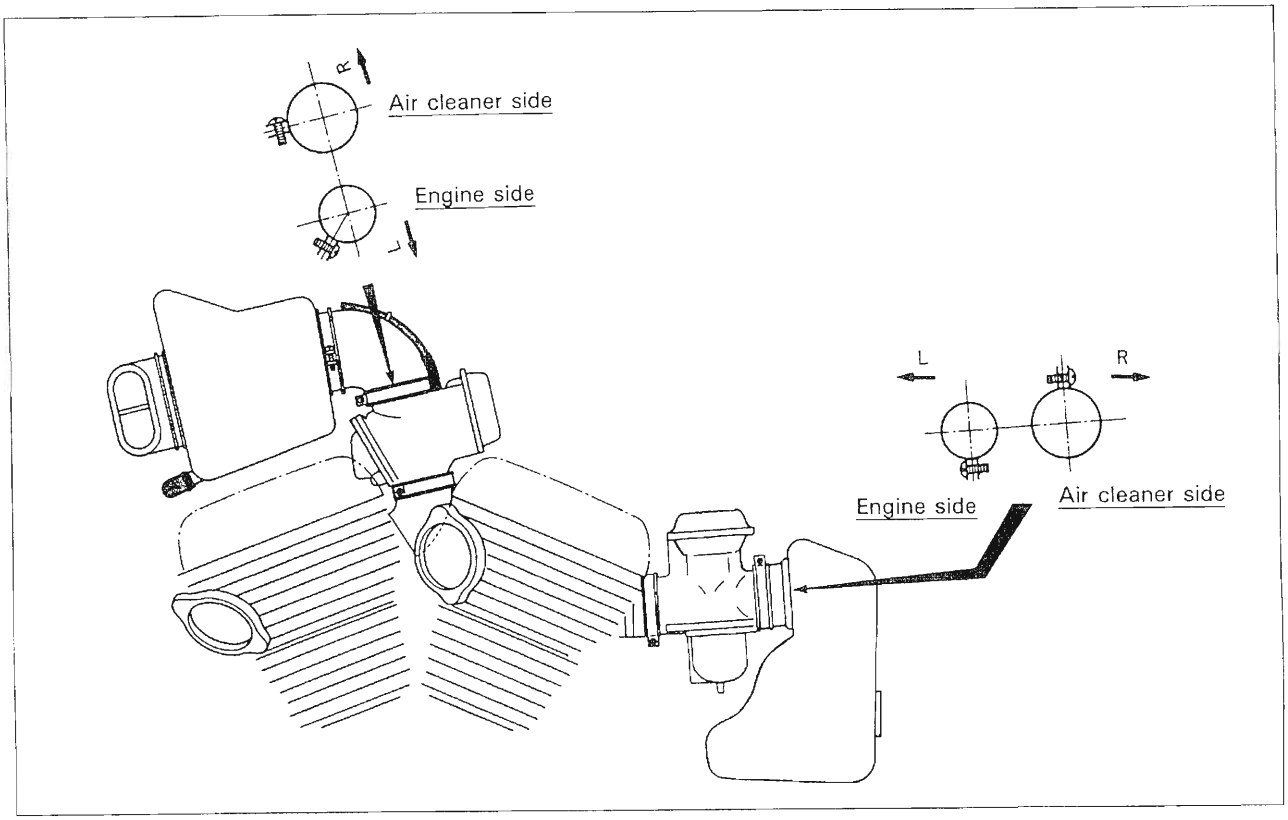
NOTE:

* *Be careful not to twist the throttle cables Ⓑ, Ⓒ.*



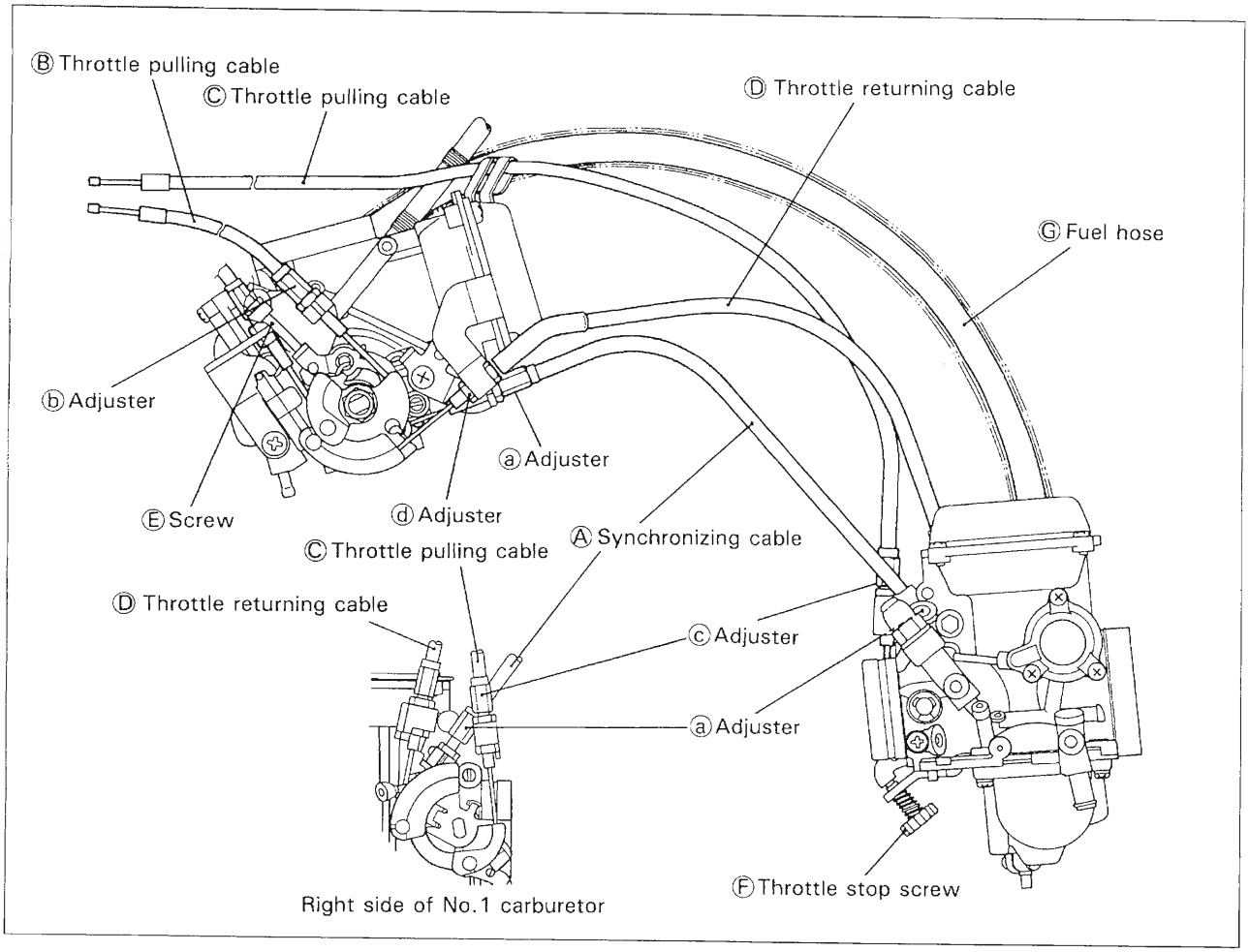
CARBURETOR CLAMP

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



- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
  - * Engine idle RPM ..... Page 2-9
  - * Throttle cable play ..... Page 2-9

BALANCE OF CARBURETORS

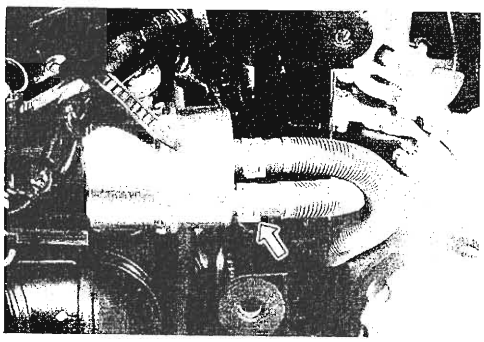


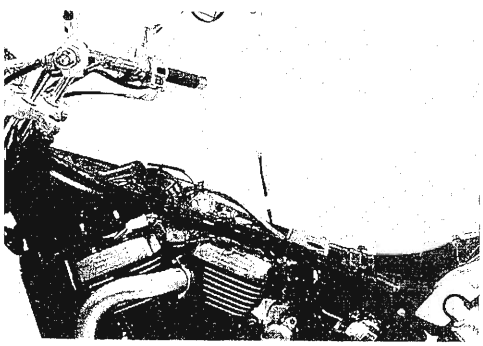
NOTE:
Once removing the synchronizing cable Ⓐ or carburetors, it is necessary to balance the two carburetors.

This section explains the balancing procedure for two carburetors by using special tool.

TOOL 09913-13121: Carburetor balancer set (09913-13140: Adapter)

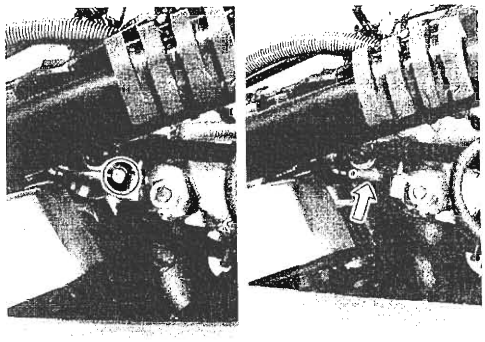
- Remove the frame covers and seat. (Refer to page 6-1.)
- Remove the fuel tank. (Refer to page 4-4.)
- Connect a separate fuel tank to the fuel pump and fuel should be supplied.
- Start up the engine and run it in idling condition for warming up.
- Stop the warm-up engine.





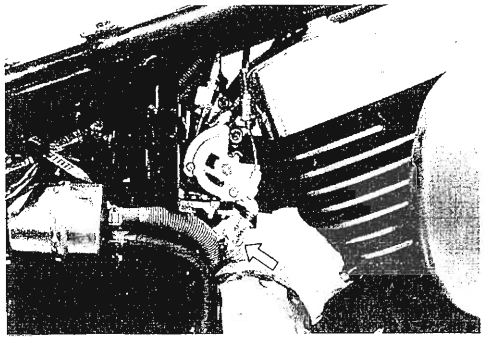
CALIBRATING EACH GAUGE (at idle speed)

- Remove the vacuum inspection screw for No.2 carburetor and install the adapter with gasket.

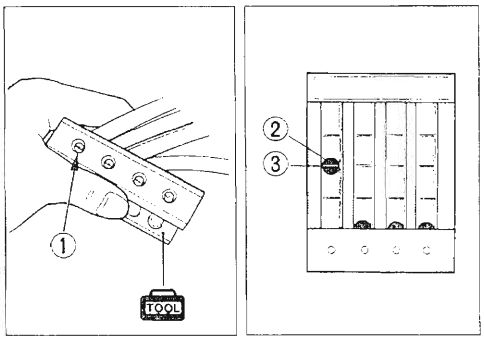


- Connect one of the four rubber hoses of the balancer gauge to this adapter, and start up the engine, and keep it running at idle speed by turning throttle stop screw.

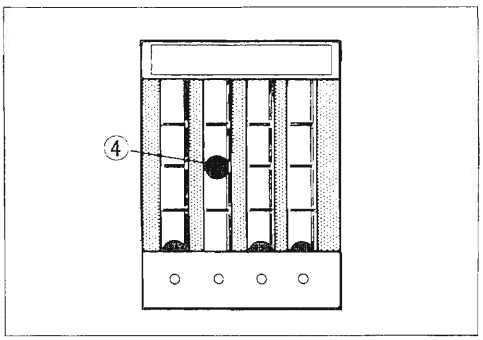
NOTE:
The idle speed is different among the countries. (Refer to pages 4-8 and -9.)



- 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.

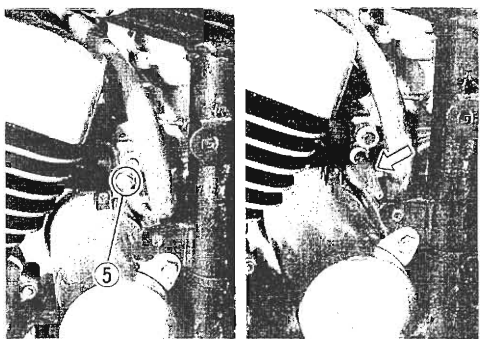


- After making sure that the steel ball stays steady at the center line, disconnect the hose from the adapter and connect the next hose to the adapter. Turn air screw to bring the other steel ball ④ to the center line. Now the balancer has been calibrated.

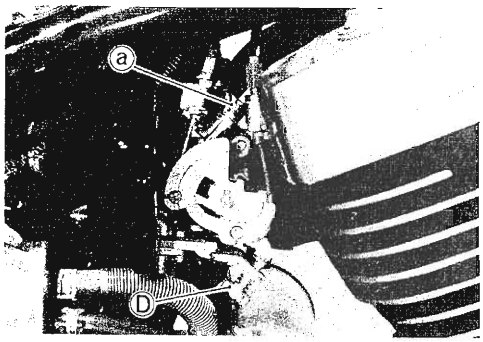


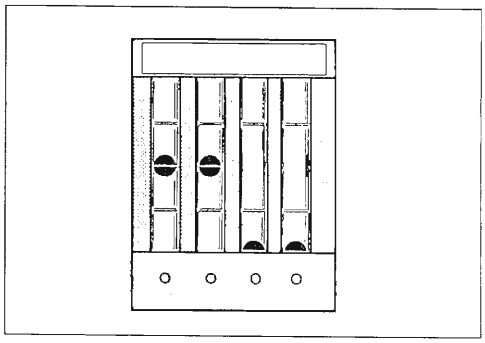
BALANCING CARBURETORS (at idle speed)

- Remove the vacuum inspection screw ⑤ from No.1 carburetor and install the adapter with gasket.
- Connect each calibrated balancer gauge hose to their respective adapters.

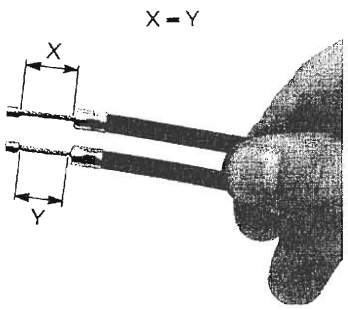


- Start up the engine, and keep it running at idle speed.
- Under this condition, see if the two steel balls stay equally at the center level line, as they should, to signify that the two carburetors are in balance: if not, loosen the lock nut and turn the synchronizing adjuster ⓐ and the throttle stop screw Ⓓ to bring the steel balls to the center level line by keeping the engine running at idle speed.





NOTE:
If turning the synchronizing adjuster, it is necessary to separate the throttle cable connector and equalize the throttle pulling cables' inner length at the connector.



LUBRICATION SYSTEM

OIL PRESSURE

Refer to page 2-20.

OIL FILTER

Refer to page 2-8.

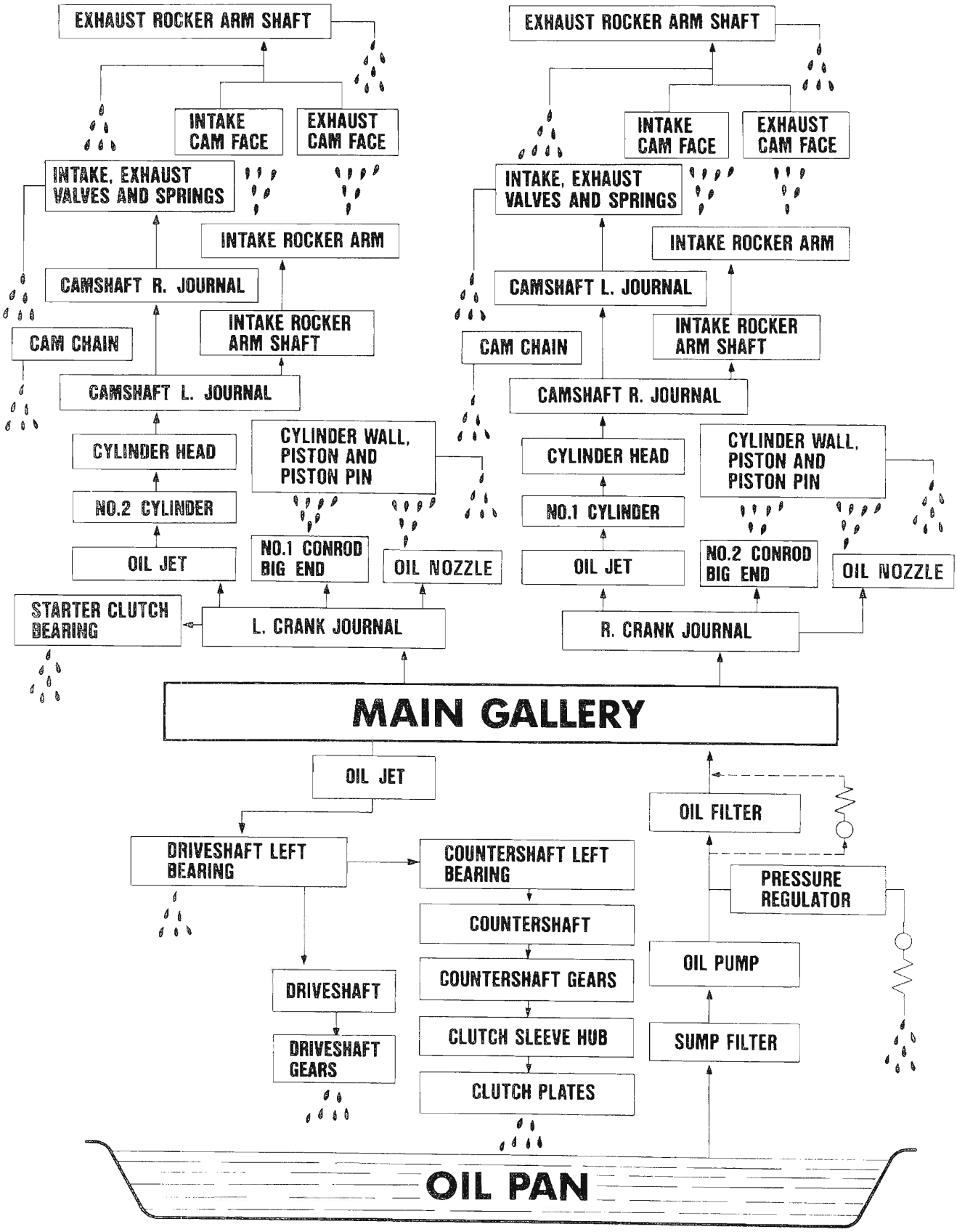
OIL PUMP

Refer to page 3-46.

OIL SUMP FILTER

If the oil sump filter is dirty with sediment or rust, oil will not flow smoothly. Clean the oil sump filter with compressed air. (Refer to page 3-22, -23 and -52.)

ENGINE LUBRICATION SYSTEM CHART



COOLING SYSTEM

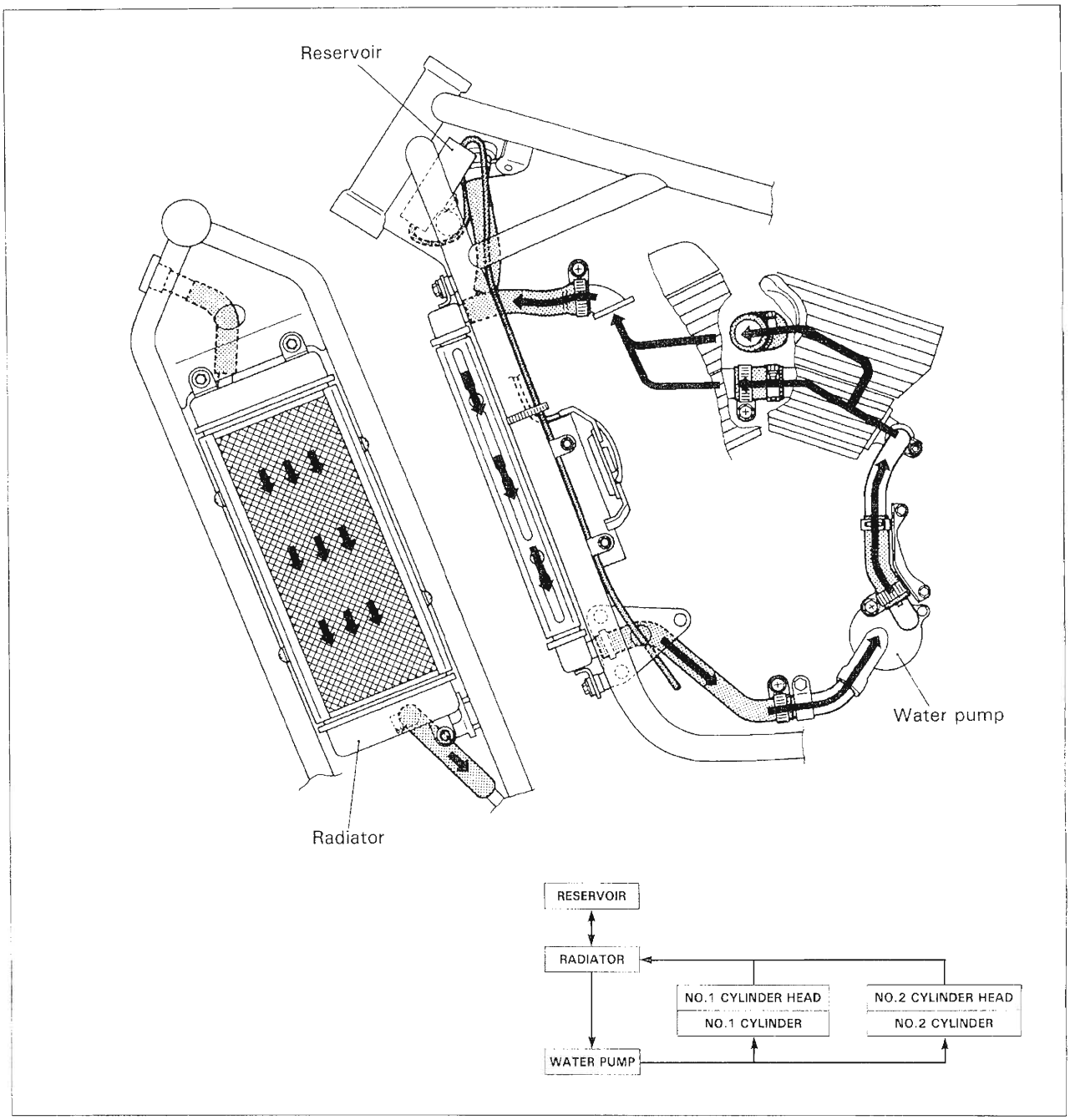
CONTENTS

COOLING SYSTEM

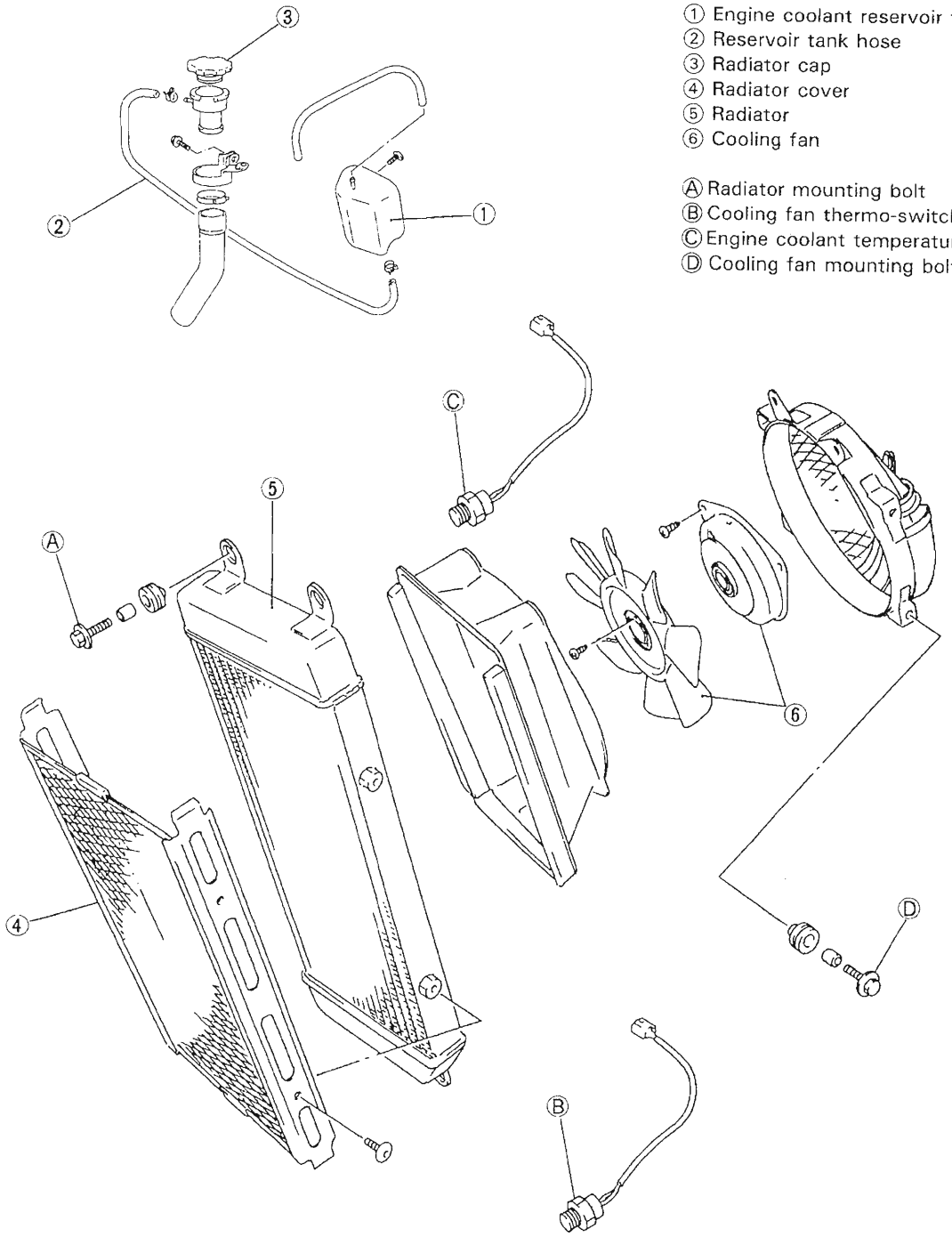
DESCRIPTION

The engine is cooled by coolant set in forced recirculation through jackets formed in the cylinder and 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 cooling fan, being located behind the radiator, is secured to the frame down tube by the 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.



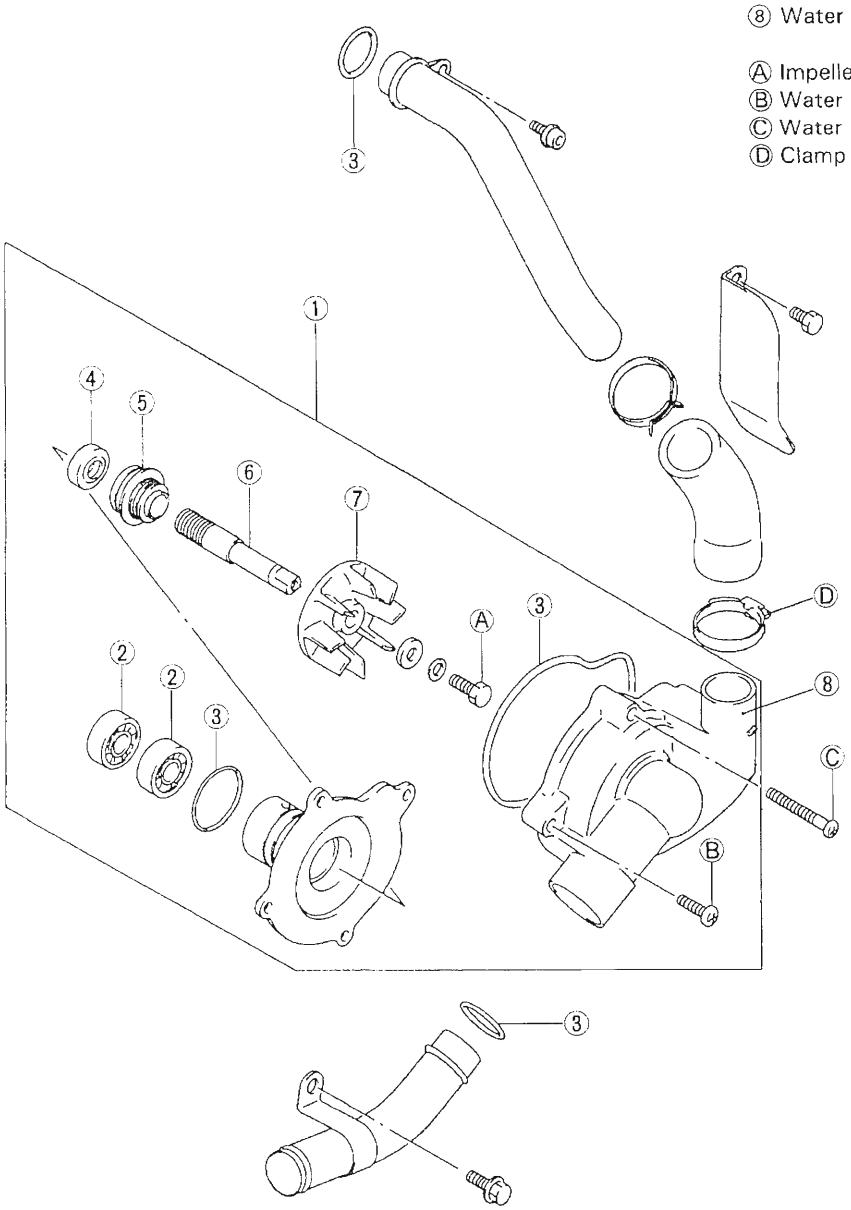
CONSTRUCTION



ITEM	N·m	kg-m	lb-ft
Ⓐ	6	0.6	4.5
Ⓑ, Ⓒ	12	1.2	8.5
Ⓓ	6	0.6	4.5

① Water pump ass'y
② Bearing
③ O-ring
④ Oil seal
⑤ Mechanical seal
⑥ Impeller shaft
⑦ Impeller
⑧ Water pump cover

Ⓐ Impeller securing bolt
Ⓑ Water pump cover screw
Ⓒ Water pump mounting bolt
Ⓓ Clamp



ITEM	N·m	kg-m	lb-ft
Ⓐ	8	0.8	6.0
Ⓑ, Ⓒ	10	1.0	0.7
Ⓓ	2.3	0.23	1.65

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°C (−24°F).
If the motorcycle is to be exposed to temperatures below −31°C (−24°F), this mixing ratio should be increased up to 55% or 60% according to the figure.

Anti-freeze density	Freezing point
50%	−31°C (−24°F)
55%	−40°C (−40°F)
60%	−55°C (−67°F)

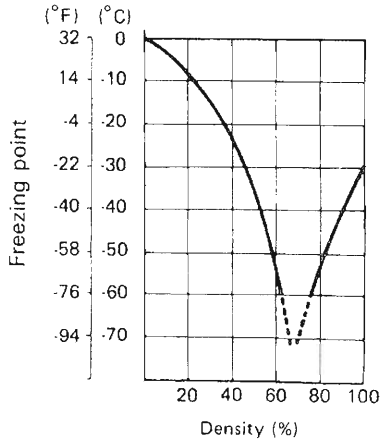


Fig. 1 Engine coolant density-freezing point curve.

⚠ 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	730 ml (1.5/1.3 US/Imp. pt)
Water	730 ml (1.5/1.3 US/Imp. pt)

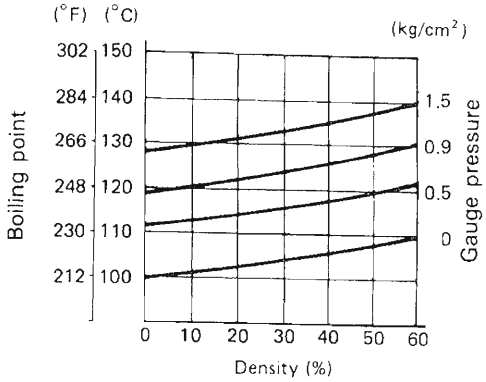


Fig. 2 Engine coolant density-boiling point curve.

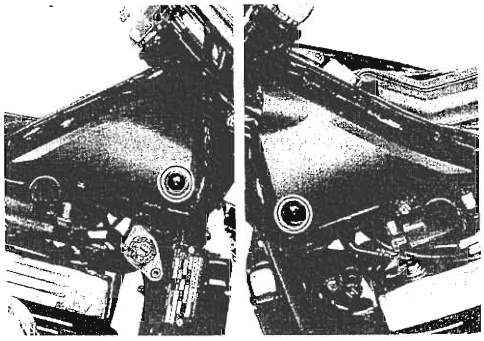
⚠ WARNING

* **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.**

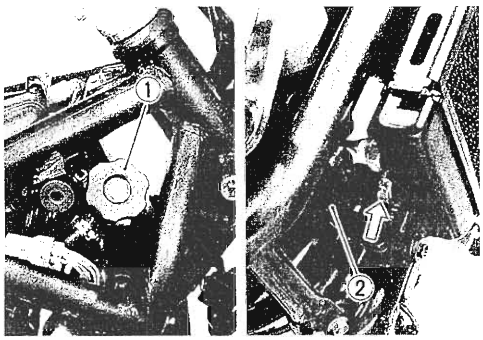
RADIATOR AND WATER HOSES

REMOVAL

- Remove the left frame cover.
- Remove the seat and the fuel tank. (Refer to pages 6-1 and 4-4.)
- Remove the frame head cover.



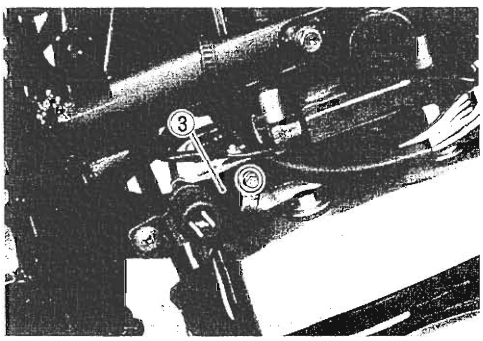
- Place a pan below the engine.
- Remove the radiator cap ① and disconnect the water hose ② from the radiator, then drain engine coolant.



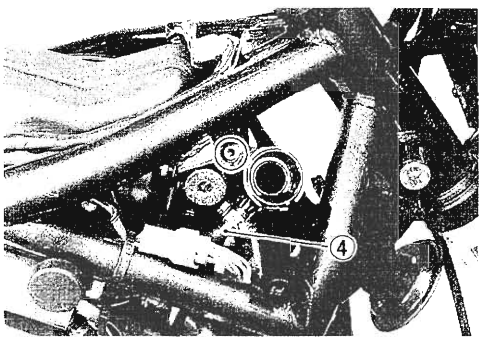
⚠ WARNING

*** 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 vomitting and call physician immediately!**

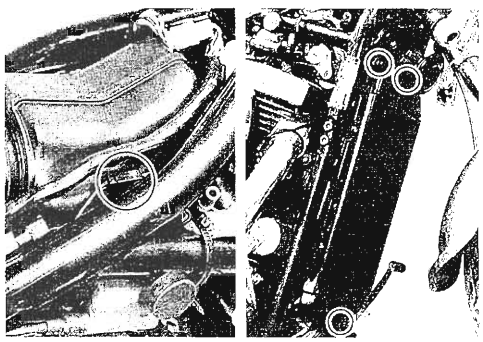
- Disconnect the water hose ③ from the front cylinder head.



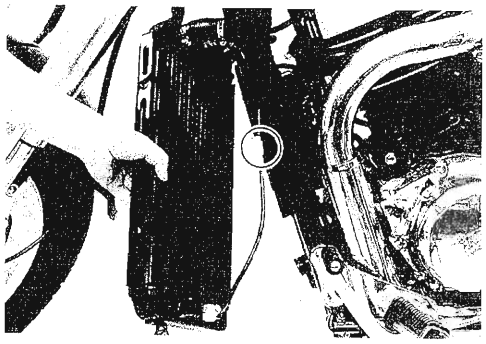
- Disconnect the reservoir tank hose ④ from the conduction case and remove the conduction case mounting bolt.



- Disconnect the engine coolant temperature switch lead wire coupler.
- Remove the radiator mounting bolts.



- Disconnect the cooling fan thermo-switch lead wire coupler and remove the radiator.

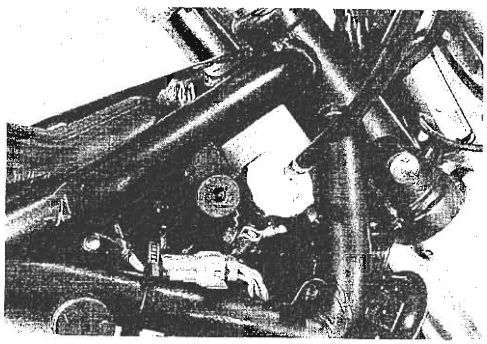


INSPECTION

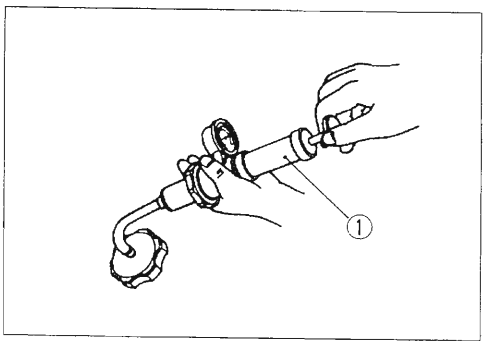
COOLING SYSTEM INSPECTION

Before removing the radiator and draining the engine coolant, inspect the cooling system for tightness.

- Remove the seat and the fuel tank. (Refer to pages 6-1 and 4-4.)



- Remove the frame head cover.
- Remove the radiator cap and connect the tester to the filler.
- Give a pressure of about 120 kPa (1.2 kg/cm², 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.**

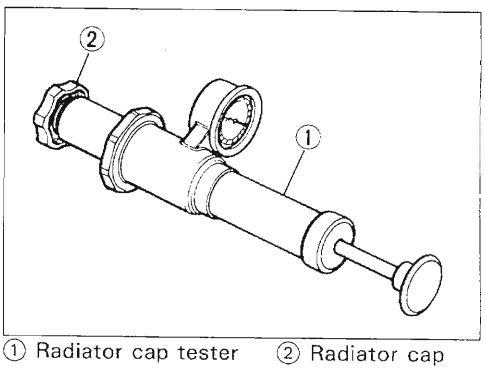
⚠ CAUTION

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 radiator 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±15 kPa (1.1±0.15 kg/cm², 15.6±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.

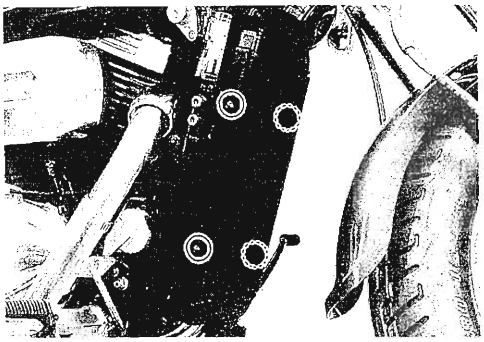


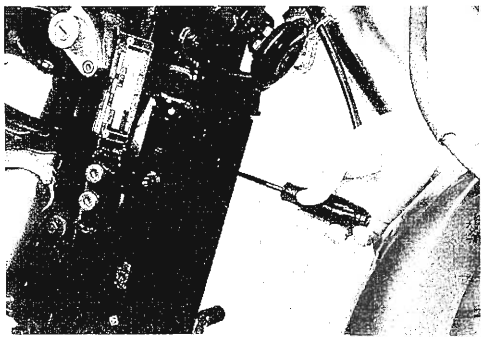
① Radiator cap tester ② Radiator cap

Radiator cap valve
release pressure: 110±15 kPa
(1.1±0.15 kg/cm², 15.6±2.1 psi)

RADIATOR INSPECTION AND CLEANING

Road dirt or trash stuck to the fins must be removed. Use of compressed air is recommended for this cleaning. Corrugated fins bent down or dented can be repaired by straightening them with the blade of a small screwdriver.





WATER HOSES

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.

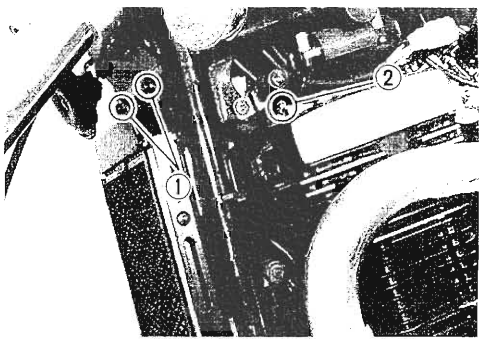
INSTALLATION

The radiator is to be installed in the reverse order of the removal procedure. Pay attention to the following points:

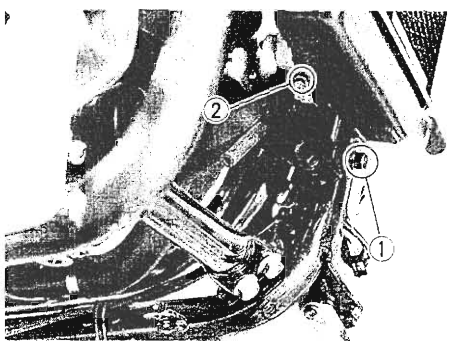
RADIATOR MOUNTING BOLT AND CLAMP

- Tighten the radiator mounting bolts ① and clamps ② to the specified torque.

Radiator mounting bolt ①: 6 N·m (0.6 kg-m, 4.5 lb-ft)
Clamp ②: 2.3 N·m (0.23 kg-m, 1.65 lb-ft)



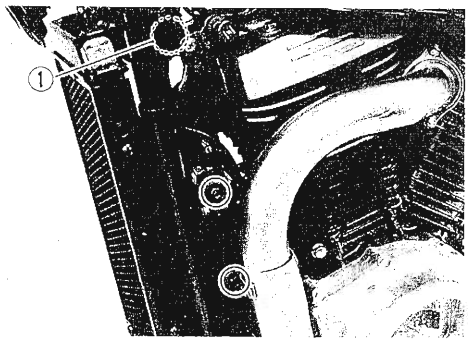
- Be sure to route the radiator hoses. (Refer to page 8-18.)
- After installing the radiator, be sure to add engine coolant: refer to page 2-10 and -11 for refilling information.



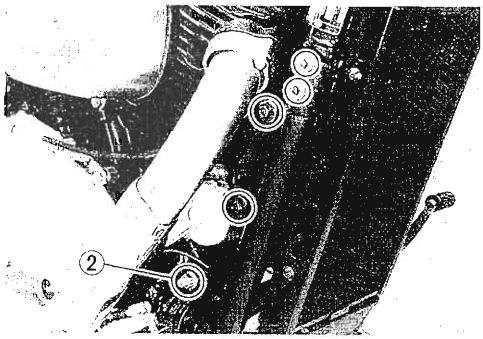
COOLING FAN

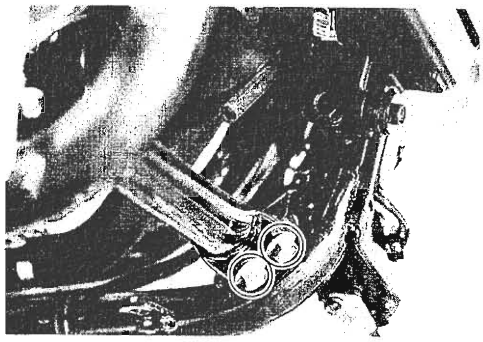
REMOVAL

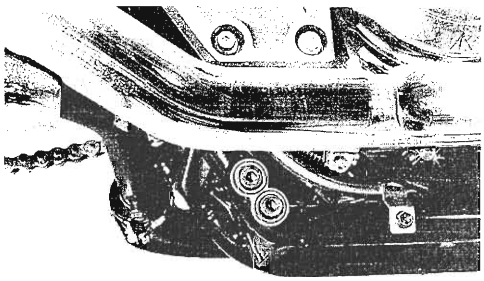
- Remove the cooling fan mounting bolt.
- Disconnect the cooling fan lead wire coupler ①.



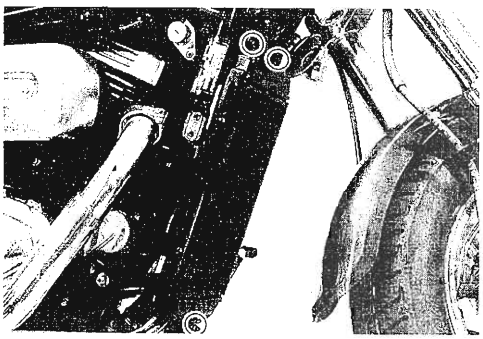
- Remove the engine mounting bolt ②.
- Remove the right frame down tube.



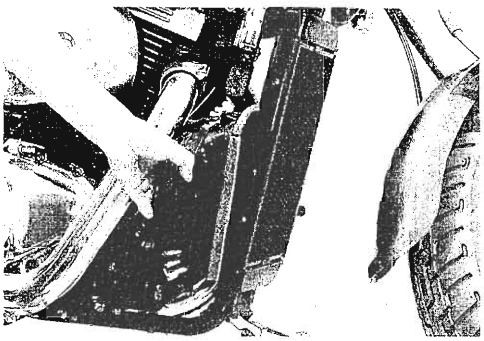




- Remove the radiator mounting bolts.

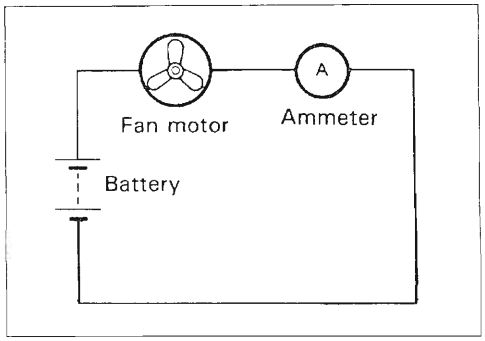


- Move the radiator forward and then remove the cooling fan.



INSPECTION

Test the cooling fan drive motor for load current with an ammeter connected as shown in the illustration.
The voltmeter is for making sure that the battery applies 12 volts to the motor. With the motor with electric motor fan running at full speed, the ammeter should be indicating not more than 5 amperes.
If the fan motor does not turn, replace the motor assembly with a new one.



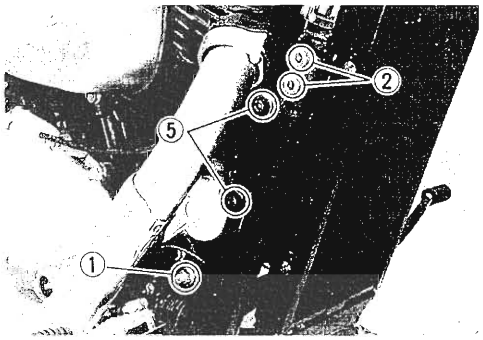
NOTE:
When making this test, it is not necessary to remove the cooling fan.

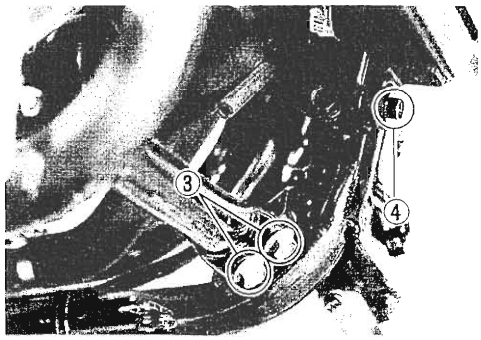
INSTALLATION

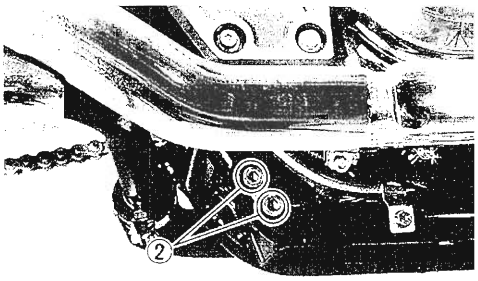
The cooling fan is to be installed in the reverse order of their removal procedure. Pay attention to the following point:

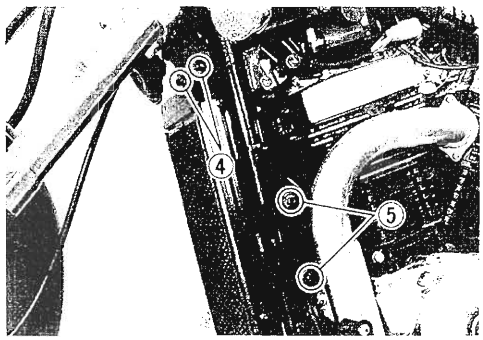
- Tighten the engine mounting bolts, frame mounting bolts, radiator mounting bolts and cooling fan mounting bolts to the specified torque.

Engine mounting bolt ①: 88 N·m (8.8 kg-m, 63.5 lb-ft)
Frame mounting bolt ②: 50 N·m (5.0 kg-m, 36.0 lb-ft)
Frame mounting bolt ③: 25 N·m (2.5 kg-m, 18.0 lb-ft)
Radiator mounting bolt ④: 6 N·m (0.6 kg-m, 4.5 lb-ft)
Cooling fan mounting bolt ⑤: 6 N·m (0.6 kg-m, 4.5 lb-ft)





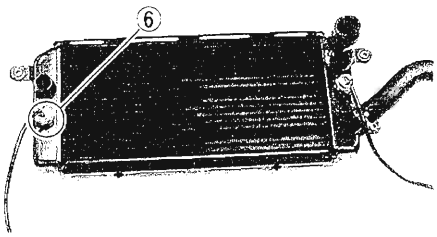




COOLING FAN THERMO-SWITCH

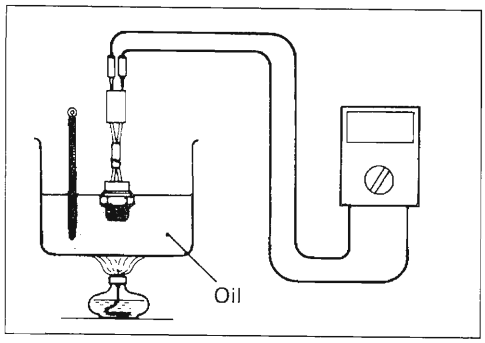
REMOVAL

- Remove the radiator. (Refer to pages 5-5 and -6.)
- Remove the cooling fan thermo-switch ⑥.



INSPECTION

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



Thermo-switch specification

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

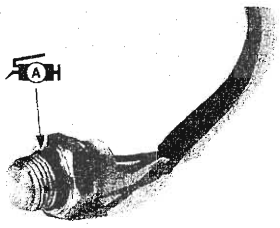
⚠ CAUTION

Do not allow the switch to touch the pan, or false reading will result.

INSTALLATION

- Apply grease to the O-ring.

99000-25030: SUZUKI SUPER GREASE "A"

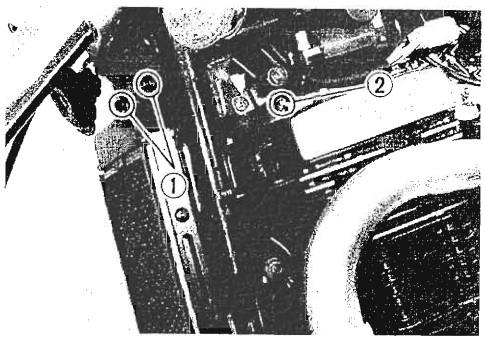


- Tighten the cooling fan thermo-switch to the specified torque.

Cooling fan thermo-switch: 12 N·m (1.2 kg-m, 8.5 lb-ft)

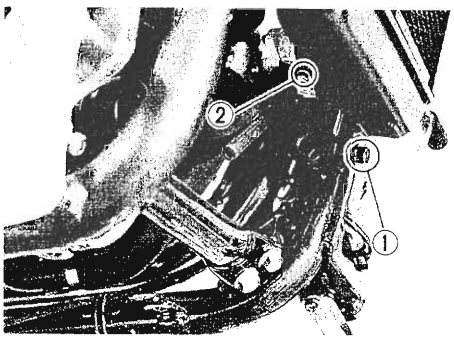
⚠ CAUTION

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.



- Tighten the radiator mounting bolts ① and clamps ② to the specified torque.

Radiator mounting bolt ①: 6 N·m (0.6 kg-m, 4.5 lb-ft)
Clamp ②: 2.3 N·m (0.23 kg-m, 1.65 lb-ft)

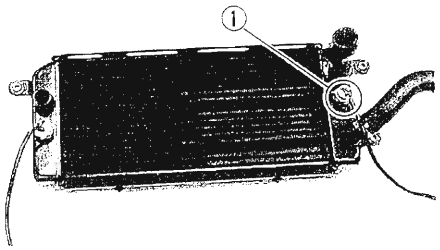


- After installing the cooling fan thermo-switch, be sure to add engine coolant. (Refer to page 2-10 and -11.)

ENGINE COOLANT TEMPERATURE SWITCH

REMOVAL

- Remove the radiator. (Refer to pages 5-5 and -6)
- Remove the engine coolant temperature switch ①.

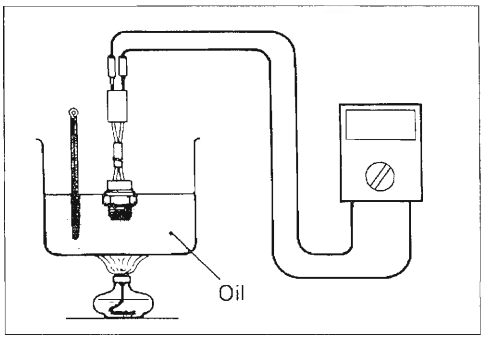


INSPECTION

- Inspect the engine coolant temperature switch in the same manner of the cooling fan thermo-switch inspection.

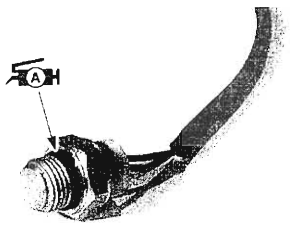
Engine coolant temperature switch

OFF → ON	Approx. 120°C (248°F)
ON → OFF	Approx. 113°C (235.4°F)



⚠ CAUTION

Do not allow the switch to touch the pan, or false reading will result.



INSTALLATION

- Apply grease to the O-ring.

A 99000-25030: SUZUKI SUPER GREASE "A"

- Tighten the engine coolant temperature switch to the specified torque.

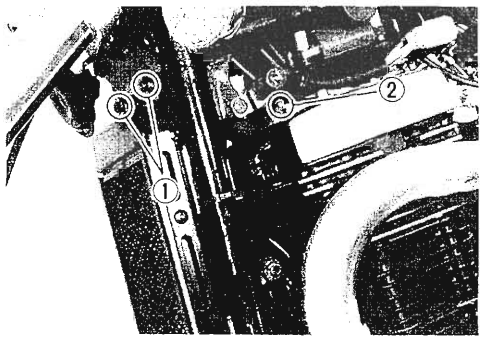
Engine coolant temperature switch:
12 N·m (1.2 kg-m, 8.5 lb-ft)

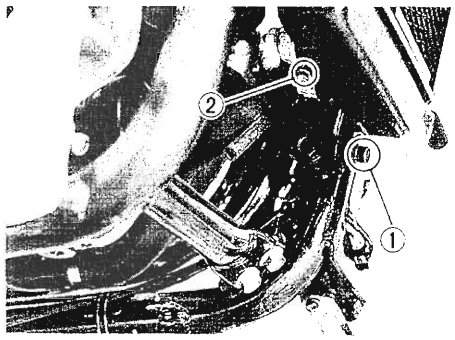
⚠ CAUTION

Take special care when handling the engine coolant temperature switch. It may cause damage if it gets a sharp impact.
Replace the O-ring with a new one.

- Tighten the radiator mounting bolts ① and clamps ② to the specified torque.

Radiator mounting bolt ①: 6 N·m (0.6 kg-m, 4.5 lb-ft)
Clamp ②: 2.3 N·m (0.23 kg-m, 1.65 lb-ft)





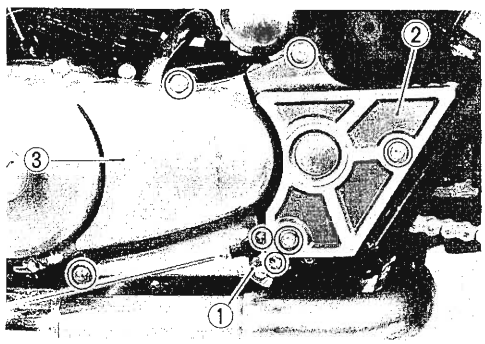
After installing the engine coolant temperature switch, be sure to add engine coolant. (Refer to page 2-10 and -11.)

WATER PUMP

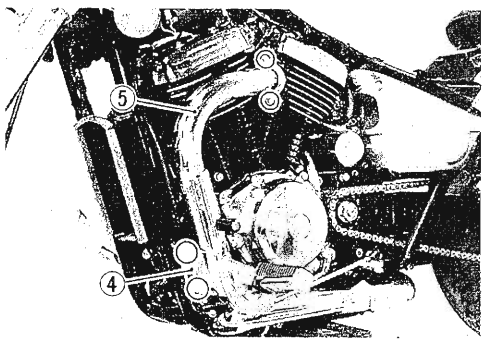
REMOVAL

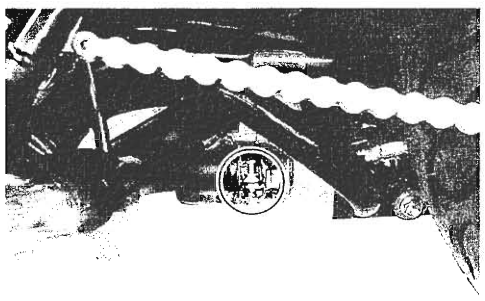
- Remove the seat and fuel tank. (Refer to pages 6-1 and 4-4.)
- Remove the frame head cover.
- Drain engine coolant. (Refer to page 2-10.)
- Drain engine oil. (Refer to page 2-8.)

- Remove the gearshift arm ①.
- Remove the swingarm pivot cover ② and engine sprocket cover ③.

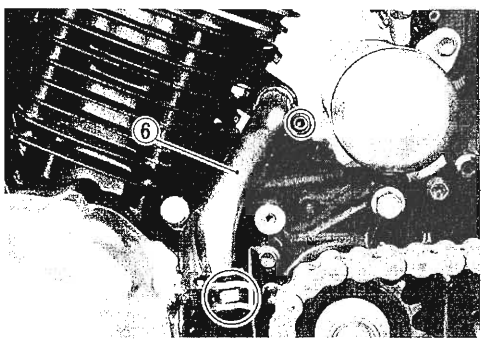


- Remove the left front footrest bracket ④.
- Remove the rear cylinder exhaust pipe ⑤.

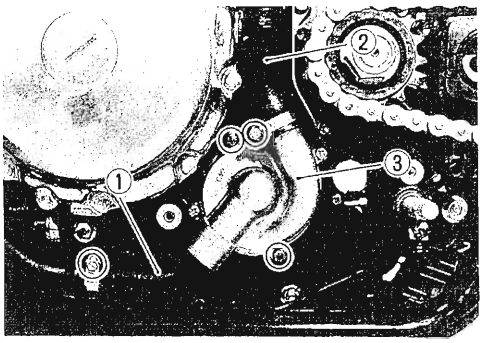




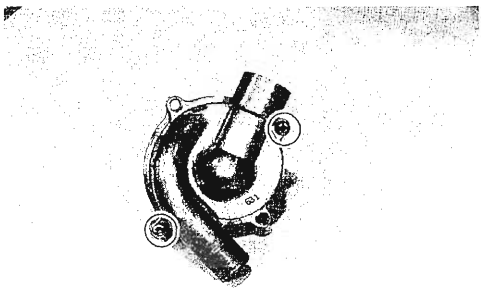
- Remove the water pipe ⑥.



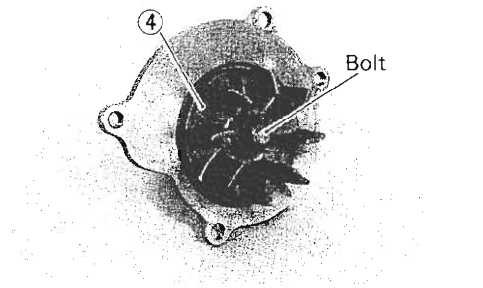
- Remove the water pump inlet pipe ① with the hose and the water outlet hose ②.
- Remove the water pump ass'y ③.



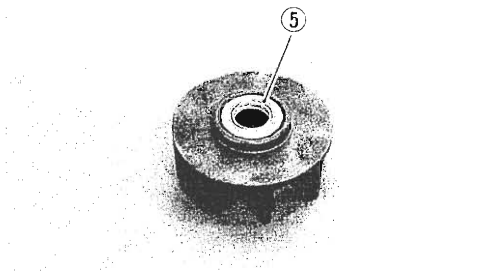
- Remove the water pump cover.



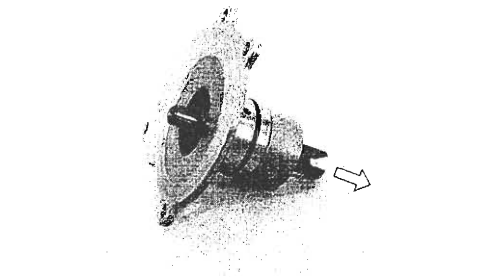
- Remove the impeller securing bolt, washer and gasket by holding the impeller shaft with a water pump pliers.
- Remove the impeller ④.



- Remove the mechanical seal ring ⑤.



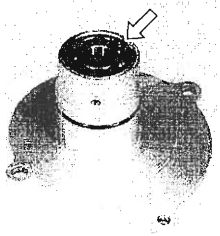
- Remove the impeller shaft.



INSPECTION AND DISASSEMBLY

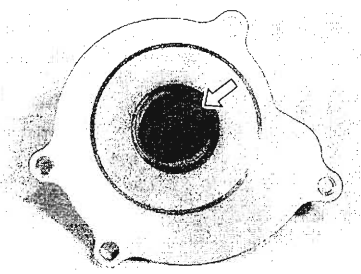
WATER PUMP BEARING

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.



DISASSEMBLY

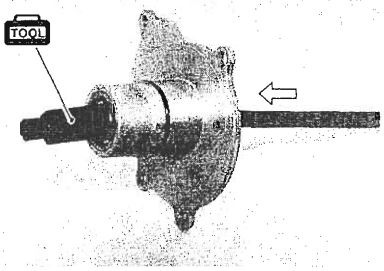
- Draw out the bearings by using the special tools.

TOOL **09941-50111: Bearing remover**

⚠ CAUTION

The removed bearings must be replaced with new ones.

NOTE:
If no abnormal noise, bearing removal is not necessary.

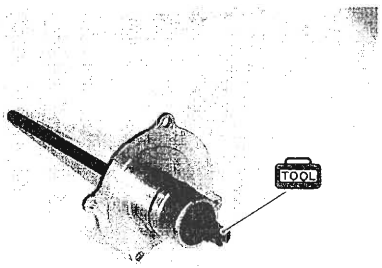


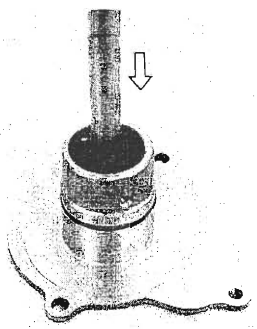
- Drive out the mechanical seal with oil seal by using a suitable size box wrench and so on.

