

FOREWORD

This manual contains an introductory description on the SUZUKI GS150R and procedures for its inspection/service and overhaul of its main components. Other information considered as generally known is not included.

Read the GENERAL INFORMATION section to familiarize yourself with the motorcycle and its maintenance. Use this section as well as other sections to use as a guide for proper inspection and service. This manual will help you know the motorcycle better so that you can assure your customers of fast and reliable service.

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

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⚠ WARNING

Inexperienced mechanics or mechanics without the proper tools and equipment may not be able to properly perform the services described in this manual.

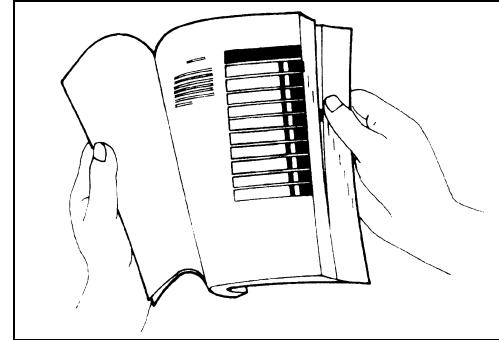
Improper repair may result in injury to the mechanic and may render the motorcycle unsafe for the rider and passenger.

SUZUKI MOTORCYCLE INDIA PVT. LTD.

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

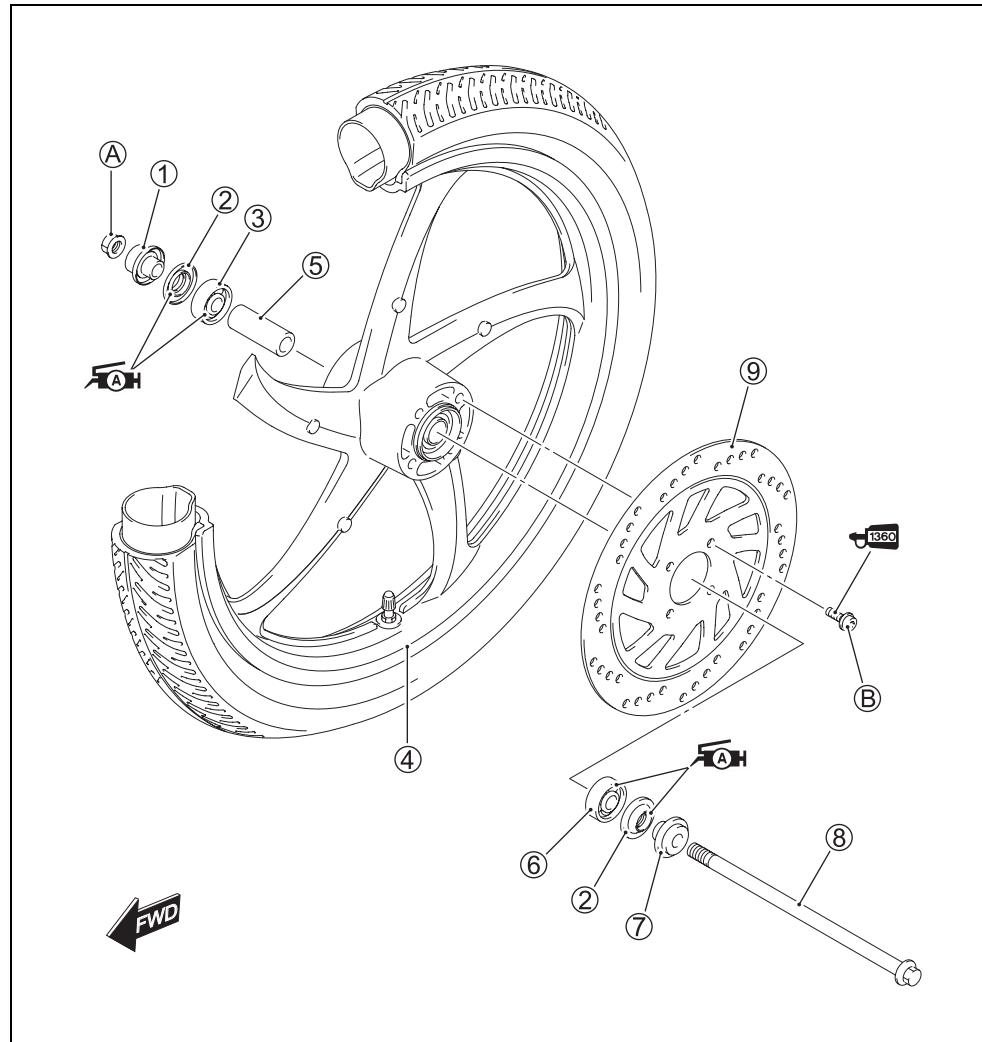
Under the name of each system or unit, is its exploded view. Work instructions and other service information such as the tightening torque, lubricating points and locking agent points, are provided.

Example: Front wheel

①	Spacer
②	Dust seal
③	Bearing
④	Front wheel
⑤	Spacer
⑥	Bearing
⑦	Spacer
⑧	Front axle
⑨	Brake disc
A	Front axle nut
B	Brake disc bolt



ITEM	N·m	kgf·m
A	44	4.4
B	23	2.3



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	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		TELESHOCAB OIL
	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".		Measure in current range.
	Apply SUZUKI MOLY PASTE.		Measure in resistance range.
	Apply WATER RESISTANCE GREASE.		Measure in diode test range.
	Apply THREAD LOCK SUPER "1303".		Measure in continuity test range.
	Apply SUZUKI BOND "1215".		Use special tool.
	Apply THREAD LOCK SUPER "1322".		Indication of service data.
	Apply THREAD LOCK "1342".		

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GENERAL INFORMATION

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COUNTRY AND AREA CODES

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

CODE	COUNTRY or AREA	EFFECTIVE FRAME NO.
P-74	India	MB8NG49A8100001

WARNING/CAUTION/NOTE

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

⚠ WARNING

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

CAUTION

Indicates a potential hazard that could result in motorcycle damage.

NOTE:

Indicates special information to make maintenance easier or instructions clearer.

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

GENERAL PRECAUTIONS

⚠ WARNING

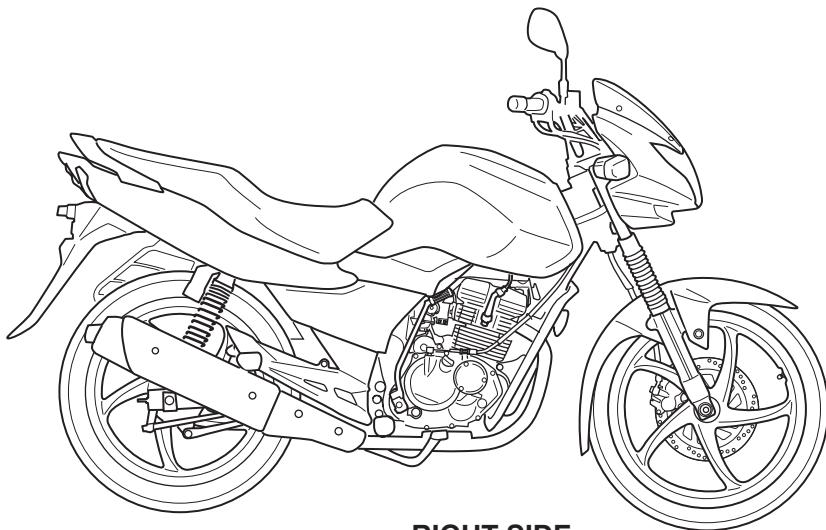
- * Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the motorcycle.
- * When 2 or more persons work together, pay attention to the safety of each other.
- * When it is necessary to run the engine indoors, make sure that exhaust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

CAUTION

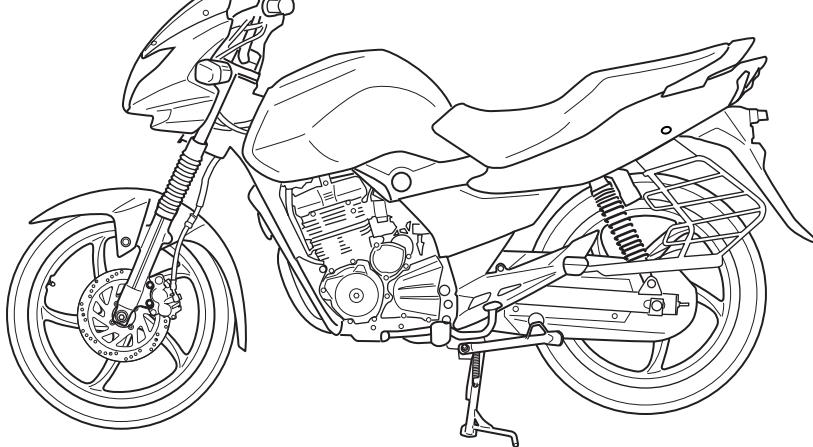
- * If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
- * When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
- * Be sure to use special tools when instructed.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

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

SUZUKI GS150RK9 ('09-MODEL)



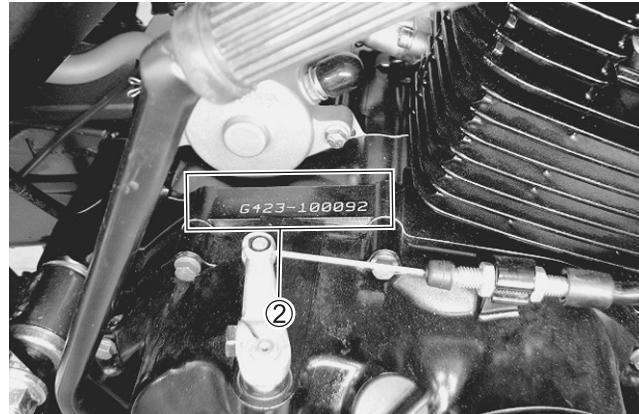
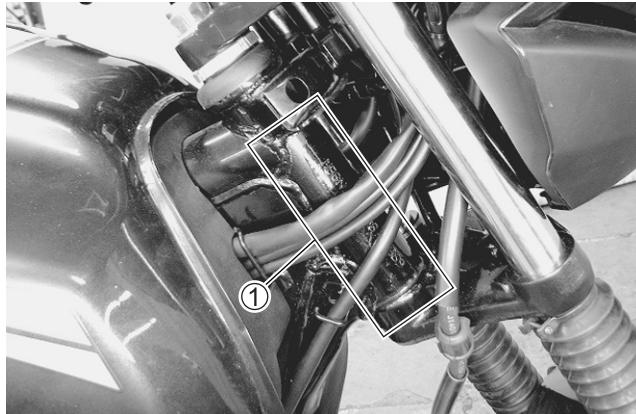
RIGHT SIDE



LEFT SIDE

SERIAL NUMBER LOCATION

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



FUEL AND OIL RECOMMENDATION

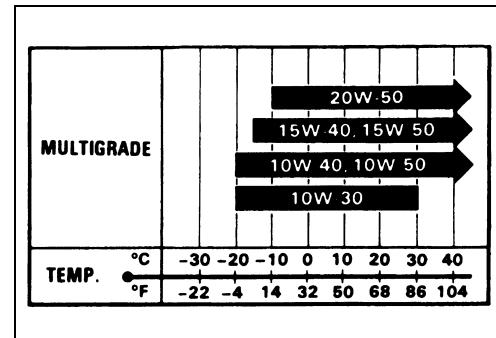
FUEL

Gasoline used should be graded 91 octane (Research Method) or higher. Unleaded gasoline is recommended.

ENGINE OIL

Oil quality is a major contributor to your engine's performance and life. Always select good quality engine oil. Use of SF/SG or SH/SJ in API with MA in JASO.

Suzuki recommends the use of SAE 20W-40 engine oil. If SAE 20W-40 engine oil is not available, select an alternative according to the right chart.



BRAKE FLUID

Specification and classification: DOT 3 or DOT 4

⚠ WARNING

- * Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.
- * Do not use any brake fluid taken from old or used or unsealed containers.
- * Never re-use brake fluid left over from a previous servicing, which has been stored for a long period.

FRONT FORK OIL

TELESHOCAB OIL or an equivalent fork oil.

BREAK-IN PROCEDURES

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. Refer to the following throttle position recommendations.

- Keep to these break-in engine speed limits:

Initial 800 kms :Below 5000 r/min

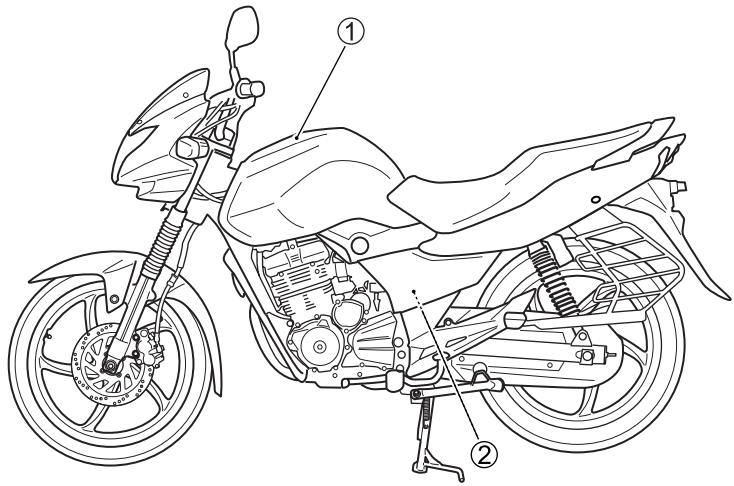
Up to 1600 kms :Below 7500 r/min

Over 1600 kms :Below 10000 r/min

- Upon reaching an odometer reading of 1600 kms you can subject the motorcycle to throttle full operation. However, do not exceed 10000 r/min at any time.

INFORMATION LABELS

NO.	LABEL or PLATE NAME
①	General warning label
②	Battery breather hose caution label



SPECIFICATIONS

DIMENSIONS AND CURB MASS

Overall length	2095 mm
Overall width	775 mm
Overall height	1120 mm
Wheelbase	1340 mm
Ground clearance.....	160 mm
Curb mass.....	149 kg

ENGINE

Type	Four stroke, air-cooled, OHC
Number of cylinder	1
Bore.....	57.0 mm
Stroke.....	58.6 mm
Displacement	150 cm ³
Compression ratio	9.4 : 1
Carburetor	MIKUNI BS26
Air cleaner	Non-woven fabric element
Starter system.....	Primary kick and electric
Lubrication system	Wet sump
Idle speed.....	1400 ± 100 r/min

TRANSMISSION

Clutch	Wet multi-plate type
Transmission.....	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	3.476 (73/21)
Gear ratios, Low	3.000 (33/11)
2nd	1.750 (28/16)
3rd.....	1.300 (26/20)
4th	1.091 (24/22)
5th	0.957 (22/23)
Top	0.833 (20/24)
Final reduction ratio.....	2.929 (41/14)
Drive chain	R428, 124 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Steering angle	40° (right & left)
Caster	25° 30'
Trail	87 mm
Turning radius	2.2 m
Front brake	Disc brake
Rear brake	Drum brake
Front tire size	2.75-18 42P, tube type
Rear tire size	100/90-18M/C 56P, tube type

ELECTRICAL

Ignition type	Electronic ignition (CDI)
Ignition timing	7° B.T.D.C at 1 400 r/min
Spark plug	NGK CPR7HSA
Battery	12 V 32.4 kC (9 Ah)/10 HR
Generator	Single-phase A.C. generator
Fuse	10 A
Headlight	12 V 35/35 W
Position light	12 V 5 W
Brake light/Taillight	LED
Turn signal light	12 V 10 W
Tachometer light	LED
Neutral indicator light	LED
High beam indicator light	LED
Turn signal indicator light	LED
Engine RPM indicator light	LED

CAPACITIES

Fuel tank, including reserve	15.5 L
reverse	3.1 L
Engine oil, oil change	1000 ml
with filter change	1100 ml
overhaul	1400 ml

These specifications are subject to change without notice.

PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE SCHEDULE

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

S. No.	Services →	1	2	3	4	5	6	7	Subsequent Services
	Kms [#]	750- 1000	3500- 4000	5500- 6000	7500- 8000	9500- 10000	11500- 12000	13500- 14000	Every 2000 kms
	Item	Days [#]	30	90	140	190	240	290	340
1	Engine oil	R	R	I, TU	R	I, TU	R	I, TU	Replace Engine oil every 4000 kms
2	Air cleaner Element	C	C	C	C	C	R	C	Replace every 12000 kms
3	Engine oil strainer screen	C	-	-	C	-	C	-	Clean strainer at the time of replacing oil except 2nd service
4	Engine oil filter	R	-	-	R	-	-	-	Replace every 8000 kms
5	*Valve clearance	I, A	I, A	I, A	I, A	I, A	I, A	I, A	Inspect, adjust if required
6	Spark plug	I, C	I, C	I, C	R	I, C	I, C	I, C	Replace every 8000 kms
7	Battery (sp. gravity)	I, TU	I, TU	I, TU	I, TU	I, TU	I, TU	I, TU	Every service check electrolyte level and top up with distilled water
8	Idle speed & CO testing	I, A	I, A	I, A	I, A	I, A	I, A	I, A	Check the RPM and CO and adjust if required
9	Drive Chain	I, L, A	I, L, A	I, L, A	I, L, A	I, L, A	I, L, A	I, L, A	Inspect, Lubricate and adjust chain if reqd. at every service
10	Tyres/wheels	I	I	I	I	I	I	I	Check for wheel bend & tyre wear/cut
11	*All fasteners incl. Engine mounting & Chassis bolts	T	T	T	T	T	T	T	Check for any looseness in every service
12	*Steering play & Race bearing kit	I	I	I	I	G	I	I	Check for any looseness and adjust if required
13	*Front fork oil	I	I	I	I	R	I	I	Check for any oil leakage & Replace oil every 10000 kms
14	*Wheel bearings	I	I	I	I	G	I	I	Repack grease every 10000 Kms
15	Control Cables- Throttle, Clutch Brakes	I, A	I, A	I, A	I, A	I, A	I, A	I, A	Inspect and adjust the play
16	Side stand Main Stand	L	L	L	L	L	L	L	Every service Lubricate
17	Headlight Focus	I	I	I	I	I	I	I	Check and adjust H/L focus if required
18	Fuel Hose	I	I	I	I	I	I	I	Inspect at every service and replace every 4 yrs
19	*Rear suspension	I	I	I	I	I	I	I	Check operation oil leakage & replace if necessary
20	Brake Fluid	I	-	I	-	I	-	I	Inspect for leakage replace every 2 years
21	Brake Pads	I	-	I	-	I	-	I	Inspect for wear replace if necessary
22	Brake Hose	I	-	I	-	I	-	I	Inspect every 4000 kms replace every 4 years

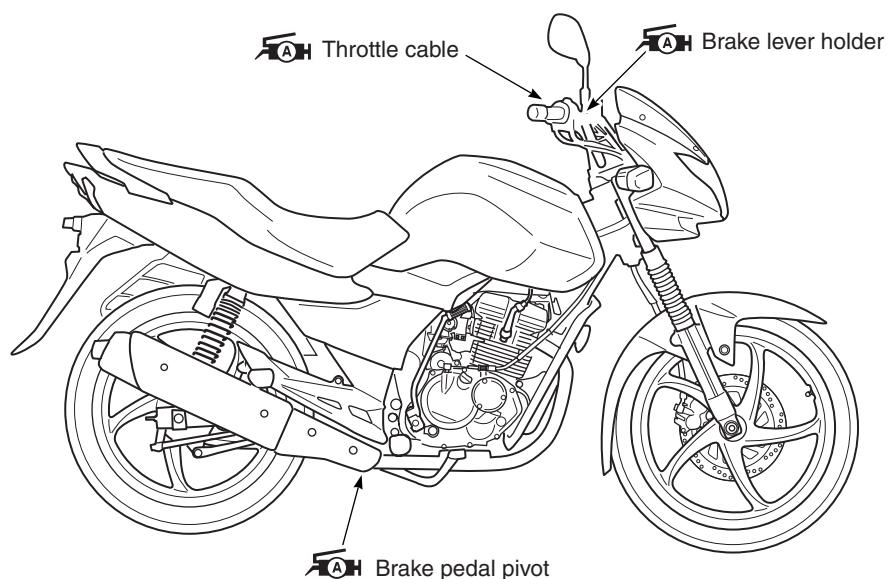
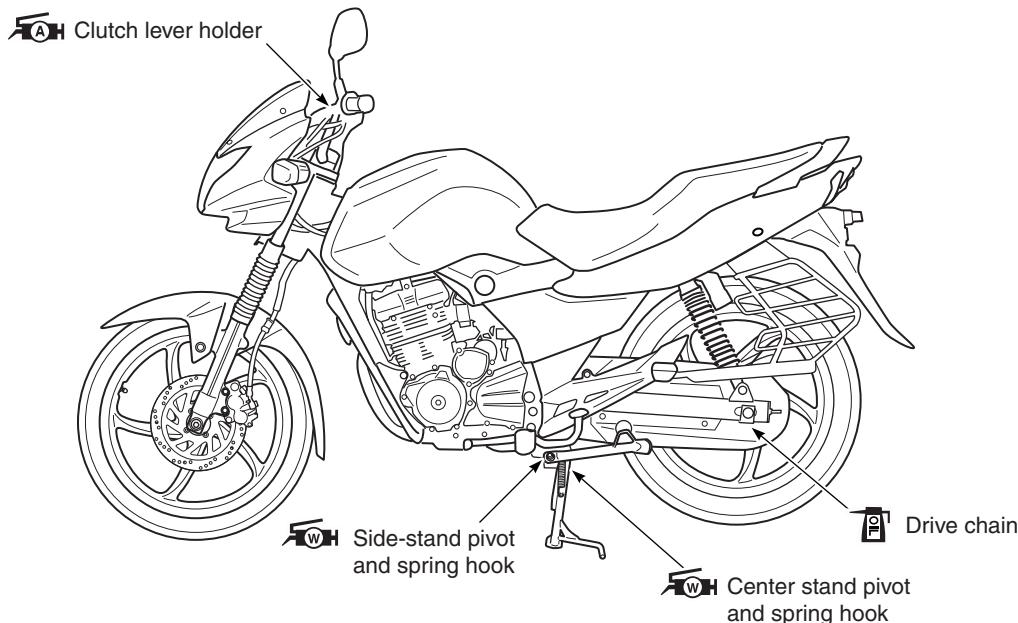
- Kms or days as mentioned whichever occurs first

NOTE : I=Inspect, A=Adjust, R=Replace, T=Tighten, C=Clean,

G=Repack Grease, L=Lubricate, TU=Top Up

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.

BATTERY

Inspect initially at 4000 kms and every 8000 kms thereafter.

- Remove the left frame side lower cover. (☞5-4)
- Remove the battery \ominus and \oplus lead wires from the battery terminals.
- Remove the plate ①.
- Remove the battery ② from its frame.
- Check the electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the MIN. level line but not above the MAX. level line.
- For checking specific gravity, use a hydrometer ③ to determine the charged condition.

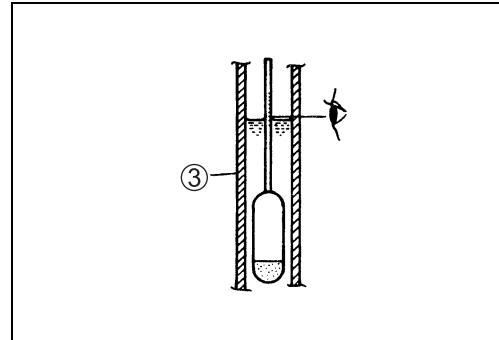
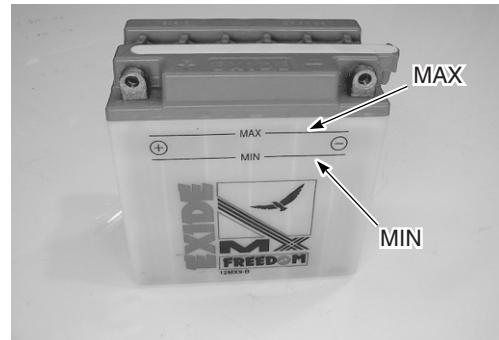
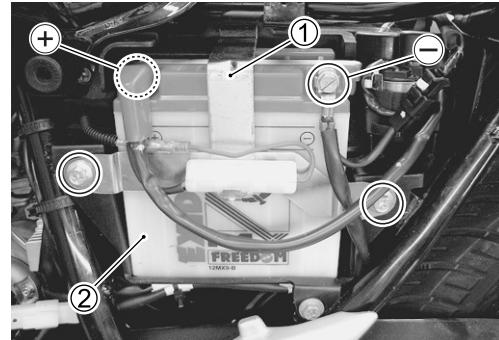
TOOL Hydrometer

Standard specific gravity: 1.280 at 20 °C or 1.230 at 27 °C

A specific gravity reading of 1.22 (at 20 °C) or less means that the battery needs recharging. Remove the battery from the motorcycle and charge it with a battery charger.

CAUTION

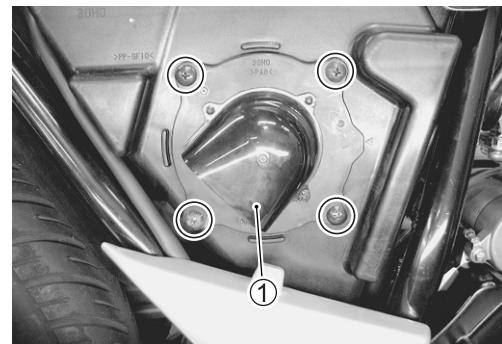
- * When removing the battery from the motorcycle, be sure to disconnect the battery \ominus lead wire first.
- * Never charge a battery while it is still in the motorcycle, as damage may result to the battery or regulator/rectifier.
- * Be careful not to bend, obstruct, or change the routing of the battery breather hose. Make sure that the battery breather hose is attached to the battery vent and that its opposite end is always fixed in battery box outlet (☞7-19)
- * When installing the battery lead wires, install the battery \oplus lead wire first and then the battery \ominus lead wire last.



AIR CLEANER

Clean every 4000 kms and replace every 12000 kms thereafter.

- Remove the right frame side lower cover. (☞5-4)
- Remove the screw and take out the air cleaner element ①.



- Inspect the air cleaner element for clogging.
- Using compressed air, blow the dust from the cleaner element.

CAUTION

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



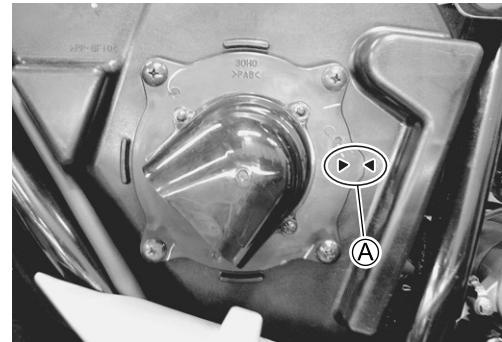
NOTE:

If driving under dusty conditions, replace the air cleaner element more frequently. Make sure that the air cleaner is in good condition at all times. The life of the engine depends largely on this component.

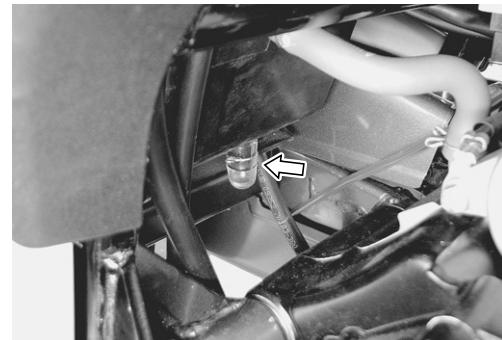
- Install a new air cleaner element in the reverse order of removal.

NOTE:

Align the arrow marks Ⓐ on the air cleaner box and air cleaner element.



- Remove the drain plug from the air cleaner box to allow any water to drain out.

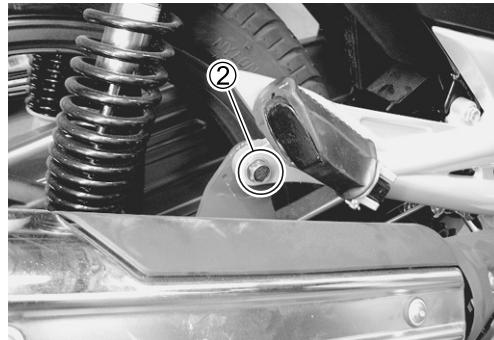
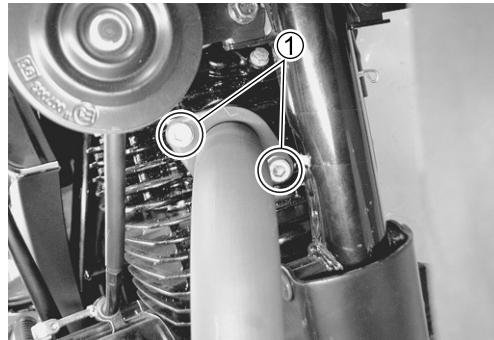


EXHAUST PIPE BOLTS AND MUFFLER MOUNTING BOLTS

Tighten initially at 1000 kms and every 8000 kms thereafter.

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

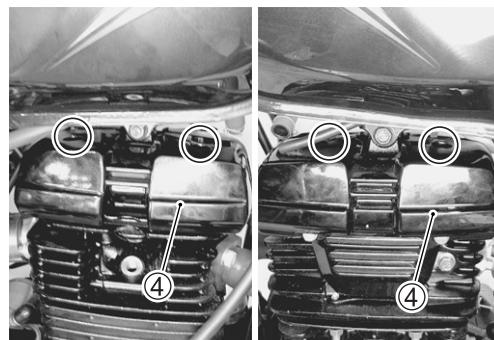
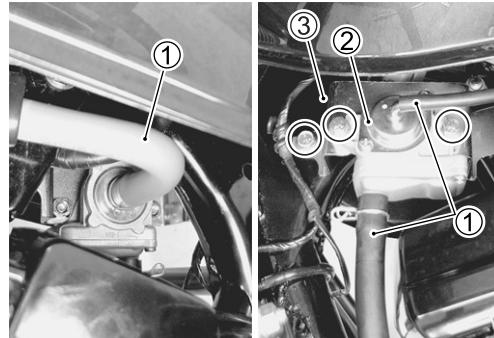
 **Exhaust pipe bolt ①: 23 N·m (2.3 kgf·m)**
Muffler mounting nut ②: 60 N·m (6.0 kgf·m)



VALVE CLEARANCE

Inspect initially at 1000 kms and every 4000 kms thereafter.

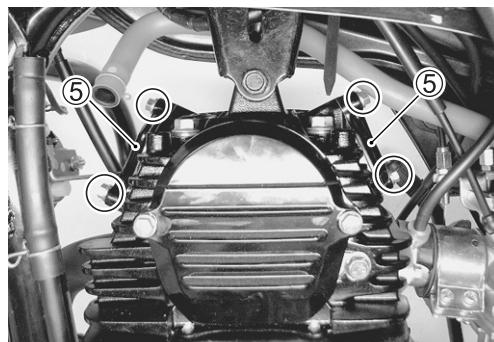
- Disconnect the PAIR valve hoses ①.
- Remove the PAIR valve assembly ② and bracket ③.



- Remove the spark plug. (2-8)
- Remove the cylinder head cover caps ④.

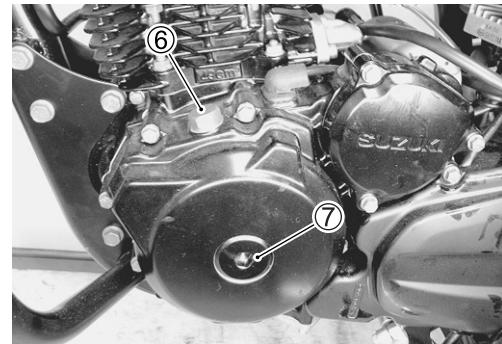
 **Cylinder head cover cap bolt: 10 N·m (1.0 kgf·m)**

- Remove the valve inspection caps ⑤.



- Remove the valve timing inspection plug ⑥ and magneto cover plug ⑦.

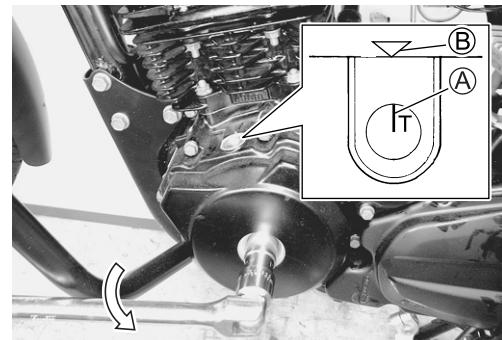
Valve timing inspection plug ⑥: 21 N·m (2.1 kgf·m)
Magneto cover plug ⑦: 5 N·m (0.5 kgf·m)



The valve clearance specification is different for both 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 disturbed by removing it for servicing.

NOTE:

- * The piston must be at (TDC) on the compression stroke in order to check the valve clearance or to adjust valve clearance.
- * The clearance specification is for COLD state.
- Turn crankshaft to bring the “TDC” line Ⓐ on the rotor to the index mark Ⓑ on the magneto cover.



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

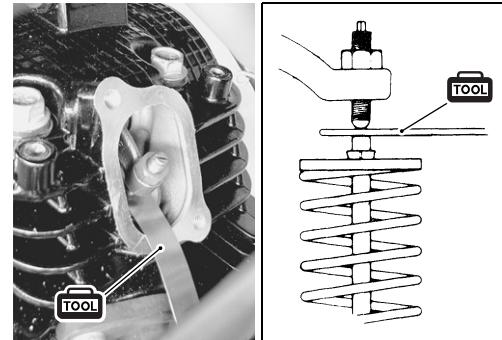
Thickness gauge

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

Valve clearance (when cold):

IN.: 0.04 – 0.07 mm

EX.: 0.10 – 0.15 mm



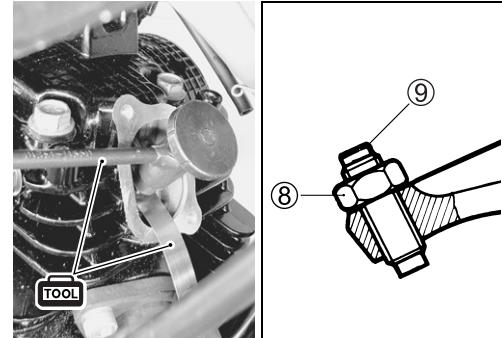
The clearance is adjusted by using a special tool.

Valve adjuster wrench

- Loosen the lock-nut ⑧.
- Adjust the valve clearance by turning the adjusting ⑨ while holding the lock-nut ⑧.
- After the adjustment is completed, tighten the lock-nut ⑧ to the specified torque.

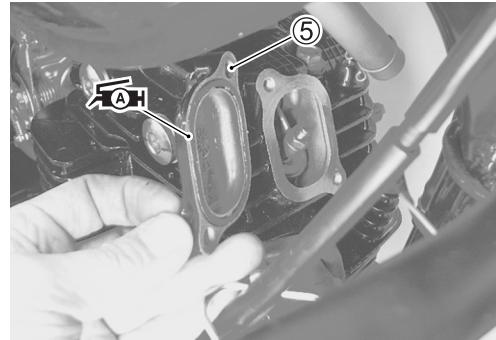
Valve clearance adjuster lock-nut ⑧: 15 N·m (1.5 kgf·m)

- Rotate the crankshaft 720° with a box wrench and check that the clearance is within specification.



- Apply SUZUKI SUPER GREASE "A" to the new O-ring and install the valve inspection caps ⑤.

 **SUZUKI SUPER GREASE "A"**



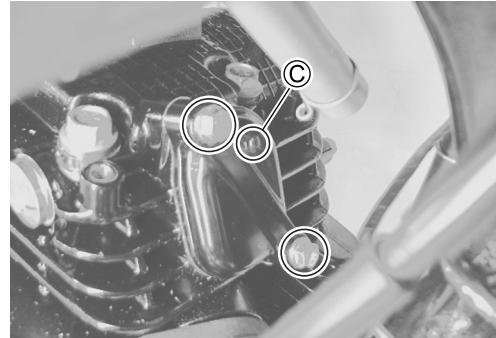
- Tighten the valve inspection cap bolts to the specified torque.

NOTE:

Make sure that the "UP" mark ⑥ comes to the up side.

 **Valve inspection cap bolt: 10 N·m (1.0 kgf·m)**

- Route the PAIR valve hoses. (☞7-18)



SPARK PLUG

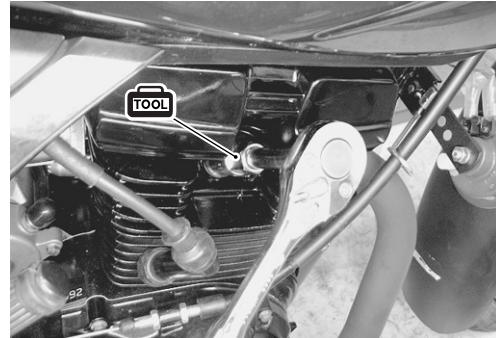
Inspect at 4000 kms and replace every 8000 kms thereafter.

REMOVAL

- Disconnect the spark plug cap and remove the spark plug.

 **Spark plug wrench set**

	Standard
NGK	CPR7HSA



CARBON DEPOSITS

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

SPARK PLUG GAP

- Measure the spark plug gap with a thickness gauge.
- Adjust the spark plug gap if necessary.

DATA Spark plug gap:

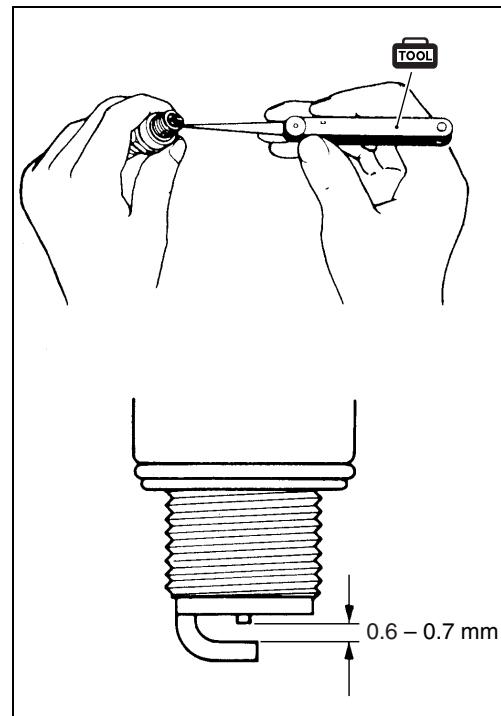
Standard: 0.6 – 0.7 mm

TOOL Thickness gauge**ELECTRODE'S CONDITION**

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

CAUTION

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

**INSTALLATION**

- Screw the spark plug into the cylinder head with fingers, and then tighten them to the specified torque.

Spark plug: 11 N·m (1.1 kgf·m)**TOOL Spark plug wrench set****CAUTION**

Do not cross thread or over tighten the spark plug, or such an operation will damage the aluminum threads of the cylinder head.

FUEL LINE

Inspect every 4000 kms and every 8000 kms thereafter.

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



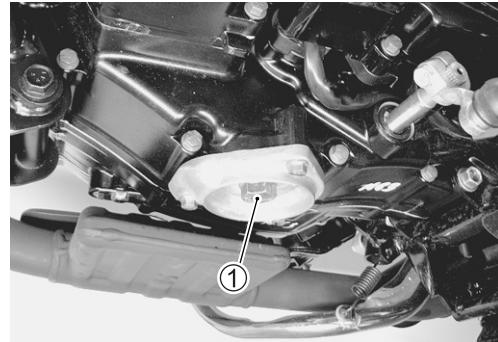
ENGINE OIL AND OIL FILTER

ENGINE OIL REPLACEMENT

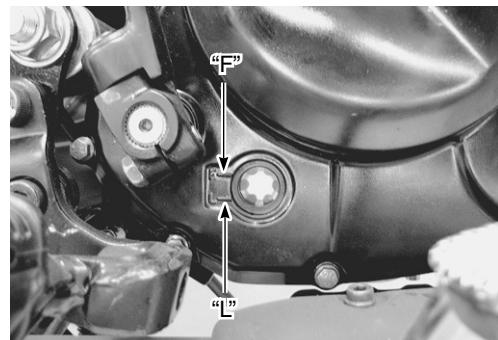
Replace initially at 1000 kms and every 4000 kms thereafter.

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain oil by removing the oil drain plug ① and filler cap ②.
- Tighten the drain plug ① to the specified torque, and pour fresh oil through the oil filler. The engine will hold about 1 000 ml of oil. Use of API SF/SG or SH/SJ with JASO MA.

 **Oil drain plug: 23 N·m (2.3 kgf·m)**



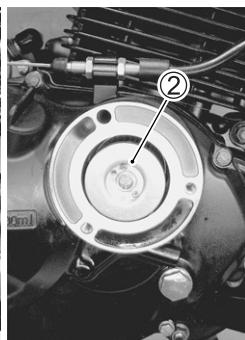
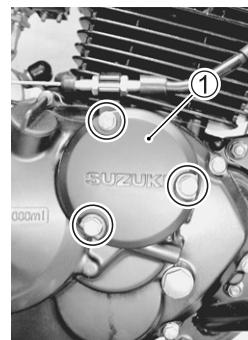
- Start up the engine and allow it to run for a few minutes at idling speed.
- Turn off the engine and wait about three minutes, release the center stand holding the motorcycle vertically then check the oil level through the inspection window. If the level is below mark “L”, add oil to “F” level. If the level is above mark “F”, drain oil to “F” level.



OIL FILTER REPLACEMENT

Replace initially at 1000 kms and every 8000 kms thereafter.

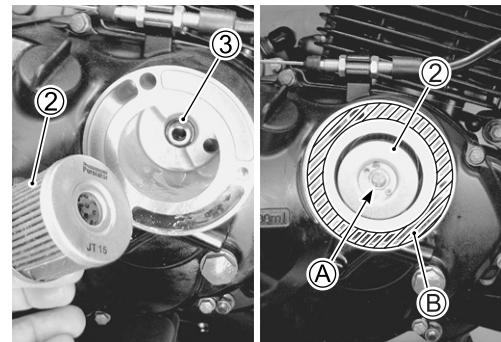
- Drain engine oil as described in the engine oil replacement procedure.
- Remove the oil filter cap ① and oil filter ②.
- Replace the oil filter with a new one.



- Apply engine oil lightly to the new O-rings ③ and ④.
- Install the spring ⑤ correctly.
- Install the new oil filter ②.

CAUTION

- * Position the oil filter so that the valve Ⓐ comes outside.
- * Make sure that the oil filter is installed properly. If the filter is installed improperly, serious engine damage may result.

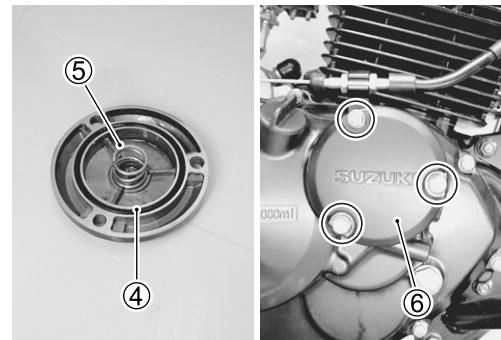


- Install the oil filter cap ⑥ and tighten the bolts securely.

Oil filter cap bolt: 10 N·m (1.0 kgf·m)

NOTE:

- * Wipe off oil on the region of the figure Ⓑ.
- * Before installing the new oil filter and oil filter cap, make sure that the spring ⑤ and new O-rings ③, ④ are installed correctly.
- Add new engine oil and check the oil level as described in the engine oil replacement procedure.



DATA Oil viscosity and classification:

SAE 20W-40, API SF/SG or SH/SJ with JASO MA

DATA NECESSARY AMOUNT OF ENGINE OIL

Oil change	: 1000 ml
Oil and filter change	: 1100 ml
Engine overhaul	: 1400 ml

OIL SUMP FILTER CLEANING (☞4-16)

THROTTLE CABLE PLAY

Inspect initially at 1000 kms and every 4000 kms thereafter.

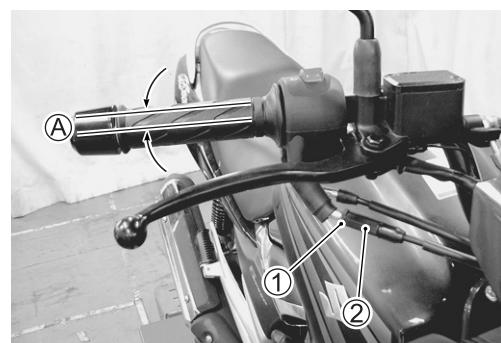
Adjust the throttle cable play Ⓐ with the following procedures.

- Loosen the lock-nut ① of the throttle pulling cable.
- Turn the adjuster ② in or out until the throttle cable play Ⓐ should be 2.0 – 4.0 mm at the throttle grip.
- Tighten the lock-nut ① while holding the adjuster ②.

DATA Throttle cable play Ⓐ: 2.0 – 4.0 mm

⚠ WARNING

After the adjustment is completed, check that handlebars 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.

ENGINE IDLE SPEED

Inspect initially at 1000 kms and every 4000 kms thereafter.

- Warm up the engine.

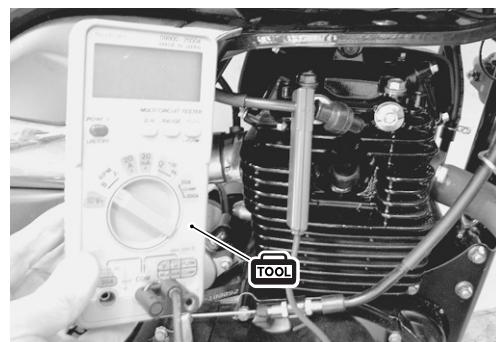
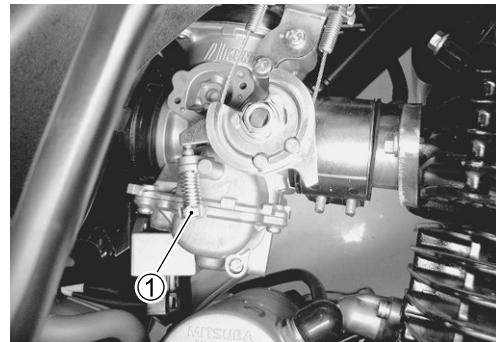
NOTE:

Make this adjustment when the engine is hot.

- Start the engine, turn the throttle stop screw ① and set the engine idle speed as follows.
- Connect the tachometer or the multi circuit tester to the high-tension cord.
- Start the engine and set the engine idle speed between 1 300 and 1 500 r/min by turning the throttle stop screw ①.

DATA Engine idle speed: 1400 ± 100 r/min

 Multi circuit tester set



PAIR (AIR SUPPLY) SYSTEM

Inspect every 4000 kms thereafter.

Inspect the PAIR (air supply) system periodically. (☞ 3-71)

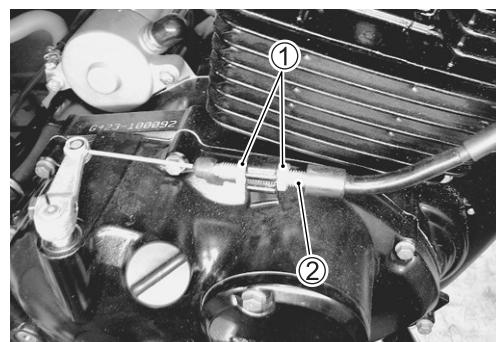
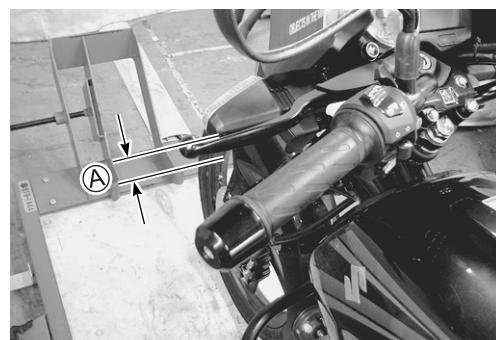
CLUTCH CABLE PLAY

Inspect initially at 4000 kms and every 8000 kms thereafter.

- Loosen the lock-nuts ① and turn the adjuster ② until the clutch lever play Ⓐ is within specification.

DATA Clutch lever play Ⓐ: 10 – 15 mm

- Tighten the lock-nuts ①.



DRIVE CHAIN

Inspect initially at 1000 kms and every 4000 kms thereafter.

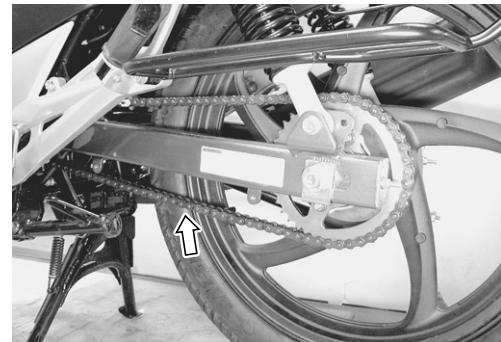
Clean and lubricate every 1000 kms.

- With the transmission in neutral, support the motorcycle using the center-stand and turn the rear wheel slowly by hand.
- Remove the chain case. (☞ 5-45)

Visually inspect the drive chain for the possible defects listed below.

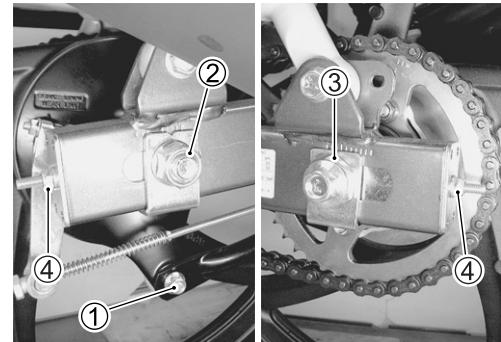
* Loose pins	* Twisted or seized links
* Damaged rollers	* Excessive wear
* Rusted links	* Kinked or binding links

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



CHECKING

- Place the motorcycle on the center stand.
- Remove the chain case. (☞ 5-45)
- Loosen the rear torque link nut (rear) ①.
- Loosen the rear axle nut ② and the rear sprocket drum nut ③.
- Tense the drive chain fully by turning both chain adjuster nuts ④.



- 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.

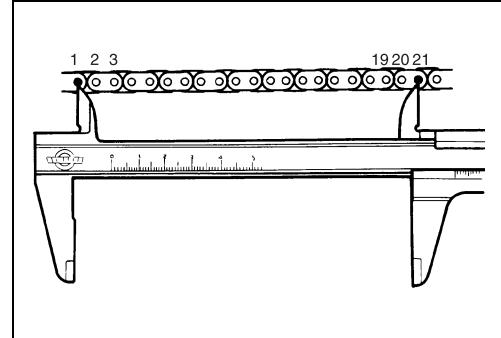
DATA Drive chain 20-pitch length:

Service limit: 256.0 mm

NOTE:

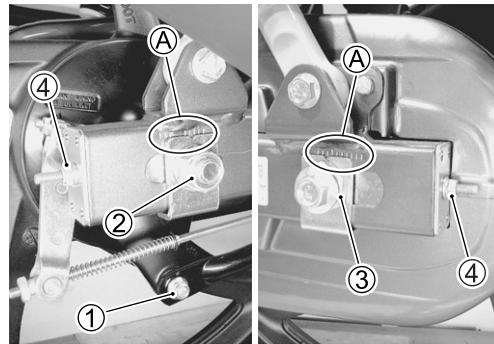
When replacing the drive chain, replace the drive chain and sprockets as a set.

- After checking the drive chain, adjust the drive chain.



ADJUSTING

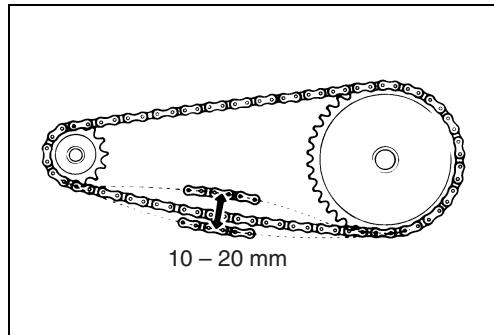
- Place the motorcycle on the center-stand.
- Loosen the rear torque nut (rear) ①.
- Loosen the rear axle nut ② and the rear sprocket drum nut ③.
- Loosen or tighten both chain adjuster nuts ④ until the chain has 10 – 20 mm of slack at the middle of the chain between the engine and rear sprockets as shown. The reference marks Ⓐ must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.

**DATA** **Drive chain slack: 10 – 20 mm**

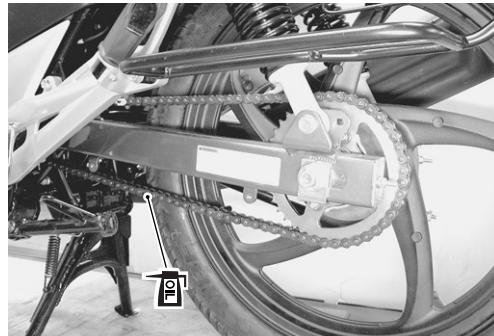
- After adjusting the drive chain, tighten the rear sprocket drum nut ③ and the rear axle nut ② to the specified torque.

Ⓐ Rear axle nut ②: 65 N·m (6.5 kgf-m)**Rear sprocket drum nut ③: 80 N·m (8.0 kgf-m)**

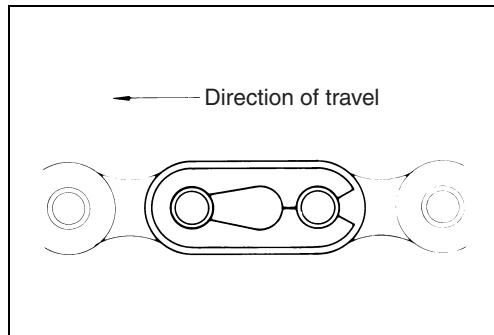
- Recheck the chain slack after tightening the axle nut ② and readjust if necessary.
- Tighten the rear torque link nut (rear) ① to the specified torque.

Ⓐ Rear torque link nut ①: 16 N·m (1.6 kgf-m)**CLEANING AND LUBRICATING**

- Place the motorcycle on the center-stand.
- Remove the chain case. (☞ 5-45)
- Clean the drive chain with kerosine. If the drive chain tends to rust quickly, the intervals must be shortened.
- After cleaning and drying the chain, oil it with a heavyweight engine oil.

**CAUTION**

The drive chain joint clip should be attached in the way that the slit end will face opposite to the direction of travel.

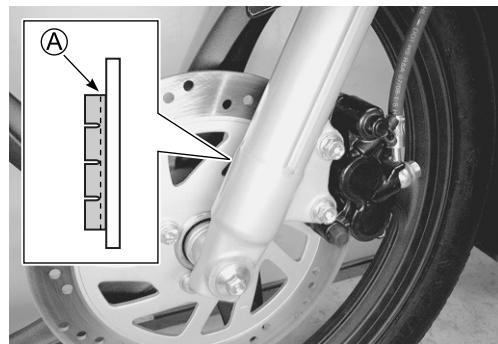


BRAKE

Inspect initially at 1000 kms and every 4000 kms thereafter.

FRONT BRAKE PADS

The extent of brake pad wear can be checked by observing the grooved limit line **(A)** on the brake pad. When the wear exceeds the grooved limit line, replace the pads with new ones. (☞ 5-23)



CAUTION

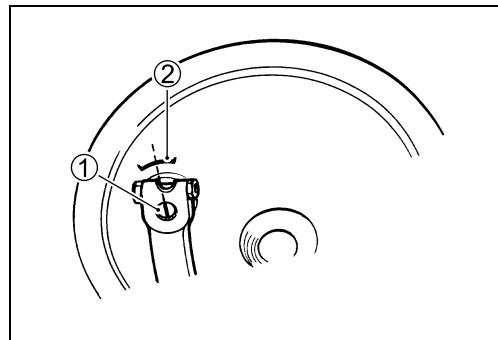
Replace the brake pads as a set, otherwise braking performance will be adversely affected.

REAR BRAKE SHOW WEAR

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

To check wear of the brake lining, perform the following steps.

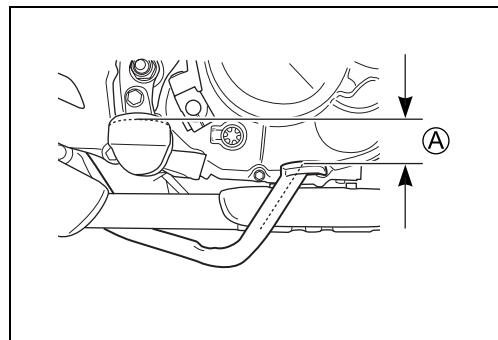
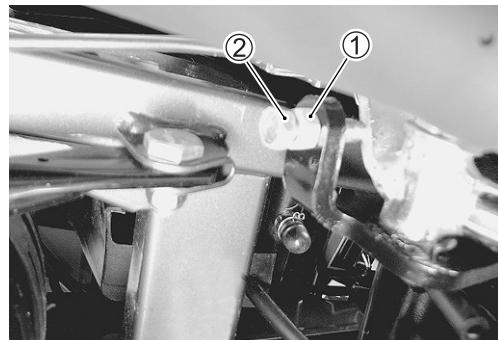
- First, check if the brake system is properly adjusted.
- While operating the brake, make sure that the index mark **①** is within the range **②** embossed on the brake panel.
- If the index mark goes beyond the range, the brake shoe assembly should be replaced with a new set of shoes. (☞ 5-49)



REAR BRAKE PEDAL ADJUSTING

- Loosen the lock-nut **①** and rotate the adjusting bolt **②** to locate brake pedal 15 mm **(A)** below the top face of the foot-rest.
- Retighten the lock-nut **①** to secure the adjusting bolt **②** in the proper position.

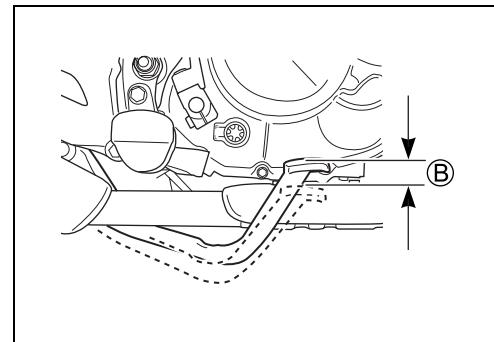
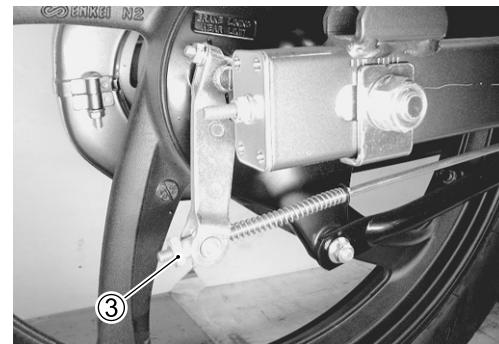
DATA Brake pedal height **(A)**: 15 mm



- Adjust the free travel ③ to 20 – 30 mm by turning the adjusting nut ③.

DATA **Brake pedal free travel ③: 20 – 30 mm**

- Check the rear brake light switch.



REAR 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.



BRAKE HOSE AND BRAKE FLUID

Inspect every 4000 kms.

Replace hoses every 4 years. Replace fluid every 2 years.

BRAKE HOSE

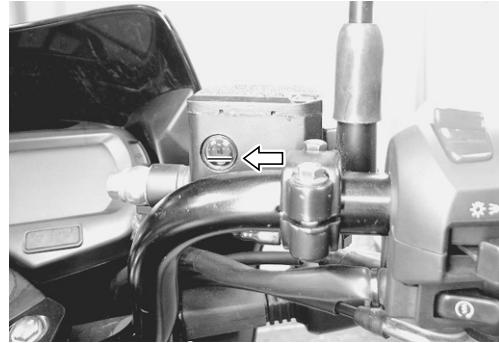
Check the brake hose for leakage, cracks, wear and damage. If any damages are found, replace the brake hose with a new one.



BRAKE FLUID LEVEL CHECK

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

 **Specification and classification: DOT 3 or 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 hoses and hose joints for cracks and fluid leakage before riding.

FRONT BRAKE FLUID REPLACEMENT (☞ 5-23)

AIR BLEEDING FOR THE FRONT BRAKE FLUID CIRCUIT

Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by “sponginess” of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:

- Remove the front master cylinder reservoir cap and diaphragm.
- Fill up the master cylinder reservoir to the “UPPER” line Ⓐ. Place the reservoir cap to prevent entry of dirt.
- Attach a hose ① to the air bleeder valve, and insert the free end of the pipe into a receptacle.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the air bleeder valve ② 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 ②, pump and squeeze the lever, and open the valve.

Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.

NOTE:

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

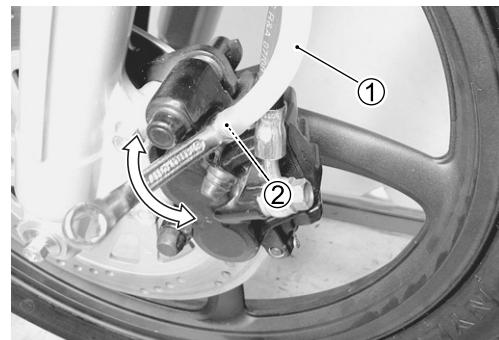
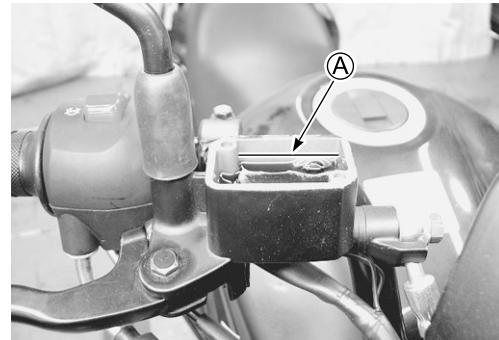
- Close the bleeder valve ②, and disconnect the hose ①.

Air bleeder valve ②: 7.5 N·m (0.75 kgf·m)

Fill the reservoir with brake fluid to the “UPPER” line Ⓐ.

CAUTION

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



TIRES

Inspect initially at 4000 kms and every 8000 kms thereafter.

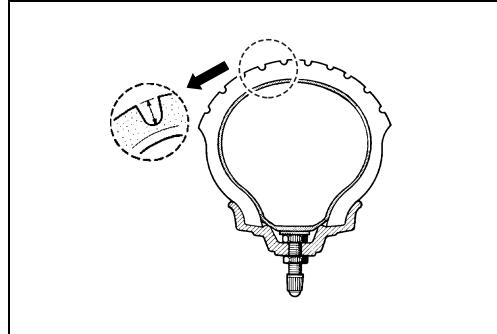
TIRE TREAD CONDITION

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.

TOOL Tire depth gauge

DATA Tire tread depth:

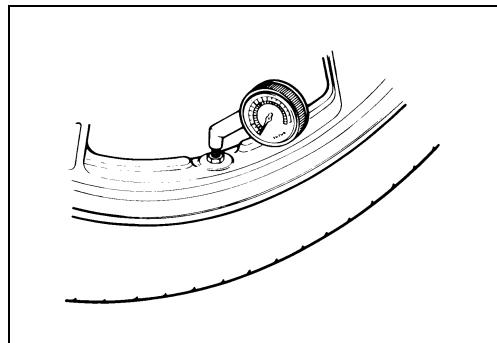
Service Limit: FRONT: 1.6 mm
REAR: 1.6 mm



TIRE PRESSURE

If the tire pressure is too high or too low, steering will be adversely affected and tire wear will increase. 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	kgf/cm ²	kPa	kgf/cm ²
FRONT	175	1.75		175	1.75
REAR	200	2.00		255	2.55



CAUTION

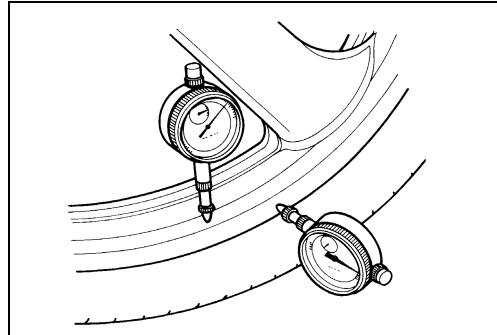
The standard tire fitted on this motorcycle is a 2.75-18 42P for the front and a 100/90-18 M/C 56P for the rear. The use of tires other than those specified may cause instability. It is highly recommended to use the specified tires.

WHEEL

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

DATA Wheel runout

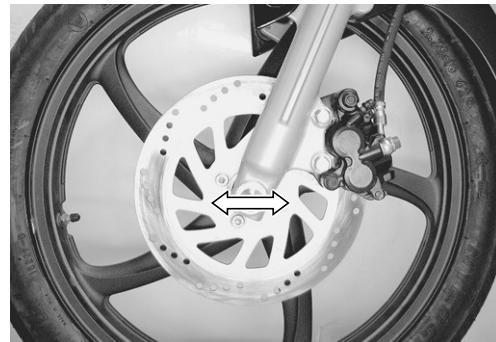
Service Limit (axial and radial): 2.0 mm



STEERING

Inspect initially at 1000 kms and every 8000 kms 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. (☞ 5-38)



FRONT FORK

Inspect every 8000 kms.

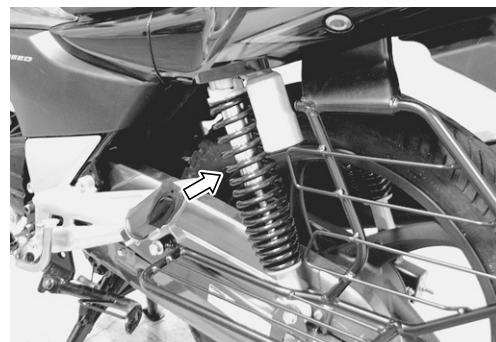
Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (☞ 5-13)



REAR SUSPENSION

Inspect every 8000 kms.

Inspect the rear shock absorbers for oil leakage and damage. Replace any defective parts, if necessary. (☞ 5-61)

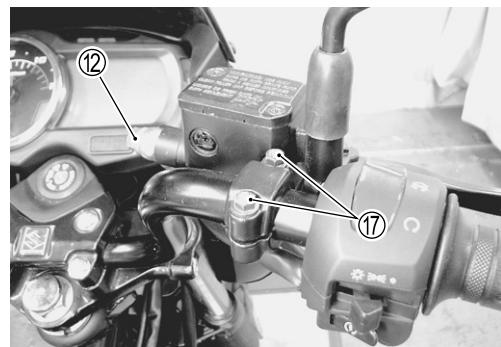
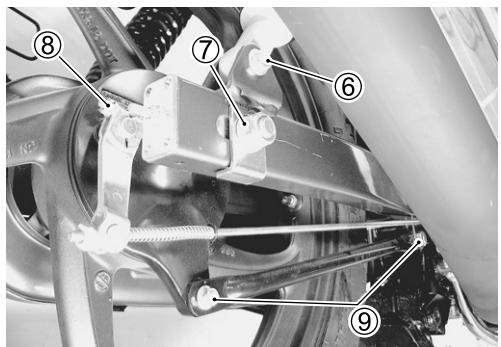
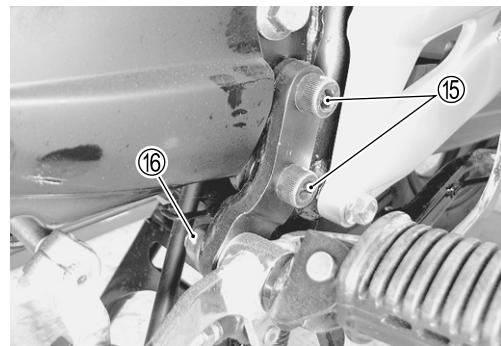
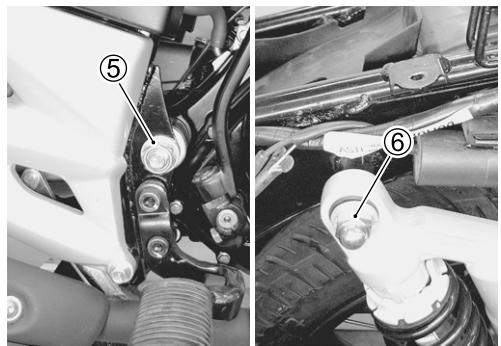
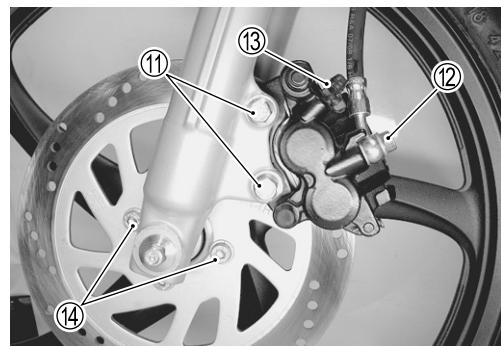
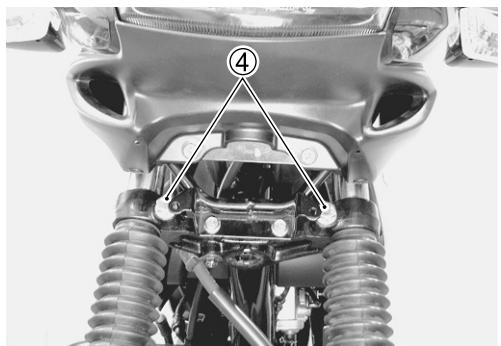
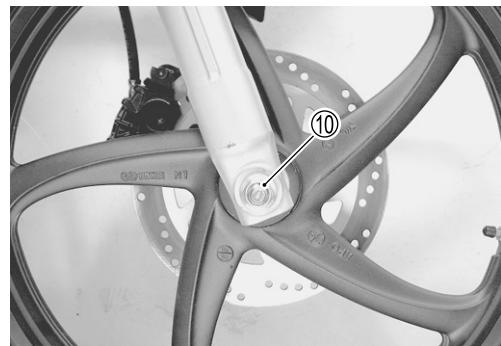
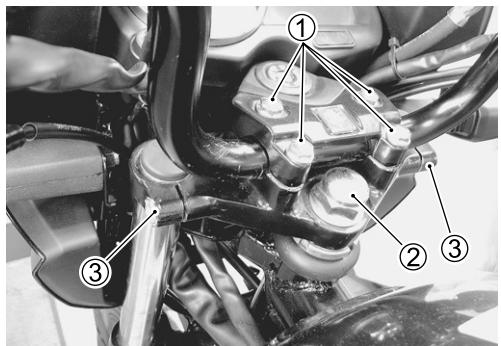


CHASSIS BOLTS AND NUTS

Tighten initially at 1000 kms and every 4000 kms thereafter.

Check that all chassis bolts and nuts are tightened to their specified torque. (Refer to page 2-22 for the locations of the following bolts and nuts on the motorcycle.)

ITEM	N·m	kgf·m
① Handlebar clamp bolt	16	1.6
② Steering stem head nut	90	9.0
③ Front fork upper clamp bolt	23	2.3
④ Front fork lower clamp bolt	29	2.9
⑤ Swingarm pivot nut	65	6.5
⑥ Rear shock absorber mounting nut & bolt (Upper & Lower)	29	2.9
⑦ Rear axle nut	65	6.5
⑧ Rear brake lever nut	7	0.7
⑨ Rear torque link nut (Front & Rear)	16	1.6
⑩ Front axle nut	44	4.4
⑪ Brake caliper mounting bolt	25	2.5
⑫ Brake hose union bolt	23	2.3
⑬ Air breeder valve	7.5	0.75
⑭ Brake disc bolt	23	2.3
⑮ Front footrest bracket mounting bolt	35	3.5
⑯ Front footrest nut	55	5.5
⑰ Brake master cylinder bolt	10	1.0



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.

DATA COMPRESSION PRESSURE SPECIFICATION

Standard
500 – 1600 kPa (5 – 16 kgf/cm ²)

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

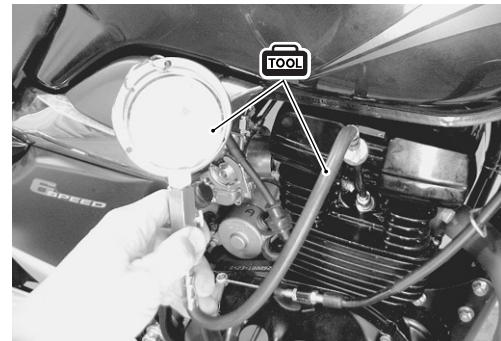
NOTE:

- * 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 adjusted.
- * 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.

- Remove the spark plug. (2-8)
- 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 **Compression gauge**
Compression gauge adapter



OIL PRESSURE CHECK

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

OIL PRESSURE SPECIFICATION

20 – 50 kPa (0.2 – 0.5 kgf/cm²) at 3 000 rpm, Oil temp. at 60 °C.

If the oil pressure is lower or higher than 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

ENGINE

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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 page listed in each section for removal and reinstallation instructions.

ENGINE CENTER

PARTS	REMOVAL	INSTALLATION
Carburetor	4-6	4-13
Cam chain tension adjuster	3-11	3-69
Cylinder head	3-11	3-67
Cylinder	3-11	3-67
Piston	3-12	3-66
Intake pipe	3-21	3-31
Starter motor	6-12	6-16
Oil sump filter	4-16	4-16

ENGINE RIGHT SIDE

PARTS	REMOVAL	INSTALLATION
Oil pump	3-15	3-62
Gearshift shaft	3-15	3-61
Kick starter drive gear and idle gear	3-15	3-61
Spark plug	2-8	2-9
Oil filter	2-10	2-11
Kick starter lever	3-12	3-65
Clutch cover	3-13	3-64
Clutch	3-13	3-62
Primary drive gear and oil pump drive gear	3-16	3-60
Muffler	3-3	3-8

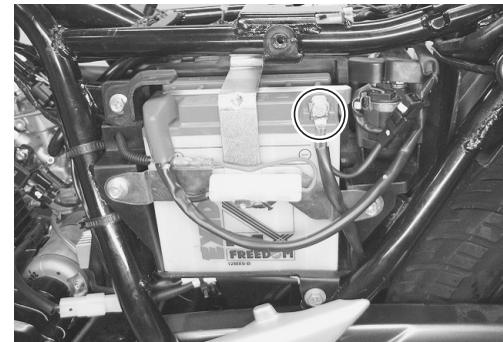
ENGINE LEFT SIDE

PARTS	REMOVAL	INSTALLATION
Camshaft sprocket	3-11	3-68
Camshaft	3-22	3-30
Engine sprocket	3-4	3-8
Cam chain	3-18	3-58
Neutral switch	3-18	3-58
Magneto cover	3-16	3-59
Magneto rotor	3-18	3-58
PAIR control valve	2-6	7-18
Starter idle gear No.1 and No.2	3-16	3-59

ENGINE REMOVAL AND INSTALLATION

ENGINE REMOVAL

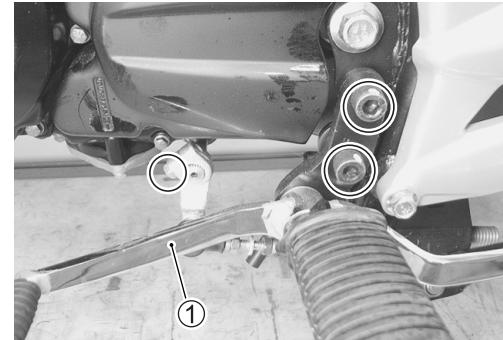
- Remove the seat. (☞5-4)
- Remove the right and left frame side lower covers. (☞5-4)
- Remove the fuel tank. (☞4-2)
- Drain the engine oil. (☞2-10)
- Disconnect the \ominus battery lead wire.



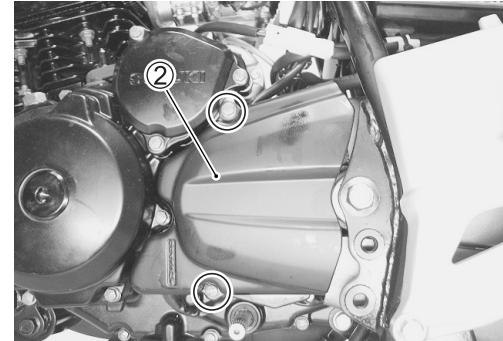
- Remove the gearshift lever assembly ①.

NOTE:

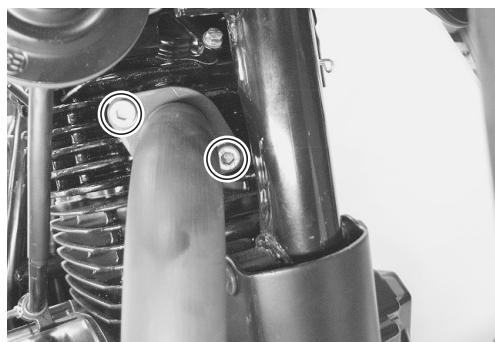
Mark the position of the gearshift lever on the gearshaft before removing.



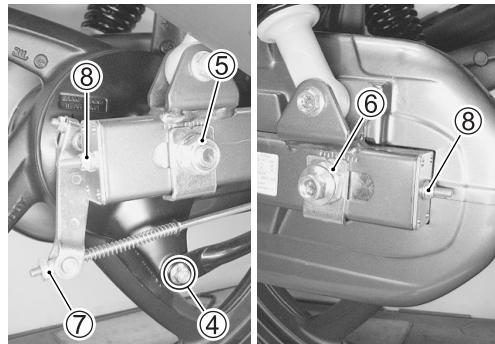
- Remove the engine sprocket cover ②.



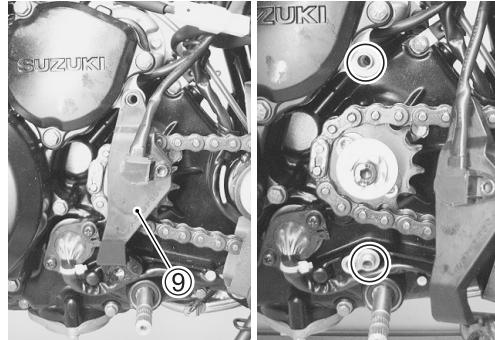
- Remove the muffler ③ and gasket.



- Loosen the rear torque link nut (rear) ④, rear axle nut ⑤, rear sprocket drum nut ⑥, rear brake lever adjuster ⑦, chain adjuster nuts ⑧, and make sure that the drive chain has enough slack.



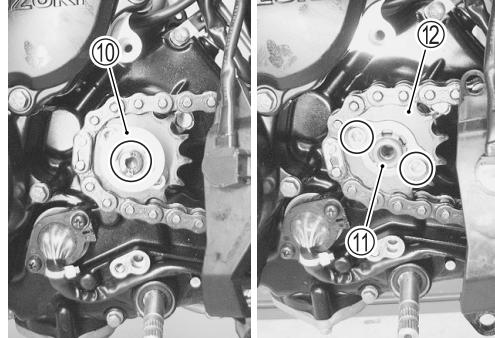
- Remove the speed sensor bracket ⑨ and dowel pins.



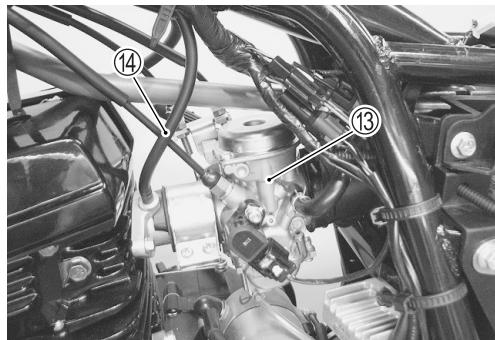
- Remove the speed sensor rotor ⑩.
- Remove the lock washer ⑪ and engine sprocket ⑫.

NOTE:

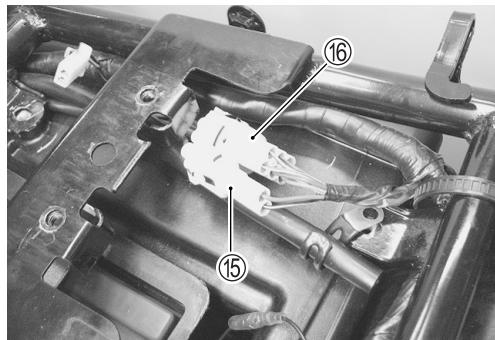
When loosening the speed sensor rotor bolt and engine sprocket bolts, depress the brake pedal.



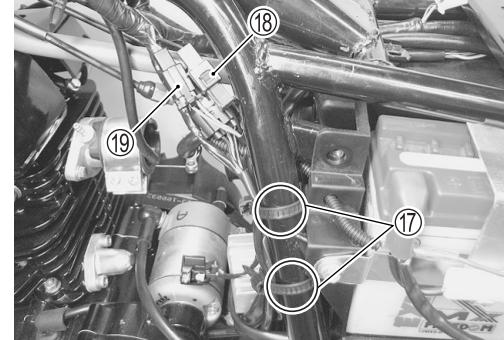
- Remove the carburetor ⑬. (☞ 4-6)
- Disconnect the vacuum hose ⑭.



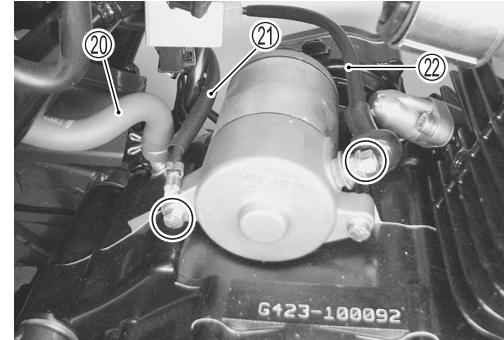
- Disconnect the neutral switch lead wire coupler ⑮ and gear position switch lead wire coupler ⑯.



- Disconnect the clamps ⑯.
- Disconnect the pickup coil lead wire coupler ⑯ and magneto lead wire coupler ⑯.



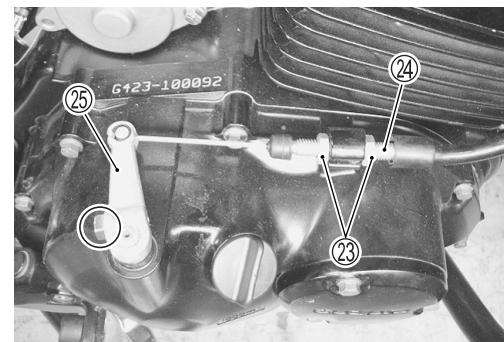
- Disconnect the crankcase breather hose ⑯ and starter motor lead wire ⑯.
- Remove the battery - lead wire ⑯.



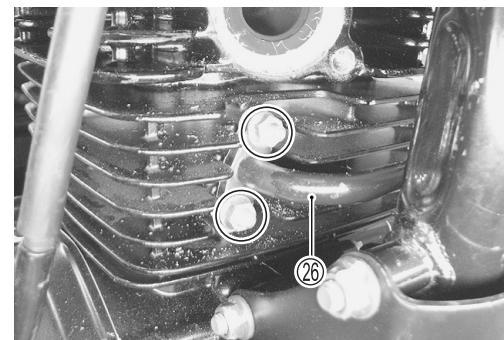
- Loosen the clutch cable nuts ⑯ and clutch cable adjuster ⑯.
- Remove the clutch release arm ⑯ along with the clutch cable.

NOTE:

Make the position of the clutch release arm on the clutch release camshaft before removing.



