SUZUKI

GZ250

SERVICE MANUAL

FOREWORD

This manual contains an introductory description on the SUZUKI GZ250 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 as a guide for proper inspection and service. This manual will help you know the motorcycle better so that you can assure your customers of fast and reliable service.

This manual has been prepared on the basis of the latest specifications at the time of publication. If modifications have been made since then, differences may exist between the content of this manual and the actual motorcycle.

Illustrations in this manual are used to show the basic principles of operation and work procedures. They may not represent the actual motorcycle exactly in detail. This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI motorcycles. If you do not have the proper knowledge and tools, ask your authorized SUZUKI motorcycle dealer to help you.

WARNING

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

SUZUKI MOTOR CORPORATION

Motorcycle Service Department

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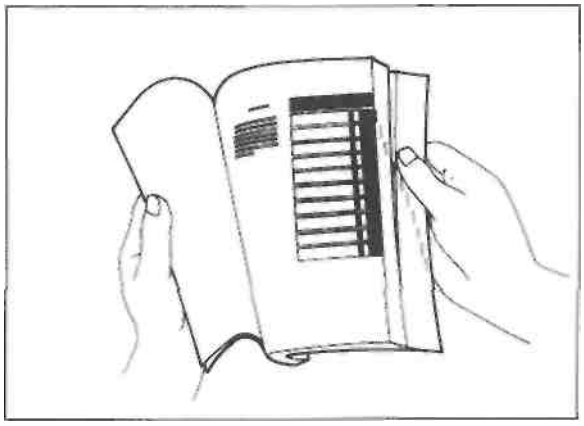
GROUP INDEX

HOW TO USE THIS MANUAL

TO LOCATE WHAT YOU ARE LOOKING FOR:

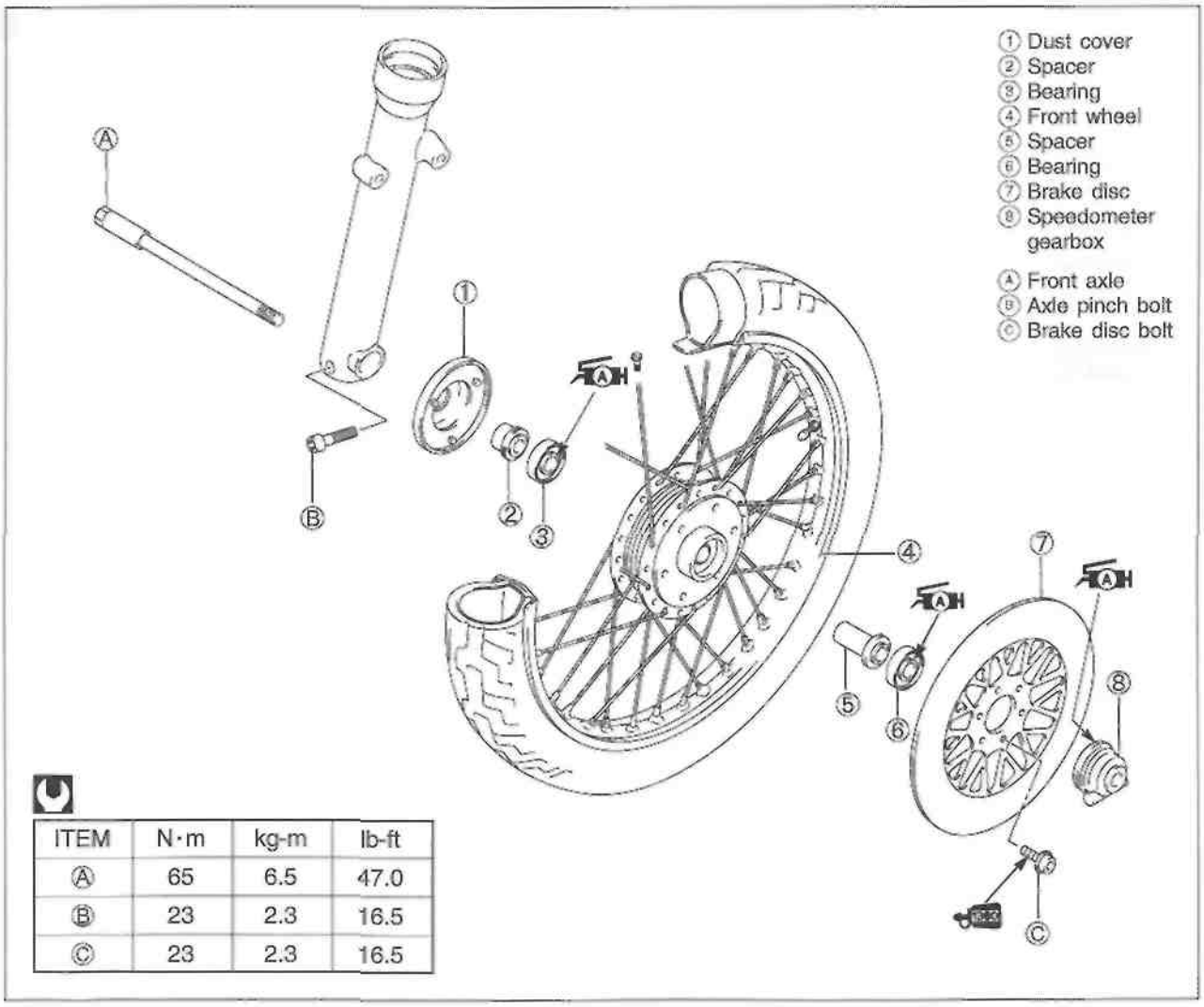
1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help you find the item and 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
Ⓐ	65	6.5	47.0
Ⓑ	23	2.3	16.5
Ⓒ	23	2.3	16.5

SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing. The meaning of each symbol is also included in the table.

SYMBOL	DEFINITION	SYMBO L	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply THREAD LOCK "1360". 99000-32130
	Apply oil. Use engine oil unless otherwise specified.		Apply or use brake fluid.
	Apply molybdenum oil solution (mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1 : 1).		Measure in voltage range.
	Apply SUZUKI SUPER GREASE "A". 99000-25010		Measure in resistance range.
	Apply SUZUKI SILICONE GREASE. 99000-25100		Measure in current range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in diode test range.
	Apply SUZUKI BOND "1215". 99000-31110		Measure in continuity test range.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Use special tool.
	Apply THREAD LOCK "1342". 99000-32050		Use fork oil. 99000- 99001-SS8

GENERAL INFORMATION

1

----------CONTENTS----------1

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 manufacturer's instructions. Never use gasoline as a cleaning solvent.
To avoid getting burned, do not touch the engine, engine oil and exhaust system until they have cooled.
After servicing fuel, oil, exhaust or brake systems, check all of the 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.
* 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 cover the positive terminal with the terminal cover.
* When performing service to electrical parts, disconnect the battery negative cable unless the service procedure requires the battery power.
* When tightening cylinder head and crankcase bolts and nuts, tighten the larger sizes first. Always tighten the bolts and nuts from the inside working out, in a crisscross pattern and to the specified tightening torque.
* Whenever you remove oil seals, gaskets, packing, O-rings, self-locking nuts, locking washers, 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.

CAUTION

* To protect the environment, do not unlawfully dispose of used motor oil and all other fluids, batteries, and tires.
* To protect the earth's natural resouces, properly dispose of used motorcycles and parts.

SUZUKI GZ250X ('99-MODEL)

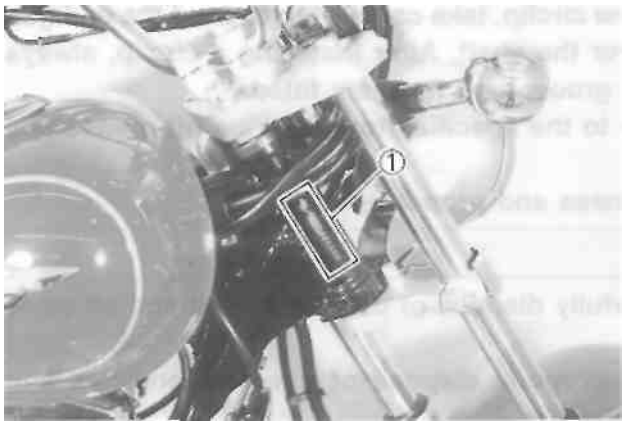
RIGHT SIDE

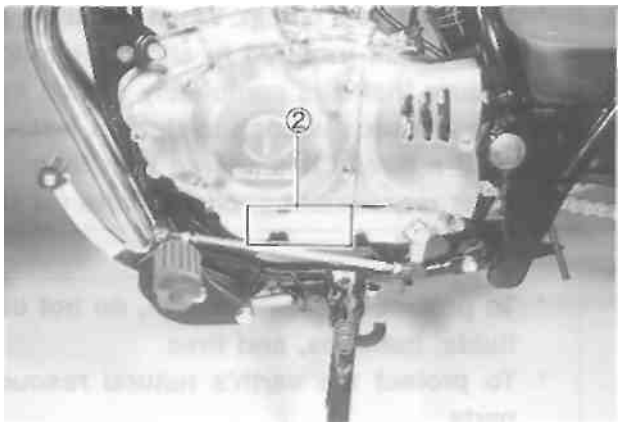
LEFT SIDE

* Difference between photographs and the 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 left side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.





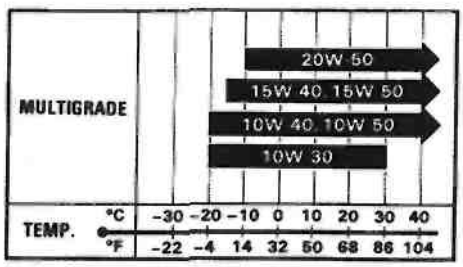
FUEL AND OIL RECOMMENDATIONS

FUEL

Use unleaded gasoline that is graded 91 octane or higher.

ENGINE OIL

Use only oils which are rated SF or SG under the API classification. The recommended viscosity is SAE 10W/40. If SAE 10W/40 engine oil is not available, select an alternative according to the chart.



BRAKE FLUID

Specification and classification: DOT 4

WARNING

This motorcycle uses a glycol-based brake fluid. Do not use or mix different types of brake fluid such as silicone-based and petroleum-based fluids for refilling the system, otherwise serious damage will result to the brake system.
Never use any brake fluid taken from old, used or unsealed containers.
Never re-use brake fluid left over from a last servicing or which has been stored for a long period of time.

FRONT FORK OIL

Use SUZUKI fork oil SS-08 (#10).

BREAK-IN PROCEDURES

During manufacturing only the best possible materials are used and all machined parts are finished to a very high standard. 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 this break-in throttle position.

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 you can subject the motorcycle to full throttle operation for short periods of time.

INFORMATION LABELS

① Noise label (For E-03, 24, 33, 34)
② Information label (For E-03, 28, 33)
③ Vacuum hose routing label (For E-33)
④ Fuel information label (For E-02, 24)
⑤ Manual notice label (For E-03, -33)
⑥ Tire pressure label
⑦ Warning safety label
⑧ ICES label (For E-28)
⑨ ID label (Except for E-03, 28, 33)
⑩ Safety plate (For E-03, 28, 33)

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 160 mm (85.0 in)
Overall width	**815** mm (32.1 in)
Overall height	1 090 mm (42.9 in)
Wheelbase	1 450 mm (57.1 in)
Ground clearance	**125** mm (4.9 in)
Seat height	680 mm (27.8 in)
Dry mass	**137** kg (302 lbs)

ENGINE

Type	Four-stroke, air-cooled, OHC
Number of cylinder	**1**
Bore	72.0 mm (2.835 in)
Stroke	**61.2** mm (2.409 in)
Displacement	249 cm^3 (15.2 cu. in)
Compression ratio	**9.0 : 1**
Carburetor	MIKUNI BSR32SS, single
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	3.238 (68/21)
Final reduction ratio	2.733 (41/15)
Gear ratios, Low	2.636 **(29/11)**
2nd	1.687 (27/16)
3rd	1.263 (24/19)
4th	1.000 (20/20)
Top	0.818 (18/22)
Drive chain	DID 520VC5, 110 links

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	10° B.T.D.C. at 1 300 r/min
Spark plug	NGK DR8EA or DENSO X24ESR-U
Battery	12V 21.6 kC (6 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	20/15/15/15/10/10A
Headlight	12V 60/55W
Position light	12V 4W ..... Except for E-03, -24, -28, -33
Brake light/Taillight	12V 21/5W
Front turn signal light/Running light	12V 21/5W ..... E-03, -28, -33
Turn signal light	12V 21W
Speedometer light	12V 1.7W
Neutral indicator light	12V 3.4W
Turn signal indicator light	12V 3.4W
High beam indicator light	12V 1.7W

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped, spring preload 5-way adjustable
Front fork stroke	120 mm (4.7 in)
Rear wheel travel	90 mm (3.5 in)
Steering angle	40° (right and left)
Caster	32° 30'
Trail	140 mm (5.5 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake
Rear brake	Internal expanding
Front tire size	110/90-16 59P
Rear tire size	130/90-15M/C 66P

CAPACITIES

Fuel tank, including reserve	14 L (3.7/3.1 US/Imp gal)
reserve	2.9 L (0.8/0.6 US/Imp gal)
Engine oil, oil change	1 300 ml (1.4/1.1 US/Imp qt)
with filter change	1 400 ml (1.5/1.2 US/Imp qt)
overhaul	1 700 ml (1.8/1.5 US/Imp qt)
Front fork oil (each leg)	369 ml (12.5/13.0 US/Imp oz)

Specifications are subject to change without notice.

COUNTRY AND AREA CODES

The following codes stand for the applicable country(-ies) and area(-s).

CODE	COUNTRY OR AREA
E-01	General
E-02	UK
E-03	U.S.A. (Except for California)
E-04	France
E-17	Sweden, Finland (E-15), Norway (E-16), Denmark (E-26)
E-22	Germany
E-24	Australia
E-25	Netherlands
E-28	Canada
E-33	California (U.S.A.)
E-34	Italy, Belgium (E-21), Spain (E-53)

PERIODIC MAINTENANCE

----------CONTENTS----------

PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Maintenance intervals are expressed in terms of kilometers and months, and are dependant on whichever comes first.

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

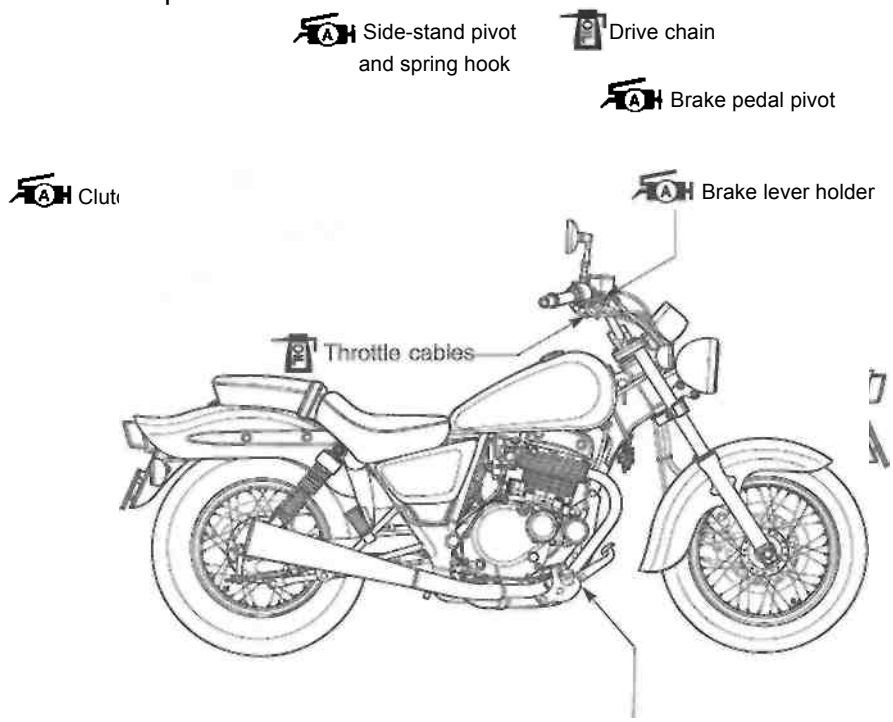
PERIODIC MAINTENANCE CHART

Item / Interval					
	km	**1** 000	5 **000**	10 **000**	15 000
	miles	**600**	3 **000**	6 **000**	9 500
	months	**3**	15	30	45
Exhaust pipe bolts and muffler mounting	bolts	-	T	T	T
Air cleaner element		**Clean every 3 000 km (2 000 miles).**			
Valve clearance		I	I	I	I
Spark plug		-	I	R	I
Fuel hose		-	I	I	I
		Replace every 4 years.			
Engine idle speed		I	I	I	I
Throttle cable play		**I**	I	I	I
Clutch		-	I	I	I
Engine oil		R	R	R	R
Engine oil filter		R	-	R	-
Drive chain		**I**	I	I	I
		Clean and lubricate every 1 000 km (600 miles).			
Brakes		**I**	I	I	I
Brake hose		-	I	I	I
		Replace every 4 years.			
Brake fluid		-	I	I	I
		Replace every 2 years.			
Tires		-	I	I	I
Steering		I	-	I	-
Front fork		-	-	I	-
Rear suspension		-	-	I	-
Chassis bolts and nuts		T	T	T	T

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

LUBRICATION POINTS

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



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 especially whenever the motorcycle has been operated under wet or rainy condition.*

MAINTENANCE AND TUNE-UP PROCEDURES

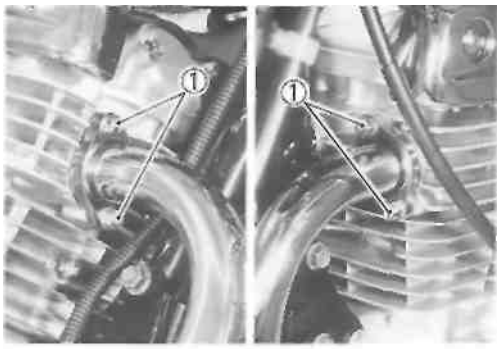
This section describes the servicing procedures for each item in the Periodic Maintenance chart.

EXHAUST PIPE BOLTS AND MUFFLER MOUNTING BOLTS

Tighten every 5 000 km (3 000 miles, 15 months).

• Tighten the exhaust pipe bolts ① and muffler mounting bolt ② to the specified torque.

Exhaust pipe bolt ①: 14 N ■ m (1.4 kg-m, 10.0 lb-ft)
Muffler mounting bolt ②: 29 N ■ m (2.9 kg-m, 21.0 lb-ft)

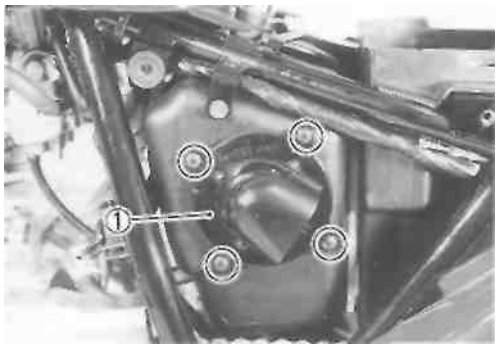


AIR CLEANER

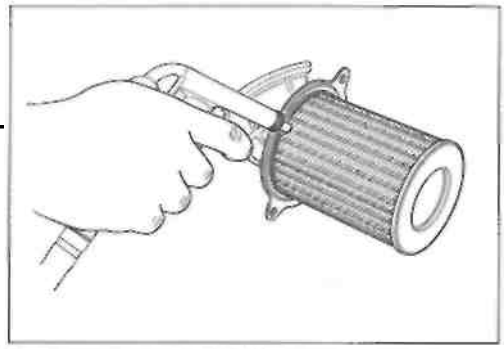
Clean every 3 000 km (2 000 miles).

If the air cleaner is clogged with dust, intake resistance will increase, resulting in a decrease in engine output and an increase in fuel consumption. Check and clean the air cleaner element in the following manner.

• Remove the front seat. (See p. 5-1.)
• Remove the left frame cover. (See p. 5-1.)
• Remove the air cleaner element ①.



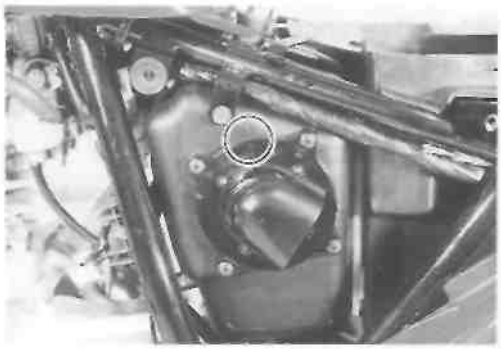
• Carefully use compressed air to clean the air cleaner element.



CAUTION CAUTION

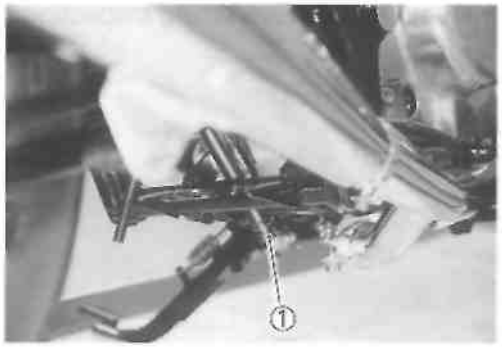
Always apply compressed air to the outside of the air cleaner element. If compressed air is applied to the inside, dirt will be forced into the pores of the air cleaner element, restricting air flow through the air cleaner element.

- Reinstall the cleaned or new air cleaner element in the reverse order of removal.
- When installing the air cleaner element into the air cleaner case, align the triangle marks on the air cleaner element and the air cleaner case.



CAUTION

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



NOTE:
When cleaning the air cleaner element, remove the plug① and drain any water from the air cleaner drain hose.

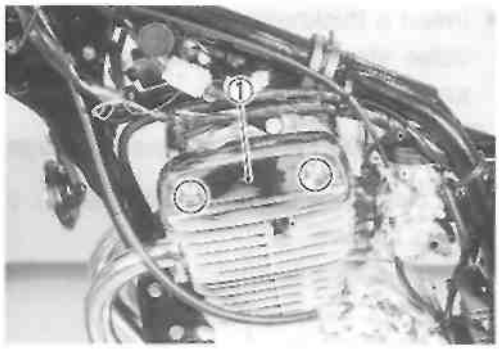
VALVE CLEARANCE

Inspect initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter.

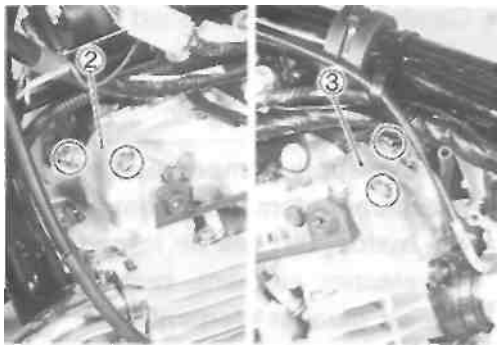
INSPECTION

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Remove the cylinder head cover left cap①
- Disconnect the spark plug cap and remove the spark plug.

09930-10121: Spark plug socket wrench set



Remove the valve inspection caps(②, ③)

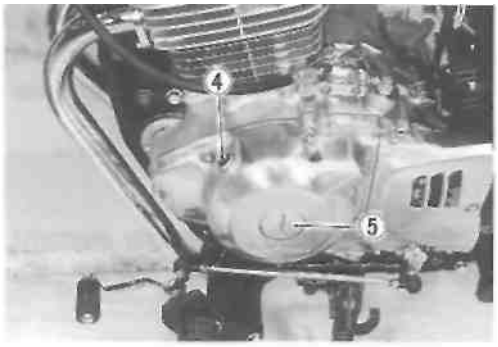


The valve clearance specification is different for intake and exhaust valves.
Valve clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshaft is removed for servicing.

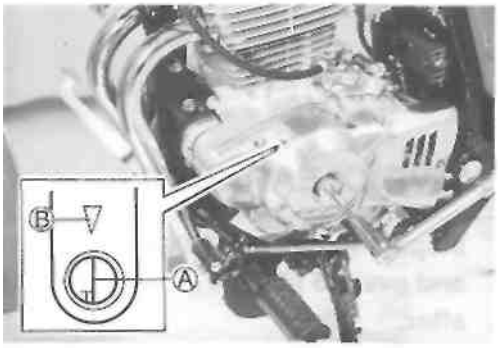
Valve clearance (when cold):
IN. : 0.03-0.08 mm (0.001-0.003 in)
EX.: 0.08-0.13 mm (0.003-0.005 in)

NOTE:

* *The piston must be at top dead center (TDC) on the compression stroke in order to check or adjust the valve clearance.*
* *The valve clearance should only be checked when the engine is cold.*
* Remove the valve timing inspection plug④and generator cover cap⑤



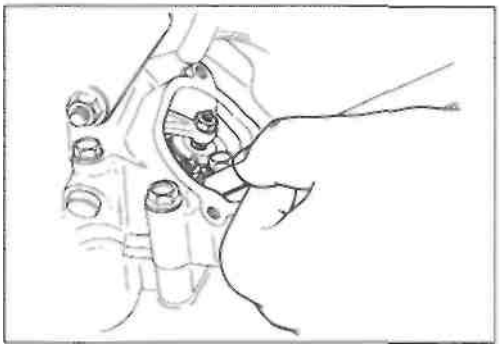
Rotate the crankshaft with a box wrench to set the piston at top dead center (TDC) on the compression stroke. (Rotate the crankshaft until the "T" line Ⓐ on the generator rotor is aligned with the triangle mark Ⓑ on the generator cover.)



Insert a thickness gauge into the clearance between the valve stem end and the adjusting screw on the rocker arm.

TOOL

09900-20803: Thickness gauge

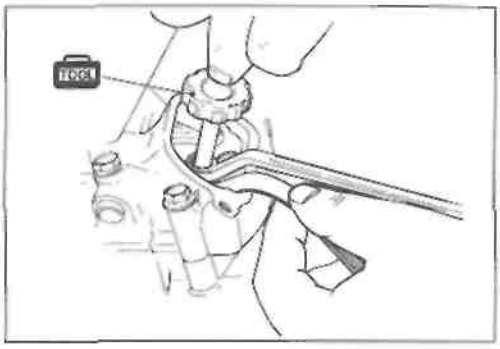


If the clearance is out of specification, adjust it to specification as follows.

ADJUSTMENT

The clearance is adjusted using the special tool and offset wrench.

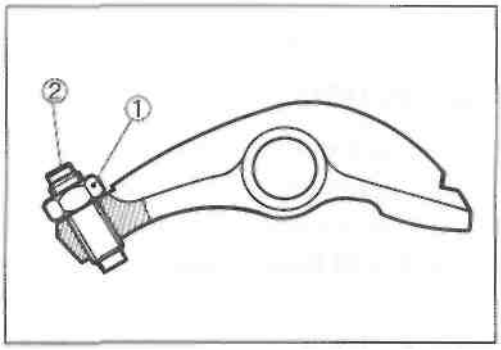
- Loosen the locknuts ①
- Insert a thickness gauge between the valve stem end and the adjusting screw ② on the rocker arm.
- Adjust the valve clearance by turning the adjusting screw ② using the special tool while holding the locknuts ①



09917-14920: Valve adjuster wrench

CAUTION

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



- After the adjustment is completed, tighten the locknut securely.
- Rotate the crankshaft 720° with a box wrench and check that the clearance is within specification.

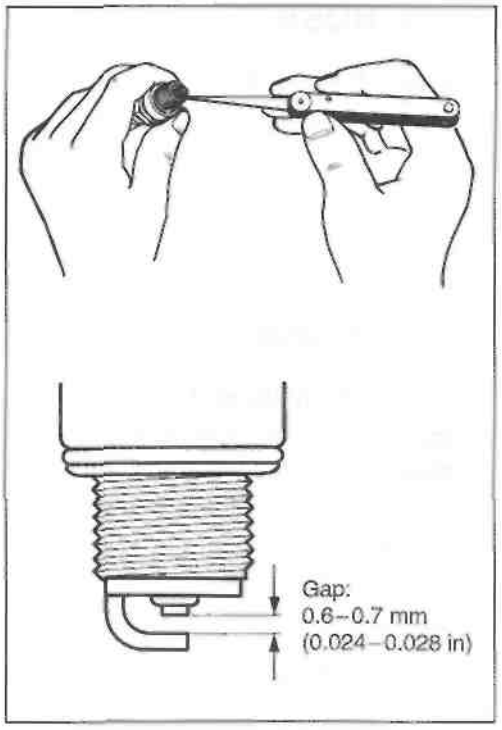
SPARK PLUG

Inspect every 5 000 km (3 000 miles, 15 months).
Replace every 10 000 km (6 000 miles, 30 months).

Neglecting the spark plug eventually leads to difficult starting and poor engine performance. If the spark plug is used for a long period, the electrode gradually bums away and carbon builds up along the inside part of the spark plug. In accordance with the Periodic Maintenance chart, the spark plug should be inspected, cleaned and regapped at the recommended intervals.

- Remove the cylinder head cover left cap.
- Disconnect the spark plug cap and remove the spark plug.

09930-10121: Spark plug socket wrench set



- Carbon deposits on the spark plug will prevent good sparking and may cause the engine to misfire. Be sure to clean the carbon deposits off periodically.

If the center electrode is fairly worn down, the spark plug should be replaced and the spark plug gap set to the specification using a thickness gauge.

09900-20803: Thickness gauge

Spark plug gap: 0.6-0.7 mm (0.024-0.028 in)

Check the spark plug for burns. If any abnormalities are found, replace the spark plug as indicated below.

NGK	**DENSO**	Remarks
DR7EA	X22ESR-U	If the standard spark plug is apt to get wet, replace with this plug.
DR8EA	X24ESR-U	Standard
DR9EA	X27ESR-U	If the standard spark plug is apt to overheat, replace with this plug.

CAUTION

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

CAUTION

Before using a spark plug wrench, carefully turn the spark plug by finger into the threads of the cylinder head to prevent damage.

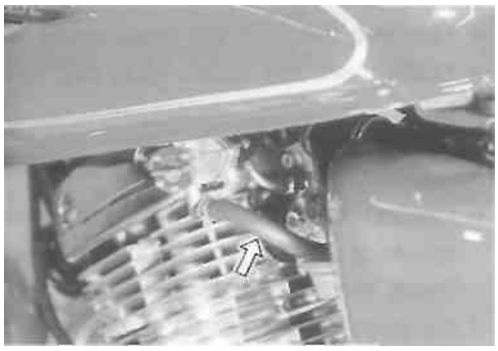
• Tighten the spark plug to the specified torque using the special tool.

Spark plug: 18 N-m (1.8 kg-m, 13.0 lb-ft)

09930-10121: Spark plug socket wrench set

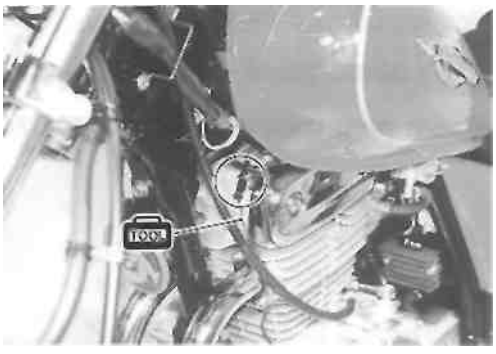
FUEL HOSE

Inspect every 5 000 km (3 000 miles, 15 months). Replace every 4 years.



ENGINE IDLE SPEED

Inspect initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter.



- Adjust the throttle cable play. (See p. 2-8.)
- Warm up the engine.

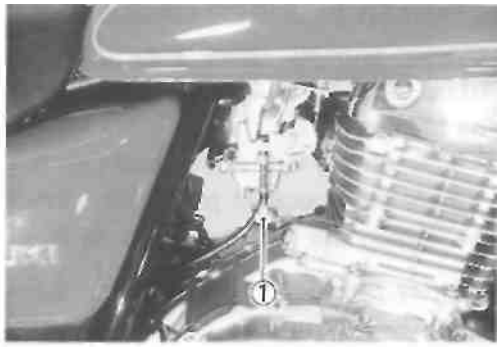
NOTE:
Make this adjustment when the engine is hot.

- Connect an electric tachometer to the high tension cord.

• Start the engine, turn the throttle stop screw ① and set the engine idle speed as follows.

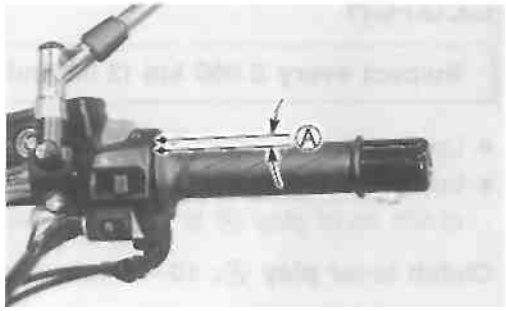
Engine idle speed:
1 300 ± 50 r/min .... For E-03, -28, -33
1 300 ±100 r/min..... For the others

09900-26006: Tachometer



THROTTLE CABLE PLAY

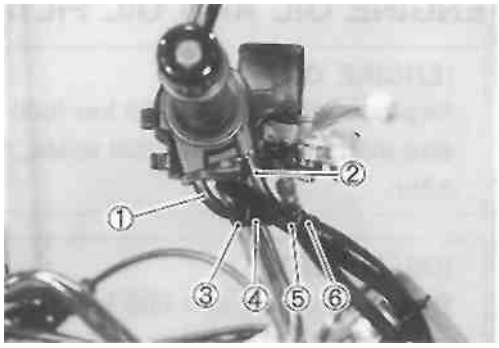
Inspect initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter.



Adjust the throttle cable play Ⓐ with the following three steps.

First step:
• Loosen the lock nut ③ of the throttle returning cable ① and turn in the adjuster ④ fully into the threads.

Second step:
• Loosen the lock nut ⑤ of the throttle pulling cable ②
• Turn the adjuster ⑥ in or out until the throttle cable play Ⓐ should be 2.0-4.0 mm (0.08-0.16 in) at the throttle grip.
• Tighten the lock nut ⑤ while holding the adjuster ⑥



Third step:
• While holding the throttle grip at the fully closed position, slowly turn out the adjuster ④ of the throttle returning cable ① to feel resistance.
• Tighten the lock nut ③ while holding the adjuster ④

Throttle cable play Ⓐ: 2.0-4.0 mm (0.08-0.16 in)

WARNING

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

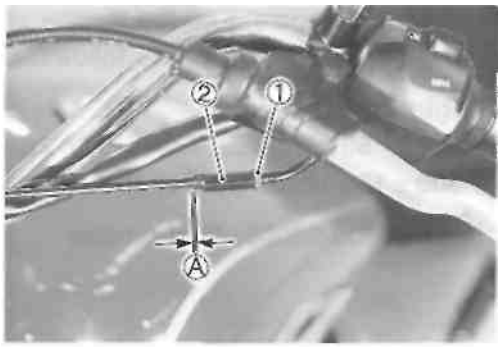
NOTE:
Major adjustment can be made by the carburetor side adjuster.

STARTER PLUNGER CABLE PLAY

Starter plunger cable play Ⓐ should be 0.5-1.0 mm (0.02-0.04 in) as shown. If the play Ⓐ is incorrect, adjust it as follows:

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

Starter plunger cable play Ⓐ 0.5-1.0 mm (0.02-0.04 in)



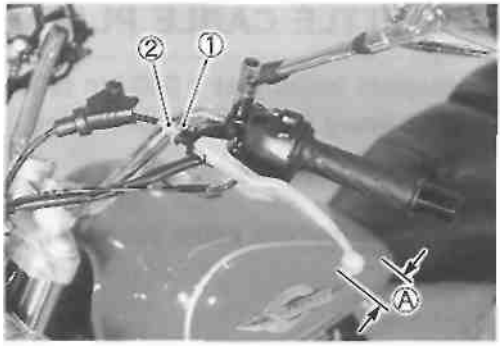
CLUTCH

Inspect every 5 000 km (3 000 miles, 15 months).

- Loosen the lock nut ① and turn the adjuster ② fully in.
- Loosen the lock nut ③ and turn the adjuster ④ until the clutch lever play Ⓐ is within specification.

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

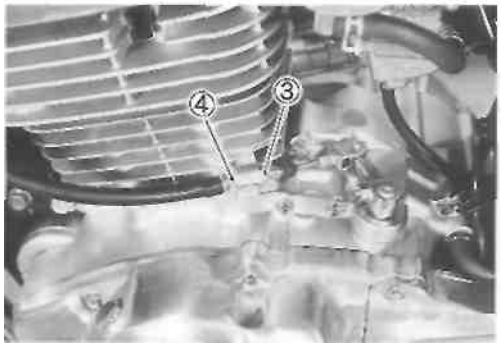
- Tighten the lock nuts (①, ③)



ENGINE OIL AND OIL FILTER

(ENGINE OIL)
Replace initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter.

(OIL FILTER)
Replace initially at 1 000 km (600 miles, 3 months) and every 10 000 km (6 000 miles, 30 months) thereafter.



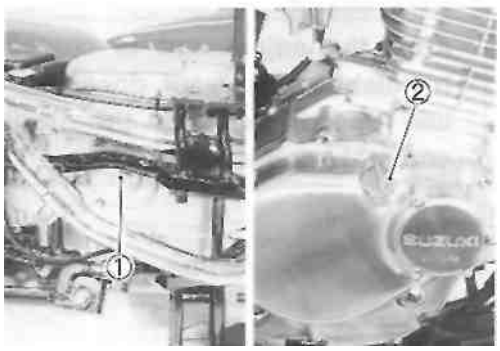
The engine oil should be changed while the engine is warm. Oil filter replacement at the above intervals should be done together with the engine oil change.

ENGINE OIL REPLACEMENT

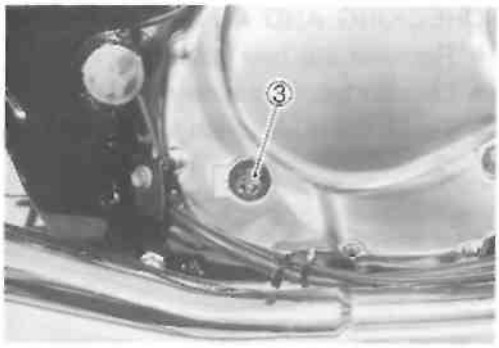
- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain the engine oil by removing the engine oil drain plug ① and oil filler cap ②.
- Tighten the oil drain plug ① to the specified torque, and pour new oil through the oil filler. When performing an oil change (without oil filter replacement), the engine will hold about 1 300 ml (1.4/1.1 US/Imp qt) of oil. Use SF or SG classified (API) engine oil with a viscosity rating of 10W-40 (SAE).

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

- Install the oil filler cap ②



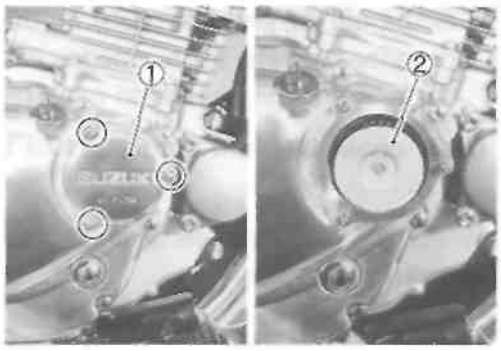
- Start up the engine and allow it to run for a few minutes at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ③. If the level is below the "F" mark, add oil to the proper level.



OIL FILTER REPLACEMENT

- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil filter cap①by removing the nuts.
- Remove the oil filter②and install a new one.
- Install the oil filter cap ①and tighten the nuts securely.

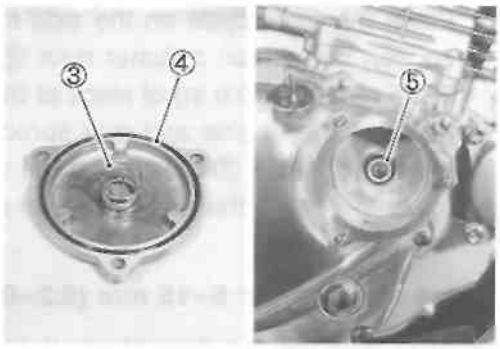
NOTE:
Before installing the new oil filter and oil filter cap, make sure that the spring ③ and new O-rings (④, ⑤) are installed correctly.



- Add new engine oil and check the oil level as described in the engine oil replacement procedure.

Oil viscosity and classification:
10W/40 (SAE)/SF or SG (API)

NECESSARY AMOUNT OF ENGINE OIL
Oil change : 1 300 ml (1.4/1.1 US/Imp qt)
Oil and filter change: 1 400 ml (1.5/1.2 US/Imp qt)
Engine overhaul : 1 700 ml (1.8/1.5 US/Imp qt)



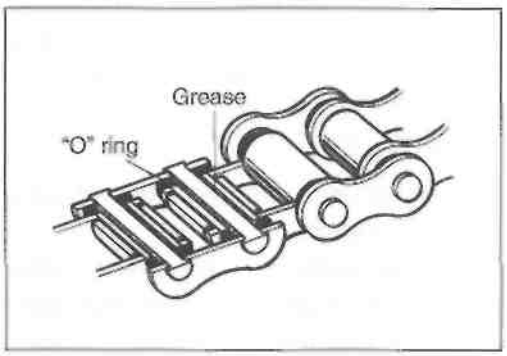
DRIVE CHAIN

Inspect initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter. Clean and lubricate every 1 000 km (600 miles).

Visually inspect 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
- Twisted or seized links
- * Excessive wear
- * Kinked or binding links
- * Missing O-ring seals

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



The standard drive chain is DID520VC5. SUZUKI recommends to use this standard drive chain as a replacement.

CAUTION

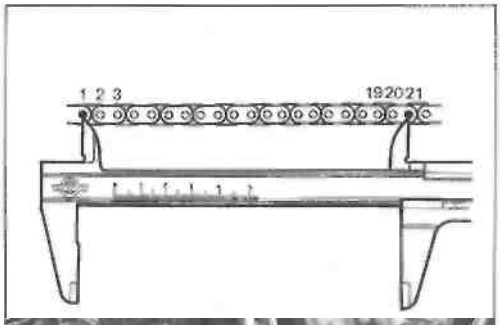
The standard drive chain is **DID520VC5. SUZUKI**

replacement.

CHECKING AND ADJUSTING

- Remove the rear axle cotter pin. (For E-28 model)
- Loosen the rear axle nut①
- Tense the drive chain fully by turning chain adjuster nuts

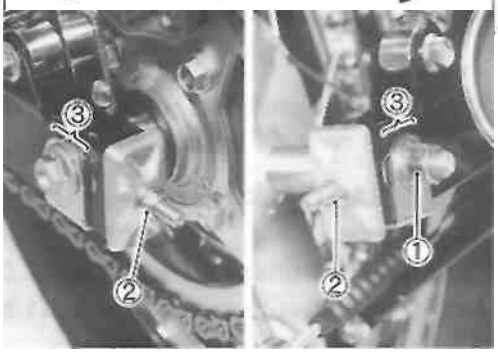
- Count out 21 pins (20-pitch) on the chain measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.



Drive chain 20-pitch length: 319.4 mm (12.57 in)

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

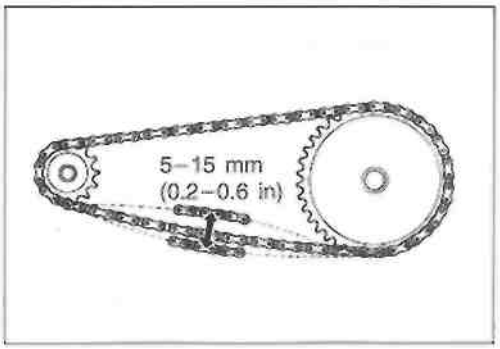
- Place the motorcycle on the side-stand.
- Loosen both chain adjuster nuts ②until the chain has 5-15 mm (0.2-0.6 in) of slack at the middle of the chain between the engine and rear sprockets as shown. The reference marks③must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.



Drive chain slack: 5-15 mm (0.2-0.6 in)

- After adjusting the drive chain, tighten the rear axle nut ① to the specified torque.

Rear axle nut:
65 N-m (6.5 kg-m, 47.0 lb-ft)..... For E-03, -28, -33
78 N-m (7.8 kg-m, 56.5 lb-ft)..... For the others



- Recheck the chain slack after tightening the axle nut and readjust if necessary.

* Tighten both chain adjuster nuts②securely.

- Install the new cotter pin. (For E-03, -28, -33 models)

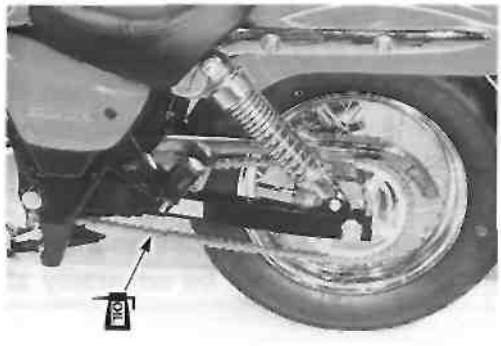
CLEANING AND LUBRICATING

- Clean the drive chain with kerosine. If the drive chain tends to rust quickly, the intervals must be shortened.

CAUTION

Do not use trichloroethylene, gasoline or any similar solvent.
These fluids have too great a dissolving power for this chain and they can damage the O-rings. Use only kerosine to clean the drive chain.

• After cleaning and drying the chain, oil it with a heavy-weight engine oil.



CAUTION

Do not use any oil sold commercially as "drive chain oil", this type of oil can such oil can damage the "0"-rings (or seals).

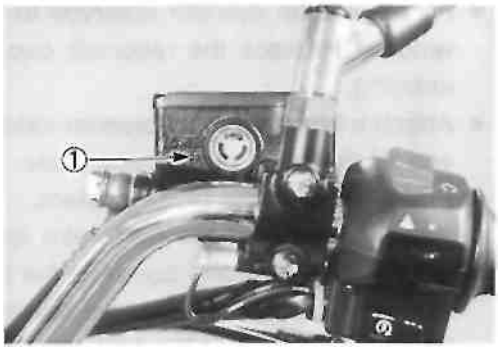
BRAKES

(BRAKE)
Inspect initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter.

(BRAKE HOSE AND BRAKE FLUID)
Inspect every 5 000 km (3 000 miles, 15 months). Replace hose every 4 years. Replace fluid every 2 years.

BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the lower limit line ① on the front brake fluid reservoir.
- When the brake fluid level is below the lower limit line ① replenish with brake fluid that meets the following specification.



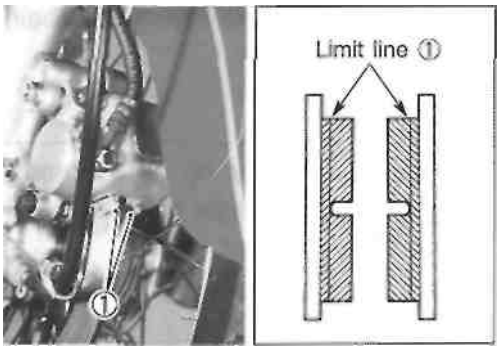
Specification and classification: DOT 4

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 and petroleum-based fluids. 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 of time.
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hose and hose joints for cracks and oil leakage.

FRONT BRAKE PADS

The extent of brake pad wear can be checked by observing the limit line ① on the pad. When the wear exceeds the limit line, replace the pads with new ones. (See p. 5-8.)



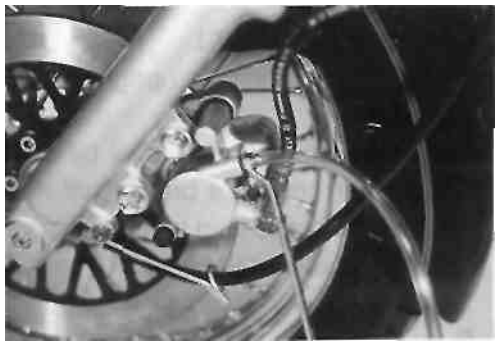
A CAUTION

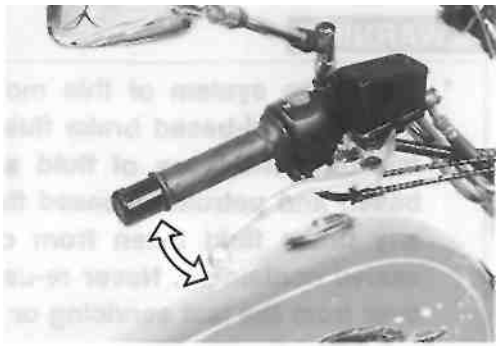
Replace the brake pad as a set, otherwise braking performance will be adversely affected.

AIR BLEEDING THE BRAKE FLUID CIRCUIT

Air trapped in the brake 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 the master cylinder reservoir to top of the inspection window. Replace the reservoir cap to prevent dirt from entering.
- Attach a hose to the air bleeder valve, and insert the free end of the hose into a receptacle.
- Bleed air from the brake system.
- 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 air bleeder valve, pump and squeeze the brake lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.





NOTE:
While bleeding the brake system, replenish the brake fluid in the reservoir as necessary. Make sure that there is always some fluid visible in the reservoir.

- Close the air bleeder valve, and disconnect the hose. Fill the reservoir with brake fluid to the top of the inspection window.

Air bleeder valve: 7.5 N ■ m (0.75 kg-m, 5.5 lb-ft)

A CAUTION

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

REAR BRAKE PEDAL HEIGHT

- Loosen the lock nut①
- Adjust the brake pedal height Ⓐ by turning the adjuster ② to locate the pedal 50 mm (2.0 in) above the top face of the footrest.

REAR BRAKE ADJUSTING

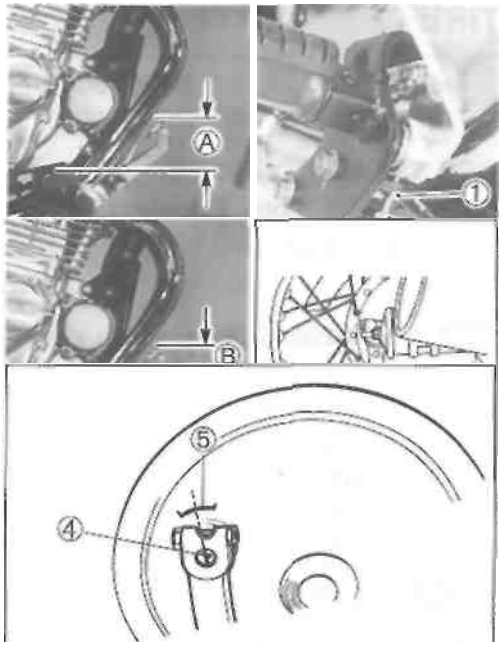
- Adjust the free travel Ⓑ to 20-30 mm (0.8-1.2 in) by turning the adjusting nut③

REAR BRAKE SHOE WEAR

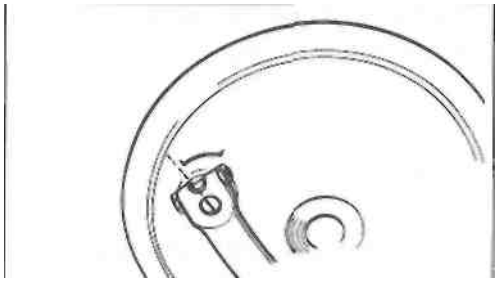
This motorcycle is equipped with brake lining wear limit indicator on the rear brake.

To check brake lining wear, perform the following steps.

- Make sure that the rear brake is properly adjusted.
- Depress the rear brake pedal. Make sure that the index mark④ is within the range⑤ embossed on the brake panel.
- If the index mark goes beyond the range, the brake shoe assembly should be replaced with a new set of shoes.



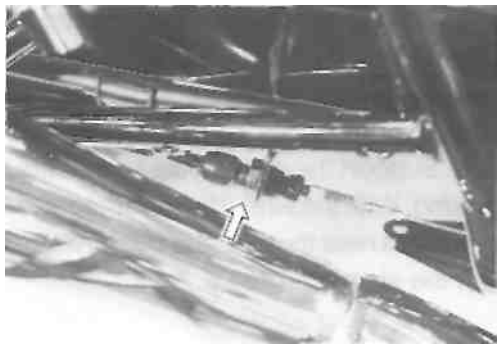
The extension line of the index mark is within the range.



The extension line of the index mark is out of the ranae.

BRAKE LIGHT SWITCH

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

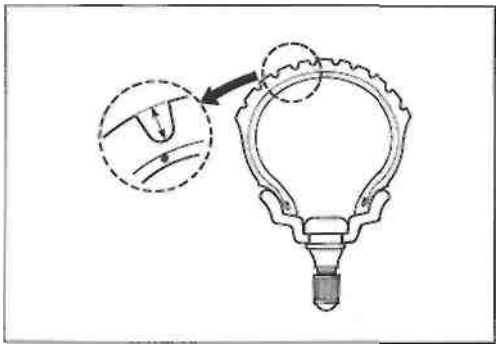


TIRE

Inspect every 5 000 km (3 000 miles, 15 months).

TIRE TREAD CONDITION

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



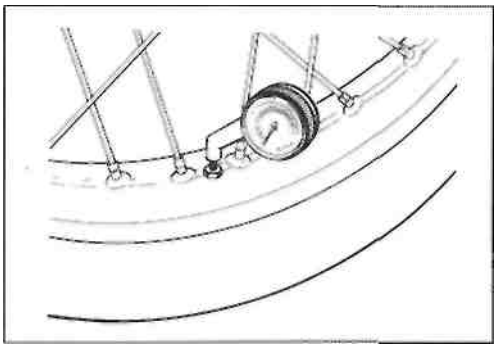
Tire tread depth limit (front): 1.6 mm (0.06 in)
(rear) : 2.0 mm (0.08 in)

09900-20805: Tire depth gauge

TOOL

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 and a longer tire life. Cold inflation tire pressure is as follows.



COLD INFLATION	SOLO RIDING			DUAL RIDING		
TIRE PRESSURE	**kPa**	**kg/cm^2**	**psi**	**kPa**	**kg/cm^2**	**psi**
FRONT	**175**	**1.75**	**25**	**175**	**1.75**	**25**
REAR	200	**2.00**	**29**	225	**2.25**	**33**

CAUTION

The standard tire fitted on this motorcycle is a 110/90-16 59P for the front and a 130/90-15M/C 66P for the rear. The use of tires other than those specified may cause instability. It is highly recommended to use the specified tires.

STEERING

Inspect initially at 1 000 km (600 miles, 3 months) and every 10 000 km (6 000 miles, 30 months) thereafter.

The steering should be adjusted properly for smooth turning of handlebars and safe operation. 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. Support the motorcycle so that the front wheel is off the ground. With the wheel facing straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, readjust the steering. (See p. 5-27.)

FRONT FORK

Inspect every 10 000 km (6 000 miles, 30 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.

REAR SUSPENSION

Inspect every 10 000 km (6 000 miles, 30 months).

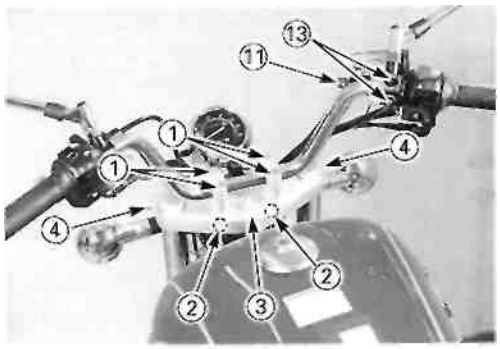
Inspect the rear shock absorber for oil leakage and damage. Replace any defective parts, if necessary.

CHASSIS BOLTS AND NUTS

Tighten initially at 1 000 km (600 miles, 3 months) and every 5 000 km (3 000 miles, 15 months) thereafter.

Check that all chassis bolts and nuts are tightened to their specified torque. (Refer to page 2-17 for the locations of the following nuts and bolts on the motorcycle.)

ITEM		N-m	**kg-m**	lb-ft
① Handlebar clamp bolt		16	1.6	11.5
② Handlebar holder nut		45	4.5	32.5
③ Steering stem head bolt		65	6.5	47.0
④ Front fork upper clamp bolt		23	2.3	16.5
⑤ Front fork lower clamp bolt		33	3.3	24.0
⑥ Front fork cap bolt		23	2.3	16.5
⑦ Front fork damper rod bolt		23	2.3	16.5
⑧ Front axle		65	6.5	47.0
⑨ Front axle pinch bolt		23	2.3	16.5
⑩ Front brake caliper mounting bolt		39	3.9	28.0
⑪ Front brake hose union bolt		23	2.3	16.5
⑫ Front brake caliper air bleeder valve		7.5	0.75	5.5
⑬ Front brake master cylinder mounting bolt		10	1.0	7.0
⑭ Front brake disc bolt		23	2.3	16.5
⑮ Front brake pad mounting bolt		18	1.8	13.0
⑯ Front footrest bolt		26	2.6	19.0
⑰ Swingarm pivot nut		72	7.2	52.0
⑱ Rear axle nut	For E-03, -28, -33	65	6.5	47.0
	For the others	78	7.8	56.5
⑲ Rear torque link nut (front and rear)		13	1.3	9.5
⑳ Rear shock absorber mounting bolt or nut		29	2.9	21.0
㉑ Rear sprocket nut		50	5.0	36.0
㉒ Rear brake cam lever bolt		10	1.0	7.0
㉓ Spoke nipple		4.5	0.45	3.5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SUZUKI
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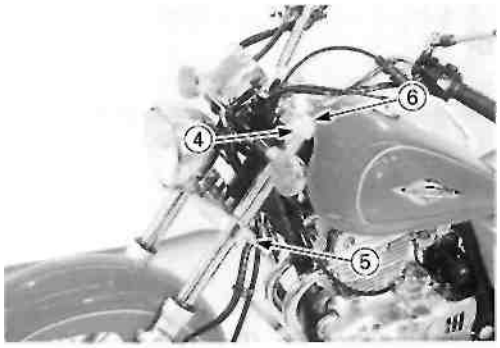
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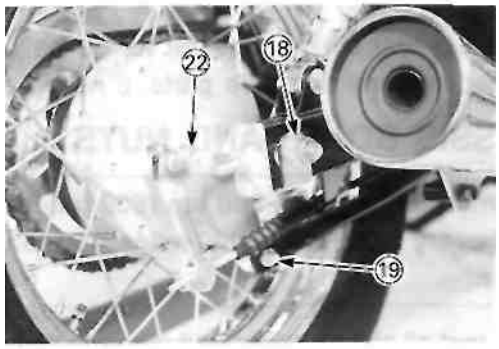
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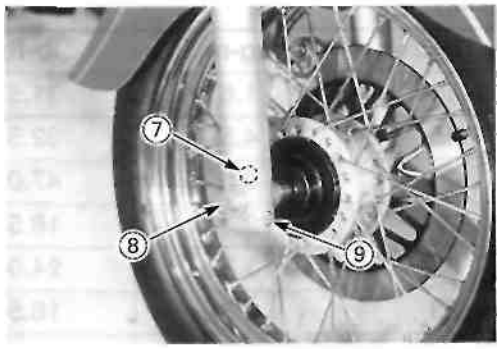
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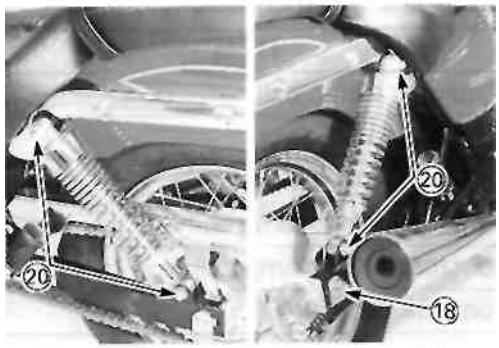
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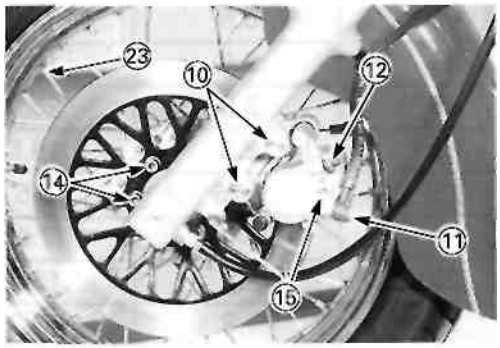
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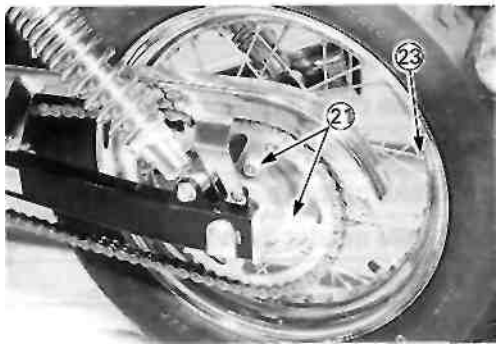
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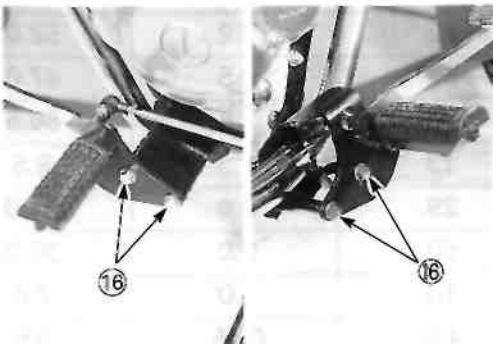
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COMPRESSION PRESSURE CHECK

The compression pressure reading of the 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
1 000-1 400 kPa 10.0-14.0 kg/cm^2 142-199 psi	800 kPa 8 kg/cm^2 114 psi

Low compression pressure can indicate any of the following conditions:

* Excessively worn cylinder wall
* Worn piston or piston rings
* Piston rings stuck in grooves
* Poor valve seating
* Ruptured or otherwise defective cylinder head gasket

COMPRESSION TEST PROCEDURE

NOTE:

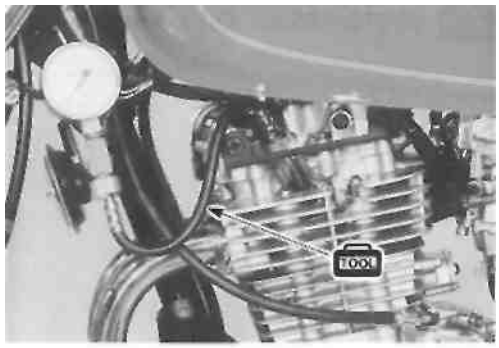
- *Before testing the engine for compression pressure, make sure that the cylinder head nuts are tightened to the specified torque values and valves are properly ad justed.*
- *Have the engine warmed-up before testing.*

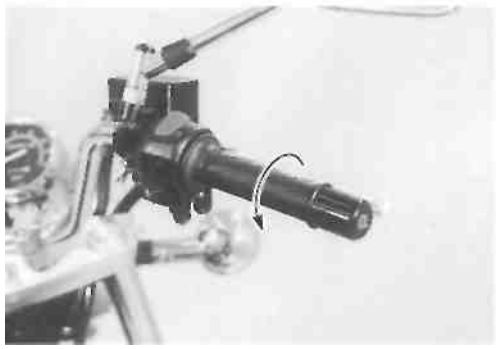
" Make sure that the battery is fully-charged.

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

- Install the compression gauge and adaptor in the spark plug hole. Make sure that the connection is tight.
- Keep the throttle grip in the fully opened position.
- Press the starter button and crank the engine for a few seconds. Record the maximum gauge reading as the cylinder compression.

TOOL 09915-64510: Compression gauge
09918-03810: Adaptor





OIL PRESSURE CHECK

Check the oil pressure periodically. This will give a good indication of the condition of the moving parts. OIL

PRESSURE SPECIFICATION

Above 30 kPa (0.3 kg/cm^2, 4.3 psi)
Below 70 kPa (0.7 kg/cm^2, 10.0 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
* Damaged O-ring
* Defective oil pump
* Combination of the above items

HIGH OIL PRESSURE

* Engine oil viscosity is too high
* Clogged oil passage
* Combination of the above items

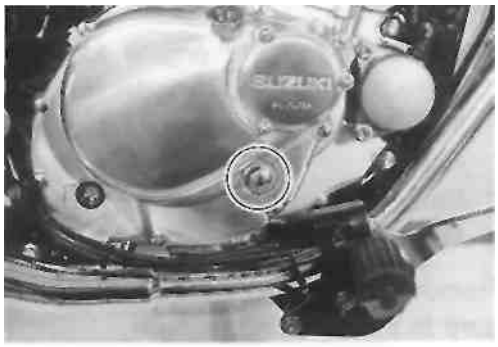
OIL PRESSURE TEST PROCEDURE

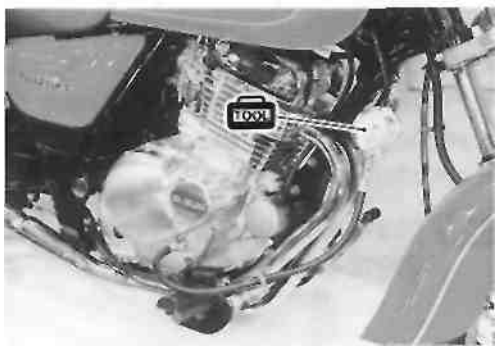
Check the oil pressure in the following manner.

o Install the oil pressure gauge in the position shown.

- Connect an electric tachometer.
- Warm up the engine as follows:
  Summer 10 min. at 2 000 r/min.
  Winter 20 min. at 2 000 r/min.
- After warm up, increase the engine speed to 3 000 r/min. and read the oil pressure gauge.

09915-74510: Oil pressure gauge





ENGINE

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 pages listed in each section for removal and reinstallation instructions.

ENGINE CENTER

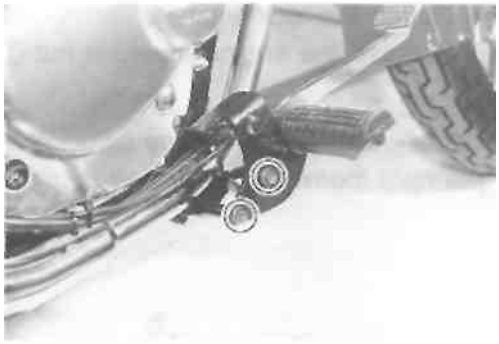
ENGINE LEFT SIDE

ENGINE RIGHT SIDE

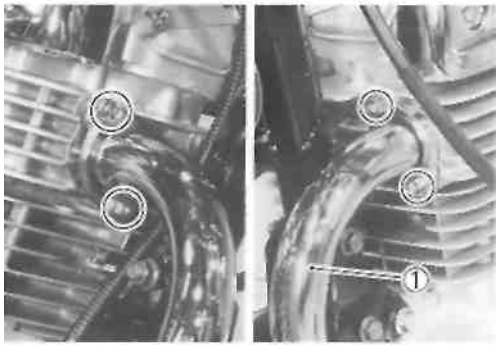
ENGINE REMOVAL AND REINSTALLATION

ENGINE REMOVAL

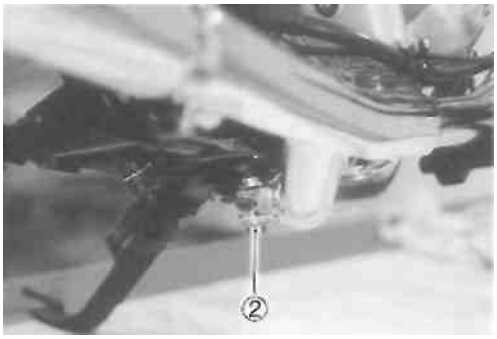
- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Remove the right frame cover. (See p. 5-1.)
- Disconnect the battery ⊖ lead wire.
- Drain the engine oil. (See p. 2-9.)

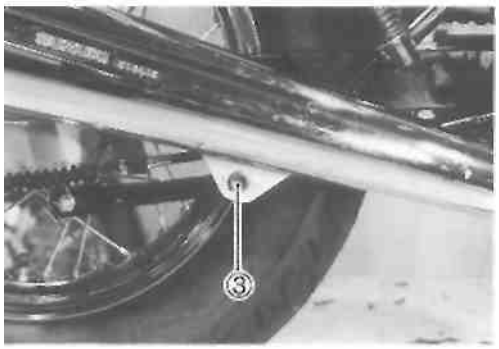


- Remove the right footrest bracket.

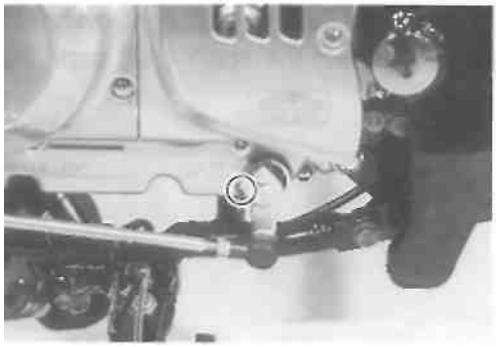


- Remove the exhaust pipe bolts.
- Remove the exhaust pipe ①by removing the bolt②
- Remove the muffler mounting bolt③

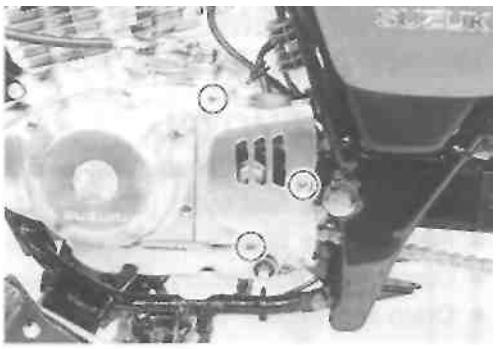




- Remove the gearshift link arm.

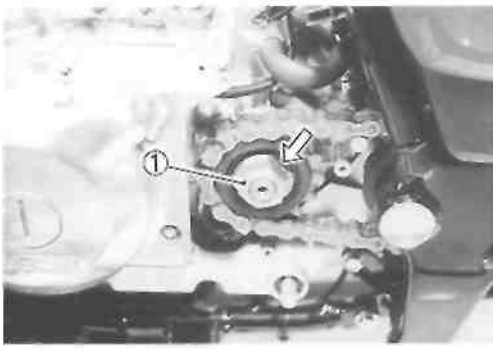


• Remove the engine sprocket cover.



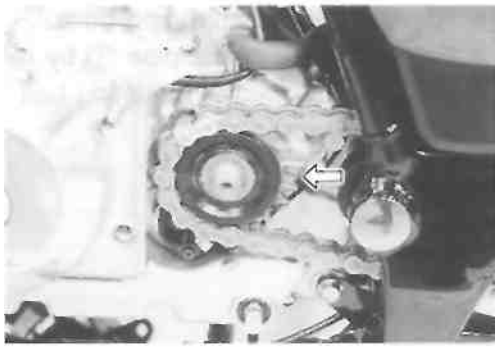
• Flatten the lock washer.
• Remove the engine sprocket nut①and washer.

NOTE:
When loosening the engine sprocket nut, temporarily install the right footrest bracket and depress the brake pedal.

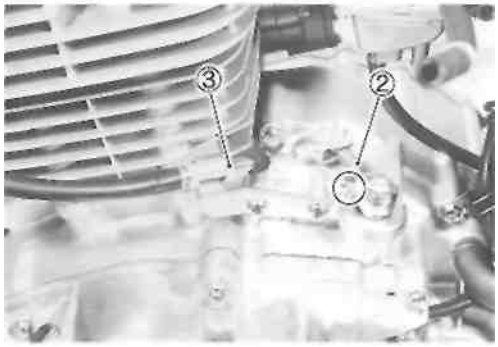


• Remove the engine sprocket.

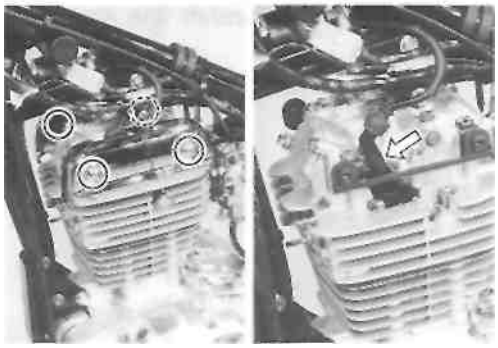
NOTE:
If it is difficult to remove the engine sprocket, loosen the rear axle nut and chain adjuster nuts to provide additional chain slack.



• Remove the clutch release arm ②.
• Loosen the clutch cable adjuster lock nut③and remove the clutch cable.



• Remove the left and right cylinder head cover caps.
• Disconnect the spark plug cap.

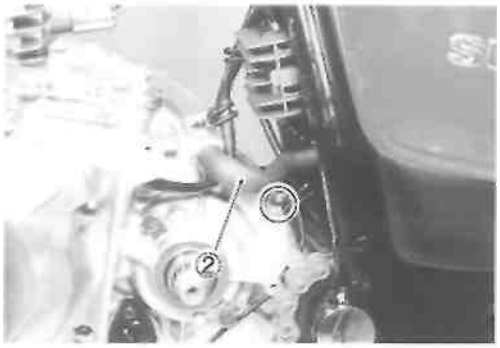


- Remove the starter plunger①.
- Loosen the carburetor clamp screws.
- Remove the carburetor.

¿WARNING

Gasoline is very explosive. Extreme care must be taken.