⚠ CAUTION

The removed mechanical seal and oil seal must be replaced with new ones.

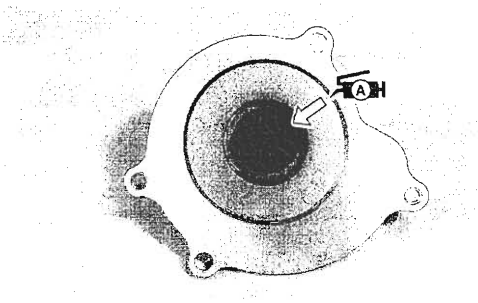
NOTE:
If no water or oil leakage, mechanical seal and oil seal removal is not necessary.





REASSEMBLY AND INSTALLATION

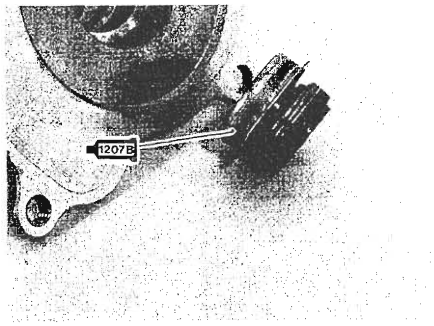
Reassemble and remount the water pump in the reverse order of removal and disassembly. Pay attention to the following points:



- Apply grease to the oil seal lip before installing.

A 99000-25030: SUZUKI SUPER GREASE "A"

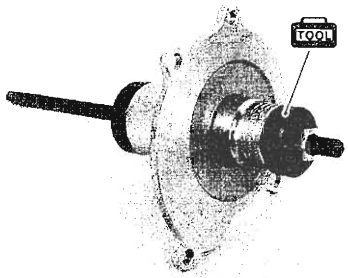
- Press the new oil seal into the stuffing box with a suitable size socket wrench and so on.
- Press the new mechanical seal into the stuffing box with the special tool, a suitable size socket wrench and so on.



NOTE:
When installing the mechanical seal, apply SUZUKI BOND "1207B" to its outer surface.

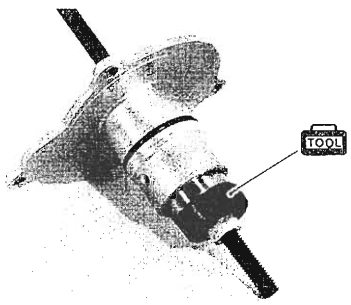
1207B 99104-31140: SUZUKI BOND "1207B"

TOOL 09924-84521: Bearing installer



- Press the new bearings into the stuffing box with the special tool, a suitable size socket wrench and so on.

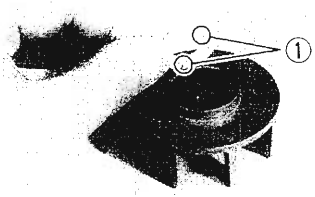
TOOL 09924-84521: Bearing installer



- Replace the mechanical seal ring and water seal with new ones when reassembling the water pump.

NOTE:
* *Apply SUZUKI SUPER GREASE "A" to the O-rings.*

A 99000-25030: SUZUKI SUPER GREASE "A"



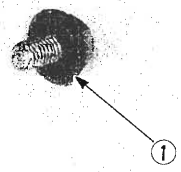
* *The mechanical seal ring must be assembled with marked face ① of the ring toward the impeller.*

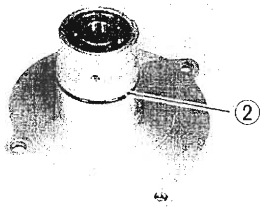
- Tighten the impeller securing bolt to the specified torque.

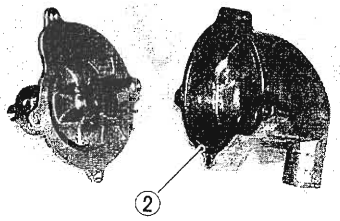
Impeller securing bolt: 8 N·m (0.8 kg-m, 6.0 lb-ft)

NOTE:
The seal lip side ① faces impeller.

- Replace the O-rings ② with new ones.





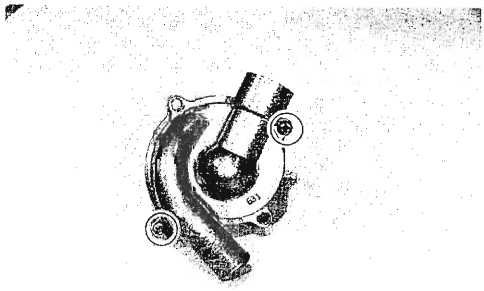


- Tighten the water pump cover screws to the specified torque.

Water pump cover screw: 10 N·m (1.0 kg-m, 7.0 lb-ft)

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

99000-25030: SUZUKI SUPER GREASE "A"

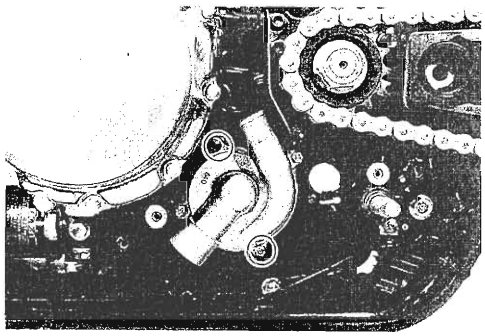


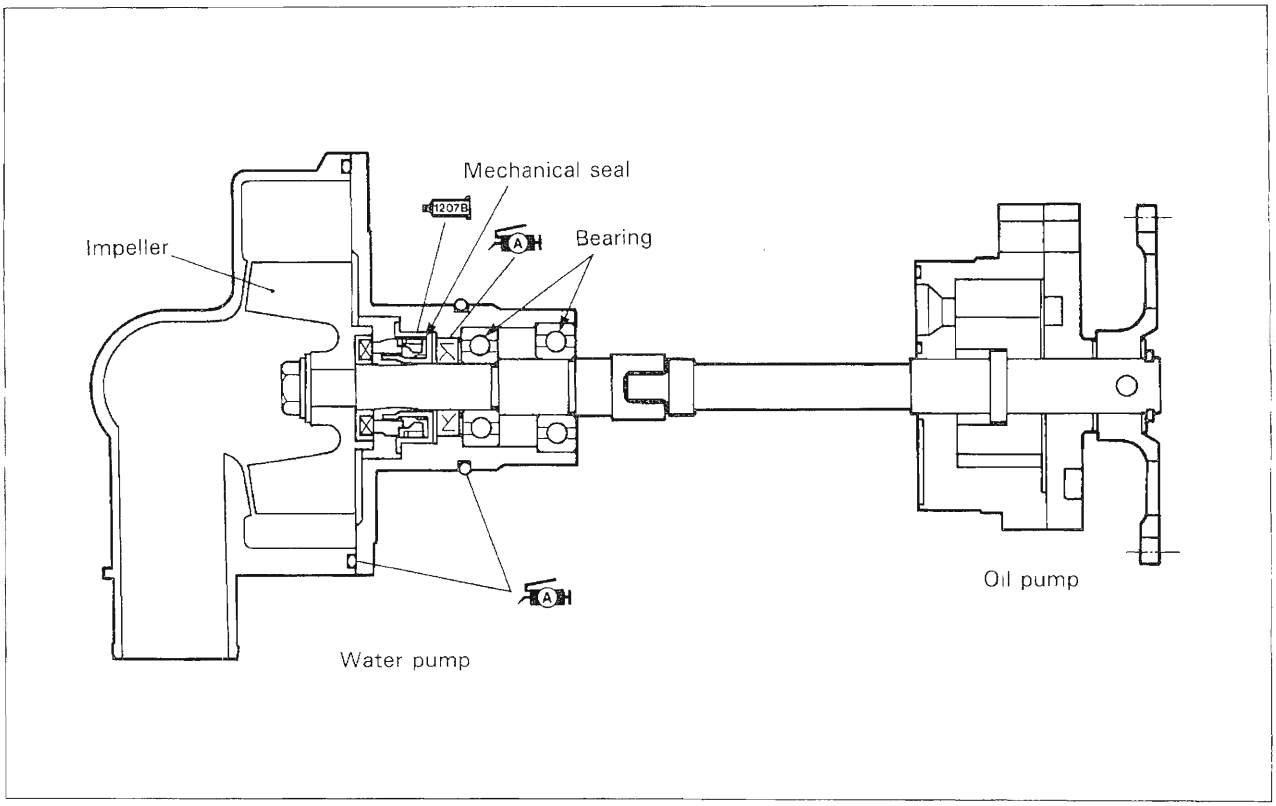
- Install the water pump and tighten its mounting bolt to the specified torque.

NOTE:
* *Apply SUZUKI SUPER GREASE "A" to the water pump O-ring.*
* *Set the water pump shaft to the oil pump shaft as shown in the illustration. (Refer to page 5-17.)*
* *Refer to page 8-18 for the radiator hose routing.*

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

99000-25030: SUZUKI SUPER GREASE "A"





- Tighten the exhaust pipe bolt and the left front footrest bracket bolt to the specified torque.

Exhaust pipe bolt: 25 N·m (2.5 kg-m, 18.0 lb-ft)
Front footrest bracket bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)

- After installing the water pump and hoses, be sure to add engine coolant. (Refer to page 2-10 and -11.)

CHASSIS

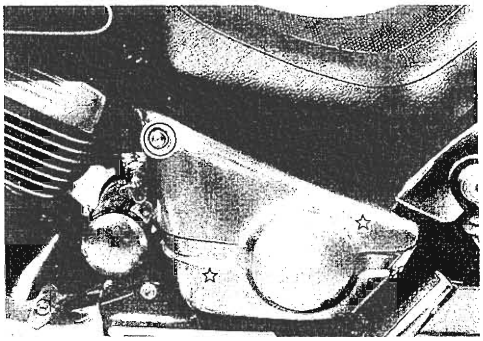
CONTENTS

EXTERIOR PARTS

REMOVAL

FRAME COVER

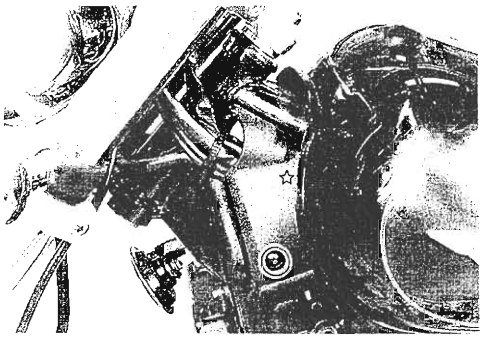
- Remove the left and right bolts.
- Remove the frame cover by extracting the hooked parts, left and right.



☆: hooked part

STEERING HEAD COVER

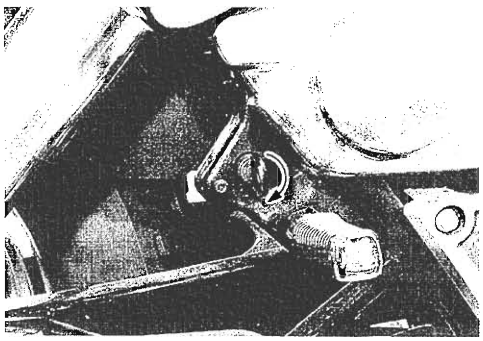
- Remove the left and right bolts.
- Remove the steering head cover by extracting the hooked part, left and right.



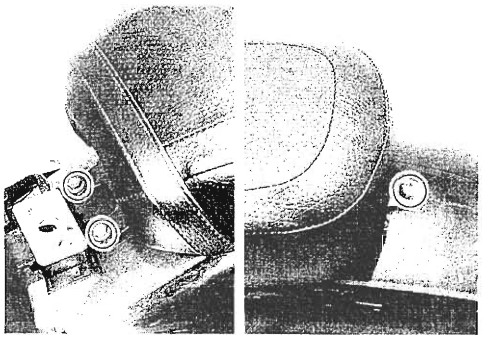
☆: hooked part

SEAT

- Remove the seat by using the ignition key.



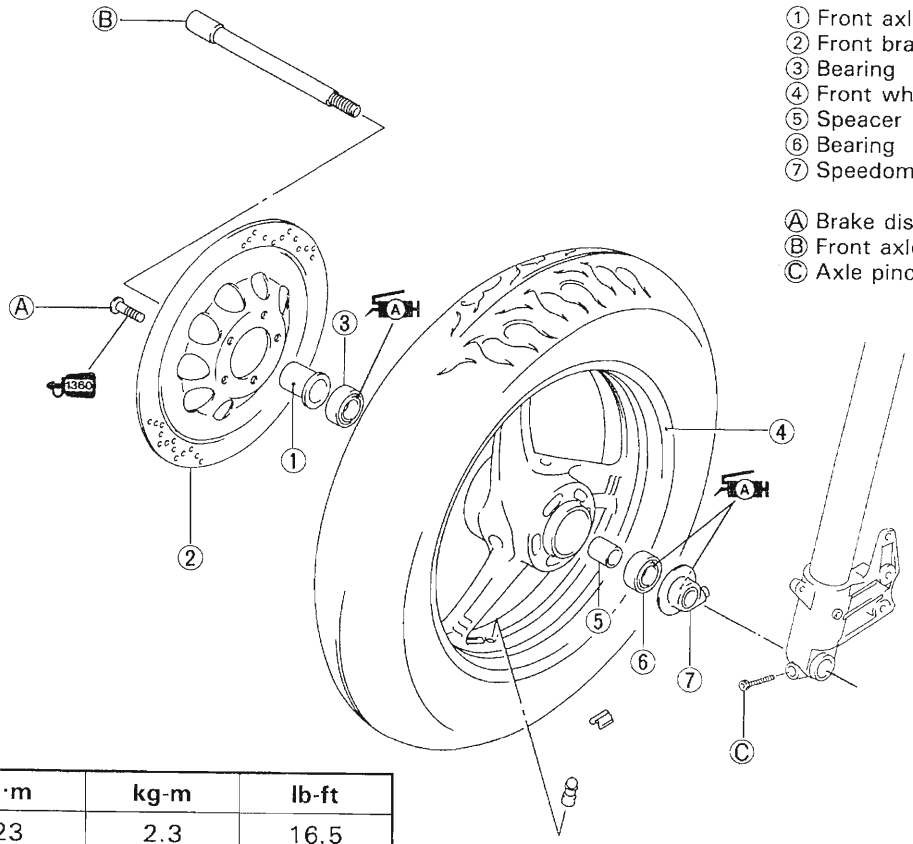
- Remove the rear seat by removing the bolts.



REMOUNTING

- Remount the frame covers and seats in the reverse order of removal.

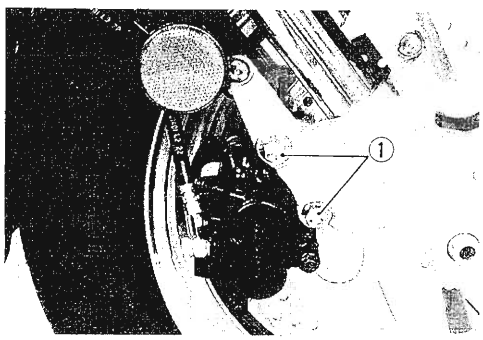
FRONT WHEEL



ITEM	N·m	kg-m	lb-ft
Ⓐ	23	2.3	16.5
Ⓑ	65	6.5	47.0
Ⓒ	23	2.3	23.0

REMOVAL

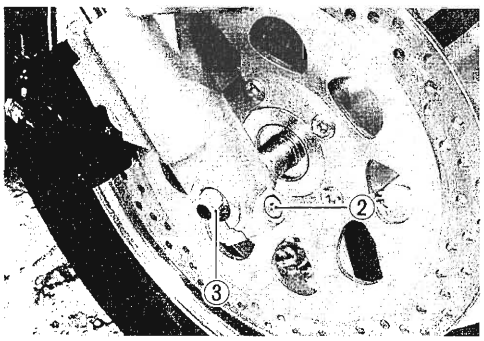
- Remove the front brake caliper mounting bolts ①.
- Loosen the axle pinch bolt ②.
- Loosen the front axle ③.
- Raise the front wheel off the ground with a jack.
- Remove the front axle and the front wheel.



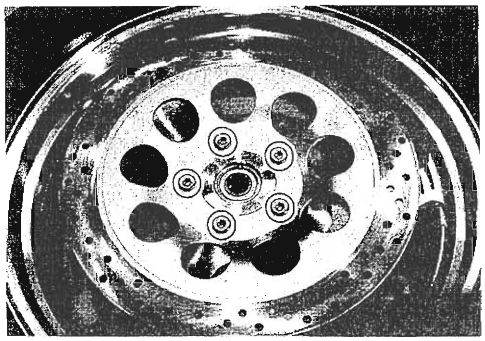
⚠ CAUTION

Do not operate the brake lever while dismounting the front wheel.

NOTE:
After removing the front wheel, fit the caliper temporarily to the original position.



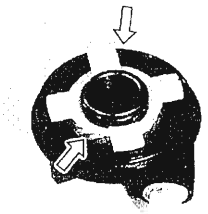
- Remove the brake disc from the front wheel.



INSPECTION AND DISASSEMBLY

SPEEDOMETER GEARBOX

Inspect the lip of dust seal and the drive lugs for damage.



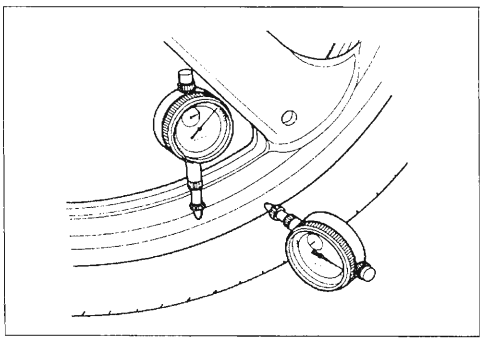
TIRE

Refer to page 2-15.

FRONT WHEEL

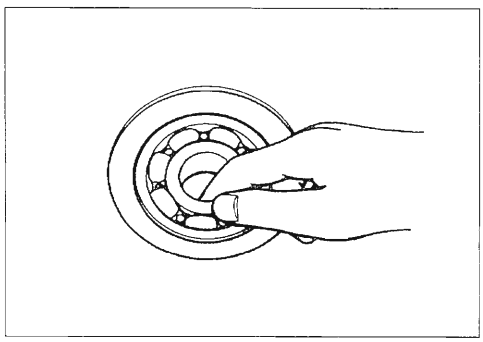
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loosen wheel bearings. If bearing replacement fails to reduce the runout, replace the wheel.

Service Limit (Axial and Radial): 2.0 mm (0.08 in)



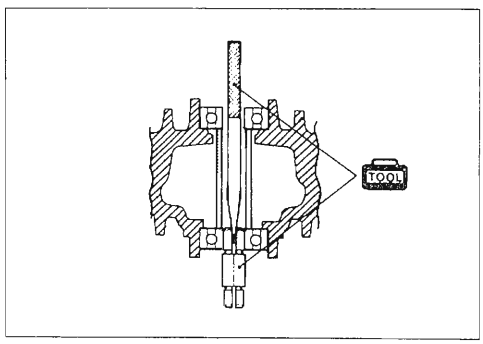
WHEEL BEARINGS

Inspect the play of the wheel bearings by finger while they are in the wheel. Rotate the inner race by finger to inspect for abnormal noise and smooth rotation.
Replace the bearing in the following procedure if there is anything unusual.



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

TOOL **09941-50111: Bearing remover**

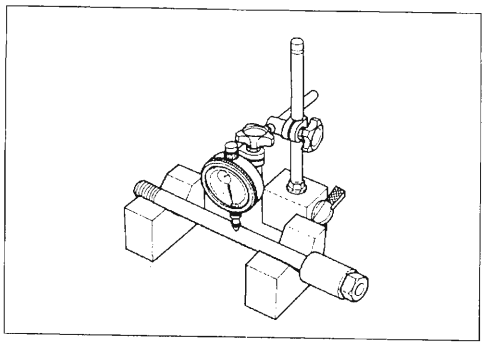


⚠ CAUTION

The removed bearings should be replaced with new ones.

FRONT AXLE

Using a dial gauge, check the front axle for runout.
If the runout exceeds the limit, replace the front axle.



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

Service Limit: 0.25 mm (0.010 in)

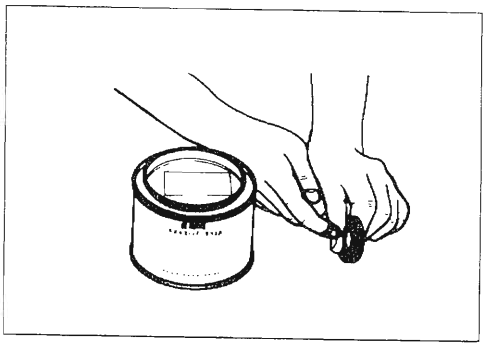
REASSEMBLY AND REMOUNTING

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

WHEEL BEARING

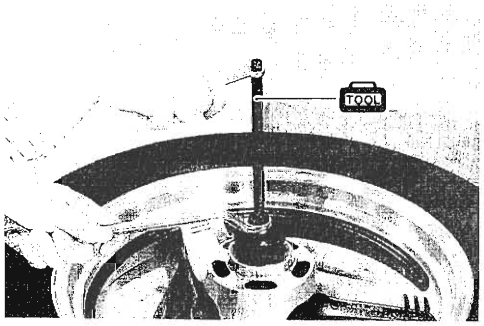
- Apply SUZUKI SUPER GREASE "A" to the bearings before installing.

99000-25030: SUZUKI SUPER GREASE "A"



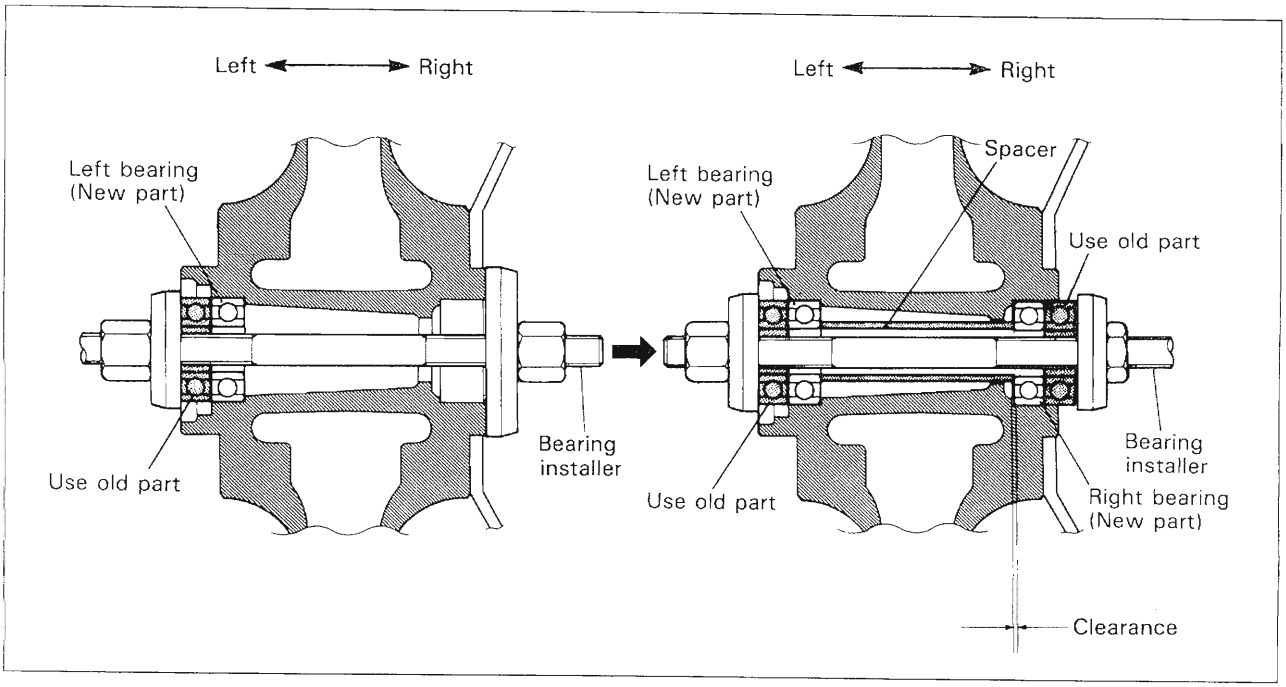
- Install the wheel bearings as follows by using the special tools.

09941-34513: Bearing/Steering race install



⚠ CAUTION

First install the left wheel bearing, then install the right wheel bearing. Refer to following illustration for details. The sealed cover on the bearing must face to the outside.

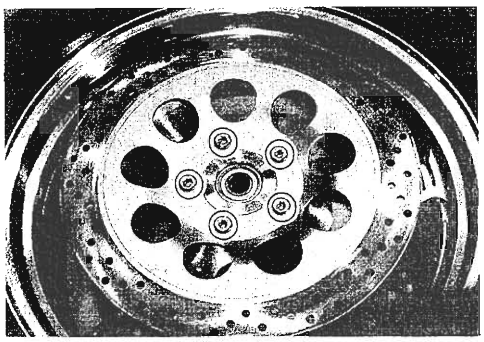


BRAKE DISC

- 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.

99000-32130: THREAD LOCK SUPER "1360"

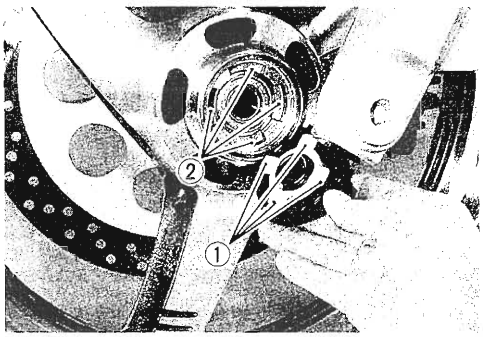
Brake disc bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)



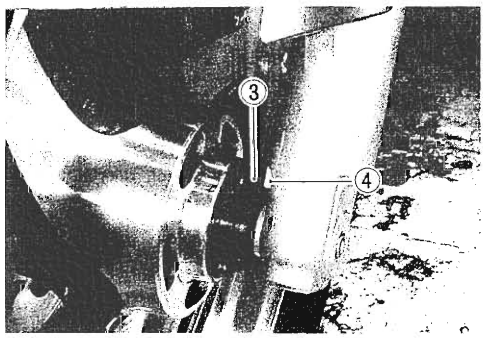
SPEEDOMETER GEARBOX

- Before installing the speedometer gearbox, apply SUZUKI SUPER GREASE "A" to its gear and dust seal lip, and align the drive lugs ① to the recesses ② of the wheel hub and attach the speedometer gearbox to the wheel hub.

99000-25030: SUZUKI SUPER GREASE "A"



- Touch the stopper ③ on the speedometer gearbox to the lug ④ on the left front fork.



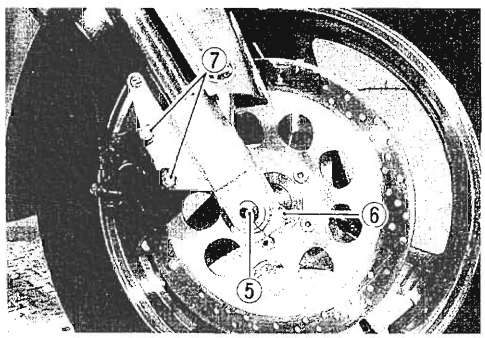
FRONT AXLE

- Tighten the front axle ⑤ to the specified torque and then moving the motorcycle up and down 4 or 5 times.
- Tighten the front axle pinch bolt ⑥ to the specified torque.

Front axle: 65 N·m (6.5 kg-m, 47.0 lb-ft)
Front axle pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

- Tighten the brake caliper mounting bolts ⑦ to the specified torque.

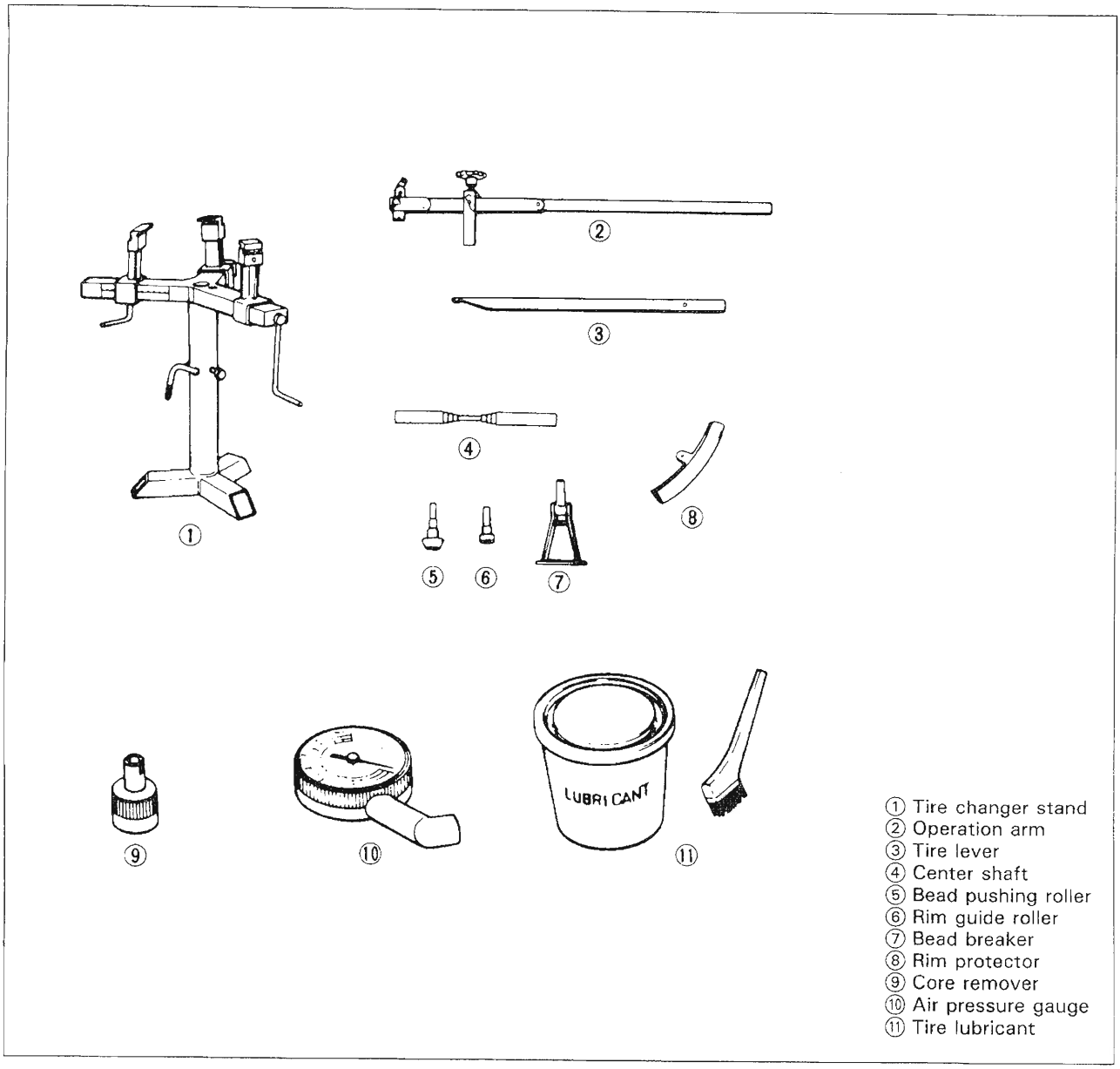
Brake caliper mounting bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)



TIRE AND WHEEL

TIRE REMOVAL

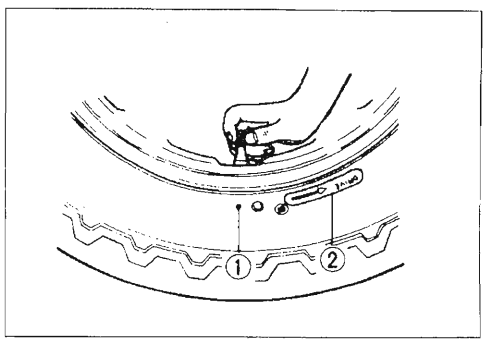
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers. For tire removal, the following tools are required.



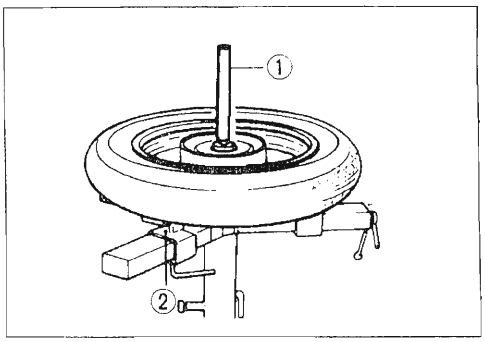
① Tire changer stand
② Operation arm
③ Tire lever
④ Center shaft
⑤ Bead pushing roller
⑥ Rim guide roller
⑦ Bead breaker
⑧ Rim protector
⑨ Core remover
⑩ Air pressure gauge
⑪ Tire lubricant

- Remove the valve core from the valve stem, and deflate the tire completely.

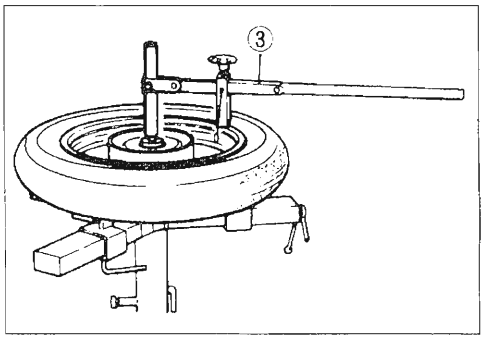
NOTE:
Mark the tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



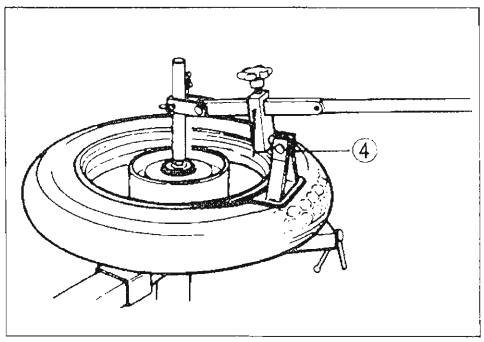
- Place the center shaft ① to the wheel, and fix the wheel with the rim holder ②.



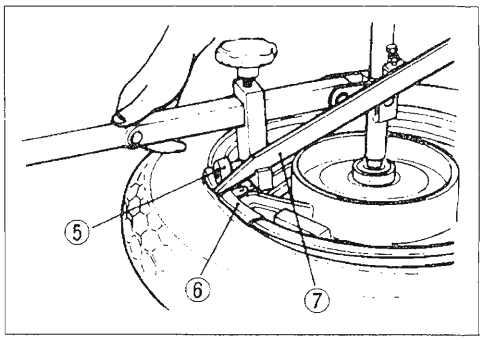
- Attach the operation arm ③ to the center shaft.



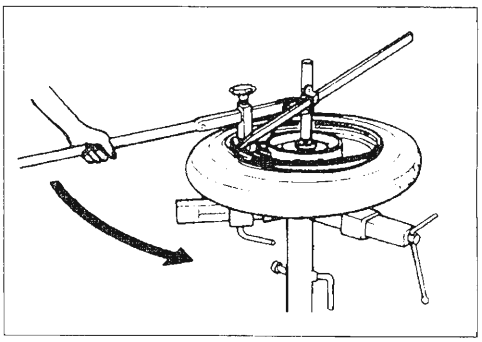
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



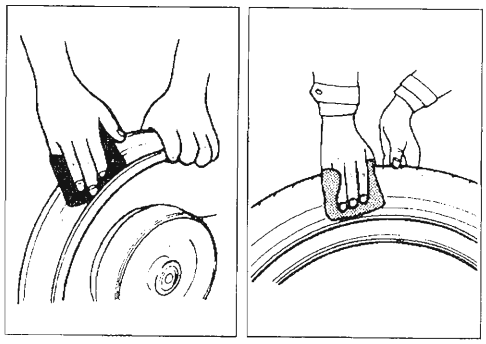
- Install the rim guide roller ⑤.
- Install the rim protector ⑥, and raise the bead with the tire lever ⑦.



- Set the tire lever against the operation arm, and rotate the lever around the rim. Repeat this procedure to remove the other bead from the rim.



INSPECTION



WHEEL

Wipe off any rubber substance or rust from the wheel, and inspect the wheel rim. If any one of the following items is observed, replace it with a new wheel.

* A distortion or crack.
* Any scratches or flaws in the bead seating area.
* Wheel runout (Axial & Radial) of more than 2.0 mm (0.08 in).

TIRE

Thoroughly inspect the removed tire, and if any one of the following items is observed, do not repair the tire. Replace with a new one.

* A puncture or a split whose total length or diameter exceeds 6.0 mm (0.24 in).
* A scratch or split at the side wall.
* Tread depth less than 1.6 mm (0.06 in) in the front tire and less than 2.0 mm (0.08 in) in the rear tire.

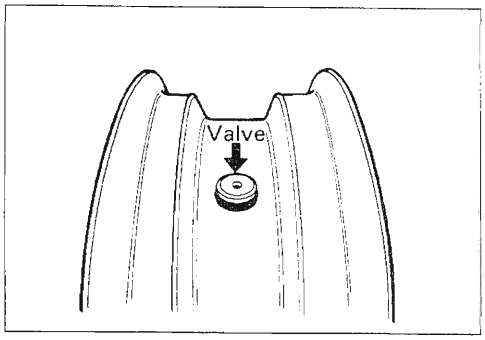
TOOL 09900-20805: Tire depth gauge

* Ply separation.
* Tread separation.
* Tread wear is extraordinarily deformed or distributed around the tire.
* Scratches at the bead.
* Cord is cut.
* Damage from skidding (flat spots).
* Abnormality in the inner liner.

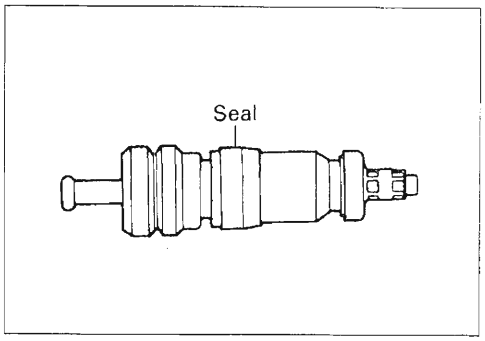
NOTE:
When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.

VALVE INSPECTION

Inspect the valve after the tire is removed from the rim, and replace with a new valve if the seal rubber has any splits or scratches.



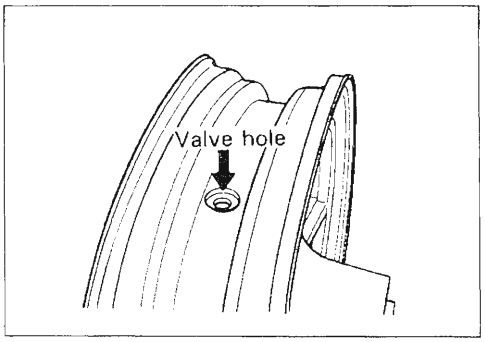
Inspect the removed valve core and replace with the new one if the seal is abnormally deformed or worn.



VALVE INSTALLATION

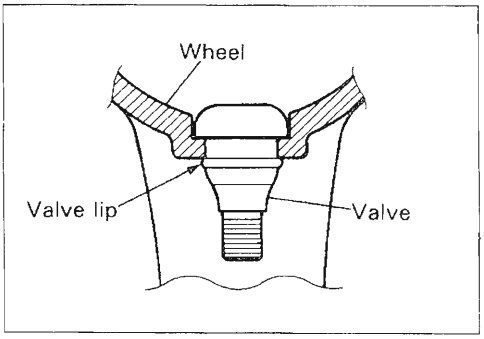
Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

NOTE:
To properly install the valve into the valve hole, apply a special tire lubricant or neutral soapy liquid to the valve.



⚠ CAUTION

Be careful not to damage the lip of valve.

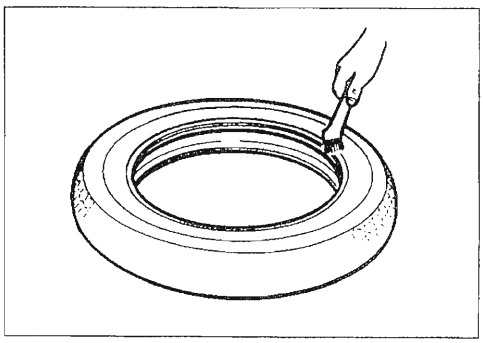


TIRE INSTALLATION

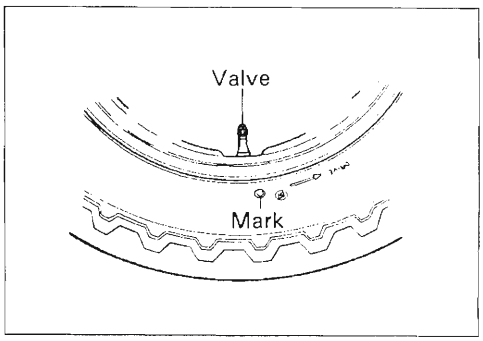
- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

⚠ CAUTION

Never apply grease, oil or gasoline to the tire bead.

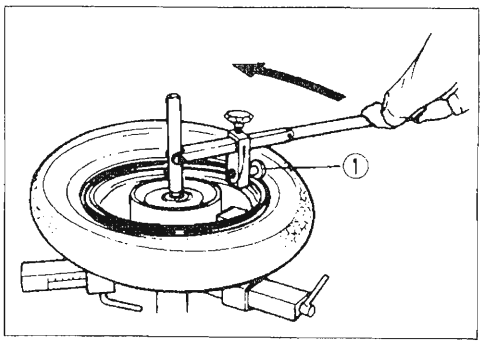


- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing mark of the tire with the valve as shown.

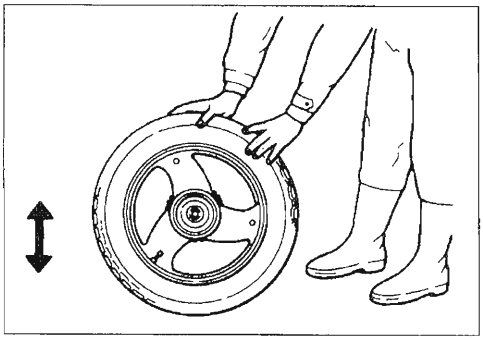


- Set the bead pushing roller ①.
- Rotate the operation arm around the rim to mount the bead completely. Do the bottom bead first, then the upper bead.
- Remove the wheel from the tire changer, and install the valve core in the valve stem.

NOTE:
Before installing the valve core, inspect the core.

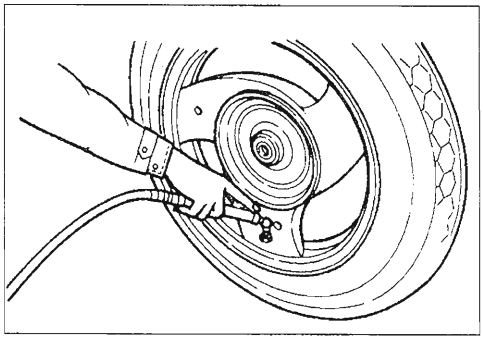


- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.



NOTE:
Before inflating, confirm that the balance mark lines up with the valve stem.

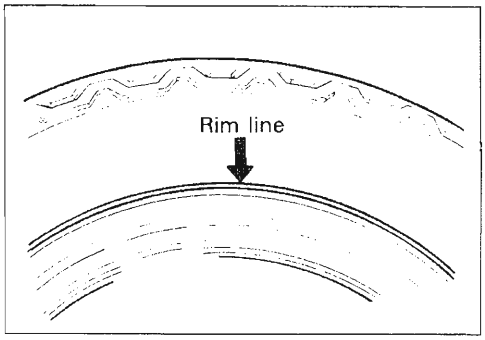
- Pump up the tire with air.



⚠ WARNING

Do not inflate the tire to more than 400 kPa (4.0 kg/cm², 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.

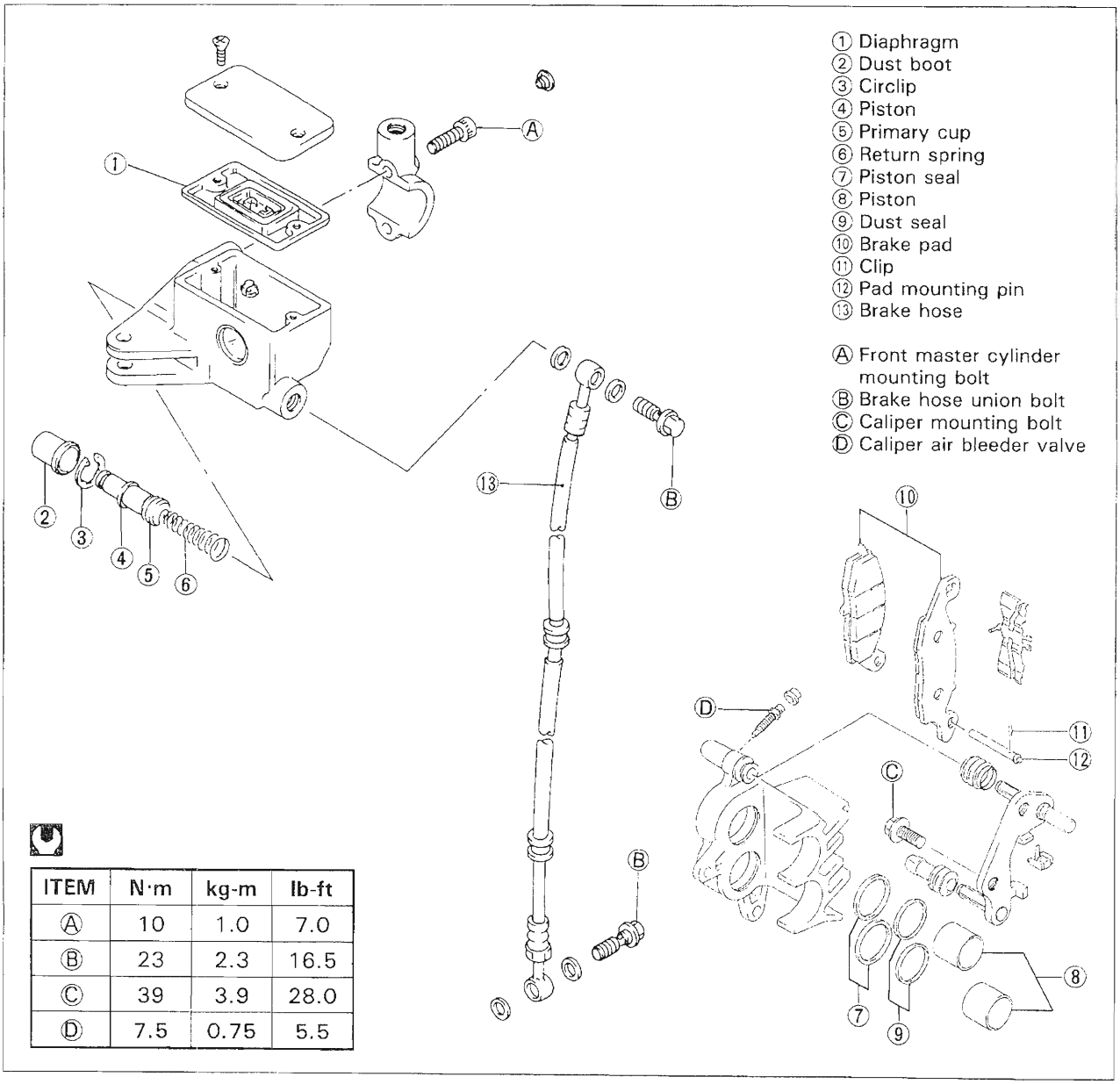
⚠ WARNING

*** 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/cm²	psi	kPa	kg/cm²	psi
FRONT	200	2.00	29	200	2.00	29
REAR	225	2.25	33	225	2.25	33

FRONT BRAKE



ITEM	N·m	kg-m	lb-ft
Ⓐ	10	1.0	7.0
Ⓑ	23	2.3	16.5
Ⓒ	39	3.9	28.0
Ⓓ	7.5	0.75	5.5

⚠ WARNING

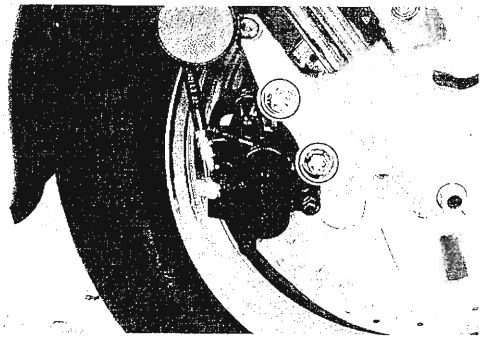
* This brake system is filled with a ethylene glycol-based DOT 4 brake fluid. Do not use or mix different types of fluid such as silicone-based or petroleum-based.
* Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored 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.

BRAKE PAD REPLACEMENT

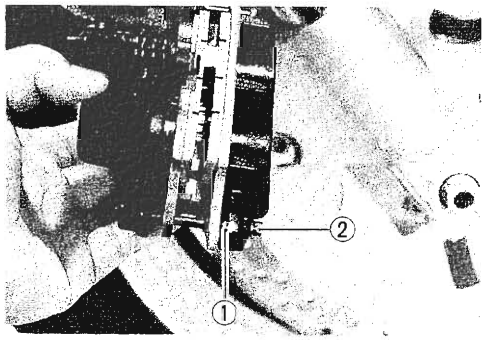
- Remove the caliper mounting bolts.
- Remove the brake pads by removing the clip ① and pad mounting pin ②.



⚠ CAUTION

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

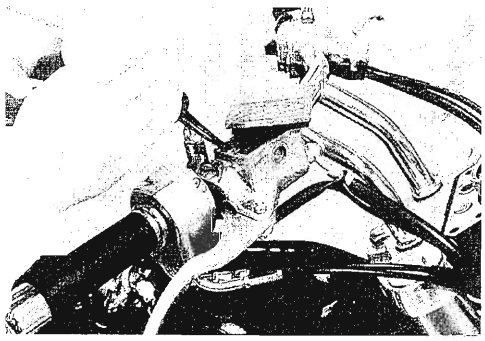
- Remount the new pads.



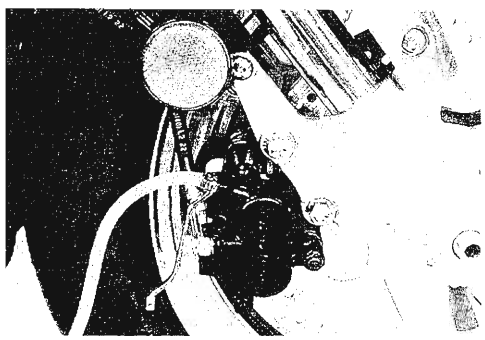
NOTE:
After replacing the brake pads, pump with the brake lever few times to operate the brake correctly and then check the brake fluid level.

BRAKE FLUID REPLACEMENT

- Place the motorcycle on a level surface and keep the handlebars straight.
- Remove the master cylinder reservoir cap and diaphragm.
- Suck up the old brake fluid as much as possible.
- Fill the reservoir with fresh brake fluid.



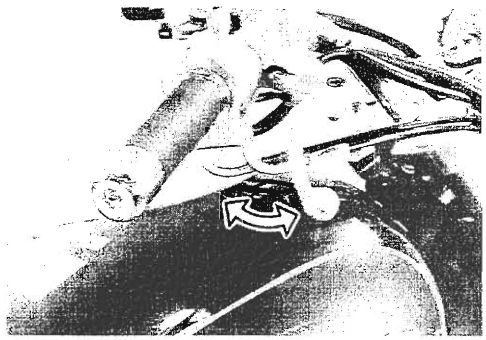
- Attach a pipe to the caliper air bleeder valve, and insert the free end of hose into a receptacle.
- Loosen the bleeder valve and pump the brake lever until no more old brake fluid flows out of the bleeder valve.
- Close the caliper air bleeder valve, and disconnect a clear hose. Fill the reservoir with fresh brake fluid to the upper end of the inspection window.



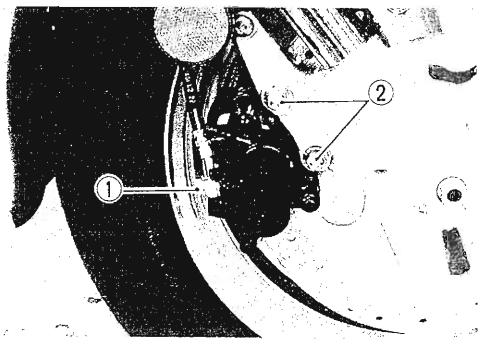
Specification and Classification: DOT 4

⚠ CAUTION

Bleed air in the brake fluid circuit. (Refer to page 2-14.)



CALIPER REMOVAL AND DISASSEMBLY



- Remove the brake hose from the caliper by removing the union bolt ① and catch the brake fluid in a suitable receptacle.
- Remove the brake caliper by removing the caliper mounting bolts ②.

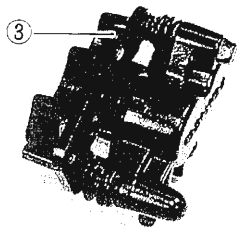
⚠ CAUTION

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 fluid leakage.

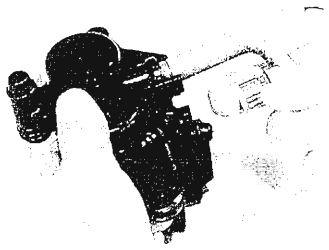
- Remove the pads. (Refer to page 6-12.)
- Remove the caliper holder ③.
- Remove the spring.



- Place a rag over the pistons to prevent its popping out and push out the pistons with an air gun.

⚠ CAUTION

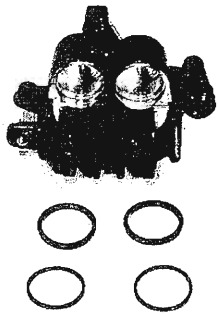
Do not use high pressure air to prevent piston damage.



- Remove the dust seals and piston seals.

⚠ CAUTION

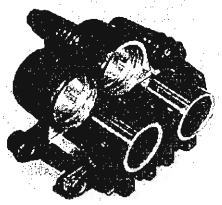
Do not reuse the dust seals and piston seals to prevent fluid leakage.



CALIPER INSPECTION

CALIPER

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



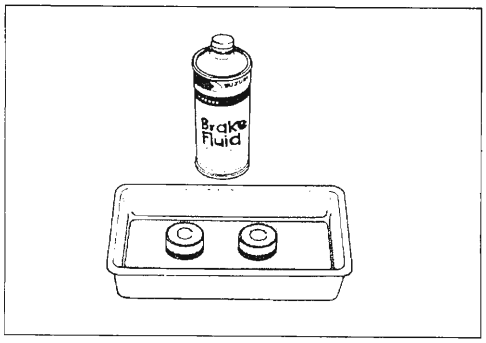
PISTON

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:

- Wash the caliper bores and pistons with specified brake fluid. Particularly wash the dust seal grooves and piston seal grooves.



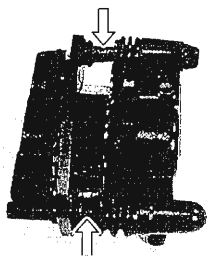
BF **Specification and Classification: DOT 4**

⚠ 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.**

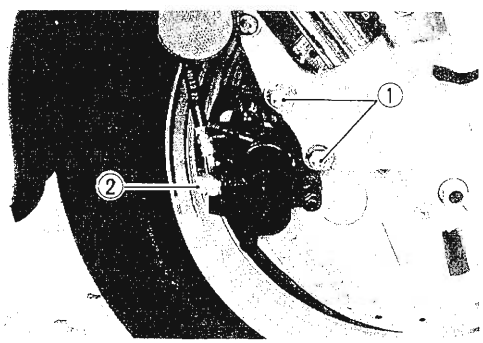
- Apply SUZUKI SILICONE GREASE to the caliper axles.

99000-25100: SUZUKI SILICONE GREASE



- Tighten each bolt to the specified torque.

Caliper mounting bolt ①: 39 N·m (3.9 kg-m, 28.0 lb-ft)
Brake hose union bolt ②: 23 N·m (2.3 kg-m, 16.5 lb-ft)

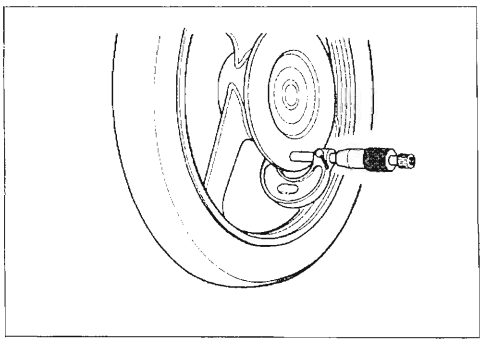


NOTE:
Before remounting the caliper, push the piston all the way into the caliper.

⚠ CAUTION

Bleed air from the system after reassembling the caliper. (Refer to page 2-14.)

BRAKE DISC INSPECTION

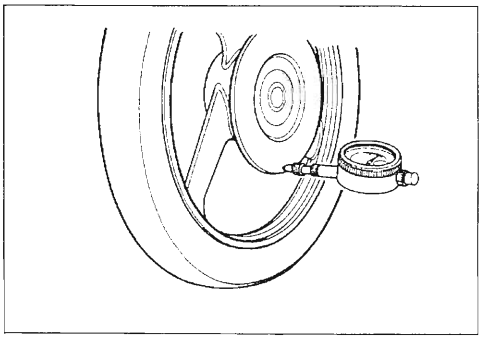


- Remove the front wheel. (Refer to page 6-2.)

Visually check the brake disc for damage or cracks.
Measure the thickness with a micrometer.
Replace the disc if the thickness is less than the service limit or if damage is found.

Service Limit
Front disc: 4.0 mm (0.16 in)

TOOL 09900-20205: Micrometer (0—25 mm)



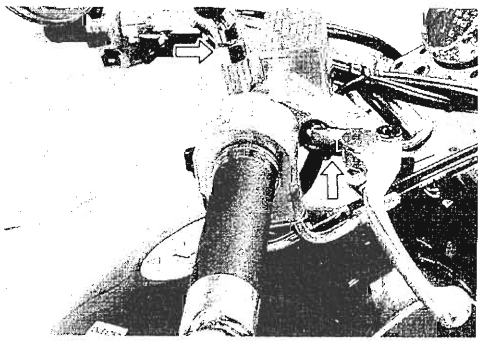
Measure the runout with a dial gauge.
Replace the disc if the runout exceeds the service limit.

Service Limit
Front disc: 0.30 mm (0.012 in)

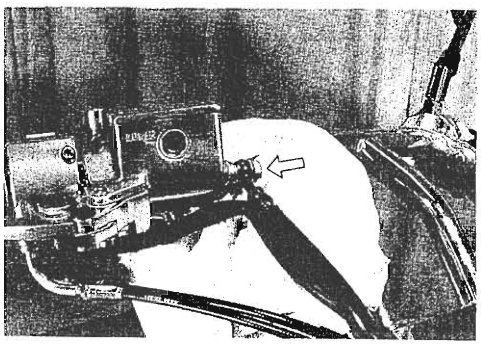
TOOL 09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand

- Remove the disc. (Refer to page 6-3.)
- Install the disc. (Refer to page 6-5.)

MASTER CYLINDER REMOVAL AND DISASSEMBLY



- Disconnect the front brake light switch lead wires and remove the rear-view mirror.

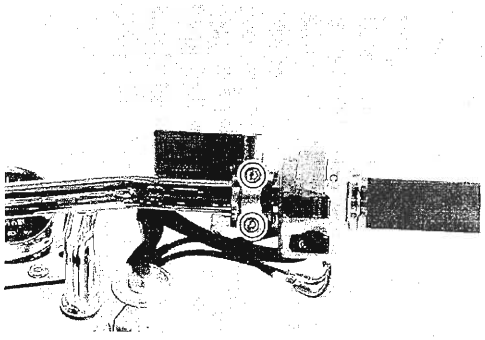


- Place a rag underneath the union bolt on the master cylinder to catch any spilled drops of brake fluid. Remove the union bolt and disconnect the brake hose.

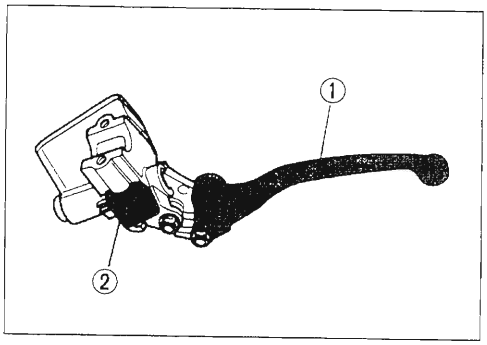
⚠ CAUTION

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

- Remove the master cylinder assembly.

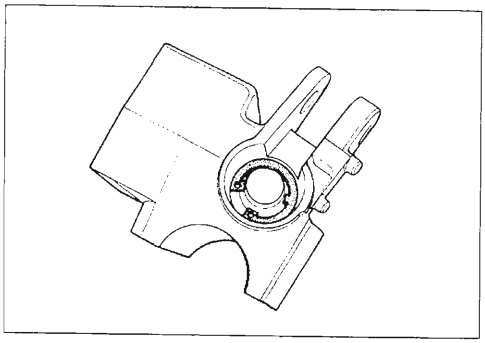


- Remove the brake lever ① and brake light switch ②.
- Remove the reservoir cap and diaphragm.
- Drain brake fluid.



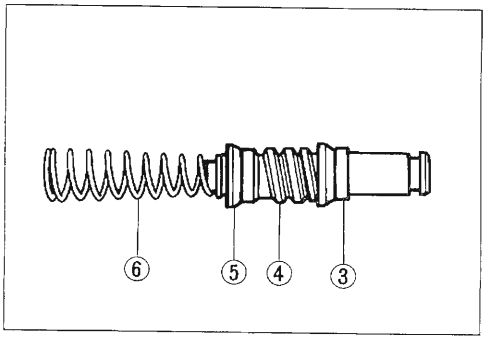
- Pull the dust boot out and remove the circlip.

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



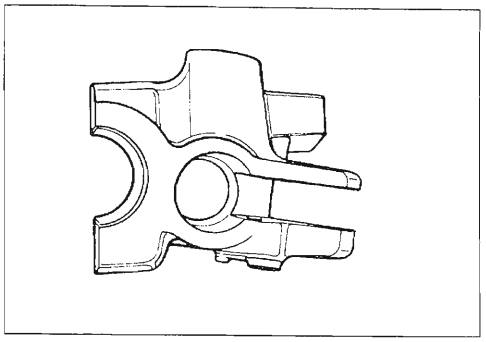
- Remove the piston, secondary cup, primary cup and return spring.

③ Secondary cup
④ Piston
⑤ Primary cup
⑥ Return spring



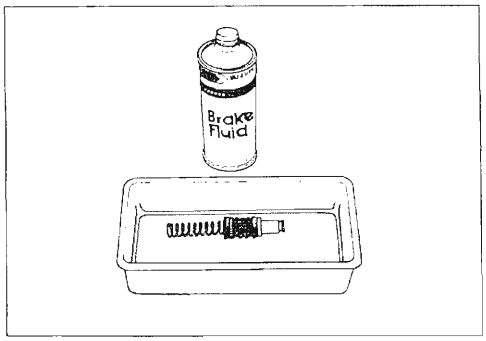
MASTER CYLINDER INSPECTION

Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the primary cup, secondary cup and dust seal for wear or damage.



MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

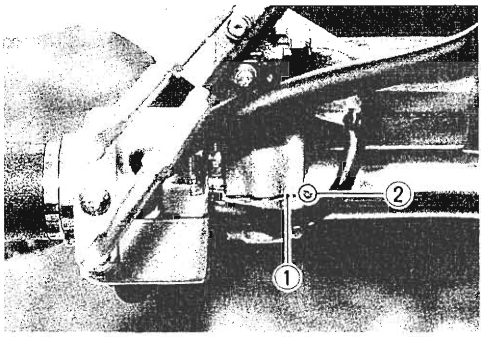


⚠ CAUTION

*** Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.**
*** Do not wipe the components with a rag.**
*** Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.**

Specification and Classification: DOT 4

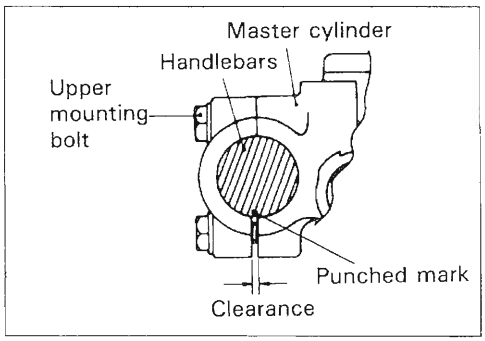
- When remounting the master cylinder on the handlebars, align the master cylinder holder's mating surface ① with punched mark ② on the handlebars and tighten the upper mounting bolt first as shown.



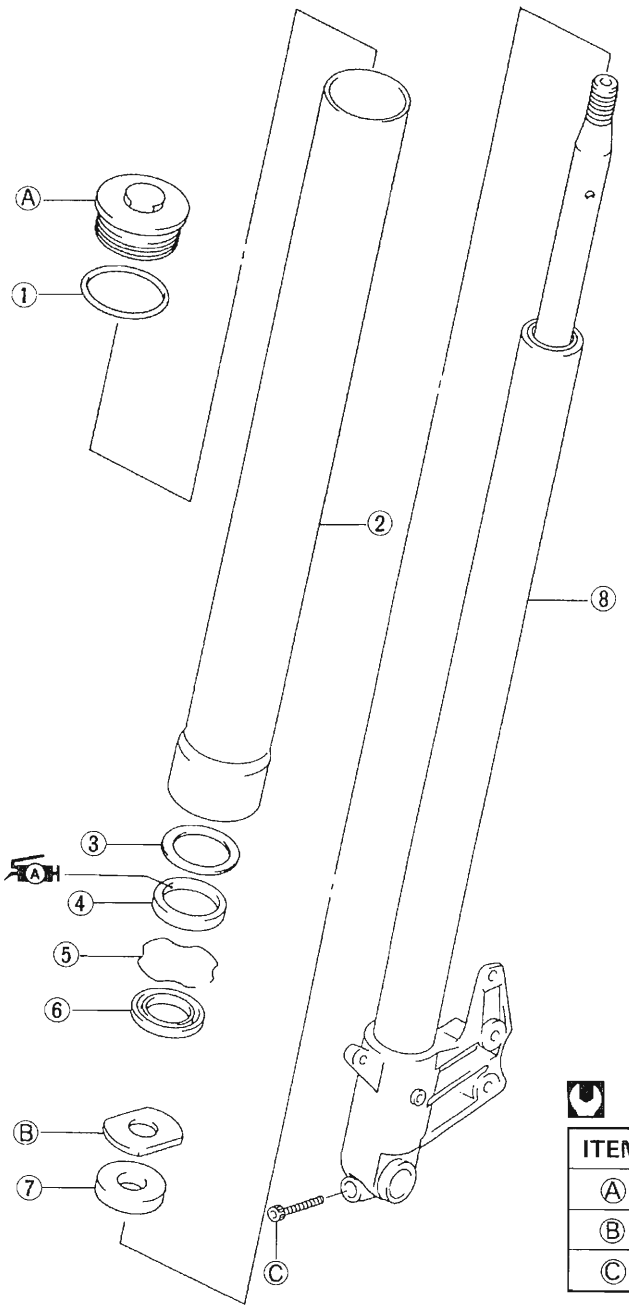
Front master cylinder mounting bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

⚠ CAUTION

Bleed air from the system after reassembling master cylinder. (Refer to page 2-14.)



FRONT FORK



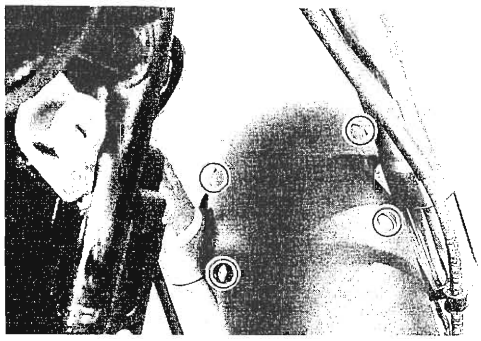
① O-ring
② Outer tube
③ Oil seal retainer
④ Oil seal
⑤ Oil seal stopper ring
⑥ Dust seal
⑦ Rubber cushion
⑧ Damper/inner tube

Ⓐ Front fork cap bolt
Ⓑ Lock nut
Ⓒ Front axle pinch bolt

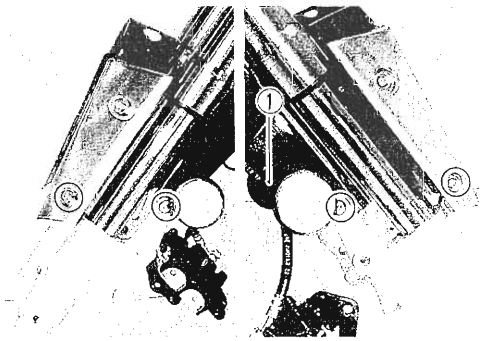
ITEM	N·m	kg-m	lb-ft
Ⓐ	23	2.3	16.5
Ⓑ	40	4.0	29.0
Ⓒ	23	2.3	16.5

REMOVAL AND DISASSEMBLY

- Remove the front wheel. (Refer to page 6-2.)
- Remove the front fender by removing the four bolts.



- Remove the brake hose from the hose guide ①.
- Remove the fender brace with fork lower covers by removing the mounting bolts.

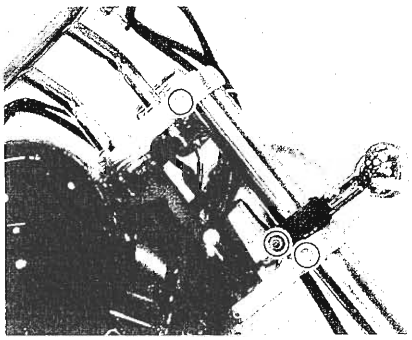


⚠ CAUTION

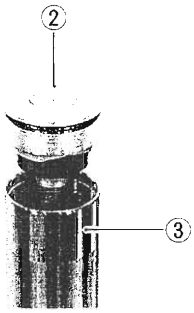
Hang the brake caliper from the motorcycle frame by using a string and so on, taking care not to bend the brake hose.

- Loosen the front fork upper and lower clamp bolts and the turn signal light clamp bolts.
- Remove the front forks.

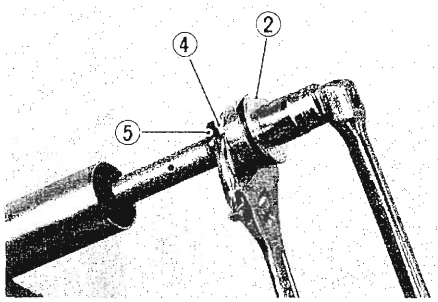
NOTE:
Slightly loosen the front fork cap bolt to facilitate later disassembly.



- Separate the front fork cap bolt ② and outer tube ③ by loosening the cap bolt.

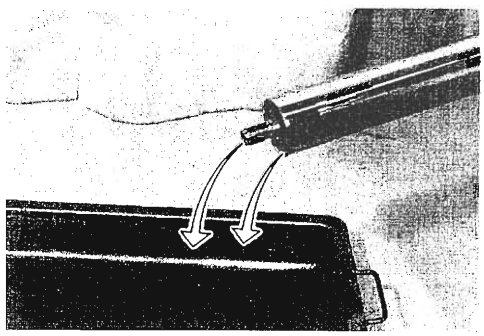


- Loosen the lock nut ④.
- Remove the cap bolt ②, lock nut and rubber cushion ⑤.

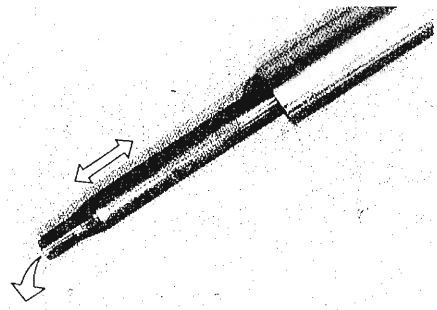


- Turn the fork upside down and drain fork oil.
- Hold the fork upside down for a few minutes to drain oil.

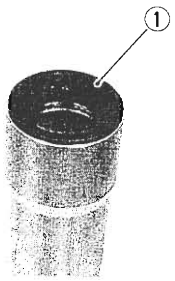
NOTE:
When draining fork oil, pull the outer tube out very slowly from the damper/inner tube.



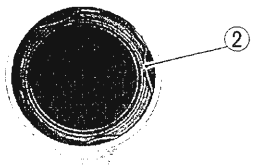
- Stroke the damper several times to let out fork oil from the damper.



- Remove the dust seal ① from the outer tube.

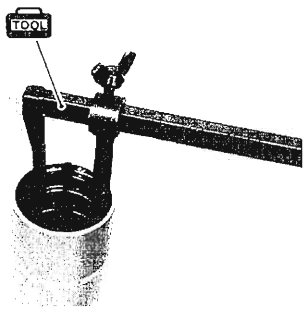


- Remove the oil seal stopper ring ②.



- Remove the oil seal with the special tool.

TOOL **09913-50121: Oil seal remover**



⚠ CAUTION

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

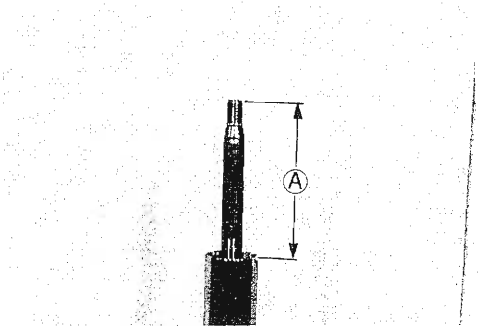
- Remove the oil seal retainer ③.

INSPECTION

DAMPER/INNER TUBE

Measure the height Ⓐ for fork spring set length as shown in the photo. If it is shorter than the service limit, replace the damper/inner tube with a new one may be damaged the fork spring.

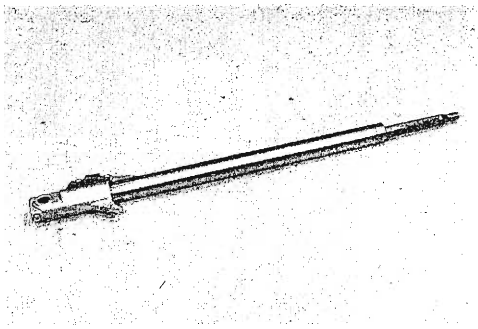
Service Limit Ⓐ: 156 mm (6.1 in)



Inspect the damper/inner tube for wear or damage.

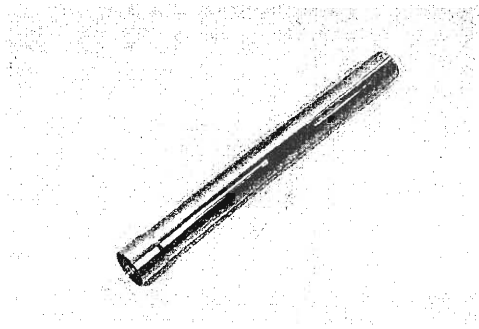
⚠ CAUTION

Do not attempt to disassemble the damper/inner tube. It is unserviceable.



OUTER TUBE

Inspect the outer tube for wear or damage.



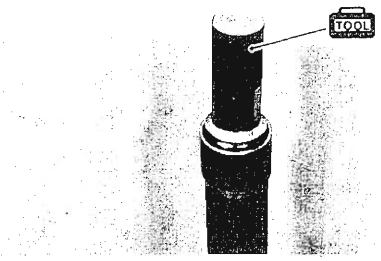
REASSEMBLY AND REMOUNTING

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

OIL SEAL

- Install the new oil seal to the outer tube with the special tool after installing the oil seal retainer.

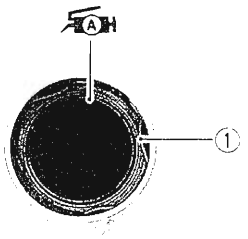
TOOL **09913-70122: Oil seal installer**



- Install the oil seal stopper ring ①.

⚠ CAUTION

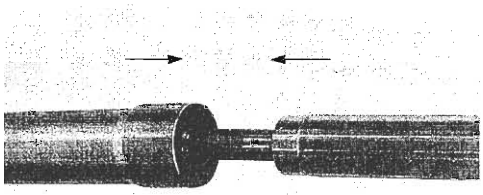
Make sure that the oil seal stopper ring fitted securely.



- Apply grease to the lip of oil seal.

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

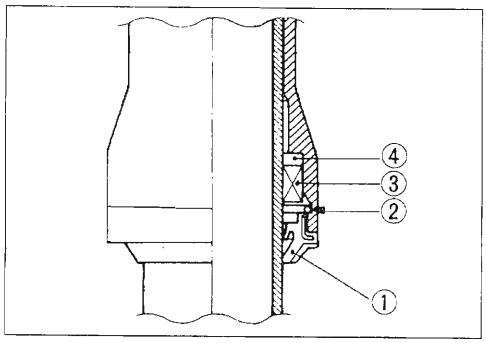
- Install the dust seal.
- Install the outer tube to the damper/inner tube.



⚠ CAUTION

Be careful not to damage the lip of oil seal when installing the outer tube.

①: Dust seal
②: Oil seal stopper ring
③: Oil seal
④: Oil seal retainer



FORK OIL

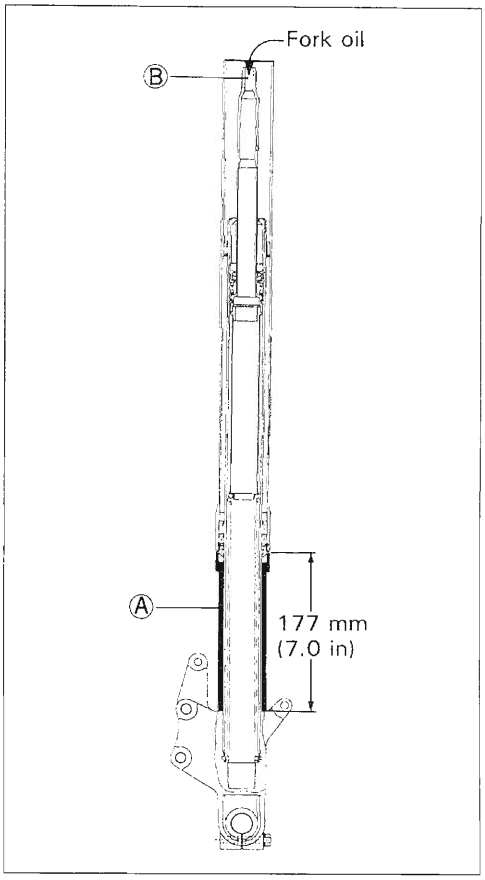
- Pour specified fork oil into the front fork and adjust fork oil level as follows.

Fork oil type: Fork oil #15

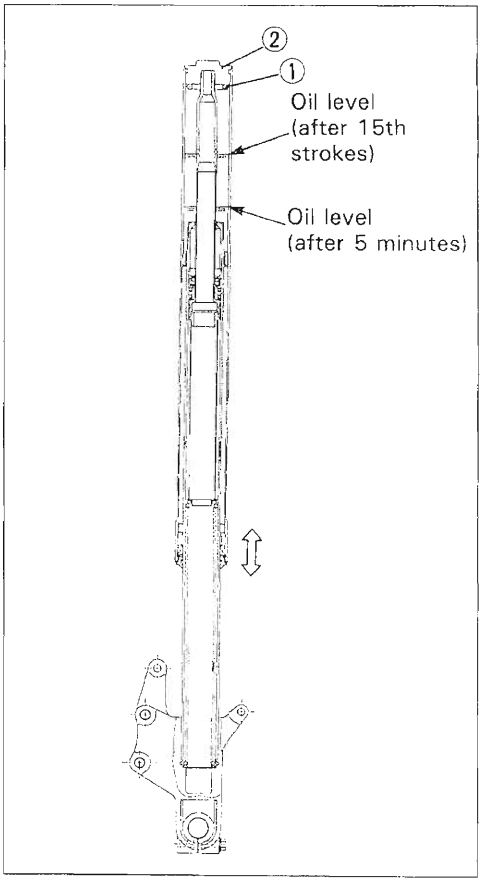
99000-99044-15G: SUZUKI FORK OIL #15

Capacity (each leg): 838 ml (28.3/29.5 US/Imp oz)

- Prepare the outer tube holder ring Ⓐ with cardboard etc. as shown in the illustration.
- Set the holder ring Ⓐ between the outer tube and axle bracket as shown in the illustration.
- Hold the front fork vertical, and pour specified oil into the damper Ⓑ approx. 800 ml.



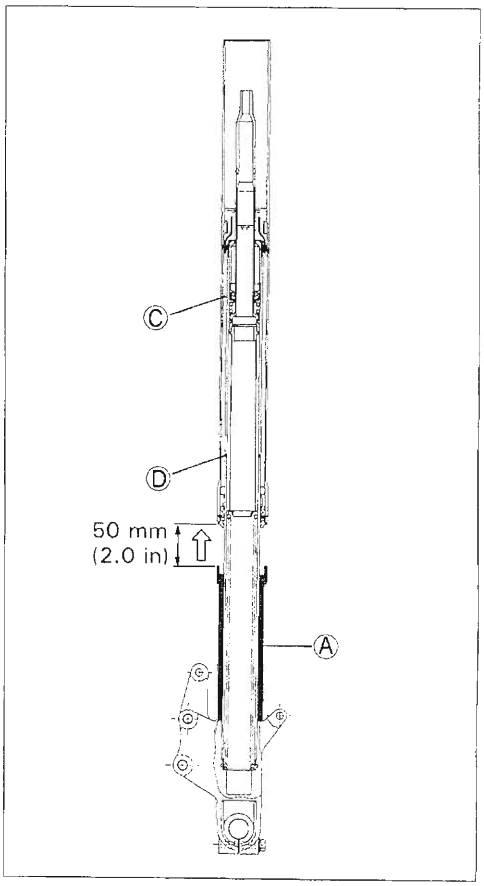
- Remove the holder ring.
- Install the lock nut ① and cap bolt ② to the damper rod and tighten the lock nut.
- Tighten the cap bolt to the outer tube.
- Compress and rebound the front fork slowly about 15th strokes at vertical position.
- Keep the front fork at 5 minutes at vertical positions.



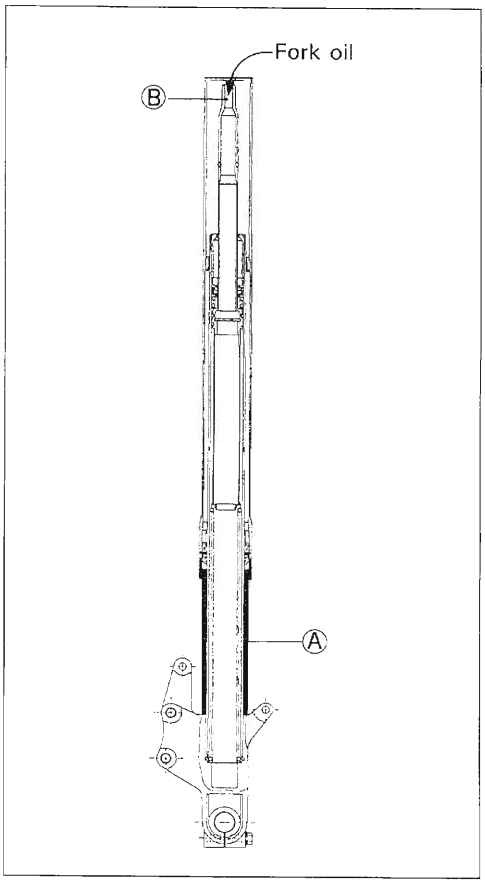
- Set the holder ring Ⓐ after removing the cap bolt and lock nut.
- Raise the outer tube 50 mm (2.0 in) from the upper surface of the holder ring Ⓐ to fill fork oil to the oil chamber Ⓒ.
- Keep the outer tube above position until no longer contains air bubbles.

NOTE:
Do not raise the outer tube over 70 mm to protect oil leakage from the hole Ⓓ of damper.

- Lower the outer tube slowly to touch the holder ring Ⓐ.



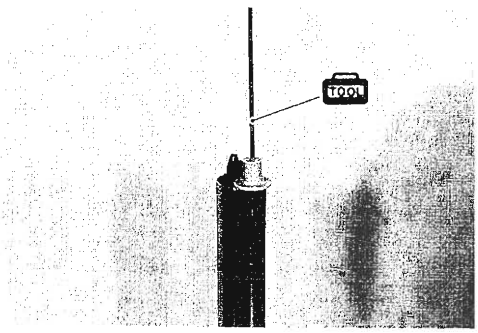
- Pour specified fork oil into the damper Ⓑ to the upper surface of the outer tube.
- Reraise the outer tube slowly 50 mm (2.0 in) from the upper surface of the holder ring Ⓐ.
- Lower the outer tube slowly to the holder ring Ⓐ.
- Keep the outer tube above position at 5 minutes.

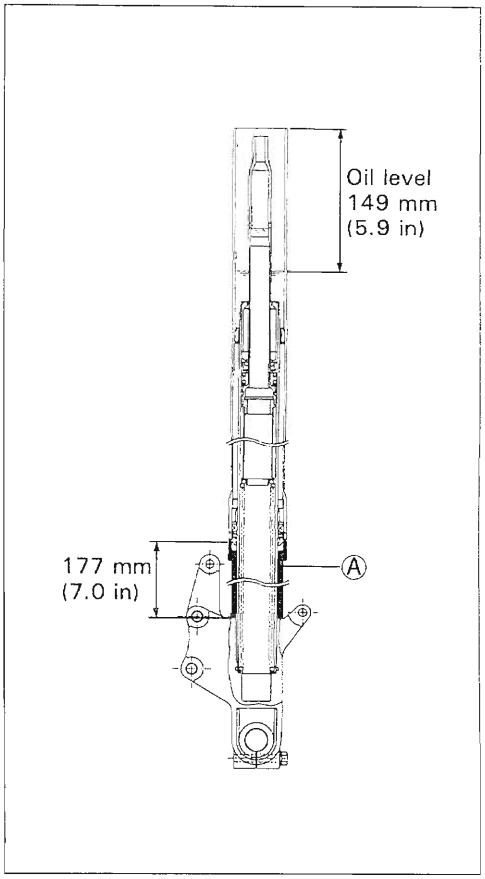


- Set the holder ring Ⓐ.
- Hold the front fork vertical and adjust the fork oil level with the special tool.

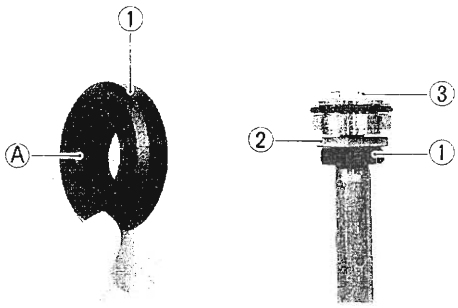
09943-74111: Fork oil level gauge

Oil level: 149 mm (5.9 in)



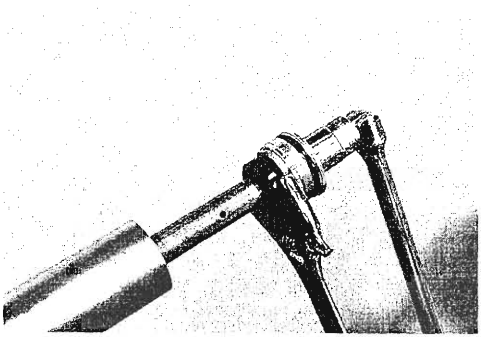


- Clean the thread of damper with an air gun.
- When installing the rubber cushion ①, face the tapared portion Ⓐ of the cushion to the bottom.
- Install the lock nut ② to the lowest position of thread.
- Tighten the cap bolt ③ with finger.



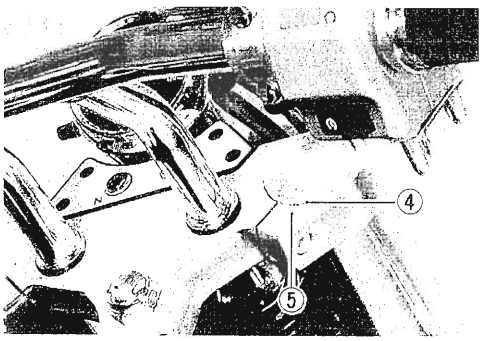
- Tighten the lock nut to the specified torque.

Lock nut: 40 N·m (4.0 kg-m, 29.0 lb-ft)



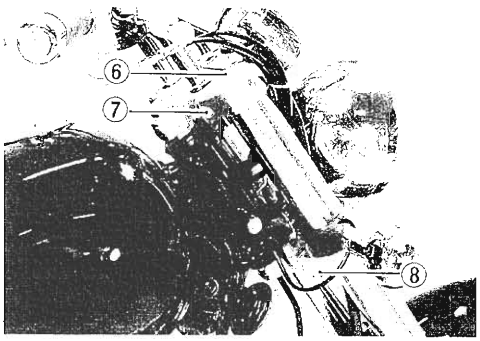
FRONT FORK REMOUNTING

- Align the top surface ④ of the inner tube with top surface ⑤ of the steering stem upper bracket.



- Tighten each bolt to the specified torque.

Front fork cap bolt ⑥: 23 N·m (2.3 kg-m, 16.5 lb-ft)
Upper clamp bolt ⑦: 23 N·m (2.3 kg-m, 16.5 lb-ft)
Lower clamp bolt ⑧: 33 N·m (3.3 kg-m, 24.0 lb-ft)

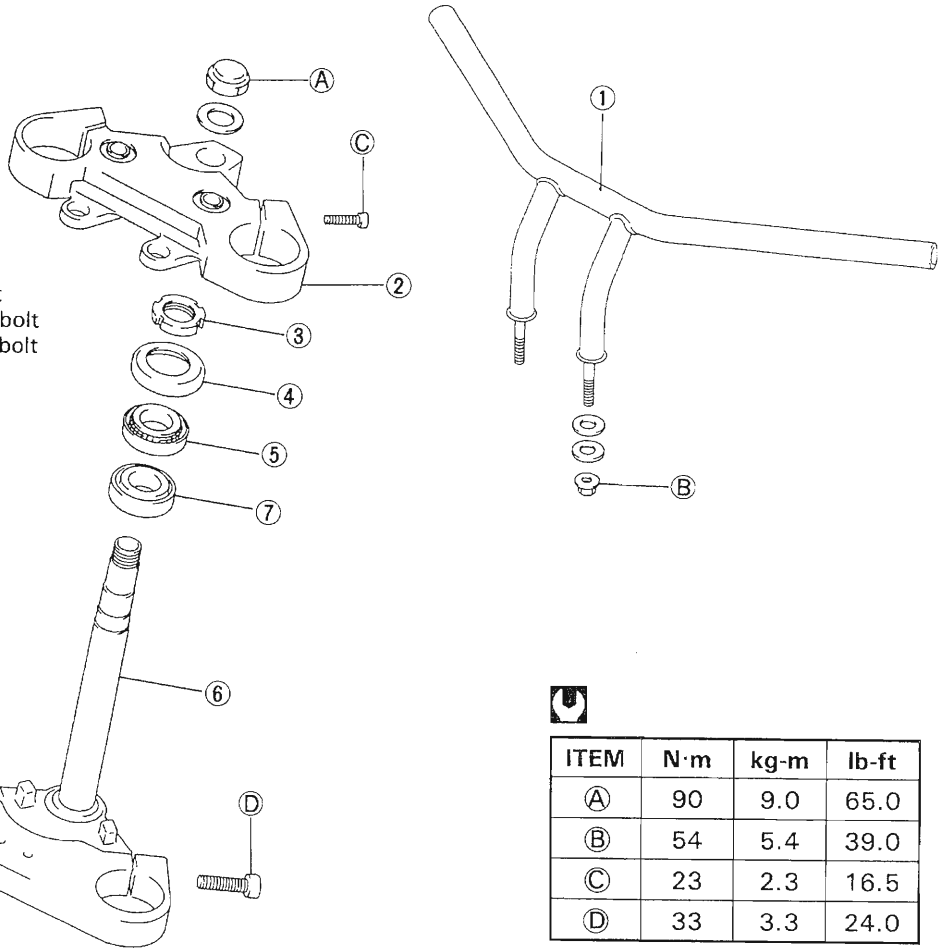


- Install the front fender brace and tighten the mounting bolts with finger.
- Install the front wheel. (Refer to page 6-5.)
- Swing the motorcycle up and down several times.
- Tighten the front fender brace mounting bolts.

STEERING

① Handlebars
② Steering stem head
③ Steering stem nut
④ Dust seal
⑤ Steering stem upper bearing
⑥ Steering stem
⑦ Steering stem lower bearing

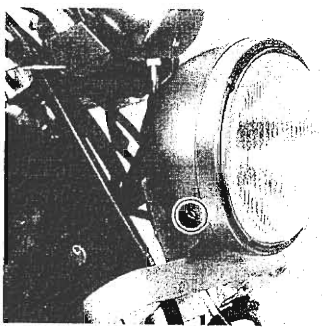
Ⓐ Steering stem head nut
Ⓑ Handlebar mounting nut
Ⓒ Front fork upper clamp bolt
Ⓓ Front fork lower clamp bolt



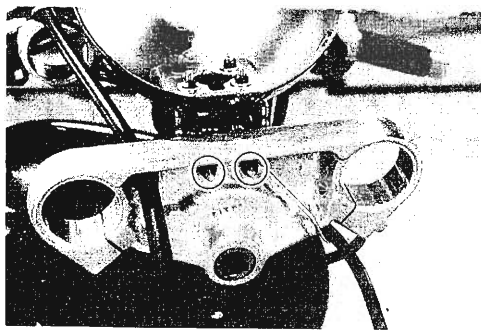
ITEM	N·m	kg-m	lb-ft
Ⓐ	90	9.0	65.0
Ⓑ	54	5.4	39.0
Ⓒ	23	2.3	16.5
Ⓓ	33	3.3	24.0

REMOVAL AND DISASSEMBLY

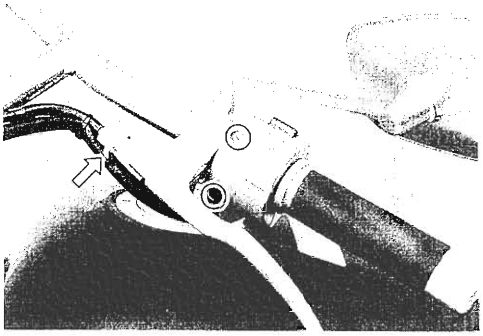
- Remove the front wheel. (Refer to page 6-2.)
- Remove the front fork. (Refer to page 6-19.)
- Remove the headlight mounting screws.
- Remove the headlight by disconnecting the lead wires.



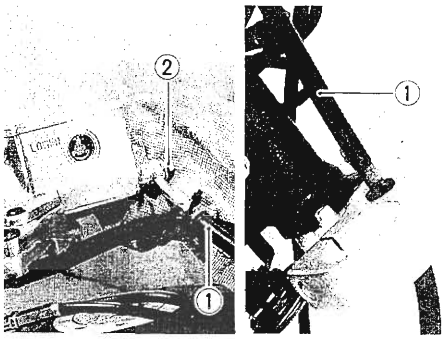
- Remove the headlight housing with housing bracket.



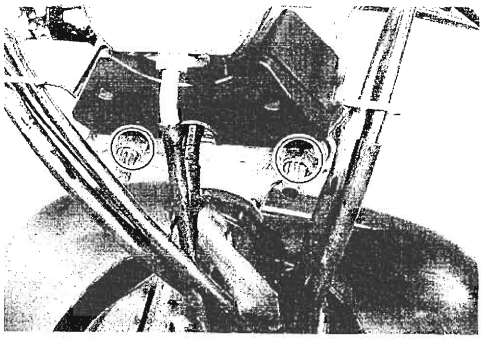
- Remove the clutch cable from the clutch lever.
- Remove the left handlebar switch from the handlebars.



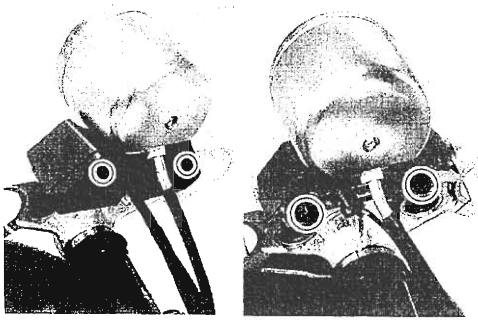
- Remove the brake hose ① from the steering stem by removing the union bolt ②.
- Remove the master cylinder. (Refer to page 6-16.)
- Remove the right handlebar switch and throttle cables.



- Remove the handlebars by removing the mounting nuts.



- Remove the indicator light lower cover.
- Remove the speedometer assembly.

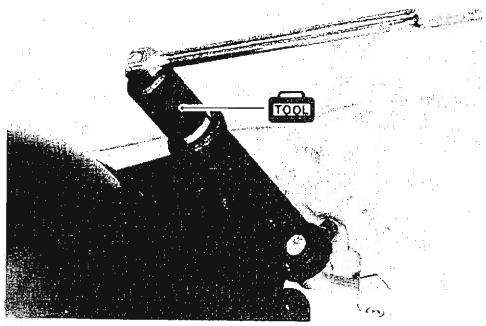


- Remove the steering stem head by removing the steering stem head nut.

• Remove the steering stem nut by using the special tool, then remove the steering stem.

TOOL **09940-14911: Steering stem nut wrench**

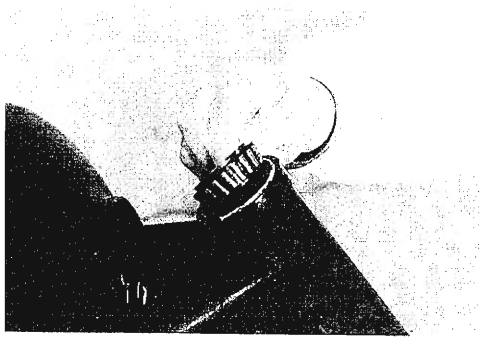
NOTE:
Hold the steering stem by hand to prevent it from falling.



INSPECTION AND DISASSEMBLY

Inspect the removed parts for the following abnormalities.
* Handlebars distortion
* Race wear and brinelling
* Bearing wear or damage
* Abnormal noise of bearing
* Distortion of steering stem

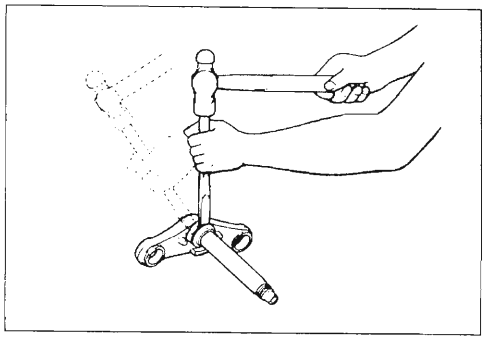
• Remove the steering stem upper bearing.



• Remove the steering stem lower bearing by using the chisel.

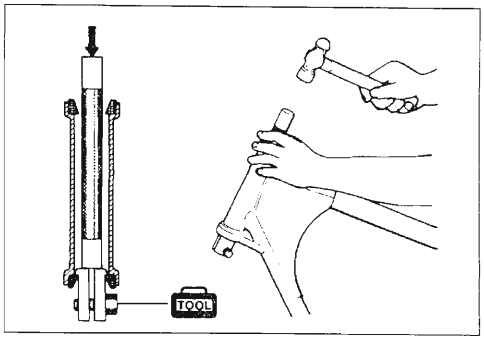
⚠ CAUTION

The removed bearing should be replaced with a new one.



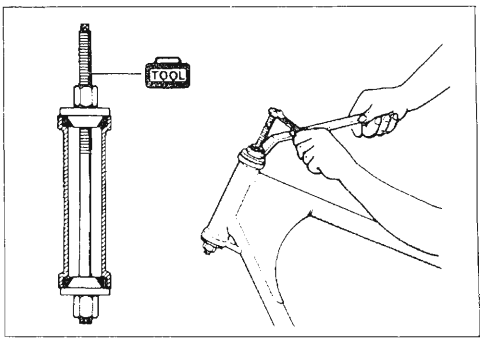
• Drive out the steering stem bearing races, upper and lower, by using the special tool and appropriate steel pipe.

TOOL **09941-54911: Bearing outer race remover**



REASSEMBLY AND REMOUNTING

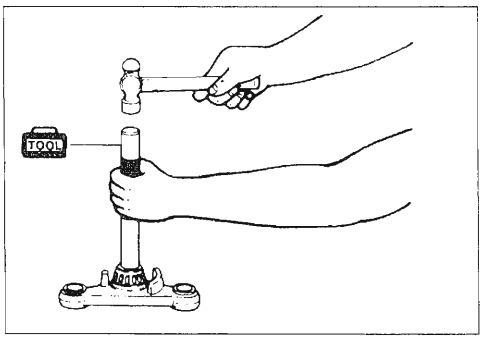
Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:



OUTER RACES

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

09941-34513: Steering race installer



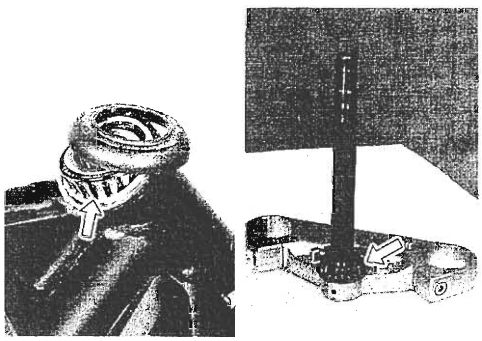
BEARING

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

09941-74910: Steering bearing installer

- Apply SUZUKI SUPER GREASE "A" to the upper and lower bearings before remounting the steering stem.

99000-25030: SUZUKI SUPER GREASE "A"

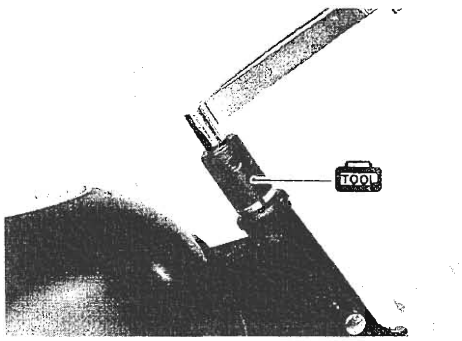


STEM NUT

- Tighten the steering stem nut to the specified torque.

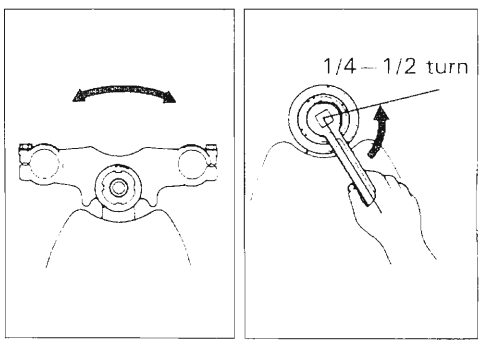
09940-14911: Steering stem nut wrench

Steering stem nut: 45 N·m (4.5 kg-m, 32.5 lb-ft)



- Turn the steering stem about five or six times to the left and right so that the taper roller bearing will be seated properly.
- Turn back the stem nut by 1/4 — 1/2 turn.
  Then retighten very lightly so that no play can be defected in the stem.

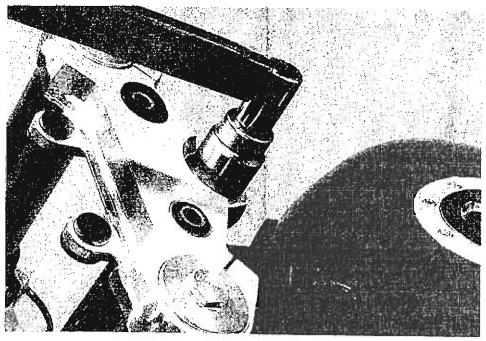
NOTE:
This adjustment will vary from motorcycle to motorcycle.

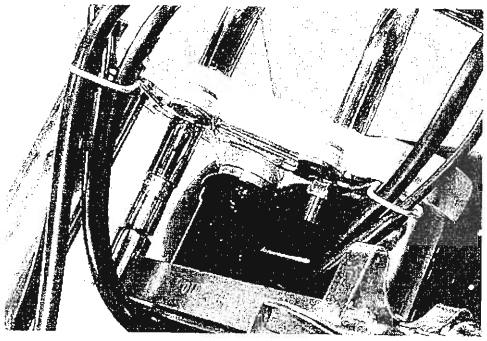


- Tighten the steering head nut and handlebar mounting nuts to the specified torque.

Steering stem head nut: 90 N·m (9.0 kg-m, 65.0 lb-ft)
Handlebar mounting nut: 54 N·m (5.4 kg-m, 39.0 lb-ft)

NOTE:
Before tighten the steering stem head nut, install the front fork temporarily.

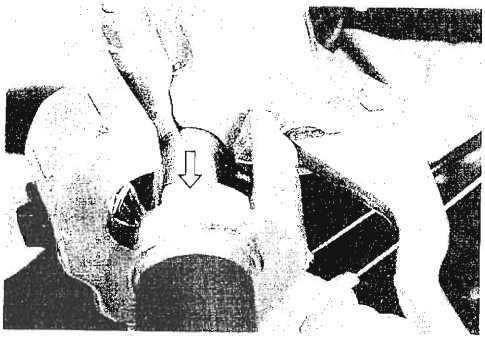




- Tighten the front fork upper and lower clamp bolts. (Refer to page 6-25.)
- Apply grease to the throttle grip.

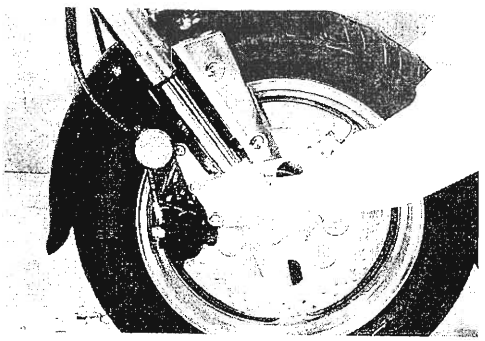
A: 99000-25030: SUZUKI SUPER GREASE "A"

- Adjust the throttle cable play. (Refer to page 2-9.)
- Install the front wheel. (Refer to page 6-5.)

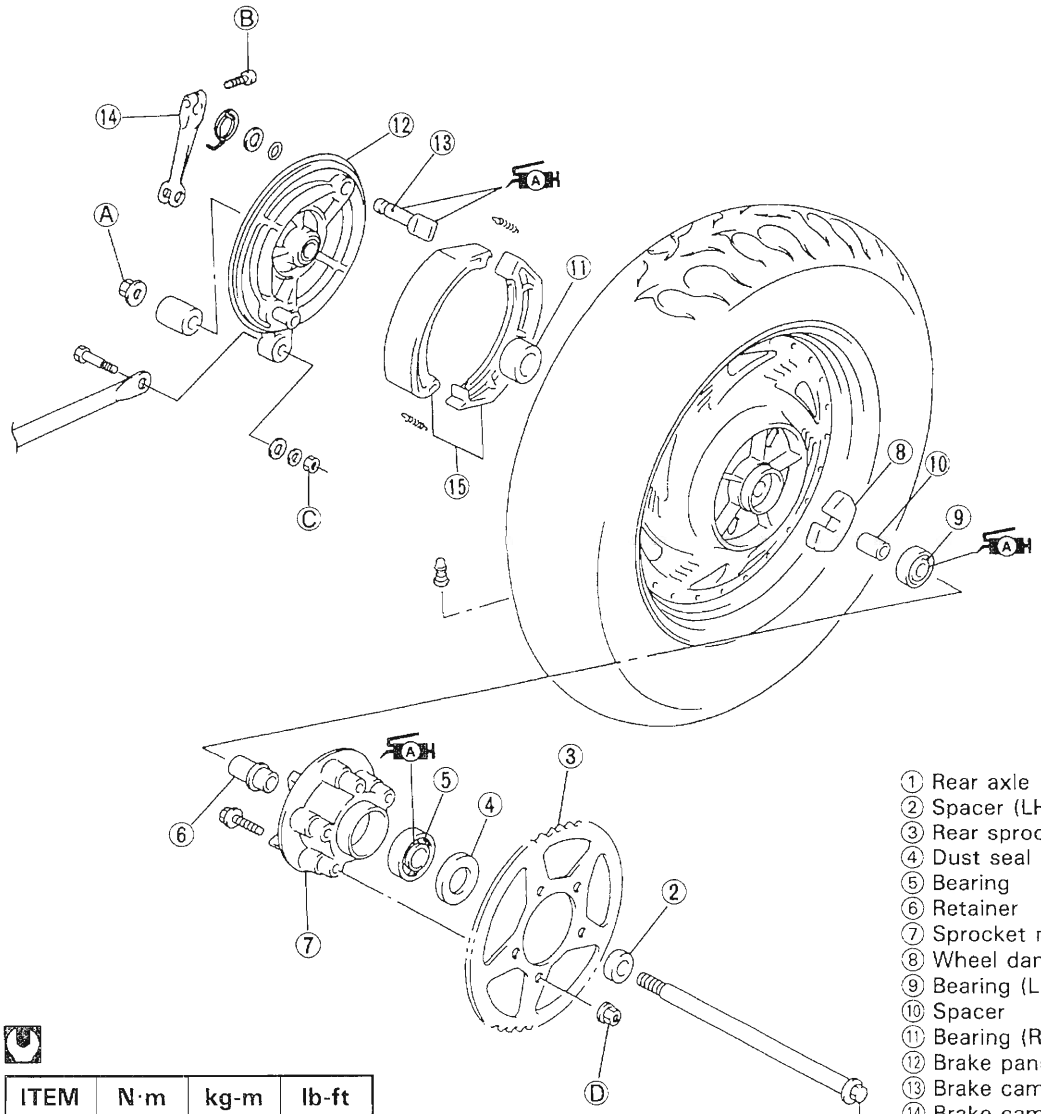


STEERING TENSION ADJUSTMENT

- Check the steering movement after reassemble and re-mount the all parts.
- If play is found, adjust it in following procedure.
  1) First, loosen the front fork upper clamp bolts and steering stem head nut, and then adjust the steering stem nut by loosening or tightening it.
  2) Tighten the steering stem head nut and clamp bolts to the specified torque and re-check.



REAR WHEEL AND BRAKE



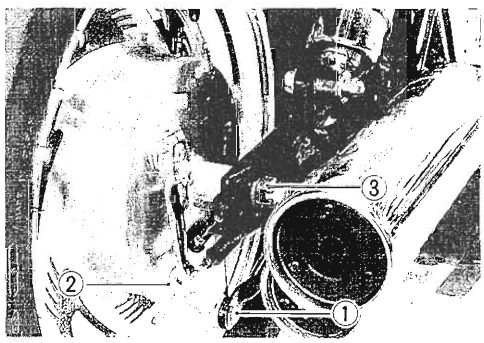
ITEM	N·m	kg-m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	10	1.0	7.0
Ⓒ	25	2.5	18.0
Ⓓ	50	5.0	36.0

① Rear axle
② Spacer (LH)
③ Rear sprocket
④ Dust seal
⑤ Bearing
⑥ Retainer
⑦ Sprocket mounting drum
⑧ Wheel damper
⑨ Bearing (LH)
⑩ Spacer
⑪ Bearing (RH)
⑫ Brake panel
⑬ Brake camshaft
⑭ Brake cam lever
⑮ Brake shoe

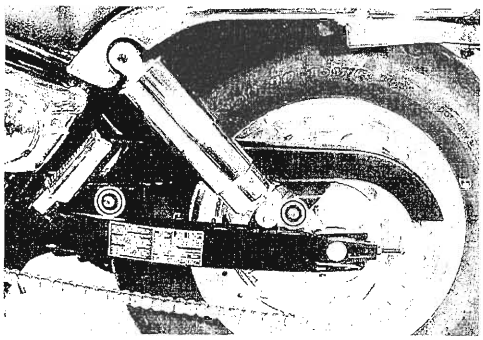
Ⓐ Rear axle nut
Ⓑ Rear brake cam lever bolt
Ⓒ Rear torque link nut
Ⓓ Rear sprocket nut

REMOVAL

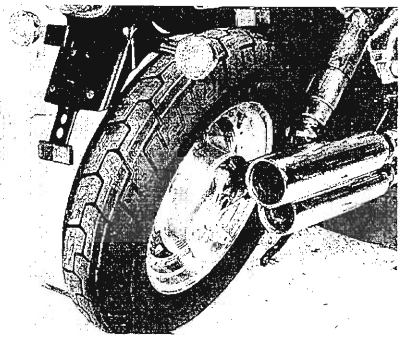
- Remove the rear torque link nut and bolt ①.
- Remove the rear brake adjuster ② and brake cable.
- Remove the cotter pin. (For Canada and U.S.A.)
- Loosen the rear axle nut ③.



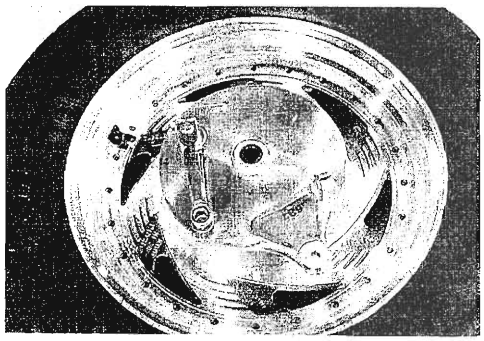
- Remove the chain case.



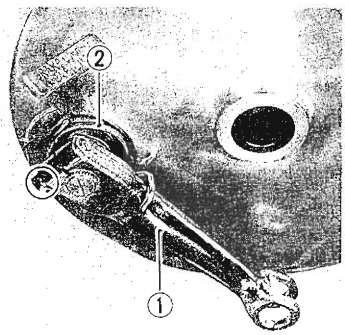
- Support the motorcycle with a jack.
- Remove the axle nut and rear axle.
- Remove the rear wheel by disengaging the drive chain.



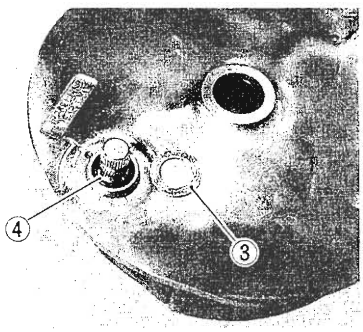
- Remove the rear brake assembly from the wheel.



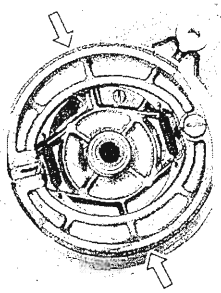
- Remove the rear brake cam lever ① and spring ②.



- Remove the washer ③ and O-ring ④.

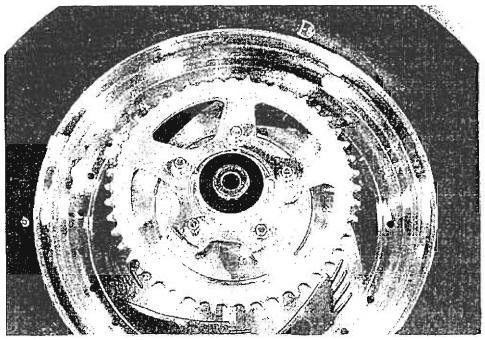


- Remove the brake shoes.

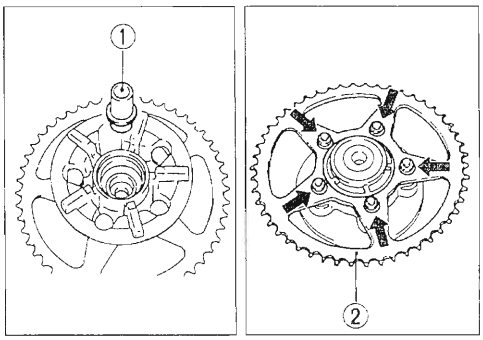


- Remove the rear sprocket mounting drum from the wheel.

NOTE:
Slightly loosen the rear sprocket mounting nuts to facilitate later disassembly before separate the mounting drum.



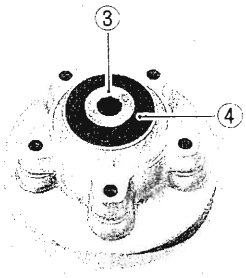
- Remove the drum retainer ①.
- Remove the rear sprocket ②.



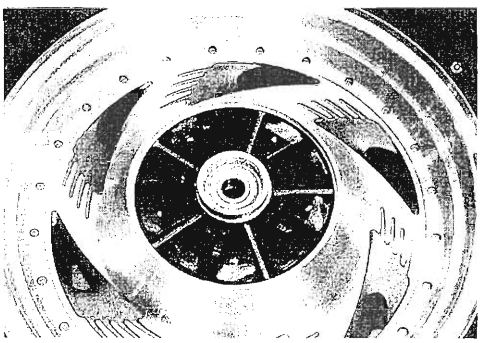
- Remove the spacer ③ and dust seal ④.

⚠ CAUTION

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



- Remove the wheel dampers.



INSPECTION AND DISASSEMBLY

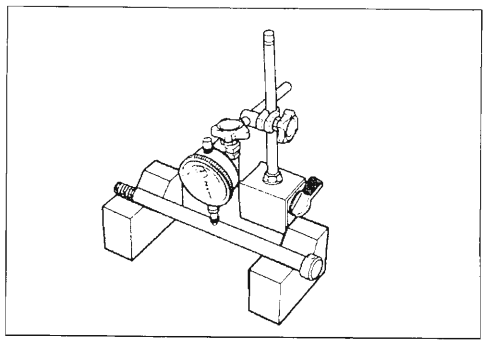
TIRE ..... Refer to page 6-3.
REAR WHEEL ..... Refer to page 6-3.
WHEEL BEARING ..... Refer to page 6-3.

REAR AXLE

Using a dial gauge, check the rear axle for runout.
If the runout exceeds the limit, replace the rear axle.

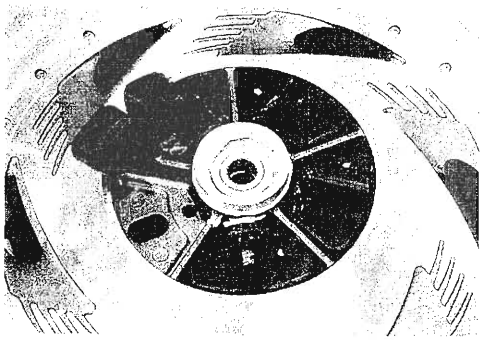
Service Limit: 0.25 mm (0.010 in)

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



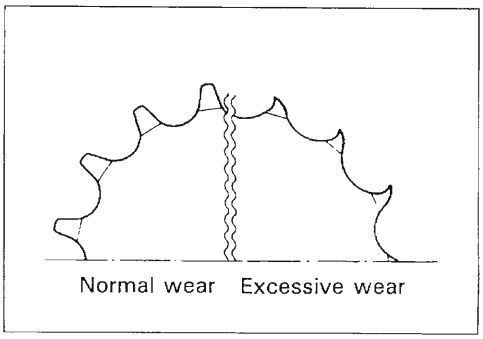
WHEEL DAMPER

Inspect the wheel dampers for wear and damage.



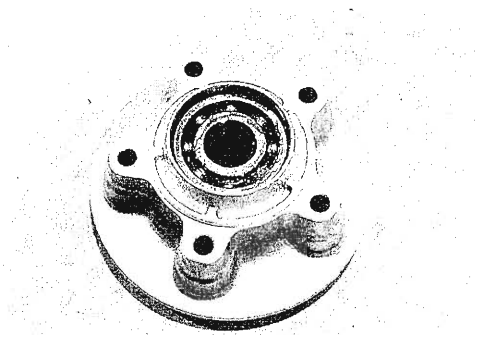
SPROCKET

Inspect the sprocket teeth for wear. If they are worn as shown, replace the sprockets and drive chain as a set.



REAR SPROCKET MOUNTING DRUM BEARING

Inspect the play of the bearing by finger while it is in the mounting drum. Rotate the inner race by finger to inspect for abnormal noise and smooth rotation.
Replace the bearing if there is anything unusual.

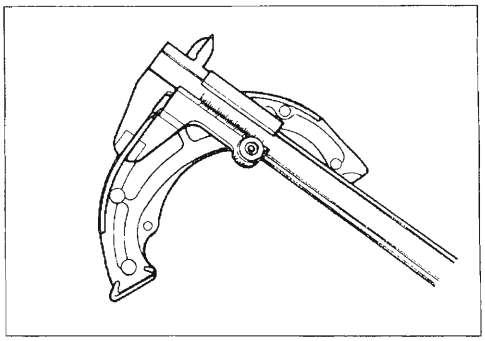


BRAKE SHOE

Check the brake shoe for the thickness of the brake shoe lining. If the brake shoe lining is worn down to the limit, replace the brake shoe.

Service Limit: 1.5 mm (0.056 in)

09900-20102: Vernier calipers



⚠ CAUTION

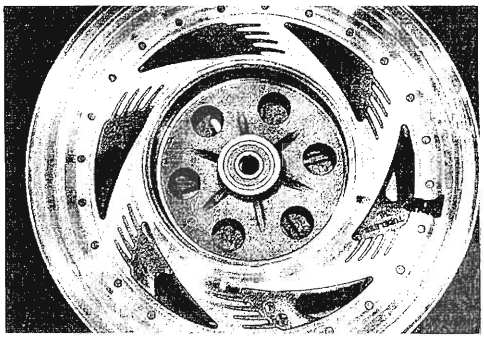
Replace the brake shoe with a set, otherwise braking performance will be adversely affected.

BRAKE DRUM

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

Service limit: 180.7 mm (7.11 in)

Inspect the drum I.D. for scratch marks. If the I.D. surface is scratched or otherwise roughened, smoothen it with sandpaper.



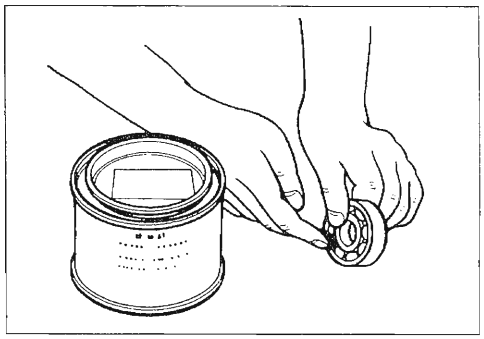
REASSEMBLY AND REMOUNTING

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

WHEEL BEARING

- Apply SUZUKI SUPER GREASE "A" to the bearing before installing.

99000-25030: SUZUKI SUPER GREASE "A"

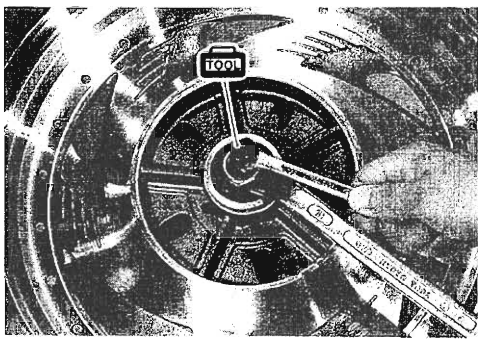


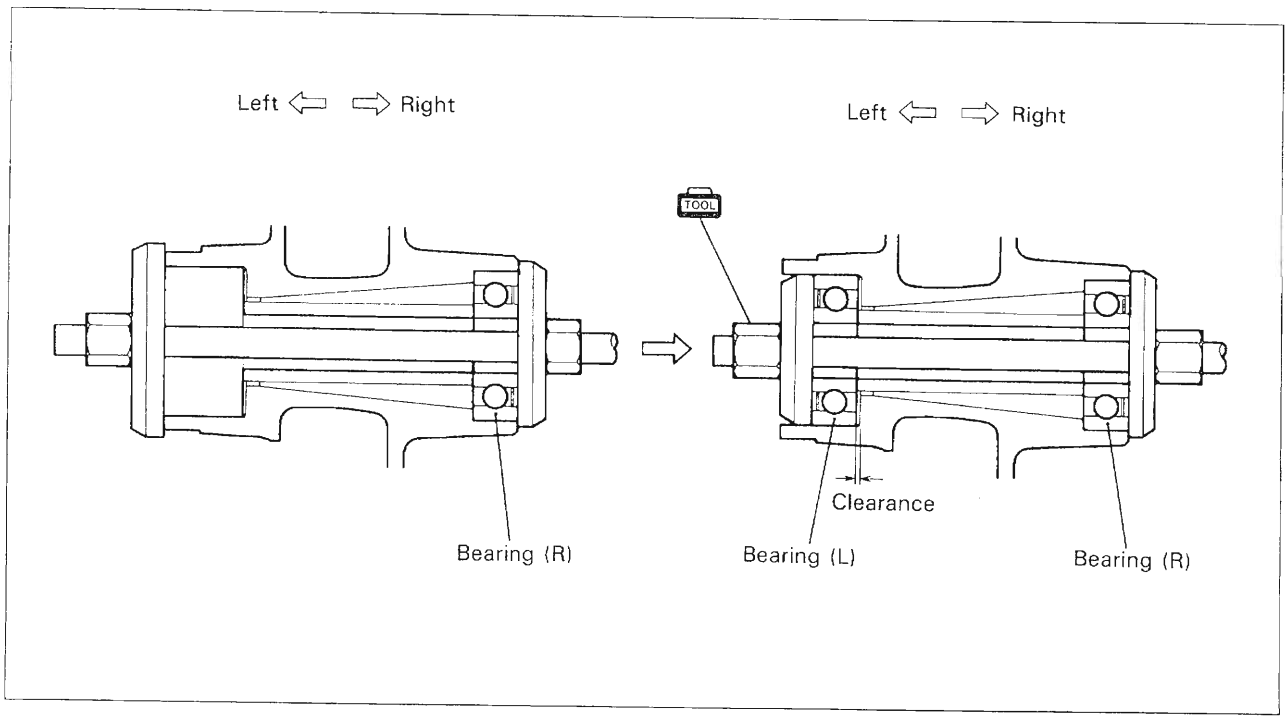
- Install the wheel bearing by using the special tool.

⚠ CAUTION

First install the wheel bearing for right side (Brake drum side).

09941-34513: Bearing/Steering race installer

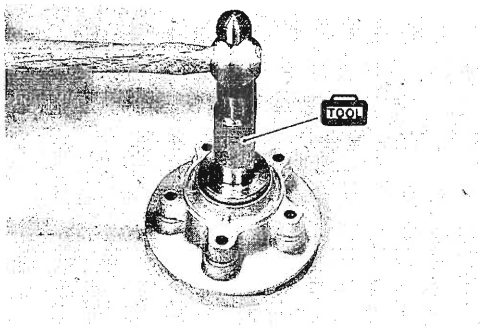




REAR SPROCKET MOUNTING DRUM BEARING

- Install the new bearing with the special tool.