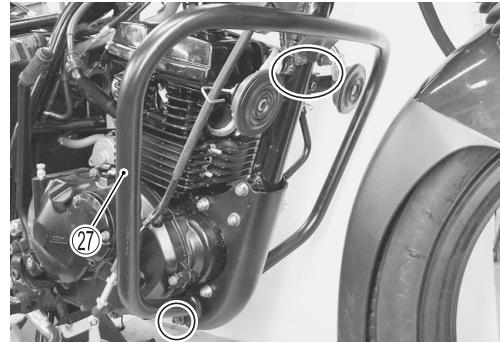
- Remove the PAIR pipe ⑯ and gasket.



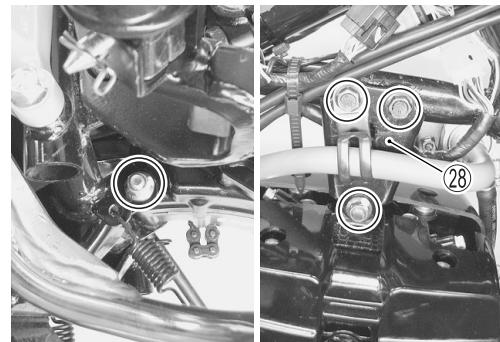
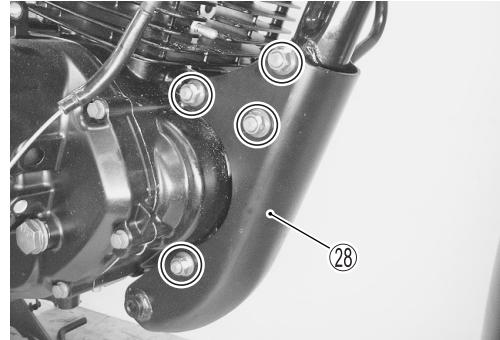
- Disconnect the spark plug cap.



- Remove the front bumper ⑦.



- Support the engine using an engine jack.
- Remove the engine mounting nuts, bolts and brackets ⑧.



- Remove the swingarm pivot nut and washer.



- Partially remove the swingarm pivot shaft so that the engine can be removed.

NOTE:

Be careful not to draw out the pivot shaft.

- Gradually lower the engine.



ENGINE INSTALLATION

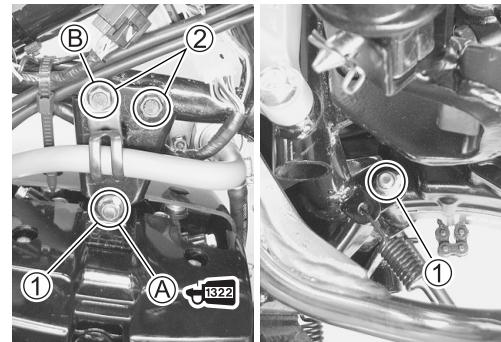
Install the engine in the reverse order of engine removal.

Pay attention to the following points:

NOTE:

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

- Insert the engine mounting bolts, engine mounting bracket bolts and swingarm pivot shaft.



NOTE:

* When reusing the removed engine upper mounting bolt ①, apply a small quantity of the THREAD LOCK SUPER to the bolt.

* Fit the clamp to the bolt ②.

 **THREAD LOCK SUPER “1322”**

- Tighten the engine mounting nuts and bracket nuts to the specified torque.

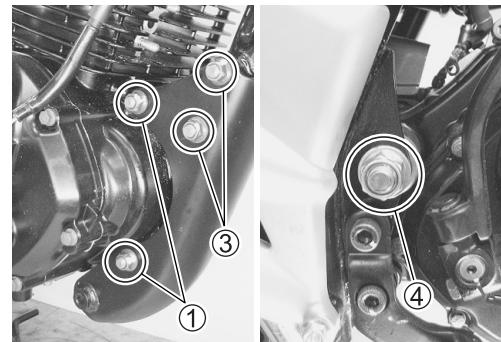
 **Engine mounting nut ①: 40 N·m (4.0 kgf·m)**

Engine mounting upper bracket nut ②:

31 N·m (3.1 kgf·m)

Engine mounting lower bracket nut ③:

40 N·m (4.0 kgf·m)



- Tighten the swingarm pivot nut to the specified torque.

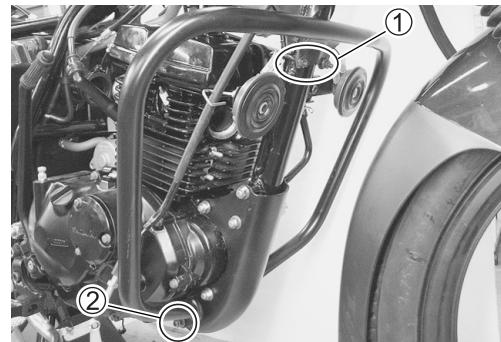
 **Swingarm pivot nut ④: 65 N·m (6.5 kgf·m)**

FRONT BUMPER

- Tighten the front bumper mounting nuts to the specified torque.

 **Front bumper upper mounting nut ①: 10 N·m (1.0 kgf·m)**

Front bumper lower mounting nut ②: 40 N·m (4.0 kgf·m)

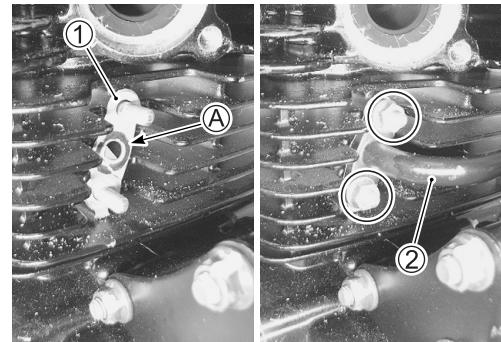


PAIR PIPE

- Install the gasket ① and PAIR pipe ②.

CAUTION

Replace the gasket with a new one.



NOTE:

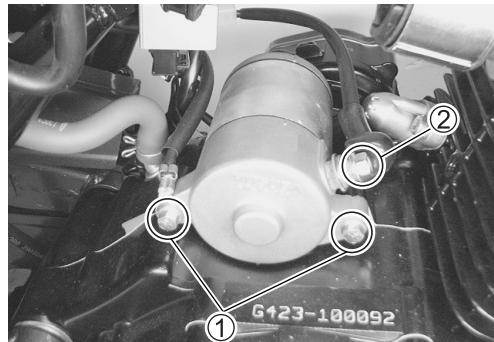
The seal ① of gasket faces outside.

- Tighten the PAIR pipe mounting nut.

STARTER MOTOR

- Tighten the starter motor mounting bolts ① and starter motor lead wire nut ② to the specified torque. (☞7-13)

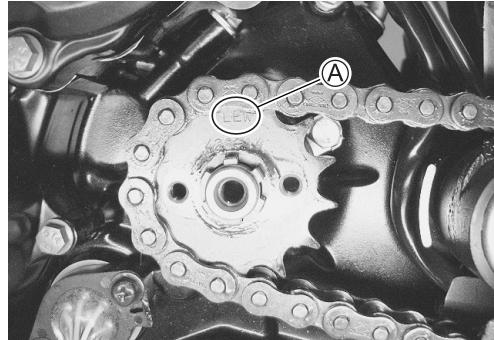
 **Starter motor mounting bolt ①: 6 N·m (0.6 kgf·m)**
Starter motor lead wire nut ②: 4 N·m (0.4 kgf·m)

**ENGINE SPROCKET**

- Install the engine sprocket with drive chain.

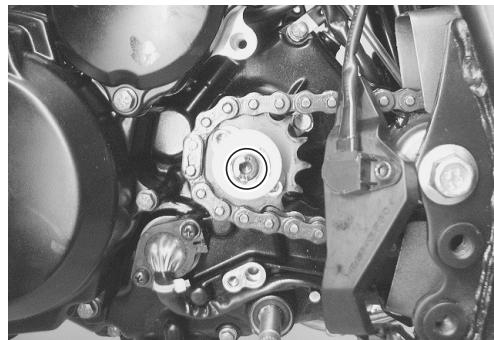
NOTE:

The letter A on the engine sprocket should face to the outside.

**SPEED SENSOR ROTOR**

- Tighten the speed sensor rotor bolt to the specified torque.

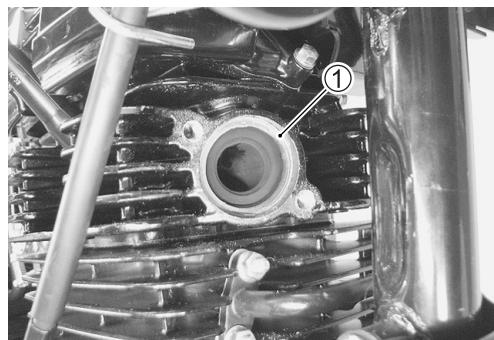
 **Speed sensor rotor bolt: 23 N·m (2.3 kgf·m)**

**MUFFLER**

- Install the gasket ①.

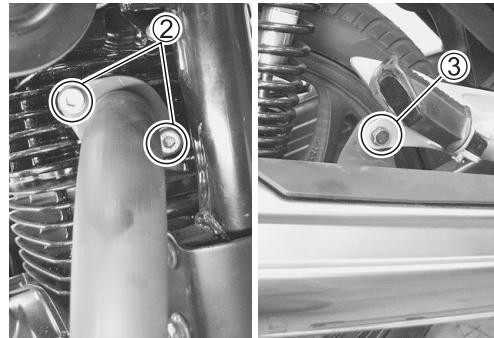
CAUTION

Replace the gasket with a new one.



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

 **Exhaust pipe bolt ②: 23 N·m (2.3 kgf·m)**
Muffler mounting nut ③: 60 N·m (6.0 kgf·m)



GEARSHIFT LEVER

- Tighten the front footrest bracket mounting bolts to the specified torque.

Front footrest bracket mounting bolt: 35 N·m (3.5 kgf·m)

- After installing the engine, properly route the wire harness, cables, and hoses. Refer to the wire and cable routing sections. (2-7-11 to -13)
- Refer to the following sections to adjust the respective items to specification.
 - * Engine oil (2-10)
 - * Throttle cable play (2-11)
 - * Clutch cable play (2-12)
 - * Engine idle speed (2-12)
 - * Drive chain slack (2-14)
 - * Rear brake (2-15)
- Check for leakage of the engine oil.

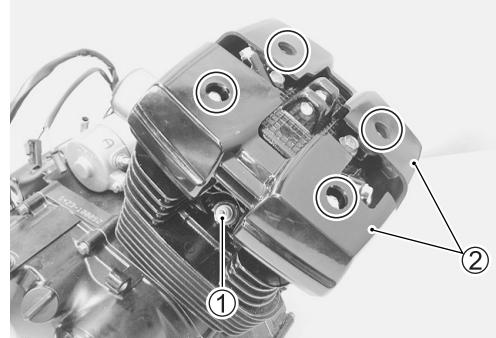
ENGINE DISASSEMBLY

CAUTION

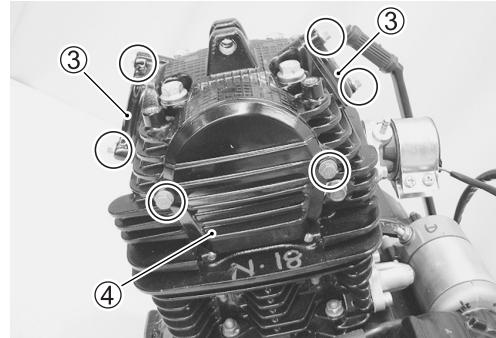
Identify the position of each removed part. Organize the parts in their respective groups so that they can be reinstalled in their original positions.

- Remove the spark plug ① and cylinder head cover caps ②.

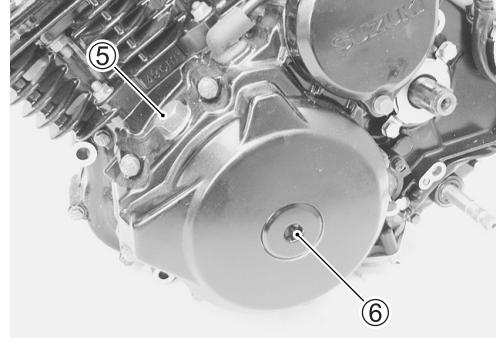
 **Spark plug wrench set**



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



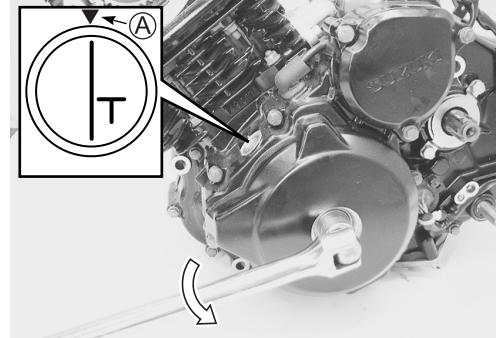
- Remove the valve timing inspection plug ⑤ and the magneto cover plug ⑥.



- Turn the crankshaft with a box wrench and align the “|T” mark on the magneto rotor with the mark Ⓐ on the magneto cover.

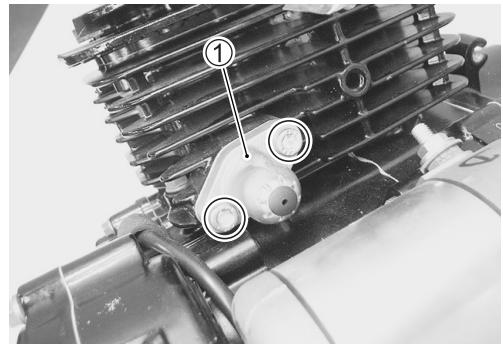
NOTE:

The piston must be at TDC on the compression stroke.

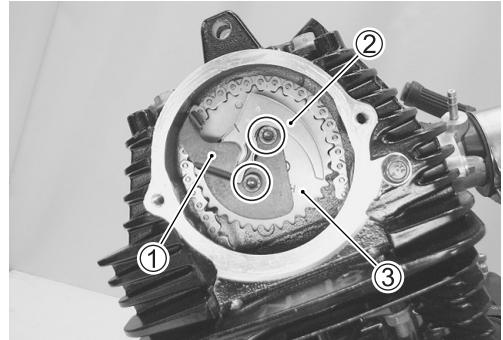


CAM CHAIN TENSION ADJUSTER

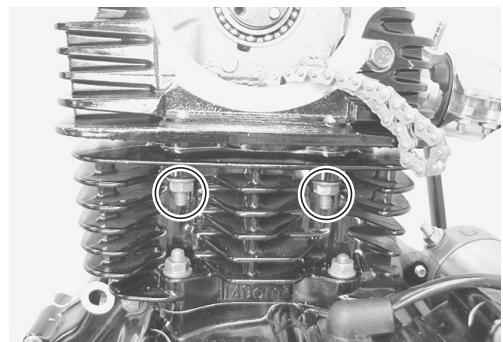
- Remove the cam chain tension adjuster ① and gasket.

**CAMSHAFT SPROCKET**

- Remove the decomp cam stopper ①, decomp cam ② and camshaft sprocket ③.

**CYLINDER HEAD**

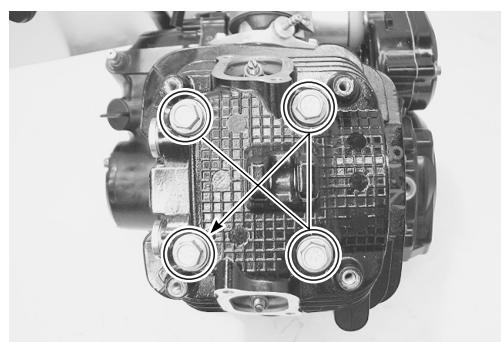
- Remove the cylinder head side nuts.



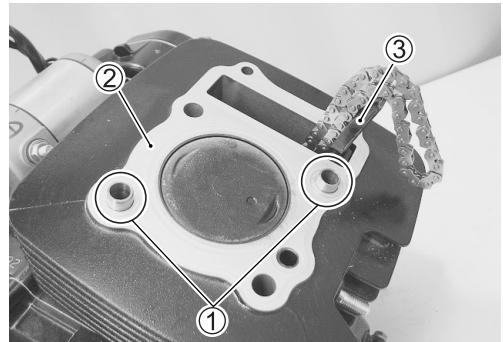
- Remove the cylinder head bolts and cylinder head.

NOTE:

- * When loosening the cylinder head bolts, loosen each bolts little by little diagonally.
- * If the cylinder head does not come off, lightly tap on the finless portion of it with a plastic hammer.

**CYLINDER**

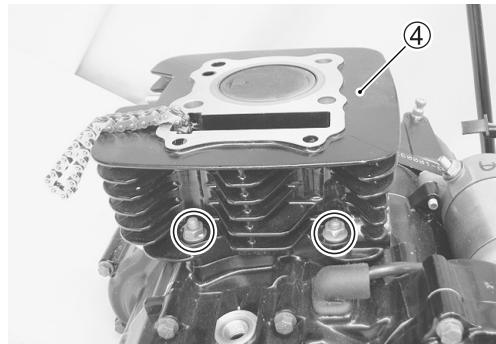
- Remove the dowel pins ①, gasket ② and cam chain guide ③.



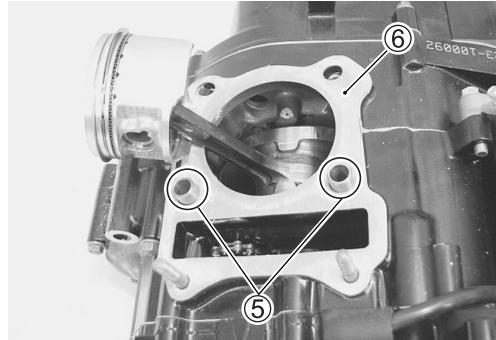
- Remove the cylinder ④.

NOTE:

If the cylinder does not come off, lightly tap on the finless portion of it with a plastic hammer.

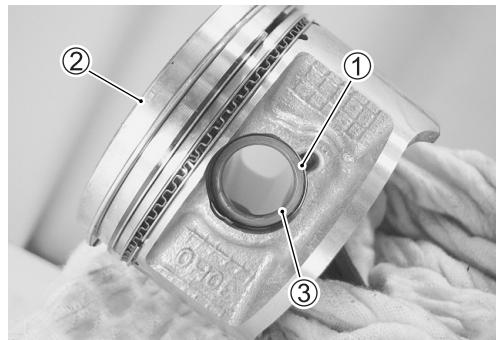


- Remove the dowel pins ⑤ and gasket ⑥.



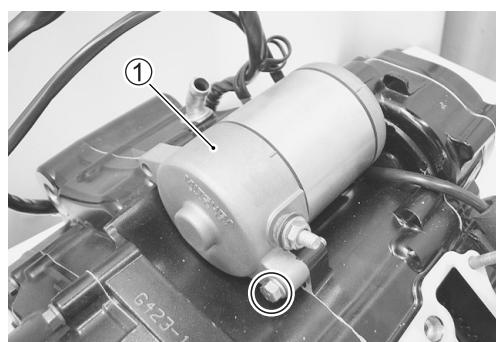
PISTON

- Place a clean rag over the cylinder base so as not to drop the piston pin circlip into the crankcase.
- Remove the piston pin circlip ①.
- Remove the piston ② by drawing out the piston pin ③.



STARTER MOTOR

- Remove the startor motor ①.

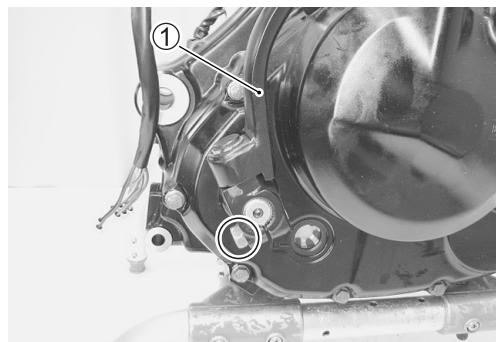


KICK STARTER LEVER

- Remove the kick starter lever ①.

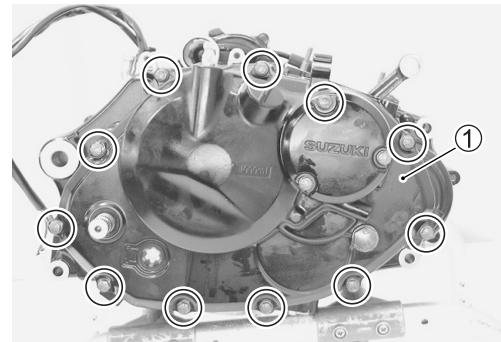
NOTE:

Mark the position of the gearshift lever on the gearshaft before removing.

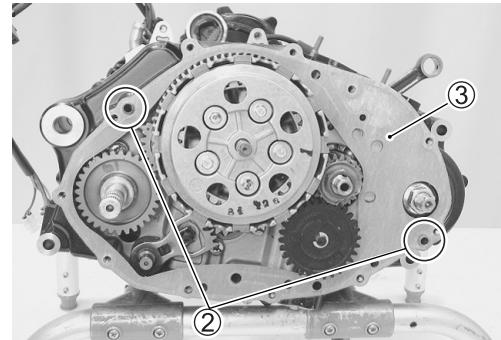


CLUTCH COVER

- Remove the clutch cover ①.



- Remove the dowel pins ② and gasket ③.

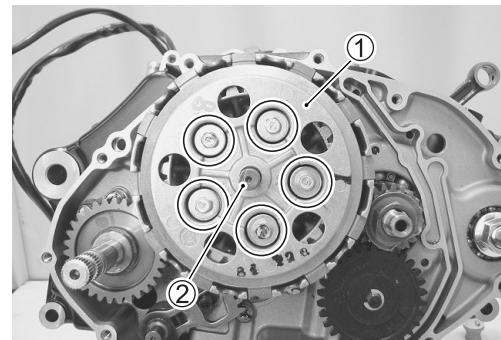
**CLUTCH**

- Remove the clutch spring mounting bolts and clutch springs.

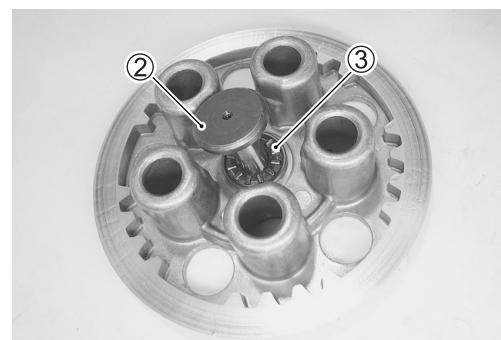
NOTE:

Loosen the clutch spring set bolts little by little and diagonally.

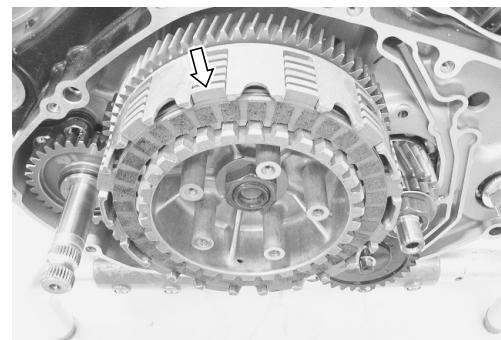
- Remove the clutch pressure plate ① with the clutch release rack ②.



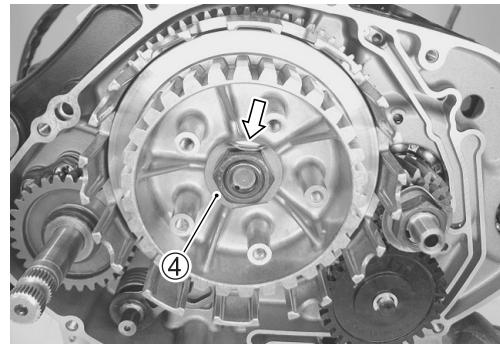
- Remove the clutch release rack ② and bearing ③ from the clutch pressure plate.



- Remove the clutch drive and driven plates.

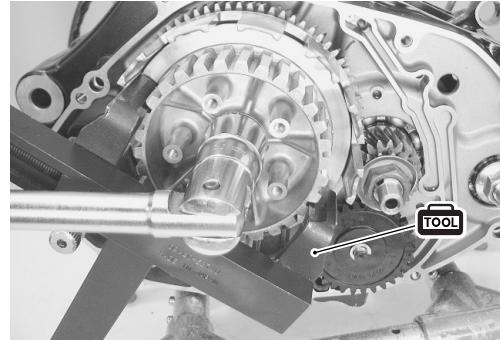


- Flatten the washer ④ of the clutch sleeve hub nut.

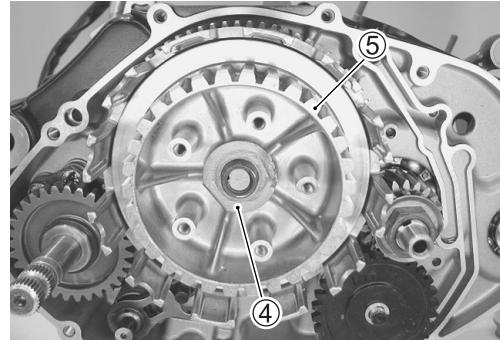


- Remove the clutch sleeve hub nut with the special tool.

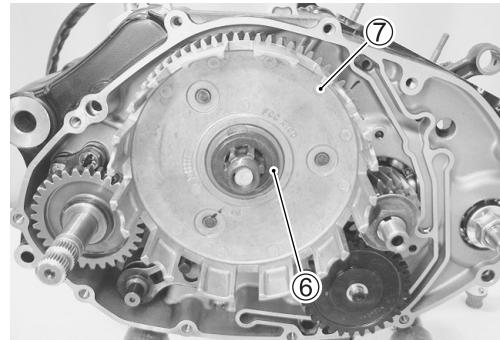
 **Clutch sleeve hub holder**



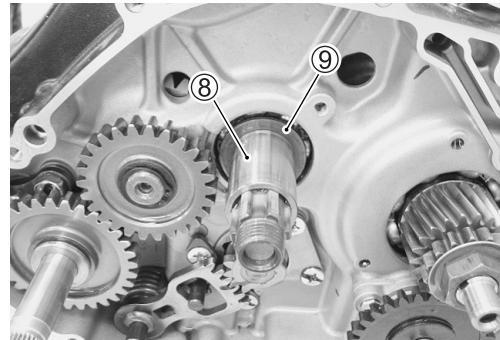
- Remove the washer ④ and clutch sleeve hub ⑤.



- Remove the thrust washer ⑥ and primary driven gear assembly ⑦.

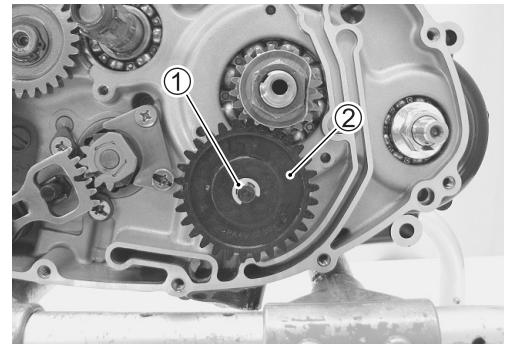


- Remove the spacer ⑧ and thrust washer ⑨.



OIL PUMP

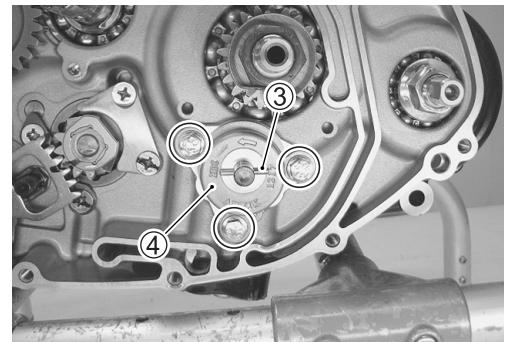
- Remove the E-ring ① and oil pump driven gear ②.



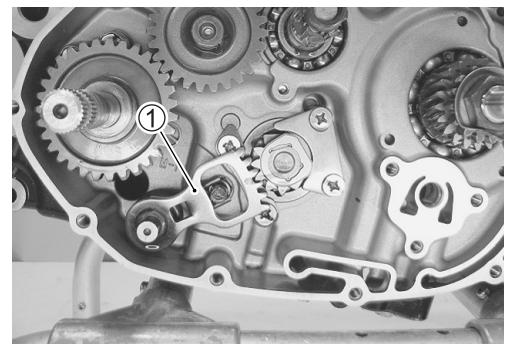
- Remove the pin ③.
- Remove the oil pump ④.

CAUTION

Do not attempt to disassemble the oil pump assembly.

**GEARSHIFT**

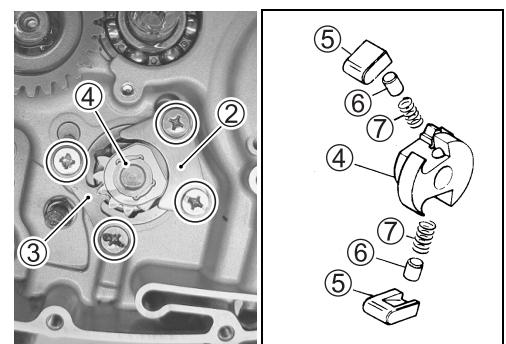
- Remove the gearshift shaft ①.



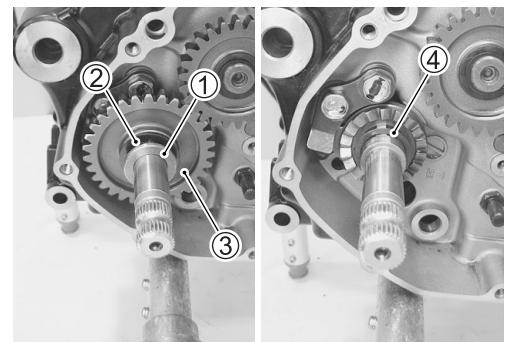
- Remove the pawl lifter ② and cam guide ③.
- Remove the gearshift cam driven gear ④.

NOTE:

When removing the cam driven gear ④, do not lose the pawls ⑤, pins ⑥ and springs ⑦.

**KICK STARTER**

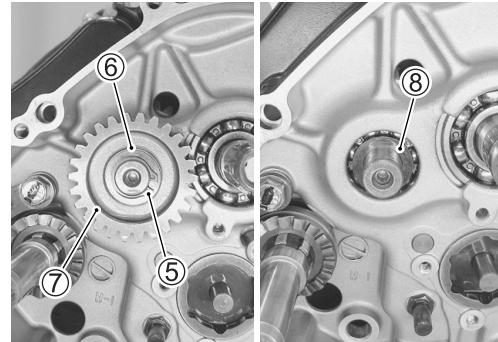
- Remove the spacer ①, washer ② and kick starter drive gear ③.
- Remove the washer ④.



- Remove the snap ring ⑤, washer ⑥ and kick starter idle gear ⑦.

TOOL Snap ring remover (Open type)

- Remove the washer ⑧.



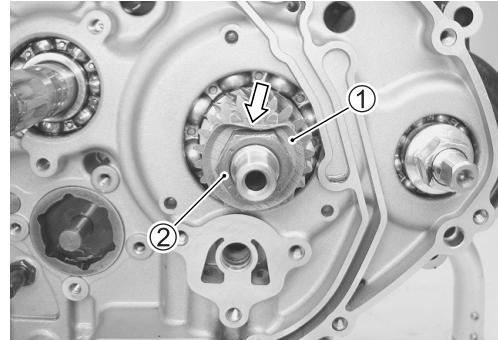
PRIMARY DRIVE GEAR AND OIL PUMP DRIVE GEAR

- Flatten the washer ① of the primary drive gear nut.
- Locking the conrod using the special tool, remove the primary drive gear nut ②.

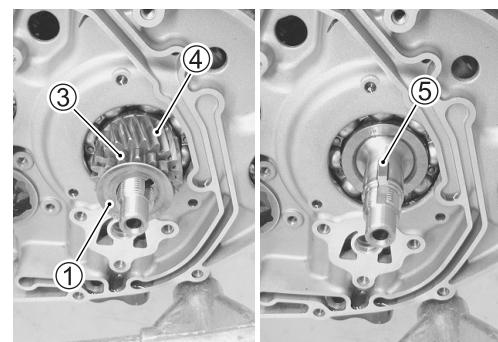
TOOL Connecting rod stopper

CAUTION

The primary drive gear nut has left-hand threads.



- Remove the washer ①, oil pump drive gear ③ and primary drive gear ④.
- Remove the key ⑤.

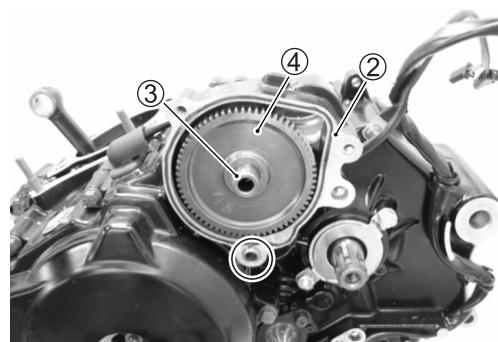


STARTER IDLE GEARS/MAGNETO COVER

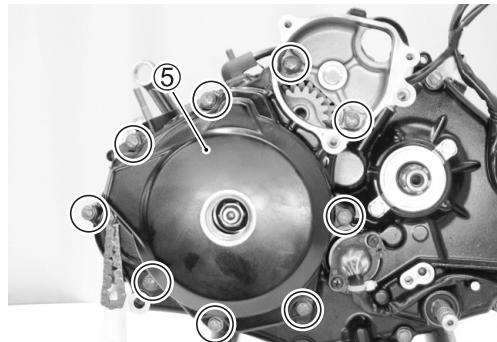
- Remove the starter idle gear cover ①.



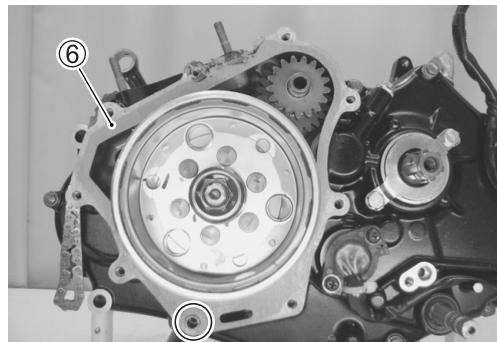
- Remove the dowel pin and gasket ②.
- Remove the shaft ③ and starter idle gear No. 1 ④.



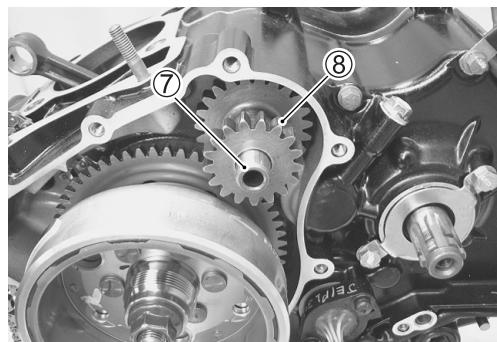
- Remove the magneto cover ⑤.



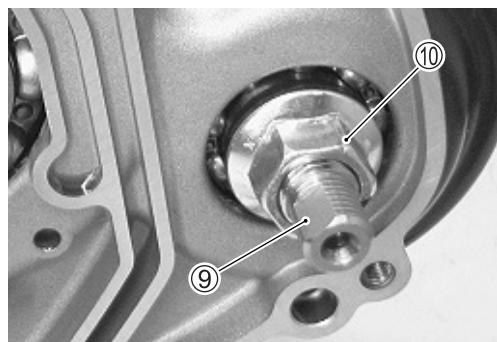
- Remove the dowel pin and gasket ⑥.



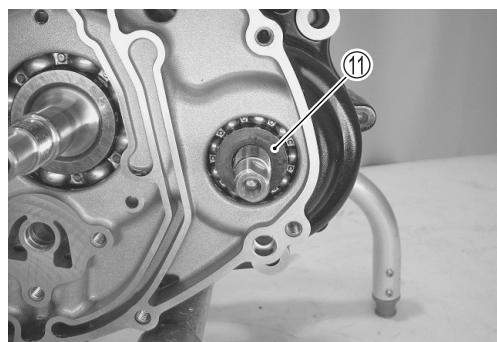
- Remove the shaft ⑦ and starter idle gear No. 2 ⑧.



- Hold the crank blancer shaft ⑨, remove the crank blancer shaft nut ⑩.



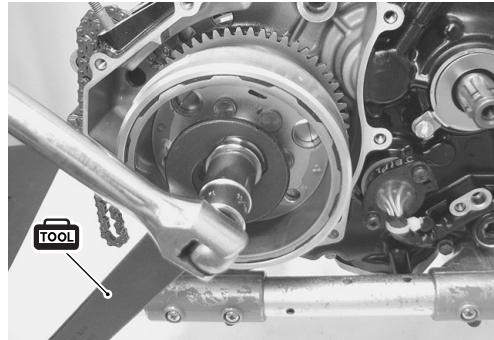
- Remove the washer ⑪.



MAGNETO ROTOR

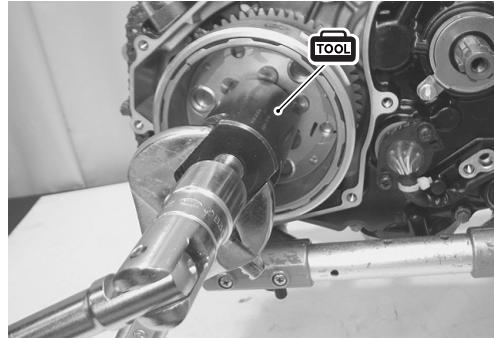
- Remove the magneto rotor nut with the special tool.

 **Rotor holder**

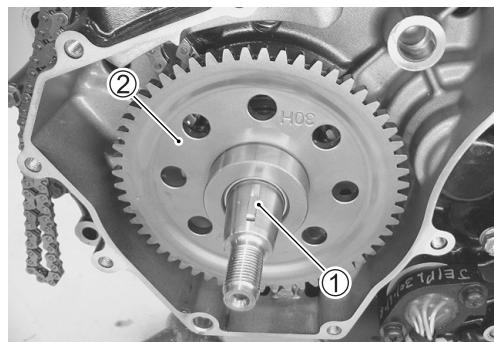


- Remove the magneto rotor with the special tool.

 **Rotor remover**



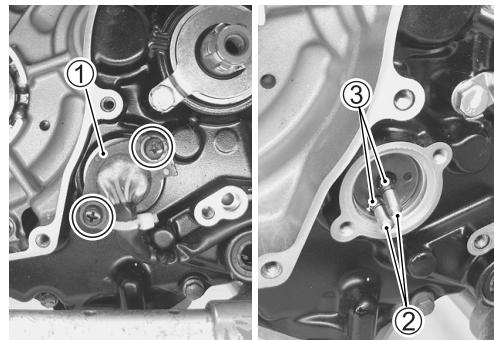
- Remove the key ① and starter clutch gear ②.

**CAM CHAIN**

- Remove the cam chain ①.

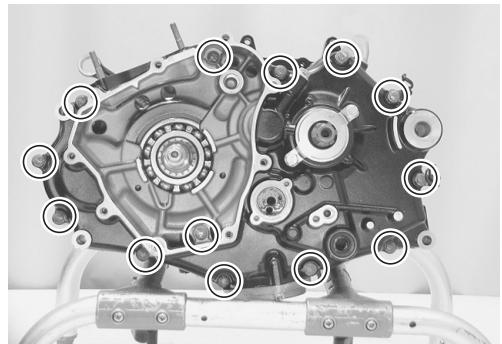
**NEUTRAL SWITCH**

- Remove the neutral switch ①.
- Remove the switch contacts ② and springs ③.



CRANKCASE

- Remove the crankcase bolts.

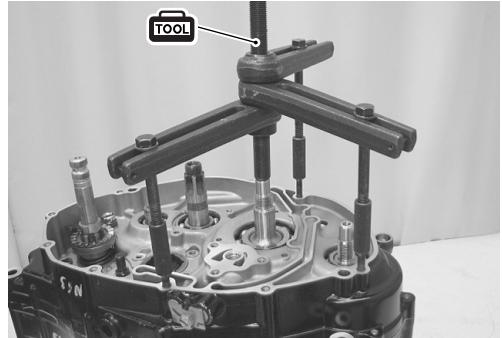


- Separate the left and right crankcases with the special tool.

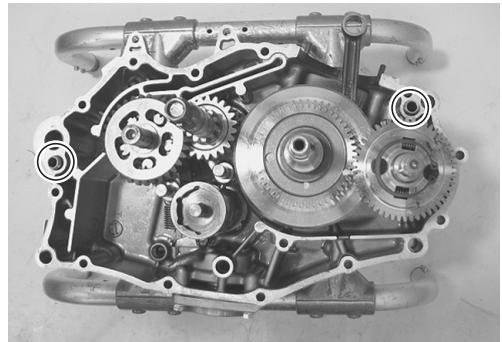
TOOL Crankshaft remover**NOTE:**

- * Fit the crankshaft remover, 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.

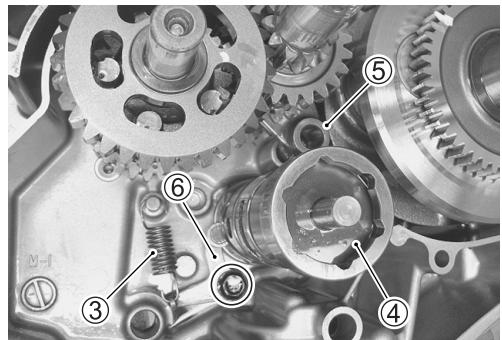
- Remove the dowel pins.

**TRANSMISSION**

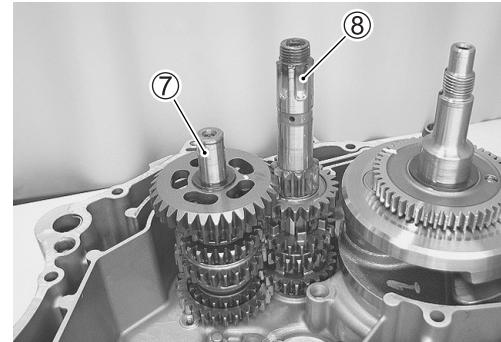
- Remove the gearshift fork shafts ① and gearshift forks ②.



- Remove the gearshift cam stopper spring ③.
- Remove the gearshift cam ④ and gearshift fork ⑤.
- Remove the gearshift cam stopper ⑥.

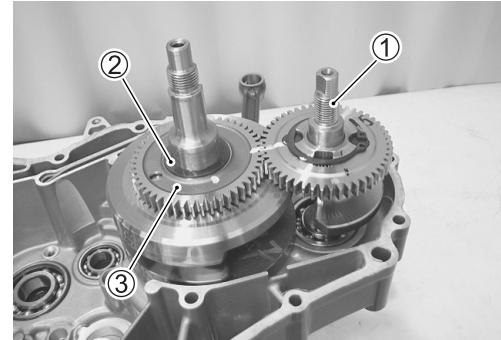


- Remove the driveshift assembly ⑦ and countershift assembly ⑧.



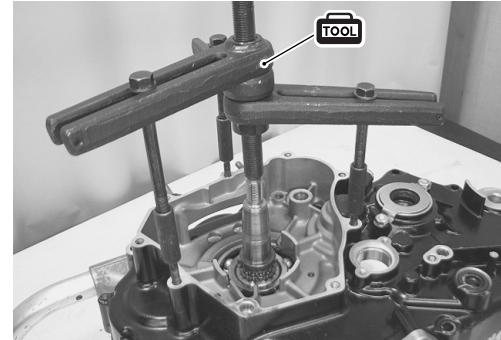
CRANK BLANCER SHAFT/CRANKSHAFT

- Remove the blancer shaft ①.
- Remove the shim ② and blancer drive gear ③.



- Remove the crankshaft with the special tool.

 **Crankshaft remover**



ENGINE COMPONENTS INSPECTION AND SERVICE

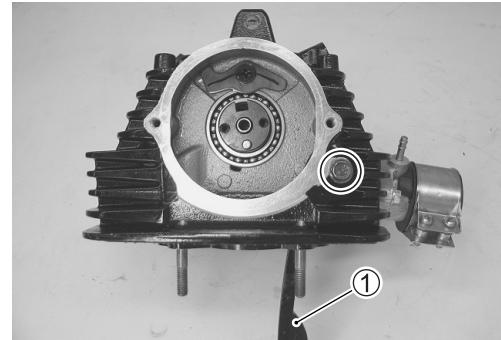
CAUTION

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.

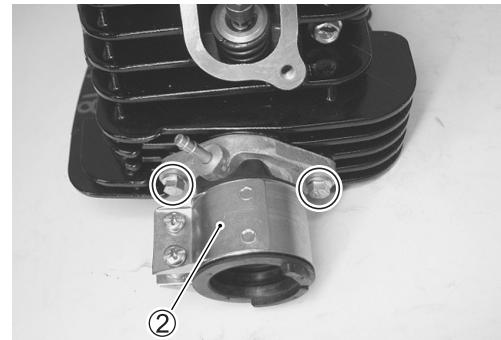
CYLINDER HEAD

DISASSEMBLY

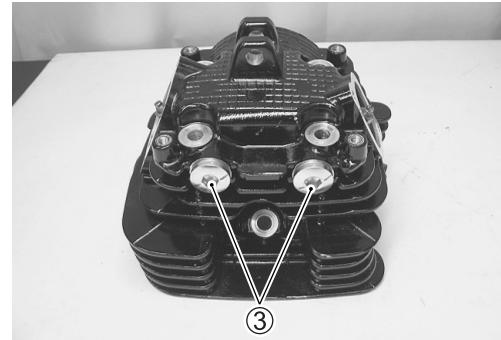
- Remove the cam chain tensioner ①.



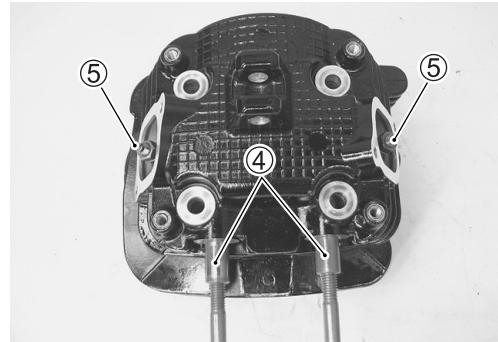
- Remove the intake pipe ②.



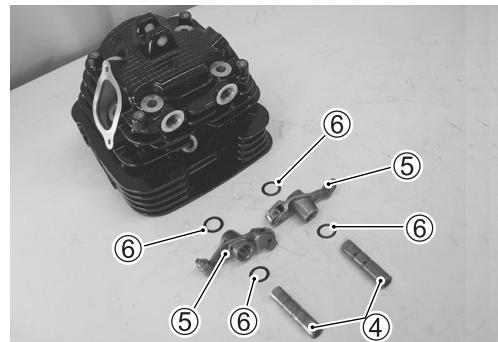
- Remove the rocker arm shaft plugs ③.



- Pull out the intake and exhaust rocker arm shafts ④ by using an 8-mm thread bolt.
- Remove the intake and exhaust rocker arms ⑤ and washers ⑥.



- Remove the camshaft retainer ⑦ and camshaft ⑧.

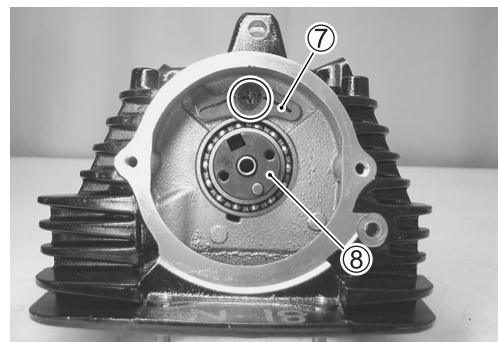


- Using the special tools, compress the valve spring and remove the two cotter halves ⑨ from the valve stem.

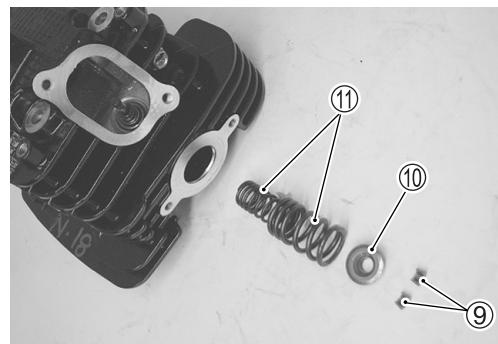
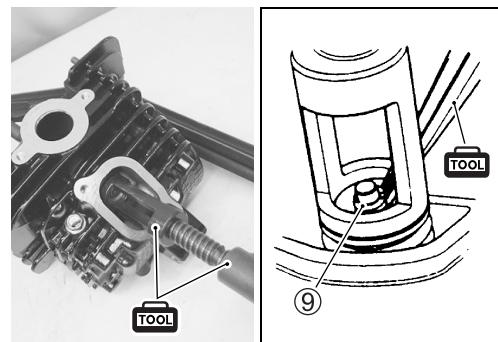
Valve lifter

Valve lifter attachment

Tweezer



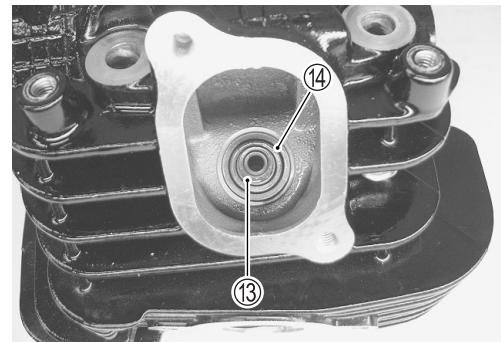
- Remove the valve spring retainer ⑩ and valve springs ⑪.



- Remove the valve ⑫ from the combustion chamber side.



- Remove the valve stem seal ⑬ and valve spring seat ⑭.



ROCKER ARM SHAFT OUTSIDE DIAMETER

On the sliding surface, take two measurements, at right angle to each other.

If the outside diameter measured is less than the standard value, replace the shaft.

DATA **Rocker arm shaft O.D. (IN. & EX.)**
Standard: 11.986 – 11.994 mm

TOOL **Micrometer (0 – 25 mm)**



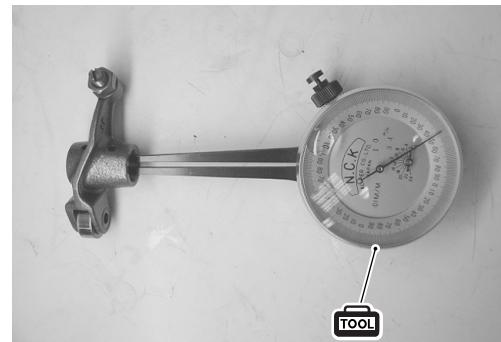
ROCKER ARM INSIDE DIAMETER

Measure the rocker arm inside diameter in two directions at right angle to each other.

If the inside diameter measured exceeds the standard value, replace the rocker arm.

DATA **Rocker arm I.D. (IN. & EX.)**
Standard: 12.000 – 12.018 mm

TOOL **Dial calipers (10 – 34 mm)**



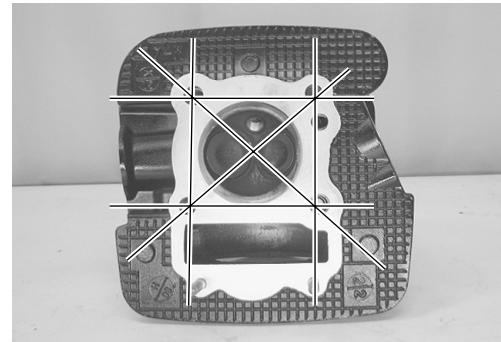
CYLINDER HEAD DISTORTION

Decarbon the combustion chamber.

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

DATA **Cylinder head distortion**
Service Limit: 0.05 mm

TOOL **Thickness gauge**



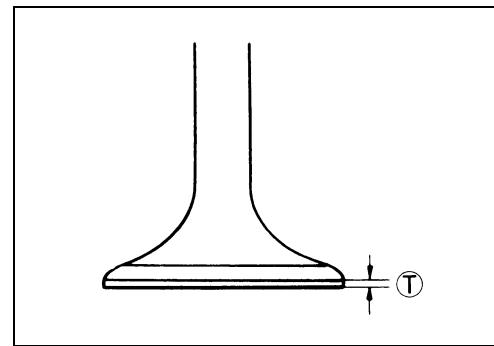
VALVE FACE WEAR

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 \textcircled{T} , if it is out of specification, replace the valve with a new one.

DATA Valve head thickness (IN. & EX.)

Service Limit \textcircled{T} : 0.5 mm

 **Venier calipers (150 mm)**

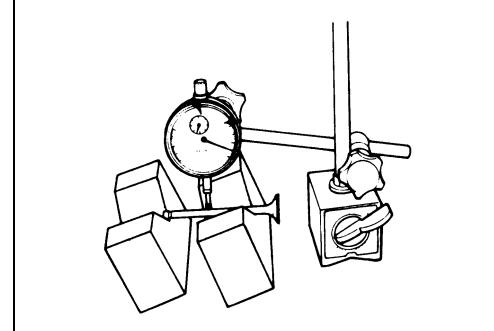
**VALVE STEM RUNOUT**

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.

DATA Valve stem runout (IN. & EX.)

Service Limit: 0.05 mm

 **Dial gauge chuck**
Dial gauge
V blocks

**VALVE HEAD RADIAL RUNOUT**

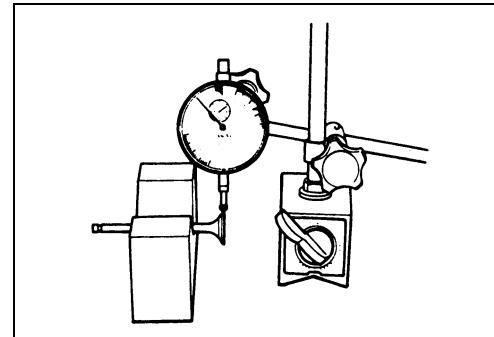
Place the dial gauge at right angles to the valve head, and measure the valve head radial runout.

If it measures more than limit, replace the valve.

DATA Valve head radial runout (IN. & EX.)

Service Limit: 0.03 mm

 **Dial gauge**
Dial gauge chuck
V blocks

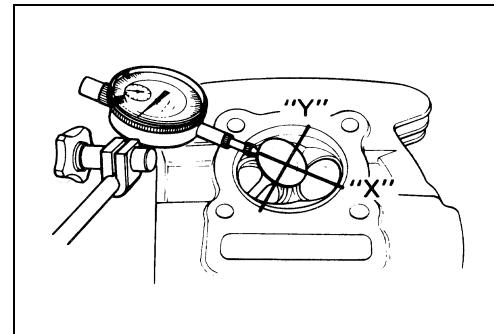
**VALVE STEM DEFLECTION**

Lift the valve about 10 mm from the valve seat. Measure the valve stem deflection in two directions, "X" and "Y", perpendicular to each other, by positioning the dial gauge as shown. If the deflection measured exceeds the limit, then determine whether the valve or the guide should be replaced with a new one.

DATA Valve stem deflection

Service Limit (IN. & EX.): 0.35 mm

 **Dial gauge**
Dial gauge chuck

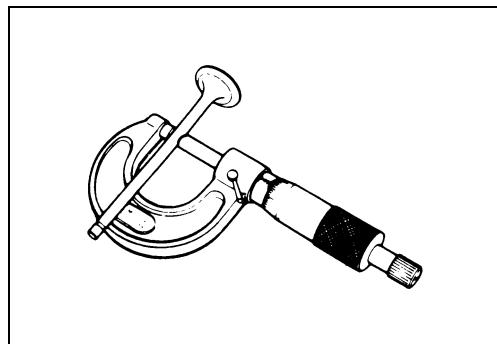


VALVE STEM WEAR

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.

Valve stem O.D.

Standard (IN.) : 4.975 – 4.990 mm
(EX.): 4.955 – 4.970 mm



Micrometer (0 – 25 mm)

NOTE:

If valve guides have to be replaced, refer to the valve guide servicing steps shown in valve guide servicing. (☞ below)

VALVE GUIDE SERVICE

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

Valve guide installer & remover

NOTE:

- * Discard the remove valve guide subassemblies.*
- * Only oversized valve guides are available as replacement parts. (Part No. 11115-20E70)*



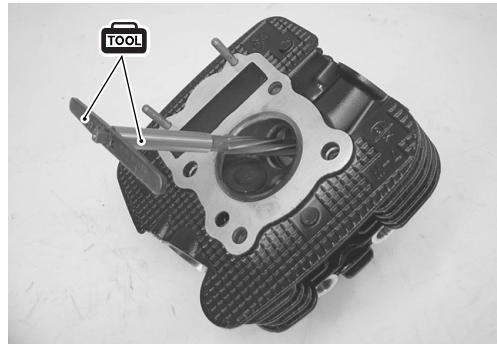
- Re-finish the valve guide holes in the cylinder head using the special tools.

Valve guide reamer (10.8 mm)

Reamer handle

NOTE:

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

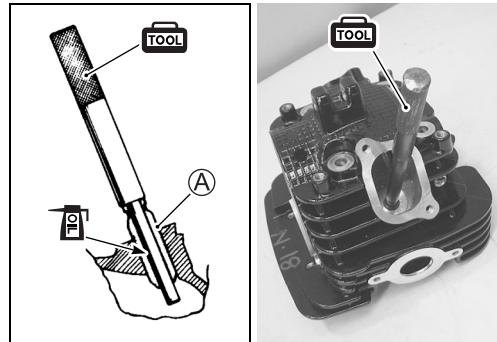


- Fit a ring  to each valve guide.
- Oil the stem hole of each valve guide and drive the guide into the guide hole using the special tool.

Valve guide installer & remover

CAUTION

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



NOTE:

Install the valve guide until the ring  contacts with the cylinder head.

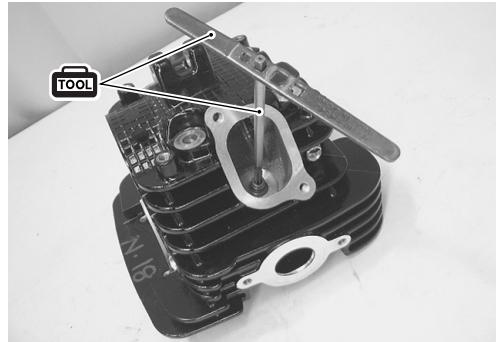
- After installing the valve guides, re-finish their guiding bores using the special tools. Be sure to clean and oil the guides after reaming.

 **Valve guide reamer (5.0 mm)**

Reamer handle

NOTE:

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



VALVE SEAT WIDTH INSPECTION

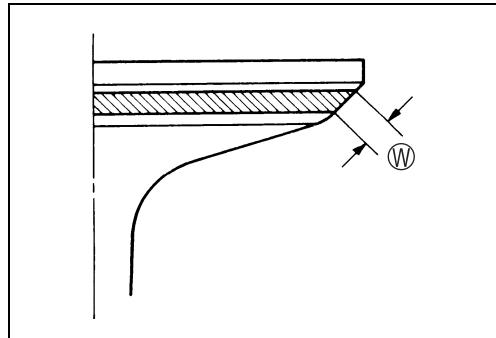
- Visually check for valve seat width on each valve face.
- If the valve face has worn abnormally, replace the valve.
- Coat the valve seat with Prussian Blue and set the valve in place. Rotate the valve with light pressure. Check that the transferred blue on the valve face is uniform all around and in center of the valve face.
- If the seat width \textcircled{W} measured exceeds the standard value, or seat width is not uniform, reface the seat using the seat cutter.



DATA **Valve seat width \textcircled{W}**

Standard: 0.9 – 1.1 mm

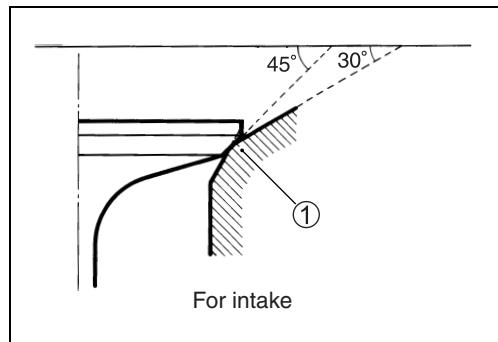
 **Valve lapper set**



VALVE SEAT SERVICE

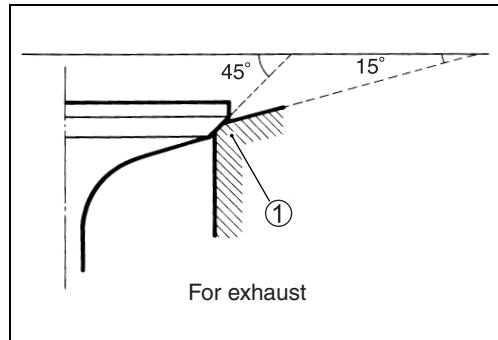
The valve seats ① for both intake and exhaust valves are machined to four different angles. The seat contact surface is cut at 45°.

	INTAKE	EXHAUST
Seat angle	30°, 45°	15°, 45°
Seat width	0.9 – 1.1 mm	0.9 – 1.1 mm
Valve diameter	27.5 mm	24.5 mm
Valve guide I.D.	5.000 – 5.012 mm	←



CAUTION

- * The valve seat contact area must be inspected after each cut.
- * Do not use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish but 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.



NOTE:

After servicing the valve seats, be sure to check the valve clearance after the cylinder head has been reinstalled. (☞ 2-6)

- 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.



VALVE SPRING INSPECTION

The force of the coil spring keeps the valve seat tight. A weakened spring results in reduced engine power output and often accounts for the chattering noise coming from the valve mechanism.

Check the valve springs for proper strength by measuring their free length and also by the force required to compress them. If the spring length is less than the service limit or if the force required to compress the spring does not fall within the specified range, replace both the inner and outer springs as a set.

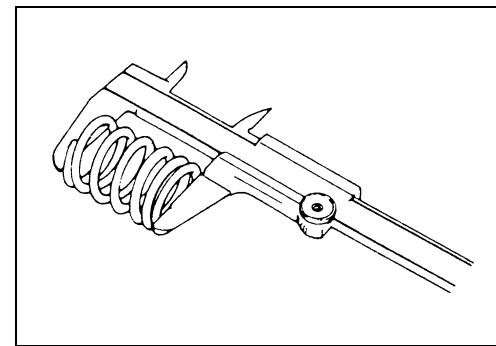
DATA **Valve spring free length (IN. & EX.)**

Service Limit INNER : 33.0 mm
OUTER: 35.2 mm

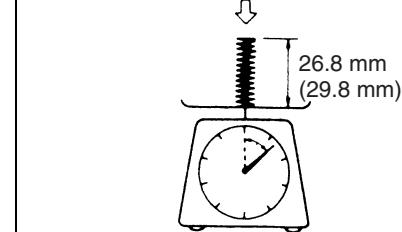
 **Vernier calipers (200 mm)**

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

Standard INNER : 53.9 N/26.8 mm (5.5 kgf/26.8 mm)
OUTER: 128.4 N/29.8 mm
(13.1 kgf/29.8 mm)



Inner spring 53.9 N (5.5 kgf)
 (outer spring) (128.4 N (13.1 kgf))



CAMSHAFT CAM WEAR

Check for abnormal surface damage or wear on the cam face.

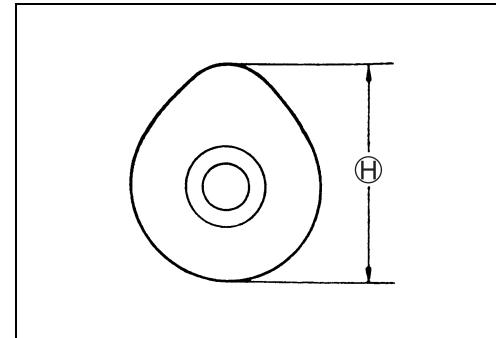
Measure the cam height \textcircled{H} with a micrometer.

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

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

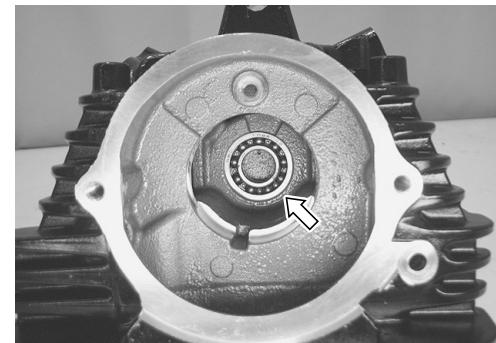
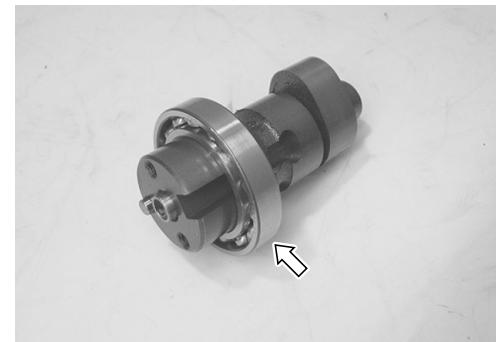
Service Limit (IN.) : 33.60 mm
(EX.): 33.11 mm

 **Micrometer (25 – 50 mm)**



CAMSHAFT BEARING INSPECTION

- Rotate the camshaft bearing outer race by finger to inspect for abnormal play, noise and smooth rotation.
- Rotete the bearing inner race by finger to inspect for abnormal play, noise and smooth rotation while the bearing are in the cylinder head.
- Replace the bearings in the following procedure if there is anything unusual.



- Remove the camshaft bearing with the special tool.

 **Bearing and gear puller**

NOTE:

Avoid removing the camshaft bearing from the camshaft unless it is really necessary to do so, for example, removing the damaged bearing.

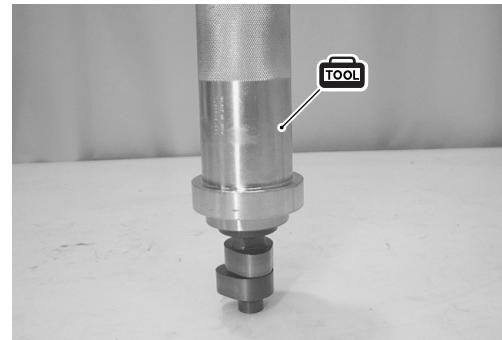
CAUTION

The removed bearing should be replaced with a new one.



- Install the bearing with the special tool.

 **Bearing installer**



CAM CHAIN TENSIONER

Inspect the cam chain tensioner for damage. If any damage are found, replace the cam chain tensioner with a new one.



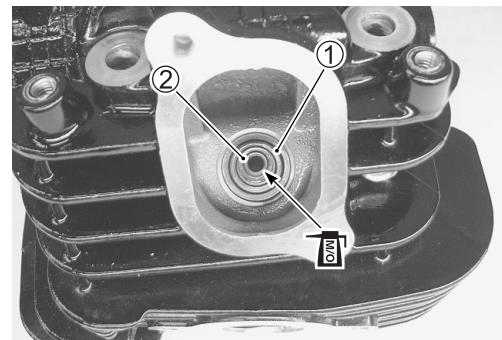
REASSEMBLY

Reassemble the cylinder head in the reverse order of disassembly. Pay attention to the following points:

- Install each valve spring seat ①.
- Apply molybdenum oil solution to the valve stem seal ②, and press-fit the seal into position by hand.

CAUTION

Do not reuse the valve stem seal.

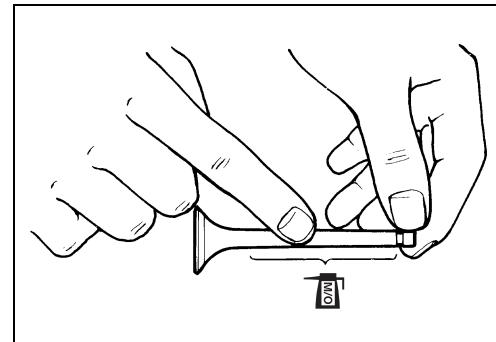


 **MOLYBDENUM OIL SOLUTION**

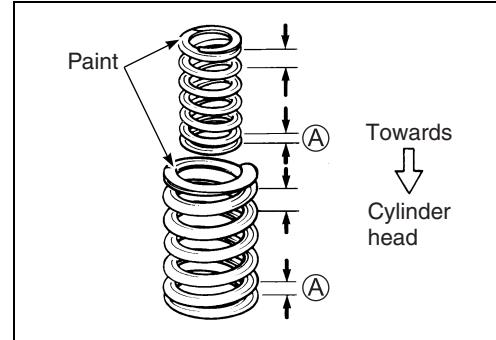
- Apply molybdenum oil solution to the valve stem.

CAUTION

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

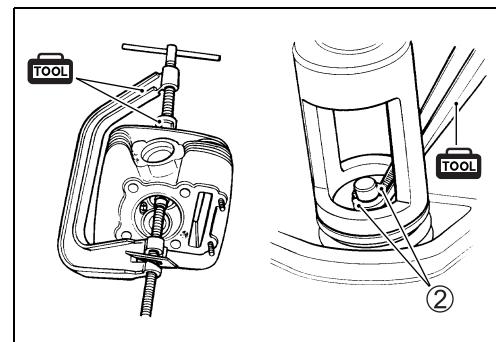
TOOL MOLYBDENUM OIL SOLUTION


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

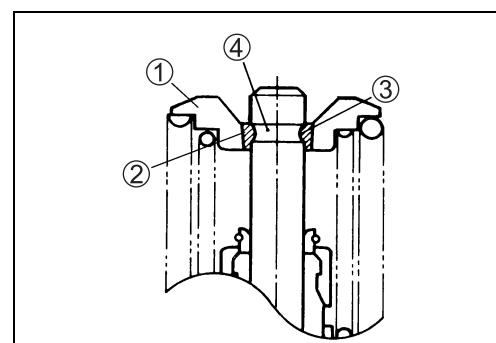


- Install the valve spring retainer ①, press down the spring using the valve lifter and then install the cotter halves onto the valve stem end. Then, release the valve lifter to allow the cotters ② to wedge between the retainer and the valve stem. Be sure that the rounded lip ③ of the cotter fits snugly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

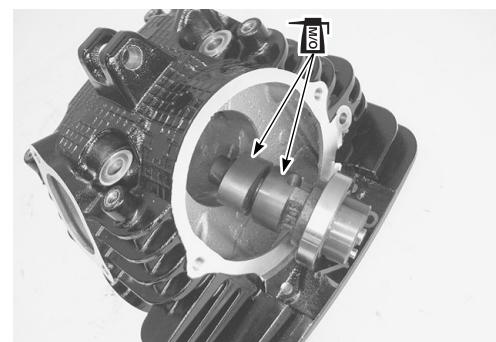
TOOL Valve lifter
Valve lifter attachment
Tweezer


CAUTION

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


NOTE:

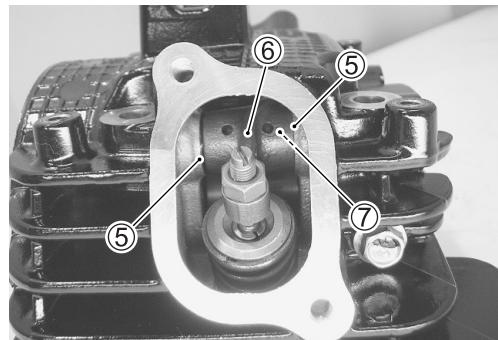
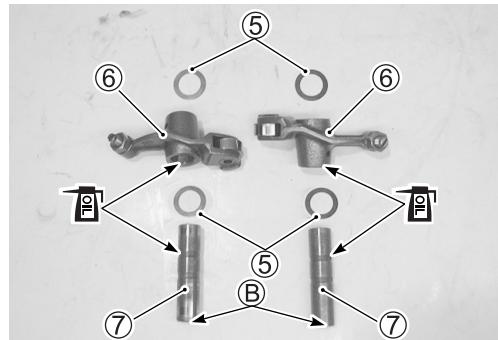
Just before installing the camshaft into the cylinder head, apply molybdenum oil solution to the cam faces.

TOOL MOLYBDENUM OIL SOLUTION


- Install the washers ⑤.
- Apply engine oil to the rocker arms ⑥, rocker arm shafts ⑦ and install them to the cylinder head.

NOTE:

The thread side ⑧ of rocker arm shafts ⑦ end outside.

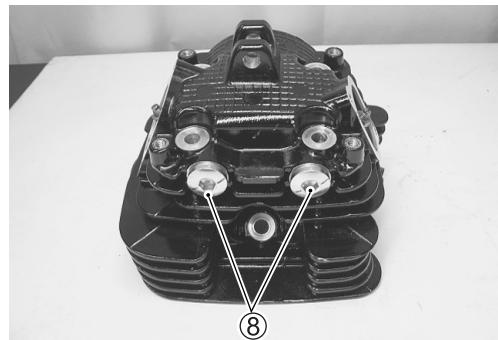


- Tighten the rocker arm shaft plugs ⑧ to the specified torque.

CAUTION

Use the new gaskets to prevent oil leakage.

Rocker arm shaft plug: 28 N·m (2.8 kgf-m)

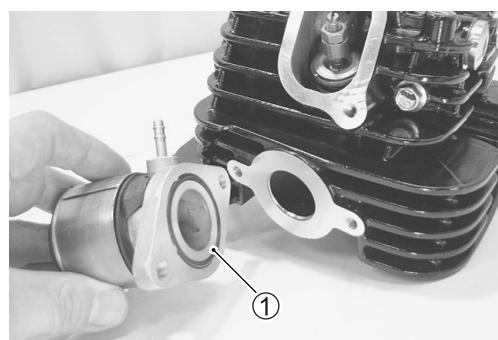


INTAKE PIPE

- Install the intake pipe.

CAUTION

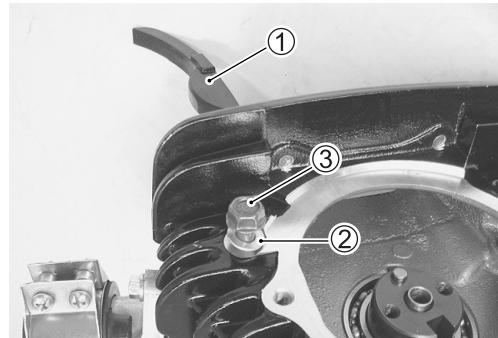
Use a new O-ring ① to prevent sucking air from the joint.



CAM CHAIN TENSIONER

- Install the cam chain tensioner ① and washer ②.
- Tighten the cam chain tensioner bolt ③ to the specified torque.

Cam chain tensioner bolt: 10 N·m (1.0 kgf-m)



CYLINDER

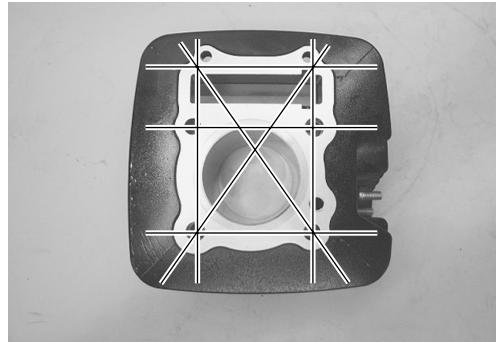
CYLINDER DISTORTION

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

DATA Cylinder distortion

Service Limit: 0.05 mm

TOOL Thickness gauge



CYLINDER BORE

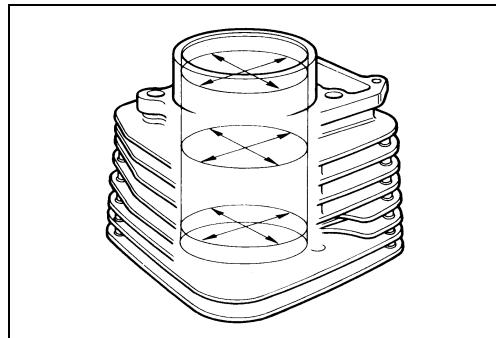
Measure the cylinder bore diameter at six places.

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

DATA Cylinder bore

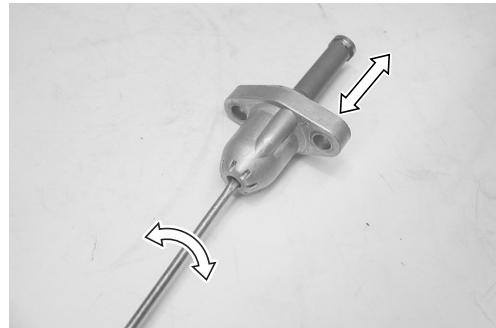
Service Limit: 57.090 mm

TOOL Cylinder gauge set



CAM CHAIN TENSION ADJUSTER

Make sure the push rod movement. If the push rod is stuck or spring mechanism failed, replace the cam chain tension adjuster assembly with a new one.



CAM CHAIN GUIDE

Inspect the cam chain guide for damage. If any damage are found, replace the cam chain guide with a new one.



PISTON

PISTON DIAMETER

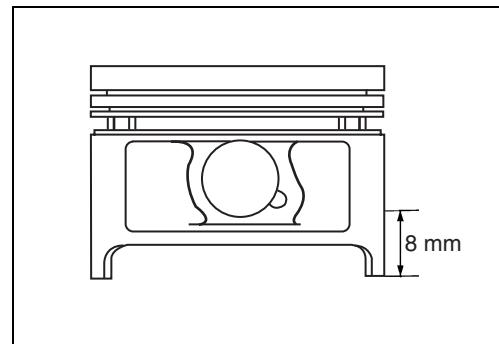
Using a micrometer, measure the piston outside diameter at the place 8 mm from the skirt end as shown. If the measurement is less than the service limit, replace the piston.

DATA **Piston diameter**

Service Limit: 56.880 mm

Piston oversize: 0.5 mm

 **Micrometer (50 – 75 mm)**

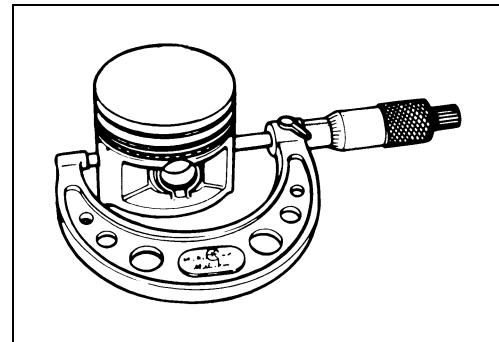


PISTON-TO-CYLINDER CLEARANCE

- Subtract the piston diameter from the cylinder bore diameter. (3-32)
- If the piston-to-cylinder clearance exceeds the service limit, replace the crankcase set or the piston, or both.

DATA **Piston-to-cylinder clearance**

Service Limit: 0.120 mm



PISTON RING-TO-GROOVE CLEARANCE

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

DATA **Piston ring-to-groove clearance**

Service Limit (1st) : 0.180 mm

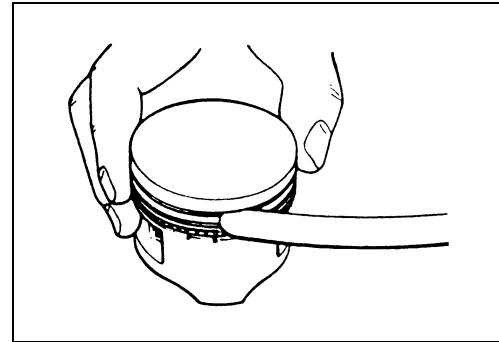
(2nd): 0.150 mm

DATA **Piston ring groove width**

Standard (1st) : 1.01 – 1.03 mm

(2nd): 1.01 – 1.03 mm

(Oil) : 2.01 – 2.03 mm



DATA **Piston ring thickness**

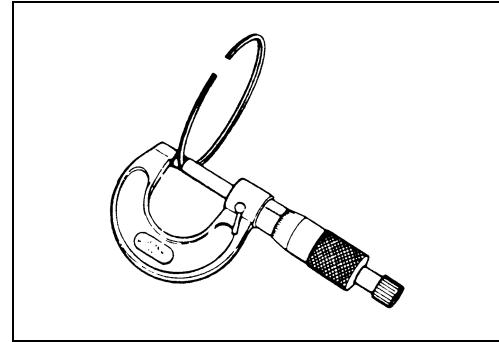
Standard (1st & 2nd): 0.97 – 0.99 mm

 **Micrometer (0 – 25 mm)**

Thickness gauge

NOTE:

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



PISTON RING FREE END GAP AND PISTON RING END GAP

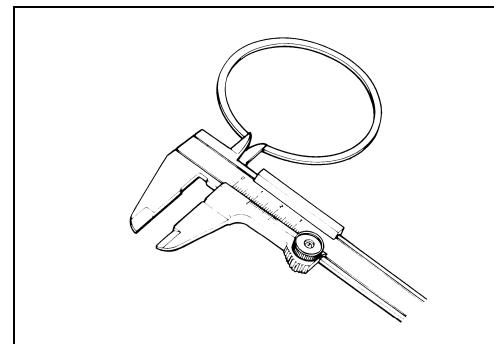
- Measure the piston ring free end gap piston ring end gap using the vernier calipers.
- Next, fit the piston ring squarely into the cylinder and measure the piston ring end gap using the thickness gauge.
- If any of the measurements exceeds the service limit, replace the piston ring with a new one.

DATA **Piston ring free end gap**

Service Limit (1st) : 4.6 mm
(2nd): 4.5 mm

TOOL **Vernier calipers (200 mm)****DATA** **Piston ring end gap**

Service Limit (1st) : 0.50 mm
(2nd): 0.50 mm

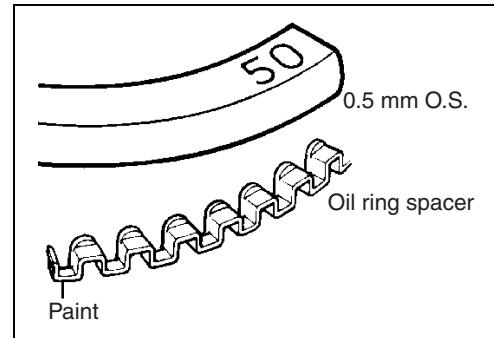
TOOL **Thickness gauge****OVERSIZE RINGS****Oversize piston ring**

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

Piston ring 1st 0.5 mm: 50
2nd 0.5 mm: 50

Oversize side rail

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

**PISTON PIN AND PIN BORE**

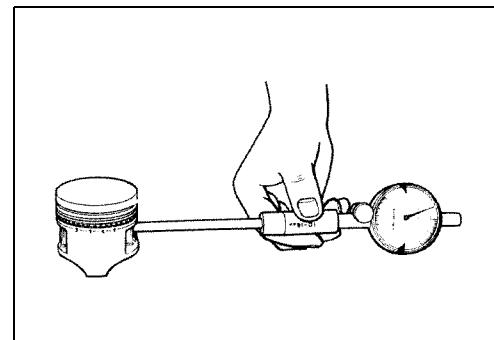
- Measure the piston pin bore diameter using the small bore gauge.
- If the measurement is out of specification, replace the piston.

DATA **Piston pin bore I.D.**

Service Limit: 15.030 mm

TOOL **Dial gauge**

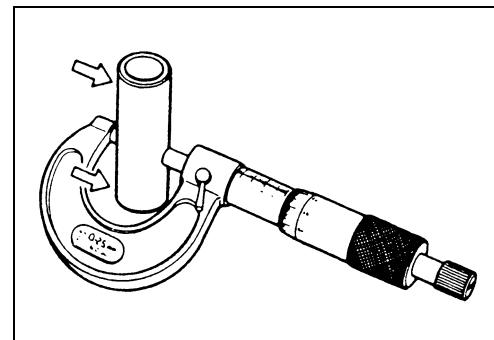
Small bore gauge (10 – 18 mm)



- Measure the piston pin outside diameter at three positions using the micrometer.
- If any of the measurements is out of specification, replace the piston pin.