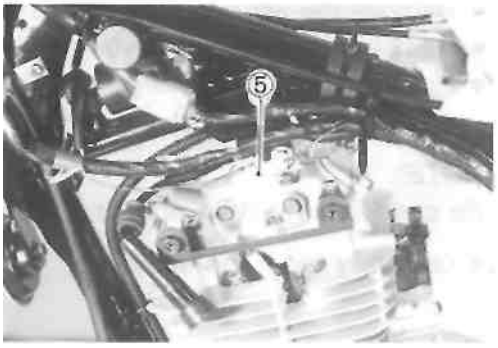
- Disconnect the engine ground wire.
- Disconnect the crankcase breather hose②



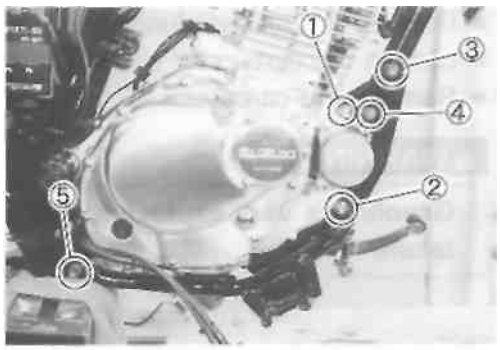
- Disconnect the starter motor lead wire.

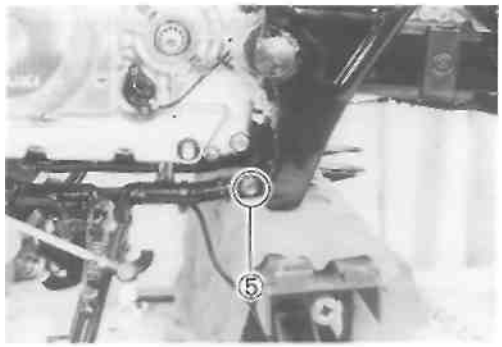
- Disconnect the side-stand switch coupler③
- Disconnect the generator couplers④

- Disconnect the neutral switch coupler⑤



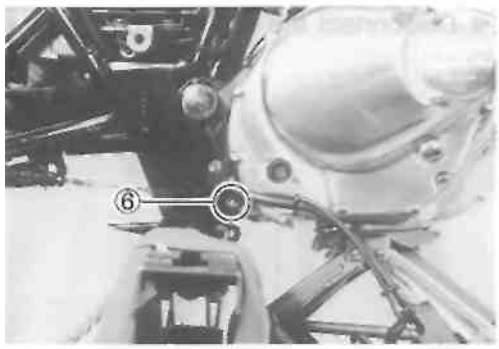
- Support the motorcycle with a jack or wooden block.
- Remove the engine mounting bolts and nuts(①, ②)
- Remove the frame down tube mounting bolts and nuts(③ ④, ⑤)





- Remove the lower engine mounting bolt and nut⑥
- Remove the upper engine mounting bolt and nut⑦

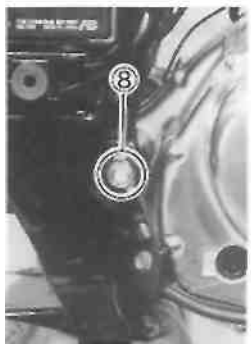
NOTE:
When removing the upper mounting bolt, support the engine with a jack.

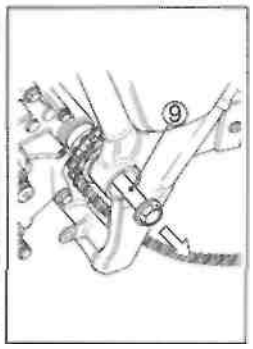


- Remove the left and right swingarm pivot end caps.
- Remove the swingarm pivot nut⑧and washer.
- Partially remove the swingarm pivot shaft⑨so that the engine can be removed.

NOTE:
Be careful not to draw out the pivot shaft.

- Gradually lower the engine.



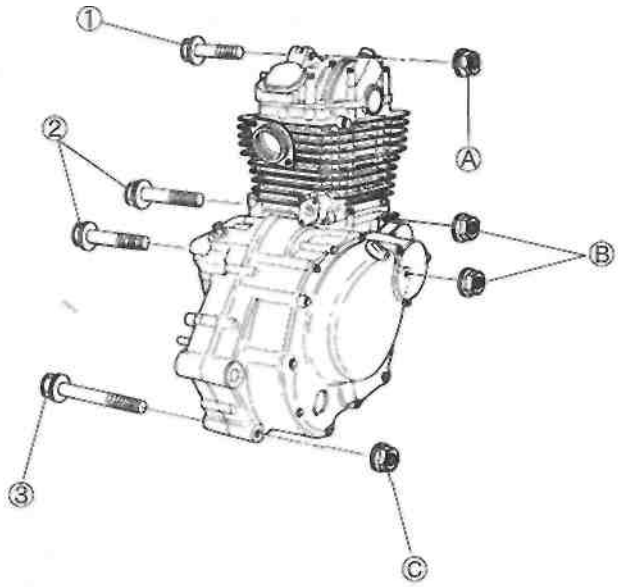


ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

- Install the engine mounting bolts and nuts as shown in the following illustration.
- Tighten the engine mounting nuts to the specified torque.

NOTE:
The engine mounting nuts are self-locking. Once the nuts have been removed, they are no longer of any use.



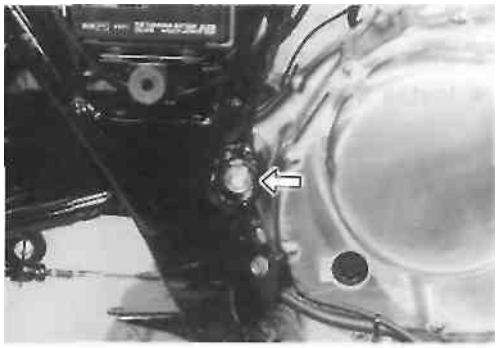
ITEM	N-m	kg-m	lb-ft
Ⓐ	41	4.1	29.5
Ⓑ	41	4.1	29.5
Ⓒ	41	4.1	29.5

BOLT LENGTH

①	50 mm (2.0 in)
②	67 mm (2.6 in)
③	100 mm (3.9 in)

- Tighten the swingarm pivot nut to the specified torque.

Swingarm pivot nut: 72 N-m (7.2 kg-m, 52.0 lb-ft)

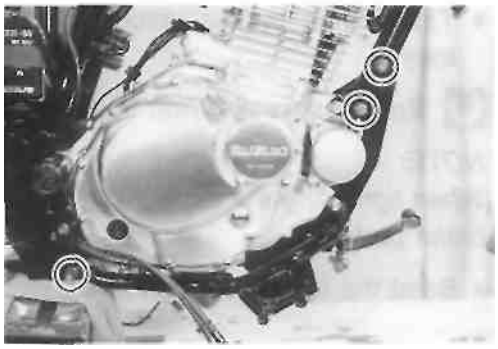


- Tighten the frame down tube mounting bolts and nuts to the specified torque.

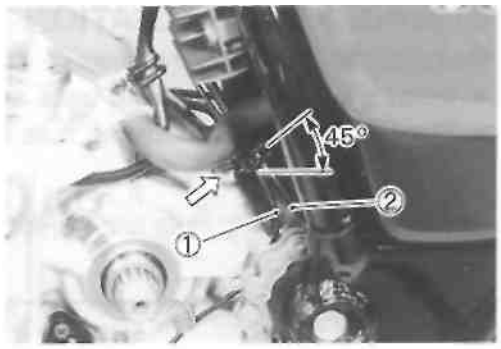
Frame down tube mounting bolt/nut: 23 N-m (2.3 kg-m, 16.5 lb-ft)

NOTE;
Apply a small quantity of THREAD LOCK "1303" to the threads of bolts.

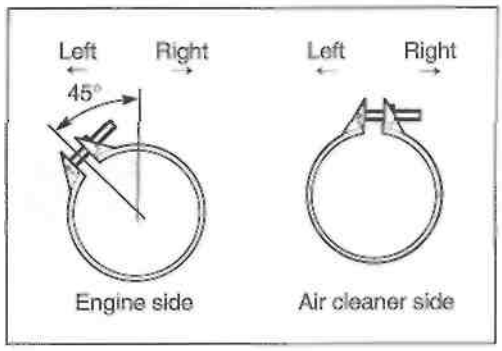
99000-32030: THREAD LOCK SUPER "1303"



- Tighten the engine ground wire and the clamp by crankcase bolt as shown.
- Clamp the neutral switch lead wire ①and side-stand switch lead wire②

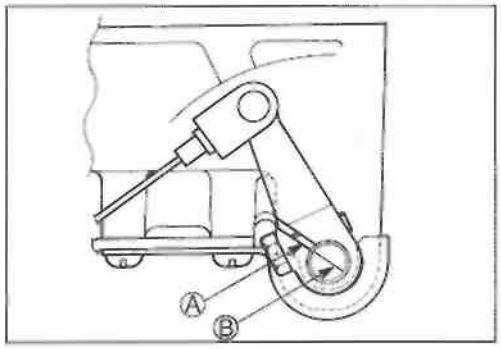


• Position the carburetor clamps as shown in the illustration.

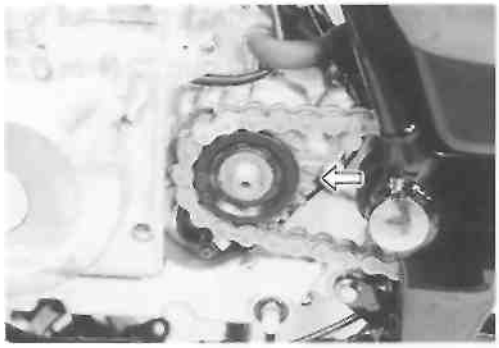


• Install the clutch release arm as shown In the illustration.

NOTE:
Align the release arm slit surface Ⓐ with the notch mark Ⓑ on the release camshaft.



- Loosen the rear axle nut and drive chain adjuster nuts.
- Install the engine sprocket as shown.
- Install the drive chain.

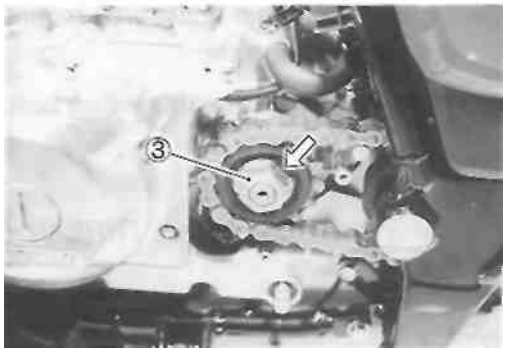


- Tighten the engine sprocket nut ③ to the specified torque.

Engine sprocket nut: 90 N-m (9.0 kg-m, 65.0 lb-ft)

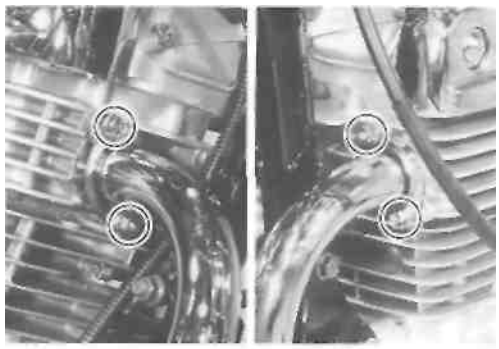
NOTE:
When tightening the engine sprocket nut, depress the rear brake pedal.

- Bend the lock washer securely.



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

Exhaust pipe bolt: 14 N-m (1.4 kg-m, 10.0 lb-ft)
Muffler mounting bolt: 29 N-m (2.9 kg-m, 21.0 lb-ft)



CAUTION

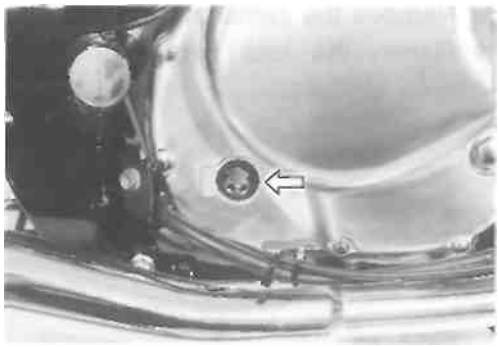
Check the wire, cable and hose routing.
(See pp. 7-11 to -18.)

• Install the right footrest and tighten its mounting bolts to the specified torque.

Front footrest bolt: 26 N-m (2.6 kg-m, 19.0 lb-ft)

• After remounting the engine, the following adjustments are necessary.
  * Engine idling speed ..... See p. 2-7.
  * Throttle cable play..... See p. 2-8.
  * Starter plunger cable play ..... See p. 2-9.
  * Clutch lever play ..... See p. 2-9.
  * Drive chain slack..... See p. 2-11.
  * Rear brake pedal height and free travel..... See p. 2-14.

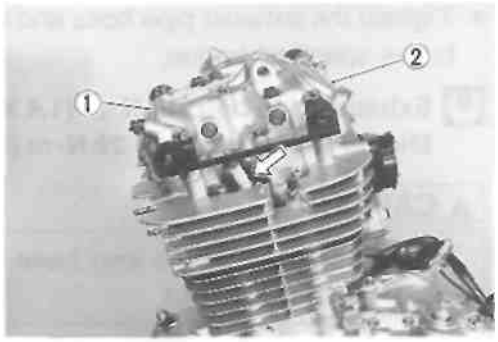
• Pour 1 700 ml (1.8/1.5 US/Imp qt) of SAE 10W/40 engine oil, graded SF or SG, into the engine after overhauling it. Start up the engine and allow it run for several minutes at idle speed. Stop the engine, wait a few minutes and check the oil level. If the level is below the "L" line, add oil until the level reaches the "F" line. (See pp. 2-9 and -10.)



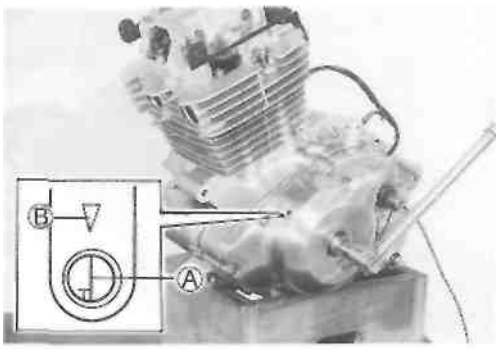
ENGINE DISASSEMBLY

The procedure for engine disassembly is sequentially explained in the following steps.

- Remove the valve inspection caps(①, ②)
- Remove the spark plug.

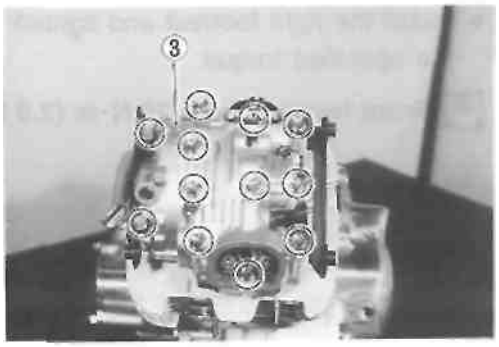


- Remove the valve timing inspection plug and generator cover cap.
- Rotate the crankshaft and align the "T" line Ⓐ on the generator rotor with the mark Ⓑ on the generator cover.

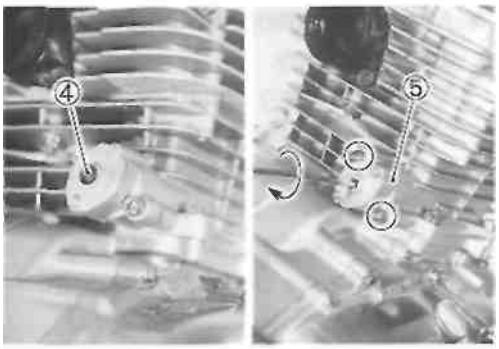


• Remove the cylinder head cover③

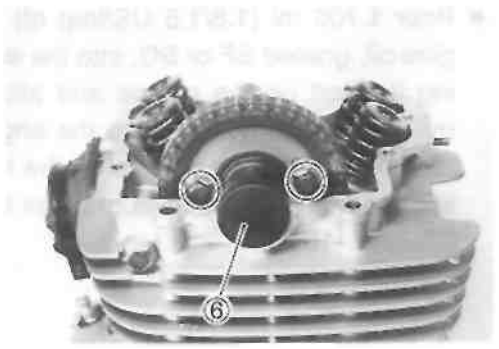
NOTE:
If the cylinder head cover does not come off, lightly tap on the finless portion of it with a plastic mallet to make the gasketed joint loose.



- Remove the rubber cap④ and then turn the slotted end of cam chain tension adjuster with the flat-head screwdriver in the clockwise direction and lock the push rod.
- Remove the cam chain tension adjuster⑤ by removing the mounting bolts.



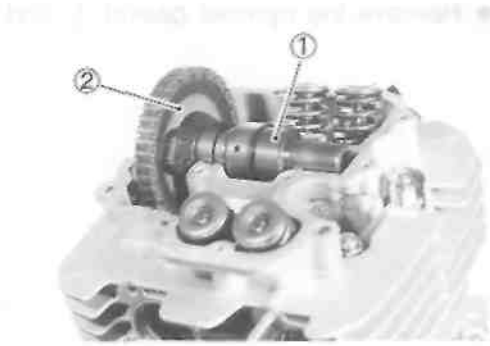
- Remove the camshaft end cap⑥
- Flatten the lock washer and remove the camshaft sprocket bolts.



• Remove the camshaft①and camshaft sprocket②.

CAUTION

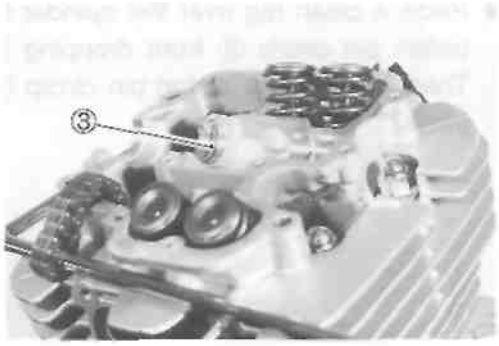
Do not drop the cam chain into the crankcase.



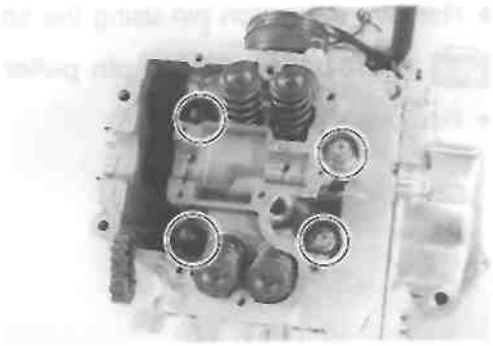
• Remove the C-ring③

CAUTION

Do not drop the C-ring into the crankcase.

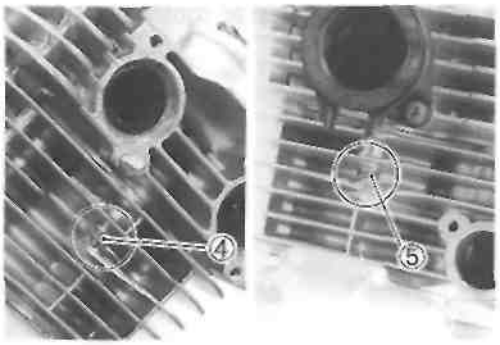


• Remove the cylinder head nuts diagonally.



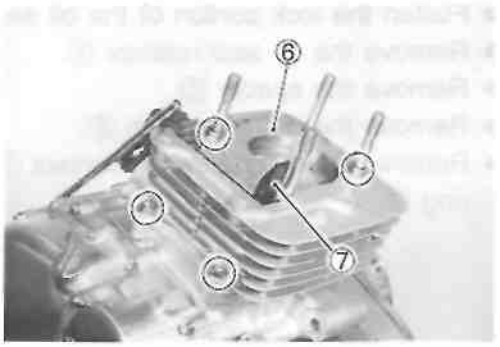
• Remove the cylinder head by removing the cylinder head nuts(④, ⑤)

NOTE:
If the cylinder head does not come off, lightly tap on the finless portion of it with a plastic mallet.

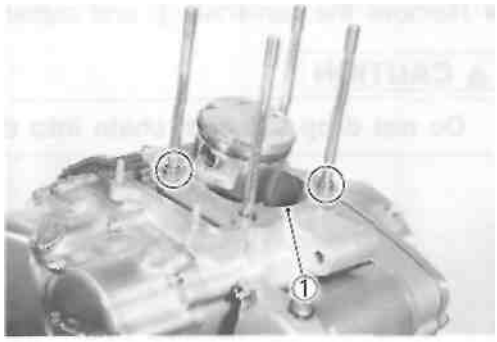


- Remove the cylinder head gasket⑥and dowel pins.
- Remove the cam chain guide⑦
- Remove the cylinder by removing the nuts.

NOTE:
If the cylinder does not come off, lightly tap on the Unless portion of it with a plastic mallet to make the gasketed joint loose.



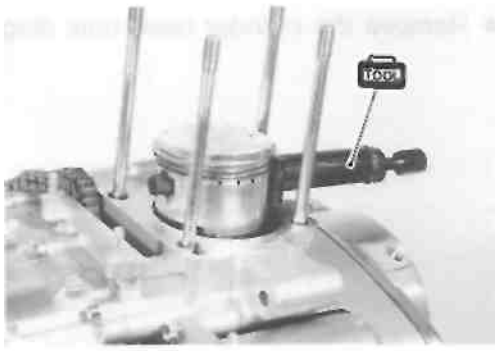
• Remove the cylinder gasket①and dowel pins.



• Place a clean rag over the cylinder base to prevent the piston pin circlip ②from dropping into the crankcase. Then, remove the piston pin circlip②with a long-nose pliers.

• Remove the piston pin using the special tool.

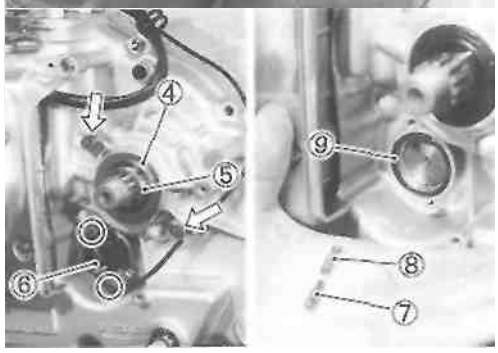
09910-34510: Piston pin puller



• Remove the piston.

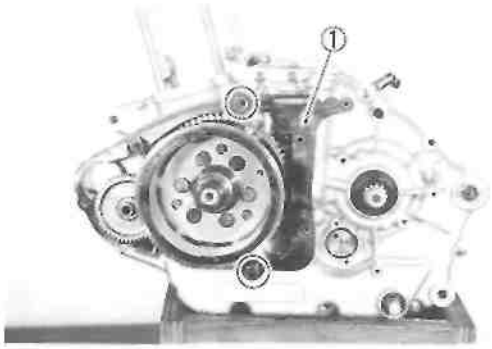
• Remove the starter motor③

- Flatten the lock portion of **the** oil seal retainer④
- Remove the oil seal retainer④.
- Remove the spacer⑤
- Remove the neutral switch⑥
- Remove the neutral switch contact⑦, **spring**⑧and O-ring⑨

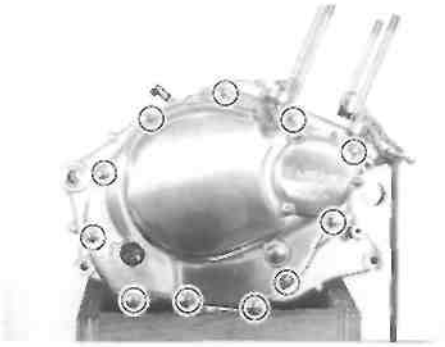


• Remove the generator cover.

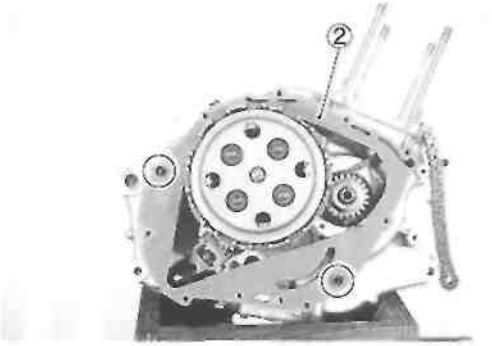
• Remove the gasket①and dowel pins.



• Remove the clutch cover.

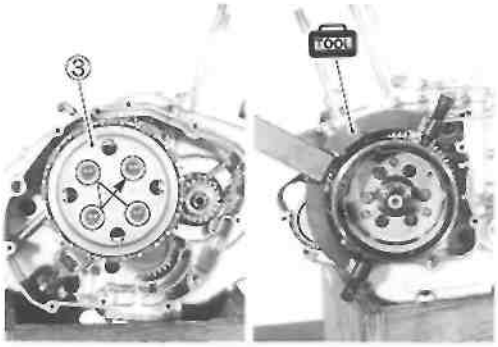


• Remove the gasket②and dowel pins.



• While holding the generator rotor using the special tool, remove the clutch spring mounting bolts in a crisscross pattern, and remove the clutch springs and clutch pressure plate③

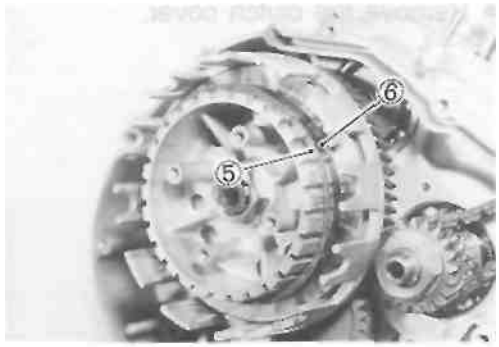
09930-44913: Rotor holder



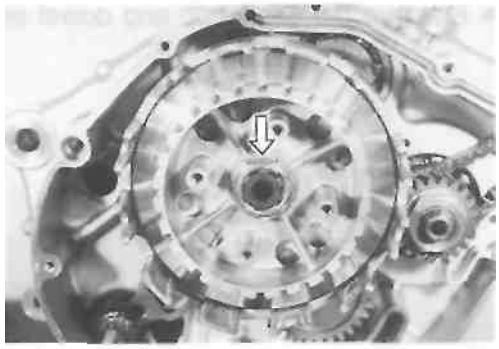
• Remove the washer①, bearing ②, clutch push piece ③ and clutch push rod④

• Remove the clutch drive and driven plates.

• Remove the spring washer⑤and washer seat⑥



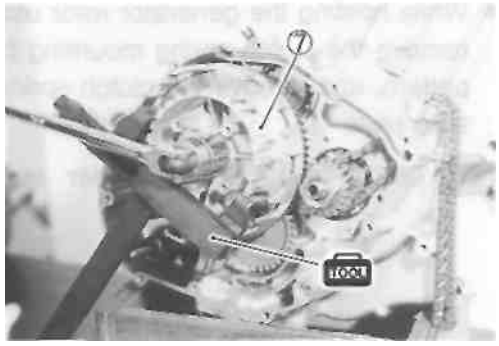
• Flatten the lock washer of the clutch sleeve hub nut.



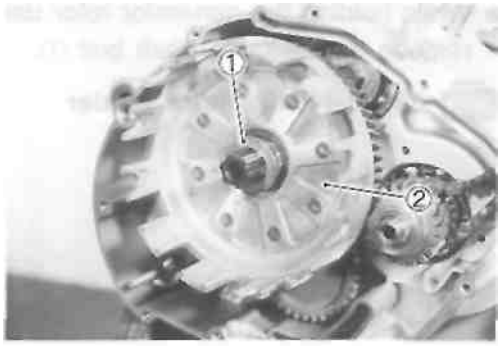
• Remove the clutch sleeve hub nut using the special tool.

09920-53740: Clutch sleeve hub holder

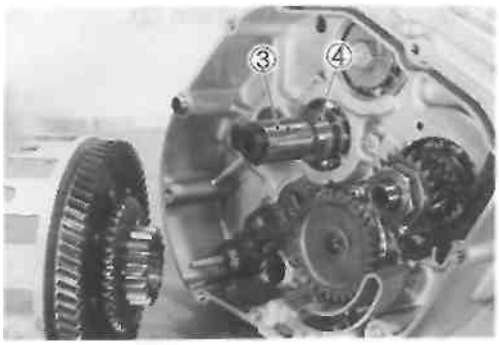
• Remove the clutch sleeve hub⑦



• Remove the thrust washer ①and primary driven gear assembly②



• Remove the spacer③and thrust washer④

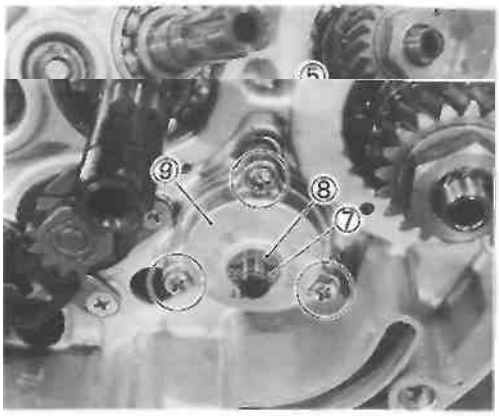


• Remove the círclíp⑤and oil pump driven gear⑥

• Remove the pin⑦and washer⑧.
• Remove the oil pump⑨

A CAUTION

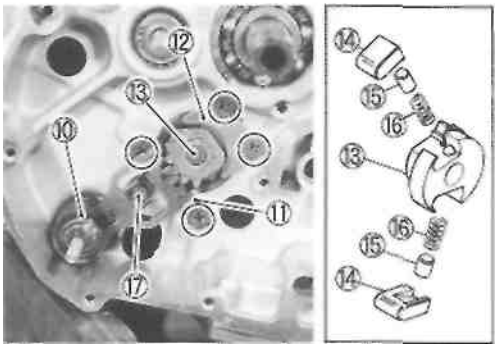
Do not attempt to disassemble the oil pump assembly.



• Remove the gearshift shaft⑩
• Remove the pawl lifter⑪and cam guide⑫by removing the screws.
• Remove the gearshift cam driven gear⑬

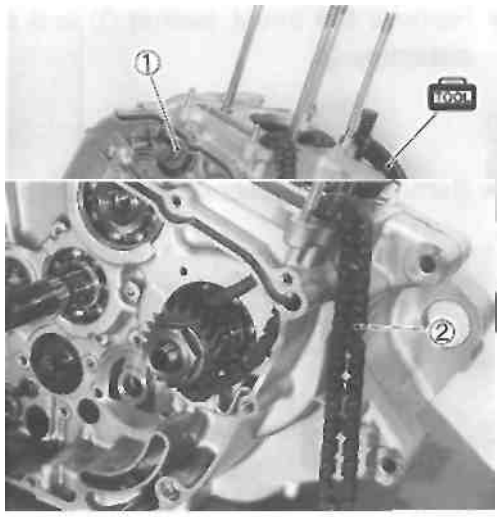
NOTE:
When removing the cam driven gear⑬, do not lose the pawls⑭, pins⑮and springs⑯.

• Remove the gearshift shaft stopper⑰



• While holding the generator rotor using the special tool, remove the balancer shaft bolt①

09930-44913: Rotor holder



• Remove the cam chain②

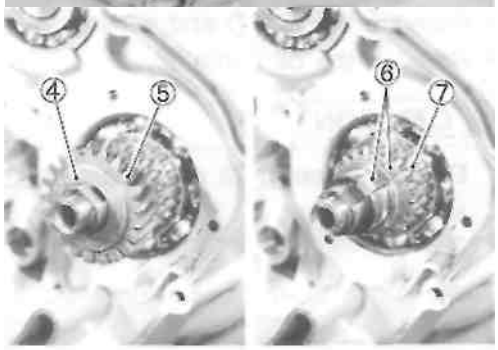
• Remove the primary drive gear nut③using the special tool.

09930-44913: Rotor holder

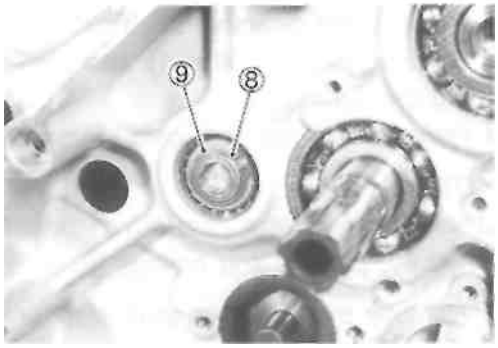
A CAUTION

The primary drive gear nut has left-hand threads.

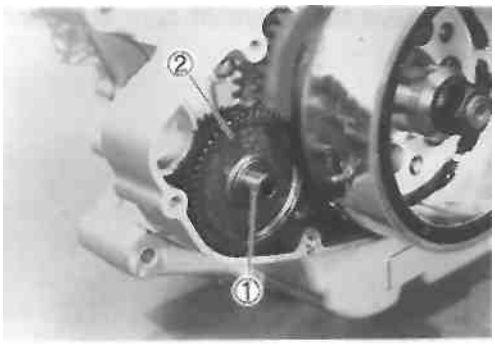
- Remove the spring washer④
- Remove the primary drive gear⑤
- Remove the keys⑥
- Remove the cam chain sprocket⑦



• Remove the circlip⑧and washer⑨



• Remove the shaft①and starter idle gear②

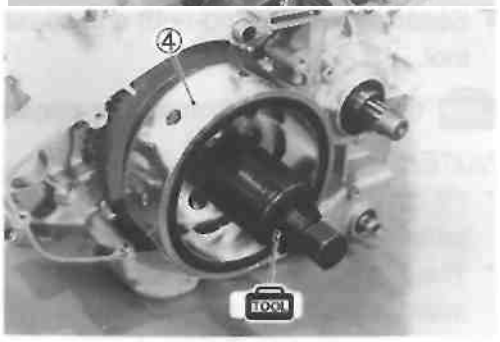


• Remove the generator rotor nut③using the special tool.

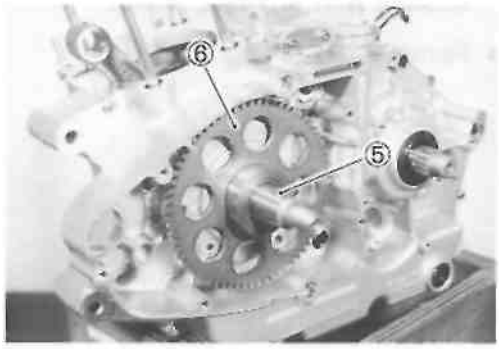
09930-44913: Rotor holder

• Remove the generator rotor④using the special tool.

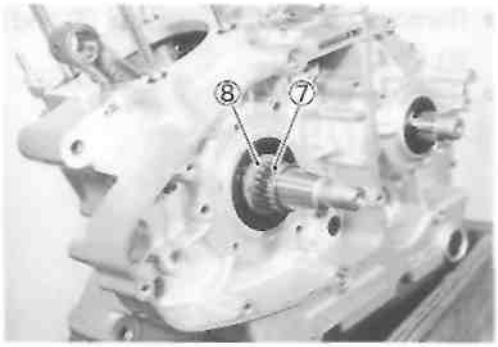
09930-34960: Rotor remover



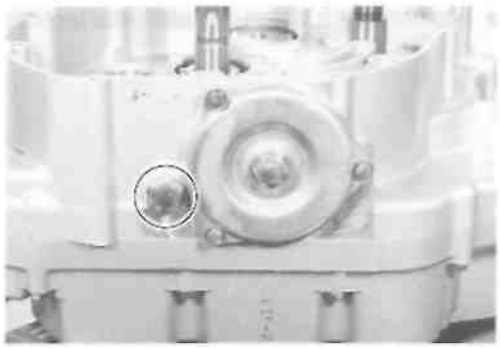
• Remove the generator rotor key⑤
• Remove the starter driven gear⑥



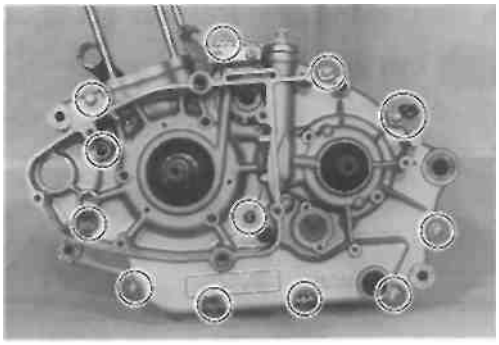
• Remove the bearing⑦and washer⑧



• Remove the gearshift cam stopper.



• Remove the crankcase bolts.



• Separate the left and right crankcases using the special tool.

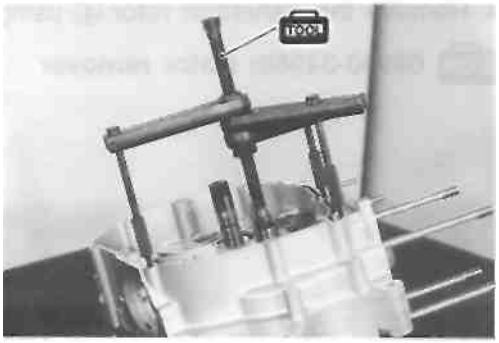
09920-13120: Crankcase separator

NOTE:

* *Fit the crankcase separator, so that the tool arms are in parallel with the side of crankcase.*

* *The crankshaft and transmission components should remain in the left crankcase half.*

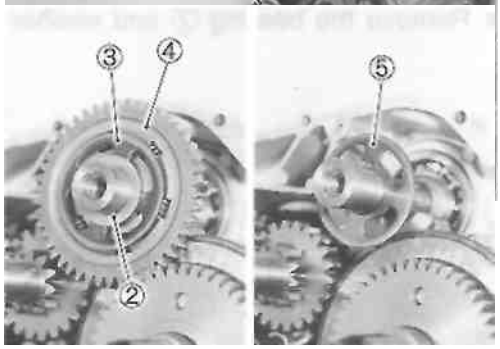
* *When separating the crankcase, tap the end of the countershaft with a plastic mallet.*



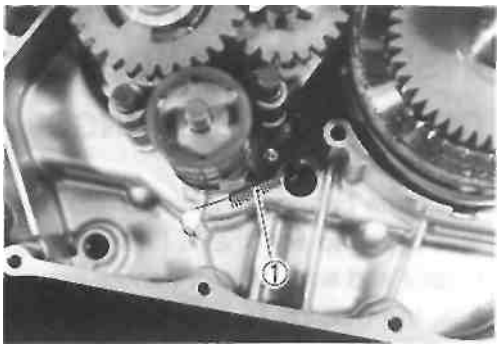
* Remove the O-ring①

• Remove the shim②, washer③and balancer shaft driven gear④

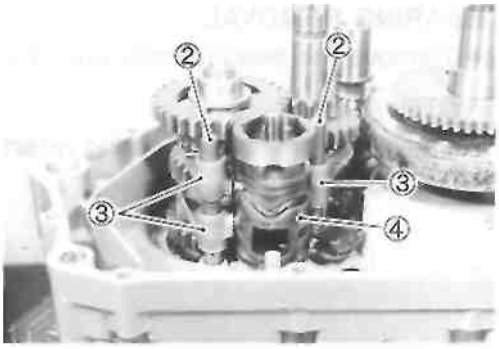
• Remove the washer⑤



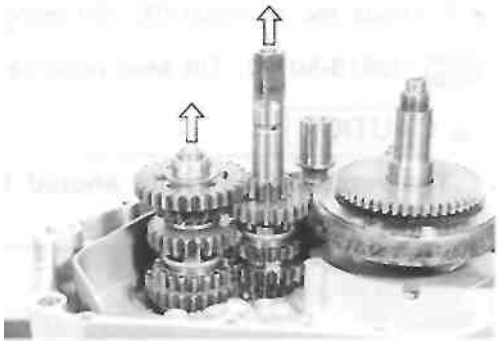
• Remove the gearshift cam stopper spring①



• Remove the gearshift fork shafts②and gearshift forks ③
• Remove the gearshift cam④



• Remove the transmission.

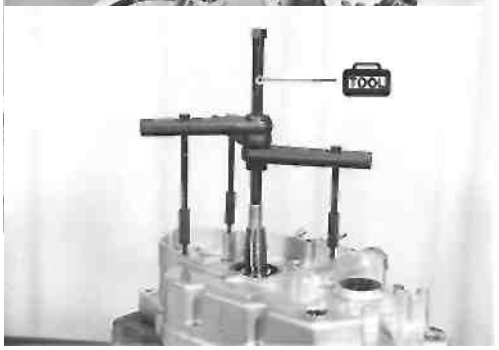


• Remove the balancer shaft⑤
• Remove the balancer shaft drive gear⑥

• Remove the crankshaft using the special tool.

09920-13120: Crankcase separator

TOOL

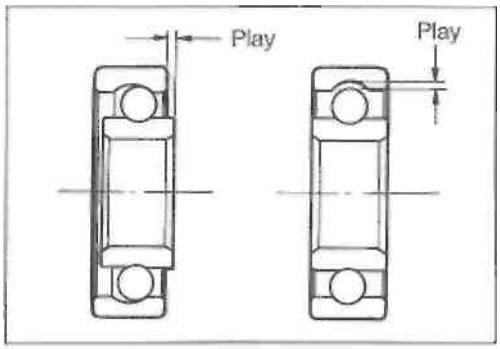


ENGINE COMPONENTS INSPECTION AND SERVICE

CRANKCASE BEARINGS

BEARING INSPECTION

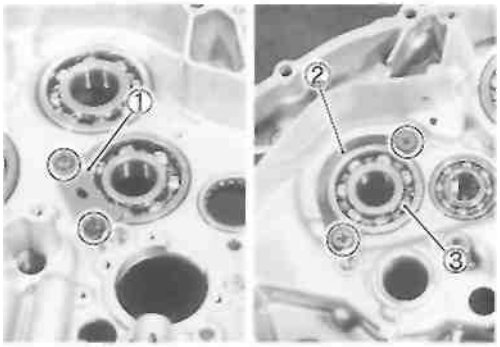
While the bearing is in the crankcase, rotate its inner race and check to see that it turns smoothly. If it does not turn quietly and smoothly, or if there are signs of any abnormalities, the bearing is defective and must be replaced as follows.



BEARING REMOVAL

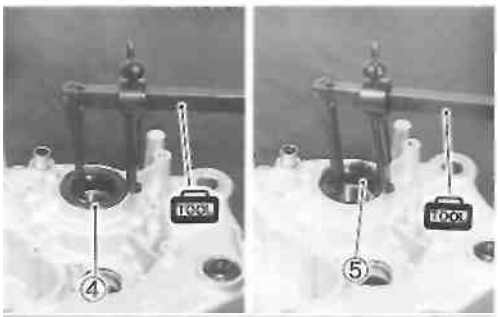
• Remove the bearing retainers(①, ②)

NOTE:
Remove the driveshaft bearing retainer② along with the driveshaft bearing③



• Remove the oil seals (④, ⑤) using the special tool.

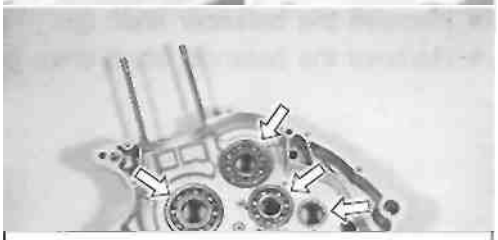
09913-50121: Oil seal remover



CAUTION

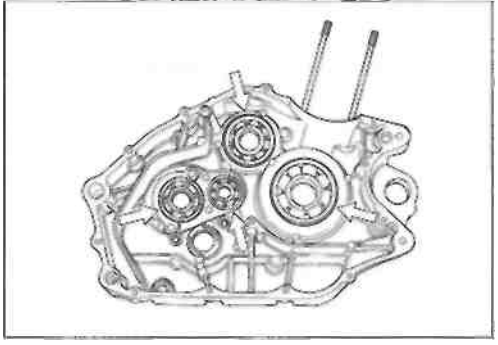
The removed oil seals should be replaced with new ones.

Remove the bearings.



CAUTION

The removed bearings should be replaced with new ones.

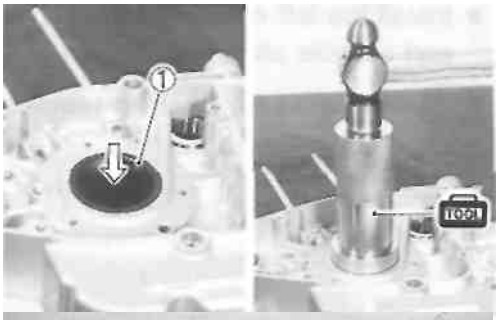


• Remove the oil seal①using the special tool.

09913-75510: Bearing remover/installer

A CAUTION

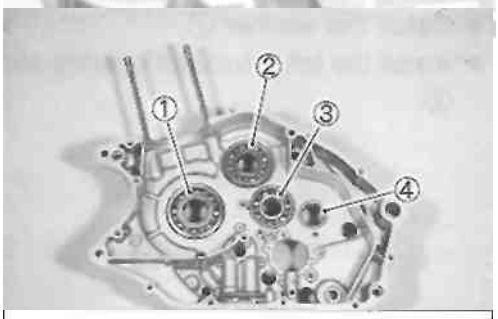
The removed oil seal should be replaced with a new one.

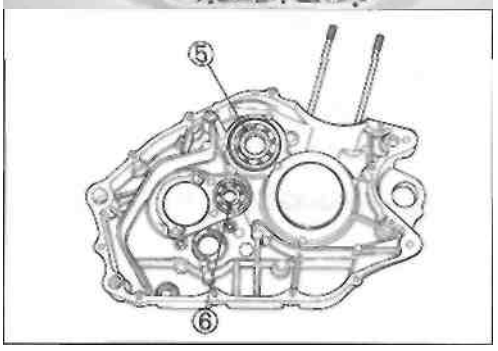


BEARING INSTALLATION

• Install the bearings using the special tools.

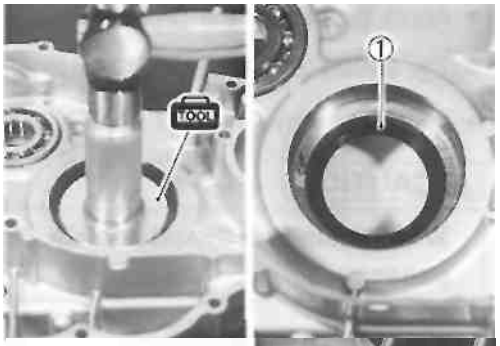
09913-75510: Bearing remover/installer (For①)
09913-75520: Bearing remover/installer (For②,⑤)
09913-75830: Bearing remover/installer (For④)
09913-84510: Bearing remover/installer (For③)
09913-85210: Bearing remover/installer (For⑥)





• Install the oil seal ① into the left crankcase using the special tool.

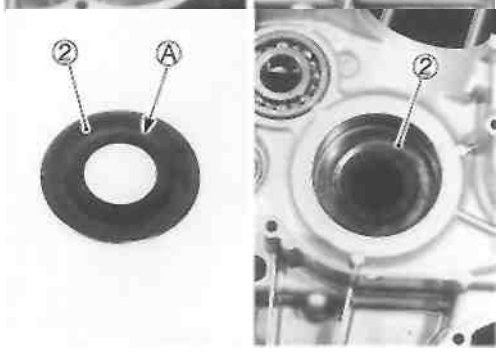
09913-85210: Bearing remover/installer



• Apply grease to the oil seal lip.

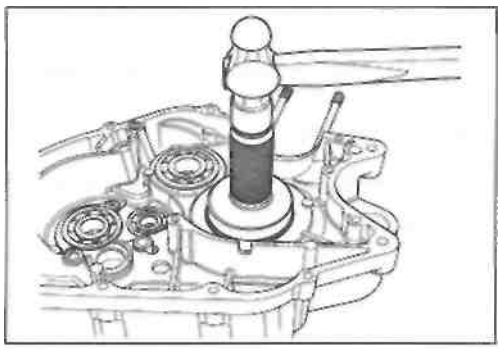
99000-25010: SUZUKI SUPER GREASE "A"

• Place the washer②so that the convexⒶof it faces towards the oil seal.



• Install the left crankcase bearing using the special tool and suitable attachment (used beanng e.g.).

09913-75510: Bearing remover/installer



• Install the washer①

• Install the left drlveshaft bearing with the bearing retainer ②

• Install the bearing retainers(③, ④)

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws.

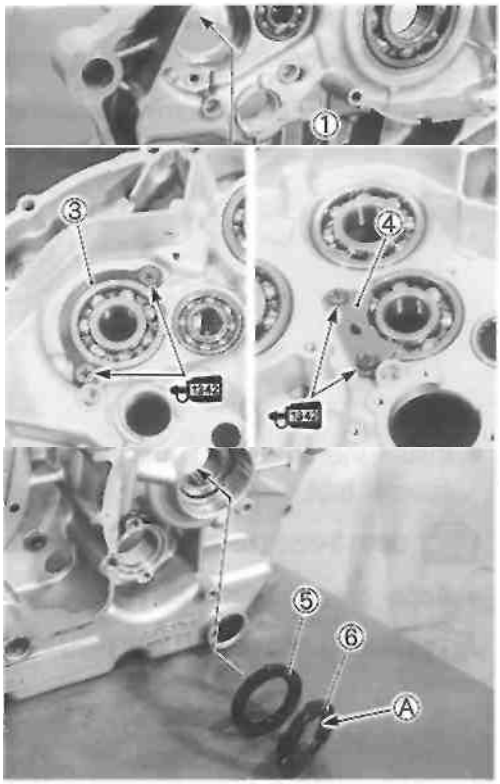
99000-32050: THREAD LOCK "1342"

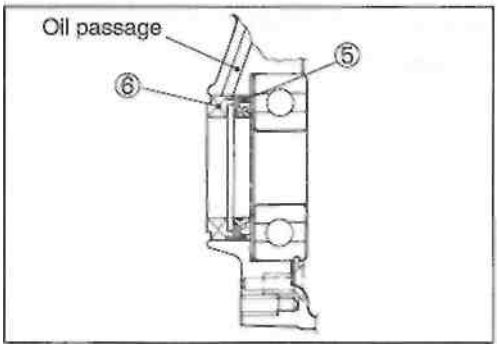
• Apply grease to the oil seal lip Ⓐ. 99000-25010: SUZUKI SUPER GREASE "A"

• Install the driveshaft oil seals (⑤, ⑥)as shown.

CAUTION

When installing the oil seal⑥, Do not block the oil passage.

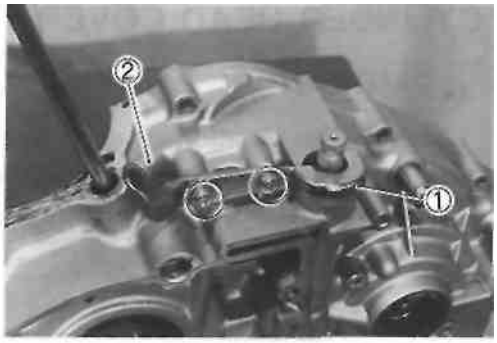




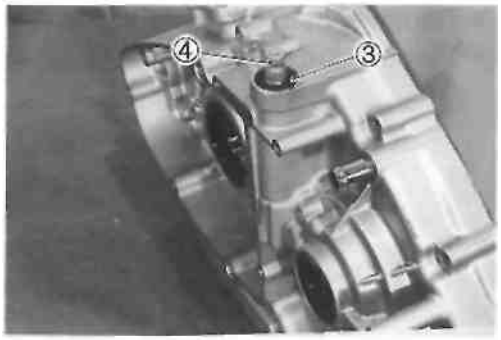
CLUTCH RELEASE CAMSHAFT

REMOVAL

• Remove the oil seal retainer①and clutch cable guide ②

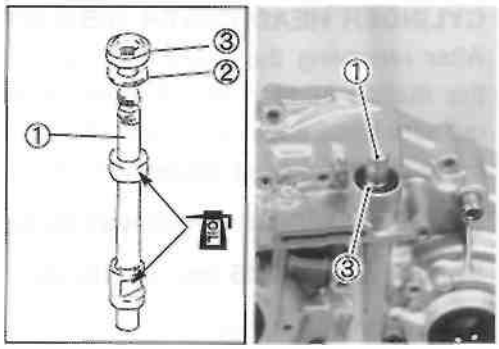


• Remove the oil seal③
• Remove the clutch release cam shaft④



REASSEMBLY

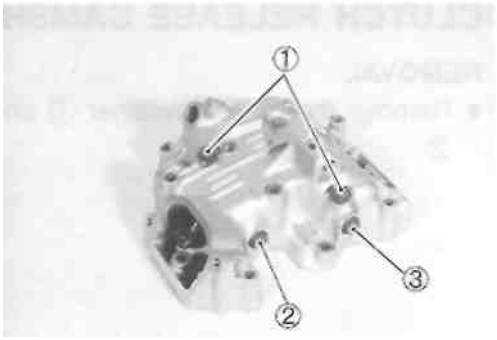
• Apply engine oil to the clutch release camshaft ① as shown in the illustration.
• Install the clutch release camshaft①, washer②and oil seal③



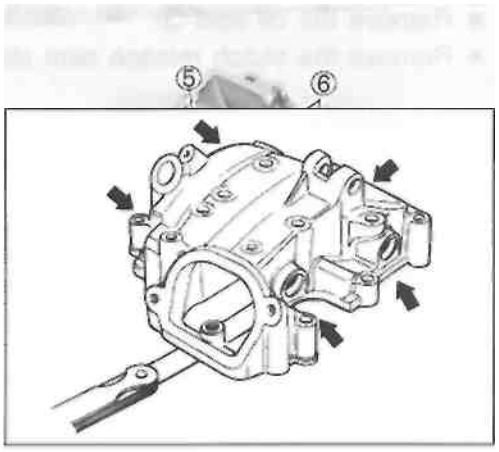
CYLINDER HEAD COVER

CAUTION

Identify the position of each removed part. Organize the parts in their respective groups (i.e., intake or exhaust) so that they can be installed in their original locations.



DISASSEMBLY
- Remove the rocker arm shaft bolts①
- Remove the rocker arm shafts(②, ③)
- Remove the rocker arms(④, ⑤)and wave washers⑥



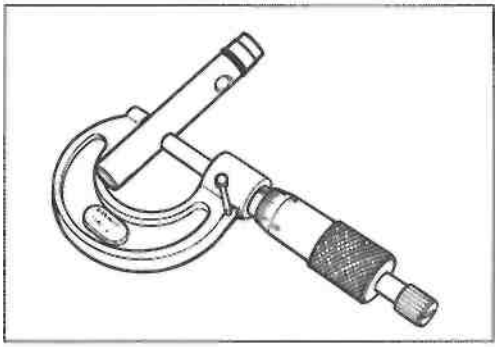
CYLINDER HEAD COVER DISTORTION

After removing the sealant (SUZUKI BOND "1215") from the mating surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a thickness gauge. Check points are shown in Fig.

09900-20803: Thickness gauge

Service Limit: 0.05 mm (0.002 in)

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

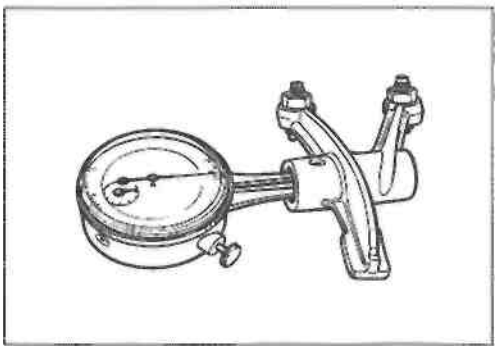


ROCKER ARM SHAFT O.D.

Measure the diameter of the rocker arm shafts.

09900-20205: Micrometer (0-25 mm)

Standard (IN. & EX.):
11.966-11.984 mm (0.4711-0.4718 in)



ROCKER ARM I.D.

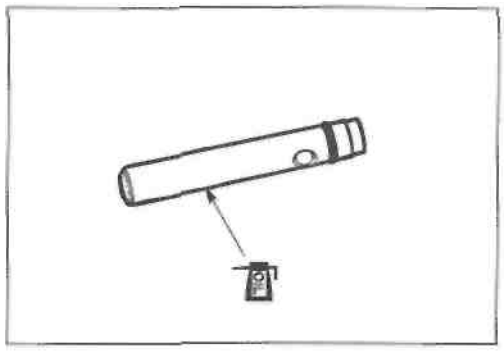
Measure the inside diameter of the rocker arm and check the wear of the camshaft contacting surface.

09900-20605: Dial calipers

Standard (IN. & EX.):
12.000-12.018 mm (0.4724-0.4731 in)

REASSEMBLY

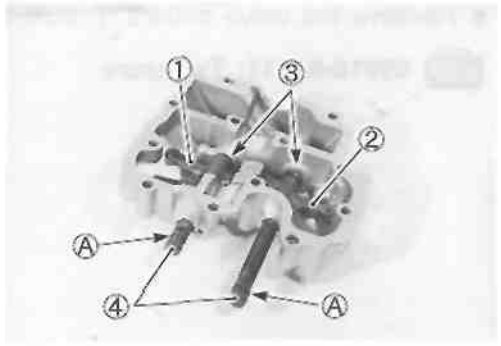
Reassemble the cylinder head cover in the reverse order of disassembly. Pay attention to the following points: • Apply engine oil to the rocker arm shafts.



• Install the rocker arms (①, ②), wave washers ③and shafts④

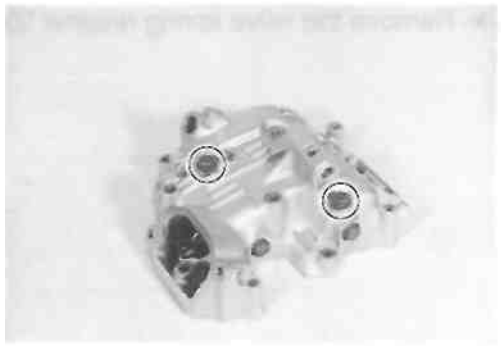
[A CAUTION]

Use the new O-rings Ⓐ to prevent oil leakage.



• Tighten the rocker arm shaft bolts to the specified torque.

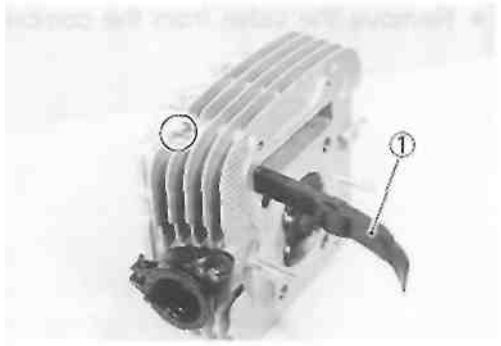
Rocker arm shaft bolt: 10 Nm (1.0 kg-m, 7.0 lb-ft)



CYLINDER HEAD

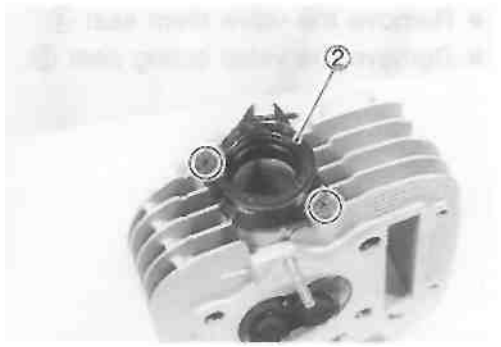
I A CAUTION |

Identify the position of each removed part. Organize the parts in their respective groups (i.e., intake or exhaust) so that they can be installed in their original locations.



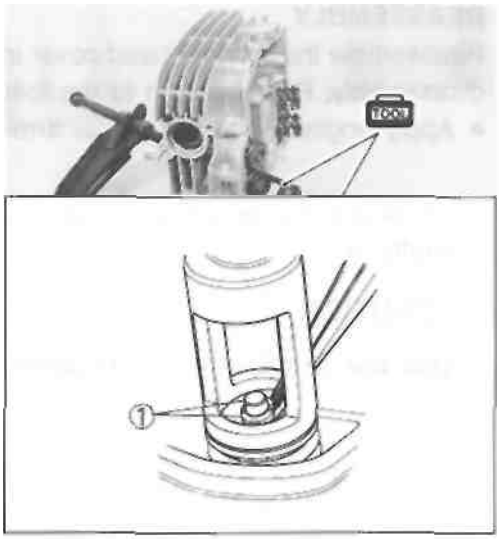
DISASSEMBLY

- Remove the cam chain tensioner①
- Remove the intake pipe②



• Compress the valve spring using the special tools.

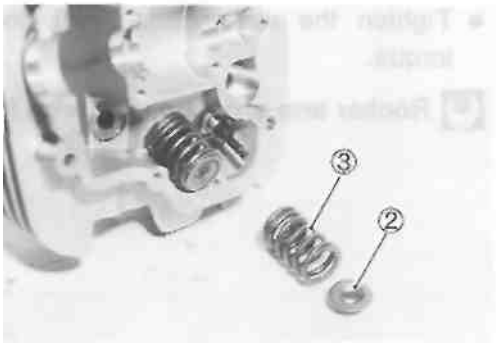
09916-14510: Valve lifter 09916-14910: Valve lifter attachment



• Remove the valve cotters①from the valve stem.

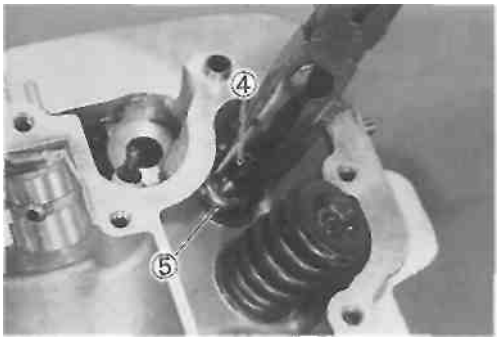
09916-84511: Tweezers

• Remove the valve spring retainer②and valve spring③



• Remove the valve from the combustion chamber side.

- Remove the valve stem seal④
- Remove the valve spring seat⑤

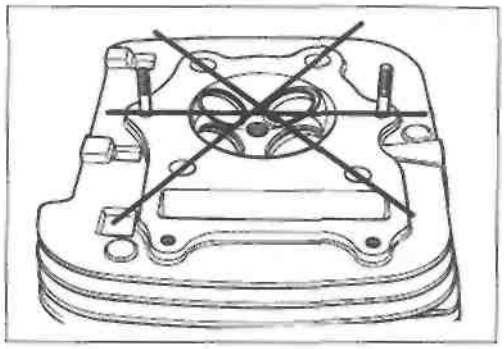


CYLINDER HEAD DISTORTION

Decarbon the combustion chamber. Check the gasket surface of the cylinder head for distortion using a straightedge and thickness gauge. Take clearance readings at several places. If readings exceed the service limit, replace the cylinder head.

09900-20803: Thickness gauge

Service Limit: 0.05 mm (0.002 in)

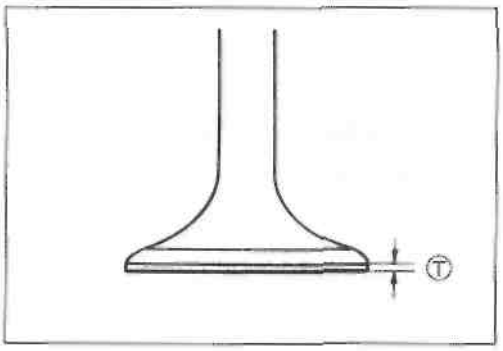


VALVE FACE WEAR

The thickness of the valve face decreases as the face wears. Visually inspect each valve face for wear and replace any valve with an abnormally worn face. Measure the valve face thickness Ⓣ, if it is out of specification, replace the valve with a new one.

09900-20101: Vernier calipers

Service Limit: 0.5 mm (0.02 in)

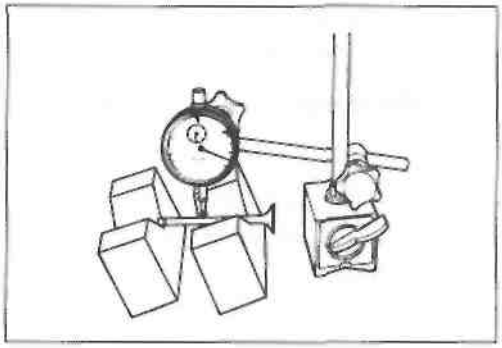


VALVE STEM RUNOUT

Support the valve using V-blocks, as shown, and measure its runout with the dial gauge. If the runout exceeds the limit, replace the valve.

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

Service Limit: 0.05 mm (0.002 in)

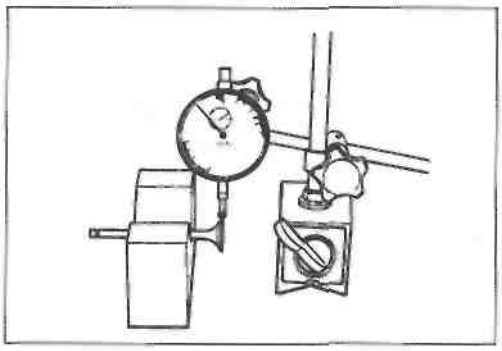


VALVE HEAD RADIAL RUNOUT

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

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

Service Limit: 0.03 mm (0.001 in)

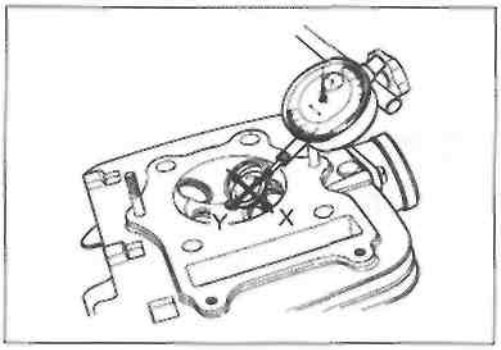


VALVE STEM DEFLECTION

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. Position the dial gauge as shown. If the deflection exceeds the service limit, then determine whether the valve or the guide should be replaced with a new one.

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

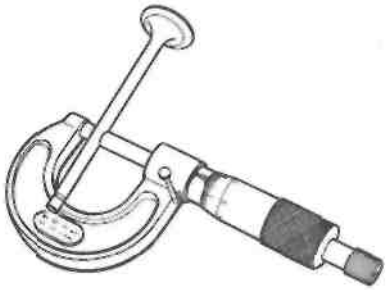
Service Limit
Intake and exhaust valves: 0.35 mm (0.014 in)



VALVE STEM WEAR

Measure the valve stem O.D. using the micrometer. If it is out of specification, replace the valve with a new one. If the valve stem O.D. is within specification but the valve stem deflection is not, replace the valve guide. After replacing the valve or valve guide, re-check the deflection.

09900-20205: Micrometer (0-25 mm)



Standard
Valve stem O.D.
IN.: 5.460-5.475 mm (0.2150-0.2156 in)
EX.: 5.445-5.460 mm (0.2144-0.2150 in)

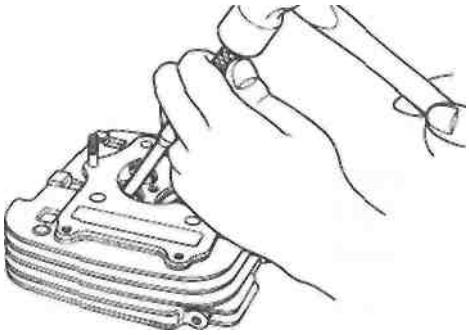
NOTE:
If valve guides have to be replaced, refer to the valve guide servicing steps below.

VALVE GUIDE SERVICE

* Remove the valve guide using the special tool.

09916-44910: Valve guide remover/installer

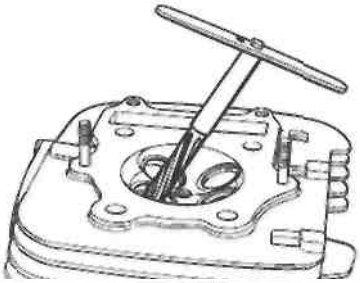
NOTE:
* *Discard the removed valve guide subassemblies.*
* *Only oversized valve guides are available as replacement parts.*



• Re-finish the valve guide holes in the cylinder head using the special tools.

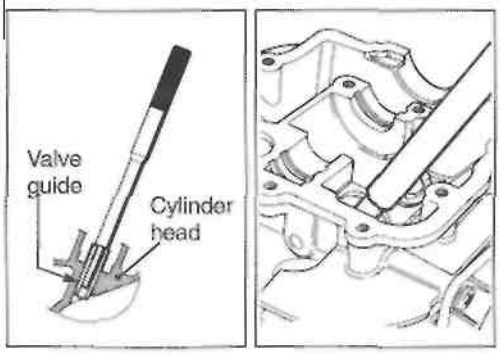
09916-34561: Valve guide reamer (11.3 mm)
09916-34542: Handle

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



• Install a ring onto each valve guide.
• Oil the stem hole of each valve guide and drive the guide into the guide hole using the special tool.

09916-44910: Valve guide remover/installer

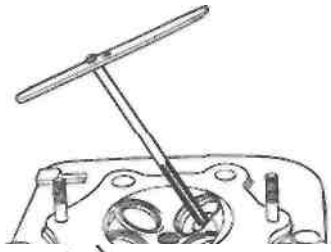


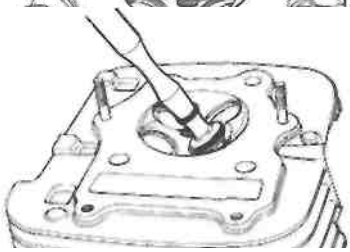
***A* CAUTION**

Be sure to use a new valve guide ring and valve guide.

• After installing the valve guides, re-finish their guiding bores using the special tools. Be sure to clean and oil the guides after reaming.

TOOL 09916-34550: Valve guide reamer (5.5 mm)
09916-34542: Handle

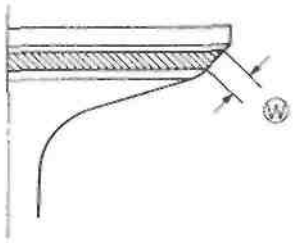




VALVE SEAT WIDTH

• Coat the valve seat uniformly with Prussian blue. Install the valve and attach a valve lapper onto it. Tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact.

• The ring-like dye impression left on the valve face must be continuous without any breaks. In addition, the width of the dye ring, which is the valve seat width, must be within the following specification:



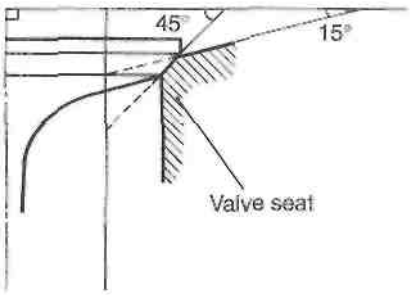
Standard
Valve seat width Ⓦ: 0.9-1.1 mm (0.035-0.043 in)

If the valve seat is out of specification, re-cut the seat.

VALVE SEAT SERVICE

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

	INTAKE SIDE		EXHAUST SIDE
45°	N-122	45°	N-122
15°	N-121	15°	N-121

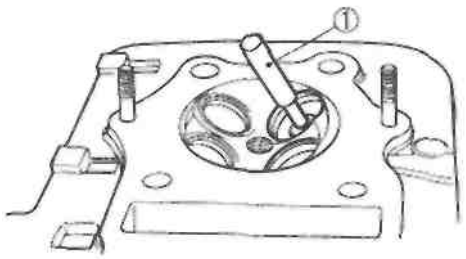


TOOL 09916-21111: Valve seat cutter set
09916-20610: Valve seat cutter (N-121)
09916-20620: Valve seat cutter (N-122)
09916-24450: Solid pilot (N-100-5.52)

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

- When installing the solid pilot ①, rotate it slightly. Seat the pilot snugly. Install the 45° cutter, attachment and T-handle.
- Using the 45° cutter, descale and clean up the seat. Rotate the cutter one or two turns.
- Measure the valve seat width after every cut. If the valve seat is pitted or burned, use the 45° cutter to condition the seat same more.

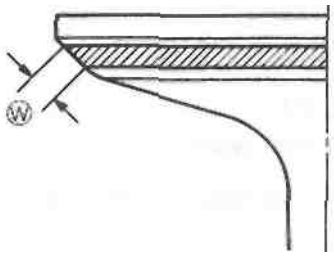
NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.



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

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

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

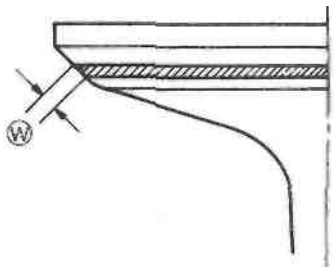


Contact area too high and too wide on face of valve

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.

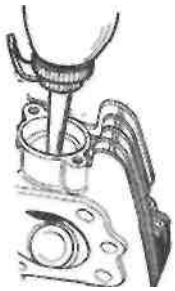
2-4 to -6.)



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.



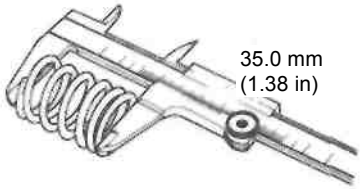
NOTE:
After servicing the valve seats, be sure to check the valve

Contact area too low and too narrow on face of valve

VALVE SPRINGS

Check the valve springs for proper strength by measuring their free length and also 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 specified range, replace the spring.