TOOL 09913-75520: Bearing installer

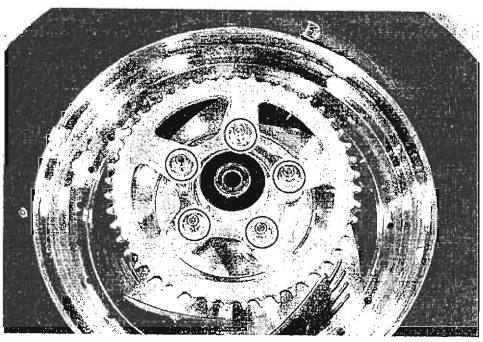


NOTE:
Apply grease to the bearing and dust seal lip before installing to the rear sprocket mounting drum.

A.H 99000-25030: SUZUKI SUPER GREASE "A"

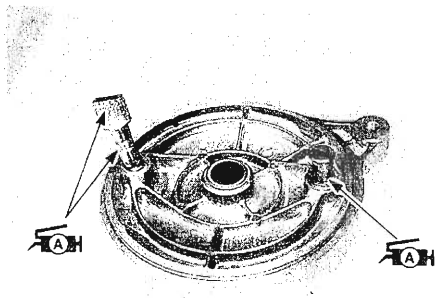
- Tighten the rear sprocket nuts to the specified torque.

Rear sprocket nut: 50 N·m (5.0 kg-m, 36.0 lb-ft)



- Apply SUZUKI SUPER GREASE "A" to the brake camshaft and camshaft surface.

A.H 99000-25030: SUZUKI SUPER GREASE "A"

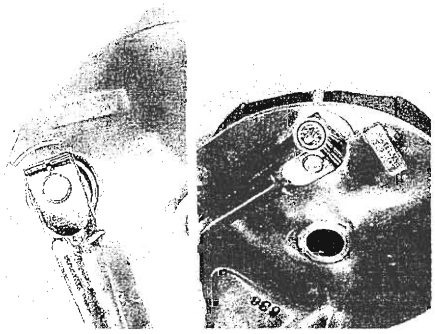


⚠ WARNING

Be careful not to apply too much grease to the brake camshaft.

- Install the brake cam lever and tighten the bolt to the specification.

Rear brake cam lever bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



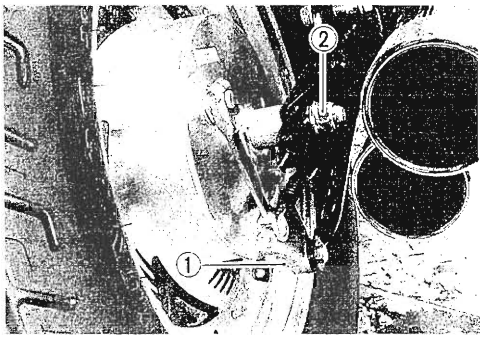
- Tighten the rear torque link nut ① to the specified torque.

Rear torque link nut: 25 N·m (2.5 kg-m, 18.0 lb-ft)

- Install the rear axle and tighen the rear axle nut ② to the specified torque.

Rear axle nut: 65 N·m (6.5 kg-m, 47.0 lb-ft)

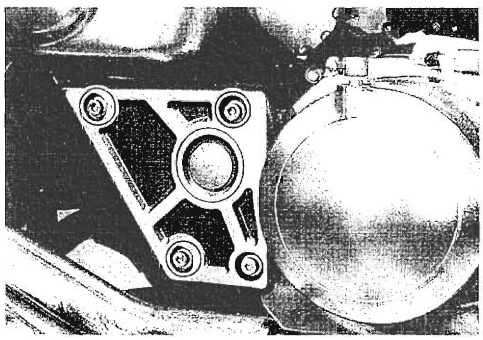
- Install the new cotter pin. (For Canada and U.S.A.)



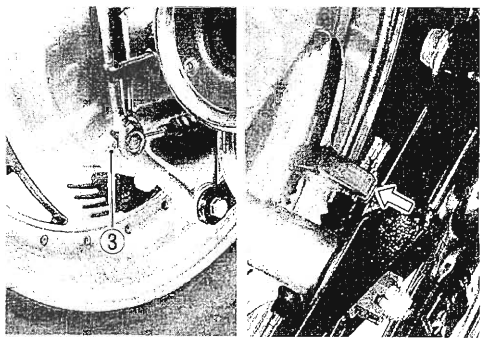
REAR BRAKE PEDAL

REMOVAL AND REASSEMBLY

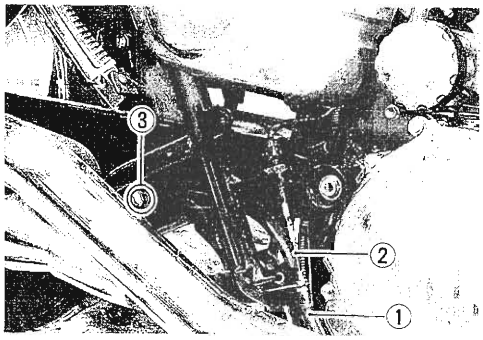
- Remove the right swingarm pivot cover.



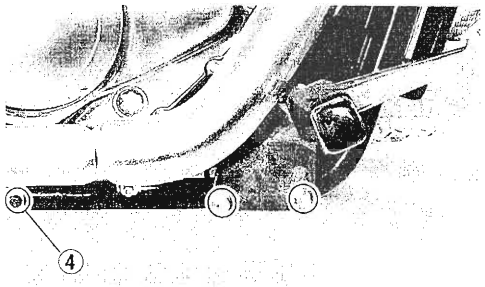
- Remove the rear brake cable adjuster ③.
- Remove the rear brake cable from the brake panel.



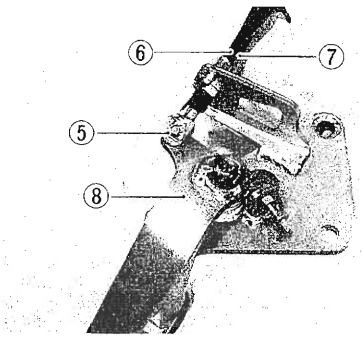
- Remove the rear brake light switch cable ① and inner wire ②.
- Remove the brake cable clamp ③.



- Remove the cable clamp ④.
- Remove the brake pedal with front footrest.



- Remove the rear brake rod link ⑤, rear brake cable ⑥, rear brake light switch cable ⑦ and brake pedal ⑧.

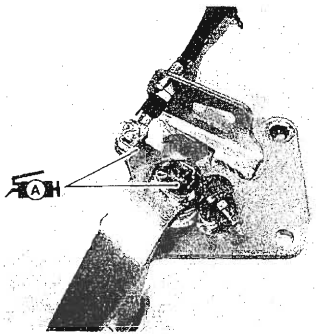


REMOUNTING AND REASSEMBLY

Reassemble and remount the rear brake pedal in the reverse order of removal and disassembly, pay attention to the following steps.

- Apply SUZUKI SUPER GREASE "A" to the brake pedal pivot and brake rod link.

99000-25030: SUZUKI SUPER GREASE "A"

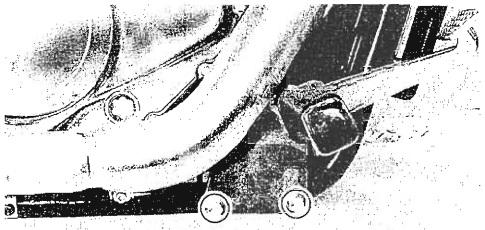


⚠ CAUTION

Always install a new cotter pin.

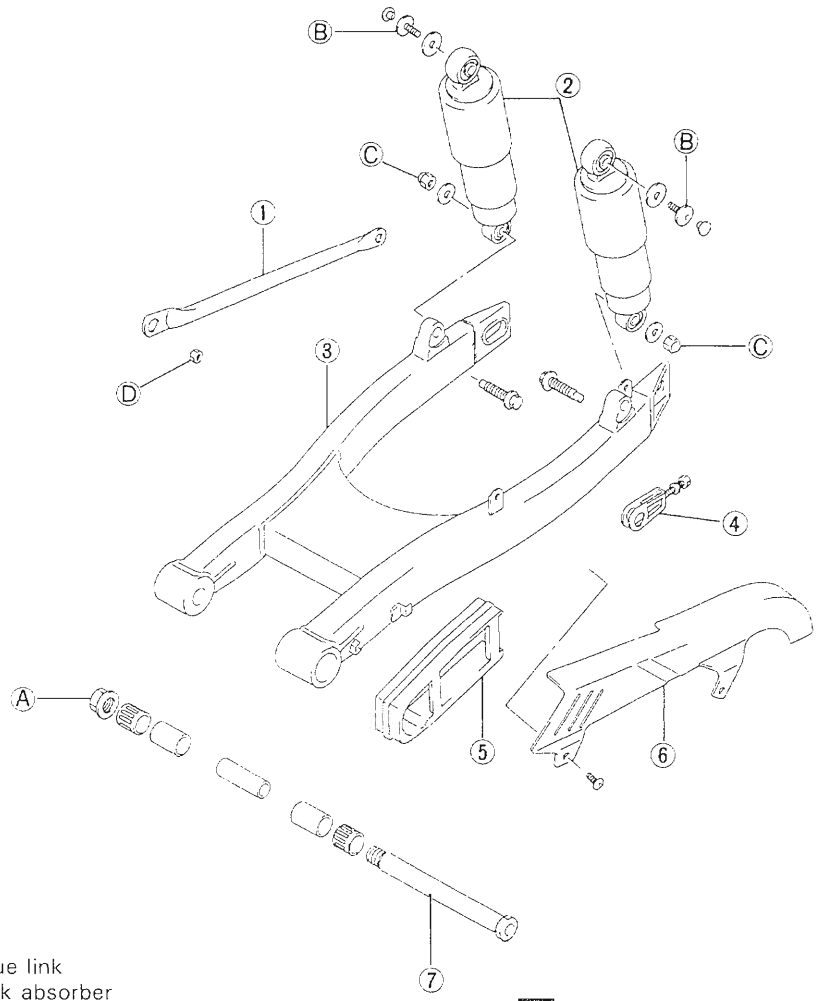
- Tighten the front footrest bolts to the specified torque.

Front footrest bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)



- After installing the rear brake pedal, adjust the brake cable play. (Refer to page 2-14.)
- Make sure that the brake system operates correctly.

REAR SUSPENSION AND SWINGARM



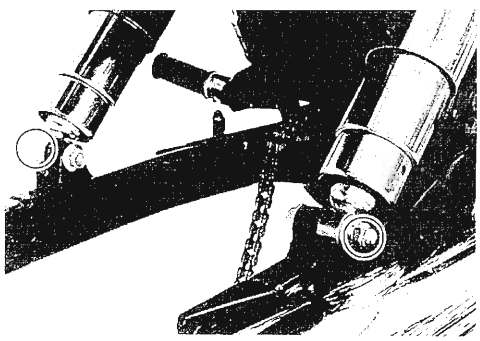
① Rear torque link
② Rear shock absorber
③ Rear swingarm
④ Chain adjuster
⑤ Chain buffer
⑥ Chain case
⑦ Swingarm pivot shaft

Ⓐ Rear swingarm pivot nut
Ⓑ Rear shock absorber bolt
Ⓒ Rear shock absorber nut
Ⓓ Rear torque link nut

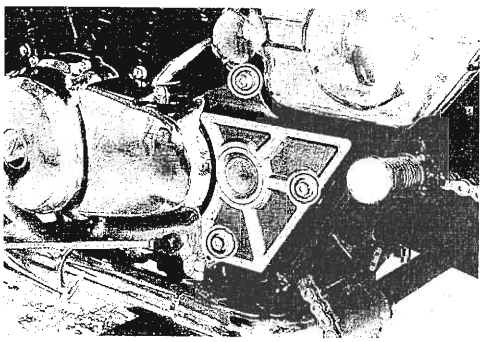
ITEM	N·m	kg-m	lb-ft
Ⓐ	100	10.0	72.5
Ⓑ	23	2.3	16.5
Ⓒ	50	5.0	36.0
Ⓓ	35	3.5	25.5

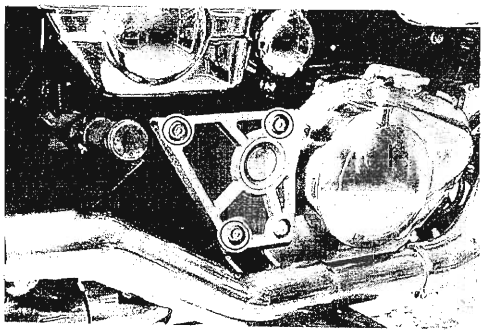
REMOVAL

- Remove the rear wheel. (Refer to page 6-31.)
- Remove the rear shock absorber lower mounting nuts.

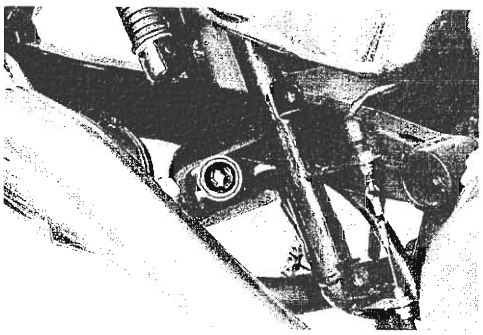


- Remove the left and right swingarm pivot covers.

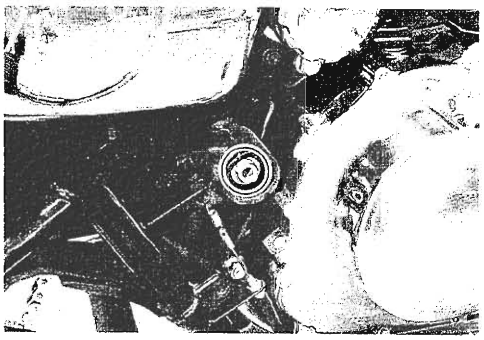




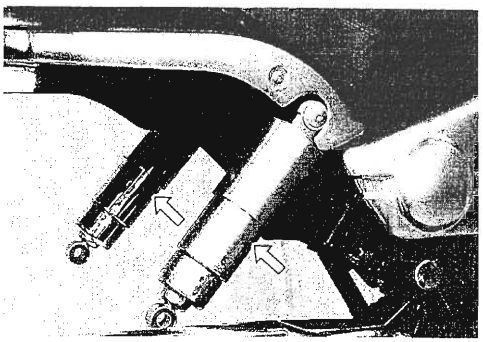
- Remove the rear torque link by removing the nut and bolt.



- Remove the swingarm pivot shaft nut.
- Remove the swingarm by removing the swingarm pivot shaft.



- Remove the rear shock absorbers.

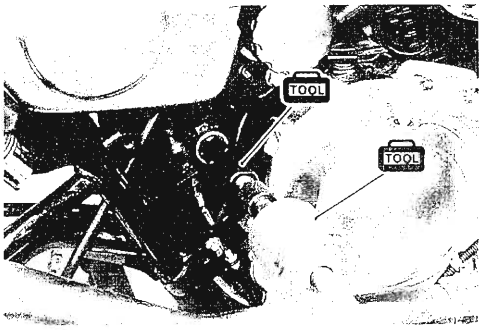


INSPECTION AND DISASSEMBLY

SWINGARM PIVOT BEARINGS

Inspect the swingarm pivot bearings for wear while they are in the frame. Rotate the spacer by hand to inspect for abnormal noise and smooth rotation. Replace the bearings if there is anything unusual. Also replace the spacer if necessary.

- Remove the left and right spacers.
- Remove the swingarm bearings from the frame with the special tools.



TOOL **09930-30102: Sliding shaft**
09923-74510: Bearing puller

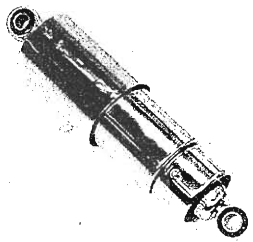
⚠ CAUTION

The removed bearings should be replaced with new ones.

- Remove the center spacer.

SHOCK ABSORBER

Inspect the shock absorber body for damage and oil leakage. If any defects are found, replace the shock absorber with new one.

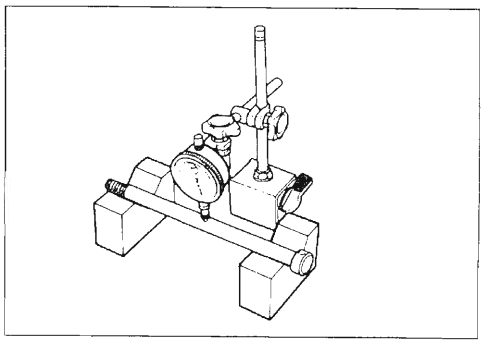


⚠ CAUTION

Do not attempt to disassemble the rear shock absorber unit. It is unserviceable.

SWINGARM PIVOT SHAFT

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

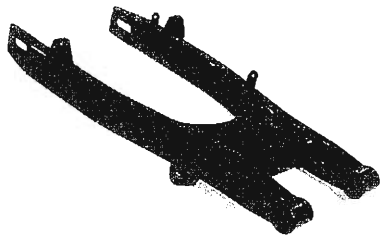


TOOL **09900-20606: Dial gauge (1/100 mm)**
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

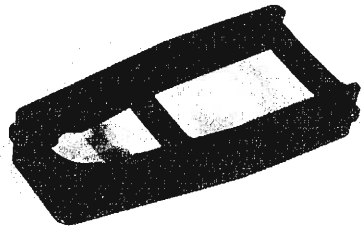
Service Limit: 0.30 mm (0.012 in)

SWINGARM

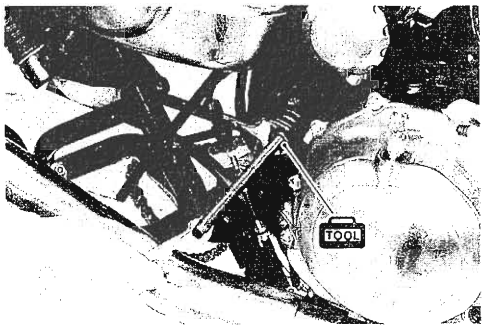
Inspect the swingarm for damage.



CHAIN BUFFER
Inspect the chain buffer for damage.



REASSEMBLY AND REMOUNTING
Reassemble and remount the swingarm and rear shock absorbers in the reverse order of removal and disassembly, and also carry out the following steps:



SWINGARM BEARING
- Press the bearings into the frame with the special tool.

TOOL **09941-34513: Bearing/Steering race installer**

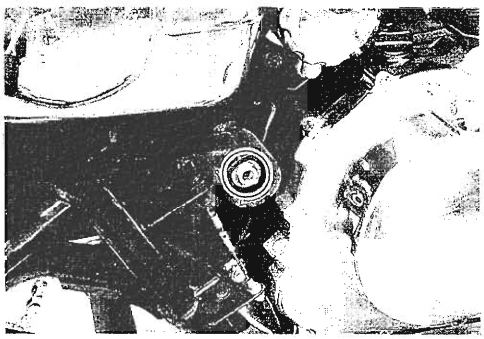
NOTE:
When reinstalling the bearing, stamped mark of bearing is positioned outside.

- Apply SUZUKI SUPER GREASE "A" to the bearings.

99000-25030: SUZUKI SUPER GREASE "A"

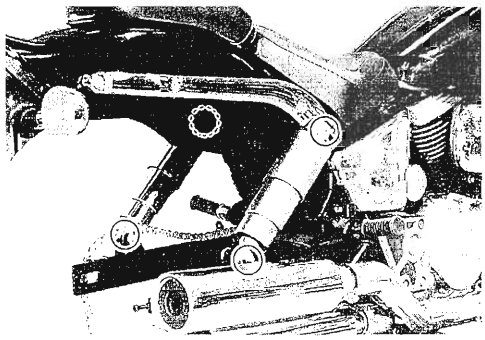
REAR SWINGARM PIVOT NUT
- Tighten the rear swingarm pivot nut to the specified torque.

Rear swingarm pivot nut: 100 N·m (10.0 kg-m, 72.5 lb-ft)



REAR SHOCK ABSORBER BOLT AND NUT
- Tighten the shock absorber mounting bolt and nut to the specified torque.

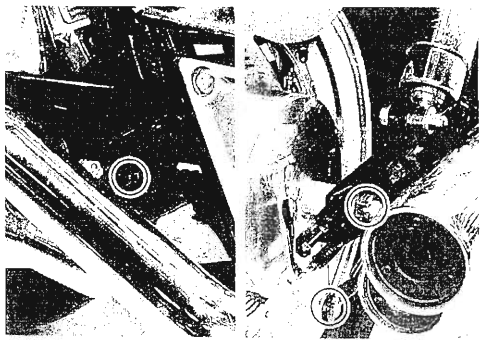
Bolt (Upper): 23 N·m (2.3 kg-m, 16.5 lb-ft)
Nut (Lower): 50 N·m (5.0 kg-m, 36.0 lb-ft)



REAR AXLE AND TORQUE LINK NUT

- Tighten the rear torque link nuts and rear axle nut to the specified torque.

Rear torque link nut (front): 35 N·m (3.5 kg-m, 25.5 lb-ft)
(rear): 25 N·m (2.5 kg-m, 18.0 lb-ft)
Rear axle nut: 65 N·m (6.5 kg-m, 47.0 lb-ft)



FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspention and rear wheel, the following adjustments are required before driving motorcycle.

DRIVE CHAIN ..... Refer to page 2-12.
REAR BRAKE ..... Refer to page 2-14.
TIRE PRESSURE ..... Refer to page 2-15.

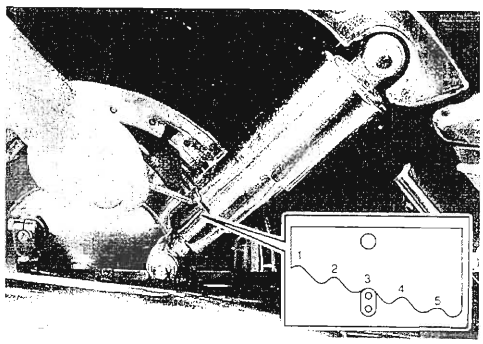
SUSPENSION SETTING

Adjust the spring pre-load as follows.

* The set position "5" provides the stiffest spring pre-load.
* The set position "1" provides the softest spring pre-load.

STD spring position: "3"

NOTE:
Make sure that both spring position should be equalized.



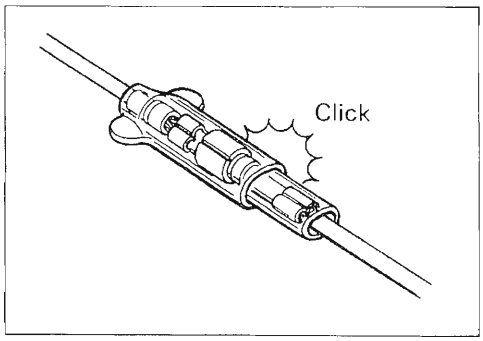
ELECTRICAL SYSTEM

CONTENTS

CAUTIONS IN SERVICING

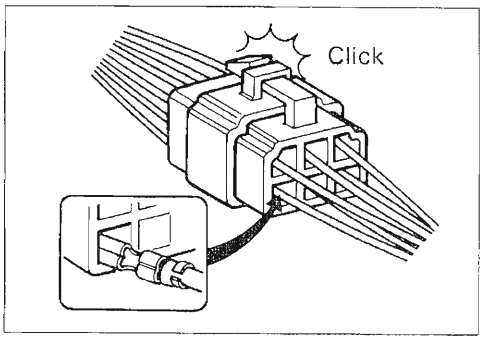
CONNECTOR

- When connecting a connector, be sure to push it in untill a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.



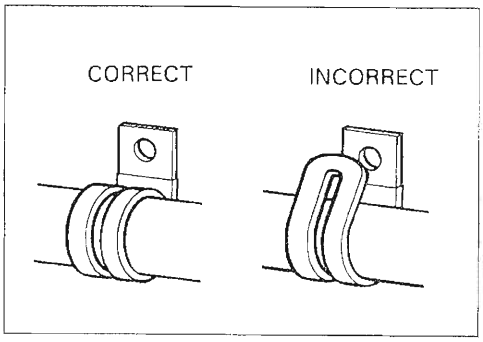
COUPLER

- 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.



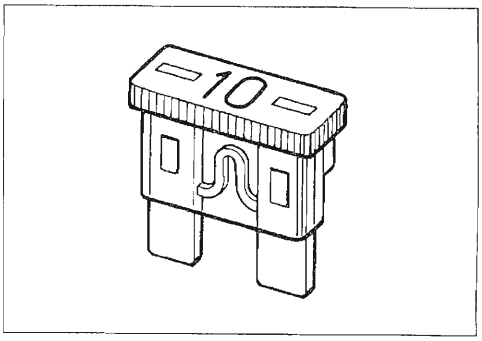
CLAMP

- Clamp the wire harness at such positions as indicated in "WIRE HARNESS ROUTING" (Refer to pages 8-10 and 11.).
- 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.



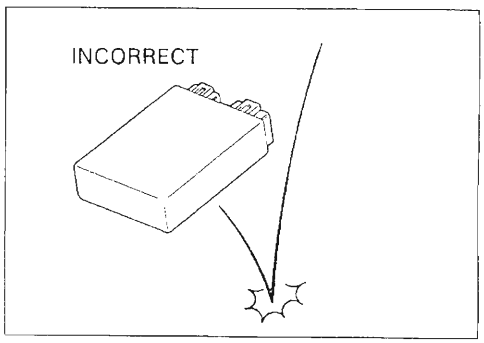
FUSE

- 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.



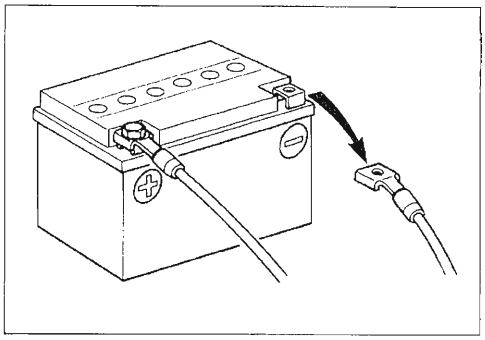
SEMI-CONDUCTOR EQUIPPED PART

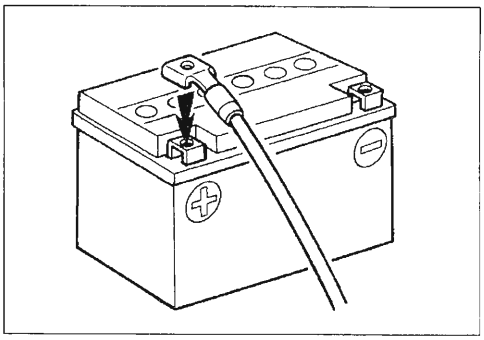
- Be careful not to drop the part with a semi-conductor built in such as a ignitor unit.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.



CONNECTING BATTERY

- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the negative (⊖) terminal first.
- When connecting terminals to the battery, be sure to connect the positive (⊕) 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 (⊕) terminal.



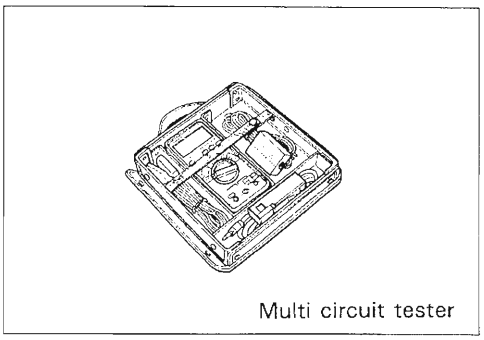


WIRING PROCEDURE

- Route the wire harness properly according to "WIRE HARNESS ROUTING" (Refer to pages 8-10 and 11.).

USING MULTI CIRCUIT TESTER

- Be sure to use positive (⊕) and negative (⊖) 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.

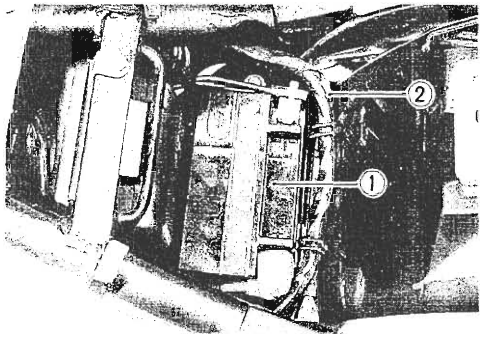


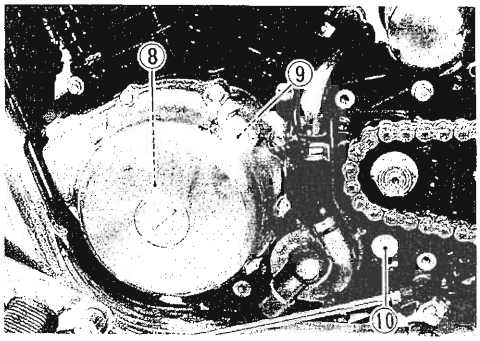
Multi circuit tester

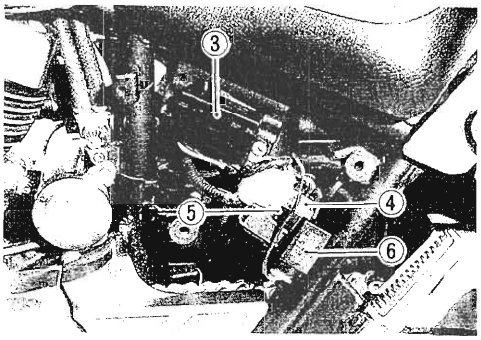
⚠ CAUTION

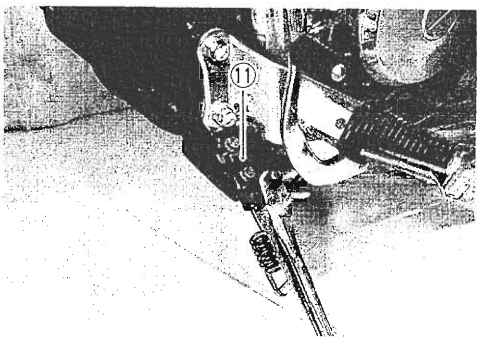
Before using the multi circuit tester, read the instruction manual.

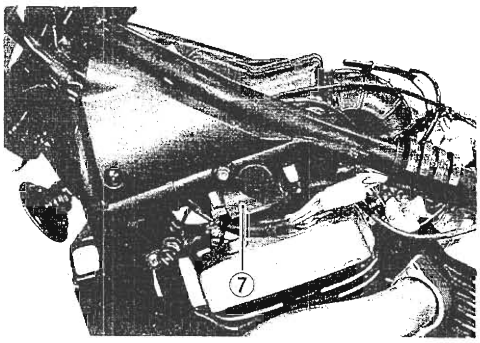
LOCATION OF ELECTRICAL COMPONENTS



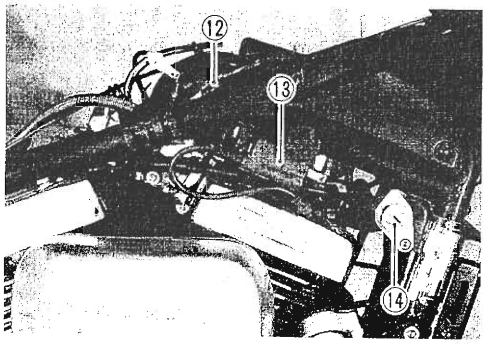


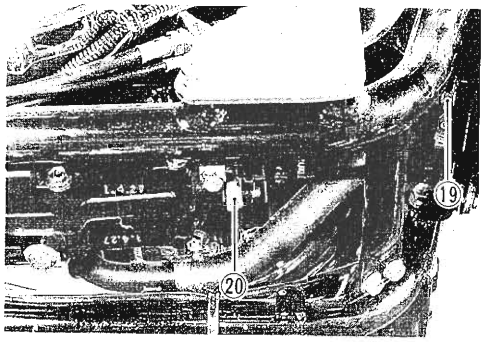


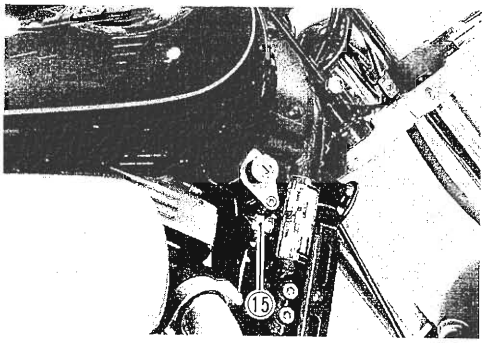


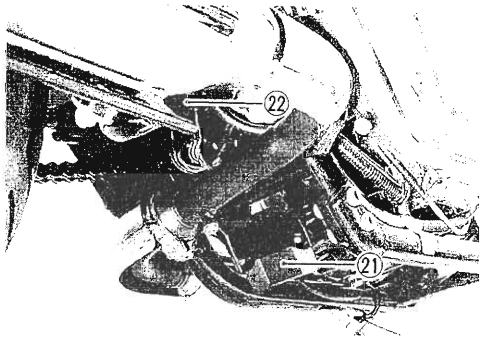


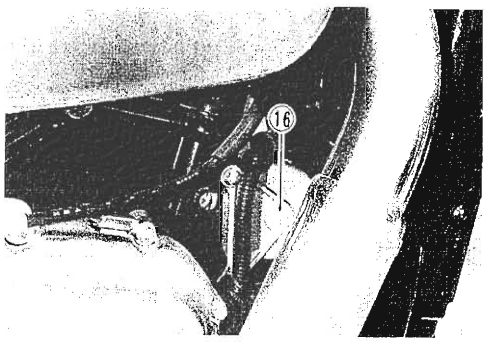
① : Battery
② : Side-stand/ignition interlock diode
③ : Fuse box
④ : Maine fuse
⑤ : Starter relay
⑥ : Starter control relay
⑦ : Ignition coil (No.1)
⑧ : Generator
⑨ : Signal generator
⑩ : Neutral switch
⑪ : Side-stand switch

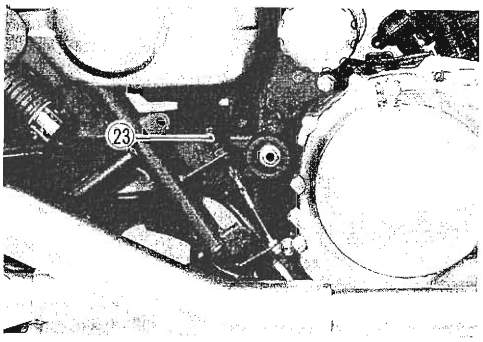


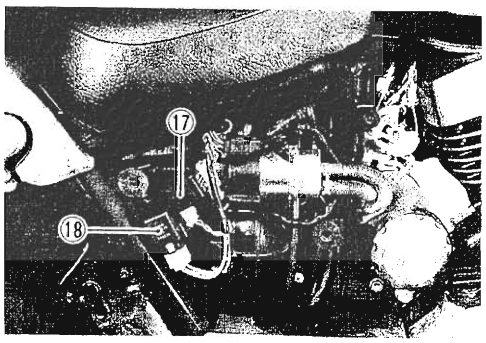












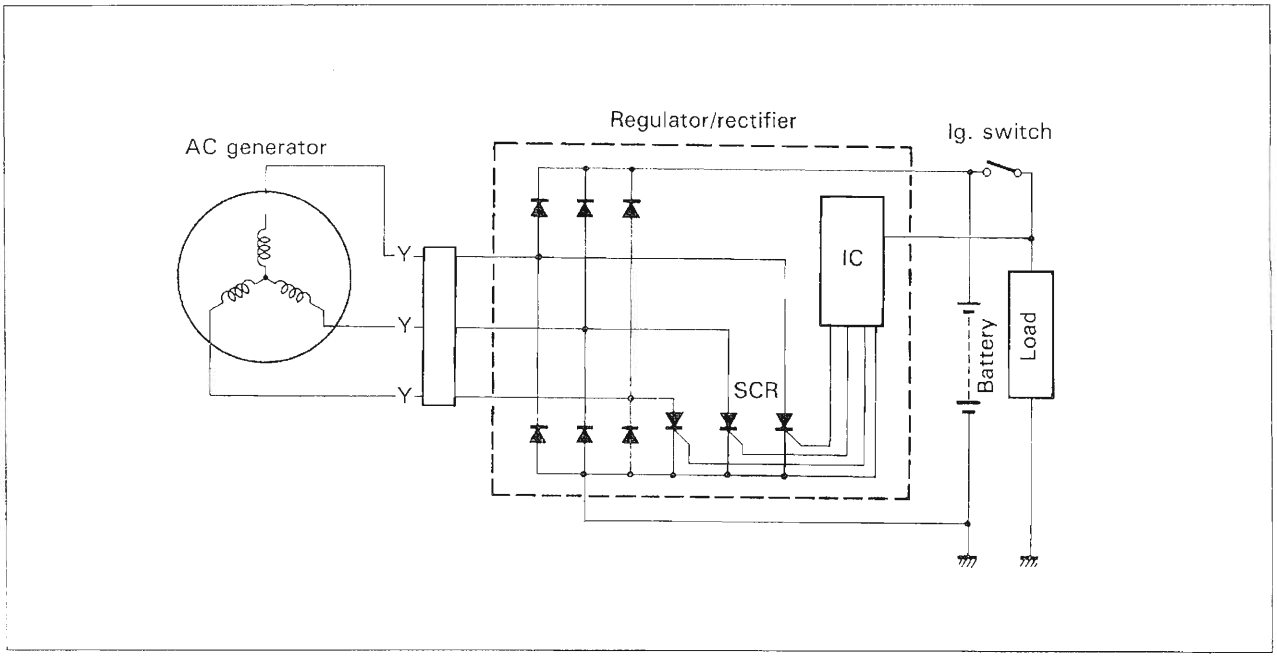
⑫ : Indicator light diode
⑬ : Ignition coil (No.2)
⑭ : Ignition switch
⑮ : Water temp. switch
⑯ : Starter motor
⑰ : Turn signal relay
⑱ : Side-stand/ignition interlock relay
⑲ : Cooling fan thermo-switch
⑳ : Oil pressure switch
㉑ : Regulator/rectifier
㉒ : Ignitor
㉓ : Rear brake switch

CHARGING SYSTEM

DESCRIPTION

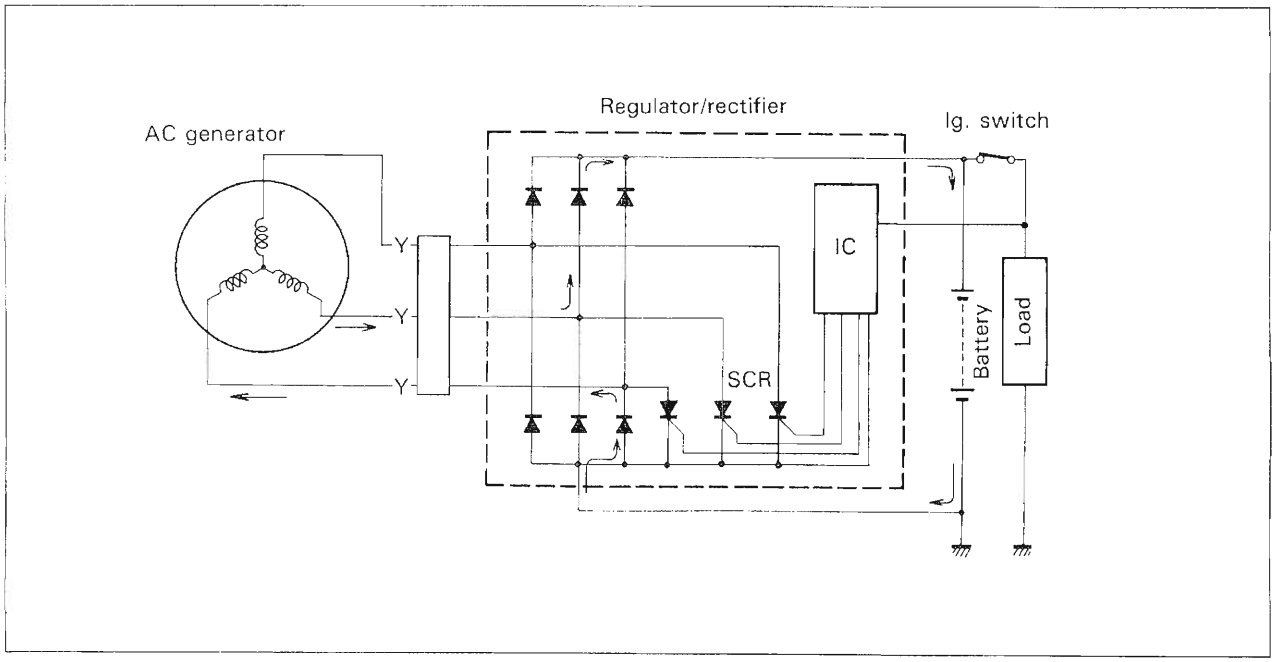
The circuit of the charging system is indicated in the figure, which is composed of an AC generator, regulator/rectifier unit and battery.

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

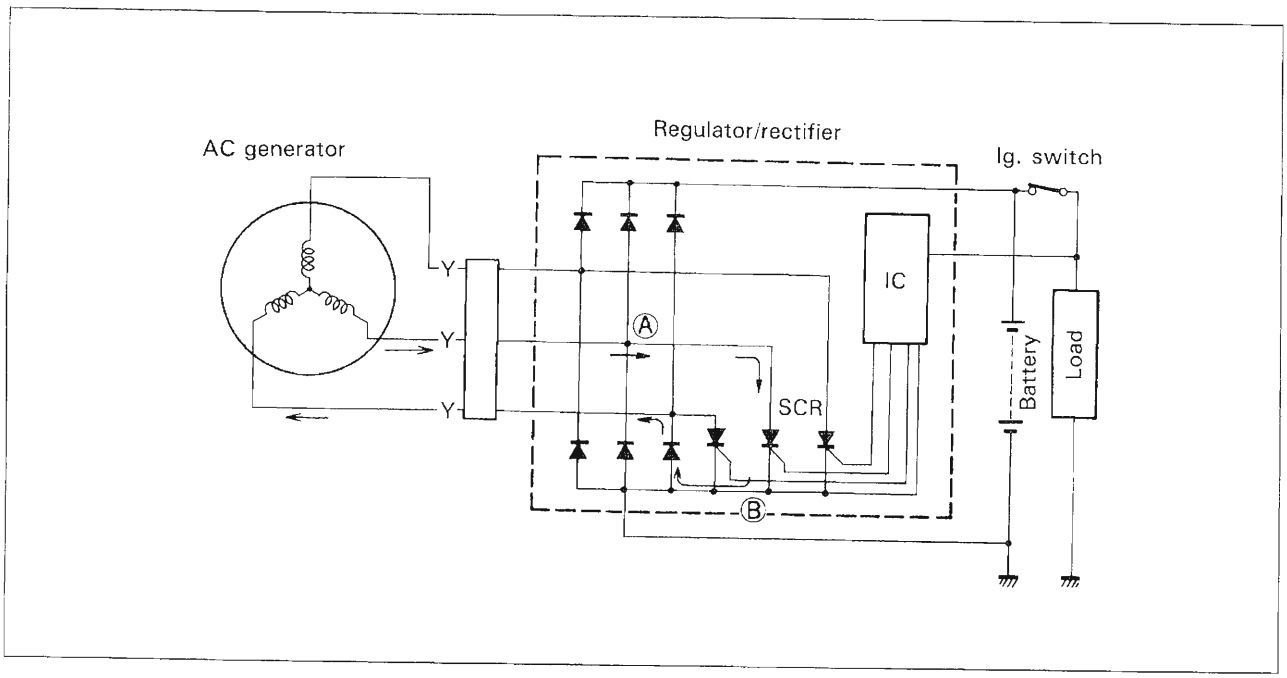


FUNCTION OF REGULATOR

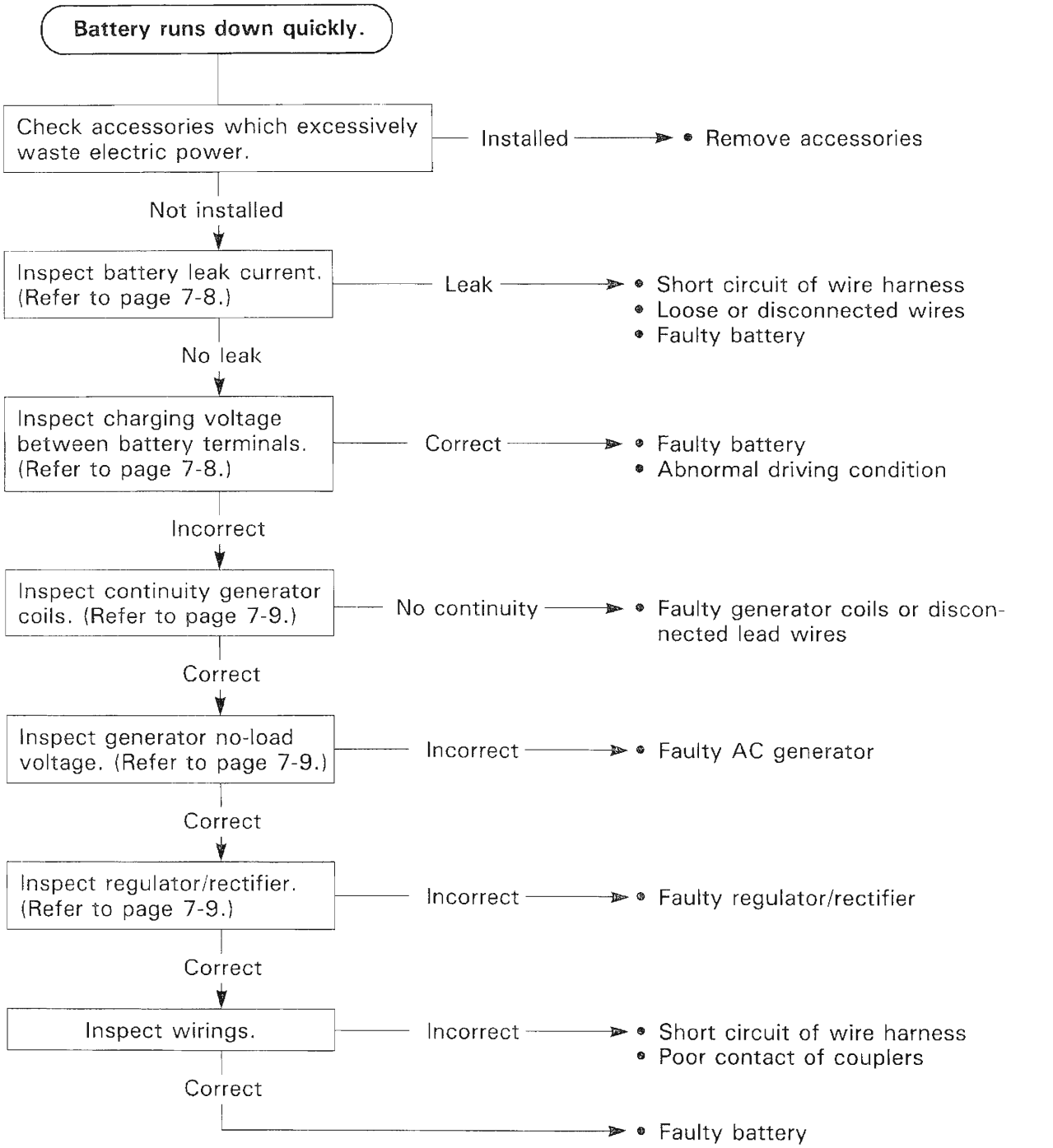
While the engine r/min is low and the generated voltage of the AC generator is lower than the adjusted voltage of Regulator, the regulator does not function. However, the generated current charges the battery directly at this time.



When the engine r/min becomes higher, the generated voltage of the AC generator also becomes higher and the voltage between the battery terminals becomes high accordingly. When it reaches the adjusted voltage of the I.C., (Integrated Circuit) and it is turned "ON", a signal will be sent to the SCR (Thyristor) gate probe and the SCR will be turned "ON".
Then, the SCR becomes conductive in the direction from point Ⓐ to point Ⓑ. At this time, the current generated from the AC generator gets through the SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows to point Ⓑ, 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



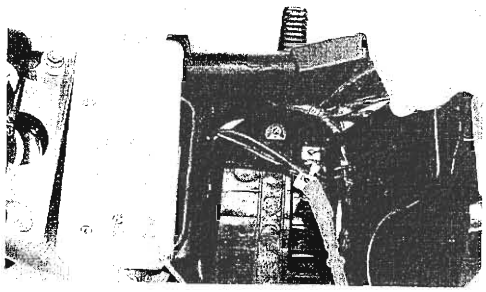
Others

Battery overcharge	• Faulty regulator/rectifier • Faulty battery • Poor contact of generator lead wire coupler

INSPECTION

BATTERY LEAK CURRENT INSPECTION

- Remove the seat and battery cover.
- Turn the ignition switch to the OFF position.
- Disconnect the battery ⊖ lead wire.
- Connect the multi circuit tester between the ⊖ terminal and ⊖ lead wire of the battery.

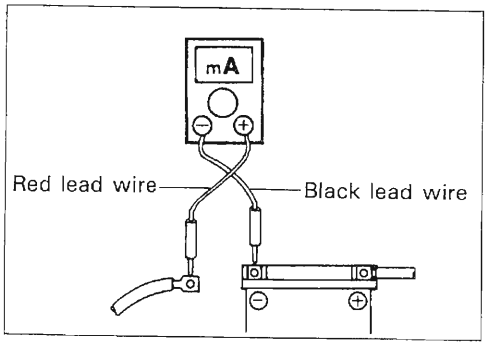


Note that leakage is indicated if the tester reads over 1mA.

TOOL 09900-25008: Multi circuit tester set

Battery leak current: Under 1mA

Tester knob indication: Current (⎓ , 20mA)



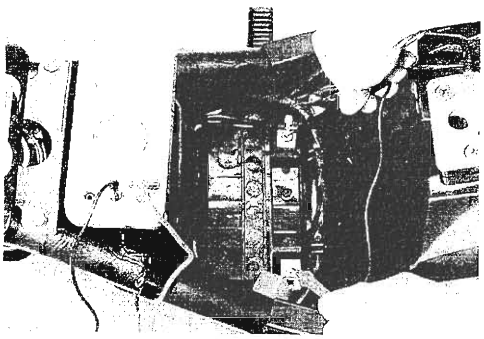
⚠ CAUTION

*** Because the leak current might be large, turn the tester to high range first when connecting an ammeter.**
*** Do not turn the ignition switch to the ON position when measuring current.**

When leakage is found, look for the part where the tester read under 1mA through the couplers and connectors are removed one by one.

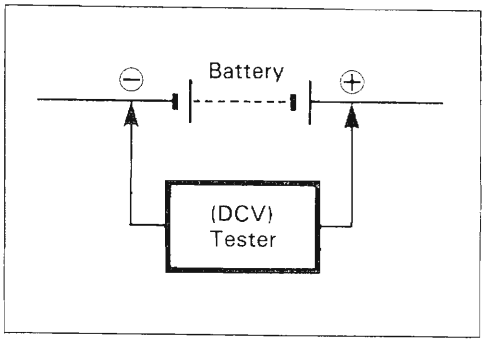
CHARGING OUTPUT INSPECTION

- Remove the seat and battery 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 ⊕ and ⊖ with a 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.



TOOL 09900-25008: Multi circuit tester set

Charging output
Standard: 13.5—15.0 at 5 000 r/min.

Tester knob indication: Voltage (⎓)

GENERATOR COIL CONTINUITY INSPECTION

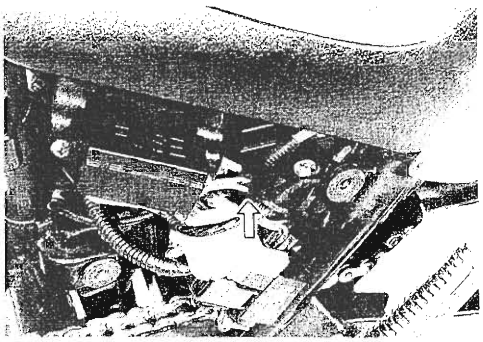
- Remove the left frame cover. (Refer to page 6-1.)
- Disconnect the generator coupler.

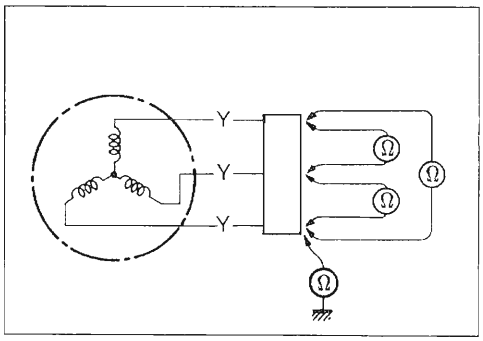
Using a multi circuit tester, inspect the continuity between the three lead wires.
Also check that the stator core is insulated.
If there is no continuity, replace the stator with a new one.

09900-25008: Multi circuit tester set

Tester knob indication: Continiuty test (•))))

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





GENERATOR NO-LOAD PERFORMANCE INSPECTION

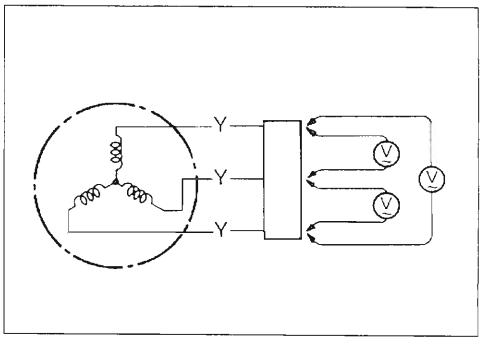
- Start the engine and keep it running at 5 000 r/min.

Using a 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.

09900-25008: Multi circuit tester set

Generator no-load performance:
More than 75V at 5 000 r/min
(When engine is cold)

Tester knob indication: Voltage (~)



REGULATOR/RECTIFIER INSPECTION

- Remove the right frame cover. (Refer to page 6-1.)
- Disconnect the regulator/rectifier couplers.

Using a multi circuit tester, measure the voltage between the lead wires in the following table.
If voltage is incorrect, replace the regulator/rectifier.

09900-25008: Multi circuit tester set

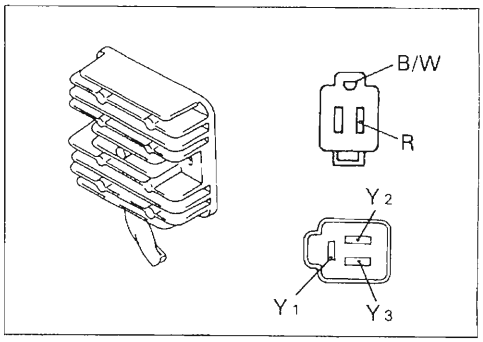
Tester knob indication: Diode test (⊣◀⊢)

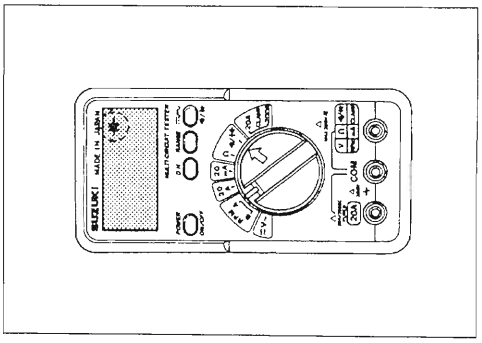
Unit: V

⊖ Probe of tester to: / ⊕ Probe of tester to:	R	Y1	Y2	Y3	B/W
R		0.4—0.6	0.4—0.6	0.4—0.6	0.5—0.7
Y1	1.4—1.5		1.4—1.5	1.4—1.5	0.4—0.6
Y2	1.4—1.5	1.4—1.5		1.4—1.5	0.4—0.6
Y3	1.4—1.5	1.4—1.5	1.4—1.5		0.4—0.6
B/W	1.4—1.5	1.4—1.5	1.4—1.5	1.4—1.5	

Y: Yellow, R: Red, 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.



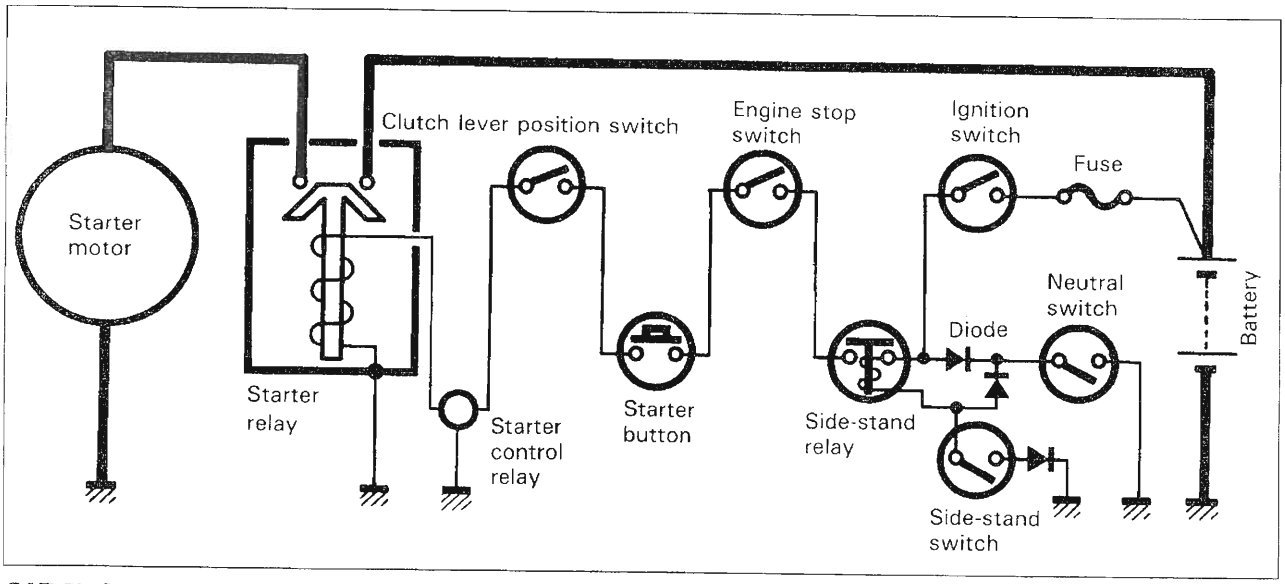


STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM

STARTER SYSTEM DESCRIPTION

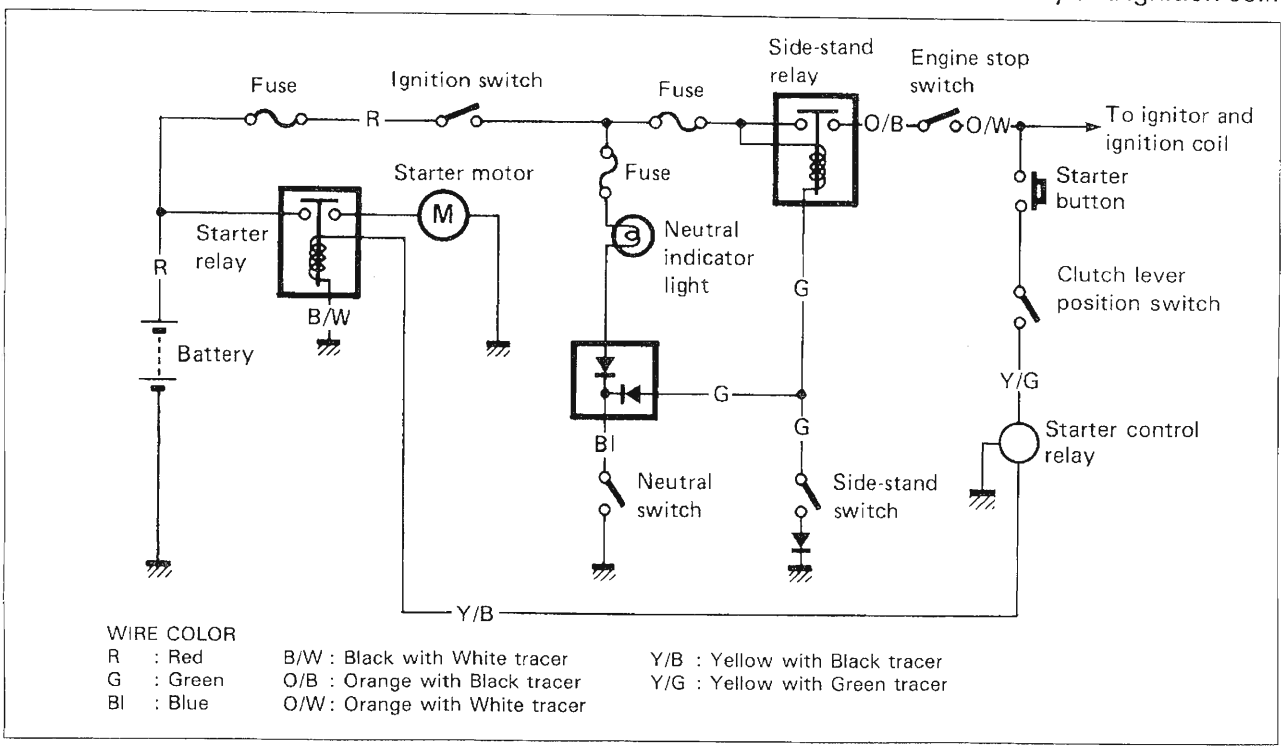
The starter system is shown in the diagram below: namely, the starter motor, starter relay, starter control relay, clutch lever position switch, starter button, engine stop switch, side-stand relay, side-stand switch, neutral switch, IG switch and battery.

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.



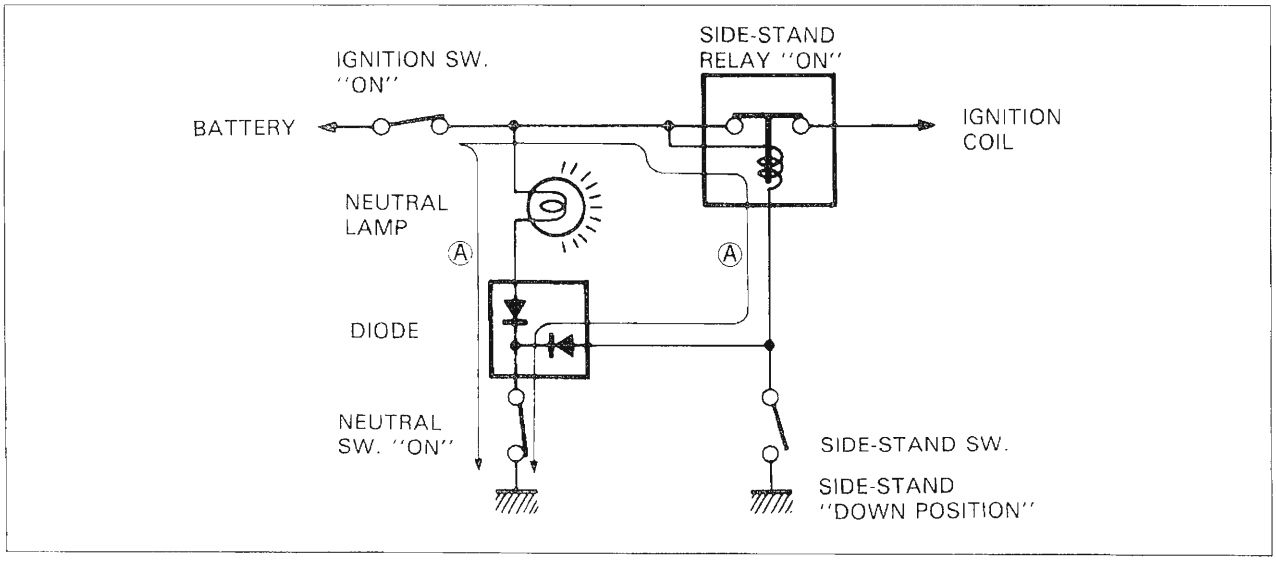
SIDE-STAND/IGNITION INTERLOCK SYSTEM DESCRIPTION

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.