DATA **Piston pin O.D.**

Service Limit: 14.980 mm

TOOL **Micrometer (0 – 25 mm)**

CRANKSHAFT AND CONROD

CONROD SMALL END I.D.

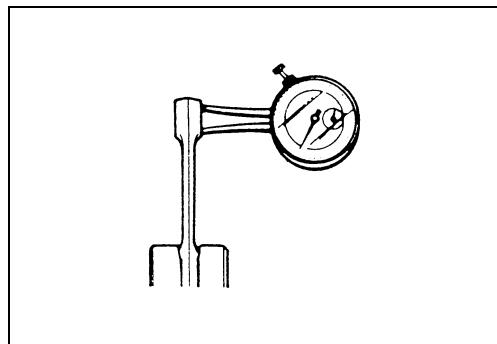
Using a caliper gauge, measure the conrod small end inside diameter.

DATA Conrod small end I.D.

Service Limit: 15.040 mm

TOOL Dial calipers (10 – 34 mm)

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



CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

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

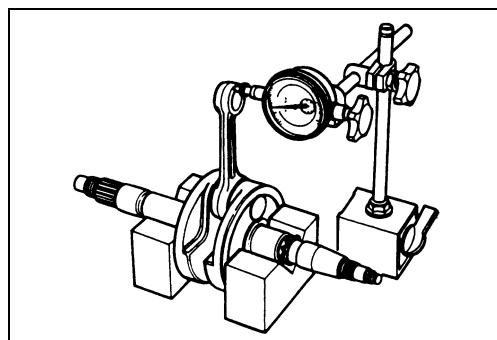
DATA Conrod deflection

Service Limit: 3.0 mm

TOOL Dial gauge chuck

Dial gauge

V blocks



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

DATA Conrod big end side clearance

Service Limit: 1.0 mm

TOOL Thickness gauge

If the clearance exceeds the service limit, 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

- Measure the crankshaft runout with V blocks and dial gauge.

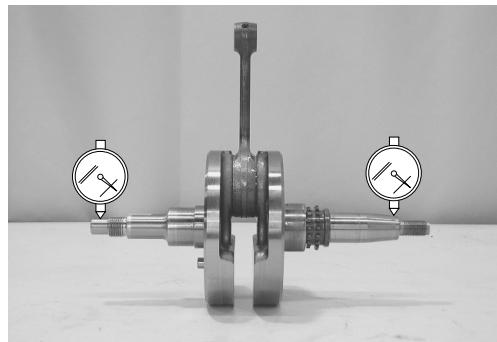
DATA Crankshaft runout

Service Limit: 0.08 mm

TOOL Dial gauge

Dial gauge chuck

V blocks



NOTE:

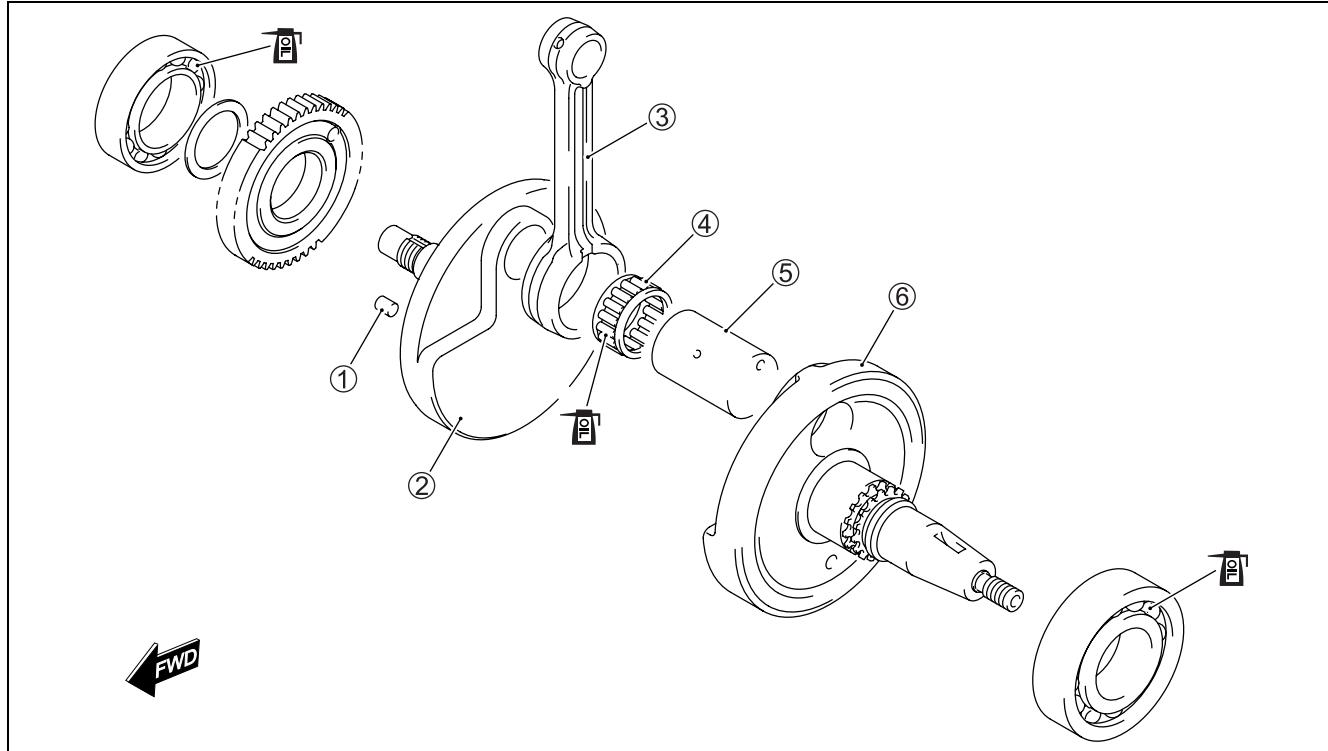
- * Place the crankshaft onto the V blocks so that it becomes horizontally.
- * Measure the runout from the tips of the crankshaft.

CRANKSHAFT REASSEMBLY

Reassemble the crankshaft as show in the illustration.

NOTE:

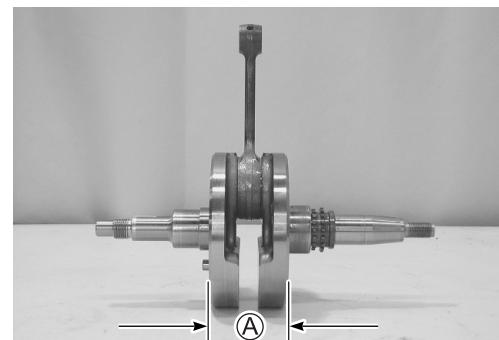
Apply engine oil to the conrod big end.



①	Pin	④	Bearing
②	Crankshaft (R)	⑤	Crank pin
③	Conrod	⑥	Crankshaft (L)

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

DATA Crank wed to wed width Ⓐ: 52.90 – 53.10 mm



OIL PUMP

INSPECTION

Rotate the oil pump shaft by finger to inspect for abnormal play, noise and smooth rotation.

If there is anything unusual, replace the oil pump.

CAUTION

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



GEARSHIFT

DISASSEMBLY

- Remove the return spring ① and spacer ② from the gearshift shaft arm.

INSPECTION

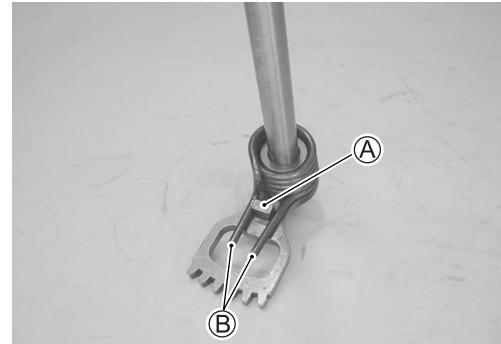
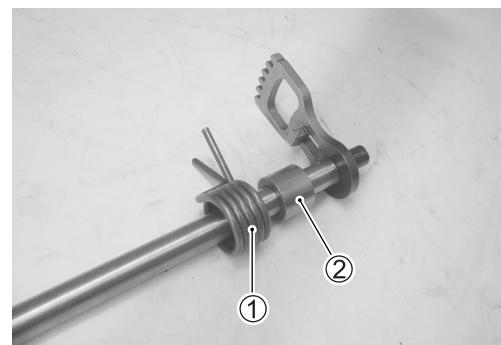
- Inspect the gearshift shaft/gearshift arm for wear or bend.
- Inspect the return springs for damage or fatigue.
- Replace the arm or spring if there is anything unusual.

REASSEMBLY

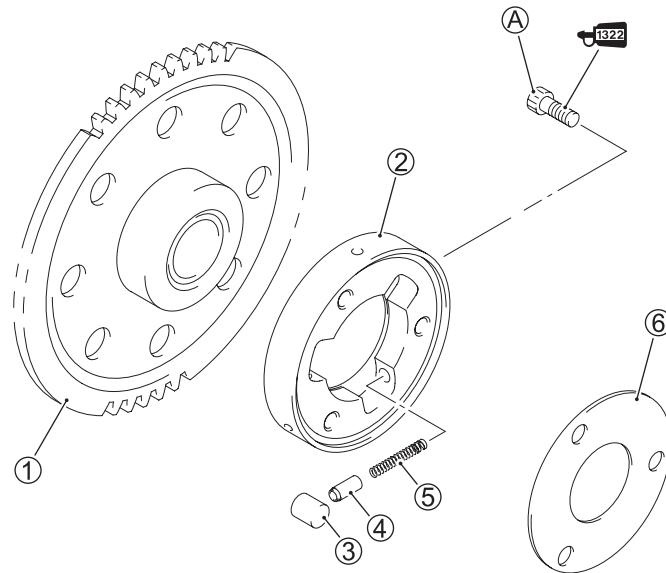
Reassemble the gearshift in the reverse order of disassembly.

NOTE:

When installing the gearshift shaft return spring, position the stopper Ⓐ of gearshift arm between the shaft return spring ends Ⓑ.



STARTER CLUTCH



①	Starter clutch gear	⑤	Spring
②	Starter clutch	⑥	Shim
③	Roller	Ⓐ	Starter clutch bolt
④	Push piece		

ITEM	N·m	kgf·m
Ⓐ	10	1.0

DISASSEMBLY

- Remove the starter clutch gear ①.



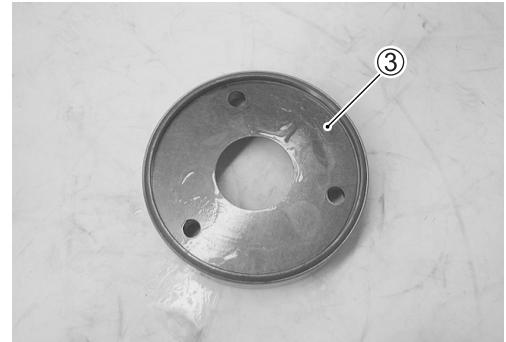
- Remove the starter clutch bolts with the special tool.

TOOL Rotor holder

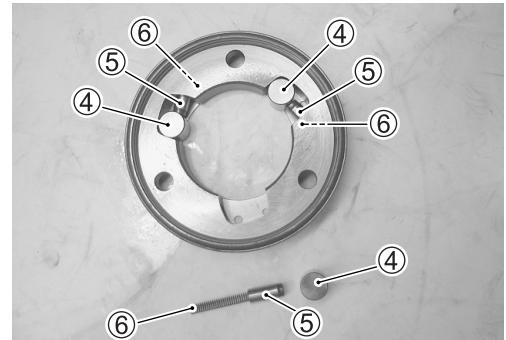
- Remove the starter clutch ② from the rotor.



- Remove the shim ③.



- Remove the roller ④, push pieces ⑤ and spring ⑥.



INSPECTION STARTER CLUTCH GEAR

Install the starter clutch gear onto the starter clutch and turn the starter clutch gear by hand to inspect the starter clutch for a smooth movement. The gear turns one direction only. If a large resistance is felt to rotation, inspect the starter clutch for damage or inspect the starter clutch contacting surface of the starter clutch gear for wear or damage.

If they are found to be damaged, replace them with new ones.



Inspect the starter clutch gear bushing and outer race for any damages.

If necessary, replace it with a new one.



PUSH PIECE/SPRING/ROLLER

Inspect the rollers, push pieces and springs for damage and excessive wear. If any defects are found, replace the new ones.



REASSEMBLY

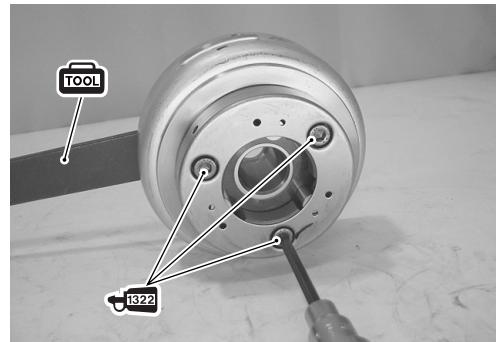
Reassemble the starter clutch in the reverse order of disassembly. Pay attention to the following points:

- Degrease the tapped holes and bolts, apply THREAD LOCK SUPER to the starter clutch bolts and tighten them to the specified torque.

 **Starter clutch bolt: 10 N·m (1.0 kgf·m)**

 **1322 THREAD LOCK SUPER "1322"**

 **Rotor holder**

**GENERATOR STATOR AND PICKUP COIL**

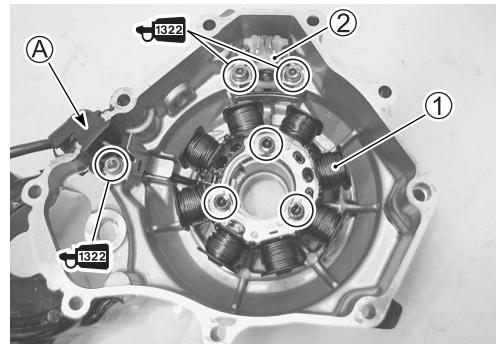
- When replacing the stator coil ① or pickup coil ②, apply THREAD LOCK SUPER to the magneto lead wire set bolts and pickup coil set bolts and tighten them to the specified torque.

 **1322 THREAD LOCK SUPER "1322"**

 **Magneto lead wire set bolt: 6 N·m (0.6 kgf·m)**

Pickup coil set bolt: 6 N·m (0.6 kgf·m)

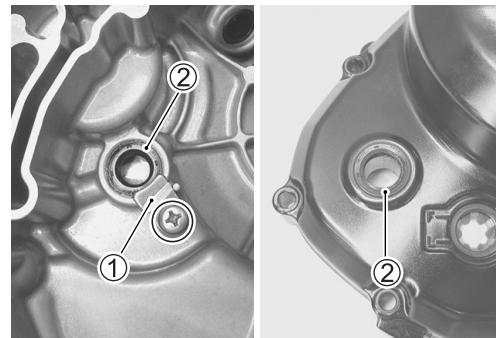
Stator coil bolt: 6 N·m (0.6 kgf·m)

**NOTE:**

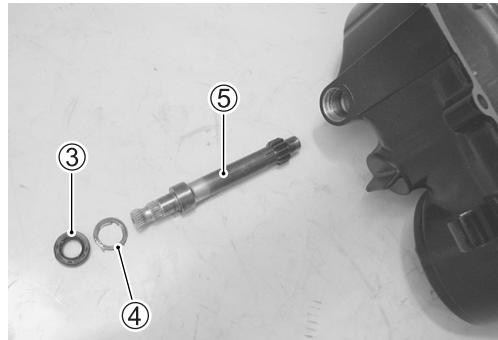
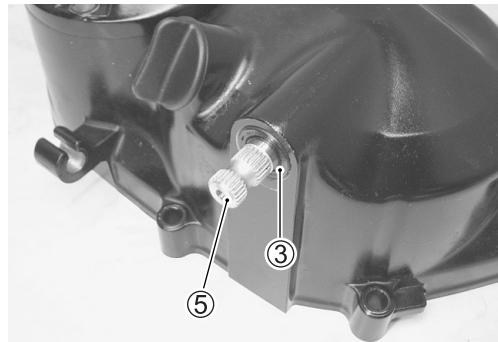
Be sure to install the gromet ④ to the magneto cover.

CLUTCH COVER**DISASSEMBLY**

- Remove the oil seal retainer ①.
- Remove the oil seals ②.



- Pull out the oil seal ③, washer ④ with the clutch release cam-shaft ⑤.



CLUTCH RELEASE CAMSHAFT INSPECTION

- Inspect the clutch release camshaft of wear bend.
- Replace the camshaft if there is anything unusual.



REASSEMBLY

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

- Apply SUZUKI SUPER GREASE "A" to the oil seal lips.

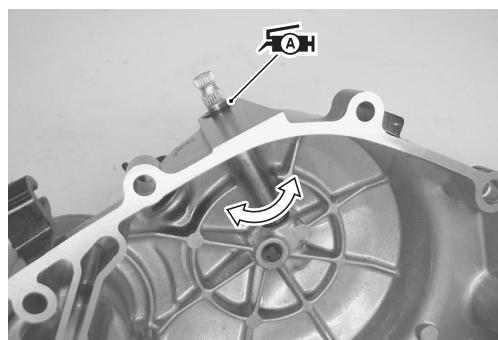
CAUTION

Replace the oil seals with the new ones.

 **SUZUKI SUPER GREASE "A"**

NOTE:

After installing the clutch release camshaft, be sure to check the clutch release camshaft operation.



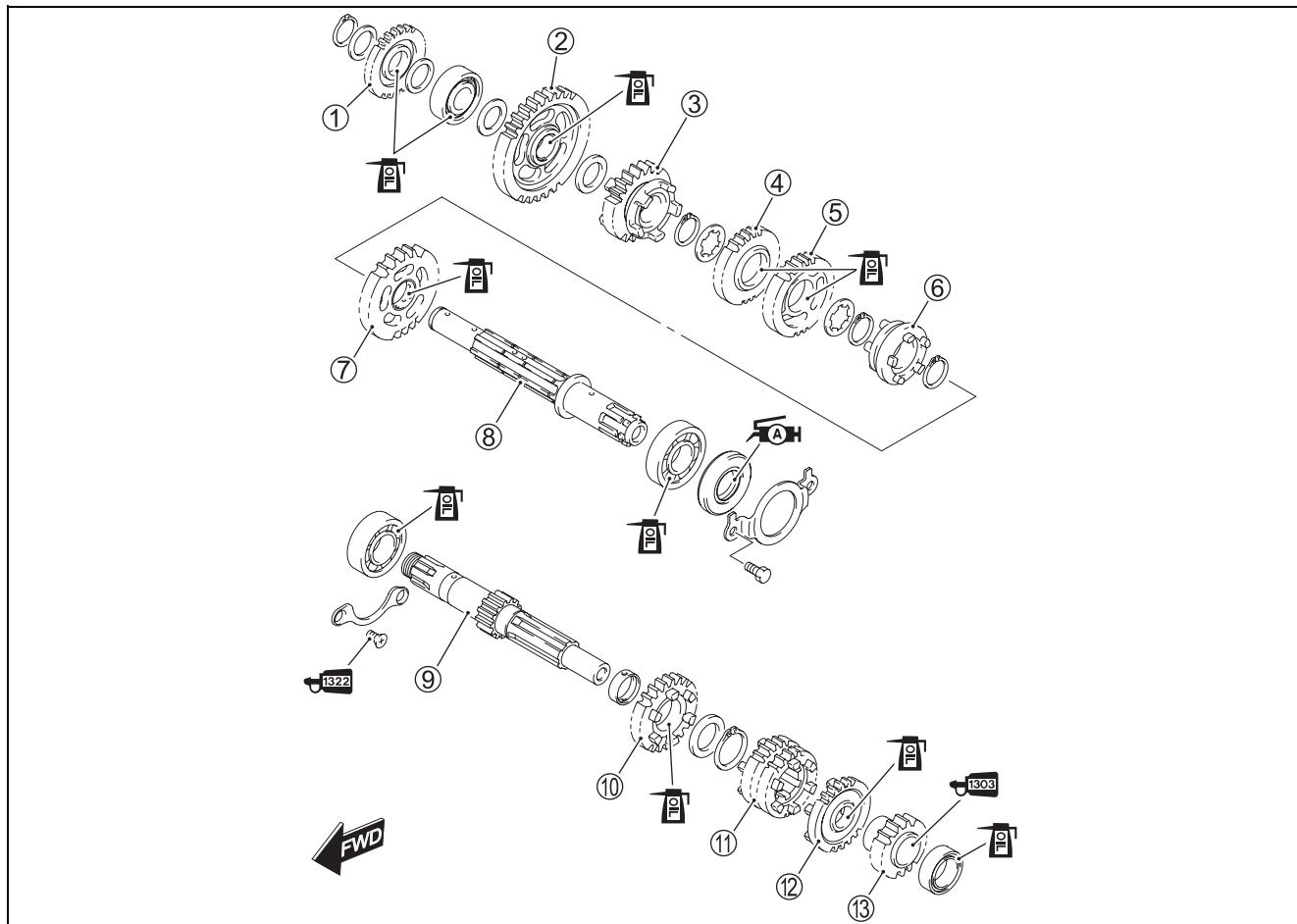
TRANSMISSION

DISASSEMBLY

- Disassemble the transmission gears as shown in the illustration.

NOTE:

When removing the 2nd drive gear, use a gear puller and a proper attachment.



① Kick starter idle gear	⑥ 6th driven gear	⑪ 3rd/4th drive gear
② 1st driven gear	⑦ 2nd driven gear	⑫ 6th drive gear
③ 5th driven gear	⑧ Driveshaft	⑬ 2nd drive gear
④ 4th driven gear	⑨ Countershaft	
⑤ 3rd driven gear	⑩ 5th drive gear	

REASSEMBLY

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

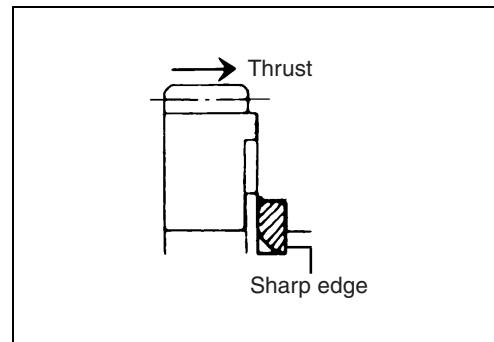
NOTE:

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

CAUTION

- * Never reuse a snap ring. After a snap ring has been removed from a shaft, it should be discarded and a new snap ring must be installed.
- * When installing a new snap ring, do not expand the end gap larger than required to slip the snap ring over the shaft.
- * After installing a snap ring, make sure that it is completely seated in its groove and securely fitted.

- When installing a new snap ring, pay attention to the direction of the snap ring. Fit the snap ring to the side where the thrust is as shown in the illustration. The rounded side should be against the gear surface.



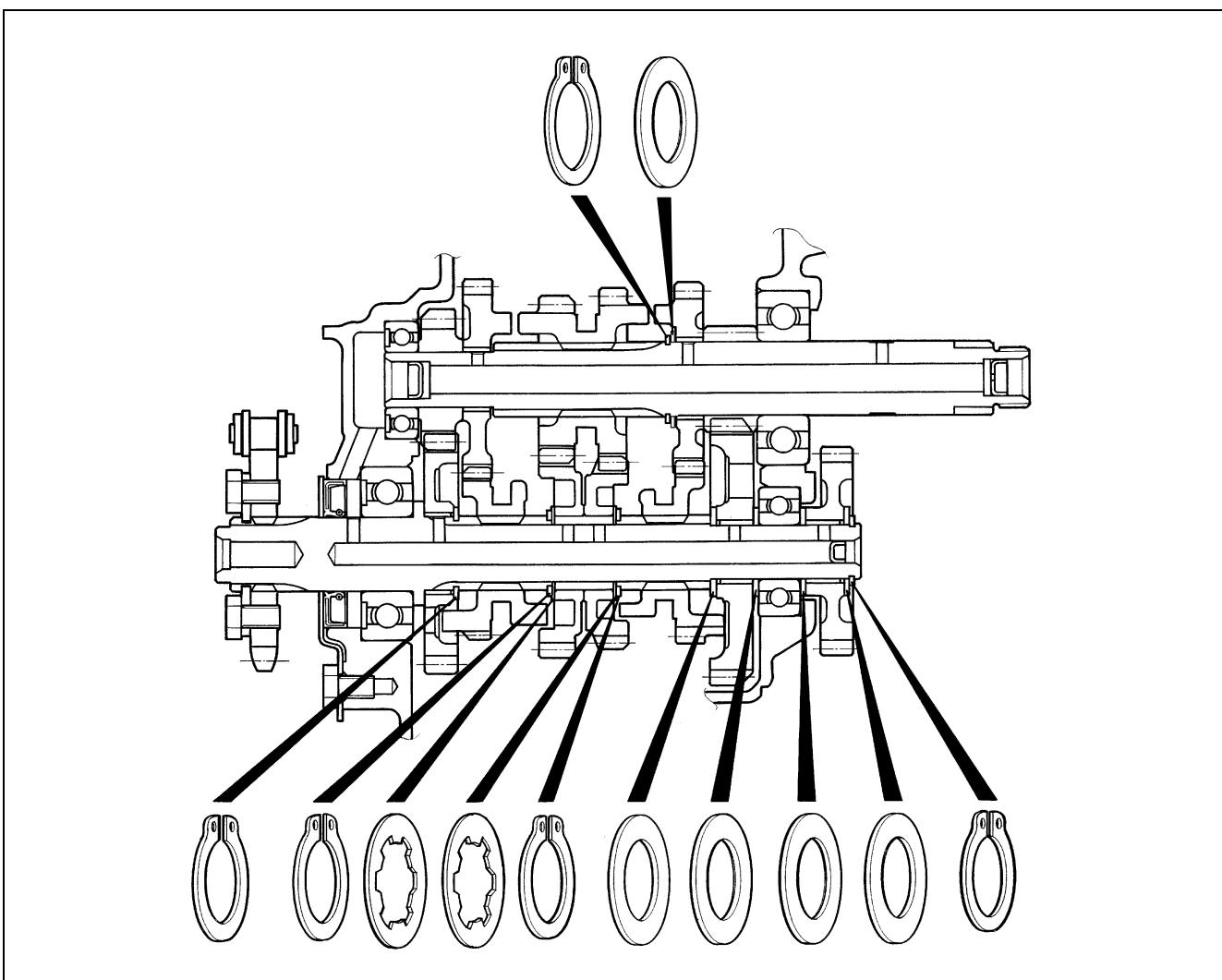
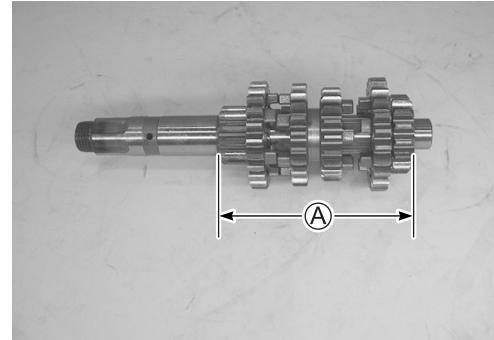
- Press fitted 2nd drive gear onto the countershaft. Before reassembling, coat the internal face of the 2nd drive gear with THREAD LOCK SUPER and install the gears so that the length \textcircled{A} is as shown.

DATA Countershaft length \textcircled{A} : 90.5 – 90.6 mm

 **1303** THREAD LOCK SUPER “1303”

NOTE:

This procedure may be performed only twice before shaft replacement is required.



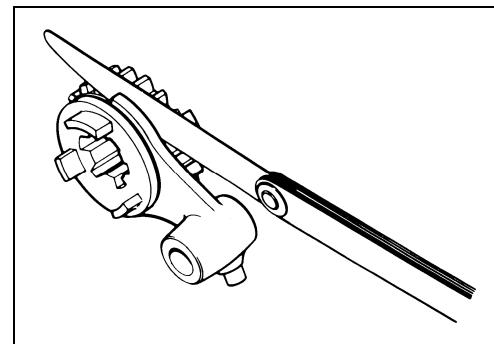
GEARSHIFT FORK

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.



DATA Gearshift fork to groove clearance

Service Limit: 0.50 mm

Thickness gauge

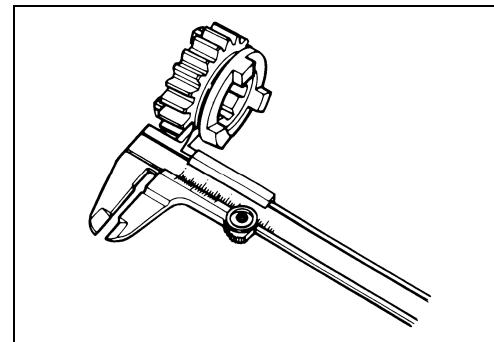
DATA Gearshift fork groove width

Standard

No. 1 & 2: 5.0 – 5.1 mm

No. 3 : 5.5 – 5.6 mm

Vernier calipers (150 mm)

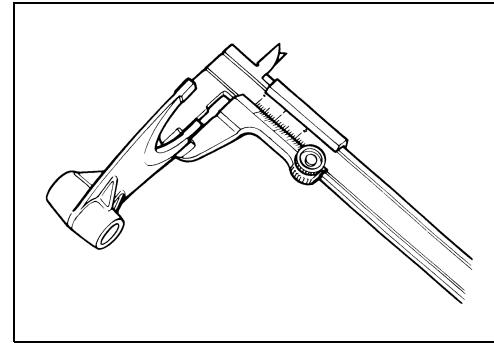


DATA Shift fork thickness

Standard

No. 1 & 2: 4.8 – 4.9 mm

No. 3 : 5.3 – 5.4 mm



CLUTCH

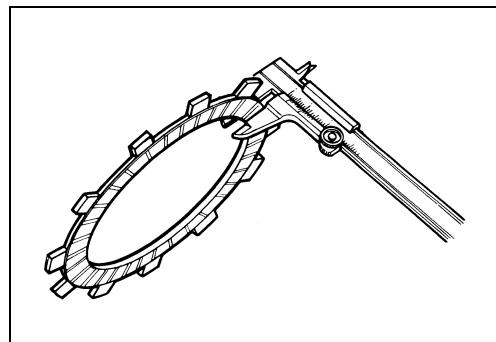
CLUTCH DRIVE PLATES

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.

DATA Clutch drive plate thickness

Service Limit: 2.6 mm

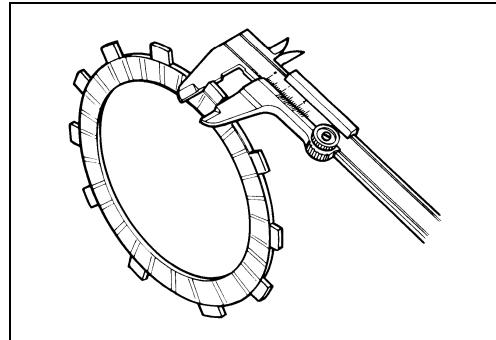
TOOL Vernier calipers (200 mm)



DATA Clutch drive plate claw width

Service Limit : 11.0 mm

: 11.1 mm (Concave parts)



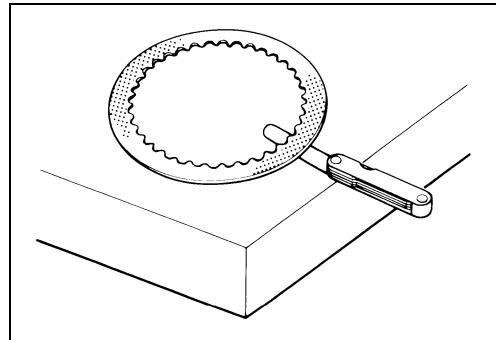
CLUTCH DRIVEN PLATES

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.

DATA Clutch driven plate distortion

Service Limit: 0.10 mm

TOOL Thickness gauge



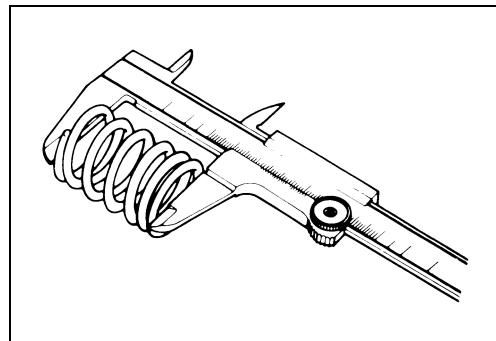
CLUTCH SPRING FREE LENGTH

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.

DATA Clutch spring free length

Service Limit: 30.9 mm

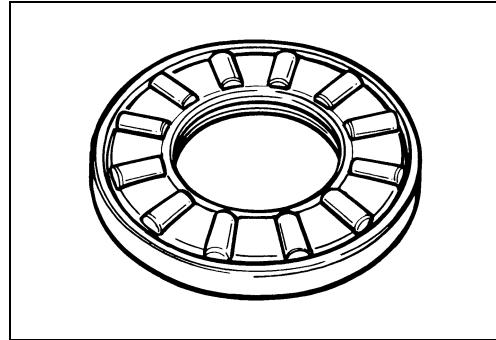
TOOL Vernier calipers (200 mm)



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 SLEEVE HUB/PRIMARY DRIVEN GEAR ASSEMBLY

- Inspect the slot of the clutch sleeve hub and primary driven gear assembly for damage or wear caused by the clutch plates. If necessary, replace it with a new one.

CAUTION

Do not attempt to disassemble the primary driven gear assembly. They are unserviceable.



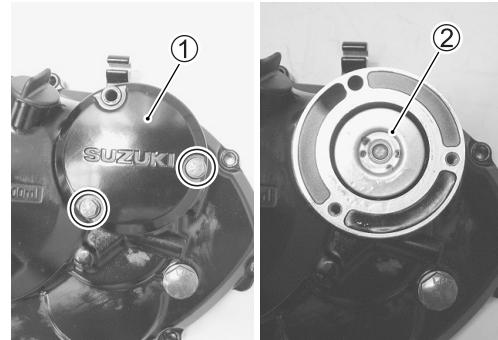
OIL FILTER

REMOVAL AND INSTALLATION

- Remove the oil filter cap ①.
- Remove the oil filter ②.
- Apply engine oil to the O-rings ③.

CAUTION

Make sure to replace the O-rings with the new ones.



NOTE:

Before installing the new oil filter ② and oil filter cap ①, make sure that the spring ⑤ and new O-rings ③ are installed correctly.

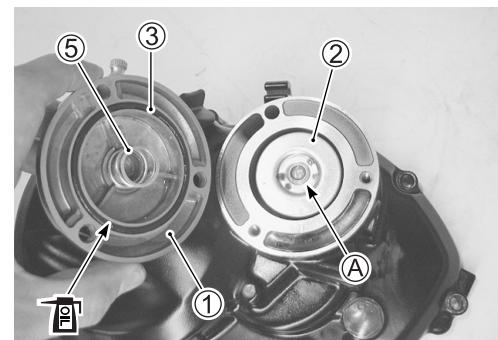
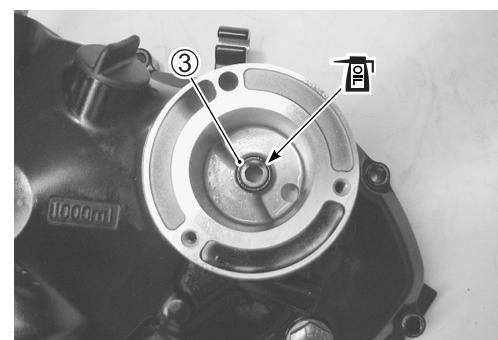
- Fit the O-rings ③.
- Position the oil filter ② and spring ⑤.

NOTE:

Insert the oil filter facing the valve A to the outside.

- Install the oil filter cap ① and tighten the oil filter cap bolts to the specified torque.

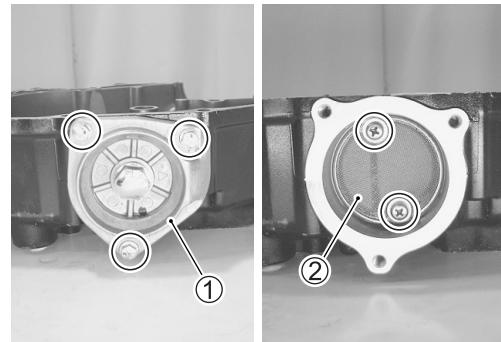
 **Oil filter cap bolt: 10 N·m (1.0 kgf·m)**



OIL SUMP FILTER

REMOVAL

- Remove the oil sump filter cap ①.
- Remove the oil sump filter ②.



CLEANING AND INSPECTION

- Clean the oil sump filter with a compressed air.
- Check the oil sump filter for any damage or clogs.
- If necessary, replace it with a new one.



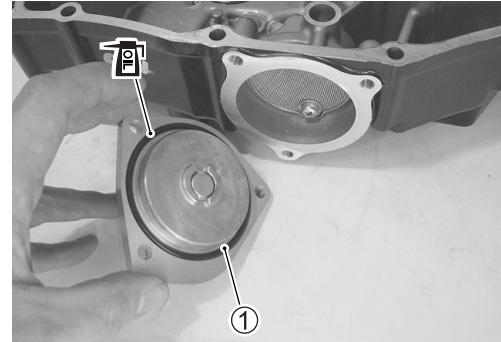
INSTALLATION

Install the oil sump filter in the reverse order of removal. Pay attention to the following points:

- Apply engine oil to the O-ring ①.

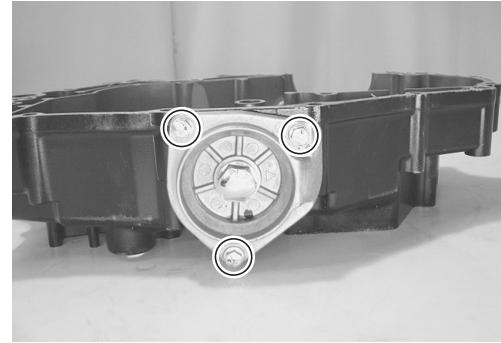
CAUTION

Replace the O-ring ① with a new one.

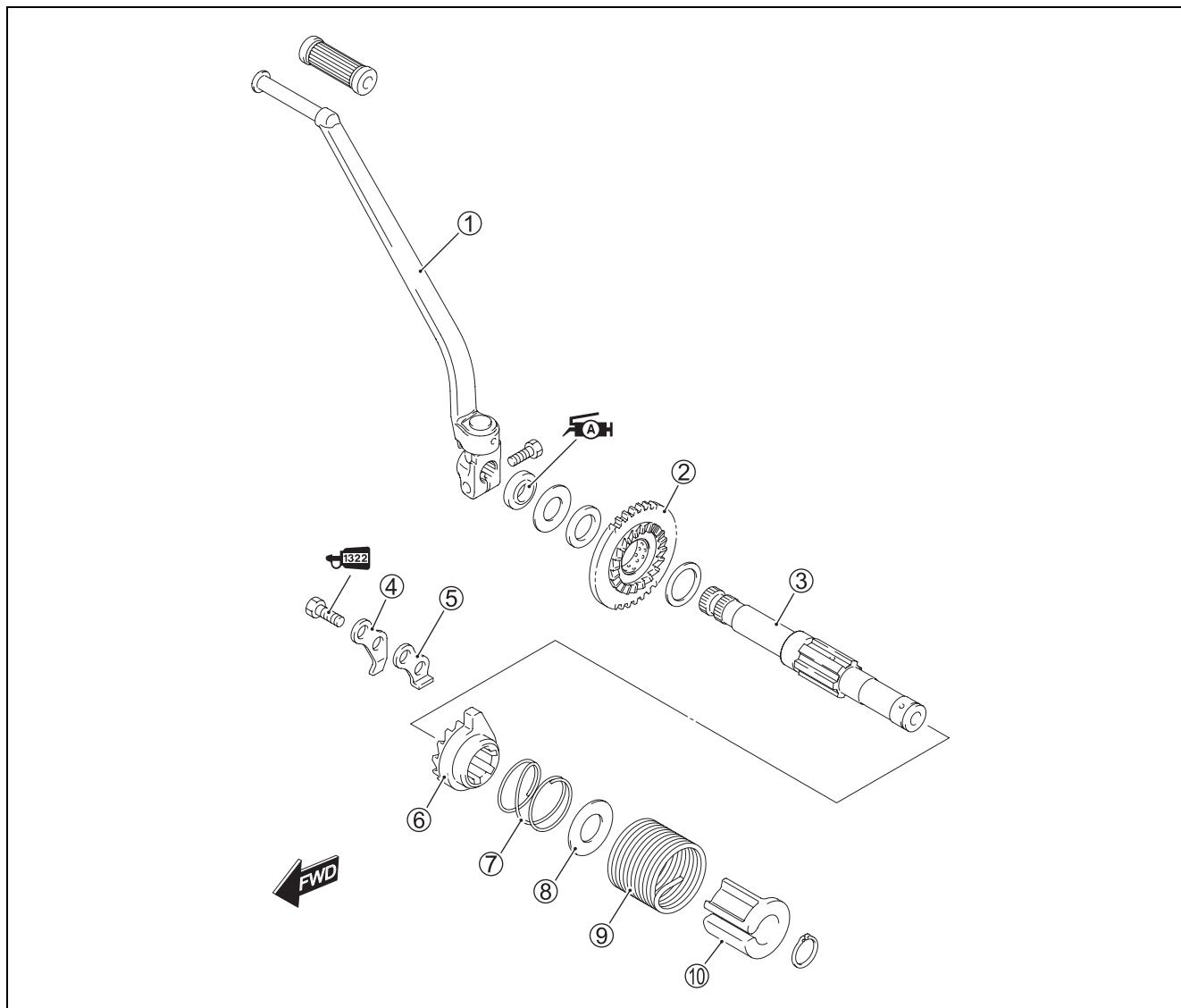


- Tighten the oil sump filter cap bolts to the specified torque.

Oil sump filter cap bolt: 10 N·m (1.0 kgf·m)



KICK STARTER

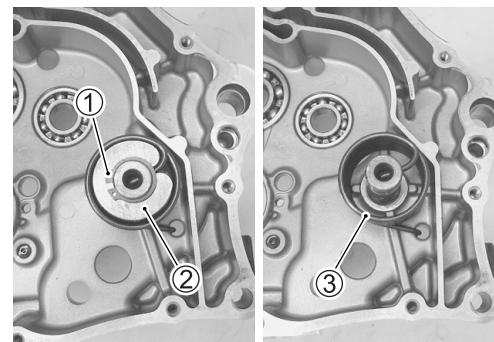


①	Kick starter lever	⑤	Kick starter stopper	⑨	Kick starter shaft return spring
②	Kick starter drive gear	⑥	Kick starter	⑩	spring guide
③	Kick starter shaft	⑦	Spring		
④	Kick starter guide	⑧	Plate		

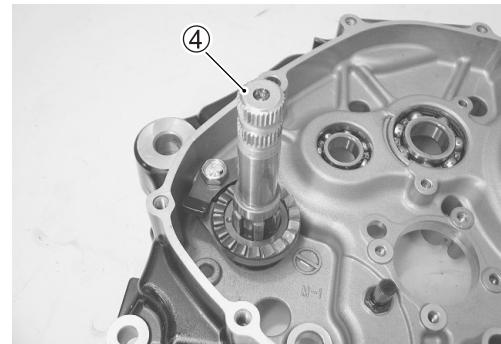
REMOVAL

- Remove the snap ring ①.
- Remove the spring guide ②.
- Remove the kick starter shaft return spring ③.

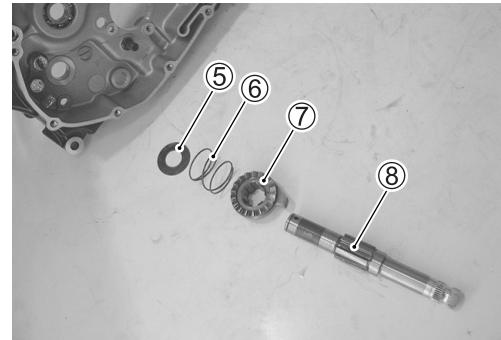
 Snap ring remover (Open type)



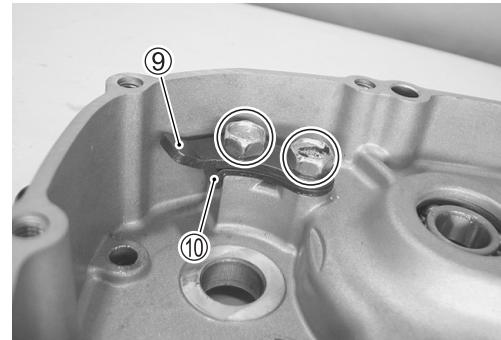
- Remove the kick starter shaft assembly ④.



- Remove the plate ⑤, spring ⑥ and kick starter ⑦ from the kick starter shaft ⑧.



- Remove the kick starter guide ⑨ and kick starter stopper ⑩.



KICK STARTER INSPECTION

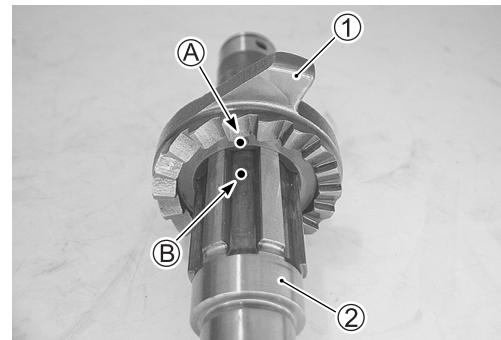
- Inspect the kick starter shaft for wear or bend.
- Inspect the return springs for damage or fatigue.
- Replace the shaft or spring if there is anything unusual.

REASSEMBLY

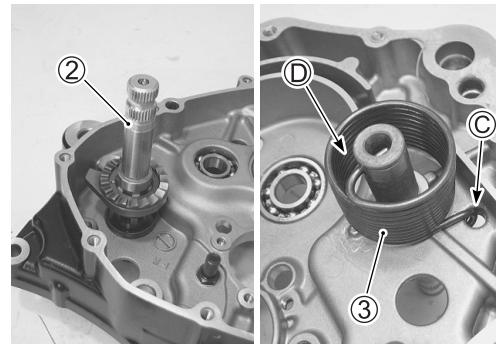
- Install the kick starter ① onto the kick starter shaft ②.

NOTE:

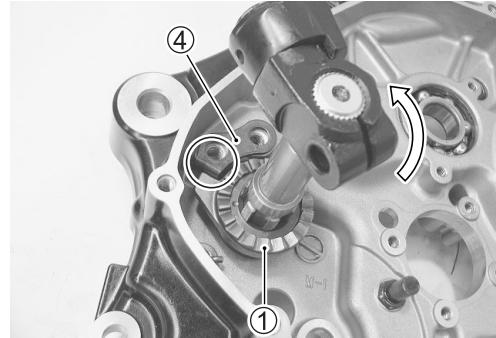
Align the punch mark Ⓐ on the kick starter ① with the punch mark Ⓑ on the kick starter shaft ②.



- Install the spring and plate to the kick starter shaft ②.
- Insert the kick starter shaft ② into the crankcase.
- When installing the return spring ③, hook the spring end ④ onto hole of the crankcase and fit the spring end ⑤ into hole of the kick starter shaft.

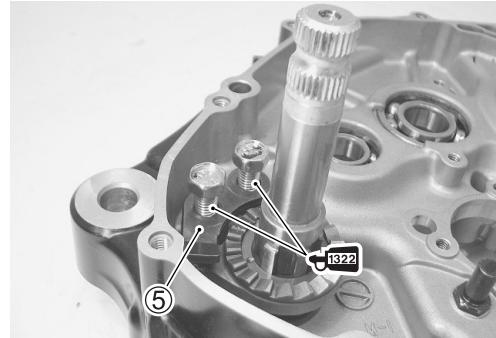


- Install the kick starter stopper ④.
- Turn the kick starter shaft counterclockwise with the kick starter lever and align the kick starter ① and kick starter stopper ④.



- Install the kick starter guide ⑤.
- Apply a small quantity of THREAD LOCK SUPER to the bolts and install the bolts.

 **THREAD LOCK SUPER “1322”**



CRANKCASE

GEARSHIFT ARM STOPPER

- When replacing the gearshift arm stopper, apply THREAD LOCK SUPER to the gearshift arm stopper and tighten it to the specified torque.

 **THREAD LOCK SUPER “1322”**

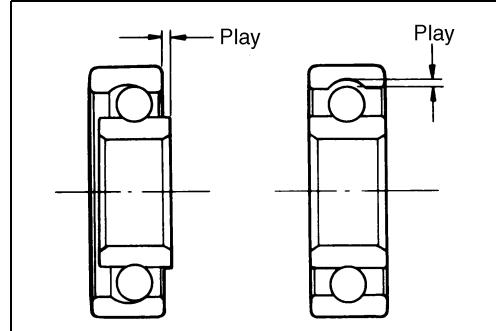
 **Gearshift arm stopper: 19 N·m (1.9 kgf·m)**



BEARING INSPECTION

Rotate the bearing inner race by finger to inspect for abnormal play, noise and smooth rotation while the bearings are in the crankcase.

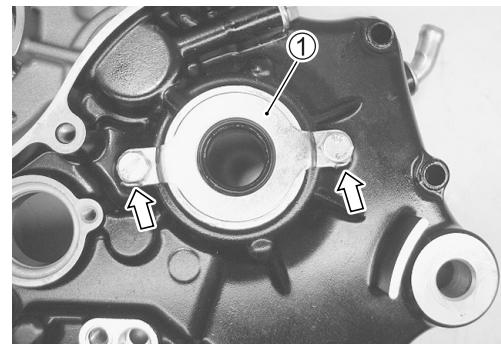
Replace the bearing in the following procedure if there is anything unusual.



OIL SEAL AND BEARING REMOVAL

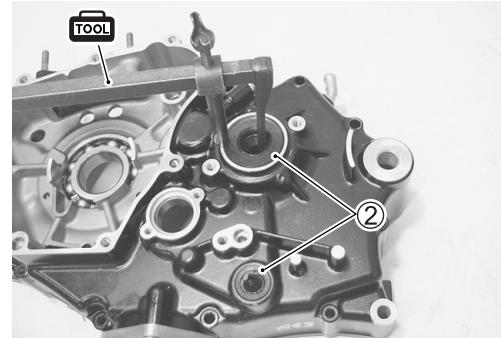
OIL SEAL

- Flatten the oil seal retainer ① and remove the oil seal retainer.



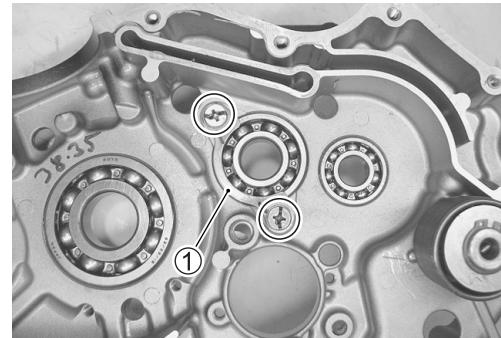
- Remove the oil seals ② with the special tool.

Oil seal remover



BEARING

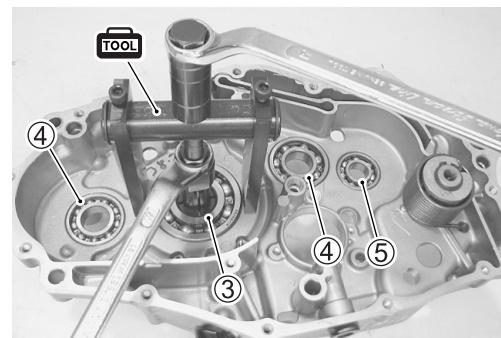
- Remove the bearing retainer ①.



- Remove the right and left crankcase bearings with the special tool.

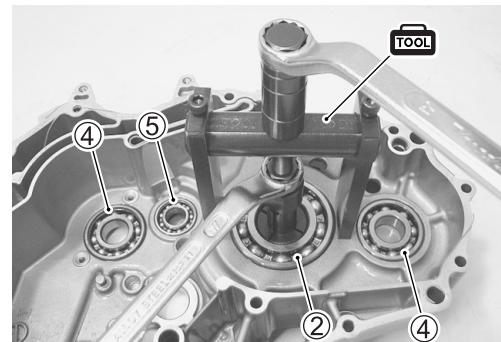
Bearing remover set

(② 35 mm)
(③ 28 mm)
(④ 20 mm)
(⑤ 15 mm)



NOTE:

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



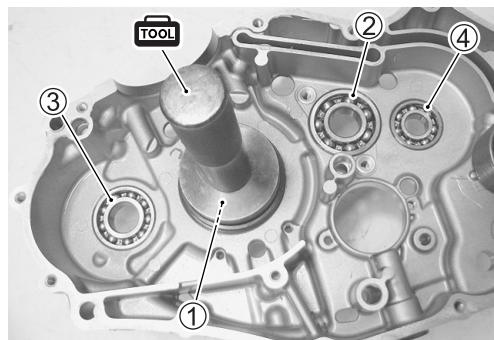
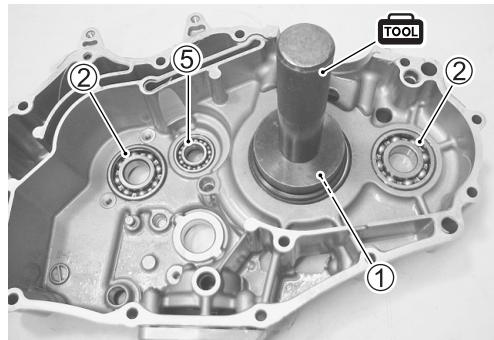
OIL SEAL AND BEARING INSTALLATION

BEARING

- Install the right and left crankcase bearings with the special tool.

 **Bearing installing set**

(10 – 75 ϕ)
 (1) 68 ϕ
 (2) 47 ϕ
 (3) 42 ϕ
 (4) 35 ϕ
 (5) 32 ϕ

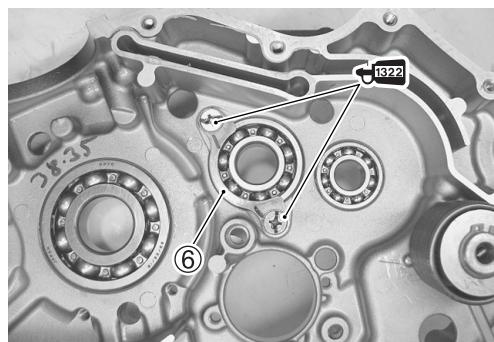


- Install the bearing retainer ⑥.

NOTE:

Apply a small quantity of *THREAD LOCK SUPER* to the bearing retainer screws.

 **THREAD LOCK SUPER "1322"**



OIL SEAL

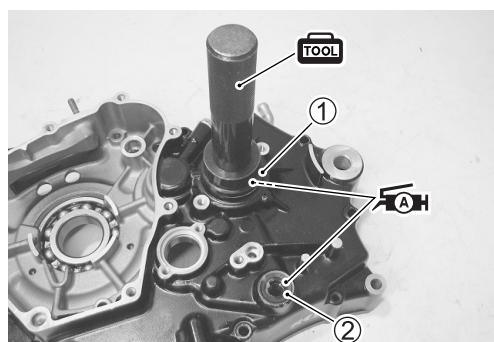
- Install the oil seals with the special tool.

 **Bearing installing set**

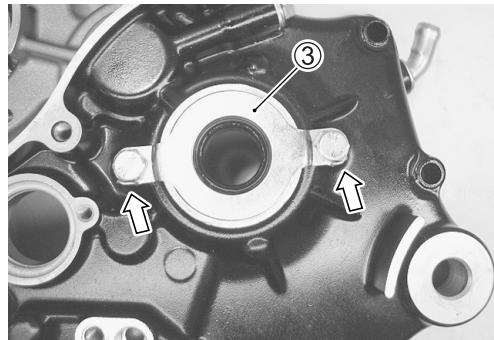
(10 – 75 ϕ)
 (1) 47 ϕ
 (2) 35 ϕ

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

 **SUZUKI SUPER GREASE "A"**



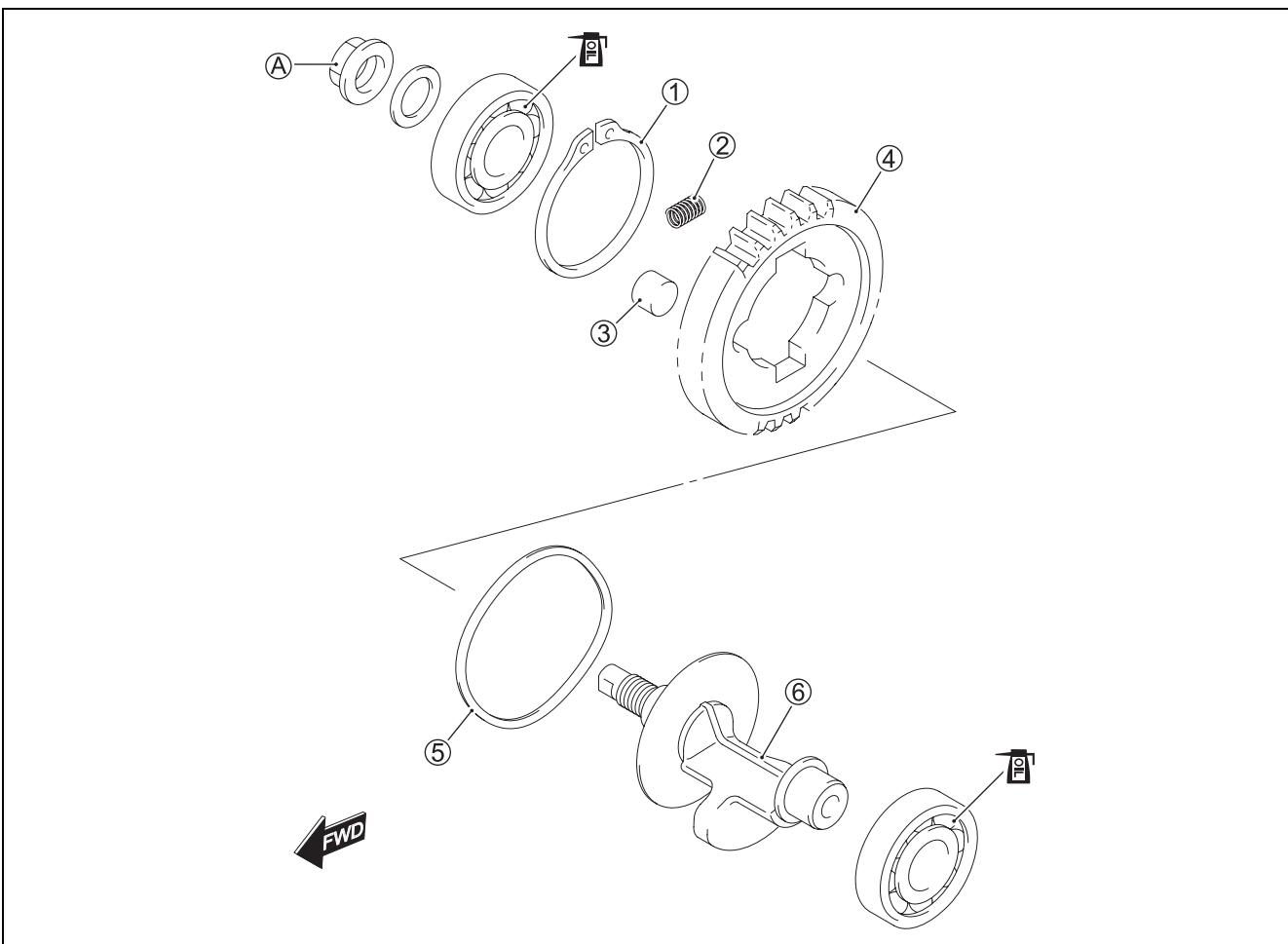
- Install the oil seal retainer ③ and bend the tongue of the oil seal retainer ③ securely.



BALANCER SHAFT AND BALANCER DRIVEN GEAR

DISASSEMBLY

- Disassemble the balancer shaft as shown in the illustration.



①	Snap ring	⑤	Spring washer
②	Spring (2 pcs.)	⑥	Balancer shaft
③	Damper (2 pcs.)	Ⓐ	Crank balancer shaft nut
④	Balancer driven gear		

ITEM	N·m	kgf·m
Ⓐ	50	5.0

INSPECTION

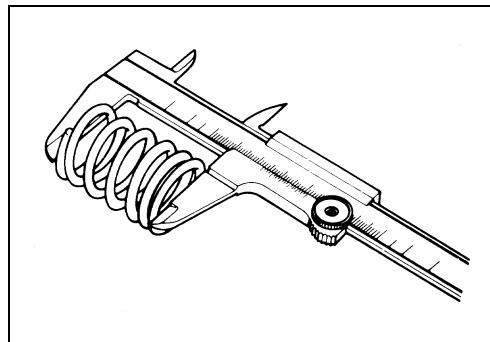
Inspect the balancer shaft and balancer driven gear for wear or damage. If any wear or damage is found, replace the defective part.

Measure the free length of each balancer spring. If any spring length is less than the service limit, replace all of the spring.

TOOL Vernier calipers (150 mm)

DATA Balancer spring free length

Service Limit: 9.6 mm



REASSEMBLY

Reassemble the balancer driven gear in the reverse order of disassembly.

CRANKSHAFT SHIM SELECTION

- Degrease the balancer drive gear ①, shim and inner race of the right crankshaft bearing.
- Install the crankshaft into the left crankcase. (3-55)
- Install the balancer drive gear ① and place the removed shim ② on to the balancer drive gear ①.
- Put the plastigage (special tool) cut out about 10 mm on the shim as shown.

TOOL **Plastigage (0.025 – 0.076 mm)**
Plastigage (0.051 – 0.152 mm)

- Install the right crankcase and tighten the crankcase bolts to the specified torque. (3-57)
- Remove the crankcase bolts.
- Separate the crankcase into 2 parts, left and right, with the special tool. (3-19)

TOOL **Crankshaft remover**

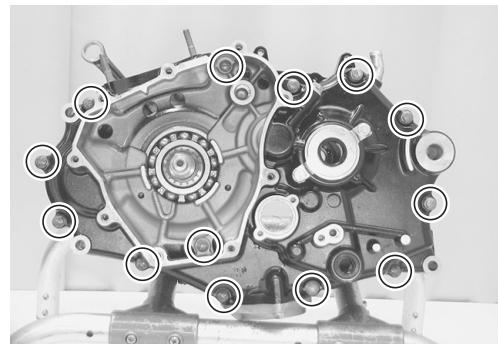
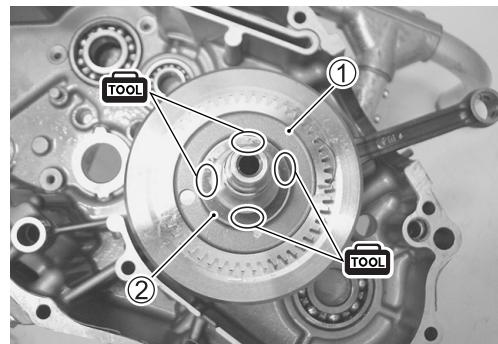
- Measure the width of compressed plastigage with the envelope scale.

DATA **Crankshaft thrust clearance: From –0.02 to 0.07 mm**

- If the thrust clearance is not within specification, select the proper size of shim.
- After selecting the proper size of shim, place it on the balance drive gear ①.

LIST OF SHIMS

Part number	Shim thickness	Thrust clearance
09181-28192	0.90 ± 0.02 mm	0.90 – 0.95 mm
09181-28193	0.95 ± 0.02 mm	0.95 – 1.00 mm
09181-28194	1.00 ± 0.02 mm	1.00 – 1.05 mm
09181-28197	1.05 ± 0.02 mm	1.05 – 1.10 mm
09181-28200	1.10 ± 0.02 mm	1.10 – 1.15 mm
09181-28202	1.15 ± 0.02 mm	1.15 – 1.20 mm
09181-28204	1.20 ± 0.02 mm	1.20 – 1.25 mm
09181-28207	1.25 ± 0.02 mm	1.25 – 1.30 mm
09181-28209	1.30 ± 0.02 mm	1.30 – 1.35 mm
09181-28022	1.35 ± 0.02 mm	1.35 – 1.40 mm
09181-28210	1.40 ± 0.02 mm	1.40 – 1.45 mm
09181-28023	1.45 ± 0.02 mm	1.45 – 1.50 mm
09181-28211	1.50 ± 0.02 mm	1.50 – 1.55 mm
09181-28024	1.55 ± 0.02 mm	1.55 – 1.60 mm
09181-28025	1.60 ± 0.02 mm	1.60 – 1.65 mm
09181-28026	1.65 ± 0.02 mm	1.65 – 1.70 mm
09181-28027	1.70 ± 0.02 mm	1.70 – 1.75 mm
09181-28028	1.75 ± 0.02 mm	1.75 – 1.80 mm
09181-28029	1.80 ± 0.02 mm	1.80 – 1.84 mm



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 AND BALANCER DRIVE GEAR

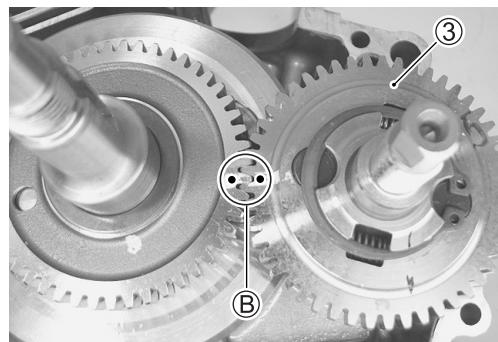
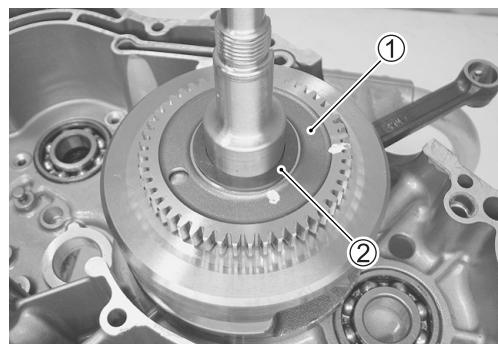
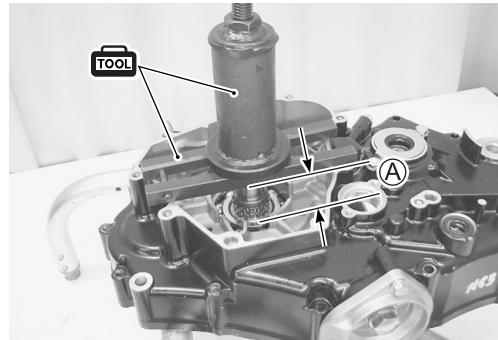
- Apply engine oil to the crankshaft bearings and balancer shaft bearings.
- When installing the crankshaft into the crankcase, install the suitable size socket Ⓐ between the left bearing inner race edge and special tool edge, and it is necessary to pull its left end into the left crankcase with the special tools.

 **Crankshaft installer**
Connecting rod stopper

CAUTION

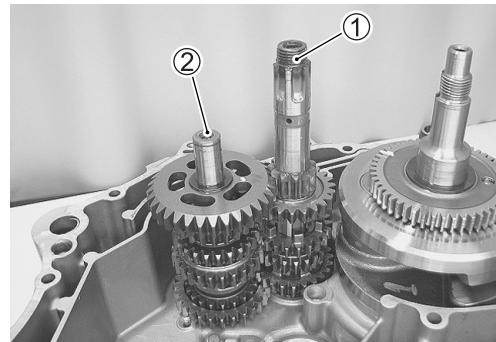
Never install the crankshaft into the crankcase by striking it with a plastic hammer. Always use the special tool, otherwise crankshaft may be misaligned.

- Install the balancer drive gear ① and shim ② to the crankshaft.
- Install the balancer shaft ③ by aligning the matching marks ④.

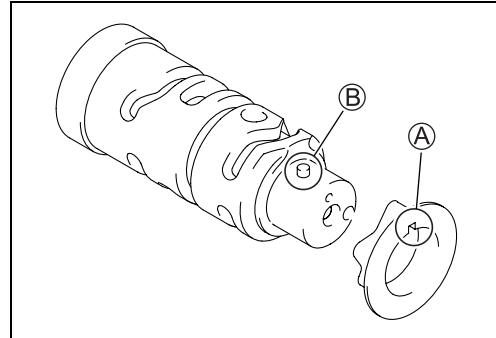


TRANSMISSION

- Install the countershaft ① and driveshaft ② assemblies.

**GEARSHIFT CAM AND GEARSHIFT FORKS**

- Align the pin groove Ⓐ of gearshift cam driven gear with the pin Ⓑ on the gearshift cam.

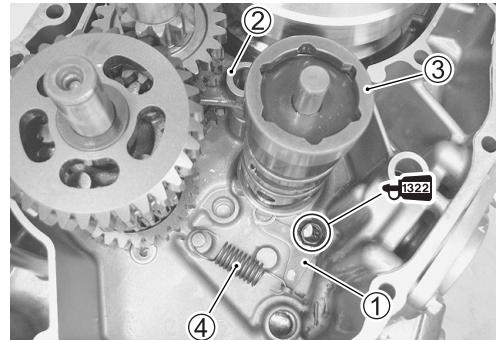


- Install the washer and gearshift cam stopper ①, gearshift fork No.3 ②, gearshift cam ③ and spring ④.

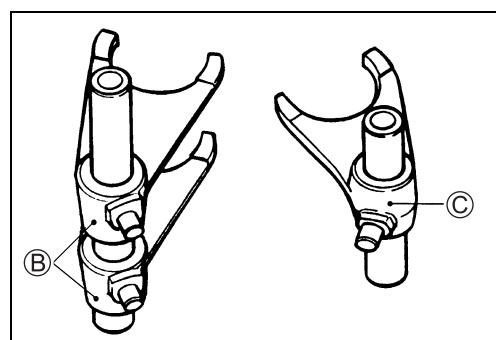
NOTE:

Apply a small quantity of *THREAD LOCK SUPER* to the gearshift cam stopper bolt.

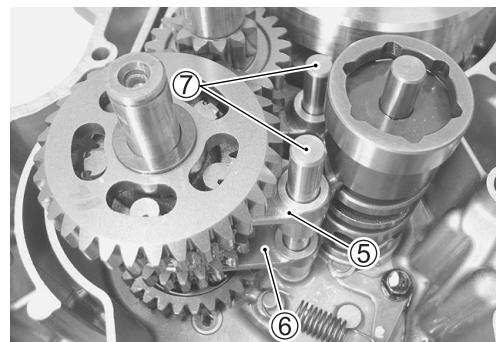
 **THREAD LOCK SUPER “1322”**

**NOTE:**

Two kinds of gearshift forks (Ⓑ, Ⓢ) are used. They resemble each other very closely in external appearance and configuration. Carefully examine the illustration for correct installing positions and directions.

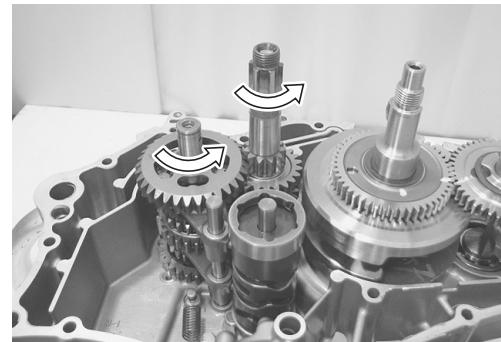


- Install the gearshift fork No. 1 ⑤ and No. 2 ⑥.
- Install the gearshift fork shafts ⑦.

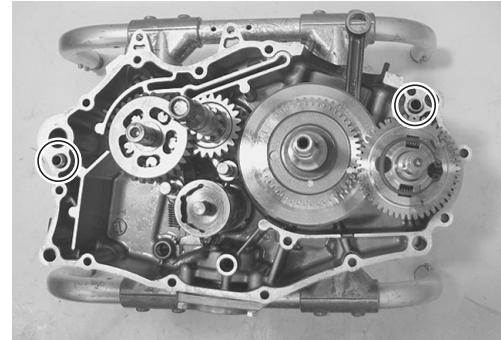


NOTE:

- * After the gearshift fork shaft and gearshift forks have been fitted, make sure that the gears engage normally.
- * Set the transmission gears to the neutral position.

**CRANKCASE**

- Wipe both crankcase mating surfaces with a cleaning solvent.
- Install the dowel pins into the left half of the crankcase.
- Apply engine oil to the conrod big end and transmission gears.

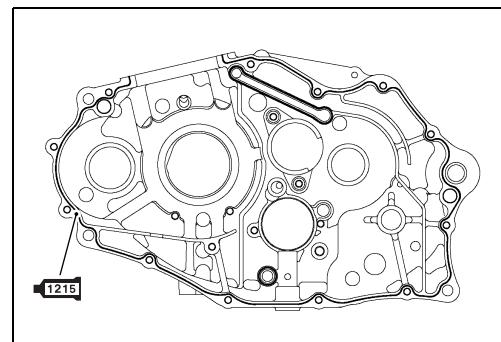


- Apply SUZUKI BOND uniformly to the mating surface of the right crankcase and assemble the cases within a few minutes.

 **SUZUKI BOND "1215"**

CAUTION

Take extreme care not to let sealant enter into the oil hole or bearing.

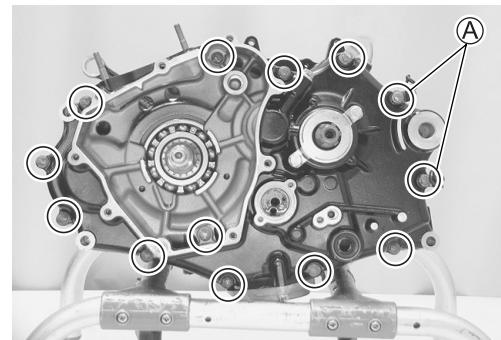


- Tighten the crankcase bolts to the specified torque.

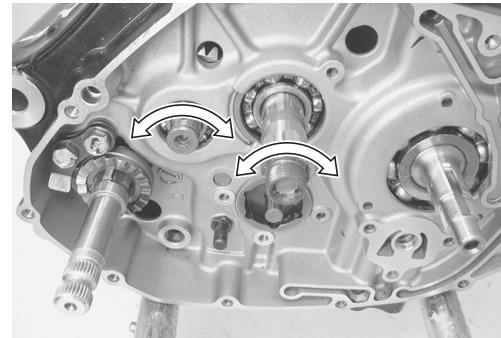
NOTE:

Fit the clamp to the bolts A.

 **Crankcase bolt: 10 N·m (1.0 kgf·m)**

**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.

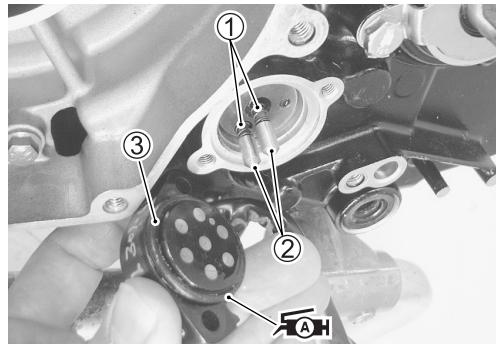


NEUTRAL SWITCH

- Install the springs ①, neutral switch contacts ② and O-ring ③.
- Apply SUZUKI SUPER GREASE "A" to the O-ring.

 SUZUKI SUPPER GREASE "A"**CAUTION**

Use a new O-ring to prevent oil leakage.



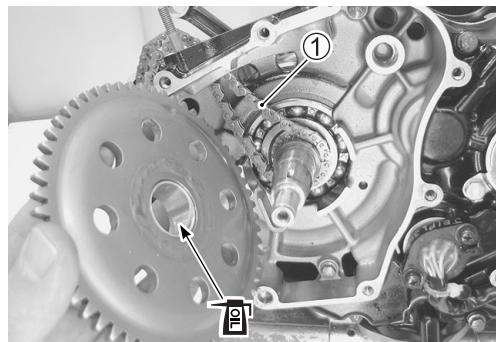
- Tighten the neutral switch mounting bolts to the specified torque.

 Neutral switch mounting bolt: 3 N·m (0.3 kgf·m)**NOTE:**

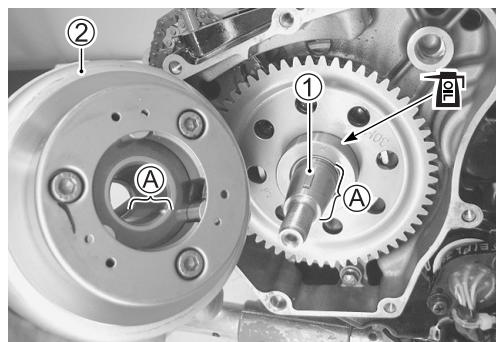
Clamps the neutral switch lead wire. (7-13)

**CAM CHAIN**

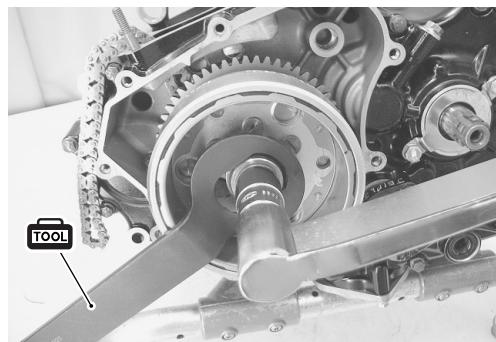
- Install the cam chain ①.
- Apply engine oil to the bushing of the starter clutch gear.

**MAGNETO ROTOR**

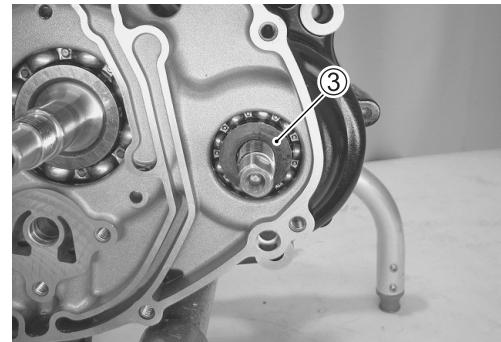
- Apply engine oil to the starter clutch gear outer race.
- Install the key ①.
- Remove any grease from the tapered portion (A) of the magneto rotor and crankshaft.
- Install the magneto rotor ② securely.



- Hold the magneto rotor with the special tool and tighten the magneto rotor nut to the specified torque.

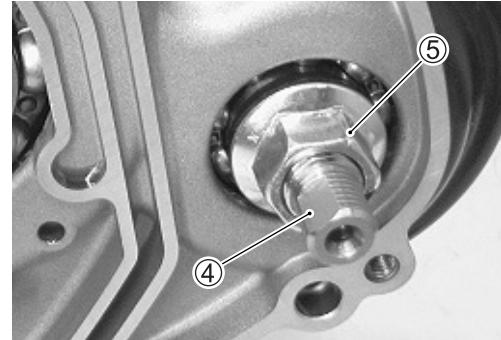
 Rotor holder** Magneto rotor nut: 100 N·m (10.0 kgf·m)**

- Install the washer ③.



- Hold the crank blancer shaft ④, tighten the crank blancer shaft nut ⑤ to the specified torque.

 **Crank balancer shaft nut: 50 N·m (5.0 kgf·m)**



STARTER IDLE GEARS/MAGNETO COVER

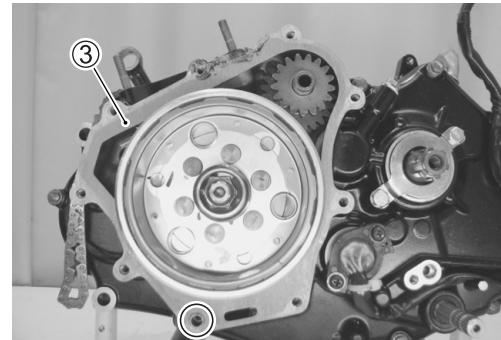
- Apply engine oil to the starter clutch gear and starter idle gear No. 2 ①.
- Install the starter idle gear No. 2 ① and shaft ②.



- Install the dowel pin and gasket ③.

CAUTION

Use a new gasket to prevent oil leakage.



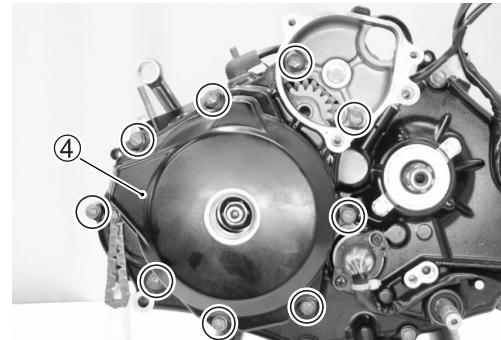
- Install the magneto cover ④.

⚠ WARNING

Be careful not to pinch the finger between the magneto cover and crankcase.

- Tighten the magneto cover bolts to the specified torque.

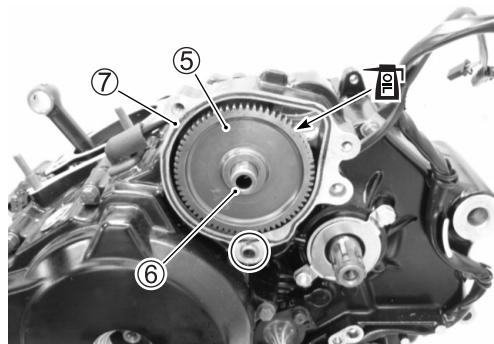
 **Magneto cover bolt: 10 N·m (1.0 kgf·m)**



- Apply engine oil to the starter idle gear No. 1 ⑤.
- Install the starter idle gear No. 1 ⑤ and shaft ⑥.
- Install the dowel pin and gasket ⑦.

CAUTION

Use a new gasket to prevent oil leakage.

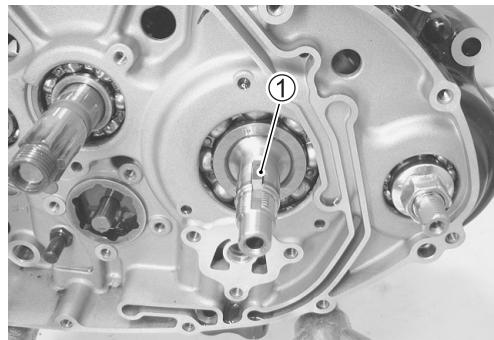


- Tighten the starter idle gear cover bolts to the specified torque.

Starter idle gear cover bolt: 10 N·m (1.0 kgf·m)


PRIMARY DRIVE GEAR AND OIL PUMP DRIVE GEAR

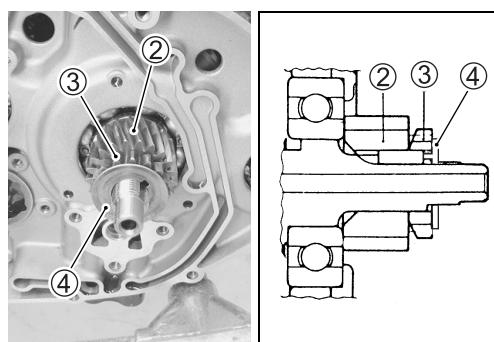
- Install the key ① onto the crankshaft.



- Install the primary drive gear ② and oil pump drive gear ③.

NOTE:

Position the oil pump drive gear ③ and washer ④, as shown in the illustration.



- Locking the conrod using the special tool, tighten the primary drive gear nut ⑤ to the specified torque.