09900-20201: Vernier calipers

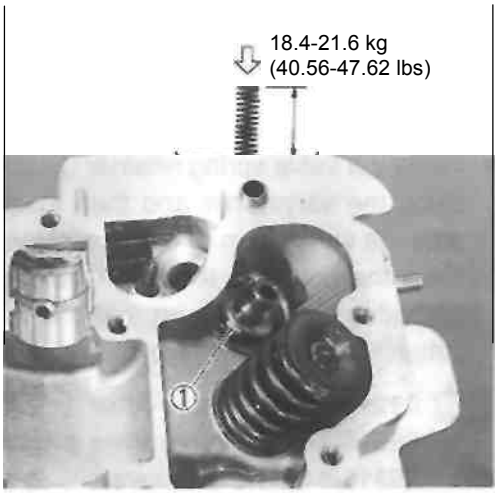


Service Limit

Valve spring free length (IN. & EX.): 40.1 mm (1.58 in)

Standard

Valve spring tension (IN. & EX.): 18.4-21.6 kg/35.0 mm (40.56-47.62 lbs/1.38 in)



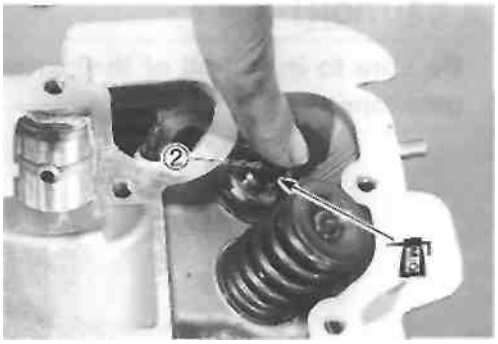
REASSEMBLY

Reassemble the cylinder head in the reverse order of disassembly. Pay attention to the following points: • Install each valve spring seat①.

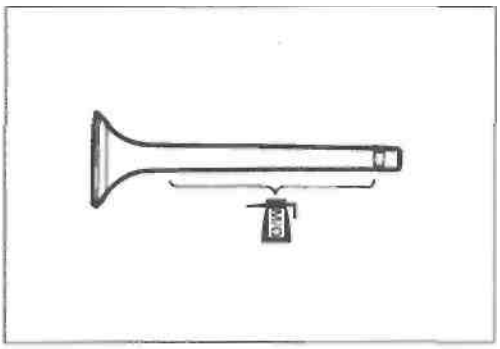
• Apply molybdenum oil solution to the valve stem seal②, and press-fit the seal into position by hand.

A CAUTION

Do not reuse the valve stem seals.



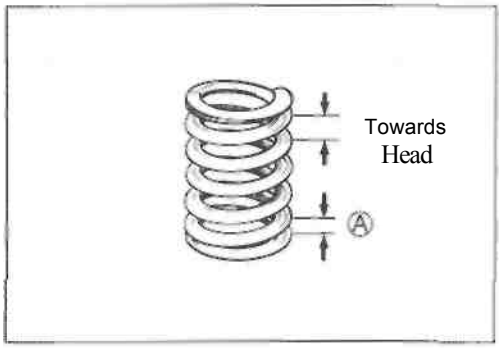
• Apply molybdenum oil solution to the valve stems.



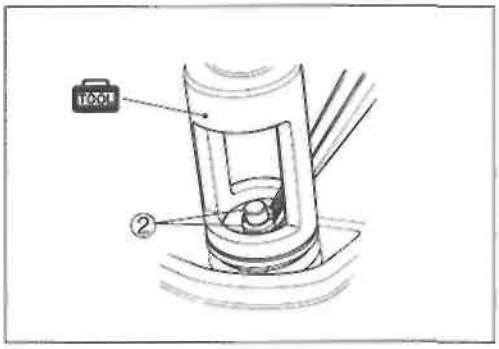
CAUTION

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

• Install the valve springs with the smaller pitch Ⓐ facing the cylinder head.



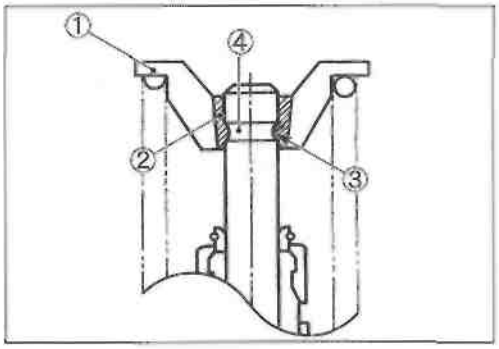
• Install the valve spring retainer ①, press down the spring using the valve lifter and then install the cotter halves onto the valve stem end. Then, release the valve lifter to allow the cotter ② to wedge between the retainer and the valve stem. Be sure that the rounded lip ③ of the cotter fits snugly into the groove ④ in the stem end.



TOOL **09916-14510: Valve lifter 09916-14910: Valve lifter attachment 09916-84511: Tweezers**

CAUTION

Be sure to install all of the parts in their original positions.



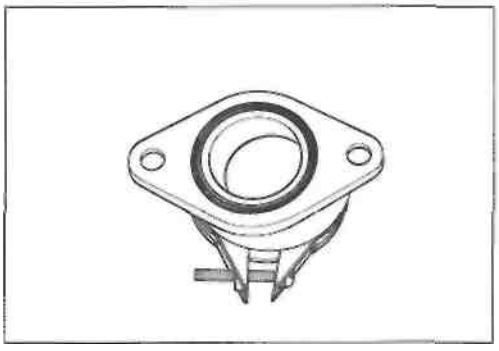
INTAKE PIPE

• When installing the intake pipe, apply grease to the CD-ring.

99000-25010: SUZUKI SUPER GREASE "A"

CAUTION

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



NOTE:
Make sure that the "UP" mark comes upward.

CAM CHAIN GUIDE AND CAM CHAIN TENSIONER

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

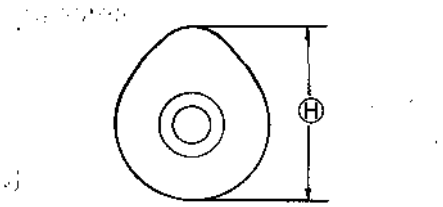
CAMSHAFT

CAMSHAFT INSPECTION

If the engine produces abnormal noises, vibration or lacks power, a camshaft may be distorted or worn to the service limit. The camshaft runout should be checked. Also, check the cams and journals for wear or damage.

CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced power output. Measure the cam height Ⓗ using the micrometer. Replace a camshaft if the cams are worn to the service limit.

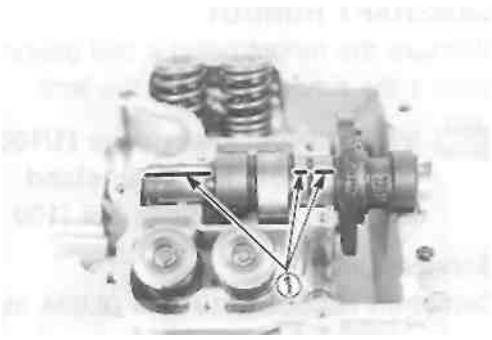


09900-20202: Micrometer (25-50 mm)

Service Limit
Cam height Ⓗ (IN.) : 34.690 mm (1.3657 in)
(EX.) : 34.730 mm (1.3673 in)

CAMSHAFT JOURNAL WEAR

Determine whether or not each journal is worn down to the limit by measuring the oil clearance with the camshaft installed in place. Measure the clearance using the plastigauge ①.



09900-22301: Plastigauge
09900-22302: Plastigauge

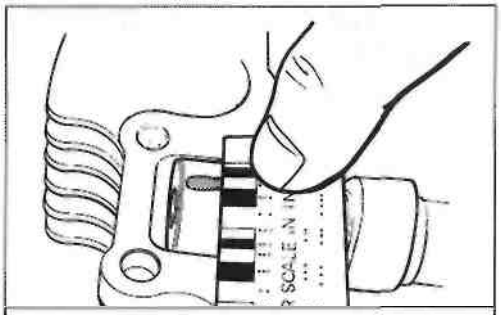
NOTE:
Install the cylinder head cover to its original position.

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

Cylinder head cover bolt: 10 N ■ m (1.0 kg-m, 7.0 lb-ft)

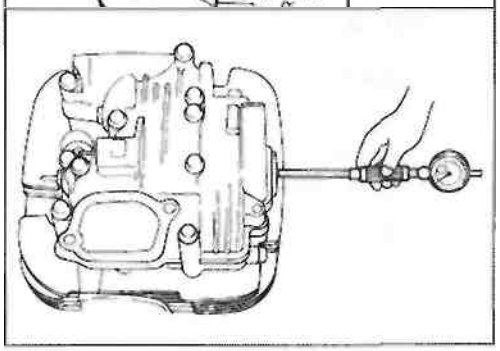
NOTE:
Do not rotate the camshaft with the plastigauge in place.

Remove the cylinder head cover and measure the width of the compressed plastigauge using the envelope scale. This measurement should be taken at the widest part of the compressed plastigauge.



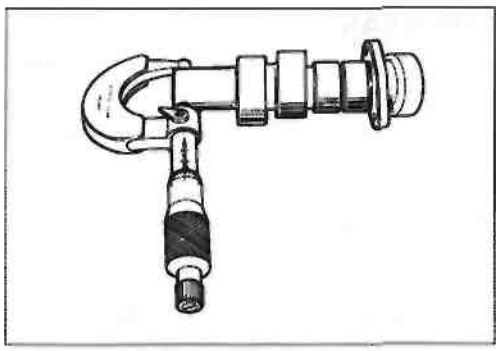
Service Limit
Camshaft-Journal oil clearance: 0.150 mm (0.0059 in)

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



09900-22403: Small bore gauge

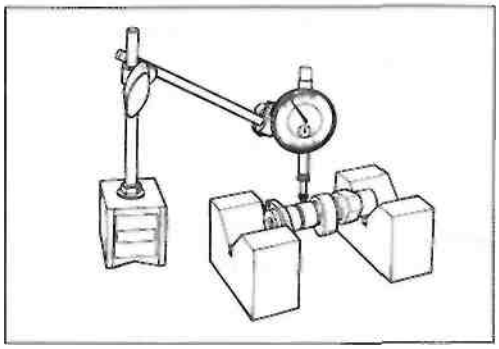
Standard
Camshaft journal holder I.D.
(Right side) : 25.012-25.025 mm (0.9847-0.9852 in)
(Left side) : 20.012-20.025 mm (0.7879-0.7884 in)



09900-20205: Micrometer (0-25 mm)

Standard
Camshaft journal O.D.
(Right side) : 24.959-24.980 mm (0.9826-0.9835 in)
(Left side) : 19.959-19.980 mm (0.7858-0.7866 in)

CAMSHAFT RUNOUT
Measure the runout using a dial gauge. Replace the camshaft if the runout exceeds the limit.



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

Service Limit
Camshaft runout: 0.10 mm (0.004 in)

CAM CHAIN TENSION ADJUSTER

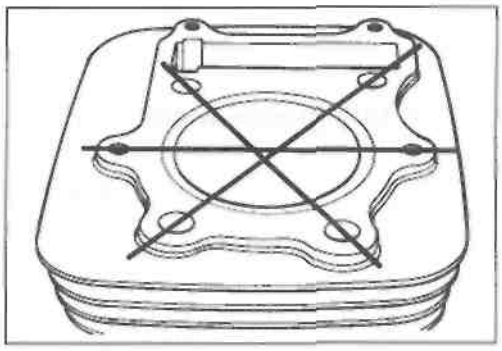
The cam chain tension adjuster is maintained at the proper tension by an automatically adjusted tensioner. Insert a flat-head screwdriver into the slotted end of the cam chain tension adjuster and turn it clockwise to release the tension. Remove the screwdriver to make sure that the push rod moves properly. If the push rod is stuck or the spring mechanism does not work, replace the cam chain tension adjuster assembly with a new one.

CYLINDER

DISTORTION

Check the gasket surface of the cylinder for distortion using a straightedge and thickness gauge. Take clearance readings at several places. If any reading exceeds the service limit, replace the cylinder.

09900-20803: Thickness gauge Service Limit: 0.05 mm (0.002 in)

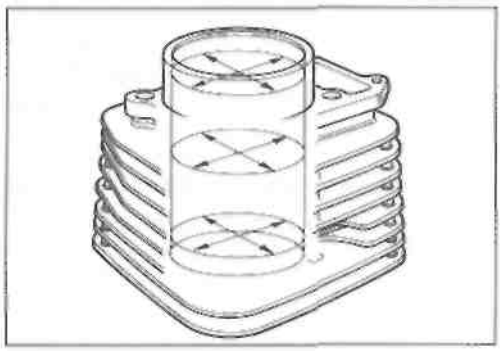


CYLINDER BORE

Measure the cylinder bore diameter at six places. If any one of the measurements exceed the limit, overhaul the cylinder and replace the piston with an oversize piston, or

09900-20508: Cylinder gauge set

Service Limit: 72.085 mm (2.8380 in)
replace the cylinder.



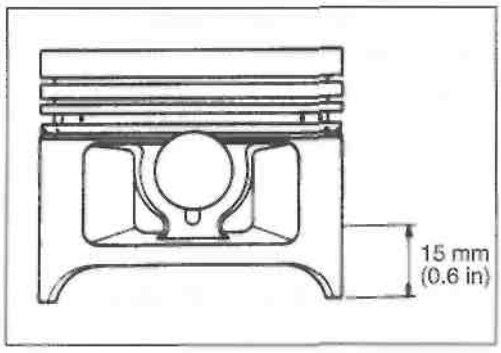
PISTON AND PISTON PIN

DIAMETER

Measure the piston diameter using the micrometer at 15 mm (0.6 in) from the skirt end.
If the piston diameter is less than the service limit, replace the piston.

09900-20203: Micrometer (50-75 mm)

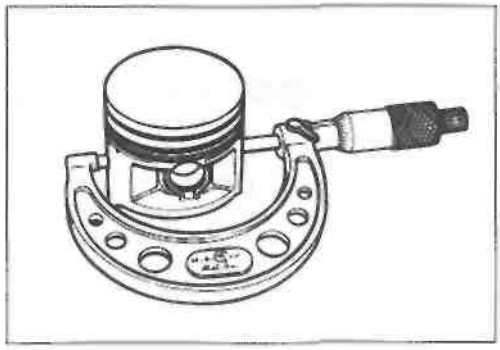
Service Limit: 71.880 mm (2.8299 in) Piston oversize: 0.5, 1.0 mm



PISTON-CYLINDER CLEARANCE

Subtract the piston diameter from the cylinder bore diameter. If the piston-to-cylinder clearance exceeds the service limit, rebore the cylinder and use an oversize piston or replace both the cylinder and the piston.

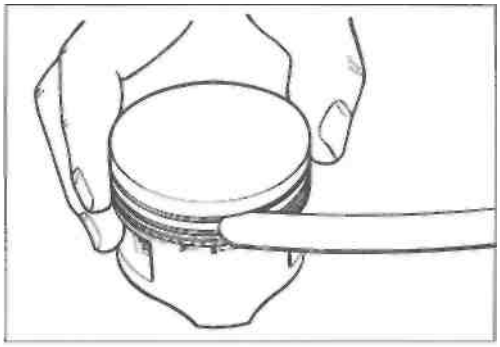
Service Limit: 0.120 mm (0.0047 in)

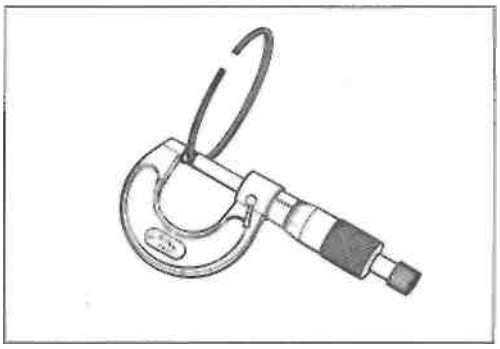


PISTON RING-GROOVE CLEARANCE

Measure the side clearance of the 1st and 2nd rings using the thickness gauge If any of the clearances exceed the limit. replace both the piston and piston rings.

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





Service Limit

Piston ring-groove clearance 1st: 0.180 mm (0.0071 in)
2nd: 0.150 mm (0.0059 in)

Standard

Piston ring groove width

1st: 1.01-1.03 mm (0.040-0.041 in)
2nd: 1.21-1.23 mm (0.047-0.048 in)
Oil: 2.51-2.53 mm (0.099-0.100 in)

Standard

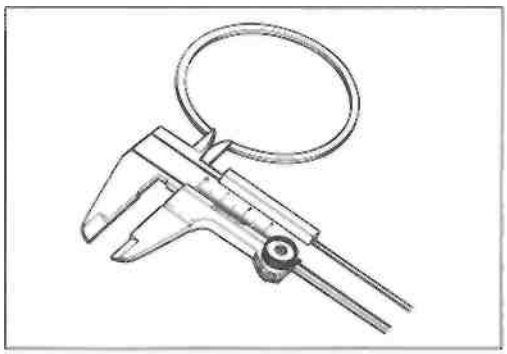
Piston ring thickness

1st: 0.975-0.990 mm (0.0384-0.0390 in)
2nd: 1.170-1.190 mm (0.0461-0.0469 in)

NOTE:
Remove any carbon from the piston crown and ring grooves using a soft-metal scraper.

PISTON RING FREE END GAP AND PISTON RING END GAP

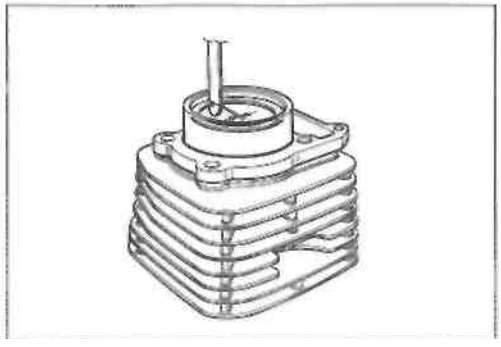
Measure the piston ring free end gap using a vernier calipers. Next, fit the piston ring squarely into the cylinder and measure the piston ring end gap using a thickness gauge. If the piston ring's end gap is out of specification, replace the piston ring.



09900-20101: Vernier calipers

Service Limit

Piston ring free end gap 1st: 7.6 mm (0.30 in)
2nd: 8.8 mm (0.35 in)



09900-20803: Thickness gauge

Service Limit

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

OVERSIZE RINGS

Oversize piston ring

The following oversize piston ring is used. It bears the following identification number.

Piston ring 1st and 2nd **0.5 mm: 50**
1.0 mm: 100

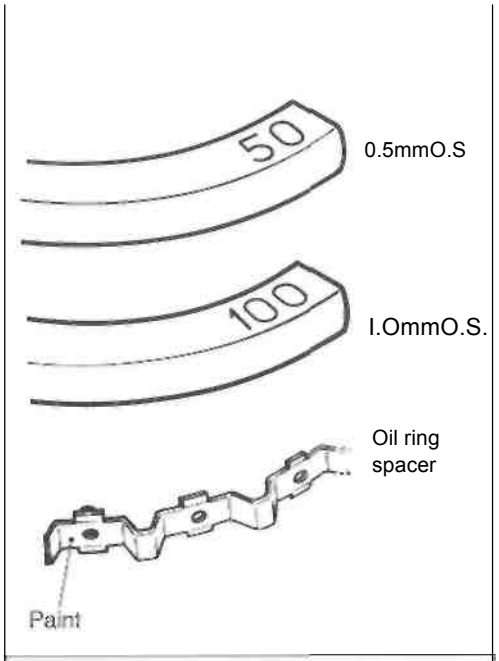
Oversize oil ring

The following oversize oil ring is used. It bears the following Identification mark.

Oil ring **0.5 mm: Painted blue 1.0 mm: Painted yellow**

Oversize side rail

Measure the outside diameter to identify the side.

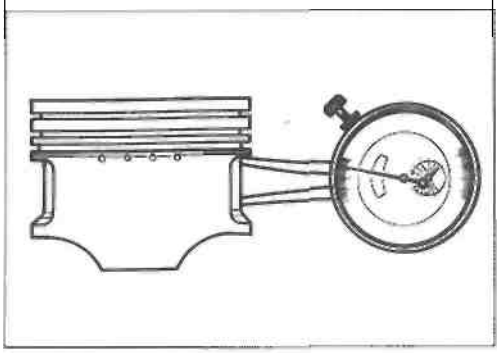


PIN BORE

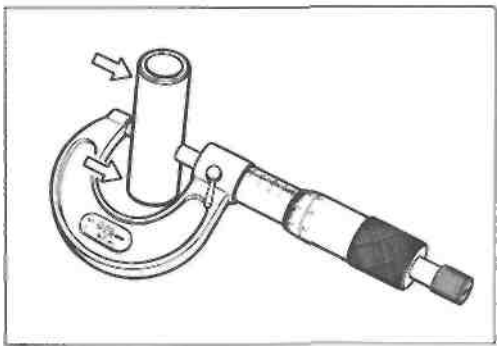
Measure the piston pin bore inside diameter using the caliper gauge and measure the piston pin outside diameter using the micrometer. If either is out of specification or the difference between these two measurements is more than the limits, replace both piston and piston pin.

TOOL

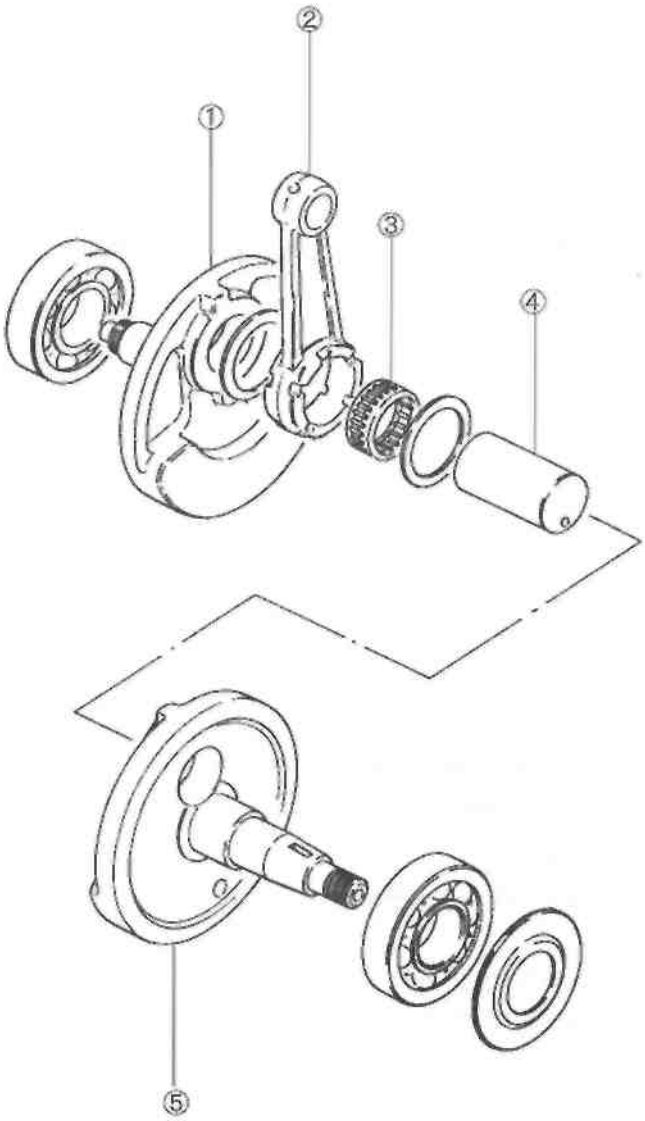
09900-20605: Dial calipers 09900-20205: Micrometer (0-25 mm)



Service Limit
Piston pin bore: 18.030 mm (0.7098 in)
Piston pin O.D.: 17.980 mm (0.7079 in)



CRANKSHAFT AND CONROD



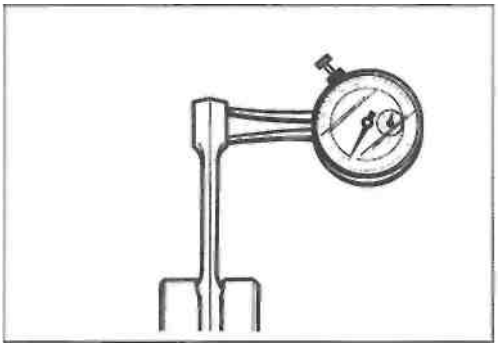
① Crankshaft, RH
② Conrod
③ Bearing
④ Crank pin
⑤ Crankshaft, LH

CONROD SMALL END I.D.

Measure the conrod small end inside diameter using the dial calipers. If the conrod small end inside diameter exceeds the service limit, replace the conrod.

09900-20605: Dial calipers

Service Limit: 18.040 mm (0.7102 in)

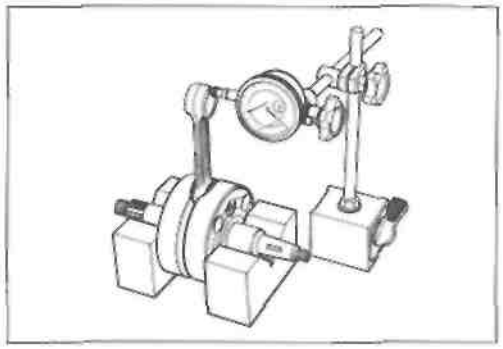


CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

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

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

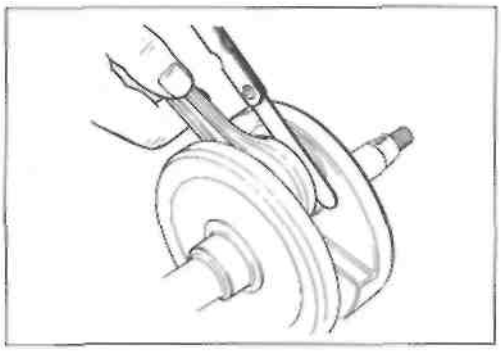
Service Limit: 3.0 mm (0.12 in)



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

09900-20803: Thickness gauge

Standard: 0.10-0.65 mm (0.004-0.026 in) Service Limit: 1.0 mm (0.04 in)



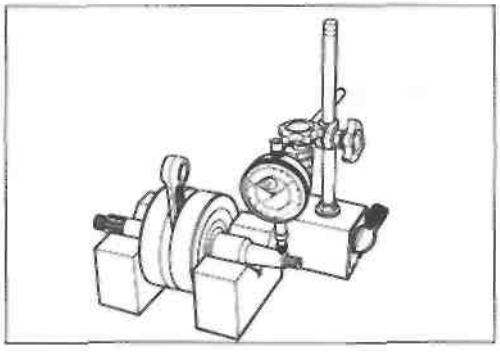
If the service limit is exceeded, replace crankshaft assembly or bring the deflection and side clearance into specification by replacing the worn parts, (e.g., conrod, big end bearing and crank pin)

CRANKSHAFT RUNOUT

Support the crankshaft with V-blocks as shown. Position the dial gauge, as shown, and rotate the crankshaft slowly to read the runout. Correct the runout or replace the crankshaft assembly if the runout is greater than the service limit.

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

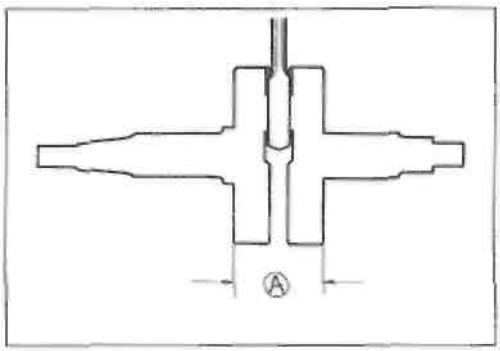
Service Limit: 0.05 mm (0.002 in)



REASSEMBLY

- When rebuilding the crankshaft, the width between the webs Ⓐ should be within the standard range.

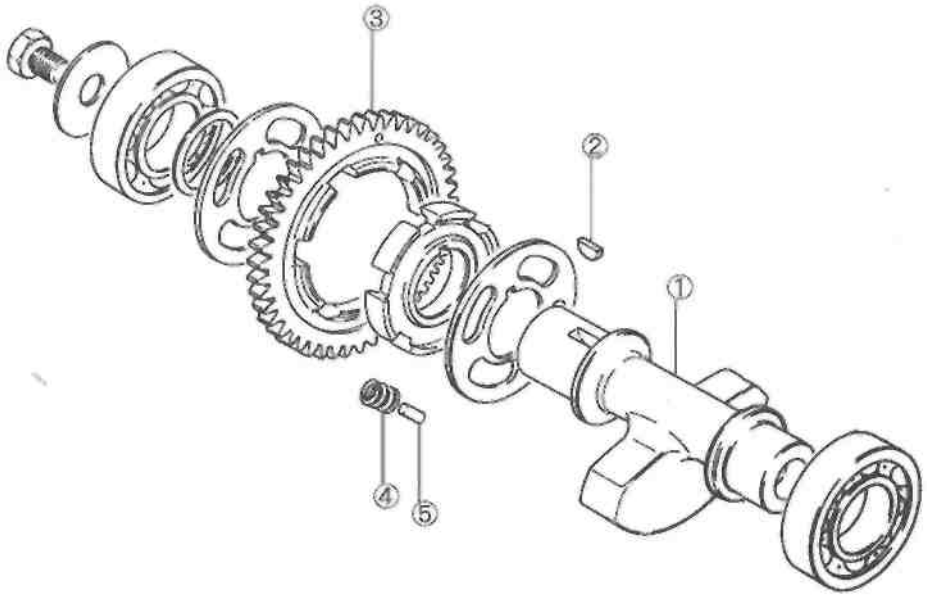
Standard width between webs Ⓐ: 60.0 + 0.1 mm (2.362 ±0.004 in)



BALANCER SHAFT AND BALANCER SHAFT DRIVEN GEAR

DISASSEMBLY

• Disassemble the balancer shaft as shown in the illustration.

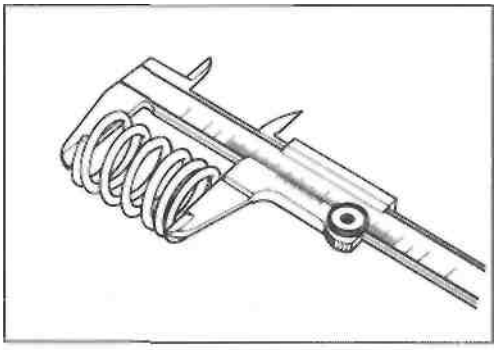


① Balancer shaft
② Key
③ Balancer shaft driven
④ Spring (6 pcs.)
⑤ Pin (3 pcs.)

INSPECTION

Inspect the balancer shaft and balancer shaft driven gear for wear or damage. If any wear or damage is found, replace the defective part.

Measure the free length of each balancer spring using vernier calipers. If any spring is not within the service limit, replace all of the spring.



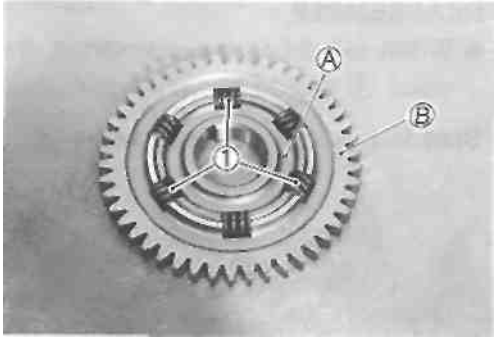
09900-20101: Vernier calipers

Service Limit: 10.0 mm (0.39 in)

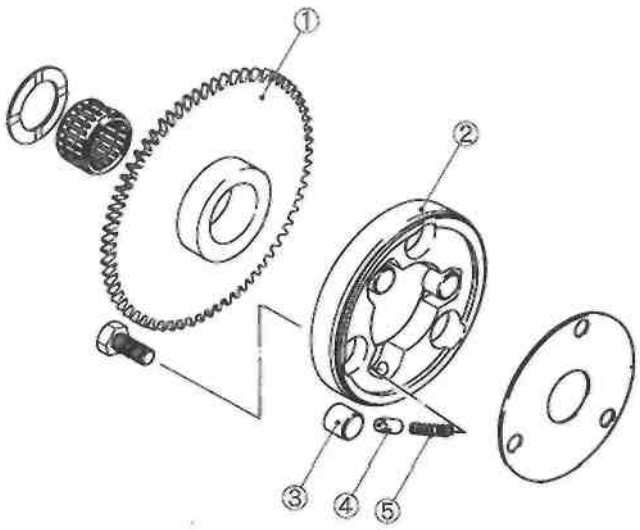
REASSEMBLY

Reassemble the balancer shaft driven gear in the reverse order of disassembly. Pay attention to the following points:

• Make sure that the punch mark Ⓐ on the inner race is aligned with the punch mark Ⓑ on the balancer shaft driven gear.
① : Pin



STARTER CLUTCH AND STARTER DRIVEN GEAR BEARING



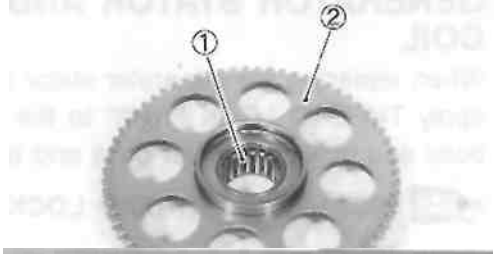
1 Starter driven gear
2 Starter clutch
3 Roller
4 Push piece
5 Spring

STARTER CLUTCH

Install the starter driven gear onto the starter clutch and turn the starter driven gear by hand (the gear turns in only one direction). The starter driven gear should turn smoothly. If excessive resistance is felt while turning the starter driven gear, inspect the starter clutch. Also, inspect the surface of the starter driven gear which contacts the starter clutch, for wear or damage. If any wear or damage is found, replace the defective part(-s).

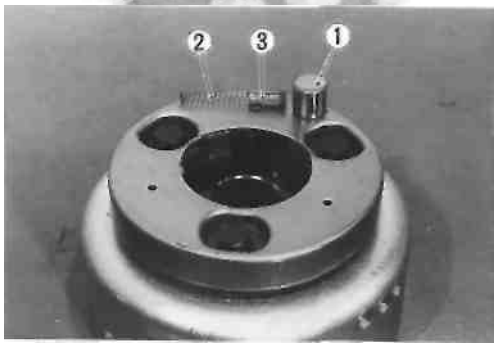
STARTER DRIVEN GEAR BEARING

Install the starter driven gear bearing ①and gear②onto the crankshaft and turn the starter driven gear by hand. Inspect the starter driven gear bearing for smooth rotation and any abnormal noise. If the bearing does not turn smoothly or there is any abnormal noise, replace it.



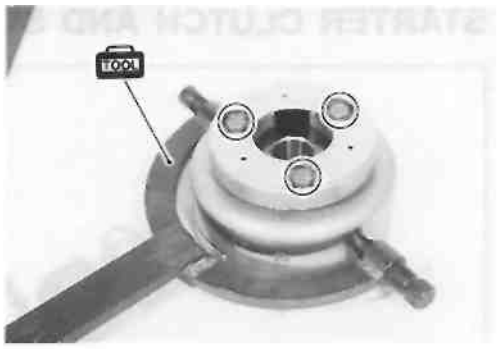
DISASSEMBLY

- Remove the starter **driven** gear.
- Remove the roller①, spring ②**and** push piece③



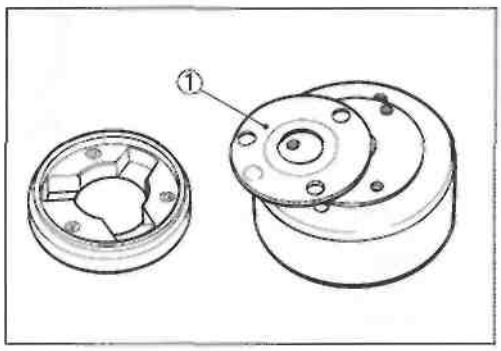
• Hold the generator rotor with the rotor holder and remove the starter clutch bolts.

09930-44913: Rotor holder



REASSEMBLY

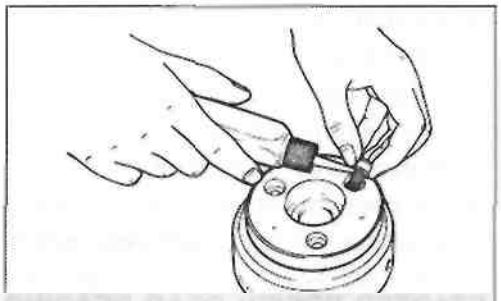
• Locate the shim ①to the proper position.



• Apply a small quantity of THREAD LOCK SUPER "1303" to the starter clutch bolts and tighten them to the specified torque while holding the rotor holder.

99000-32030: THREAD LOCK SUPER "1303"

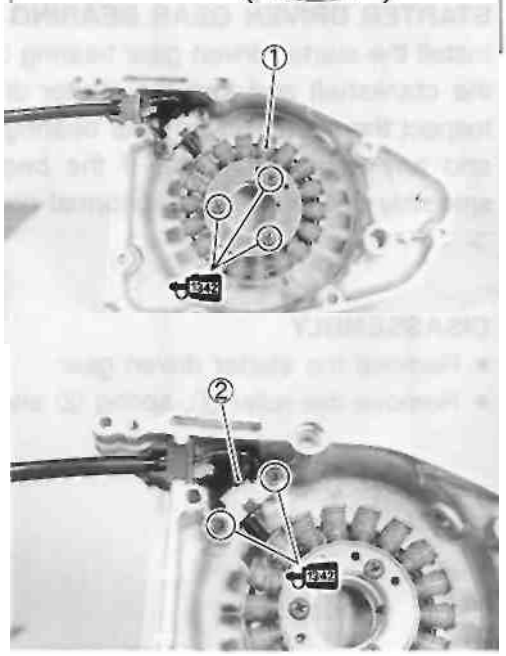
09930-44913: Rotor holder **Starter clutch bolt: 18 N-m (1.8 kg-m, 13.0 lb-ft)**



GENERATOR STATOR AND PICK-UP COIL

When replacing the generator stator①or pick-up coil② apply THREAD LOCK "1342" to the generator stator set bolts and pick-up coil set bolts and tighten them.

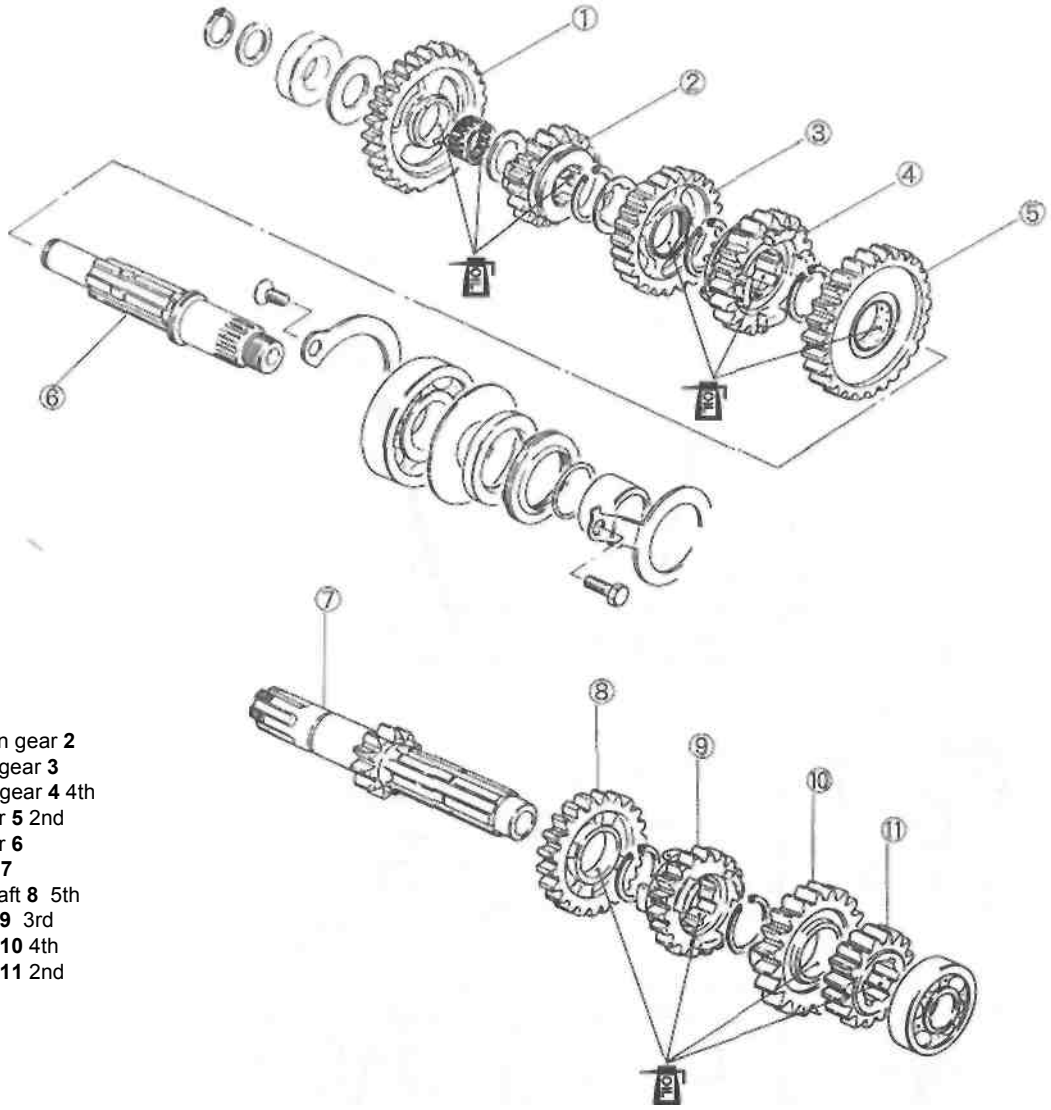
99000-32050: THREAD LOCK "1342"



TRANSMISSION

DISASSEMBLY

• Disassemble the transmission gears as shown in the illustration.



1 1st driven gear **2** 5th driven gear **3** 3rd driven gear **4** 4th driven gear **5** 2nd driven gear **6** Driveshaft **7** Countershaft **8** 5th drive gear **9** 3rd drive gear **10** 4th drive gear **11** 2nd drive gear

REASSEMBLY

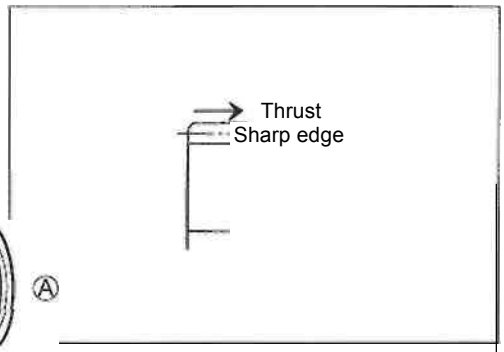
Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to the following points.

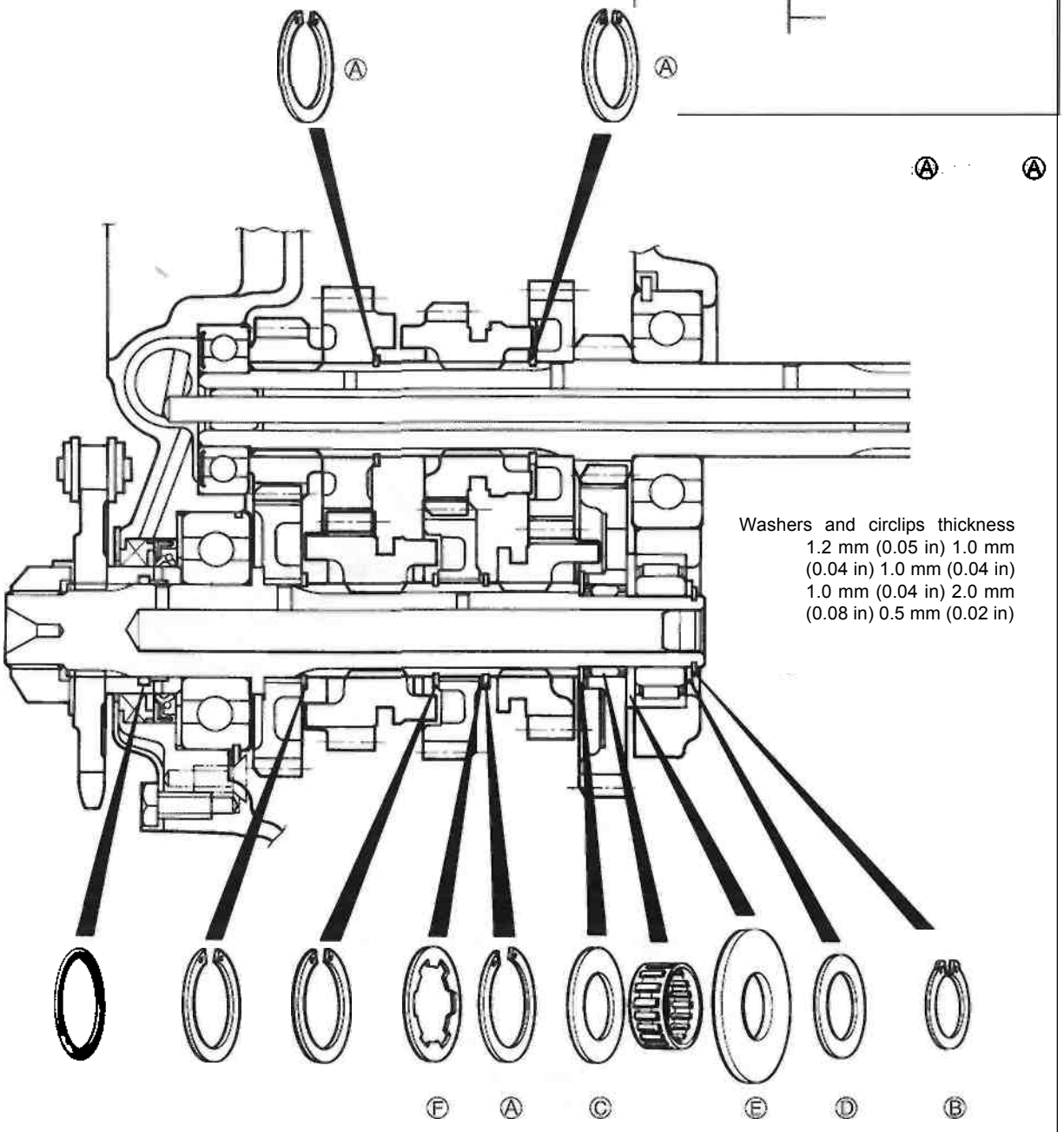
NOTE:
Before installing the gears, apply engine oil to the bearing and inner surface of the each gear.

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, do not expand the end gap larger than required to slip the circlip over the shaft.
* After installing a circlip, make sure 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 the circlip to the side where the thrust is as shown in the illustration. The rounded side should be against the gear surface.





GEARSHIFT FORKS

Measure the gearshift fork clearance in the groove of its respective gear using the thickness gauge. The clearance for each of the two gearshift forks plays an important role in the smoothness and positiveness of the shifting action. Each fork has its prongs fitted into the annular groove provided in its gear. During operation there is sliding contact between the fork and gear and, when a shifting action is initiated, the fork pushes the gear axially. If the clearance is too great, the meshed gears may slip apart.

If the clearance exceeds the specification, replace the fork, its respective gear or both.

09900-20803: Thickness gauge

Service Limit

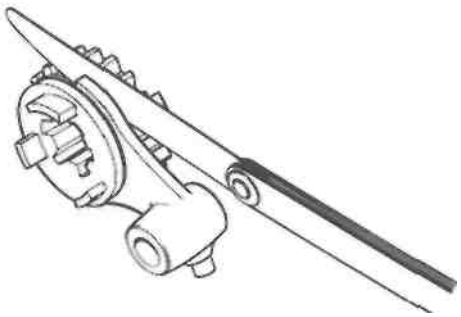
Gearshift fork to groove clearance: 0.60 mm (0.024 in)

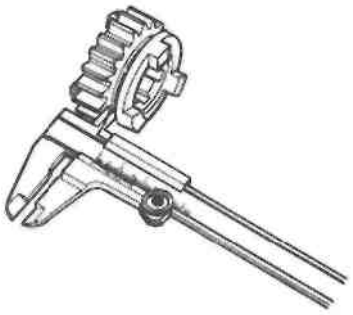
Standard

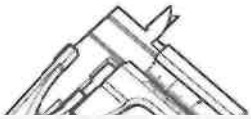
Gearshift fork groove width No.1, No.2 & No.3: 4.25-4.35 mm (0.167-0.171 in)

Standard

Shift fork thickness No.1, No.2 & No.3: 3.95-4.05 mm (0.156-0.159 in)





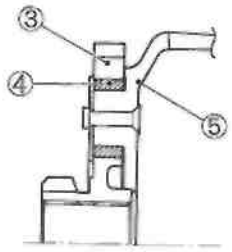


PRIMARY DRIVEN GEAR

- Remove the stopper ring①
- Remove the oil pump drive gear②

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

③ Primary driven gear
④ Damper
⑤ Clutch housing



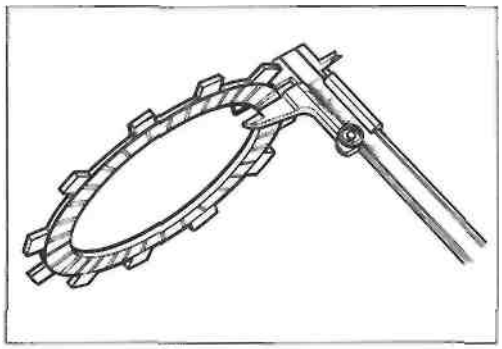
CLUTCH

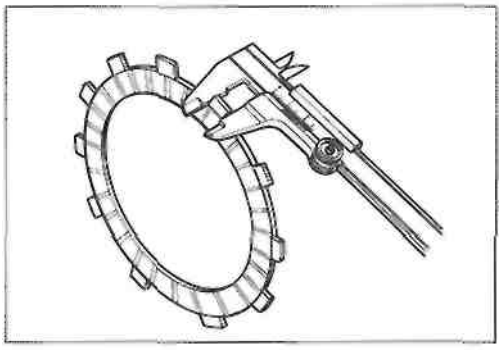
CLUTCH DRIVE PLATES

Measure the thickness and claw width of the clutch drive plates using vernier calipers. If a clutch drive plate is not within the service limit, replace the clutch plates as a set.

09900-20101: Vernier calipers

Service Limit
Thickness (No.1): 2.62 mm (0.103 in)
(No.2): 3.15 mm (0.124 in) Claw width:
15.0 mm (0.590 in)



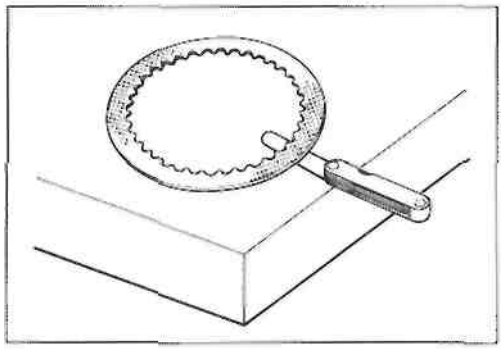


CLUTCH DRIVEN PLATES

Measure each clutch driven plates for distortion using the thickness gauge. If a clutch driven plate is not within the service limit, replace the clutch plates as a set.

09900-20803: Thickness gauge

Service Limit: 0.10 mm (0.004 in)



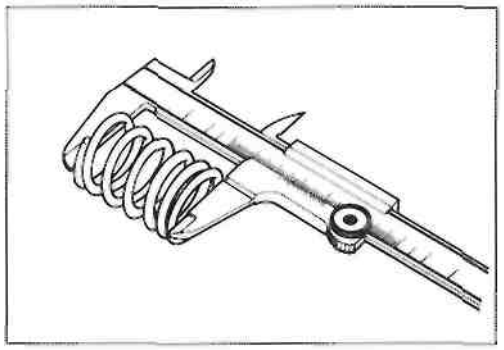
CLUTCH SPRING FREE LENGTH

Measure the free length of each clutch spring using vernier calipers. If any spring is not within the service limit, replace all of the spring.

09900-20101: Vernier

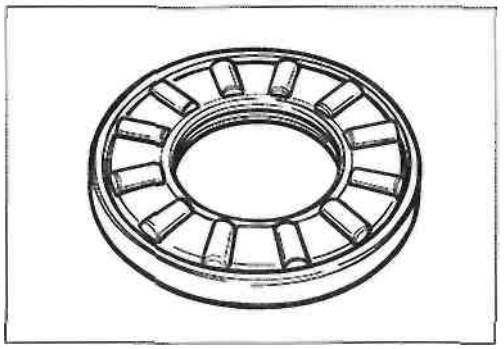
calipers Service Limit: 40.9 mm (1.61

in)



CLUTCH RELEASE BEARING

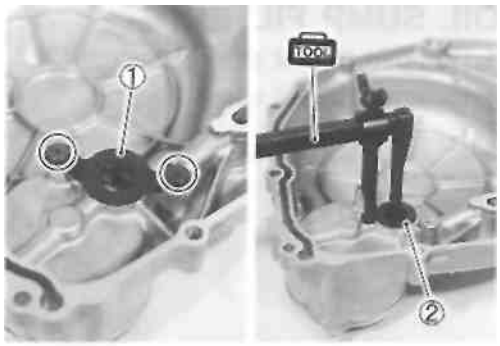
Inspect the clutch release bearing for any abnormality, especially cracks. When removing the bearing from the clutch, decide whether it can be reused or if it should be replaced.
Smooth engagement and disengagement of the clutch depends on the condition of this bearing.



CLUTCH COVER

- Remove the oil seal retainer①
- Remove the oil seal②using the special tool.

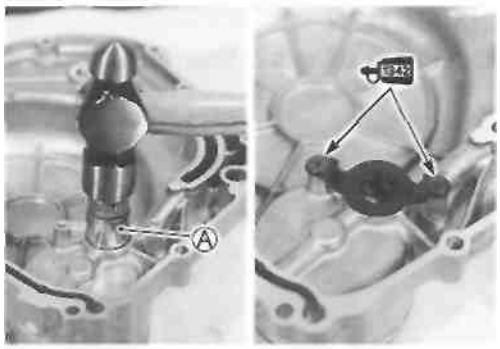
09913-50121: Oil seal remover



- Install the new oil seal using a suitable socketⒶ
- Install the oil seal retainer.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the oil seal retainer screws.

99000-32050: THREAD LOCK "1342"

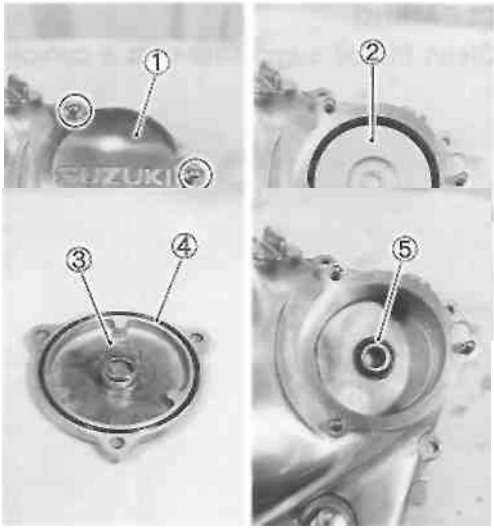


OIL FILTER

- Remove the oil filter cap①
- Remove the oil filter②and install a new one.

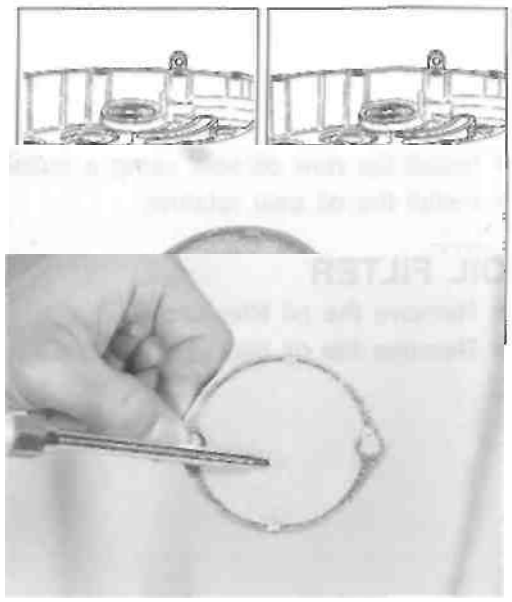
NOTE:
Before installing the new oil filter and oil filter cap, make sure that the spring ③ and new O-rings (④, ⑤) are installed correctly.

- Install the oil filter cap.



OIL SUMP FILTER

- Remove the oil sump filter cap①
- Remove the oil sump filter②



INSPECTION

Check the oil sump filter for any damage or clogs.

CLEANING

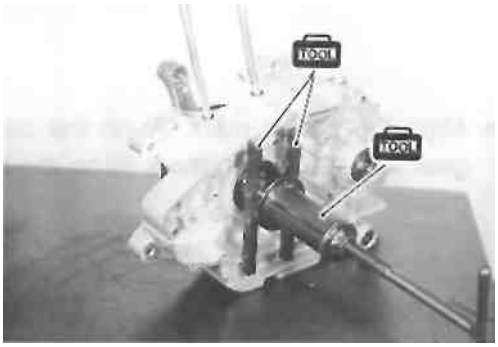
Clean the oil sump filter with a compressed air.

ENGINE REASSEMBLY

Reassemble the engine in the reverse order of disassembly. The following steps require special attention or precautionary measures should be taken.

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

CRANKSHAFT

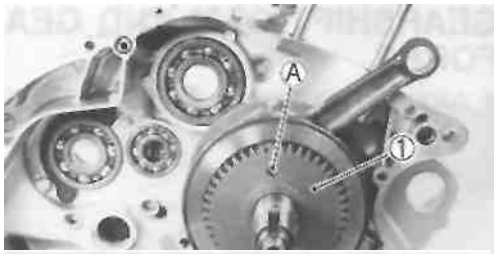


• When installing the crankshaft into the crankcase, it is necessary to pull its left end into the left crankcase with the special tools.

TOOL **09910-32812: Crankshaft installer**
09910-32840: Attachment 09910-20116: Conrod holder

CAUTION

Never install the crankshaft into the crankcase by striking it with a plastic hammer. Always use the special tool, otherwise crankshaft may be misaligned.



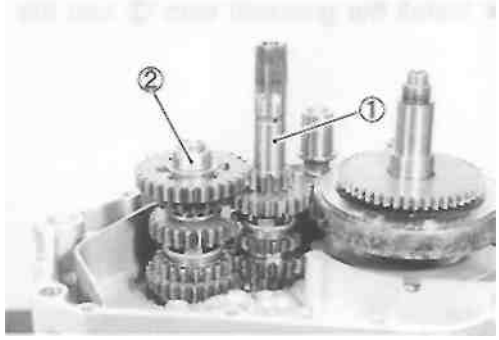
• Apply engine oil to the crankshaft bearings.
• Install the balancer shaft drive gear①.

NOTE:
Make sure that the hole in the drive gear is aligned with the pin Ⓐ on the crankshaft.

BALANCER SHAFT

• Install the balancer shaft①

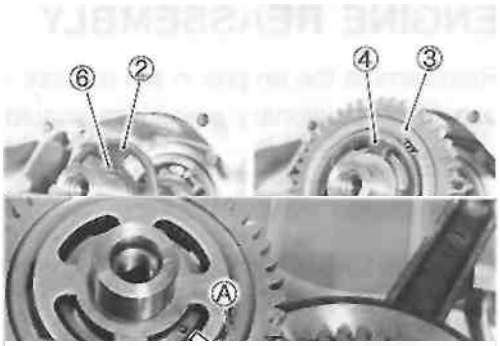
TRANSMISSION



• Install the countershaft① and driveshaft② assemblies.

• Install the washer ②, balancer shaft driven gear③ washer④and shim⑤onto the balancer shaft.

NOTE:
Make sure that the key⑥is aligned with the keyway.

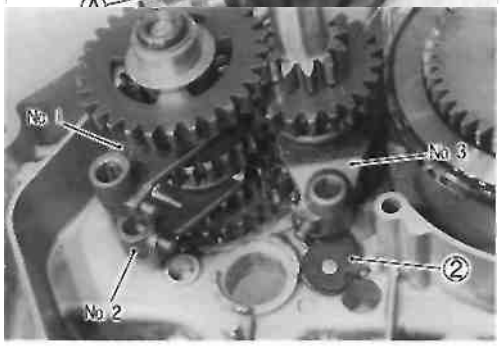


• Align the punch mark Ⓐon the balancer shaft driven gear with the punch markⒷon the balancer shaft drive gear⑦

GEARSHIFT CAM AND GEARSHIFT FORKS

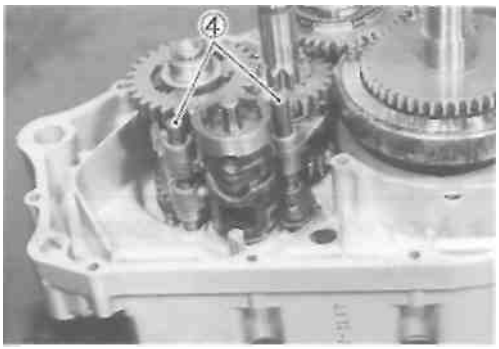
• Align the pin grooveⒶof gearshift cam stopper plate① with the pin Ⓑon the gearshift cam.

• Install the gearshift forks to their respective gears.
• Install the gearshift cam stopper②

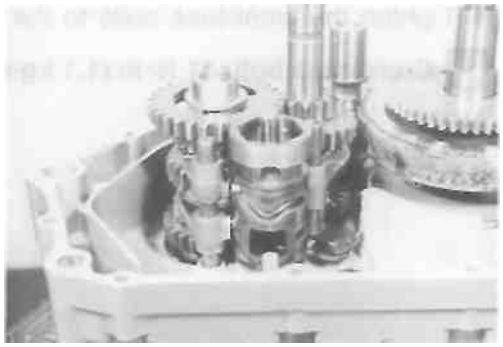


• Install the gearshift cam③ into the crankcase.

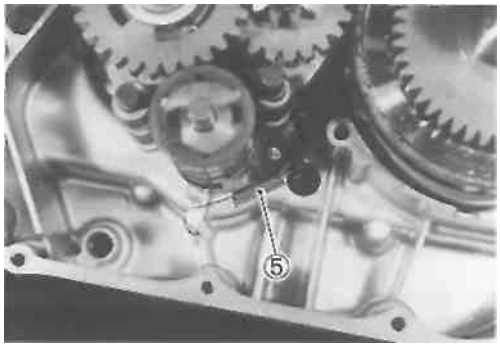
• Install the gearshift fork shafts④



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



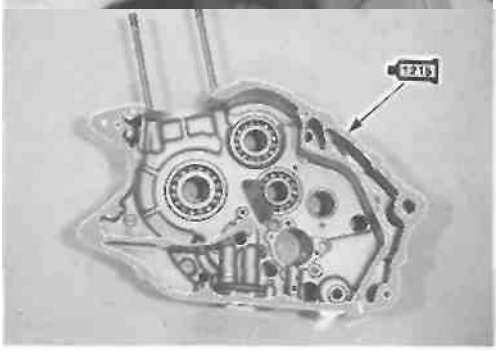
• Install the the gearshift cam stopper spring⑤



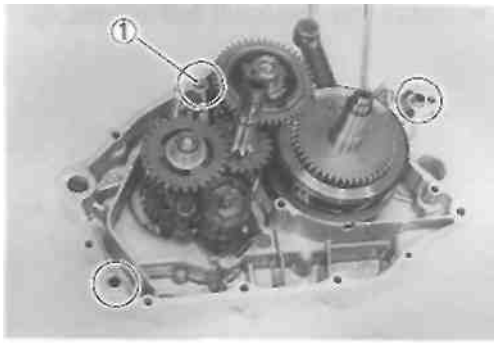
CRANKCASE

- Wipe both crankcase mating surfaces with a cleaning solvent.
- Apply SUZUKI BOND "1215" uniformly to the mating surface of the right crankcase and assemble the cases within a few minutes.

1215 99000-31110: SUZUKI BOND "1215"



- Install the dowel pins into the left half of the crankcase.
- Install the O-ring①



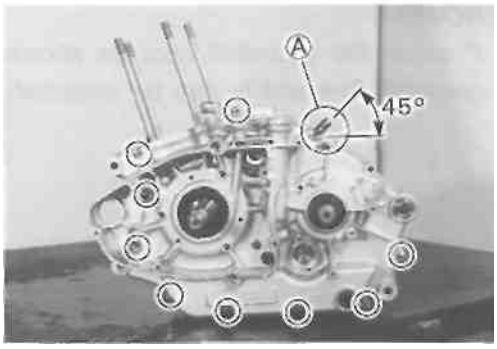
A CAUTION

Use a new O-ring①

- Apply engine oil to the conrod big end and transmission gears.

- Tighten the crankcase bolts to the specified torque.

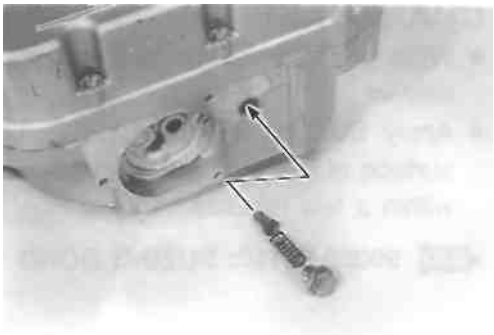
Crankcase bolt: 11 N-m (1.1 kg-m, 8,0 lb-ft)



NOTE:
Install the clamp to the bolt Ⓐ.

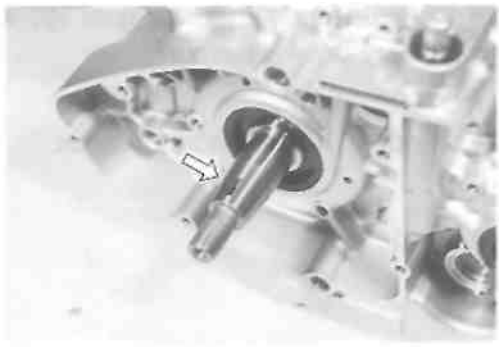
NOTE:
* *After the crankcase bolts have been tightened, make sure that the crankshaft, countershaft and driveshaft rotate smoothly.*
* *If these shafts do not rotate smoothly, try to free it by tapping with a plastic hammer.*

- Install the the gearshift cam stopper.

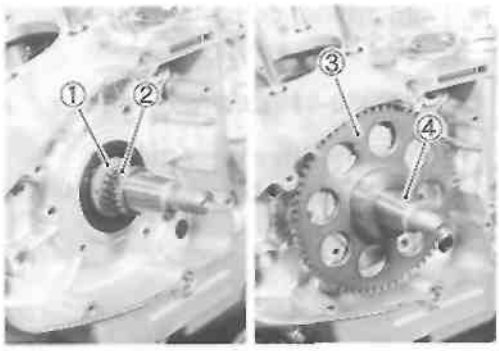


GENERATOR ROTOR

• Remove any grease from the tapered portion of the generator rotor and crankshaft.



• Install the washer①so that the convex side of it faces the crankcase bearing.
• Install the bearing②
• Install the starter driven gear③
• Install the generator rotor key ④onto the crankshaft.



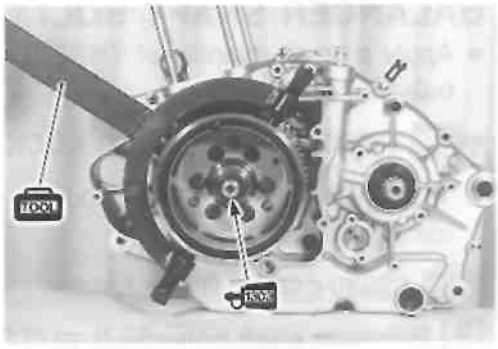
• Install the generator rotor securely.
• Apply a small quantity of THREAD LOCK "1303" to the generator rotor nut.

99000-32030: THREAD LOCK SUPER "1303"

• Tighten the generator rotor nut to the specified torque using the special tool.

09930-44913: Rotor holder

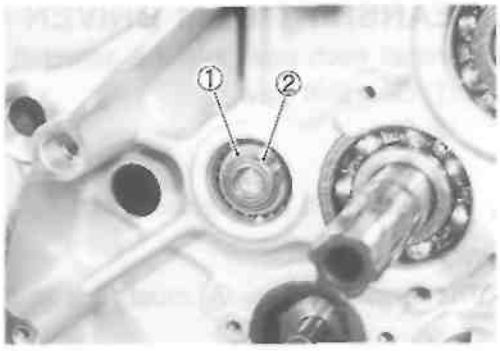
Generator rotor nut: 160 N ■ m (16.0 kg-m, 115.5 lb-ft)



DRIVESHAFT RETAINER

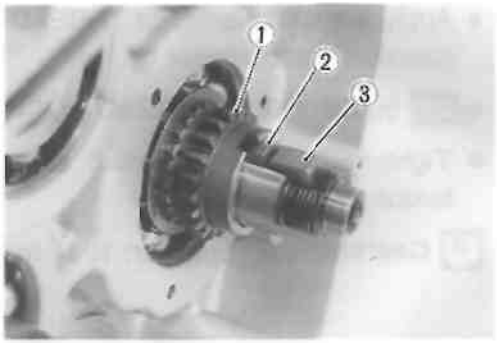
• Install the washer①and circlip ②to the driveshaft.

CAUTION Use a new circlip②



PRIMARY DRIVE GEAR

• Install the cam chain sprocket①, cam chain sprocket key②and primary drive gear key③



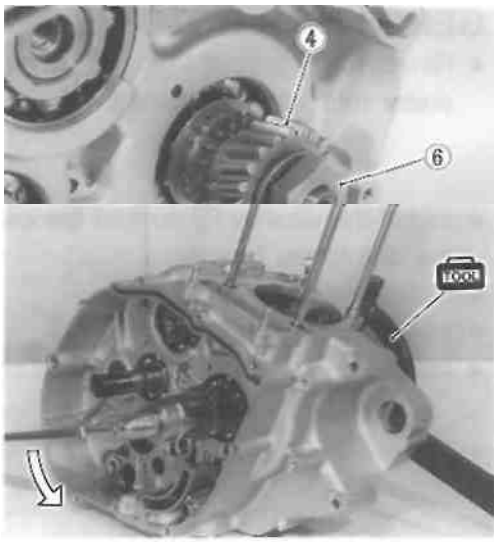
• Install the primary drive gear④, wave washer⑤and primary drive gear nut⑥

NOTE:
This nut⑥ has left hand threads.

• Tighten the primary drive gear nut to the specified torque using the special tool.

09930-44913: Rotor holder

Primary drive gear nut :
100 N-m (10.0 kg-m, 72.5 lb-ft)



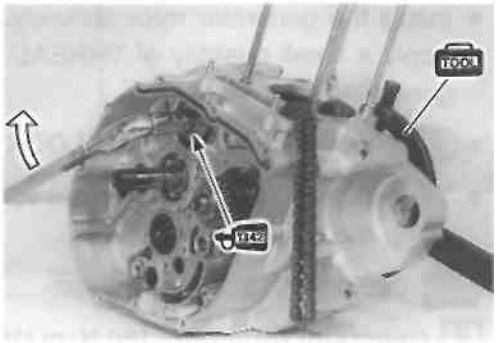
BALANCER SHAFT BOLT

• **Apply a small** quantity of **THREAD LOCK "1342" to the** balancer shaft bolt.

99000-32050: THREAD LOCK "1342"

• Tighten the balancer shaft bolt to the specified torque using the special tool.

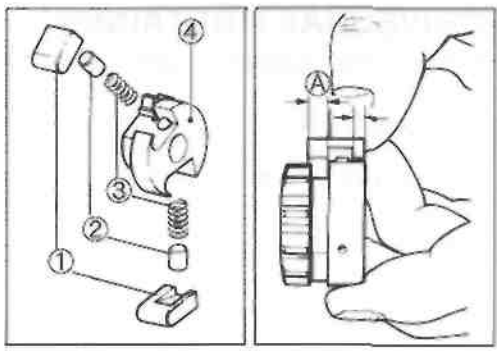
09930-44913: Rotor holder **Balancer shaft bolt**: **39 N-m** (3.9 **kg-m, 28.0 lb-ft)**



GEARSHIFT CAM DRIVEN GEAR

• Install eac ① ɔwl into the gearshift cam driven gear.
Gearsh ② ɒawl
Pin ③
Spring ④ Gearshift cam driven gear

NOTE:
The large shoulderⒶmust face to the outside.

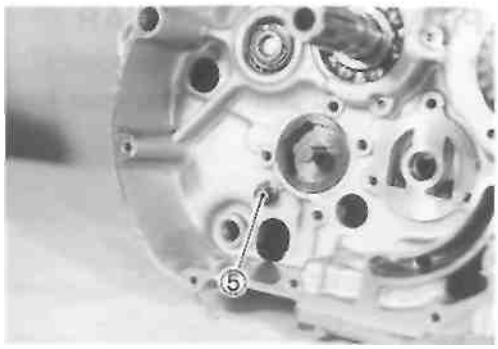


• Apply a small quantity of THREAD LOCK "1303" to the gearshift shaft stopper⑤

99000-32030: THREAD LOCK SUPER "1303"

• Tighten the gearshift shaft stopper to the specified torque.

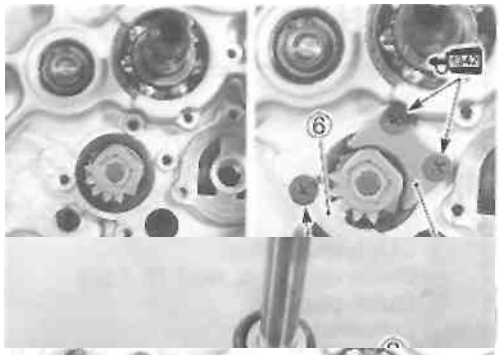
Gearshift cam stopper: 19 N-m (1.9 kg-m, 13.5 lb-ft)



- Install the gearshift cam driven gear assembly.
- Install the pawl lifter ⑥and cam guide⑦

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the threads of the screws.