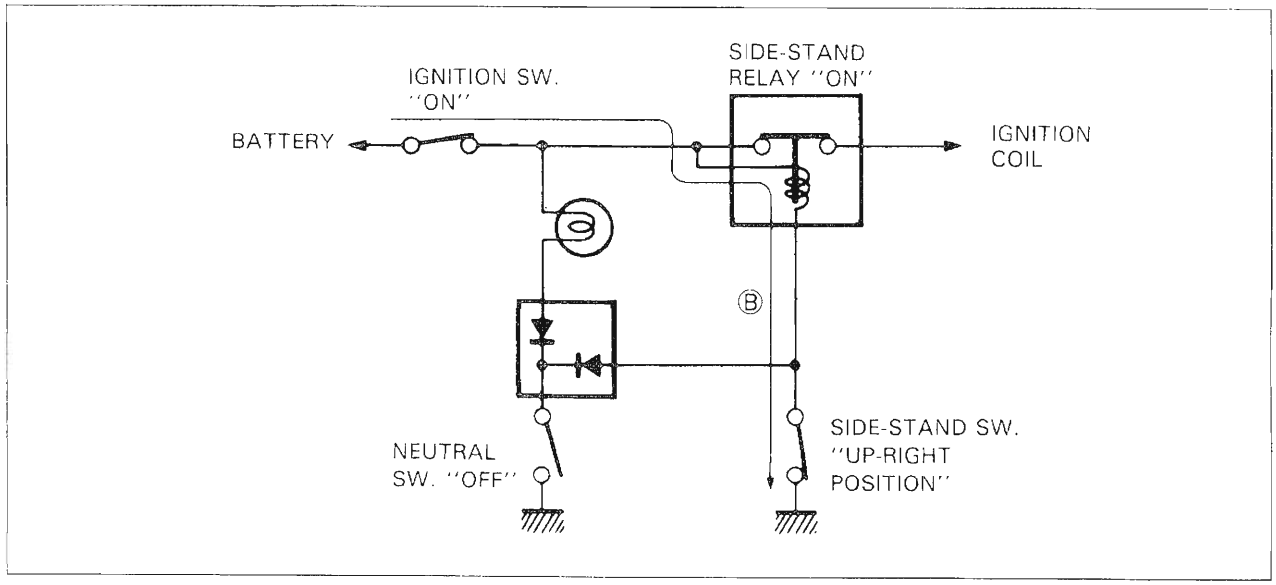


The circuit consists of relay, lamp, diode and switches and decides to live the ignition coil depending on the position of the TRANSMISSION and SIDE-STAND with the neutral and side-stand switches working mutually.
The ignition coil lives only in two situations as follows.

1. Transmission: "NEUTRAL (ON)" Side-stand: "DOWN (OFF)"
   The current flow Ⓐ turns "ON" the relay and the ignition coil lives even the side-stand is kept down. This is or warming up the engine.



2. Side-stand: "UP-RIGHT (ON)"
   The current flow Ⓑ turns "ON" the relay and the ignition coil lives. The engine can be easily started at any transmission position.



TROUBLESHOOTING

Starter motor will not run.

The transmission is in neutral.
Turn on the ignition switch with the engine stop switch in "RUN" position.
Check whether to hear the click noise from the starter relay when the starter button is pushed.

— Clicks → Check whether to run the starter motor when connect the starter motor terminal to the battery ⊕ terminal directly. (Do not use thin wire, because a large amount of current flows.)

Run → • Faulty starter relay
• Loosen or disconnected starter motor lead wire

Not run → • Faulty starter motor

No click ↓

Measure the starter relay voltage at the starter relay connectors (between Y/B ⊕ and B/W ⊖) when the starter button is pushed.

— Not voltage → • Faulty ignition switch
• Faulty engine stop switch
• Faulty neutral switch
• Faulty diode
• Faulty side-stand relay
• Faulty starter button
• Faulty clutch lever position switch
• Faulty starter control relay
• Poor contact of connector
• Open circuit in wiring harness

Voltage measured ↓

Check the starter relay. (Refer to page 7-15.)

— Incorrect → • Faulty starter relay

Correct ↓

→ • Poor contact of the starter relay

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.

Check the side-stand switch. (Refer to page 7-17.)

— Incorrect → • Faulty side-stand switch

Correct ↓

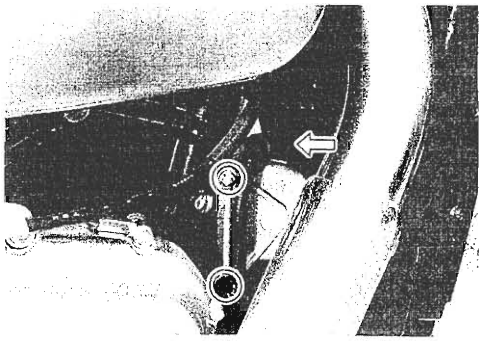
→ • Open circuit in wiring harness
• Poor contact of connector

Others

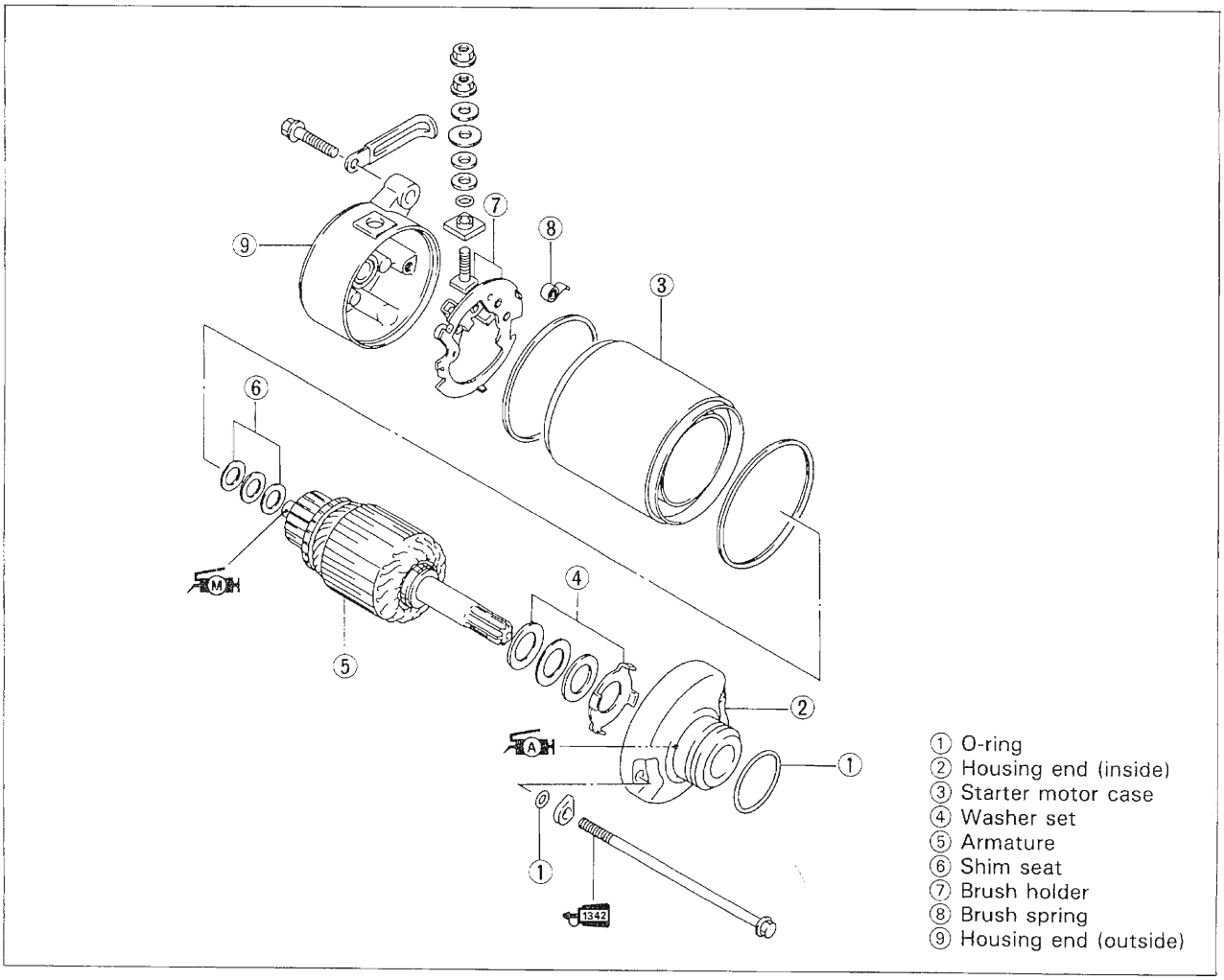
Engine does not turn though starter motor runs.	• Faulty starter clutch

STARTER MOTOR REMOVAL AND DISASSEMBLY

- Disconnect the starter motor lead wire.
- Remove the starter motor.



- Disassemble the starter motor as shown in the illustration.

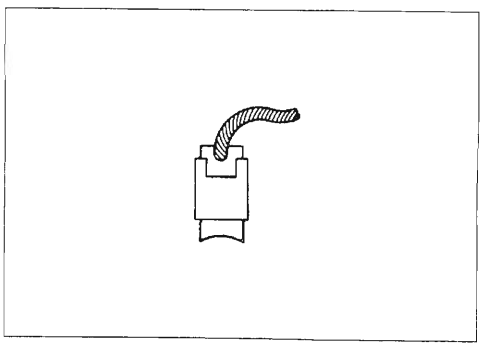


① O-ring
② Housing end (inside)
③ Starter motor case
④ Washer set
⑤ Armature
⑥ Shim seat
⑦ Brush holder
⑧ Brush spring
⑨ Housing end (outside)

STARTER MOTOR INSPECTION

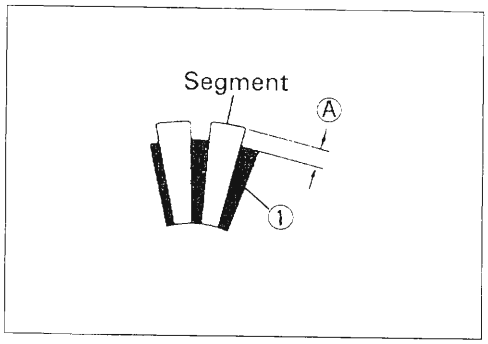
CARBON BRUSH

Inspect the brushed for abnormal wear, crack or smoothness in the brush holder.
If the brush has failed, replace the brush sub assy.



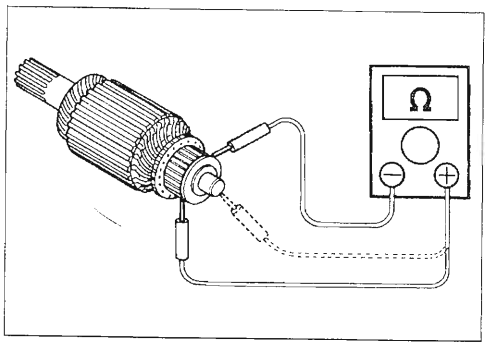
COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut Ⓐ.
If the commutator is abnormally worn, replace the armature.
When surface is descolored, 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.



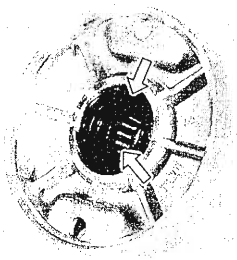
ARMATURE COIL INSPECTION

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 housing end.

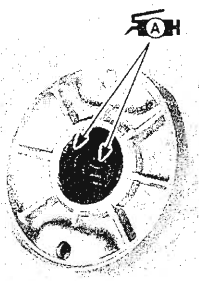


STARTER MOTOR REASSEMBLY

Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

⚠ CAUTION

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

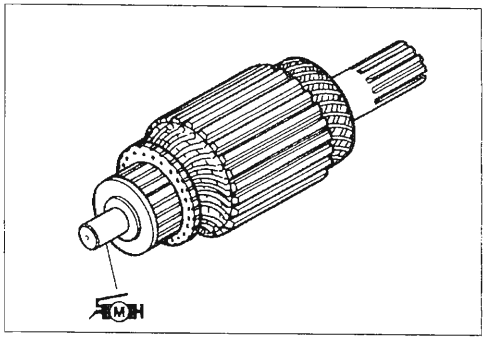


- Apply SUZUKI SUPER GREASE "A" to the lip of the oil seal.

A 99000-25030: SUZUKI SUPER GREASE "A"

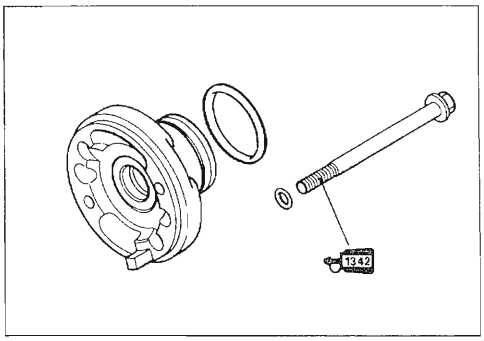
- Apply a small quantity of MOLY PASTE to the armature shaft.

M 99000-25140: SUZUKI MOLY PASTE



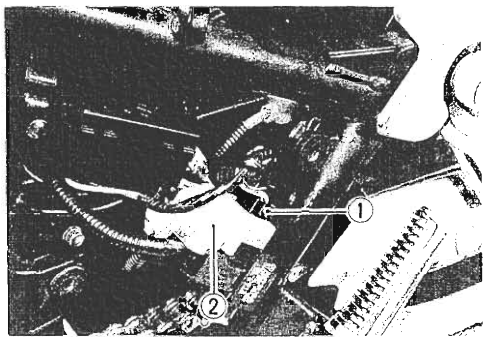
- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing bolts.

99000-32050: THREAD LOCK "1342"



STARTER RELAY INSPECTION

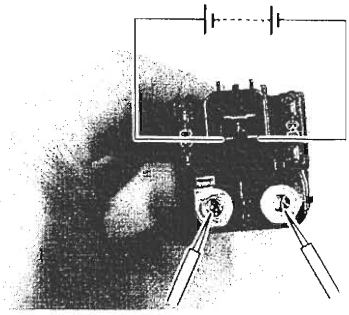
- Remove the seat and left frame cover. (Refer to page 6-1.)
- Disconnect the battery ⊖ lead wire.
- Disconnect the starter relay lead wire coupler ① and relay cover ②.
- Disconnect the starter motor lead wire and battery lead wire at the starter relay.
- Remove the starter relay.



Apply 12 volts to Ⓐ and Ⓑ terminals, inspect the continuity between the terminals, positive and negative.
If the starter relay is in sound condition, continuity is found.

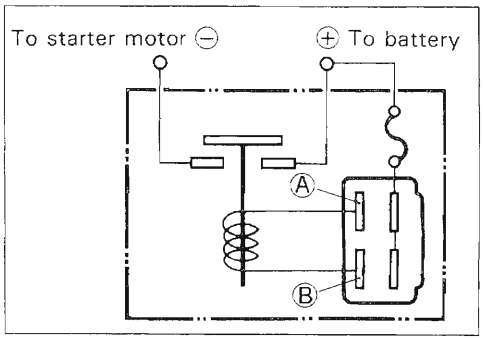
09900-25008: Multi circuit tester set

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



⚠ CAUTION

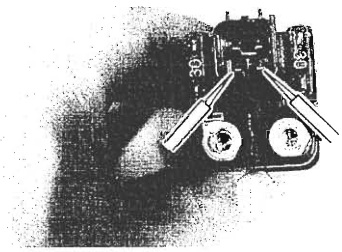
Do not apply a battery voltage more than 5 seconds to the starter relay as it may overheat and cause damage to the relay coil.



- Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition if the resistance is as follows.

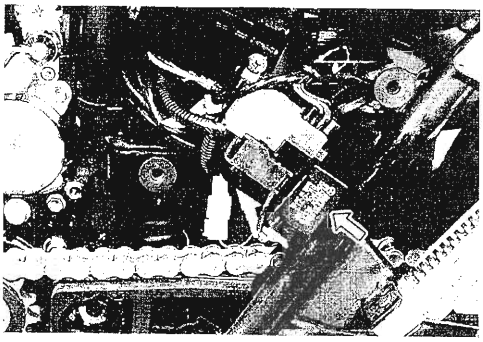
09900-25008: Multi circuit tester set

Starter relay resistance
Standard: 3—5Ω



STARTER CONTROL RELAY INSPECTION

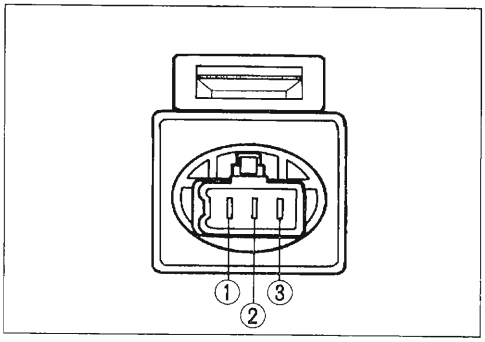
- Remove the left frame cover. (Refer to page 6-1.)
- Remove the starter control relay and disconnect the coupler.



Using a multi circuit tester, measure the voltage between the terminals in the following table.

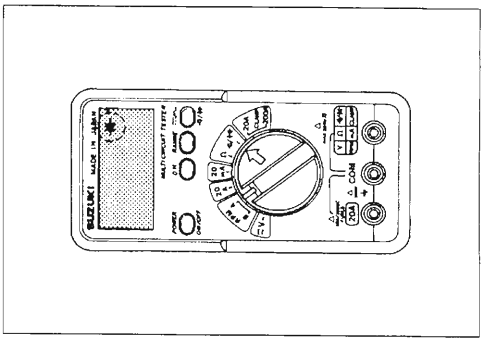
Unit:V

⊖ Probe of tester to:	⊕ Probe of tester to: ①	②	③
①		0.5—0.6	0.4—0.6
②	0.4—0.5		0.1—0.2
③	0.4—0.6	0.1—0.2	



09900-25008: Multi circuit tester set

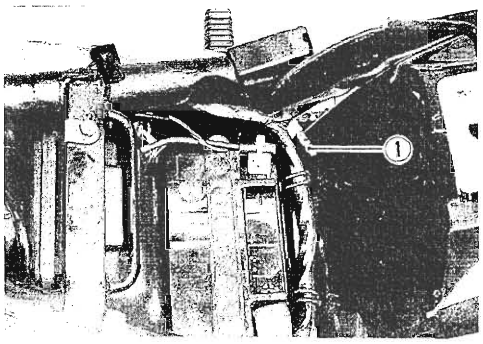
Tester knob indication: Diode test (+◀—)



NOTE:
If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

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

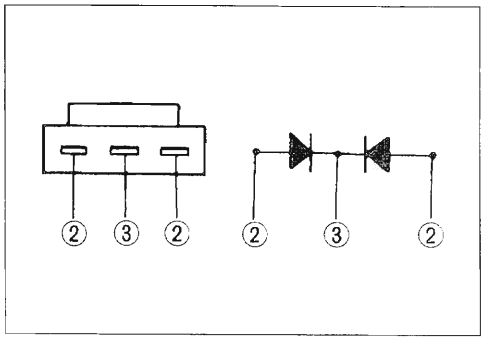
The diode ① is located under the battery cover.

- Remove the seat and battery cover.
- Disconnect the diode.

Using a multi circuit, tester, measure the voltage between the terminals in the following table.

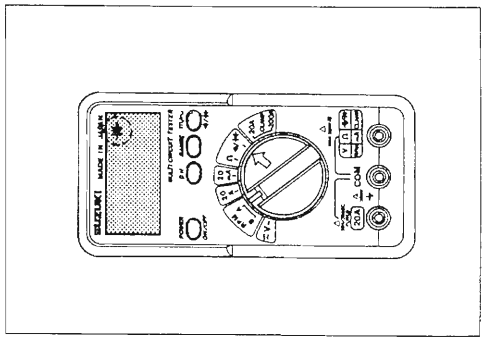
Unit:V

⊖ Probe of tester to: ①	⊕ Probe of tester to: ②	⊕ Probe of tester to: ③
②		1.4—1.5
③	0.4—0.6	



09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀⊢)



NOTE:

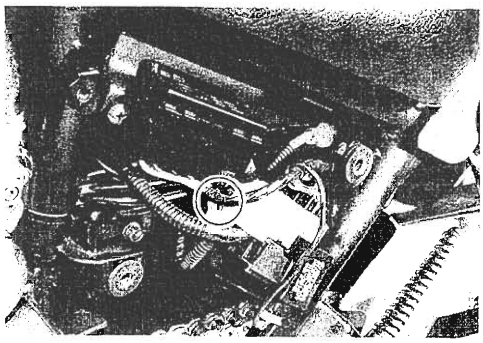
If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

NEUTRAL SWITCH

The neutral switch lead wire coupler is located behind the left frame cover.

- Remove the left frame cover. (Refer to page 6-1.)
- Disconnect the neutral switch lead wire and check the continuity between Blue and Ground with the transmission in "NEUTRAL".

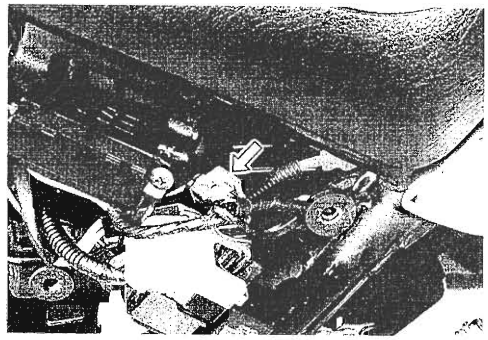
	Blue	Ground
ON (Neutral)	○———	———○
OFF (Except neutral)		



SIDE-STAND SWITCH

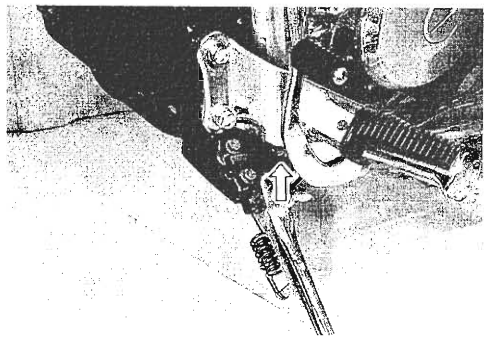
The side-stand switch lead wire coupler is located behind the left frame cover.

- Remove the left frame cover. (Refer to page 6-1.)
- Disconnect the side-stand switch lead wire coupler and check the continuity between Green and Black/White lead wires.



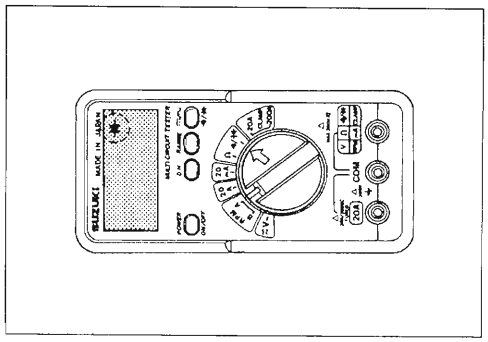
09900-25008: Multi circuit tester set

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	

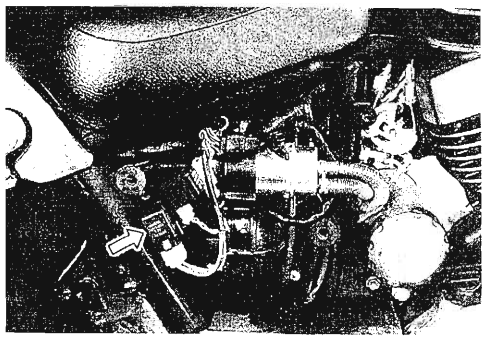
NOTE:
If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.



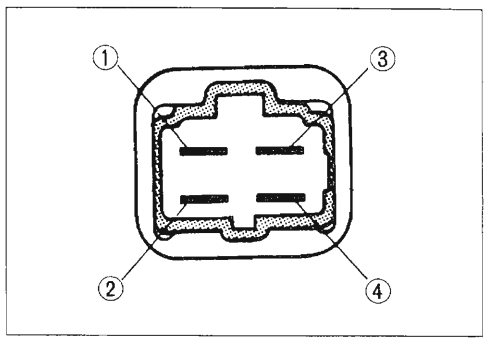
SIDE-STAND/IGNITION INTERLOCK RELAY

The side-stand/ignition interlock relay is located behind the right frame cover.

- Remove the right frame cover. (Refer to page 6-1.)
- Remove the side-stand/ignition interlock relay.



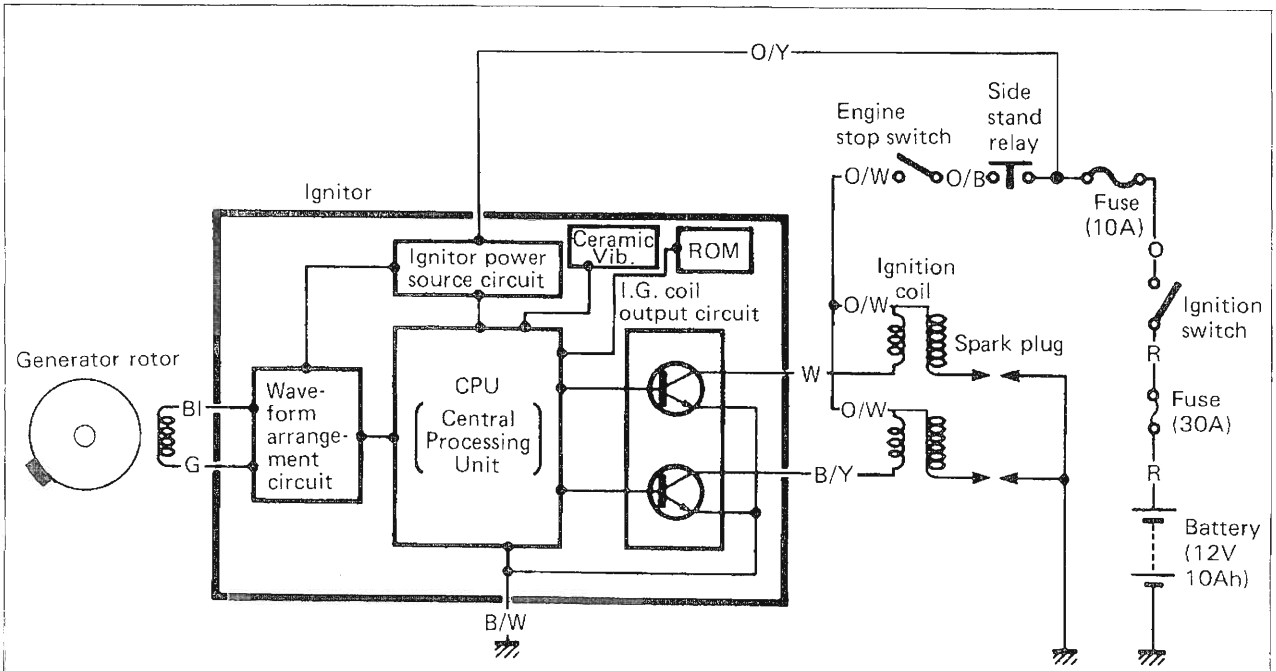
First, check the insulation between ① and ② terminals with tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.
If there is no continuity, replace it with a new one.



IGNITION SYSTEM

DESCRIPTION

The fully transistorized ignition system consists of the signal generator, ignitor, ignition coils, and spark plugs. The signal generator comprises the rotor tip and signal coil.
The rotor tip is mounted at the rotor. The signal coil is mounted at the generator cover. The induced signal in the signal generator is sent to wave-form arrangement circuit, and CPU receives this signal and calculates the best ignition timing from the signal of ceramic vibrator and data stored in the ROM. The CPU outputs signal to the transistor of the I.G. coil output circuit which is connected to the primary windings of the ignition coil which is turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.

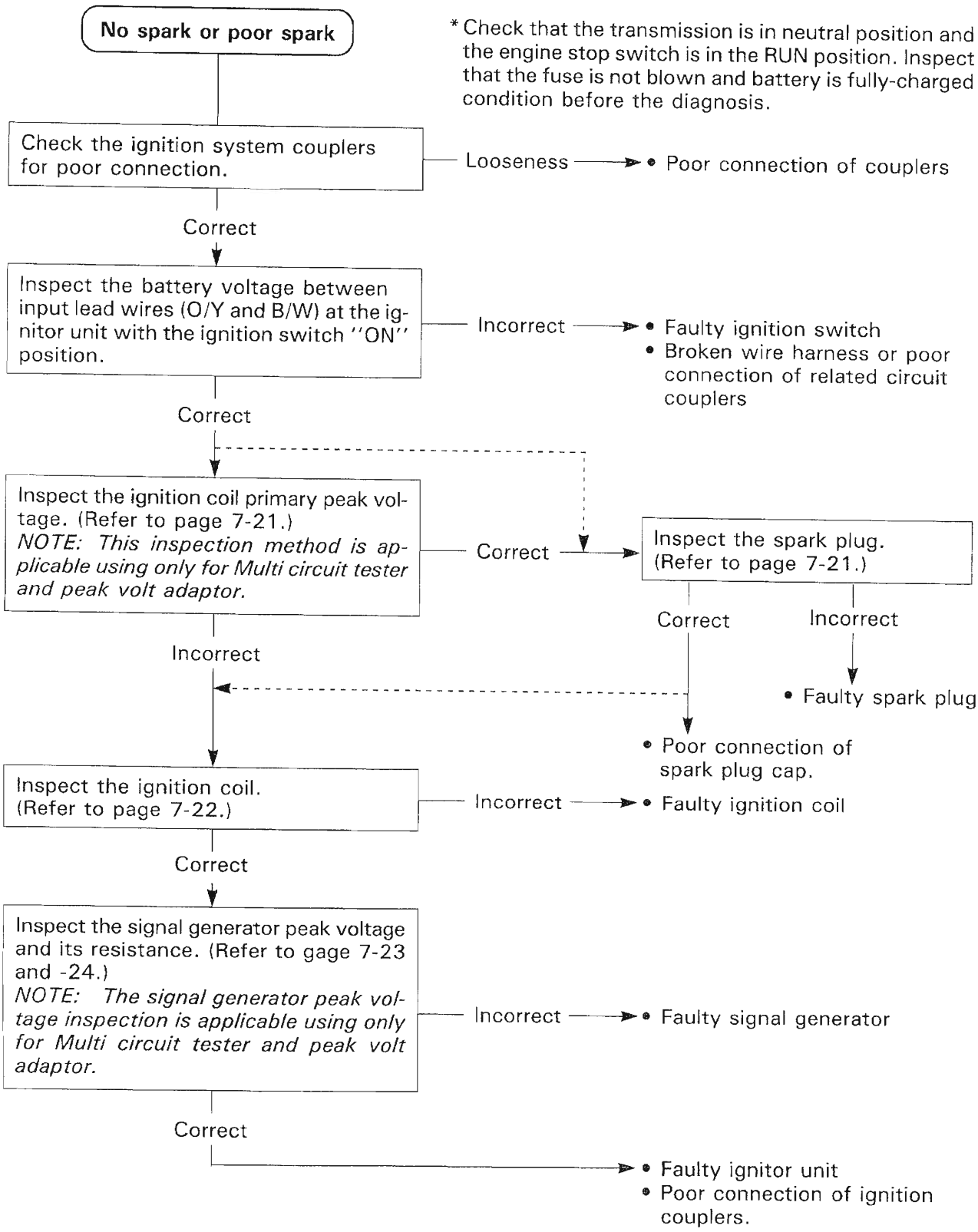


WIRE COLOR

G : Green	R : Red	B/Y : Black with Yellow tracer
Bl : Blue	O/W : Orange with White tracer	B/W : Black with White tracer
W : White	O/Y : Orange with Yellow tracer	R/W : Red with White tracer
O : Orange	O/B : Orange with Black tracer	

NOTE:
The ignition cut-off circuit is not incorporated in this ignitor unit.

TROUBLESHOOTING

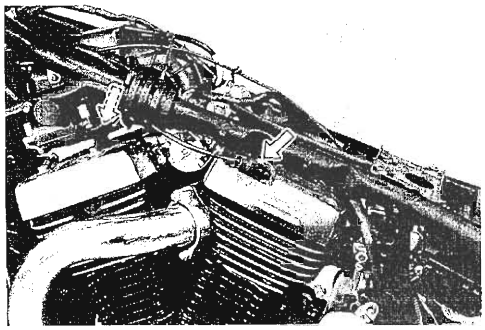


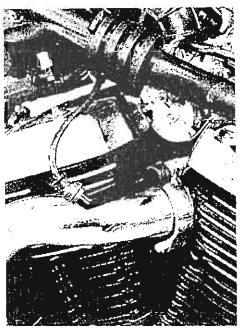
INSPECTION

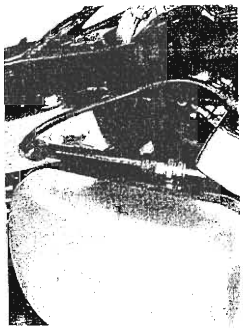
IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the fuel tank. (Refer to page 4-4.)
- Remove the two spark plug caps.
- Connect new two spark plugs to the each spark plug cap and ground them.

NOTE:
Be sure that all couplers and spark plugs are connected properly and the battery used is in fully-charged condition.



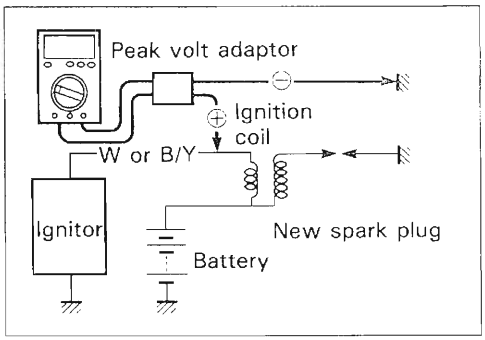




Inspect the No.1 ignition coil primary peak voltage in the following procedure.

- Connect the multi circuit tester with peak voltage adaptor as follow.

No.1 ignition coil: White terminal—Ground
(⊕ Probe) (⊖ Probe)

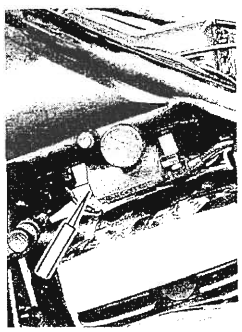


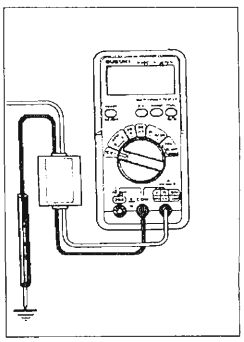
NOTE:
Do not disconnect the ignition coil primary wire.

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

⚠ CAUTION

When using the 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 inspection a few times and measure the highest ignition coil primary peak voltage.

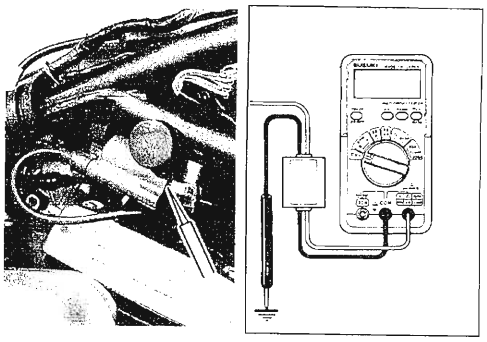
Tester knob indication: Voltage (⎓)

Ignition coil primary peak voltage: More than 210 V

⚠ WARNING

Do not touch the tester probes and spark plugs to prevent an electric shock while testing.

Inspect the No.2 ignition coil primary peak voltage in the same manner of No.1 ignition coil inspection.
No.2 ignition coil: B/Y terminal—Ground
(⊕ Probe) (⊖ Probe)
B/Y: Black with Yellow tracer



NOTE:
Do not disconnect the ignition coil primary wire.

Tester knob indication: Voltage (⎓)

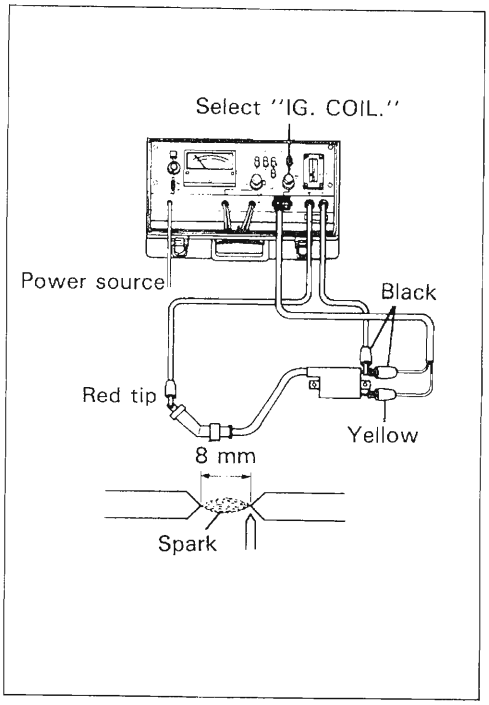
Ignition coil primary peak voltage: More than 205 V

If they are lower than the specified values, inspect the ignition coil, signal generator and ignitor. (Refer to page 7-20.)

IGNITION COIL (Checking with Electro Tester)
- Remove the fuel tank. (Refer to page 4-4.)
- Remove the ignition coils.

NOTE:
Make sure that the three-needle sparking distance of electro tester is set at 8 mm (0.3 in).

- With the tester, test the ignition coil for sparking performance. The test connection is as indicated.



If no sparking or orange color sparking occures 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

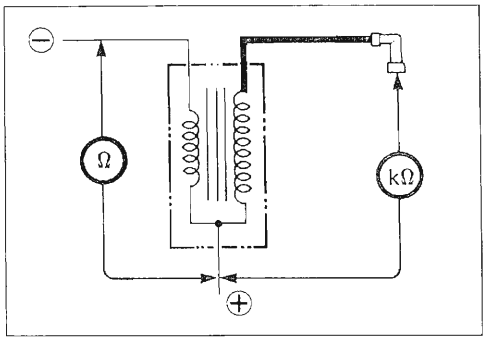
Do not touch the wire clips to prevent an electric shock when testing.

⚠ CAUTION

When using the electro tester, follow the instruction manual.

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

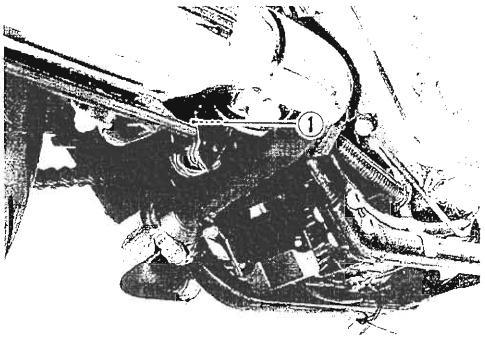
Ignition coil resistance
Primary: 2—6Ω (⊕ tap—⊖ tap)
Secondary: 15—30 kΩ (Plug cap—⊕ tap)



SIGNAL GENERATOR (Checking with Multi Circuit Tester)

- Disconnect the ignitor lead wire coupler ① from the ignitor unit.

NOTE:
Be sure that all couplers are connected properly and the battery used is in fully-charged condition.



Inspect the signal generator peak voltage between Green and Blue lead wires on the ignitor coupler.

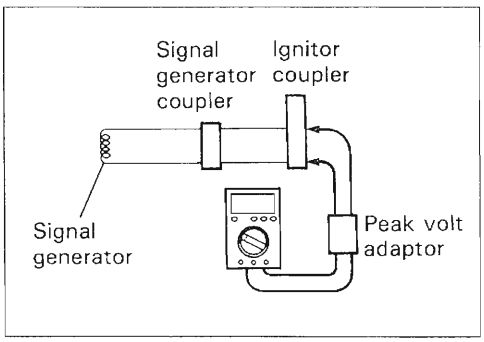
- Connect the multi circuit tester with peak volt adaptor as follow.

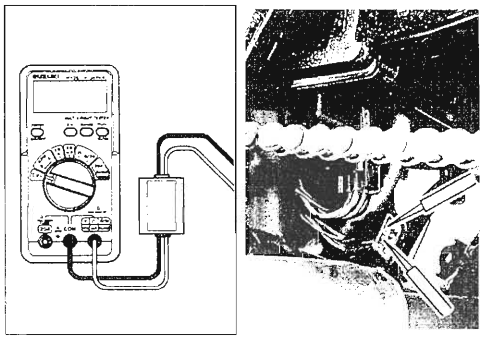
Green (⊕ Probe)—Blue (⊖ Probe)

TOOL 09900-25008: Multi circuit tester set

⚠ 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.

Tester knob indication: Voltage (⎓)

Signal generator peak voltage:
More than 1.5V (Green—Blue)

If the peak voltage measured on the ignitor lead wire coupler is lower than the specified value, check the peak voltage on the signal generator lead wire coupler in the following procedure.

- Remove the left frame cover. (Refer to page 6-1.)
- Disconnect the signal generator lead wire coupler and connect the multi circuit tester with peak volt adaptor.

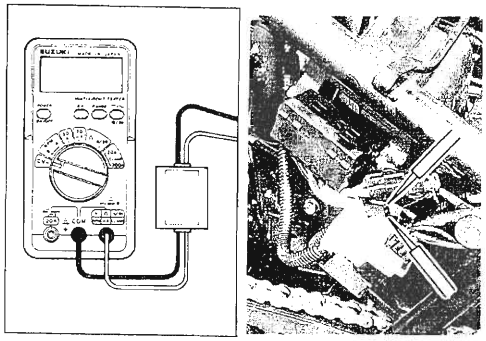
Green (⊕ Probe) — Blue (⊖ Probe)

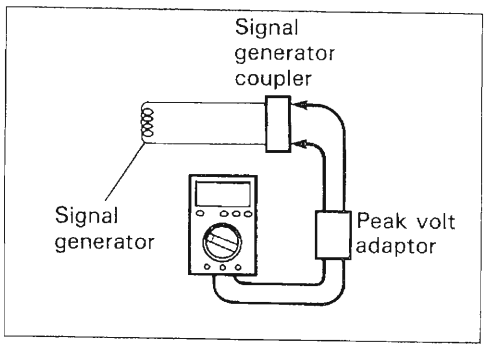
- Measure the signal generator peak voltage in the same manner of measuring on the signal generator lead wire coupler.

Tester knob indication: Voltage (⎓)

Signal generator peak voltage:
More than 1.5V (Green — Blue)

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.

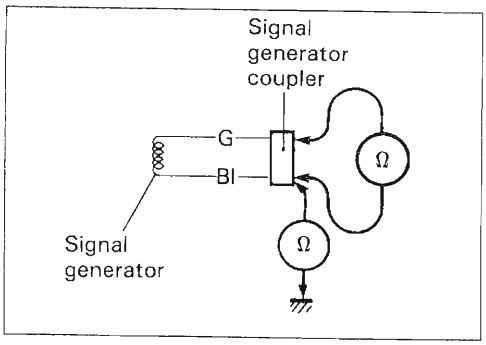




SIGNAL GENERATOR RESISTANCE

- Remove the left 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.

Signal coil resistance: 170 — 280Ω (Green — Blue)
∞ Ω (Green — Ground)



NOTE:
Refer to page 3-45 for signal generator replacing.

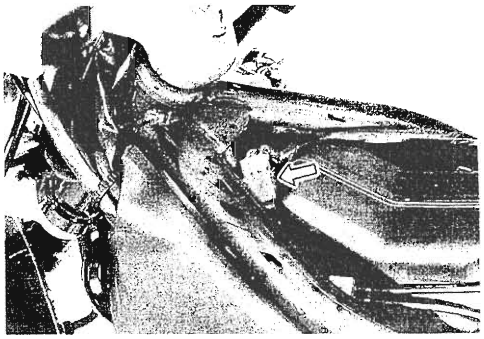
SPARK PLUG

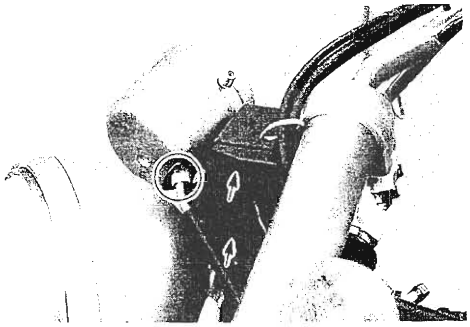
Refer to page 2-7.

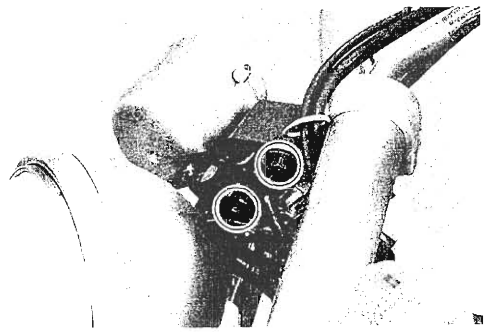
SPEEDOMETER AND INSTRUMENT PANEL

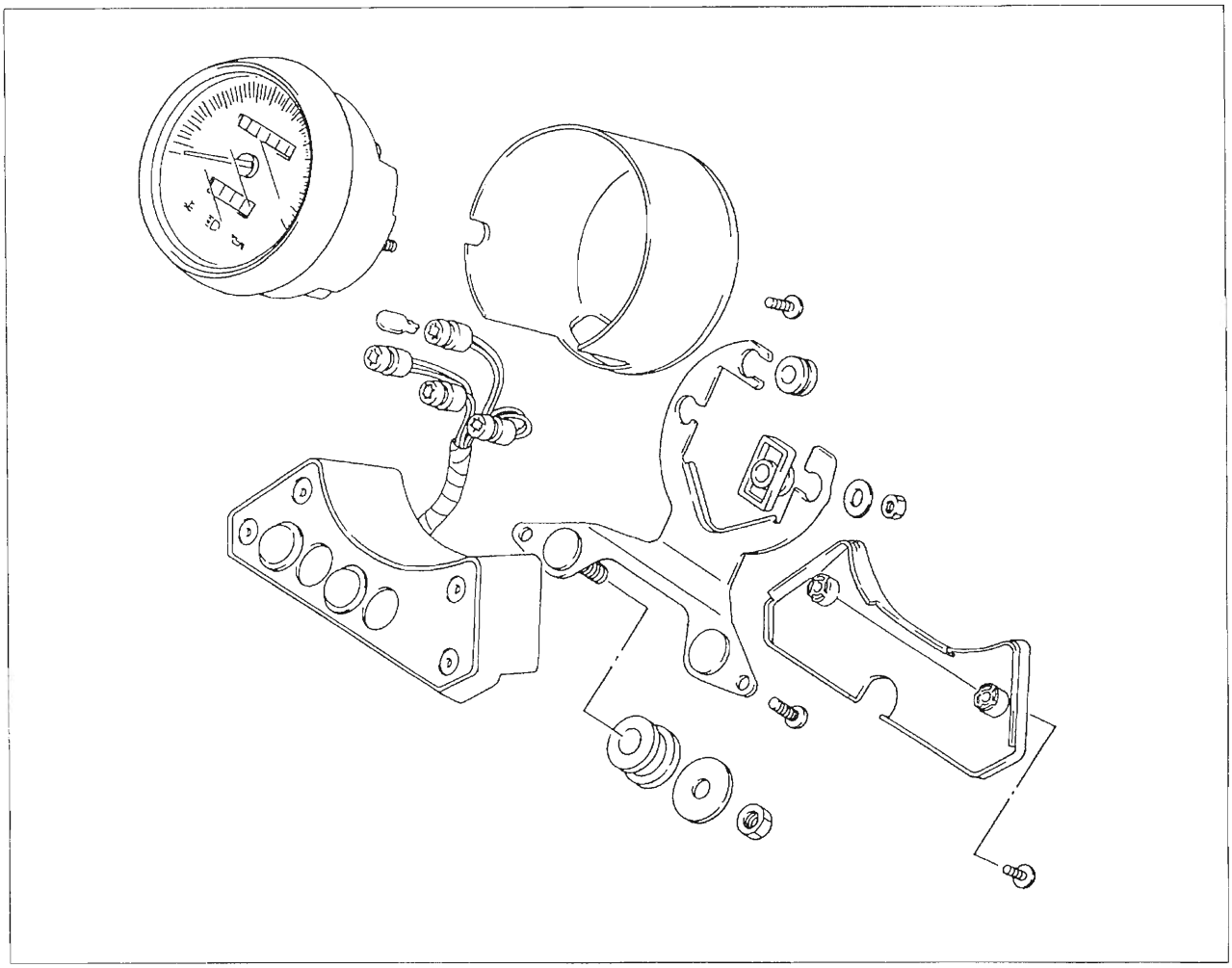
REMOVAL AND DISASSEMBLY

- Remove the fuel tank. (Refer to page 4-4.)
- Disconnect the speedometer lead wire coupler.
- Disconnect the speedometer cable.
- Remove the indicator light lower cover.
- Remove the speedometer assembly by removing the nuts.





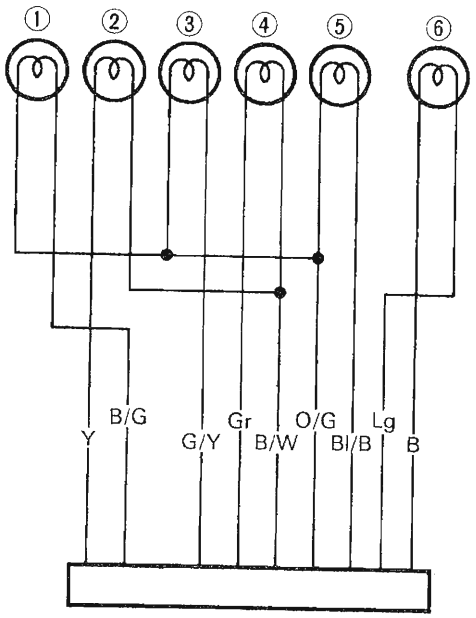




INSPECTION

Check the continuity between lead wires in the diagram. If the continuity measured is incorrect, replace the respective parts.

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

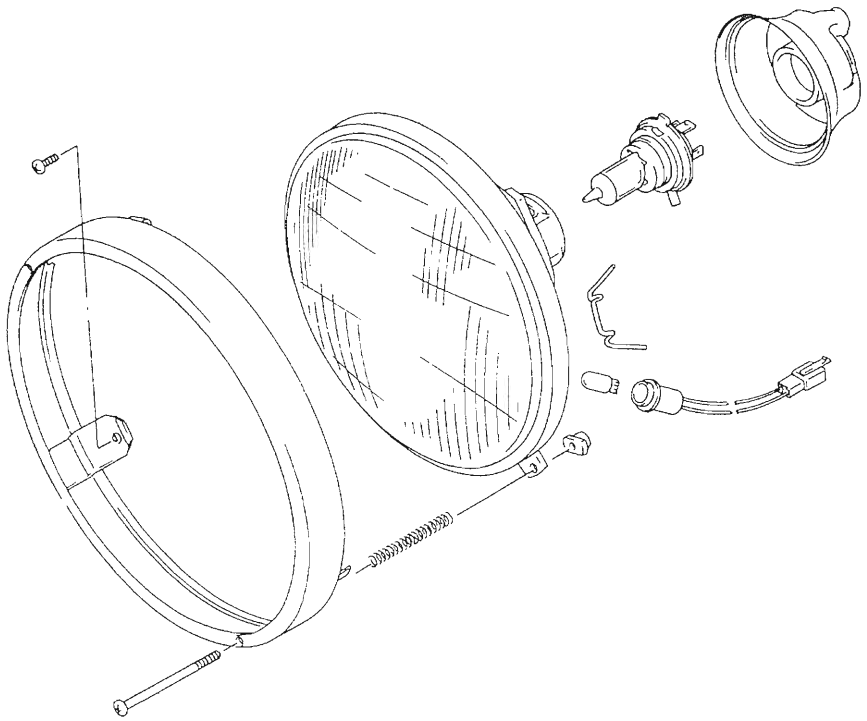


ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
① TEMP	O/G	B/G
② HIGH BEAM	Y	B/W
③ OIL	O/G	G/Y
④ METER ILLUMI	Gr	B/W
⑤ NEUTRAL	O/G	Bl/B
⑥ TURN	B	Lg

WIRE COLOR
B : Black
Gr : Gray
Lg : Light green
Y : Yellow
B/G : Black with Green tracer
B/W: Black with White tracer
Bl/B : Blue with Black tracer
G/Y : Green with Yellow tracer
O/G : Orange with Green tracer

LAMPS

HEADLIGHT



Headlight bulb: 12V 60/55W
Position light bulb: 12V 4W (Except for E-03,24,28,33)

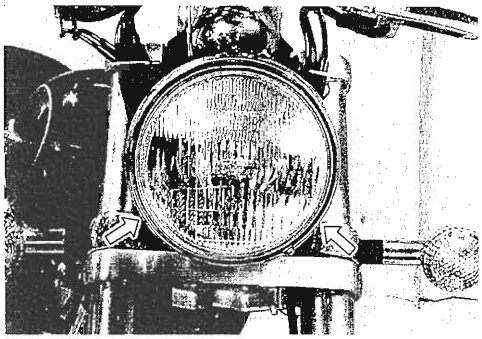
NOTE:
Adjust the headlight, both vertical and horizontal, after reassembling.

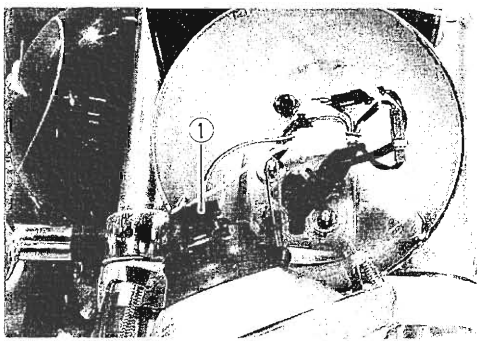
BULB REPLACEMENT

- Remove the headlight by removing the two screws.
- Disconnect the lead wire coupler ①.
- Remove the headlight bulb.
- Reassemble the headlight bulb in the reverse order of removal.

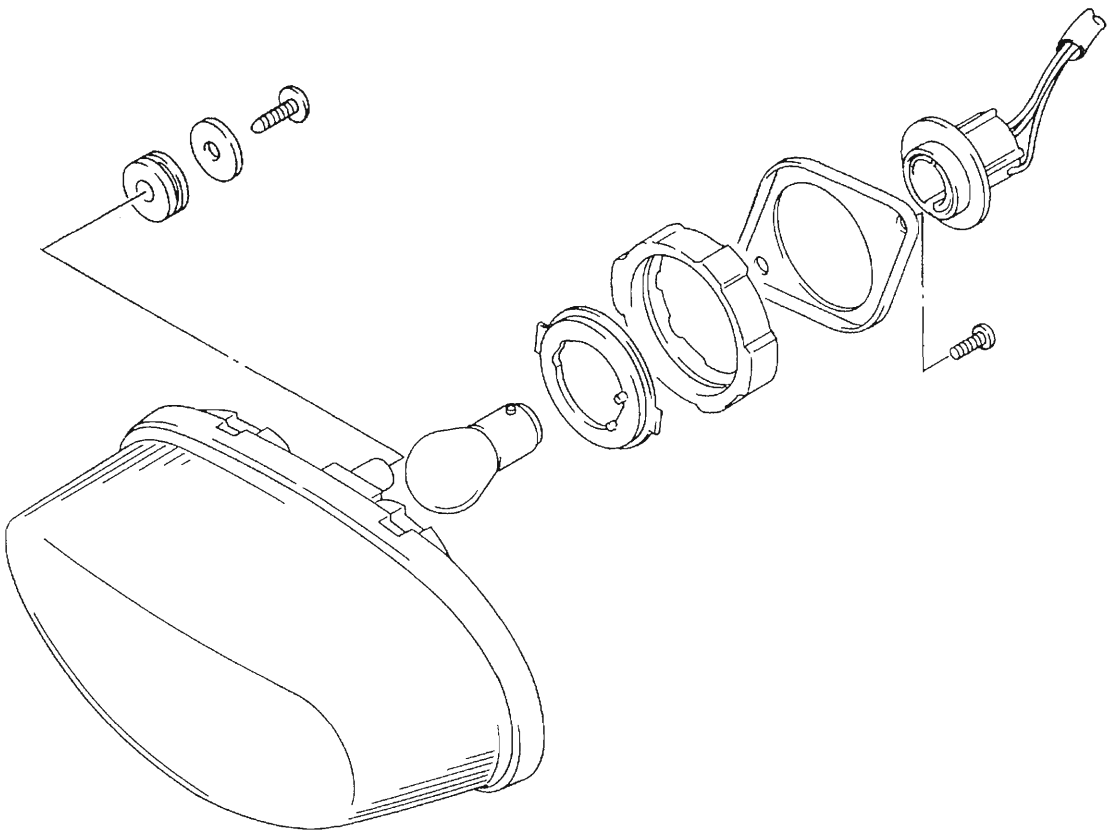
⚠ CAUTION

If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol or soapy water to prevent early failure.





TAIL/BRAKE LIGHT



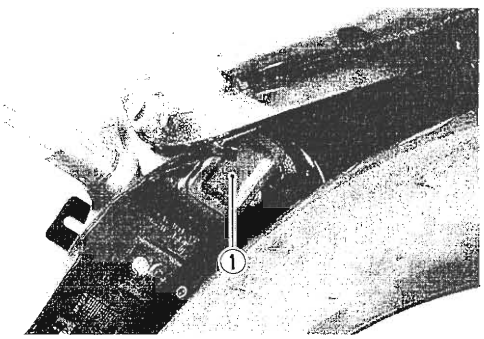
Tail/brake light bulb: 12V 5/21W

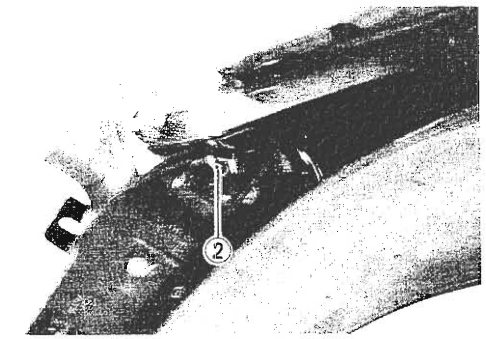
BULB REPLACEMENT

- Remove the cap ①.
- Remove the bulb socket ②.
- Remove the tail/brake light bulb.
- Reassemble the tail/brake light bulb in the reverse order of removal.

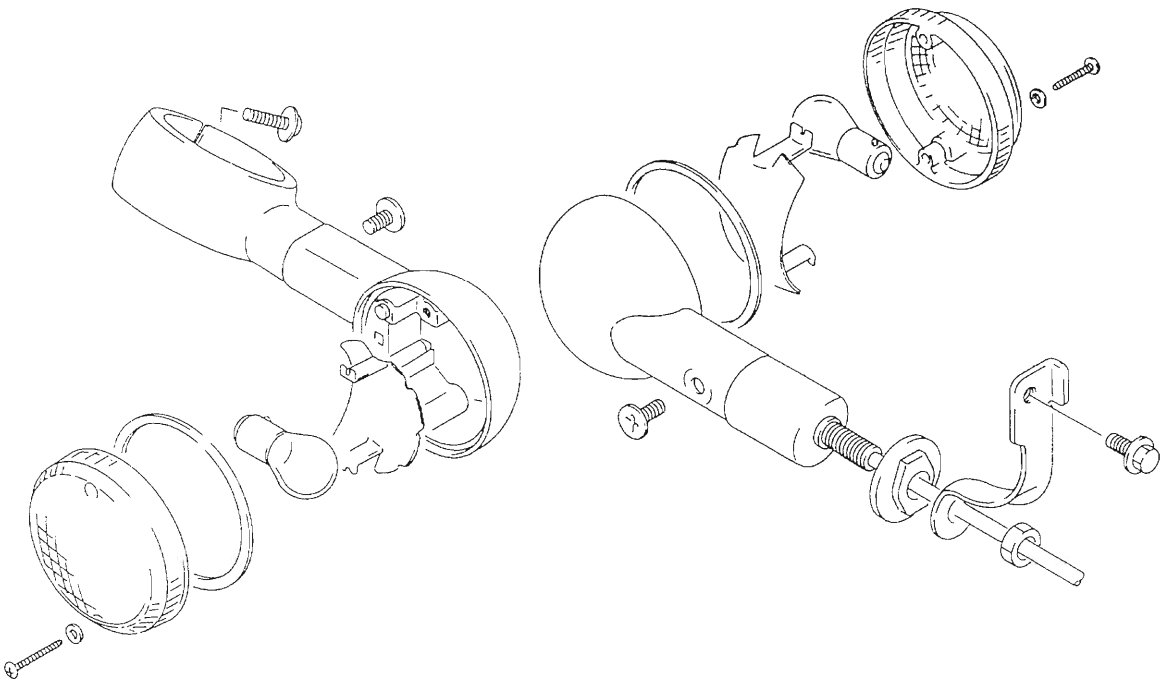
⚠ CAUTION

If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol or soapy water to prevent early failure.





TURN SIGNAL LIGHT



Turn signal light bulb: 12V 5/21W (For E-03,28,33)
12V 21W (For others)

⚠ 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.

RELAY

STARTER RELAY

The starter relay is located behind the left frame cover. (Refer to pages 7-3 and 7-15 for details.)

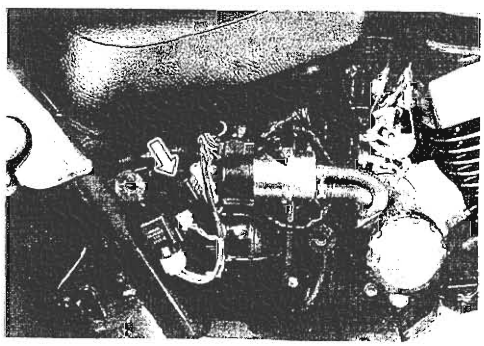
SIDE-STAND/IGNITION INTERLOCK RELAY

The side-stand/ignition interlock relay is located behind the right frame cover. (Refer to pages 7-4 and 7-18 for details.)

TURN SIGNAL RELAY

The turn signal relay is located behind the right frame cover. If the turn signal light does not light, inspect the bulb, turn signal switch and circuit connection.
If the bulb, turn signal switch and circuit connection checked are correct, the turn signal relay may be faulty, replace it with a new one.

NOTE:
Be sure that the battery used is in fully-charged condition.



SWITCHES

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

IGNITION SWITCH

For E-24

Color / Position	R	O	O/Y	Gr	Br
OFF					
ON	○	○	○	○	○

For others

Color / Position	R	O	O/Y	Gr	Br
OFF					
ON	○	○	○	○	○
P	○				○

LIGHTING SWITCH

For E-03,24,28,33

Color / Position	O/Bl	Gr	O/R	Y/W
ON	○	○	○	○

For others

Color / Position	O/Bl	Gr	O/R	Y/W
OFF				
S	○	○		
ON	○	○	○	○

DIMMER SWITCH

Color / Position	Y/W	W	Y
HI	○		○
LO	○	○	

TURN SIGNAL SWITCH

Color / Position	Lg	Lbl	B
L		○	○
PUSH			
R	○	○	

PASSING LIGHT SWITCH

Color / Position	O/R	Y
•		
PUSH	○	○

ENGINE STOP SWITCH

Color / Position	O/B	O/W
OFF		
RUN	○	○

STARTER BUTTON

Color / Position	O/W	Y/G
•		
PUSH	○	○

HORN BUTTON

Color / Position	B/Bl	B/W
•		
PUSH	○	○

FRONT BRAKE SWITCH

Color / Position	B/R	B
OFF		
ON	○	○

REAR BRAKE SWITCH

Color / Position	O	W/B
OFF		
ON	○	○

OIL PRESSURE SWITCH

Color / Position	G/Y	Ground
Engine is stopped	○	○
Engine is running		

NOTE:
Before inspecting the oil pressure switch, check if the engine oil level is enough.