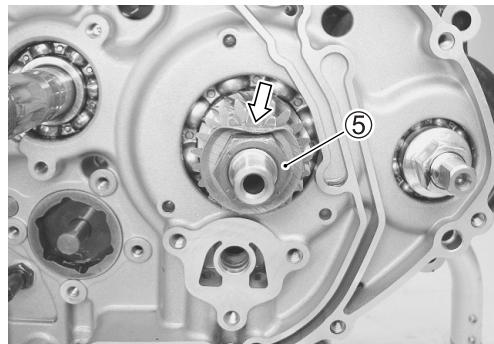
NOTE:

This primary drive gear nut ⑤ has left-hand threads.

Connecting rod stopper

Primary drive gear nut: 50 N·m (5.0 kgf·m)

- Bend the washer securely.

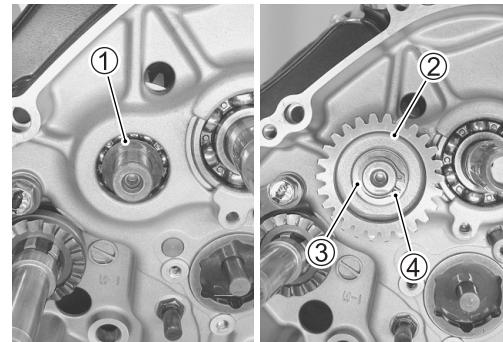


KICK STARTER

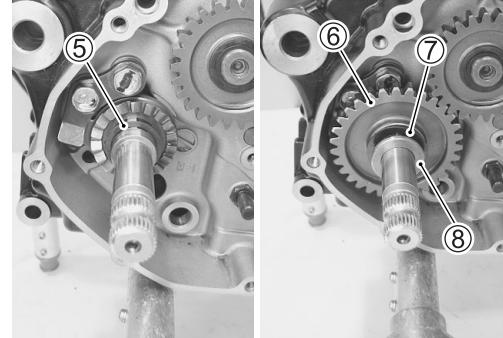
- Install the washer ①.
- Install the kick starter idle gear ②, washer ③ and snap ring ④ to the driveshaft.

CAUTION

Use a new snap ring ④.

TOOL Snap ring remover (Open type)

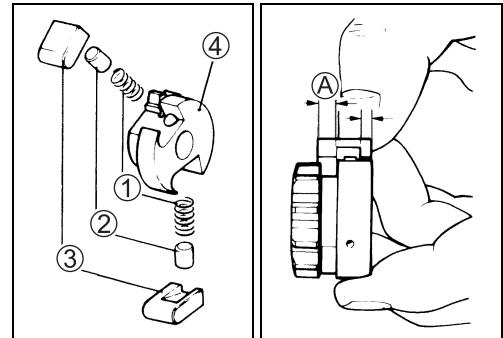
- Install the washer ⑤.
- Install the kick starter drive gear ⑥, washer ⑦ and spacer ⑧.

**GEARSHIFT**

- Install each springs ①, pins ② and pawls ③ into the gearshift cam driven gear ④.

NOTE:

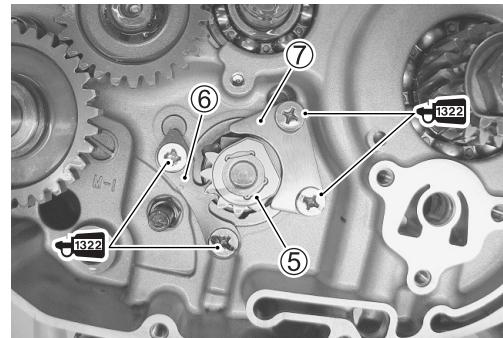
The large shoulder Ⓐ must face to the outside.



- Install the gearshift cam driven gear assembly ⑤.
- Install the cam guide ⑥ and pawl lifter ⑦.

NOTE:

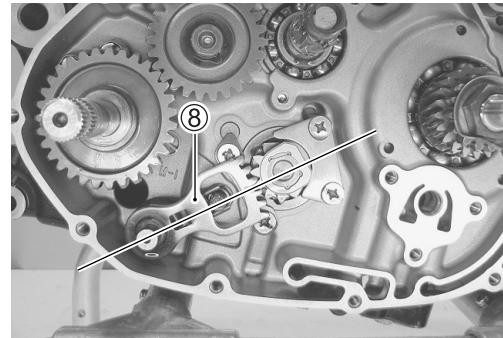
Apply a small quantity of THREAD LOCK SUPER to the threads of the screws.

TOOL THREAD LOCK SUPER "1322"

- Install the gearshift shaft ⑧.

NOTE:

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



OIL PUMP

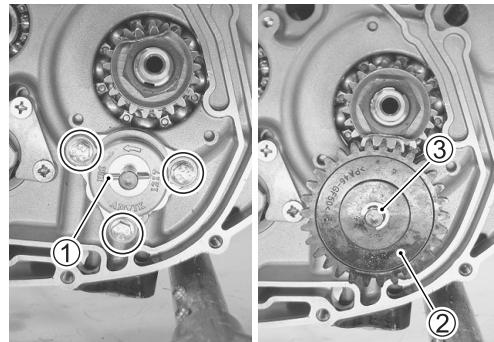
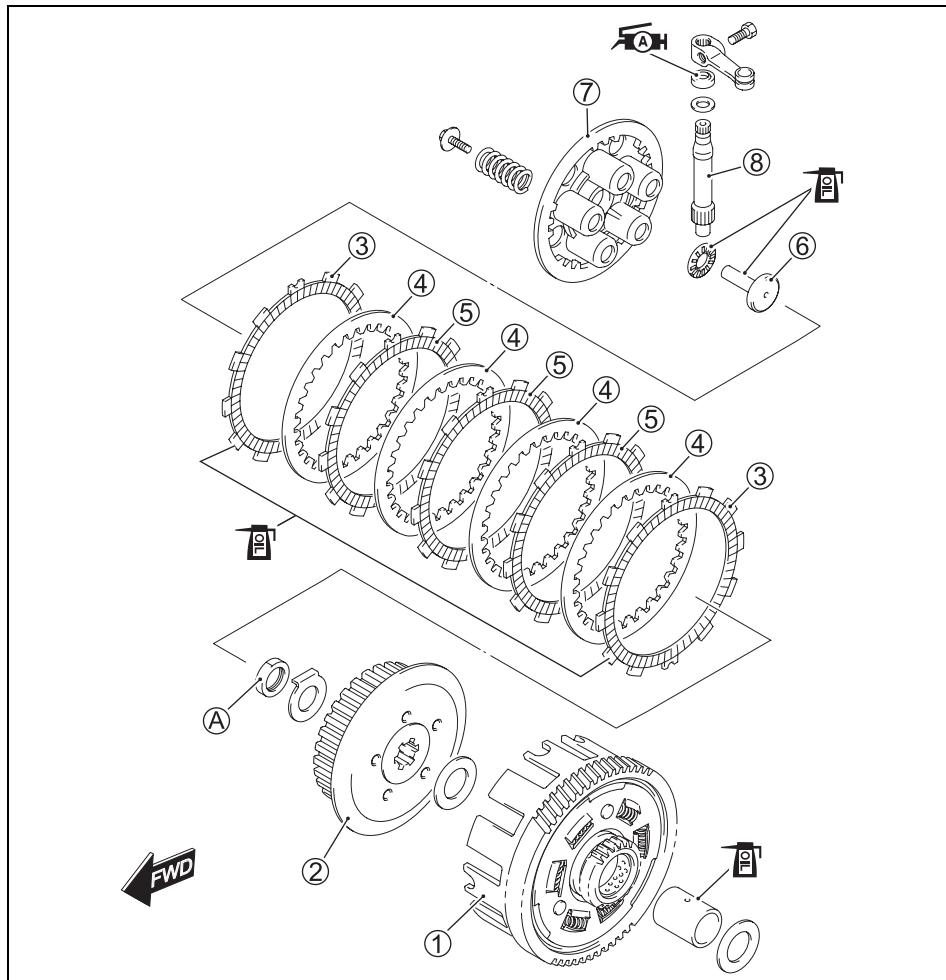
- Tighten the oil pump mounting bolts to the specified torque.

Oil pump mounting bolt: 10 N·m (1.0 kgf·m)

- Install the pin ①.
- Install the oil pump driven gear ② and E-ring ③.

CAUTION

Use a new E-ring.

**CLUTCH****BOLT LENGTH**

①	Primary driven gear assembly
②	Clutch sleeve hub
③	Clutch drive No. 1 plate
④	Clutch driven plate
⑤	Clutch drive No. 2 plate
⑥	Clutch release rack
⑦	Clutch pressure plate
⑧	Clutch release camshaft
Ⓐ	Clutch sleeve hub nut

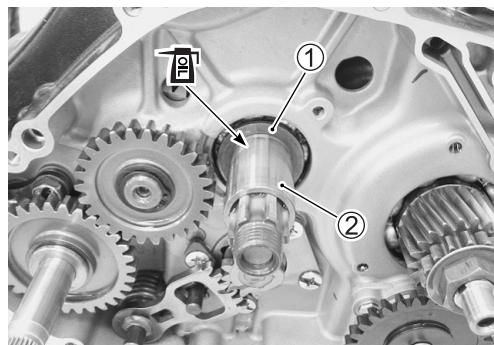


ITEM	N·m	kgf·m
Ⓐ	40	4.0

- Install the thrust washer ① and spacer ② onto the counter-shaft.

NOTE:

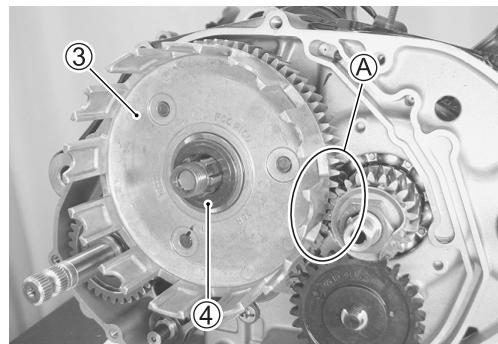
Apply engine oil to the inside and outside surfaces of the spacer.



- Install the primary driven gear assembly ③ and thrust washer ④ onto the countershaft.

NOTE:

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



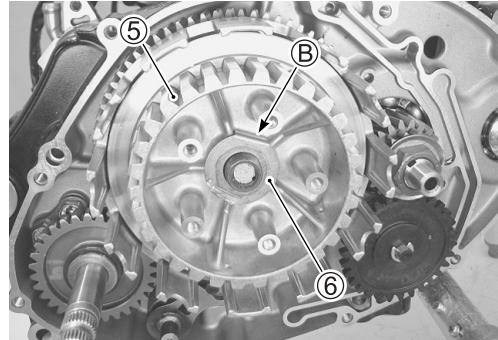
- Install the clutch sleeve hub ⑤ and washer ⑥.

NOTE:

The removed washer ⑥ must be replaced with a new one.

CAUTION

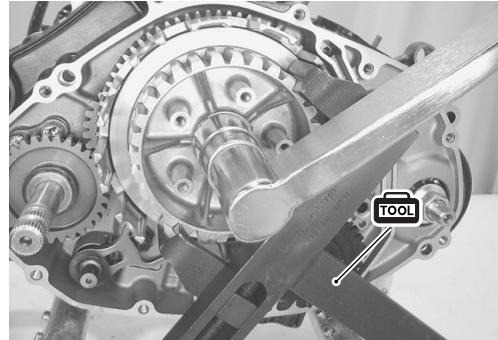
Install the washer so that its tongue Ⓑ is aligned with the flat portion of the clutch sleeve hub.



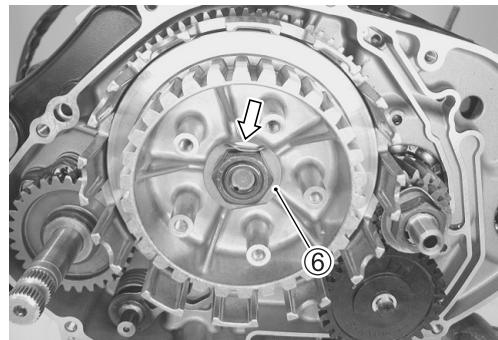
- Hold the clutch sleeve hub and tighten the clutch sleeve hub nut to the specified torque with the special tool.

Clutch sleeve hub holder

Clutch sleeve hub nut: 40 N·m (4.0 kgf·m)



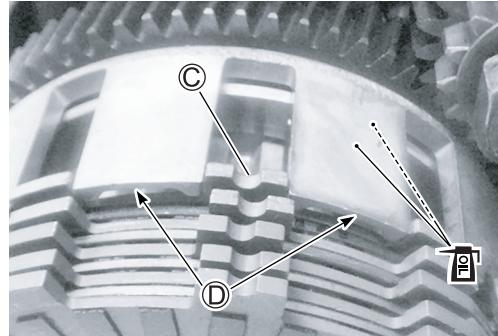
- Bend the washer ⑥ securely.



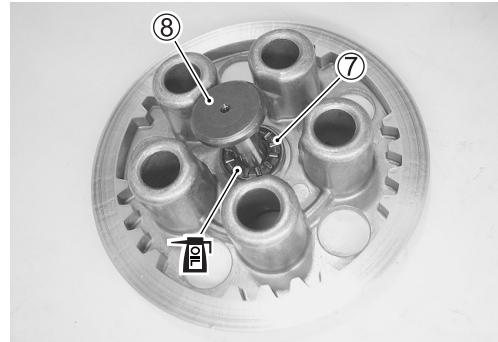
- Apply engine oil to the clutch drive and driven plates.
- Install the clutch drive and driven plates one by one into the clutch sleeve hub.

NOTE:

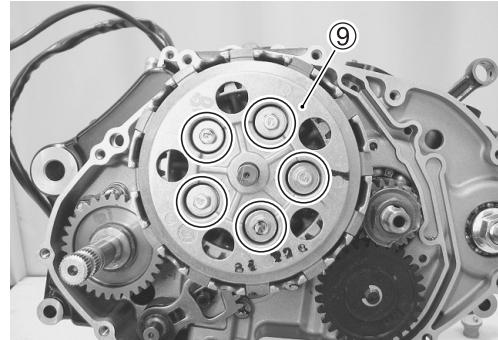
Insert all the the drive plates in such a way that the claws having undercut Ⓒ are in between the two claws Ⓓ of clutch housing not having undercut.



- Apply engine oil to the bearing ⑦.
- Install the bearing ⑦ and clutch release rack ⑧ into the clutch pressure plate.



- Install the clutch pressure plate ⑨, clutch springs and clutch spring mounting bolts.
- Tighten the clutch spring set bolts securely in diagonal steps.

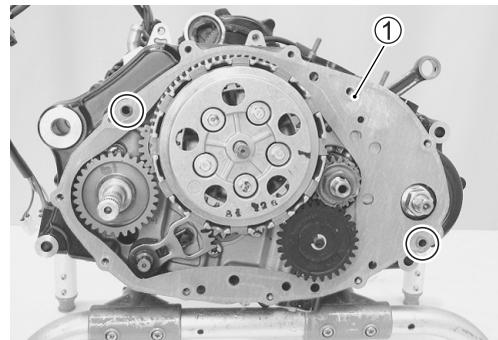


CLUTCH COVER

- Install the gasket ① and dowel pins.

CAUTION

Use a new gasket to prevent oil leakage.

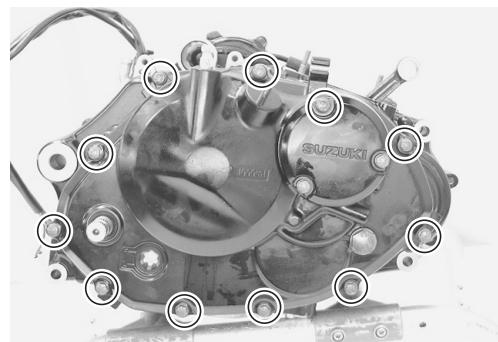
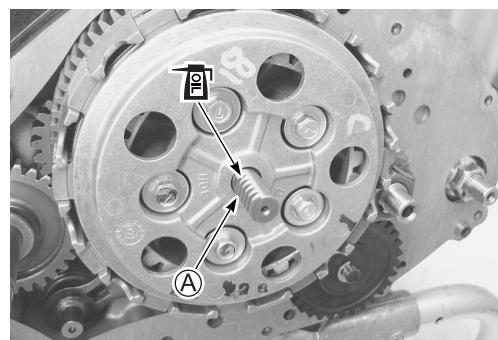


NOTE:

- * Apply engine oil to the clutch release rack gear A.
- * The gear side A of the clutch release rack must face left side.

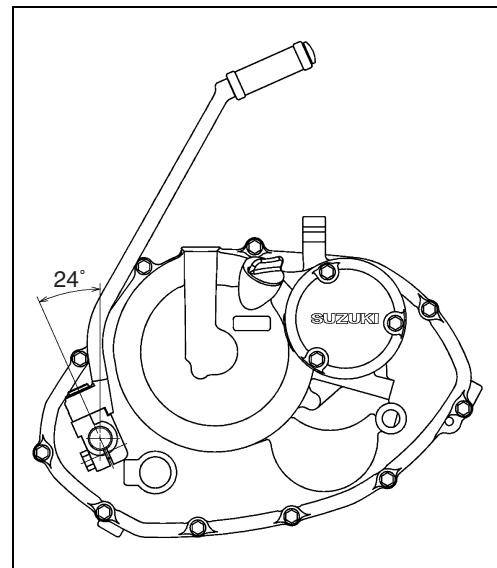
- Tighten the clutch cover bolts to the specified torque.

Clutch cover bolt: 10 N·m (1.0 kgf·m)



KICK STARTER LEVER

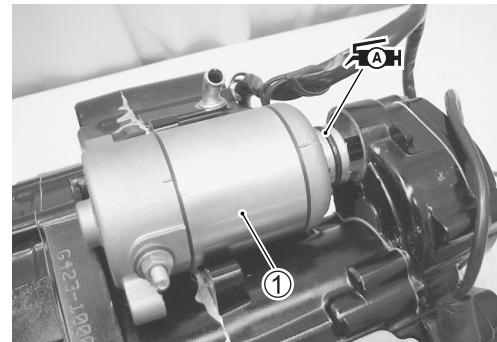
- Install the kick starter lever as shown.

**STARTER MOTOR**

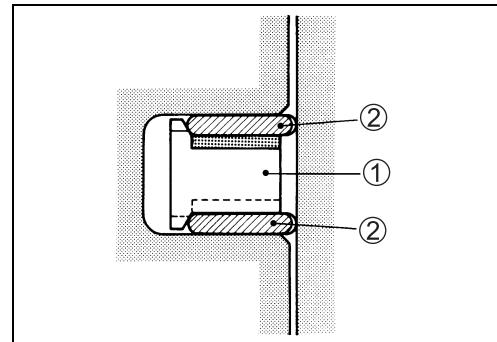
- Apply SUZUKI SUPER GREASE "A" to the O-ring.

 SUZUKI SUPER GREASE "A"

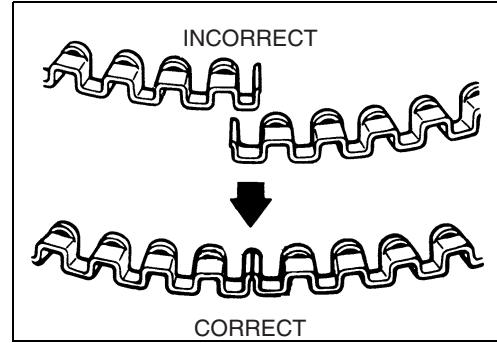
- Pass the magneto lead wire and install the starter motor ①.
(7-13)

**PISTON RING**

- First, install a spacer ① into the oil ring groove and then install two side rails ②. 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.

**CAUTION**

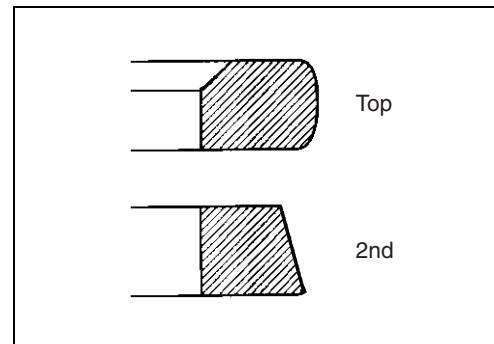
When installing the spacer, be careful not to allow its two ends to overlap in the piston ring groove.



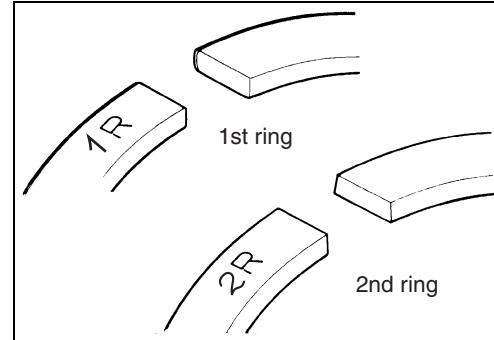
- Install the 2nd ring and 1st ring.

NOTE:

1st ring and 2nd ring differ in shape.



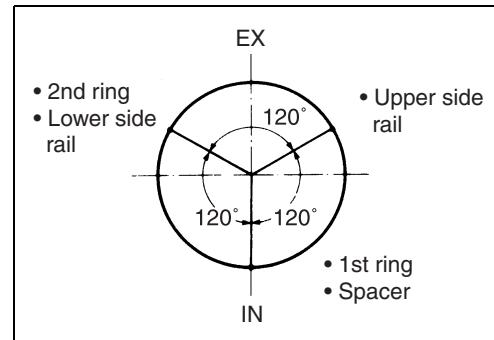
- The 1st and 2nd piston rings should be installed with their marks facing up.



- Position the piston ring gaps as shown.

NOTE:

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



PISTON

- Before installing the piston pin ①, apply molybdenum oil solution onto its surface.
- Apply molybdenum oil solution to the big and small ends of the conrod.

MOLYBDENUM OIL SOLUTION

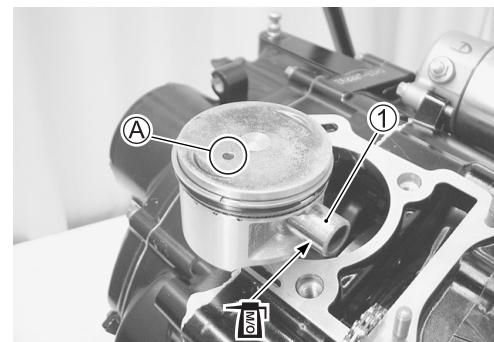
- Install the piston with the circle concave Ⓐ facing towards the exhaust side.
- Place a clean rag over the cylinder base to prevent the piston pin circlip from dropping into crankcase. Install the piston pin circlip ②.

CAUTION

Use a new piston pin circlip ② to prevent circlip failure.

NOTE:

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

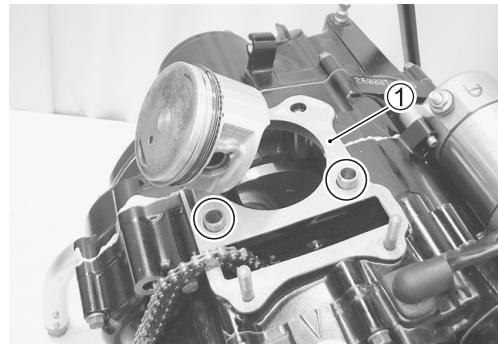


CYLINDER/CYLINDER HEAD

- Before installing the cylinder, oil the big end and small end of the conrod and also the sliding surface of the piston, piston ring set and cylinder bore.
- Install the dowel pins and a new gasket ①.

CAUTION

Use a new gasket to prevent oil leakage.

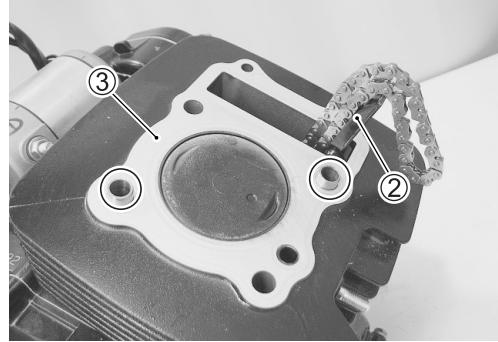


- Hold each piston ring with properly position, and insert the piston into the cylinder.

NOTE:

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

- Install the cam chain guide ②.
- Install the dowel pins and a new gasket ③.

**CAUTION**

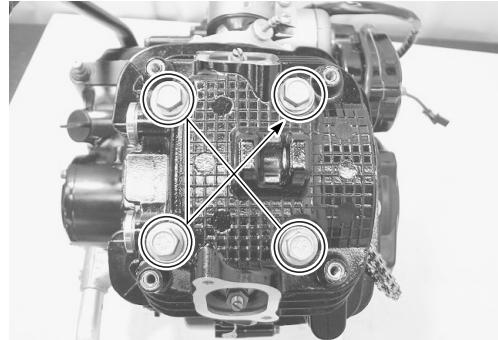
Use a new gasket to prevent oil leakage.

- Install the cylinder head and tighten the cylinder head bolts to the specified torque diagonally.

NOTE:

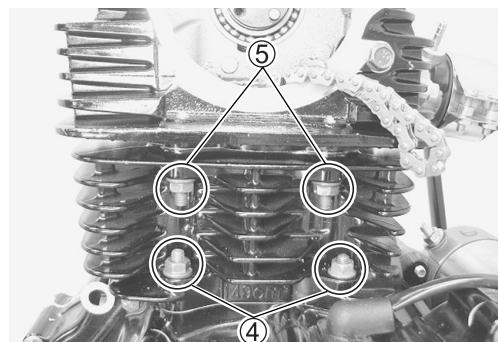
The chamfer side of washer face to the cylinder head side.

 **Cylinder head bolt: 25 N·m (2.5 kgf·m)**



- Tighten the cylinder base nuts ④ and cylinder head nuts ⑤ to the specified torque.

 **Cylinder base nut ④: 10 N·m (1.0 kgf·m)**
Cylinder head nut ⑤: 10 N·m (1.0 kgf·m)

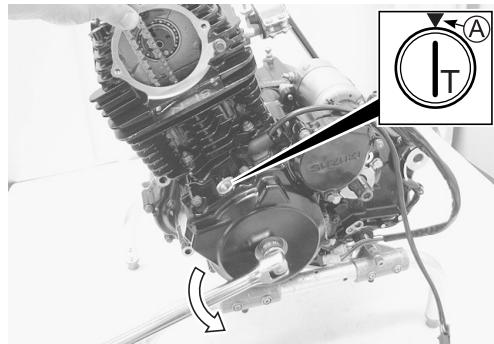


CAMSHAFT SPROCKET

- Turn the crankshaft counterclockwise, and align the “|T” mark on the magneto rotor with the mark **A** on the magneto cover while keeping the cam chain tight.

CAUTION

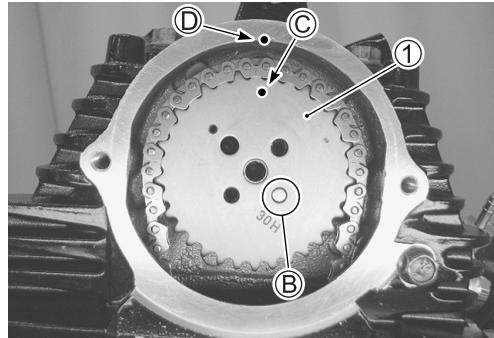
If the crankshaft is turned without drawing the cam chain upward, the cam chain will catch between crank-case and cam chain drive sprocket.



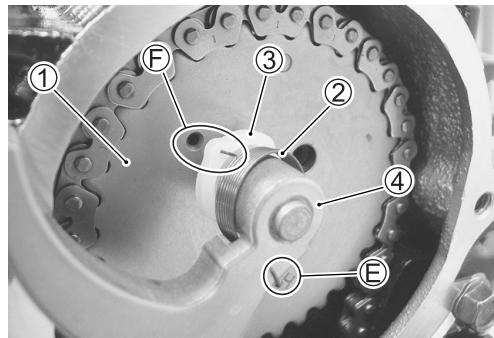
- Engage the chain on the cam sprocket with the locating pin **B** at just top position and then install the cam sprocket **①** on the camshaft, after align top mark **C** with top mark **D**.

NOTE:

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

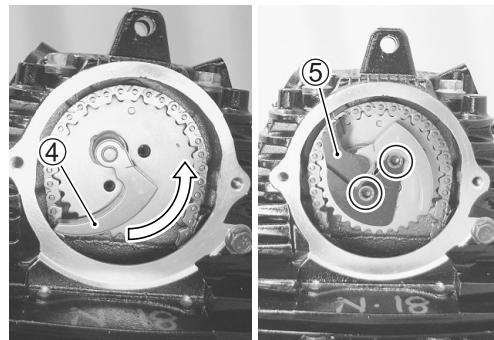


- Install the spring **②** and plastic washer **③** to the decompression cam **④**.
- Hook the part **E** of the spring onto the decompression cam **④** and fit the part **F** to the plastic washer **③** hole and hole of cam sprocket **①**.



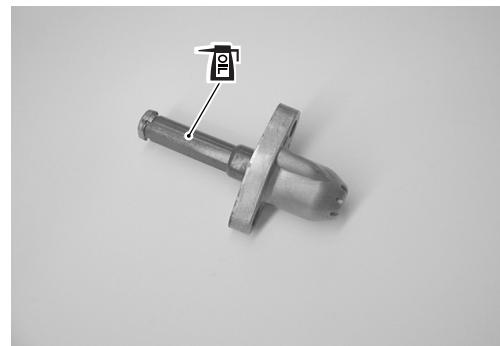
- Turn the decompression cam **④** counterclockwise, and install the decompression cam stopper **⑤**.
- Tighten the camshaft sprocket bolts to the specified torque.

Camshaft sprocket bolt: 11 N·m (1.1 kgf·m)

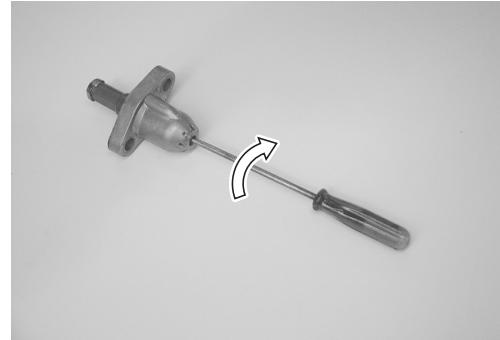


CAM CHAIN TENSION ADJUSTER

- Apply engine oil to the push rod.



- Turn the adjusting screw clockwise with a flat-bladed screw driver to lock.



- Fit a new gasket ①.

CAUTION

Use a new gasket to prevent oil leakage.

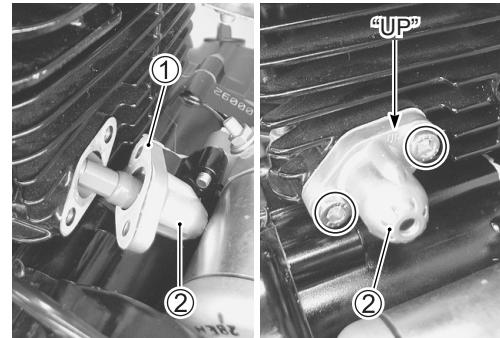
- Install the cam chain tension adjuster ② to the cylinder and tighten the bolts to the specified torque.

NOTE:

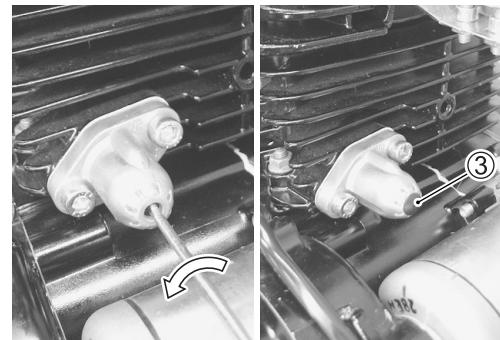
Make sure that the "up" mark faces up.

 **Cam chain tension adjuster mounting bolt:**

10 N·m (1.0 kgf·m)



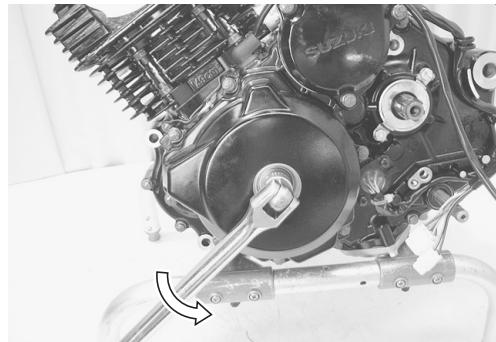
- Turn the adjusting screw counterclockwise with a flat-bladed screw driver to unlock.
- Install the rubber cap ③.



- After installing the cam chain tension adjuster, rotate the crankshaft (some turns), and recheck the positions of the cam shafts.

CAUTION

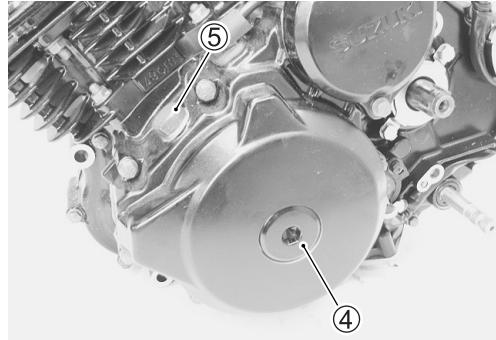
Be sure to check the valve clearance. (☞ 2-6)



- Tighten the magneto cover plug ④ and valve timing inspection plug ⑤ to the specified torque.

■ Magneto cover plug ④: 5 N·m (0.5 kgf·m)

Valve timing inspection plug ⑤: 21 N·m (2.1 kgf·m)



CYLINDER HEAD COVER

- Apply grease to the new O-rings and install them to the cylinder head cover ① and valve inspection caps ②.

CAUTION

Use the new O-rings to prevent oil leakage.

■ SUZUKI SUPER GREASE "A"

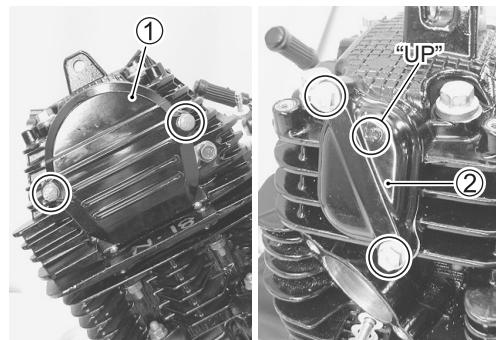
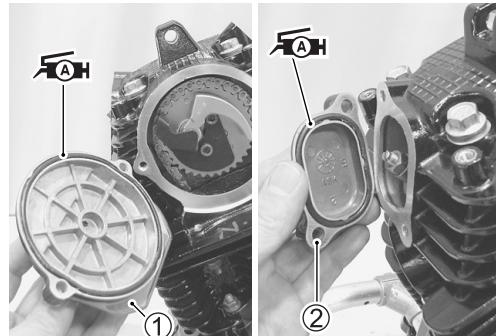
- Tighten the cylinder head cover bolts and valve inspection cap bolts.

NOTE:

Make sure that the "UP" mark comes to the up side.

■ Cylinder head cover bolt: 10 N·m (1.0 kgf·m)

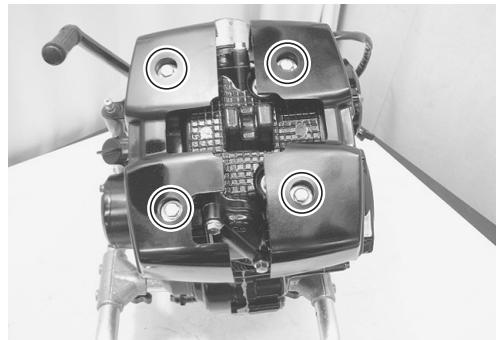
Valve inspection cap bolt: 10 N·m (1.0 kgf·m)



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

■ Cylinder head cover cap bolt: 10 N·m (1.0 kgf·m)

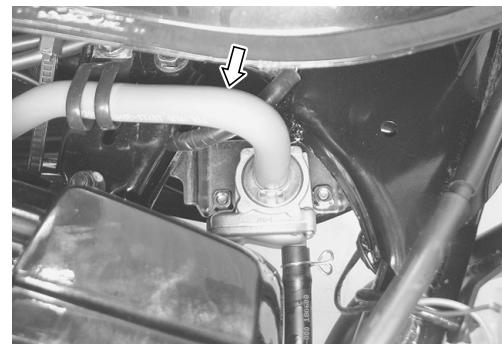
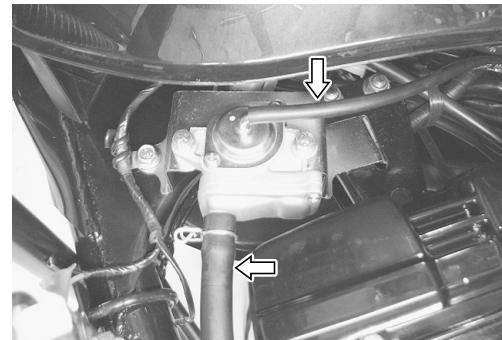
- Install the spark plug. (☞ 2-9)



PAIR (AIR SUPPLY) SYSTEM

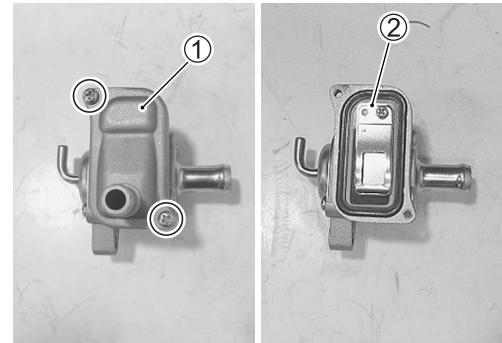
PAIR HOSES INSPECTION

- Inspect the PAIR hoses for wear or damage.
- Inspect the PAIR hoses are securely connected.



PAIR REED VALVE AND PAIR CONTROL VALVE INSPECTION

- Remove the PAIR control valve assembly. (☞2-6)
- Remove the PAIR reed valve cover ① and PAIR reed valve ②.

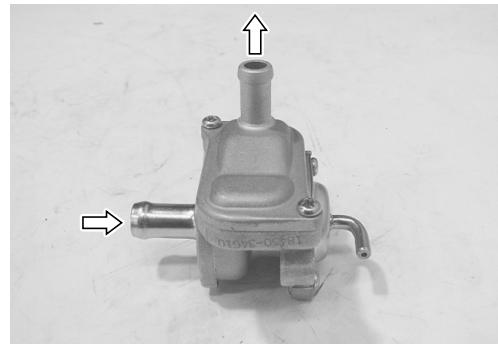


- Inspect the reed valve for the carbon deposit.
- If the carbon deposit is found in the reed valve, replace the PAIR reed valve with a new one.



PAIR CONTROL VALVE INSPECTION

- Remove the PAIR control valve assembly. (☞2-6)
- Inspect that air flows through the PAIR control valve air inlet port to the air outlet port. If air does not flow out, replace the PAIR control valve with a new one.



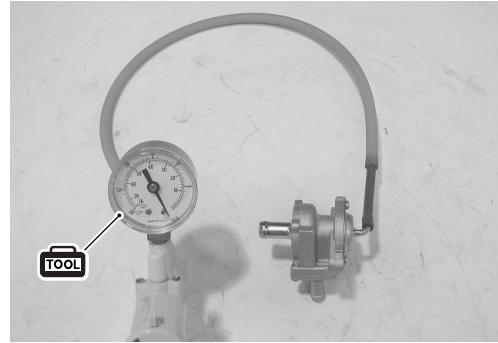
- Connect the vacuum pump gauge to the vacuum port of the control valve as shown in the photograph.
- Apply negative pressure slowly to the PAIR control valve and inspect the air flow. If air does not flow out, the PAIR control valve is in normal condition. If the PAIR control valve does not function, replace the PAIR control valve with a new one.

DATA Negative pressure range: 1.47 kPa (150 mmHg)

Vacuum pump gauge set

CAUTION

Use a hand operated vacuum pump to prevent the control valve damage.



FUEL AND LUBRICATION SYSTEM

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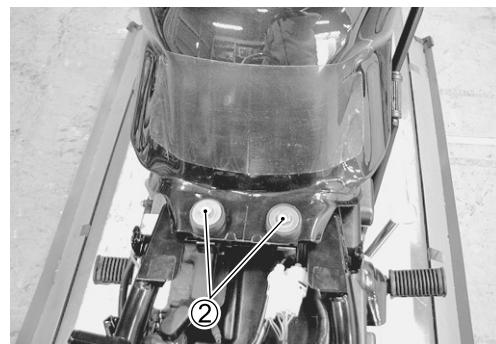
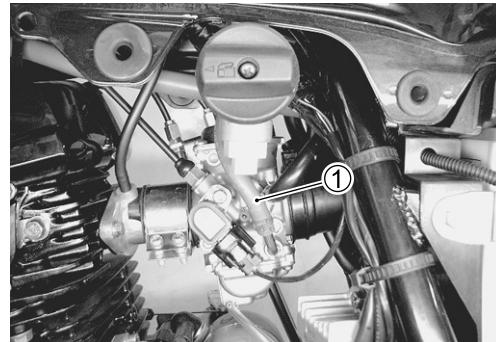
FUEL TANK/FUEL VALVE/FUEL LEVEL GAUGE

REMOVAL

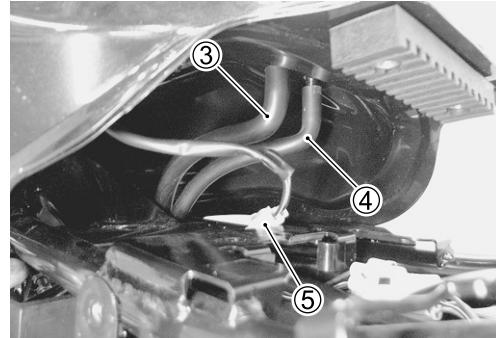
⚠ WARNING

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

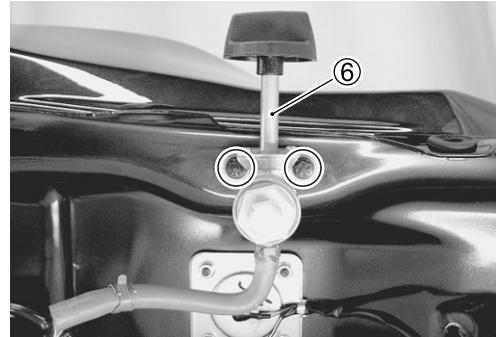
- Remove the seat. (☞ 5-4)
- Remove the left and right frame side lower covers. (☞ 5-4)
- Turn the fuel valve to “OFF” position and disconnect the fuel hose ①.
- Remove the fuel tank mounting bolts ②.



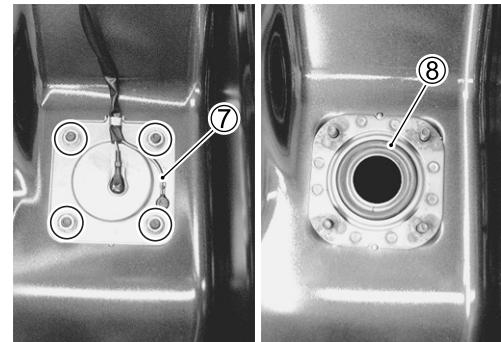
- Lift and support the fuel tank.
- Disconnect the fuel tank air breather hose ③ and water drain hose ④.
- Disconnect the fuel level gauge lead wire coupler ⑤.
- Remove the fuel tank.



- Remove the fuel valve ⑥.



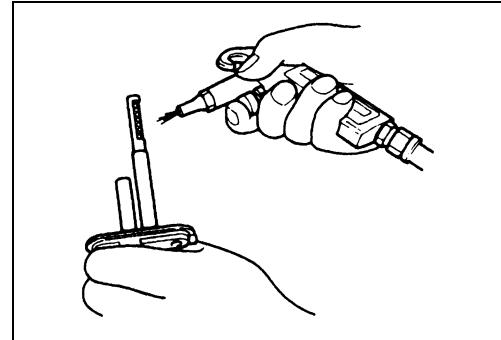
- Remove the fuel level gauge ⑦ and O-ring ⑧.



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.



FUEL LEVEL GAUGE

(☞ 6-29)

REMOUNTING

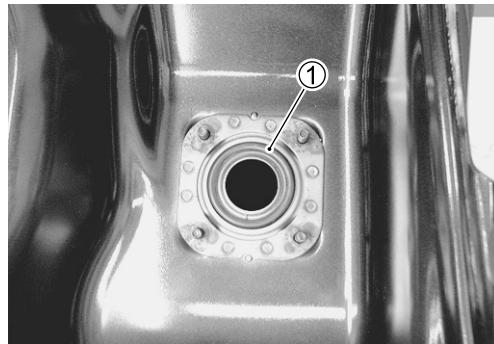
Remount the fuel level gauge, fuel valve and tank in the reverse order of removal. Pay attention to the following points:

FUEL LEVEL GAUGE

- Install the new O-ring ①.

⚠ WARNING

The O-ring must be replaced with a new one to prevent fuel leakage.



FUEL VALVE

- Install the fuel valve ①.

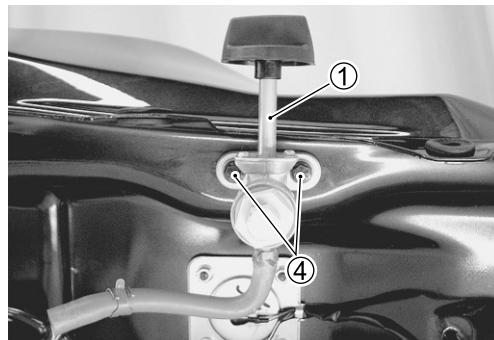
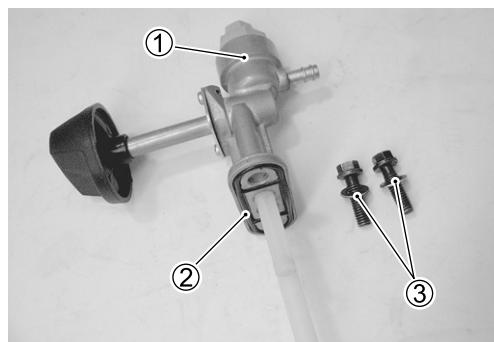
⚠ WARNING

Replace the removed gasket ② and seal washers ③ with new ones to prevent leakage of fuel.

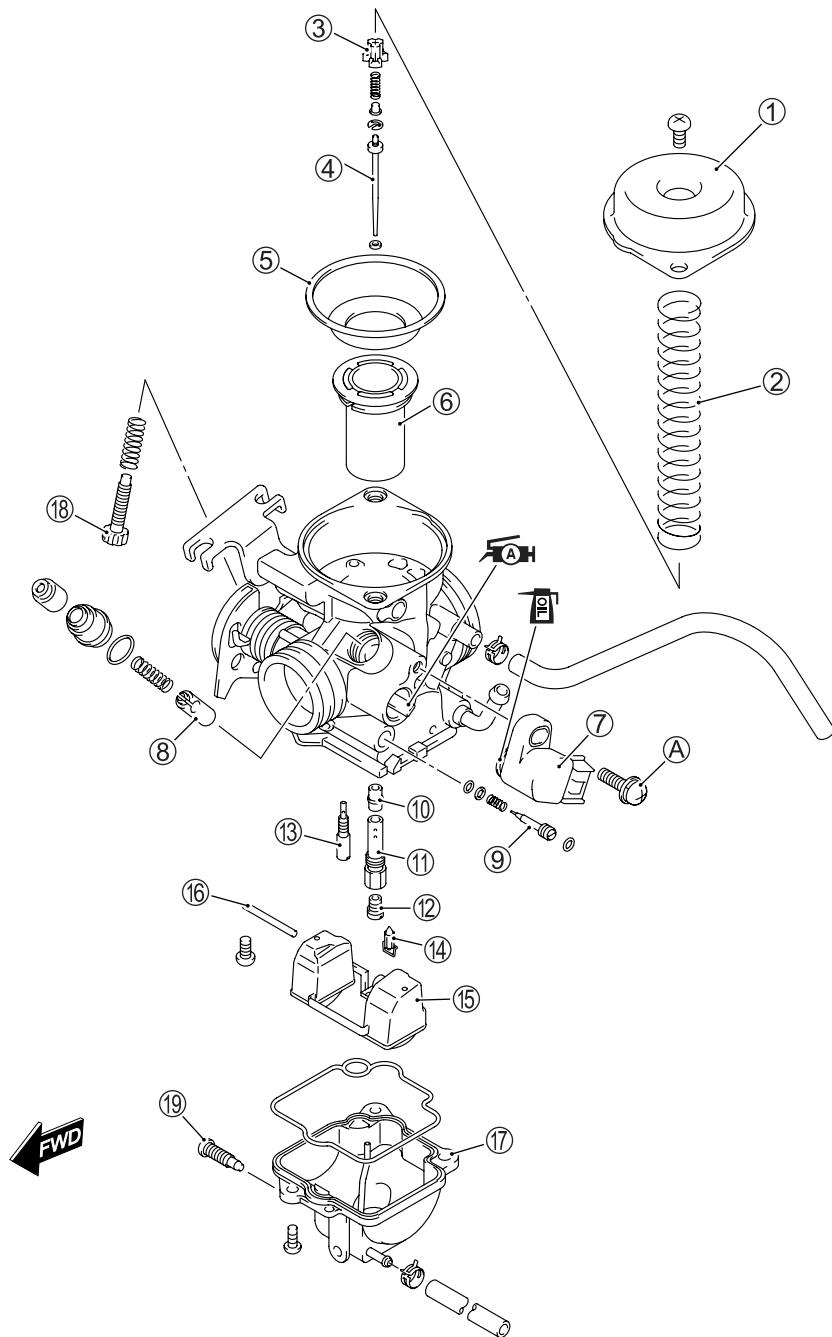
- Tighten the fuel valve bolts ④ to the specified torque.

Fuel valve bolt ④: 4.4 N·m (0.44 kgf·m)

- Check the fuel hose routing. (☞ 7-17)



CARBURETOR CONSTRUCTION



①	Top cap	⑨	Pilot screw	⑯	Float chamber
②	Spring	⑩	Needle jet	⑯	Idle stop screw
③	Holder	⑪	Needle jet holder	⑯	Drain plug
④	Jet needle	⑫	Main jet	Ⓐ	Throttle position sensor mounting screw
⑤	Diaphragm	⑬	Pilot jet		
⑥	Piston valve	⑭	Needle valve		
⑦	Throttle position sensor	⑮	Float		
⑧	Starter plunger	⑯	Float pin		

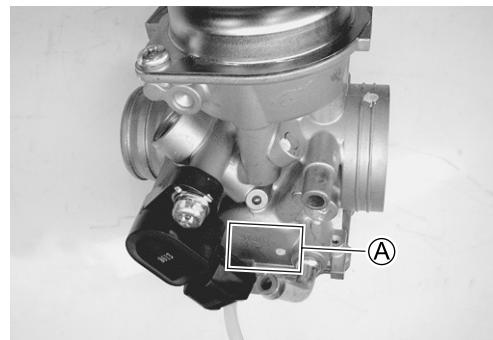
ITEM	N·m	kgf·m
Ⓐ	3.5	0.35

SPECIFICATIONS

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS26
Bore size	26 mm
I.D. No.	30H0
Idle r/min	1400 ± 100 r/min
Float height	10.5 ± 0.5 mm
Main jet (M.J.)	#110
Jet needle (J.N.)	4DN22-2
Needle jet (N.J.)	E-3M
Throttle valve (Th.V.)	#110
Pilot jet (P.J.)	#15
Pilot air jet (P.A.J.)	1.4
Pilot screw (P.S.)	2 turns out
Throttle cable play	2.0 – 4.0 mm

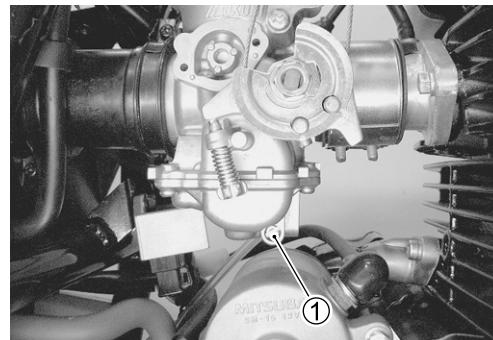
I.D. NO. LOCATION

Carburetor has an I.D. number **Ⓐ** on its body.

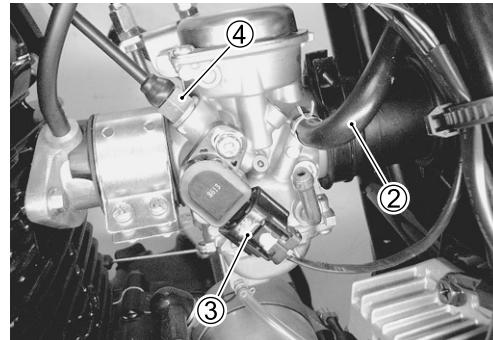


REMOVAL

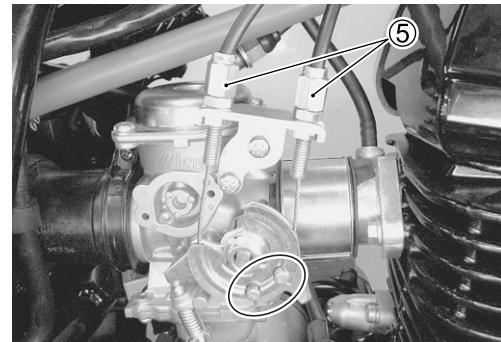
- Remove the seat. (☞5-4)
- Remove the left and right frame side lower covers. (☞5-4)
- Remove the fuel tank. (☞4-2)
- Drain gasoline by loosen the screw ①.



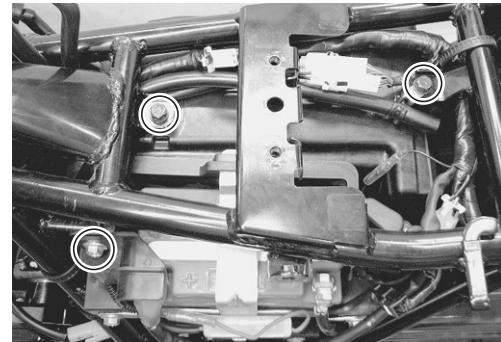
- Disconnect the air vent hose ② and throttle position sensor coupler ③.
- Remove the starter plunger assembly ④.



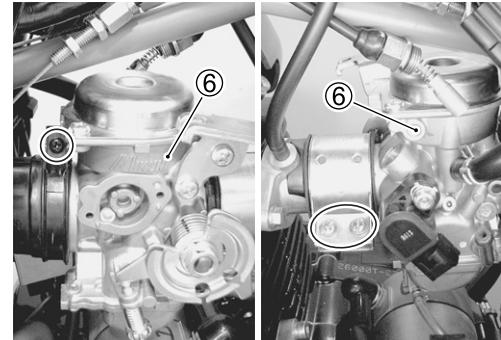
- Disconnect the throttle cables ⑤.



- Remove the air cleaner mounting bolts.

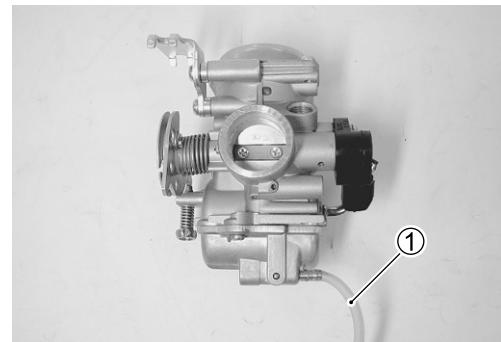


- Loosen the clamp screws.
- Slightly move the air cleaner box backward and remove the carburetor ⑥.



DISASSEMBLY

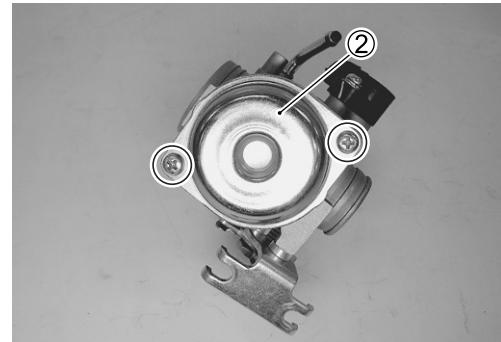
- Disconnect the overflow hose ①.



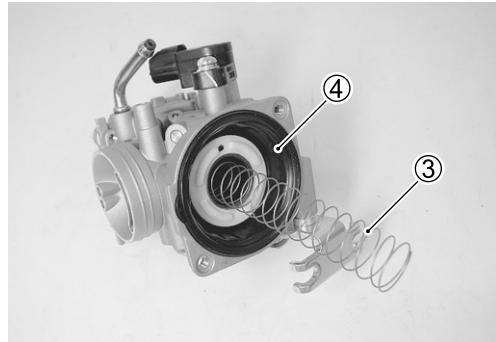
- Remove the carburetor top cap ②.

CAUTION

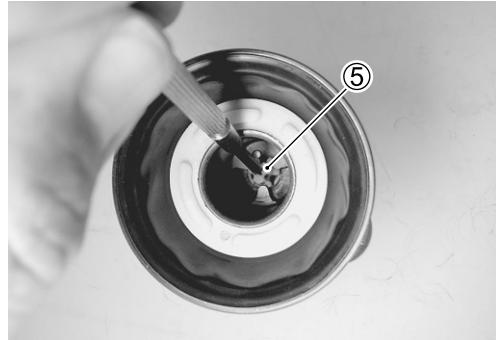
Do not blow the carburetor body with compressed air, before removing the diaphragm. It may cause a damage to the diaphragm.



- Remove the spring ③ and diaphragm ④.

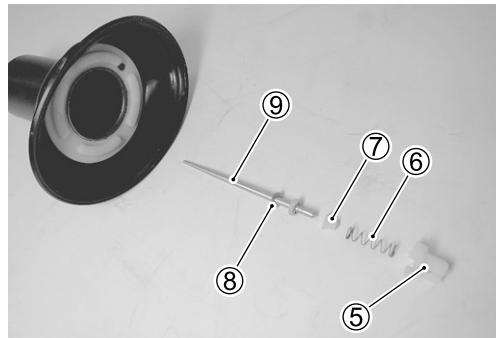


- Remove the holder ⑤ by turning it counterclockwise with a screwdriver.

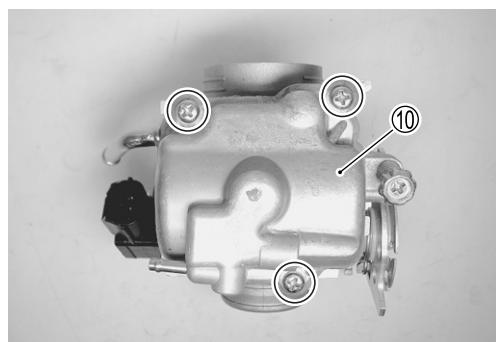


- Remove the following parts.

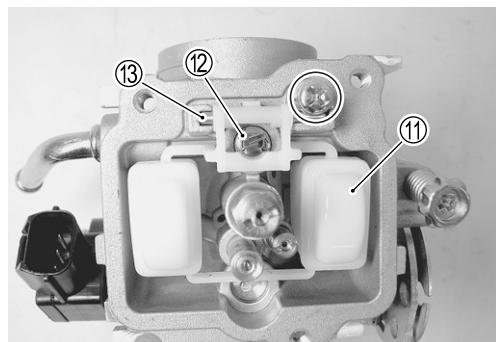
⑤ Holder
 ⑥ Spring
 ⑦ Ring
 ⑧ Washer
 ⑨ Jet needle



- Remove the float chamber body ⑩.



- Remove the float assembly ⑪ and needle valve ⑫ by removing the pin ⑬.

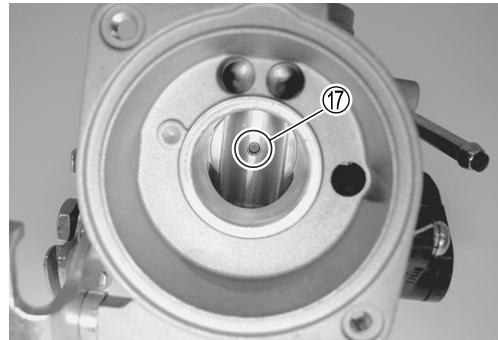
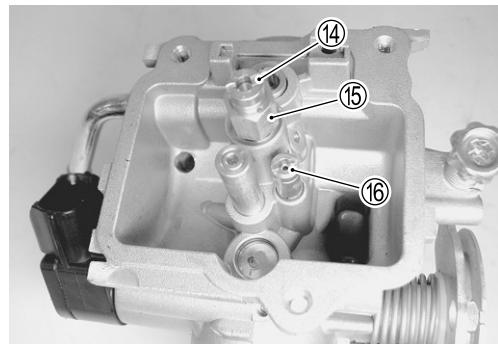


- Remove the following parts.

- ⑯ Main jet
- ⑯ Needle jet holder
- ⑯ Pilot jet
- ⑯ Needle jet

CAUTION

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

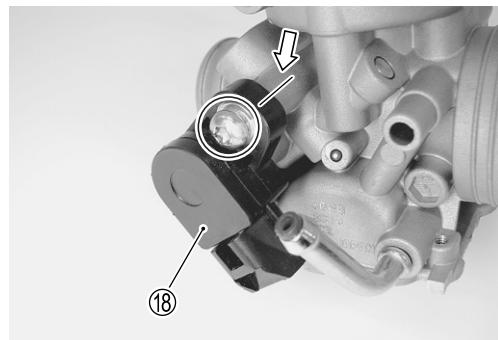


- Remove the throttle position sensor ⑯ with the special tool.

TOOL **Torx wrench (5 mm)**

NOTE:

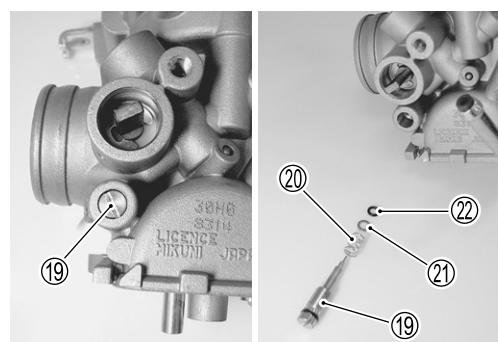
Prior to disassembly, mark the throttle position sensor original position with a paint or scribe for accurate reinstallation.



- Remove the pilot screw ⑯, spring ⑯, washer ⑯ and O-ring ⑯.

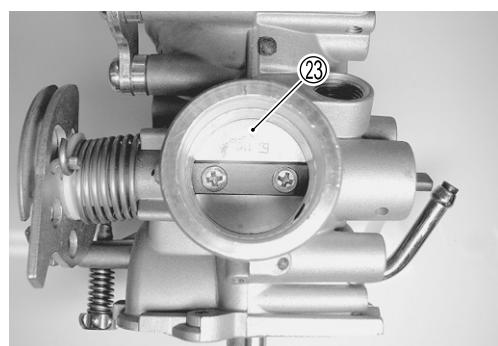
NOTE:

Before removing the pilot screw ⑯, determine the setting by slowly turning it clockwise and count the number of turns required to lightly seat the screw. This counted number is important when reassembling pilot screw to original position.



CAUTION

Never remove the throttle valve ⑯.



CLEANING

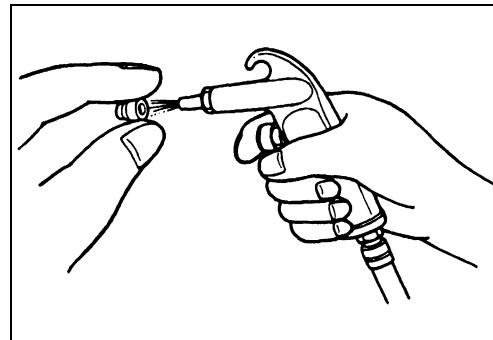
⚠ WARNING

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

- Clean all jets with a spray-type carburetor cleaner and 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.

CAUTION

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



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

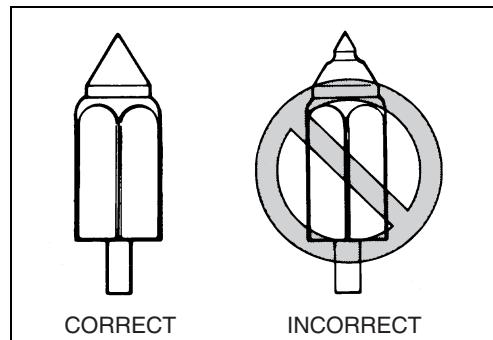
INSPECTION

Check the following items for damage or clogging.

- * Pilot jet
- * Main jet
- * Main air jet
- * Pilot air jet
- * Needle valve
- * Needle jet
- * Needle jet holder
- * Jet needle
- * Needle jet air bleeding hole
- * Diaphragm
- * Pilot outlet and by-pass ports
- * Float
- * Starter passage
- * Pilot screw
- * Piston valve
- * Seal and O-rings

NEEDLE VALVE

If foreign matter is caught between the valve seat and the needle valve, the gasoline will continue flowing and cause it to 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 together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.



FLOAT HEIGHT ADJUSTMENT

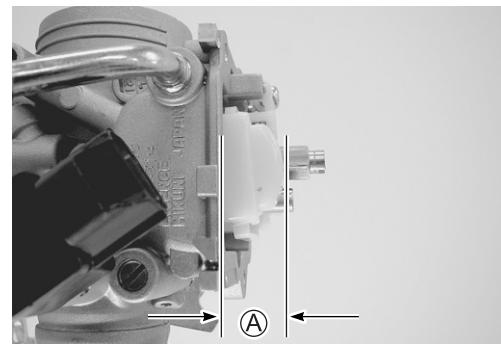
- To check the float height, tilt the carburetor body, with the float arm kept free, measure the height **A** while the float arm is just contacting the needle valve by using venier calipers.

DATA **Float height **A**:** 10.5 ± 0.5 mm

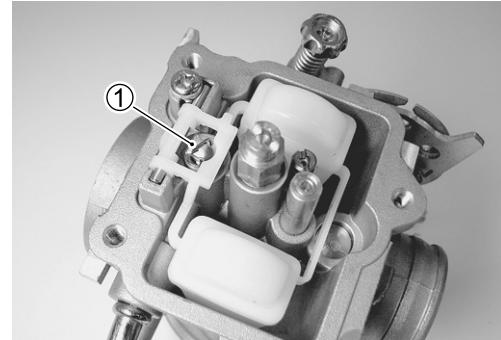
TOOL **Venier calipers (200 mm)**

NOTE:

This data is approximate values for reference purpose.



- If necessary slightly bend the float arm **①** to change the float height **A**.



REASSEMBLY AND REMOUNTING

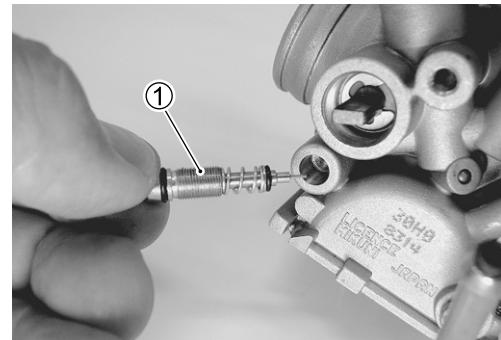
Reassemble and remount the carburetor in the reverse order of disassembly and removal. Pay attention to the following points:

PILOT SCREW

- Install the pilot screw **①**.

NOTE:

*Turn in the pilot screw **①** until it lightly seats, then back it out the counted number of turns. (➡ 4-6)*



CAUTION

Replace the O-rings with new ones.

THROTTLE POSITION SENSOR

- Install the throttle position sensor **①** and tighten the throttle position sensor mounting screw to the specified torque.

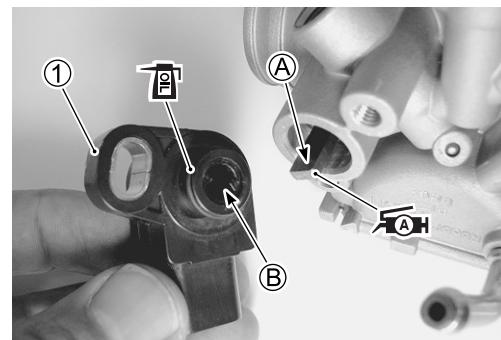
NOTE:

- * Apply thin coat of the engine oil to the O-ring.
- * Align the throttle shaft end **A** with the groove **B** of the throttle position sensor.
- * Apply SUZUKI SUPER GREASE "A" to the throttle shaft end **A** if necessary.

SUZUKI SUPER GREASE "A"

TOOL **Torx wrench (5 mm)**

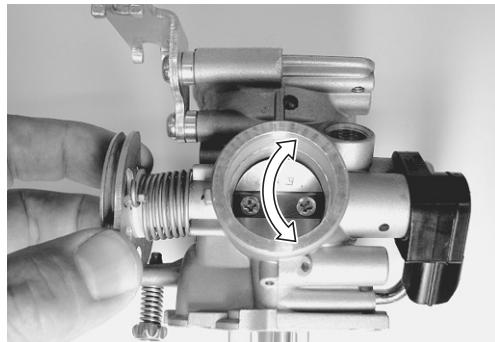
Throttle position sensor mounting screw: 3.5 N·m (0.35 kgf·m)



NOTE:

Make sure the throttle valve open or close smoothly.

- Close and open the throttle valve, and measure the valve closing and opening resistance.
- If the throttle position sensor resistance is out of specification, loosen the throttle position sensor mounting screw and adjust the throttle position sensor resistance to specification.
- Tighten the throttle position sensor mounting screw to the specified torque.

**DATA Throttle position sensor total of resistance:**

4 – 6 k Ω (BI A – B/W C)

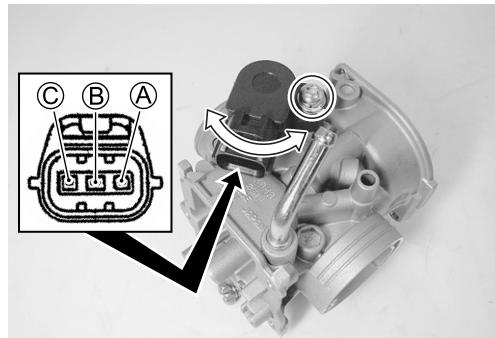
DATA Throttle position sensor resistance:

When the throttle fully closed:

Approx. 1.76 k Ω (B/G B – B/W C)

When the throttle fully opened:

Approx. 5.12 k Ω (B/G B – B/W C)

**TOOL Multi circuit tester set**

Torx wrench (5 mm)

Throttle position sensor mounting screw:

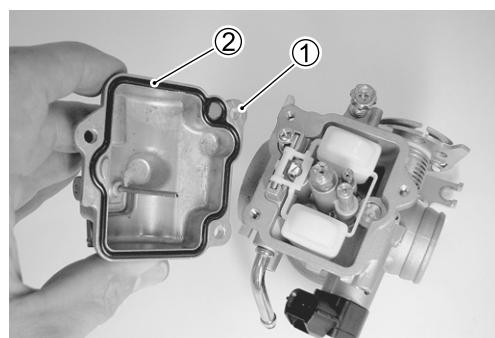
3.5 N·m (0.35 kgf-m)

Tester knob indication: Resistance (Ω)**FLOAT CHAMBER**

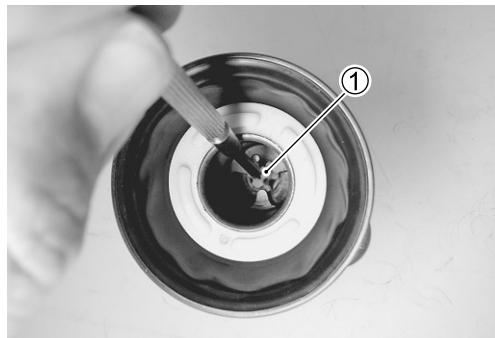
- Install the float chamber ①.

CAUTION

Replace the O-ring ② with a new one.

**JET NEEDLE**

- Fit the jet needle assembly and spring to the piston valve.
- Install the holder ① by turning it clockwise with a screwdriver.

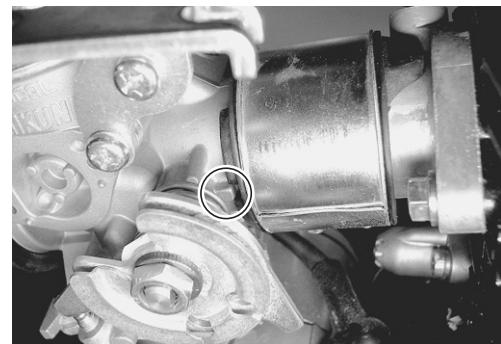
**DIAPHRAGM**

- Position the diaphragm to the carburetor body properly.



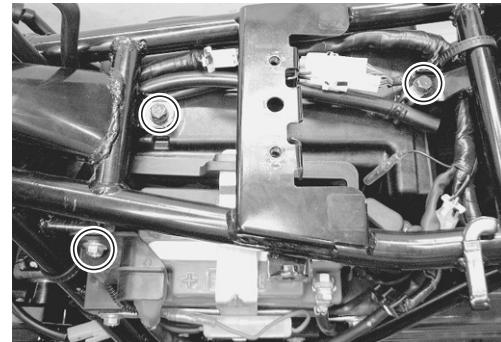
CARBURETOR

- Fit the projection on the carburetor body to the depression of the intake pipe.
- Tighten the carburetor clamp screws as shown in illustration. (☞ 7-16)

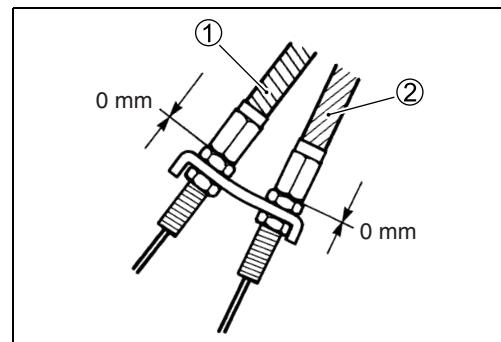


- Tighten the air cleaner box mounting bolts to the specified torque.

Air cleaner box mounting bolt: 10 N·m (1.0 kgf-m)

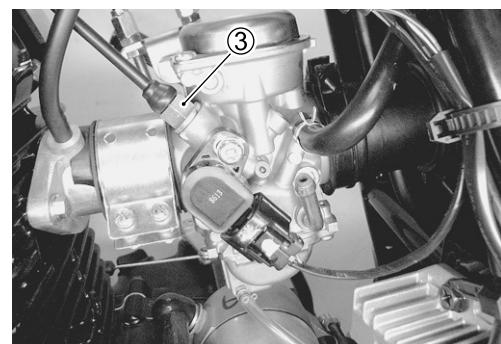


- Connect the throttle pulling cable ① and throttle returning cable ② to the throttle cable drum.



- Tighten the starter plunger ③ to the specified torque.

Starter plunger: 4 N·m (0.4 kgf-m)



After the assembly and installation on the engine have been completed, perform the following adjustment.

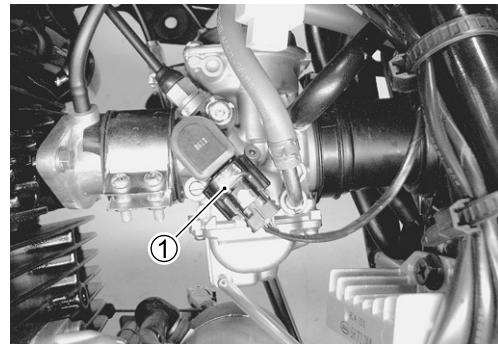
* Engine idle speed (☞ 2-12)

* Throttle cable play (☞ 2-11)

THROTTLE POSITION SENSOR INSPECTION

THROTTLE POSITION SENSOR INPUT VOLTAGE

- Disconnect the throttle position sensor coupler ①.



- Turn the ignition switch ON.
- Measure the throttle position sensor input voltage between BI wire and B/W wire.

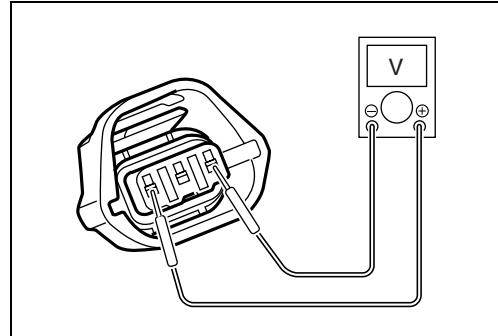
DATA Throttle position sensor input voltage:

4.5 – 5.5 V (+ BI – ⊖ B/W)

TOOL Multi circuit tester set

 Tester knob indication: Voltage (—)

- If the voltage is not within the specified value, replace the CDI unit.



THROTTLE POSITION SENSOR RESISTANCE

- Disconnect the throttle position sensor coupler ①.
( above)
- Measure the throttle position sensor resistance using the multi circuit tester.

DATA Throttle position sensor total of resistance:

4 – 6 kΩ (BI – B/W)

DATA Throttle position sensor resistance:

When the throttle fully closed:

Approx. 1.76 kΩ (B/G – B/W)

When the throttle fully opened:

Approx. 5.12 kΩ (B/G – B/W)

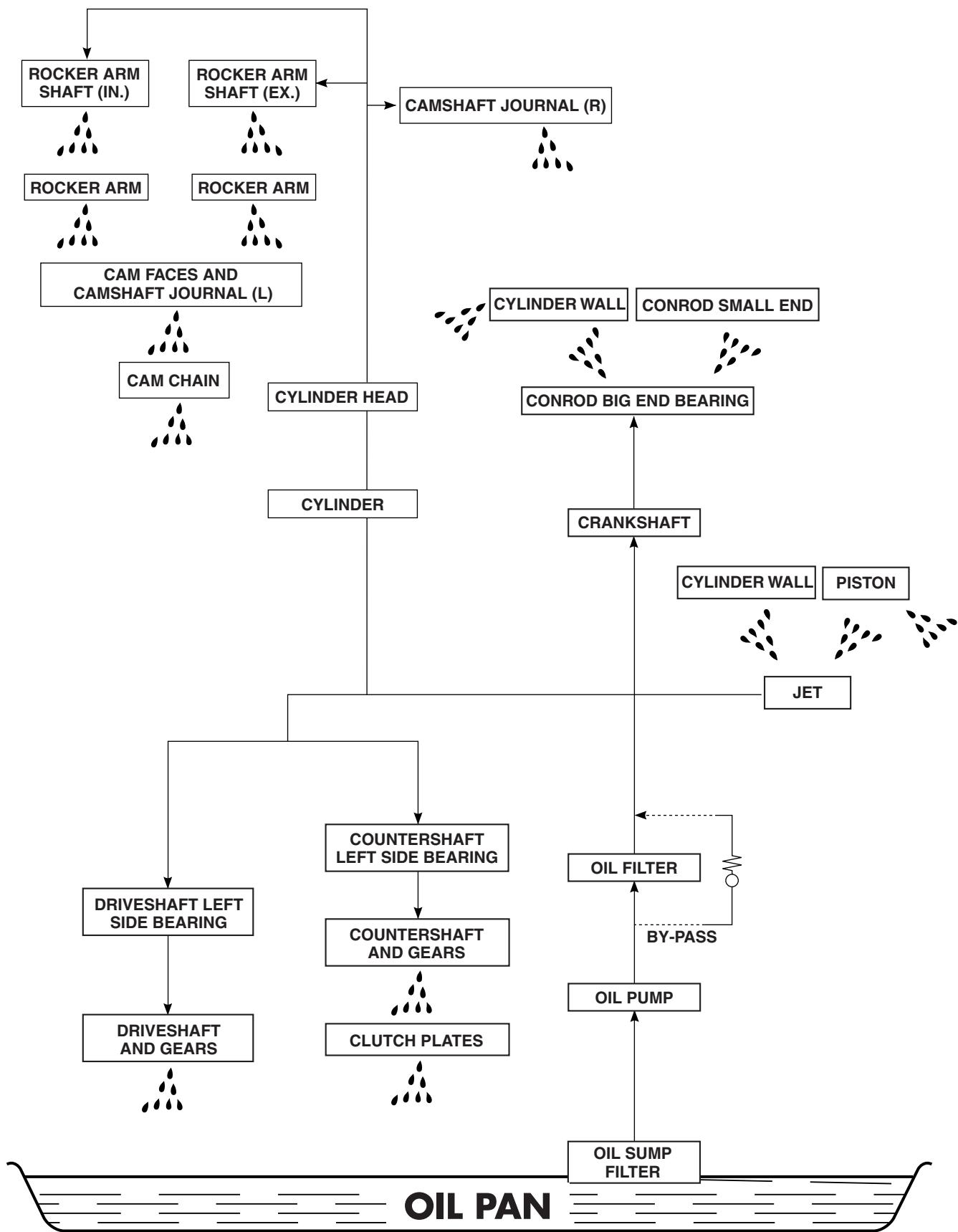
TOOL Multi circuit tester set

 Tester knob indication: Resistance (Ω)

- If the resistance is not within the specified value, replace the throttle position sensor with a new one.

ENGINE LUBRICATION SYSTEM

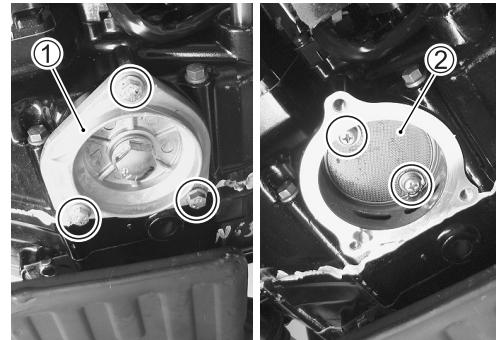
ENGINE LUBRICATION SYSTEM CHART



OIL SUMP FILTER

OIL SUMP FILTER CLEANING

- Drain engine oil as described in the engine oil replacement procedure.
- Remove the oil sump filter cap ①.
- Remove the oil sump filter ②.



- Clean the oil sump filter using compressed air.



- Install the oil sump filter ②.
- Apply engine oil lightly to the new O-ring ③.

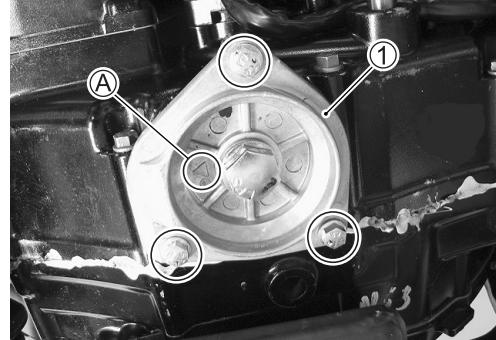


- Install the oil sump filter cap ① and tighten the bolts to the specified torque.

NOTE:

The triangle mark Ⓐ should be positioned forward.

 **Oil sump filter cap bolt: 10 N·m (1.0 kgf·m)**



OIL FILTER

( 2-10)

OIL PRESSURE

( 2-24)

OIL PUMP

( 3-15 and 3-62)

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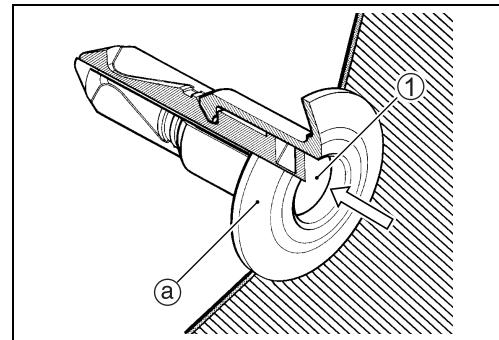
EXTERIOR PARTS

FASTENER REMOVAL AND INSTALLATION

FASTENER

Removal

- Depress the head of fastener center piece ①.
- Pull out the fastener ②.