99000-32050: THREAD LOCK "1342"



• Install the return spring ⑧ to the gearshift shaft as shown.

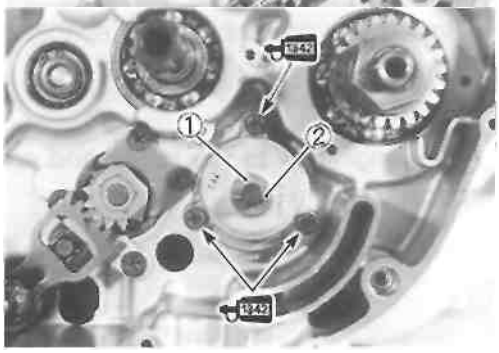
• Install the gearshift shaft.

NOTE:
Align the center teeth on the gearshift shaft with the center teeth on the gearshift cam driven gear.

OIL PUMP

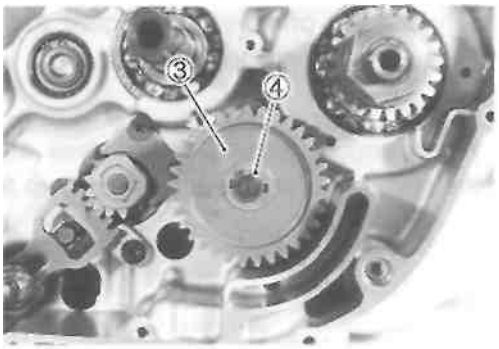
- Apply engine oil to the sliding surfaces of the oil pump case, outer rotor, inner rotor and shaft, before mounting the oil pump.
- Apply a small quantity of THREAD LOCK "1342" to the oil pump mounting screws and tighten them.

99000-32050: THREAD LOCK "1342"

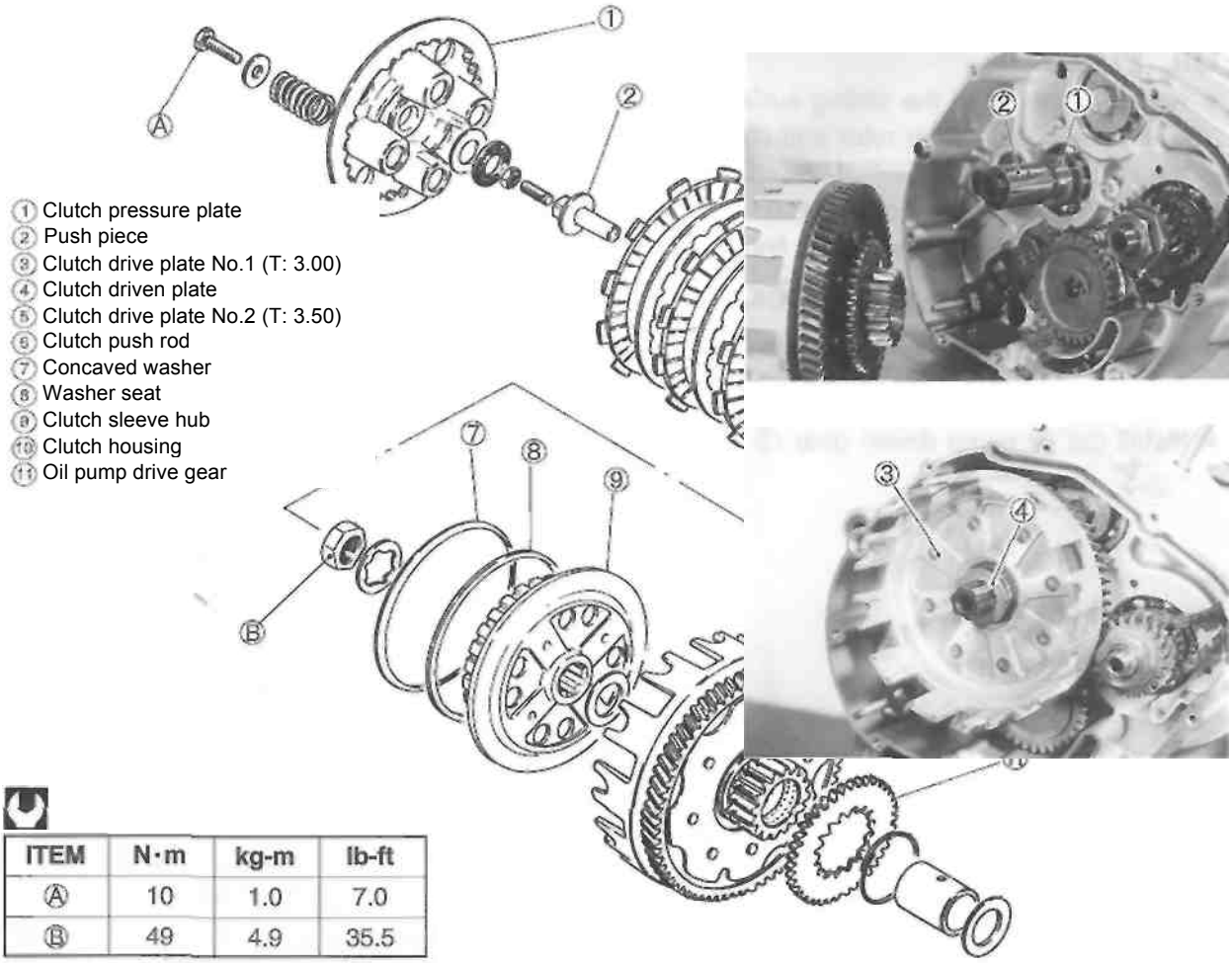


- Install the washer①and pin②

• Install the oil pump driven gear③and circlip④



CLUTCH



ITEM	N·m	kg-m	lb-ft
Ⓐ	10	1.0	7.0
Ⓑ	49	4.9	35.5

• Install the washer① and spacer②onto the counter-shaft.

NOTE:
Apply engine oil to the inside and outside surfaces of the spacer.

• Install the primary driven gear assembly③and thrust washer④onto the countershaft.

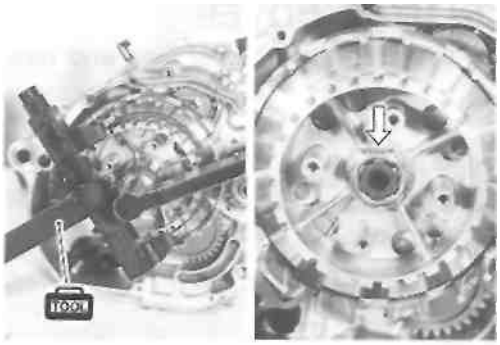
NOTE:
When engaging the primary drive and driven gears, turn the primary driven gear assembly to the counterclockwise.

- Install the clutch sleeve hub and lock washer.
- Install the clutch sleeve hub nut, and tighten it to the specified torque using the special tool.

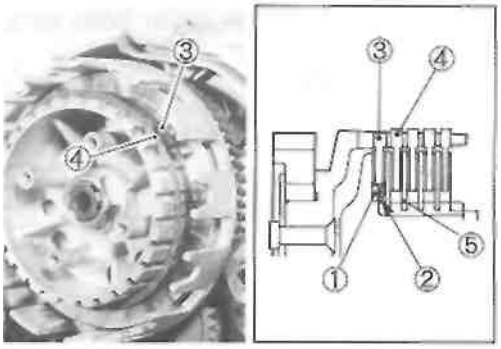
09920-53740: Clutch sleeve hub holder

Clutch sleeve hub nut: 50 N-m (5.0 kg-m, 36.0 lb-ft)

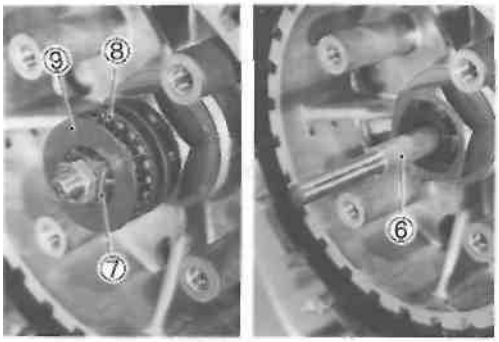
- Bend the lock washer securely.



- Install the washer seat ① and spring washer ② as shown.
- Install the clutch drive plate No.2③
- Install the clutch drive plates No.1 ④and driven plates ⑤ one by one into the clutch sleeve hub.



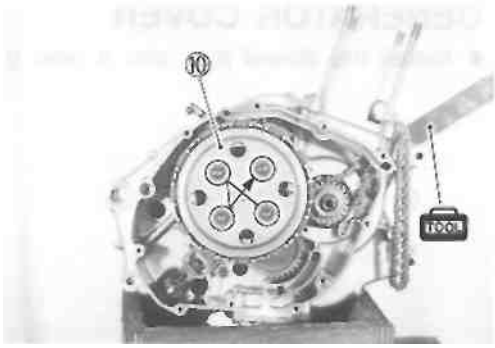
- Install the clutch push rod⑥
- Install the push piece⑦, bearing⑧and washer⑨



- Install the clutch pressure plate ⑩, clutch springs and clutch spring mounting bolts.
- Hold the generator rotor using the special tool and tighten the clutch spring mounting bolts to the specified torque in a crisscross pattern.

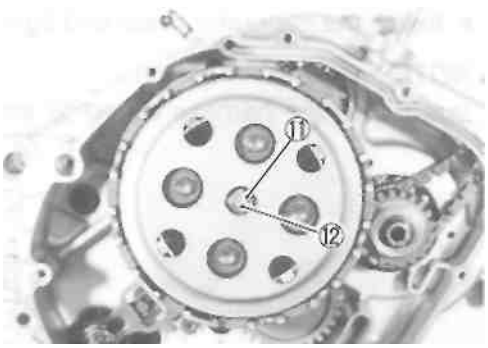
09930-44913: Rotor holder

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



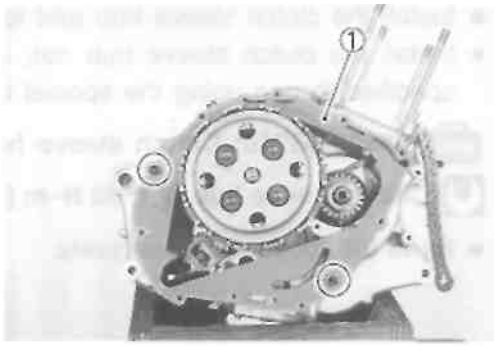
NOTE:
Make sure that the clutch pressure plate is installed correctly.

- Loosen the lock nut⑪, and turn in the release screw⑫ to feel resistance.
- From that position, turn out the release screw⑫ ¼turn, and tighten the lock nut⑪by holding the release screw ⑫



CLUTCH COVER

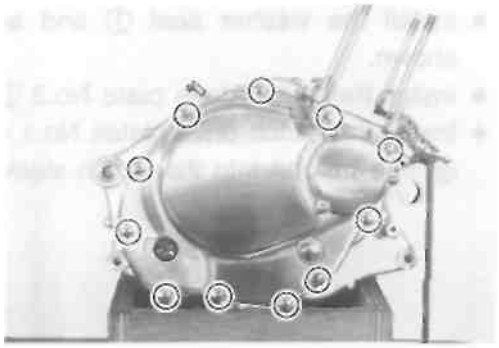
• Install the two dowel pins and new gasket①



• Tighten the clutch cover bolts securely.

A CAUTION

Install the new gasket washer to the bolt Ⓐ.



STARTER IDLE GEAR

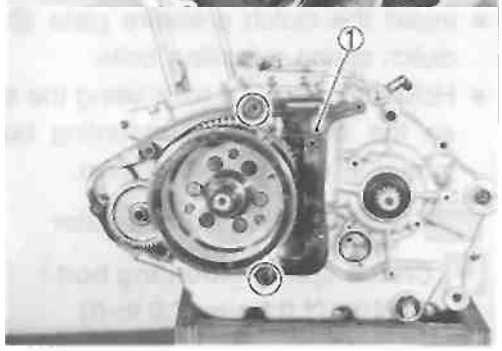
• Install the starter idle gear①

A CAUTION

Apply engine oil to the starter idle gear①

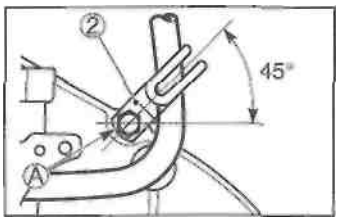
GENERATOR COVER

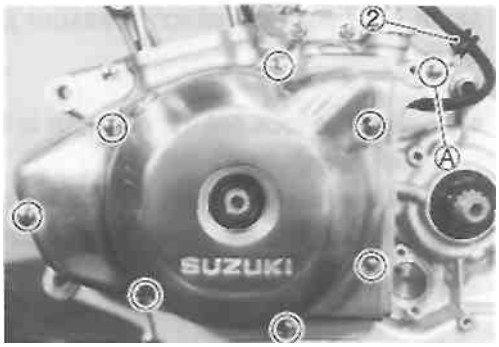
• Install the dowel pins and a new gasket①



• Install the generator cover and tighten the bolts securely.

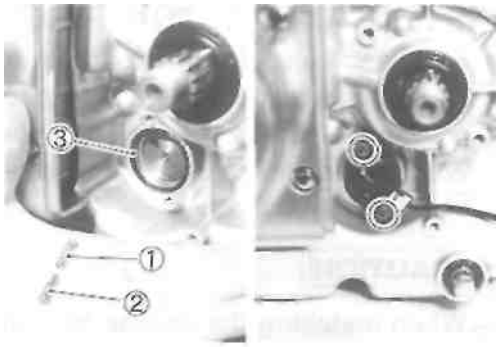
NOTE:
Install the wire harness clamp② with the bolt Ⓐ





NEUTRAL SWITCH

- Install the spring ①and neutral switch contact ②and new O-ring③
- Install the neutral switch.



ENGINE SPROCKET SPACER

• Apply SUZUKI SUPER GREASE "A" to the O-ring①of the engine sprocket spacer and the oil seal lip.

99000-25010: SUZUKI SUPER GREASE "A"

A CAUTION

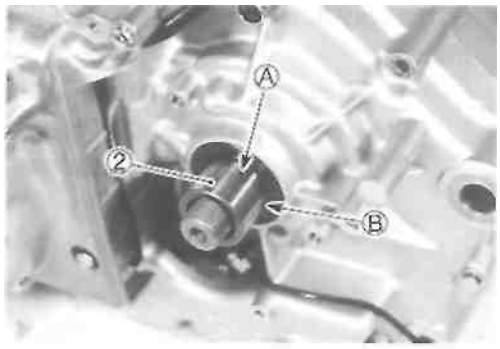
Use a new O-ring①

* Install the engine sprocket spacer②onto the driveshaft.

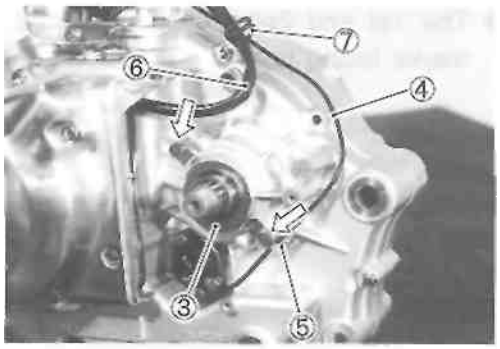
NOTE:

* *The oil hole Ⓐ on the spacer should be on the engine side.*

* *Be careful that the oil seal lip Ⓑ does not turn in.*



- Install the oil seal retainer ③.
- Bend the tabs on the oil seal retainer to lock the bolts.
- Pass through the neutral switch lead wire ④ inside of the guide⑤
- Clamp the neutral switch lead wire④and generator lead wire⑥with the clamp⑦



STARTER MOTOR

• Install the starter motor.

A CAUTION

Use a new O-ring.

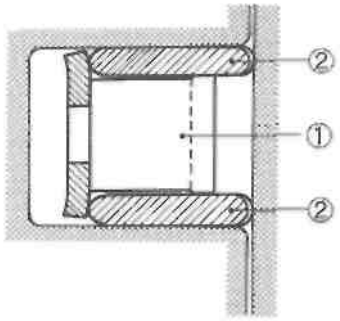
NOTE:

Apply grease to the O-ring.

99000-25010: SUZUKI SUPER GREASE "A"

PISTON AND PISTON RING

• First, install a spacer①into the oil ring groove and then install the two side rails②. The spacer and side rails do not have a specific top or bottom when they are new. When reassembling used parts, install them in their original place and direction.



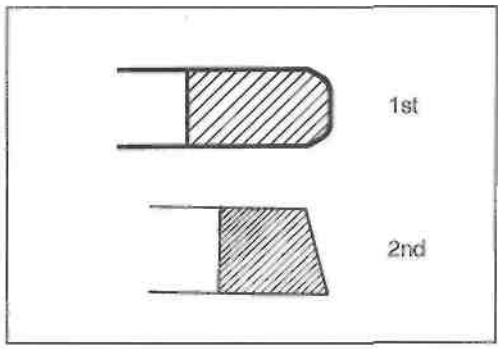
A CAUTION

When installing the spacer, be careful not to allow its two ends to overlap in the piston ring groove.

INCORRECT

• Same way in which to distinguish the 1st and 2nd piston rings:

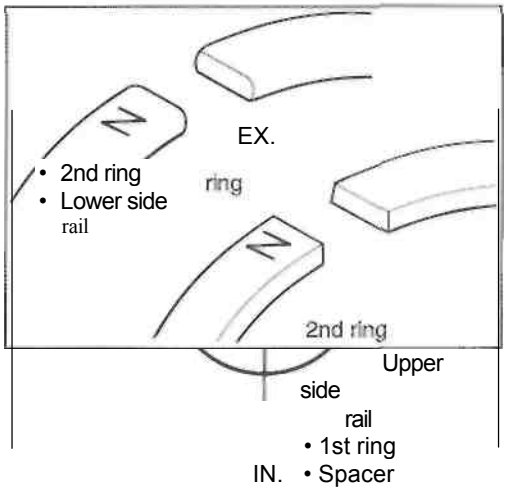
1. Their ring face shapes are different.
2. The 1st piston ring's face is chrome-plated.
3. The 2nd piston ring appears darker in color.



• The 1st and 2nd piston should be installed with their marks facing up.

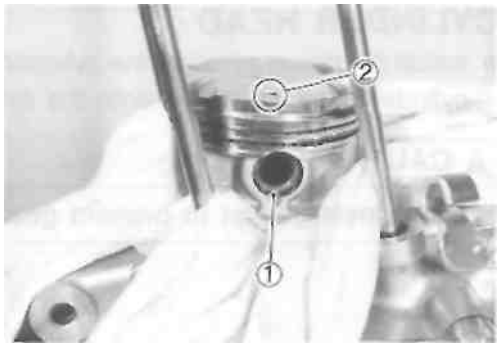
• Position the piston ring gaps as shown.

NOTE:
Before inserting the piston into the cylinder, check that the gaps are properly positioned.



The following are reminders for piston installation:

- Before Installing the piston pin, apply molybdenum oil solution onto its surface.
- Apply engine oil to the big and small ends of the conrod.
- Place a clean rag over the cylinder base to prevent the piston pin circlip from dropping into crankcase. Install the piston pin circlip①with long-nose pliers.



A CAUTION

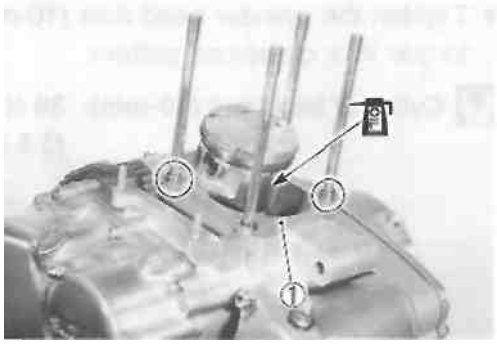
Use a new piston pin circlip①to prevent circlip failure.

- Install the piston with the arrow mark②facing towards the exhaust side.

CYLINDER

Before installing the cylinder, apply engine oil to the sliding surface of the piston.

- Install the dowel pins into the crankcase and then Install the cylinder gasket①



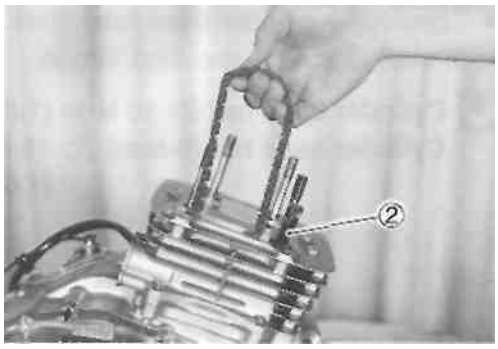
A CAUTION

Use a new gasket to prevent oil leakage.

- Make sure that the piston rings are properly positioned, and insert the piston into the cylinder.

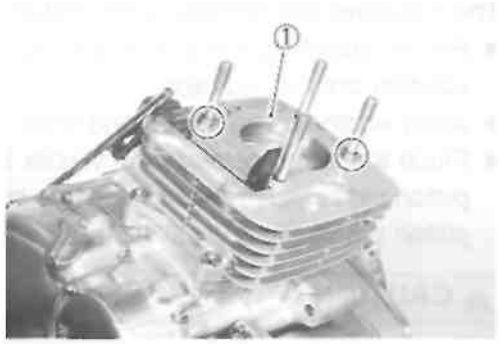
NOTE:
When mounting the cylinder, keep the cam chain taut. The cam chain must not be caught between the cam chain drive sprocket and crankcase when crankshaft is rotated.

- Temporarily tighten the cylinder base nuts.
- Install the cam chain guide②



CYLINDER HEAD

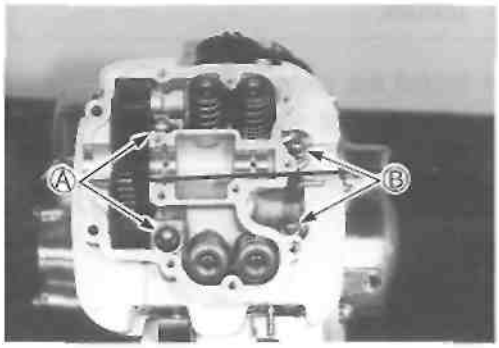
• Install the dowel pins into the cylinder and then install the cylinder head gasket ① onto the cylinder.



A CAUTION

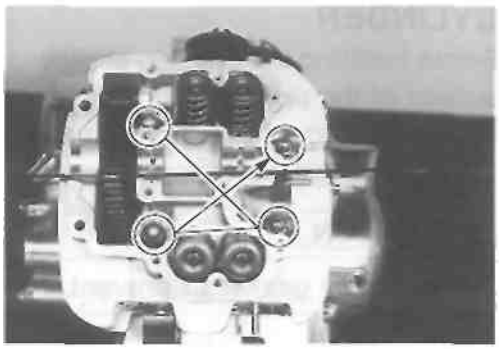
Use a new gasket to prevent gas leakage.

• Place the cylinder head onto the cylinder.
• Cylinder head nuts and washers must be installed correctly as shown.
Ⓐ Copper washer Ⓑ
Steel washer



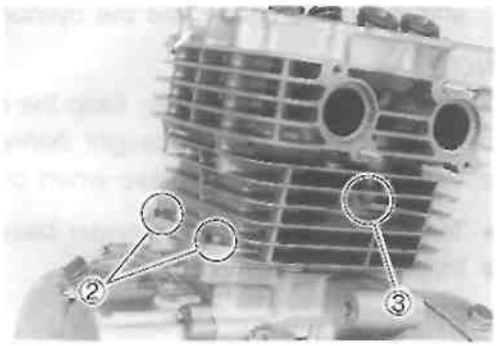
• Tighten the cylinder head nuts (10-mm) to the specified torque in a crisscross pattern.

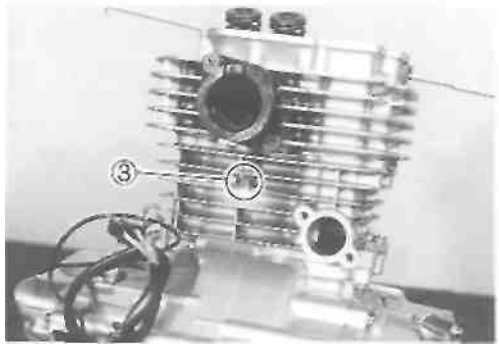
Cylinder head nut (10-mm): 38N-m (3.8 kg-m, 27.5 lb-ft)



• Tighten the cylinder base nuts (2) and cylinder head nuts (6-mm) (D to the specified torque.

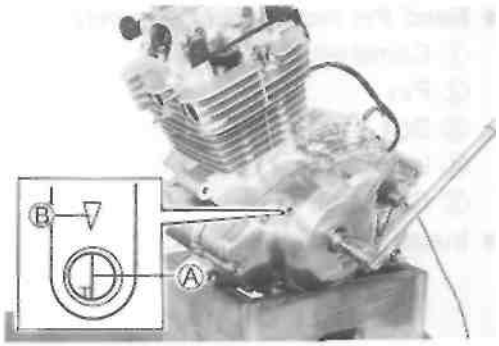
H Cylinder base nut ©: 10 N-m (1.0 kg-m, 7.0 lb-ft)
Cylinder head nut (6-mm) ®: 10 N-m (1.0 kg-m, 7.0 lb-ft)





CAMSHAFT

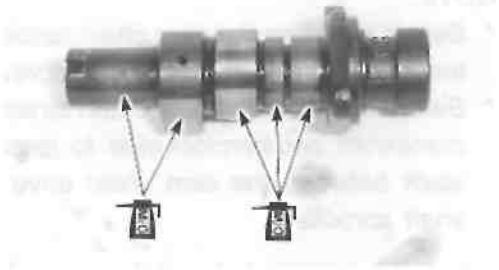
• Turn the crankshaft counterclockwise, and align the T line Ⓐon the generator rotor with the mark Ⓑon the generator cover while keeping the cam chain tight.



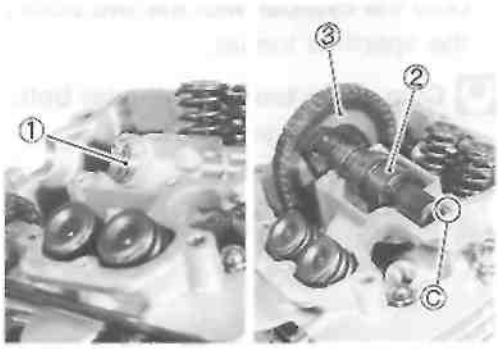
I A CAUTION]

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

NOTE:
Just before installing the camshaft into the cylinder head, apply molybdenum oil solution to the camshaft journals and cam faces. Also, apply engine oil to the camshaft journal holders.

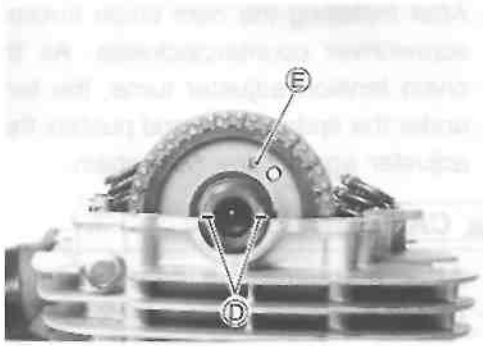


• Install the C-ring①into the ring groove of the cylinder head.
• Install the cam chain.
• Install the camshaft②and camshaft sprocket③
• Face the notch Ⓒon the camshaft towards the intake side.



• Align the engraved line marksⒹon the camshaft so it is parallel with mating surface of the cylinder head and cylinder head cover.
• Engage the cam chain on the camshaft sprocket with the locating pin hole Ⓔat one o'clock position.

NOTE:
Do not rotate the crankshaft while installing the camshaft or cam chain.



• Install the lock washer so that it is covering the locating pin.

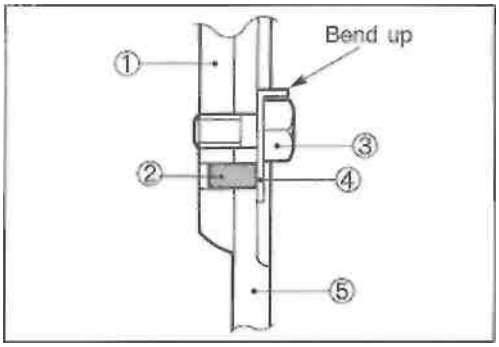
NOTE:
Apply a small quantity of THREAD LOCK SUPER "1303" to the threads of the camshaft sprocket bolts.

1303 99000-32030: THREAD LOCK SUPER "1303"

• Tighten the camshaft sprocket bolts to the specified torque.

Camshaft sprocket bolt: 15 N-m (1.5 kg-m, 11.0 lb-ft)

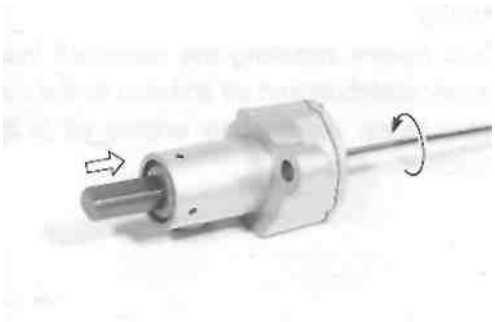
• Bend the lock wa ① r securely.
  Camshaft ②
  Pin ③
  Bolt ④
  Lock washer ⑤
  Camshaft sprocket
• Install the camshaft end cap.



CAM CHAIN TENSION ADJUSTER

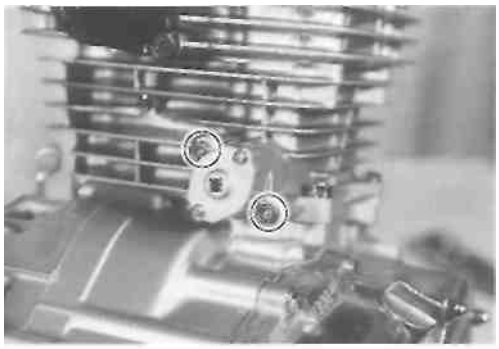
NOTE:

* *Before installing the cam chain tension adjuster, lock the tension spring with a flat-head screwdriver.*
* *Before installing the cam chain tension adjuster, turn the crankshaft counterclockwise to remove any cam chain slack between the cam chain drive sprocket and camshaft sprocket.*

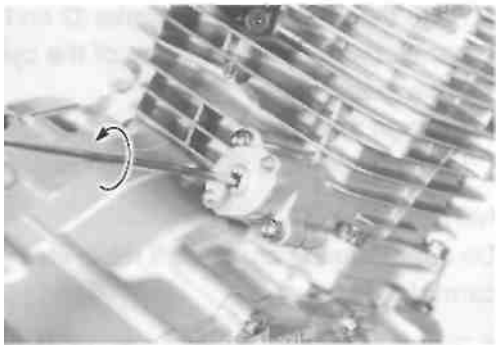


* Install a new gasket and the cam chain tension adjuster onto the cylinder with the two bolts and tighten them to the specified torque.

Cam chain tension adjuster bolt:
7 N-m (0.7 kg-m, 5.0 lb-ft)



• After installing the cam chain tension adjuster, turn the screwdriver counterclockwise. As the slot in the cam chain tension adjuster turns, the tension rod advances under the spring force and pushes the cam chain tension adjuster against the cam chain.



A CAUTION

After installing the cam chain tension adjuster, check the cam chain slack to make sure that the cam chain tension adjuster is working properly.

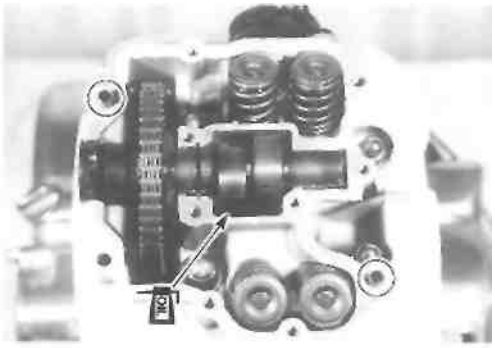
• Fit the rubber cap.

CYLINDER HEAD COVER

- Pour motor oil in the oil pocket in the cylinder head.

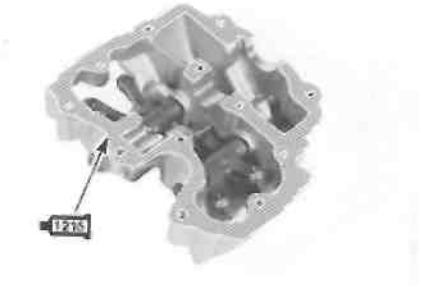
NOTE:
Turn the crankshaft and check that all the moving parts (e.g., cam follower, camshaft) work properly.

- Clean the mating surfaces of the cylinder head and head cover.
- Install the dowel pins.



- Apply SUZUKI BOND N0.1215 uniformly to the mating surface of the cylinder head cover and install it within a few minutes.

1215 99000-31110: SUZUKI BOND N0.1215

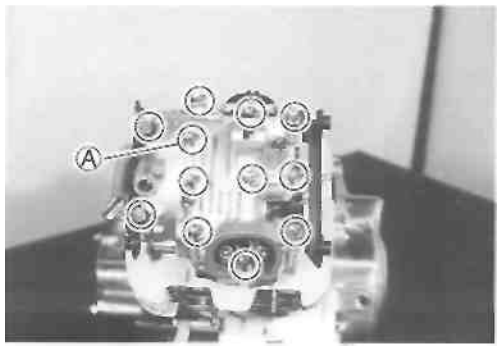


- Tighten the cylinder head cover bolts to the specified torque.

Cylinder head cover bolt: 10 N ■ m (1.0 kg-m, 7.0 lb-ft)

I A CAUTION |

Install the new gasket washer to the bolt Ⓐ



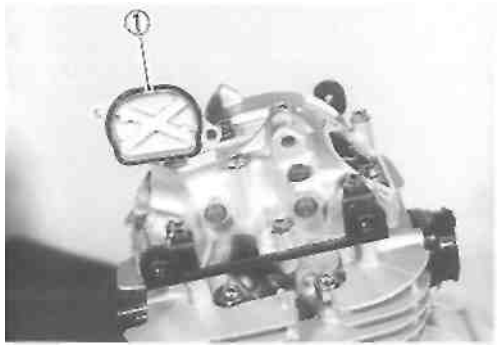
A CAUTION

Be sure to check the valve clearance. (See pp. 2-3 and -4.)

- Install the valve timing inspection caps.

CAUTION

Use new O-rings ①to prevent oil leakage.



FUEL AND LUBRICATION SYSTEM

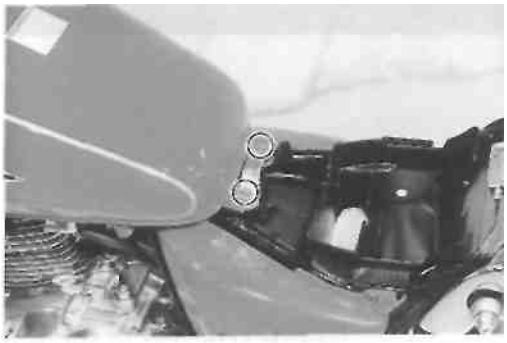
---------- CONTENTS ----------

FUEL TANK AND FUEL VALVE

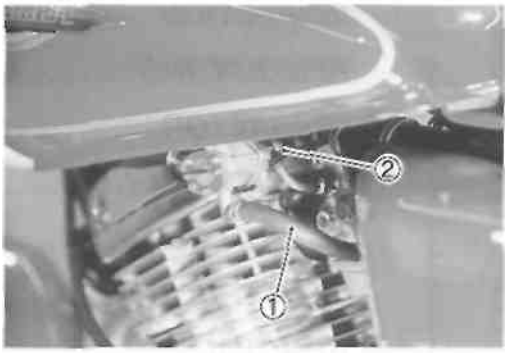
REMOVAL

A WARNING

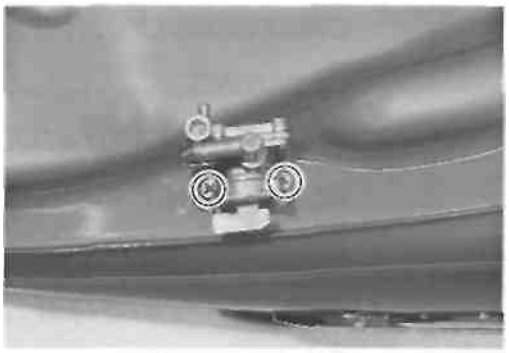
Gasoline is very explosive. Extreme care must be taken.



- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank mounting bolts.
- Turn the fuel valve to "ON" or "RES" position.
- Disconnect the fuel hose①and vacuum hose②
- Remove the fuel tank.



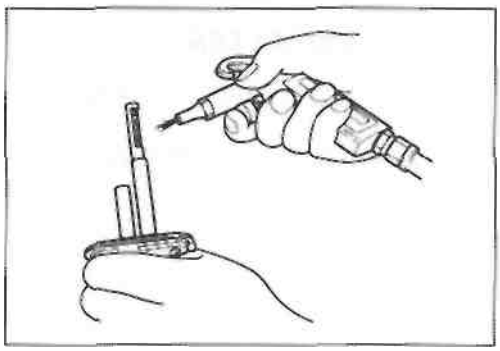
- Remove the fuel valve.



INSPECTION

FUEL VALVE

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. Also check the fuel filter for cracks.



AWARNING

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

REMOUNTING

- Remount the fuel tank and fuel valve in the reverse order of removal.

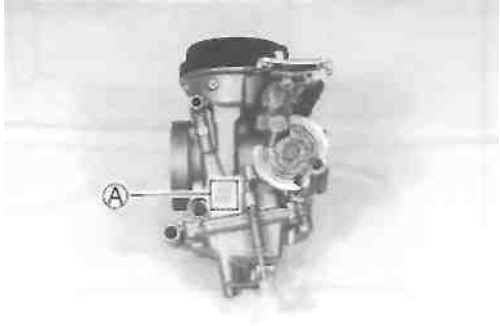
CARBURETOR

SPECIFICATIONS

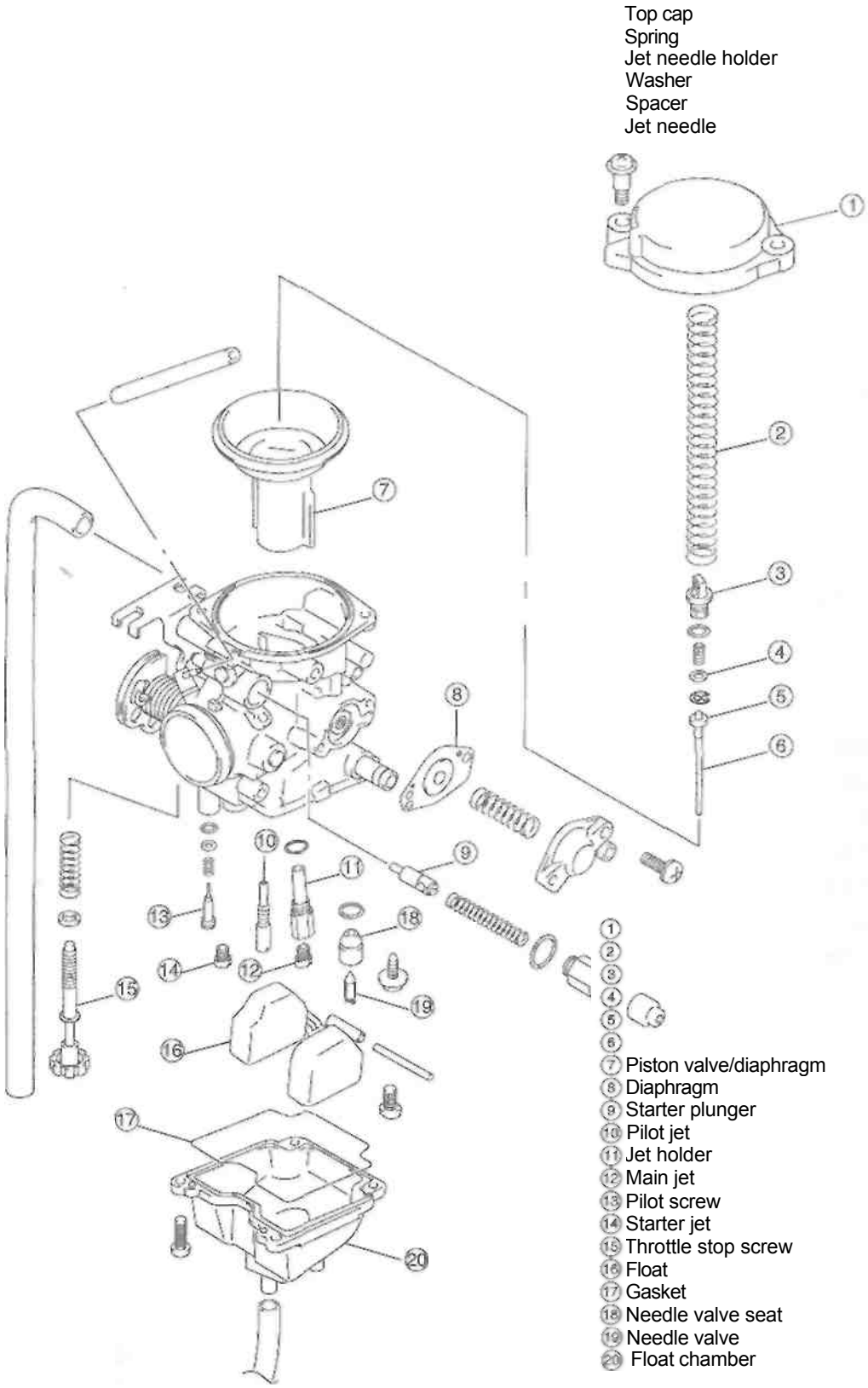
ITEM		SPECIFICATION	
		E-01, 02, 04, 25, 34	E-17, 22, 24
Carburetor type		MIKUNI BSR32SS	←
Bore size		32 mm	←
I.D. No		13F0	13F2
Idle r/min.		1 300 ± 100 r/min.	←
Float height		13.0 ±0.5 mm	←
Main jet	(M.J.)	#115	←
Jet needle	(J.N.)	5C60-3rd	←
Needle jet	(N.J.)	P-0	←
Pilot jet	(P.J.)	#17.5	←
Pilot air jet No. 1	(P.A.J.1)	#87.5	←
Pilot air jet No.2	(P.A.J.2)	#140	←
Throttle valve	(Th.V.)	#110	←
Pilot screw	(PS.)	2½ turns out	$1\frac{3}{8}$ turns out
Throttle cable play		2-4 mm (0.08-0.16 in)	
Starter plunger cable play		0.5-1.0 mm (0.02-0.04 in)	
ITEM		SPECIFICATION	
		E-03, 28	E-33
Carburetor type		MIKUNI BSR32SS	←
Bore size		32 mm	←
I.D. No		13F3	13F4
Idle r/min.		1 300 ± 50 r/min.	←
Float height		13.0 ±0.5 mm	←
Main jet	(M.J.)	#120	←
Jet needle	(J.N.)	5C65	←
Needle jet	(N.J.)	P-0M	←
Pilot jet	(P.J.)	#17.5	←
Pilot air jet No. 1	(P.A.J.1)	#87.5	←
Pilot air jet No.2	(P.A.J.2)	#120	←
Throttle valve	(Th.V.)	#110	←
Pilot screw	(PS.)	PRE-SET	←
Throttle cable play		2-4 mm (0.08-0.16 in)	
Starter plunger cable play		0.5-1.0 mm (0.02-0.04 in)	

I.D. NO. LOCATION

The carburetor has I.D. NumberⒶstamped on its body according to its specifications.



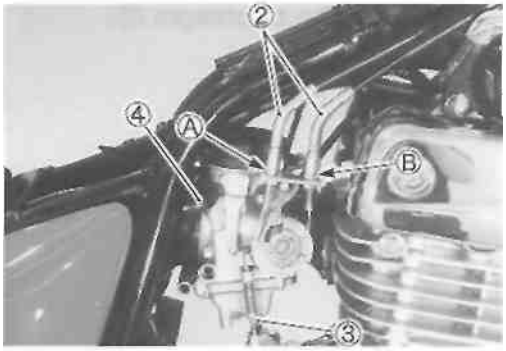
CONSTRUCTION



REMOVAL

- Remove the fuel tank. (See p. 4-1.)
- Remove the starter plunger①

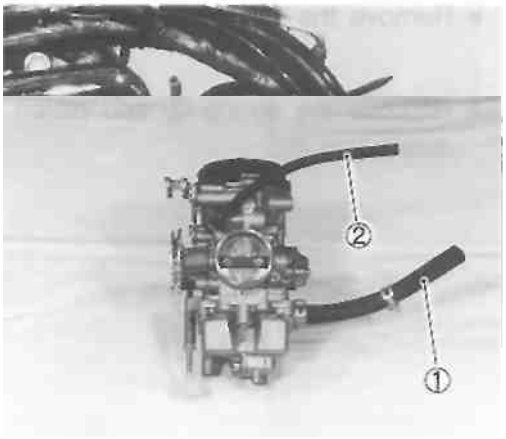
- Loosen the lock nuts(Ⓐ, Ⓑ)and disconnect the throttle cables②
- Remove the overflow hose③and air vent hose④



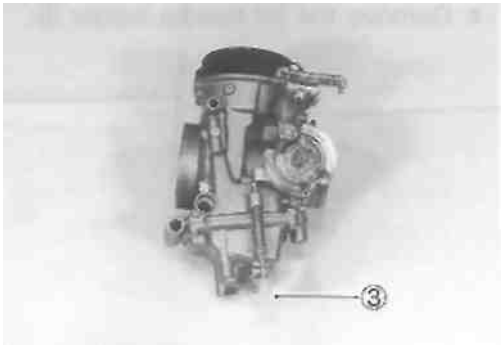
- Loosen the clamp screws.
- Remove the carburetor.

DISASSEMBLY

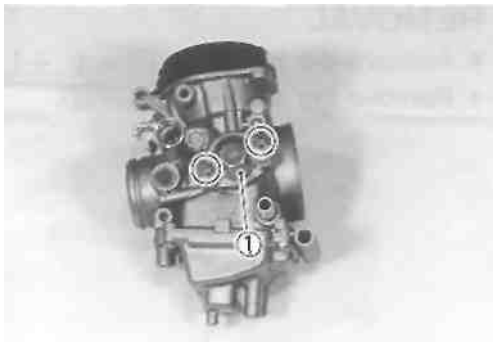
• Remove the fuel hose①and vacuum hose②



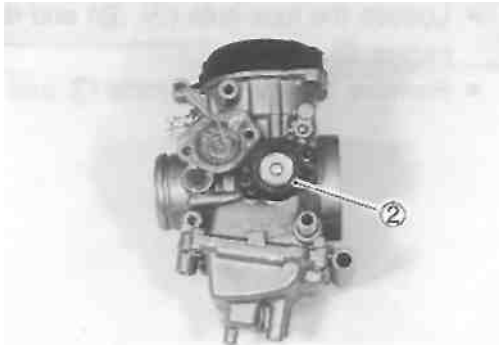
• Remove the throttle stop screw③



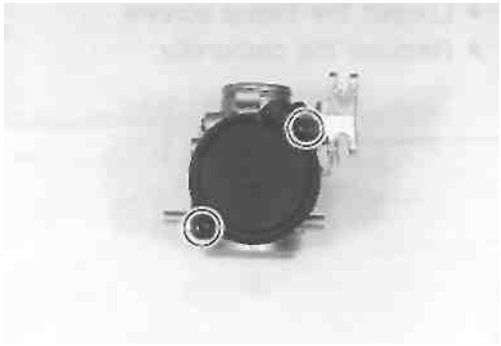
Remove the diaphragm cover ©.



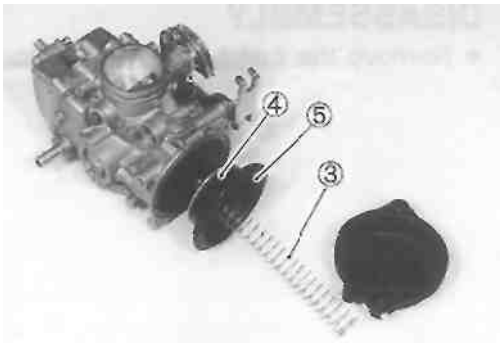
Remove the diaphragm



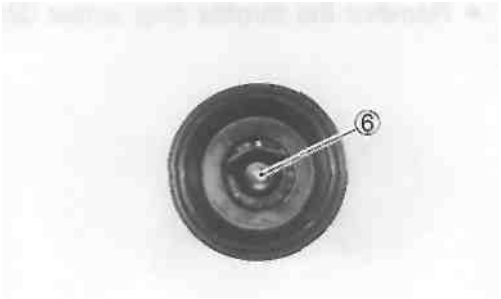
• Remove the carburetor top cap.



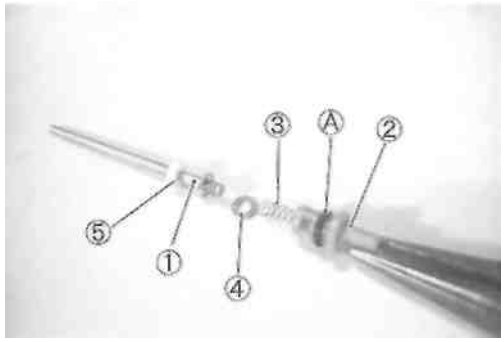
• Remove the spring ③**and** piston valve ④ along with diaphragm⑤



• Remove the jet needle holder⑥.



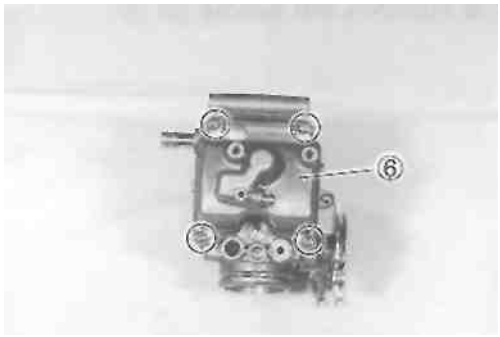
• Remove the jet needle①
② Holder
③ Spring
④ Washer
⑤ Spacer



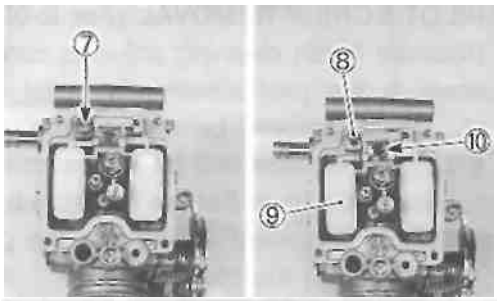
The O-ringⒶshould be replaced with a new one.

A CAUTION

• Remove the float chamber body⑥.



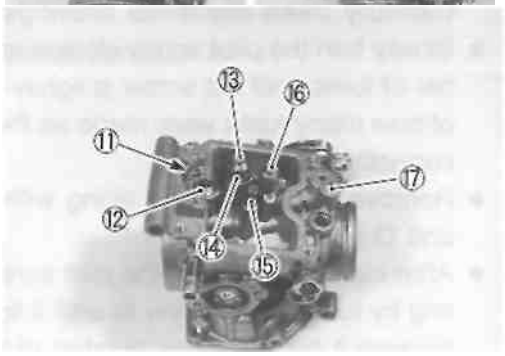
• Remove the screw⑦
• Remove the float pin⑧
• Remove the float assembly ⑨ along with the needle valve⑩.



A CAUTION

Do not use a wire to clean the valve seat.

• Remove the screw⑪and needle valve seat⑫
• Remove the main jet ⑬and jet holder⑭
• Remove the pilot jet⑮
• Remove the starter jet⑯
• Remove the pilot screw⑰

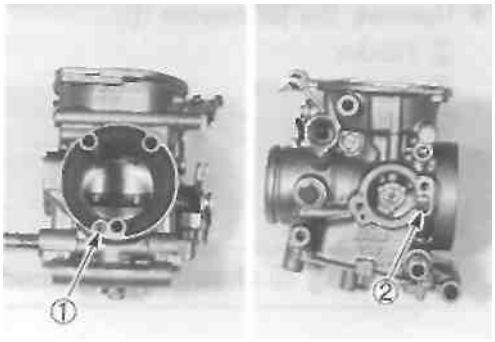


NOTE:
Before removing the pilot screw⑰, its setting must be determined. Slowly turn the pilot screw clockwise and count the number of turns until it is lightly seated. When reassembling the pilot screw, you will want to set it to its original position.

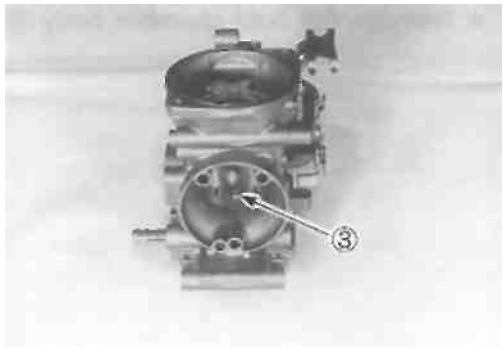
A CAUTION

Do not use a wire to clean the passage and jets.

• Remove the pilot air jet No.1 ①and No.2②



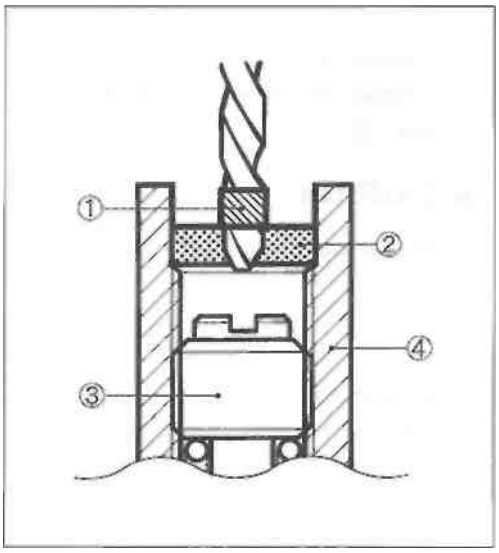
• Remove the needle jet③



PILOT SCREW REMOVAL (For E-03, -28, -33)

Because harsh cleaning solvents can damage the O-rlng seals In the pilot system, the pilot system components should be removed before cleaning.

- 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.
- Slowly turn the pilot screw 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 along with the spring, washer, and O-ring.
- 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 a new plug by tapping it into place with a punch.



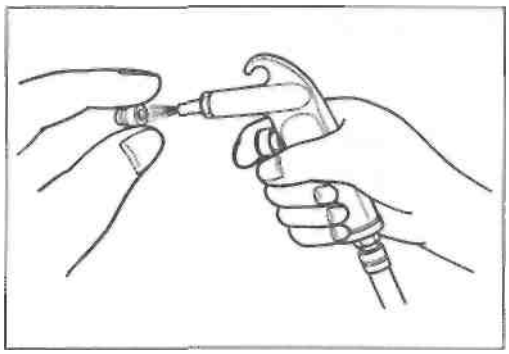
① Drill-stop
② Plug
③ Pilot screw
④ Carburetor body

CLEANING

AWARNING

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

Clean all jets with a spray-type carburetor cleaner and dry them using 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 using compressed air.



A CAUTION

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

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

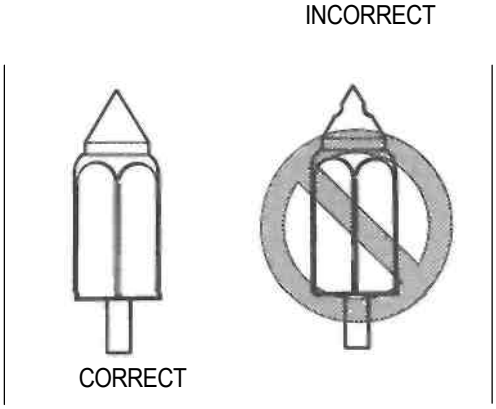
INSPECTION AND ADJUSTMENT

Check the following items for any damage or clogging.

* Pilot jet
* Main jet
* Starter jet
* Diaphragm
* Pilot screw
* Needle jet air bleeding hole
* Float
* Needle valve
* Gasket and O-ring
* Pilot outlet and by-pass holes

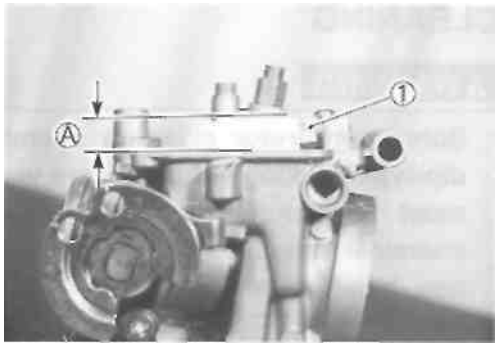
NEEDLE VALVE INSPECTION

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



FLOAT HEIGHT ADJUSTMENT

To check the float height, turn the carburetor upside down. Measure the float height Ⓐ while the float arm is just contacting the needle valve using vernier calipers. Bend the tongue ① as necessary to bring the float height Ⓐ to the specified value.



Float height Ⓐ: 13.0 ±0.5 mm (0.51 ±0.02 in)

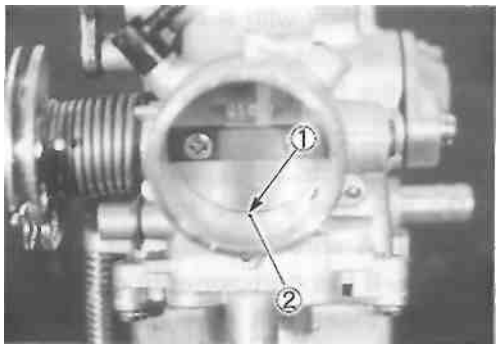
09900-20101: Vernier calipers

TOOL

REASSEMBLY

Reassemble the carburetor in the reverse order of disassembly.

Pay attention to the following points: • Turn the throttle stop screw until the throttle valve's bottom end ① is aligned with the foremost by-pass port ②



NOTE:

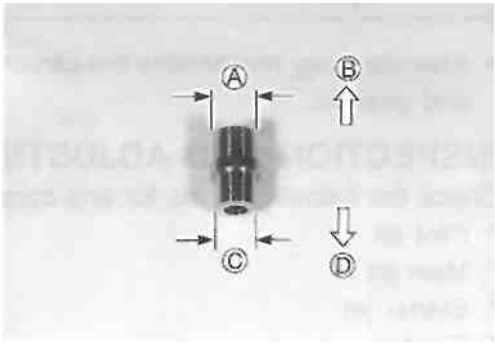
*When removing the throttle valve, applying a small quantity of **THREAD LOCK** "1342" to the throttle valve mounting screws and tighten them.*

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

A CAUTION

Face the stamped side of the throttle valve out.

• Install the needle jet as shown.



Ⓐ Large diameter side Bore
Ⓑ side
Ⓒ Small diameter side
Ⓓ Main jet side

REMOUNTING

Remount the carburetor in the reverse order of removal.

* Adjust the following items to the specification.
* Engine idle r/min ..... See pp. 2-7 and -8.
* Throttle cable play ..... **See** p. 2-8.
* Starter plunger cable play ..... See p. 2-9.

LUBRICATION SYSTEM

OIL PRESSURE

See p. 2-19.

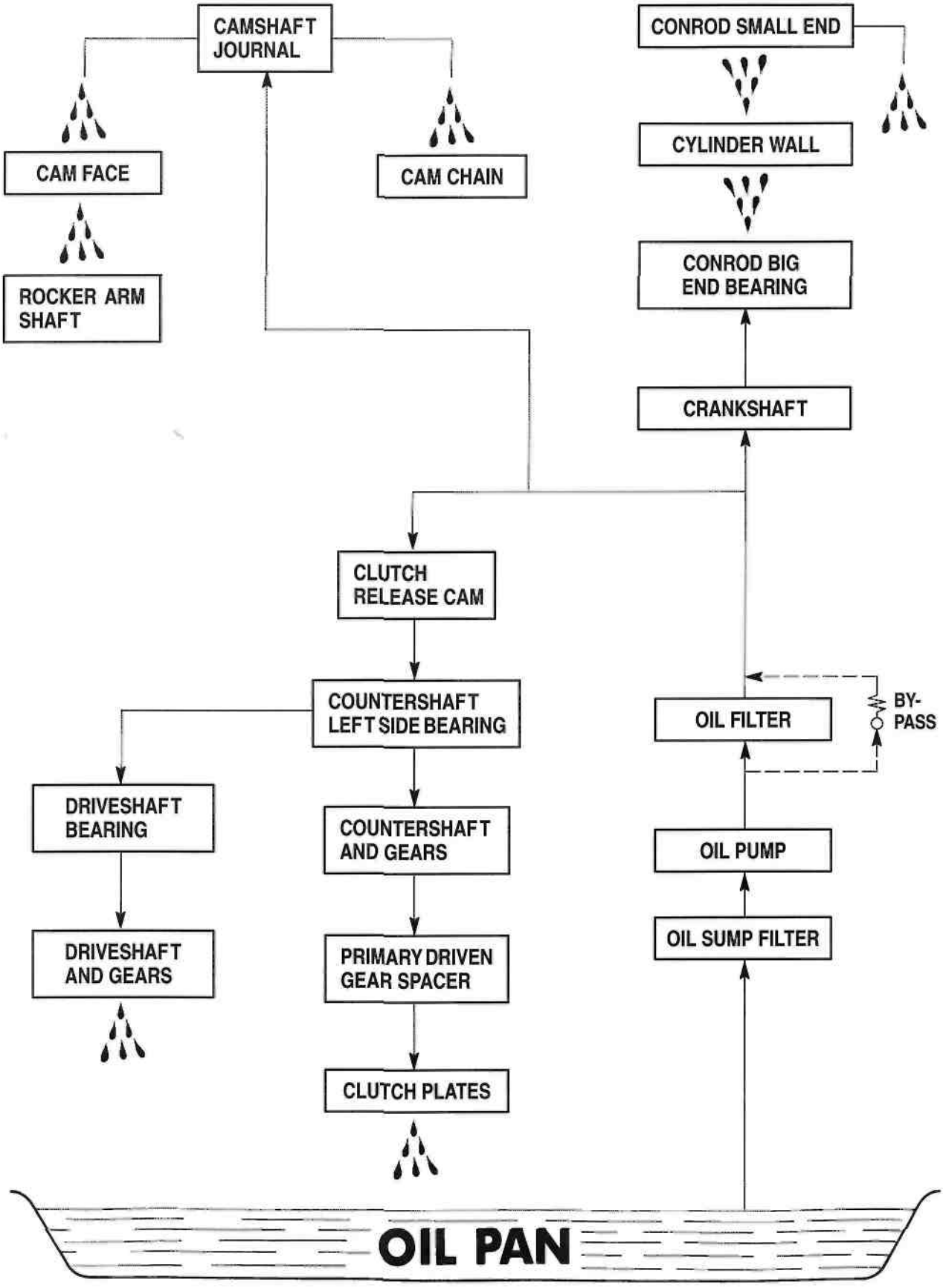
OIL FILTER

See pp. 2-9 and -10.

OIL SUMP FILTER

When replacing the engine oil, make sure that the oil sump filter has no tears or damage. Also, be sure to clean the oil sump filter periodically. (See pp. 3-16, -47 and -51.)

ENGINE LUBRICATION SYSTEM CHART



CHASSIS

---------- CONTENTS ----------

EXTERIOR PARTS

REMOVAL

FRONT SEAT

• Remove the seat with the ignition key.

RIGHT FRAME COVER

- Remove the screw.
- Remove the right frame cover.

☆ hooked part

LEFT FRAME COVER

- Remove the screw.
- Remove the left frame cover.

☆ hooked part

• Remove the seat lock.

REAR SEAT

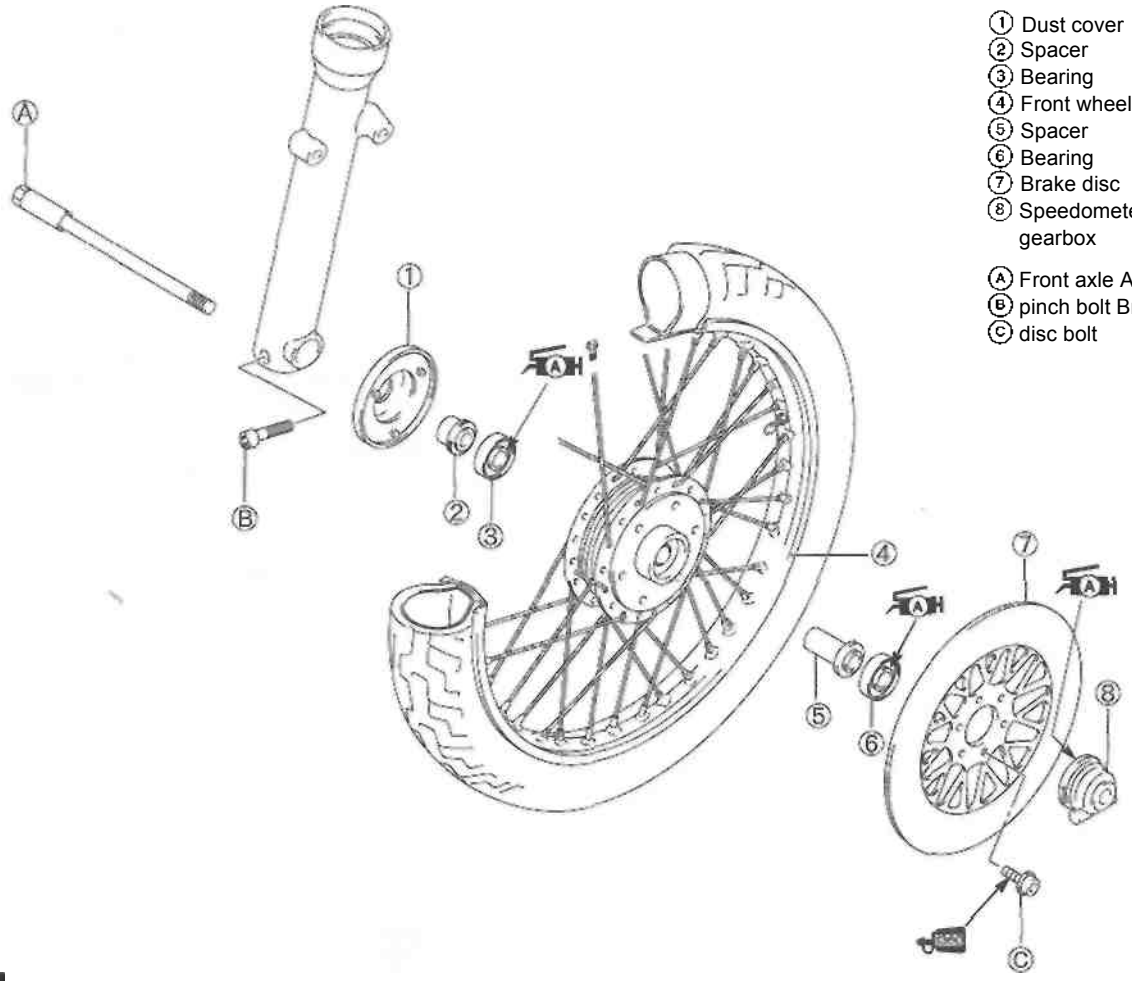
• Remove the rear seat by removing the bolts.

REMOUNTING

Remount the seats, frame covers, front and rear fenders in the reverse order of removal.

FRONT WHEEL

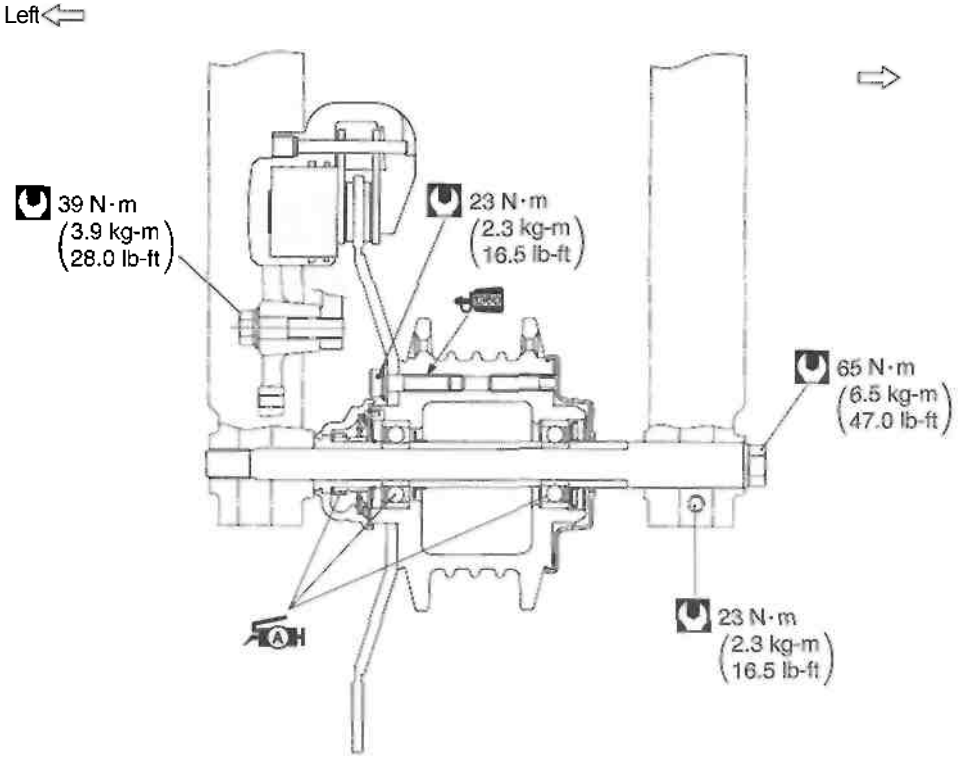
CONSTRUCTION



① Dust cover
② Spacer
③ Bearing
④ Front wheel
⑤ Spacer
⑥ Bearing
⑦ Brake disc
⑧ Speedometer gearbox

Ⓐ Front axle Axle
Ⓑ pinch bolt Brake
Ⓒ disc bolt

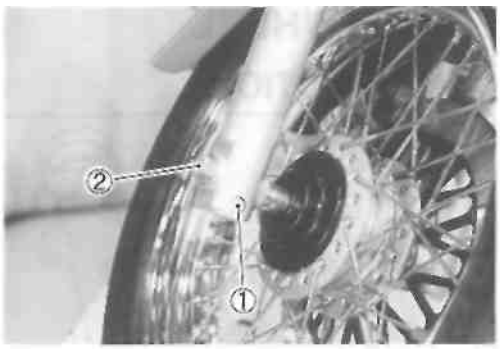
ITEM	N-m	kg-m	lb-ft
Ⓐ	**65**	**6.5**	47.0
Ⓑ	**23**	**2.3**	16.5
Ⓒ	**23**	**2.3**	16.5


Left
39 N·m
(3.9 kg-m
28.0 lb-ft)
23 N·m
(2.3 kg-m
16.5 lb-ft)
65 N·m
(6.5 kg-m
47.0 lb-ft)
23 N·m
(2.3 kg-m
16.5 lb-ft)
A

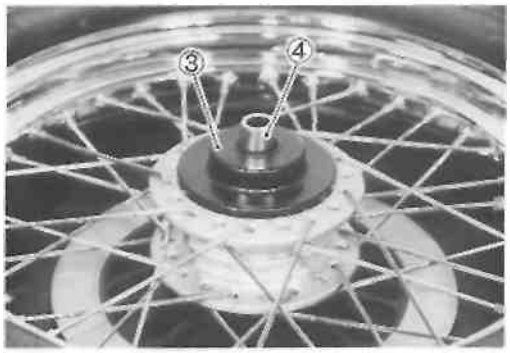
REMOVAL

FRONT WHEEL

- Loosen the axle pinch bolt①
- Loosen the front axle②
- Raise the front wheel off the ground with a jack or wooden block.
- Remove the front wheel by removing the front axle②

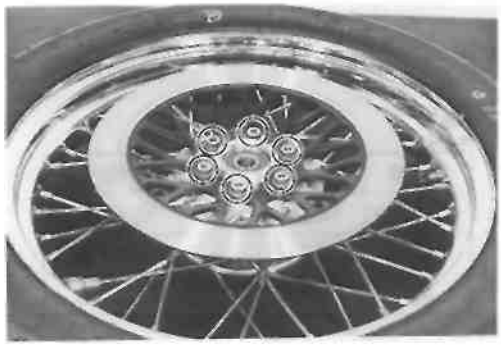


- Remove the dust cover③and spacer④



- Remove the brake disc.

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



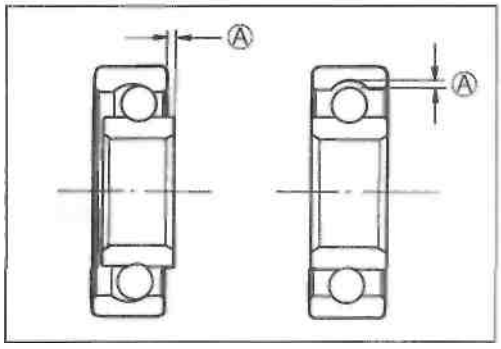
INSPECTION AND DISASSEMBLY

SPEEDOMETER GEARBOX

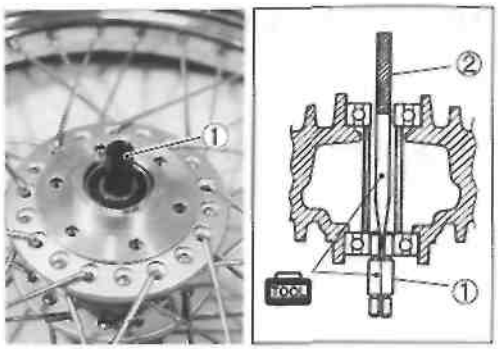
Turn the speedometer gear and check to see that the gear turns smoothly together with the speedometer pinion.