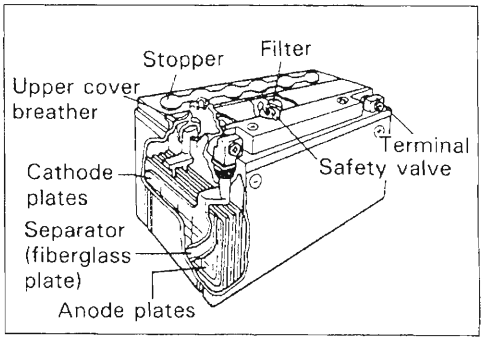
WIRE COLOR

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/R : Black with Red tracer
B/Bl : Black with Blue tracer
G/Y : Green with Yellow tracer
O/B : Orange with Black tracer
O/Bl : Orange with Blue 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

BATTERY

SPECIFICATIONS

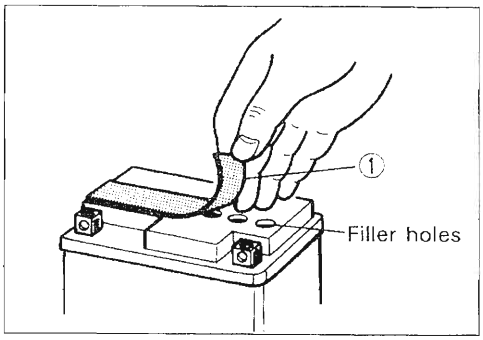
Type designation	FTX12-BS
Capacity	12V, 36 kC (10 Ah)/10HR
Standard electrolyte S.G.	1.320 at 20°C (68°F)



INITIAL CHARGING

Filling electrolyte

- Remove the aluminum tape ① sealing the battery electrolyte filler holes.

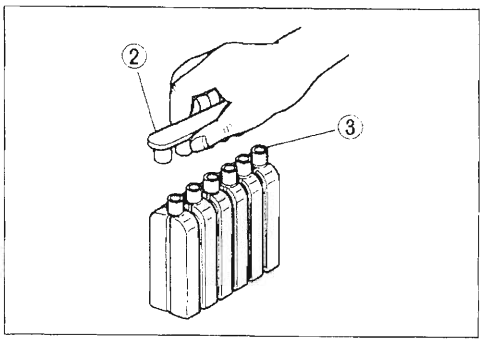


- Remove the caps ② .

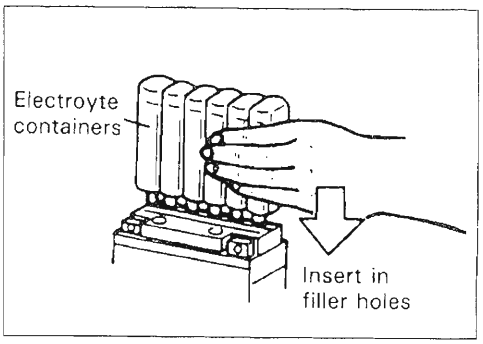
NOTE:

* *After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.*

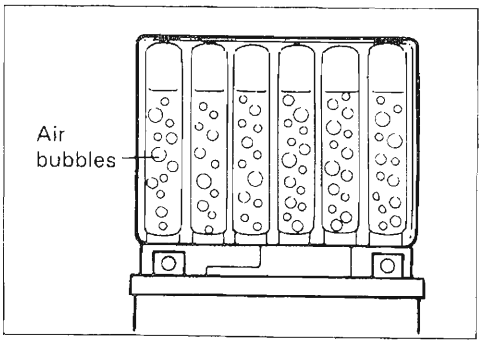
* *Do not remove or pierce the sealed areas ③ of the electrolyte container.*



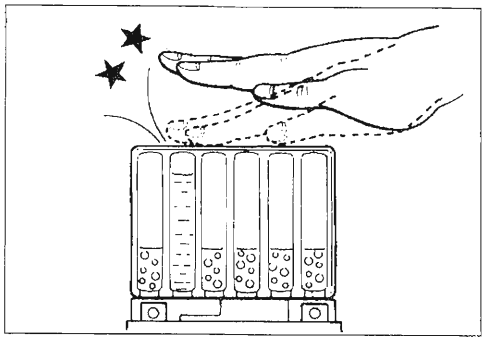
- Insert the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall. Take precaution not to allow any of the fluid to spill.



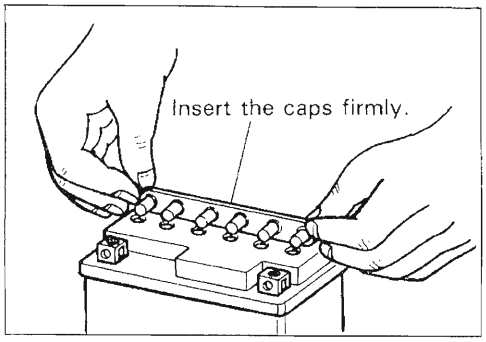
- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.



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.

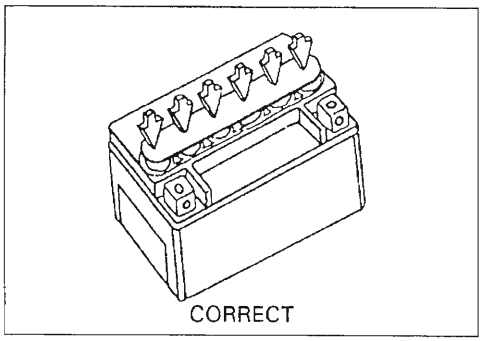


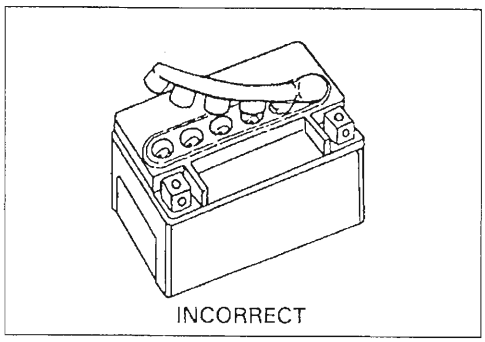
- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for around 20 minutes.
- Insert the caps into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.



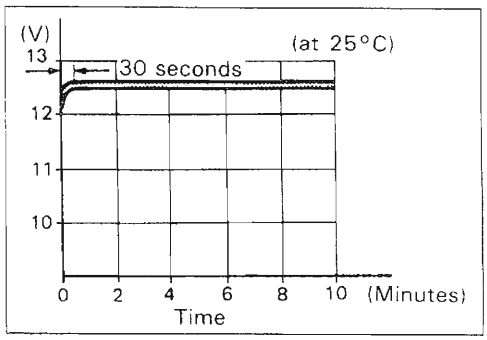
⚠ CAUTION

*** Never use anything except the specified battery.**
*** Once install the caps to the battery; do not remove the caps.**


CORRECT


INCORRECT

- 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 multi circuit 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.

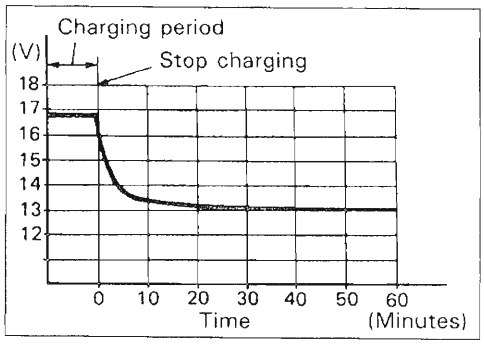
NOTE:
Do not remove the caps on the battery top while recharging.

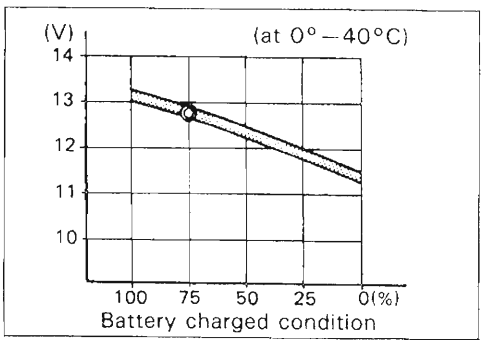
Recharging time: 5A for one hour or 1.2A for 5 to 10 hours

⚠ CAUTION

Be careful not to permit the charging current to exceed 5A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a multi circuit 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

CONTENTS

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Out of adjustment valve clearance.	Adjust.
	2. Worn valve guides or poor seating of valves.	Repair or replace.
	3. Mistiming valves.	Adjust.
	4. Excessively worn piston rings.	Replace.
	5. Worn-down cylinder bores.	Replace or rebore.
	6. Too slowly starter motor cranks.	See electrical section.
	7. Poor seating of spark plugs.	Retighten.
	Plugs not sparking	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Defective ignition coil.	Replace.
	4. Open or short in high-tension cords.	Replace.
	5. Defective signal coil or ignitor unit.	Replace.
	No fuel reaching the carburetors	
	1. Clogged or defective fuel valve.	Clean or replace.
	2. Defective fuel pump.	Replace.
	3. Defective carburetor needle valve.	Replace.
	4. Clogged fuel hose or fuel valve strainer.	Clean or replace.
	5. Defective signal coil, ignition coil and ignitor.	Replace.
Engine stalls easily.	1. Fouled spark plugs.	Clean.
	2. Defective signal coil or ignitor unit.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Clogged jets in carburetors.	Clean.
	5. Out of adjustment valve clearance.	Adjust.
	6. Defective fuel pump.	Replace.
Noisy engine.	**Excessive valve chatter**	
	1. Too large valve clearance.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Worn down rocker arm or rocker arm shaft.	Replace.
	4. Worn and burnt camshaft journal.	Replace.
	Noise seems to come from piston	
	1. Worn down pistons or cylinders.	Replace.
	2. Fouled with carbon combustion chambers.	Clean.
	3. Worn piston pins or piston pin bore.	Replace.
	4. Worn piston rings or ring grooves.	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Not working tension adjuster.	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of clutch plates.	Replace.
	3. Distorted clutch plates, driven and drive.	Replace.
	4. Worn clutch release bearing.	Replace.
	5. Weakened clutch dampers.	Replace the primary driven gear.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	**Noise seems to come from crankshaft**	
	1. Due to wear rattling bearings.	Replace.
	2. Worn and burnt big-end bearings.	Replace.
	3. Worn and burnt journal bearings.	Replace.
	4. Too large thrust clearance.	Replace thrust bearing.
	Noise seems to come from transmission	
	1. Worn or rubbing gears.	Replace.
	2. Worn splines.	Replace.
	3. Worn or rubbing primary gears.	Replace.
	4. Worn bearings.	Replace.
	Noise seems to come from water pump	
	1. Too much play on pump shaft bearing.	Replace.
	2. Worn or damaged impeller shaft.	Replace.
	3. Worn or damaged mechanical seal.	Replace.
	4. Touches pump case and impeller.	Replace.
Slipping clutch.	1. Out of adjustment or loss of play clutch control.	Adjust.
	2. Weakened clutch springs.	Replace.
	3. Worn or distorted pressure plate.	Replace.
	4. Distorted clutch plates, driven and drive.	Replace.
Dragging clutch.	1. Out of adjustment or too much play clutch control.	Adjust.
	2. Some clutch springs weakened while others are not.	Replace.
	3. Distorted pressure plate or clutch plate.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift forks.	Replace.
	3. Worn gearshift pawl.	Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft.	Replace.
	2. Rubbing or stickly shift shaft.	Repair or replace.
	3. Distorted or worn gearshift forks.	Replace.
Transmission jumps out of gear.	1. Worn shifting gears on driveshaft or countershaft.	Replace.
	2. Distorted or worn gearshift forks.	Replace.
	3. Weakened stopper spring on gearshift stopper.	Replace.
Engine idles poorly.	1. Out of adjustment valve clearance.	Adjust.
	2. Poor seating of valves.	Replace or repair.
	3. Defective valve guides.	Replace.
	4. Worn down rocker arm or rocker arm shaft.	Replace.
	5. Too wide spark plug gaps.	Adjust or replace.
	6. Defective ignition coil.	Replace.
	7. Defective signal coil or ignitor unit.	Replace.
	8. Out of adjustment in carburetors float-chamber fuel level.	Adjust.
	9. Clogged jets or imbalance of carburetors.	Clean or adjust.
	10. Defective fuel pump or ignitor unit.	Replace.

Complaint	Symptom and possible causes	Remedy
Engine runs poorly in high speed range.	1. Weakened valve springs.	Replace.
	2. Worn camshafts.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Too narrow spark plug gaps.	Adjust.
	5. Ignition not advanced sufficiently due to poorly working timing advance circuit.	Replace ignitor unit.
	6. Defective ignition coil.	Replace.
	7. Defective signal coil or ignitor unit.	Replace.
	8. Too low float-chamber fuel level.	Adjust.
	9. Clogged air cleaner element.	Clean.
	10. Clogged fuel hose, resulting in inadequate fuel supply to carburetors.	Clean and prime.
	11. Defective fuel pump or ignitor unit.	Replace.
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine.	Check with inspection window drain out excess oil.
	2. Worn piston rings or cylinders.	Replace.
	3. Worn valve guides.	Replace.
	4. Scored or scuffed cylinder walls.	Rebore or replace.
	5. Worn valves stems.	Replace.
	6. Defective stem seal.	Replace.
	7. Worn oil ring side rails.	Replace.
Engine lacks power.	1. Loss of valve clearance.	Adjust.
	2. Weakened valve springs.	Replace.
	3. Out of adjustment valve timing.	Adjust.
	4. Worn piston rings or cylinders.	Replace.
	5. Poor seating of valves.	Repair.
	6. Fouled spark plug.	Clean or replace.
	7. Incorrect spark plug.	Adjust or replace.
	8. Clogged jets in carburetors.	Clean.
	9. Out of adjustment float-chamber fuel level.	Adjust.
	10. Clogged air cleaner element.	Clean.
	11. Loose carburetor balancing adjuster.	Retighten and balance the carburetor.
	12. Sucking air from intake pipe.	Retighten or replace.
	13. Too much engine oil.	Drain out excess oil.
	14. Defective fuel pump or ignitor unit.	Replace.
	15. Defective signal coil, ignitor unit and ignition coil.	Replace.
Engine overheats.	1. Heavy carbon deposit on piston crowns.	Clean.
	2. Not enough oil in the engine.	Add oil.
	3. Defective oil pump or clogged oil circuit.	Replace or clean.
	4. Too low in float chambers fuel level.	Adjust.
	5. Sucking air from intake pipes.	Retighten or replace.
	6. Use incorrect engine oil.	Change.
	7. Defective cooling system.	See radiator section.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	1. Clogged starter jet. 2. Clogged starter pipe. 3. Air leaking from a joint between starter body and carburetor. 4. Air leaking from carburetor's joint or vacuum gauge joint. 5. Not operation properly starter plunger.	Clean. Clean. Check starter body and carburetor for tightness, adjust and replace gasket. Check and adjust. Check and adjust.
Idling or low-speed trouble.	1. Clogged or loose pilot jet, pilot air jet. 2. Air leaking from carburetor's joint, vacuum gauge joint, or starter. 3. Clogged pilot outlet or bypass. 4. Not fully closed starter plunger.	Check and clean. Check and adjust. Check and clean. Check and adjust.
Medium-or high speed trouble.	1. Clogged main jet or main air jet. 2. Clogged needle jet. 3. Not operating properly throttle valve. 4. Clogged fuel filter. 5. Carburetor balancing adjuster loose.	Check and clean. Check and clean. Check throttle valve for operation. Check and clean. Retighten and balance the carburetor.
Overflow and fuel level fluctuations.	1. Worn or damaged needle valve. 2. Broken spring in needle valve. 3. Not working properly float. 4. Foreign matter has adhered to needle valve. 5. Too high or low fuel level. 6. Defective fuel pump or ignitor unit. 7. Clogged carburetor air vent pipe. 8. Defective signal coil, ignitor unit and ignition coil.	Replace. Replace. Check and adjust. Clean. Adjust float height. Replace. Clean. Replace.

RADIATOR

Complaint	Symptom and possible causes	Remedy
Engine overheats.	1. Not enough engine coolant. 2. Clogged with dirt or trashes radiator core. 3. Faulty cooling fan. 4. Defective cooling fan thermo-switch. 5. Clogged water passage. 6. Air trapped in the cooling circuit. 7. Defective water pump. 8. Use incorrect engine coolant.	Add engine coolant. Clean. Repair or replace. Replace. Clean. Bleed out air. Replace. Replace.
Engine overcools.	1. Defective cooling fan thermo-switch. 2. Extremely cold weather.	Replace. Put on the radiator cover.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering.	1. Overtightened steering stem nut. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires.	Adjust. Replace. Replace. Adjust.
Wobbly handlebars.	1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle or crooked tire. 4. Loose steering stem nut. 5. Worn or incorrect tire or wrong tire pressure.	Replace. Repair or replace. Replace. Adjust. Adjust or replace.
Wobby front wheel.	1. Distorted wheel rim. 2. Worn front wheel bearings. 3. Defective or incorrect tire. 4. Loose axle or axle pinch bolt. 5. Incorrect front fork oil level.	Replace. Replace. Replace. Retighten. Adjust.
Front suspension too soft.	1. Weakened springs. 2. Not enough fork oil. 3. Wrong weight fork oil.	Replace. Replenish. Replace.
Front suspension too stiff.	1. Too viscous fork oil. 2. Too much fork oil. 3. Front axle bent.	Replace. Drain excess oil. Replace.
Noisy front suspension.	1. Not enough fork oil. 2. Loose bolts on suspension.	Replenish. Retighten.
Wobbly rear wheel.	1. Distorted wheel rim. 2. Worn rear wheel bearing or swingarm bearings. 3. Defective or incorrect tire. 4. Worn swingarm and rear shock absorber. 5. Loose nuts or bolts on rear suspensions.	Replace. Replace. Replace. Replace. Retighten.
Rear suspension too soft.	1. Weakened shock absorber spring. 2. Improperly set rear suspension adjuster. 3. Leakage oil of shock absorber.	Replace. Adjust. Replace.
Rear suspension too stiff.	1. Improperly set rear suspension adjuster. 2. Bent shock absorber shaft. 3. Bent swingarm. 4. Worn swingarm bearings.	Adjust. Replace. Replace. Replace.
Noisy rear suspension.	1. Loose nuts or bolts on rear suspension. 2. Worn swingarm bearings.	Retighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads/shoe. 3. Oil adhesion of engaging surface of pads/shoe. 4. Worn disc/drum. 5. Air in hydraulic system. 6. Not enough brake fluid in the reservoir. 7. Too much play on brake pedal.	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air. Replenish. Adjust.
Brake squeaking.	1. Carbon adhesion on pad/shoe surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loosen front-wheel axle or rear-wheel axle. 5. Worn pads. 6. Foreign material in brake fluid. 7. Clogged return port of master cylinder.	Repair surface with sandpaper. Modify pad fitting or replace. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever stroke.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid.	Bleed air. Replenish fluid to specified level; bleed air. Replace with correct fluid.
Leakage of brake fluid.	1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup.	Tighten to specified torque. Replace. Replace piston and/or cup.

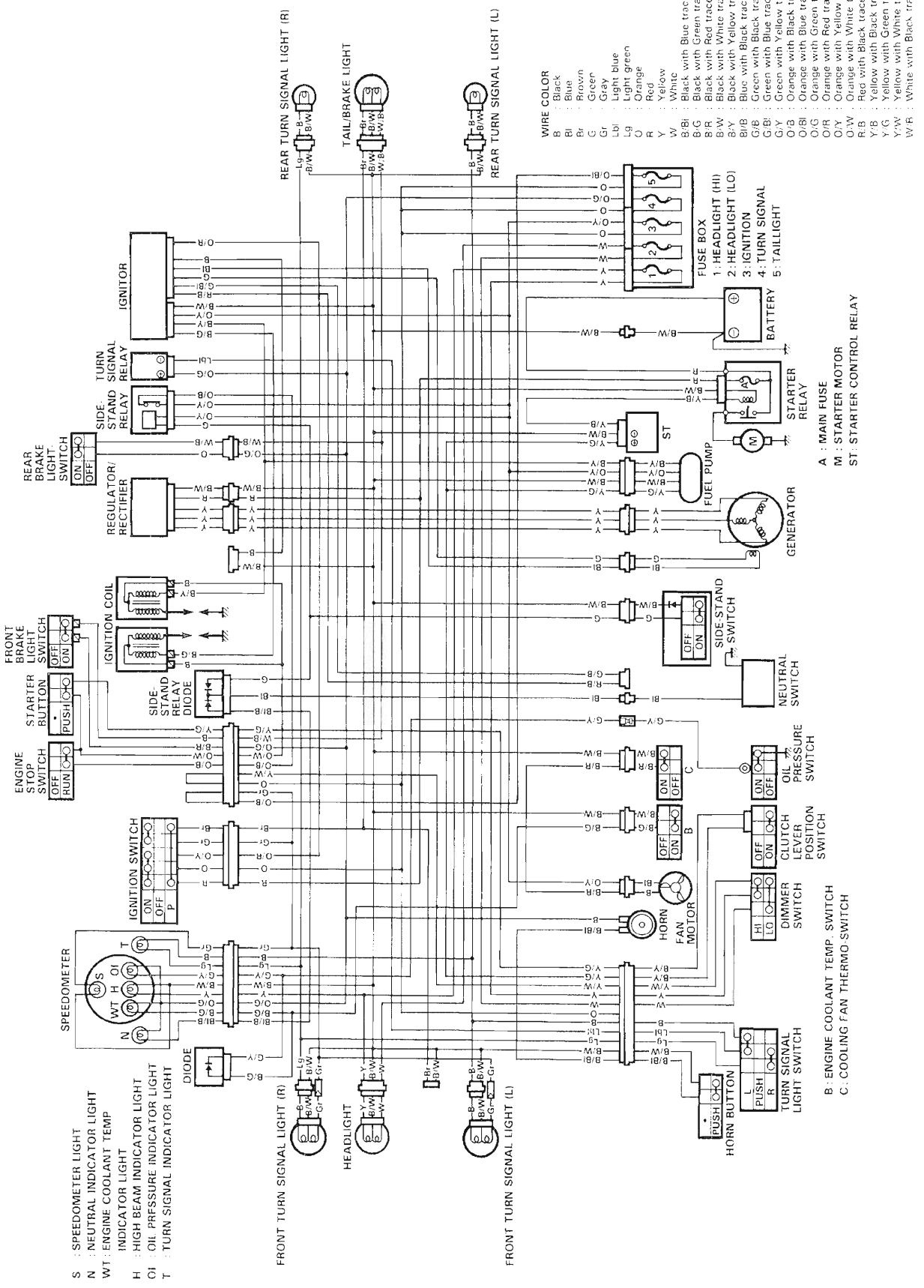
ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plugs. 3. Defective signal coil or ignitor unit.	Replace. Replace. Replace.
Spark plug soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Too cold spark plugs.	Adjust carburetors. Adjust carburetors. Change. Clean. Replace with hot type plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Worn piston or cylinders. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal.	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Too hot spark plugs. 2. Overheated the engine. 3. Loose spark plugs. 4. Too lean mixture.	Replace with cold type plugs. Tune up. Retighten. Adjust carburetors.
Generator does not charge.	1. Open or short lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or panctured regulator/rectifiers.	Repair or replace or retighten. Replace. Replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils or generator. 3. Defective regulator/rectifier. 4. Defective cell plates in the battery.	Repair or retighten. Replace. Replace. Replace the battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Damaged or defective resistor element in the regulator/rectifier. 3. Poorly grounded regulator/rectifier.	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Internally shorted generator. 3. Defective regulator/rectifier.	Repair or replace. Replace. Replace.
Starter button is not effective.	1. Run down battery. 2. Defective switch contacts. 3. Not seating properly brushes on commutator in starter motor. 4. Defective starter relay/starter interlock switch.	Repair or replace. Replace. Repair or replace. Replace.

BATTERY

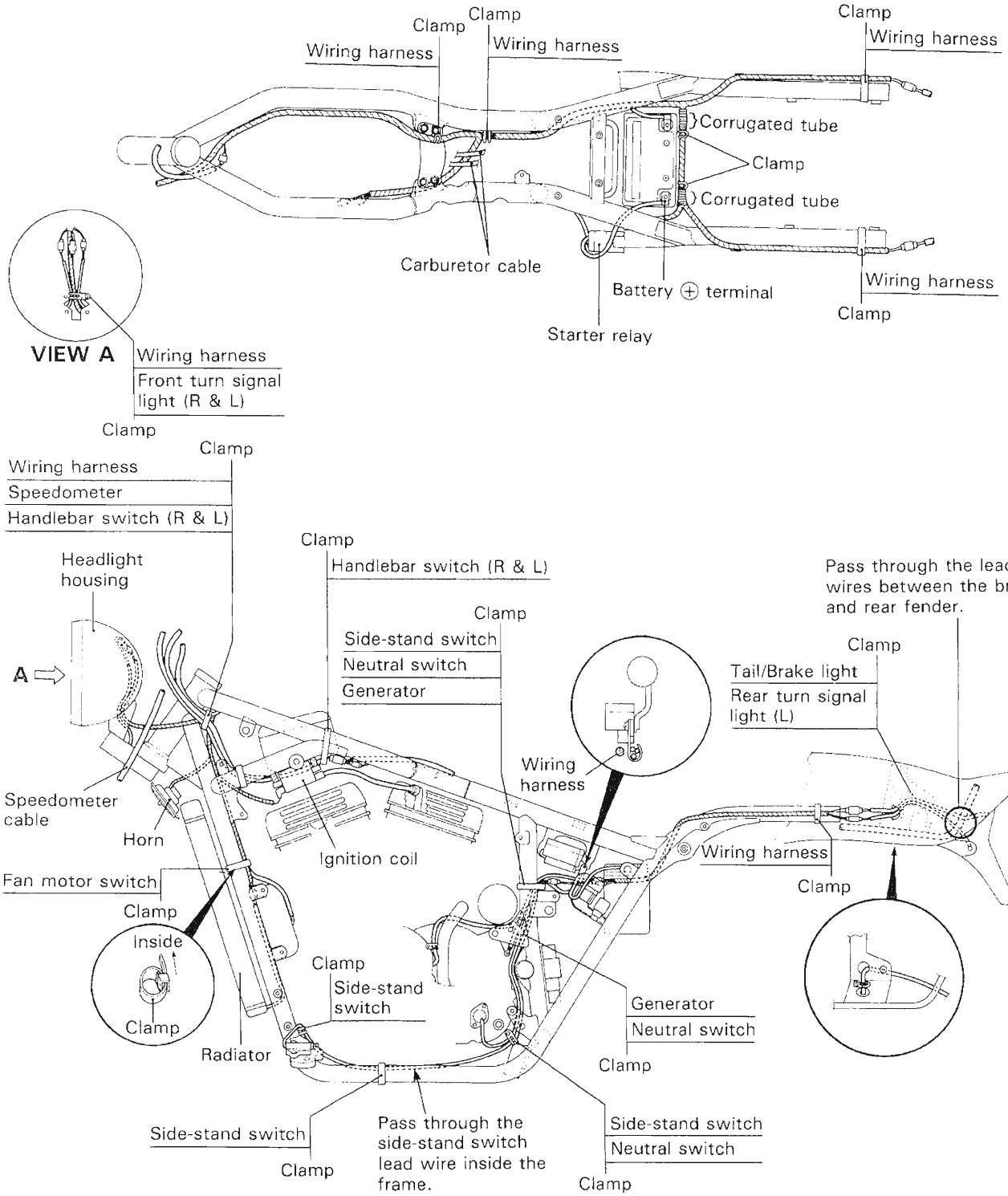
Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Cracked battery case. 2. Battery has been left in a run-down condition for a long time.	Replace the battery. Replace the battery.
Battery runs down quickly.	1. Not correct the charging system. 2. Cell plates have lost much of their active material as a result of overcharging. 3. A short-circuit condition exists within the battery. 4. Too low battery voltage. 5. Too old battery.	Check the generator, regulator/rectifier and circuit connections and make necessary adjustments to obtain specified charging operation. Replace the battery, and correct the charging system. Replace the battery. Recharge the battery fully. Replace the battery.
Battery "sulfation".	1. Too low or too high charging rate. (When not in use batteries should be checked at least once a month to avoid sulfation.) 2. Left unused the battery for too long in cold climate.	Replace the battery. Replace the battery, if badly sulfated.
Battery discharges too rapidly.	Dirty container top and sides.	Clean.

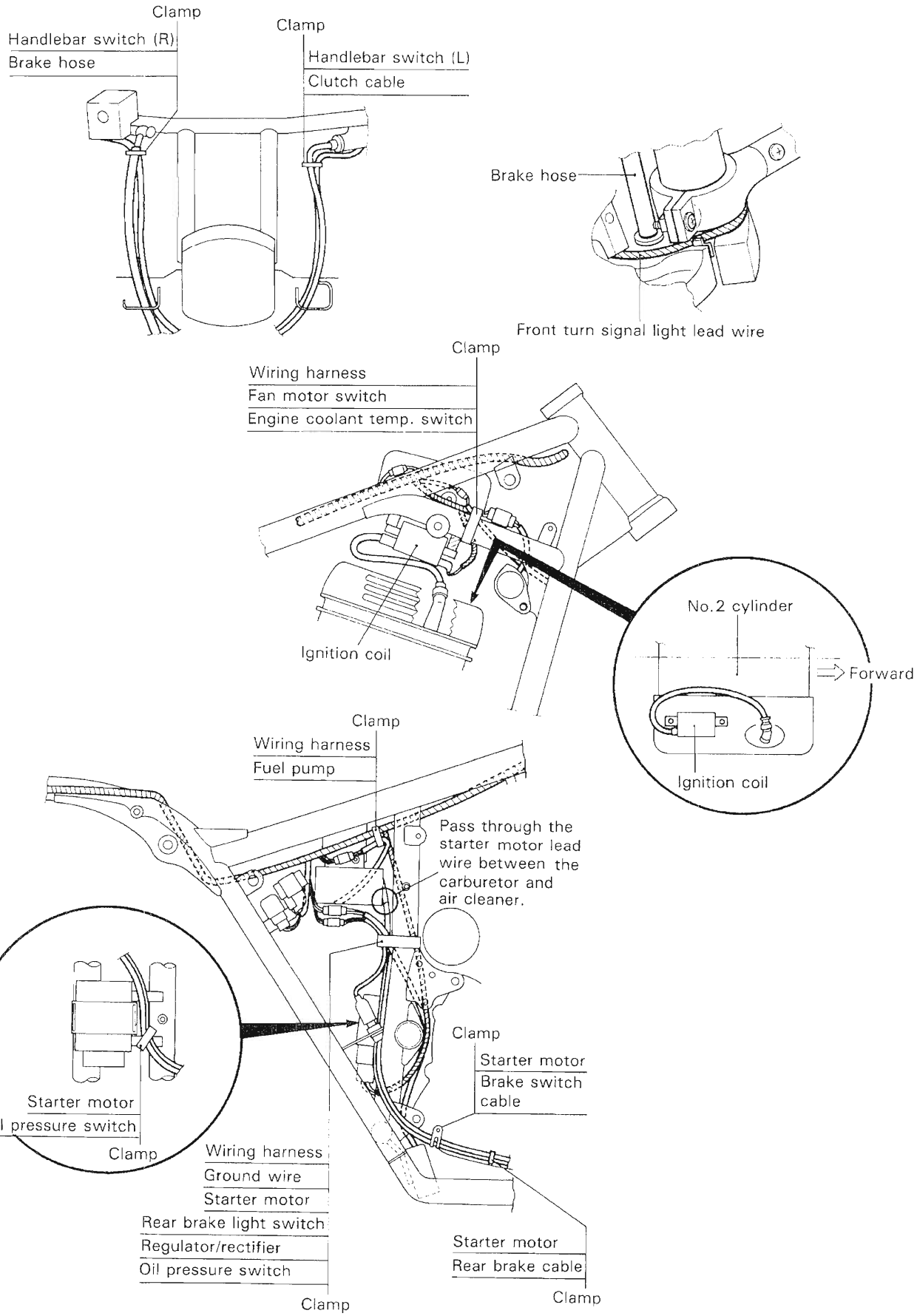
WIRING DIAGRAM

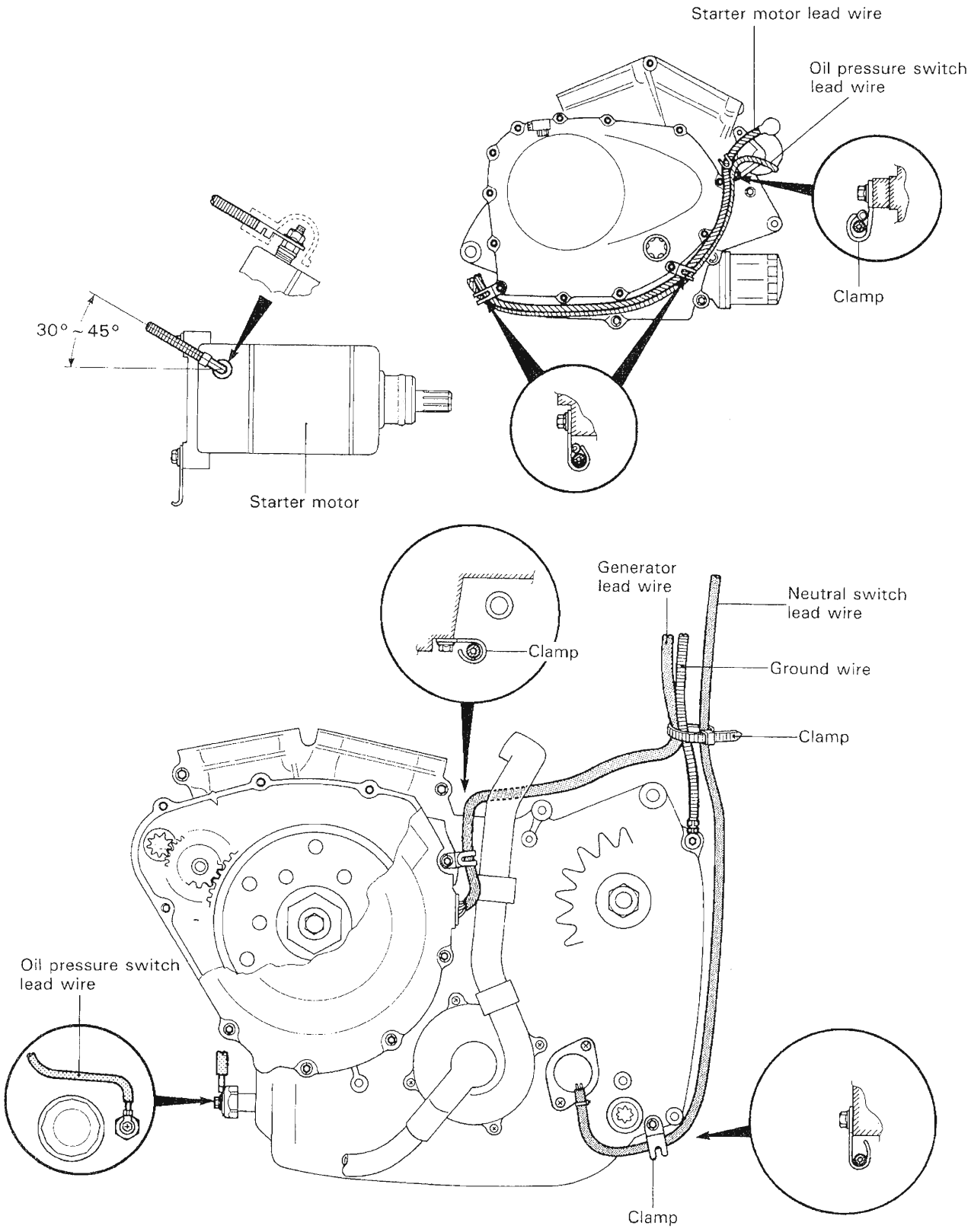


WIRE HARNESS, CABLE AND HOSE ROUTING

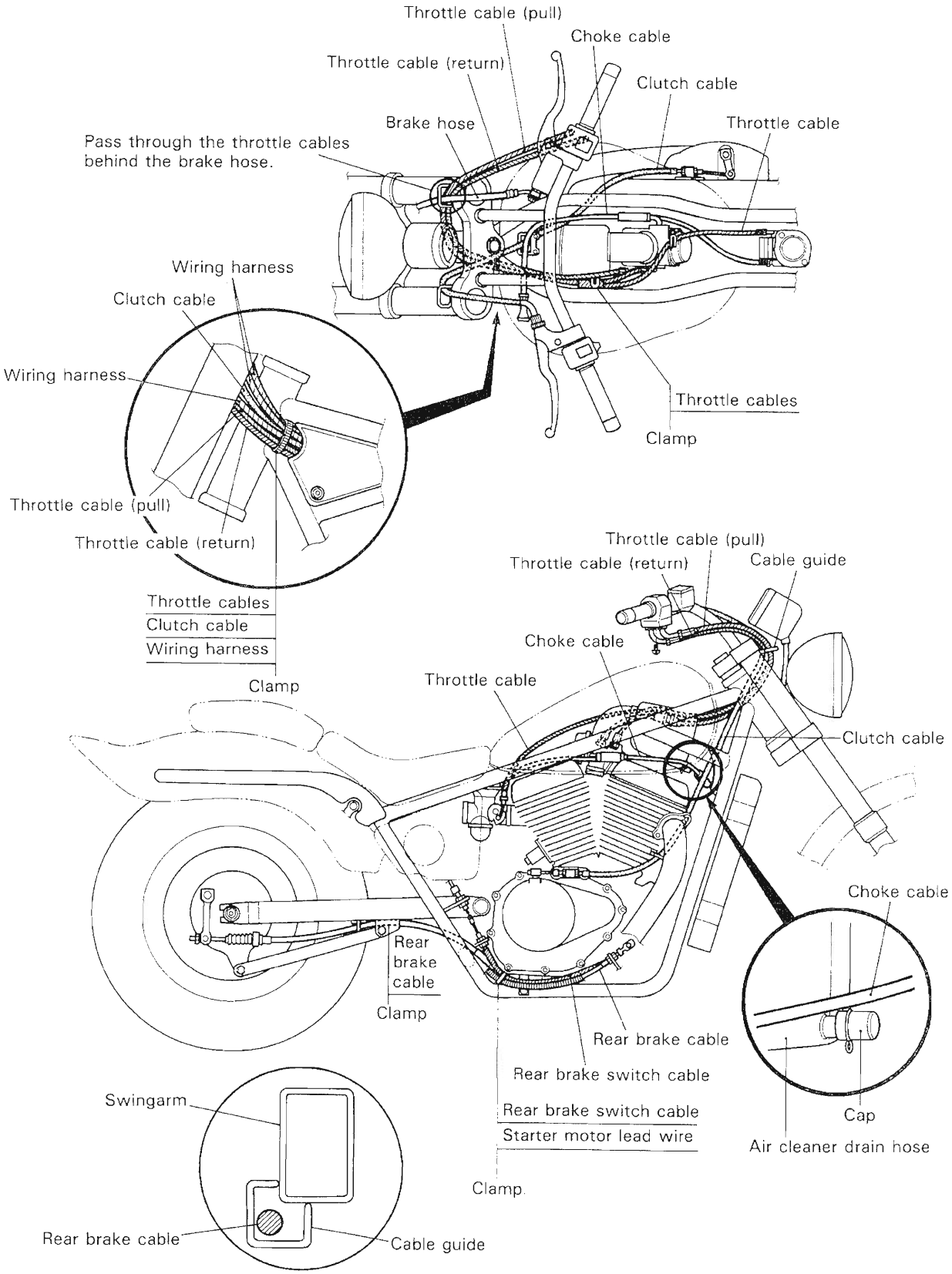
WIRE HARNESS ROUTING



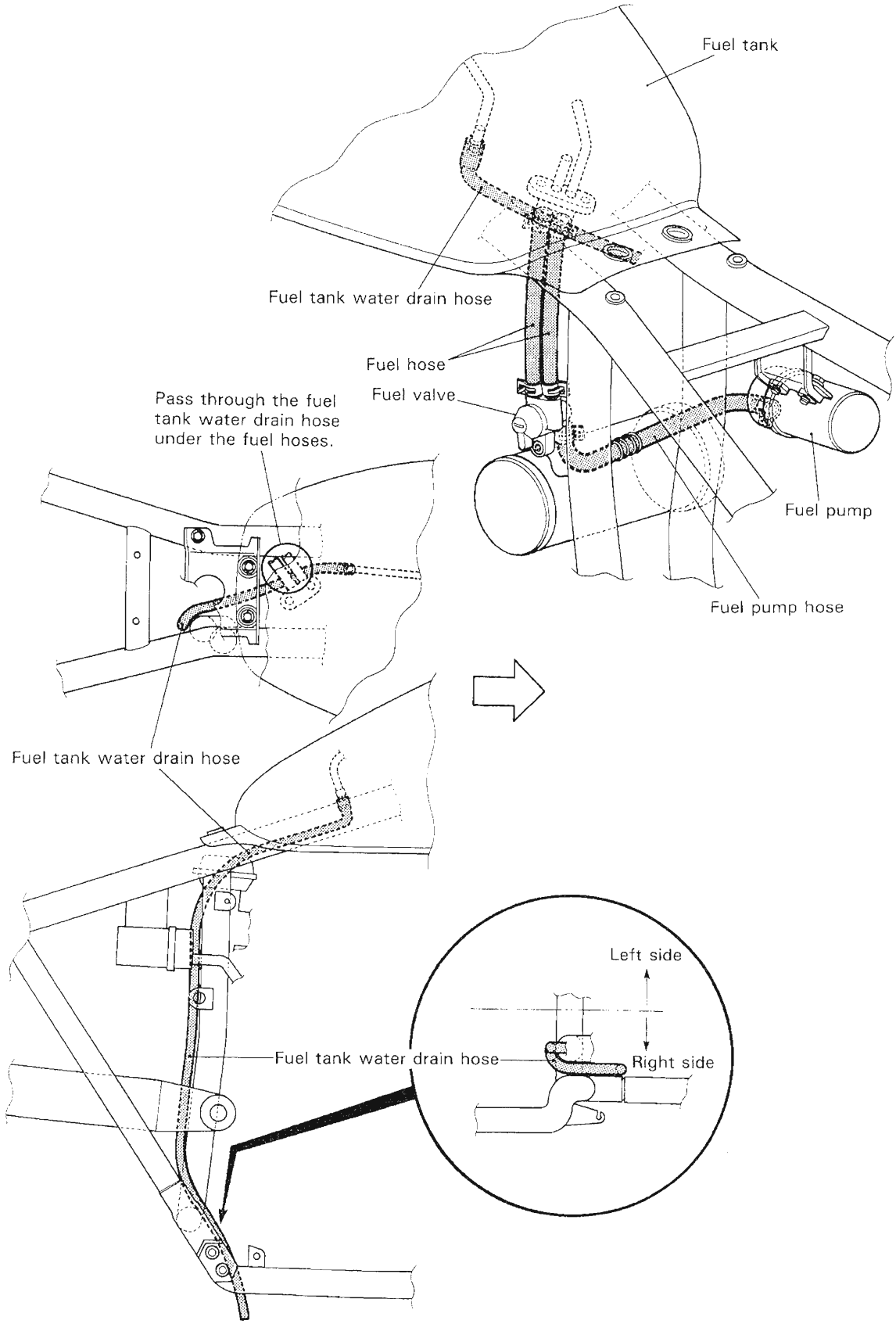

Clamp
Handlebar switch (R)
Brake hose
Clamp
Handlebar switch (L)
Clutch cable
Brake hose
Front turn signal light lead wire
Clamp
Wiring harness
Fan motor switch
Engine coolant temp. switch
Ignition coil
No.2 cylinder
Forward
Ignition coil
Clamp
Wiring harness
Fuel pump
Pass through the starter motor lead wire between the carburetor and air cleaner.
Starter motor
Oil pressure switch
Clamp
Clamp
Starter motor
Brake switch cable
Wiring harness
Ground wire
Starter motor
Rear brake light switch
Regulator/rectifier
Oil pressure switch
Clamp
Starter motor
Rear brake cable
Clamp

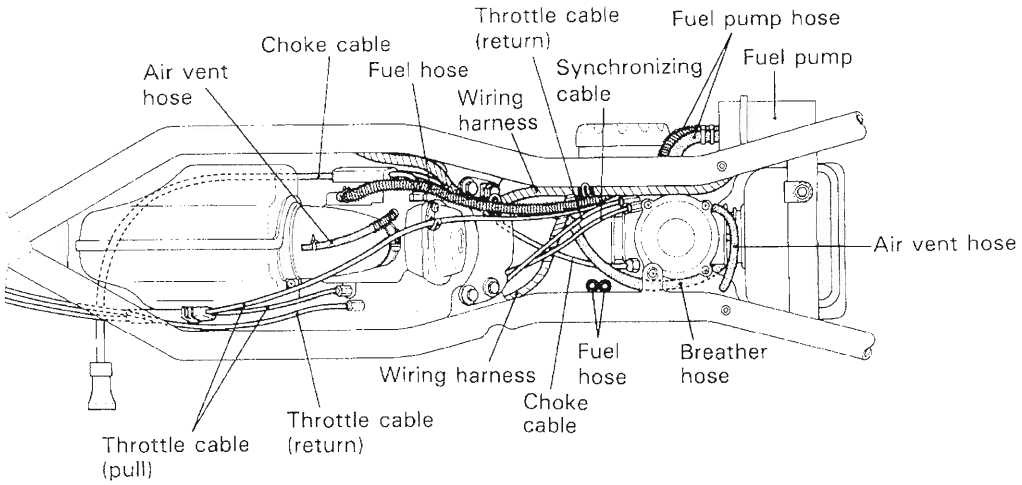

Starter motor lead wire
Oil pressure switch lead wire
Clamp
30° ~ 45°
Starter motor
Generator lead wire
Neutral switch lead wire
Clamp
Ground wire
Clamp
Oil pressure switch lead wire
Clamp

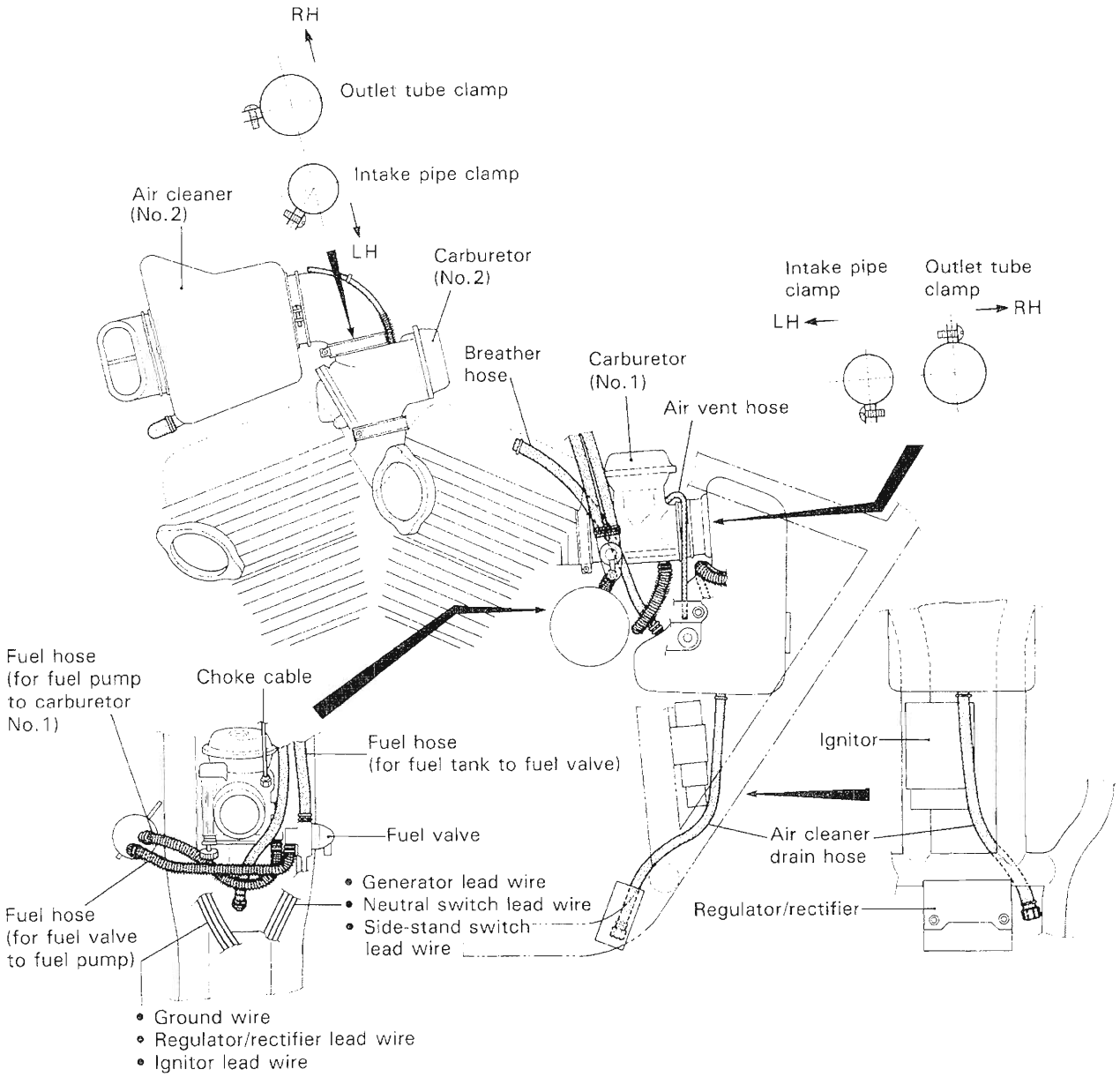
CABLE ROUTING



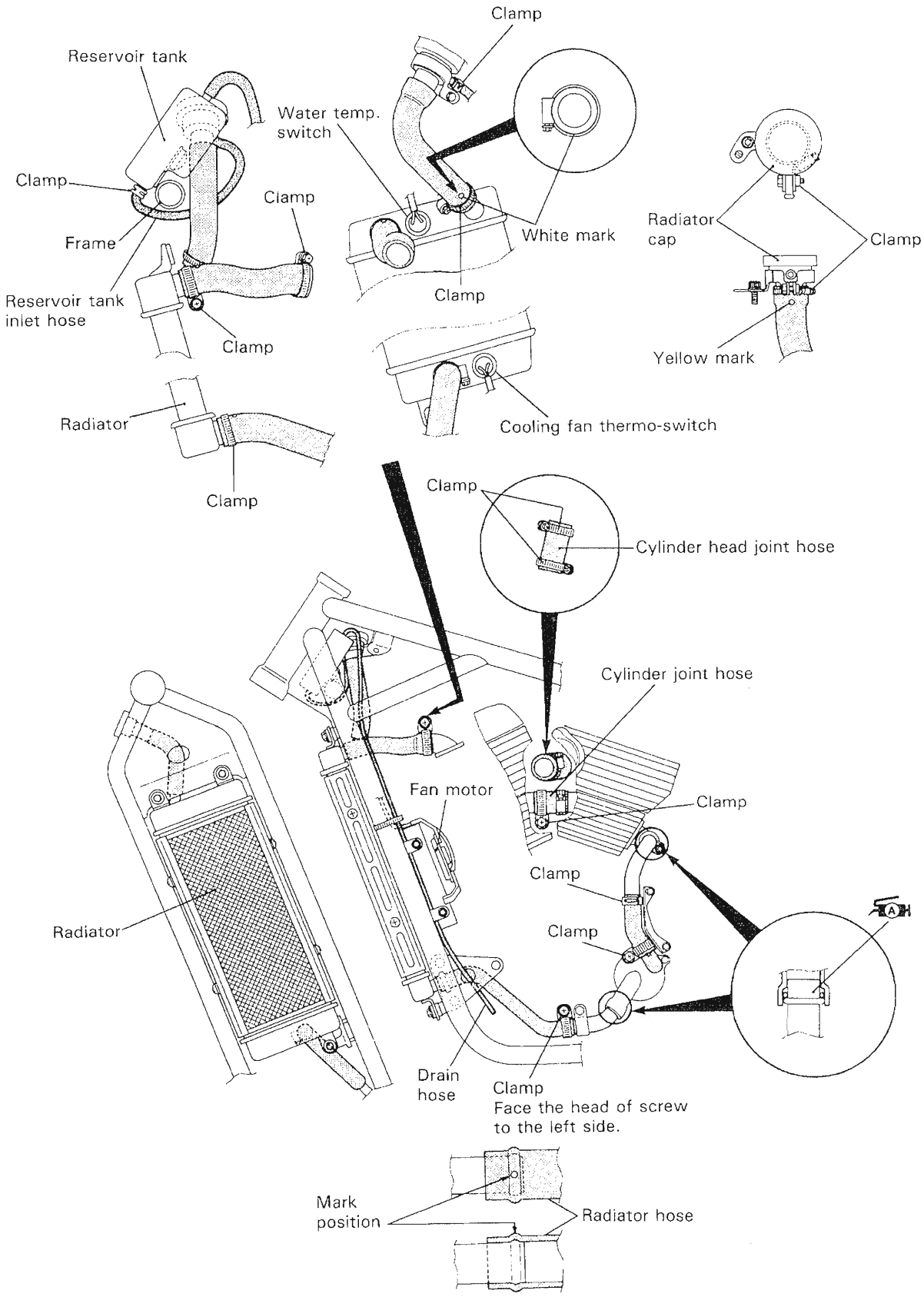
FUEL SYSTEM HOSE ROUTING



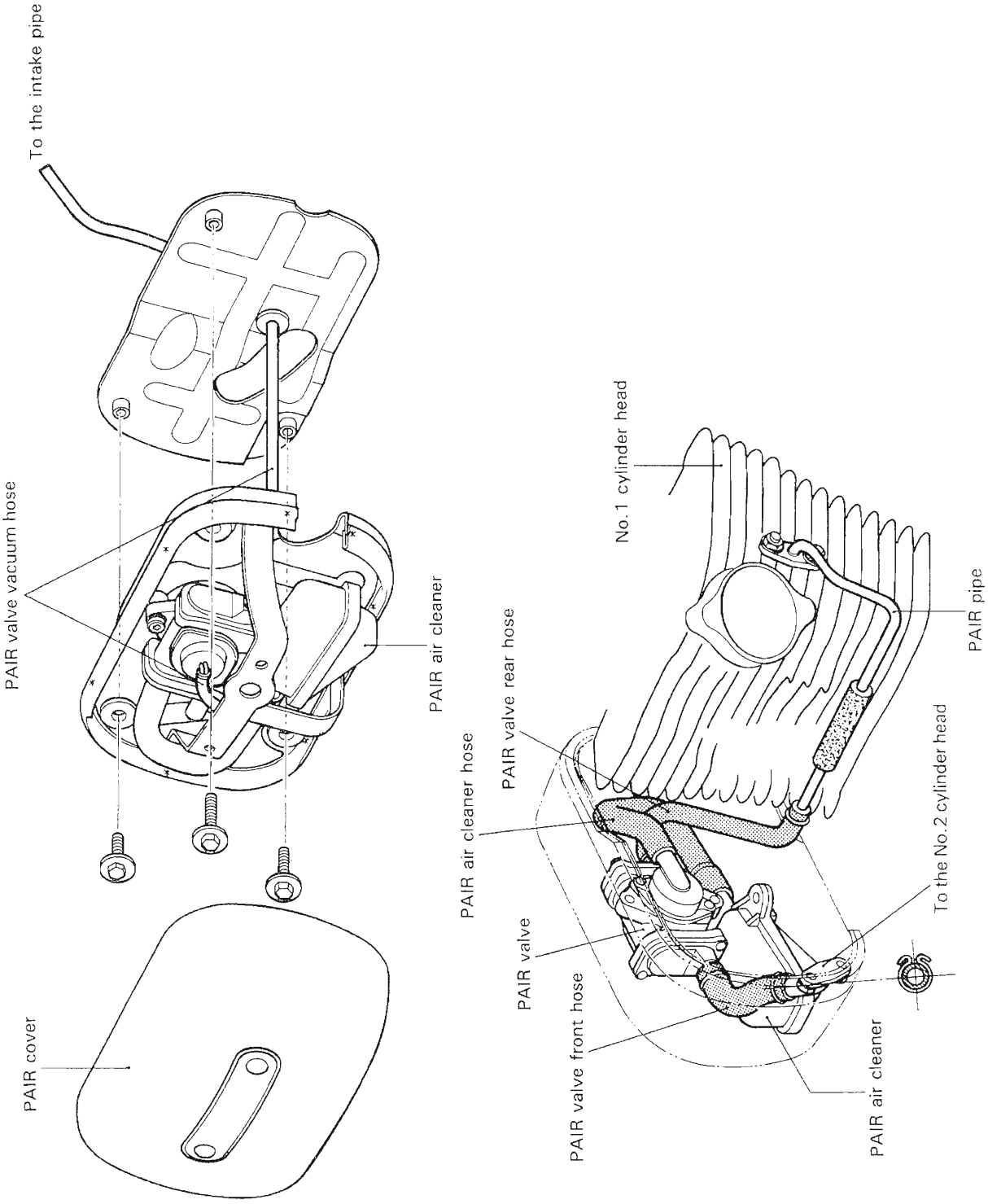

Throttle cable (return)
Fuel pump hose
Choke cable
Air vent hose
Fuel hose
Synchronizing cable
Fuel pump
Wiring harness
Air vent hose
Fuel hose
Breather hose
Wiring harness
Choke cable
Throttle cable (return)
Throttle cable (pull)


RH
Outlet tube clamp
Intake pipe clamp
Air cleaner (No.2)
LH
Carburetor (No.2)
Intake pipe clamp
Outlet tube clamp
LH
RH
Breather hose
Carburetor (No.1)
Air vent hose
Fuel hose (for fuel pump to carburetor No.1)
Choke cable
Fuel hose (for fuel tank to fuel valve)
Ignitor
Fuel valve
Air cleaner drain hose
• Generator lead wire
• Neutral switch lead wire
• Side-stand switch lead wire
Regulator/rectifier
Fuel hose (for fuel valve to fuel pump)
• Ground wire
• Regulator/rectifier lead wire
• Ignitor lead wire

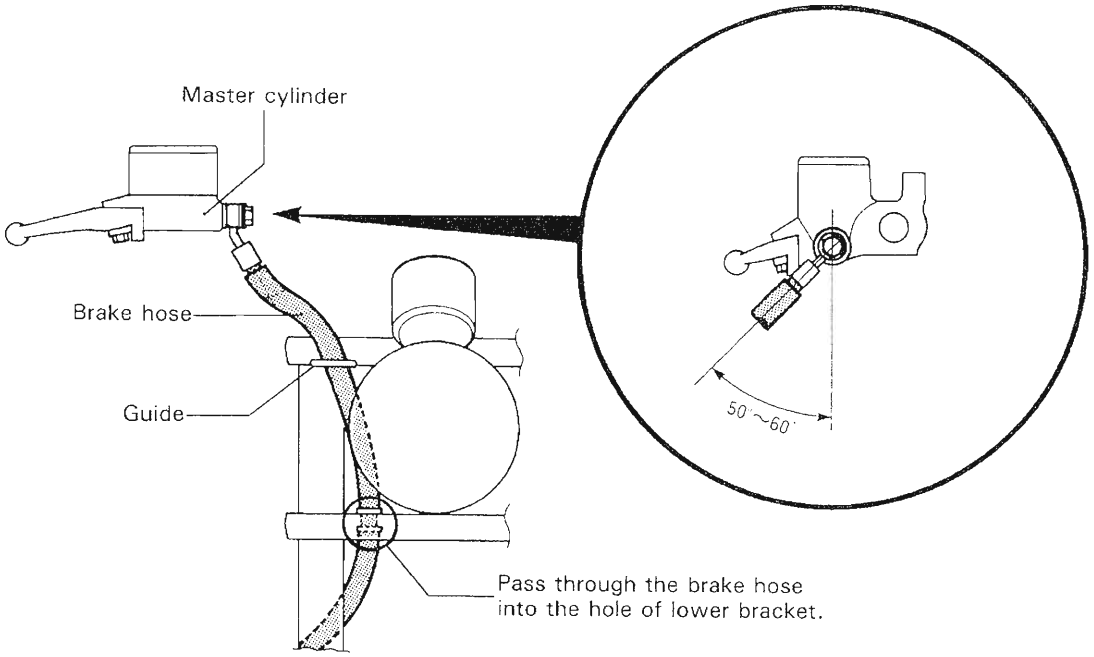
COOLING SYSTEM HOSE ROUTING

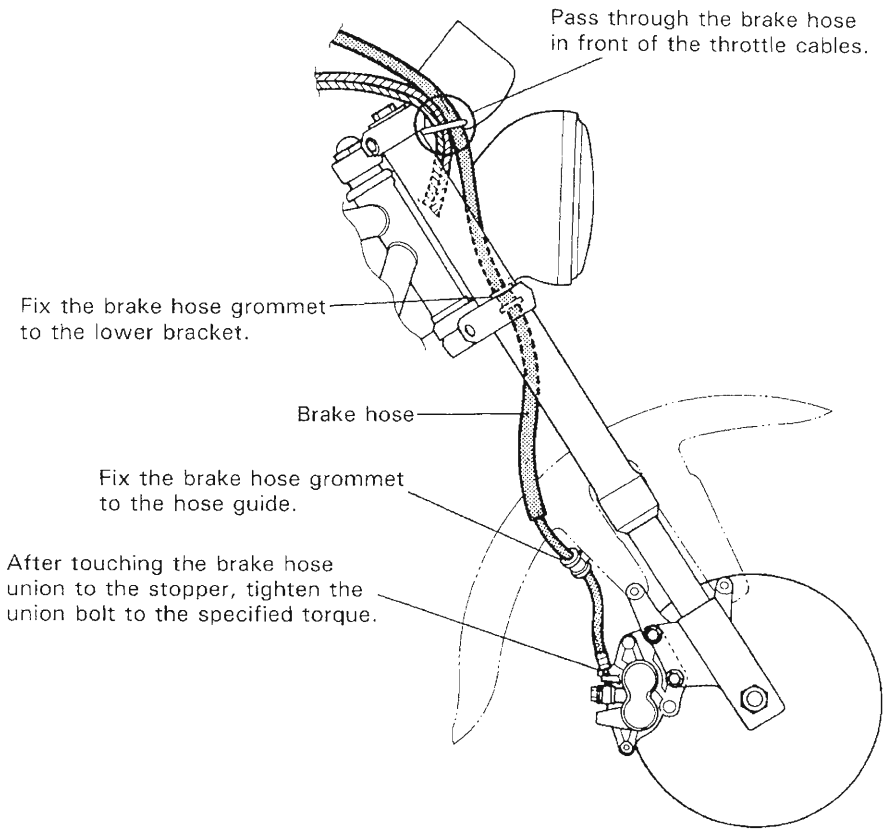


PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING

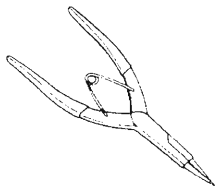
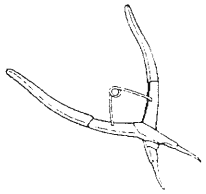
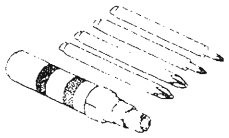
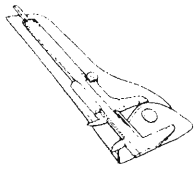
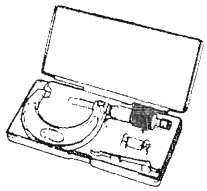
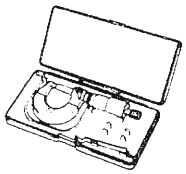
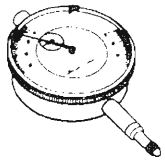
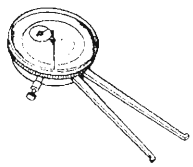
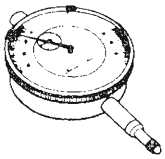
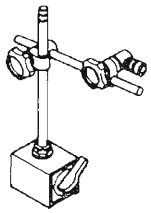
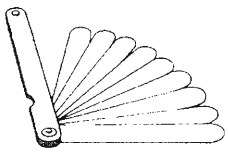
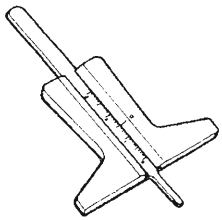
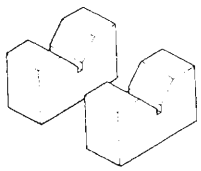
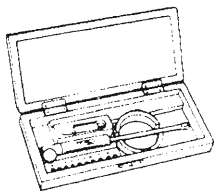
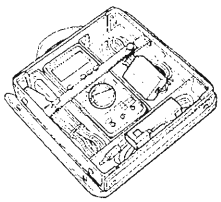
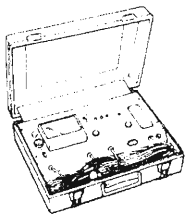
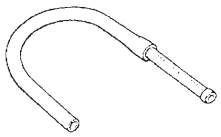
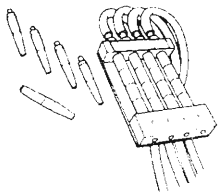
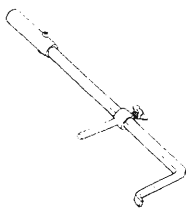
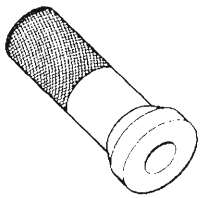
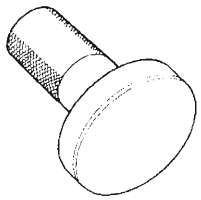
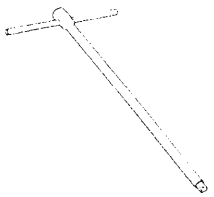
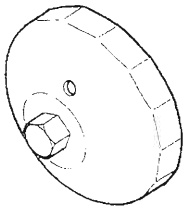
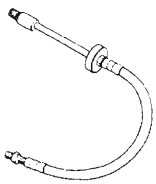
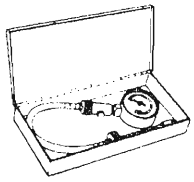
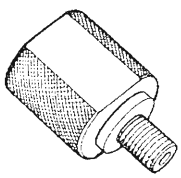