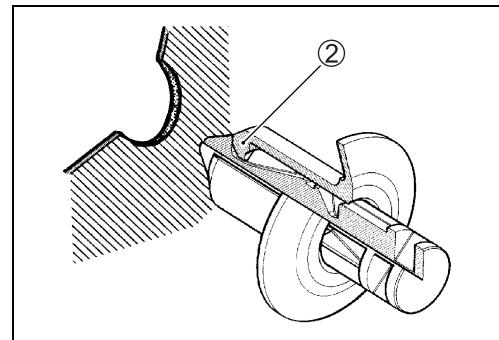


Installation

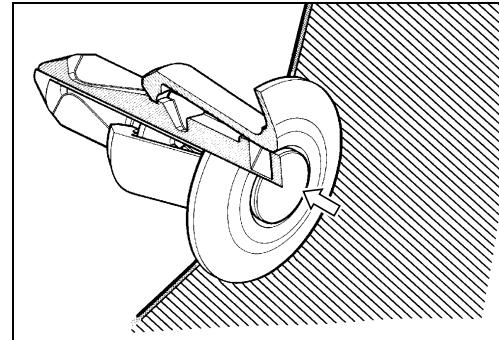
- Let the center piece stick out toward the head so that the pawls ② close.
- Insert the fastener into the installation hole.

NOTE:

To prevent the pawl ② from damage, insert the fastener all the way into the installation hole.



- Push in the head of center piece until it becomes flush with the fastener outside face.

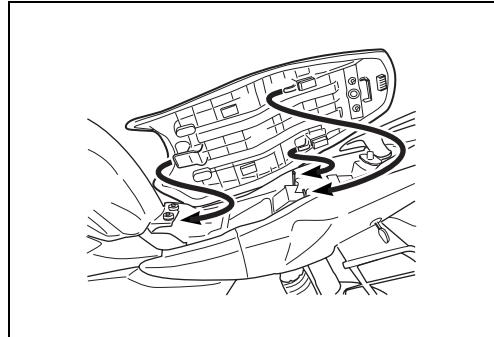


SEAT**REMOVAL**

- Unlock the seat with the ignition key and remove the seat.

**INSTALLATION**

- Slide the seat hooks into the seat hook retainers and push down the seat firmly until the seat snaps into the locked position.

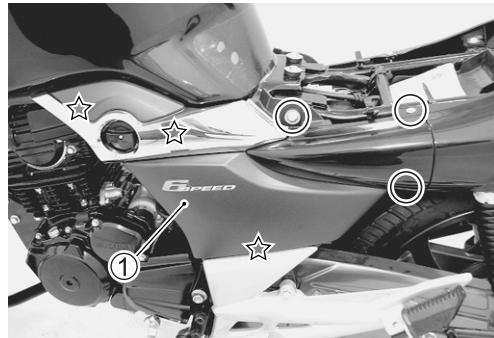
**LEFT FRAME SIDE LOWER COVER****REMOVAL**

- Remove the seat. (☞ above)
- Remove the left frame side lower cover ①.

INSTALLATION

- Install the left frame side lower cover in the order of removal.

☆: Hooked part

**RIGHT FRAME SIDE LOWER COVER****REMOVAL**

- Remove the seat. (☞ above)
- Remove the right frame side lower cover ①.

INSTALLATION

- Install the right frame side lower cover in the order of removal.

☆: Hooked part

**PILLION RIDER HANDLE****REMOVAL**

- Remove the seat. (☞ above)
- Remove the pillion rider handle ①.

INSTALLATION

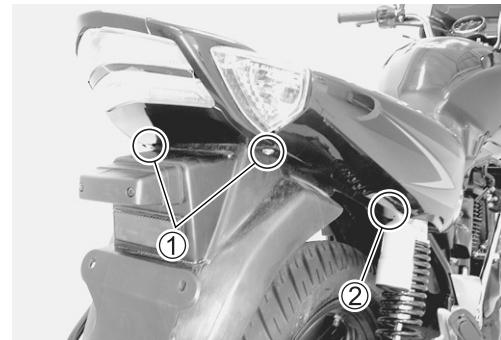
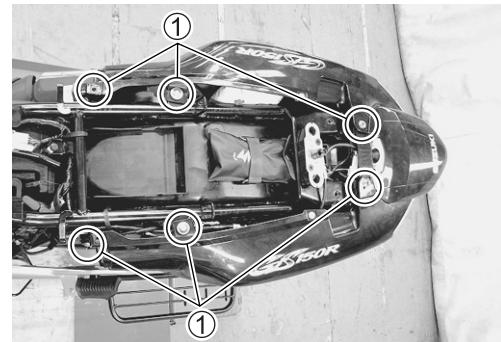
- Install the pillion rider handle in the reverse of removal.



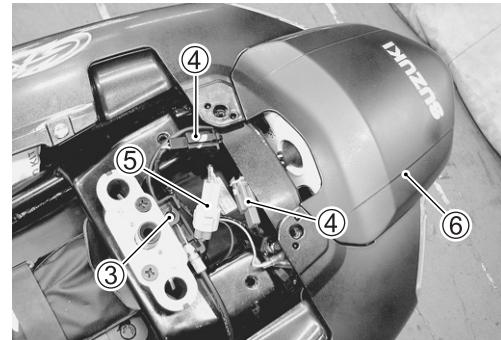
FRAME COVER

REMOVAL

- Remove the frame side lower covers, left and right. (☞5-4)
- Remove the pillion rider handle. (☞5-4)
- Remove the screws ① and fastener ②.



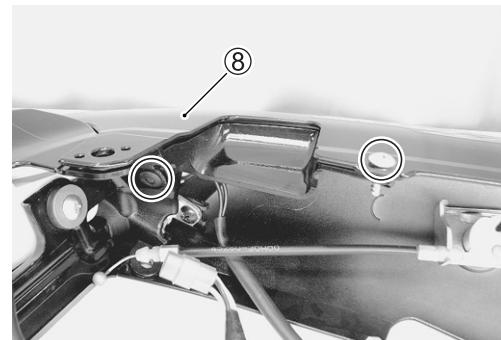
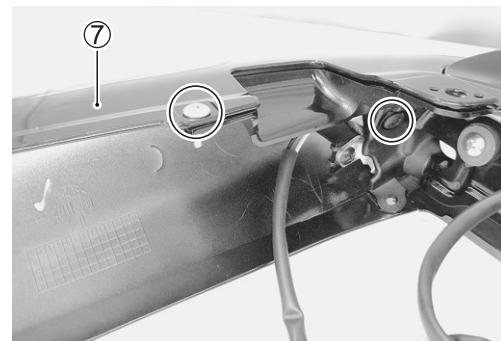
- Disconnect the seat lock cable ③.
- Disconnect the turn signal lead wire couplers ④ and brake light/taillight lead wire coupler ⑤.
- Remove the frame cover assembly ⑥.



- Remove the right frame cover ⑦ and left frame cover ⑧.

INSTALLATION

- Install the frame covers in the reverse order of removal.



FRONT BUMPER

REMOVAL

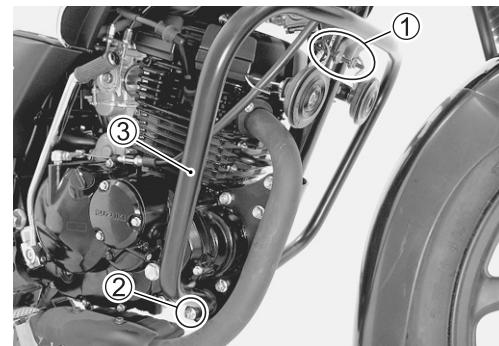
- Remove the nuts and hook ①.
- Remove the nut and bolt ②.
- Remove the front bumper ③.

INSTALLATION

- Install the front bumper in the reverse of removal.
- Tighten the front bumper mounting nuts to the specified torque.

 **Front bumper upper mounting nut ①: 10 N·m (1.0 kgf·m)**

Front bumper lower mounting nut ②: 40 N·m (4.0 kgf·m)



REAR SIDE GUARD

REMOVAL

- Remove the rear side guard ①.

INSTALLATION

- Install the rear side guard in the reverse order of removal.
- Tighten the rear side guard mounting bolts.



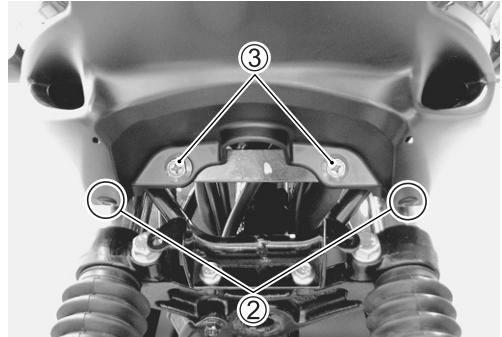
BODY COWLING

REMOVAL

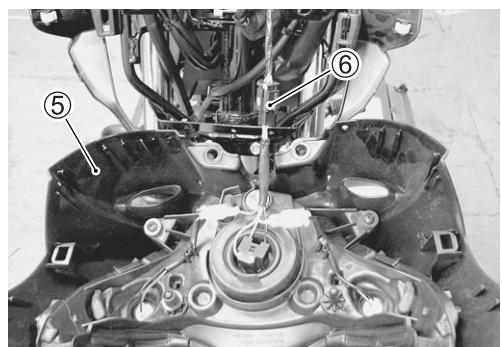
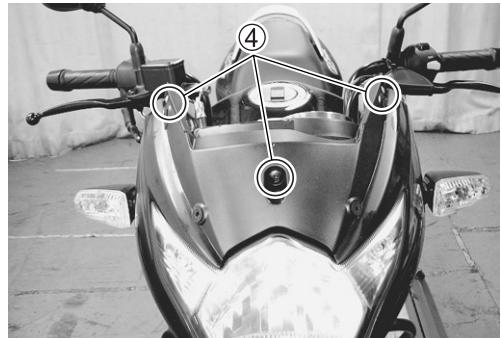
- Remove the screen ①.



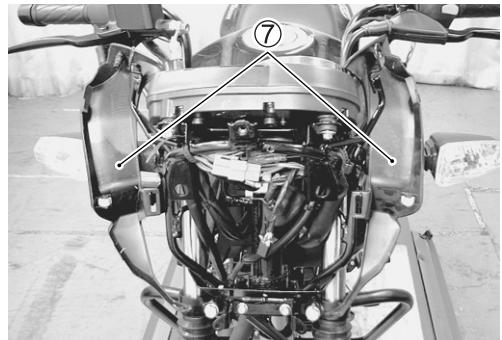
- Remove the fasteners ② and bolts ③.



- Remove the screws ④.
- Remove the body cowling ⑤ by disconnecting the headlight coupler ⑥.



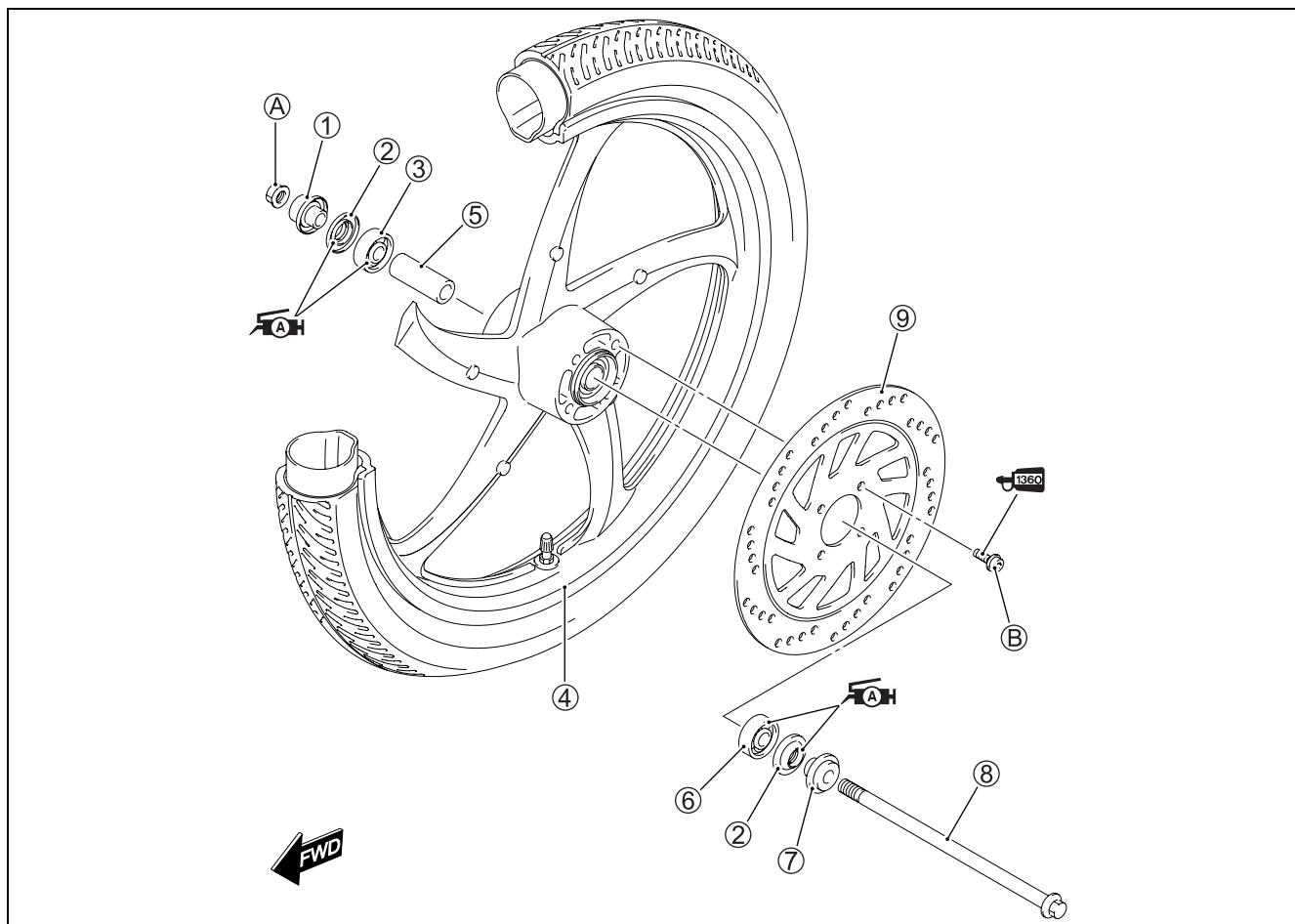
- Remove the side panels ⑦.



INSTALLATION

- Install the body cowling in the reverse order of removal.
(7-23)

FRONT WHEEL



① Spacer	⑦ Spacer
② Dust seal	⑧ Front axle
③ Bearing	⑨ Brake disc
④ Front wheel	Ⓐ Front axle nut
⑤ Spacer	Ⓑ Brake disc bolt
⑥ Bearing	

ITEM	N·m	kgf·m
Ⓐ	44	4.4
Ⓑ	23	2.3

REMOVAL AND DISASSEMBLY

- Remove the front axle nut ①.
- Raise the front wheel off the ground and support the motorcycle with a jack or wooden block.

CAUTION

Do not carry out the work with the motorcycle resting on the side-stand. Do not support the motorcycle with the exhaust pipes. Make sure that the motorcycle is supported securely.



- Draw out the front axle and remove the front wheel.

CAUTION

Do not operate the brake lever after front wheel removal.

- Remove the spacers ②, left and right.



- Remove the brake disc ③.



INSPECTION AND DISASSEMBLY

WHEEL (☞ 2-19)

TIRE (☞ 2-19)

DUST SEAL

Inspect the dust seal lips for wear or damage. If any damages are found, replace the dust seals with the new ones.

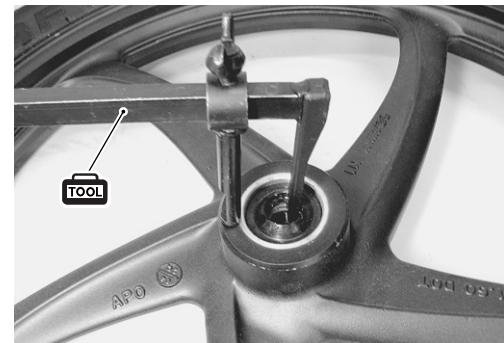


- Remove the dust seals by using the special tool.

 **Oil seal remover**

CAUTION

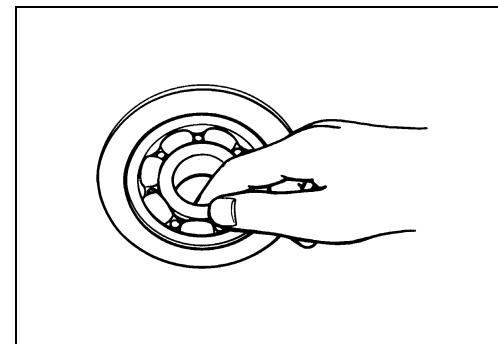
Do not reuse the removed dust seals.



WHEEL BEARINGS

Inspect the play of the wheel bearings by finger while they are in the wheel. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation.

Replace the bearing in the following procedure if there is anything unusual.



- Remove the wheel bearings by using the special tool.

Bearing remover set (12 mm)

CAUTION

The removed bearings must be replace the new ones.



- Remove the spacer ①.

**FRONT AXLE**

Measure the front axle runout using the dial gauge.

If the runout exceeds the service limit, replace the front axle.

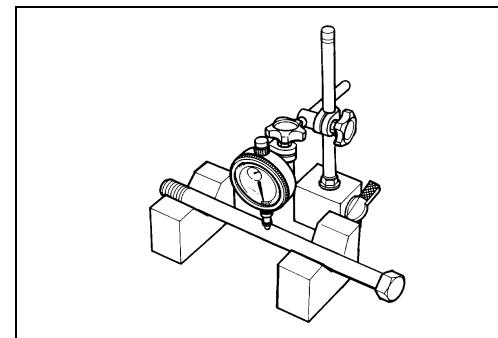
Front axle runout

Service limit: 0.25 mm

Dial gauge

Dial gauge chuck

V blocks



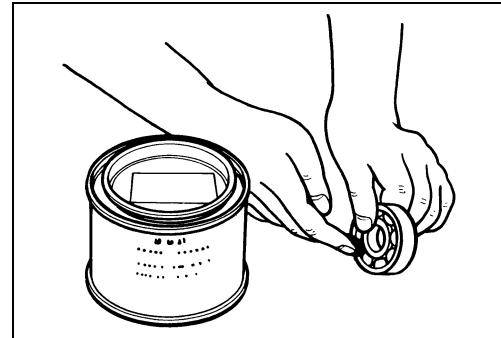
REASSEMBLY AND INSTALLATION

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

WHEEL BEARINGS

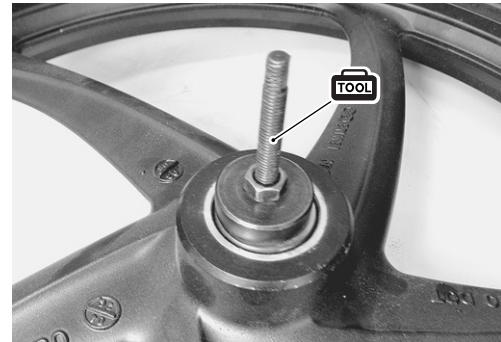
- Apply SUZUKI SUPER GREASE "A" to the bearings before installing.

 **SUZUKI SUPER GREASE "A"**



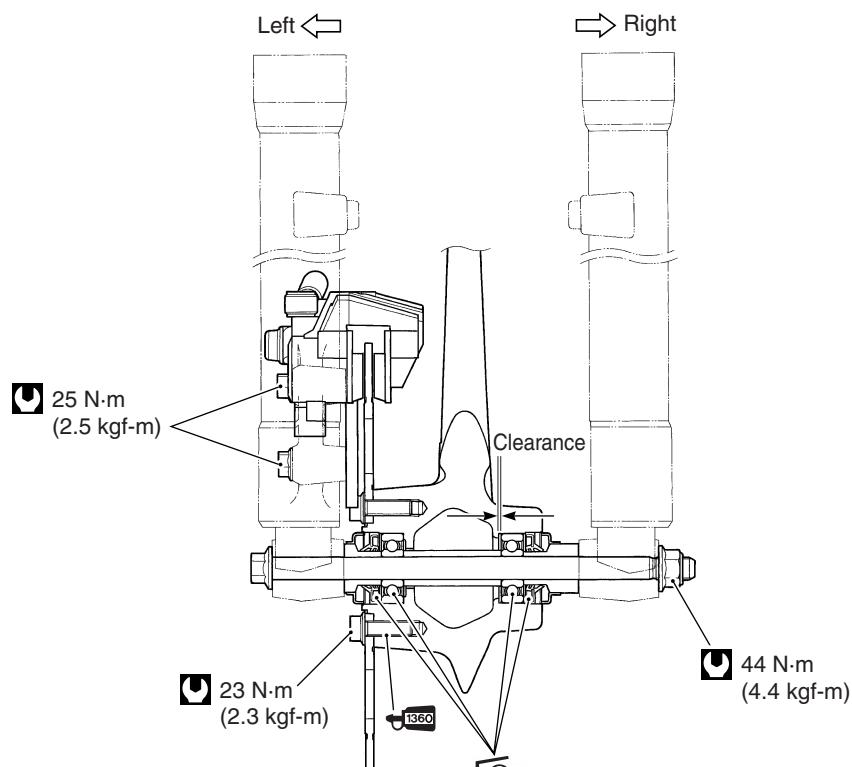
- Install the new wheel bearings using the special tools as described following pages.

 **Bearing installer set**
Bearing installer set



CAUTION

- * The stamped mark on the bearings must face to the outside.
- * First install the left wheel bearing, then install the spacer and right wheel bearing.



DUST SEAL

- Install the new dust seals by using the suitable size socket wrench.

**BRAKE DISC**

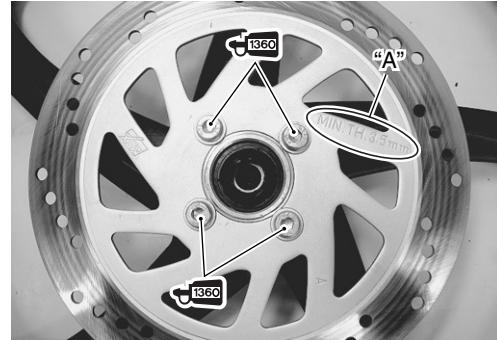
- Apply THREAD LOCK SUPER to the brake disc bolts and tighten them to the specified torque.

 **THREAD LOCK SUPER "1360"**

 **Brake disc bolt: 23 N·m (2.3 kgf·m)**

⚠ WARNING

Keep the brake disc clean, free front dirt and grease.

**NOTE:**

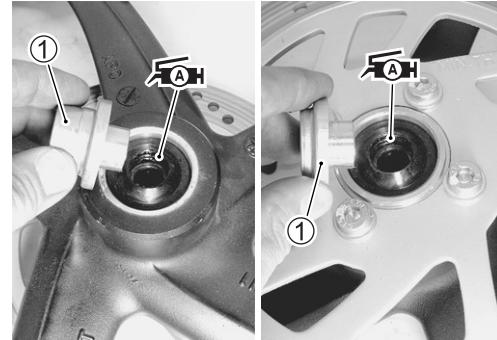
When installing the brake disc the stamped mark "A" on the brake disc must face outside.

- Apply SUZUKI SUPER GREASE "A" to the dust seal lips.

 **SUZUKI SUPER GREASE "A"**

CAUTION

Be careful not to damage the dust seal lips when installing the spacers ①.

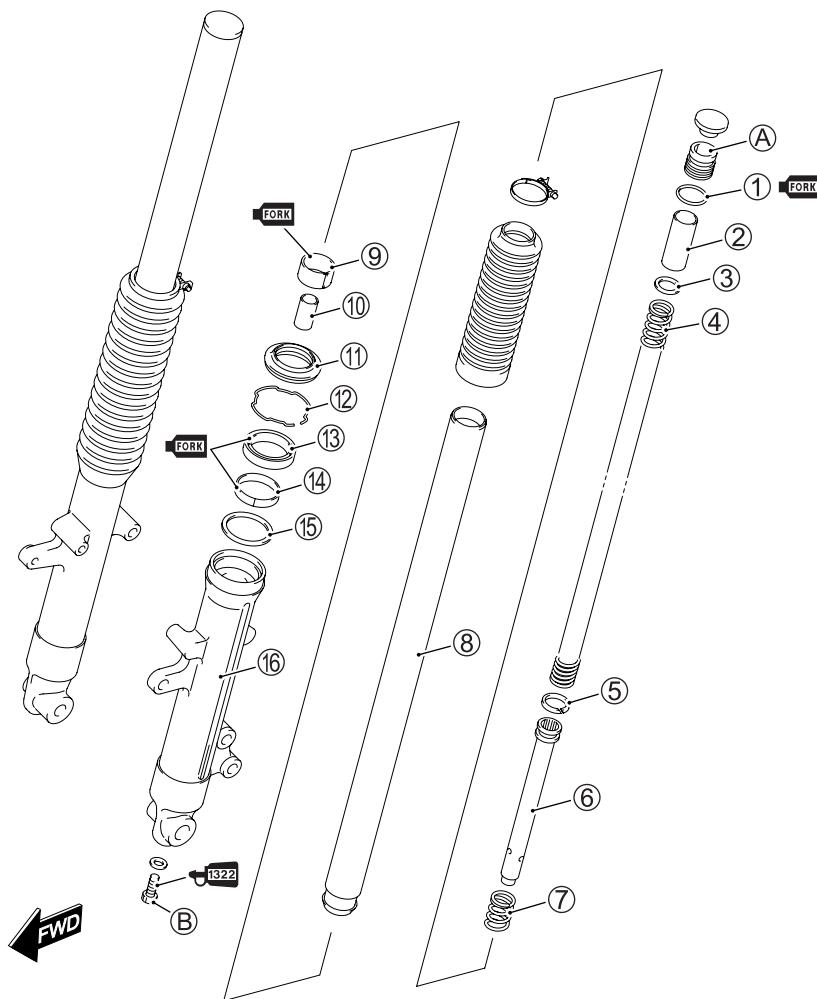
**FRONT AXLE**

Tighten the front axle nut to the specified torque.

 **Front axle nut: 44 N·m (4.4 kgf·m)**



FRONT FORK

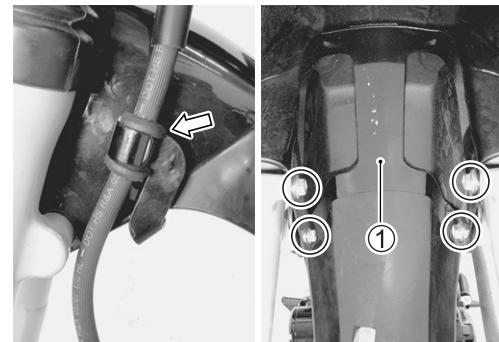


①	O-ring	⑧	Inner tube	⑯	Oil seal retainer
②	Spacer	⑨	Inner tube side metal	⑯	Outer tube
③	Washer	⑩	Oil lock piece	Ⓐ	Front fork cap bolt
④	Front fork spring	⑪	Dust seal	Ⓑ	Damper rod bolt
⑤	Damper rod ring	⑫	Oil seal stopper ring		
⑥	Damper rod	⑬	Oil seal		
⑦	Rebound spring	⑭	Outer tube side metal		

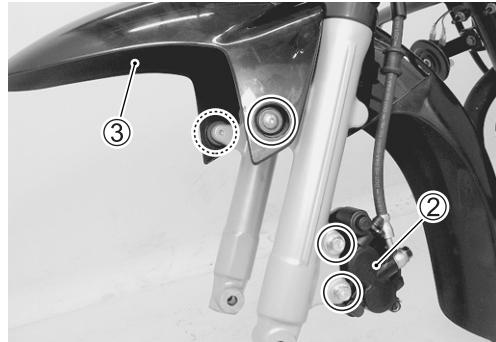
ITEM	N·m	kgf·m
Ⓐ	24	2.4
Ⓑ	23	2.3

REMOVAL AND DISASSEMBLY

- Remove the front wheel. (5-8)
- Disconnect the brake hose from the guide.
- Remove the front fender bracket ①.



- Remove the front brake caliper ②.
- Remove the front fender ③.



- Remove the front fork cap ④.
- Loosen the front fork upper clamp bolt ⑤.

NOTE:

Slightly loosen the front fork cap bolt ⑥ before loosening the lower clamp bolts to facilitate later disassembly.

 **Hexagon socket (14 mm)**



- Remove the front fork after loosening the front fork lower clamp bolt ⑦.

NOTE:

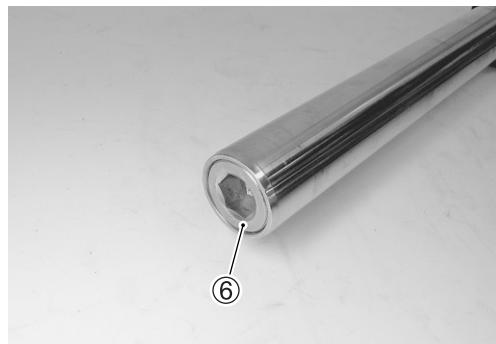
Hold the front fork by the hand to prevent sliding out of the steering stem.



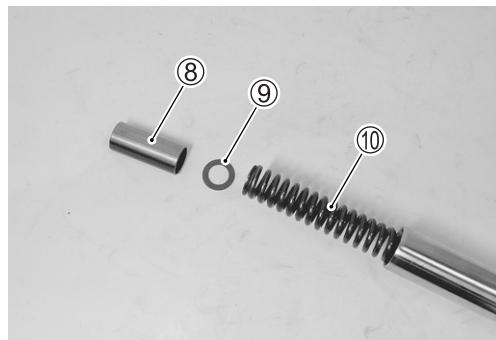
- Remove the front fork cap bolt ⑥ by using the hexagon wrench.

⚠ WARNING

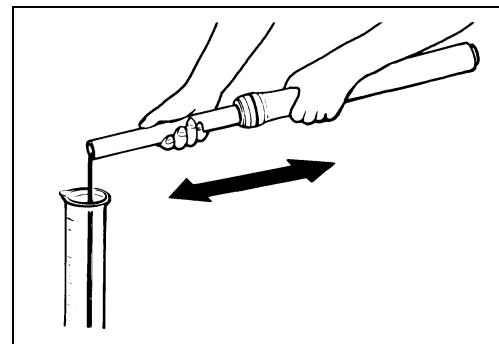
Take care so that the cap bolt does not spring out by the force of the spring.



- Remove the spacer ⑧, washer ⑨ and spring ⑩.

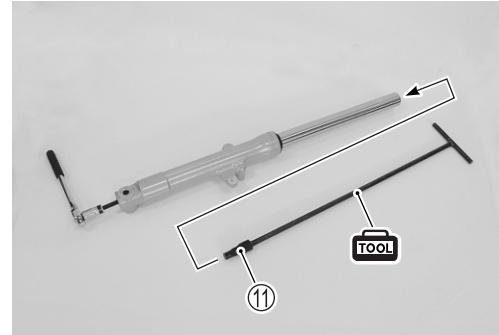


- Invert the front fork and stroke it several times to drain out the fork oil.
- Hold the front fork in the inverted position for a few minutes to allow the fork oil to fully drain.

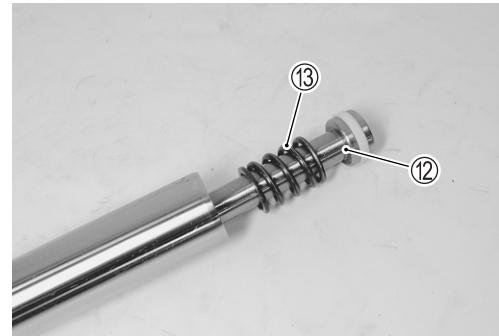


- Remove the damper rod bolt by using a 14 mm hexagon wrench ⑪ and special tool.

T type handle



- Remove the damper rod ⑫ and rebound spring ⑬ from the inner tube.



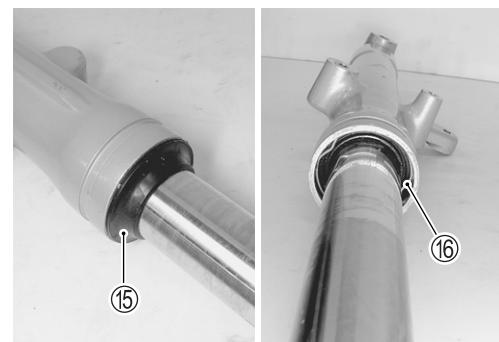
- Remove the boots ⑭.



- Remove the dust seal ⑮ and oil seal stopper ring ⑯.

CAUTION

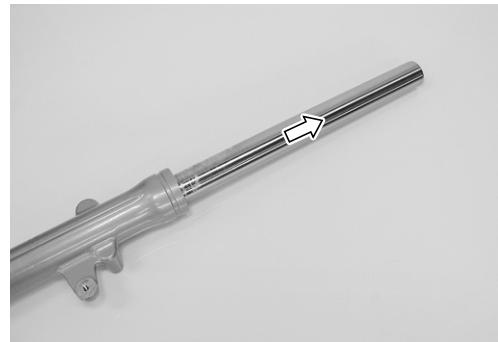
The removed dust seal must be replaced with a new one.



- Remove the oil seal by slowly pulling out the inner tube.

NOTE:

Be careful not to damage the inner tube.



- Remove the oil lock piece ⑯ from the outer tube.



- Remove the following parts from the inner tube.

⑯ Inner tube slide metal

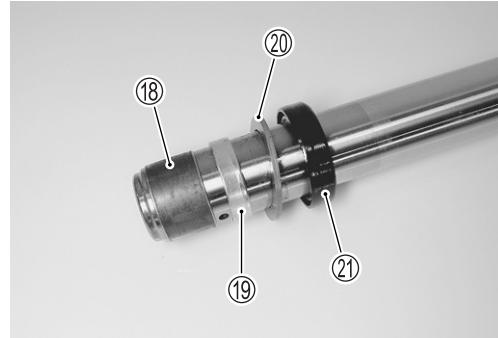
⑰ Outer tube slide metal

⑱ Oil seal retainer

⑲ Oil seal

CAUTION

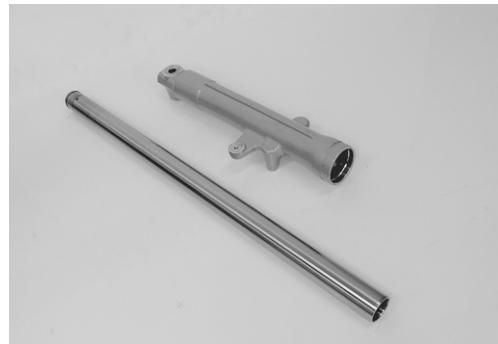
The outer and inner tube's slide metals must be replaced along with the dust seal when assembling the front fork.



INSPECTION

INNER AND OUTER TUBE

Inspect the inner tube sliding surface and outer tube sliding surface for any scuffing or damage.



FRONT FORK SPRING

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

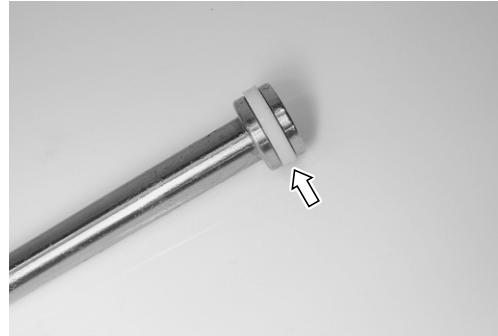
DATA Front fork spring free length

Standard: 438.1 mm



DAMPER ROD RING

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



REASSEMBLY

Reassemble the front fork in the reverse order of disassembly.

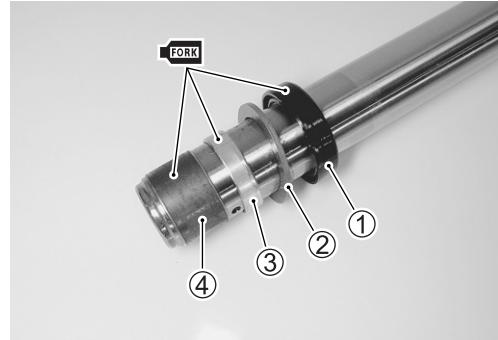
Pay attention to the following points:

CAUTION

- * Thoroughly wash all the component parts being assembled.
- * When reassembling the front fork, use new fork oil.
- * Use the specified fork oil for the front fork.

INNER TUBE

- Install the following parts onto the inner tube.
 - ① Oil seal
 - ② Oil seal retainer
 - ③ Outer tube slide metal
- Hold the inner tube vertically, clean the metal groove and install the inner tube slide metal ④ by hand.



CAUTION

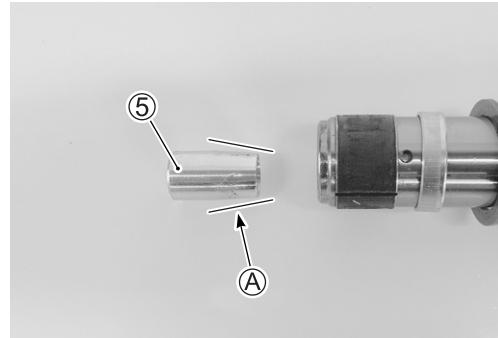
- * When install the oil seal, the stamped mark on the oil seal must face upper side.
- * When installing the oil seal to inner tube, be careful not to damage the oil seal lip.
- * Apply fork oil to the slide metals and oil seal lip.
- * Do not damage the Teflon coated surface of the inner tube's slide metal when installing it.

TELESHOCAB OIL or equivalent fork oil

- Insert the oil lock piece ⑤.

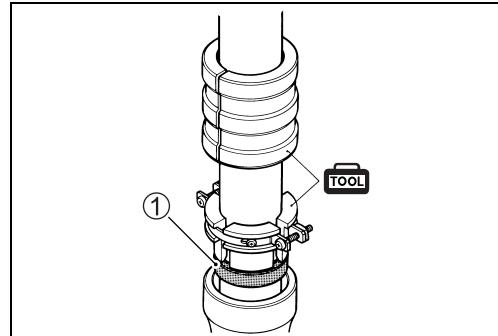
NOTE:

- * When installing the oil lock piece ⑤, insert the tapered end Ⓐ of oil lock piece into the inner tube.
- * When inserting the inner tube into the outer tube, take care not to come off the oil lock piece from the inner tube.



- Insert the inner tube into the outer tube and fit the oil seal ① and dust seal with the special tool.

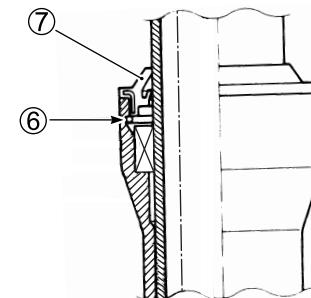
Front fork oil seal installer set



- Install the oil seal stopper ring ⑥ and dust seal ⑦.

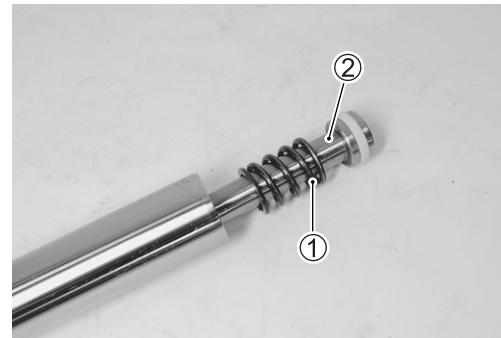
CAUTION

Make sure that the oil seal stopper ring is fitted securely.



DAMPER ROD

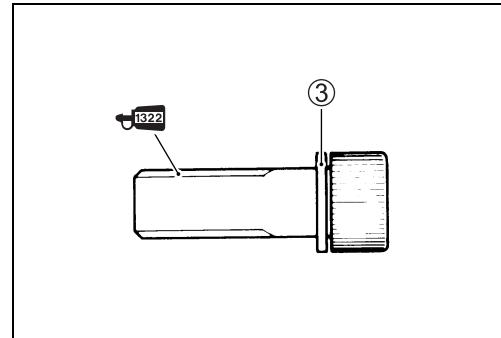
- Fit the rebound spring ① to the damper rod ② and install them to the inner tube.



- Apply THREAD LOCK to the cylinder bolt and tighten it to the specified torque using a 14 mm hexagon wrench and the special tool.

CAUTION

Use a new damper rod bolt gasket ③ to prevent oil leakage.



Damper rod bolt: 23 N·m (2.3 kgf·m)

1322 THREAD LOCK SUPER "1322"

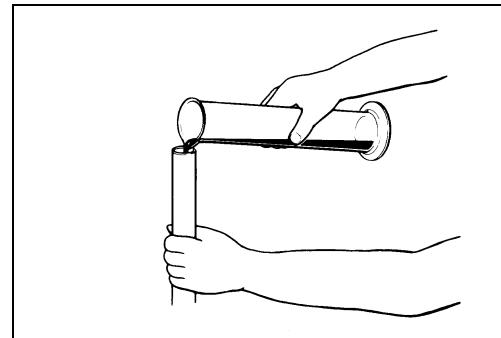
T type handle

FORK OIL

- Pour the specified fork oil into the inner tube.

DATA **Front fork oil capacity (each leg): 145 ml**

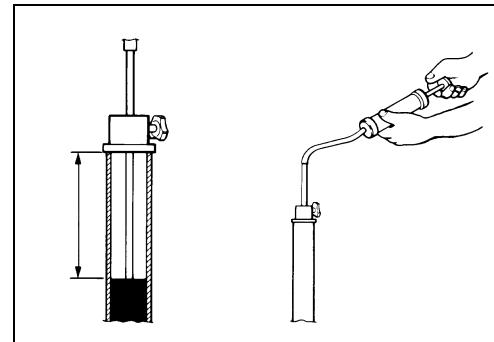
FORK **TELESHOCAB OIL or equivalent fork oil**



- Hold the front fork leg in a vertical position and adjust the fork oil level by using the special tool.
- When adjusting the oil level, remove the fork spring and compress the inner tube fully.

DATA Front fork oil level (without spring): 200 mm

TOOL Fork oil level gauge

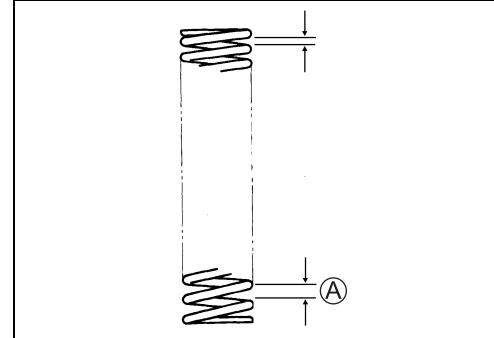


FORK SPRING

- Install the front spring as shown.

NOTE:

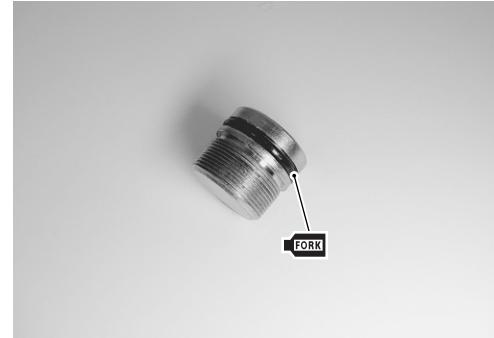
The smaller pitch \textcircled{A} should face to the bottom side of the front fork.



- Fit the O-ring to the front fork cap bolt and apply fork oil.

CAUTION

Use a new O-ring to prevent oil leakage.



INSTALLATION

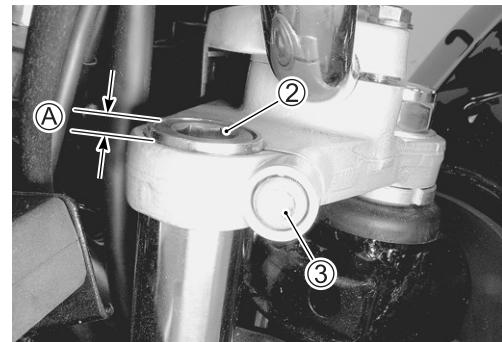
Install the front fork in the reverse order of removal. Pay attention to the following points:

- Install the front fork to the steering stem and steering stem upper bracket.
- Install the top of inner tube 3 mm higher Ⓐ than the upper surface of the steering stem upper bracket and tighten the front fork lower clamp bolts ① to the specified torque.

 **Hexagon socket (14 mm)**

 **Front fork lower clamp bolt: 29 N·m (2.9 kgf·m)**

- Tighten the front fork cap bolt ② to the specified torque and recheck the front fork inner tube upper surface height Ⓐ.

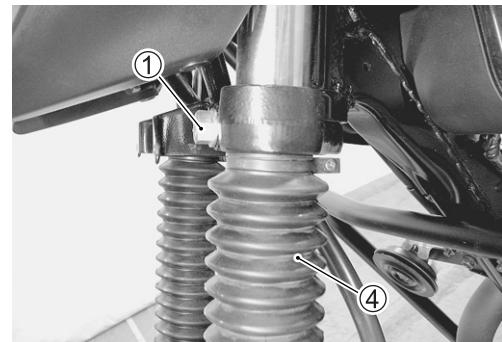


 **Front fork cap bolt: 24 N·m (2.4 kgf·m)**

- Tighten the front fork upper clamp bolt ③.

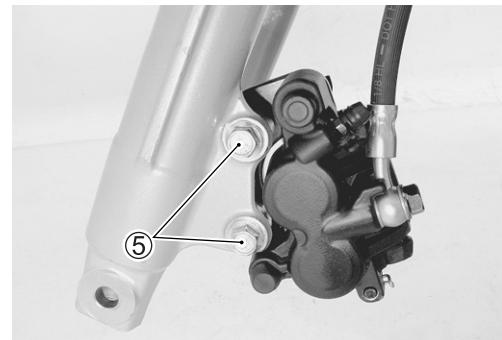
 **Front fork upper clamp bolt: 23 N·m (2.3 kgf·m)**

- Fit the boot ④ to the steering stem.



- Tighten the front brake caliper mounting bolts ⑤ to the specified torque.

 **Brake caliper mounting bolt: 25 N·m (2.5 kgf·m)**



- Install the front wheel. (☞ 5-12)
- Move the front fork up and down several times.

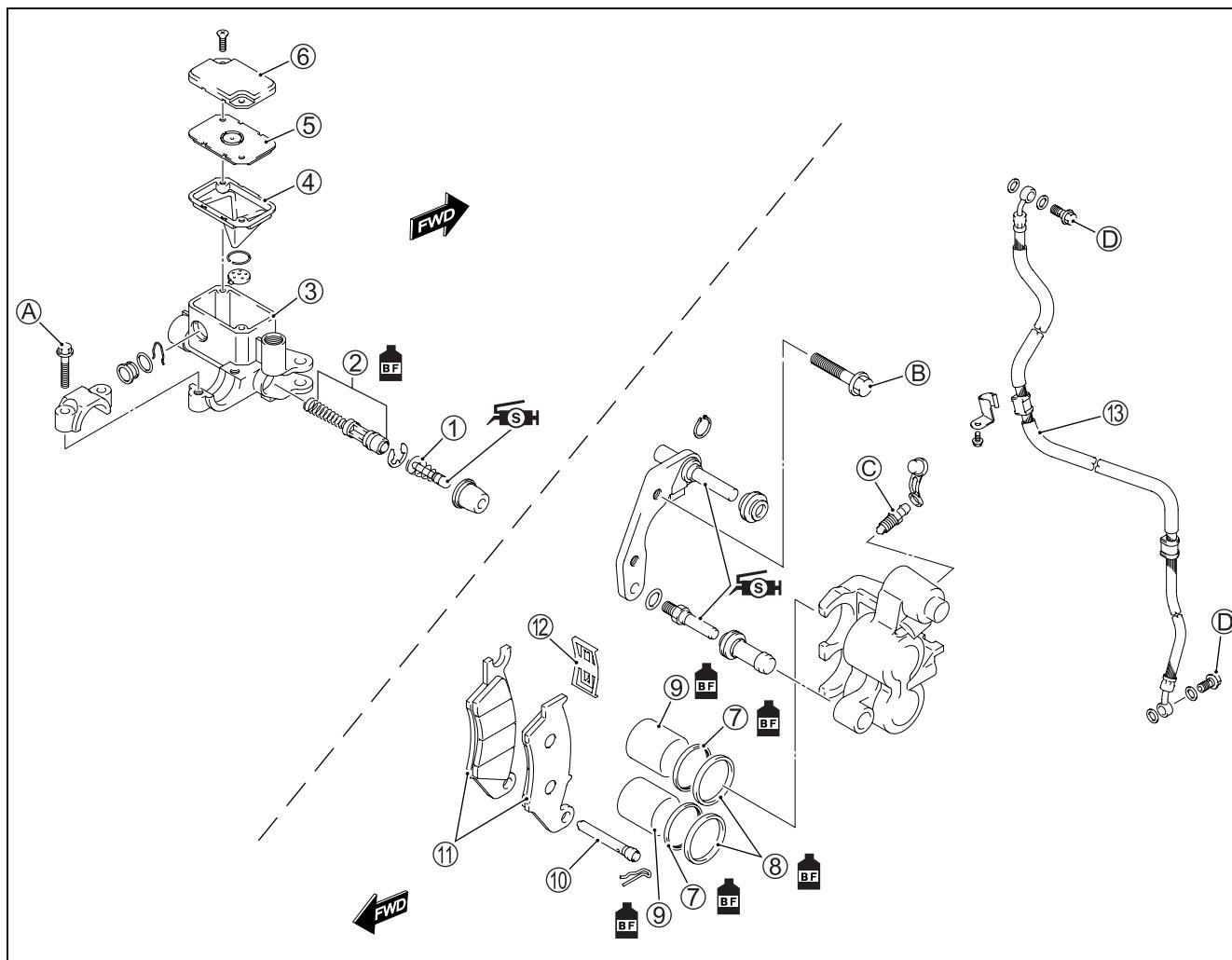
CAUTION

* After installation the front wheel, pump the brake lever a few times to check for proper brake operation.

* Check for oil leakage.



FRONT BRAKE



①	Push rod	⑦	Dust seal	⑬	Brake hose
②	Piston/cup set	⑧	Piston seal	Ⓐ	Brake master cylinder bolt
③	Master cylinder	⑨	Brake caliper piston	Ⓑ	Brake caliper mounting bolt
④	Diaphragm	⑩	Brake pad mounting pin	Ⓒ	Air bleeder valve
⑤	Insulator	⑪	Brake pad	Ⓓ	Brake hose union bolt
⑥	Reservoir cap	⑫	Brake pad spring		

ITEM	N·m	kgf·m
Ⓐ	10	1.0
Ⓑ	25	2.5
Ⓒ	7.5	0.75
Ⓓ	23	2.3

WARNING

- * This brake system is filled with an ethylene glycol-based DOT 3 or DOT 4 brake fluid. Do not use mix different types of fluid such as silicone-based or petroleum-based.
- * Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored for long periods.
- * When storing the brake fluid, seal the container completely and keep away from children.
- * When replenishing brake fluid, take care not to get dust into fluid.
- * When washing brake components, use fresh brake fluid. Never use cleaning solvent.
- * A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.

CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials, etc., and will damage them severely.

BRAKE FLUID REPLACEMENT

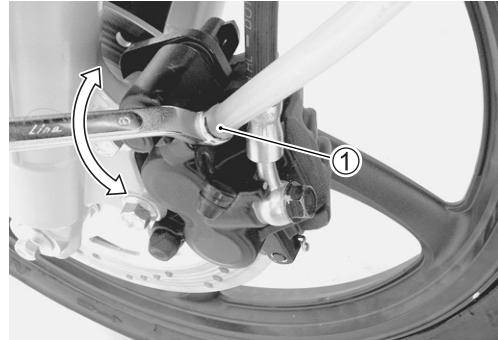
- Place the motorcycle on a level surface and keep the handlebars straight.
- Remove the master cylinder reservoir cap and diaphragm.
- Suck up the old brake fluid as much as possible.
- Fill the reservoir with new brake fluid.

 **Specification and classification: DOT 3 or DOT 4**



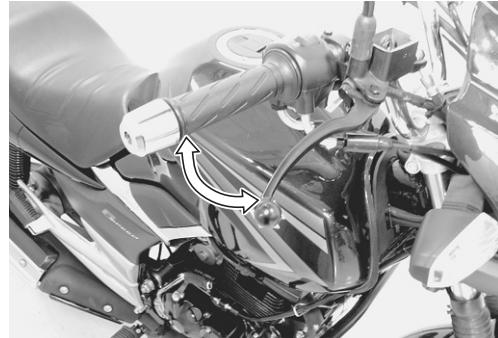
- Connect a clear hose to the air bleeder valve ① and insert the other end of the hose into a receptacle.
- Loosen the air bleeder valve and pump the brake lever until the old brake fluid is completely out of the brake system.
- Close the air bleeder valve and disconnect a clear hose. Fill the reservoir with new brake fluid to the upper level of the reservoir.

 **Air bleeder valve: 7.5 N·m (0.75 kgf·m)**



CAUTION

- * Never reuse the brake fluid left over from previous servicing and which has been stored for long periods of time.
- * Bleed air from the brake system. (☞ 2-18)



BRAKE PAD REPLACEMENT

- Remove the brake caliper.



- Remove the pin ①.
- Remove the brake pad mounting pin ② and brake pads ③.

CAUTION

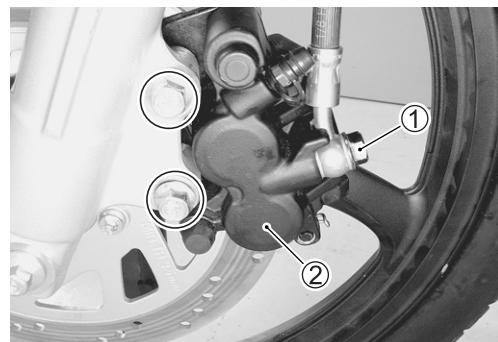
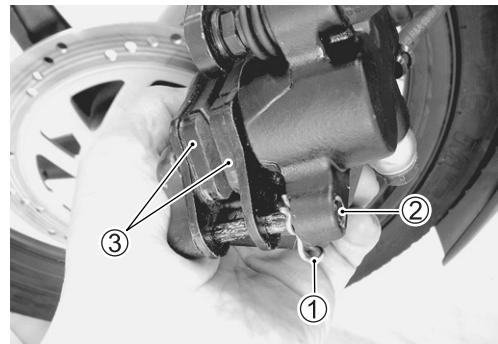
- * Do not operate the brake lever after brake pad removal.
- * Replace the brake pad as a set, otherwise braking performance will be adversely affected.

- Install the new brake pads.
- Tighten the brake caliper mounting bolts to the specified torque.

 **Brake caliper mounting bolt: 25 N·m (2.5 kgf·m)**

NOTE:

After replacing the brake pads, pump the brake lever a few times to check for proper brake operation and then check the brake fluid level.



BRAKE CALIPER REMOVAL AND DISASSEMBLY

- Remove the brake hose union bolt ①.

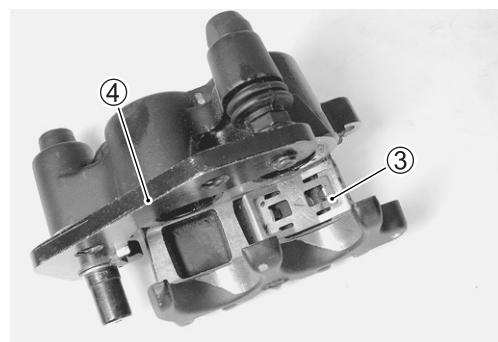
NOTE:

Place a rag underneath the union bolt on the brake caliper to catch any split brake fluid.

CAUTION

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

- Remove the brake caliper ②.
- Remove the brake pads. (☞ 5-23)
- Remove the brake pad spring ③ and brake caliper holder ④.



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

CAUTION

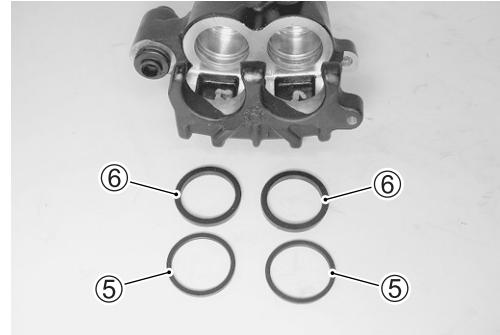
Do not use high pressure air to prevent piston damage.



- Remove the dust seals ⑤ and piston seals ⑥.

CAUTION

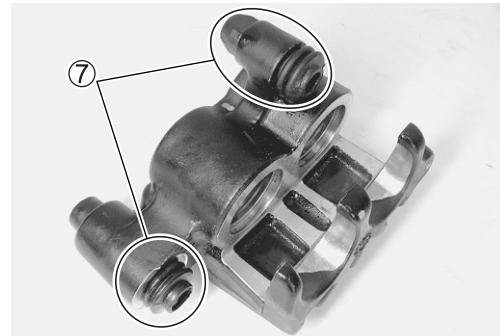
Do not reuse the removed dust seals and piston seals to prevent fluid leakage.



- Remove the rubber boots ⑦.

NOTE:

If there is no abnormal condition, the rubber boots removal is not necessary.



CALIPER INSPECTION

CALIPER AND PISTON

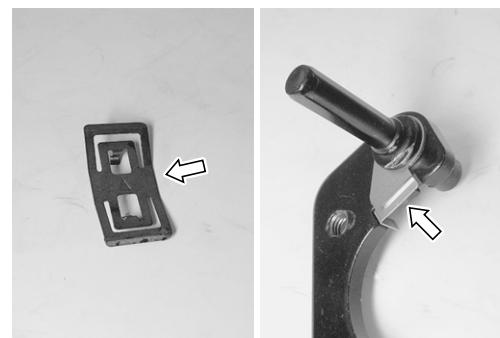
Inspect the caliper cylinder wall and pistons surface for scratch, corrosion or other damages.

If any abnormal condition is found, replace the caliper or caliper pistons with new ones.



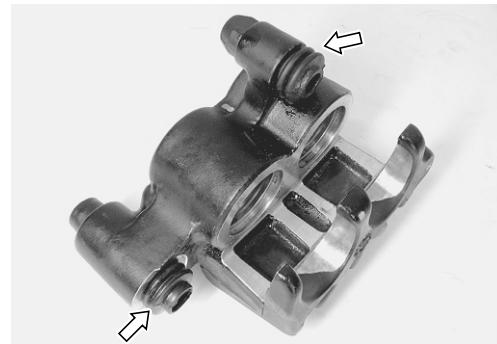
PAD SPRING

Inspect the brake pad springs for damage excessive bend. If any damage is found, replace it with new ones.



RUBBER PARTS

Inspect the boots for damage and cracks. If any damage is found, replace the rubbers with new ones.

**CALIPER HOLDER**

Inspect the caliper holder and pins for damage. If any damage is found, replace it with new ones.

**CALIPER REASSEMBLY**

Reassemble and remount the brake caliper in the reverse order of disassembly. Pay special attention to the following points:

Wash the caliper bores and pistons with the specified brake fluid.

Thoroughly wash the dust seal grooves and piston seal grooves.

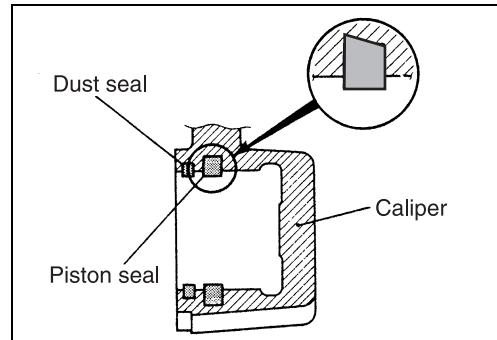
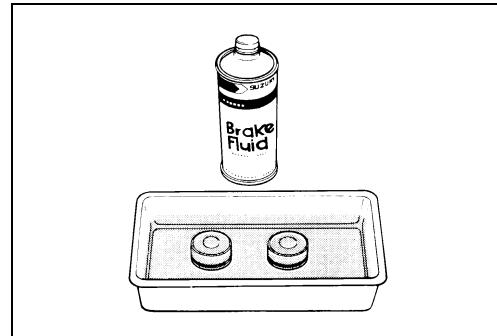
CAUTION

- * Wash the brake caliper components with new brake fluid before reassembly. Do not wipe the brake fluid off after washing the components with a rag.
- * Replace the removed piston seals and dust seals with new ones. Apply brake fluid to all of the seals, brake caliper bores and pistons before reassembly.

 **Specification and classification: DOT 3 or DOT 4**

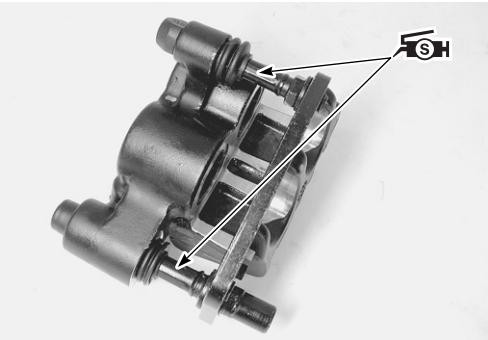
PISTON AND DUST SEALS

- Install the piston seals and dust seals as shown.



BRAKE CALIPER HOLDER

- Apply SUZUKI SILICON GREASE to the brake caliper holder pin.

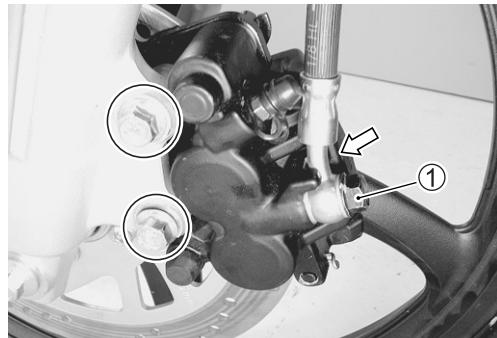
 SUZUKI SILICONE GREASE**CALIPER INSTALLATION**

Install the caliper in the reverse order of removal. Pay attention to the following points:

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

 Brake caliper mounting bolt: 25 N·m (2.5 kgf·m)

- With the hose and contacted to the stopper, tighten the union bolt ① to the specified torque.

 Brake hose union bolt: 23 N·m (2.3 kgf·m)**CAUTION**

The seal washers should be replaced with the new ones to prevent fluid leakage.

 WARNING

Bleed air from the system after reassembling the caliper. (☞ 2-18)

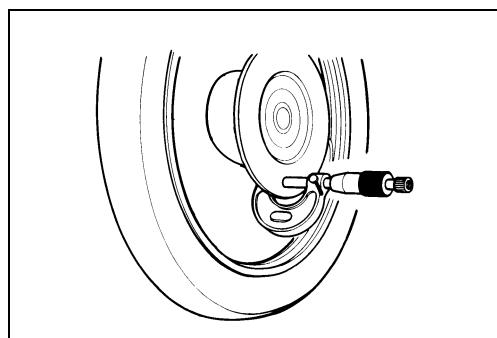
BRAKE DISC INSPECTION

Check the brake disc for cracks or damage and measure the thickness using the micrometer.

If any damage is found or if the thickness is less than the service limit, replace the brake disc with a new one. (☞ 5-9)

 Brake disc thickness: Service Limit: 3.5 mm

 Micrometer (0 – 25 mm)

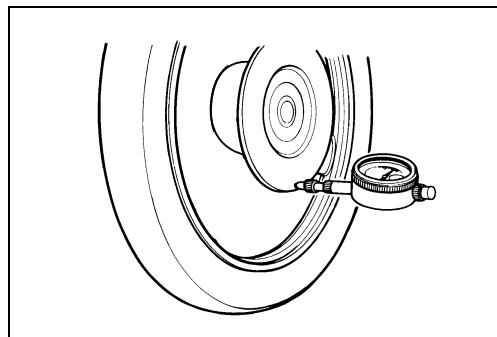


- Measure the runout with a dial gauge.
- If either measurement exceeds the service limit, replace the brake disc with a new one. (☞ 5-9)

 Brake disc runout: Service Limit: 0.3 mm

 Dial gauge

Dial gauge chuck



MASTER CYLINDER REMOVAL AND DISASSEMBLY

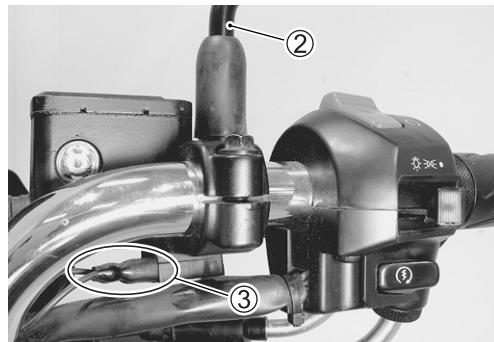
- Drain brake fluid. (5-23)
- Place a rag underneath the brake hose union bolt ① on the master cylinder to catch any split brake fluid.
- Remove the brake hose union bolt ① and disconnect the brake hose.

CAUTION

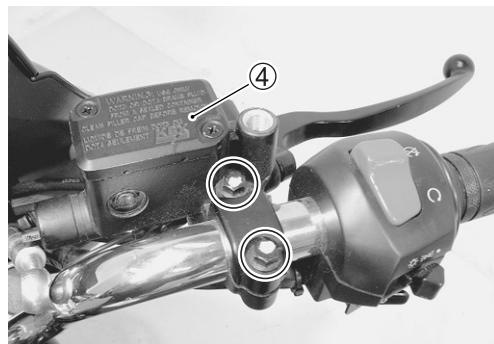
Immediately wipe off any brake fluid contacting any part of the motorcycle. The brake fluid reacts chemically with paint, plastics, rubber materials, etc., and will damage them severely.



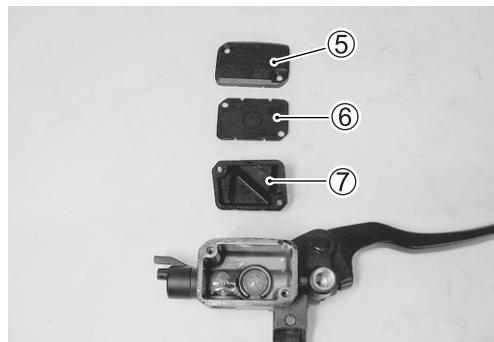
- Remove the right rear view mirror ②.
- Disconnect the front brake light switch lead wires ③.



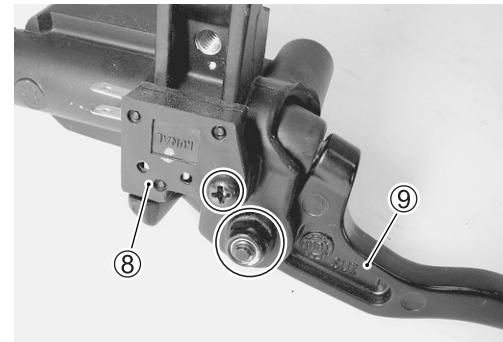
- Remove the brake master cylinder assembly ④.



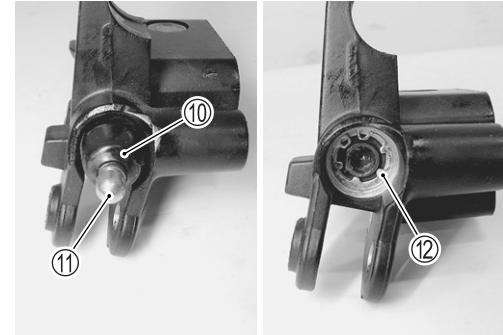
- Remove the reservoir cap ⑤, insulator ⑥ and diaphragm ⑦.



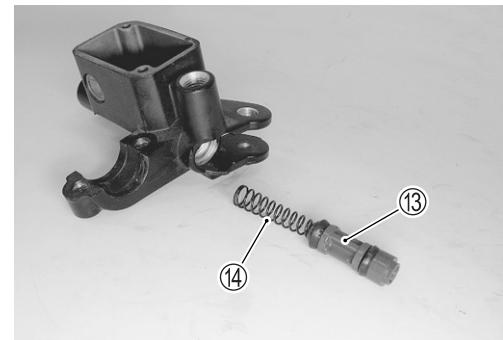
- Remove the brake switch ⑧ and brake lever ⑨.



- Pull out the boot ⑩ with the push rod ⑪.
- Remove the snap ring ⑫.



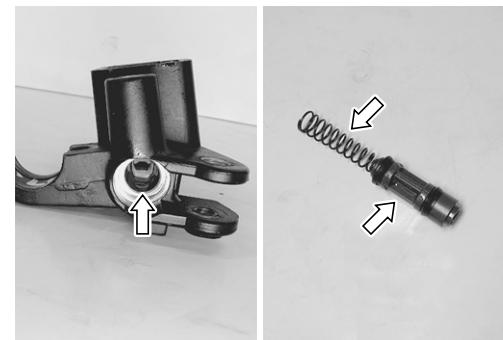
- Remove the piston/cup set ⑬ and spring ⑭.



MASTER CYLINDER INSPECTION

Inspect the cylinder wall, piston/cup set and spring for scratch or other damages.

If any abnormal condition is noted, replace the inner parts or master cylinder.

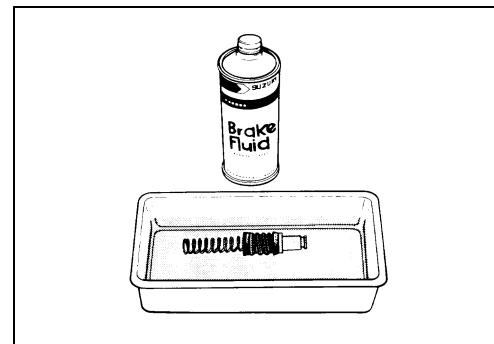


MASTER CYLINDER REASSEMBLY

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

CAUTION

- * Wash the master cylinder components with new brake fluid before reassembly.
- * Do not wipe the brake fluid off after washing the components with a rag.
- * 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.



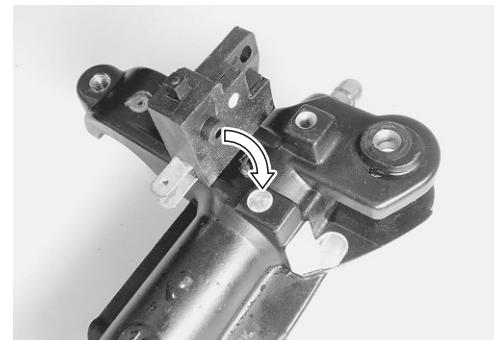
BF Specification and classification: DOT 3 or DOT 4

- Apply SUZUKI SILICONE GREASE to the push rod.

SH SUZUKI SILICONE GREASE

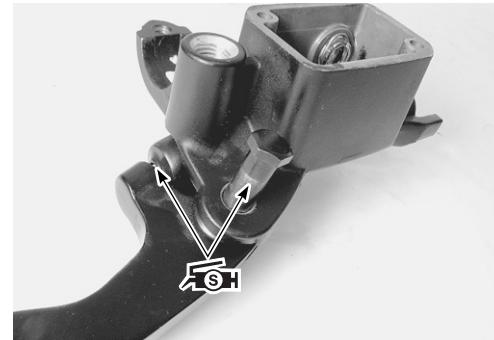


- When installing the brake light switch, align the projection on the switch with the hole in the master cylinder.



- Apply SUZUKI SILICONE GREASE to the push rod and bolt.

SH SUZUKI SILICONE GREASE



INSTALLATION

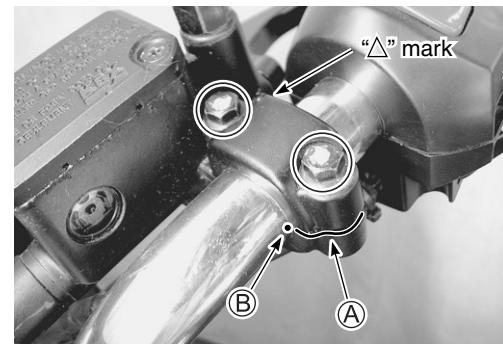
Install the master cylinder in the reverse order of removal. Pay attention to the following points:

- When installing the master cylinder on the handlebars, align the master cylinder holder's mating surface **A** with the punched mark **B** on the handlebars, and then tighten the front clamp bolt first.

Brake master cylinder bolt: 10 N·m (1.0 kgf·m)

NOTE:

Be sure to face the “△” mark on the holder to the forward.



- With the hose and contacted to the stopper, tighten the union bolt **①** to the specified torque.

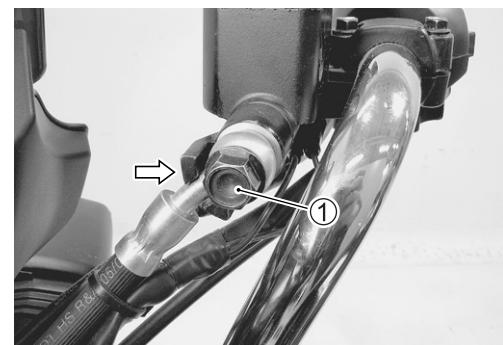
Brake hose union bolt: 23 N·m (2.3 kgf·m)

CAUTION

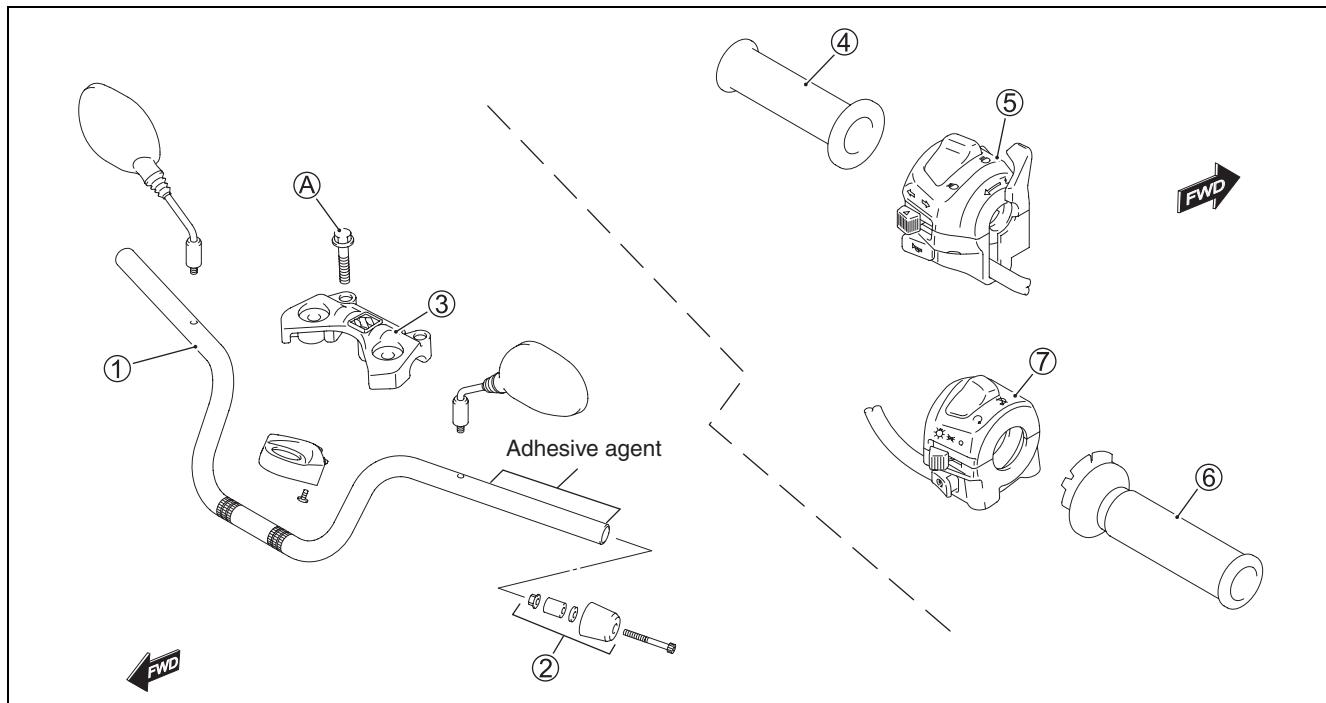
The seal washers should be replaced with the new ones to prevent fluid leakage.

⚠ WARNING

Bleed air from the brake system after reassembling the master cylinder. (☞2-18)



HANDLEBARS



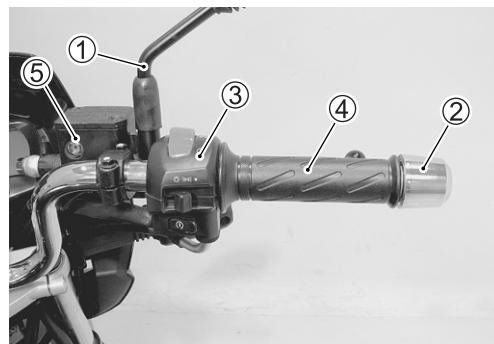
① Handlebars	⑤ Left handle switch
② Balancer	⑥ Right handle throttle grip
③ Handlebar clamp	⑦ Right handle switch
④ Left handle grip	A Handlebar clamp bolt



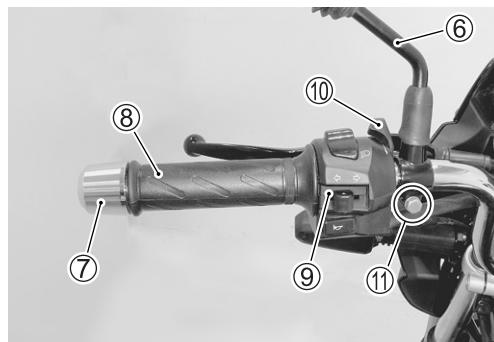
ITEM	N·m	kgf·m
A	16	1.6

REMOVAL

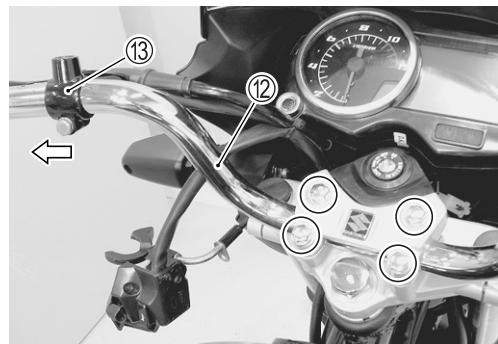
- Remove the right rear view mirror ①.
- Remove the right handlebar balancer ②.
- Remove the handlebar right switch box ③.
- Disconnect the throttle cable and remove the throttle grip ④.
- Remove the front brake master cylinder ⑤.



- Remove the left rear view mirror ⑥.
- Remove the left handlebar balancer ⑦.
- Remove the left grip ⑧.
- Disconnect the starter cable and remove the left handlebar switch box ⑨.
- Remove the starter lever ⑩.
- Loosen the clutch lever holder bolt ⑪.



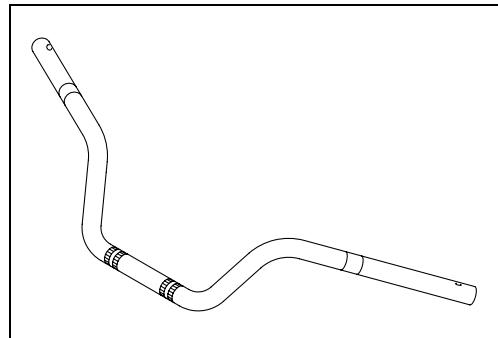
- Remove the handlebars ⑫ and clutch lever ⑬.



INSPECTION

Inspect the handlebars for abnormal distortion.

If abnormal distortion is found, replace the handlebars with a new one.



INSTALLATION

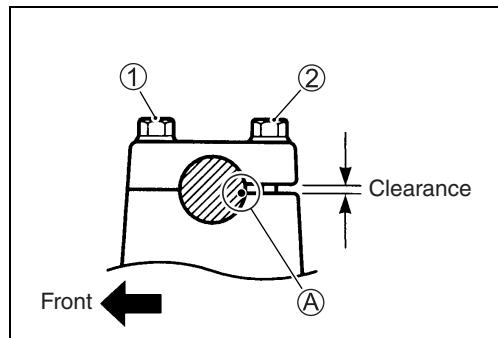
Install the handlebars in the reverse order of removal. Pay special attention to the following points:

- Install the handlebars with the punch mark Ⓐ aligned with the steering stem upper bracket as shown.

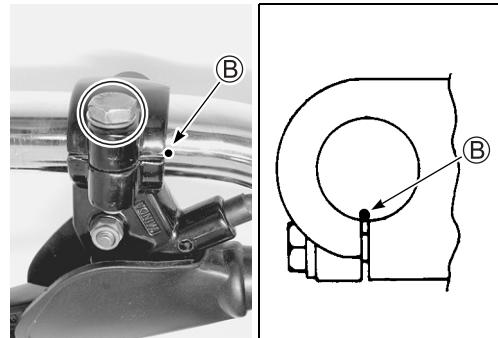


- First, tighten the handlebar clamp bolts ① to the half of specified torque, and then tighten the handlebar clamp bolts ① and ② to the specified torque.

 **Handlebar clamp bolt: 16 N·m (1.6 kgf·m)**



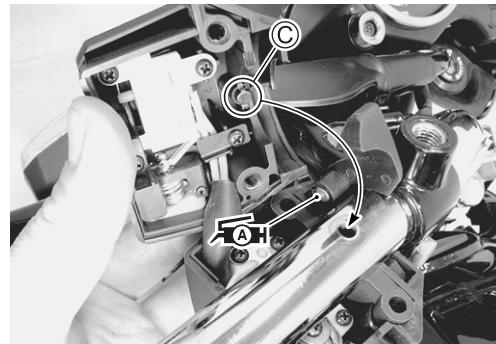
- Align the punch mark Ⓑ on the handlebars with the clutch lever holder matching surface.
- Tighten the clutch lever holder mounting bolt.



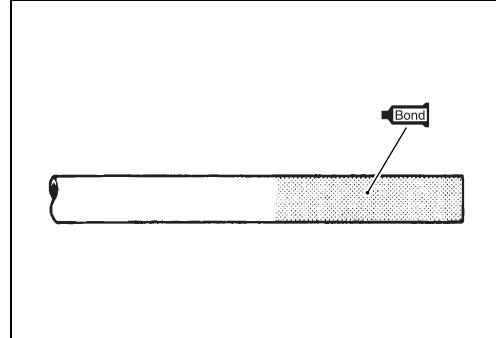
- Apply SUZUKI SUPER GREASE “A” to the starter cable.

SAH SUZUKI SUPER GREASE “A”

- Align the hole on the handlebars with the projection © on the left handlebar switch.



- Apply a handle grip bond onto the handlebars before installing the handlebar grip.



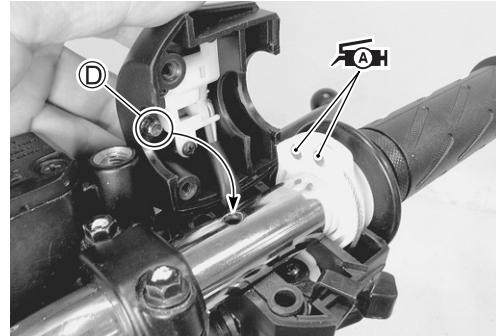
- Install the front brake master cylinder. (5-31)
- Apply SUZUKI SUPER GREASE “A” to the throttle cables.