WHEEL BEARINGS

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



Remove the wheel bearings as follows:
- Insert the adapter ① into the wheel bearing.
- After inserting the wedge bar ② from the opposite side, lock the wedge bar into the slit of the adapter.
- Drive out both bearings by striking the wedge bar.



TOOL 09941-50111: Bearing remover

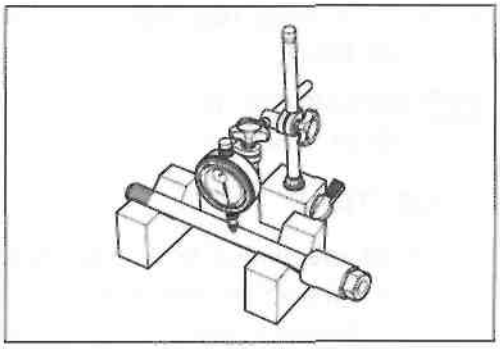
A CAUTION

The removed bearings should be replaced with new ones.

FRONT AXLE

Measure the front axle runout using the dial gauge. If the runout exceeds the limit, replace the front axle.

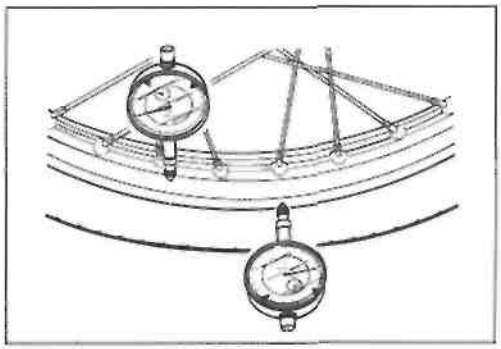
TOOL **09900-20606: Dial gauge (1/100) 09900-20701: Magnetic stand 09900-21304: V-block set (100 mm)**



Service Limit: 0.25 mm (0.010 in)

WHEEL

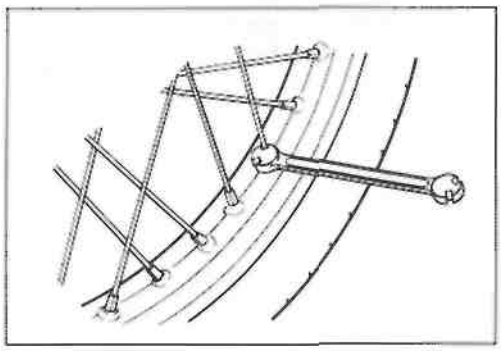
Make sure that the wheel runout (axial and radial) does not exceed the service limit when checked as shown. An excessive amount of runout is usually due to worn or loose wheel bearings and can be corrected by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.



Service Limit (axial and radial): 2.0 mm (0.08 in)

SPOKE NIPPLE

Check to be sure that all nipples are tight, and retighten them as necessary using a spoke nipple wrench.

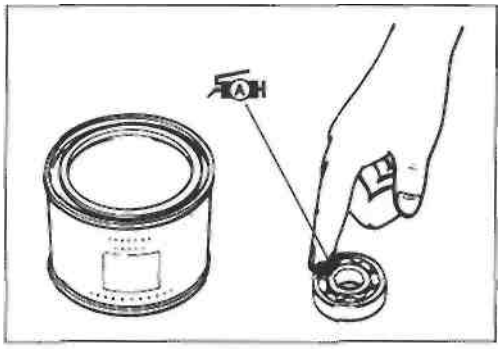


TOOL 09940-60113: Spoke nipple wrench Spoke nipple: 4.5 N-m (0.45 kg-m, 3.5 lb-ft)

REASSEMBLY

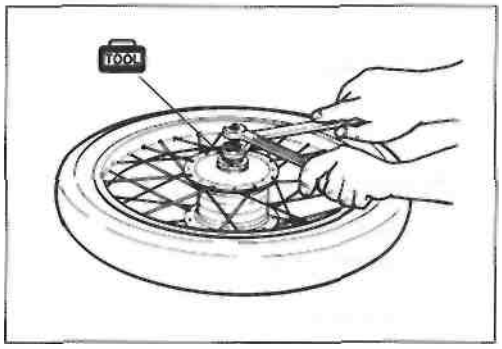
• Apply SUZUKI SUPER GREASE "A" to the bearings before installing.

99000-25010: SUZUKI SUPER GREASE "A"



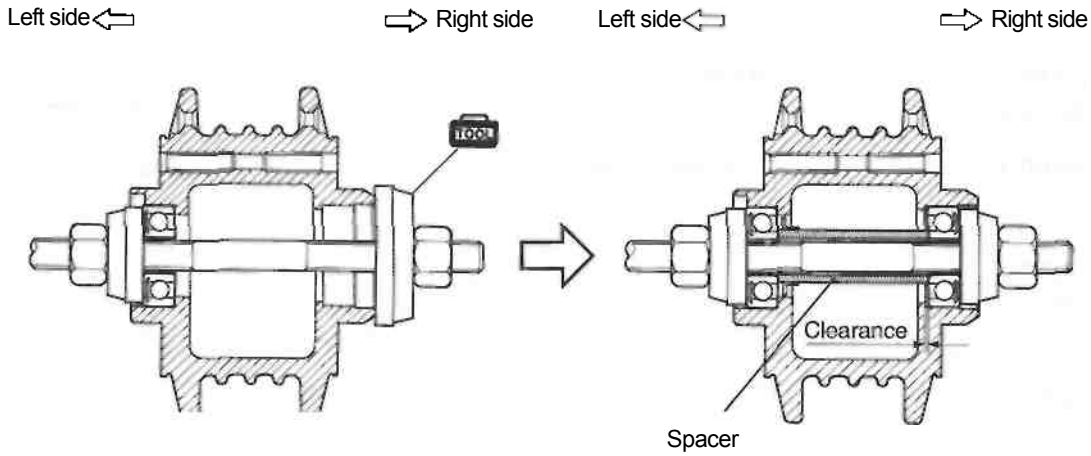
• Install the wheel bearings using the special tools as described below.

09924-84510: Bearing installer set
09924-84521: Bearing installer set



CAUTION

* First install the left wheel bearing, then install the right wheel bearing.
* The sealed cover on the bearings must face to the outside.



BRAKE DISC

• Make sure that the brake disc is clean and free of any grease. Apply THREAD LOCK SUPER "1360" to **the** brake disc 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)

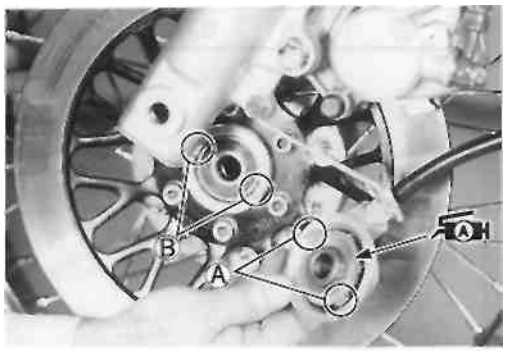
REMOUNTING

Remount the front wheel in the reverse order of removal.
Pay attention to the following points:

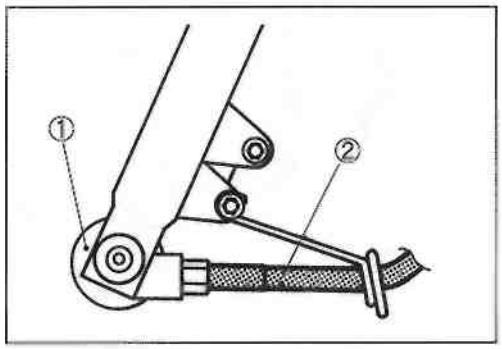
- Apply SUZUKI SUPER GREASE "A" to the speedometer gearbox.

99000-25010: SUZUKI SUPER GREASE "A"

- Align the lugsⒶon the speedometer gearbox with the recessesⒷon the front wheel.



- Set the speedometer gearbox①with cable②as shown in the illustration.

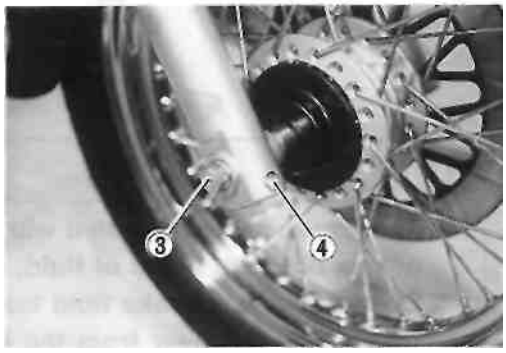


- Tighten the front axle③to the specified torque.

Front axle: 65 N-m (6.5 kg-m, 47.0 lb-ft)

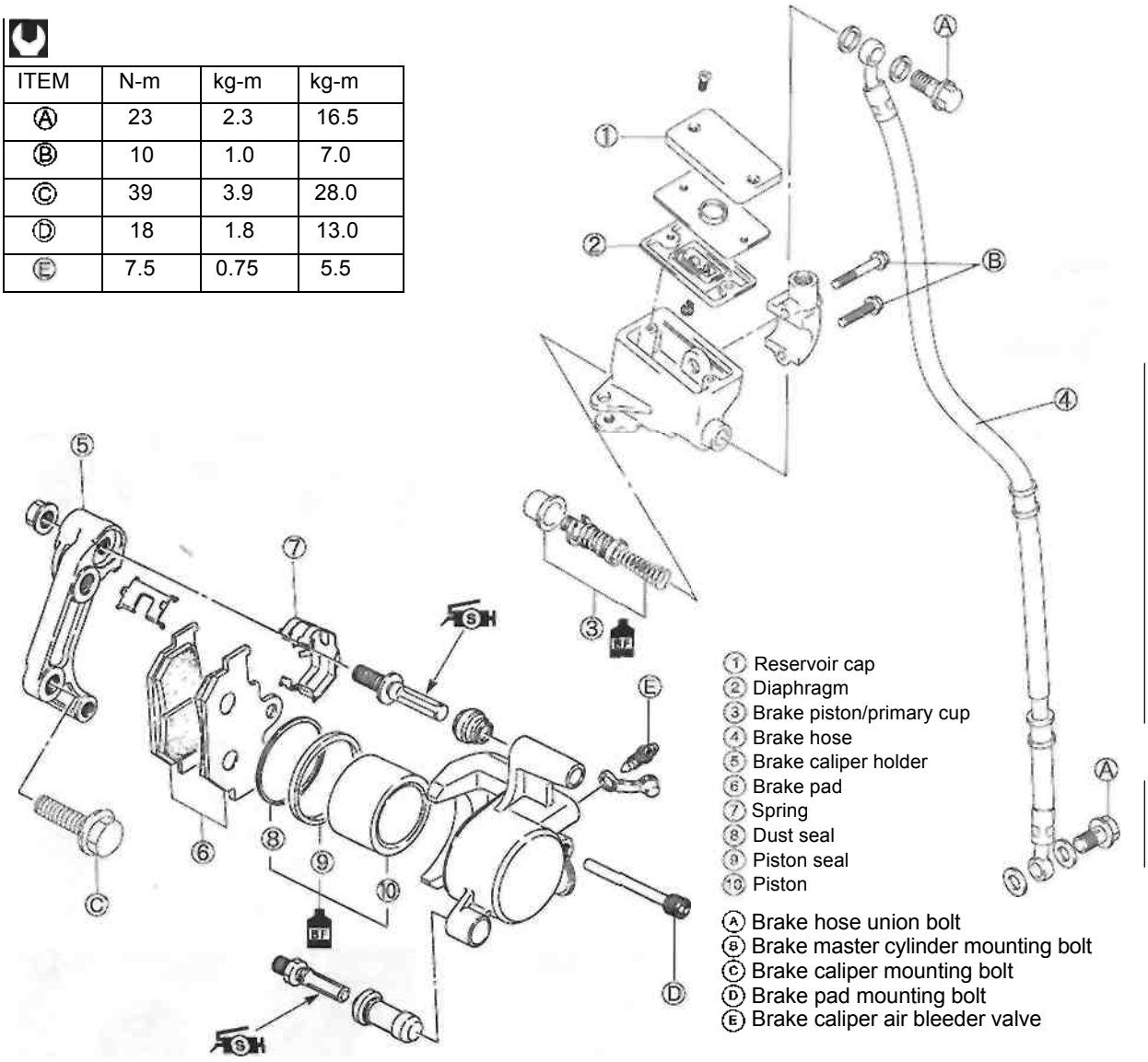
- Tighten the axle pinch bolt @ to the specified torque.

Axle pinch bolt: 23 N-m (2.3 kg-m, 16.5 lb-ft)



FRONT BRAKE
CONSTRUCTION

ITEM	N-m	kg-m	kg-m
Ⓐ	23	2.3	16.5
Ⓑ	10	1.0	7.0
Ⓒ	39	3.9	28.0
Ⓓ	18	1.8	13.0
Ⓔ	7.5	0.75	5.5



① Reservoir cap
② Diaphragm
③ Brake piston/primary cup
④ Brake hose
⑤ Brake caliper holder
⑥ Brake pad
⑦ Spring
⑧ Dust seal
⑨ Piston seal
⑩ Piston

Ⓐ Brake hose union bolt
Ⓑ Brake master cylinder mounting bolt
Ⓒ Brake caliper mounting bolt
Ⓓ Brake pad mounting bolt
Ⓔ Brake caliper air bleeder valve

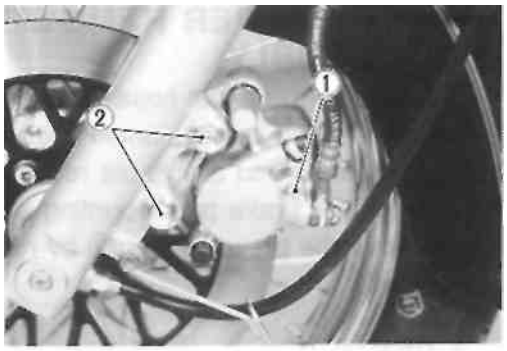
¿WARNING

This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not use or mix different types of fluid, such as silicone-based or petroleum-based brake fluids. Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or which stored for long periods of time. When storing the brake fluid, seal the container completely and keep it away from children.
When replenishing brake fluid, take care not to get dust into the fluid. When washing brake components, use new 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 a neutral detergent.

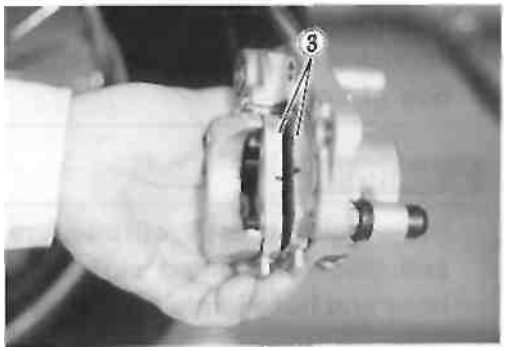
A CAUTION

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

BRAKE PAD REPLACEMENT



- Loosen the brake pad mounting bolt①
- Remove the brake caliper mounting bolts②



- Remove the brake pad mounting bolt①
- Remove the brake pads③

A CAUTION

* Do not operate the brake lever during or after brake pad removal.
* Replace the brake pads as a set, otherwise braking performance will be adversely affected.

- Install the new brake pads and brake pad mounting bolt.
- Tighten the brake caliper mounting bolts ②and brake pad mounting bolt ①to the specified torque.

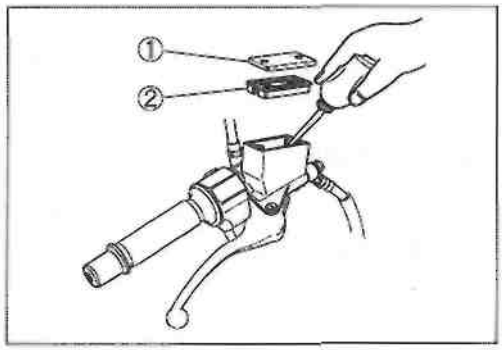
Brake caliper mounting bolt: 39 N-m (3.9 kg-m, 28.0 lb-ft)

Brake pad mounting bolt: 18 N-m (1.8 kg-m, 13.0 lb-ft)

NOTE:

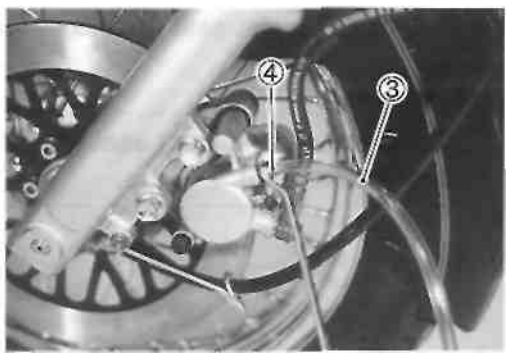
After replacing the brake pads, pump with the brake lever a few times to operate the brake correctly and then check the brake fluid level.

BRAKE FLUID REPLACEMENT



- Place the motorcycle on a level surface and keep the handlebars straight.
- Remove the master cylinder reservoir cap ①and diaphragm②
- Suck up the old brake fluid as much as possible.
- Fill the reservoir with new brake fluid.

Specification and Classification: DOT 4

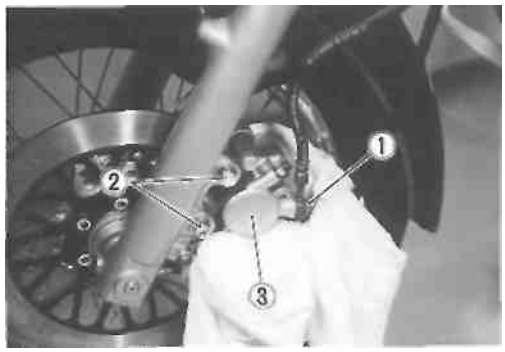


- Connect a cleaner hose③to the air bleeder valve④ and insert the free end of hose into a receptacle.
- Loosen the air bleeder valve and pump the brake lever until the old brake fluid is completely out of the brake system.
- Close the air bleeder valve and disconnect the clear hose. Fill the reservoir with new brake fluid to the upper end of the inspection window.

A CAUTION

Bleed air from the brake system. (See p. 2-13.)

BRAKE CALIPER REMOVAL AND DISASSEMBLY



- Disconnect the brake hose from the brake caliper by removing the brake hose union bolt①and allow the brake fluid to drain into a suitable receptacle.
- Loosen the brake pad mounting bolt.
- Remove the brake caliper③by removing the mounting bolts ②.

A CAUTION

Never reuse the brake fluid left over from previous servicing and which has been stored for long periods of time.

AWARNING

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

- Remove the brake pads. (See p. 5-8.)
- Remove the brake caliper holder④
- Remove the spring⑤

- Place a rag over the brake caliper piston to prevent it from popping out and then force out the piston using compressed air.

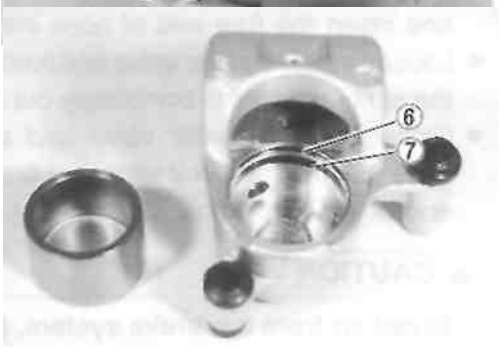
A CAUTION

Do not use high pressure air to prevent brake caliper piston damage.

- Remove the dust seal ⑥and piston seal⑦

A CAUTION

Do not reuse the dust seal and piston seal to prevent brake fluid leakage.



BRAKE CALIPER INSPECTION

BRAKE CALIPER

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

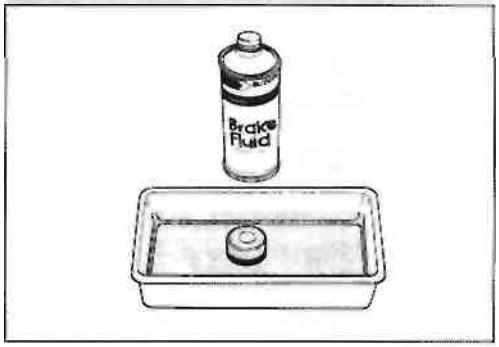
BRAKE CALIPER PISTONS

Inspect the brake caliper piston for any scratches or other damage.

BRAKE CALIPER REASSEMBLY AND REMOUNTING

Reassemble and remount the brake caliper in the reverse order of removal and disassembly. Pay attention to the following points: • Wash the caliper bore and piston with the specified

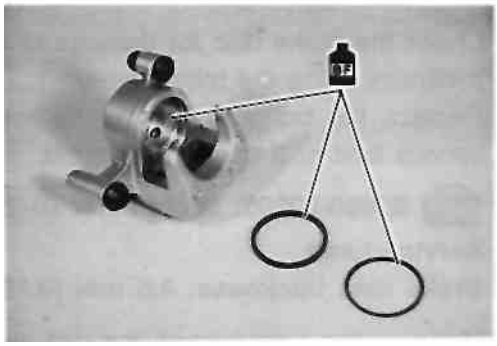
brake fluid. Thoroughly wash the dust seal groove and piston seal groove.



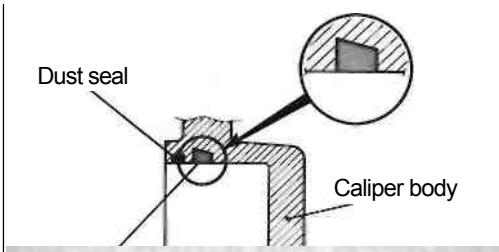
Specification and Classification: DOT 4

A CAUTION

* Wash the brake caliper components with new 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 solvents such as gasoline, ker-osine, etc.
* Replace the piston seal and dust seal with new ones.
* Apply brake fluid to all of the seals, brake caliper bore and piston before reassembly.



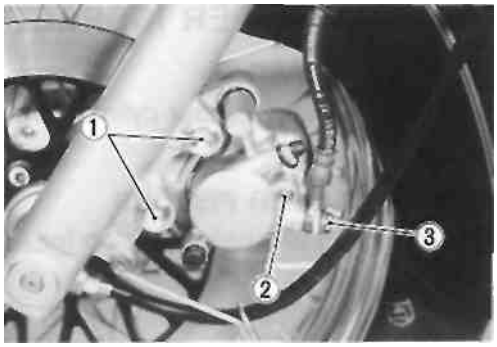
• Install the piston seal as shown in the illustration.



• Apply grease to the brake caliper holder.

99000-25100: SUZUKI SILICONE GREASE

- Tighten the brake caliper mounting bolts①and brake pad mounting bolt ②to the specified torque.
- Tighten the brake hose union bolt ③ to the specified torque.



Brake caliper mounting bolt①
39 N-m (3.9 kg-m, 28.0 lb-ft)
Brake pad mounting bolt②: 18 N-m
(1.8 kg-m, 13.0 lb-ft)
Brake hose union bolt③: 23 N-m
(2.3 kg-m, 16.5 lb-ft)

NOTE:
Before remounting the brake caliper, push the brake caliper piston all the way into the caliper.

***A* CAUTION**

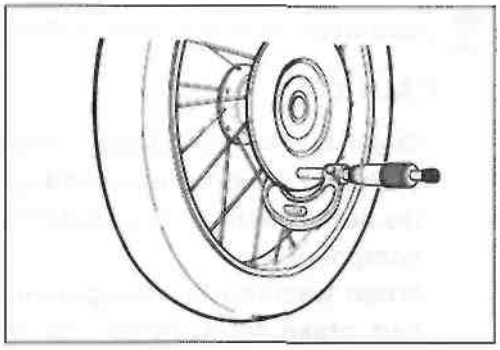
Bleed air from the system after reassembling the brake caliper. (See p. 2-13.)

BRAKE DISC INSPECTION

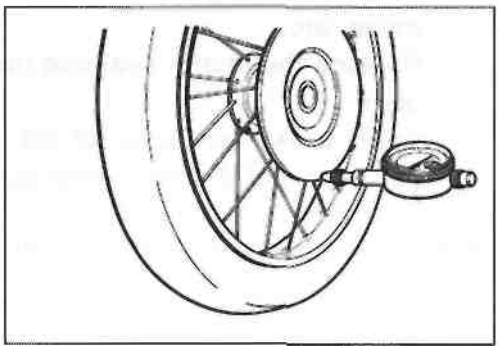
• Remove the front wheel. (See p. 5-3.)

Check the brake disc for damage or cracks. Measure the thickness using the micrometer.
Replace the brake disc if the thickness is less than the service limit or if damage is found.

09900-20205: Micrometer (0-25 mm)
Service Limit Brake disc thickness: 4.5 mm (0.18 in)



Measure the runout using the dial gauge.
Replace the brake disc if the runout exceeds the service limit.

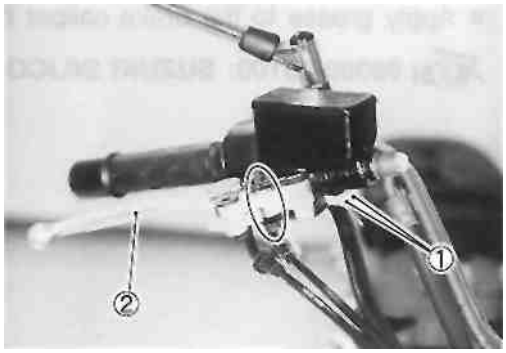


09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand
Service Limit Brake disc runout: 0.30 mm (0.012 in)

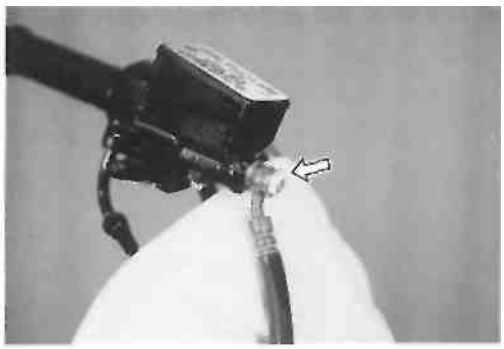
- If either measurement exceeds the service limit, replace the brake disc. (See pp. 5-3 and -5.)
- Install the front wheel. (See p. 5-6.)

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Disconnect the front brake light switch lead wires①
- Remove the brake lever②



- Place a rag underneath the brake hose union bolt on the master cylinder to catch any spilt brake fluid.
- Remove the brake hose union bolt.



A CAUTION

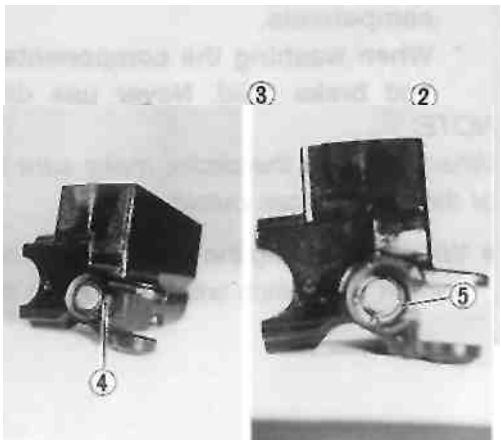
Immediately wipe off any brake fluid contacting any part of the motorcycle. The brake fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

- Remove the master cylinder assembly.

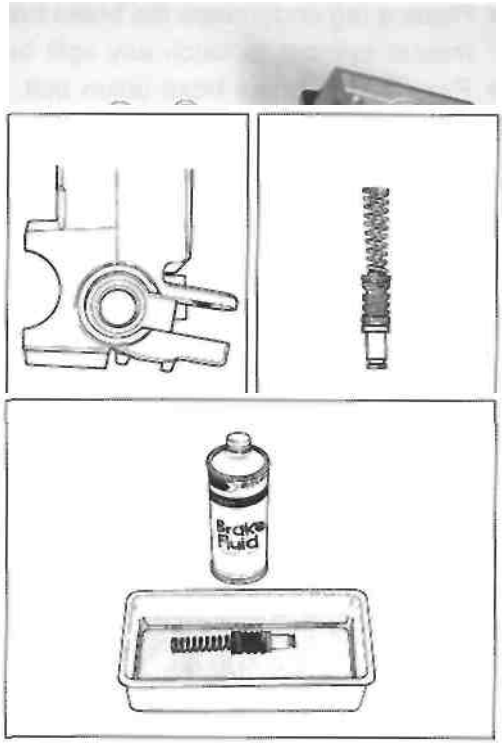
- Remove the front brake light switch①

- Remove the reservoir cap②and diaphragm③
- Drain the brake fluid.
- Remove the dust boot④
- Remove the circlip ⑤ using the special tool.

09900-06108: Snap ring pliers



• Remove the piston/secondary cup⑥and return spring ⑦



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

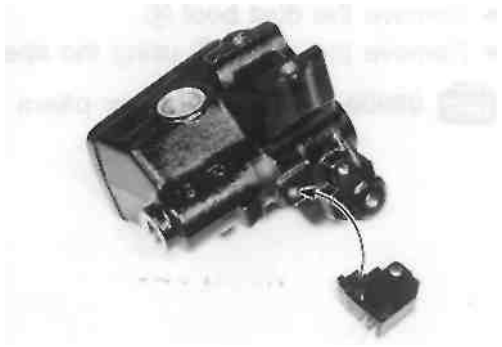
A CAUTION

* **Wash the master cylinder components with new 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 solvents such as gasoline, kerosine, etc.**
* **Apply brake fluid to the master cylinder bore and all of the master cylinder components before reassembly.**

Specification and Classification: DOT 4

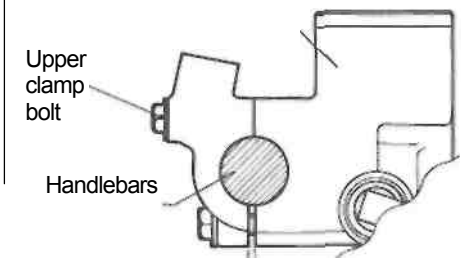
NOTE:
When installing the circlip, make sure that the sharp edge of the circlip faces outside.

• When reinstalling the brake light switch, align the projection on the switch with the hole in the master cylinder.



• When remounting the master cylinder onto the handlebars, align the master cylinder holder's mating surface Ⓐ with punch mark Ⓑ on the handlebars and tighten the upper clamp bolt first.

Master cylinder bolt: 10 N-m (1.0 kg-m, 7.0 lb-ft)



Master cylinder

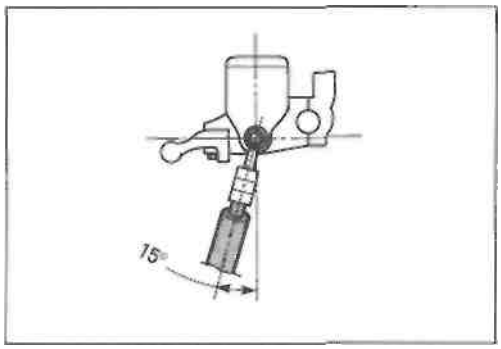
Clearance

• Install the brake hose union as shown and tighten the union bolt to the specified torque.

Brake hose union bolt: 23 N-m (2.3 kg-m, 16.5 lb-ft)

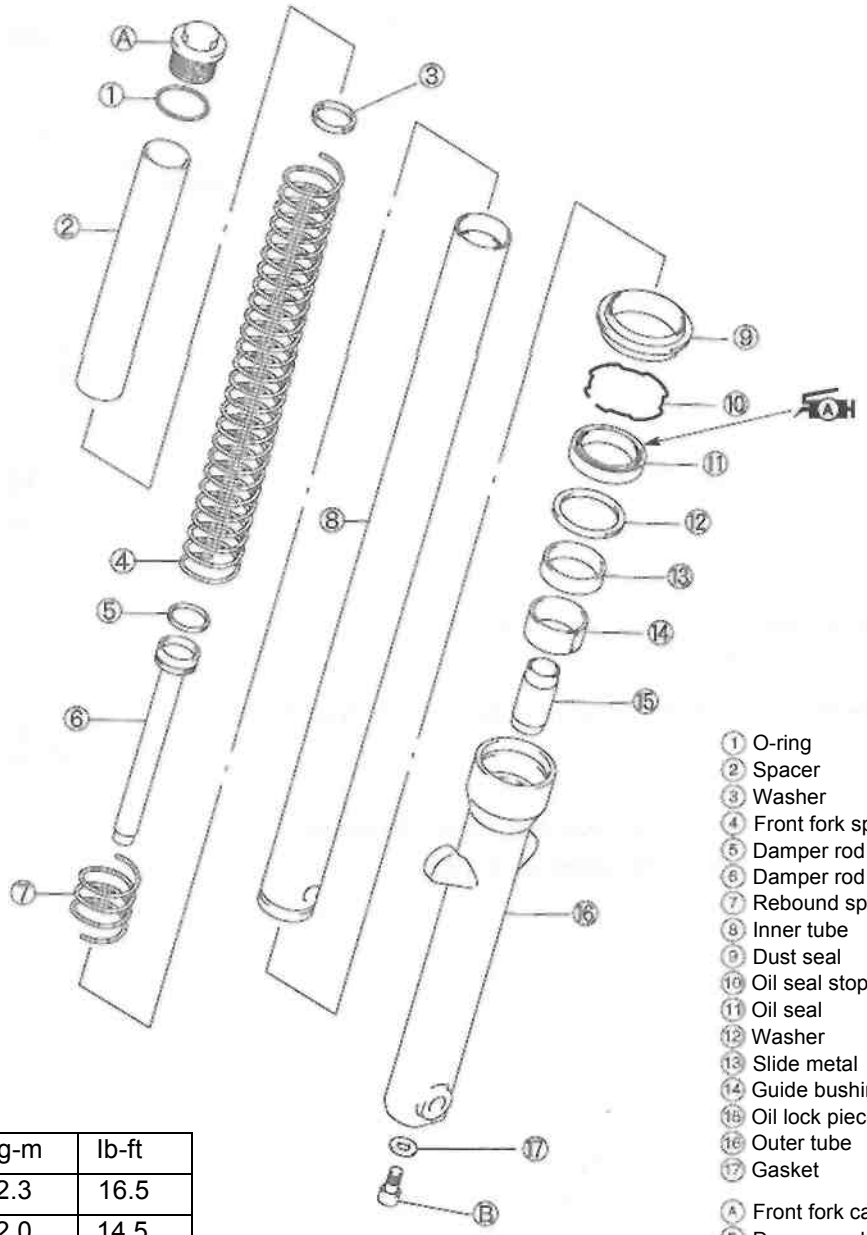
A CAUTION

Bleed air from the brake system after reassembling the master cylinder. (See p. 2-13.)



FRONT FORK

CONSTRUCTION



①	O-ring
②	Spacer
③	Washer
④	Front fork spring
⑤	Damper rod ring
⑥	Damper rod
⑦	Rebound spring
⑧	Inner tube
⑨	Dust seal
⑩	Oil seal stopper ring
⑪	Oil seal
⑫	Washer
⑬	Slide metal
⑭	Guide bushing
⑮	Oil lock piece
⑯	Outer tube
⑰	Gasket
Ⓐ	Front fork cap bolt
Ⓑ	Damper rod bolt

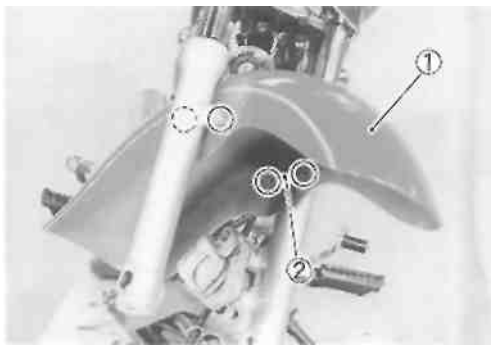
ITEM	N-m	kg-m	lb-ft
Ⓐ	23	2.3	16.5
Ⓑ	20	2.0	14.5

REMOVAL AND DISASSEMBLY

- Remove the front wheel. (See p. 5-3.)
- Remove the brake caliper. (See p. 5-9.)

A CAUTION

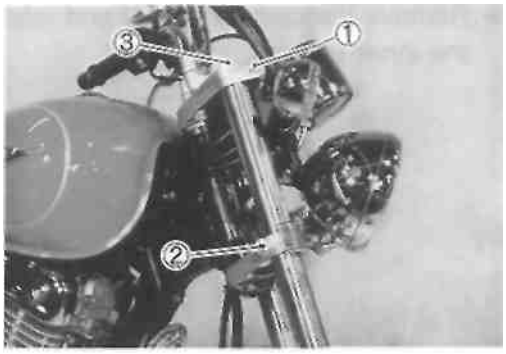
Secure the brake caliper to the frame with a string etc., taking care not to bend the brake hose.



- Remove the speedometer cable guide from the left fork leg.
- Remove the front fender①and brake hose guide②

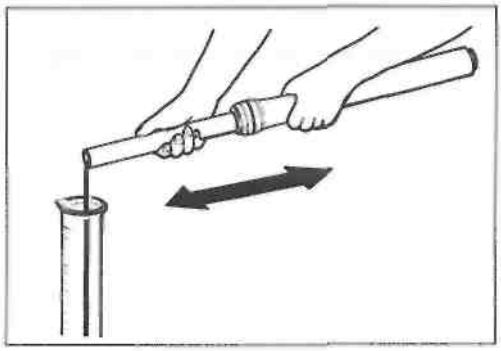
• Remove the front fork after loosening the front fork upper and lower clamp bolts(①, ②)

NOTE:
Slightly loosen the front fork cap bolt③ to facilitate later disassembly.

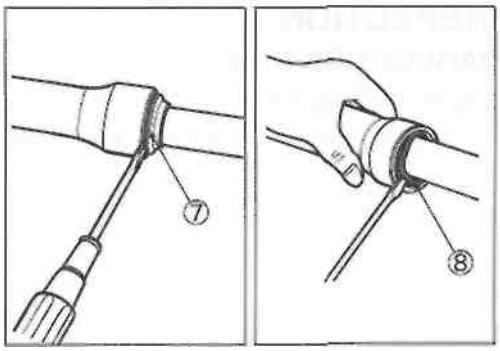


• Remove the front fork cap bolt③, spacer④, washer⑤ and spring⑥

• Invert the front fork and stroke it several times to drain out the fork oil.
• Hold the front fork in the inverted position for a few minutes to allow the fork oil to fully drain.



• Remove the dust seal ⑦and oil seal stopper ring⑧

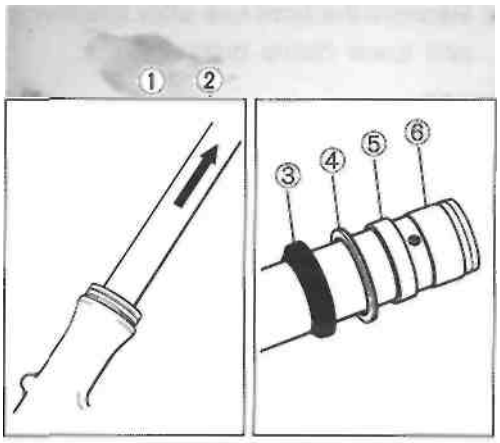


• Remove the damper rod bolt⑨

09900-00410: Hexagon wrench set

TOOL

• Remove the damper rod ① and rebound spring ② from the inner tube.

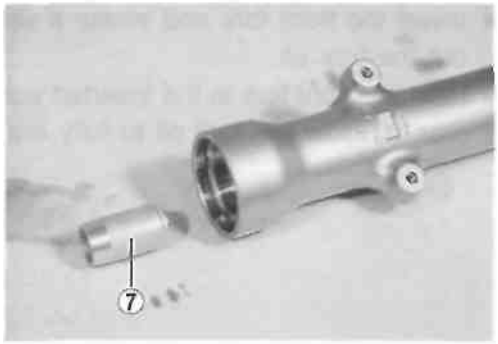


• Separate the inner tube fr ③ the outer tube.
• Remove the following p ④ s.
Oil seal Washer ⑤
Outer tube slide metal ⑥
Inner tube slide metal

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

A CAUTION

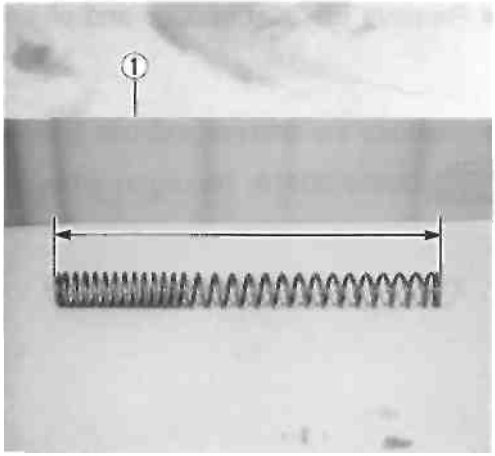
• Remove the oil lock piece ⑦ from the outer tube.



INSPECTION

DAMPER ROD RING

Inspect the damper rod ring ① for wear or damage. If it is worn or damaged, replace it with a new one.

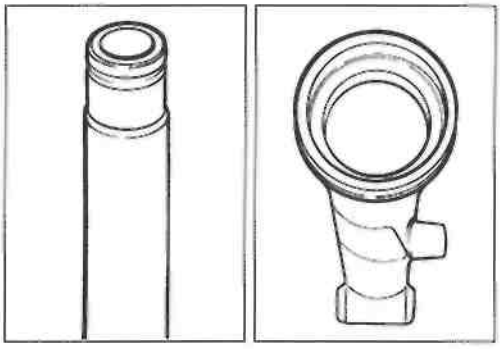


FRONT FORK SPRING

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

Service Limit: 301 mm (11.9 in)

INNER AND OUTER TUBES
Inspect the inner tube sliding surface and outer tube sliding surface for scuffing.

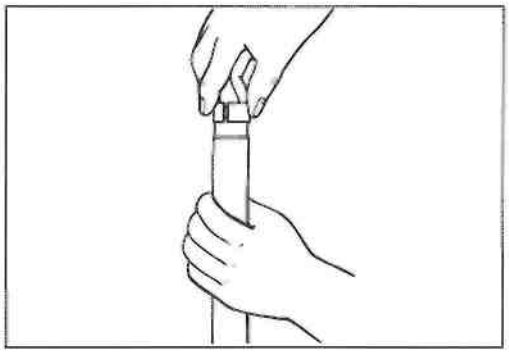


REASSEMBLY AND REMOUNTING

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

I A CAUTION!

* **Wash each metal part with cleaning solvent before reassembly.**
* **Never reuse fork oil left over from the last servicing.**
* **Replace the oil seal and dust seal with new ones during reassembly.**

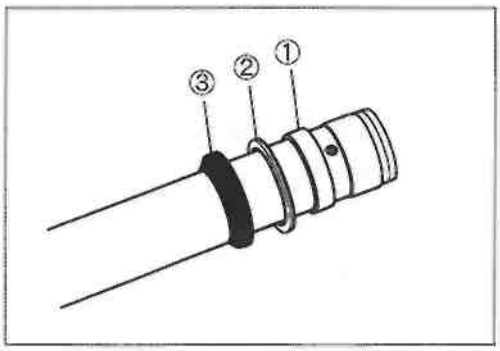


• Hold the inner tube vertically, clean the metal groove and install the slide metal by hand.

I A CAUTION!

Do not damage the Teflon coated surface of the inner tube's slide metal when mounting it.

• Install the outer tube metal①, washer②and oil seal③ to the inner tube.



IA CAUTION]

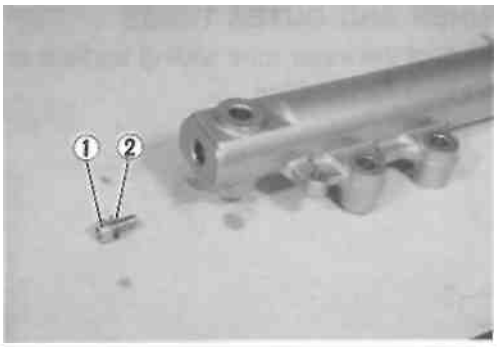
* **When installing the oil seal ③ onto the inner tube, protect their seal lips to prevent seal lip damage.**
* **Before installing the oil seal, apply SUZUKI SUPER GREASE "A" to its seal lip lightly.**

99000-25010: SUZUKI SUPER GREASE "A"

• Tighten the damper rod bolt①to the specified torque.

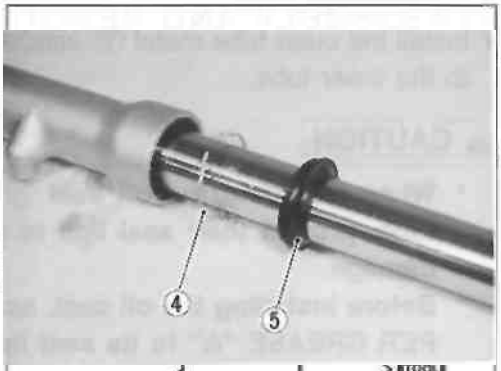
09900-00410: Hexagon wrench set

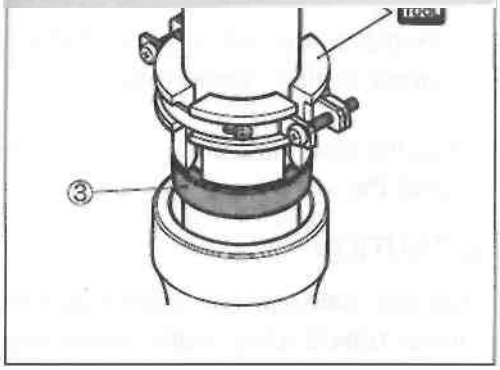
Front fork damper rod bolt: 20 N-m (2.0 kg-m, 14.5 lb-ft)



CAUTION

Use a new damper rod gasket②to prevent oil leakage.





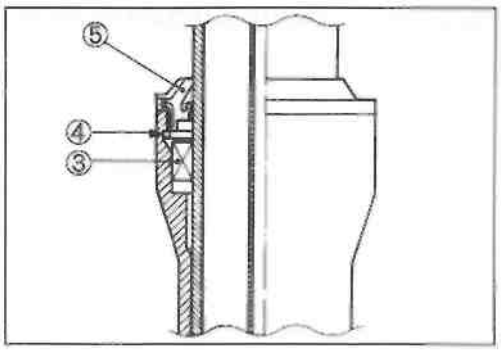
• Install the oil seal stopper ring ④and dust seal⑤

A CAUTION

Make sure that the oil seal stopper ring④is fitted securely.

NOTE:
Before installing the dust seal⑤, apply a small quantity of SUZUKI SUPER GREASE "A" to the lip of dust seal.

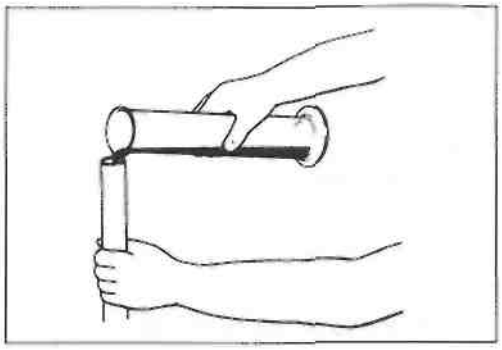
99000-25010: SUZUKI SUPER GREASE "A"



• Pour the specified fork oil into the inner tube.

Fork oil type: SUZUKI FORK OIL SS-08 (#10)
99000-99001-SS8: SUZUKI FORK OIL SS-08

Specification
Front fork oil capacity (each leg):
369 ml (12.5/13.0 US/Imp oz)

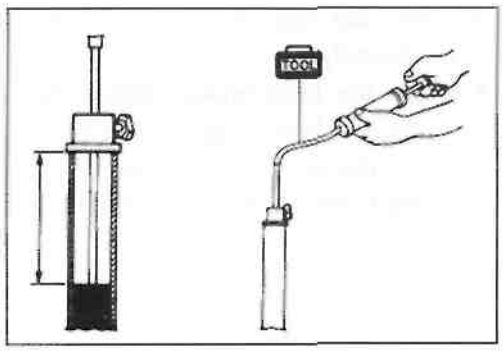


• Hold the front fork leg in a vertical position and adjust the fork oil level using the special tool.

09943-74111: Fork oil level gauge

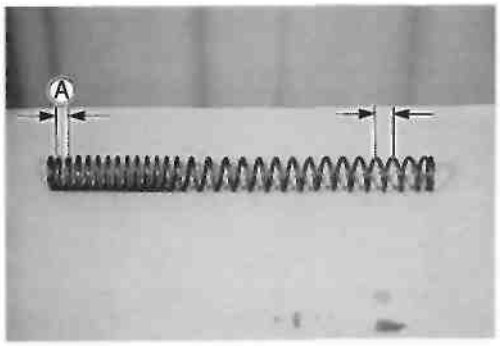
Specification
Front fork oil level: 105 mm (4.1 in)

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



• Install the fork spring as shown.

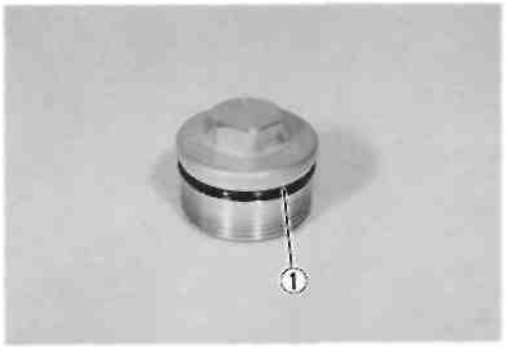
NOTE:
The end of the fork spring with the smaller pitch Ⓐ should be at the bottom of the front fork.



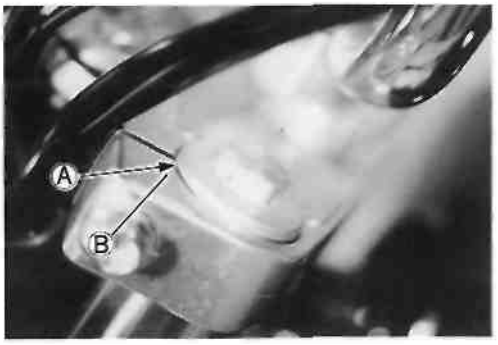
• Install the front fork cap bolt to the inner tube.

A CAUTION

Use a new O-ring ① to prevent oil leakage.

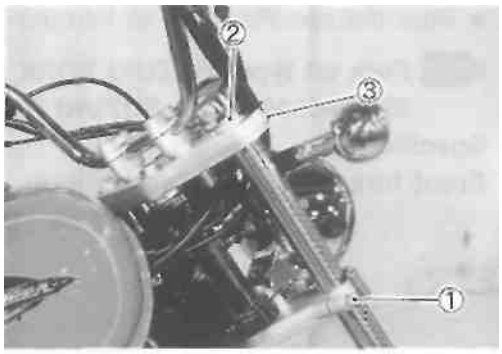


- Install the front fork to the motorcycle.
- Align the upper surface of the inner tube Ⓐ with the upper surface of the steering stem upper bracket Ⓑ

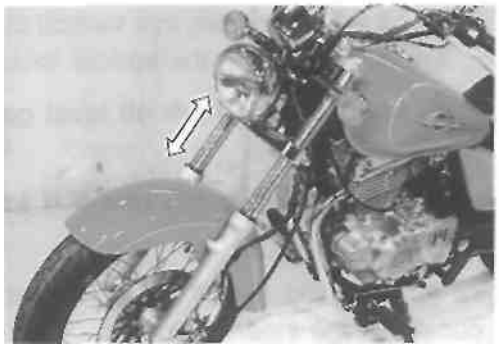


- Tighten the front fork lower clamp bolts① and front fork cap bolts ②to the specified torque.
- Tighten the front fork upper clamp bolts ③to the specified torque.

Front fork upper clamp bolt: 23 N-m (2.3 kg-m, 16.5 lb-ft)
Front fork lower clamp bolt: 33 N • m (3.3 kg-m, 24.0 lb-ft)
Front fork cap bolt: 23 N-m (2.3 kg-m, 16.5 lb-ft)

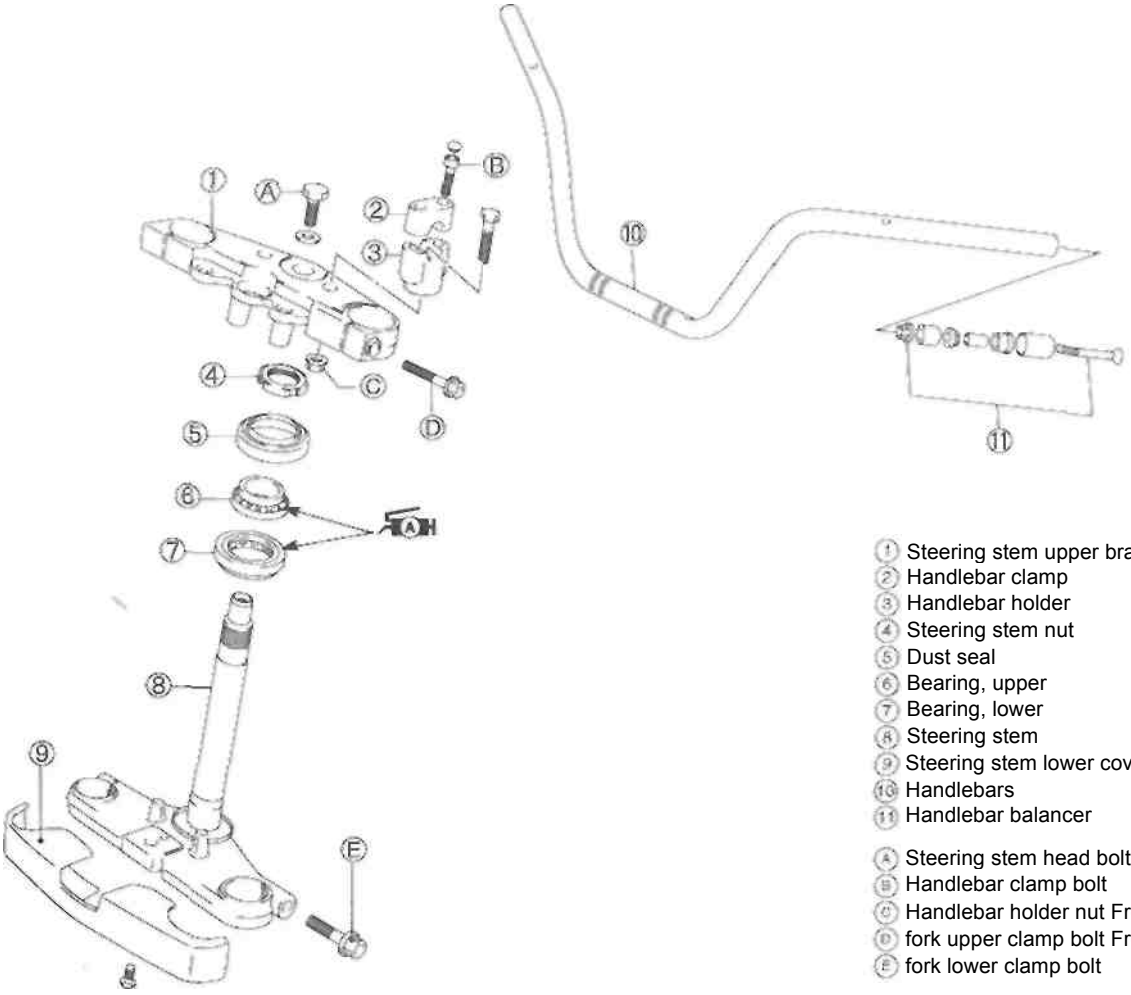


- Install the front fender and tighten the mounting bolts temporarily.
- Install the front brake caliper. (See p. 5-10.)
- Install the front wheel. (See p. 5-8.)
- Move the front fork up and down several times.
- Tighten the front fender mounting bolts securely.



STEERING

CONSTRUCTION



① Steering stem upper bracket
② Handlebar clamp
③ Handlebar holder
④ Steering stem nut
⑤ Dust seal
⑥ Bearing, upper
⑦ Bearing, lower
⑧ Steering stem
⑨ Steering stem lower cover
⑩ Handlebars
⑪ Handlebar balancer

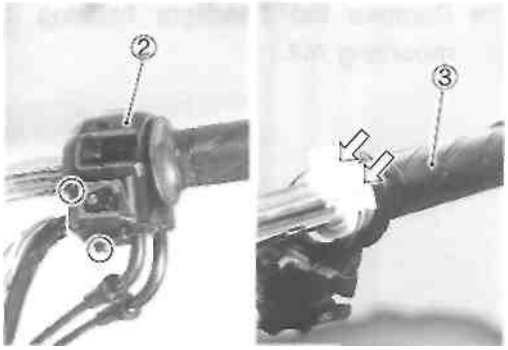
Ⓐ Steering stem head bolt
Ⓑ Handlebar clamp bolt
Ⓒ Handlebar holder nut Front
Ⓓ fork upper clamp bolt Front
Ⓔ fork lower clamp bolt

ITEM	N-m	kg-m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	16	1.6	11.5
Ⓒ	45	4.5	32.5
Ⓓ	23	2.3	16.5
Ⓔ	33	3.3	24.0

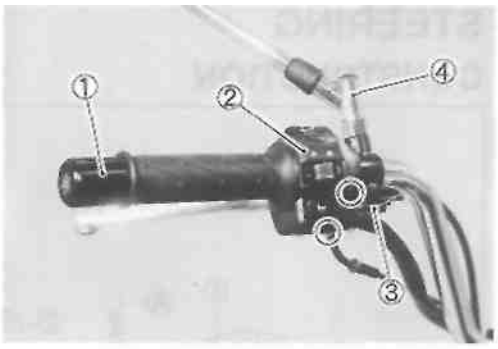
REMOVAL AND DISASSEMBLY

- Remove the front wheel. (See p. 5-4.)
- Remove the front fork. (See p. 5-15.)
- Disconnect the front brake light switch lead wires.
- Remove the front brake master cylinder.
- Remove the right handlebar balancer①.

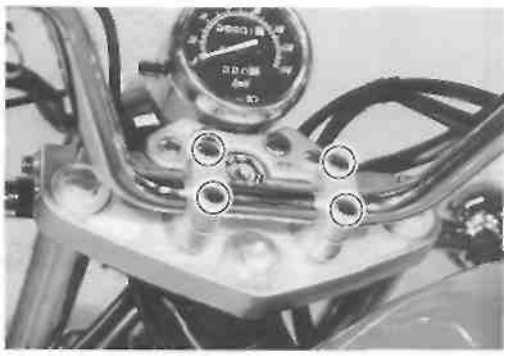
- Remove the handlebar right switch②
- Disconnect the throttle cables and remove the throttle grip ③.



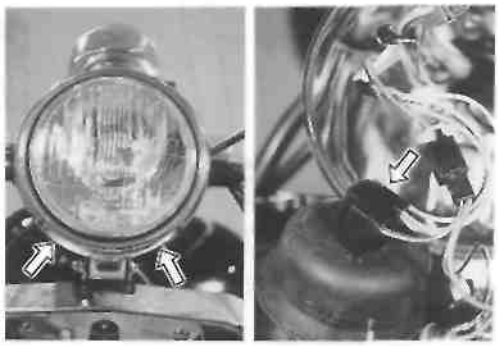
- Remove the left handlebar balancer①.
- Remove the handlebar left switch②
- Disconnect the clutch lever position switch coupler③
- Remove the rear view mirror④
- Disconnect the clutch cable.



- Remove the handlebar clamp bolt caps.
- Remove the handlebars by removing the handlebar clamp bolts.

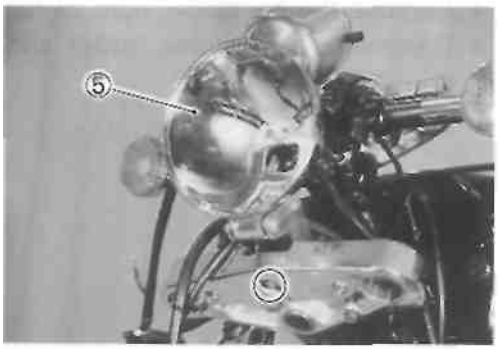


- Remove the headlight.
- Disconnect the headlight coupler.



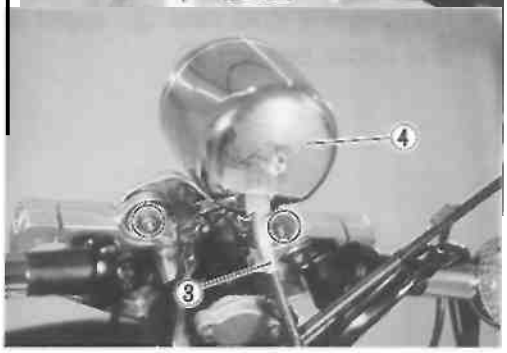
- Disconnect the lead wire couplers.

- Remove the headlight housing ⑤ by removing the mounting nut.



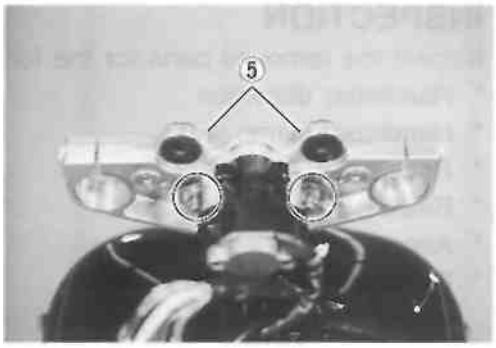
- Remove the steering stem lower cover①
- Remove the front brake hose/speedometer cable guide ②

- Disconnect the speedometer cable③
- Remove the speedometer④.

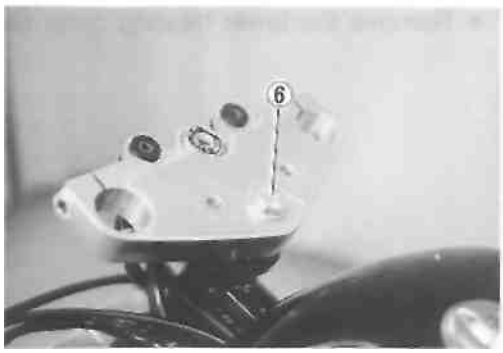


- Remove the front turn signal light brackets.

- Remove the handlebar holders⑤



- Remove the steering stem head bolt⑥

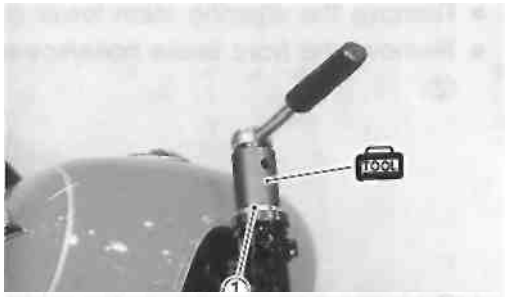


• Remove the steering stem nut①using the special tool.

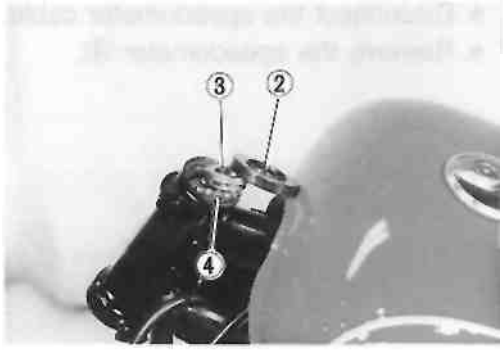
09940-14911: Steering stem nut wrench

• Draw out the steering stem lower bracket.

NOTE:
Hold the steering stem lower bracket to prevent it from falling.

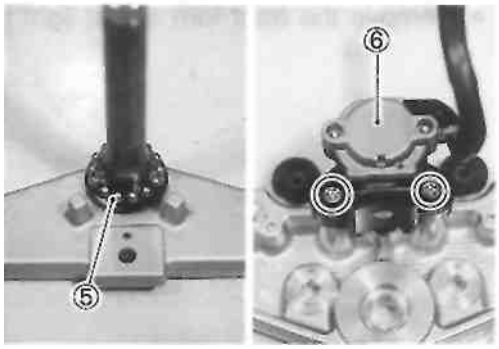


• Remove the dust seal ②, upper bearing inner race③ and upper bearing④



• Remove the lower bearing⑤
• Remove the ignition switch⑥using the special tool.

09930-11920: Torx bit JT40H
09930-11940: Bit holder

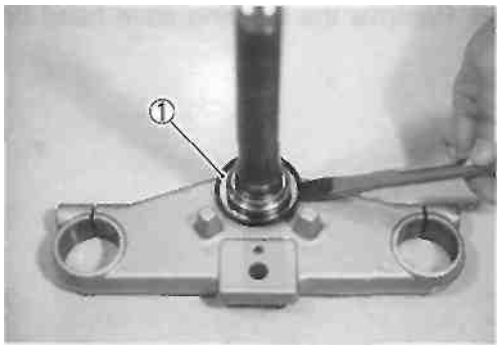


INSPECTION

Inspect the removed parts for the following abnormalities.

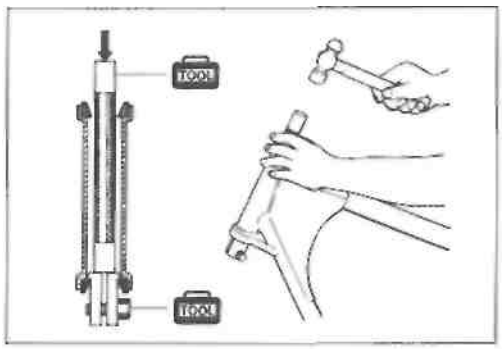
* Handlebar distortion
* Handlebar clamp wear
* Race wear and brinelling
* Bearing wear or damage
* Abnormal bearing noise
* Distortion of the steering stem

• Remove the lower bearing outer race①using a chisel.



• Drive out the steering stem upper and lower bearing races using the special tool.

09941-54911: Bearing outer race remover
09941-74910: Steering bearing installer

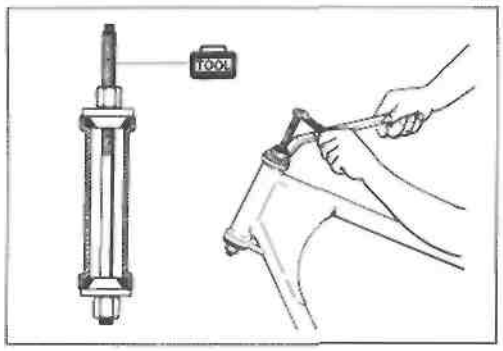


REASSEMBLY AND REMOUNTING

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

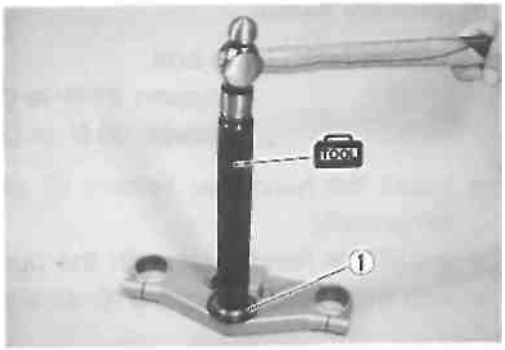
• Press in the upper and lower outer races using the special tool.

09941-34513: Steering race installer



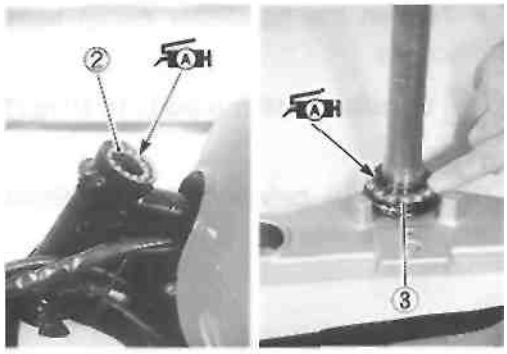
• Press ¡n the steering stem lower race①using the special tool.

09941-74910: Steering bearing installer



• Apply grease to the upper②and lower③bearings.

99000-25010: SUZUKI SUPER GREASE "A"



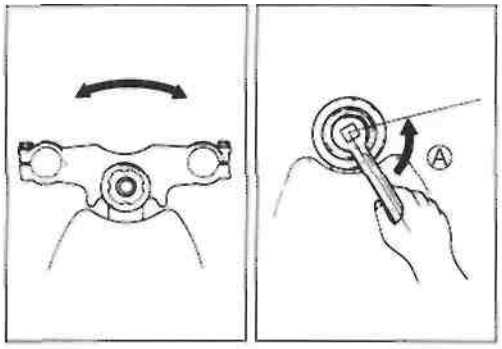
• Tighten the steering stem nut using the special tool.

09940-14911: Steering stem nut wrench

Steering stem nut: 45 N ■ m (4.5 kg-m, 32.5 lb-ft)

- Turn the steering stem lower bracket about five or six times to the left and right.
- Loosen the steering stem nut 1/4 – 1/2 of a turn Ⓐ

NOTE:
This adjustment will vary from motorcycle to motorcycle. Make sure that the steering turns smoothly and easily in both directions.



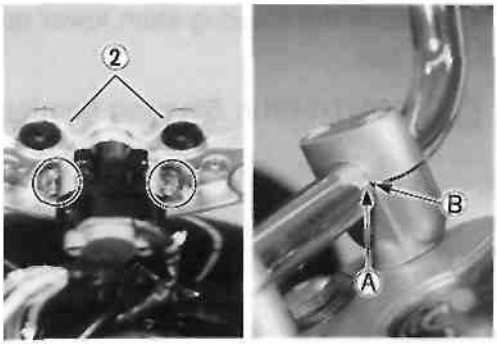
- Install the steering stem upper bracket ①
- Install the right and left front forks.
- Tighten the front fork lower clamp bolts.
- Tighten the steering stem head bolt to the specified torque.

Steering stem head bolt: 65 N ■ m (6.5 kg-m, 47.0 lb-ft)

- Align the upper surface of the front fork inner tube with the upper surface of the steering stem upper bracket.
- Tighten the upper and lower front fork clamp bolts to the specified torque.

Front fork clamp bolt

upper: 23 N-m (2.3 kg-m, 16.5 lb-ft)
lower: 33 N-m (3.3 kg-m, 24.0 lb-ft)

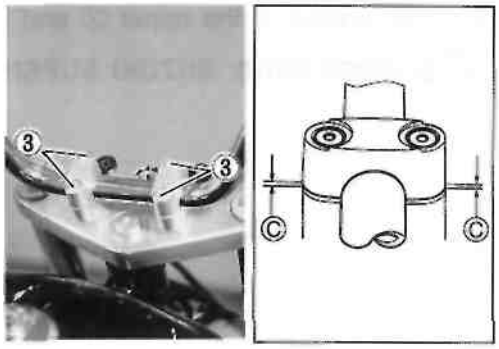


- Install the handlebar holders ② and tighten their nuts temporarily.
- Install the handlebars with the punch mark Ⓐ aligned with the handlebar clamp Ⓑ as shown.

- Tighten the handlebar clamp bolts ③ to the specified torque.

Handlebar clamp bolt: 16 N-m (1.6 kg-m, 11.5 lb-ft)

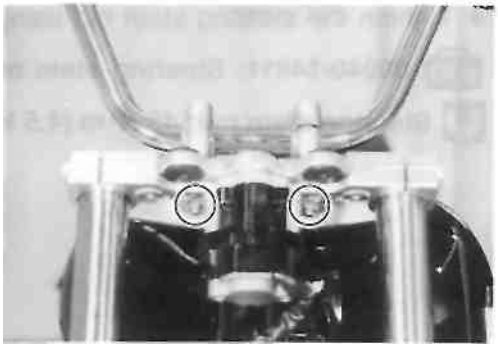
NOTE:
The gap Ⓒ between the handlebar clamp and holder should be even.



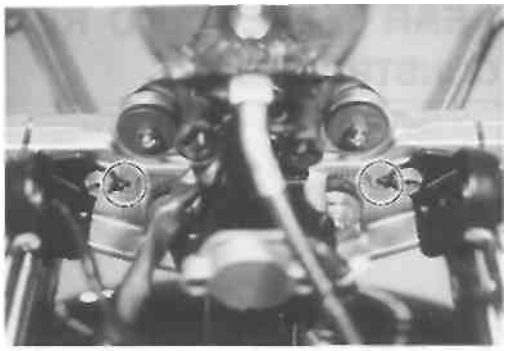
- Tighten the handlebar holder nuts to the specified torque.

Handlebar holder nut: 45 N-m (4.5 kg-m, 32.5 lb-ft)

- Install the handlebar clamp bolt caps.



NOTE:
When installing the front turn signal lights, insert the projection on the turn signal light bracket into the hole of steering stem upper bracket.



• Install the handlebar left switch.

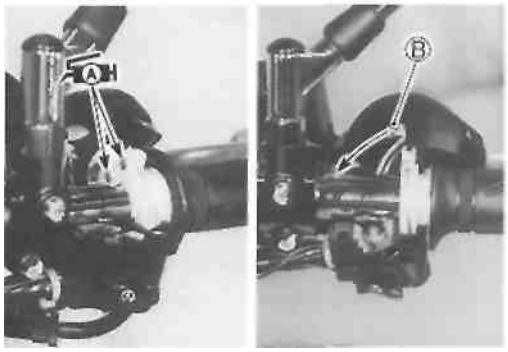
NOTE:
Insert the projection Ⓐ into the hole of the handlebars.