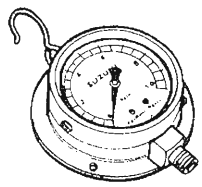
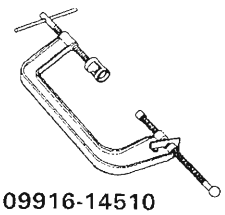
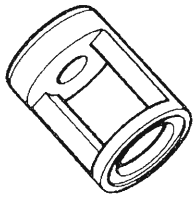
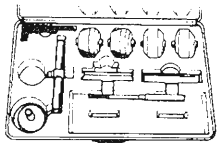
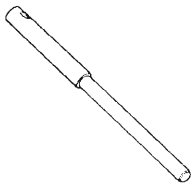
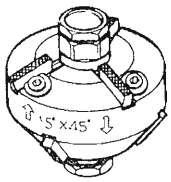
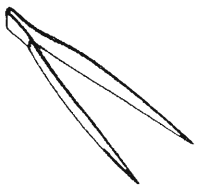
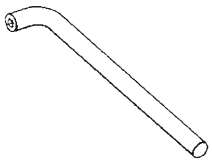
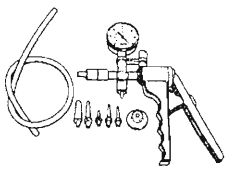
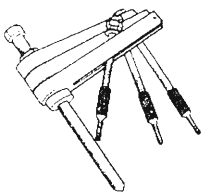
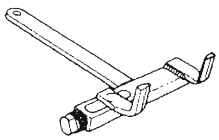
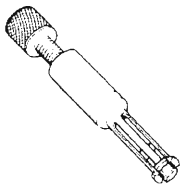
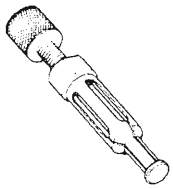
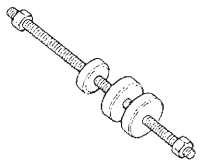
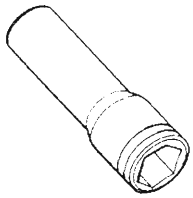
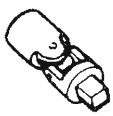
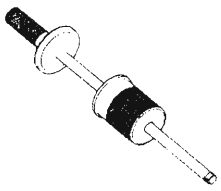
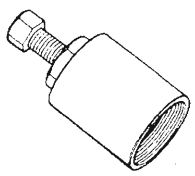
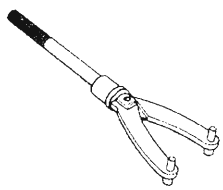
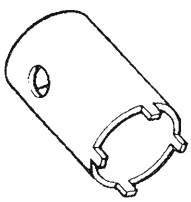
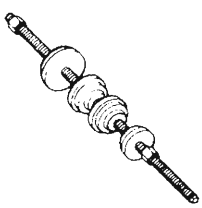
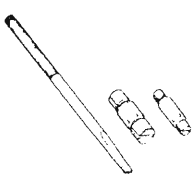
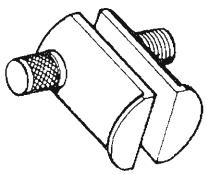
FRONT BRAKE HOSE ROUTING

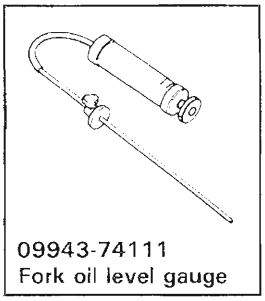




SPECIAL TOOLS

 09900-06107 Snap ring pliers	 09900-06108 Snap ring pliers	 09900-09003 Impact driver set	 09900-20101 or 09900-20102 Vernier calipers	 09900-20202 Micrometer (25—50 mm)
 09900-20204 Micrometer (75—100 mm)	 09900-20205 Micrometer (0—25 mm)	 09900-20508 Cylinder gauge set	 09900-20602 Dial gauge (1/1000 mm, 1 mm)	 09900-20605 Dial calipers
 09900-20606 Dial gauge (1/100 mm, 10 mm)	 09900-20701 Magnetic stand	 09900-20803 09900-20806 Thickness gauge	 09900-20805 Tire depth gauge	 09900-21304 V-block (100 mm)
 09900-22302 Plastigauge	 09900-22403 Small bore gauge (18—35 mm)	 09900-25008 Multi circuit tester set	 09900-28106 Electro tester	 09913-10730 Fuel level gauge
 09913-13121 Carburetor balancer set	 09913-50121 Oil seal remover	 09913-70122 Bearing installer	 09913-75520 09913-85210 Bearing installer	 09914-24510 T-handle
 09915-40610 Oil filter wrench	 09915-63210 Compression gauge adapter	 09915-64510 Compression gauge	 09915-74510 Oil pressure gauge	 09915-74531 Oil pressure gauge adaptor

 09915-77330 Meter (for high pressure)	 09916-14510 Valve spring compressor	 09916-14910 Valve spring compressor attachment	 09916-21110 Valve seat cutter set	 09916-24480 Solid pilot (N-140-5.5)
 Valve seat cutter head See page 3-31.	 09916-34541 Reamer handle	 09916-34550 Valve guide reamer (5.5 mm)	 09916-34580 Valve guide reamer (10.8 mm)	 09916-44910 Valve guide remover/ installer
 09916-44920 Attachment	 09916-84511 Tweezers	 09917-10410 Valve adjuster driver	 09917-47910 Vacuum pump gauge	 09918-53810 Chain tensioner locking tool
 09920-13120 Crankcase separating tool	 09920-53740 Clutch sleeve hub holder	 09923-73210 Bearing puller	 09923-74510 Bearing puller	 09924-84521 Bearing installer set
 09930-10141 Socket wrench	 09930-14530 Universal joint	 09930-30102 Sliding shaft	 09930-34970 Rotor remover	 09930-40113 Rotor holder
 09940-14911 Steering stem nut wrench	 09941-34513 Steering race installer	 09941-50111 Bearing remover	 09941-54911 Bearing outer race remover	 09941-74910 Steering bearing installer



09943-74111
Fork oil level gauge

NOTE:
When order 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	M6	11	1.1	8.0
	M8	23	2.3	16.5
Cylinder head bolt and nut	M10	38	3.8	27.5
	M8	25	2.5	18.0
	M6	11	1.1	8.0
Primary drive gear bolt		95	9.5	68.5
Clutch sleeve hub nut		95	9.5	68.5
Rocker arm shaft		28	2.8	20.0
Cam chain tensioner bolt		10	1.0	7.0
Cam chain guide set bolt		10	1.0	7.0
Cam chain sprocket bolt		15	1.5	11.0
Valve adjuster lock nut		15	1.5	11.0
Crankcase bolt		22	2.2	16.0
Generator cover hole plug		15	1.5	11.0
T.D.C. Inspection plug		23	2.3	16.5
Oil drain plug		21	2.1	15.0
Oil pump bolt		8	0.8	6.0
Oil pressure regulator		28	2.8	20.0
Engine mounting bolt		88	8.8	63.5
Generator rotor bolt		160	16.0	115.5
Engine mounting bracket bolt		50	5.0	36.0
Frame mounting bolt	M10	50	5.0	36.0
	M8	25	2.5	18.0
Conrod nut		51	5.1	37.0
Exhaust pipe clamp bolt		25	2.5	18.0
Starter clutch securing bolt		26	2.6	18.5
Gearshift arm stopper		19	1.9	14.0
Clutch spring mounting bolt		10	1.0	7.0
Water union bolt		10	1.0	7.0
Muffler mounting bolt		25	2.5	18.0
Clutch cover bolt		11	1.1	8.0

ITEM	N·m	kg-m	lb-ft
Gearshift cam stopper bolt	10	1.0	7.0
Gearshift cam stopper plate bolt	10	1.0	7.0
Oil pressure switch	14	1.4	10.0
Oil nozzle retainer bolt	10	1.0	7.0
Oil sump filter cover bolt	10	1.0	7.0
Bearing retainer screw	8	0.8	6.0
Engine sprocket nut	115	11.5	83.0
Generator stator set bolt	10	1.0	7.0
Generator stator clamp bolt	10	1.0	7.0
Signal generator stator set bolt	4.5	0.45	3.5
Starter motor mounting bolt	10	1.0	7.0

ENGINE COOLING

ITEM	N·m	kg-m	lb-ft
Radiator mounting bolt	6	0.6	4.5
Cooling fan thermo-switch	12	1.2	8.5
Engine coolant temperature switch	12	1.2	8.5
Water pump mounting bolt	10	1.0	7.0
Water pump cover bolt	10	1.0	7.0
Impeller securing bolt	8	0.8	6.0
Cooling fan mounting bolt	6	0.6	4.5

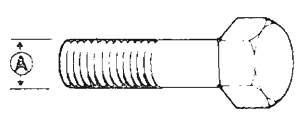
CHASSIS

ITEM	N·m	kg-m	lb-ft
Steering stem head nut	90	9.0	65.0
Front fork cap bolt	23	2.3	16.5
Front fork lower clamp bolt	33	3.3	24.0
Handlebar mounting nut	54	5.4	39.0
Front fork upper clamp bolt	23	2.3	16.5
Front fork cap lock nut	40	4.0	29.0
Front axle	65	6.5	47.0
Front axle pinch bolt	23	2.3	16.5
Front master cylinder mounting bolt	10	1.0	7.0
Brake hose union bolt	23	2.3	16.5
Caliper mounting bolt	39	3.9	28.0
Caliper air bleeder valve	7.5	0.75	5.5
Brake disc plate bolt	23	2.3	16.5
Rear shock absorber fitting bolt (upper)	23	2.3	16.5
nut (lower)	50	5.0	36.0
Rear axle nut	65	6.5	47.0
Rear brake cam lever bolt	10	1.0	7.0
Rear torque link nut (front)	35	3.5	25.5
(rear)	25	2.5	18.0
Rear swingarm pivot nut	100	10.0	72.5
Front footrest bolt	39	3.9	28.0

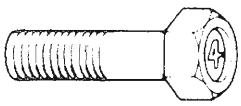
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

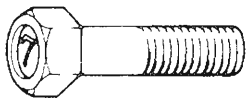
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1.5	0.15	1.0	2.3	0.23	1.5
5	3	0.3	2.0	4.5	0.45	3.0
6	5.5	0.55	4.0	10	1.0	7.0
8	13	1.3	9.5	23	2.3	16.5
10	29	2.9	21.0	50	5.0	36.0
12	45	4.5	32.5	85	8.5	61.5
14	65	6.5	47.0	135	13.5	97.5
16	105	10.5	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.	30 (1.18)	—
	EX.	26 (1.02)	—
Valve clearance (when cold)	IN. & EX.	0.08—0.13 (0.003—0.005)	—
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.	5.500—5.512 (0.2165—0.2170)	—
Valve stem O.D.	IN.	5.475—5.490 (0.2156—0.2161)	—
	EX.	5.455—5.470 (0.2148—0.2154)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	3.1 (0.12)
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	INNER	—	38.3 (1.51)
	OUTER	—	40.1 (1.58)
Valve spring tension	INNER	6.51—7.49 kg (14.35—16.51 lbs) at length 32.5 mm (1.28 in)	—
	OUTER	12.09—13.91 kg (26.65—30.67 lbs) at length 36.0 mm (1.42 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-18	IN.	35.950—35.998 (1.4154—1.4172)	35.660 (1.4039)
		EX.	36.920—36.968 (1.4535—1.4554)	36.620 (1.4417)
	Others	IN.	35.954—36.002 (1.4155—1.4174)	35.660 (1.4039)
		EX.	36.919—36.967 (1.4535—1.4554)	36.620 (1.4417)
Camshaft journal oil clearance		0.032—0.066 (0.0013—0.0026)		0.150 (0.0059)

ITEM	STANDARD		LIMIT
Camshaft journal holder I.D.	No.1 Left side No.2 Right side	20.012—20.025 (0.7879—0.7884)	———
	No.1 Right side No.2 Left side	25.012—25.025 (0.9847—0.9852)	———
Camshaft journal O.D.	No.1 Left side No.2 Right side	19.959—19.980 (0.7858—0.7866)	———
	No.1 Right side No.2 Left side	24.959—24.980 (0.9826—0.9835)	———
Camshaft runout	———		0.10 (0.004)
Rocker arm I.D.	IN. & EX.	12.000—12.018 (0.4724—0.4731)	———
Rocker arm shaft O.D.	IN. & EX.	11.966—11.984 (0.4711—0.4718)	———
Cylinder head distortion	———		0.05 (0.002)
Cylinder head cover distortion	———		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 500 kPa (15 kg/cm², 213 psi)			1 100 kPa (11 kg/cm², 156 psi)
Compression pressure difference	———			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.045—0.055 (0.0018—0.0022)			0.120 (0.0047)
Cylinder bore	83.000—83.015 (3.2677—3.2683)			83.085 (3.2711)
Piston diam.	82.950—82.965 (3.2657—3.2663) Measure at 15 mm (0.6 in) from the skirt end.			82.880 (3.2630)
Cylinder distortion	———			0.05 (0.002)
Piston ring free end gap	1st		Approx. 10.5 (0.413)	8.40 (0.331)
	2nd	R	Approx. 11.8 (0.465)	9.44 (0.372)
Piston ring end gap	1st		0.20—0.35 (0.008—0.014)	0.50 (0.020)
	2nd		0.20—0.35 (0.008—0.014)	0.50 (0.020)
Piston ring to groove clearance	1st		———	0.180 (0.0071)
	2nd		———	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01—1.03 (0.0398—0.0406)	—
	2nd	1.21—1.23 (0.0476—0.0484)	—
	Oil	2.51—2.53 (0.0988—0.0996)	—
Piston ring thickness	1st	0.970—0.990 (0.0382—0.0390)	—
	2nd	1.170—1.190 (0.0461—0.0469)	—
Piston pin bore	20.002—20.008 (0.7875—0.7877)		20.030 (0.7886)
Piston pin O.D.	19.996—20.000 (0.7827—0.7874)		19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	20.010—20.018 (0.7878—0.7881)	20.040 (0.7890)
Conrod big end side clearance	0.10—0.20 (0.004—0.008)	0.30 (0.012)
Conrod big end width	21.95—22.00 (0.864—0.866)	—
Crank pin width	22.10—22.15 (0.870—0.872)	—
Conrod big end oil clearance	0.024—0.042 (0.0009—0.0017)	0.080 (0.0031)
Crank pin O.D.	40.982—41.000 (1.6135—1.6142)	—
Crankshaft journal oil clearance	0.020—0.050 (0.0008—0.0020)	0.080 (0.0031)
Crankshaft journal O.D.	47.965—47.980 (1.8884—1.8890)	—
Crankshaft journal bearing I.D.	48.000—48.015 (1.8898—1.8904)	—
Crankshaft thrust bearing thickness	1.925—2.175 (0.0758—0.0856)	—
Crankshaft thrust clearance	0.05—0.10 (0.002—0.004)	—
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.364 (83/44 x 34/47)	—
Oil pressure (at 60°C,140°F)	Above 450 kPa (4.5 kg/cm², 64 psi) Below 750 kPa (7.5 kg/cm², 107 psi) at 3 000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD		LIMIT
Clutch cable play	10—15 (0.4—0.6)		—
Drive plate thickness	No.1	2.92—3.08 (0.115—0.121)	2.62 (0.103)
	No.2	3.42—3.58 (0.135—0.141)	3.12 (0.123)
Drive plate claw width	15.9—16.0 (0.626—0.630)		15.1 (0.594)
Driven plate distortion	—		0.10 (0.004)
Clutch spring free length	No.1	—	24.6 (0.97)
	No.2	—	23.3 (0.92)

RADIATOR + FAN

ITEM	STANDARD		LIMIT
Radiator cap valve release pressure	110 ± 15 kPa (1.1 ± 0.15 kg/cm², 15.6 ± 2.1 psi)		—
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature switch operating temperature	ON	Approx. 120°C (248°F)	—
	OFF	Approx. 113°C (235°F)	—

TRANSMISSION

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		1.886 (83/44)		—
Final reduction ratio		3.200 (48/15)		—
Gear ratios	Low	2.461 (32/13)		—
	2nd	1.578 (30/19)		—
	3rd	1.200 (24/20)		—
	4th	0.956 (22/23)		—
	Top	0.800 (20/25)		—
Shift fork to groove clearance		0.10—0.30 (0.004—0.012)		0.50 (0.020)
Shift fork groove width		5.50—5.60 (0.217—0.220)		—
Shift fork thickness		5.30—5.40 (0.209—0.213)		—
Drive chain		Type	DID 50VA$_2$	—
		Links	116 links, ENDLESS	—
		20-pitch length	—	319.4 (12.6)
Drive chain slack		15—25 (0.6—1.0)		—
Gearshift lever height		50 (2.0)		—

CARBURETOR

ITEM		SPECIFICATION	
		E-03	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48E7	←
Idle r/min.		1200±100 r/min.	←
Fuel level		7.3±0.5 mm (0.29±0.02 in)	15.0±0.5 mm (0.59±0.02 in)
Float height		27.7±1.0 mm (1.09±0.04 in)	9.1±1.0 mm (0.36±0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	(PRE-SET)	(PRE-SET)
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-33	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48EB	←
Idle r/min.		1 200±100 r/min.	←
Fuel level		7.3±0.5 mm (0.29±0.02 in)	15.0±0.5 mm (0.59±0.02 in)
Float height		27.7±1.0 mm (1.09±0.04 in)	9.1±1.0 mm (0.36±0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	(PRE-SET)	(PRE-SET)
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. below 1 500 r/min.		
Firing order		1-2		
Spark plug		Type	N.G.K.: DPR8EA-9 ND: X24EPR-U9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		170—280 Ω		G—Bl
Ignition coil resistance		Primary	2—6 Ω	⊕ tap—⊖ tap
		Secondary	15—30 kΩ	Plug cap—⊕ tap
Generator coil resistance		Charging	0.2—1.5 Ω	Y—Y
Generator no-load voltage (When engine cold)		More than 75V (AC) at 5 000 r/min.		
Generator Max. output		250W at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter relay resistance		3—6 Ω		
Battery		Type designation	FTX12-BS	
		Capacity	12V 36kC (10Ah)/10HR	
		Standard electrolyte S.G.	1.32 at 20°C (68°F)	
Fuse size	Headlight (HI)	15 A		
	(LO)	15 A		
	Signal	15 A		
	Ignition	10 A		
	Tail	10 A		
	Main	30 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION		
		E-03,28,33	E-24	The others
Headlight	HI	60	←	←
	LO	55	←	←
Parking light				4
Tail/Brake light		5/21	←	←
Turn signal light	Front	5/21	←	21
	Rear	21	←	←
Speedometer light		1.7	←	←
Water temp. indicator light		1.7	←	←
Turn signal indicator light		3.4	←	←
High beam indicator light		1.7	←	←
Neutral indicator light		3.4	←	←
Oil pressure indicator light		1.7	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal free travel	20—30 (0.8—1.2)		—
Rear brake pedal height	60 (2.4)		—
Brake lining thickness	Rear	—	1.5 (0.06)
Brake drum I.D.	Rear	—	180.7 (7.11)
Brake disc thickness	Front	4.5±0.2 (0.18±0.01)	4.0 (0.16)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4993)	—
Brake caliper cylinder bore	Front	30.230—30.306 (1.1902—1.1931)	—
Brake caliper piston diam.	Front	30.150—30.200 (1.1870—1.1890)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	J16 × MT3.00	—
	Rear	J15M/C × MT3.50	—
Tire size	Front	130/90-16 67H	—
	Rear	150/90-15 M/C 74H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140 (5.5)	—	
Front fork damper free length	—	156 (6.1)	
Front fork oil level (At outer tube 177 mm up position)	154 (6.1)	—	
Rear wheel travel	102 (4.0)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING					
	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	200	2.00	29	200	2.00	29
REAR	225	2.25	33	225	2.25	33

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.		U.S.A. 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.		Canada model
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		Other models
Fuel tank including reserve	13.0 L (3.4/2.9 US/Imp gal)		
reserve	3.0 L (0.8/0.7 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	1 700 ml (1.8/1.5 US/Imp qt)	
	Filter change	2 100 ml (2.2/1.8 US/Imp qt)	
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)	
Front fork oil type	Fork oil #15		
Front fork oil capacity (each leg)	838 ml (28.3/29.5 US/Imp oz)		
Brake fluid type	DOT 4		
Coolant capacity	1 460 ml (1.5/1.3 US/Imp qt)		

EMISSION CONTROL INFORMATION

CONTENTS

EMISSION CONTROL CARBURETOR COMPONENTS

VZ800 motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

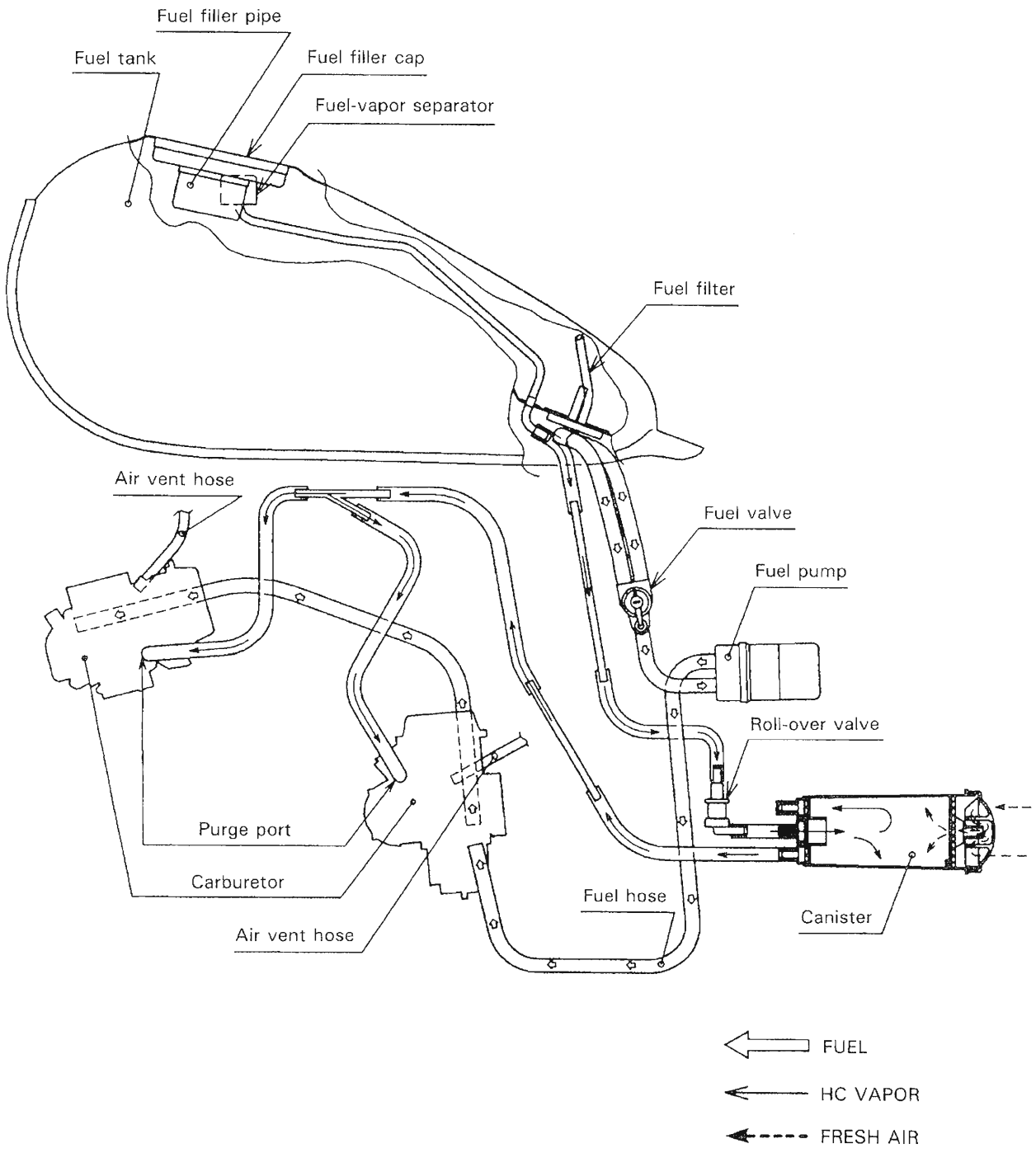
Conventional Figures Used on Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used on Close Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0

The carburetor specifications for the emission-controlled VZ800 are as follows.

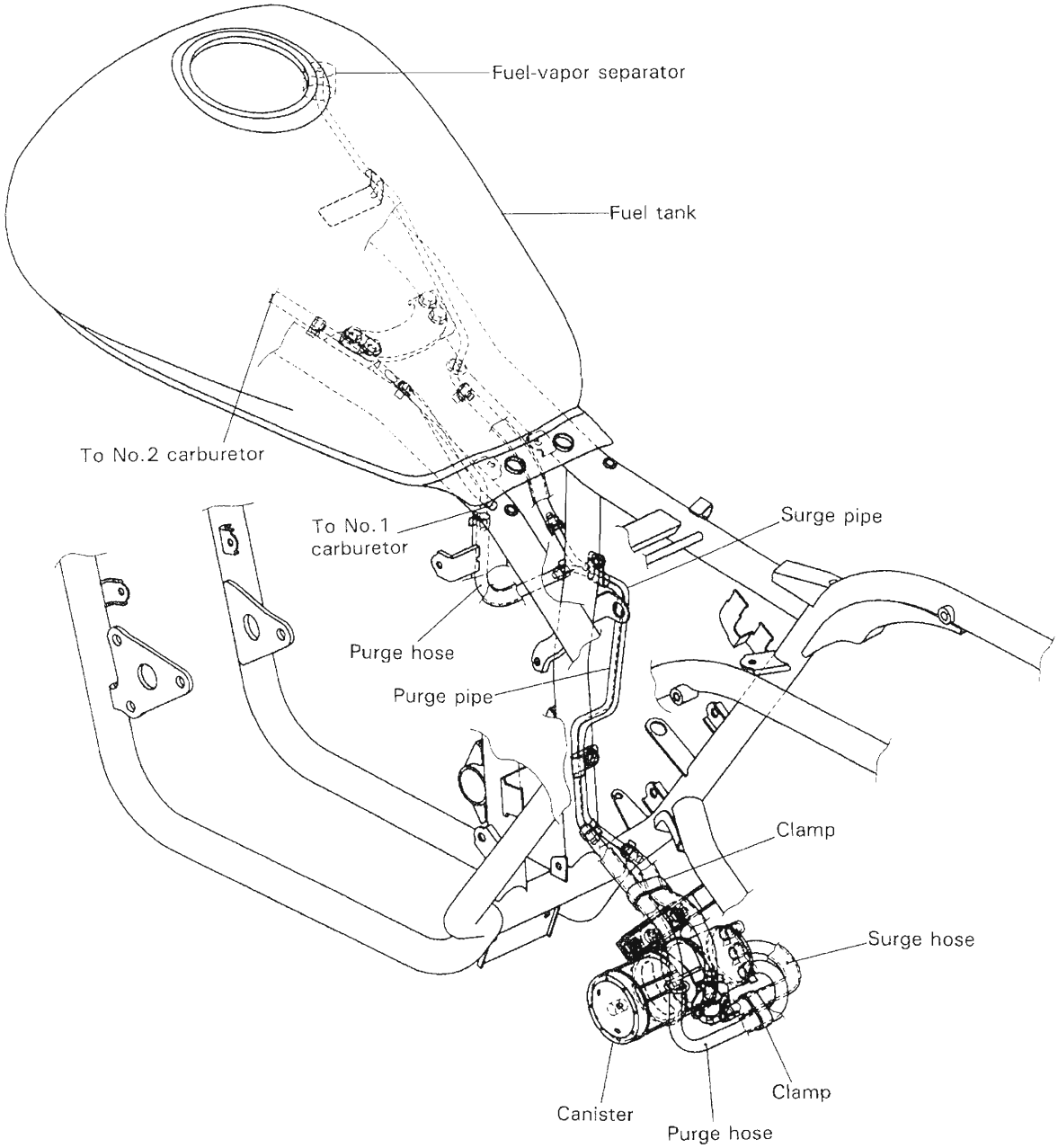
Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
48EB (California model only)	#100 (No.1) #90 (No.2)	P-3M (No.1) P-4M (No.2)	5D83 (No.1) 5C43 (No.2)	#45 (No.1) #40 (No.2)	PRE-SET DO NOT ADJUST
48E7					

Adjusting, interferring 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 frame covers and fuel tank. (Refer to page 4-4.)

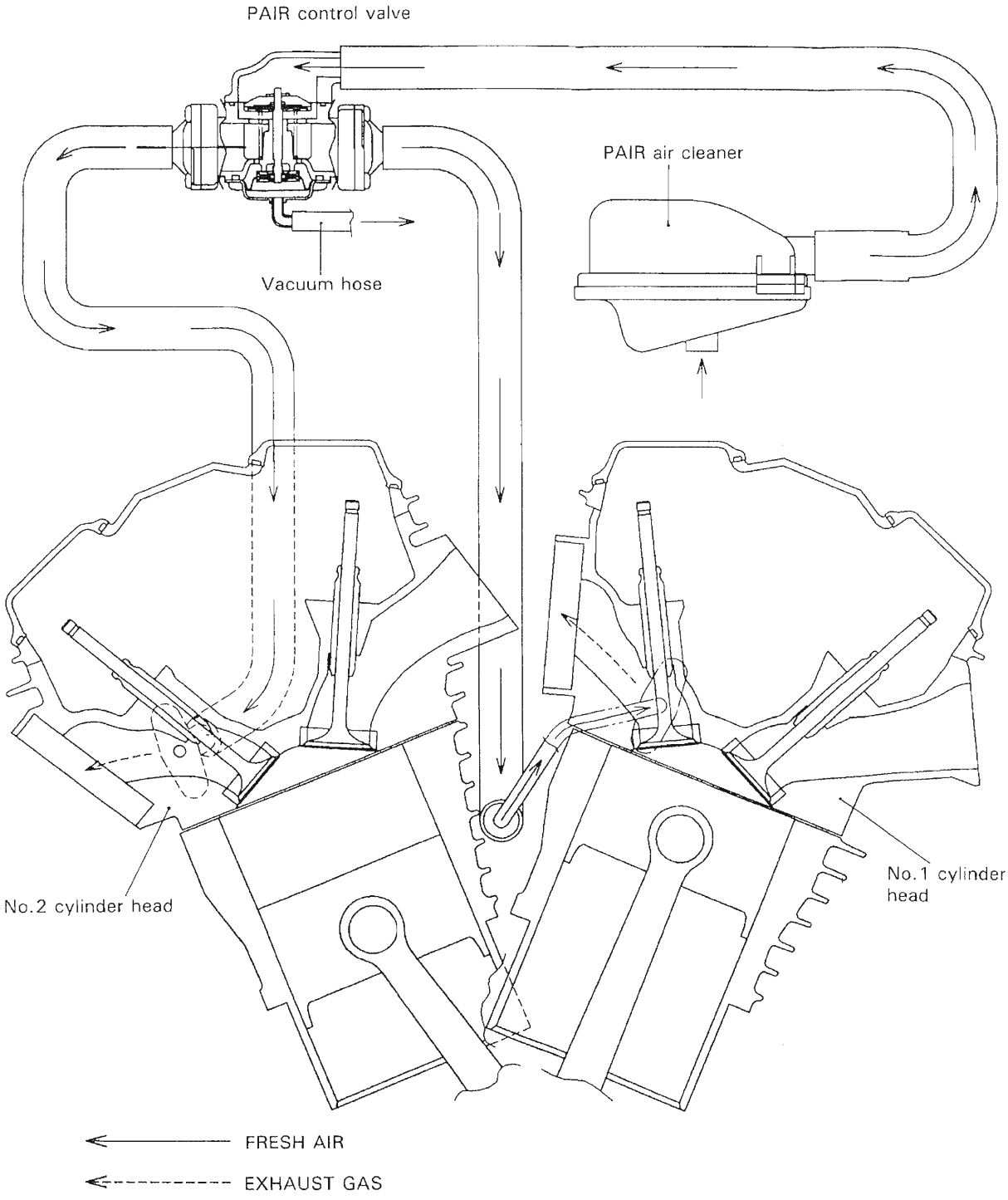
HOSES AND PIPES

Inspect the hoses and pipes for wear or damage.
Inspect that the hoses and pipes are securely connected.

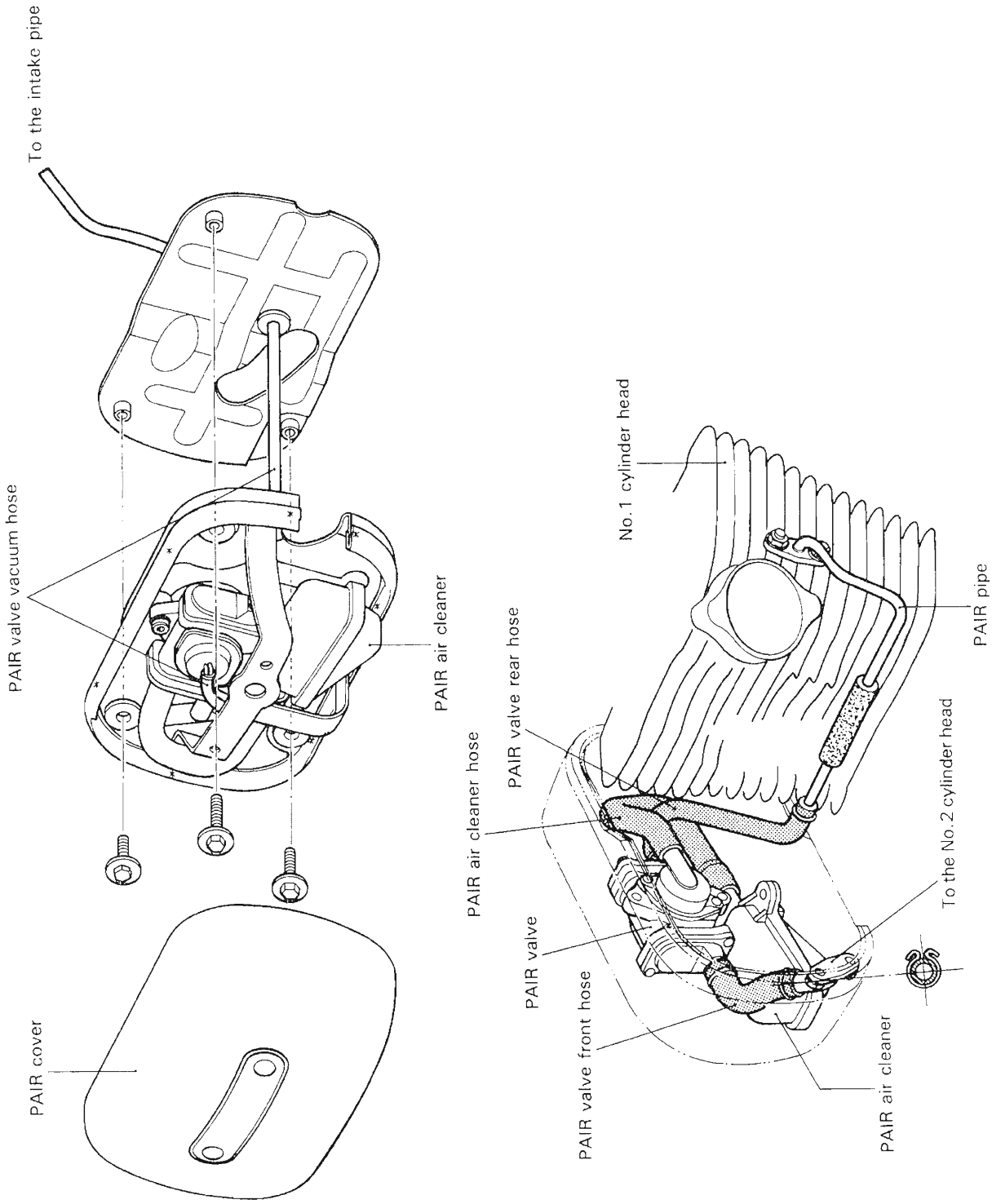
CANISTER

Inspect the canister for damage of the body.

PAIR (AIR SUPPLY) SYSTEM DIAGRAM



PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING



PAIR (AIR SUPPLY) SYSTEM INSPECTION (California model only)

• Remove the PAIR cover. (Refer to page 3-3.)

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.

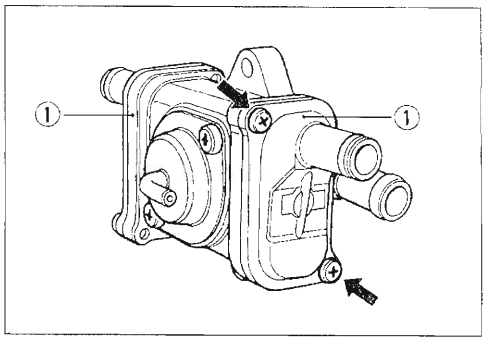
PAIR CLEANER

Inspect the PAIR cleaner for damage of the body.

REED VALVE OF PAIR CONTROL VALVE

• Remove the PAIR control valve.
• Remove the both reed valves ①.

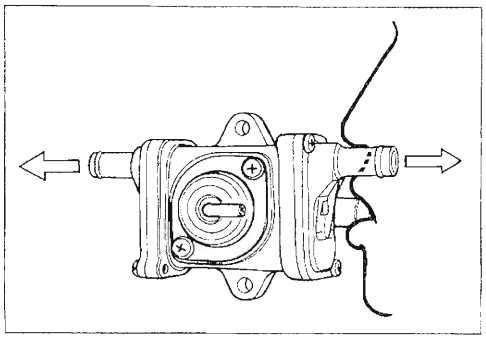
Inspect the reed valves.
If the carbon deposit is found in the reed valve, replace the PAIR control valve with a new one.



PAIR CONTROL VALVE

• Remove the PAIR control valve.

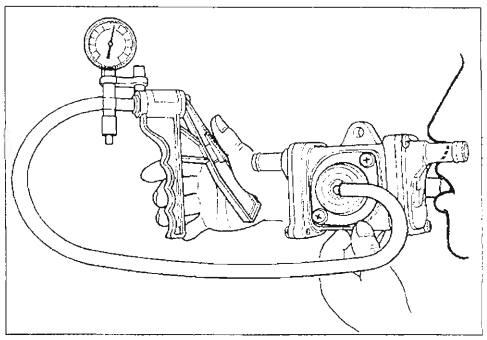
Blow the air inlet port of the control valve as shown in the illustration. If air does not flow out, replace the control vlave with a new one.



Connect the vacuum pump to the vaccum 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.

VZ800W ('98-MODEL)

This section describes service data, service specifications and servicing procedures which differ from those of the VZ800V ('97-model).

NOTE:
- *The specifications and service data are the same as those of the V-MODEL.*
- *Please refer to the section 1 through 9 for details which are not given in this section.*

CONTENTS

SPECIFICATIONS

DIMENSIONS AND DRY MASS	
Overall length	2 405 mm (94.7 in) E-17, 18, 22, 25
	2 365 mm (93.1 in) ..... Others
Overall width	750 mm (29.5 in)
Overall height	1 110 mm (43.7 in)
Wheelbase	1 645 mm (64.8 in)
Ground clearance	135 mm (5.3 in)
Seat height	700 mm (27.6 in)
Dry mass	207 kg (456 lbs)
ENGINE	
Type	Four-stroke, water-cooled, OHC, 45-degree, V-twin
Number of cylinders	2
Bore	83.0 mm (3.268 in)
Stroke	74.4 mm (2.929 in)
Displacement	805 cm^3 (49.1 cu. in)
Compression ratio	10.0 : 1
Carburetor, front	MIKUNI BDS36
rear	MIKUNI BS36
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 150 – 1 300 r/min E-18
	1 100 – 1 300 r/min ..... Others
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.886 (83/44)
Secondary reduction	3.200 (48/15)
Gear ratios, Low	2.461 (32/13)
2nd	1.578 (30/19)
3rd	1.200 (24/20)
4th	0.956 (22/23)
Top	0.800 (20/25)
Drive chain	DID50VM, 116 links
CHASSIS	
Front suspension	Inverted telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped, spring pre-load 5-way adjustable
Steering angle	40° (right & left)
Caster	35°
Trail	146 mm (5.7 in)
Turning radius	3.1 m (10.2 ft)
Front brake	Disk brake
Rear brake	Drum brake
Front tire size	130/90-16 67H, tubeless
Rear tire size	150/90-15 M/C 74H, tubeless
Front fork stroke	140 mm (5.5 in)
Rear wheel travel	102 mm (4.0 in)
ELECTRICAL	
Ignition type	Electronic ignition (Transistorized)
Ignition timing	5° B.T.D.C. below 1 500 r/min
Spark plug	NGK DPR8EA-9 or DENSO X24EPR-U9
Battery	12V 36.0 kC (10 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	30/15/15/15/10/10A
Headlight	12V 60/55W
Parking or city light	12V 4W E-02, 04, 17, 18, 22, 25, 34, P-37
Brake light/Taillight	12V 21/5W
Front turn signal light	12V 5/21W E-03, 28, 33
	12V 21W ..... Others
Rear turn signal light	12V 21W
Speedometer light	12V 1.7W
Turn signal indicator light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Coolant temperature check light	12V 1.7W
Oil pressure indicator light	12V 1.7W
CAPACITIES	
Fuel tank, including reserve	13.0 L (3.4/2.9 US/Imp gal)
reserve	3.0 L (0.8/0.7 US/Imp gal)
Engine oil, without filter change	1 700 ml (1.8/1.5 US/Imp qt)
with filter change	2 100 ml (2.2/1.8 US/Imp qt)
Overhaul	2 500 ml (2.6/2.2 US/Imp qt)
Front fork oil (each leg)	845 ml (28.6/29.6 US/Imp oz)
Coolant	1 460 ml (1.4/1.2 US/Imp qt)

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	30 (1.18)	—
	EX.	26 (1.02)	—
Valve clearance (when cold)	IN. & EX.	0.08–0.13 (0.003–0.005)	—
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.	5.500–5.512 (0.2165–0.2170)	—
Valve stem O.D.	IN.	5.475–5.490 (0.2156–0.2161)	—
	EX.	5.455–5.470 (0.2148–0.2154)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	3.1 (0.12)
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	INNER	—	38.3 (1.51)
	OUTER	—	40.1 (1.58)
Valve spring tension	INNER	6.51–7.49 kg (14.35–16.51 lbs) at length 32.5 mm (1.28 in)	—
	OUTER	12.09–13.91 kg (26.65–30.67 lbs) at length 36.0 mm (1.42 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM			STANDARD	LIMIT
Cam height	E-18	IN.	35.950–35.998 (1.4154–1.4172)	35.660 (1.4039)
		EX.	36.920–36.968 (1.4535–1.4554)	36.620 (1.4417)
	Others	IN.	35.954–36.002 (1.4155–1.4174)	35.660 (1.4039)
		EX.	36.919–36.967 (1.4535–1.4554)	36.620 (1.4417)

ITEM	STANDARD		LIMIT
Camshaft journal oil clearance	0.032—0.066 (0.0013—0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	No.1 Left side No.2 Right side	20.012—20.025 (0.7879—0.7884)	—
	No.1 Right side No.2 Left side	25.012—25.025 (0.9847—0.9852)	—
Camshaft journal O.D.	No.1 Left side No.2 Right side	19.959—19.980 (0.7858—0.7866)	—
	No.1 Right side No.2 Left side	24.959—24.980 (0.9826—0.9835)	—
Camshaft runout	—		0.10 (0.004)
Rocker arm I.D.	IN. & EX.	12.000—12.018 (0.4724—0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.966—11.984 (0.4711—0.4718)	—
Cylinder head distortion	—		0.05 (0.002)
Cylinder head cover distortion	—		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 500 kPa (15 kg/cm², 213 psi)			1 100 kPa (11 kg/cm², 156 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.045—0.055 (0.0018—0.0022)			0.120 (0.0047)
Cylinder bore	83.000—83.015 (3.2677—3.2683)			83.085 (3.2711)
Piston diam.	82.950—82.965 (3.2657—3.2663) Measure at 15 mm (0.6 in) from the skirt end.			82.880 (3.2630)
Cylinder distortion	—			0.05 (0.002)
Piston ring free end gap	1st		Approx. 10.5 (0.413)	8.40 (0.331)
	2nd	R	Approx. 11.8 (0.465)	9.44 (0.372)
Piston ring end gap	1st		0.20—0.35 (0.008—0.014)	0.50 (0.020)
	2nd		0.20—0.35 (0.008—0.014)	0.50 (0.020)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01—1.03 (0.0398—0.0406)	———
	2nd	1.21—1.23 (0.0476—0.0484)	———
	Oil	2.51—2.53 (0.0988—0.0996)	———
Piston ring thickness	1st	0.970—0.990 (0.0382—0.0390)	———
	2nd	1.170—1.190 (0.0461—0.0469)	———
Piston pin bore	20.002—20.008 (0.7875—0.7877)		20.030 (0.7886)
Piston pin O.D.	19.996—20.000 (0.7827—0.7874)		19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	20.010—20.018 (0.7878—0.7881)	20.040 (0.7890)
Conrod big end side clearance	0.10—0.20 (0.004—0.008)	0.30 (0.012)
Conrod big end width	21.95—22.00 (0.864—0.866)	———
Crank pin width	22.10—22.15 (0.870—0.872)	
Conrod big end oil clearance	0.024—0.042 (0.0009—0.0017)	0.080 (0.0031)
Crank pin O.D.	40.982—41.000 (1.6135—1.6142)	———
Crankshaft journal oil clearance	0.020—0.050 (0.0008—0.0020)	0.080 (0.0031)
Crankshaft journal O.D.	47.965—47.980 (1.8884—1.8890)	———
Crankshaft journal bearing I.D.	48.000—48.015 (1.8898—1.8904)	———
Crankshaft thrust bearing thickness	1.925—2.175 (0.0758—0.0856)	———
Crankshaft thrust clearance	0.05—0.10 (0.002—0.004)	———
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.364 (83/44 x 34/47)	———
Oil pressure (at 60°C,140°F)	Above 450 kPa (4.5 kg/cm^2, 64 psi) Below 750 kPa (7.5 kg/cm^2, 107 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD		LIMIT
Clutch cable play	10–15 (0.4–0.6)		—
Drive plate thickness	No.1	2.92–3.08 (0.115–0.121)	2.62 (0.103)
	No.2	3.42–3.58 (0.135–0.141)	3.12 (0.123)
Drive plate claw width	15.9–16.0 (0.626–0.630)		15.1 (0.594)
Driven plate distortion	—		0.10 (0.004)
Clutch spring free length	No.1	—	24.6 (0.97)
	No.2	—	23.3 (0.92)

RADIATOR + FAN

ITEM	STANDARD		LIMIT
Radiator cap valve release pressure	110 ± 15 kPa (1.1 ± 0.15 kg/cm², 15.6 ± 2.1 psi)		—
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature switch operating temperature	ON	Approx. 120°C (248°F)	—
	OFF	Approx. 113°C (235°F)	—

TRANSMISSION

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.886 (83/44)	—
Final reduction ratio		3.200 (48/15)	—
Gear ratios	Low	2.461 (32/13)	—
	2nd	1.578 (30/19)	—
	3rd	1.200 (24/20)	—
	4th	0.956 (22/23)	—
	Top	0.800 (20/25)	—
Shift fork to groove clearance		0.10–0.30 (0.004–0.012)	0.50 (0.020)
Shift fork groove width		5.50–5.60 (0.217–0.220)	—
Shift fork thickness		5.30–5.40 (0.209–0.213)	—
Drive chain	Type	DID 50VA$_2$	—
	Links	116 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack		15–25 (0.6–1.0)	—
Gearshift lever height		50 (2.0)	—

CARBURETOR

ITEM		SPECIFICATION	
		E-02,04,17,22,24,25,34	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48E6	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-3
Needle jet	(N.J.)	P-3	P-4
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	(PRE-SET) 1⅝ turns back	(PRE-SET) 1¾ turns back
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-03,28	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48E7	←
Idle r/min.		1200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	PRE-SET	PRE-SET
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-18	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48E9	←
Idle r/min.		1 200 $^{+100}_{-50}$ r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-2
Needle jet	(N.J.)	P-3	P-4
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#40	←
Pilot screw	(P.S.)	(PRE-SET) 2¼ turns back	(PRE-SET) 1¾ turns back
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-33	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48EB	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	(PRE-SET)	(PRE-SET)
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		P-37	
Carburetor type		MIKUNI BS36SS (No.1)	MIKUNI BDS36SS (No.2)
Bore size		36 mm	←
I.D. No.		48EC	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-3
Needle jet	(N.J.)	P-3	P-4
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	(PRE-SET) 1⅝ turns back	(PRE-SET) 1¾ 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 2 000 r/min.		
Firing order	1-2		
Spark plug	Type	N.G.K.: DPR8EA-9 DENSO: X24EPR-U9	
	Gap	0.8–0.9 (0.031–0.035)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	170–280 Ω		G–Bl
Ignition coil resistance	Primary	2–6 Ω	⊕ tap–⊖ tap
	Secondary	15–30 kΩ	Plug cap–⊕ tap
Generator coil resistance	Charging	0.2–1.5 Ω	Y–Y
Generator no-load voltage (When engine cold)	More than 75V (AC) at 5 000 r/min.		
Generator Max. output	250W at 5 000 r/min.		
Regulated voltage	13.5–15.5 V at 5 000 r/min.		
Starter relay resistance	3–6 Ω		
Battery	Type designation	FTX12-BS	
	Capacity	12V 36kC (10Ah)/10HR	
	Standard electrolyte S.G.	1.32 at 20°C (68°F)	
Fuse size	Headlight (HI)	15 A	
	(LO)	15 A	
	Signal	15 A	
	Ignition	10 A	
	Tail	10 A	
	Main	30A	

WATTAGE

Unit:W

ITEM		SPECIFICATION		
		E-03,28,33	E-24	The others
Headlight	HI	60	←	←
	LO	55	←	←
Parking light				4
Brake light/Taillight		21/5	←	←
Turn signal light	Front	21/5	←	21
	Rear	21	←	←
Speedometer light		1.7	←	←
Water temp. indicator light		1.7	←	←
Turn signal indicator light		3.4	←	←
High beam indicator light		1.7	←	←
Neutral indicator light		3.4	←	←
Oil pressure indicator light		1.7	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal free travel		20–30 (0.8–1.2)	—
Rear brake pedal height		60 (2.4)	—
Brake lining thickness	Rear	—	1.5 (0.06)
Brake drum I.D.	Rear	—	180.7 (7.11)
Brake disc thickness	Front	4.5±0.2 (0.18±0.01)	4.0 (0.16)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4993)	—
Brake caliper cylinder bore	Front	30.230–30.306 (1.1902–1.1931)	—
Brake caliper piston diam.	Front	30.150–30.200 (1.1870–1.1890)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	J16 × MT3.00	—
	Rear	J15M/C × MT3.50	—
Tire size	Front	130/90-16 67H	—
	Rear	150/90-15 M/C 74H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140 (5.5)	—	
Front fork damper free length	—	156 (6.1)	
Front fork oil level (At outer tube 177 mm up position)	154 (6.1)	—	
Rear wheel travel	102 (4.0)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING					
	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	200	2.00	29	200	2.00	29
REAR	225	2.25	33	225	2.25	33

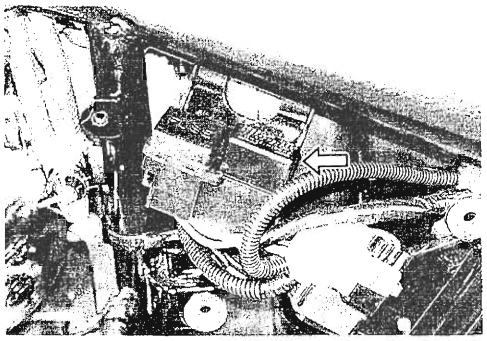
FUEL + OIL + COOLANT

	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.		U.S.A. 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.		Canada model
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		Other models
Fuel tank including reserve	13.0 L (3.4/2.9 US/Imp gal)		
reserve	3.0 L (0.8/0.7 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	1 700 ml (1.8/1.5 US/Imp qt)	
	Filter change	2 100 ml (2.2/1.8 US/Imp qt)	
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)	
Front fork oil type	Fork oil #15		
Front fork oil capacity (each leg)	838 ml (28.3/29.5 US/Imp oz)		
Brake fluid type	DOT 4		
Coolant capacity	1 460 ml (1.5/1.3 US/Imp qt)		

TURN SIGNAL/SIDE-STAND RELAY

The turn signal relay is corporated with the side-stand relay and diode to form the one component part which is called the turn signal/side-stand relay.
It is located behind the left frame cover.

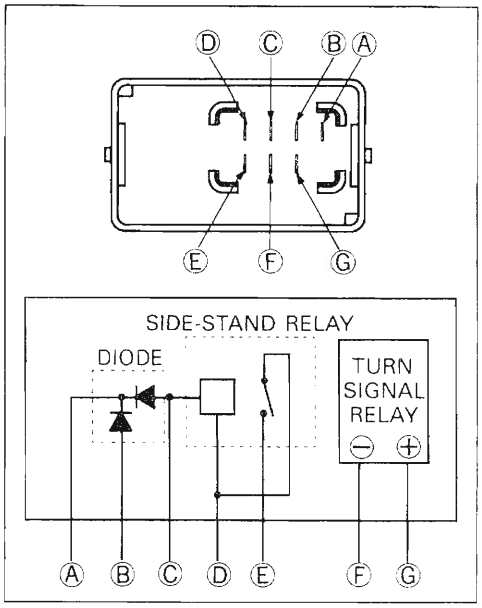
- Remove the left frame cover.
- Remove the turn signal/side-stand relay.



TURN SIGNAL RELAY INSPECTION

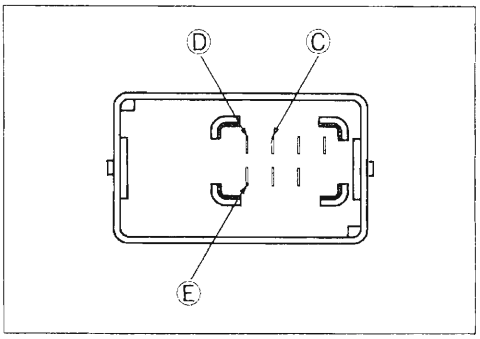
Before removing the turn signal/side-stand relay, check the operation of the turn signal light.
If the turn signal light does not light, inspect the bulb, turn signal switch and circuit connection.
If the bulb, turn signal switch and circuit connection checked are all right, the turn signal relay may 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 Ⓓ and Ⓔ terminals with tester. Then apply 12 volts to Ⓓ and Ⓒ terminals, ⊕ to Ⓓ and ⊖ to Ⓒ, and check the continuity between Ⓓ and Ⓔ. If there is no continuity, replace turn signal/side-stand relay with a new one.