SAH SUZUKI SUPER GREASE “A”

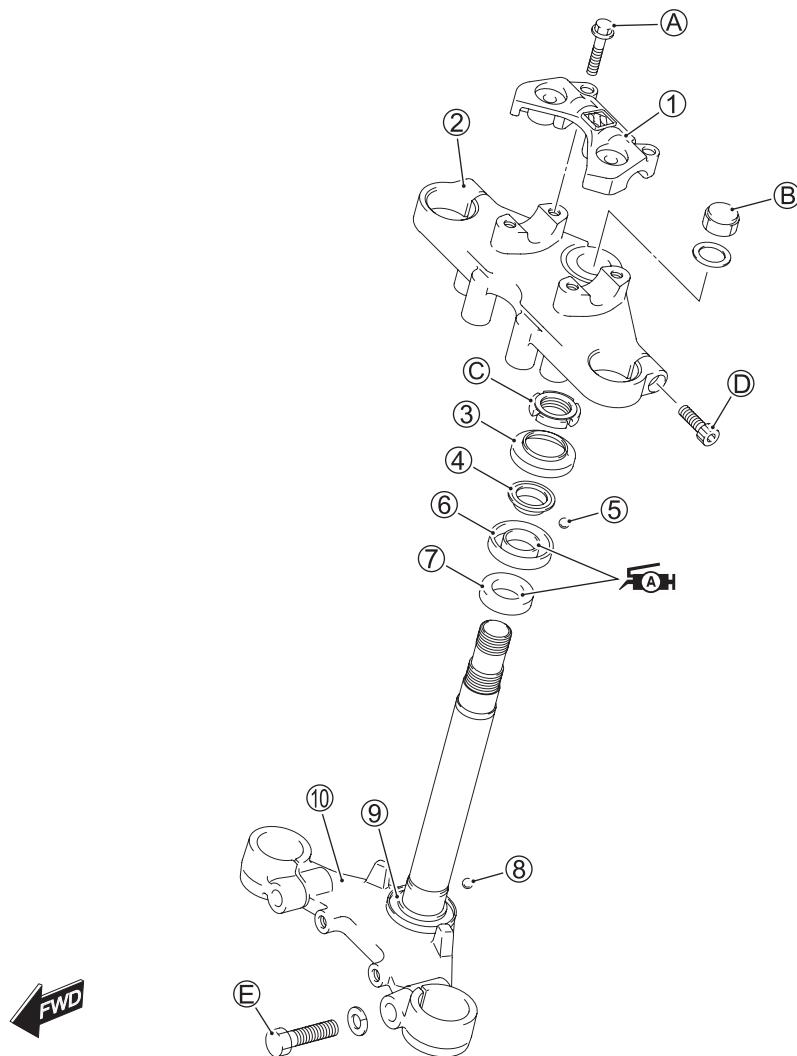
- Align the holes on the handlebars with the projection © on the right and left handlebar switch.
- Pass the wire harnesses and cables correctly.
(7-11 to -12 and 7-14)

After installing the handlebars, the following adjustments are required before driving.

- Adjust the throttle cable play. (2-11)



STEERING

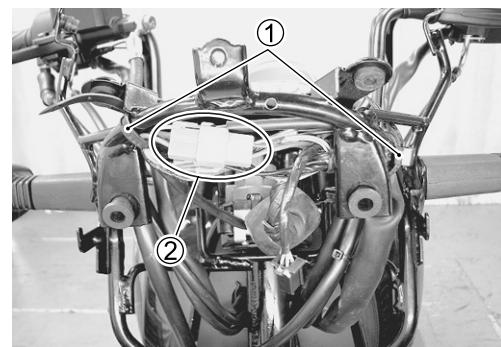


①	Handlebar clamp	⑨	Lower inner race
②	Steering stem upper bracket	⑩	Steering stem lower bracket
③	Dust cover	Ⓐ	Handlebar clamp bolt
④	Upper inner race	Ⓑ	Steering stem head nut
⑤	Upper steel ball	Ⓒ	Steering stem nut
⑥	Upper outer race	Ⓓ	Front fork upper clamp bolt
⑦	Lower outer race	Ⓔ	Front fork lower clamp bolt
⑧	Lower steel ball		

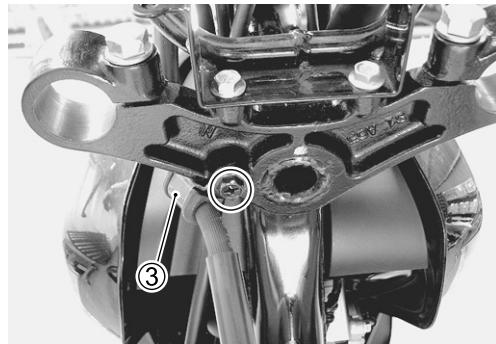
ITEM	N·m	kgf·m
Ⓐ	16	1.6
Ⓑ	90	9.0
Ⓒ	45	4.5
Ⓓ	23	2.3
Ⓔ	29	2.9

REMOVAL

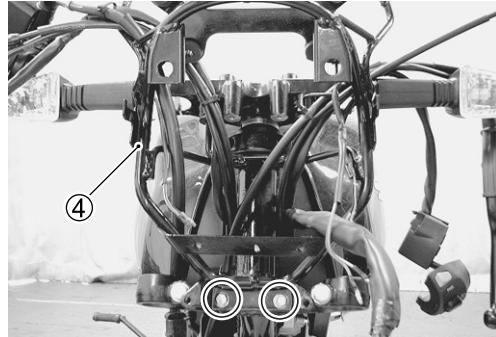
- Remove the front wheel. (5-8)
- Remove the front forks. (5-13)
- Remove the body cowling. (5-7)
- Remove the combination meter. (6-26)
- Disconnect the clamps ①.
- Disconnect the ignition switch, left turn signal, right turn signal, clutch switch couplers and lead wires ②.



- Remove the ignition switch. (☞ 6-37)
- Remove the handlebars. (☞ 5-32)
- Remove the brake hose guide ③.



- Remove the cowling brace ④.



- Remove the steering stem upper bracket ⑤ by removing the steering stem head nut and washer.

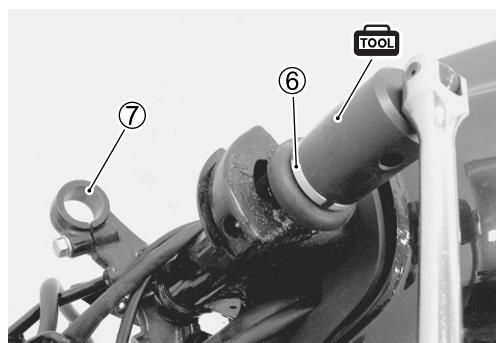


- Remove the steering stem nut ⑥ using the special tool.
- Draw out the steering stem lower bracket ⑦.

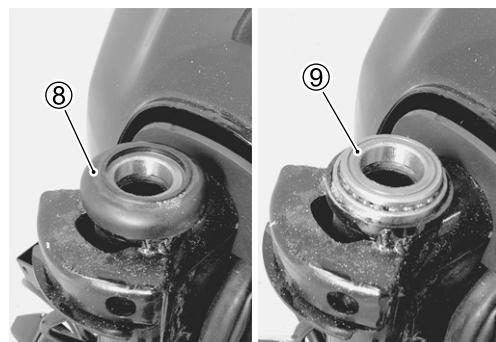
 **Steering stem nut socket wrench**

NOTE:

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

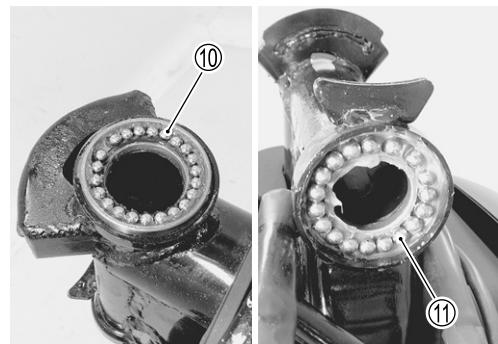


- Remove the dust cover ⑧ and upper steel ball inner race ⑨.



- Remove the upper ⑩ and lower ⑪ steel balls.

Number of balls	Upper	22 psc.
	Lower	18 psc.



INSPECTION AND DISASSEMBLY

Inspect the removed parts for the following abnormalities. If any damages are found, replace the respective parts with the new ones.

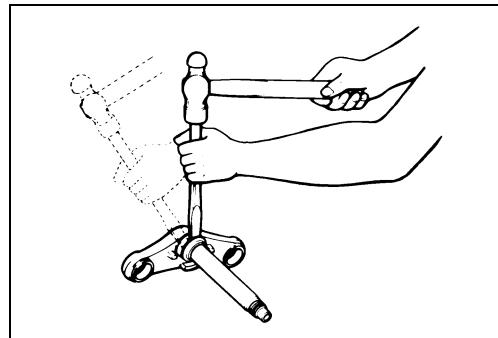
- * Steering race wear and steel ball
- * Steel ball wear or damage
- * Abnormal bearing noise
- * Distortion of steering stem



- Remove the lower inner race using a chisel.

CAUTION

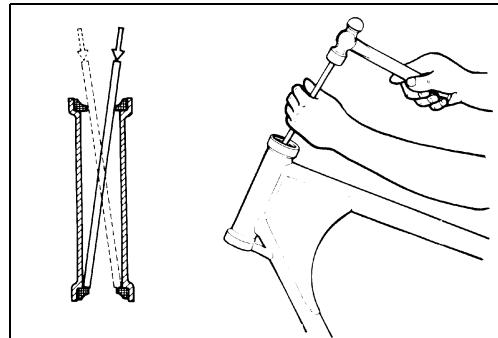
The removed lower inner race must be replaced with a new one.



- Drive out the steel ball upper and lower outer races using a suitable bar.

CAUTION

The removed outer races must be replaced with new ones.



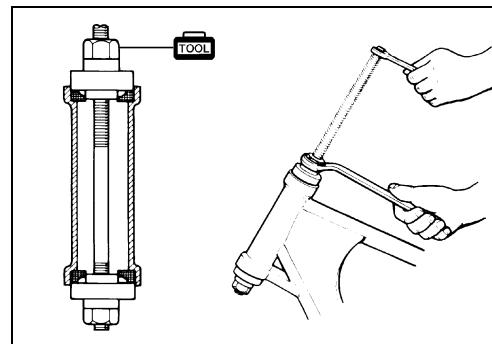
REASSEMBLY

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

OUTER RACE

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

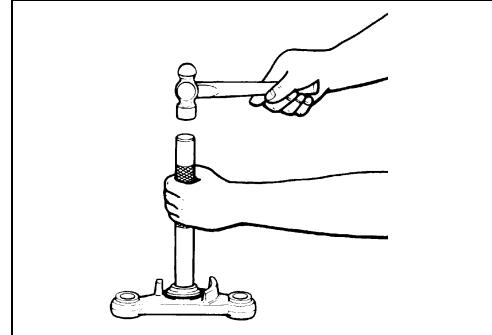
 **Bearing installer**



INNER RACE

- Press in the lower inner race using the special tool.

 **Steering bearing installer**



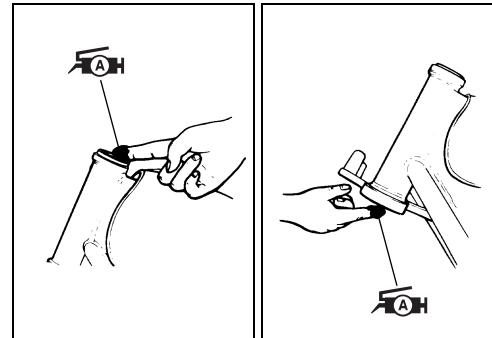
INSTALLATION

Install the steering stem in the reverse order of removal. Pay attention to the following points:

BEARING

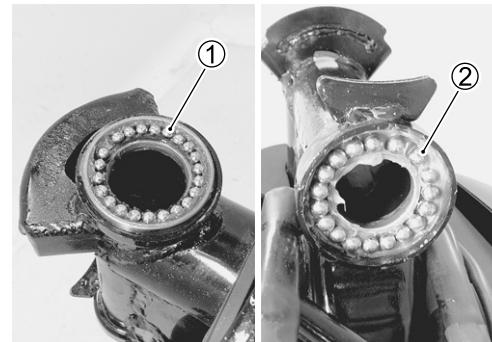
- Apply SUZUKI SUPER GREASE "A" to the upper and lower outer races.

 **SUZUKI SUPER GREASE "A"**



- Install the upper ① and lower ② steel balls.

Number of balls	Upper	22 psc.
	Lower	18 psc.



STEERING STEM

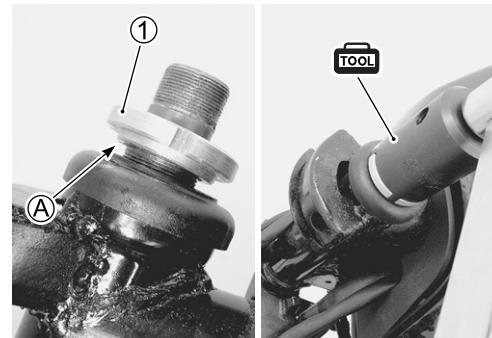
- Tighten the steering stem nut ① to the specified torque using the special tool.

 **Steering stem nut: 45 N·m (4.5 kgf·m) then turn back 1/4 – 1/2**

 **Steering stem nut socket wrench**

NOTE:

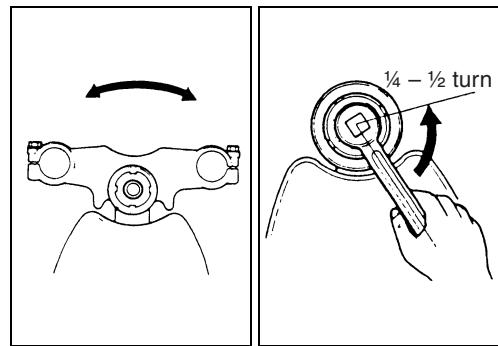
The flange side ④ of the steering stem nut must face down.



- Turn the steering stem bracket about five or six times to the left and right so that the steel balls seat properly.
- Loosen the steering stem nut $1/4 - 1/2$ of a turn.
- In this condition, check that the steering stem can turn smoothly with no rattle and stiffness.
- If there is a rattle or heavy movement, adjust the tightness by the stem nut.

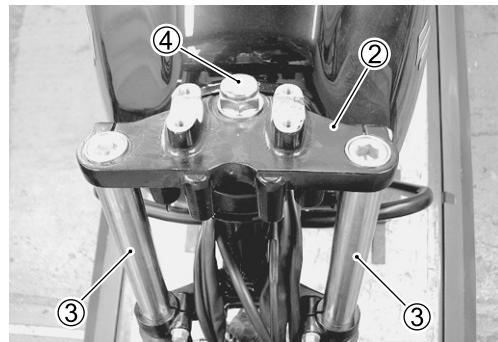
NOTE:

This adjustment will vary from motorcycle to motorcycle.

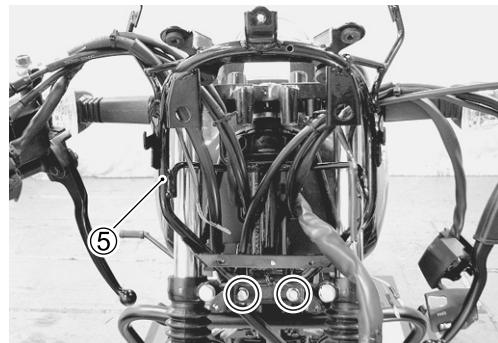


- Temporary, install the steering stem upper bracket ② and front fork ③.
- Tighten the steering stem head nut ④ to the specified torque, then install the front fork ③ again. (☞5-21)

Steering stem head nut: 90 N·m (9.0 kgf·m)



- Pass the wire harnesses, cables and brake hose correctly. (☞7-11 to -12 and 7-14 to -15)
- Install the cowling brace ⑤.



- Install the brake hose guide ⑥.



- Install the brake caliper. (☞5-24)
- Install the handlebars. (☞5-33)
- Connect the ignition switch, left turn signal, right turn signal, clutch switch couplers and lead wires ⑦.
- Bind the wire harnesses with clamps ⑧. (☞7-11 to -12)



- Install the front wheel. (☞ 5-12)

CAUTION

Check that the cable or wire harness does not prevent the handle operation.

NOTE:

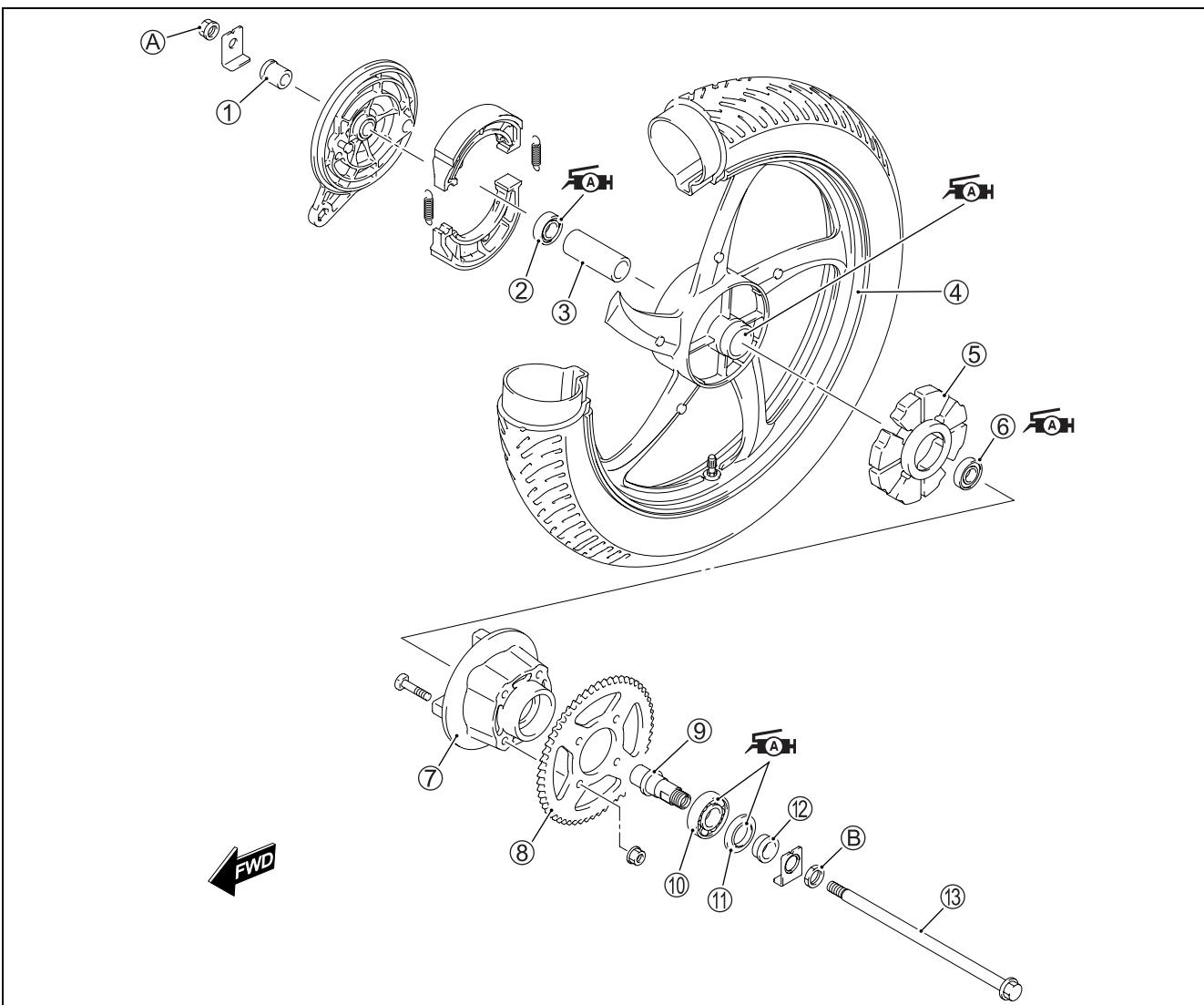
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

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 stiffness is noticeable, re-adjust the steering stem nut.



REAR WHEEL AND REAR SPROCKET DRUM



①	Spacer
②	Bearing
③	Bearing
④	Rear wheel
⑤	Rear sprocket damper
⑥	Rear sprocket drum bearing
⑦	Rear sprocket drum

⑧	Rear sprocket
⑨	Rear sprocket drum shaft
⑩	Bearing
⑪	Dust seal
⑫	Spacer
⑬	Rear axle

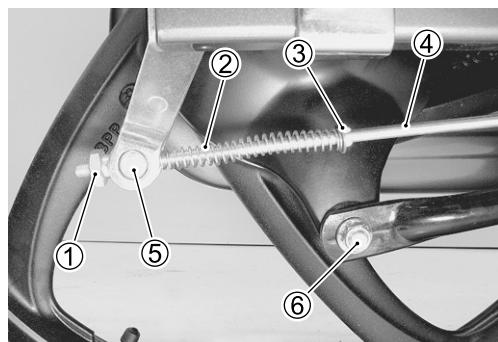
Ⓐ	Rear axle nut
Ⓑ	Rear sprocket drum nut

ITEM	N·m	kgf·m
Ⓐ	65	6.5
Ⓑ	80	8.0

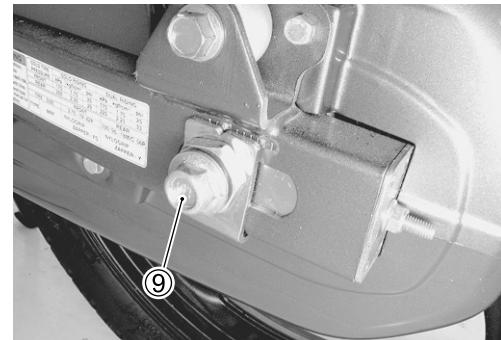
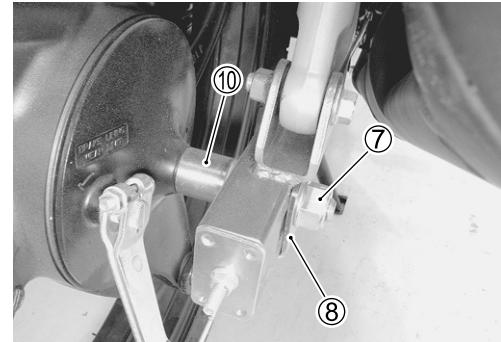
REAR WHEEL

REMOVAL

- Place the motorcycle with a center stand.
- Remove the rear brake adjuster nut ①, spring ②, washer ③, pin ⑤ and brake rod ④ from the cam lever.
- Remove the torque link nut and bolt ⑥.



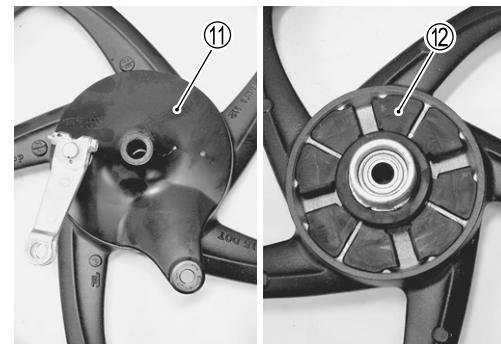
- Remove the rear axle nut ⑦ and washer ⑧.
- Remove the rear axle ⑨ and spacer ⑩.



- Remove the rear wheel.



- Remove the rear brake panel (11) and rear sprocket damper (12).



INSPECTION AND DISASSEMBLY

WHEEL (☞2-19)

TIRE (☞2-19)

REAR AXLE

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

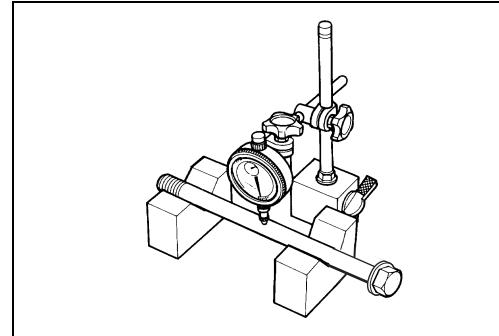
DATA **Rear axle runout**

Service Limit: 0.25 mm

TOOL **Dial gauge**

Dial gauge chuck

V blocks



REAR SPROCKET DAMPER

Inspect the dampers for wear and damage.

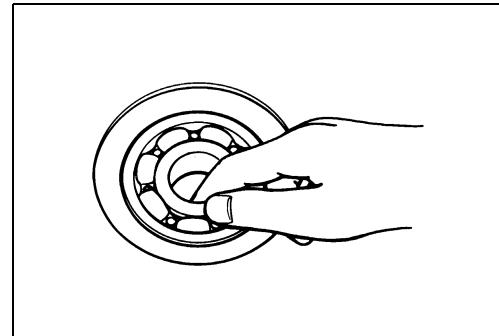
Replace the damper if there is anything unusual.



WHEEL BEARINGS

Inspect the play of the wheel bearings by finger while they are in the wheel. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation.

Replace the bearing in the following procedure if there is anything unusual.



- Remove the wheel bearings by using the special tool.

TOOL **Bearing remover set (15 mm)**

CAUTION

The removed bearing must be replaced with the new ones.



- Remove the spacer ①.



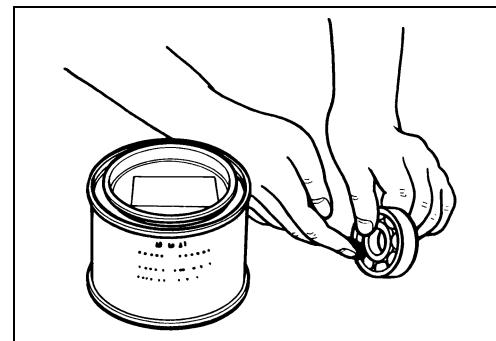
REASSEMBLY AND INSTALLATION

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

BEARING

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

SUZUKI SUPER GREASE "A"

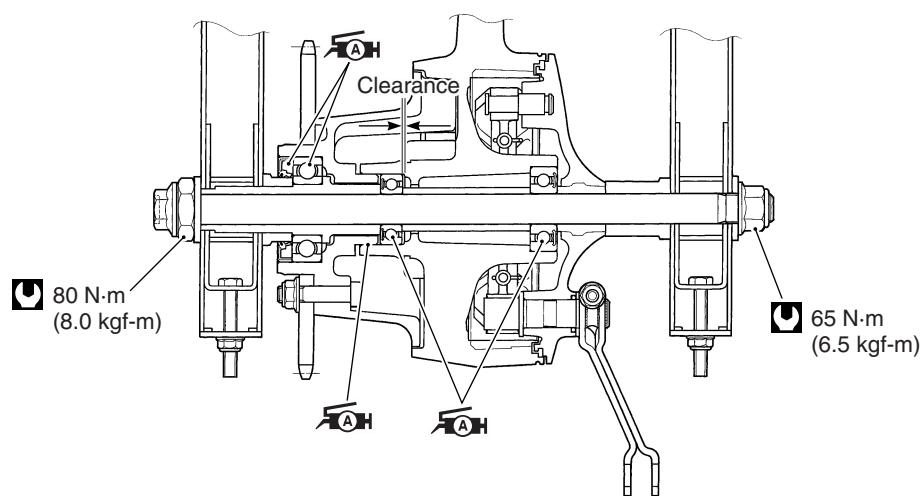


- Install the new wheel bearings with the special tools.

Bearing installer set
Bearing installer set

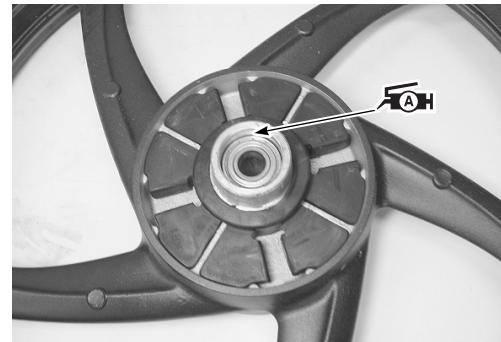
CAUTION

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



REAR WHEEL

- Before installing the rear wheel, apply a small quantity of the SUZUKI SUPER GREASE "A" to the contacting surface between the rear wheel and the rear sprocket drum.

 SUZUKI SUPER GREASE "A"

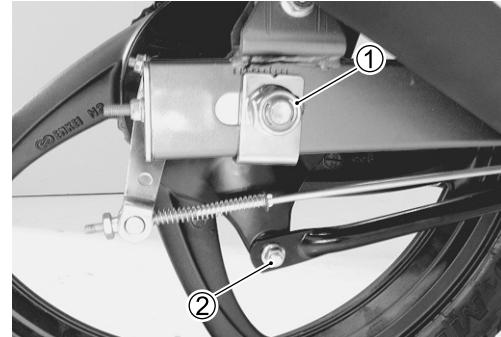
- Temporary, tighten the rear axle nut ①.
- Tighten the rear torque link nut (rear) ② to the specified torque.

 Rear torque link nut: 16 N·m (1.6 kgf-m)

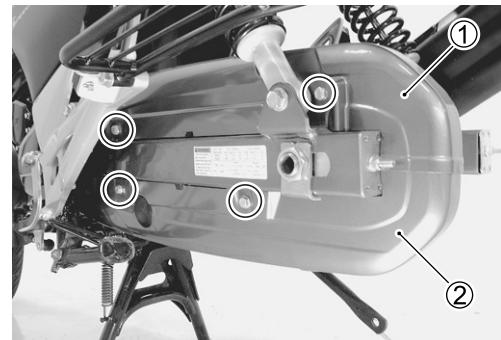
- Tighten the rear axle nut ① to the specified torque.

 Rear axle nut: 65 N·m (6.5 kgf-m)

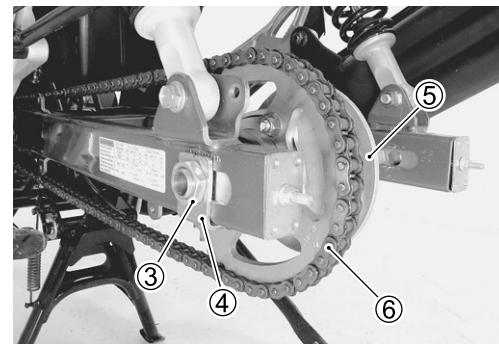
- Adjust the rear brake adjusting. (2-15)
- Check the drive chain slack. (2-14)

**REAR SPROCKET DRUM****REMOVAL**

- Remove the rear wheel. (5-41)
- Remove the upper ① and lower ② chain cases.



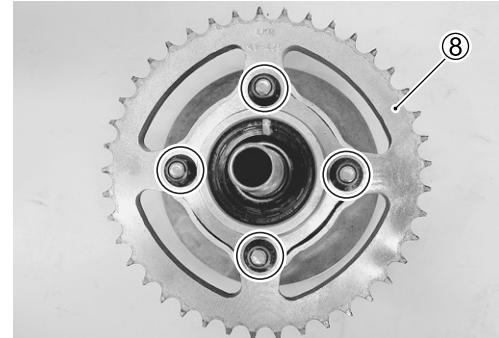
- Remove the rear sprocket drum nut ③ and washer ④.
- Remove the rear sprocket drum ⑤ by disengaging the drive chain ⑥.



- Remove the spacer ⑦.



- Remove the rear sprocket ⑧.

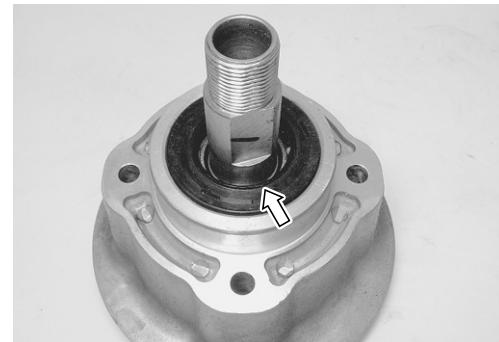


INSPECTION AND DISASSEMBLY

DUST SEAL/BEARING

Inspect the dust seal lip for wear or damage.

If any damages are found, replace the dust seal with a new one.



Inspect the play of the rear sprocket drum bearing while they are in the drum. Rotate the shaft by hand to inspect for abnormal noise and smooth rotation.

Replace the bearing if there is anything unusual.

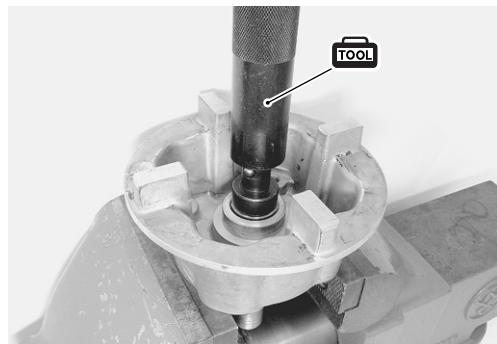


- Remove the rear sprocket drum shaft with the dust seal and bearing from the rear sprocket drum with the special tool.

 **Bearing installing set (10 – 75 ϕ)**

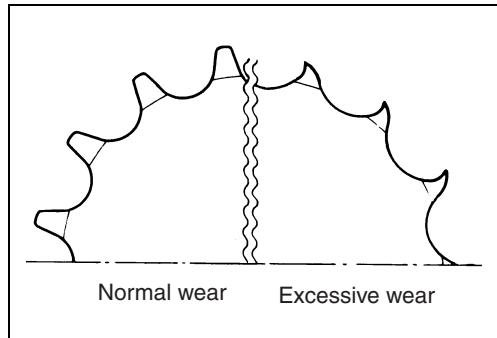
NOTE:

Hold the rear sprocket drum shaft by hand to prevent it from falling.



SPROCKET

- Inspect the rear sprocket teeth for wear.
- If they are worn as shown, replace the engine sprocket, rear sprocket and drive chain as a set.

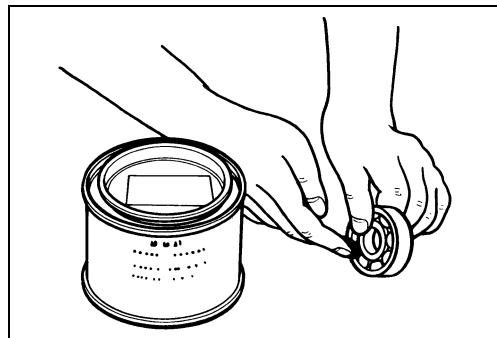


REASSEMBLY AND REMOUNTING

BEARING

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

 **SUZUKI SUPER GREASE "A"**

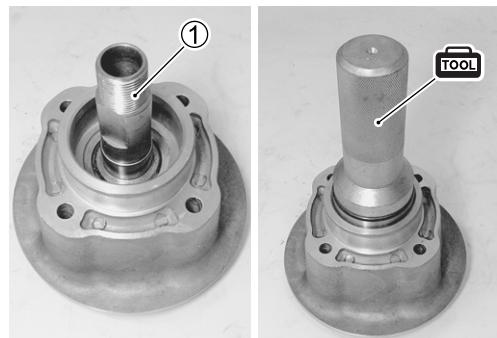


- Install the rear sprocket drum shaft ①.
- Install the new bearing to the sprocket drum with the special tool.

 **Bearing installing tool**

CAUTION

The removed bearing should be replaced with a new one.



DUST SEAL

- Install the new dust seal using the special tool.

 **Bearing installing set (10 – 75 ϕ)**

NOTE:

When installing the dust seal, the stamped mark of dust seal must face outside.



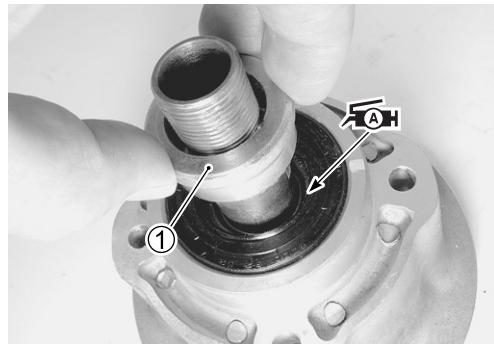
- Apply SUZUKI SUPER GREASE "A" to the dust seal lip.

 SUZUKI SUPER GREASE "A"

- Install the spacer ①.

CAUTION

Be careful not to damage the dust seal when installing the spacer.



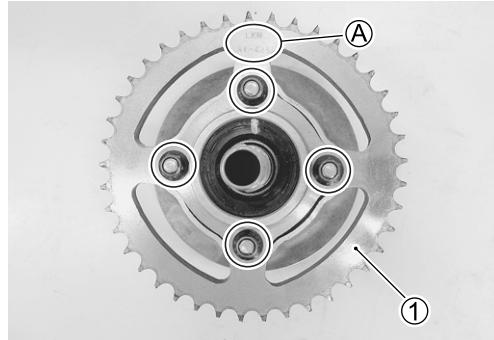
REAR SPROCKET

- Install the rear sprocket ① to the rear sprocket drum.

NOTE:

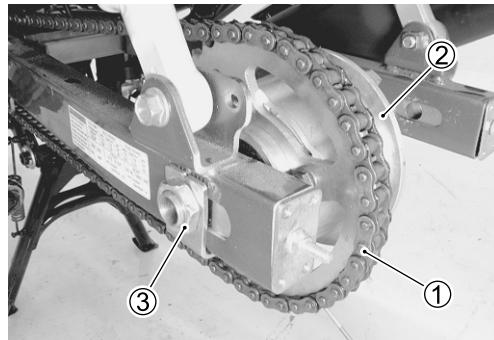
The stamped mark Ⓐ on the rear sprocket should face to the outside.

- Tighten the rear sprocket drum nuts.

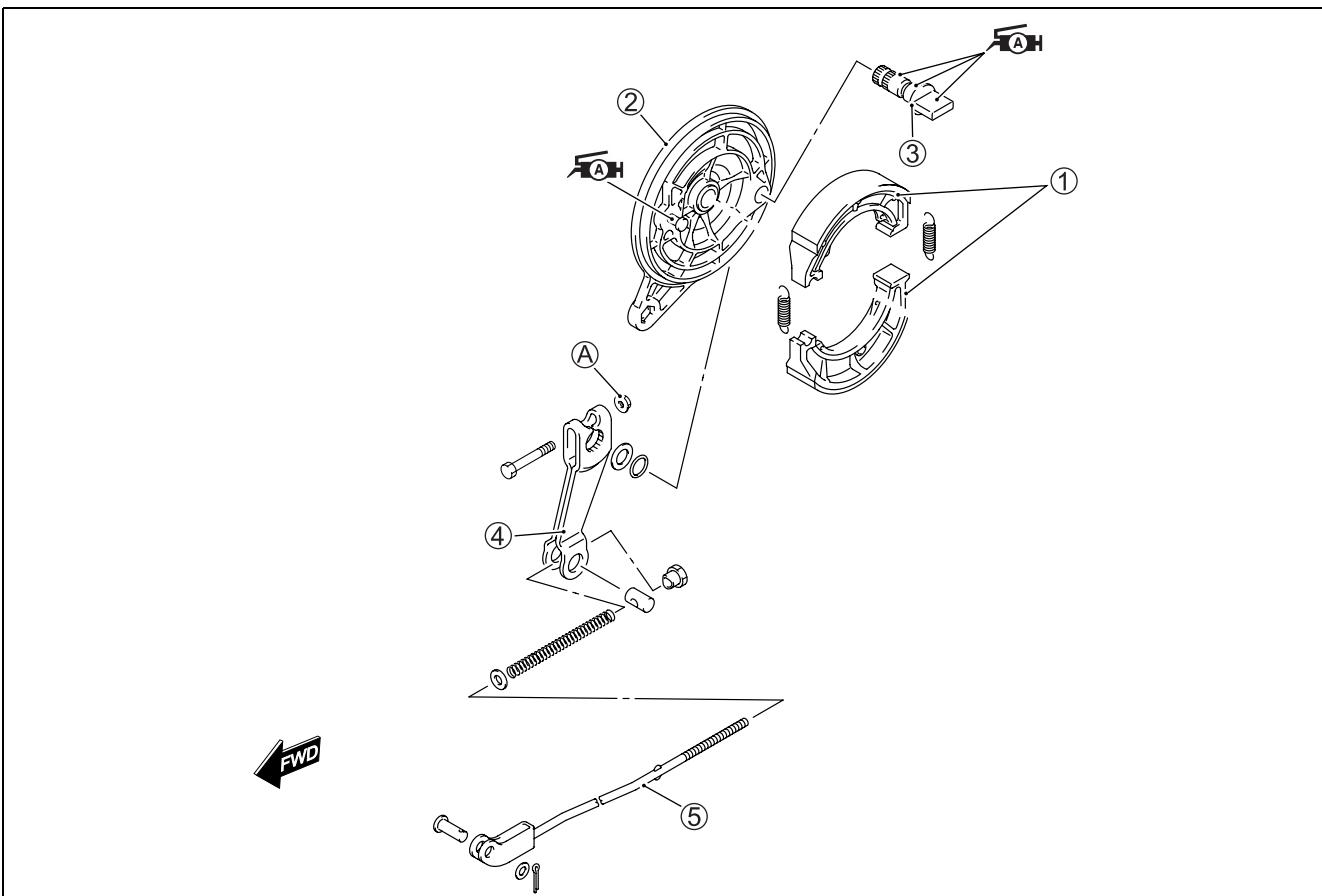


SPROCKET DRUM

- Engage the drive chain ① to the rear sprocket drum ②.
- Remount the rear sprocket drum ② and tighten the rear sprocket drum nut ③ temporarily.
- Install the chain case.
- Install the rear wheel. (参照 5-45)
- Adjust the drive chain slack after installing the rear wheel. (参照 2-14)



REAR BRAKE

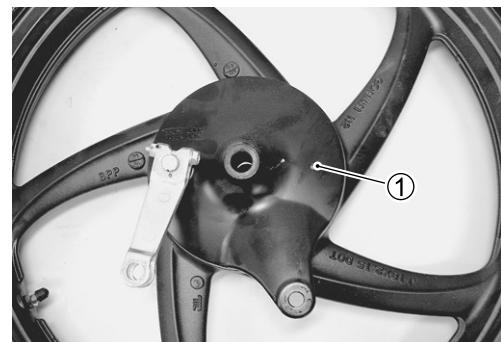


(1)	Brake shoe	(4)	Brake cam lever
(2)	Brake panel	(5)	Brake rod
(3)	Brake cam	(Ⓐ)	Rear cam lever nut

ITEM	N·m	kgf·m
(Ⓐ)	7	0.7

REMOVAL AND DISASSEMBLY

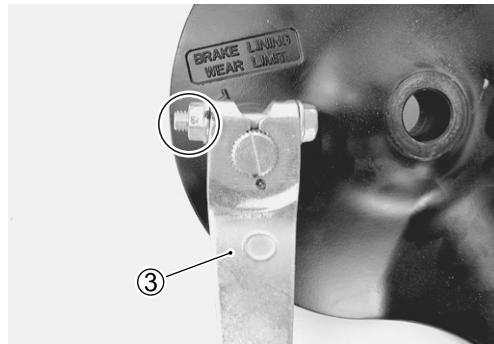
- Remove the rear wheel. (5-41)
- Remove the rear brake panel ①.



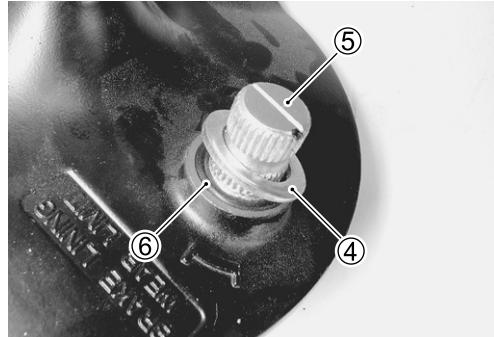
- Remove the brake shoes ② from the brake panel.



- Remove the brake cam lever bolt and nut.
- Remove the brake cam lever ③.



- Remove the washer ④, brake cam shaft ⑤ and O-ring ⑥.



INSPECTION

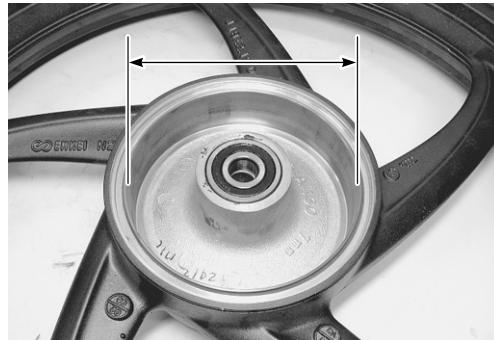
BRAKE DRUM

Measure the brake drum I.D. to determine the extent of wear and, if the limit is exceeded by the wear noted, replace the wheel hub. The value of this limit is indicated inside the drum.

DATA Brake drum I.D.:

Service limit: 130.7 mm

TOOL Vernier calipers (150 mm)

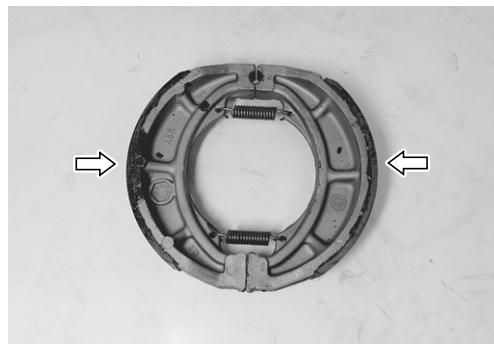


BRAKE SHOE

Inspect the brake shoes for wear or damage. If any defects are found, replace the brake shoes as a set.

CAUTION

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



BRAKE CAM

Inspect the brake cam for abnormal wear.

Place the brake cam into the brake panel and check for smooth rotation.

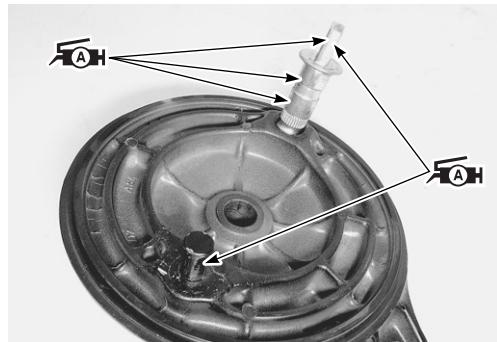
Check that the rotating parts are coated with sufficient grease.



REASSEMBLY AND INSTALLATION

- When installing the brake camshaft, apply SUZUKI SUPER GREASE "A" to the camshaft and pin.

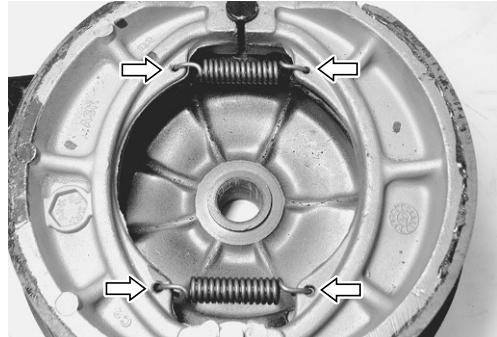
 **SUZUKI SUPER GREASE "A"**



- Install the brake shoes with spring hooks faced inside.

CAUTION

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



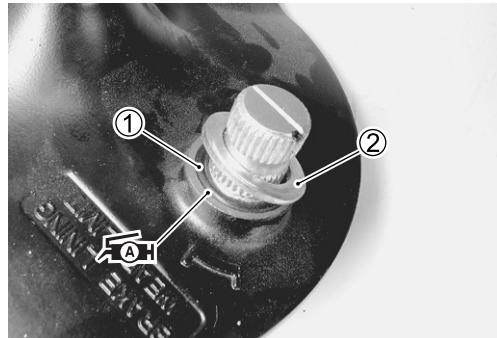
- Apply SUZUKI SUPER GREASE "A" to the new O-ring ①.

CAUTION

Use a new O-ring.

 **SUZUKI SUPER GREASE "A"**

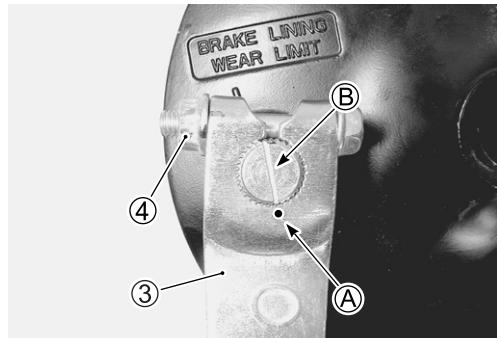
- Install the O-ring ① and washer ②.



- When installing the brake cam lever ③, align the punch mark Ⓐ of camshaft with slit Ⓑ of cam lever.
- Tighten the brake cam lever nut ④ to the specified torque.

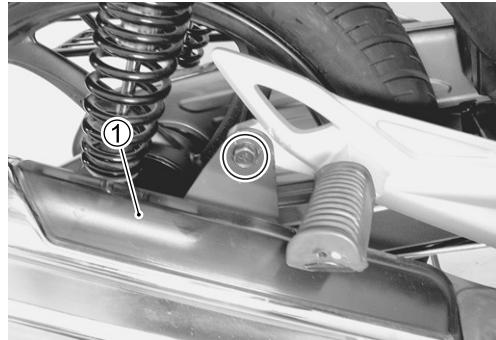
 **Brake cam lever nut: 7 N·m (0.7 kgf·m)**

- Install the brake panel to the rear wheel.
- Install the rear wheel. (☞5-45)

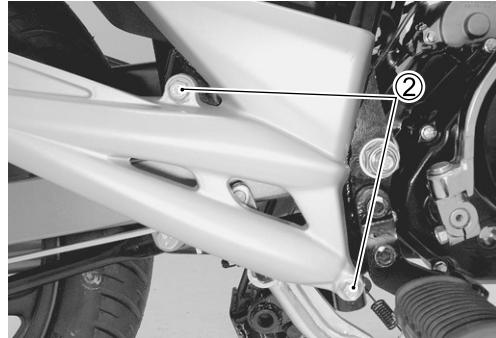


REAR BRAKE PEDAL REMOVAL

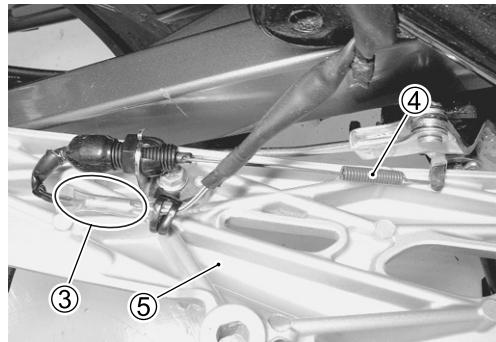
- Remove the muffler ①.



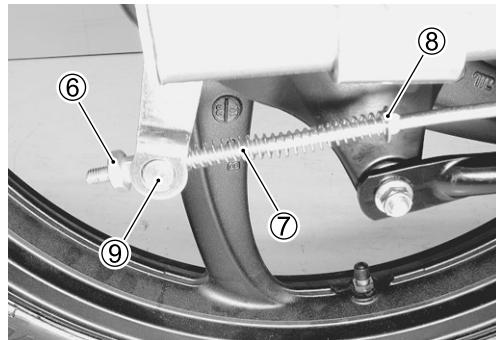
- Remove the right frame side lower cover. (☞5-4)
- Remove the rear footrest mounting bolts ②.



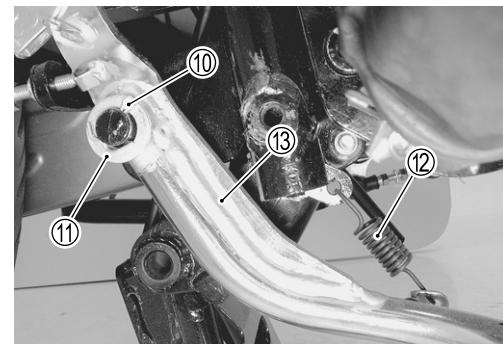
- Disconnect the rear brake light switch lead wire couplers ③.
- Remove the rear brake light switch spring ④ and rear footrest bracket ⑤.



- Remove the rear brake adjuster nut ⑥, spring ⑦, washer ⑧, brake rod and pin ⑨ from the cam lever.



- Remove the cotter pin ⑩, washer ⑪ and brake pedal return spring ⑫.
- Remove the brake pedal ⑬.



INSPECTION

Inspect the brake pedal and rod for damage and excessive bend.

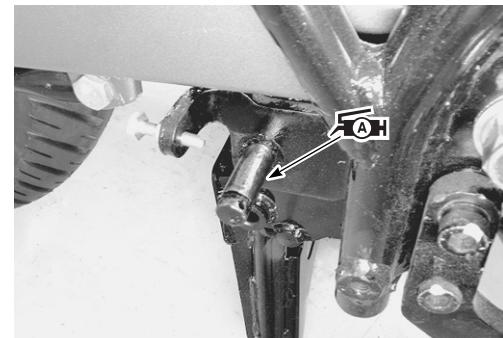


REAR BRAKE PEDAL INSTALLATION

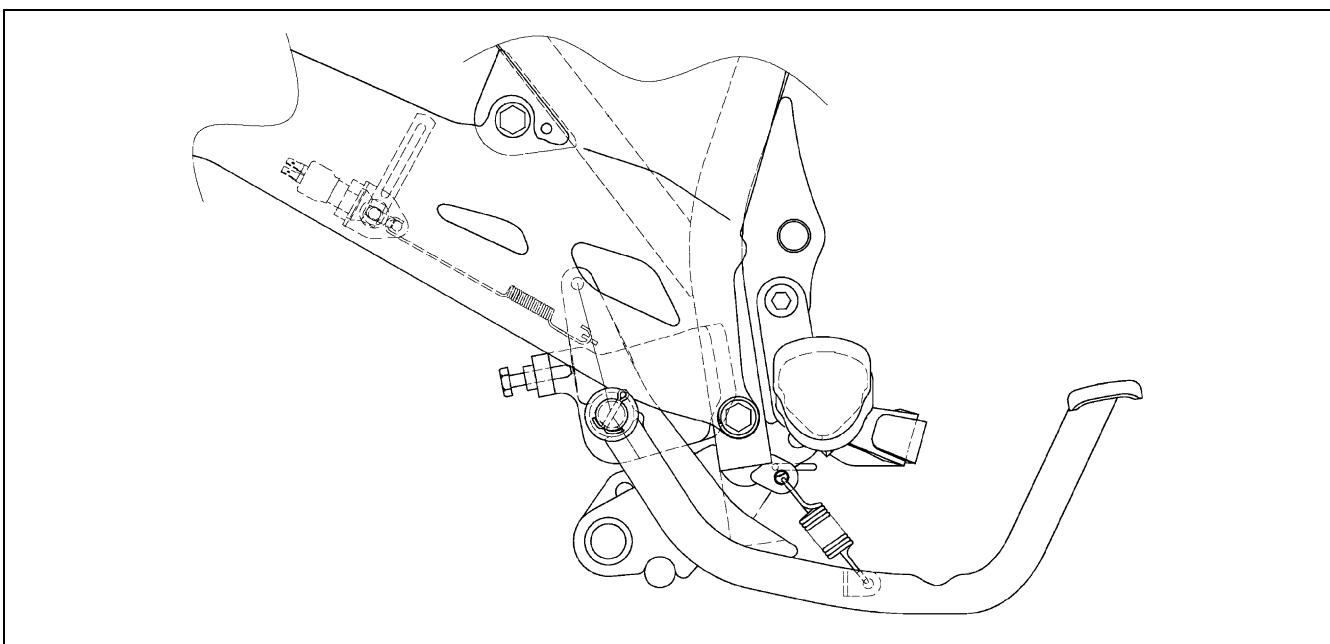
Install the rear brake pedal in the reverse order of removal. Pay attention to the following points:

- Apply SUZUKI SUPER GREASE "A" to the brake pedal shaft.

 **SUZUKI SUPER GREASE "A"**



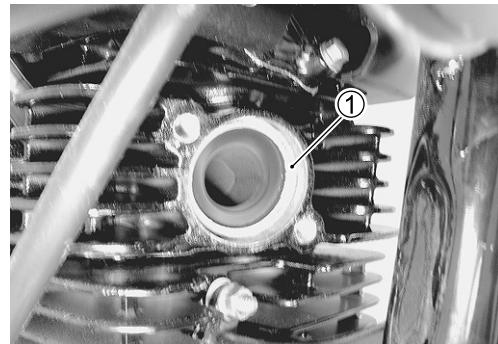
- Install the brake pedal as shown in the illustration.



- Install the new gasket ①.

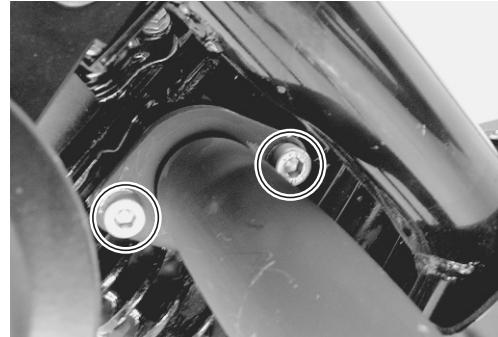
CAUTION

Replace the gasket with a new one.



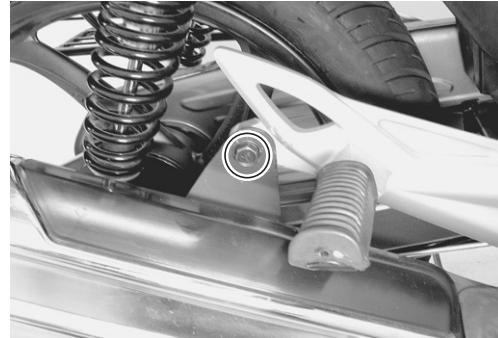
- Tighten the muffler mounting nut and exhaust pipe bolts to the specified torque.

 **Muffler mounting nut:** 60 N·m (6.0 kgf·m)
Exhaust pipe bolt: 23 N·m (2.3 kgf·m)

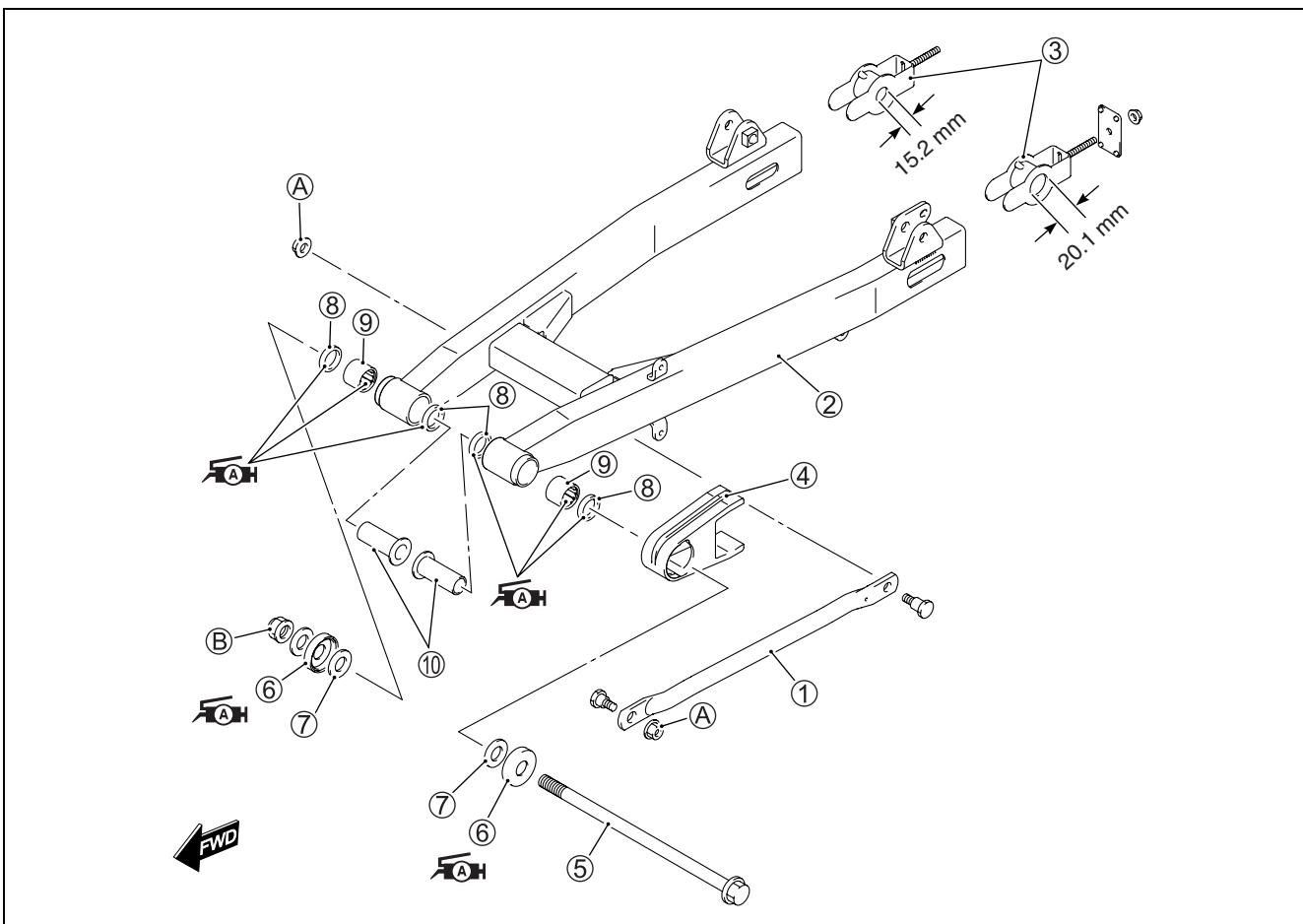


After installing the rear brake pedal, the following adjustments are required before driving.

- Rear brake pedal (2-15)
- Check the brake for operating condition, play and braking effect.
- Check the brake lamp lighting timing.



SWINGARM



①	Rear torque link	⑦	Washer
②	Swingarm	⑧	Dust seal
③	Chain adjuster	⑨	Bearing
④	Chain buffer	⑩	Spacer
⑤	Pivot shaft	Ⓐ	Torque link nut
⑥	Dust cover	Ⓑ	Swingarm pivot nut

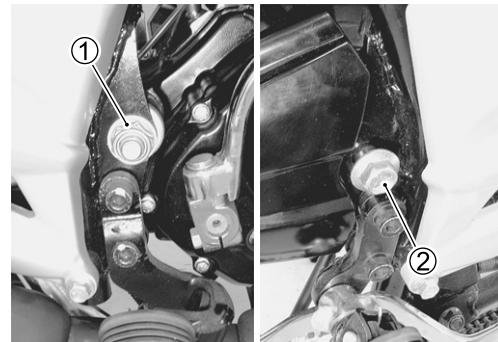
ITEM	N·m	kgf·m
Ⓐ	16	1.6
Ⓑ	65	6.5

REMOVAL

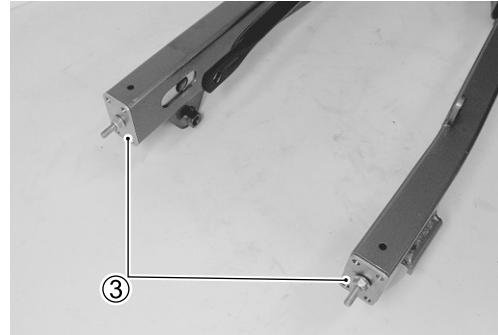
- Remove the rear wheel. (5-41)
- Remove the rear sprocket drum. (5-45)
- Remove the lower rear shock absorber mounting bolts.



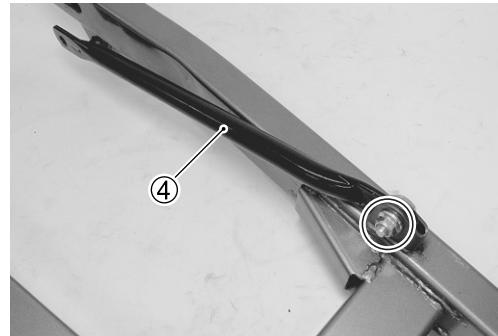
- Remove the swingarm pivot nut and washer ①, and draw out the shaft ②.
- Remove the swingarm assembly.



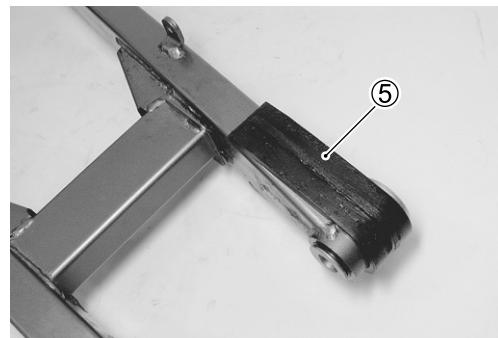
- Remove the chain adjusters ③.



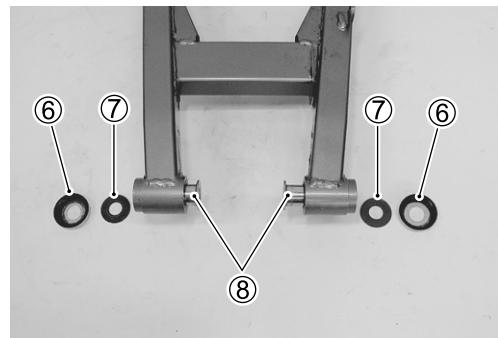
- Remove the torque link ④.



- Remove the chain buffer ⑤.



- Remove the dust covers ⑥ and washers ⑦.
- Remove the spacers ⑧.



INSPECTION AND DISASSEMBLY

SWINGARM

Inspect the swingarm for damage.

If any damages are found, replace the swingarm with a new one.



CHAIN BUFFER

Inspect the chain buffer for damage.

If any damages are found, replace the chain buffer with a new one.



SWINGARM PIVOT SHAFT

Measure the pivot shaft runout using the dial gauge. If the runout exceeds the service limit, replace the pivot shaft.

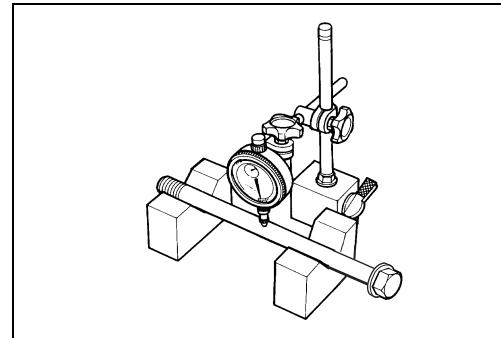
DATA Swingarm pivot shaft runout

Service limit: 0.3 mm

Dial gauge

Dial gauge chuck

V blocks



REAR TORQUE LINK

Inspect the rear torque link for damage. If any damage is found, replace the rear torque link with a new one.



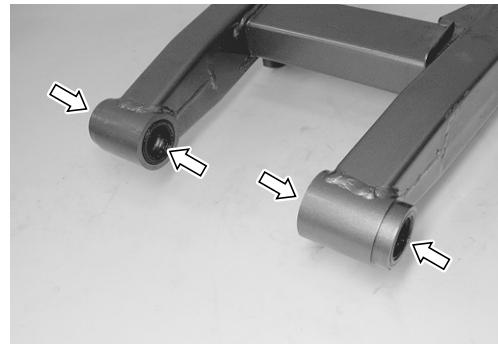
SPACER

Inspect the spacers for wear and damage. If any defects are found, replace the spacers with new ones.

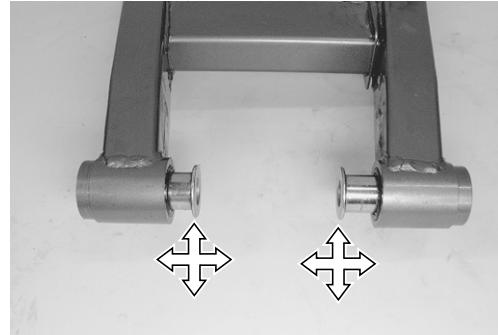


DUST SEAL/BEARING

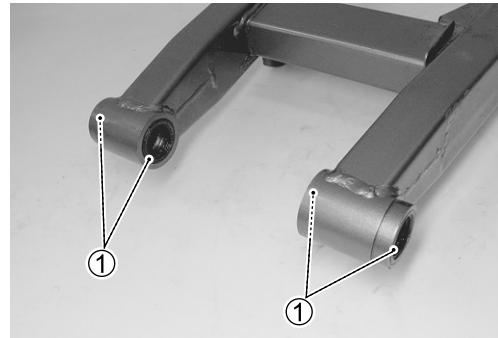
- Inspect the dust seal lips for wear or damage. If any damages are found, replace the dust seal with new ones.



- Insert the spacers into bearings and check the play to move the spacer up and down. If an excessive play is noted, replace the bearing with new ones.

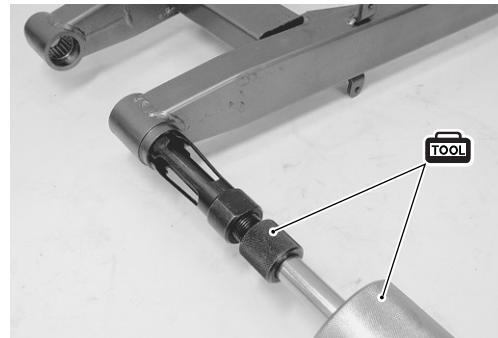


- Remove the dust seals ①.



- Remove the bearings with the special tools.

 **Bearing remover**
Rotor remover sliding shaft



REASSEMBLY AND INSTALLATION

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

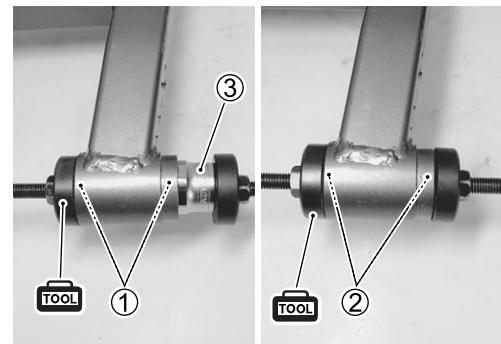
BEARING/DUST SEAL

- Pass the bearings ① and dust seals ② with the special tool and suitable size socket wrench ③.

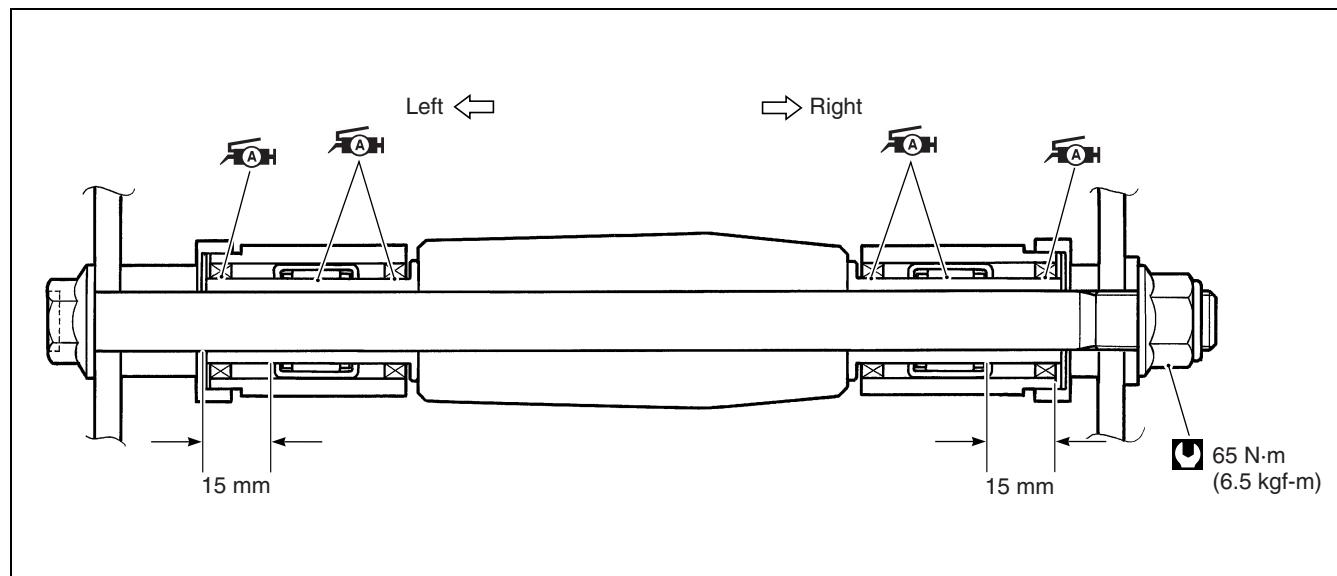
Bearing installer set

NOTE:

- * The stamped mark side of the bearing faces outside.
- * Pass the bearings ① at 15 mm depth from the swingarm edge.
- Apply SUZUKI SUPER GREASE "A" to the bearings and dust seals.

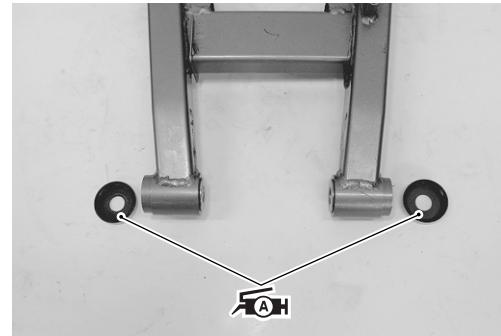


SUZUKI SUPER GREASE "A"



- Apply SUZUKI SUPER GREASE "A" to the dust cover lips.

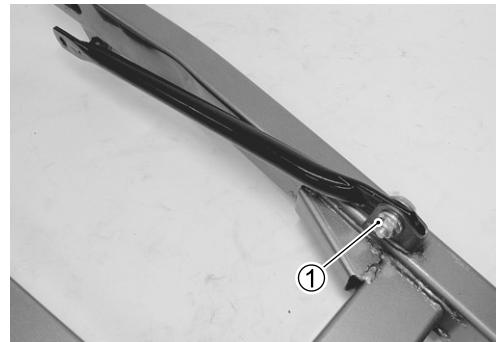
SUZUKI SUPER GREASE "A"



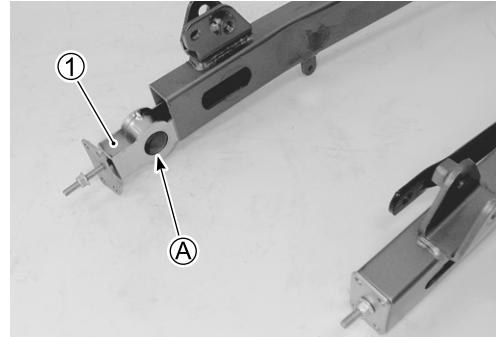
REAR TORQUE LINK

- Tighten the rear torque link nut ① to the specified torque.

 **Rear torque link nut: 16 N·m (1.6 kgf·m)**

**CHAIN ADJUSTER**

- When installing the left chain adjuster ①, large hole side Ⓐ of left chain adjuster must face inside.

**SWINGARM**

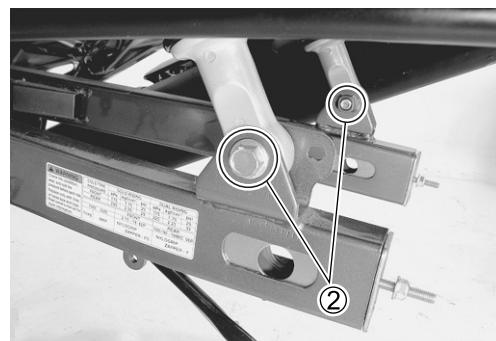
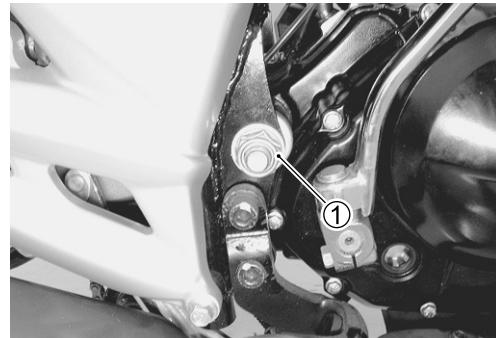
- Tighten the swingarm pivot nut ① to the specified torque.

 **Swingarm pivot nut: 65 N·m (6.5 kgf·m)**

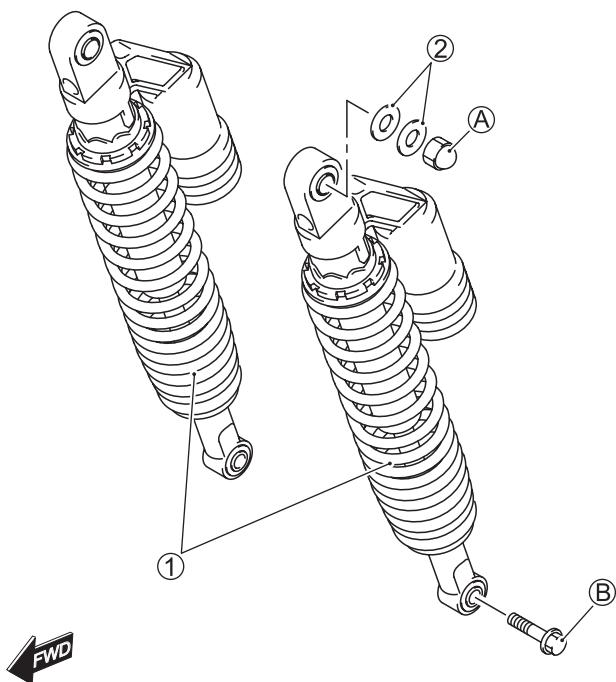
- Tighten the rear shock absorber lower mounting bolt ② to the specified torque.

 **Rear shock absorber mounting bolt: 29 N·m (2.9 kgf·m)**

- Install the rear sprocket drum. (☞5-48)
- Install the rear wheel. (☞5-45)



REAR SHOCK ABSORBER

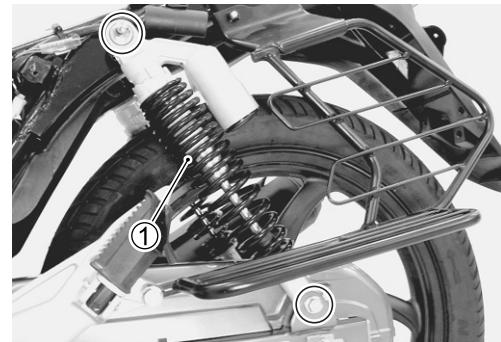


①	Rear shock absorber
②	Washer
Ⓐ	Rear shock absorber nut (Upper)
Ⓑ	Rear shock absorber bolt (Lower)

ITEM	N·m	kgf·m
Ⓐ	29	2.9
Ⓑ	29	2.9

REMOVAL

- Remove the frame cover assembly. (5-5)
- Remove the rear shock absorber ①.



INSPECTION

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

CAUTION

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



INSTALLATION

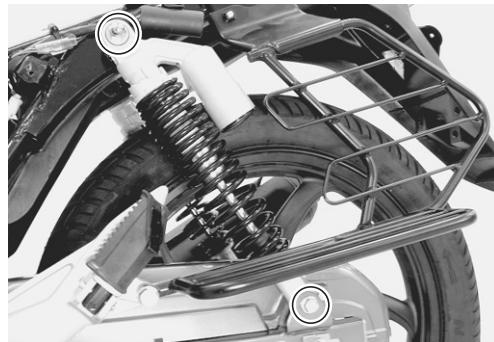
Install the rear shock absorber in the reverse order of removal.

Pay attention to the following points:

- Install the rear shock absorber and tighten the rear shock absorber mounting bolt and nut.

Rear shock absorber mounting bolt and nut:

29 N·m (2.9 kgf·m)



REAR SHOCK ABSORBER DISPOSAL

WARNING

- * The rear shock absorber unit contains high-pressure nitrogen gas.
- * Mishandling can cause explosion.
- * Keep away from fire and heat. High gas pressure caused by heat can cause an explosion.
- * Release gas pressure before disposing.

GAS PRESSURE RELEASE

The rear cushion damper unit contains high-pressure nitrogen gas. Make sure to observe the following precautions.

WARNING

- * Never apply heat or disassemble the damper unit since it can explode or oil can splash hazardously.
- * When discarding the rear cushion unit, be sure to release gas pressure from the unit following the procedures below.

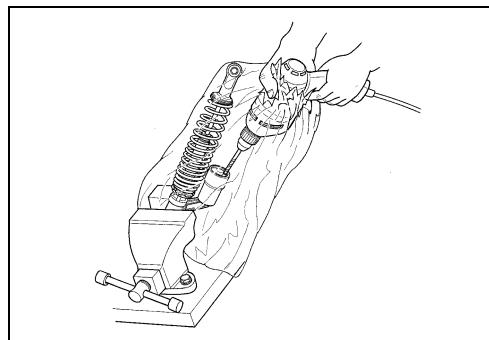
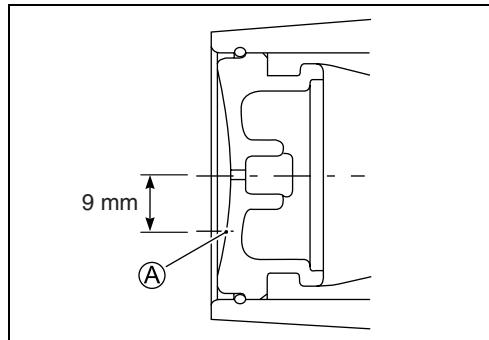
Mark the drill center at the location  using a center punch.

Wrap the rear cushion unit with a vinyl bag and fix it on a vise as shown.

Drill a 2 – 3 mm hole at the marked drill center using a drilling machine and let out gas while taking care not to get the vinyl bag entangled with the drill bit.

WARNING

- * Be sure to wear protective glasses since drilling chips and oil may fly off with blowing gas when the drill bit has penetrated through the body.
- * Make sure to drill at the specified position. Otherwise, pressurized oil may spout out forcefully.



ELECTRICAL SYSTEM

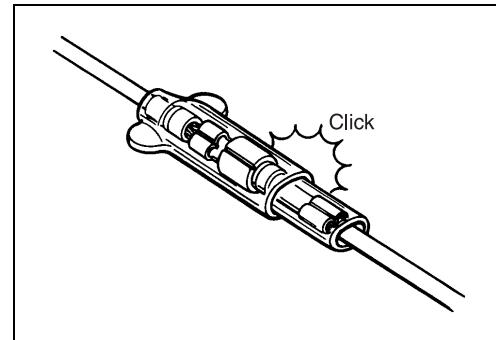
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CAUTIONS IN SERVICING

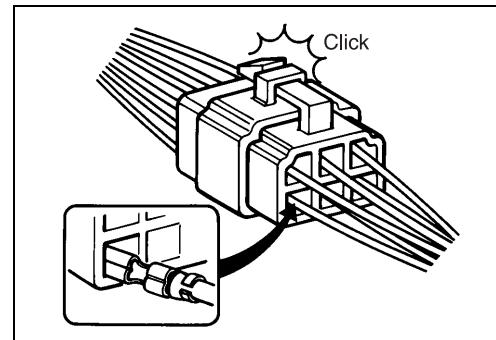
CONNECTOR

- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.
- Avoid applying grease or other similar material to connector/ coupler terminals to prevent electric trouble.