* Install the handlebar right switch.

NOTE:
* *Apply SUZUKI SUPER GREASE "A" to the end of the throttle cable.*

99000-25010: SUZUKI SUPER GREASE "A"

* *Insert the projection Ⓑ into the hole of the handlebars.*



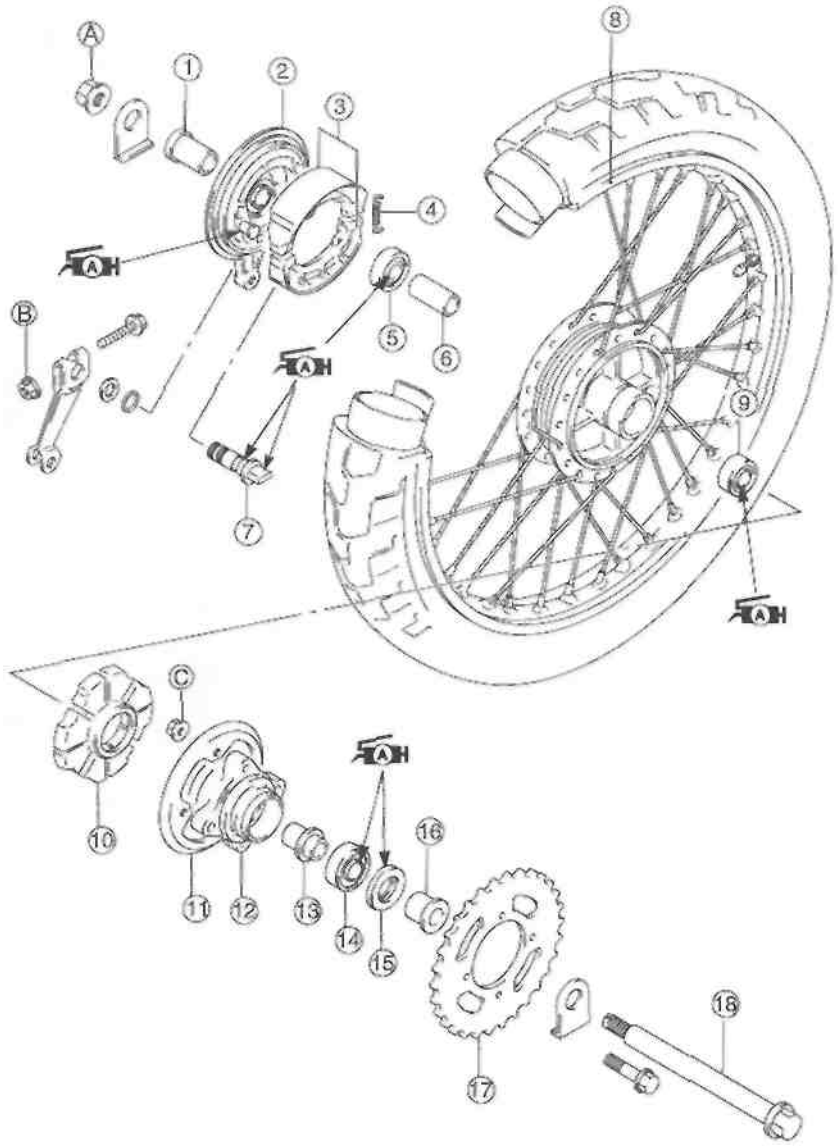
- Install the master cylinder. (See p. 5-13.)
- Install the front brake caliper. (See p. 5-10.)
- Install the front fender and front wheel. (See pp. 5-6 and -21.)

NOTE:
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

A CAUTION

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

REAR WHEEL AND REAR BRAKE CONSTRUCTION



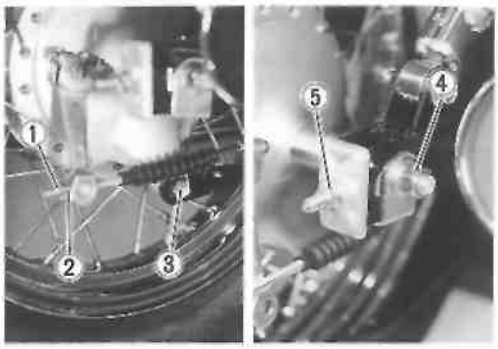
① Spacer
② Brake panel
③ Brake shoe
④ Spring
⑤ Bearing
⑥ Spacer
⑦ Brake camshaft
⑧ Rear wheel
⑨ Bearing
⑩ Damper
⑪ Drive chain guide
⑫ Rear sprocket mounting drum
⑬ Retainer
⑭ Bearing
⑮ Dust seal
⑯ Spacer
⑰ Rear sprocket
⑱ Rear axle

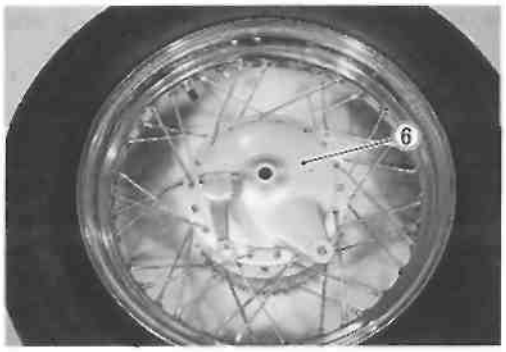
Ⓐ Rear axle **nut**
Ⓑ Rear brake cam lever nut
Ⓒ Rear sprocket mounting **nut**

ITEM	N-m	kg-m	kg-m
Ⓐ	78	7.8	56.5
Ⓑ	10	1.0	7.0
Ⓒ	50	5.0	36.0

REMOVAL

- Remove the clip①and rear brake adjusting nut②
- Remove the cotter pin, torque link nut ③and bolt.
- Remove the rear axle nut④
- Raise the rear wheel off the ground with a jack or wooden block.
- Loosen the drive chain adjusting nuts⑤, left and right.
- Remove the rear axle.
- Disengage the drive chain from the rear sprocket.
- Remove the rear wheel.
- Remove the rear brake panel⑥

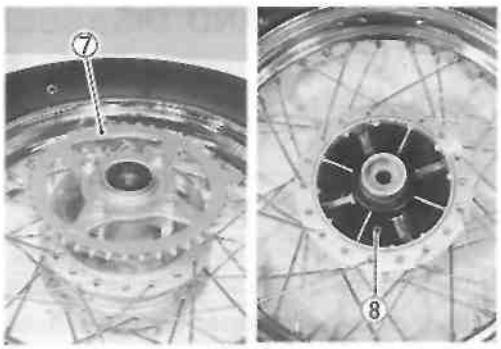




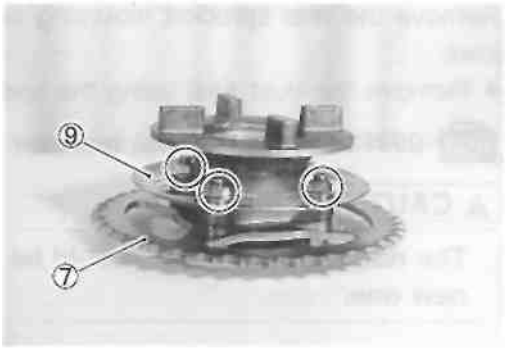
- Remove the rear sprocket⑦with mounting drum from the rear wheel.

NOTE:
Before separating the rear sprocket and mounting drum, slightly loosen the rear sprocket bolts.

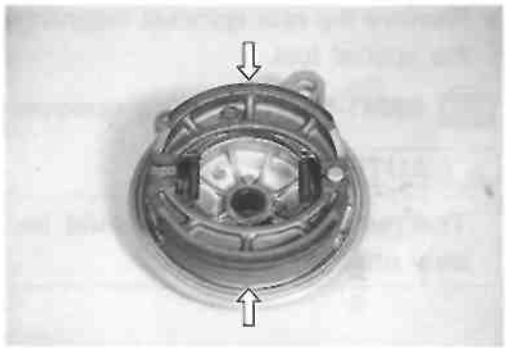
- Remove the rear sprocket damper⑧



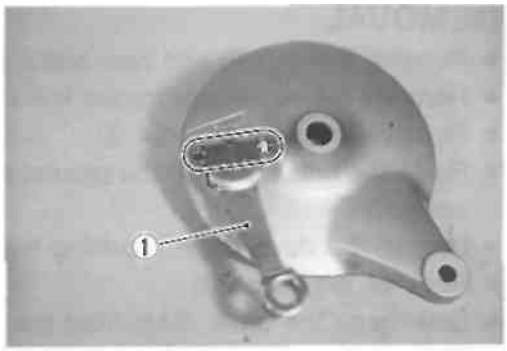
- Remove the drive chain guide⑨and rear sprocket⑦ from the rear sprocket mounting drum.



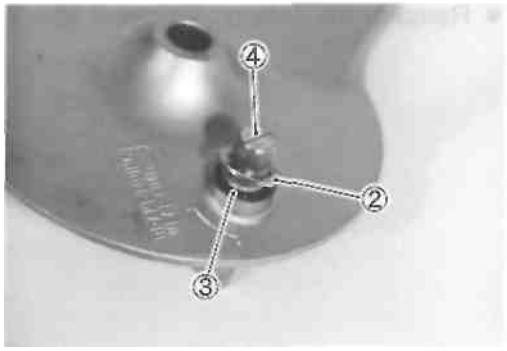
- Remove the brake shoes from the brake panel.



- Remove the brake cam lever bolt and nut.
- Remove the brake cam lever①



• Remove the washer②, O-ring③and brake camshaft④



INSPECTION AND DISASSEMBLY

WHEEL BEARING ..... See pp. 5-3 and -4.
WHEEL AXLE..... See p. 5-4.
WHEEL..... See p. 5-4.
SPOKE NIPPLE ..... **See** p. 5-4.
REAR SPROCKET MOUNTING
DRUM BEARING ..... See p. 5-3.

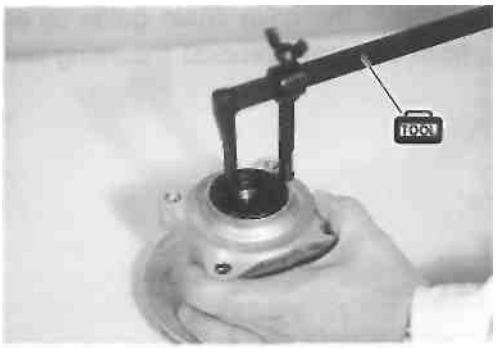
* **Inspect of the rear sprocket mounting drum bearing in the same manner as the wheel bearing.**

Remove the rear sprocket mounting drum bearing as follows. • Remove the dust seal using the special tool.

09913-50121: Oil seal remover

A CAUTION

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

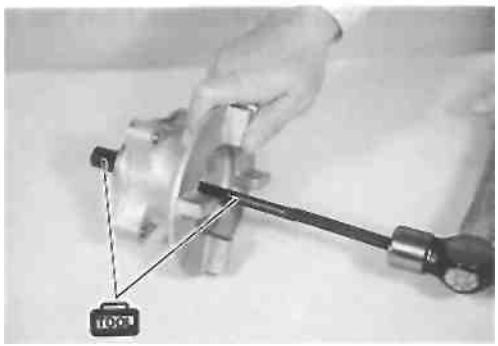


• Remove the rear sprocket mounting drum bearing using the special tool.

09941-50111: Bearing remover

A CAUTION

The removed bearing should be replaced with a new one.

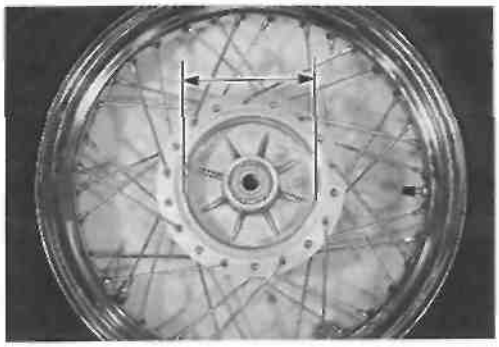


• Remove the retainer①

BRAKE DRUM

Inspect the brake drum and measure the brake drum I.D. to determine the extent of wear. Replace the brake drum if the measurement exceeds the service limit. The value of this limit is indicated inside the brake drum.

TOOL **09900-20101: Vernier calipers Service Limit: 130.7 mm (5.15 in)**



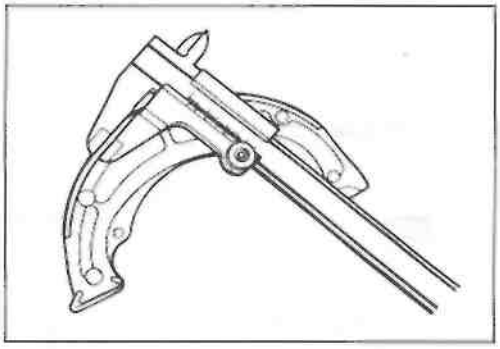
BRAKE SHOES

Check the brake shoes and decide whether it should be replaced or not from the thickness of the brake shoe lining.

Service Limit: 1.5 mm (0.06 in)

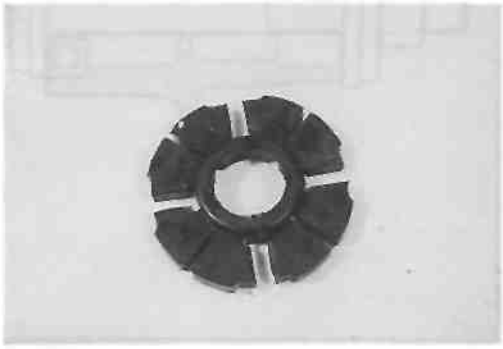
A CAUTION

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



REAR SPROCKET DAMPER

Inspect the rear sprocket damper for wear and damage. Replace the rear sprocket damper if there is anything unusual.

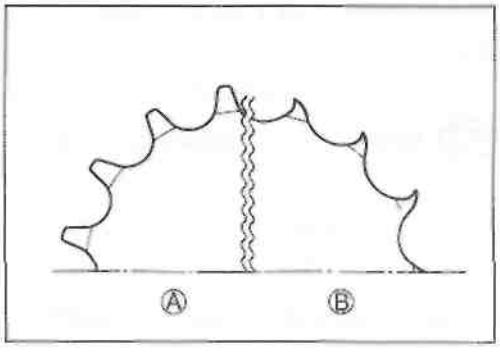


REAR SPROCKET

Inspect the sprocket's teeth for wear. If they are worn, replace the sprocket and drive chain as a set.

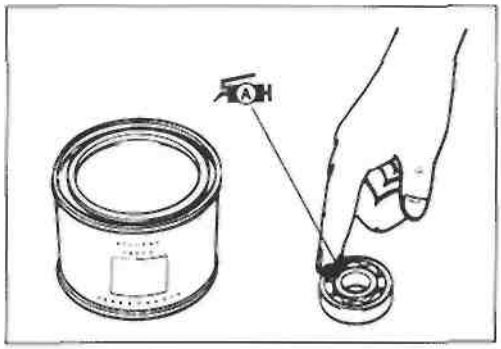
Ⓐ Normal wear

Ⓑ Excessive wear



REASSEMBLY AND REMOUNTING

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



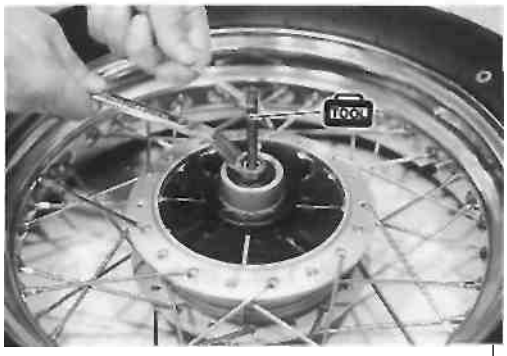
WHEEL BEARING

- Apply SUZUKI SUPER GREASE "A" to the bearing before installation.

99000-25010: SUZUKI SUPER GREASE "A"

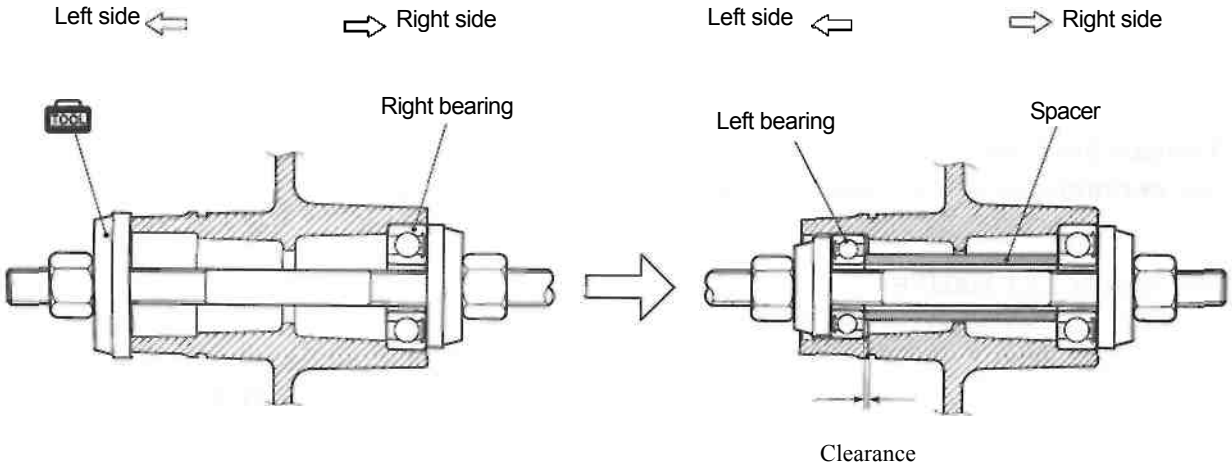
- Press fit the bearing to the wheel using the special tools.

09924-84510: Bearing installer set
09924-84521: Bearing installer set



A CAUTION

* **First install the right wheel bearing, then left wheel bearing.**
* **The sealed cover on the bearing must face out.**



REAR SPROCKET MOUNTING DRUM BEARING

- Install the rear sprocket mounting drum bearing and dust seal using the special tool.

09913-76010: Bearing installer

NOTE:
Apply grease to the bearing and dust seal lip before assembling the rear sprocket mounting drum.

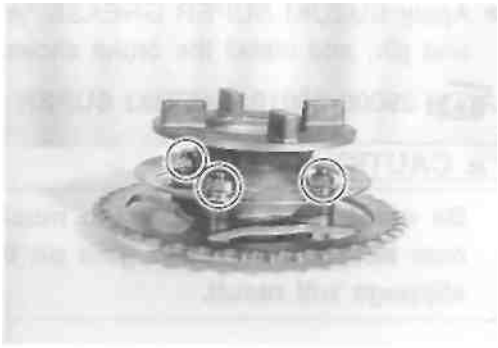
99000-25010: SUZUKI SUPER GREASE "A"

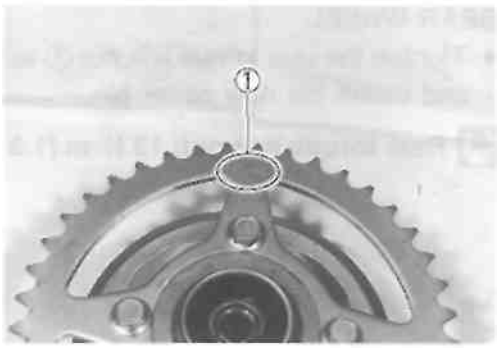
REAR SPROCKET

• Tighten the rear sprocket nuts to the specified torque.

Rear sprocket nut: 50 N·m (5.0 kg-m, 36.0 lb-ft)

NOTE:
The stamped mark①on the rear sprocket should face to the outside.

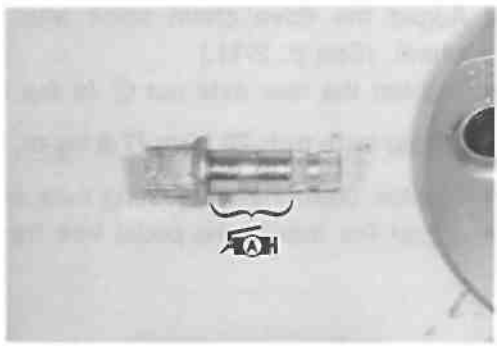




BRAKE CAMSHAFT

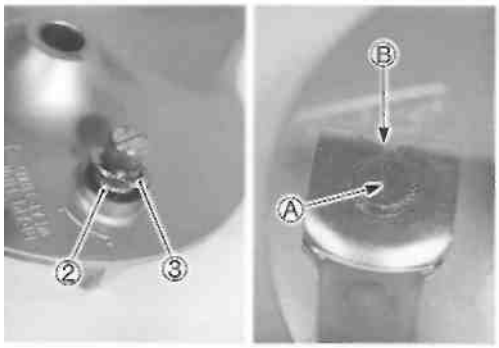
• When installing the brake camshaft, apply SUZUKI SUPER GREASE "A" to the camshaft.

99000-25010: SUZUKI SUPER GREASE "A"



BRAKE CAM LEVER

• Install the new O-ring②and washer③
• Align the notchⒶon the brake camshaft with the slitⒷ in the brake cam lever as shown.



• Tighten the brake cam lever nut to the specified torque.

Brake cam lever nut: 10 N·m (1.0 kg-m, 7.0 lb-fl)

• Apply SUZUKI SUPER GREASE "A" to the brake cam and pin, and install the brake shoes.

99000-25010: SUZUKI SUPER GREASE "A"

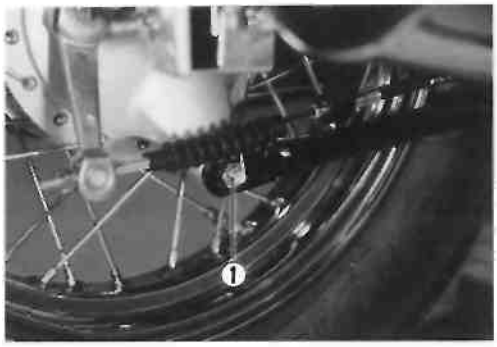
A CAUTION

Be careful not to apply too much grease to the cam and pin. If grease gets on the lining, brake slippage will result.

REAR WHEEL

• Tighten the rear torque link nut①to the specified torque and install the new cotter pin.

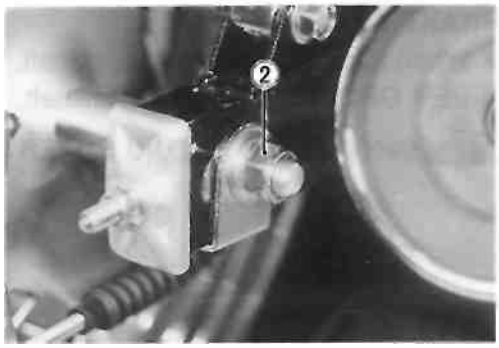
Rear torque link nut: 13 N-m (1.3 kg-m, 9.5 lb-ft)



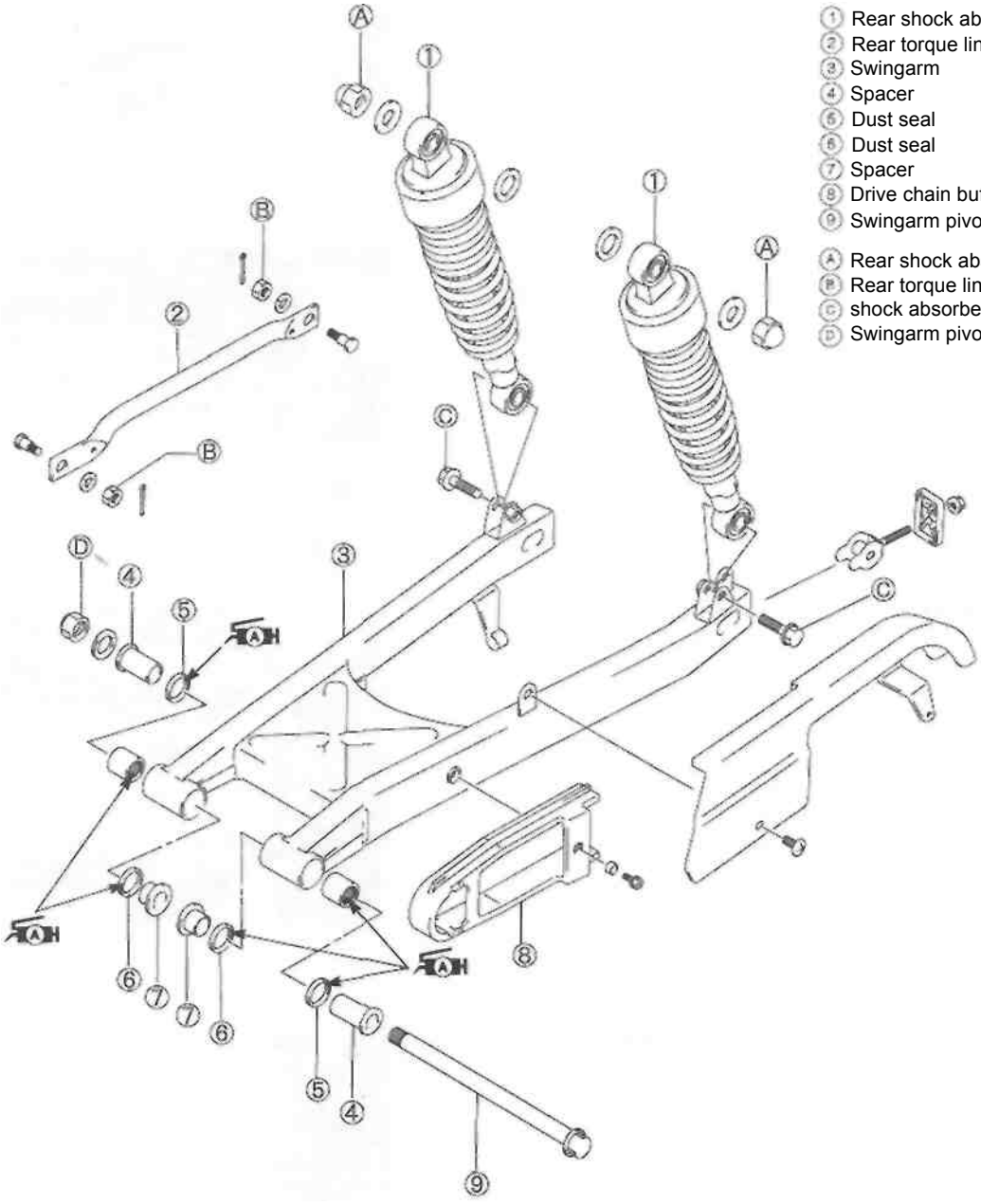
• Adjust the drive chain slack after installing the rear wheel. (See p. 2-11.)
• Tighten the rear axle nut②to the specified torque.

Rear axle nut: 78 N-m (7.8 kg-m, 56.5 lb-ft)

• Tighten both chain adjusting nuts securely.
• Adjust the rear brake pedal free travel. (See p. 2-14.)

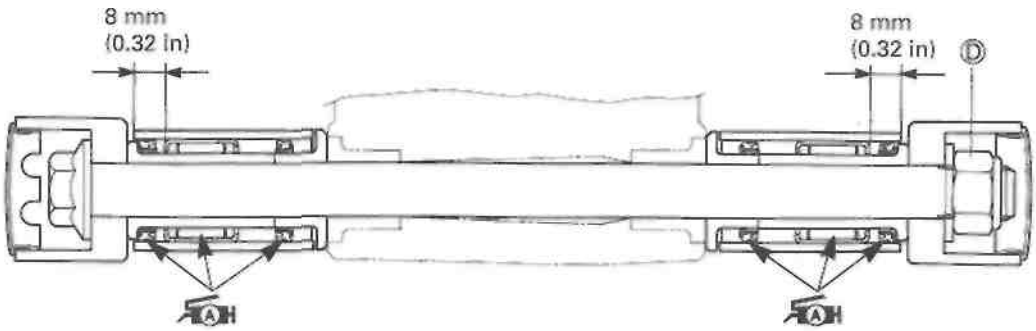


REAR SUSPENSION
CONSTRUCTION



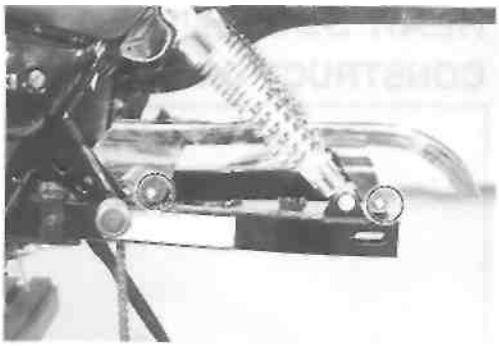
ITEM	N-m	kg-m	lb-ft
Ⓐ	29	2.9	21.0
Ⓑ	13	1.3	9.5
Ⓒ	29	2.9	21.0
Ⓓ	72	7.2	52.0

Left side ⇦ ⇨ Right side

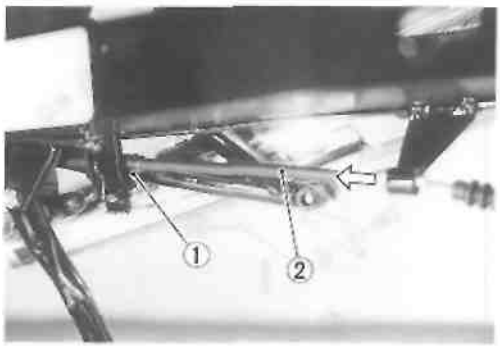

8 mm
(0.32 in)
8 mm
(0.32 in)
D
A
H
A
H

REMOVAL

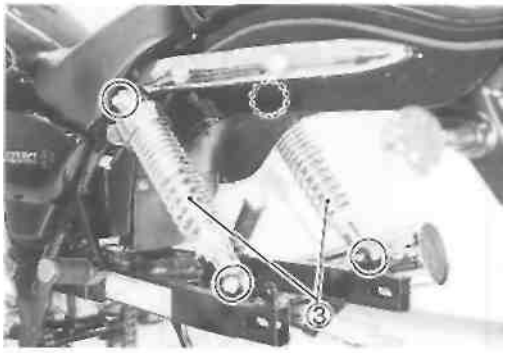
- Remove the rear wheel. (See p. 5-30.)
- Remove the drive chain case.



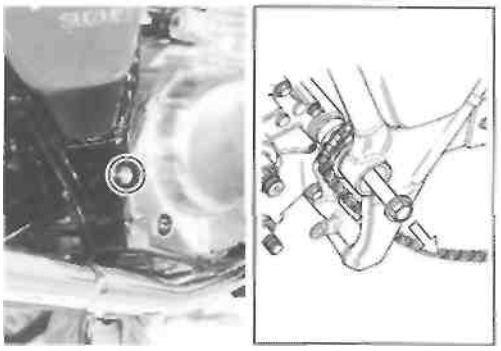
- Remove the rear brake cable holder①
- Remove the rear brake cable②from the swingarm.



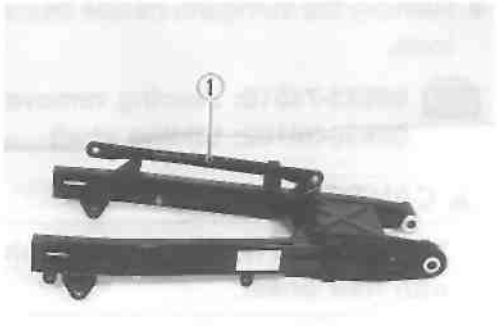
• Remove the shock absorbers③.



- Remove the swingarm pivot shaft end caps.
- Remove the swingarm pivot nut and washer.
- Remove the swingarm by removing the pivot shaft.

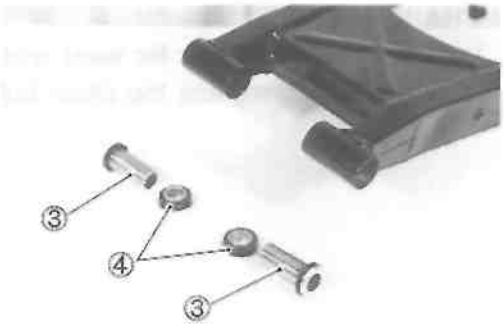


• Remove the rear torque link①from the swingarm.



• Remove the chain buffer②from the swingarm.

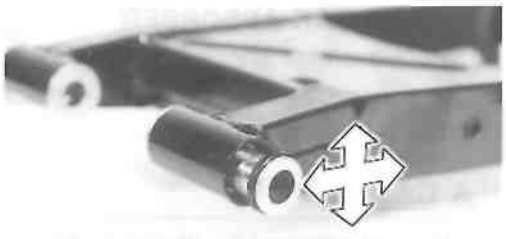
• Remove the spacers(③, ④)



INSPECTION AND DISASSEMBLY

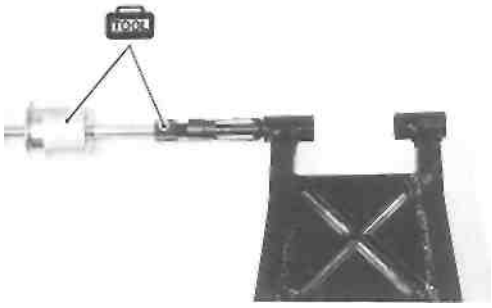
SWINGARM PIVOT SPACERS AND DUST SEALS
Inspect the swingarm pivot spacers and dust seals for damage. If any defects are found, replace the spacer with a new one.

SWINGARM NEEDLE BEARINGS
Insert the spacers into the needle bearings, move the spacer up and down and check for any play. If there is excessive play, replace the bearing(-s) with a new one.



• Remove the swingarm needle bearings using the special tools.

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



A CAUTION

The removed needle bearings should be replaced with new ones.

SWINGARM

Inspect the swingarm for damage.
If any defects are found, replace the swingarm with a new one.

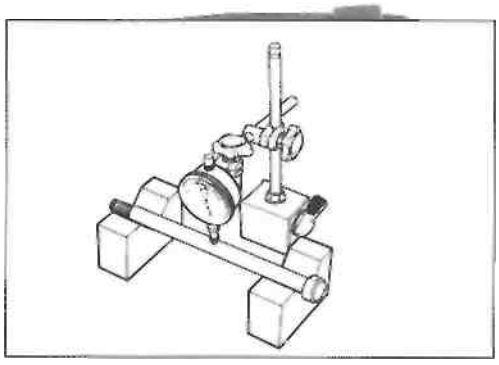
CHAIN BUFFER

Inspect the chain buffer for wear and damage. If any defects are found, replace the chain buffer with a new one.

SWINGARM PIVOT SHAFT

Measure the pivot shaft runout using the dial gauge. If the pivot shaft exceeds the service limit, replace it with a new one.

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



Service Limit: 0.3 mm (0.01 in)

REAR SHOCK ABSORBER

Inspect the rear shock absorber for damage and oil leakage. If any defects are found, replace the rear shock absorber with a new one.

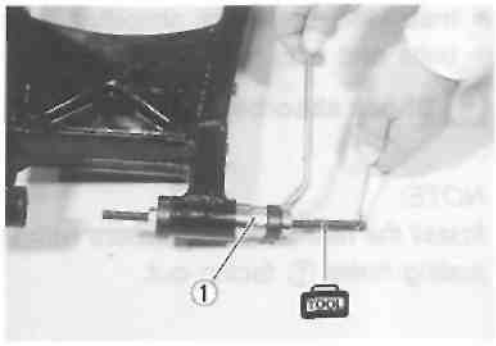
A CAUTION

Do not attempt to disassemble the rear shock absorber. It is unserviceable.

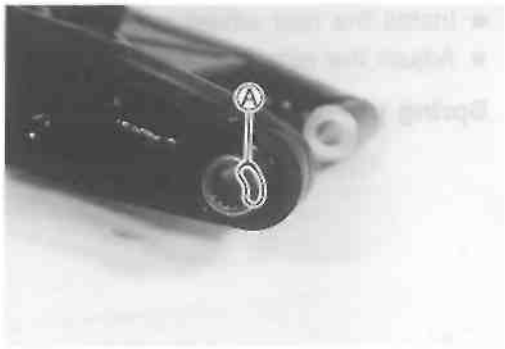
REASSEMBLY AND REMOUNTING

Reassemble and remount the swingarm and rear shock absorber in the reverse order of removal and disassembly. Pay attention to the following points: • Press the needle bearings into the swingarm pivot using a suitable socket①and the special tool. (See p. 5-36.)

09924-84521: Bearing installer set

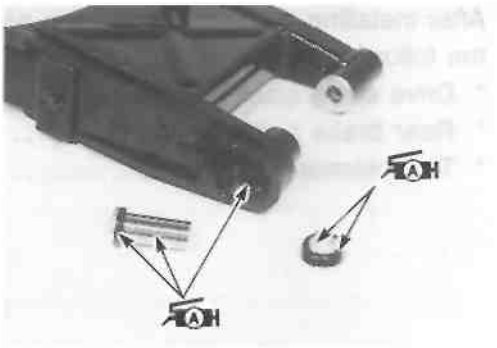


NOTE:
Install the needle bearings with the stamped mark Ⓐ facing out.



• Apply grease to the spacers, dust seals and needle bearings.

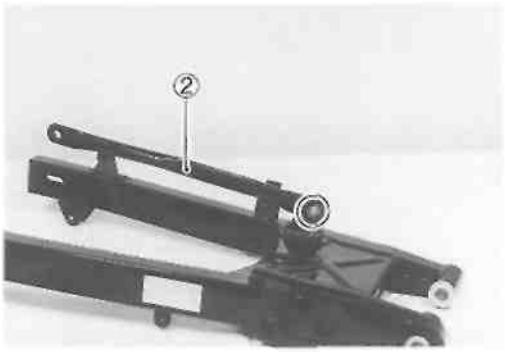
99000-25010: SUZUKI SUPER GREASE "A"



- Install the rear torque link②to the swingarm.
- Tighten the rear torque link nut to the specified torque.

Rear torque link nut: 13 N-m (1.3 kg-m, 9.5 lb-ft)

- Install the new cotter pin.



• Install the swingarm and tighten the swingarm pivot nut to the specified torque.

Swingarm pivot nut: 72 N■ m (7.2 kg-m, 52.0 lb-ft)

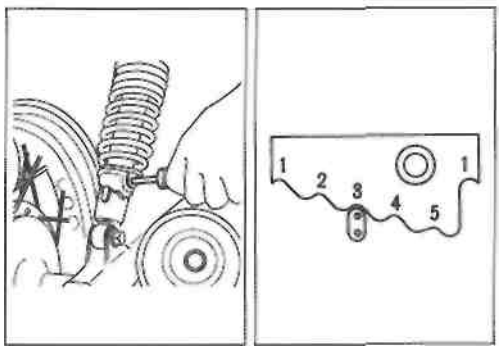
• Install the rear shock absorber and tighten the mounting bolts and nuts to the specified torque.

Shock absorber mounting bolt/nut: 29 N-m (2.9kg-m,21.0lb-ft)

NOTE:
Install the rear shock absorbers with the spring tension adjusting holes① facing out.

• Install the rear wheel and rear brake. (See p. 5-35.)
• Adjust the rear shock absorber spring pre-load.

Spring pre-load (STD): 3/5 position



After installing the rear suspension and rear wheel, adjust the following before riding.

* Drive chain slack ..... See p. 2-11
* Rear brake pedal free travel ..... See p. 2-14
* Tire pressure ..... See p. 2-15

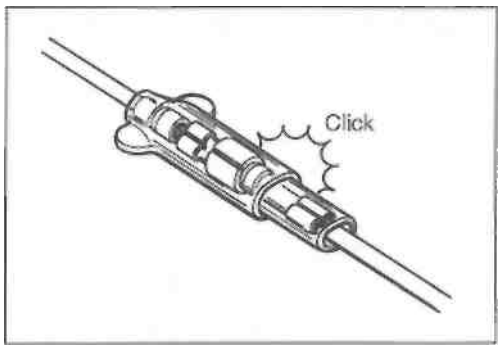
ELECTRICAL SYSTEM

---------- CONTENTS ----------

CAUTIONS IN SERVICING

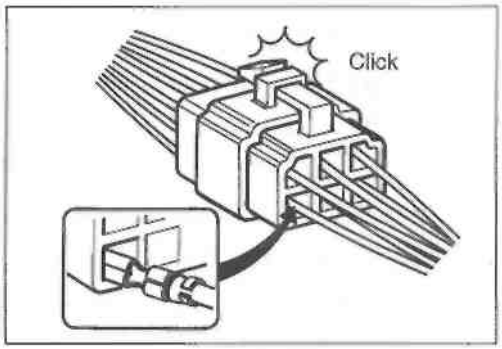
CONNECTORS

- When disconnecting a connector, be sure to hold the terminals; do not pull the lead wires.
- When connecting a connector, push it in so it is firmly attached.
- Inspect the connector for corrosion, contamination and any breakage in the cover.



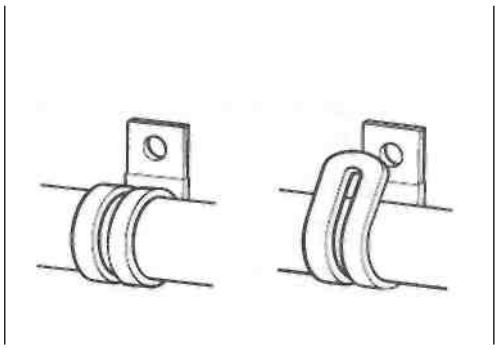
COUPLERS

- With a lock-type coupler, be sure to release the lock before disconnecting it. When connecting a connector, push it in until the lock clicks shut.
- When disconnecting the coupler, be sure to hold the coupler; do **not** pull the lead wires.
- Inspect each terminal on **the** coupler for looseness or bends.
- Inspect each terminal for corrosion and contamination.



CLAMPS

- **Refer to "WIRE, CABLE AND HOSE ROUTING"** (See pp. 7-11 to **-18.)** for proper clamping procedures.
- Bend the clamp properly, as shown in the illustration.
- When clamping the wire harness, do not allow it to hang down.
- Do not use wire or any other substitute for the band-type clamp.



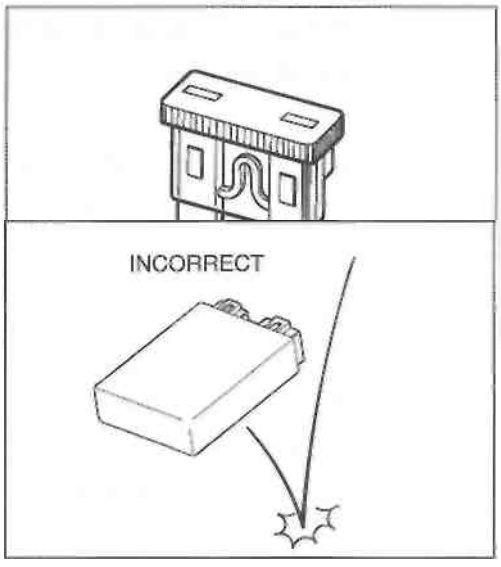
CORRECT INCORRECT

FUSES

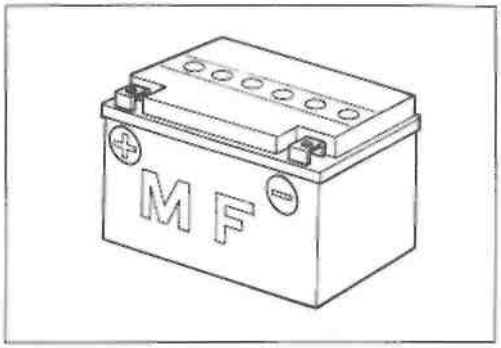
- When a fuse blows, always investigate the cause, correct the problem and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use any substitute for the fuse (e.g., wire).

SEMI-CONDUCTOR EQUIPPED PARTS

- Do not drop any part that contains a semi-conductor (e.g., ignitor unit, regulator/rectifier).
- When inspecting the part, follow the inspection instructions carefully. Neglecting proper procedures may cause this part to be damaged.

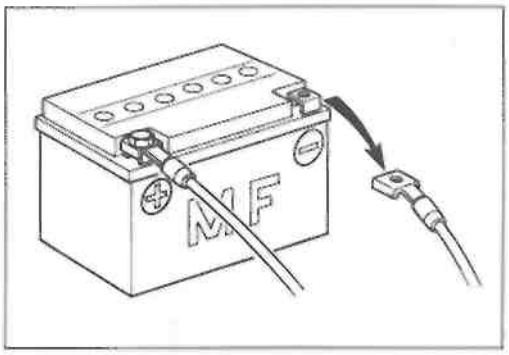


BATTERY

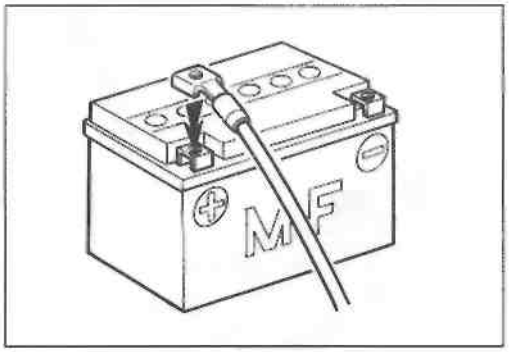


- The MF battery used in this motorcycle does not require maintenance (e.g., electrolyte level inspection, distilled water replenishing).
- During normal charging, no hydrogen gas is produced. However, if the battery is overcharged, hydrogen gas may be produced. Therefore, be sure that there are no fire or spark sources nearby (e.g., short-circuit) when charging the battery.
- Be sure to recharge the battery in a well-ventilated and open area.
- Note that the charging system for the MF battery is different from that of a conventional battery. Do not replace the MF battery with a conventional battery.

CONNECTING THE BATTERY



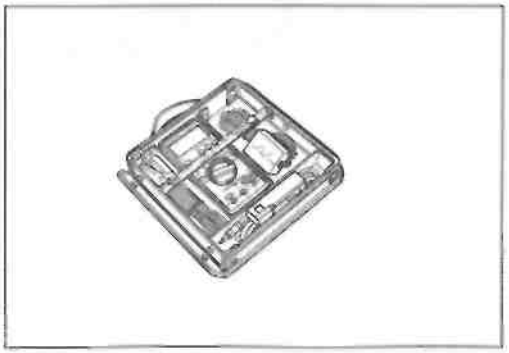
- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the battery (⊖) lead wire, first.
- When connecting the battery lead wires, be sure to connect the battery (⊕) lead wire, first.
- If the terminal is corroded, remove the battery, pour warm water over it and clean it using a wire brush.
- After connecting the battery, apply a light coat of grease to the battery terminals.
- Reinstall the cover over the battery (⊕) terminal.



WIRING PROCEDURE

- Properly route the wire harness according to "WIRE, CABLE AND HOSE ROUTING". (See pp. 7-11 to -18.)

USING THE MULTI CIRCUIT TESTER

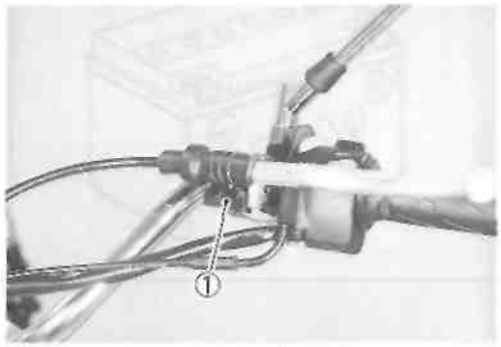


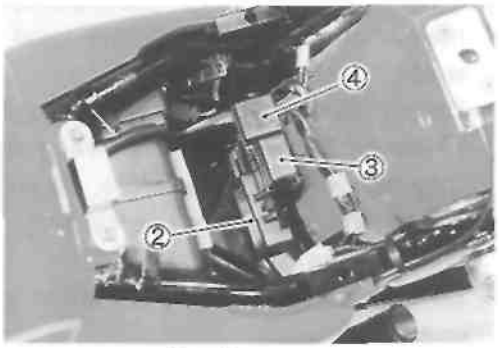
- Properly use the multi circuit tester(⊕)and(⊖)probes. Improper use can cause damage to the motorcycle and tester.
- If the voltage and current values are not known, begin measuring in the highest range.
- When measuring the resistance, make sure that no voltage is applied. If voltage is applied, the tester will be damaged.
- After using the tester, turn the switch to the OFF position.

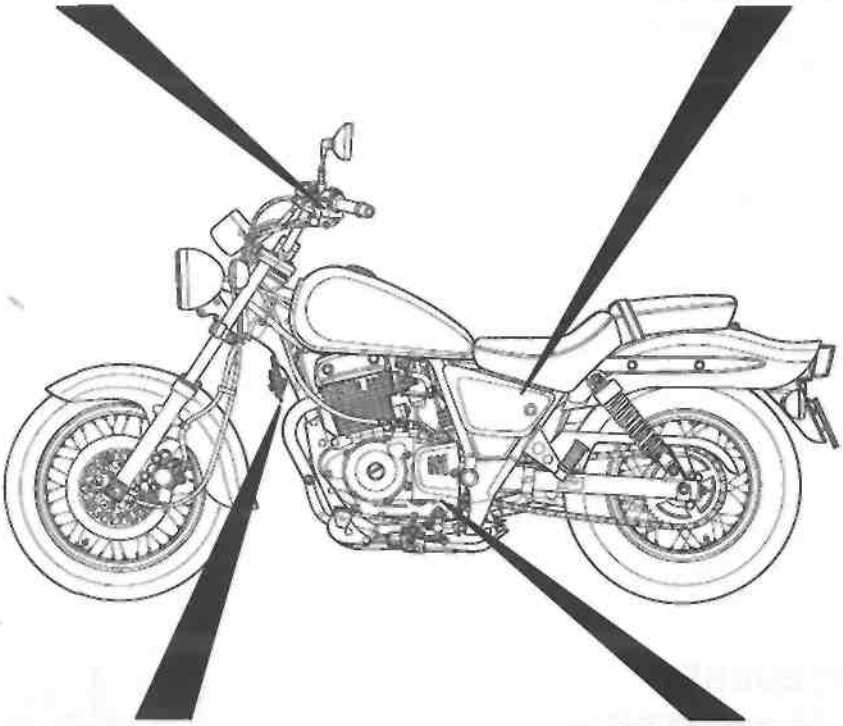
CAUTION

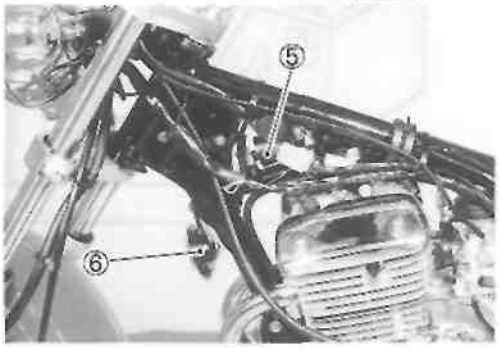
Before using the multi circuit tester, read its instruction manual.

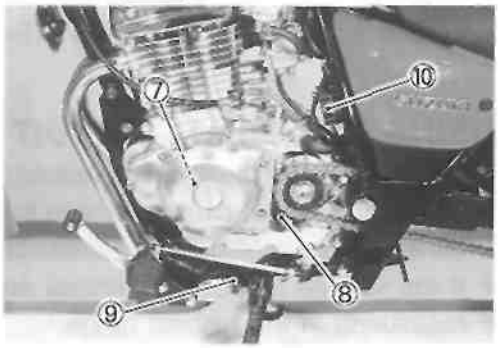
LOCATION OF ELECTRICAL COMPONENTS



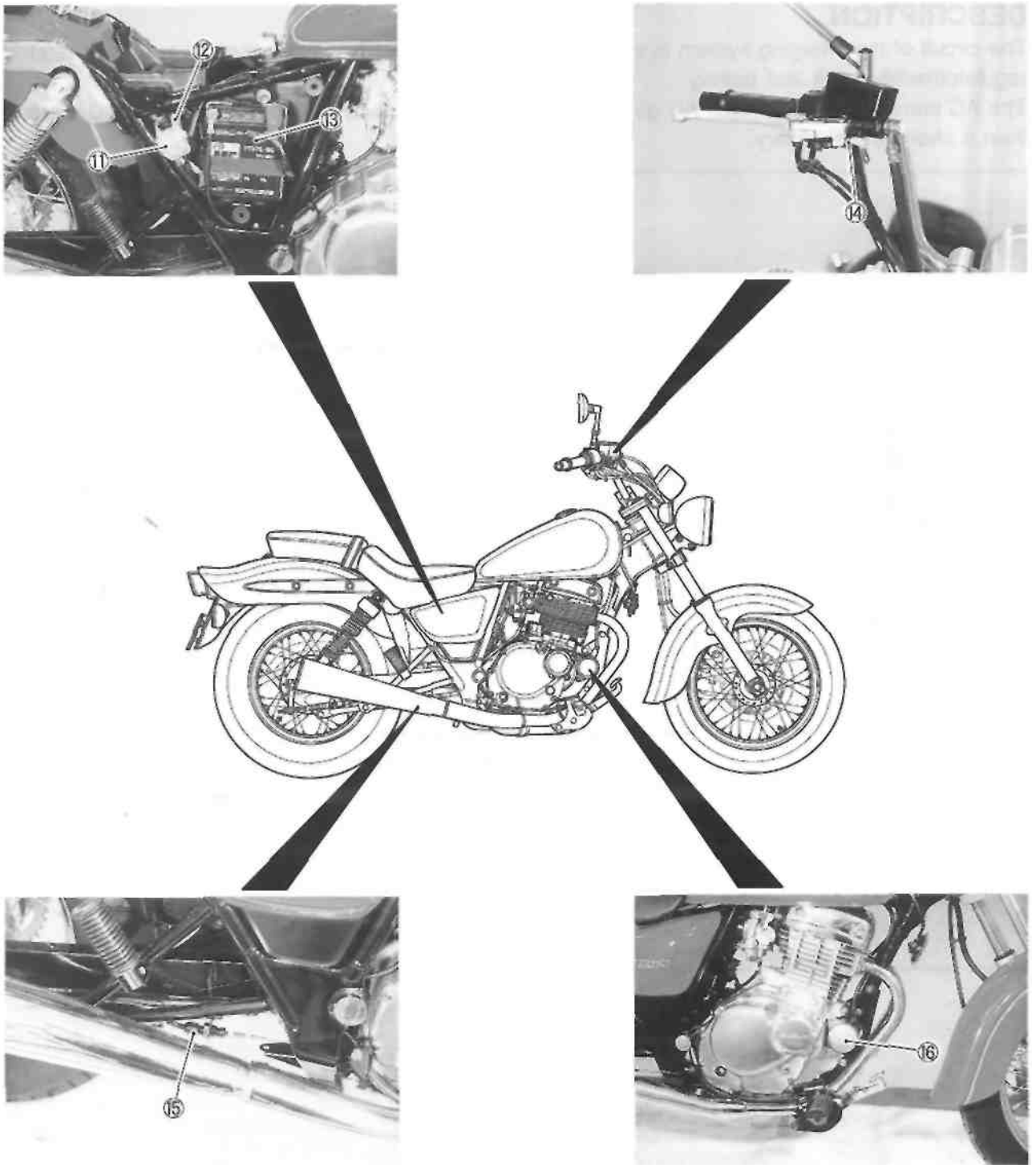








① Clutch lever position switch
② Ignitor
③ Turn signal/side-stand relay
④ Fuse box
⑤ Ignition coil
⑥ Horn
⑦ Generator
⑧ Neutral switch
⑨ Side-stand switch
⑩ Regulator/rectifier



⑪ Starter relay
⑫ Main fuse
⑬ Battery

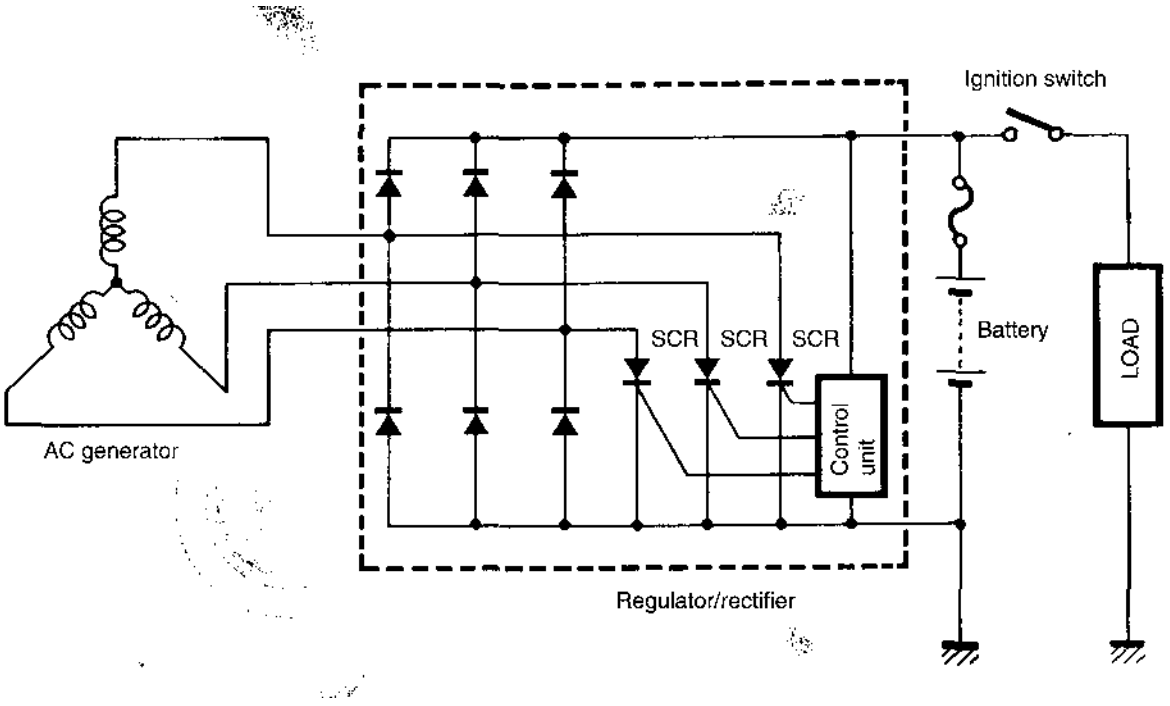
⑭ Front brake light switch
⑮ Rear brake light switch
⑯ Starter motor

CHARGING SYSTEM

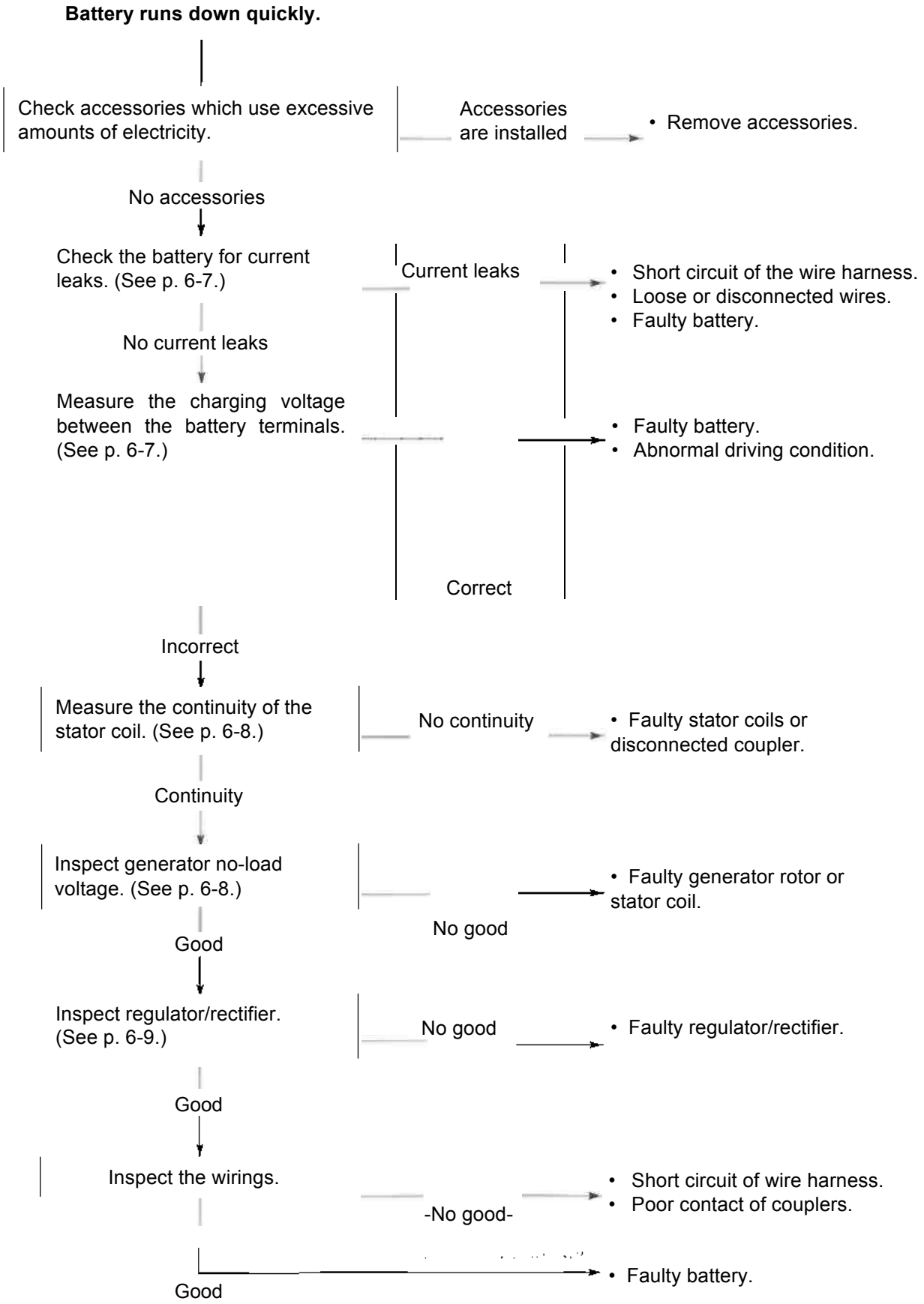
DESCRIPTION

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



TROUBLESHOOTING



Battery overcharges	• Faulty regulator/rectifier • Faulty battery • Poor contact of stator coil coupler

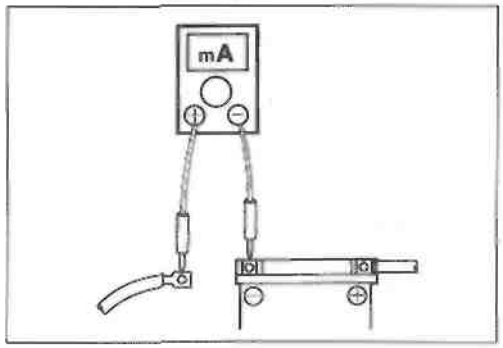
INSPECTION

BATTERY LEAK CURRENT INSPECTION

- Remove the front seat and right frame cover. (See p. 5-1.)
- Turn the ignition switch to the OFF position.
- Disconnect the battery ⊖ lead wire.
- Connect the tester between the battery ⊖ terminal and the battery ⊖ lead wire.

NOTE:
Leakage is evident if the reading is over 1mA.

Battery current leak: Under 1mA



A CAUTION

*** Because the current leak might be large, turn the tester to the high range first to avoid tester** damage. * Do not turn the ignition switch to the "ON" position when measuring the current.

When checking to find the excessive current leak, remove the couplers and connectors, one by one, checking each part.

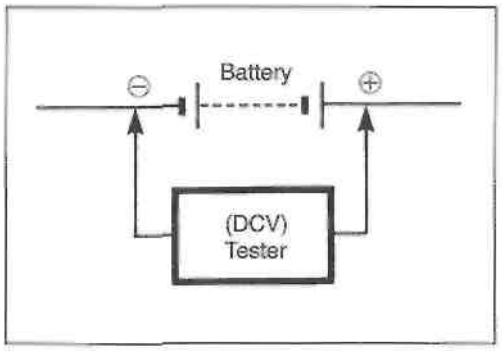
CHARGING OUTPUT INSPECTION

- Remove the front seat and right frame cover. (See p. 5-1.)
- Start the engine, turn the lighting switch to ON and the dimmer switch to HI, and run the engine at 5 000 r/min.

Measure the DC voltage between the ⊕ and ⊖ battery terminals with a tester. If the tester reads under 13.5V or over 15.0V, inspect the stator coil and regulator/rectifier.

A CAUTION

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



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

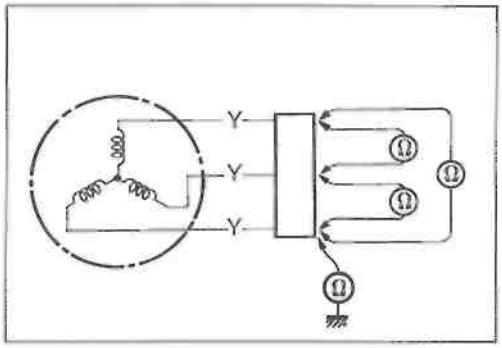
Charging output
Standard: 13.5-15.0V at 5 000 r/min.

STATOR COIL RESISTANCE

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the stator coil coupler.

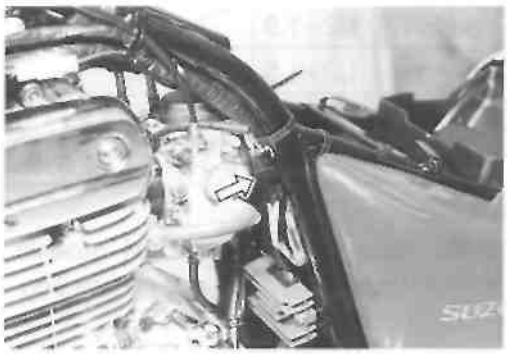
Measure the resistance between the three lead wires using a tester.
Also check that the stator core is insulated.
If the resistance is incorrect, replace the stator coil with a new one.

Stator coil resistance: 0.1–1.5Ω



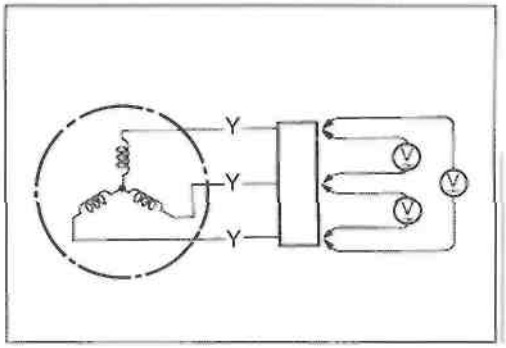
GENERATOR NO-LOAD PERFORMANCE INSPECTION

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the stator coil coupler.
- Start the engine and keep it running at 5 000 r/min.



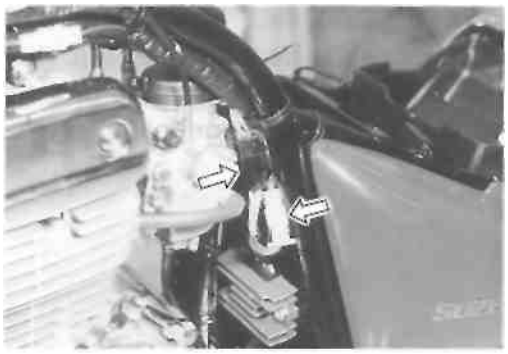
Measure the voltage between the three lead wires using a tester.
If the tester reads under the specified value, replace the stator coil and pick-up coil, or the generator rotor with a new one.

Generator no-load performance:
More than 60V (AC) at 5 000 r/min
(When engine is cold)



REGULATOR/RECTIFIER

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the regulator/rectifier couplers.



Measure the voltage between the lead wires in the following table.

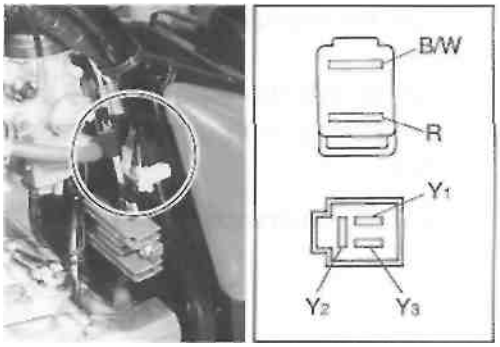
09900-25008: Multi circuit tester set

Tester knob indication: Diode test(⊣◀)

Unit: V

⊖ Probe of tester to	⊕ Probe of tester to: R	B/W	Y_1	Y_2	Y_3
R		**0.5-1.0**	0.3-0.7	**0.3-0.7**	0.3-0.7
B/W	**1.2-1.5**		**1.2-1.5**	**1.2-1.5**	**1.2-1.5**
Y_1	**1.2-1.5**	0.3-0.7		**1.2-1.5**	1.2-1.5
Y_2	**1.2-1.5**	0.3-0.7	**1.2-1.5**		**1.2-1.5**
Y_3	**1.2-1.5**	0.3-0.7	**1.2-1.5**	**1.2-1.5**	

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

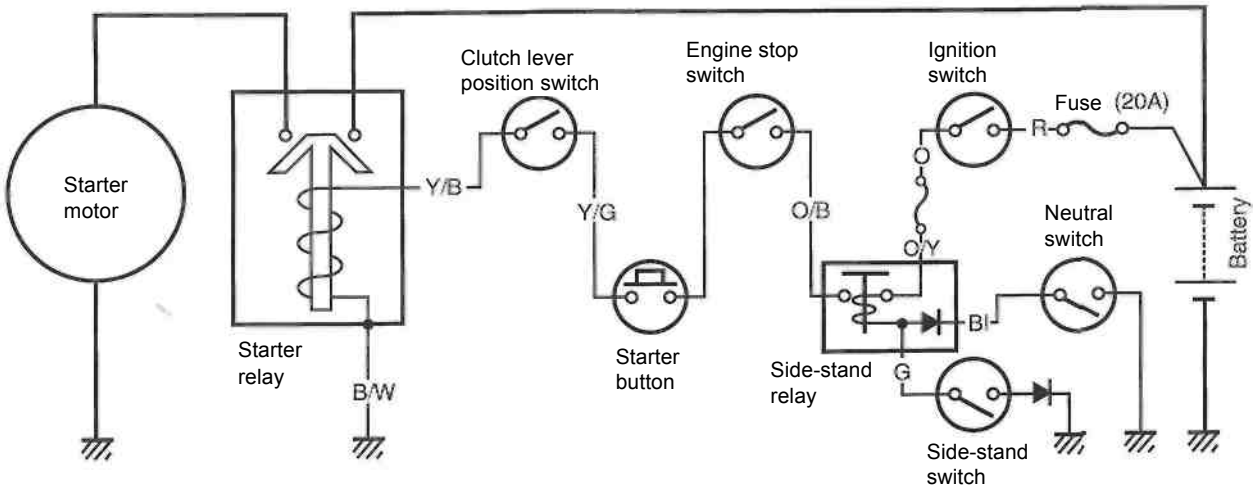


WIRE COLOR
R: Red
Y: Yellow
B/W: Black with White tracer

STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM

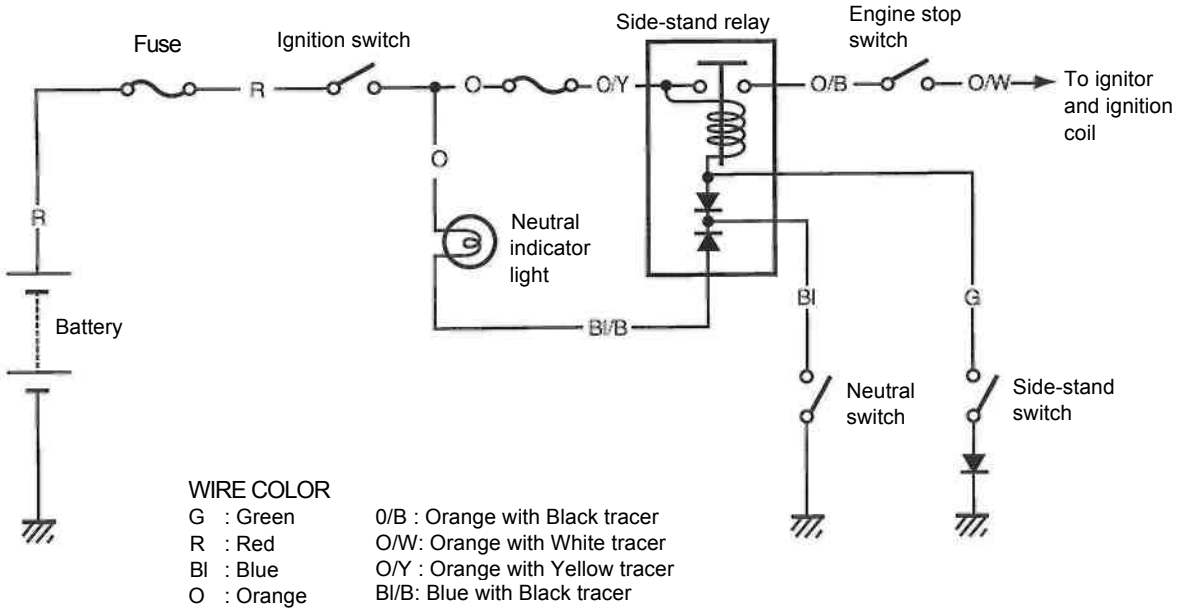
STARTER SYSTEM DESCRIPTION

The starter system consists of the following components: the starter motor, starter relay, clutch lever position switch, side-stand relay, side-stand switch, neutral switch, starter button, engine stop switch, ignition switch and battery. Pressing the starter button (on the right handlebar switch) energizes the starter relay, causing the contact points to close, thus completing the circuit from the starter motor to the battery. The starter motor draws about 80 amperes to start the engine.