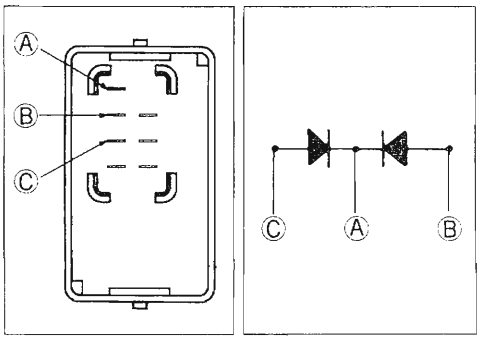


DIODE INSPECTION

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: Ⓒ, Ⓑ	⊕ Probe of tester to: Ⓐ
Ⓒ, Ⓑ		1.4–1.5
Ⓐ	0.4–0.6	



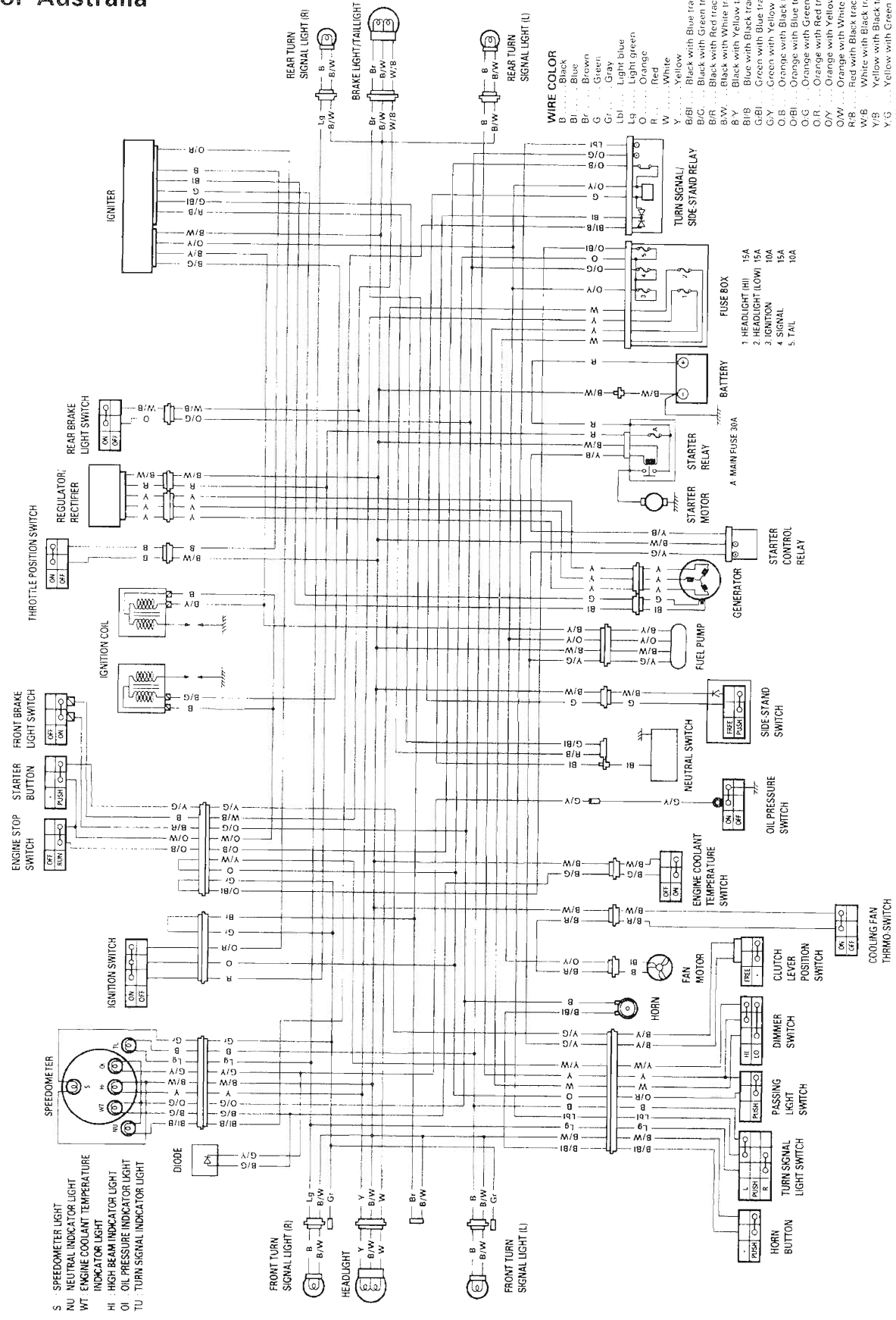
09900-25008: Multi circuit tester set (except for European market)

Tester knob indication: Diode test (⊣◂)

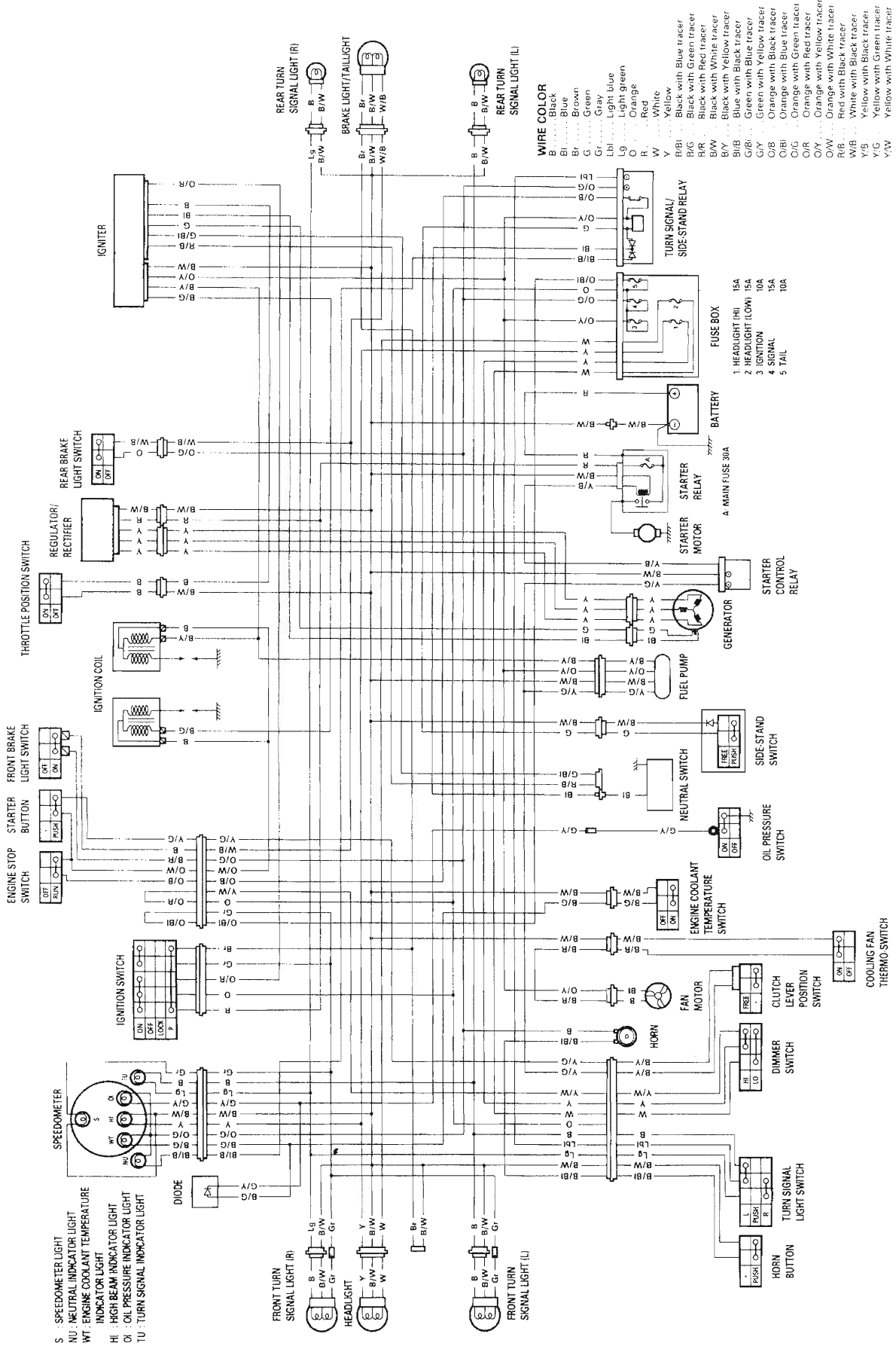
NOTE:
If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

WIRING DIAGRAM

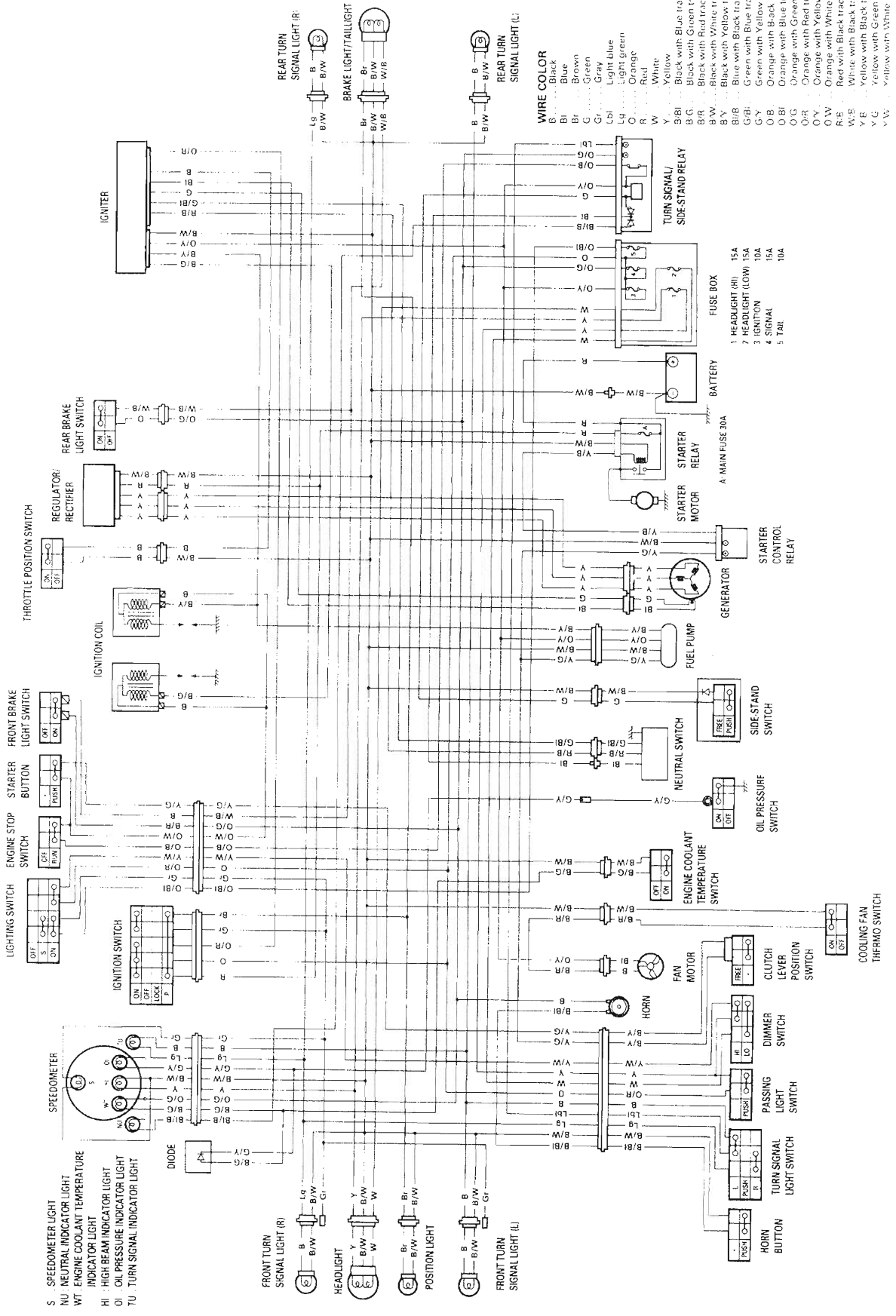
For Australia



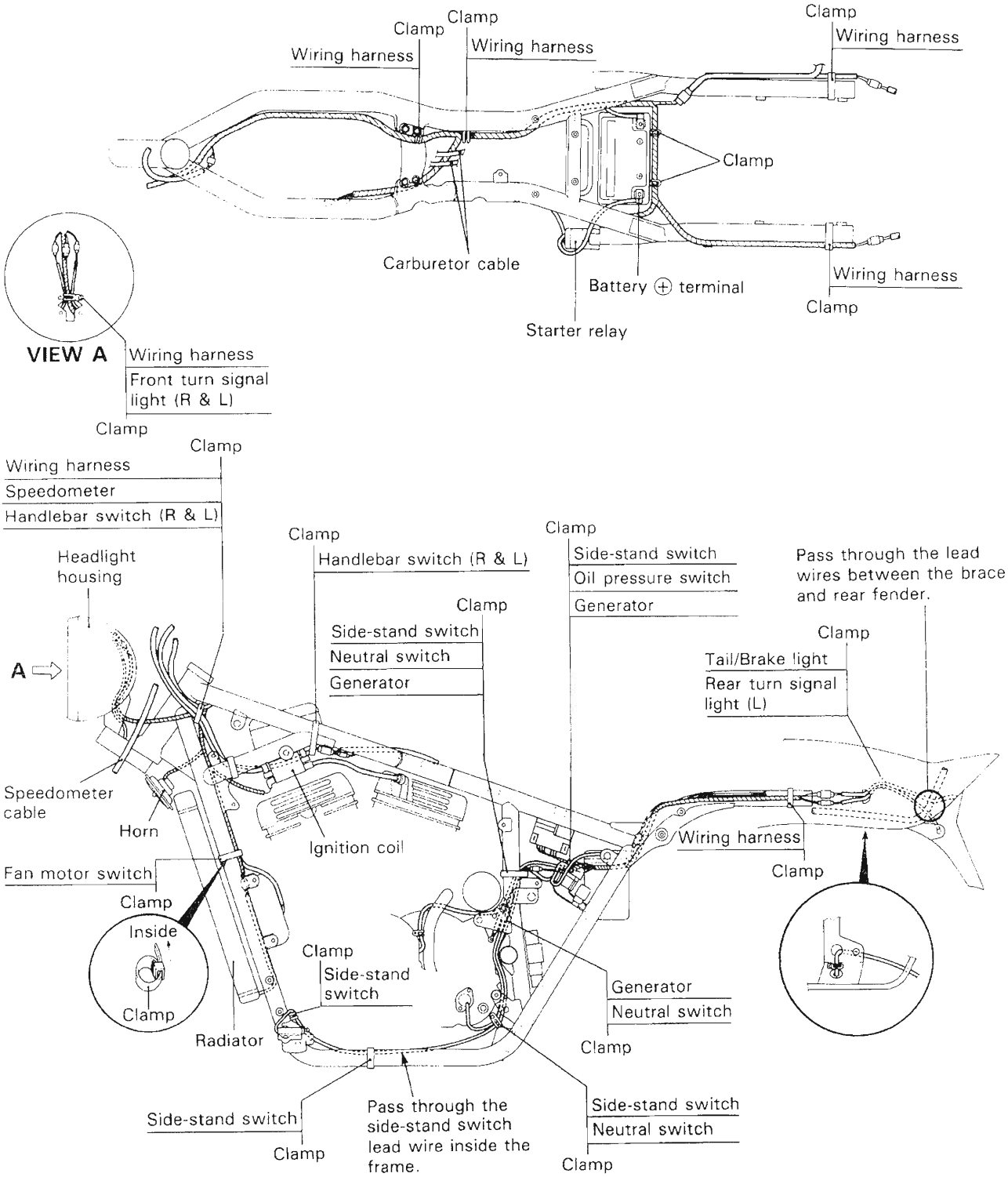
For Canada and U.S.A.

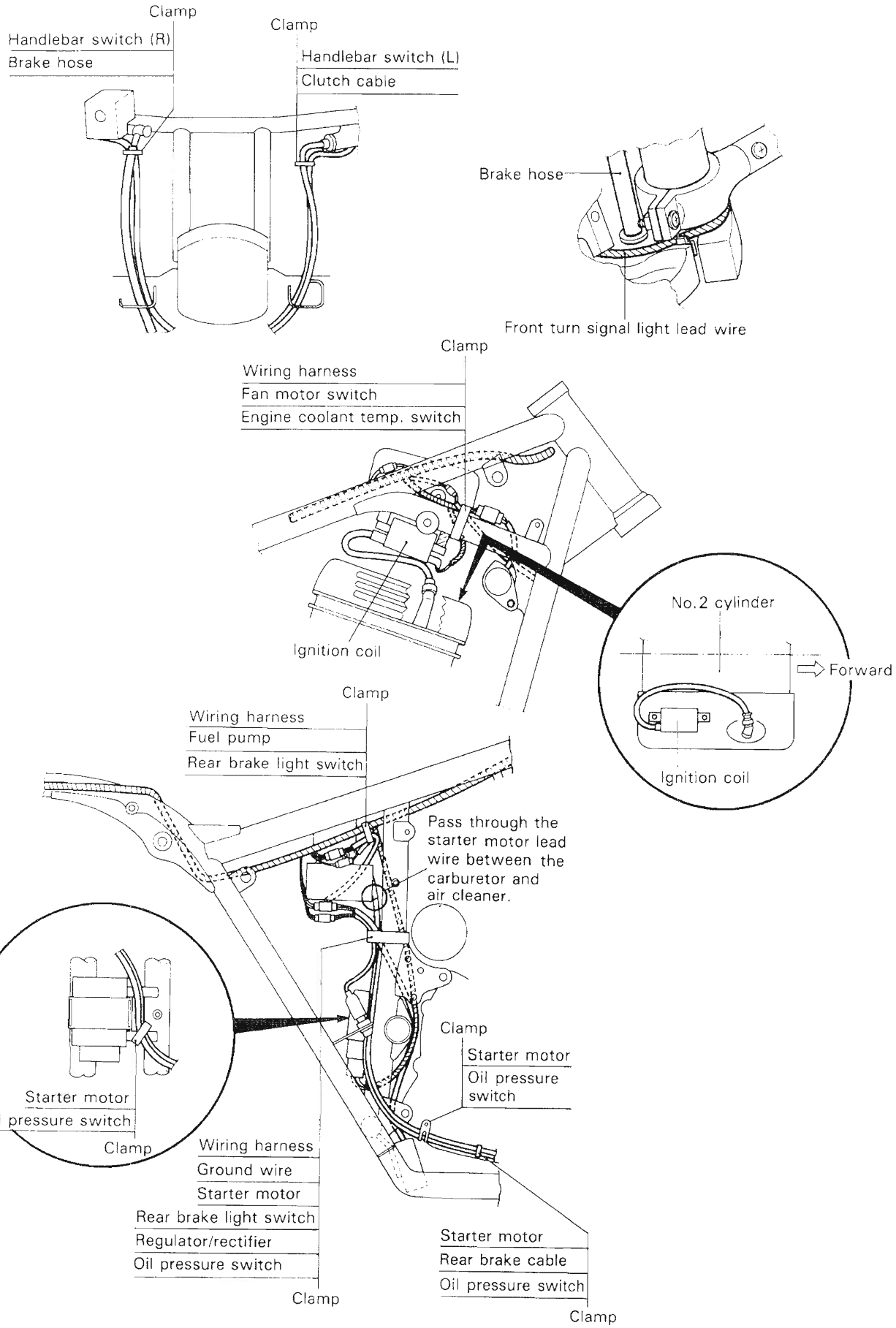


For the others



WIRE HARNESS ROUTING




Clamp
Handlebar switch (R)
Brake hose
Clamp
Handlebar switch (L)
Clutch cable
Brake hose
Front turn signal light lead wire
Clamp
Wiring harness
Fan motor switch
Engine coolant temp. switch
Ignition coil
No.2 cylinder
Forward
Ignition coil
Clamp
Wiring harness
Fuel pump
Rear brake light switch
Pass through the starter motor lead wire between the carburetor and air cleaner.
Clamp
Starter motor
Oil pressure switch
Starter motor
Oil pressure switch
Clamp
Wiring harness
Ground wire
Starter motor
Rear brake light switch
Regulator/rectifier
Oil pressure switch
Clamp
Starter motor
Rear brake cable
Oil pressure switch
Clamp

VZ800X/Y/K1/K2 ('99, '00, '01, '02-MODELS)

This section describes service data, service specifications and servicing procedures which differ from those of the VZ800W ('98-model).

NOTE:
- *Any differences between the VZ800W ('98-model) and VZ800X/Y/K1/K2 ('99, '00, '01 '02-models) 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 section.*

CONTENTS

X/Y-MODELS	E-02, 03, 04, 17, 18, 22, 24, 25, 28, 33, 34, P-37
K1/K2-MODELS	E-02, 03, 04, 17, 18, 22, 24, 25, 28, 33, 34

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 405 mm (94.7 in) E-17, 18, 22, 25
	2 365 mm (93.1 in) ..... Others
Overall width	750 mm (29.5 in)
Overall height	1 110 mm (43.7 in)
Wheelbase	1 645 mm (64.8 in)
Ground clearance	135 mm (5.3 in)
Seat height	700 mm (27.6 in)
Dry mass	207 kg (456 lbs)

ENGINE

Type	Four-stroke, water-cooled, OHC, 45-degree, V-twin
Number of cylinders	2
Bore	83.0 mm (3.268 in)
Stroke	74.4 mm (2.929 in)
Displacement	805 cm^3 (49.1 cu. in)
Compression ratio	10.0 : 1
Carburetor, front	MIKUNI BDS36SS
rear	MIKUNI BS36SS
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 150 – 1 300 r/min E-18
	1 100 – 1 300 r/min ..... Others

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.886 (83/44)
Secondary reduction	3.200 (48/15)
Gear ratios, Low	2.461 (32/13)
2nd	1.578 (30/19)
3rd	1.200 (24/20)
4th	0.956 (22/23)
Top	0.800 (20/25)
Drive chain	DID50VM, 116 links

CHASSIS

Front suspension	Inverted telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil dampad, spring pre-load 5-way adjustable
Steering angle	40° (right & left)
Caster	35°
Trail	146 mm (5.7 in)
Turning radius	3.1 m (10.2 ft)
Front brake	Disc brake
Rear brake	Drum brake
Front tire size	130/90-16 67H, tubeless
Rear tire size	150/90-15 M/C 74H, tubeless
Fornt fork stroke	140 mm (5.5 in)
Rear wheel travel	102 mm (4.0 in)

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	5° B.T.D.C. below 1 500 r/min
Spark plug	NGK DPR8EA-9 or DENSO X24EPR-U9
Battery	12V 36.0 kC (10 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	30/15/15/15/10/10A
Headlight	12V 60/55W
Parking or city light	12V 4W E-02, 04, 17, 18, 22, 25, 34, P-37
Brake light/Taillight	12V 21/5W
Front turn signal light	12V 5/21W E-03, 28, 33
	12V 21W ..... Others
Rear turn signal light	12V 21W
Speedometer light	12V 1.7W
Turn signal indicator light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Coolant temperature check light	12V 1.7W
Oil pressure indicator light	12V 1.7W

CAPACITIES

Fuel tank, including reserve	13.0 L (3.4/2.9 US/Imp gal)
reserve	3.0 L (0.8/0.7 US/Imp gal)
Engine oil, without filter change	1 700 ml (1.8/1.5 US/Imp qt)
with filter change	2 100 ml (2.2/1.8 US/Imp qt)
overhaul	2 500 ml (2.6/2.2 US/Imp qt)
Front fork oil (each leg)	845 ml (28.6/29.6 US/Imp oz)
Coolant	1 460 ml (1.4/1.2 US/Imp qt)

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	30 (1.18)	———
	EX.	26 (1.02)	———
Valve clearance (when cold)	IN. & EX.	0.08 – 0.13 (0.003 – 0.005)	———
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.	5.500 – 5.512 (0.2165 – 0.2170)	———
Valve stem O.D.	IN.	5.475 – 5.490 (0.2156 – 0.2161)	———
	EX.	5.455 – 5.470 (0.2148 – 0.2154)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve stem end length	IN. & EX.	———	3.1 (0.12)
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	INNER	———	38.3 (1.51)
	OUTER	———	40.1 (1.58)
Valve spring tension	INNER	6.51 – 7.49 kg (14.35 – 16.51 lbs) at length 32.5 mm (1.28 in)	———
	OUTER	12.09 – 13.91 kg (26.65 – 30.67 lbs) at length 36.0 mm (1.42 in)	———

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM			STANDARD	LIMIT
Cam height	E-18	IN.	35.950 – 35.998 (1.4154 – 1.4172)	35.660 (1.4039)
		EX.	36.920 – 36.968 (1.4535 – 1.4554)	36.620 (1.4417)
	Others	IN.	35.954 – 36.002 (1.4155 – 1.4174)	35.660 (1.4039)
		EX.	36.919 – 36.967 (1.4535 – 1.4554)	36.620 (1.4417)

ITEM	STANDARD		LIMIT
Camshaft journal oil clearance	0.032 – 0.066 (0.0013 – 0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	No.1 Left side No.2 Right side	20.012 – 20.025 (0.7879 – 0.7884)	———
	No.1 Left side No.2 Right side	25.012 – 25.025 (0.9847 – 0.9852)	———
Camshaft journal O.D.	No.1 Left side No.2 Right side	19.959 – 19.980 (0.7858 – 0.7866)	———
	No.1 Left side No.2 Right side	24.959 – 24.980 (0.9826 – 0.9835)	———
Camshaft runout	———		0.10 (0.004)
Rocker arm I.D.	IN. & EX.	12.000 – 12.018 (0.4724 – 0.4731)	———
Rocker arm shaft O.D.	IN. & EX.	11.966 – 11.984 (0.4711 – 0.4718)	———
Cylinder head distortion	———		0.05 (0.002)
Cylinder head cover distortion	———		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Campression pressure	1 500 kPa (15 kg/cm², 213 psi)			1 100 kPa (11 kg/cm², 156 psi)
Campression pressure difference	———			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.045 – 0.055 (0.0018 – 0.0022)			0.120 (0.0047)
Cylinder bore	83.000 – 83.015 (3.2677 – 3.2683)			83.085 (3.2711)
Piston diam.	82.950 – 82.965 (3.2657 – 3.2663) Measure at 15 mm (0.6 in) from the skirt end.			82.880 (3.2630)
Cylinder distortion	———			0.05 (0.002)
Piston ring free end gap	1st		Approx. 10.5 (0.413)	8.40 (0.331)
	2nd	R	Approx. 11.8 (0.465)	9.44 (0.372)
Piston ring end gap	1st		0.20 – 0.35 (0.008 – 0.014)	0.50 (0.020)
	2nd		0.20 – 0.35 (0.008 – 0.014)	0.50 (0.020)
Piston ring to groove clearance	1st		———	0.180 (0.0071)
	2nd		———	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01 – 1.03 (0.0398 – 0.0406)	———
	2nd	1.21 – 1.23 (0.0476 – 0.0484)	———
	Oil	2.51 – 2.53 (0.0988 – 0.0966)	———
Piston ring thickness	1st	0.970 – 0.990 (0.0382 – 0.0390)	———
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	———
Piston pin bore	20.002 – 20.008 (0.7875 – 0.7877)		20.030 (0.7886)
Piston pin O.D.	19.996 – 20.000 (0.7827 – 0.7874)		19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	20.010 – 20.018 (0.7878 – 0.7881)	20.040 (0.7890)
Conrod big end side clearance	0.10 – 0.20 (0.004 – 0.008)	0.30 (0.012)
Conrod big end width	21.95 – 22.00 (0.864 – 0.866)	———
Crank pin width	22.10 – 22.15 (0.870 – 0.872)	———
Conrod big end oil clearance	0.024 – 0.042 (0.0009 – 0.0017)	0.080 (0.0031)
Crank pin O.D.	40.982 – 41.000 (1.6135 – 1.6142)	———
Crankshaft journal oil clearance	0.020 – 0.050 (0.0008 – 0.0020)	0.080 (0.0031)
Crankshaft journal O.D.	47.965 – 47.980 (1.8884 – 1.8890)	———
Crankshaft journal bearing I.D.	48.000 – 48.015 (1.8898 – 1.8904)	———
Crankshaft thrust bearing thickness	1.925 – 2.175 (0.0758 – 0.0856)	———
Crankshaft thrust clearance	0.05 – 0.10 (0.002 – 0.004)	———
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.364 (83/44 × 34/47)	———
Oil pressure (at 60°C, 140°F)	Above 450 kPa (4.5 kg/cm^2, 64 psi) Below 750 kPa (7.5 kg/cm^2, 107 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD		LIMIT
Clutch cable play	10 – 15 (0.4 – 0.6)		———
Drive plate thickness	No. 1	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
	No. 2	3.42 – 3.58 (0.135 – 0.141)	3.12 (0.123)
Drive plate claw width	15.9 – 16.0 (0.626 – 0.630)		15.1 (0.594)
Driven plate distortion	———		0.10 (0.004)
Clutch spring free length	No. 1	———	24.6 (0.97)
	No. 2	———	23.3 (0.92)

RADIATOR + FAN

ITEM	STANDARD		LIMIT
Radiator cap valve release pressure	110 ± 15 kPa (1.1 ± 0.15 kg/cm², 15.6 ± 2.1 psi)		———
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	———
	OFF	Approx. 100°C (212°F)	———
Engine coolant temperature switch operating temperature	ON	Approx. 120°C (248°F)	———
	OFF	Approx. 113°C (235°F)	———

TRANSMISSION

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		1.886 (83/44)		———
Final reduction ratio		3.200 (48/15)		———
Gear ratios	Low	2.461 (32/13)		———
	2nd	1.578 (30/19)		———
	3rd	1.200 (24/20)		———
	4th	0.956 (22/23)		———
	Top	0.800 (20/25)		———
Shift fork to groove clearance		0.10 – 0.30 (0.004 – 0.012)		0.50 (0.020)
Shift fork groove width		5.50 – 5.60 (0.217 – 0.220)		———
Shift fork thickness		5.30 – 5.40 (0.209 – 0.213)		———
Drive chain	Type	DID 50VA$_2$		———
	Links	116 links, ENDLESS		———
	20-pitch length	———		319.4 (12.6)
Drive chain slack		15 – 25 (0.6 – 1.0)		———
Gearshift lever height		50 (2.0)		———

CARBURETOR

ITEM		SPECIFICATION	
		E-02, 04, 17, 22, 24, 25, 34	
Carburetor type		MIKUNI BS36SS (No. 1)	MIKUNI BDS36SS (No. 2)
Bore size		36 mm	←
I.D. No.		*48EE	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-3
Needle jet	(N.J.)	P-3	P-4
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#45	#40
Pilot screw	(P.S.)	*PRE-SET (1½ turns back)	*←
Throttle cable play		2.0 – 4.0 mm (0.08 – 0.16 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-28	
Carburetor type		MIKUNI BS36SS (No. 1)	MIKUNI BDS36SS (No. 2)
Bore size		36 mm	←
I.D. No.		*48FF	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	# 100	# 90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	# 45	# 40
Pilot screw	(P.S.)	*PRE-SET (1½ turns back)	*←
Throttle cable play		2.0 – 4.0 mm (0.08 – 0.16 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-18	
Carburetor type		MIKUNI BS36SS (No. 1)	MIKUNI BDS36SS (No. 2)
Bore size		36 mm	←
I.D. No.		*48EJ	←
Idle r/min.		1 200 $^{+100}_{-50}$ r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	#100	#90
Jet needle	(J.N.)	5D27-3	5C29-2
Needle jet	(N.J.)	P-3	P-4
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	#40	←
Pilot screw	(P.S.)	*PRE-SET (2 turns back)	*PRE-SET (1¼ turns back)
Throttle cable play		2.0 – 4.0 mm (0.08 – 0.16 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-33	
Carburetor type		MIKUNI BS36SS (No. 1)	MIKUNI BDS36SS (No. 2)
Bore size		36 mm	←
I.D. No.		*48EG	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	# 100	# 90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	# 45	# 40
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		2.0 – 4.0 mm (0.08 – 0.16 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		E-03	
Carburetor type		MIKUNI BS36SS (No. 1)	MIKUNI BDS36SS (No. 2)
Bore size		36 mm	←
I.D. No.		*48EF	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	# 100	# 90
Jet needle	(J.N.)	5D83	5C43
Needle jet	(N.J.)	P-3M	P-4M
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	# 45	# 40
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		2.0 – 4.0 mm (0.08 – 0.16 in)	←

CARBURETOR

ITEM		SPECIFICATION	
		P-37	
Carburetor type		MIKUNI BS36SS (No. 1)	MIKUNI BDS36SS (No. 2)
Bore size		36 mm	←
I.D. No.		*48EH	←
Idle r/min.		1 200 ± 100 r/min.	←
Fuel level		7.3 ± 0.5 mm (0.29 ± 0.02 in)	15.0 ± 0.5 mm (0.59 ± 0.02 in)
Float height		27.7 ± 1.0 mm (1.09 ± 0.04 in)	9.1 ± 1.0 mm (0.36 ± 0.04 in)
Main jet	(M.J.)	*#105	*#95
Jet needle	(J.N.)	*5D105-3	*5C29-5
Needle jet	(N.J.)	P-3	*P-7
Throttle valve	(Th.V.)	#115	←
Pilot jet	(P.J.)	*#50	*#47.5
Pilot screw	(P.S.)	*PRE-SET (1 ½ turns back)	PRE-SET (1¾ 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 2 000 r/min.		
Firing order		1-2		
Spark plug		Type	NGK: DPR8EA-9 DENSO: X24EPR-U9	
		Gap	0.8 – 0.9 (0.031 – 0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		170 – 280 Ω		G – Bl
Ignition coil resistance		Primary	2 – 6 Ω	⊕ tap – ⊖ tap
		Secondary	15 – 30 kΩ	Plug cap – ⊕ tap
Generator coil resistance		Charging	0.2 – 1.5 Ω	Y – Y
Generator no-load voltage (when engine cold)		More than 75V (AC) at 5 000 r/min.		
Generator Max. output		250W at 5 000 r/min.		
Regulated voltage		13.5 – 15.5V at 5 000 r/min.		
Starter relay resistance		3 – 6 Ω		
Battery		Type designation	FTX12-BS	
		Capacity	12V 36kC (10Ah)/10HR	
		Standard electrolyte S.G.	1.32 at 20°C (68°F)	
Fuse size	Headlight (HI)	15 A		
	(LO)	15 A		
	Signal	15 A		
	Ignition	10 A		
	Tail	10 A		
	Main	30 A		

WATTAGE

Unit: W

ITEM		SPECIFICATION		
		E-03, 28, 33	E-24	The others
Headlight	HI	60	←	←
	LO	55	←	←
Parking light				4
Brake light / Taillight		21/5	←	←
Turn signal light	Front	21/5	←	21
	Rear	21	←	←
Speedometer light		1.7	←	←
Water temp. indicator light		1.7	←	←
Turn signal indicator light		3.4	←	←
High beam indicator light		1.7	←	←
Neutral indicator light		3.4	←	←
Oil pressure indicator light		1.7	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal free travel		20 – 30 (0.8 – 1.2)	———
Rear brake pedal height		60 (2.4)	———
Brake lining thickness	Rear	———	1.5 (0.06)
Brake drum I.D.	Rear	———	180.7 (7.11)
Brake disc thickness	Front	4.5 ± 0.2 (0.18 ± 0.01)	4.0 (0.16)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	———
Master cylinder piston diam.	Front	12.657 – 12.684 (0.4983 – 0.4993)	———
Brake caliper cylinder bore	Front	30.230 – 30.306 (1.1902 – 1.1931)	———
Brake caliper piston diam.	Front	30.150 – 30.200 (1.1870 – 1.1890)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Wheel rim size	Front	J16 × MT3.00	———
	Rear	J15M/C × MT3.50	———
Tire size	Front	130/90-16 67H	———
	Rear	150/90-15 M/C 74H	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140 (5.5)	———	
Front fork damper free length	———	156 (6.1)	
Front fork oil level (At outer tube 177 mm up position)	154 (6.1)	———	
Rear wheel travel	102 (4.0)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

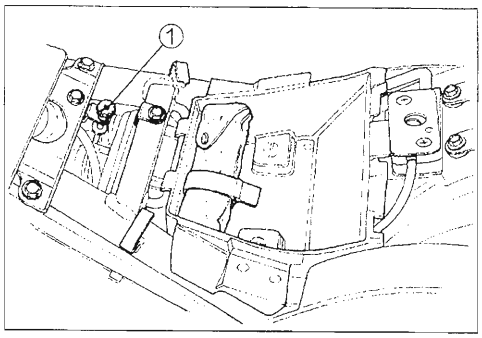
TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING					
	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	200	2.00	29	200	2.00	29
REAR	225	2.25	33	225	2.25	33

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, 28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		Other models
Fuel tank including reserve	13.0 L (3.4/2.9 US/Imp gal)		
reserve	3.0 L (0.8/0.7 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	1 700 ml (1.8/1.5 US/Imp qt)	
	Filter change	2 100 ml (2.2/1.8 US/Imp qt)	
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)	
Front fork oil type	Fork oil #15		
Front fork oil capacity (each leg)	838 ml (28.3/29.5 US/Imp oz)		
Brake fluid type	DOT 4		
Coolant capacity	1 460 ml (1.5/1.3 US/Imp qt)		

ENGINE IDLE RPM (IDLE ADJUSTMENT)

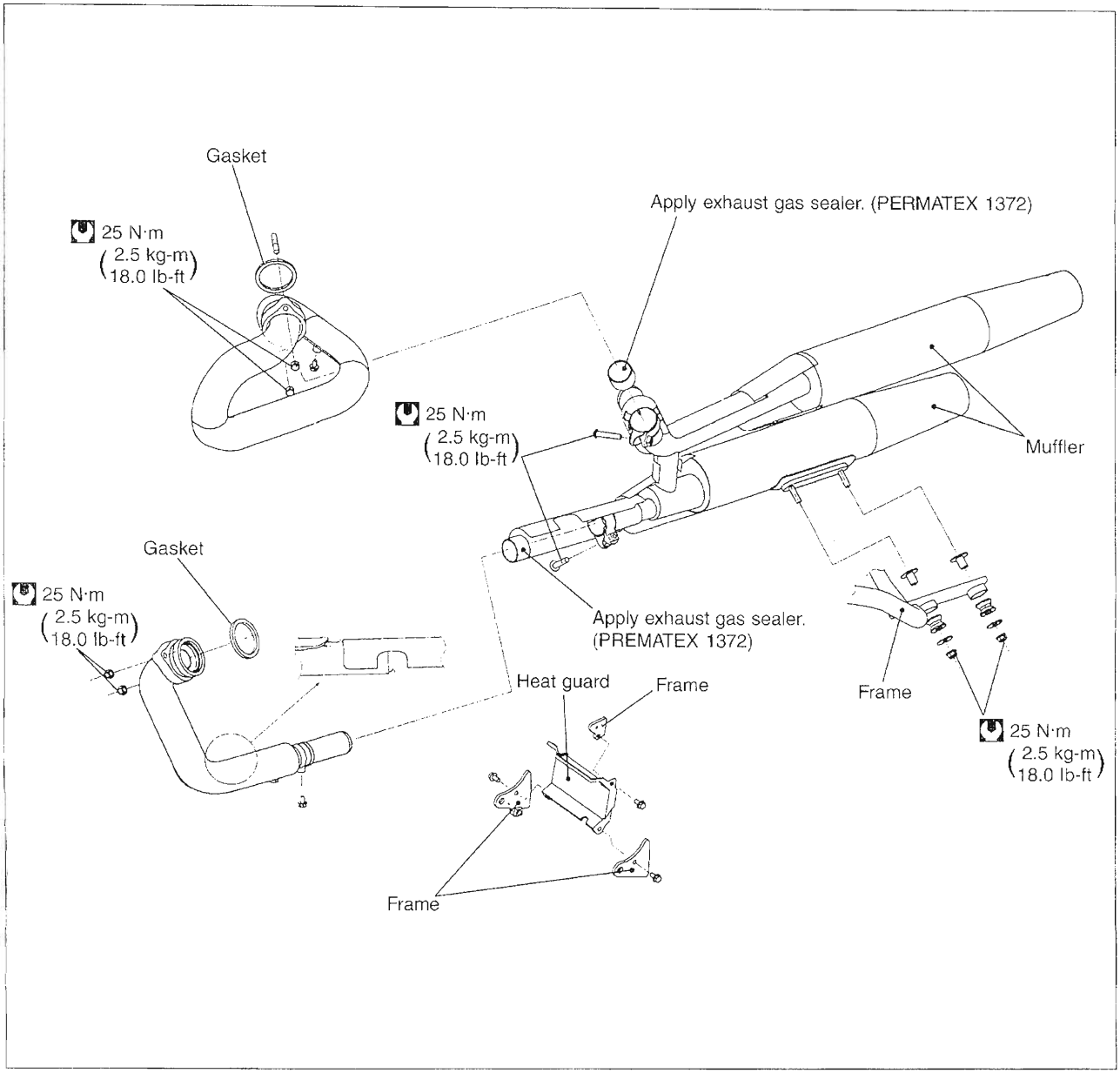


NOTE:
The engine idling speed should be adjusted when the engine is hot.

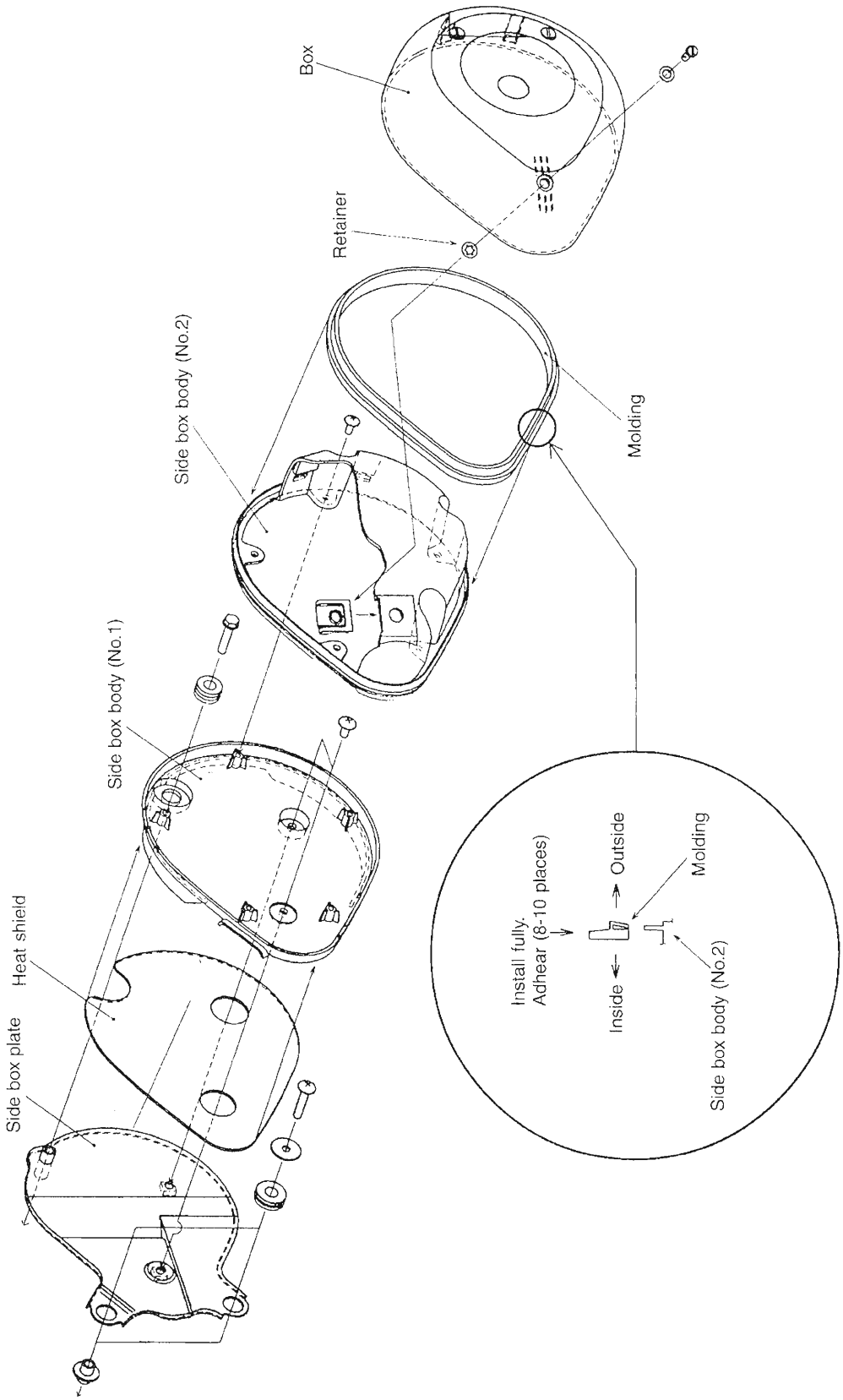
- Remove the seat.
- Connect a tachometer.
- Start up the engine and set its speed at idle speed by turning throttle stop screw ①.

Engine idle speed: 1 200 $^{+100}_{-50}$ r/min ..... for E-18
1 200 ± 100 r/min ..... for others

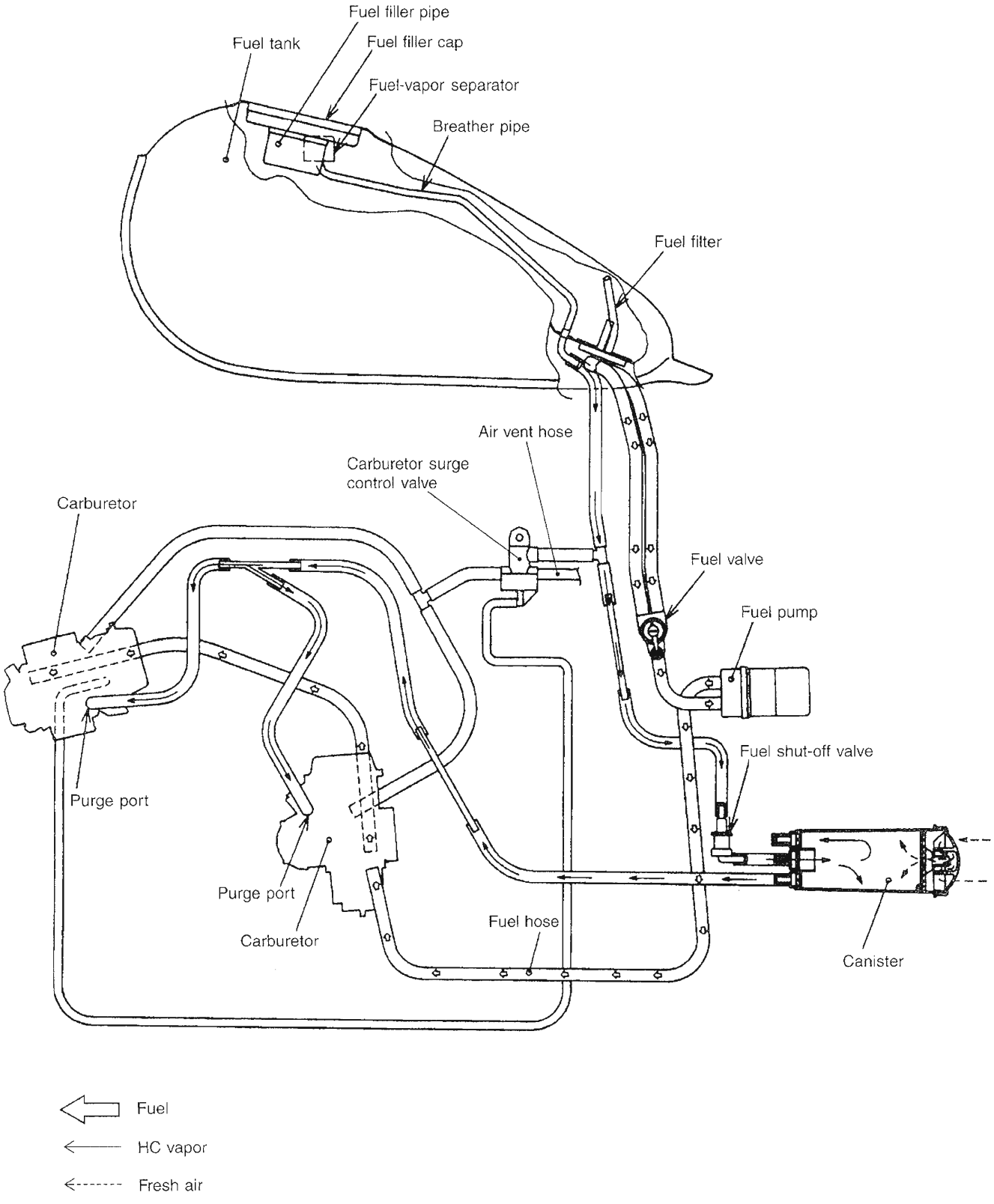
EXHAUST PIPE AND MUFFLER



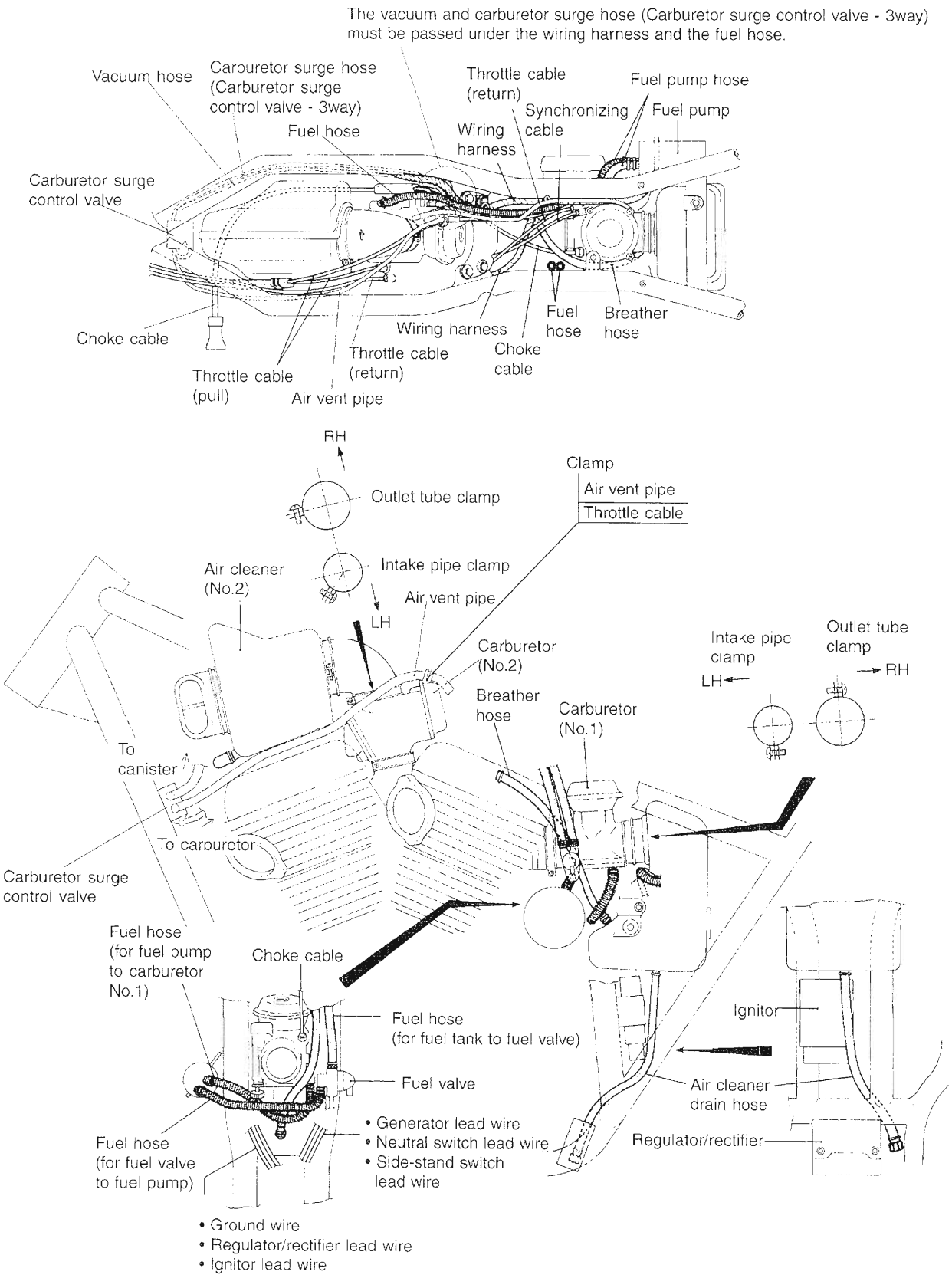
ENGINE SIDE BOX SET-UP



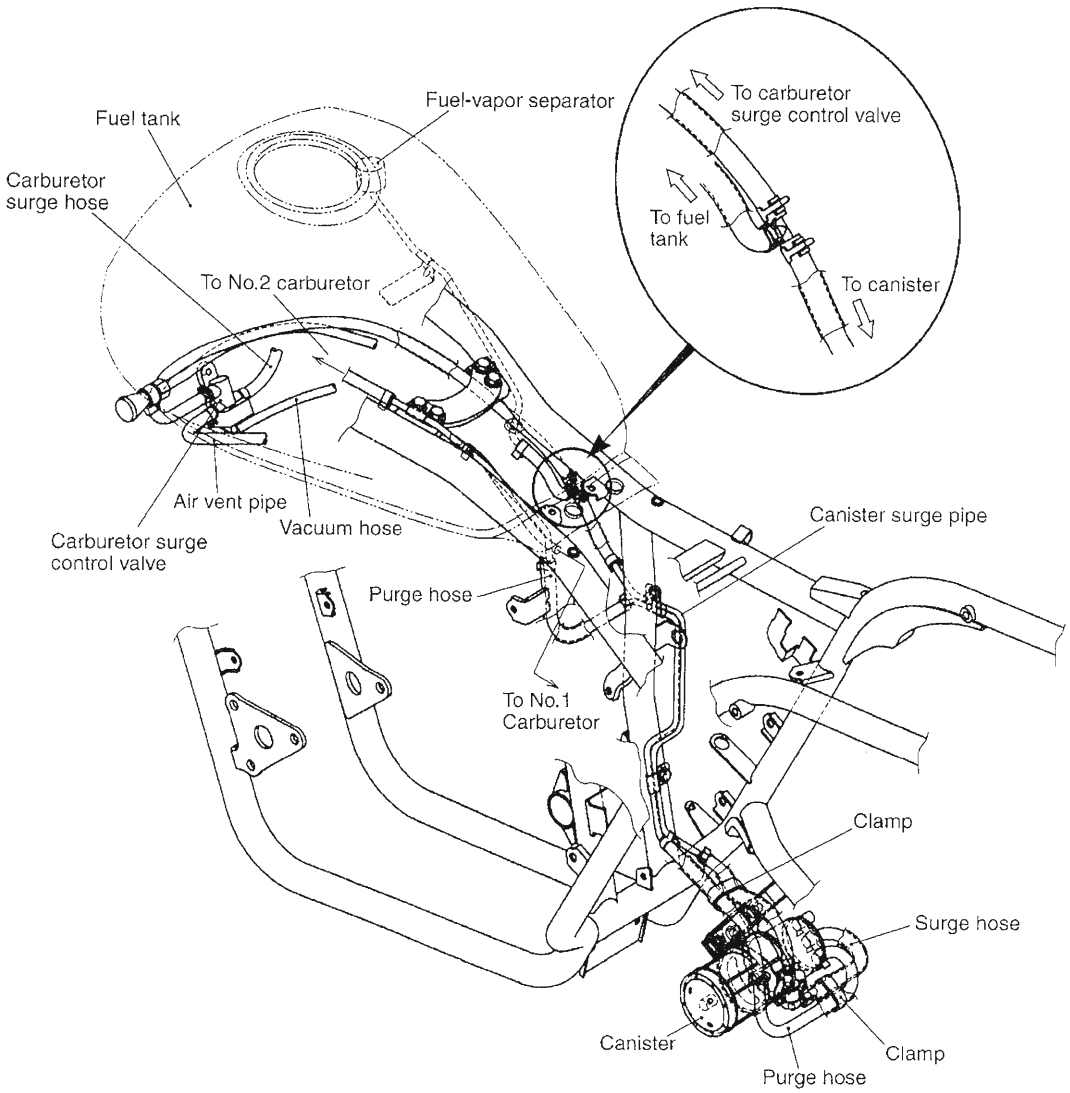
EVAPORATIVE EMISSION CONTROL SYSTEM
(California model only)

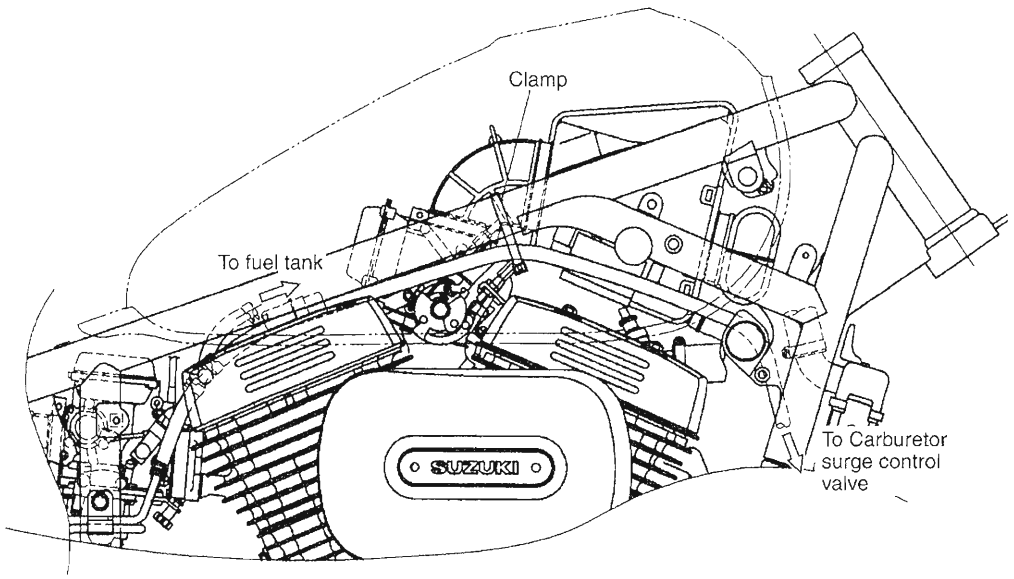


EVAPORATIVE EMISSION CONTROL SYSTEM HOSE ROURING

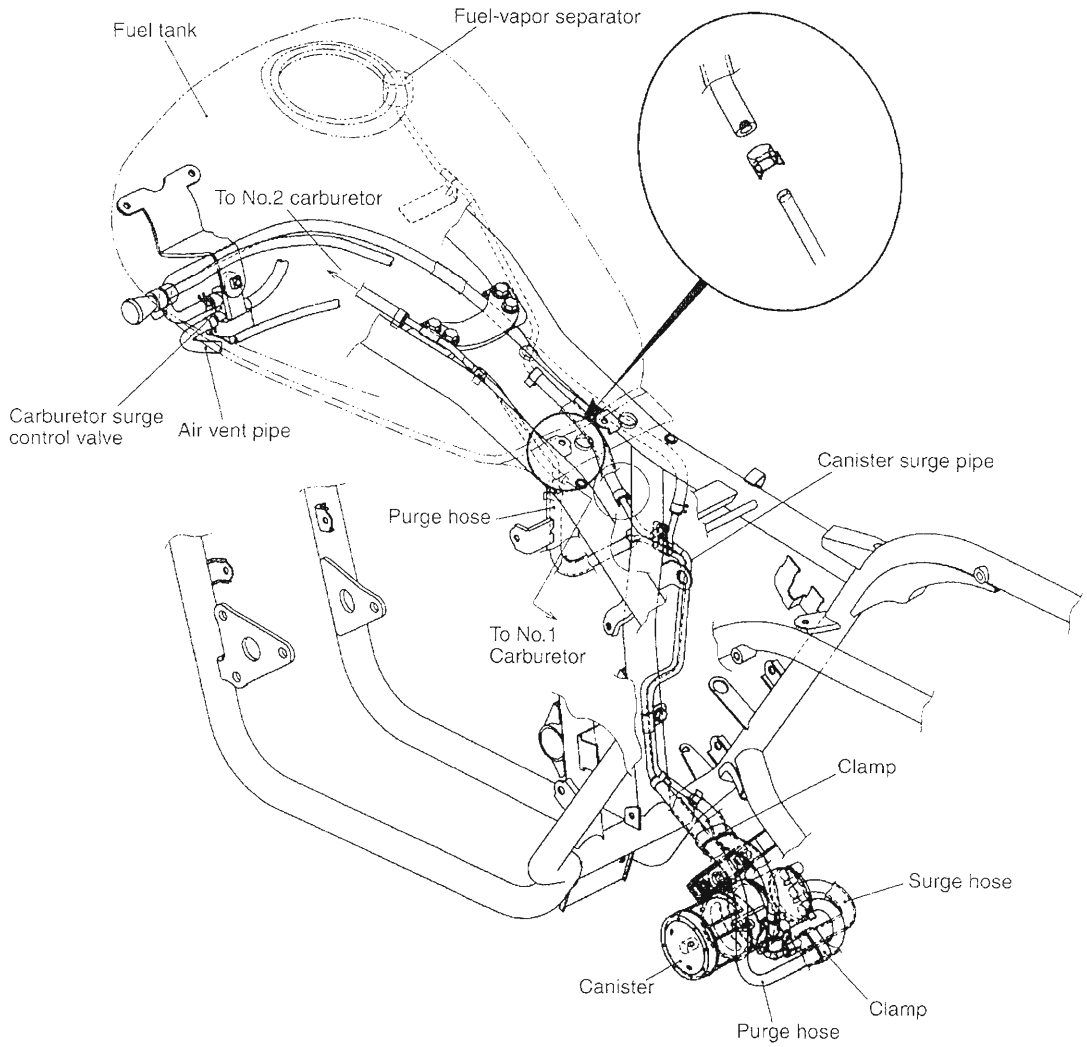


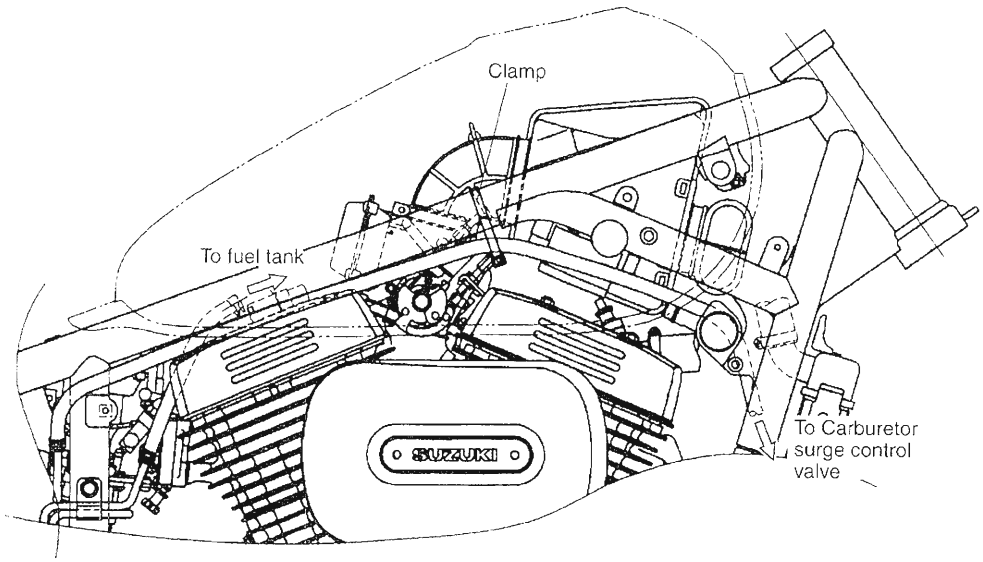
[Frame Number = JS1VS53A-X2101115 ~]





[Frame Number = JS1VS53A-X2102685 ~]





EVAPORATIVE EMISSION CONTROL SYSTEM INSPECTION

- Remove the frame covers and the fuel tank.

HOSES

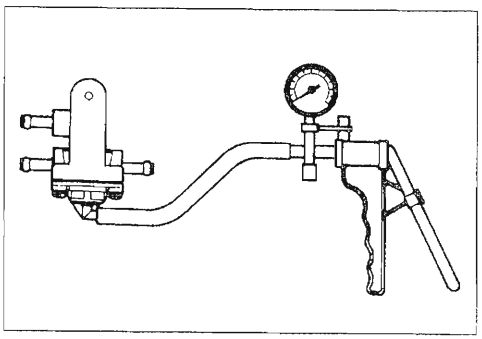
Inspect the hoses and pipes for wear or damage.
Inspect the hoses and pipes for connection.

CANISTER

Inspect the canister for damage of the body.

CARBURETOR SURGE CONTROL VALVE

- Remove the carburetor surge control valve.
- Connect the vacuum pump to the vacuum port as shown.
- Apply the specified negative pressure to the carburetor surge control valve.
- The specified negative pressure must be maintained.
- Replace the carburetor surge control valve if negative pressure is not maintained.



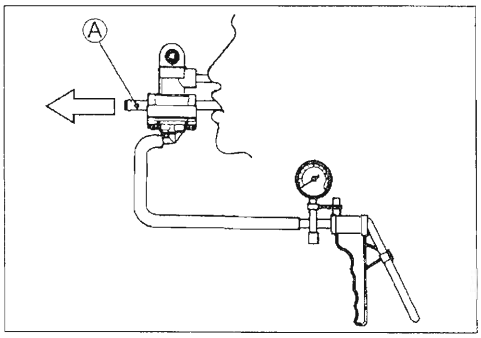
DATA Negative pressure: 2.7 kPa (20 mm Hg)

TOOL 09917-47010: Vacuum pump gauge

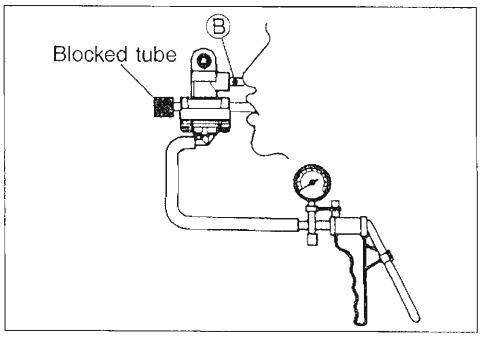
⚠ CAUTION

Use a hand operated vacuum pump to prevent the control valve damage.

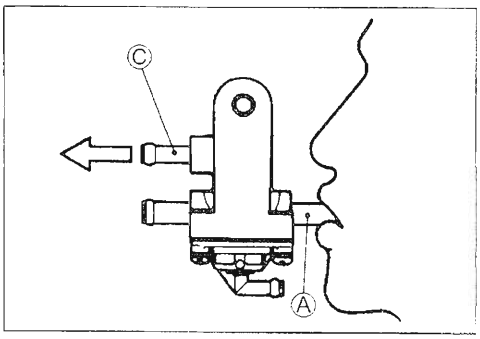
- While applying the specified negative pressure to the carburetor surge control valve vacuum port, blow air through the open air port.
- Air shuld flow through the carburetor surge cntrol valve and out the air vent port Ⓐ.
- Replace the carburetor surge control valve if air does not flow out the air vent port Ⓐ.



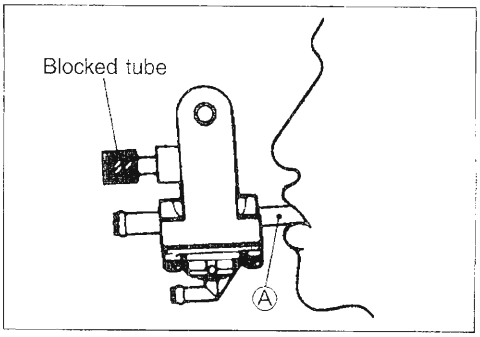
- Plug the air vent port Ⓐ.
- While applying the specified negative pressure to the carburetor surge control valve vacuum port, blow air through the open air port.
- Air should not flow through the carburetor surge control valve and out the canister port Ⓑ
- Replace the carburetor surge control valve if air leakes out the canister port Ⓑ.



- Remove the vacuum pump and blow air through the air vent port Ⓐ.
- Air should flow through the carbureter surge control valve and out the canister port Ⓒ.
- Replace the carburetor surge control valve if air does not flow out the canister port Ⓒ.



- Plug the canister port Ⓒ.
- Air should not flow through the carburetor surge control valve and out the open air port.
- Replace the carburetor surge control valve if air leak out the open air port.



Prepared by

SUZUKI MOTOR CORPORATION

5th Ed. February, 2002
1st Ed. October, 1996
Part No. 99500-38034-03E
Printed in Japan