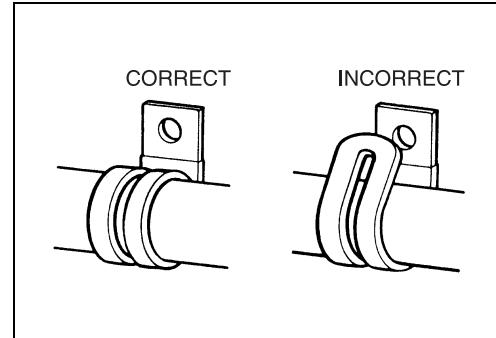
COUPLER

- With a lock type coupler, be sure to release the lock before disconnecting and push it in fully till the lock works when connecting.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- Inspect each terminal on the coupler for being loose or bent.
- Push in the coupler straightly. An angled or skewed insertion may cause the terminal to be deformed, possibly resulting in poor electrical contact.
- Inspect each terminal for corrosion and contamination.



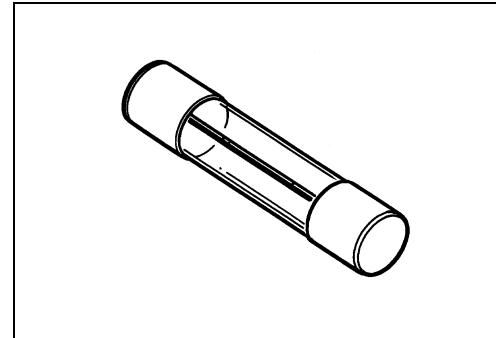
CLAMP

- Clamp the wire harness at such positions as indicated in "WIRING HARNESS". (☞ 7-11 to -12)
- Bend the clamp properly so that the wire harness is clamped securely.
- In clamping the wire harness, use care not to allow it to hang down.
- Do not use wire or any other substitute for the band type clamp.



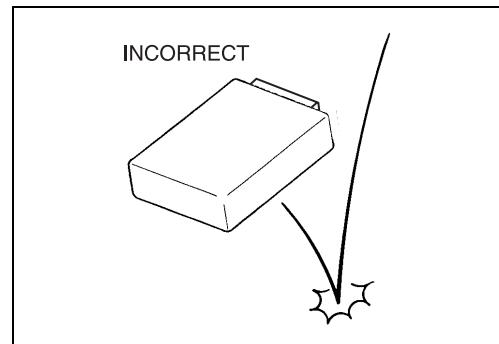
FUSE

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



SEMI-CONDUCTOR EQUIPPED PART

- Be careful not to drop the part with semi-conductor built in such as CDI and regulator/rectifier.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.



CONNECTING THE BATTERY

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

WIRING PROCEDURE

- Properly route the wire harness according to the "WIRING HARNESS" section. (7-11 to -12)

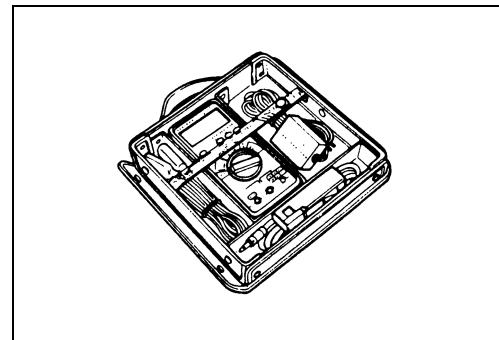
USING THE MULTI CIRCUIT TESTER

- Properly use the multi circuit tester \oplus and \ominus 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, be sure to turn the switch to the OFF position.

TOOL Multi circuit tester set

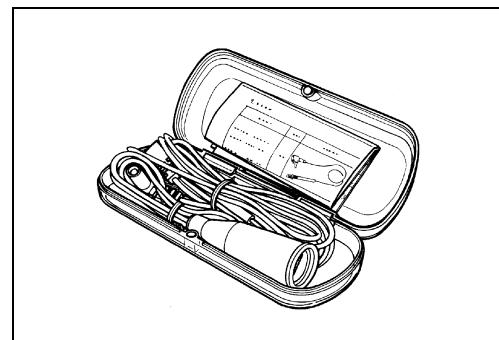
CAUTION

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



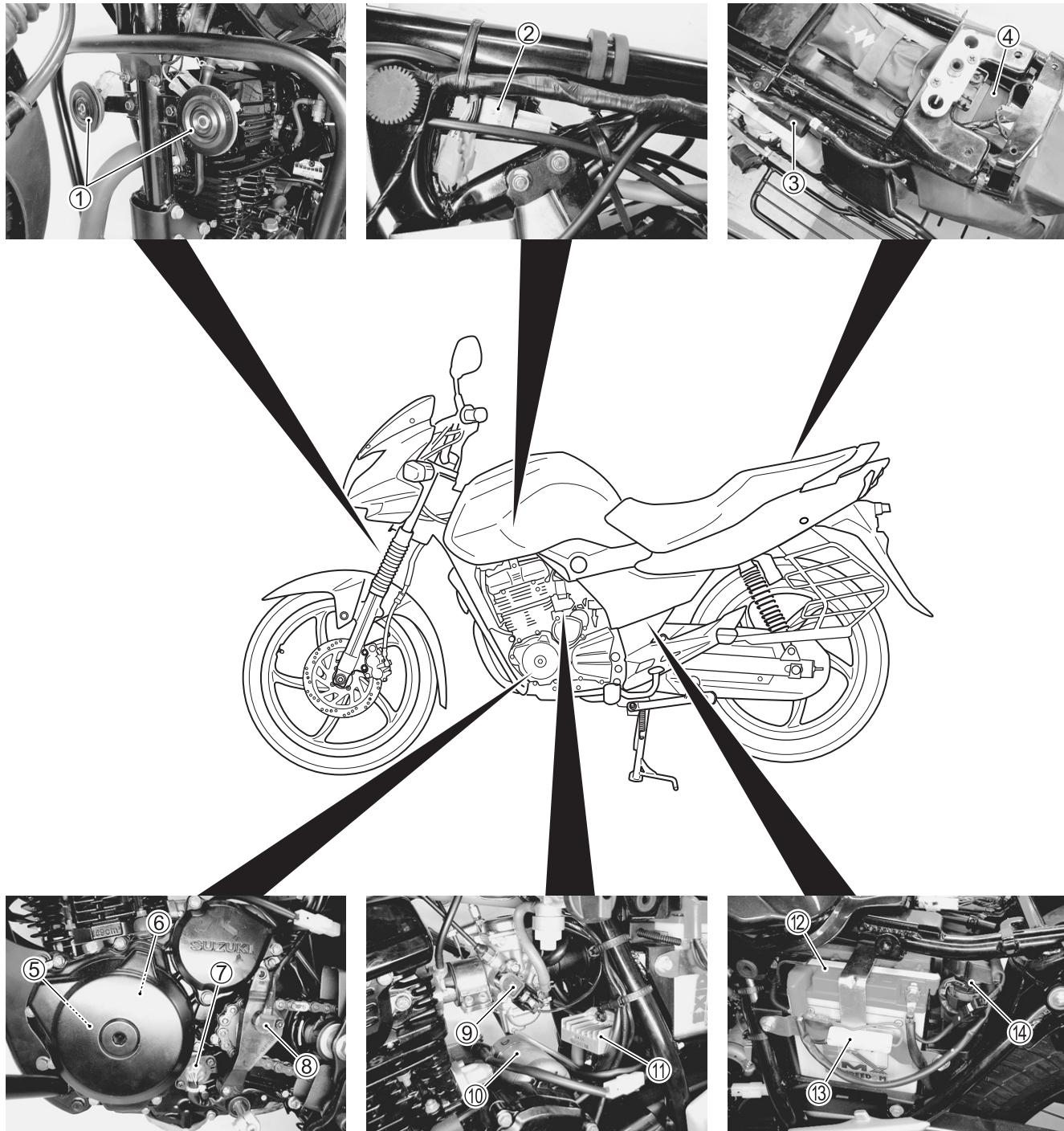
NOTE:

- * When connecting the multi circuit tester, use the needle-point probe to the back side of the lead wire coupler and connect the probes of tester to them.
- * Use the needle-point probe to prevent the rubber of the waterproof coupler from damage.

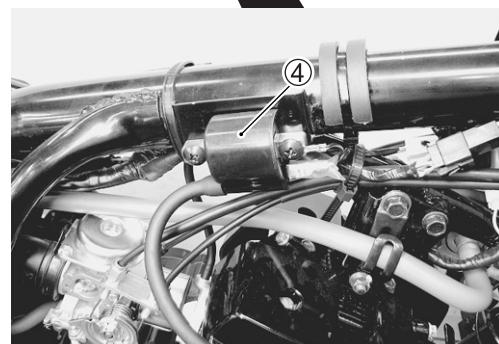
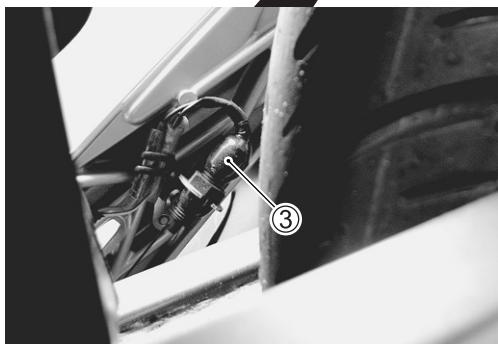
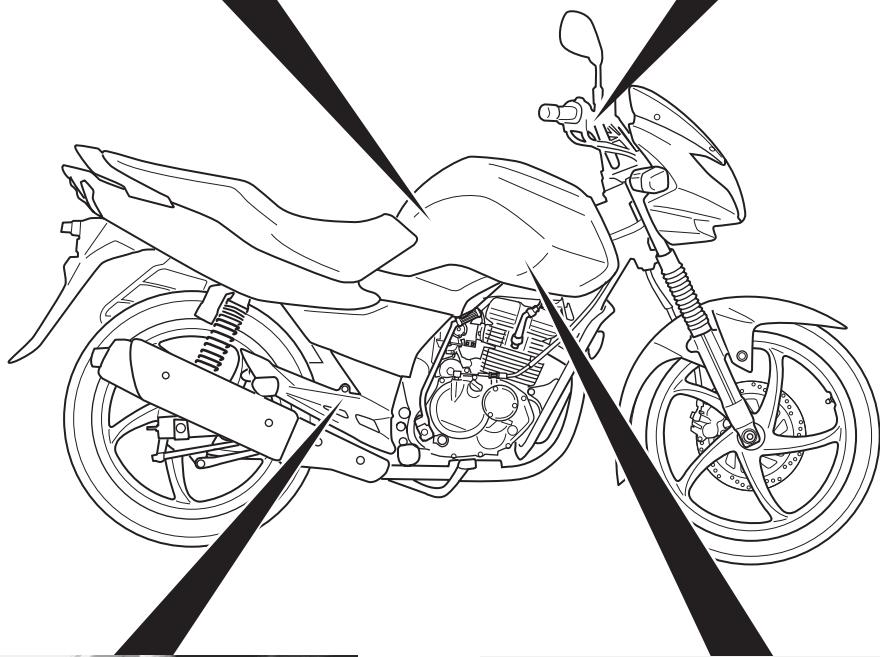
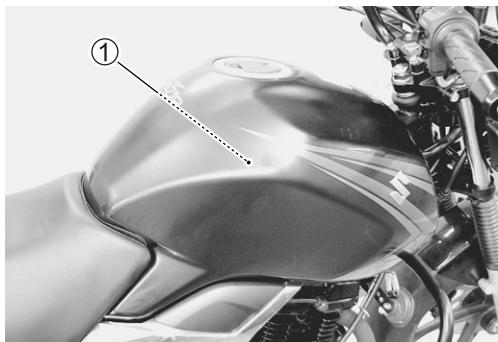


TOOL Needle-point probe set

LOCATION OF ELECTRICAL COMPONENTS

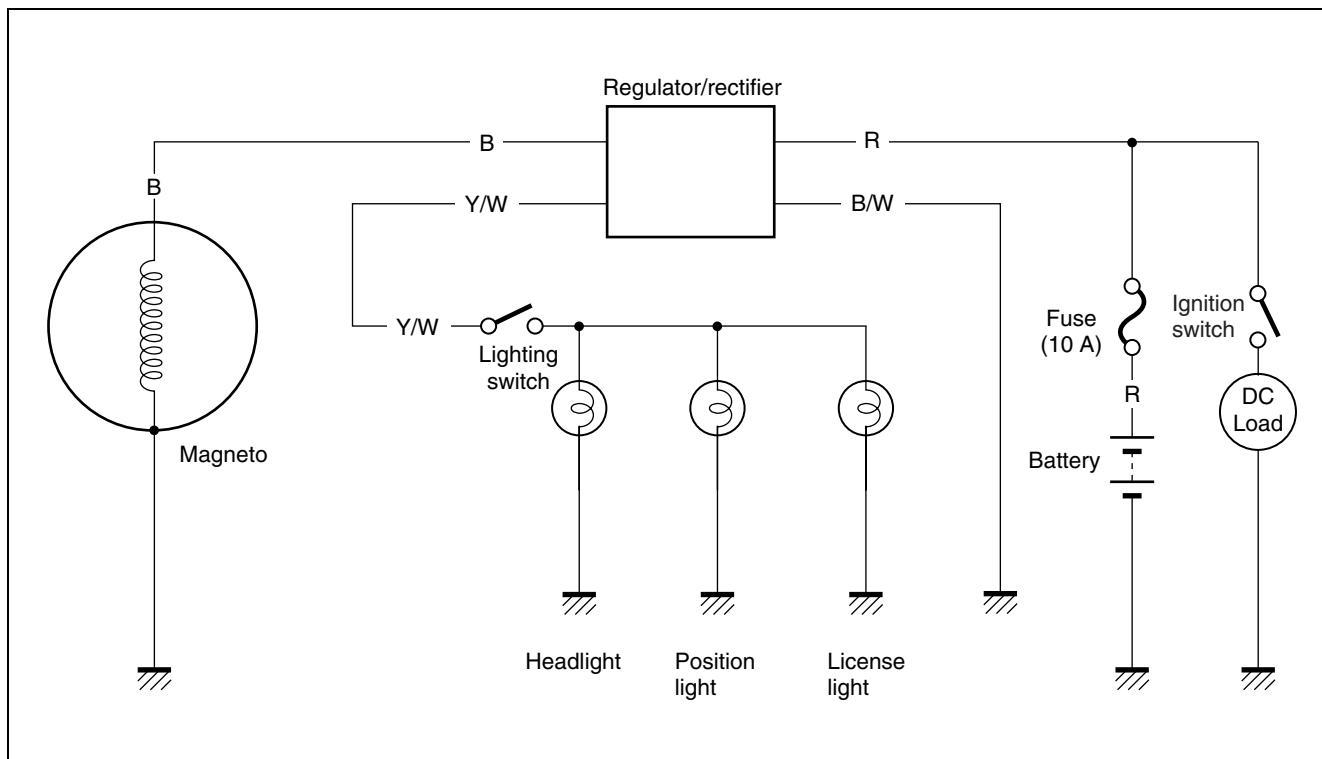


① Horn	⑥ Pickup coil	⑪ Regulator/rectifier
② Turn signal relay	⑦ Neutral switch	⑫ Battery
③ Condenser	⑧ Speed sensor	⑬ Fuse
④ CDI unit	⑨ TP sensor	⑭ Starter relay
⑤ Magneto	⑩ Starter motor	



①	Fuel level gauge
②	Front brake light switch
③	Rear brake light switch
④	Ignition coil

CHARGING SYSTEM



TROUBLESHOOTING

Battery runs down quickly.

Step 1

1) Check accessories which use excessive amounts of electricity.

Are accessories being installed?

YES	Remove accessories.
NO	Go to Step 2.

Step 2

1) Check the battery for current leaks. (☞ 6-8)

Is the battery for current leaks OK?

YES	Go to Step 3.
NO	<ul style="list-style-type: none"> • Short circuit of wire harness • Faulty electrical equipment

Step 3

1) Measure the charging voltage between the battery terminals. (☞ 6-8)

Is the battery charging of voltage OK?

YES	<ul style="list-style-type: none"> • Faulty battery • Abnormal driving condition
NO	Go to Step 4.

Step 4

1) Measure the resistance of the stator coil. (☞ 6-9)

Is the resistance of stator coil OK?

YES	Go to Step 5.
NO	Faulty stator coil or disconnected lead wires

Step 5

1) Measure the stator no-load voltage. (☞ 6-9)

Is the stator no-load voltage OK?

YES	Go to Step 6.
NO	Faulty stator

Step 6

1) Inspect the regulator/rectifier. (☞ 6-10)

Is the regulator/rectifier OK?

YES	Go to Step 7.
NO	Faulty regulator/rectifier

Step 7

1) Inspect the wirings.

Are the wirings OK?

YES	Faulty battery
NO	<ul style="list-style-type: none">• Short circuit of wire harness• Poor contact of couplers

Battery overcharge

- Faulty regulator/rectifier
- Faulty battery
- Poor contact of stator lead wire coupler

INSPECTION

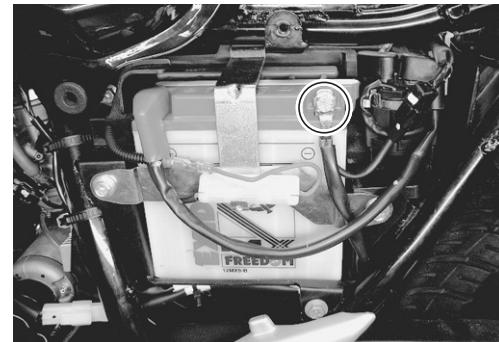
BATTERY CURRENT LEAKAGE

- Remove the left frame side lower cover. (☞5-4)
- Turn the ignition switch to the “OFF” position.
- Disconnect the \ominus battery lead wire.
- Measure the current between the \ominus battery terminal and \ominus battery lead wire using the multi circuit tester. If the reading exceeds the specified value, leakage is evident.

 **Multi circuit tester set**

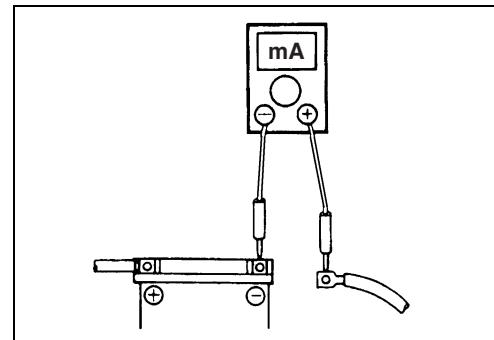
 **Tester knob indication: Current (---, 20 mA)**

 **Battery current (leak): Under 1 mA**



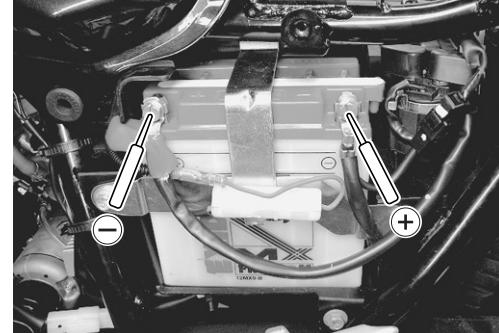
CAUTION

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



REGULATED VOLTAGE

- Remove the left frame side lower cover. (☞5-4)
- Start the engine and keep it running at 5 000 r/min with dimmer switch turned “HI” position.
- Measure the DC voltage between the \oplus and \ominus battery terminals using the multi circuit tester. If the voltage is not within the specified value, inspect the stator coil and regulator/rectifier. (☞6-10)



NOTE:

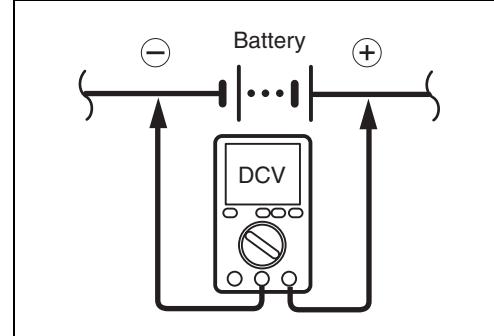
When making this test, be sure that the battery is in fully-charged condition.

 **Multi circuit tester set**

 **Tester knob indication: Voltage (---)**

 **Charging output (Regulated voltage):**

13.5 – 15.5 V at 5000 r/min



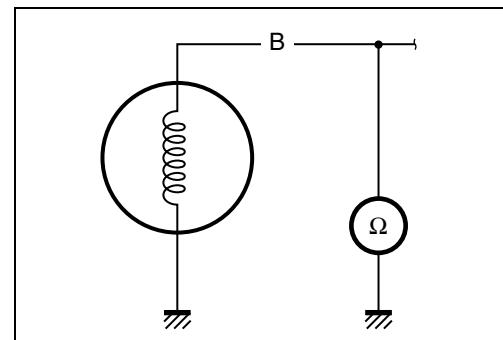
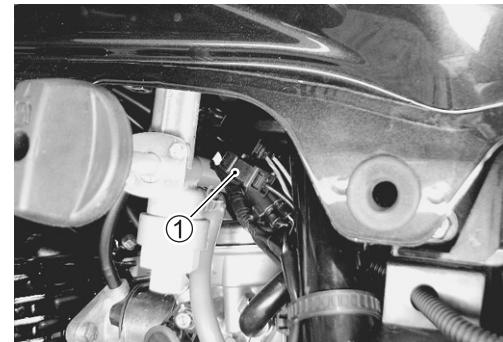
STATOR COIL RESISTANCE

- Remove the left frame side lower cover. (☞5-4)
- Disconnect the stator coupler ①.
- Measure the resistance between the Black lead wire and ground using the multi circuit tester. If the resistance is not within the specified value, replace the stator coil with a new one.

 **Multi circuit tester set**

 **Tester knob indication: Resistance (Ω)**

 **Stator coil resistance: 0.6 – 2.0 Ω (Black – Ground)**



STATOR NO-LOAD PERFORMANCE

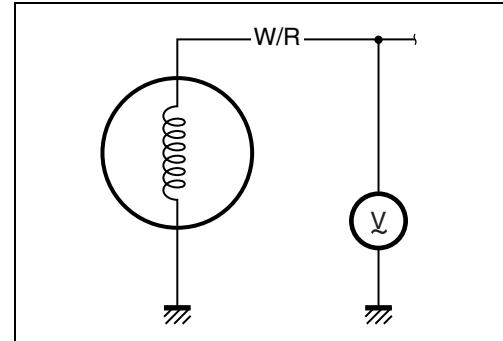
- Disconnect the stator coupler ①. (☞above)
- Start the engine and keep it running at 5 000 rpm.
- Using the multi circuit tester, measure the voltage between the Black lead wire and ground.
- If the tester reads under the specified value, replace the stator coil with a new one.

 **Multi circuit tester set**

 **Tester knob indication: Voltage (~)**

 **Stator no-load performance:**

30 V and more at 5000 r/min (When engine is cold)



REGULATOR/RECTIFIER

- Remove the left frame side lower cover. (5-4)
- Disconnect the regulator/rectifier coupler ①.
- Remove the regulator/rectifier ②.
- Measure the voltage between the terminals using the multi circuit tester, as indicated in the table below. If voltage is not within the specified value, replace the regulator/rectifier with a new one.

 **Multi circuit tester set**

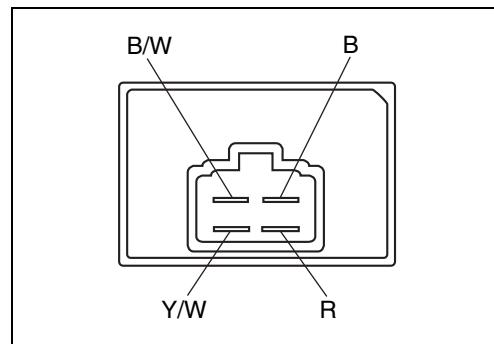
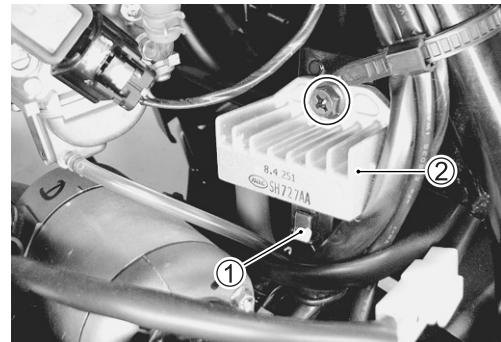
 **Tester knob indication: Diode test (↔)**

		+ Tester probe			
		B/W	B	Y/W	R
Tester probe	B/W		*	*	*
	B	*		*	*
	Y/W	*	*		*
	R	0.5 – 1.0	*	*	

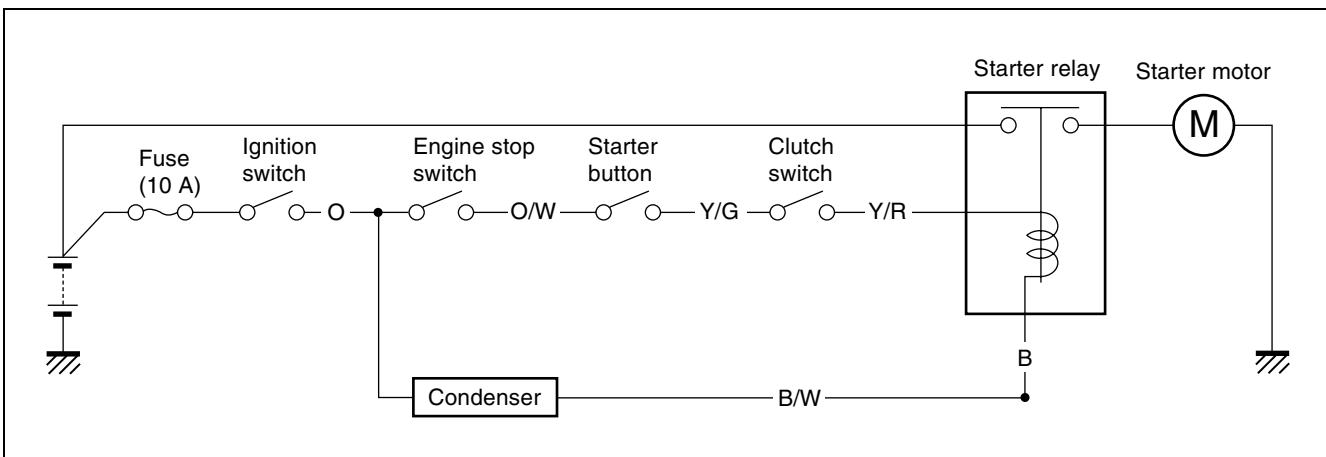
*1.4 V and more (tester's battery voltage)

NOTE:

If the tester reads 1.4 V and below when the tester probes are not connected, replace its battery.



STARTER SYSTEM



TROUBLESHOOTING

Make sure that the fuse is not blown and the battery is fully-charged before diagnosing.

Starter motor will not run.

Step 1

- 1) Shift the transmission to neutral.
- 2) Grasp the clutch lever, turn on the ignition switch with the engine stop switch in the “RUN” position and listen for a click from the starter relay when the starter button is pushed.

Is a click sound heard?

YES	Go to Step 2.
NO	Go to Step 3.

Step 2

- 1) Check if the starter motor runs when its terminal is connected to the battery \oplus terminal. (Do not use thin “wire” because a large amount of current flows.)

Does the starter motor run?

YES	<ul style="list-style-type: none"> • Faulty starter relay • Loose or disconnected starter motor lead wire • Loose or disconnected between starter relay and battery \oplus terminal
NO	Faulty starter motor

Step 3

- 1) Measure the starter relay voltage at the starter relay connectors (between Y/R \oplus and B/W \ominus) when the starter button is pushed.

Is a voltage OK?

YES	Go to Step 4.
NO	<ul style="list-style-type: none"> • Faulty starter button • Faulty ignition switch • Faulty brake light switches (front and rear brakes) • Poor contact of connector • Open circuit in wire harness

Step 4

1) Check the starter relay. (☞ 6-17)

Is the starter relay OK?

YES	Poor contact of the starter relay
NO	Faulty starter relay

Starter motor runs but does not crank the engine.**Step 1**

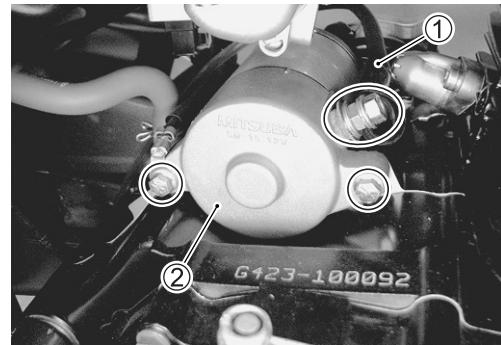
1) Check the starter clutch.

Is the starter clutch OK?

YES	Faulty starter motor
NO	Faulty starter clutch

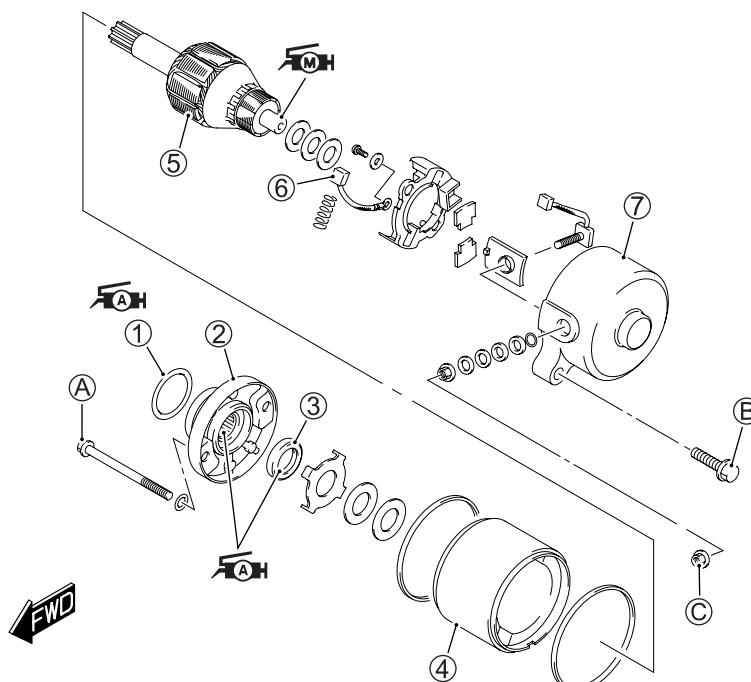
STARTER MOTOR REMOVAL

- Disconnect the battery \ominus lead wire.
- Disconnect the starter motor lead wire ①.
- Remove the starter motor ②.



STARTER MOTOR DISASSEMBLY

- Disassemble the starter motor as shown in the illustration.



①	O-ring	⑥	Brush
②	Housing end (Inside)	⑦	Housing end (Outside)
③	Oil seal	Ⓐ	Starter motor housing bolt
④	Starter motor case	Ⓑ	Starter motor mounting bolt
⑤	Armature	Ⓒ	Starter motor lead wire nut

ITEM	N·m	kgf·m
Ⓐ	4	0.4
Ⓑ	10	1.0
Ⓒ	6	0.6

STARTER MOTOR INSPECTION

CARBON BRUSH

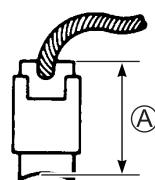
Inspect the brushes for abnormal wear, cracks, or smoothness in the brush holder.

If any defects are found, replace the brush assembly with a new one.

Make sure that the length Ⓐ is not less than 6.5 mm. If this length becomes less than 6.5 mm, replace the brush.

DATA Starter motor brush length

Service Limit: 6.5 mm



COMMUTATOR

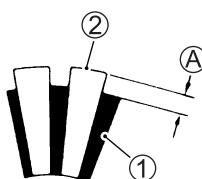
Inspect the commutator for discoloration, abnormal wear or undercut Ⓐ.

If abnormal wear is found, replace the armature with a new one.

If the commutator surface is discolored, polish it with #400 sand paper and wipe it using a clean dry cloth.

If there is no undercut, scrape out the insulator with a saw blade.

① Insulator
② Segment



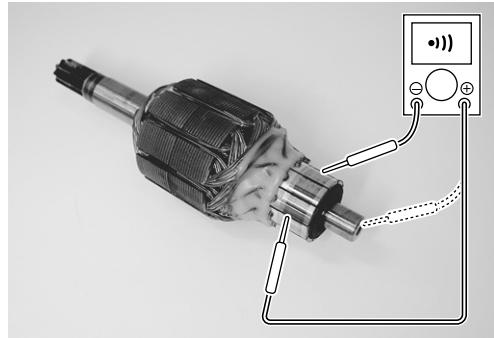
ARMATURE COIL

Check for continuity between each segment and between each segment and the armature shaft using the multi circuit tester.

If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.

 **Multi circuit tester set**

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

**OIL SEAL AND BEARING**

Check the oil seal lip for damage or leakage.

Check the bearing for abnormal noise and smooth movement.

If any defects are found, replace the housing end (inside).

**BUSHING**

Check the bushing for wear and damage.

If any defects are found, replace the housing end (outside).

**STARTER MOTOR REASSEMBLY**

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

- Apply SUZUKI SUPER GREASE "A" to the lip of the oil seal and bearing.

 **SUZUKI SUPER GREASE "A"**



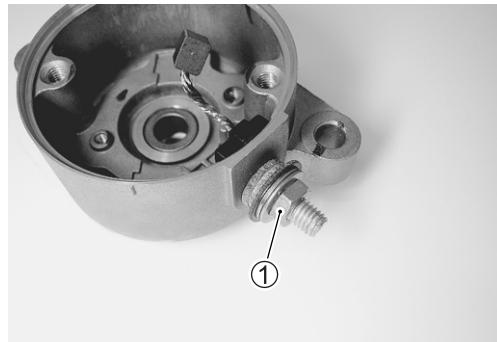
- Apply a small quantity of SUZUKI MOLY PASTE to the armature shaft.

 **SUZUKI MOLY PASTE**



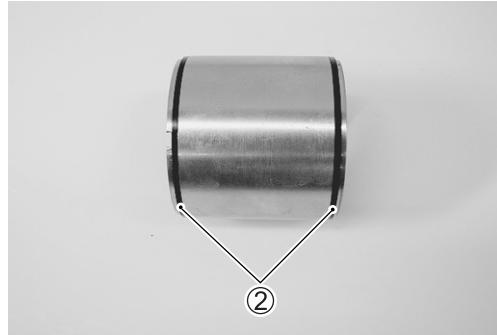
- Tighten the bush holder mounting nut ① to the specified torque.

 **Starter motor bush holder mouting nut: 6 N·m (0.6 kgf·m)**



CAUTION

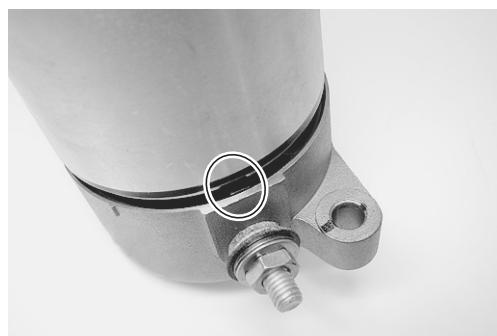
Replace the square-ring ② with new ones.



- Fit the washer to the housing end correctly as shown in the figure.



- Fit the depression of the starter motor case to the projection of the terminating holder.



- Align the line on the starter motor case with the line on the housing end (inside).



- Apply SUZUKI SUPER GREASE "A" to the O-ring ③.

 **SUZUKI SUPER GREASE "A"**

CAUTION

Replace the O-rings with new ones.

- Tighten the starter motor housing bolts ④ to the specified torque.

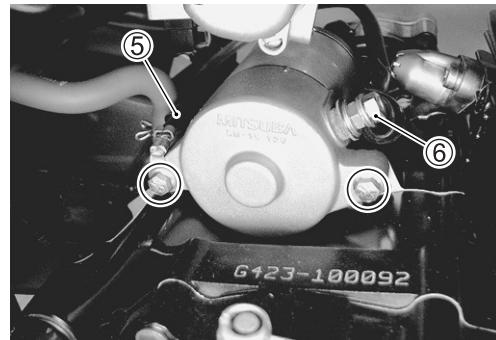
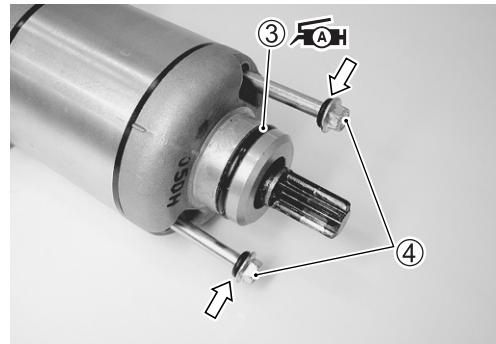
 **Starter motor housing bolt: 4 N·m (0.4 kgf·m)**

- Tighten the starter motor mounting bolt with the battery \ominus lead wire ⑤. (7-13)

 **Starter motor mounting bolt: 10 N·m (1.0 kgf·m)**

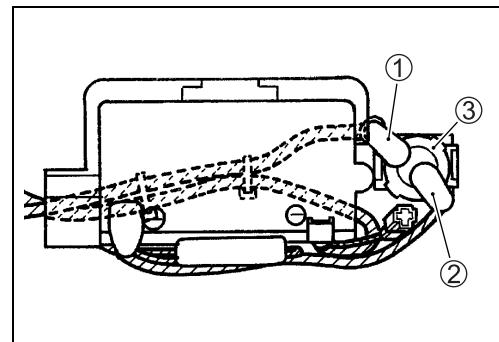
- Tighten the starter motor lead wire nut ⑥ to the specified torque. (7-13)

 **Starter motor lead wire nut: 6 N·m (0.6 kgf·m)**



STARTER RELAY INSPECTION

- Remove the left frame side lower cover. (☞5-4)
- Disconnect the battery \ominus lead wire from the battery.
- Disconnect the starter motor lead wire ①, battery lead wire ② and starter relay coupler.
- Remove the starter relay ③.



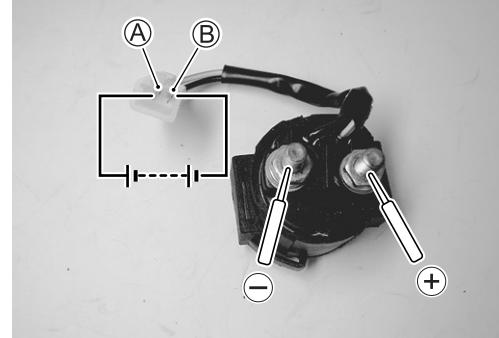
- Apply 12 V to Ⓐ and Ⓑ terminals and check for continuity between the positive \oplus and negative \ominus terminals using the multi circuit tester. If the starter relay clicks and continuity is found, the relay is OK.

TOOL Multi circuit tester set

Tester knob indication: Continuity test (•))

CAUTION

Do not apply battery voltage to the starter relay for more than five seconds, since the relay coil may overheat and get damaged.

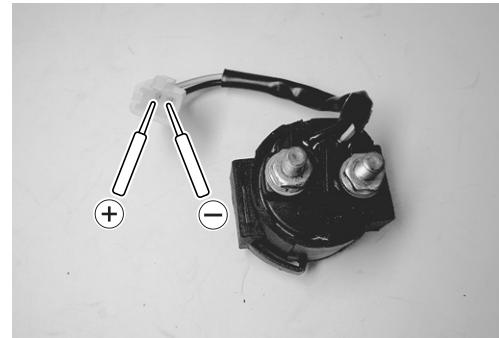


Measure the relay coil resistance between the terminals using the multi circuit tester. If the resistance is not within the specified value, replace the starter relay with a new one.

TOOL Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Starter relay resistance: 3 – 6 Ω



CONDENSER DIODE INSPECTION

- Remove the frame cover assembly. (5-5)
- Disconnect the condenser lead wires ①.



Measure the voltage between Ⓐ and Ⓑ terminals using the multi circuit tester as indicated in the table below.

 **Multi circuit tester set**

 **Tester knob indication: Diode test (→)**

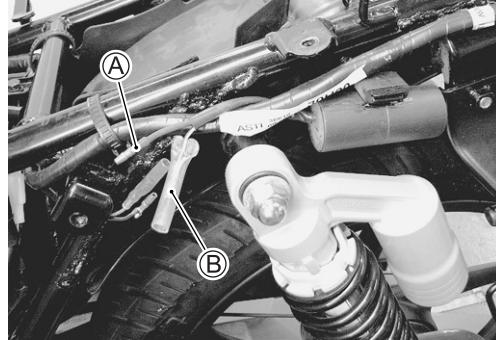
Unit: V

➊ Tester probe		
	Ⓐ (O)	Ⓑ (B/W)
➊ Tester probe	Ⓐ (O)	Approx. 0.5
➊ Tester probe	Ⓑ (B/W)	*

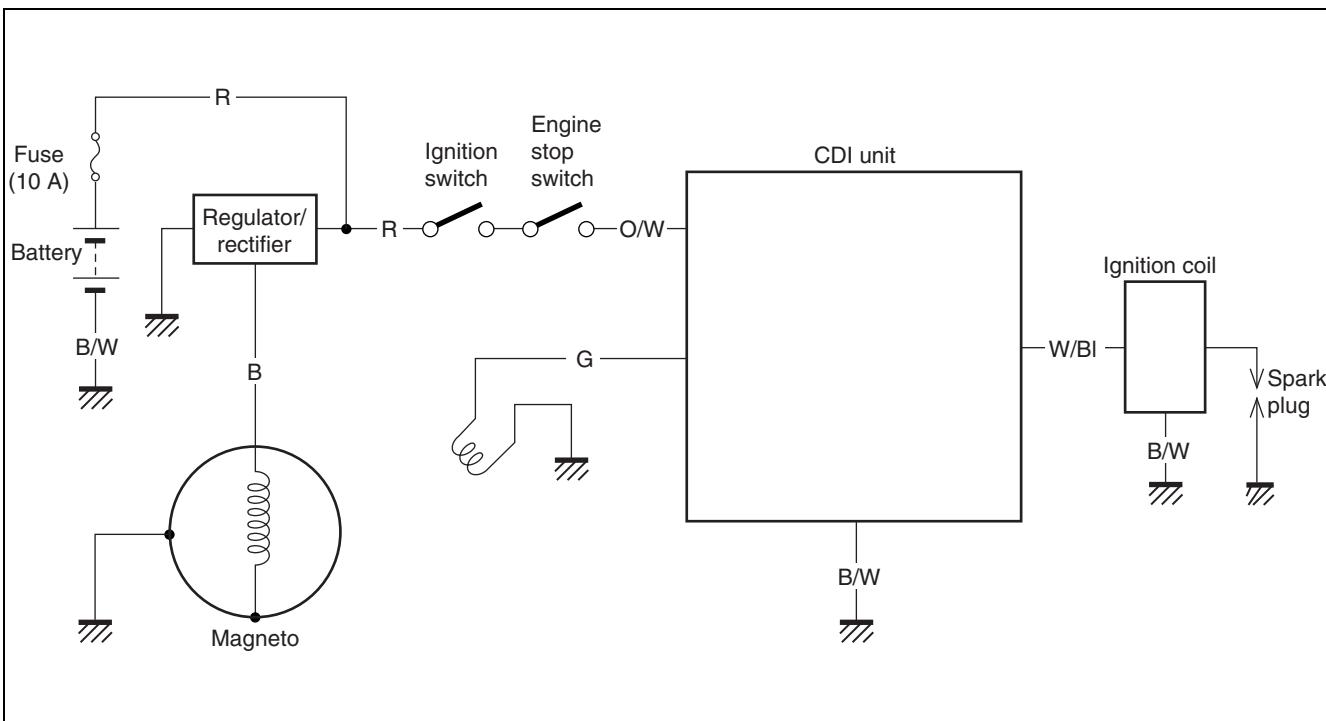
*More than 1.4 V

NOTE:

If the tester reads under 1.4 V when the tester probes are not connected, replace its battery.



IGNITION SYSTEM



TROUBLESHOOTING

Check that the transmission is in neutral and engine stop switch is in the “RUN” position. Check that the fuse is not blown and the battery is fully-charged before diagnosing.

No spark or poor spark

Step 1

1) Check the ignition system couplers for poor connections.

Is there connection in the ignition switch couplers?

YES	Go to Step 2.
NO	Poor connection of couplers

Step 2

- 1) Measure the battery voltage between input lead wires (O/W and B/W) at the CDI unit with the ignition switch in the “ON” position.

Is the voltage OK?

YES	Go to Step 3.
NO	<ul style="list-style-type: none">• Faulty ignition switch• Faulty engine stop switch• Faulty wire harness• Broken wire harness or poor connection of related circuit couplers

Step 3

1) Measure the ignition coil primary peak voltage. (☞ 6-21)

NOTE:

This inspection method is applicable only with the multi circuit tester and the peak volt adaptor.

Is the peak voltage and its resistance OK?

YES	Go to Step 4.
NO	Go to Step 5.

Step 4

1) Inspect the spark plug. (☞ 2-8)

Are the spark plug OK?

YES	<ul style="list-style-type: none">• Poor connection of the spark plug• Go to Step 5.
NO	Faulty spark plug

Step 5

1) Inspect the ignition coil. (☞ 6-22)

Is the ignition coil OK?

YES	Go to Step 6.
NO	<ul style="list-style-type: none">• Poor connection of the ignition coil• Faulty ignition coil

Step 6

1) Measure the pickup coil peak voltage and its resistance. (☞ 6-22 to -23)

NOTE:

The pickup coil peak voltage inspection is applicable only with the multi circuit tester and peak volt adaptor.

Is the peak voltage and its resistance OK?

YES	<ul style="list-style-type: none">• Faulty CDI unit• Open or short circuit in wire harness• Poor connection of ignition wire harness
NO	Faulty pickup coil

INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Disconnect the spark plug cap and spark plug. (☞ 2-8)
- Connect a new spark plug to the spark plug cap and ground it to the cylinder head.

CAUTION

Avoid grounding the spark plugs and supplying the electrical shock to the cylinder head cover (magnesium parts) to prevent the magnesium material from damage.



NOTE:

Make sure that spark plug cap and spark plug are connected properly and the battery is used in fully-charged condition.

Measure the ignition coil primary peak voltage using the multi circuit tester in the following procedure:

- Connect the multi circuit tester with the peak voltage adaptor as follows.
- Probe: White/Blue terminal
- Probe: Ground

NOTE:

Do not disconnect the ignition coil primary lead wire.

TOOL Multi circuit tester set

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.

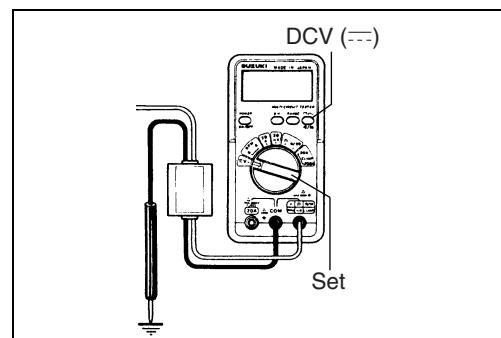
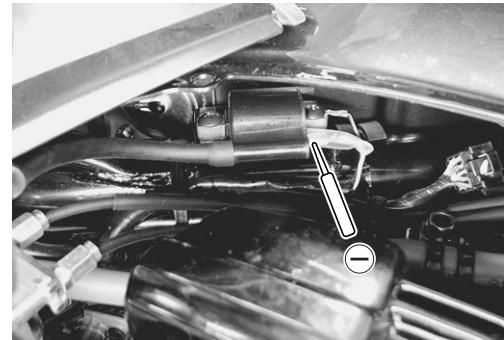
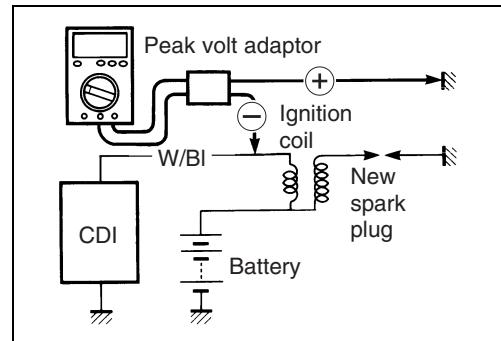
- Shift the transmission into the neutral, and then turn the ignition switch to the “ON” position.
- Pull the brake lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.

Tester knob indication: Voltage (—)

DATA Ignition coil primary peak voltage: 150 V and more

WARNING

While testing, do not touch the tester probes and spark plugs to prevent receiving an electric shock.



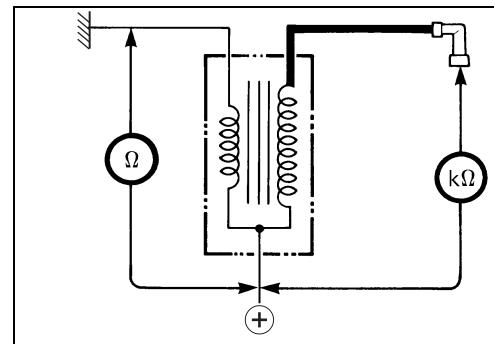
If the peak voltage is lower than the specified values, inspect the ignition coil. (☞ 6-22)

IGNITION COIL RESISTANCE

- Disconnect the ignition coil lead wires and plug cap.
- Measure the ignition coil resistance in both the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil with a new one.

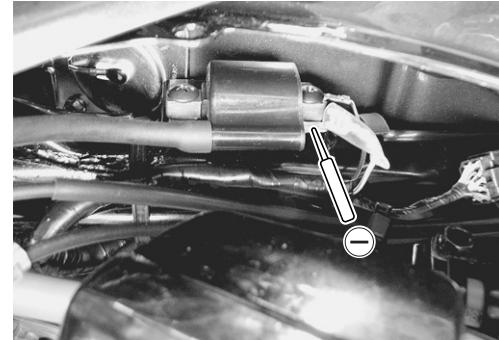
 **Multi circuit tester set**

 **Tester knob indication: Resistance (Ω)**



DATA Ignition coil resistance

Primary : $0.5 - 1.3 \Omega$ (\ominus Terminal – Ground)
 Secondary: $8.1 - 15.4 \text{ k}\Omega$ (Plug cap – \ominus Terminal)

**PICKUP COIL PEAK VOLTAGE**

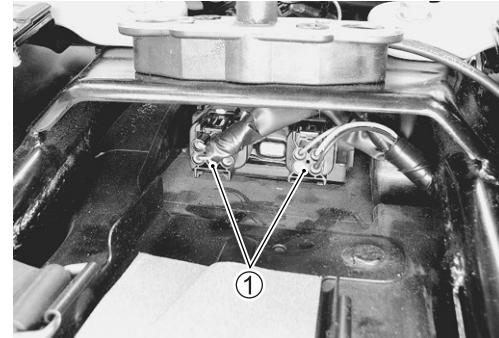
- Remove the seat. (5-4)
- Disconnect the CDI unit couplers ①.

NOTE:

Make sure that all of the couplers are connected properly and the battery is used in fully-charged condition.

- Measure the pickup coil peak voltage in the following procedures.
- Insert the needle-point probes to the CDI unit lead wire couplers.
- Connect the multi circuit tester with peak volt adaptor as follows.

\oplus Probe: Green lead wire
 \ominus Probe: B/W lead wire



 **Multi circuit tester set**
 **Needle-point probe set**

CAUTION

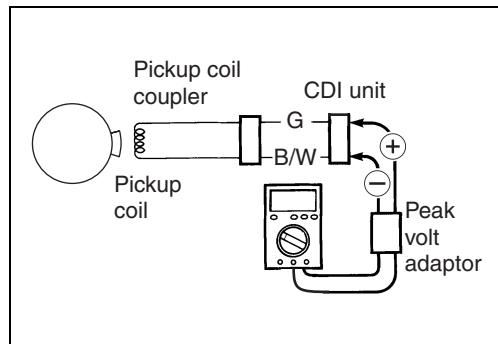
Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.

- Shift the transmission into the neutral, and then turn the ignition switch to the “ON” position.
- Measure the pickup coil peak voltage while squeezing the front brake lever and pressing the starter button to turn the engine for a few seconds.
- Repeat the above procedure a few times and measure the highest peak voltage.

 **Tester knob indication: Voltage (---)**

DATA **Pickup coil peak voltage: 1.2 V and more**

If the peak voltage measured on the CDI unit coupler is lower than the standard value, measure the peak voltage on the pickup coil coupler as follows.



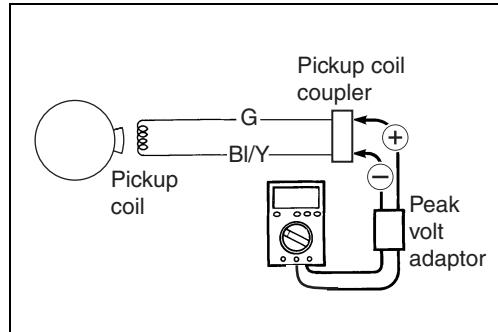
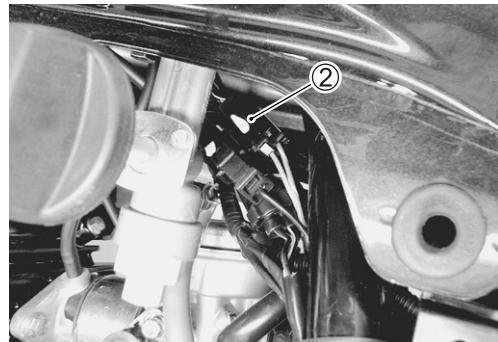
- Remove the left frame side lower cover. (☞ 5-4)
- Disconnect the pickup coil lead wire coupler ② and connect the multi circuit tester with the peak volt adaptor as follows.
 - ⊕ Probe: Green lead wire
 - ⊖ Probe: BI/Y lead wire

Measure the pickup coil peak voltage at the pickup coil lead wire coupler in the same manner as on the CDI unit coupler.

 **Tester knob indication: Voltage (---)**

DATA **Pickup coil peak voltage: 1.2 V and more**

If the peak voltage on the pickup coil coupler is within specification, but on the CDI unit coupler is not within specification, replace the wire harness with a new one. If both peak voltages are out of specification, replace the pickup coil with a new one.



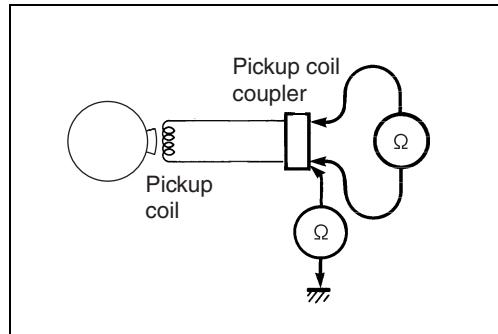
PICKUP COIL RESISTANCE

• Disconnect the pickup coil lead wire coupler ②. (☞ above)
Measure the resistance between the lead wires using the multi circuit tester. If the resistance is not within the specified value, the pickup coil must be replaced.

 **Multi circuit tester set**

 **Tester knob indication: Resistance (Ω)**

DATA **Pickup coil resistance: 180 – 280 Ω (Green – BI/Y)
∞ Ω (Green – Ground)**



COMBINATION METER

DESCRIPTION

This combination meter mainly consists of the movement, LCD (Liquid Crystal Display) and LED (Light Emitting Diode).

The rpm pointer is driven by the air core coil.

The LCDs indicate Speed, Odo/Trip A/Trip B/Clock/Gear position, Engine RPM indicator and Fuel level indicator respectively.

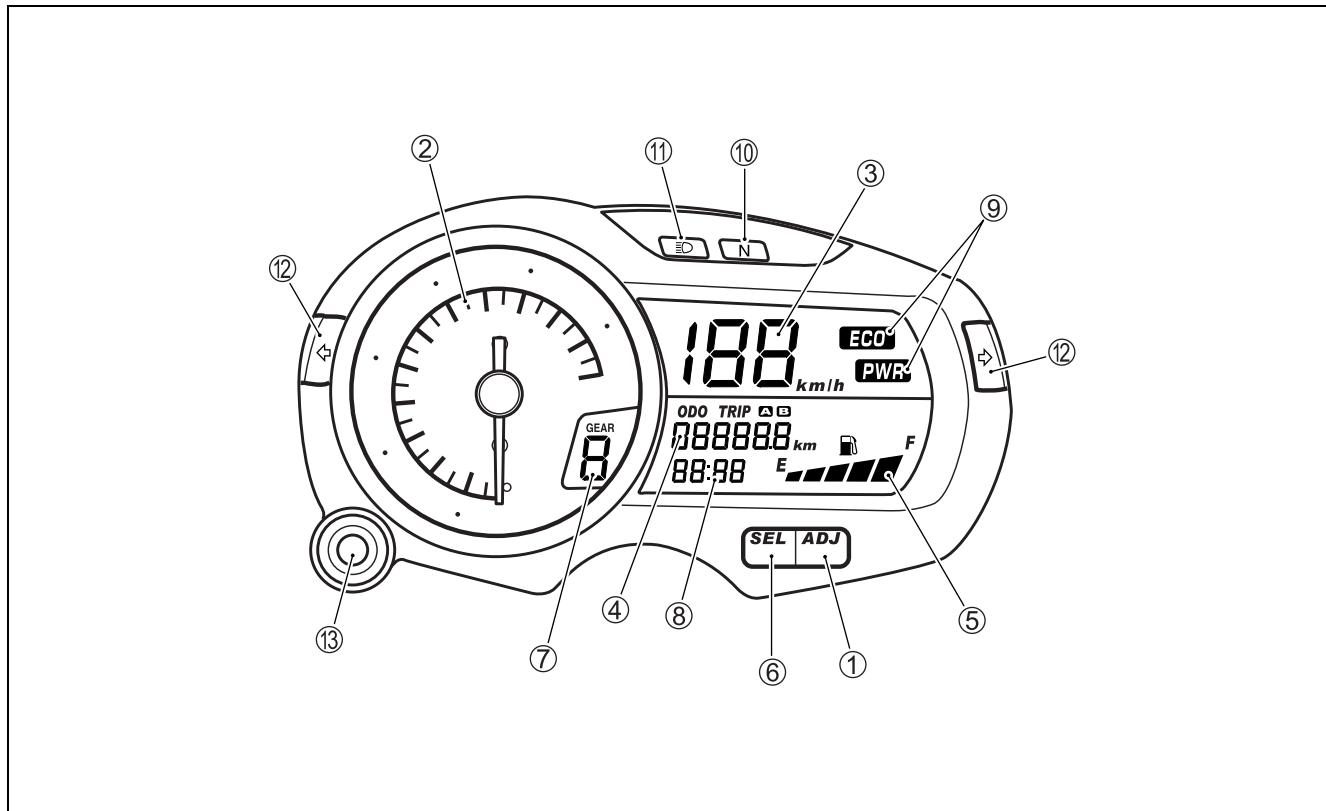
LED (Light Emitting Diode)

LED is used for the illumination light and each indicator light.

LED is maintenance free. LED is less electric-power consuming and stronger to vibration resistance compared to the bulb.

Engine RPM indicator lamp

The engine rpm indicator lamp will light or blink when the engine speed reaches a preset engine rpm.

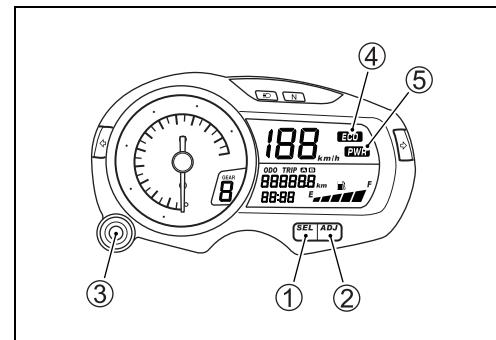


①	Adjust switch (Trip/Engine RPM/Clock/ECO, PWR)	⑧	LCD (Clock)
②	LED (Tachometer)	⑨	LCD (ECO/PWR indicator light)
③	LCD (Speedometer)	⑩	LED (Neutral indicator light)
④	LCD (Odo/Trip 1/Trip 2)	⑪	LED (High-beam indicator light)
⑤	LCD (Fuel level indicator)	⑫	LED (Turn signal indicator light)
⑥	Select switch (Odo/Trip 1/Trip 2/Clock/Engine RPM)	⑬	LED (Engine RPM indicator light)
⑦	LCD (Gear position)		

ENGINE RPM OPERATING PROCEDURE

To select mode, push SEL button ① for more than 2 seconds. Push ADJ ② button switch mode from non-light to ECO mode, ECO mode to PWR mode, and PWR mode to non-light mode. Push SEL button to fix mode.

MODE INDICATOR	INDICATOR LAMP ③	ENGINE SPEED
ECO ④	Blink	4 500 rpm
	Light	6 000 rpm
PWR ⑤	Light	8 000 rpm

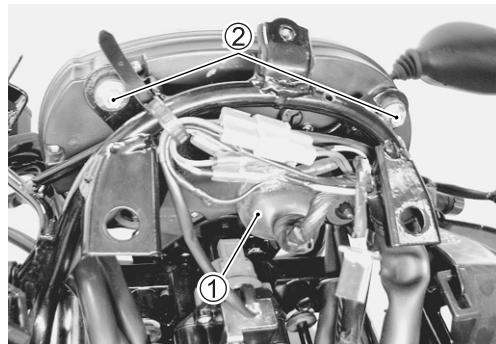


REMOVAL AND DISASSEMBLY

- Remove the body cowling. (☞ 5-7)
- Disconnect the combination meter lead wire coupler ①.
- Remove the nuts ②.

CAUTION

When disconnecting and reconnecting the combination meter coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.



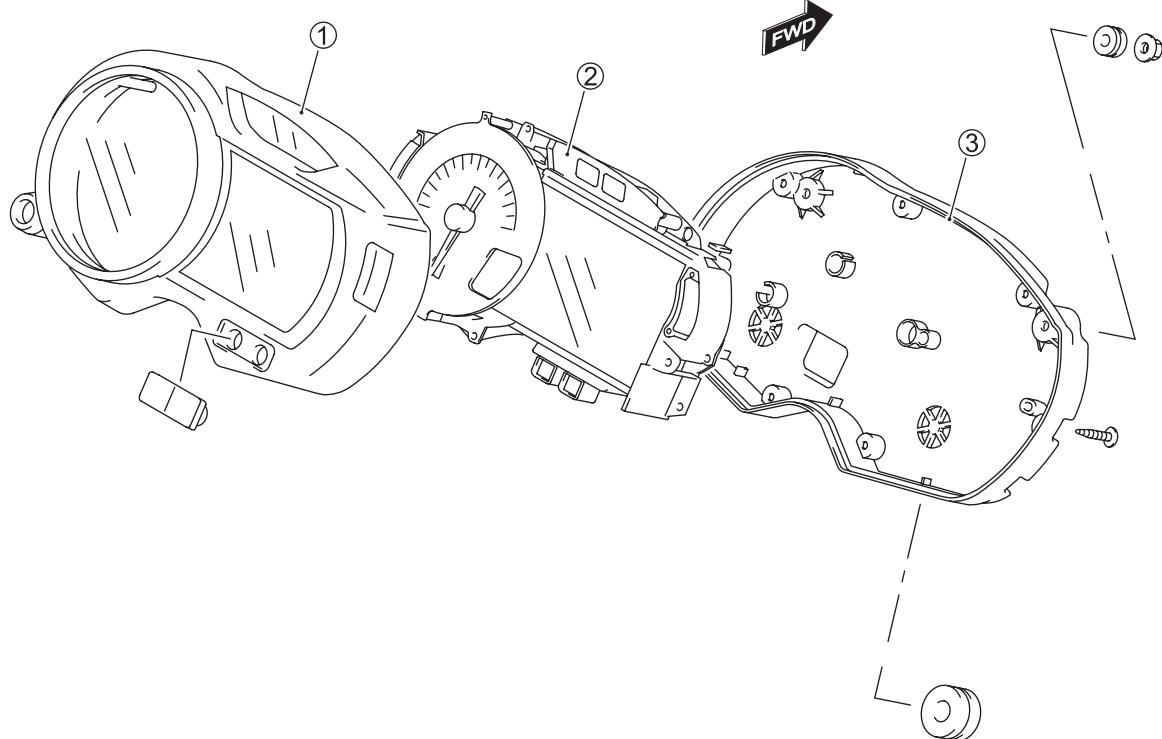
- Remove the combination meter ③.



- Disassemble the combination meter as follows.

CAUTION

Do not attempt to disassemble the combination meter unit.



①	Combination meter cover	③	Combination meter case
②	Combination meter unit		

INSPECTION

LED (LIGHT EMITTING DIODE)

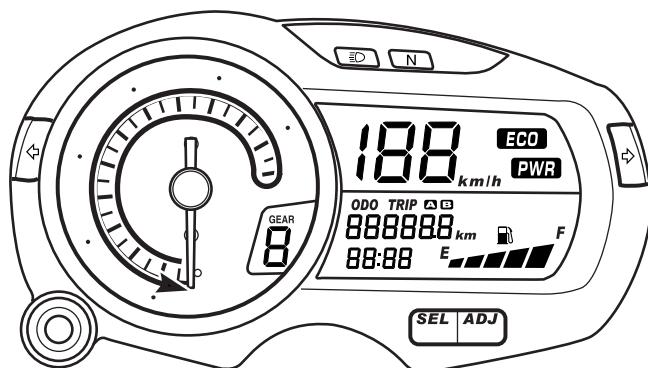
Check that the LED lights (Neutral indicator light, High-beam indicator light, Turn signal indicator light and Engine revolution indicator light) can be checked by depending on each switch position.

If the LED fails in operation, replace the combination meter unit with a new one after checking its wire harness/coupler.

MOVEMENT

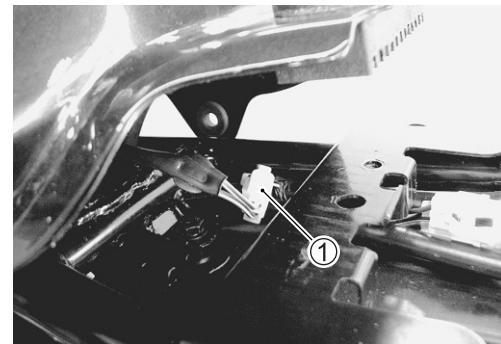
Check that the pointer calibrates itself immediately after turning the ignition switch on and stops at zero point.

If abnormal condition is found, replace the combination meter unit with a new one after checking its wire harness/coupler.



FUEL LEVEL METER INSPECTION

- Lift and support the fuel tank. (☞ 4-2)
- Disconnect the fuel level gauge lead wire coupler ①.
- Connect variable resistor between the Y/B and B/W lead wires at the wire harness.
- Turn the ignition switch “ON” position.
- Check the display of fuel meter as shown below, If any abnormality is found, replace the combination meter with a new one.



Resistance	More than 90 Ω	68 – 74 Ω	52 – 55 Ω	38 – 42 Ω	25 – 29 Ω	Less than 18 Ω
Fuel level meter						

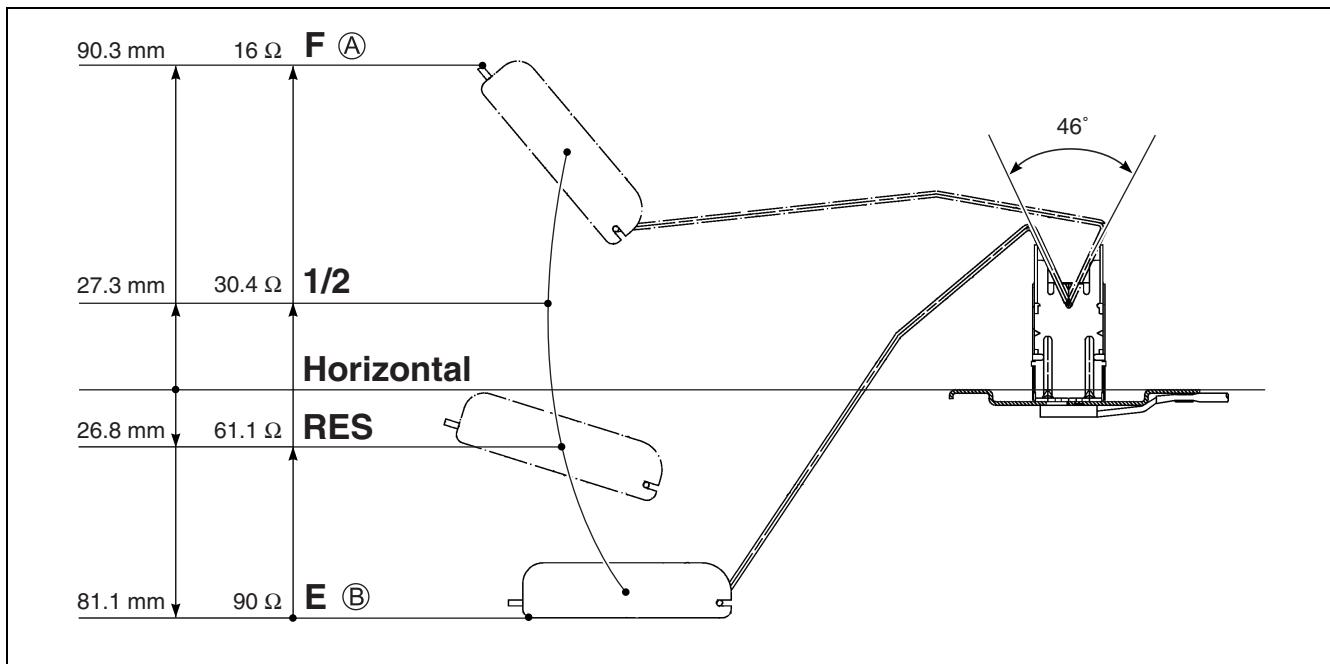
FUEL LEVEL GAUGE INSPECTION

- Remove the fuel level gauge. (☞ 4-3)
- Measure the resistance at each fuel level gauge float position. If the resistance is incorrect, replace the fuel level gauge with a new one.

Float position	Resistance
Ⓐ (Full)	10 – 16 Ω
Ⓑ (Empty)	90 – 100 Ω

 **Multi circuit tester set**

 **Tester knob indication: Resistance (Ω)**



SPEEDOMETER

If the speedometer, odometer or trip meter does not function properly, inspect the speedometer sensor and connection of couplers. If the speed sensor and connection are functioning properly, replace the meter with a new one.

SPEED SENSOR

- Remove the left frame side lower cover. (☞5-4)
- Remove the engine sprocket cover. (☞3-3)
- Disconnect speed sensor coupler ①.
- Remove the speed sensor ②.
- Connect 12 V battery, 10 kΩ resistor and the multi circuit tester as shown in the right illustration.

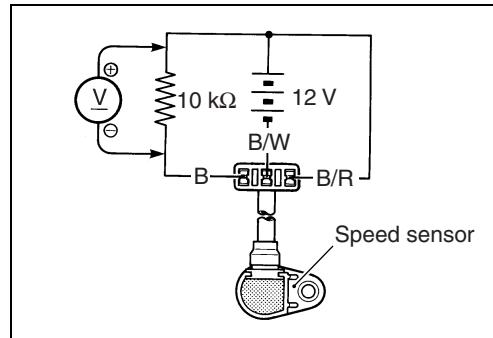
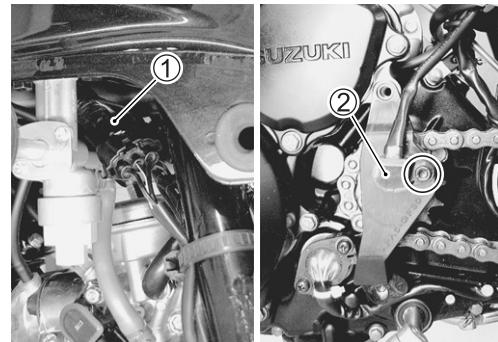
B/R : Black with Red tracer

B/W : Black with White tracer

B : Black

 **Multi circuit tester set**

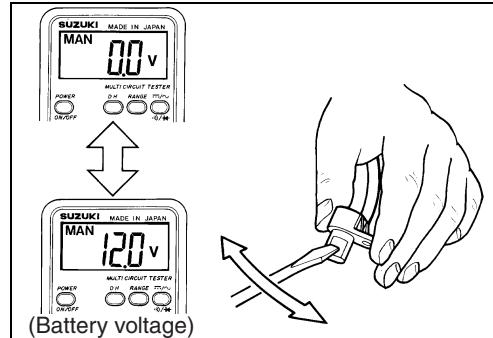
 **Tester knob indication: Voltage (---)**



- Under above condition, if a suitable screwdriver touching the pickup surface of the speed sensor is moved, the tester reading voltage changes (0 V → 12 V or 12 V → 0 V). If the tester reading voltage does not change, replace the speedometer sensor with a new one.

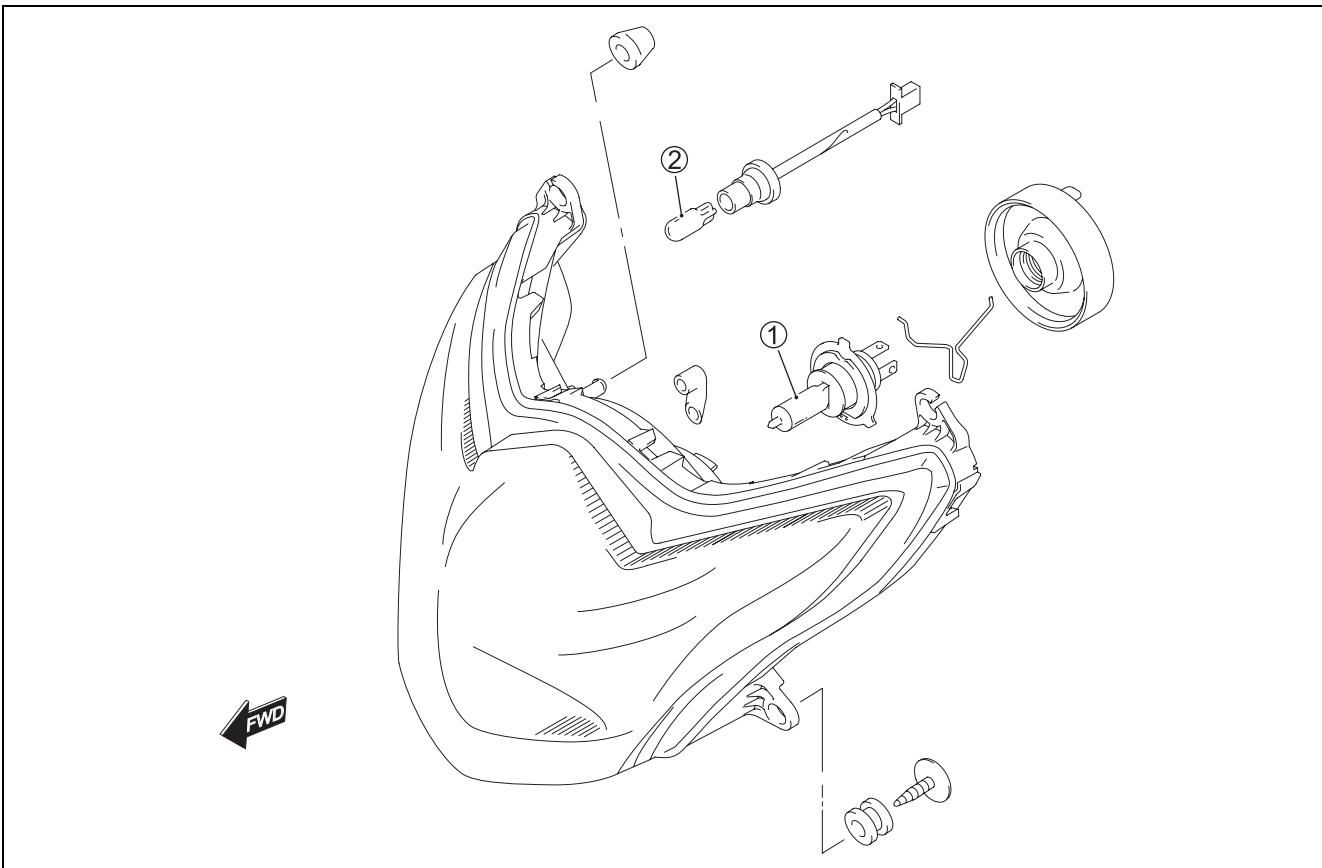
NOTE:

The highest voltage reading in this test will be the same as that of battery (12 V).



LAMPS

HEADLIGHT AND POSITION LIGHT



Headlight bulb ①: 12 V 35/35 W

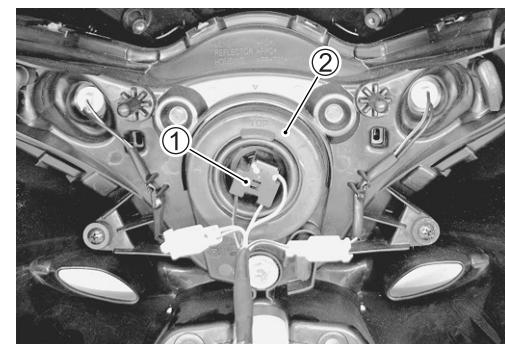
Position light bulb ②: 12 V 5 W

CAUTION

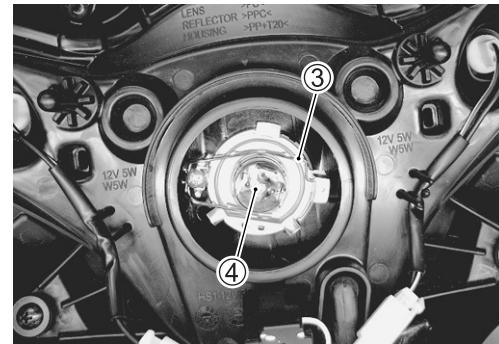
- * If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.
- * Do not use bulb other than those with predetermined wattage.
- * Remove the bulb when it gets cool, since it may be heated to an extremely high temperature when the headlamp is turned ON.

HEADLIGHT BULB REPLACEMENT

- Remove the body cowling. (☞ 5-7)
- Disconnect the headlight coupler ①.
- Remove the rubber cap ②.

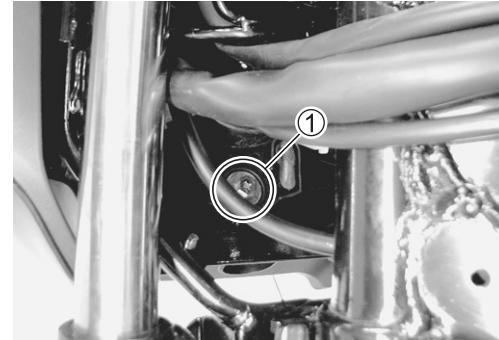


- Unhook the holder spring ③ and replace the headlight bulb ④.



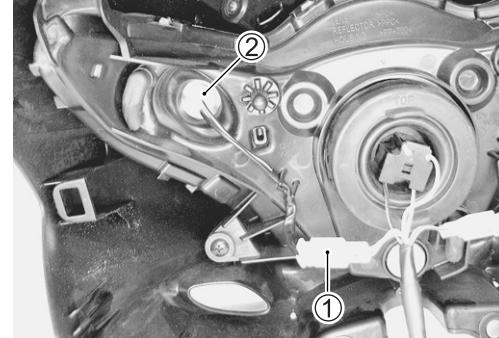
HEADLIGHT BEAM ADJUSTMENT

- To adjust the beam, turn the adjuster ① clockwise to raise the beam or counterclockwise to lower the beam with a screwdriver.

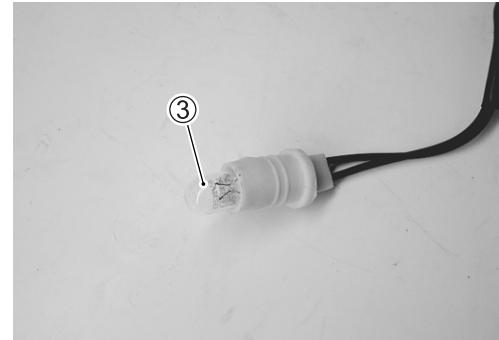


POSITION LIGHT BULB REPLACEMENT

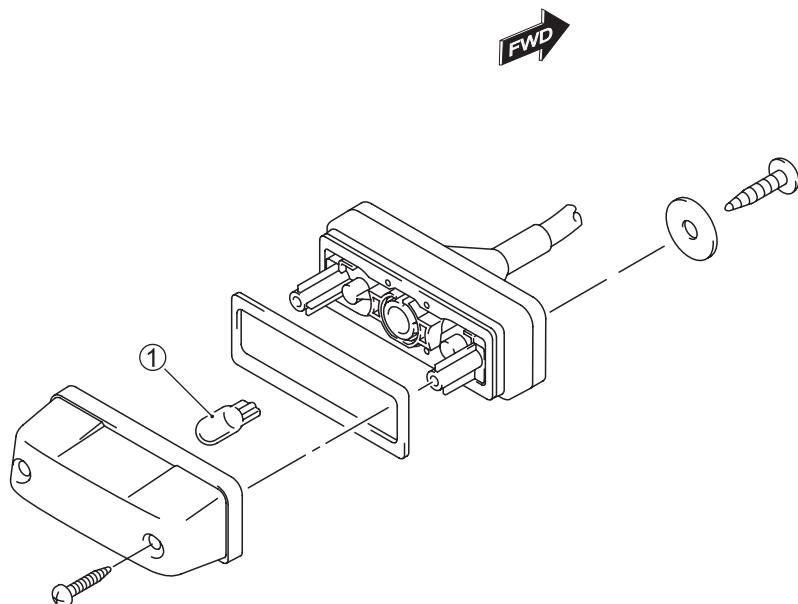
- Remove the body cowling. (☞5-7)
- Disconnect the position light coupler ① and position light ②.



- Disconnect the position light bulb ③.



LICENSE LIGHT



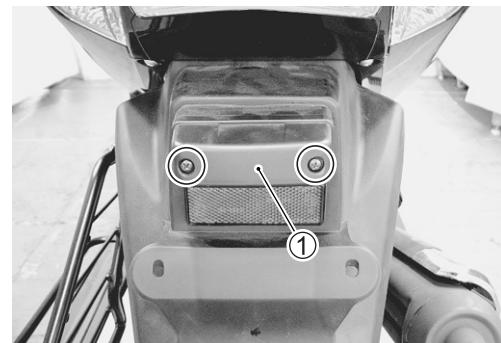
License light bulb ①: 12 V 5 W

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.
- * Do not use bulb other than those with predetermined wattage.