SIDE-STAND/IGNITION INTERLOCK SYSTEM DESCRIPTION

This side-stand/ignition interlock system prevents the motorcycle from being started with the side-stand down. The system is operated by an electric circuit provided between the battery and ignition coil.



TROUBLESHOOTING

Starter motor will not run.

The transmission is in neutral. Grasp the clutch lever. Turn on the ignition switch with the engine stop **switch** in "RUN" position. Listen for a click from the starter relay when the starter button is pushed.

- Clicks → Check if the starter motor runs when its terminal is connected to the battery⊕terminal. (Do not use a thin "wire" because a large amount of current flows.)
  - Run
    - • Faulty starter motor
    - • Faulty starter relay
    - • Loosen or disconnected starter motor lead wire
  - Does not run
- No click

Measure the starter relay voltage at **the starter relay** connectors (between Y/B⊕and B/W⊖) when the starter button is pushed.

- No voltage
  - • Faulty ignition switch
  - • Faulty engine stop switch
  - • Faulty clutch lever position switch
  - • Faulty neutral switch
  - • Faulty side-stand relay
  - • Faulty starter button
  - • Poor contact of connector
  - • Open circuit in wire harness
- Voltage

Check the starter relay.
(See pp. 6-14 and -15.)

- No good
  - • Faulty starter relay
- OK
  - • Poor contact of the starter relay

The starter motor runs when the transmission is in neutral, but does not run when the transmission is in any position other than neutral, with the side-stand up.

Check the side-stand switch.
(See pp. 6-15 and -16.)

- No good
  - • Faulty side-stand switch
- OK
  - • Open circuit in wire harness
  - • Poor contact of connector

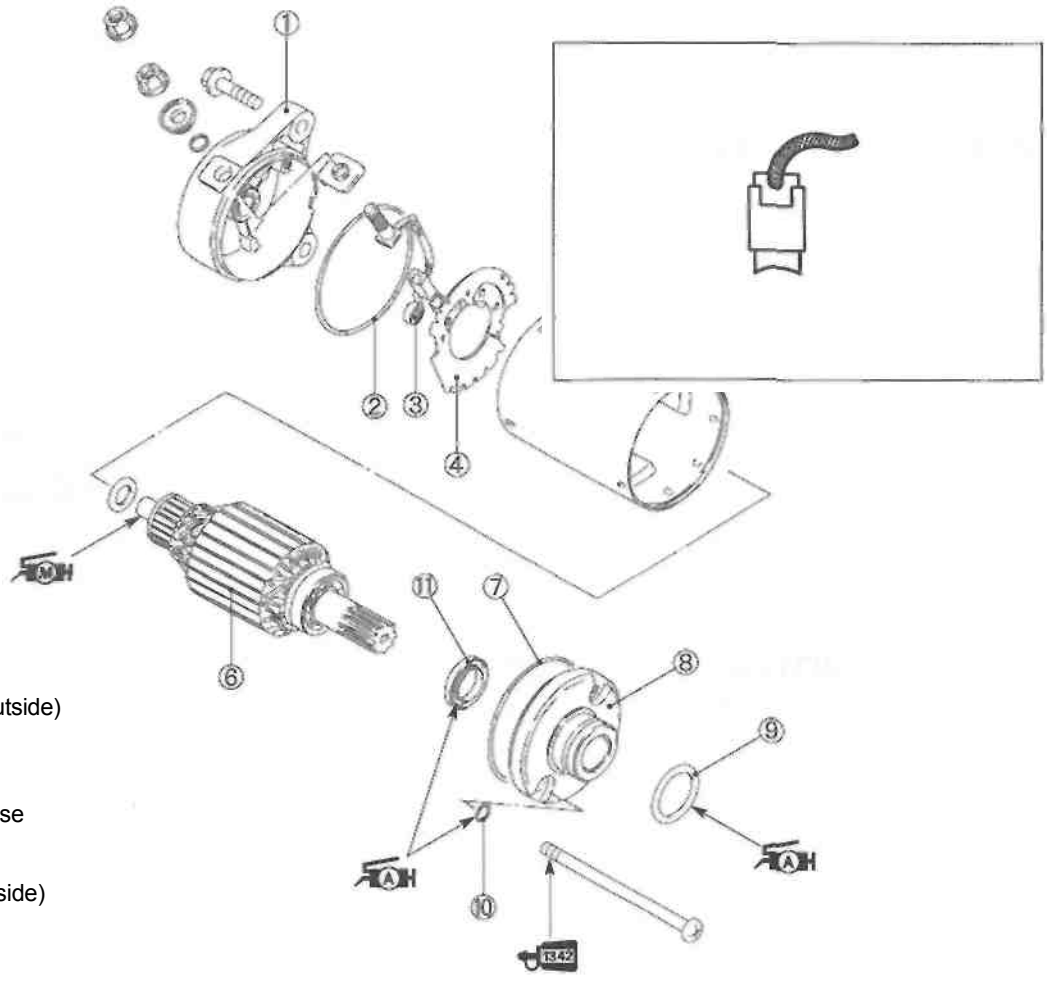
Others

- 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 Housing end (Outside)
② O-ring
③ Brush spring
④ Brush holder
⑤ Starter motor case
⑥ Armature
⑦ O-ring
⑧ Housing end (Inside)
⑨ O-ring
⑩ O-ring (2 pcs)
⑪ Oil seal

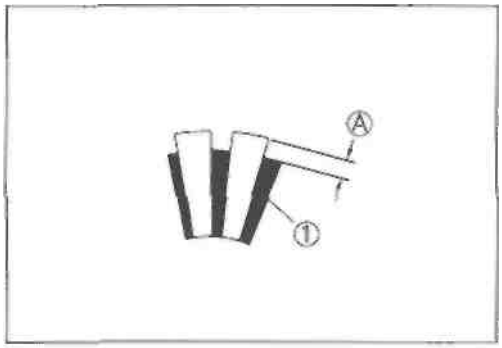
STARTER MOTOR INSPECTION

CARBON BRUSH

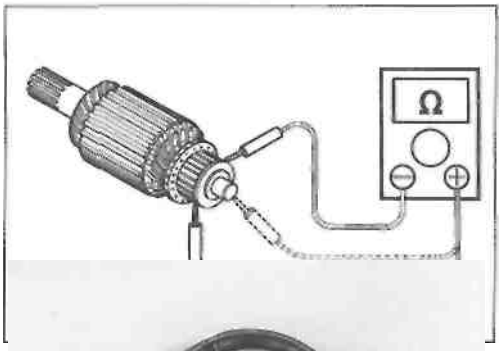
Inspect the brushes for abnormal wear, crack or smoothness in the brush holder.

If either carbon brush is defective, replace the brush assembly.

COMMUTATOR
Inspect the commutator for discoloration, abnormal wear or undercut Ⓐ
If the commutator is abnormally worn, replace the armature.
If the commutator surface is discolored, polish it with #400 sandpaper and wipe it using a clean, dry cloth. If there is no undercut, scrape out the insulator ①with a saw blade.



ARMATURE COIL INSPECTION
Measure for continuity between each segment. Measure 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 (inside).

STARTER MOTOR REASSEMBLY

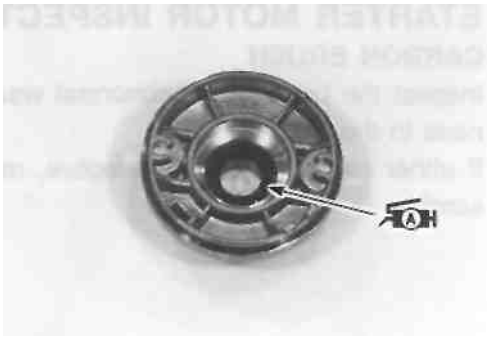
Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

A CAUTION

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

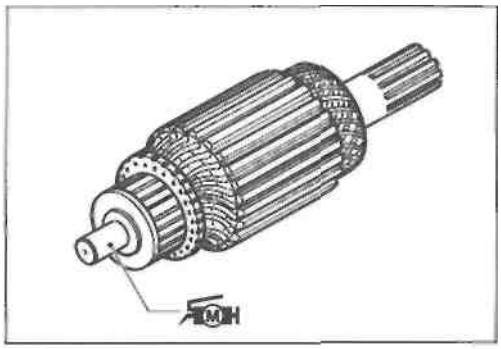
• Apply SUZUKI SUPER GREASE "A" to the lip of the oil seal.

99000-25010: SUZUKI SUPER GREASE "A"



• Apply a small quantity of SUZUKI MOLY PASTE to the armature shaft.

99000-25140: SUZUKI MOLY PASTE

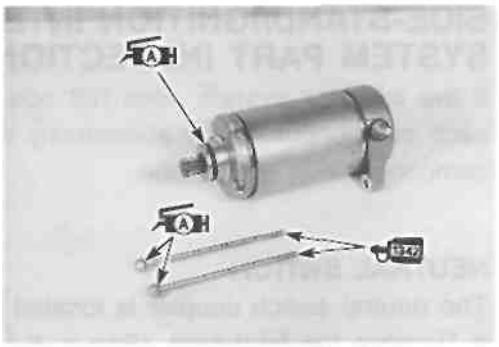


• Apply SUZUKI SUPER GREASE "A" to the O-rings.

99000-25010: SUZUKI SUPER GREASE "A"

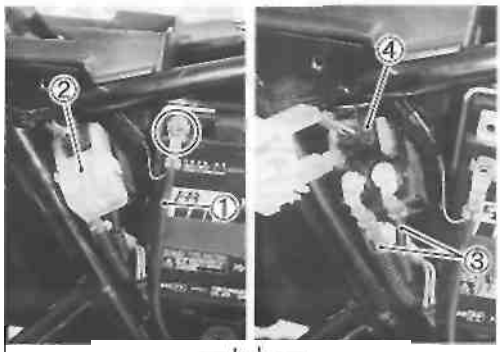
• Apply a small quantity of THREAD LOCK "1342" to the starter motor housing bolts.

99000-32050: THREAD LOCK "1342"



STARTER RELAY INSPECTION

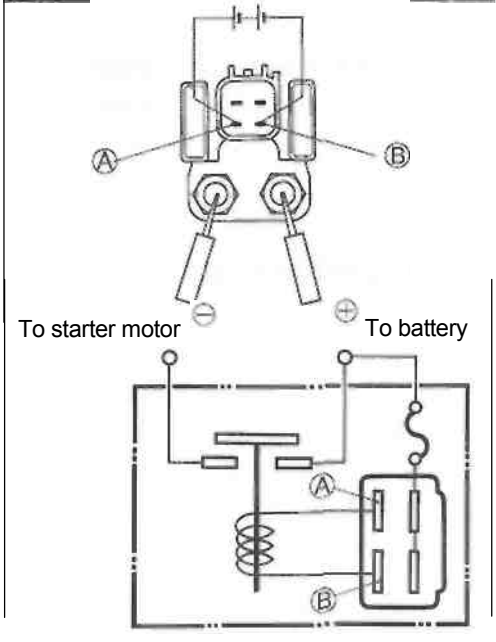
- Remove the front seat and right frame cover. (See p. 5-1.)
- Disconnect the battery ⊖ lead wire ①
- Remove the starter relay cover ②
- Disconnect the starter motor lead wires ③ and starter relay lead wire coupler ④
- Remove the starter relay.



Apply 12 volts to terminals Ⓐ and Ⓑ, and measure for continuity between the positive and negative terminals. If the starter relay clicks and continuity is found, the relay is ok.

09900-25008: Multi circuit tester set

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

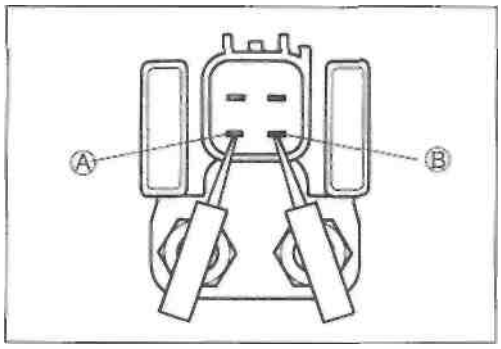


A CAUTION

Do not apply battery voltage to the starter relay for more than five secondes.
This may overheat and damage the relay coil.

Measure the starter relay resistance between the terminals (Ⓐ and Ⓑ).

Starter relay resistance: 3-6Ω



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.

NEUTRAL SWITCH

The neutral switch coupler is located under the fuel tank.

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the neutral switch coupler and measure the continuity between Blue and Ground with the transmission in neutral.

	Blue	Ground
ON (in neutral)	○	○
OFF (not in neutral)		

SIDE-STAND SWITCH

The side-stand switch coupler is located under the fuel tank.

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the side-stand switch lead wire coupler and measure the voltage between Green and Black/White lead wires.

TOOL 09900-25008: Multi circuit tester set Tester knob indication: Diode test (⊣◀)

	Green (⊕ Probe)	Black/White (⊖ Probe)
ON (UP-right position)	0.4-0.6 V	
OFF (DOWN position)	1.4-1.5 V	

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

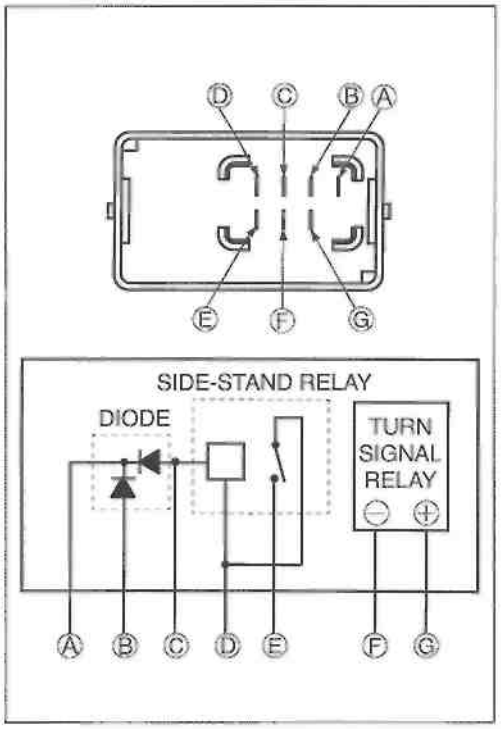
TURN SIGNAL/SIDE-STAND RELAY

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 under the luggage box.

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box①

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.

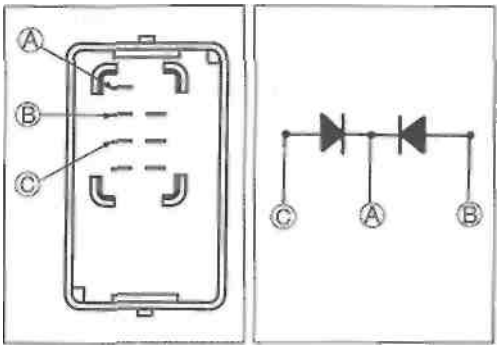


DIODE INSPECTION

Using multi circuit tester, measure the voltage between the terminals in the following table.

Unit: V

⊖ Probe c tester to:	⊕ Probe of tester to:		
		Ⓒ ,Ⓑ	Ⓐ
	Ⓒ Ⓑ		1.4-1.5
	Ⓐ	0.4-0.6	



09900-25008: Multi circuit tester set Tester

knob indication: Diode test(⊣◀)

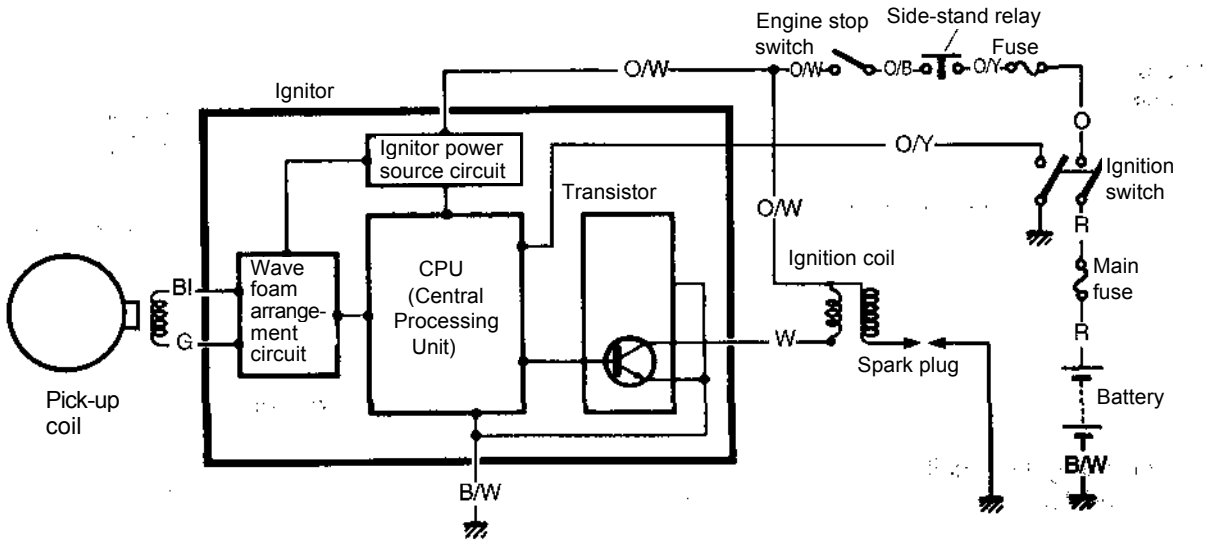
NOTE:

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

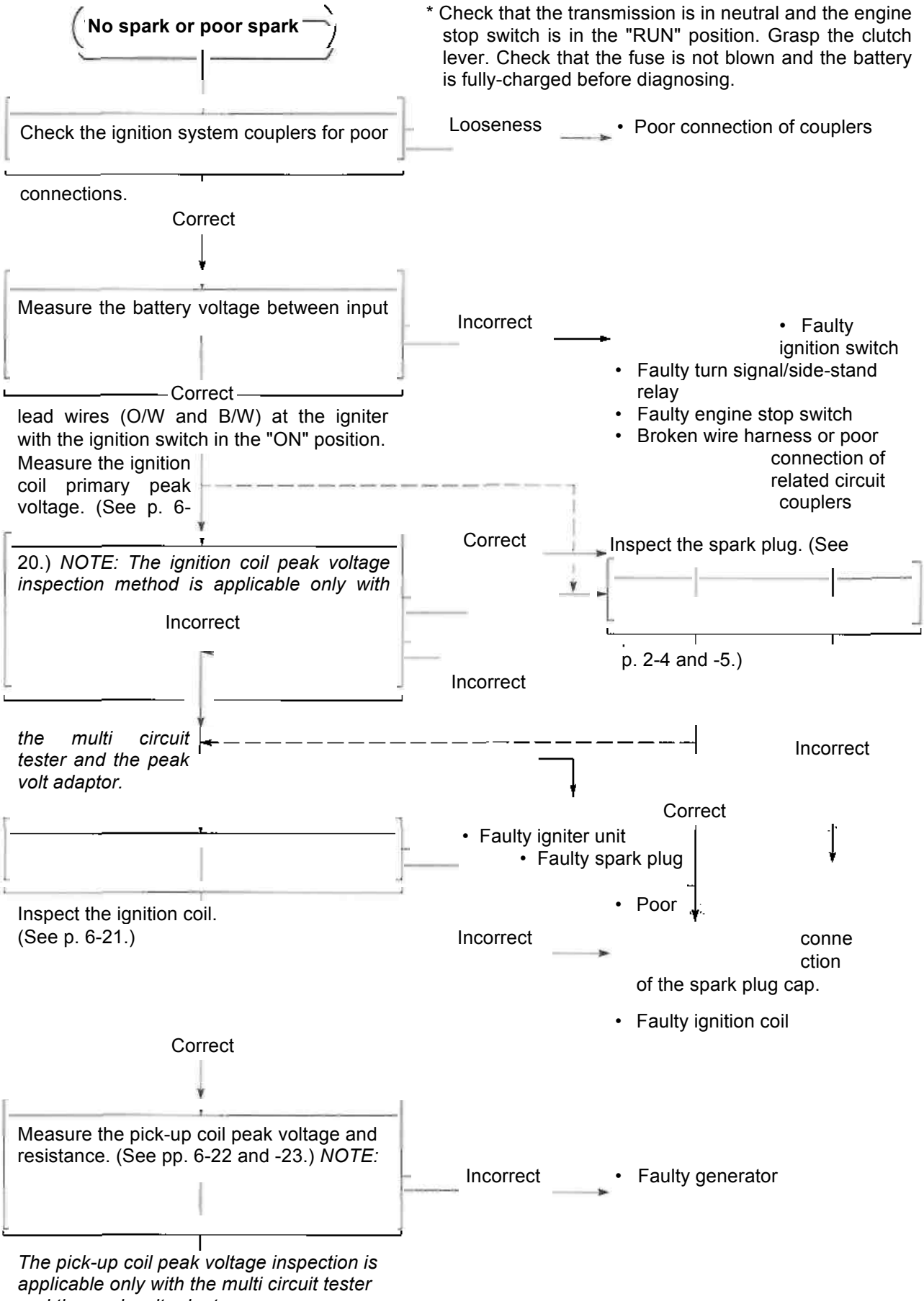
IGNITION SYSTEM (DIGITAL IGNITOR)

DESCRIPTION

The fully transistorized ignition system consists of the following components: a generator, ignitor, ignition coil and spark plug. The ignition timing is programmed and stored in the ignitor. The pick-up coil is mounted in the generator. The induced signal in the pick-up coil is sent to the wave-form arrangement circuit and the CPU receives this signal and calculates the best ignition timing. The CPU outputs the signal to the transistor of the ignition 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 in the ignition coil's secondary winding and produces the spark between the spark plug gap.



TROUBLESHOOTING



- Open circuit in wiring harness
- Poor connection of ignition couplers

INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the spark plug cap.
- Connect new spark plug to the spark plug cap and ground it to the cylinder head.

NOTE:
Make sure that the spark plug cap and spark plug is connected properly and the battery Is fully-charged.

Measure ignition coil primary peak voltage in the following procedure.

- Connect the multi circuit tester with the peak volt adaptor as follows.

⊕ Probe: White lead wire connector
⊖ Probe: Ground

NOTE:
Do not disconnect the ignition coil primary wire.

TOOL 09900-25008: Multi circuit tester set

A CAUTION

When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.

- Shift the transmission into neutral, turn the ignition switch to the "ON" position and grasp the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the Ignition coll primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.

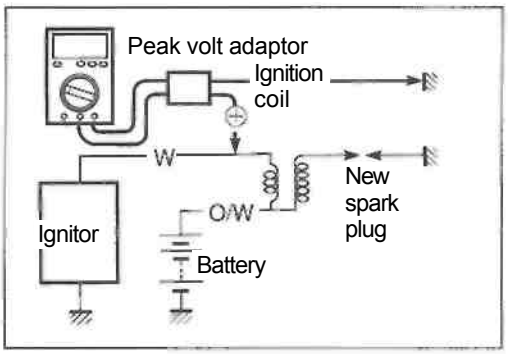
Tester knob indication: Voltage (⎓)

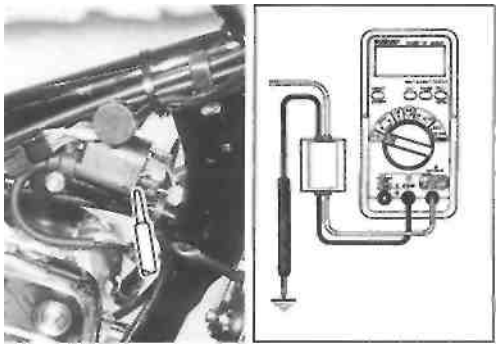
Ignition coil primary peak voltage: More than 200 V

AWARNING

While testing, do not touch the tester probes and spark plug to prevent receiving an electric shock.

If the voltage is lower than the standard value, inspect the ignition coil and the pick-up coil. (See pp. 6-21 to -23.)

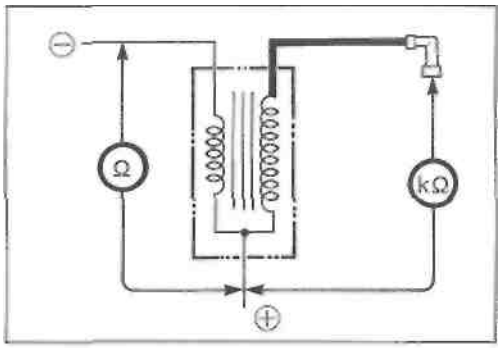




IGNITION COIL RESISTANCE

Measure the ignition coil resistance in both the primary and secondary windings. If the windings are in sound condition, their resistance should be close to the specified values.

Ignition coil resistance
Primary: 3-5Ω (⊕terminal-⊖terminal)
Secondary: 17-28 kΩ(⊕terminal-Spark plug cap)

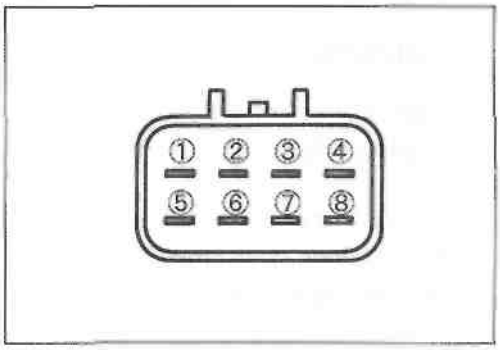


IGNITOR

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box.
- Remove the ignitor①

Measure the voltage between the terminals in the following table.

09900-25008: Multi circuit tester set Tester knob indication: Diode test (⊣◀)



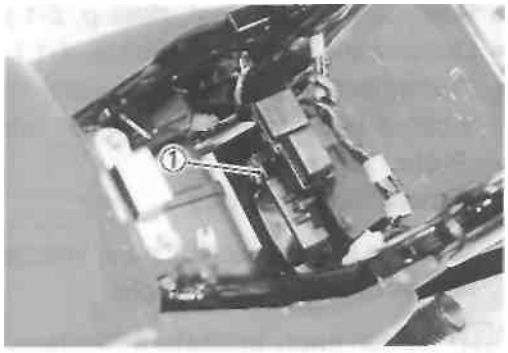
⊖ Probe of tester to: / ⊕ Probe of tester to:	①	②	③	④	⑤	⑥	⑦	⑧
①		1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5
②	1.2-1.5		1.1-1.5	1.1-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.1-1.5
③	0.9-1.4	1.1-1.5		0	1.2-1.5	1.2-1.5	1.2-1.5	0.5-0.8
④	0.9-1.4	1.1-1.5	0		1.2-1.5	1.2-1.5	1.2-1.5	0.5-0.8
⑤	1.1-1.5	1.1-1.5	0.3-0.6	0.3-0.6		1.2-1.5	1.2-1.5	0.8-1.2
⑥	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5		1.2-1.5	1.2-1.5
⑦	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5	1.2-1.5		1.2-1.5
⑧	1.0-1.5	1.1-1.5	0.4-0.6	0.4-0.6	1.2-1.5	1.2-1.5	1.2-1.5	

PICK-UP COIL PEAK VOLTAGE

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box.

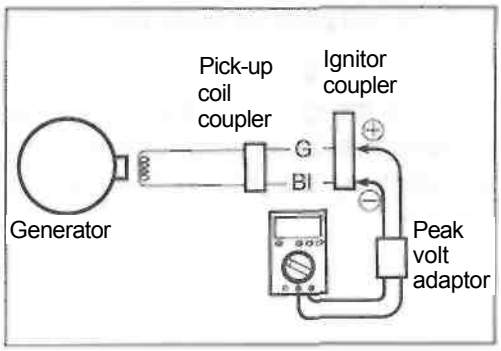
NOTE:
Be sure that all of the couplers are connected properly and the battery is fully-charged.

- Disconnect the ignitor coupler①at the ¡gnitor.



- Measure the pick-up coil peak voltage between the Green and Blue lead wires on the ignitor coupler.
- Connect the multi circuit tester with the peak volt adaptor as follows.

⊕ Probe: Green lead wire ⊖
Probe: Blue lead wire

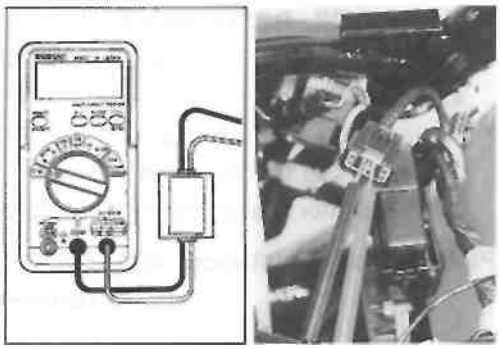


TOOL

09900-25008: Multi circuit tester set

A CAUTION

When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.



- Shift the transmission into neutral, turn the ignition switch to the "ON" position and grasp the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the pick-up coil peak voltage.
- Repeat the above procedure a few times and measure the highest pick-up coil peak voltage.

Tester knob indication: Voltage (⎓)

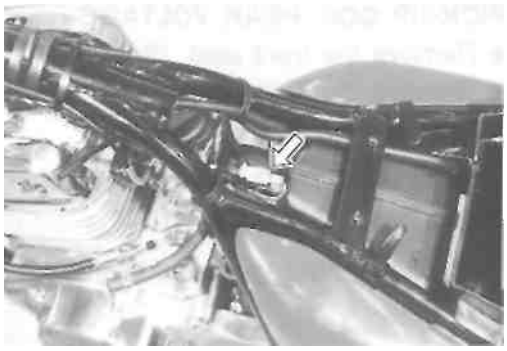
Pick-up coil peak voltage: More than 5.0 V (Green-Blue)

If the peak voltage measured on the ignitor coupler is lower than the standard value, measure the peak voltage on the pick-up coil coupler as follows.

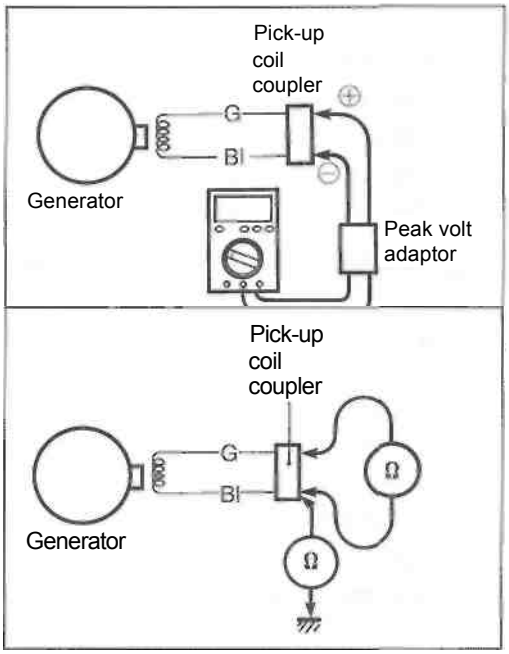
- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the pick-up coil coupler and connect the multi circuit tester with the peak volt adaptor.

⊕ Probe: Green lead wire ⊖
Probe: Blue lead wire

- Measure the pick-up coil peak voltage in the same manner as on the ignitor coupler.



Tester knob indication: Voltage (⎓)



Pick-up coil peak voltage: More than 5.0 V (Green-Blue)

If the peak voltage on the pick-up coil lead wire coupler is ok but on the ignitor coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the generator must be replaced and rechecked.

PICK-UP COIL RESISTANCE

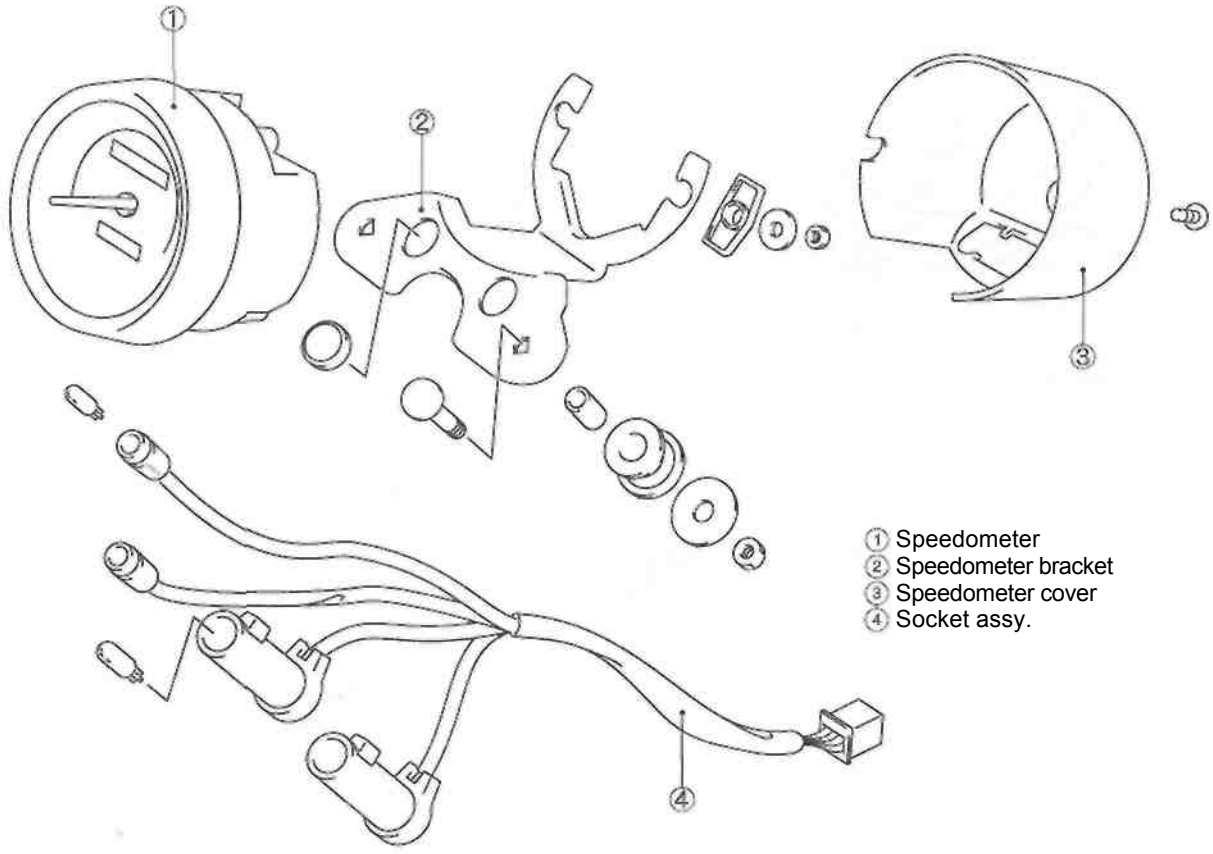
- Remove the seat and fuel tank and disconnect the pick-up coil coupler.
- Measure the resistance between the lead wires and ground. If the resistance is not within the specified value, the generator stator must be replaced.

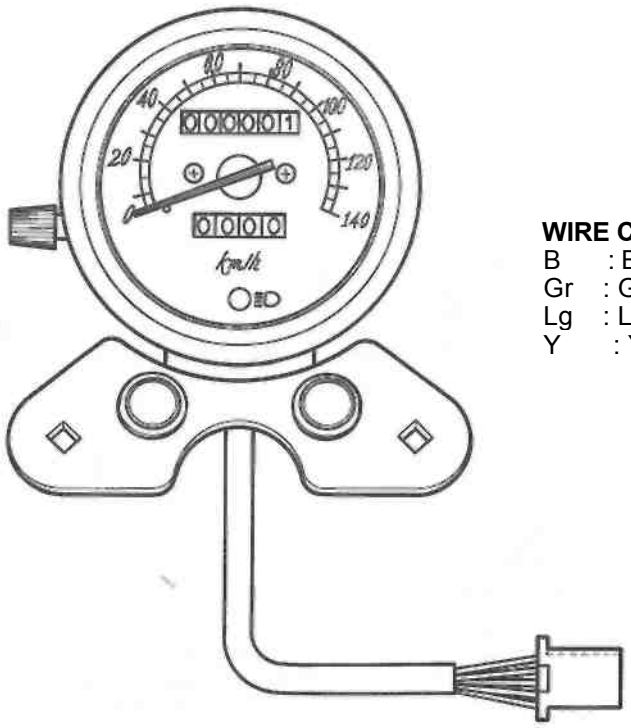
Pick-up coil resistance: 400-650Ω (Blue-Green)
∞ Ω (Blue-Ground)

SPEEDOMETER

REMOVAL AND DISASSEMBLY

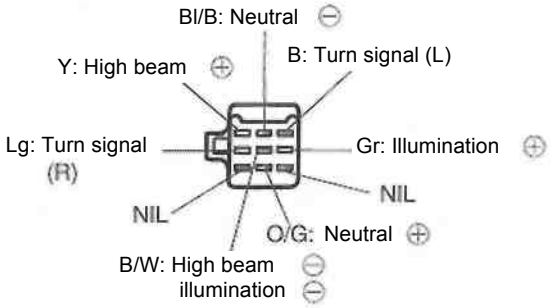
- Remove the speedometer.
- Disassemble the speedometer as follows.





WIRE COLOR

B	: Black	B/W	: Black with White tracer
Gr	: Gray	Bl/B	: Blue with Black tracer
Lg	: Light green	O/G	: Orange with Green tracer
Y	: Yellow		



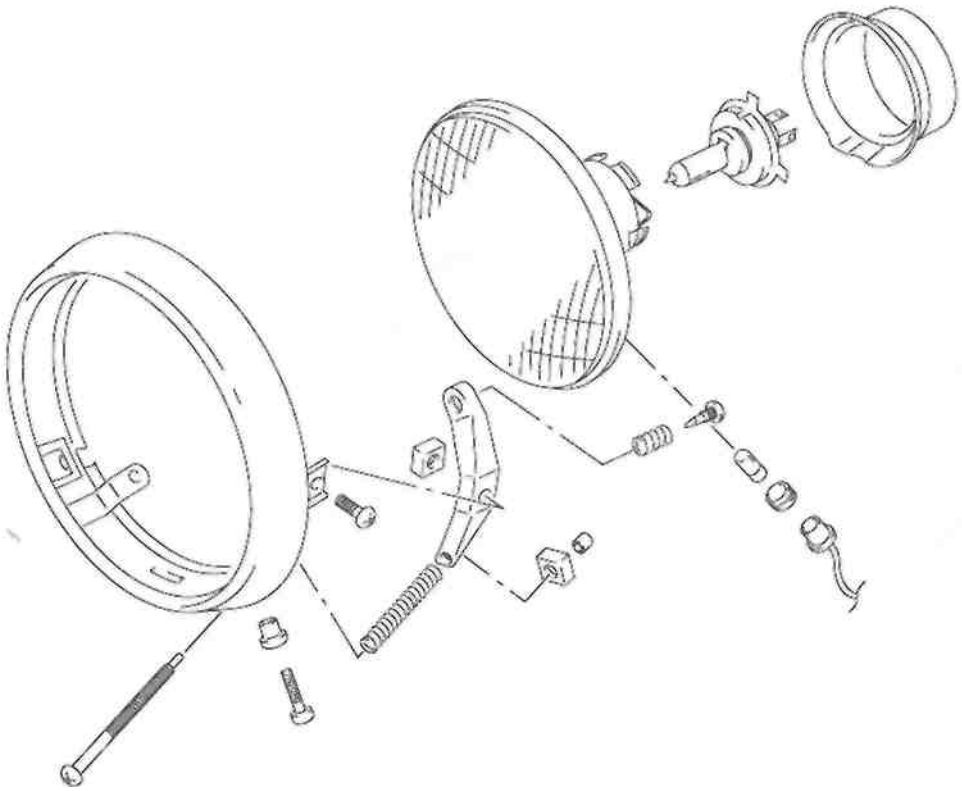
INSPECTION

Check the continuity between lead wires.
If there is no continuity, replace the respective parts.

NOTE:
When checking for continuity, it is not necessary to remove the speedometer.

LAMPS

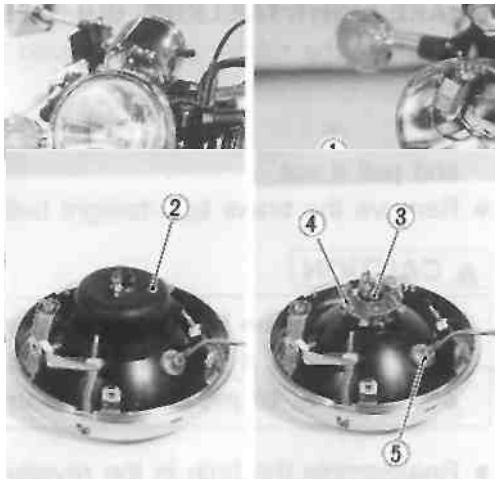
HEADLIGHT AND POSITION LIGHT



Headlight: 12V 60/55W
Position light: 12V 4W ..... Except for E-03, -24, -28 and -33 models

HEADLIGHT BULB REPLACEMENT

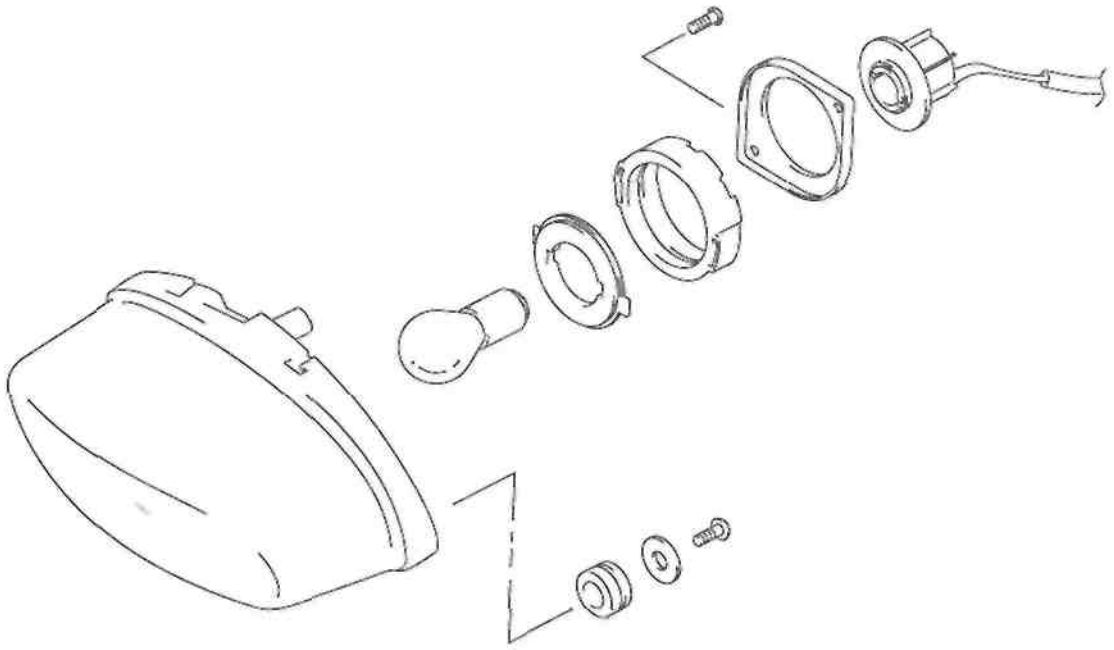
- Remove the headlight.
- Disconnect the socket①
- Remove the rubber cap②
- Remove the bulb③by removing the bulb holder spring ④
- Remove the position light bulb⑤
- Reassemble the bulb in the reverse order of removal.



A CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

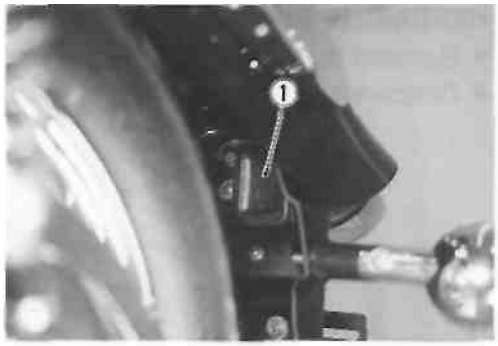
BRAKE LIGHT/TAILLIGHT



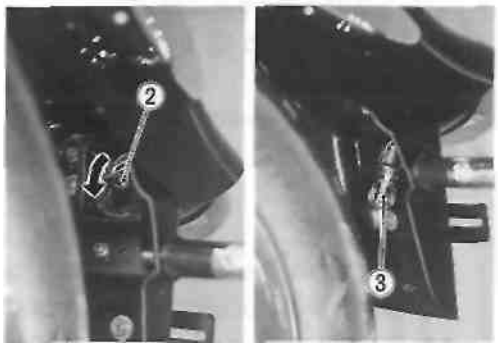
Brake light/Taillight: 12V 21/5W

BRAKE LIGHT/TAILLIGHT BULB REPLACEMENT

• Remove the rubber cap①behind the rear fender.



• Push in on the bulb socket②, turn it counterclockwise, and pull it out.
• Remove the brake light/taillight bulb③

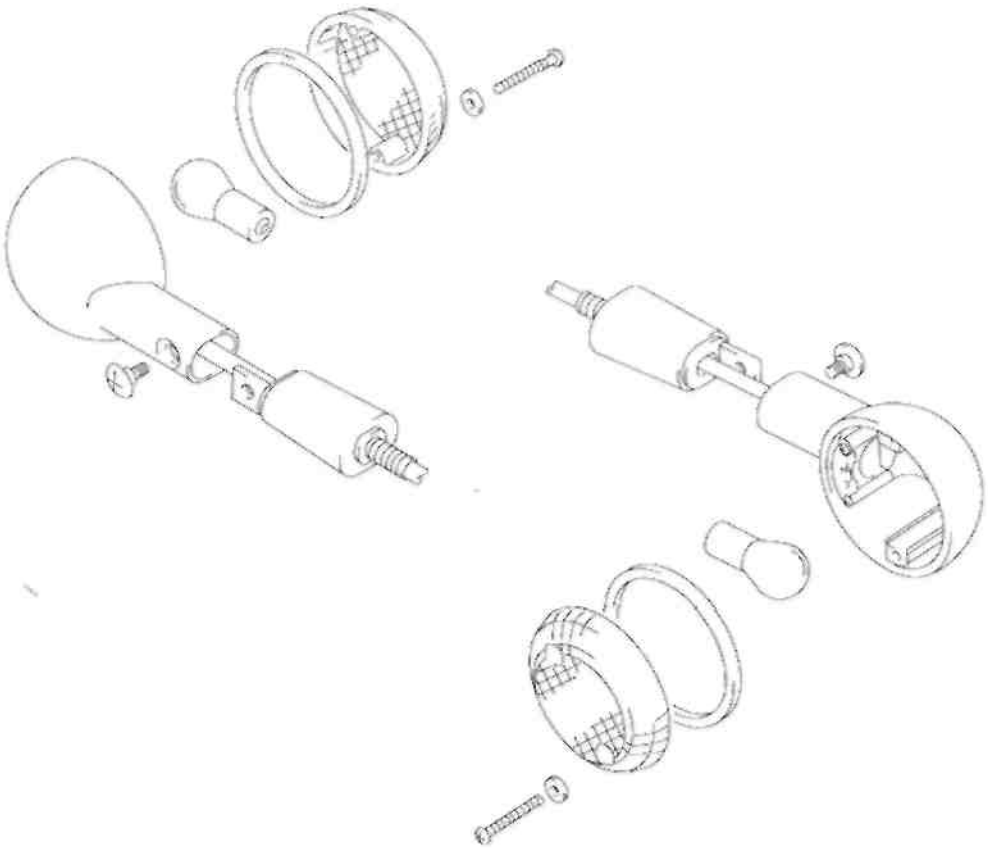


A CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

• Reassemble the bulb in the reverse order of removal.

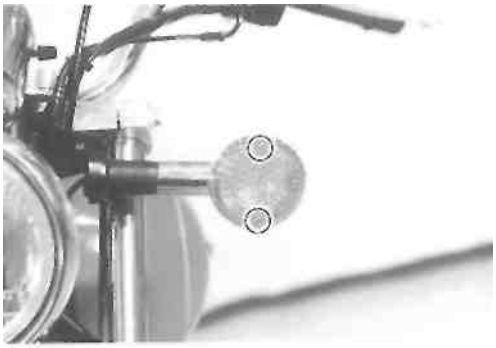
TURN SIGNAL LIGHTS



Turn signal light/Running light: 12V 21/5W..... For E-03, -28 and -33 models
Turn signal light: 12V 21W .....For the others

TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the lens by removing the screws.
- Remove the bulb.



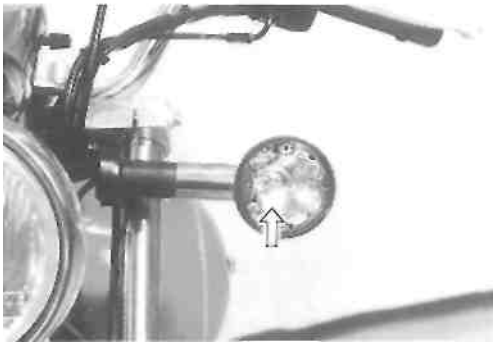
CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

- Reassemble the bulb in the reverse order of removal.

CAUTION

Do not overtighten the lens fitting screws.



RELAYS

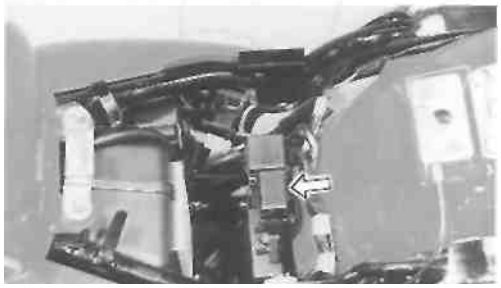
STARTER RELAY

The starter relay is located behind the right frame cover. (See pp. 6-14 and -15.)

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 under the luggage box.

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box.



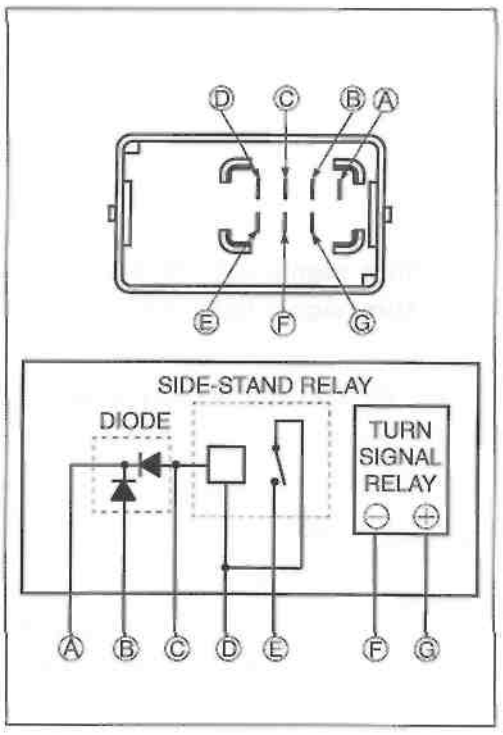
INSPECTION

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 it with a new one.

NOTE:
Be sure that the battery is full-charged.



SWITCHES

Measure each switch for continuity using **a** tester. If any abnormality is found, replace the respective switch assemblies with new ones.

IGNITION SWITCH

Position \ Color	R	O	O/Y	B/W	Gr	Br
ON	○—○		○—○		○—○	
OFF						
LOCK						
P	○————					○

For E-24

Position \ Color	R	O	O/Y	B/W
ON	○—○		○—○	
OFF				
LOCK				

LIGHTING SWITCH
(Except for E-03, -24, -28, -33)

Position \ Color	O/Bl	Gr	O/R	Y/W
OFF (●)				
S ( )	○—○			
ON ( )	○—○		○—○	

DIMMER SWITCH

Position \ Color	W	Y	Y/W
HI ( )		○—○	
LO ( )	○————		○

PASSING LIGHT SWITCH
(Except for E-03, -28, -33)

Position \ Color	O/R	Y
•		
PUSH	○————	○

TURN SIGNAL SWITCH

Position \ Color	Lg	Lbl	B
L (⇦)		○—○	
PUSH			
R (⇨)	○—○		

ENGINE STOP SWITCH

Position \ Color	O/B	O/W
OFF ( )		
RUN ( )	○————	○

STARTER BUTTON

Position \ Color	O/W	Y/G
•		
PUSH	○————	○

HORN BUTTON

Position \ Color	B/Bl	B/W
•		
PUSH	○————	○

FRONT BRAKE LIGHT SWITCH

Position \ Color	B/R	B
OFF		
ON	○————	○

REAR BRAKE LIGHT

Position \ Color	O	W/B
OFF		
ON	○————	○

CLUTCH LEVER

Position \ Color	B/Y	B/Y
FREE		
•	○————	○

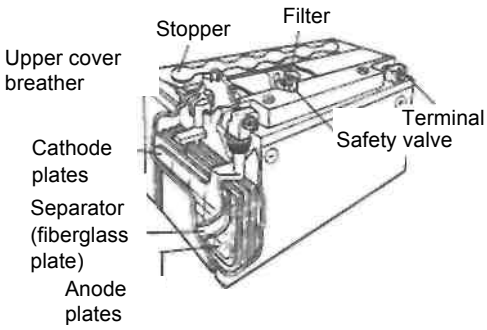
WIRE COLOR

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

BATTERY

SPECIFICATIONS

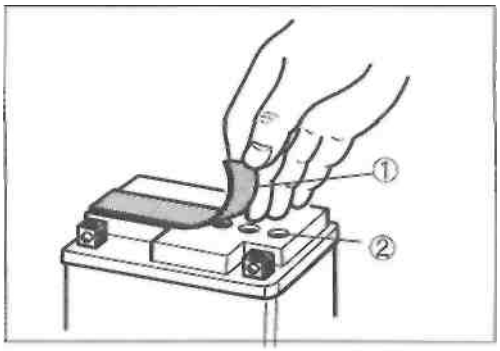
Type designation	FTX7L-BS
Capacity	12V, 21.6 kC(6Ah)/10HR
Standard electrolyte S.G.	1.320 at 20°C (68°F)



INITIAL CHARGING

FILLING ELECTROLYTE

• Remove the aluminum tape①which seals the battery filler holes②

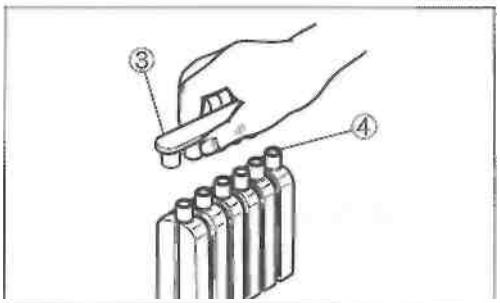


* Remove the caps③from the electrolyte container.

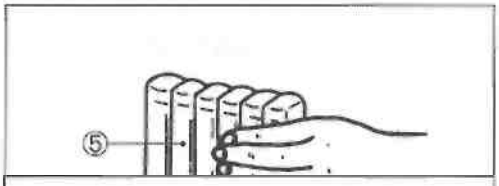
NOTE:

* *Do not remove or pierce the sealed areas④of the electrolyte container.*

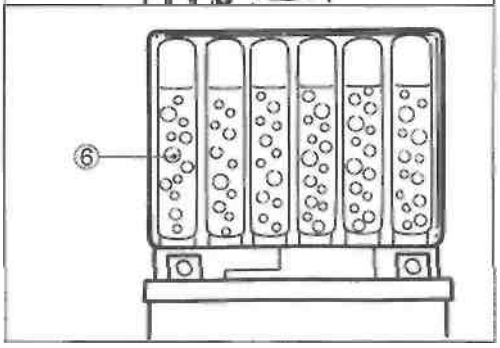
* *After completely filling the battery with electrolyte, use the caps ③ from the electrolyte container to seal the battery filler holes.*



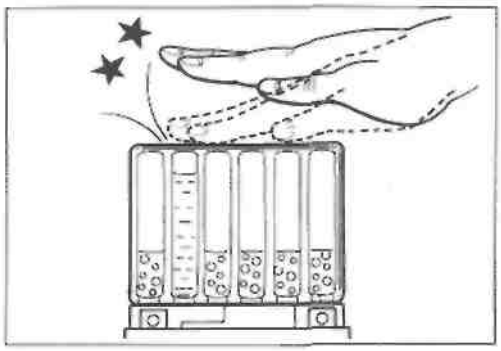
• Insert the nozzles of the electrolyte container⑤into the battery's electrolyte filler holes. Hold the electrolyte container firmly so that it does not fall. Do not allow any of the electrolyte to spill.



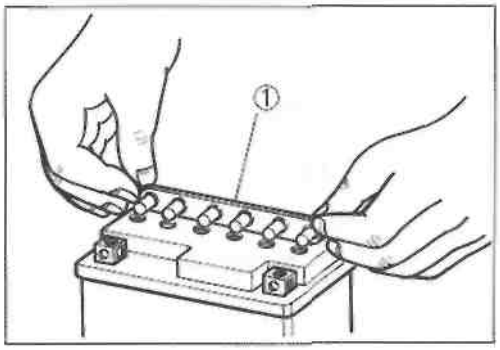
• Make sure that the air bubbles⑥rise to the top of each electrolyte container and leave the electrolyte container in this position for more than 20 minutes.



NOTE:
If air bubbles do not rise from any one of the filler ports, tap the bottom of the electrolyte container two or three times. Never remove the electrolyte container from the battery while there is still electrolyte in the container.

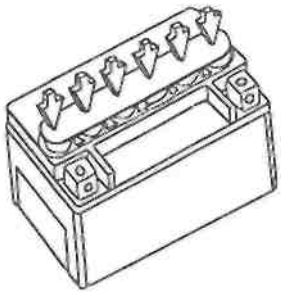


- After the electrolyte container is completely empty, remove it from the battery and wait about 20 minutes.
- Insert the caps①firmly into the filler holes, so that the top of the caps do not protrude above the upper surface of the battery's top cover.

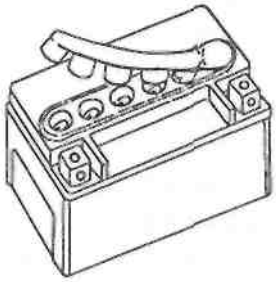


A CAUTION

* **The charging system for a MF battery is different from that of a conventional battery. Only use the specified MF battery.**
* **Do not remove the caps once they are installed in the battery**

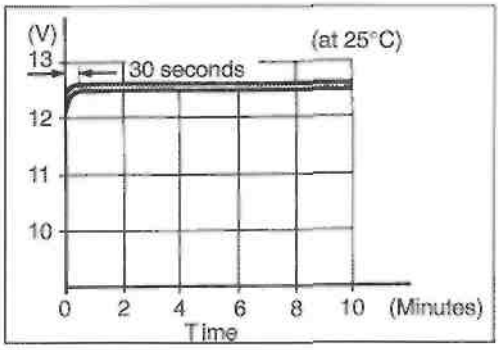


CORRECT



INCORRECT

- Measure the battery voltage using a tester. The tester should indicate more than 12.5-12.6V (DC), as shown. If the battery voltage is lower than specification, charge the battery with a battery charger.



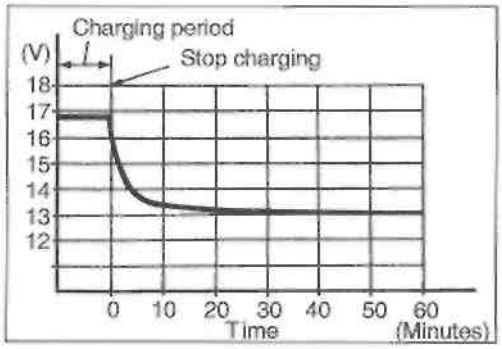
NOTE:
Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.

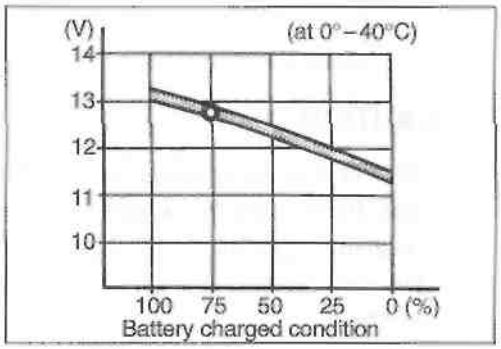
SERVICING

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, clean the battery terminals with sandpaper.

RECHARGING OPERATION

• Measure the battery voltage using a tester. If the voltage reading is less than 12.0V (DC), recharge the battery with a battery charger.





! A CAUTION!

When recharging the battery, remove the battery from the motorcycle.

NOTE:
While recharging, do not remove the caps on the top of the battery.

Recharging time: 0.7A for 5 to 10 hours or 3A for 1 hour

! A CAUTION]

Be careful not to permit the charging current to exceed 3A at any time.

- After recharging, wait at least 30 minutes and then measure the battery voltage using a tester.
- If the battery voltage is less than 12.5V, recharge the battery again.
- If the battery voltage is still less than 12.5V after recharging, replace the battery with a new one.
- When a battery is left unused for a long time, its voltage needs to be regularly measured. When the motorcycle is not used for more than one month (especially during the winter season), measure the battery voltage at least once a month.

SERVICING INFORMATION

---------- CONTENTS ----------

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start. s	**Compression too low** 1. Worn cylinder. 2. Worn piston ring. 3. Worn valve guide or improper valve seating. 4. Loose spark plug. 5. Broken, cracked or damaged piston 6. Slow cranking starter motor. 7. Mistimed valves. 8. Valve clearance out of adjustment. **Spark plug not sparking** 1. Damaged spark plug. 2. Damaged spark plug cap. 3. Fouled spark plug. 4. Wet spark plug. 5. Defective ignition coil. 6. Open or short in high-tension cord. 7. Defective pick-up coil or ignitor unit. **No fuel reaching the carburetor** 1. Clogged or defective fuel valve. 2. Defective carburetor needle valve. 3. Clogged fuel hose. 4. Clogged fuel filter.	Rebore or replace. Replace. Repair or replace Tighten. Replace See electrical section. Adjust. Adjust. Replace. Replace. Clean or replace. Clean and dry or replace. Replace. Replace. Replace. Clean or replace. Replace with carburetor needle valve seat. Clean or replace. Clean or replace.
Engine stalls easily.	1. Fouled spark plug. 2. Defective pick-up coil or ignitor unit. 3. Clogged fuel hose. 4. Clogged carburetor jet. 5. Valve clearance out of adjustment.	Clean or replace. Replace. Clean. Clean. Adjust.

Complaint	Symptom and possible causes	Remedy
Engine is noisy.	**Excessive valve chatter**	
Noisy engine.	1. Excessive valve clearance.	Adjust.
	2. Weak or broken valve spring.	Replace.
	3. Worn cam surface.	Replace.
	4. Worn or burnt camshaft journal. **Noise seems to come from the piston**	Replace camshaft.
	1. Worn piston.	Replace.
	2. Worn cylinder.	Rebore or replace.
	3. Carbon build-up in combustion chamber.	Clean.
	4. Worn piston pin or piston pin bore.	Replace.
	5. Worn piston ring or ring groove. **Noise seems to come from the cam chain**	Replace.
	1. Stretched cam chain.	Replace cam chain and sprocket.
	2. Worn cam chain sprocket.	Replace cam chain and sprocket.
	3. Improperly working cam chain tension adjuster. **Noise seems to come from the clutch**	Repair or replace.
	1. Worn countershaft spline.	Replace countershaft.
	2. Worn clutch hub spline.	Replace clutch hub.
	3. Worn clutch plate teeth.	Replace clutch plate.
	4. Distorted clutch plate.	Replace.
	5. Worn clutch release bearing.	Replace.
	6. Weak clutch damper.	Replace primary driven gear.
	7. Weak clutch spring. **Noise seems to come from the crankshaft**	Replace.
	1. Rattling bearing.	Replace.
	2. Worn or burnt crank pin bearing.	Replace.
	3. Worn or burnt ball bearing. **Noise seems to come from the transmission**	Replace.
	1. Worn or rubbing gear.	Replace.
	2. Worn countershaft spline.	Replace countershaft.
	3. Worn driveshaft spline.	Replace driveshaft.
	4. Worn or rubbing primary gear.	Replace.
	5. Worn bearing.	Replace.
Clutch slips.	1. Clutch cable out of adjustment.	Adjust.
	2. Weak or broken clutch spring.	Replace.
	3. Worn or distorted clutch pressure plate.	Replace.
	4. Distorted clutch plate.	Replace.
Clutch drags.	1. Clutch out of adjustment.	Adjust.
	2. Some clutch springs are weak, while others are not.	Replace.
	3. Worn or distorted clutch pressure plate.	Replace.
	4. Distorted clutch plate.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift fork.	Replace.
	3. Worn gearshift pawl.	Replace.

Complaint	Symptom and possible causes	Remedy
Transmission will not shift back.	1. Broken gearshift shaft return spring. 2. Rubbing or stuck gearshift shaft. 3. Worn or distorted gearshift fork.	Replace. Repair or replace. Replace.
Transmission jumps out of gear.	1. Worn gear. 2. Worn or distorted gearshift fork. 3. Weakened gearshift cam stopper spring. 4. Worn gearshift pawl.	Replace. Replace. Replace. Replace.
Engine idles poorly.	1. Valve clearance out of adjustment. 2. Improper valve seating. 3. Worn valve guide. 4. Worn cam surface. 5. Excessive spark plug gap. 6. Defective ignition coil. 7. Defective pick-up coil or ignitor unit. 8. Spark plug too cold. 9. Incorrect float chamber fuel level. 10. Clogged carburetor jet. 11. Defective generator.	Adjust. Repair or replace. Replace. Replace. Adjust or replace. Replace. Replace. Replace by hot type plug. Adjust float height. Clean. Replace.
Engine runs poorly in high-speed range.	1. Weak valve spring. 2. Worn camshaft. 3. Insufficient spark plug gap. 4. Mistimed valves. 5. Ignition not advanced sufficiently due to poorly working timing advance circuit. 6. Defective ignition coll. 7. Defective pick-up coil or ignitor unit. 8. Low float chamber fuel level. 9. Clogged air cleaner element. 10. Clogged fuel hose, resulting in inadequate fuel supply to carburetor.	Replace. Replace. Regap or replace. Adjust. Replace ignitor unit. Replace. Replace. Adjust float height. Clean or replace. Clean and prime.
Exhaust smoke is dirty or thick.	1. Excessive amount of engine oil. 2. Worn cylinder. 3. Worn piston ring. 4. Worn valve guide. 5. Scored or scuffed cylinder wall. 6. Worn valve stem. 7. Defective valve stem oil seal. 8. Worn oil ring side rail.	Check level and drain. Rebore or replace. Replace. Replace. Rebore or replace. Replace valve. Replace. Replace oil ring.
Engine lacks power.	1. Insufficient valve clearance. 2. Weak valve spring. 3. Mistimed valves. 4. Worn cylinder. 5. Worn piston ring. 6. Improper valve seating. 7. Fouled spark plug. 8. Incorrect spark plug. 9. Clogged carburetor jet. 10. Incorrect float chamber fuel level. 11. Clogged air cleaner element. 12. Worn camshaft. 13. Air leaked from intake pipe. 14. Excessive amount of engine **oil.**	Adjust. Replace. Adjust. Rebore or replace. Replace. Repair or replace. Clean or replace. Replace. Clean. Adjust float height. Clean or replace. Replace. Tighten or replace. Check level and drain.

Complaint	Symptom and possible causes	Remedy
Engine overheats.	1. Heavy carbon deposit on piston crown. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Too low in float chambers fuel level. 5. Sucking air from intake pipe. 6. Use incorrect engine oil. 7. Clogged air Intake with dust.	Clean. Add oil. Replace or clean. Adjust. Retighten or replace. Change. Clean.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Starting difficulty.	1. Clogged fuel pipe. 2. Air leaking from joint between starter body and car buretor. 3. Air leaking from carburetor joint. 4. Improperly working starter plunger.	Clean. Tighten, adjust or replace gasket. Tighten or replace defective parts. Adjust.
Idling or low-speed trouble.	1. Clogged or loose pilot jet. 2. Air leaking from carburetor joint. 3. Clogged pilot outlet port. 4. Clogged bypass port. 5. Starter plunger not fully closed.	Clean or tighten. Tighten or replace defective part. Clean. Clean. Adjust.
Medium-or high speed trouble.	1. Clogged main jet. 2. Clogged needle jet. 3. Improperly working throttle valve. 4. Clogged fuel filter.	Clean. Clean. Adjust. Clean or replace.
Overflow and fuel level fluctuations.	1. Worn or damaged needle valve. 2. Broken needle valve spring. 3. Improperly working float. 4. Foreign matter on the needle valve. 5. Incorrect float chamber fuel level.	Replace. Replace. Adjust or replace. Clean or replace with needle valve seat. Adjust float height.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Steering is heavy.	1. Overtightened steering stem nut. 2. Broken bearing/race in steering stem. 3. Distorted steering stem. 4. Low tire pressure.	Adjust. Replace. Replace. Regulate.
Handlebars wobbles.	1. Loss of balance between right and left front fork legs. 2. Distorted front fork. 3. Distorted front axle. 4. Twisted tire.	Adjust or replace. Repair or replace. Replace. Replace.

Complaint	Symptom and possible causes	Remedy
Front wheel wobbles.	**1.** Distorted wheel rim. 2. Worn front wheel bearing. 3. Defective or incorrect tire. 4. Loose front axle. 5. Incorrect front fork oil level. 6. Loose wheel spoke.	Replace. Replace. Replace. Tighten. Adjust. Tighten.
Front suspension too soft.	1. Weak spring. 2. Insufficient fork oil.	Replace. Check level and add.
Front suspension too stiff.	1. Excessively viscous fork oil. 2. Excessive fork oil.	Replace. Check level and drain.
Front suspension too noisy.	1. Insufficient fork oil. 2. Loose front suspension fastener.	Check level and add. Tighten.
Rear wheel wobbles.	1. Distorted wheel rim. 2. Worn rear wheel bearing. 3. Defective or incorrect tire. 4. Worn swingarm bearing. 5. Loose rear axle nut or swingarm pivot nut. 6. Loosen wheel spokes. 7. Loosen rear suspension fastener.	Replace. Replace. Replace. Replace. Tighten. Tighten. Tighten.
Rear suspension too soft.	1. Weak rear shock absorber spring. 2. Rear shock absorber leaks oil. 3. Improper suspension setting.	Replace. Replace. Adjust.
Rear suspension too stiff.	1. Improperly adjusted rear suspension. 2. Bent swingarm. 3. Worn swingarm and rear suspension related bearings.	Adjust. Replace. Replace.
Rear suspension too noisy.	1. Loose rear suspension fastener. 2. Worn swingarm bearing.	Tighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Brake power insufficient.	1. Leakage of brake fluid. 2. Worn brake pad. 3. Oil in brake pad surface. 4. Worn brake disc. 5. Air in hydraulic system. 6. Worn brake shoe. 7. Oil in brake shoe surfaces. 8. Excessively worn brake drum. 9. Excessive brake pedal play.	Repair or replace. Replace. Clean brake disc and brake pads. Replace. Bleed. Replace. Clean. Replace. Adjust.

Complaint	Symptom and possible causes	Remedy
Brake squeaks.	1. Carbon adhesion on brake pad surface. 2. Tilted brake pad. 3. Damaged wheel bearing. 4. Worn brake pad. 5. Foreign material in brake fluid. 6. Clogged return port of master cylinder. 7. Brake shoe surface glazed. 8. Worn brake shoe. 9. Loose front axle or rear axle nut.	Clean surface with sand-paper. Readjust brake pad position or replace. Replace. Replace. Change brake fluid. Disassemble and clean master cylinder. Clean surface with sandpaper. Replace. Tighten.
Brake lever or pedal stroke excessive.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Incorrect brake fluid. 4. Worn brake camshaft. 5. Excessively worn brake shoes and/or brake drum.	Bleed. Check level and add. Bleed any air. Change. Replace. Replace.
Brake fluid leaks.	1. Loose connection joint. 2. Cracked brake hose. 3. Worn piston seal.	Tighten. Replace. Replace

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plug. 3. Defective pick-up coil. 1. Defective ignitor unit.	Replace. Replace. Replace. Replace.
Spark plug is wet or quickly becomes fouled with carbon.	1. Excessively rich air/fuel mixture. 2. Excessively high idling speed. 3. Incorrect gasoline. 4. Clogged air cleaner element. 5. Incorrect spark plug (cold type).	Adjust carburetor Adjust carburetor Change. Clean or replace. Change to hot type spark plug.
Spark plug quickly becomes fouled with oil or carbon.	1. Worn piston ring. 2. Worn piston. 3. Worn cylinder. 4. Excessive valve-stem-to-valve-guide clearance. 5. Worn valve stem oil seal.	Replace. Replace. Rebore or replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Incorrect spark plug (hot type). 2. Overheated engine. 3. Loose spark plug. 4. Excessively lean air/fuel mixture.	Change to cold type spark plug. Tune-up. Tighten. Adjust carburetor.
Generator does not charge.	1. Open or short in lead wires, or loose lead connec tions. 2. Shorted, grounded or open stator coil. 3. Shorted or panctured regulator/rectifier.	Repair, replace or connect properly. Replace. Replace.

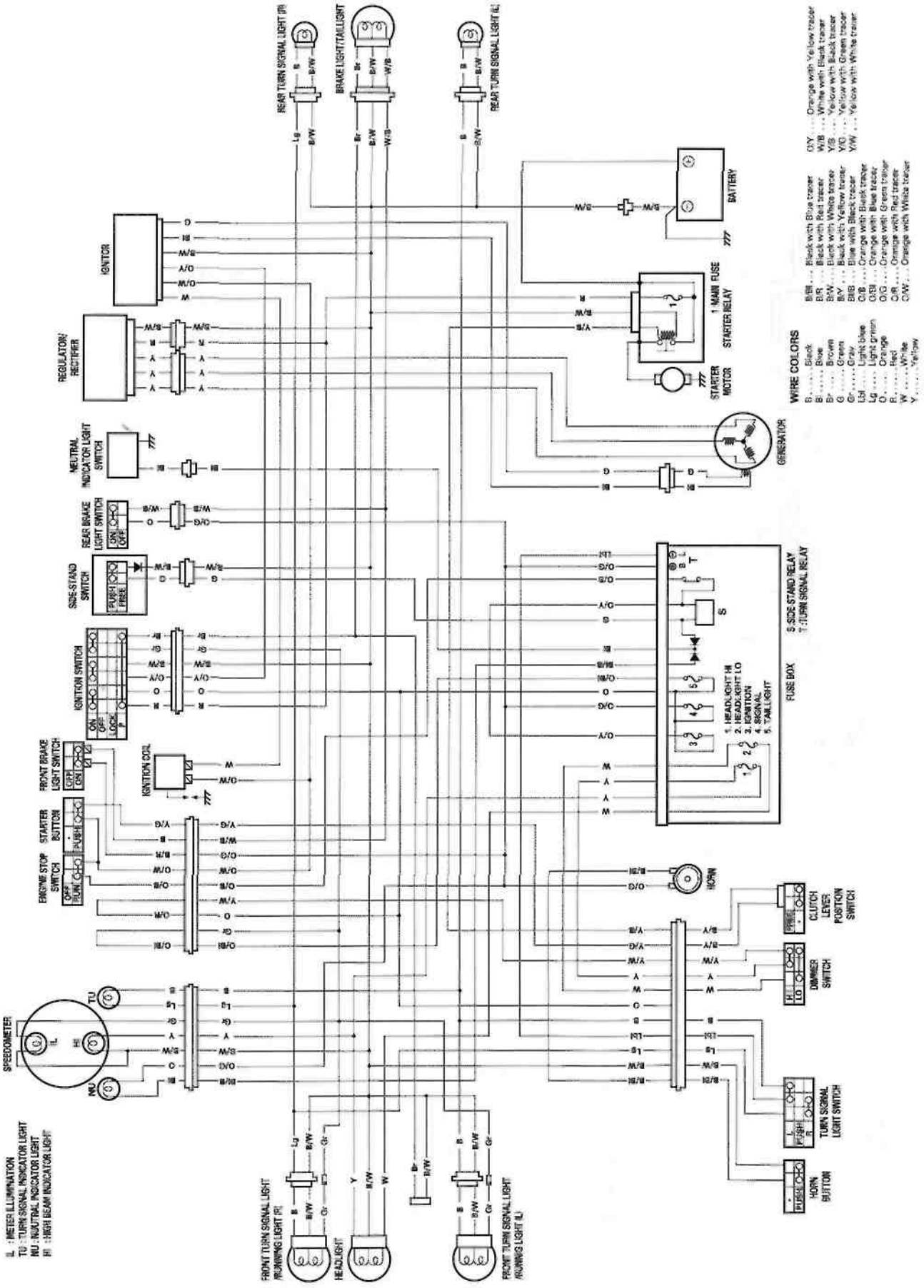
Complaint	Symptom and possible causes	Remedy
Generator charges but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminal. 2. Grounded or open-circuited stator coils or genera tor. 3. Defective regulator/rectifier. 4. Defective battery cell plates.	Repair or tighten. Replace. Replace. Replace battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Damaged or defective regulator/rectifier. 3. Poorly grounded regulator/rectifier.	Replace battery. Replace. Clean, repair or replace.
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 does not work.	1. Run down battery. 2. Defective switch contact. 3. Brushes do not seat properly on the commutator in the starter motor. 4. Defective starter relay.	Recharge or replace. Replace. Repair or replace. Replace.

BATTERY

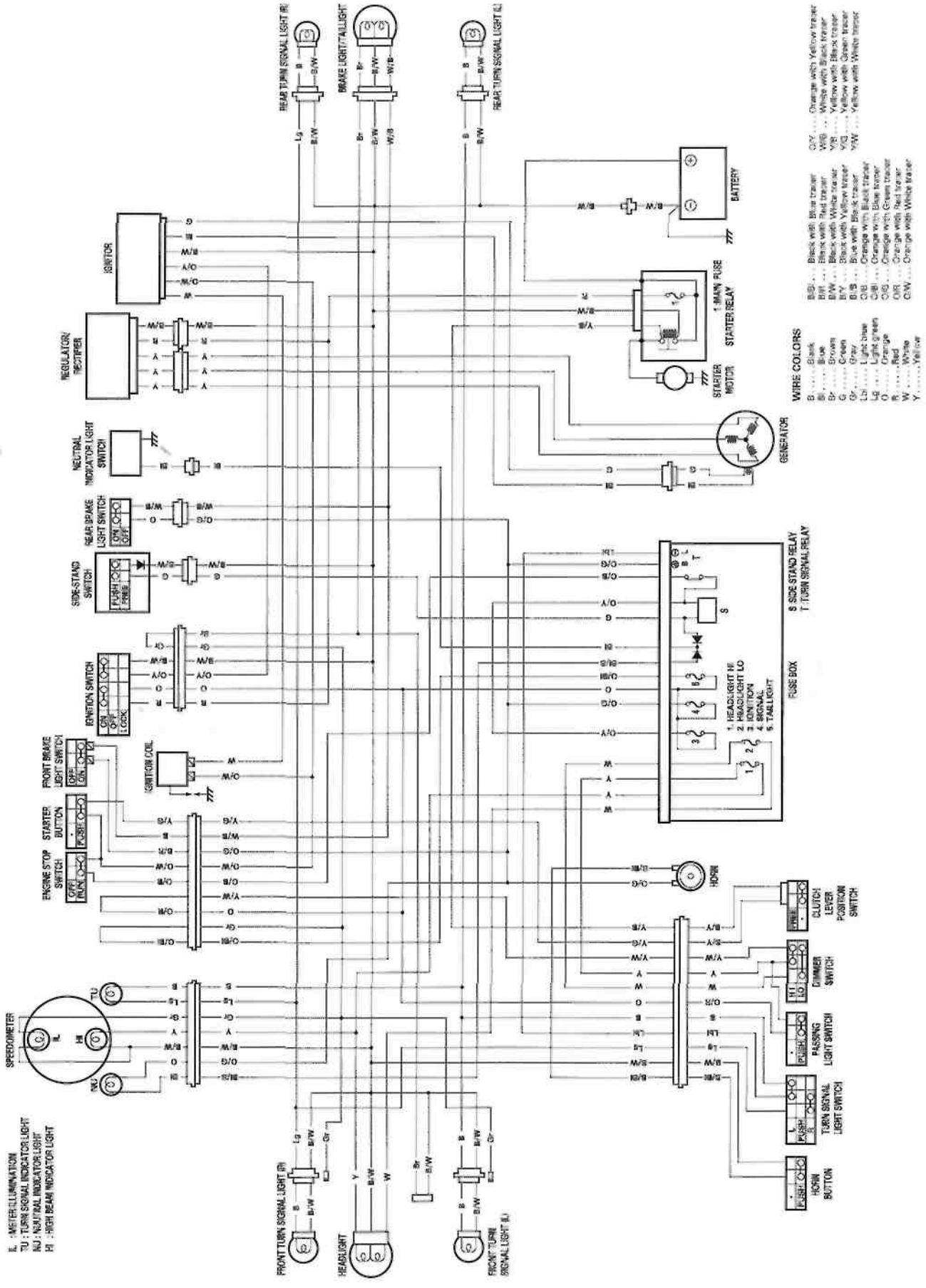
Complaint	Symptom and possible causes	Remedy
Sulfation or spots on surfaces of cell plates.	1. Cracked battery case. 2. Battery has been left In a run-down condition for a long time.	Replace battery. Replace.
Battery runs down quickly.	1. Incorrect charging method. 2. Battery cell plates have lost much of their active ma terial as a result of overcharging. 3. Internally shorted battery. 4. Excessively low battery voltage. 5. Battery is too old.	Check generator or regu-lator/rectifier circuit con-nections, and make nec-essary adjustment to obtain specified charging operation. Replace battery and correct charging system. Replace. Recharge Replace.
Battery sulfation.	1. Incorrect charging rate. (When not in use, the battery should be checked at least once a month and properly charged if necessary, to avoid sulfation.) 2. The battery was left unused in a cold climate for too long.	Replace battery. Replace battery if badly sulfated.

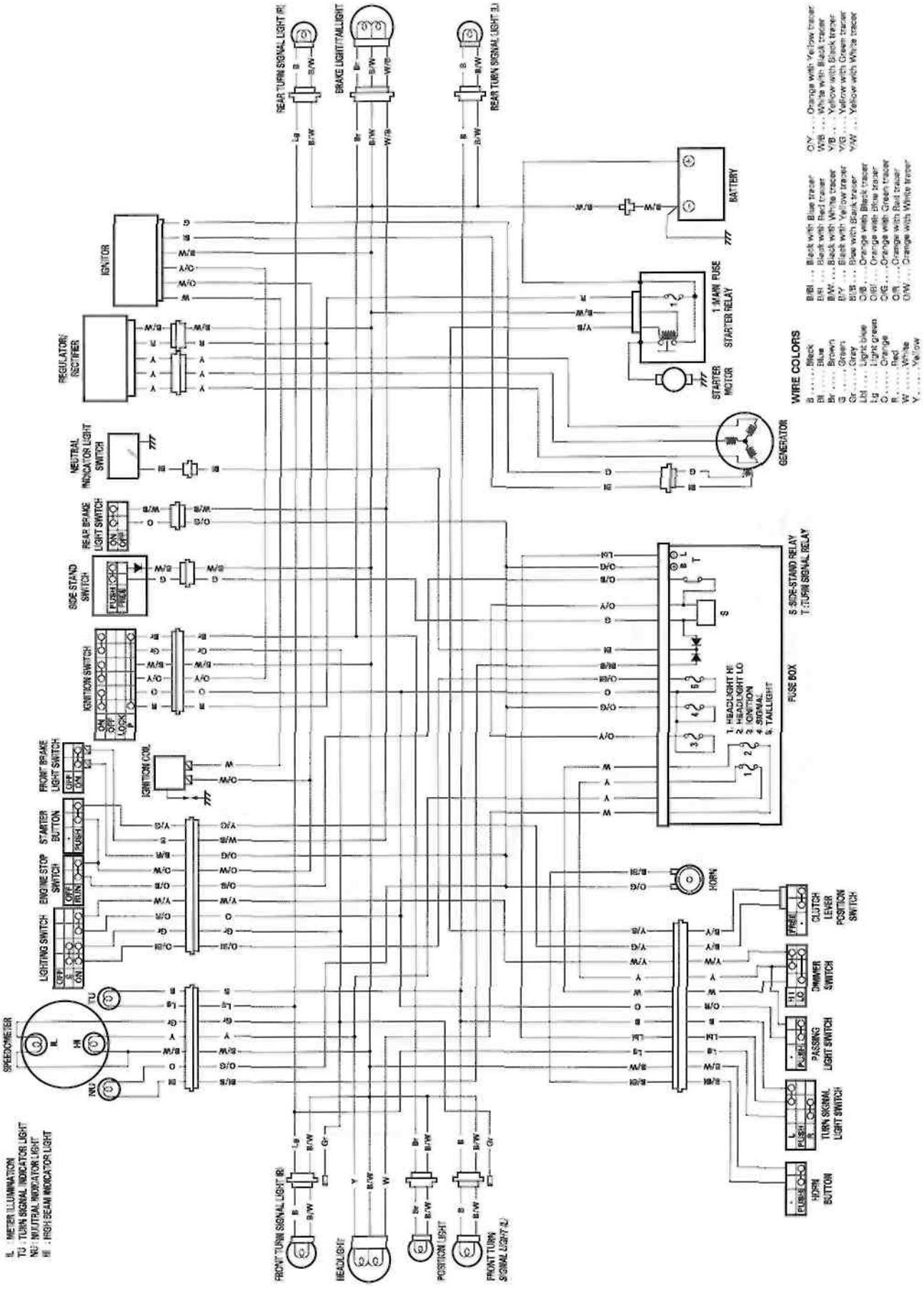
WIRING DIAGRAM

FOR E-03, -28 and -33



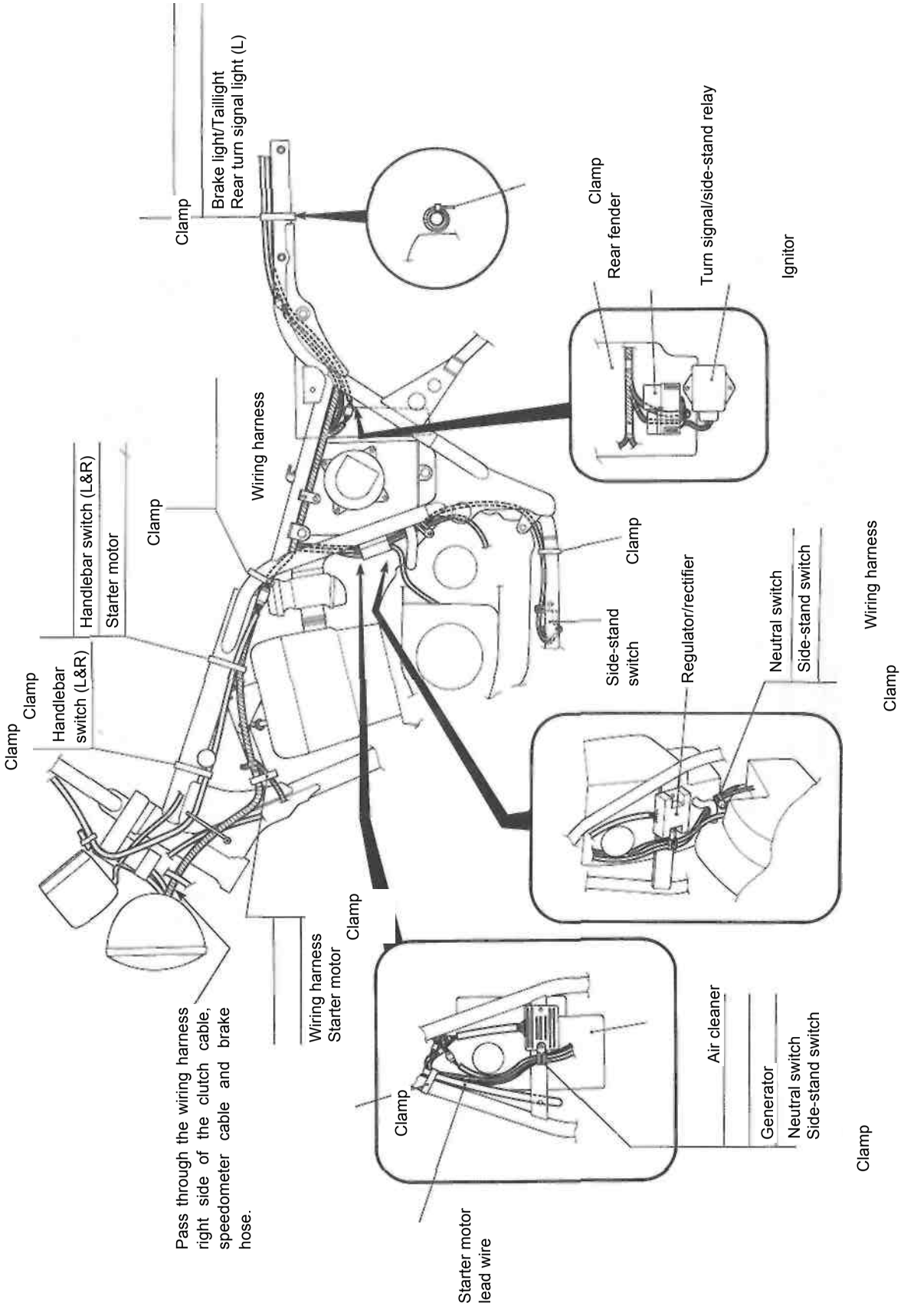
FOR E-24

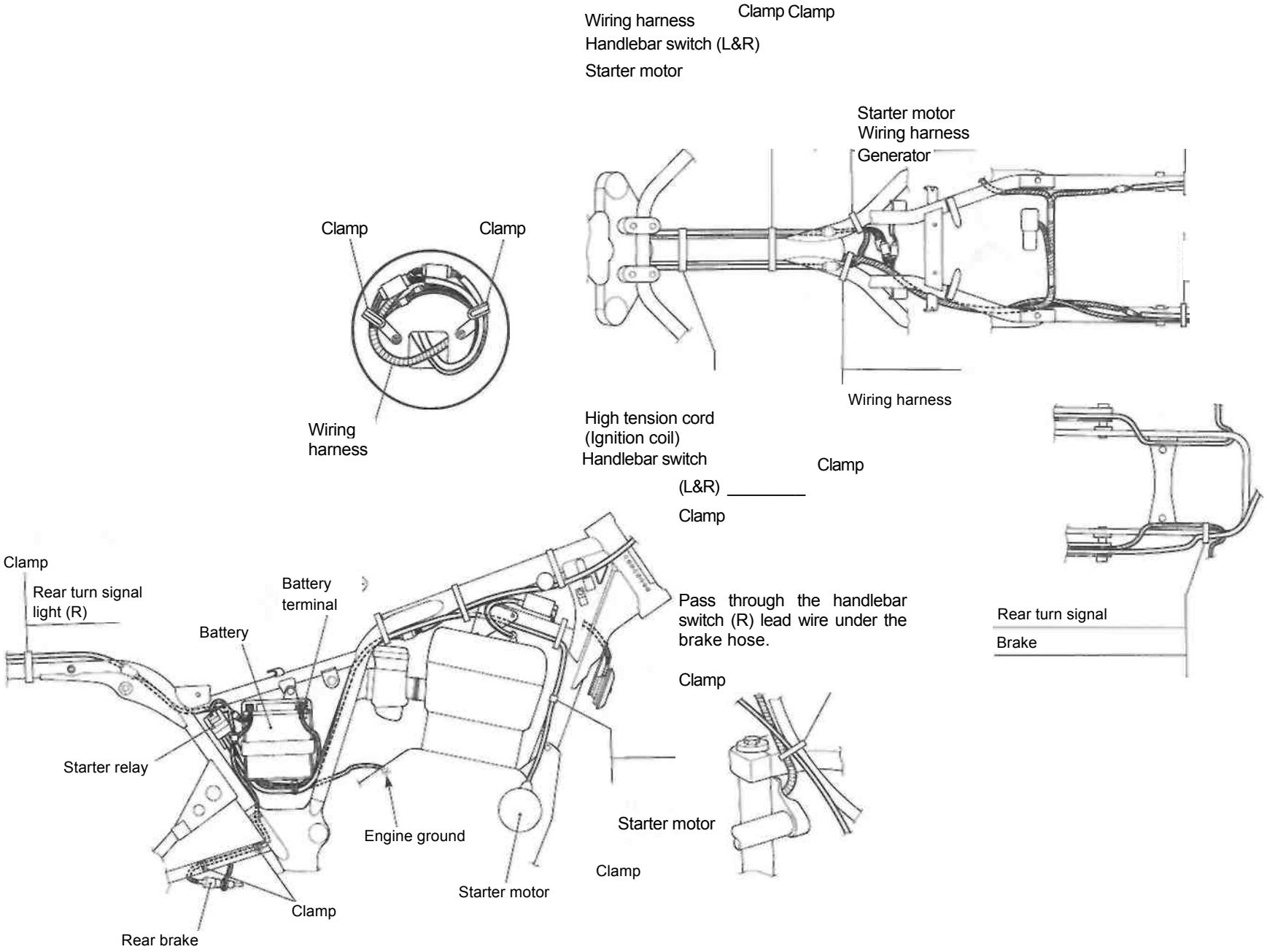

REAR TURN SIGNAL LIGHT (R)
BRAKE LIGHT/TAILLIGHT
REAR TURN SIGNAL LIGHT (L)
BATTERY
IGNITOR
REGULATOR/ RECTIFIER
1.MAIN FUSE
STARTER RELAY
STARTER MOTOR
GENERATOR
NEUTRAL INDICATOR LIGHT SWITCH
REAR BRAKE LIGHT SWITCH
SIDE-STAND SWITCH
IGNITION SWITCH
IGNITION COIL
FRONT BRAKE LIGHT SWITCH
STARTER BUTTON
ENGINE STOP SWITCH
SPEEDOMETER
HORN
CLUTCH LEVER POSITION SWITCH
DIMMER SWITCH
PASSING LIGHT SWITCH
TURN SIGNAL LIGHT SWITCH
HORN BUTTON
FRONT TURN SIGNAL LIGHT (R)
HEADLIGHT
FRONT TURN SIGNAL LIGHT (L)
FUSE BOX
S SIDE STAND RELAY
T TURN SIGNAL RELAY
1. HEADLIGHT HI
2. HEADLIGHT LO
3. IGNITION
4. SIGNAL
5. TAILLIGHT
WIRE COLORS
B ..... Black
Bl ..... Blue
Br ..... Brown
G ..... Green
Gr ..... Gray
Lb ..... Light blue
Lg ..... Light green
O ..... Orange
R ..... Red
W ..... White
Y ..... Yellow
B/G ... Black with Blue tracer
B/R ... Black with Red tracer
B/W ... Black with White tracer
B/Y ... Black with Yellow tracer
Bl/B ... Blue with Black tracer
O/B ... Orange with Black tracer
O/Bl ... Orange with Blue tracer
O/G ... Orange with Green tracer
O/R ... Orange with Red tracer
O/W ... Orange with White tracer
O/Y ... Orange with Yellow tracer
W/B ... White with Black tracer
Y/B ... Yellow with Black tracer
Y/G ... Yellow with Green tracer
Y/W ... Yellow with White tracer
IL : MASTER ILLUMINATION
TU : TURN SIGNAL INDICATOR LIGHT
NU : NEUTRAL INDICATOR LIGHT
HI : HIGH BEAM INDICATOR LIGHT

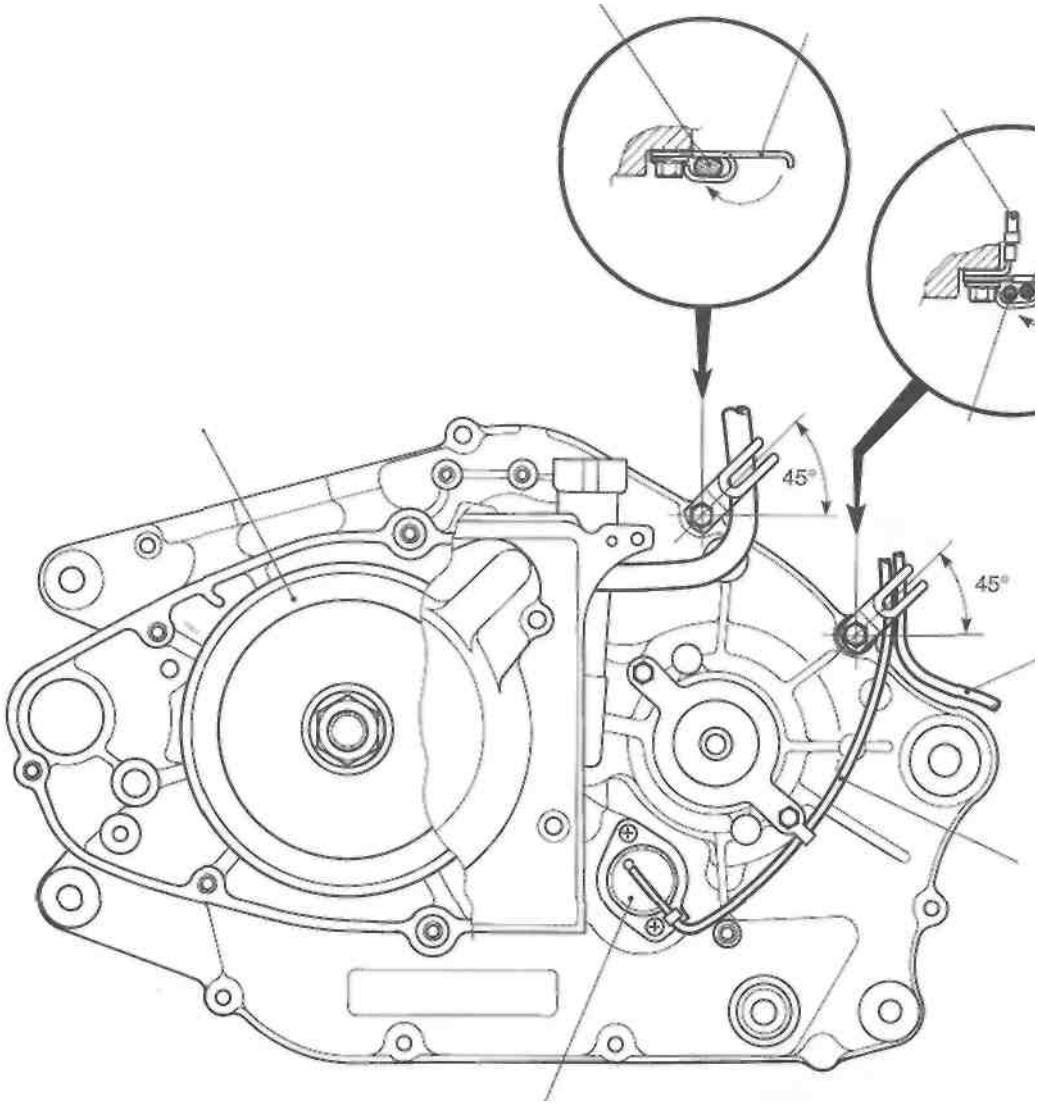

WIRE COLORS
B . . . . . Black
Bl . . . . Blue
Br . . . . Brown
G . . . . . Green
Gr . . . . Grey
Lbl . . . Light blue
Lg . . . . Light green
O . . . . . Orange
R . . . . . Red
W . . . . . White
Y . . . . . Yellow
B/Bl . . . Black with Blue tracer
B/R . . . Black with Red tracer
B/W . . . Black with White tracer
B/Y . . . Black with Yellow tracer
Bl/B . . . Blue with Black tracer
Bl/R . . . Blue with Red tracer
Bl/W . . . Blue with White tracer
Br/W . . . Brown with White tracer
G/B . . . Green with Black tracer
G/R . . . Green with Red tracer
G/Y . . . Green with Yellow tracer
O/B . . . Orange with Black tracer
O/Bl . . . Orange with Blue tracer
O/G . . . Orange with Green tracer
O/R . . . Orange with Red tracer
O/W . . . Orange with White tracer
O/Y . . . Orange with Yellow tracer
R/B . . . Red with Black tracer
R/W . . . Red with White tracer
W/B . . . White with Black tracer
Y/B . . . Yellow with Black tracer
Y/G . . . Yellow with Green tracer
Y/W . . . Yellow with White tracer
REAR TURN SIGNAL LIGHT (R)
BRAKE LIGHT/TAILLIGHT
REAR TURN SIGNAL LIGHT (L)
BATTERY
IGNITOR
REGULATOR/ RECTIFIER
1 MAIN FUSE
STARTER RELAY
STARTER MOTOR
GENERATOR
NEUTRAL INDICATOR LIGHT SWITCH
REAR BRAKE LIGHT SWITCH
SIDE STAND SWITCH
IGNITION SWITCH
IGNITION COIL
FRONT BRAKE LIGHT SWITCH
START BUTTON
ENGINE STOP SWITCH
LIGHTING SWITCH
SPEEDOMETER
S: SIDE-STAND RELAY
T: TURN SIGNAL RELAY
FUSE BOX
1. HEADLIGHT HI
2. HEADLIGHT LO
3. IGNITION
4. SIGNAL
5. TAILLIGHT
HORN
CLUTCH LEVER POSITION SWITCH
DIMMER SWITCH
PASSING LIGHT SWITCH
TURN SIGNAL LIGHT SWITCH
HORN BUTTON
FRONT TURN SIGNAL LIGHT (R)
HEADLIGHT
POSITION LIGHT
FRONT TURN SIGNAL LIGHT (L)
IL : METER ILLUMINATION
TU : TURN SIGNAL INDICATOR LIGHT
NU : NEUTRAL INDICATOR LIGHT
HI : HIGH BEAM INDICATOR LIGHT

WIRE, CABLE AND HOSE ROUTING

WIRE ROUTING

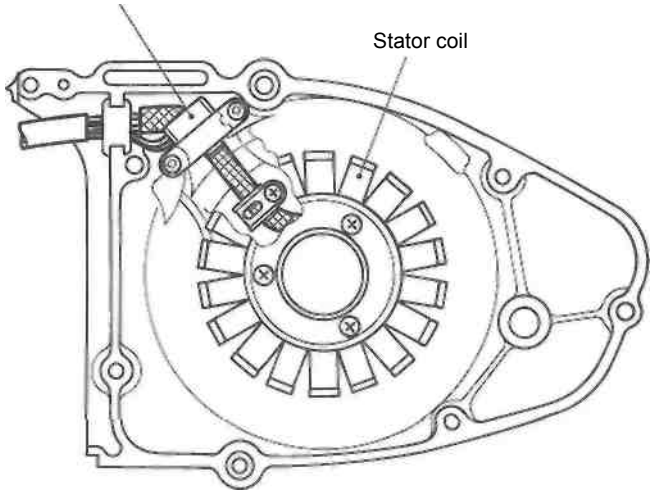



Wiring harness
Clamp Clamp
Handlebar switch (L&R)
Starter motor
Starter motor
Wiring harness
Generator
Clamp
Clamp
Wiring harness
Wiring harness
High tension cord
(Ignition coil)
Handlebar switch
(L&R)
Clamp
Clamp
Clamp
Rear turn signal
light (R)
Battery
terminal
Battery
Pass through the handlebar switch (R) lead wire under the brake hose.
Rear turn signal
Brake
Clamp
Starter relay
Engine ground
Starter motor
Clamp
Starter motor
Clamp
Rear brake

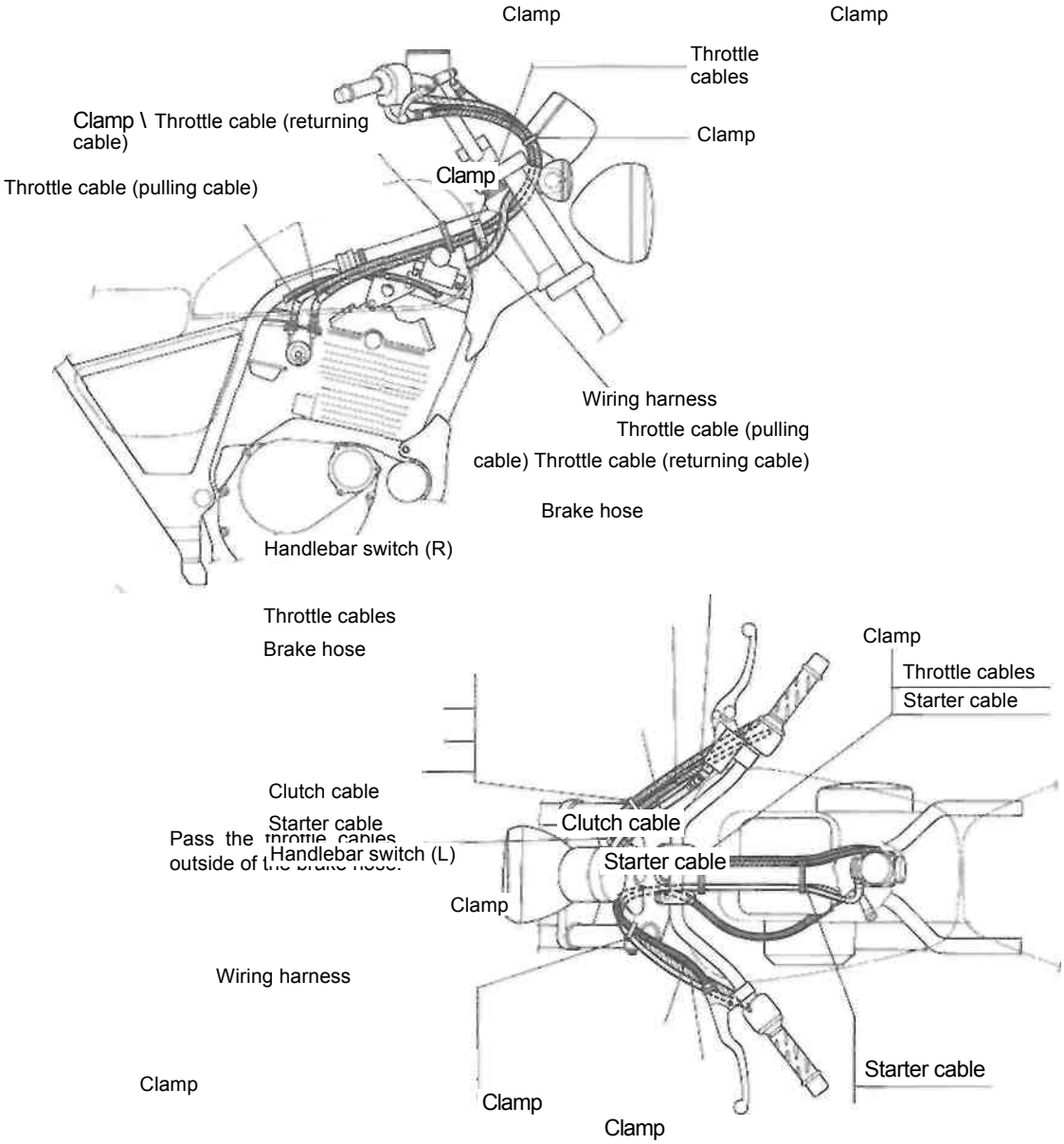


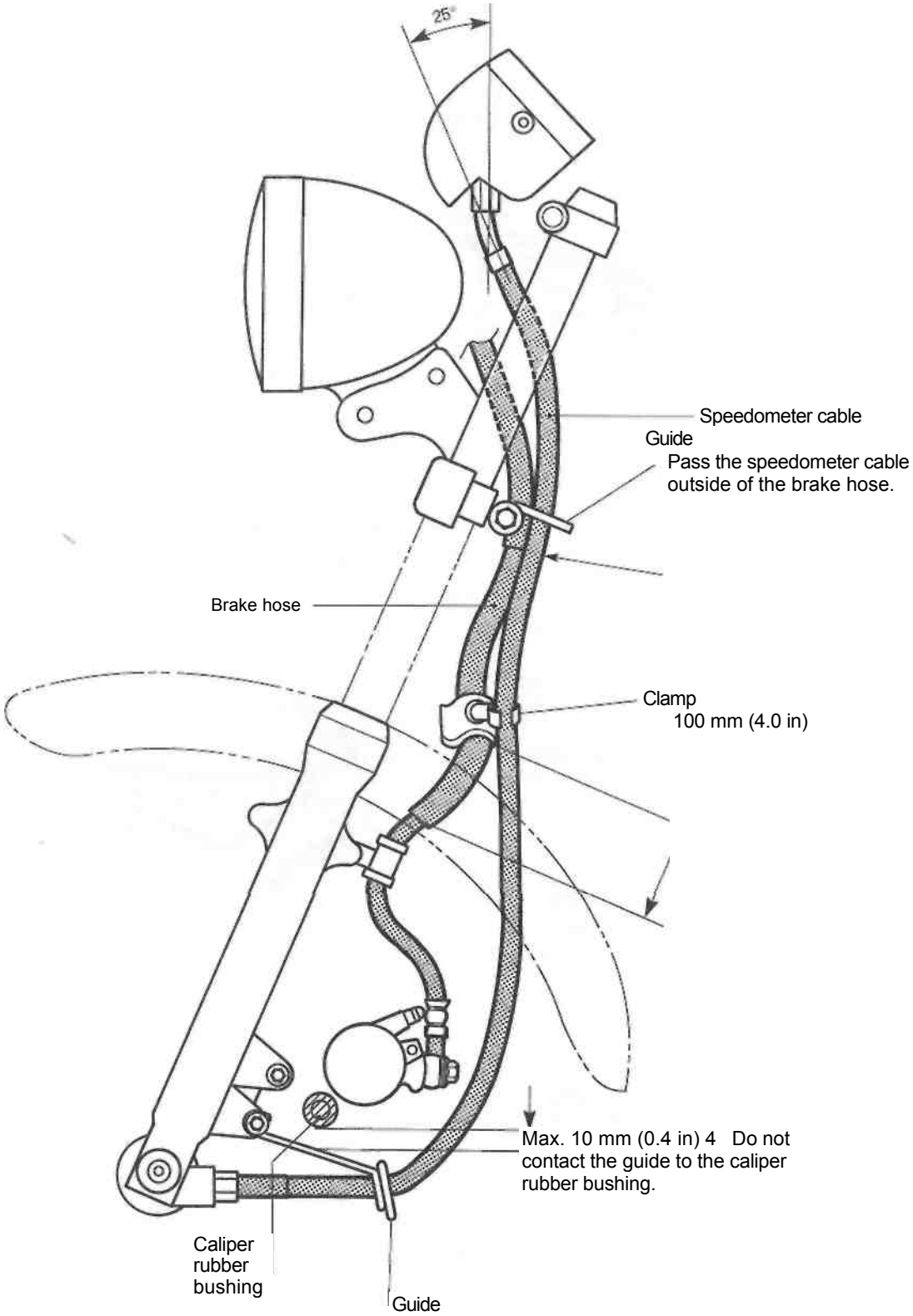
Generator lead wire
Neutral switch

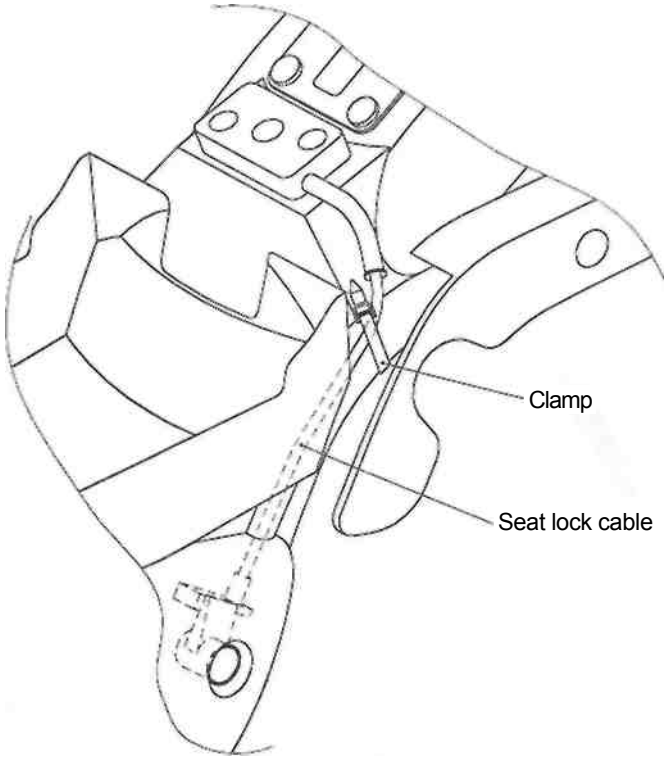
Pick-up coil

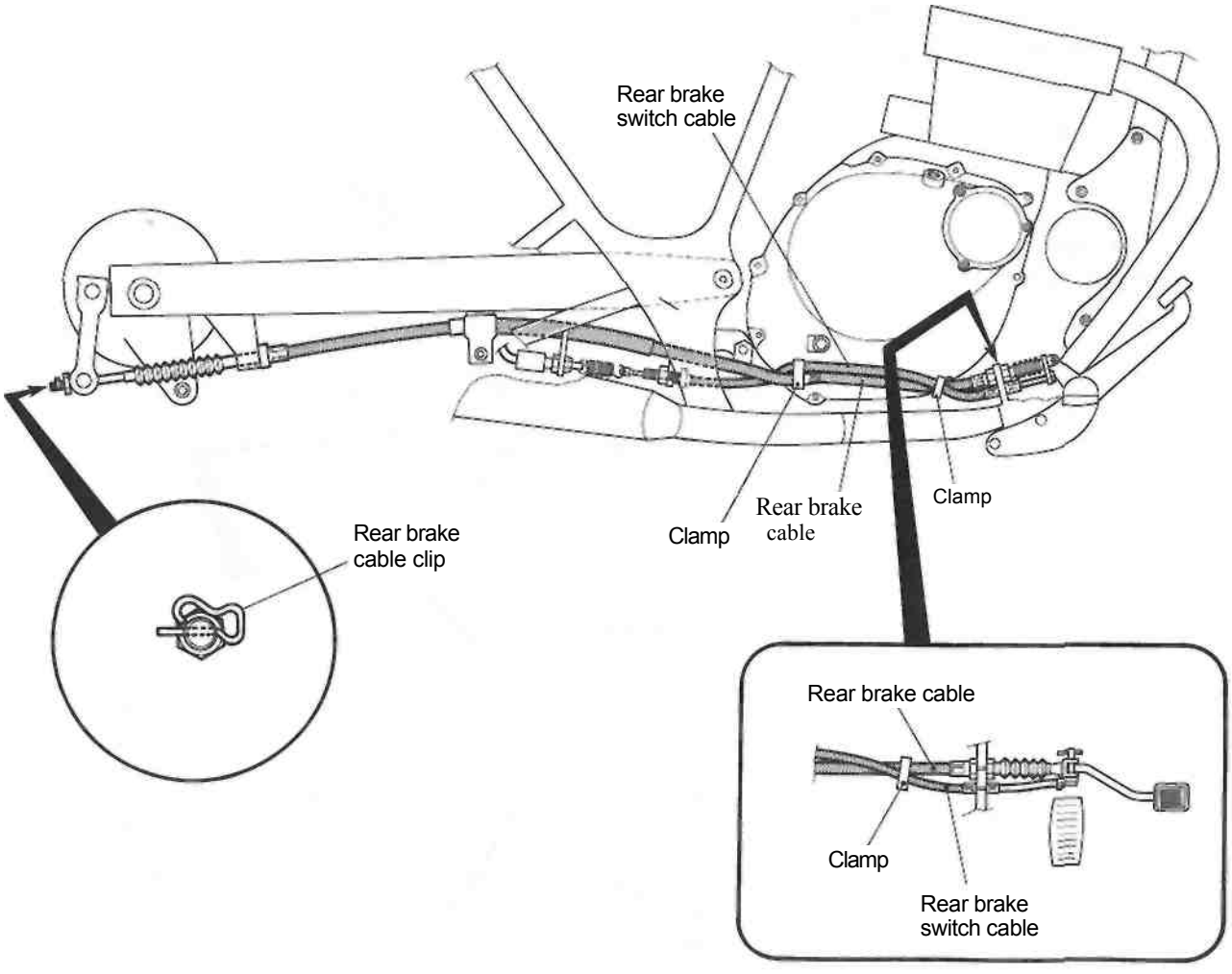

Stator coil

CABLE ROUTING

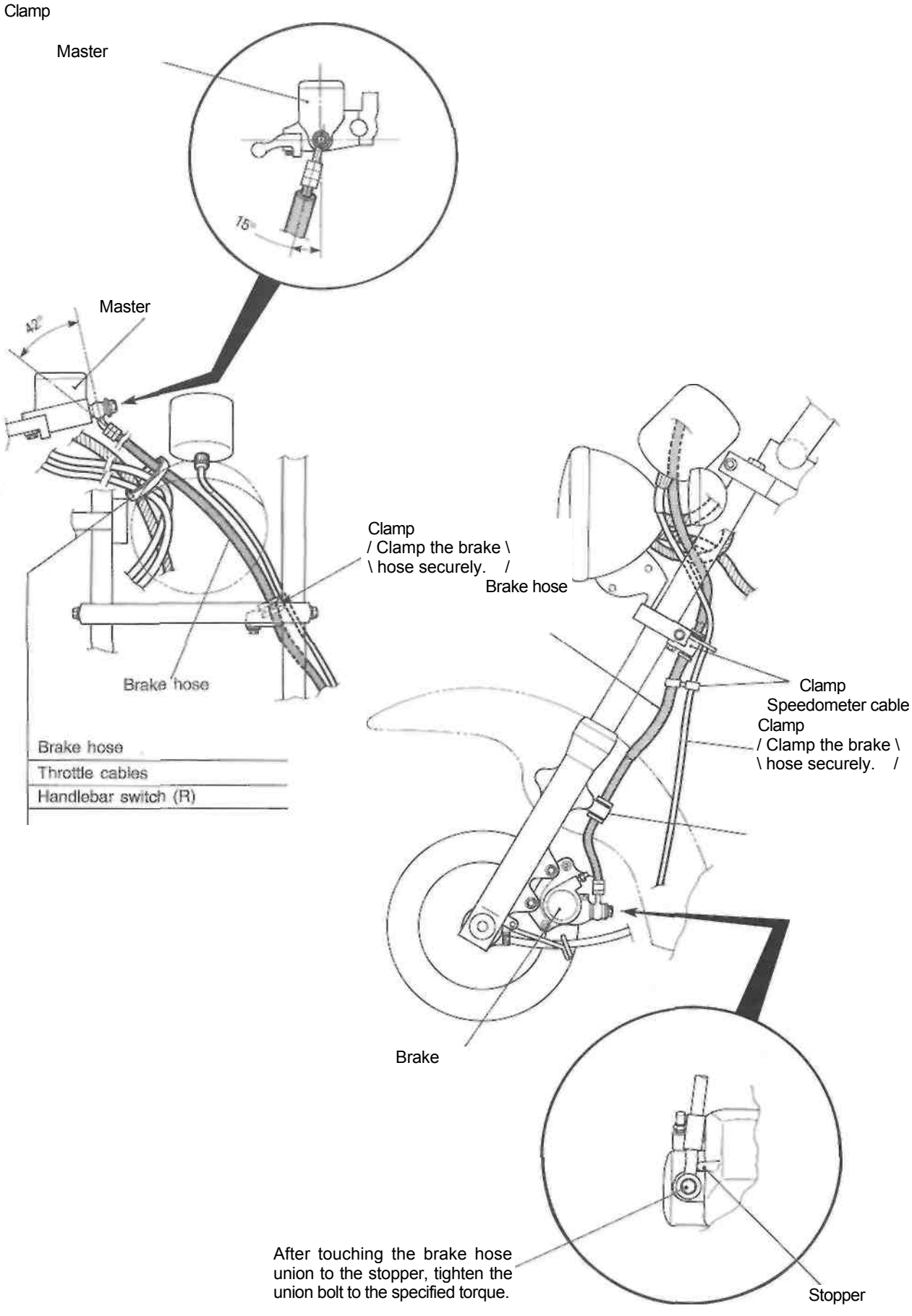



25°
Speedometer cable
Guide
Pass the speedometer cable outside of the brake hose.
Brake hose
Clamp
100 mm (4.0 in)
Max. 10 mm (0.4 in) 4 Do not contact the guide to the caliper rubber bushing.
Caliper rubber bushing
Guide

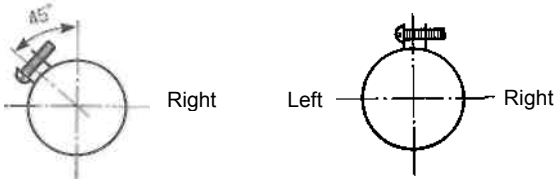

Clamp
Seat lock cable


Rear brake switch cable
Rear brake cable clip
Clamp
Rear brake cable
Clamp
Rear brake cable
Clamp
Rear brake switch cable

FRONT BRAKE HOSE ROUTING



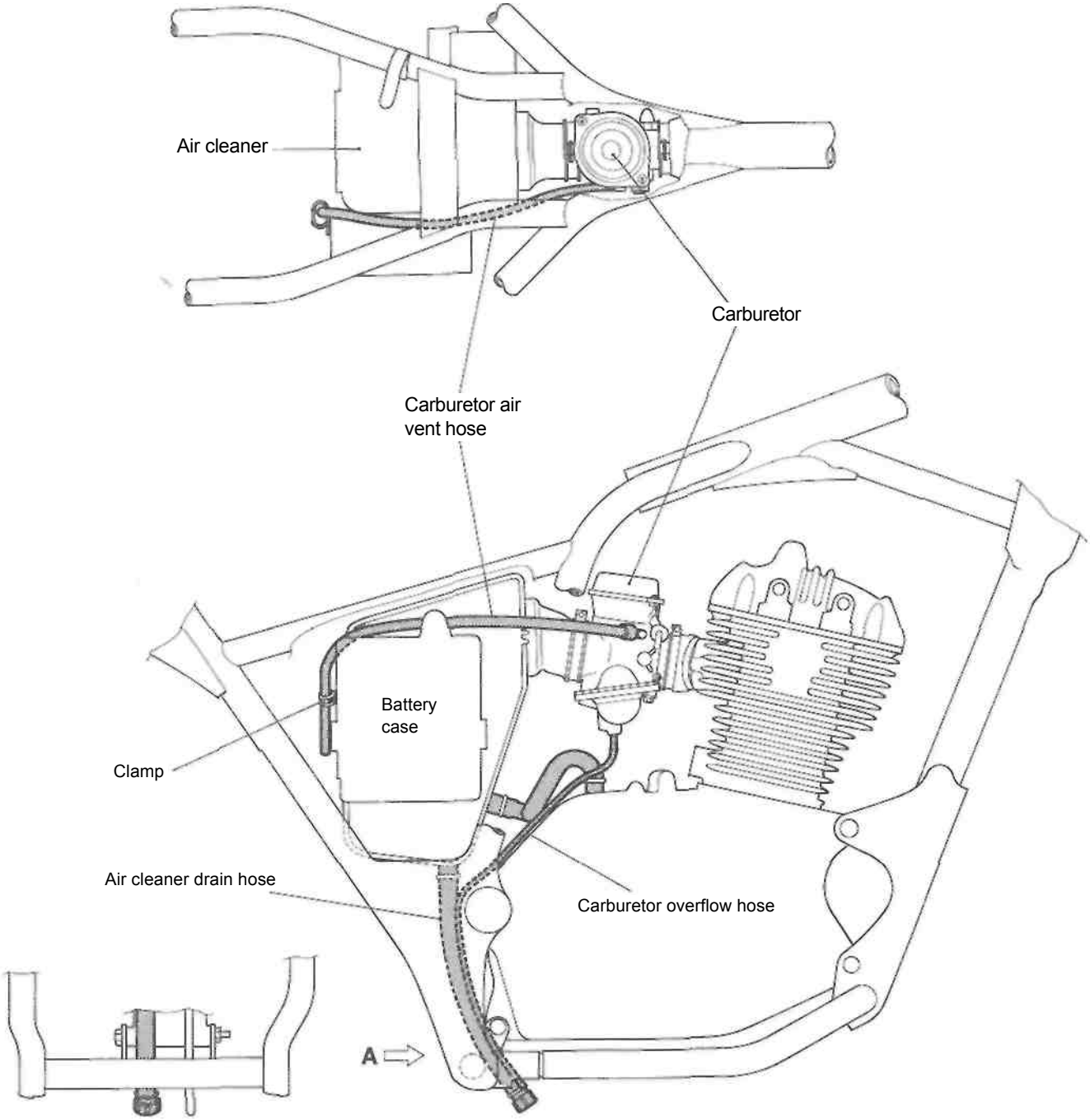
CARBURETOR HOSE ROUTING



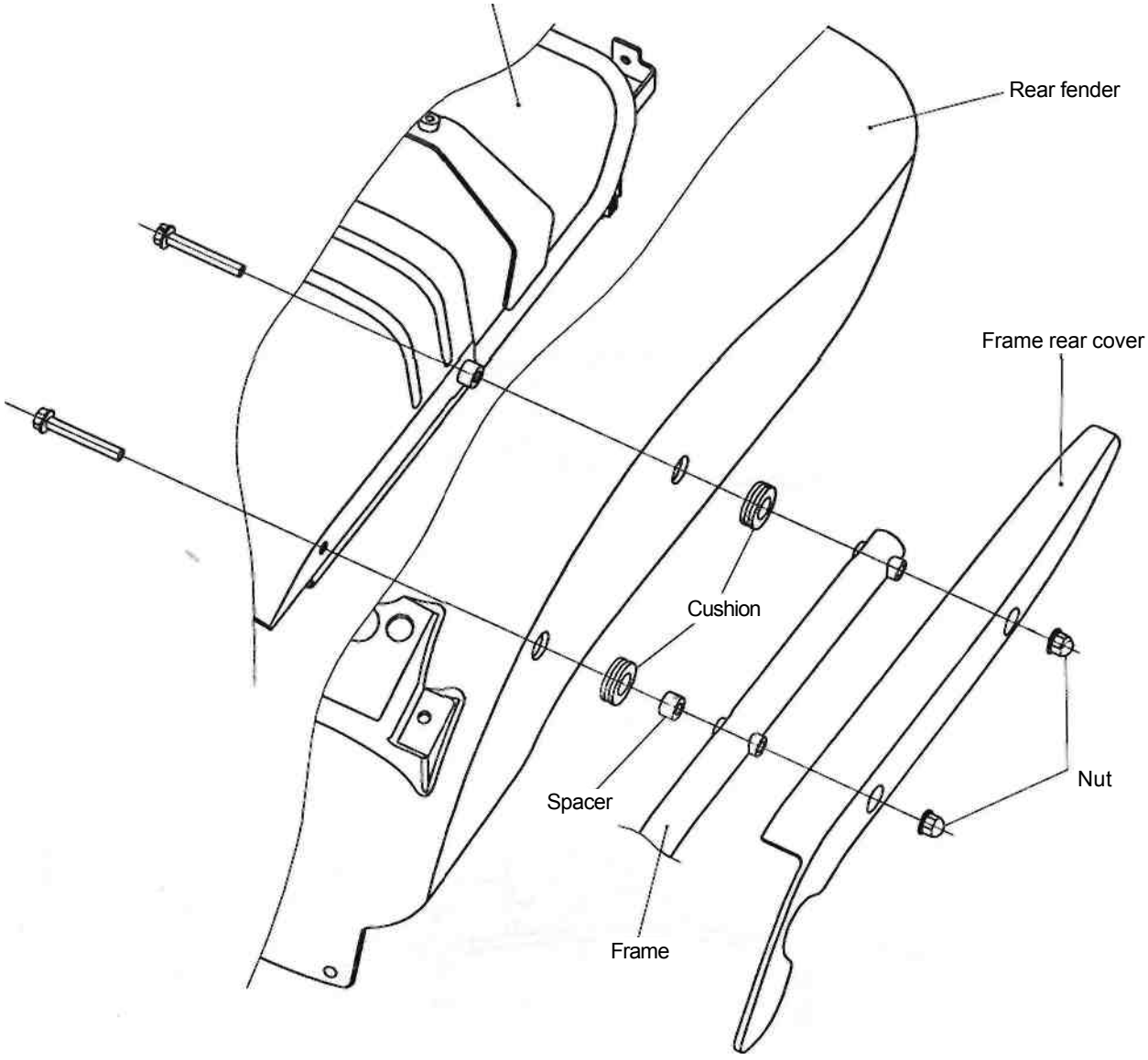
Left

(Engine side) (Air cleaner side)

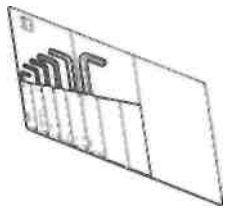
Carburetor clamp position



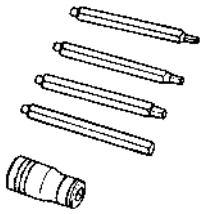
FRAME REAR COVER SET-UP



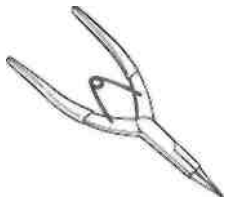
SPECIAL TOOLS



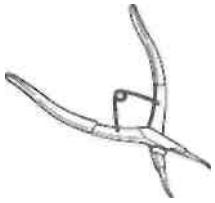
09900-00401
"L" type hexagon wrench set



09900-00410 Hexagon wrench set



09900-06107
Snap ring pliers



09900-06108
Snap ring pliers

09900-09004
Impact driver set

09900-20101
Vernier calipers (150 mm)

09900-20202
Micrometer (25-50 mm)

09900-20203
Micrometer (50-75 mm)

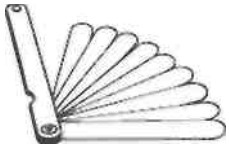
09900-20205
Micrometer (0-25 mm)

09900-20508
Cylinder gauge set

09900-20605
Dial calipers

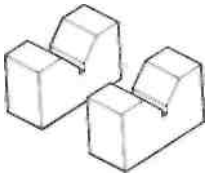
09900-20606
Dial gauge (1/100 mm, 10 mm)

09900-20701
Magnetic stand



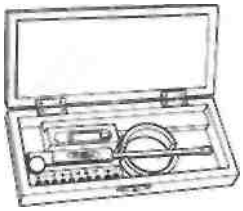
09900-20803
Thickness gauge

09900-20805 Tire depth gauge



09900-21304
V-block set (100 mm)

09900-22301
09900-22302
Plastigauge

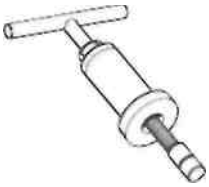


09900-22401
09900-22403 Small bore gauge

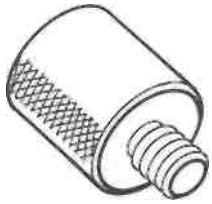
09900-25008 Multi circuit tester set

09900-26006
Tachometer

09910-20116
Conrod holder



09910-32812
Crankshaft installer



09910-32840
Attachment

09910-34510
Piston pin puller

09913-50121 Oil seal remover

09913-75510
Bearing installer

09913-75520
Bearing installer

09913-75830
Bearing installer

09913-76010
Bearing installer

09913-84510
Bearing installer

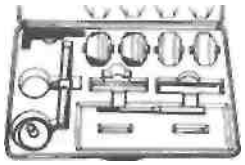
09913-85210
Bearing installer

09915-64510
Compression gauge

09915-74510
Oil pressure gauge

09916-14510
Valve lifter

09916-14910 Valve lifter attachment



09916-21111
Valve seat cutter set

See p. 3-28.

09916-24450
Solid pilot (N-100-5.52)

09916-34542 Valve guide reamer handle

09916-34550 Valve guide reamer (5.5 mm)

09916-34561
Valve guide reamer (11.3 mm)

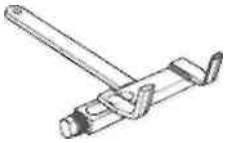
09916-44910
Valve guide remover/ installer

09916-84511
Tweezers

09917-14920
Valve adjuster wrench

09918-03810
Adaptor

09920-13120
Crankcase separator



09920-53740 Clutch sleeve hub holder

09923-74510
Bearing remover

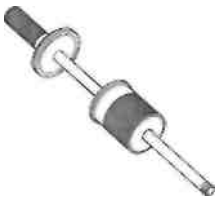
09924-84510 Bearing installer set

09924-84521 Bearing installer set

09930-10121 Spark plug socket wrench set

09930-11920
Torx bit JT40H

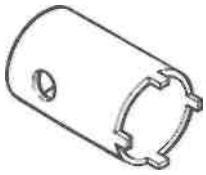
09930-11940
Bit holder



09930-30102
Sliding shaft

09930-34960
Rotor remover

09930-44913
Rotor holder

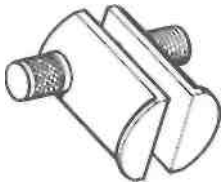


09940-14911
Steering stem nut wrench

09940-52880 Front fork oil seal installer set

09940-60113
Spoke nipple wrench

09941-34513 Steering outer race installer

			
09941-50111 Bearing remover	09941-54911 Bearing outer race remover	09941-74910 Steering bearing installer	09943-74111 Front fork oil level gauge

NOTE:
When ordering a special tool, please confirm whether it is available or not.

CHASSIS

ITEM		N-m	kg-m	lb-ft
Handlebar clamp bolt		**16**	1.6	**11.5**
Handlebar holder nut		**45**	4.5	**32.5**
Steering stem head bolt		**65**	6.5	**47.0**
Front fork upper clamp bolt		**23**	2.3	**16.5**
Front fork lower clamp bolt		**33**	**3.3**	24.0
Front fork cap **bolt**		**23**	**2.3**	**16.5**
Front fork damper rod bolt		20	**2.0**	**14.5**
Front axle		**65**	**6.5**	47.0
Front axle pinch bolt		**23**	**2.3**	**16.5**
Front brake caliper mounting bolt		39	3.9	28.0
Front **brake pad mounting bolt**		18	1.8	13.0
Front brake hose union bolt		**23**	**2.3**	**16.5**
Front brake caliper air bleeder valve		7.5	**0.75**	**5.5**
Front brake master cylinder mounting bolt		10	**1.0**	**7.0**
Front brake disc bolt		23	**2.3**	**16.5**
Front footrest bolt		26	**2.6**	19.0
Swingarm pivot nut		**72**	**7.2**	**52.0**
Rear axle nut	E-03, **-28, -33**	**65**	**6.5**	**47.0**
	The others	78	7.8	**56.5**
Rear torque link nut (front and rear)		**13**	**1.3**	**9.5**
Rear shock absorber mounting bolt or nut		**29**	2.9	21.0
Rear sprocket **nut**		**50**	**5.0**	36.0
Rear brake cam lever nut		**10**	**1.0**	**7.0**
Spoke nipple		**4.5**	0.45	**3.5**

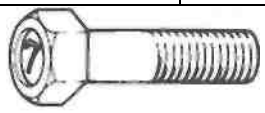
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

Bolt Diameter Ⓐ (mm)	Conventional or **"4" marked** bolt			"7" marked **bolt**		
	N-m	**kg-m**	**lb-ft**	**N-m**	**kg-m**	lb-ft
4	**1.5**	**0.15**	**1.0**	**2**	**0.2**	**1.5**
5	**3**	**0.3**	2.0	**5**	**0.5**	**3.5**
6	6	**0.6**	**4.5**	**10**	**1.0**	**7.0**
8	13	**1.3**	9.5	23	**2.3**	**16.5**
10	29	**2.9**	**21.0**	**50**	**5.0**	**36.0**
12	**45**	**4.5**	**32.5**	**85**	**8.5**	**61.5**
14	**65**	**6.5**	**47.0**	**135**	13.5	**97.5**
16	**105**	**10.5**	76.0	**210**	**21.0**	**152.0**
18	160	**16.0**	115.5	**240**	**24.0**	**173.5**

Conventional bolt

"4" marked bolt



"7" marked bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	26 (1.0)	
	EX.	22 (0.9)	
Valve clearance (when cold)	IN.	0.03-0.08 (0.001 -0.003)	
	EX.	0.08-0.13 (0.003-0.005)	
Valve guide to valve stem clearance	IN.	0.025-0.052 (0.0010-0.0020)	
	EX.	0.040-0.067 (0.0016-0.0026)	
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.	5.460-5.475 (0.2150-0.2156)	
	EX.	5.445-5.460 (0.2144-0.2150)	
Valve stem runout	IN. & EX.		0.05 (0.002)
Valve head thickness	IN. & EX.		0.5 (0.02)
Valve stem end length	IN. & EX.		3.6 (0.14)
Valve seat width	IN. & EX.	0.9-1.1 (0.035-0.043)	
Valve head radial runout	IN. & EX.		0.03 (0.001)
Valve spring free length	IN. & EX.		40.1 (1.58)
Valve spring tension	IN. & EX.	18.4-21.6 kg (40.56-47.62 lbs) at length 35.0 mm (1.38 in)	

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	34.990-35.040 (1.3776-1.3795)	34.690 (1.3657)
	EX.	35.030-35.080 (1.3791-1.3811)	34.730 (1.3673)
Camshaft journal oil clearance	0.032-0.066 (0.0013-0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	R. side	25.012-25.025 (0.9847-0.9852)	
	L. side	20.012-20.025 (0.7879-0.7884)	
Camshaft journal O.D.	R. side	24.959-24.980 (0.9826-0.9835)	
	L. side	19.959-19.980 (0.7858-0.7866)	
Camshaft runout	IN. & EX.		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	1 000-1 400 kPa /10.0-14.0 kg/cm^2\ *[* 142-199 psi *)*		800 kPa / 8 kg/cm^2 \ *{* 114 psi *j*
Piston to cylinder clearance	0.045-0.055 (0.0018-0.0022)		0.120 (0.0047)
Cylinder bore	72.000-72.015 (2.8346-2.8352)		72.085 (2.8380)
Piston diam.	71.950-71.965 (2.8327-2.8333) Measure at 15 mm (0.6 in) from the skirt end.		71.880 (2.8299)
Cylinder distortion			0.05 (0.002)
Piston ring free end gap	1st N	Approx. 9.5 (0.37)	7.6 (0.30)
	2nd N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st	0.10-0.30 (0.004-0.012)	0.50 (0.020)
	2nd	0.10-0.30 (0.004-0.012)	0.50 (0.020)
Piston ring to groove clearance	1st		0.180 (0.0071)
	9nH c.\\\		0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01-1.03 (0.040-0.041)	
	2nd	1.21-1.23 (0.047-0.048)	
	Oil	2.51-2.53 (0.099-0.100)	
Piston ring thickness	1st	0.975-0.990 (0.0384-0.0390)	
	2nd	1.170-1.190 (0.0461 -0.0469)	
Piston pin bore	18.002-18.008 (0.7087-0.7090)		18.030 (0.7098)
Piston pin O.D.	17.992-18.000 (0.7083-0.7087)		17.980 (0.7079)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006-18.014 (0.7089-0.7092)	18.040 (0.7102)
Conrod deflection		3.0 (0.12)
Conrod big end side clearance	0.10-0.65 (0.004-0.026)	1.0 (0.04)
Conrod big end width	20.95-21.00 (0.825-0.827)	
Crankshaft web to web width	60.0 + 0.1 (2.362 ± 0.004)	
Crankshaft runout		0.05 (0.002)
Balancer spring free length		10.0 (0.39)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	2.812(68/21 x 33/38)	
Oil pressure (at 60°C, 140°F)	Above 30 kPa (0.3 kg/cm^2, 4.3 psi) Below 70 kPa (0.7 kg/cm^2, 10.0 psi) at 3 000 r/min.	

CLUTCH

Unit: mm (in)

ITEM	STANDARD		LIMIT
Clutch cable play	10-15 (0.4-0.6)		
Clutch release screw	$^1/_4$ turn back		
Drive plate thickness	No.1	2.92-3.08 (0.115-0.121)	2.62 (0.103)
	No.2	3.45-3.55 (0.136-0.140)	3.15 (0.124)
Drive plate claw width	15.9-16.0 (0.626-0.630)		15.0 (0.590)
Driven plate distortion			0.10 (0.004)
Clutch spring free length			40.9 (1.61)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		3.238(68/21)		
Final reduction ratio		2.733(41/15)		
Gear ratios	Low	2.636(29/11)		
	2nd	1.687(27/16)		
	3rd	1.263(24/19)		
	4th	1.000(20/20)		
	Top	0.818(18/22)		
Shift fork to groove clearance		0.20-0.40 (0.008-0.016)		0.60 (0.024)
Shift fork groove width		4.25-4.35 (0.167-0.171)		
Shift fork thickness		3.95-4.05 (0.156-0.159)		
Drive chain		Type	DID520VC5	
		Links	110	
		20-pitch length		319.4 (12.57)
Drive chain slack		5-15		
			(0.2-0.6)	

CARBURETOR

ITEM		SPECIFICATION	
		E-01,02, 04, 25, 34	E-17, 22, 24
Carburetor type		MIKUNI BSR32SS	←
Bore size		**32 mm**	←
I.D. No		13F0	13F2
Idle r/min.		1 300 ± 100 r/min.	←
Float height		13.0 ±0.5 mm	←
Main jet	(M.J.)	#115	←
Jet needle	(J.N.)	5C60-3rd	←
Needle jet	(N.J.)	P-0	←
Pilot jet	(P.J.)	#17.5	←
Pilot air jet No. 1	(P.A.J.1)	#87.5	←
Pilot air jet No.2	(P.A.J.2)	#140	←
Throttle valve	(Th.V.)	#110	←
Pilot screw	(PS.)	2Vá turns out	$1\frac{3}{8}$ turns out
Throttle cable play		2-4 mm (0.08-0.16 in)	
Starter plunger cable play		0.5-1.0 mm (0.02-0.04 in)	

CARBURETOR

ITEM	SPECIFICATION	
	E-03, 28	E-33
Carburetor type	MIKUNI BSR32SS	←
Bore **size**	32 mm	←
I.D. No	13F3	13F4
Idle r/min.	1 300 ± 50 r/min.	←
Float height	13.0 **±0.5** mm	←
Main jet (M.J.)	#120	←
Jet needle (J.N.)	5C65	←
Needle jet (N.J.)	P-0M	←
Pilot jet (P.J.)	#17.5	←
Pilot air jet No. 1 (P.A.J.1)	#87.5	←
Pilot air jet No.2 (P.A.J.2)	#120	←
Throttle valve (Th.V.)	#110	←
Pilot screw (PS.)	PRE-SET	←
Throttle cable play	2-4 mm **(0.08-0.16** in)	
Starter plunger cable play	0.5-1.0 mm (0.02-0.04 in)	

ELECTRICAL

Unit: mm (in)

ITEM			SPECIFICATION		NOTE
Ignition timing			10°B.T.D.C. at1 300r/min.		
Spark plug			Type	NGK: **DR8EA** DENSO: X24ESR-U	
			Gap	0.6-0.7 (0.024-0.028)	
Spark performance			Over 8 (0.3) at 1 atm.		
Ignition coil resistance			Primary	3-5 Ω	terminal- ⊕ terminal
			Secondary	17-28 kΩ	⊕ terminal- Plug cap
Ignition coil primary peak voltage			More than 200 V		
Generator coil resistance			Pick-up	400-650 Ω	BI-G
			Charging	0.1-1.5 Ω	Y-Y
Pick-up coil peak voltage			**More** than 5.0 V		
Generator Max. output			210Wat5 000r/min.		
Generator no-load voltage			More than 60 V (AC) at 5 000 r/min.		
Regulated voltage			13.5-15.0 Vat 5 000 r/min.		
Starter relay resistance			3-6 Ω		
Battery	Type designation		FTX7L-BS		
	Capacity		**12V21.6kC(6Ah)/10HR**		
	Standard electrolyte S.G.		1.320 at 20°C (68°F)		
Fuse size	Main		20A		
	Headlight	HI	15A		
	Headlight	LO	15A		
	Turn signal		15A		
	Ignition		10A		
	Taillight		10A		

WATTAGE

Unit: W

ITEM		SPECIFICATION		
		E-01,02, 04, 17,22,25,34	E-24	E-03, 28, 33
Headlight	HI	60	←	←
	LO	55	←	←
Position light		4		
Brake light/Taillight		21/5	←	←
Turn signal light		21	←	← (rear)
Front turn signal light/Running light				21/5
Speedometer light		1.7	←	←
Neutral indicator light		3.4	←	←
Turn signal indicator light		3.4	←	←
High beam 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	50 (2.0)		
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ±0.01)	4.5 (0.18)
Brake disc runout	Front		0.30 (0.012)
Master cylinder bore	12.700-12.743 (0.4999-0.5017)		
Master cylinder piston diam.	12.657-12.684 (0.4983-0.4994)		
Brake caliper cylinder bore	33.960-34.036 (1.3370-1.3400)		
Brake caliper piston diam.	33.884-33.934 (1.3340-1.3360)		
Brake drum I.D.	Rear		130.7 (5.15)
Brake lining thickness	Rear		1.5 (0.06)
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	16XMT2.50	
	Rear	15XMT3.00	
Tire size	Front	110/90-16 59P	
	Rear	130/90-15M/C66P	

ITEM	STANDARD		LIMIT
Tire tread depth	Front		**1.6** (0.06)
	Rear		2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 **(4.7)**		
Front fork spring free length		301 (11-9)	
Front fork oil level	105 **(4.1)**		
Rear wheel travel	**90 (3.5)**		
Swingarm pivot shaft runout		0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING					
	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi
FRONT	175	1.75	25	175	1.75	25
REAR	200	2.00	29	225	2.25	33

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 33
	Use only unleaded gasoline of at least 87 pump octane($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		The others
Fuel tank including reserve	14 L (3.7/3.1 US/Imp gal)		
reserve	2.9 L (0.8/0.6 **US/Imp** gal)		
Engine oil type and grade	SAE10W/40, APISForSG		
Engine oil capacity	Change	1 300 ml (1.4/1.1 US/Imp qt)	
	Filter change	1 400 ml (1.5/1.2 US/Imp qt)	
	Overhaul	1 700 ml (1.8/1.5 US/Imp qt)	
Front fork oil type	SUZU	KlforkoilSS-08(#10)	
Front fork oil capacity (each leg)	369 ml (12.5/13.0 US/Imp oz)		
Brake fluid type	DOT 4		

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