LICENSE LIGHT BULB REPLACEMENT

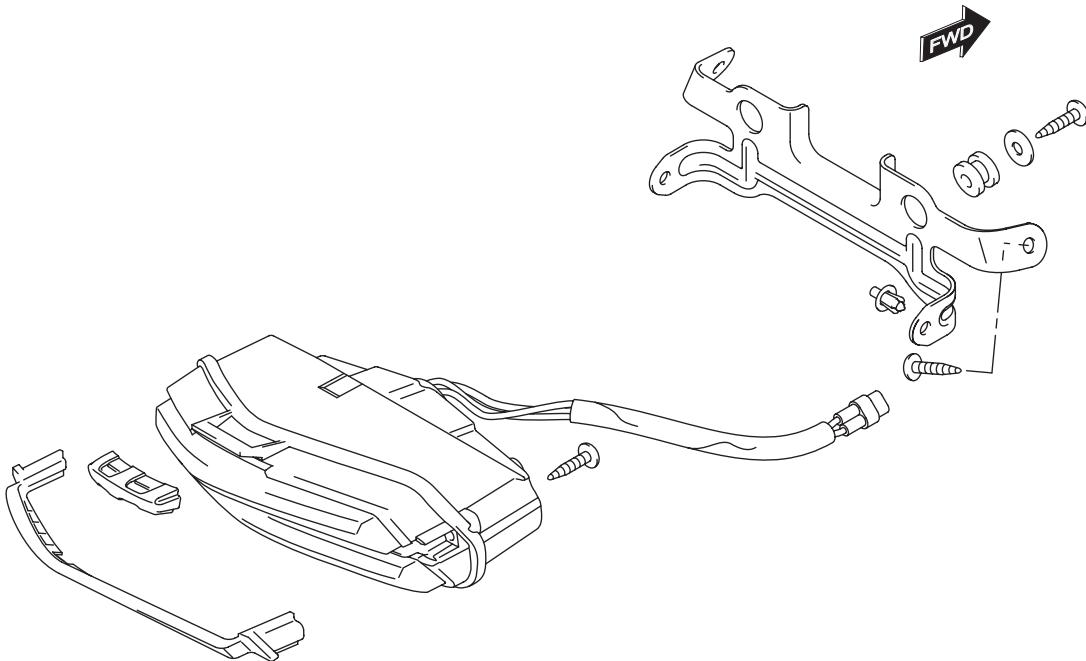
- Remove the cover with the lens ①.



- Push in on the bulb, turn it counterclockwise, and pull it out.



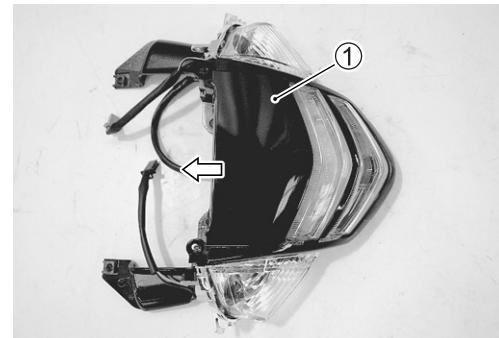
BRAKE LIGHT/TAILLIGHT



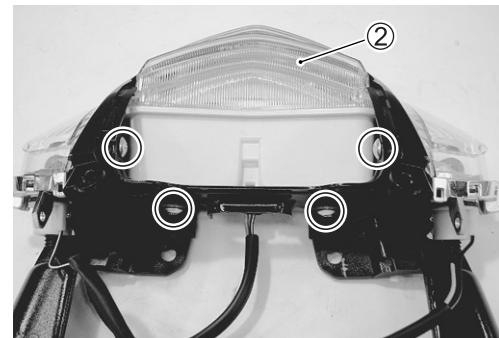
Brake light/Taillight: LED

BRAKE LIGHT/TAILLIGHT REPLACEMENT

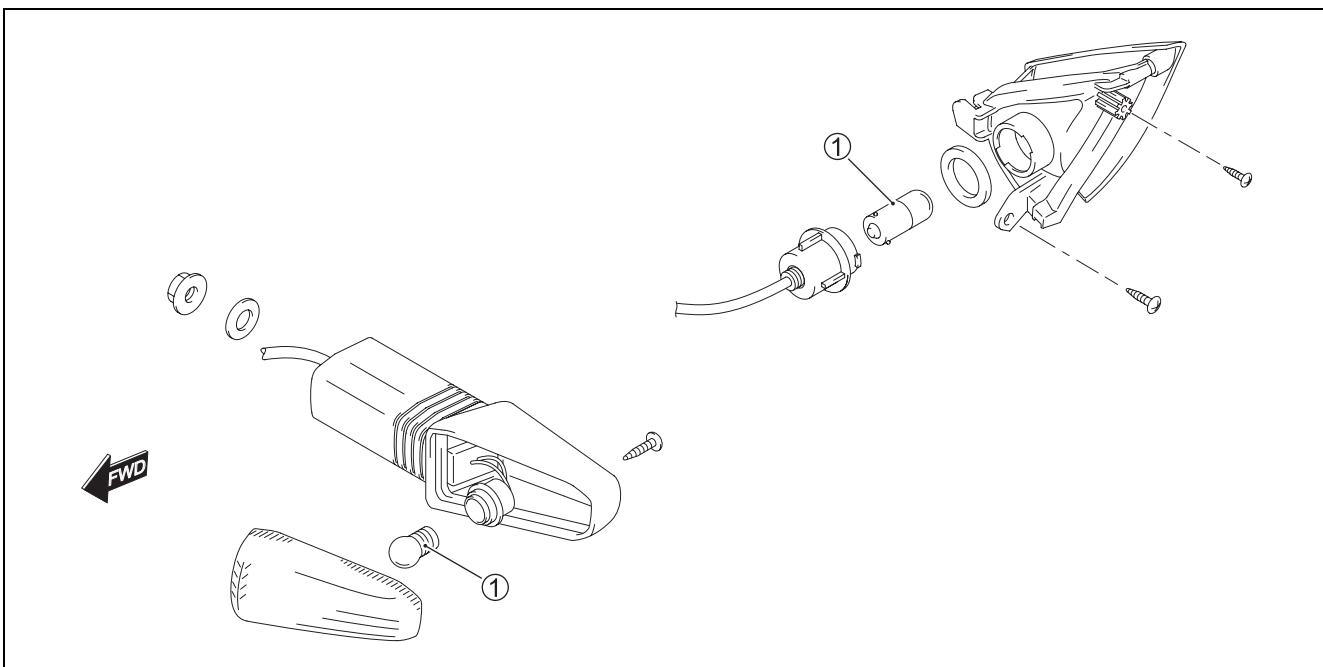
- Remove the frame covers, left and right. (☞ 5-5)
- Remove the frame center cover ①.



- Remove the brake light/taillight ②.



TURN SIGNAL LIGHT



Turn signal light ①: 12 V 10 W

CAUTION

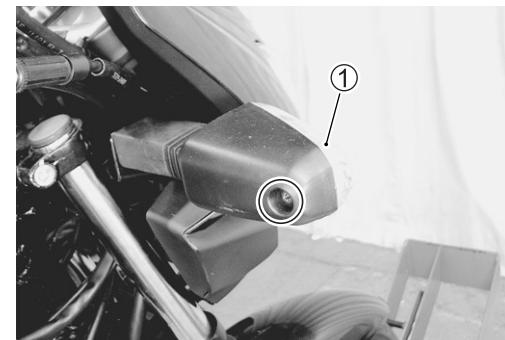
- * If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.
- * Do not use bulb other than those with predetermined wattage.

FRONT TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the lens ① by removing the screws.

CAUTION

Do not overtighten the lens fitting screws.



- Remove the bulb socket by turning it counterclockwise.



- Push in on the bulb, turn it counterclockwise, and pull it out.



REAR TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the lens ① by removing the screws.

CAUTION

Do not overtighten the lens fitting screws.



- Push in on the bulb, turn it counterclockwise, and pull it out.



TURN SIGNAL RELAY INSPECTION

The turn signal relay is located under the fuel tank.

If the turn signal light does not light, inspect the bulb or repair the circuit connection.

If the bulb and circuit connection are OK, the turn signal relay may be faulty, replace it with a new one.

NOTE:

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

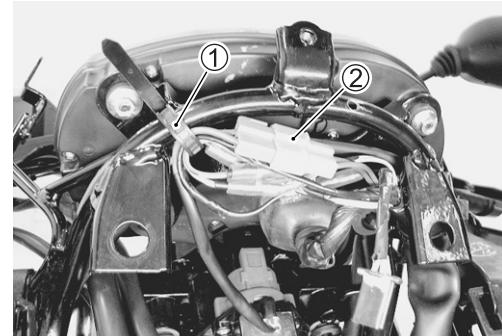


SWITCHES

IGNITION SWITCH REMOVAL AND INSTALLATION

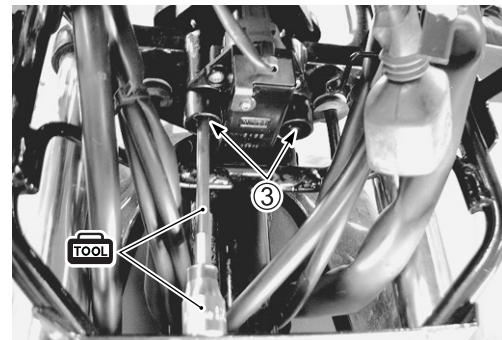
REMOVAL

- Remove the body cowling. (5-7)
- Remove the combination meter. (6-26)
- Disconnect the clamp ① and ignition switch coupler ②.



- Remove the ignition switch mounting bolts ③ with the special tools.

Torx bit (JT30H)
Torx bit holder



INSTALLATION

- Install the ignition switch in the reverse order removal.

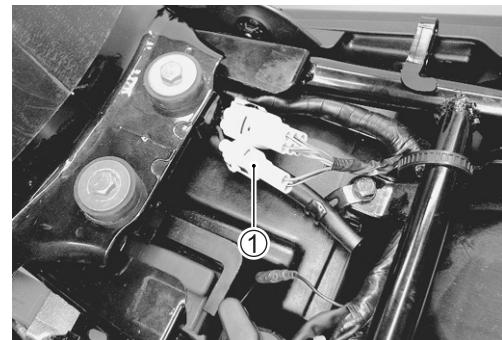
GEAR POSITION SWITCH INSPECTION

- Remove the seat. (5-4)
- Disconnect the neutral switch lead wire ① and check the continuity between Blue and Ground with the transmission in "NEUTRAL".

	Blue	Ground
ON (Neutral)	○	—
OFF (Expect neutral)	—	—

CAUTION

When disconnecting and connecting the neutral switch coupler, make sure to turn "OFF" the ignition switch, or electronic parts may get damaged.



Multi circuit tester set

Tester knob indication: Continuity test (•))

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

 **Multi circuit tester set**

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

IGNITION SWITCH

Color Position	R	O
OFF	○	—
ON	—	—
LOCK	—	—

DIMMER SWITCH

Color Position	W	Y	Y/W
HI (HIGH)	—	○	—
LO (LOW)	○	—	—

TURN SIGNAL SWITCH

Color Position	Lg	Lbl	B
L	—	○	—
PUSH	—	—	—
R	○	—	—

HORN BUTTON

Color Position	B/BI	B/W
•	—	—
PUSH	○	—

STARTER BUTTON

Color Position	O/W	Y/G
•	—	—
PUSH	○	—

PASSING LIGHT SWITCH

Color Position	O/R	Y
•	—	—
PUSH	○	—

LIGHTING SWITCH

Color Position	Br	O/BI	Gr	Y/W	O/R
OFF	—	—	—	—	—
(E00)	○	—	○	—	—
ON (E1)	○	—	○	—	—

ENGINE STOP SWITCH

Color Position	O/B	O/W
OFF (X)	—	—
RUN (Q)	○	—

FRONT BRAKE SWITCH

Color Position	B/R	B/BI
ON	○	—
OFF	—	—

REAR BRAKE SWITCH

Color Position	O	W/B
ON	○	—
OFF	—	—

WIRE COLOR

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

BATTERY SPECIFICATIONS

Type designation	12MX9-B
Capacity	12 V, 32.4 kC (9 Ah)/10 HR
Standard electrolyte (specific gravity)	1.28 at 20 °C or 1.23 at 27 °C

In fitting the battery to the motorcycle, connect the breather hose to the battery vent. (☞7-19)

INITIAL CHARGING

FILLING ELECTROLYTE

- Remove the short sealed tube Ⓐ.
- Fill the battery with electrolyte to the UPPER LEVEL line ①.
- Wait approximately a half-hour and check the electrolyte level.
- If the level has fallen, add electrolyte to the UPPER LEVEL line ①.
- Slowly charge the battery with a battery charger that is adjusted to the specified current, as described below.

DATA Maximum charging current: 0.9 A

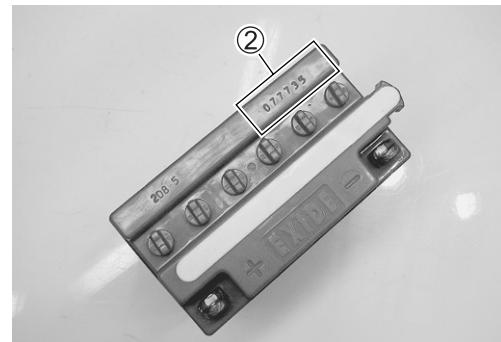
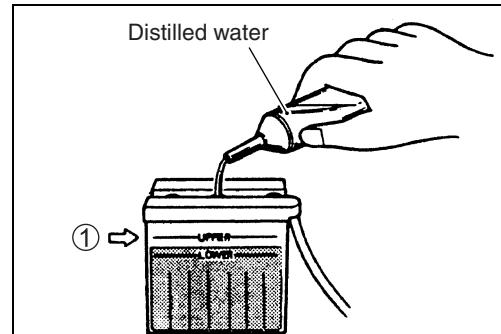
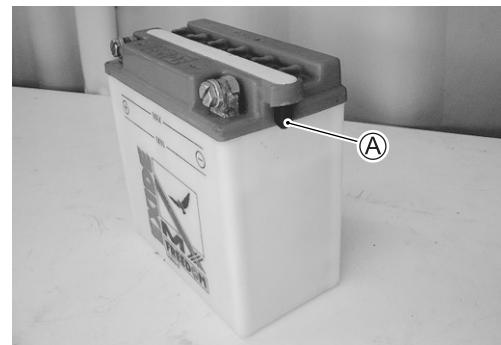
The charging time for a new battery is determined by the number of months that have elapsed since the date of manufacture. The manufacture's date is indicated by the six-digit stamp ②. The day, month and year are each indicated by two-digits.

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

NOTE:

If necessary, add only distilled water to the UPPER LEVEL line.

- Install the seal caps after charging.
- After charging, allow the battery to cool for two hours, before installing it.



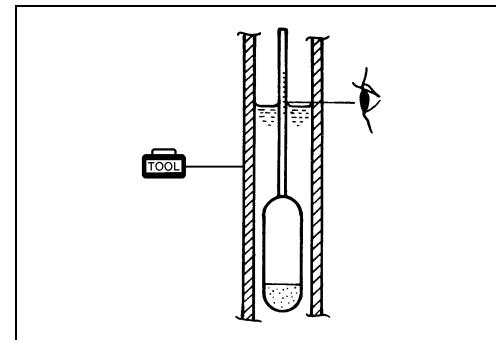
SERVICING

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, use sandpaper to clean them.

Check the electrolyte level, and if necessary, add distilled water to raise the electrolyte level, for each cell, to the UPPER LEVEL line.

- Use a hydrometer to measure the electrolyte specific gravity reading. If the reading is 1.22 or less, as corrected to 20 °C, this indicates that the battery needs to be recharged.

Specific gravity at 20 °C	Condition	Measure
1.250 – 1.280	Normal	
1.220 – 1.250	Under-charged	Recharge
Below 1.220	Run down	Recharge or Replace



 **Hydrometer**

RECHARGING OPERATION

NOTE:

When recharging, be sure to remove the battery from the motorcycle to protect the regulator/rectifier against excessive voltage.

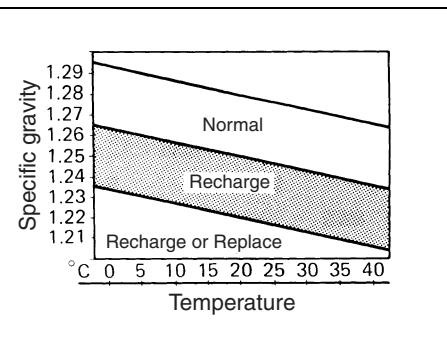
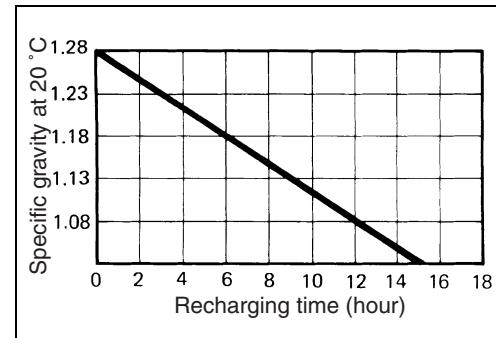
- Use the following formula to correct the specific gravity reading to 20 °C.

$$S_{20} = S_t + 0.0007 (t-20)$$

Where S_{20} = Corrected value of specific gravity (20 °C)
 S_t = Value of specific gravity read at temperature t °C
0.0007 = Temperature coefficient of specific gravity
 t = Temperature in degrees centigrade at which S_t was read

- Check the corrected specific gravity reading with the chart, to determine the recharging time in hours. This is when a constant-current charge at a rate of 0.8 amperes (which is a tenth of the capacity of the present battery) is used.
- When recharging, do not allow the electrolyte temperature to exceed 45 °C. Interrupt the operation, as necessary, to let the electrolyte cool down.

DATA **Electrolyte specific gravity: 1.280 at 20 °C**
or 1.23 at 27 °C



CAUTION

Do not quick charge the battery. Quick charging will shorten the life of the battery.

SERVICE LIFE

Lead oxide is on the plates of the battery and will gradually come off of the plates during the life of the battery. When the bottom of the battery case becomes full of this sediment, replace the battery. If the battery is not charged for a long period of time, lead sulfate may accumulate on the surface of the plates. If this occurs, replace the battery.

STORAGE

When a battery is not used for a long period or time, sulfation may occur. When the motorcycle is not used for more than one month (especially during the winter season), the battery should be charged at least once a month.

⚠ WARNING

- * Before charging a battery, remove the seal cap from each cell.
- * Keep fire and sparks away from a battery which is being charged.
- * When removing a battery from the motorcycle, be sure to remove the battery (⊖) terminal first.

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SERVICING INFORMATION

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TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start.	<p>Compression too low</p> <ol style="list-style-type: none"> 1. Worn-down cylinder bore 2. Excessively worn piston rings 3. Worn valve guide or improper valve seating 4. Poor seating of spark plug 5. Valve clearance out of adjustment 6. Starter motor cranks too slow <p>Spark plug not sparking</p> <ol style="list-style-type: none"> 1. Damaged spark plug 2. Too wide spark plug gap 3. Fouled spark plug 4. Wet spark plug 5. Defective ignition coil 6. Open or short in high-tension cord 7. Defective startor coil 8. Defective CDI unit 9. Defective pick-up coil 10. Open-circuited wiring connections <p>No fuel reaching the carburetor</p> <ol style="list-style-type: none"> 1. Clogged fuel filter or fuel hose 2. Defective carburetor needle valve 	<p>Replace.</p> <p>Replace.</p> <p>Repair or replace.</p> <p>Retighten.</p> <p>Adjust.</p> <p>See electrical section.</p> <p>Replace.</p> <p>Adjust or replace.</p> <p>Clean or replace.</p> <p>Clean and dry or replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Repair or replace.</p> <p>Clean or replace.</p> <p>Replace.</p>
Engine idles poorly.	<ol style="list-style-type: none"> 1. Valve clearance out of adjustment 2. Poor seating of valves 3. Defective valve guides 4. Worn down camshaft 5. Too wide spark plug gap 6. Defective ignition coil 7. Defective CDI unit 8. Defective startor coil 9. Clogged carburetor jets 10. Throttle stop screw and pilot screw out of adjustment 11. Damaged or cracked vacuum hose 12. Clogged air cleaner element 13. Incorrect float chamber fuel level 	<p>Adjust.</p> <p>Repair or replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Adjust or replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Clean or replace.</p> <p>Adjust.</p> <p>Replace.</p> <p>Clean or replace.</p> <p>Adjust float height.</p>
Engine stalls easily.	<ol style="list-style-type: none"> 1. Fouled spark plug 2. Defective pickup coil or CDI unit 3. Clogged fuel hose 4. Clogged jets in carburetor 5. Out of adjustment valve clearance 6. Clogged exhaust pipe 7. Open or short circuited wiring connection 	<p>Clean.</p> <p>Replace.</p> <p>Clean or replace.</p> <p>Clean.</p> <p>Adjust.</p> <p>Clean.</p> <p>Repair or replace.</p>

Complaint	Symptom and possible causes	Remedy
Noisy engine	Excessive valve chatter <ol style="list-style-type: none"> 1. Too large tappet clearance 2. Weakened or broken valve springs 3. Worn rocker arm or cam surface 4. Worn and burnt camshaft bearing Noise seems to come from piston <ol style="list-style-type: none"> 1. Worn down piston or cylinder 2. Combustion chamber fouled with carbon 3. Worn piston pins or piston pin bore 4. Worn piston rings or ring grooves Noise seems to come from timing chain <ol style="list-style-type: none"> 1. Stretched cam chain 2. Worn cam chain sprocket 3. Tension adjuster not working Noise seems to come from clutch <ol style="list-style-type: none"> 1. Worn countershaft spline 2. Worn clutch hub spline 3. Worn clutch plate teeth 4. Distorted clutch plates 5. Worn clutch release bearing 6. Weak clutch springs 7. Weak clutch dampers Noise seems to come from crankshaft <ol style="list-style-type: none"> 1. Rattling bearings due to wear 2. Worn and burnt crank pin bearing 3. Worn and burnt journal bearing 4. Too large thrust clearance Noise seems to come from transmission <ol style="list-style-type: none"> 1. Worn or rubbing gears 2. Worn splines 3. Worn or rubbing primary gears 4. Worn bearings 	Adjust. Replace. Replace. Replace. Replace. Clean. Replace. Replace. Replace. Replace. Repair or replace. Replace countershaft. Replace clutch hub. Replace clutch plate. Replace. Replace. Replace. Replace primary driven gear. Replace. Replace. Replace. Replace thrust bearing. Replace. Replace. Replace. Replace.
Slipping clutch.	<ol style="list-style-type: none"> 1. Clutch cable out of adjustment 2. Weak or broken clutch springs 3. Worn or distorted clutch pressure plate 4. Distorted clutch plates 	Adjust. Replace. Replace. Replace.
Dragging clutch.	<ol style="list-style-type: none"> 1. Clutch out of adjustment 2. Some clutch springs are weak, while others are not 3. Worn or distorted clutch pressure plate 4. Distorted clutch plates 	Adjust. Replace. Replace. Replace.
Transmission will not shift or shift back.	<ol style="list-style-type: none"> 1. Broken gearshift cam 2. Broken gearshift shaft return spring 3. Distorted gearshift fork 4. Rubbing or stuck gearshift shaft 5. Worn gearshift pawl 	Replace. Replace. Replace. Repair or replace. Replace.
Transmission jumps out of gear.	<ol style="list-style-type: none"> 1. Worn gears 2. Worn or distorted gearshift forks 3. Weakened gearshift stopper spring 4. Worn gearshift pawl 	Replace. Replace. Replace. Replace.

Complaint	Symptom and possible causes	Remedy
Engine runs poorly in high-speed range.	1. Weak valve springs 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 coil 7. Defective pick up coil 8. Defective CDI unit 9. Low float chamber fuel level 10. Dirty air cleaner element 11. Clogged fuel hose, resulting in inadequate fuel supply to carburetor	Replace. Replace. Regap or replace. Adjust. Replace CDI unit. Replace. Replace. Replace. Adjust float height. Clean or replace. Clean and prime.
Dirty or heavy exhaust smoke.	1. Excessive amount of engine oil 2. Worn cylinder 3. Worn piston rings 4. Worn valve guides 5. Scored or scuffed cylinder wall 6. Defective valve stem oil seals and valve stems 7. Worn oil ring side rails	Check level and drain. Replace. Replace. Replace. Replace. Replace. Replace oil ring.
Engine lacks power.	1. Insufficient valve clearance 2. Weak valve springs 3. Out of adjustment valve timing 4. Worn cylinder 5. Worn piston rings 6. Improper valve seating 7. Fouled spark plug 8. Incorrect spark plug 9. Clogged carburetor jet 10. Incorrect float chamber fuel level 11. Dirty air cleaner element 12. Air leakage from intake pipe 13. Too much engine oil 14. Dirty muffler 15. Defective CDI unit	Adjust. Replace. Adjust. Replace. Replace. Repair or replace. Clean or replace. Replace. Clean. Adjust float height. Clean or replace. Tighten or replace. Drain cut excess oil. Replace. Replace.
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 starter jet 2. Clogged starter jet passage 3. Air leaking from joint between starter body and carburetor 4. Air leaking from carburetor joint or vacuum hose joint 5. Improperly working starter cable	Clean. Clean. Tighten, adjust, or replace gasket. Tighten or replace defective part. Adjust.
Idling or low-speed trouble	1. Clogged or loose pilot jet 2. Clogged or loose pilot air jet 3. Air leaking from carburetor joint 4. Clogged pilot outlet port 5. Clogged bypass port 6. Starter (enricher) plunger not fully closed	Clean or tighten. Clean or tighten. Tighten or replace defective part. Clean. Clean. Adjust.
Medium or high-speed trouble	1. Clogged main jet 2. Clogged main air jet 3. Clogged needle jet 4. Improperly working throttle valve 5. Clogged fuel filter	Clean. 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
Heavy steering	1. Overtightened steering stem nut 2. Broken bearing in steering stem 3. Distorted steering stem 4. Low tire pressure	Adjust. Replace. Replace. Regulate.
Handlebar wobbles.	1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle or crooked tire. 4. Loose handlebar set bolt or clamp bolt. 5. Loose steering stem nut. 6. Worn or incorrect tire or wrong tire pressure. 7. Worn steel ball/race in steering stem.	Replace. Repair or replace. Replace. Retighten. Adjust. Adjust or replace. Replace.
Front wheel wobbles.	1. Distorted wheel rim 2. Worn front wheel bearings 3. Defective or incorrect tire 4. Loose front axle nut 5. Incorrect fork oil level 6. Incorrect front wheel weight balance	Replace. Replace. Replace. Tighten. Adjust. Adjust.
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 bearings 5. Loose rear axle nut 6. Loose rear suspension fastener	Replace. Replace. Replace. Replace. 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. Improper suspension setting 2. Bent rear shock absorber shaft 3. Worn swingarm bearings and rear suspension related bushings	Adjust. Replace. Replace.
Noisy rear suspension	1. Loose rear suspension fastener 2. Worn swingarm bearings and rear suspension related bushings	Tighten. Replace.

Complaint	Symptom and possible causes	Remedy
Rear wheel wobbles.	1. Distorted wheel rim 2. Worn rear wheel bearing 3. Defective or incorrect tire 4. Worn swingarm bushing 5. Loose rear axle nut or swingarm pivot nut 6. Loose rear suspension fastener	Replace. Replace. Replace. Replace. Tighten. Tighten.
Rear suspension too soft	1. Weak rear shock absorber spring 2. Rear shock absorber leaks oil	Replace. Replace.
Rear suspension too stiff	1. Bent swingarm 2. Worn swingarm and rear suspension related bushing	Replace. Replace.
Rear suspension too noisy	1. Loose rear suspension fastener 2. Worn swingarm bushing	Tighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Brake power insufficient	1. Leakage of brake fluid from hydraulic system 2. Worn brake pads or disc 3. Oil adhesion on friction surface of pads 4. Not enough brake fluid in the reservoir 5. Air in hydraulic system 6. Friction surfaces of pads are dirty with oil or dust 7. Excessive brake pedal play 8. Worn brake shoe or drum 9. Oil in brake shoe surfaces 10. Excessively worn brake drum	Repair or replace. Replace. Clean brake disc and brake pads. Replenish. Bleed air. Replace. Adjust. Replace. Clean. Replace.
Brake squeaks.	1. Carbon adhesion on brake pad and brake shoe surface 2. Tilted brake pad 3. Damaged wheel bearing 4. Worn brake pad and brake shoe 5. Foreign material in brake fluid 6. Clogged return port of master cylinder 7. Loose front or rear axle nut 8. Brake shoe surface glazed 9. Tilted shoe	Clean surface with sandpaper. Readjust brake pad position or replace. Replace. Replace. Change brake fluid. Disassemble and clean master cylinder. Tighten. Clean surface with sandpaper. Readjust shoe position or replace.
Excessive brake lever or pedal stroke	1. Worn brake camlever 2. Excessively worn brake shoes and/or brake drum 3. Air in hydraulic system 4. Insufficient brake fluid 5. Improper quality of brake fluid	Replace. Replace. Bleed. Replenish fluid to specified level and bleed air. Replace with correct fluid.
Leakage brake fluid.	1. Loose connection joint 2. Cracked hose 3. Worn piston 4. Worn cup 5. Worn piston seal and dust seal	Tighten. Replace. Replace. Replace. Replace.

Complaint	Symptom and possible causes	Remedy
Brake drags.	1. Rusty part 2. Insufficient brake lever or brake pedal pivot lubrication	Clean and lubricate. Lubricate.

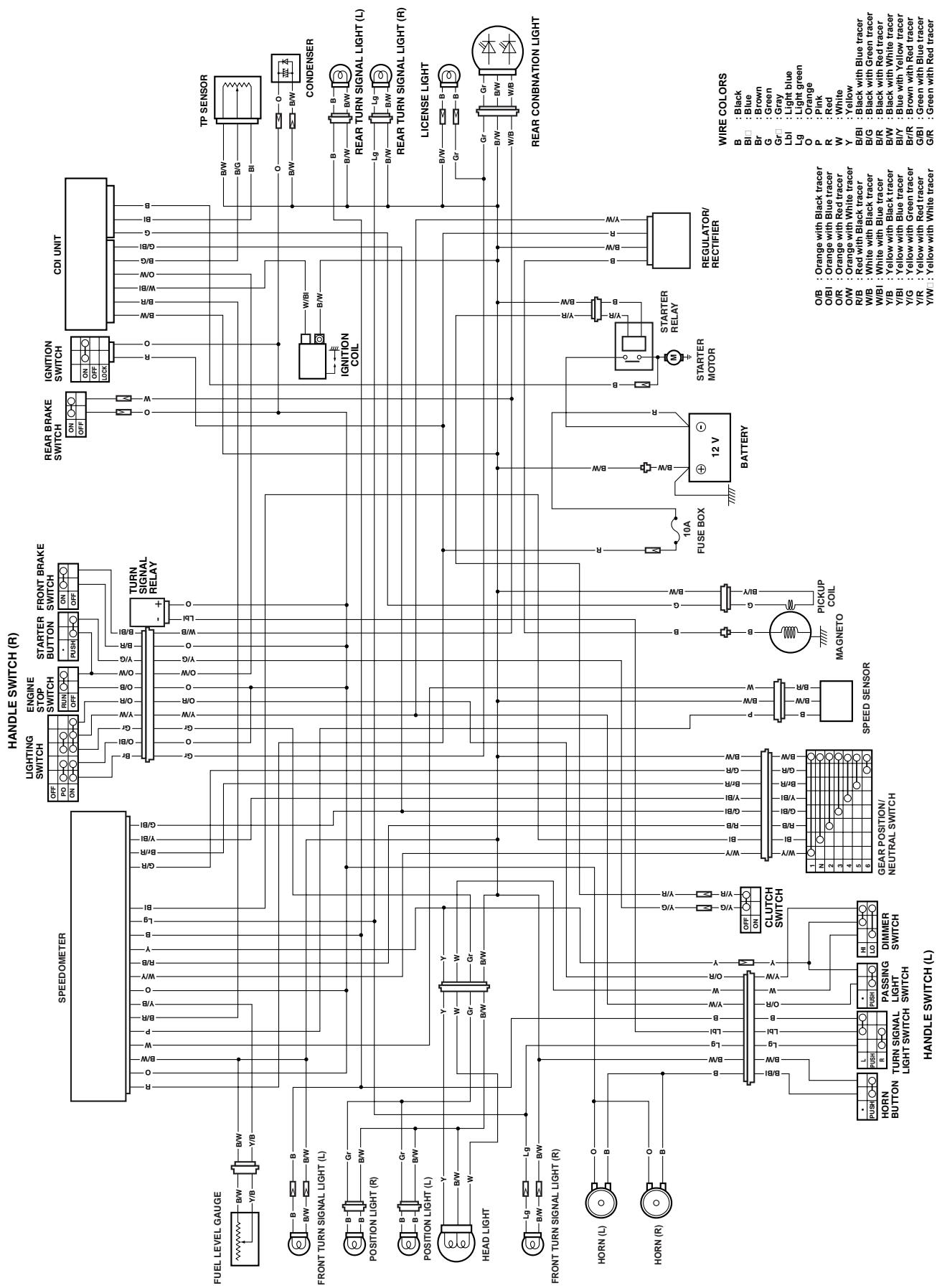
ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil or CDI unit 2. Defective spark plug 3. Defective pickup coil or startor coil 4. Open or short in high-tension cord 5. Open-circuited wiring connections	Replace. Replace. Replace. Replace. Check and repair.
Spark plug is wet or quickly becomes fouled with carbon.	1. Mixture too rich 2. Excessively high idling speed 3. Incorrect gasoline 4. Clogged air cleaner element 5. Too cold spark plug	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 rings 2. Worn piston 3. Worn cylinder 4. Excessive clearance of valve stems in valve guides 5. Worn valve stem oil seal	Replace. Replace. Rebore or replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Too hot spark plug 2. Overheated engine 3. Loose spark plug 4. Too lean mixture	Change to cold type spark plug. Turn-up. Tighten. Adjust carburetor.
Battery does not charge.	1. Open or short in lead wires, or loose lead connections 2. Shorted, grounded or open stator coils 3. Shorted or punctured regulator/rectifier	Repair, replace or connect properly. Replace. Replace.
Battery charge but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals 2. Grounded or open-circuited stator coils 3. Defective regulator/rectifier 4. Defective battery cell plates	Repair or tighten. Replace. Replace. Replace the battery.
Overcharges.	1. Internal short-circuit in the battery 2. Damaged or defective resistor element in the 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 stator coils 3. Defective regulator/rectifier	Repair or replace. Replace. Replace.
Starter button is not effective.	1. Run down battery. 2. Defective switch contacts. 3. Brushes not seating properly on starter motor commutator. 4. Defective starter relay. 5. Defective main fuse.	Repair or replace. Replace. Repair or replace. Replace. Replace.

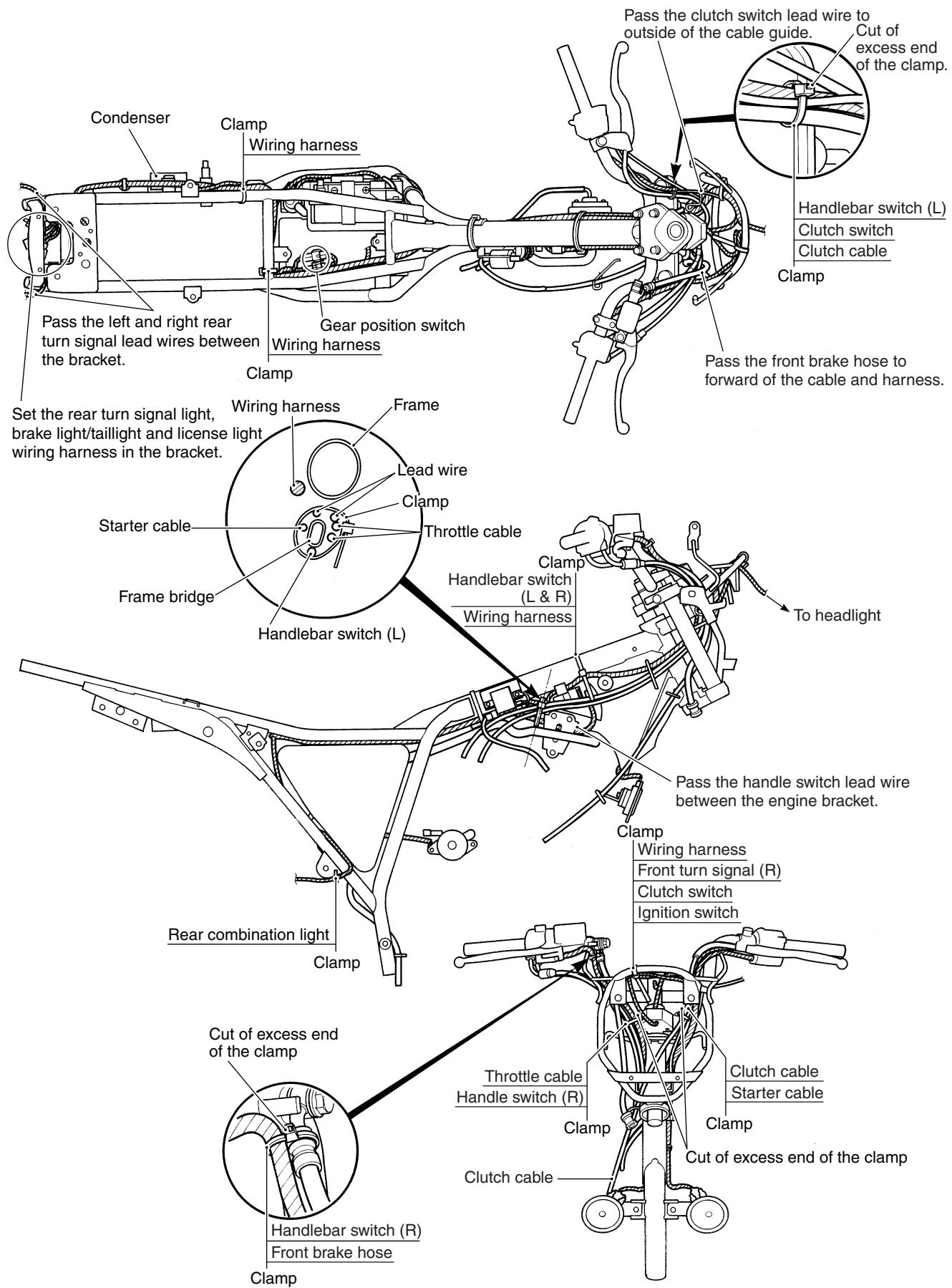
BATTERY

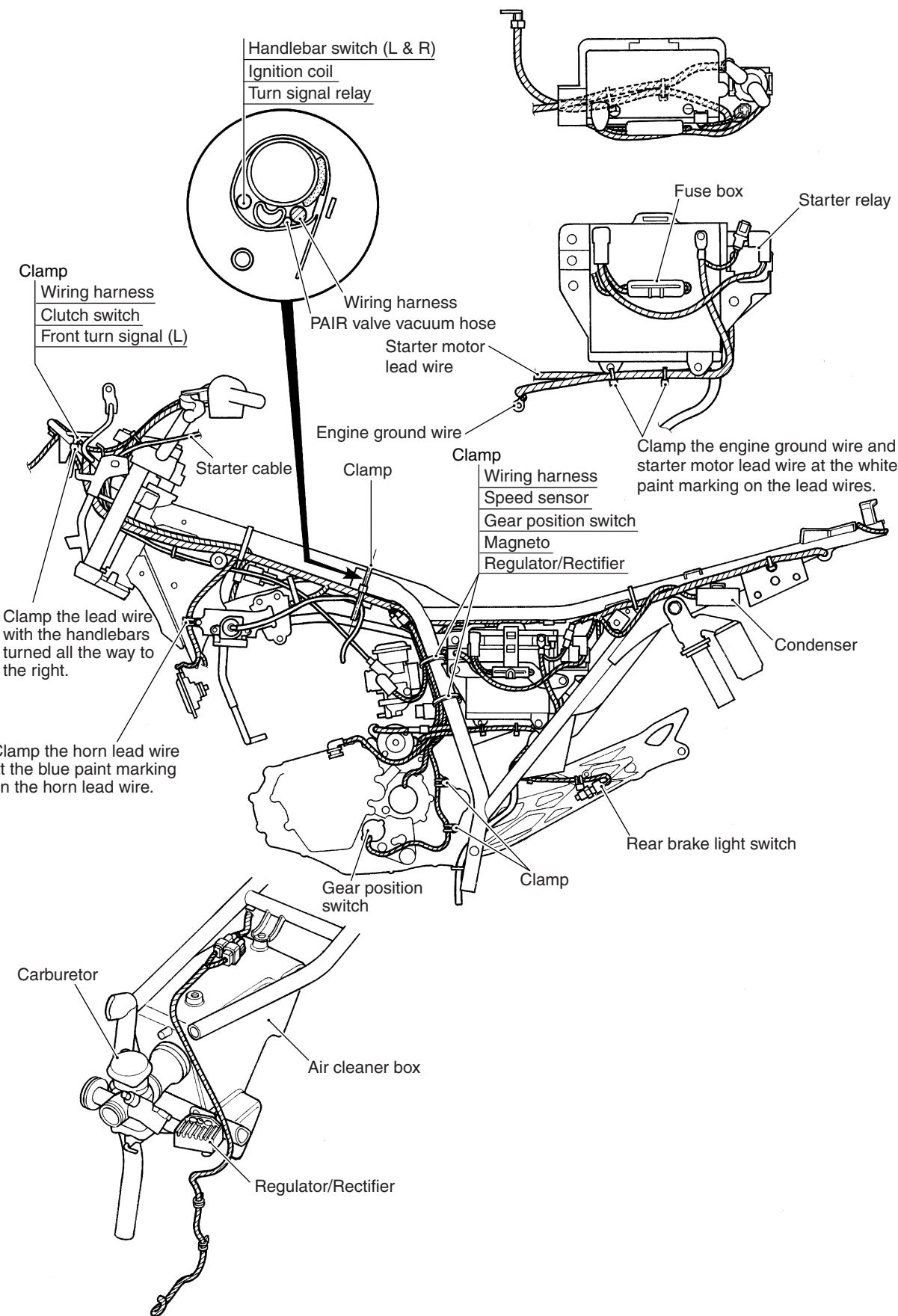
Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Cracked battery case 2. Battery has been left in a run-down condition for a long time	Replace the battery. Replace the battery.
Battery runs down quickly.	1. Trouble in charging system 2. Cell plates have lost much of their active material as a result of overcharging 3. Internal shorted in the battery 4. Too low battery voltage 5. Too old battery	Check the generator, regulator/rectifier and circuit connections and make necessary adjustments to obtain specified charging operation. Replace the battery, and correct the charging system. Replace the battery. Recharge the battery fully. Replace the battery.
Battery "sulfation".	1. Incorrect charging rate (When not in use battery should be checked at least once a month to avoid sulfation) 2. The battery was left unused for too long	Replace the battery. Replace the battery if badly sulfated.

WIRING DIAGRAM

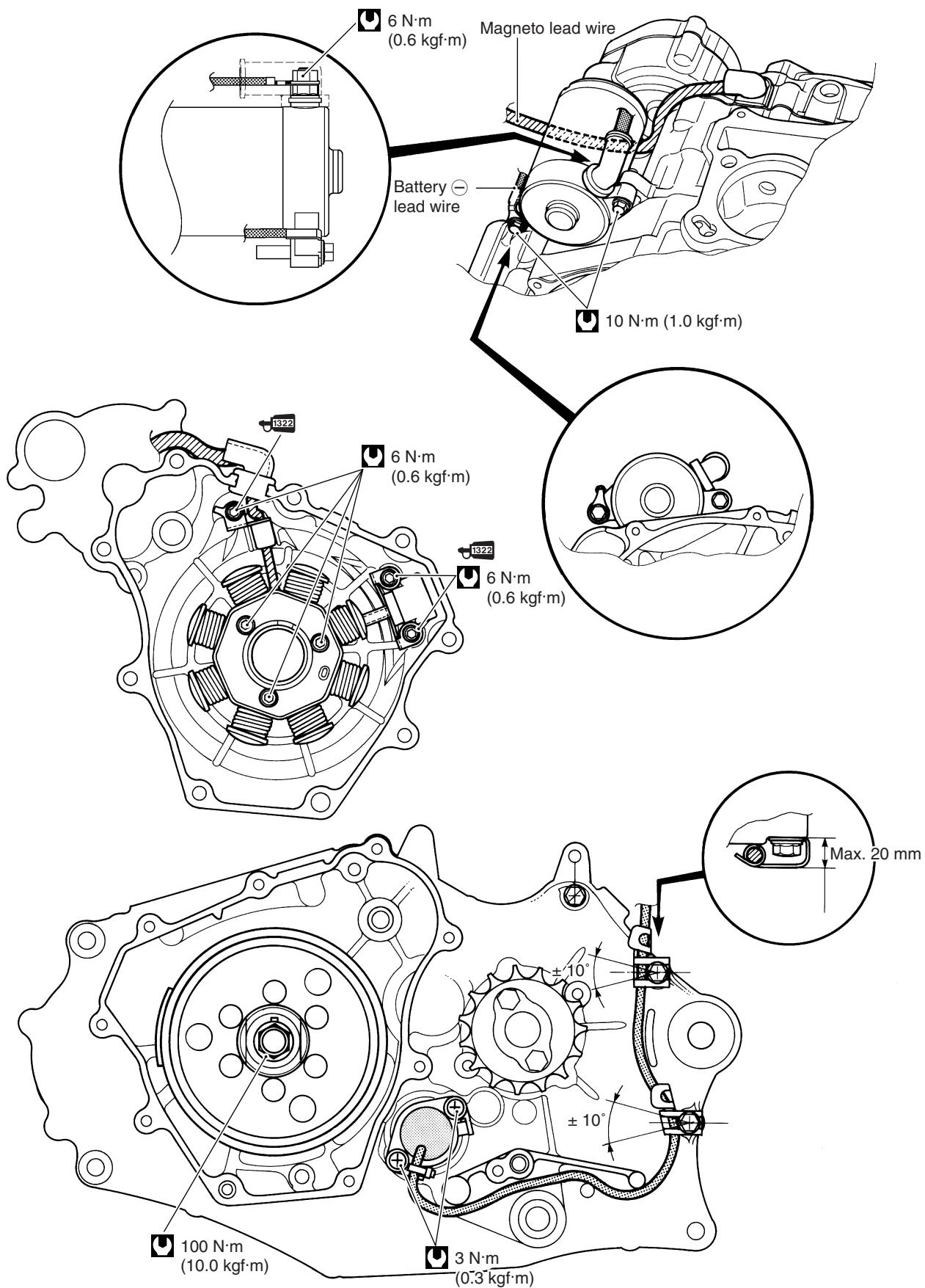


WIRING HARNESS

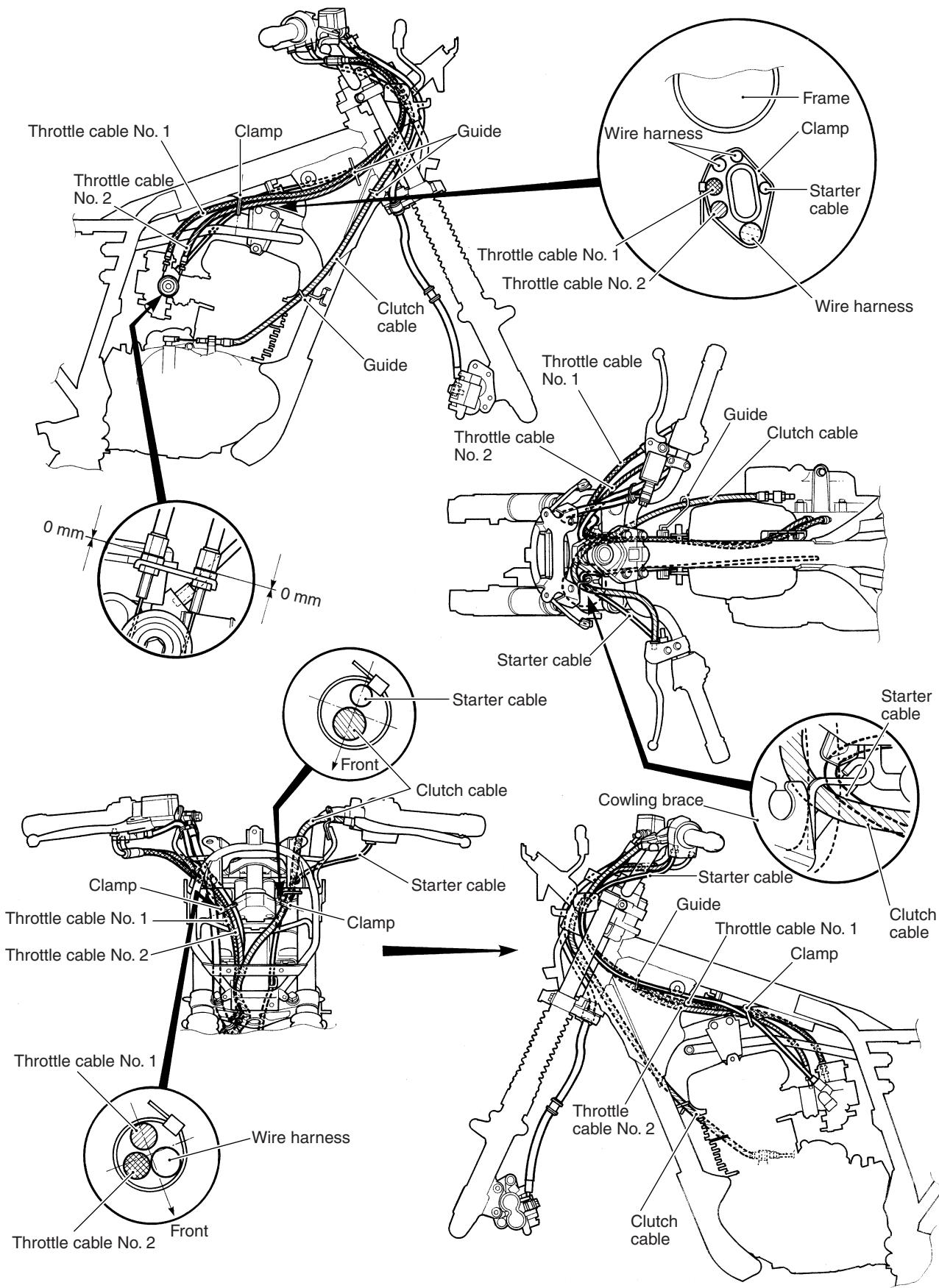




ENGINE ELECTRICAL PARTS WIRE ROUTING

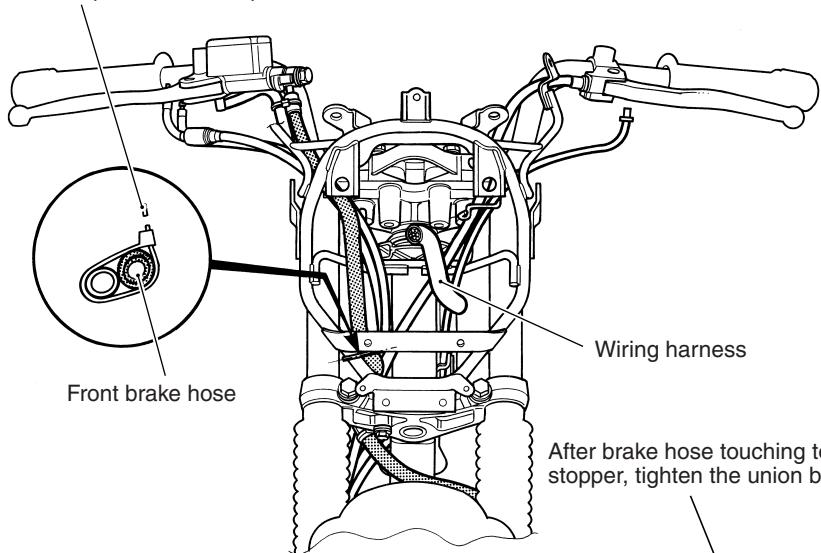


CABLE ROUTING



FRONT BRAKE HOSE ROUTING

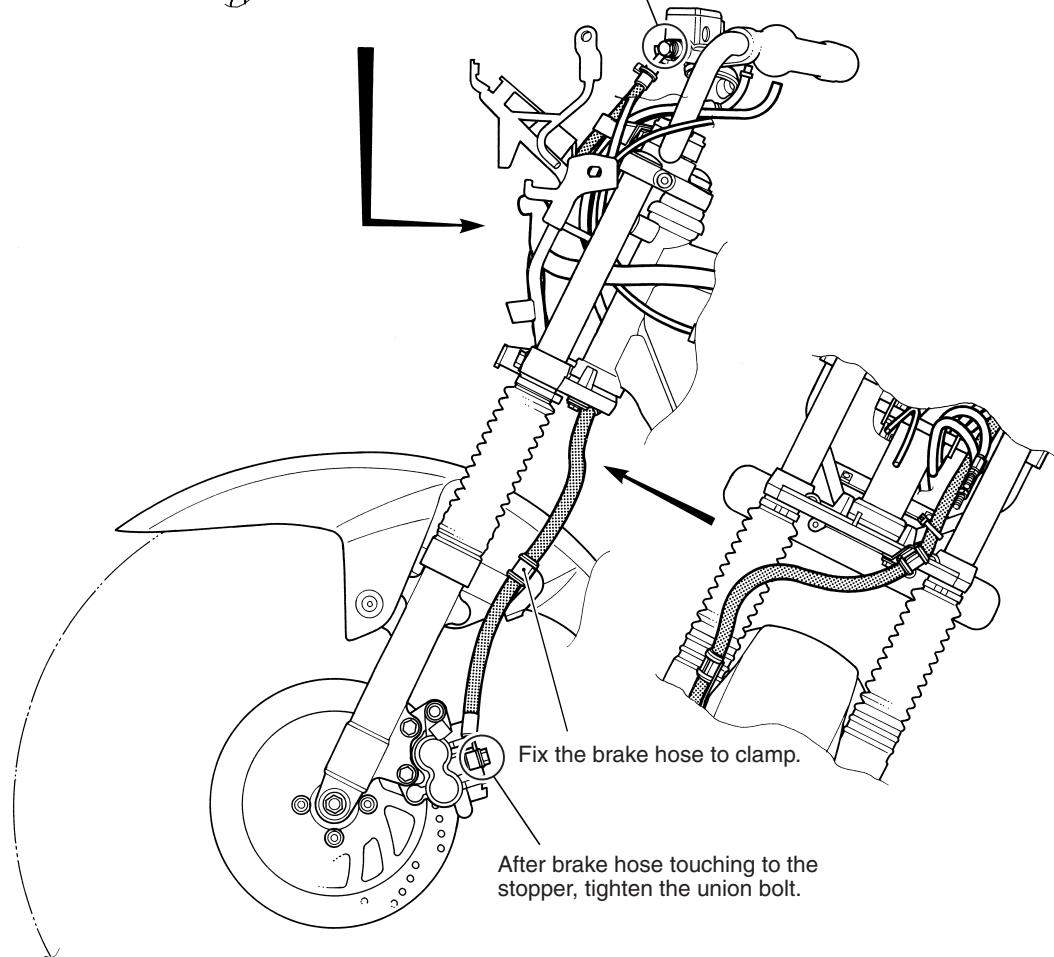
Cut the excessive part of the clamp.



Front brake hose

Wiring harness

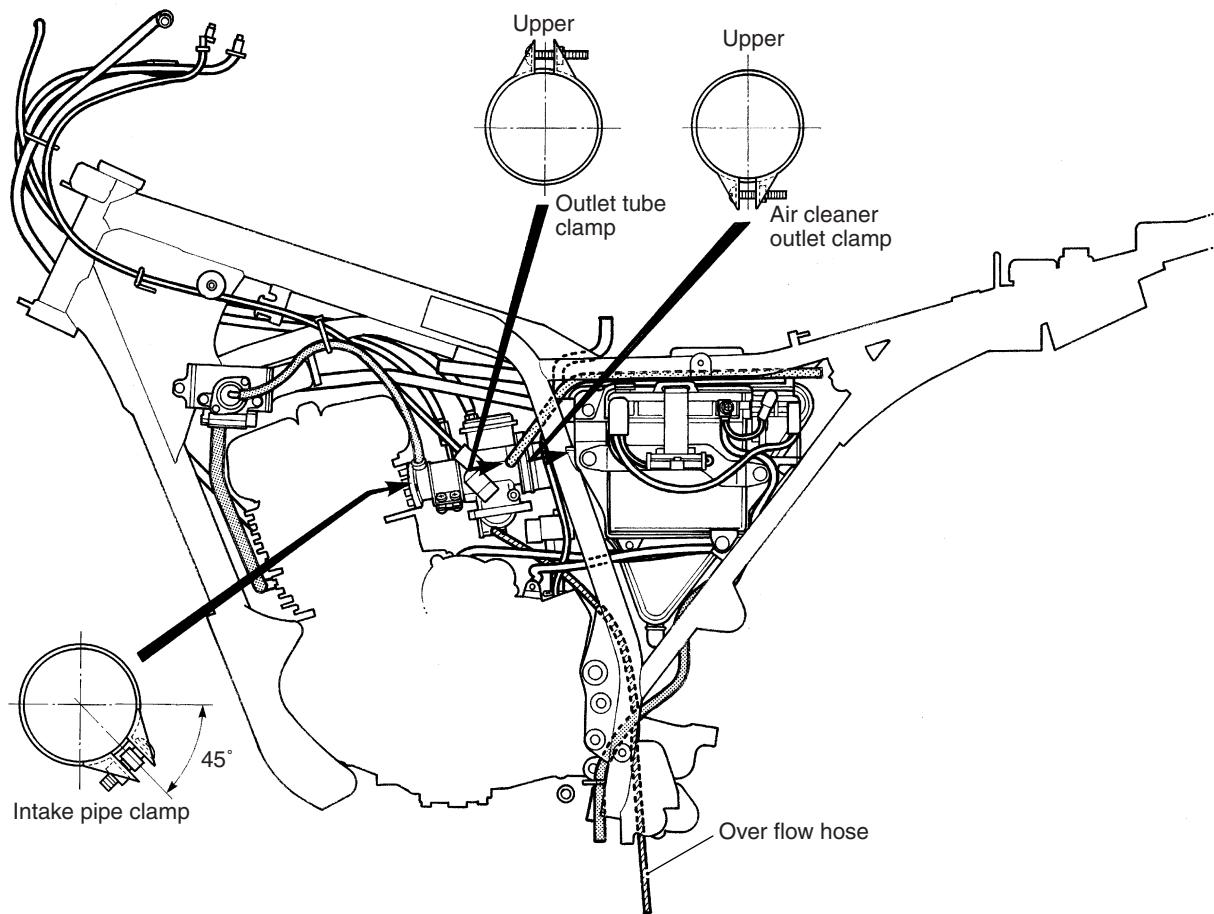
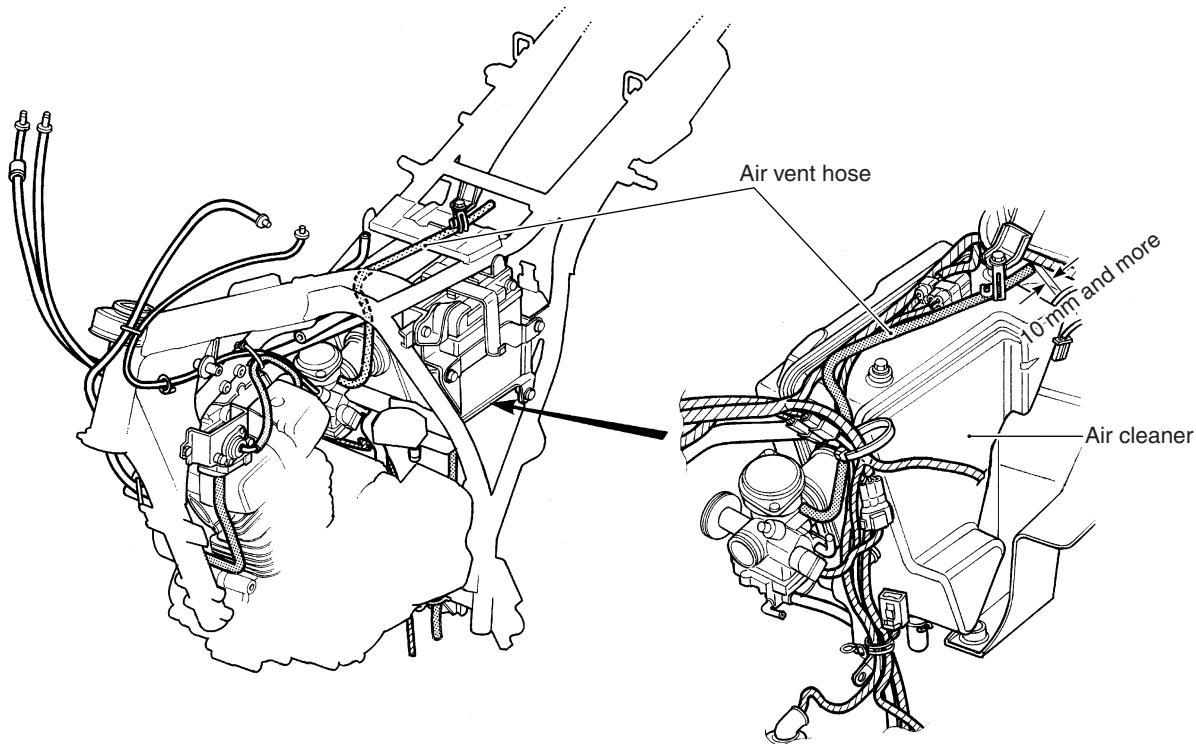
After brake hose touching to the stopper, tighten the union bolt.



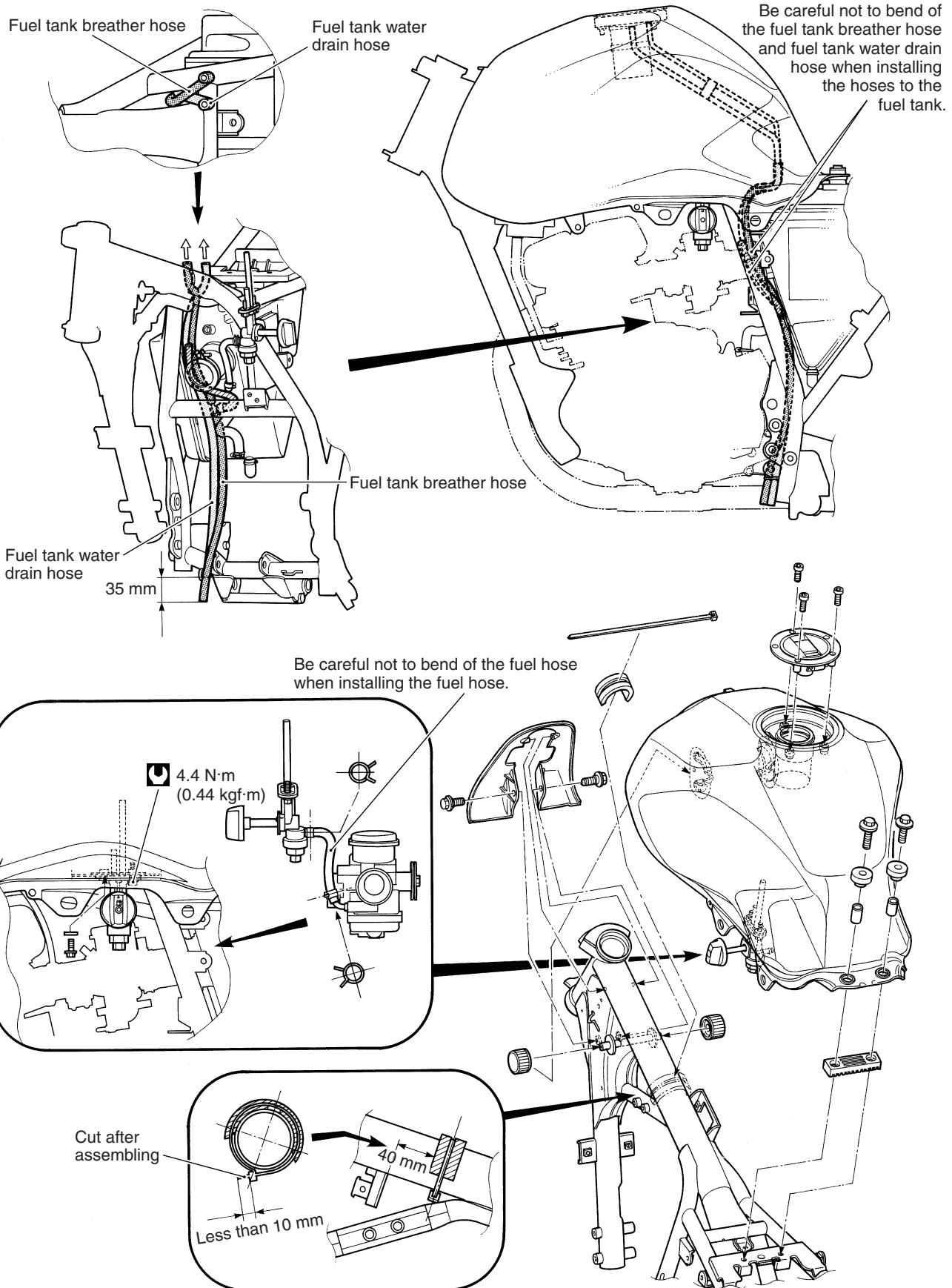
Fix the brake hose to clamp.

After brake hose touching to the stopper, tighten the union bolt.

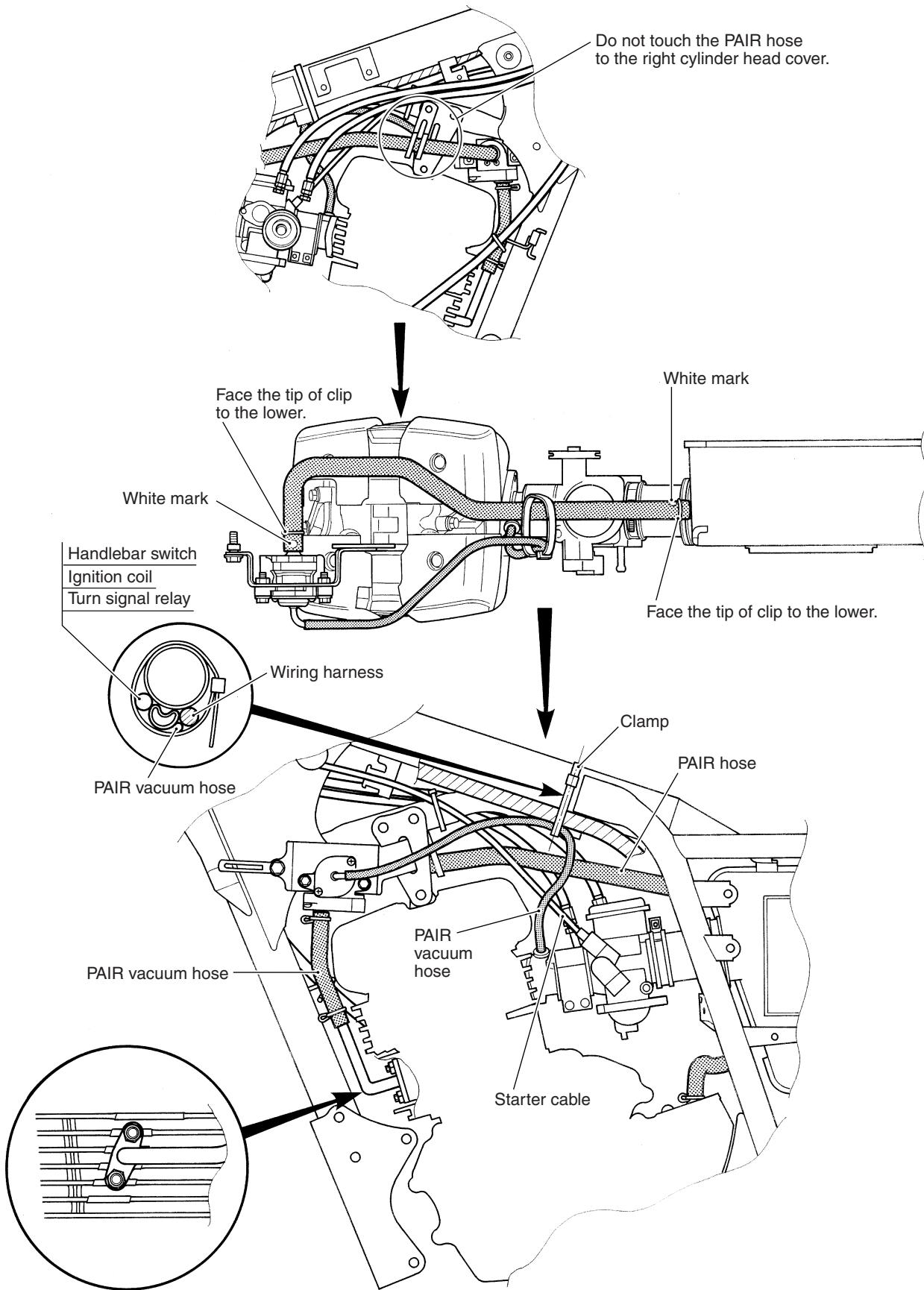
CARBURETOR HOSE ROUTING



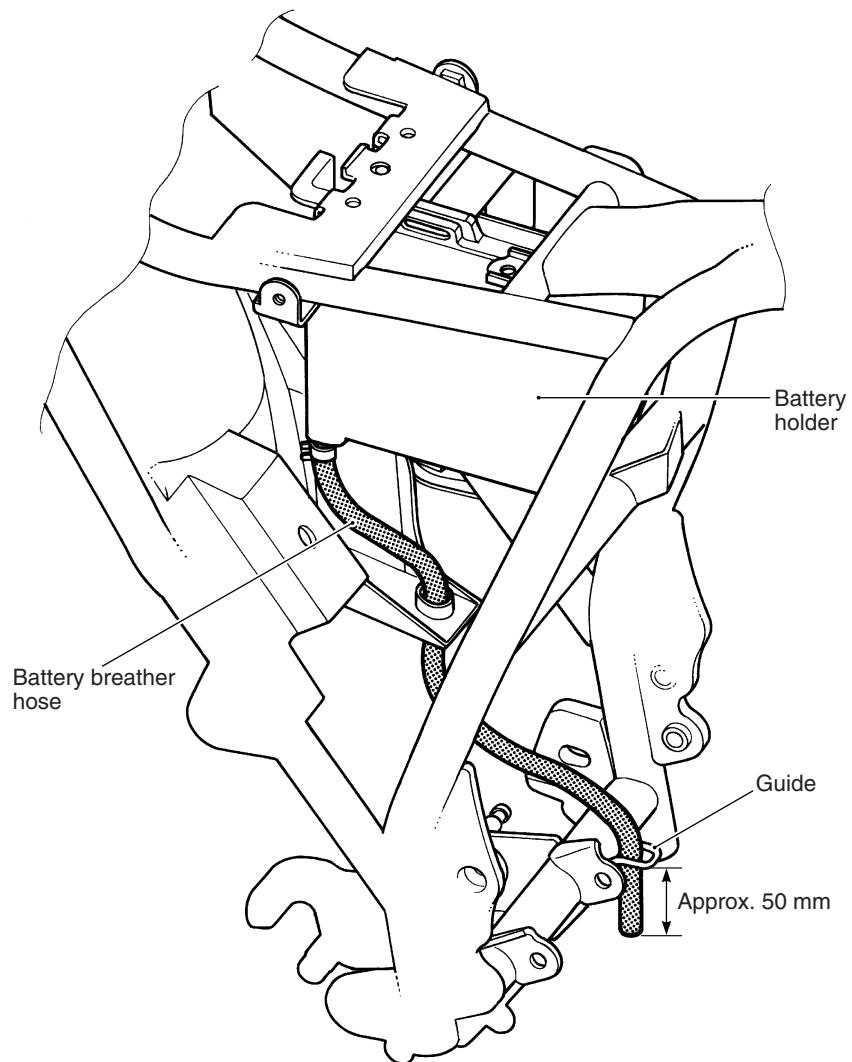
FUEL TANK HOSE ROUTING



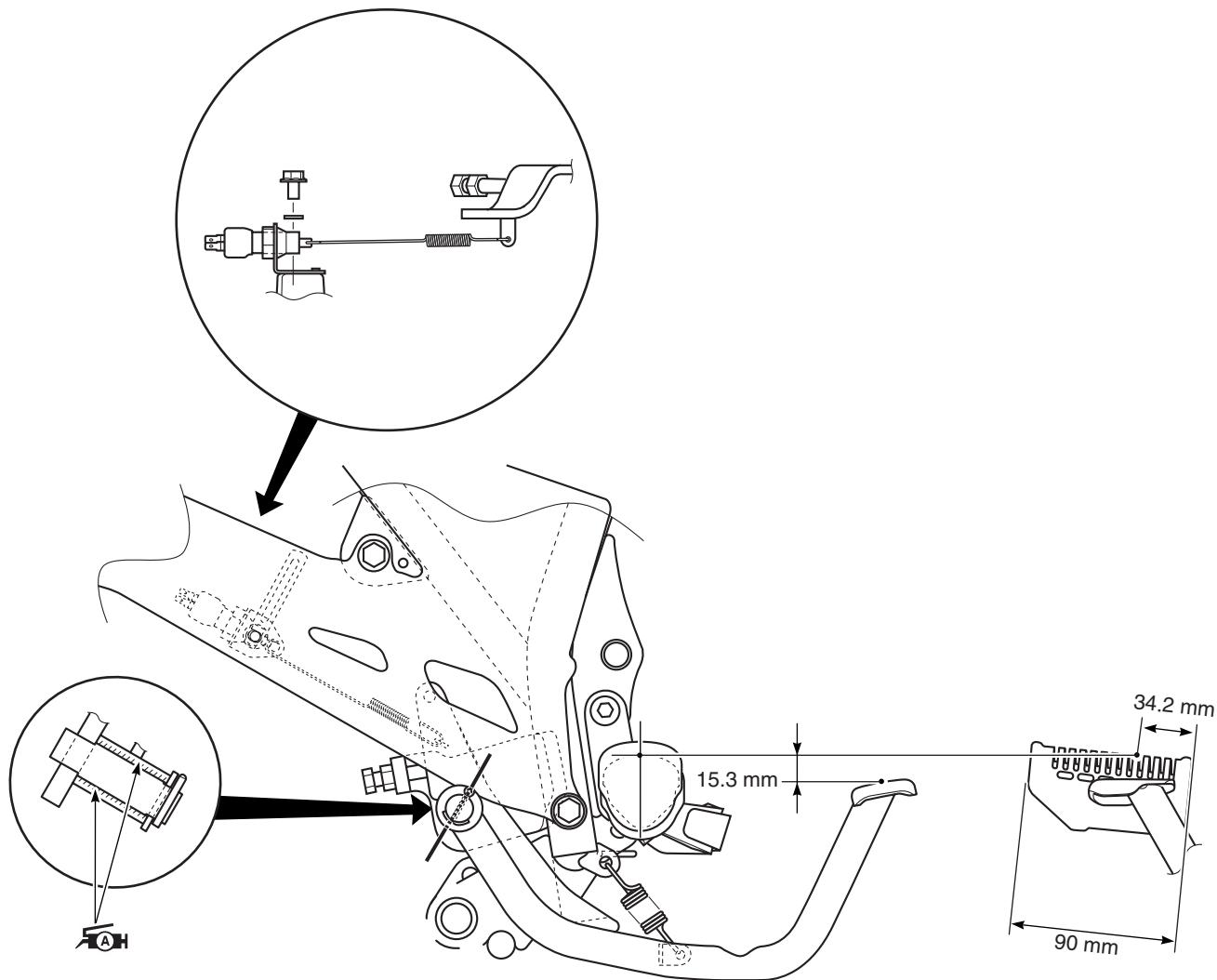
PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING



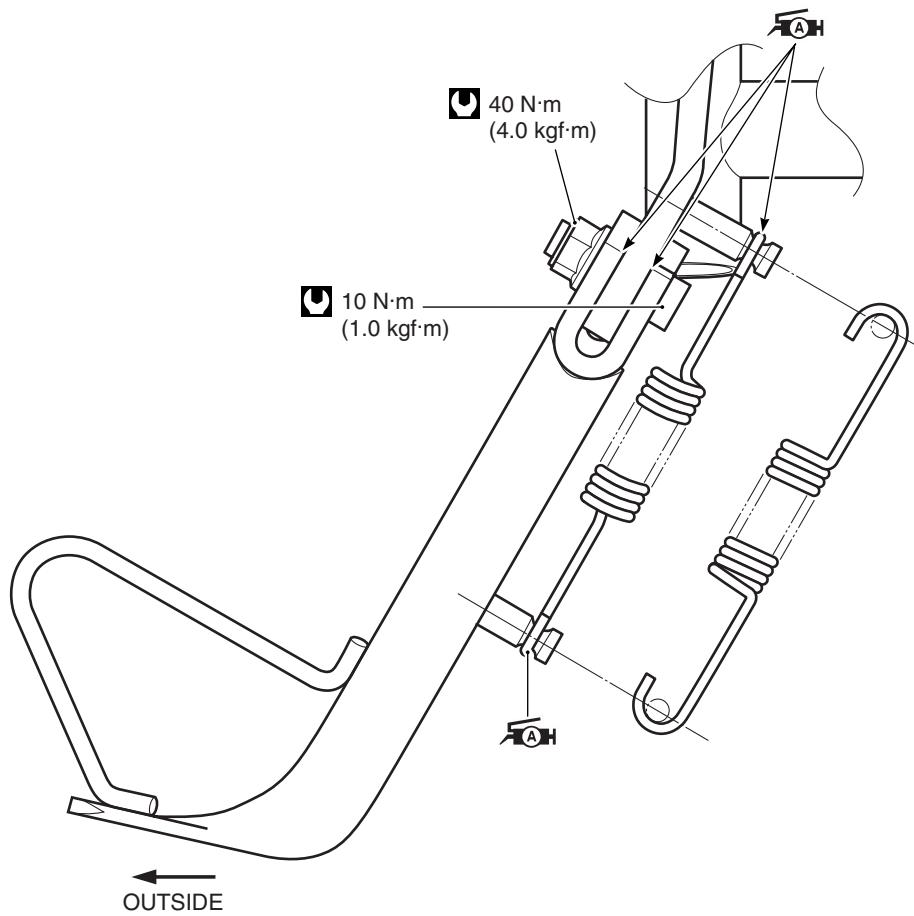
BATTERY BREATHER HOSE ROUTING



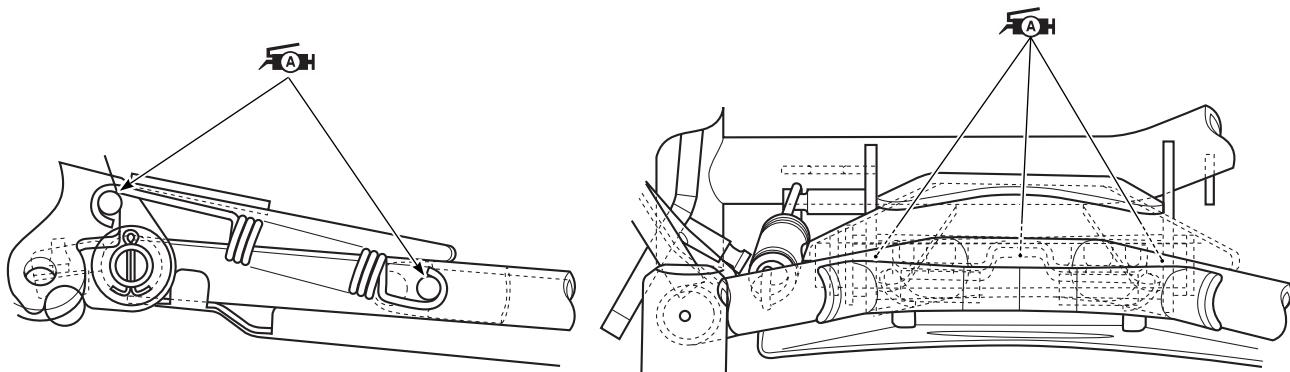
BRAKE PEDAL INSTALLATION



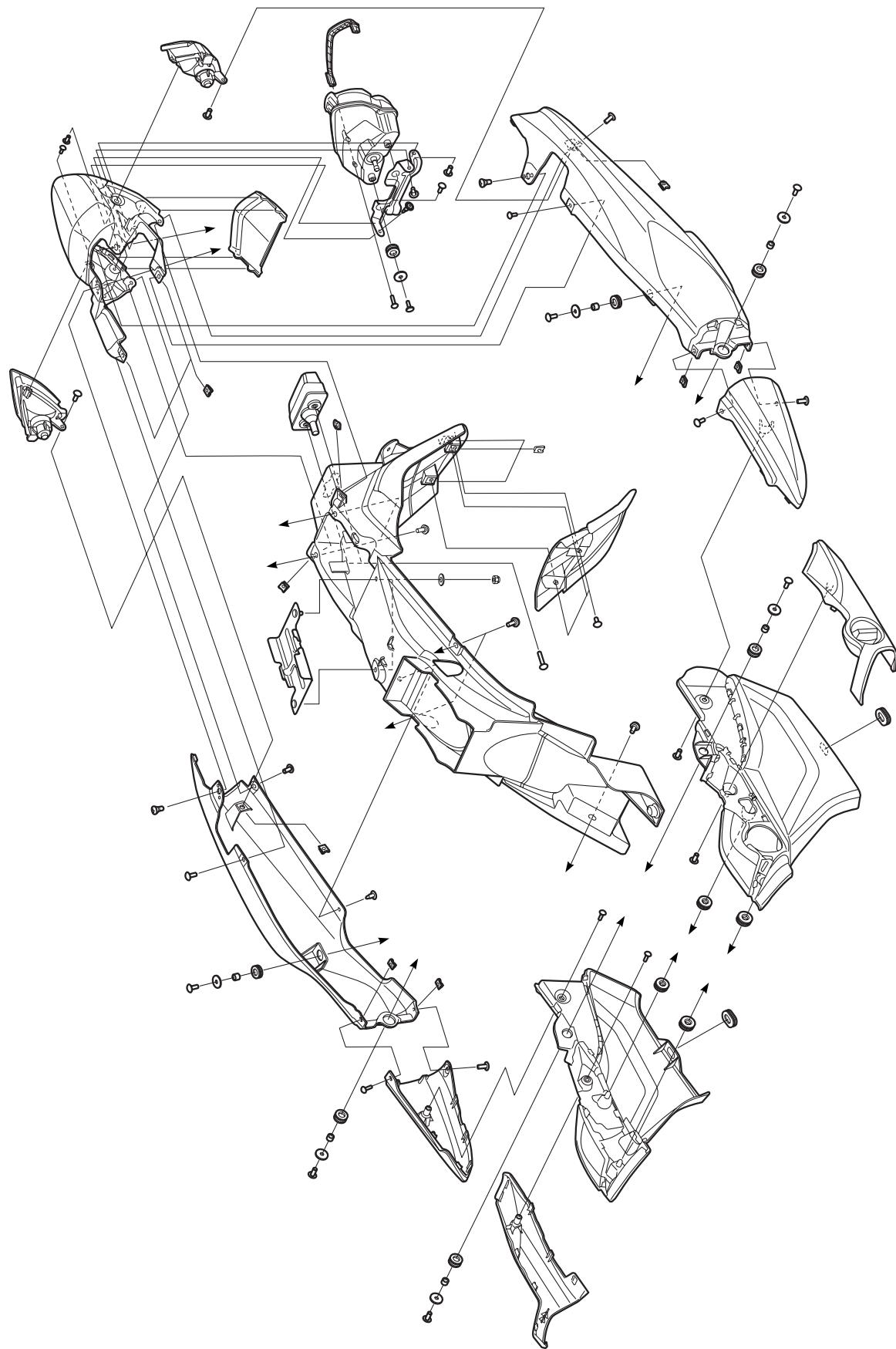
SIDE-STAND INSTALLATION



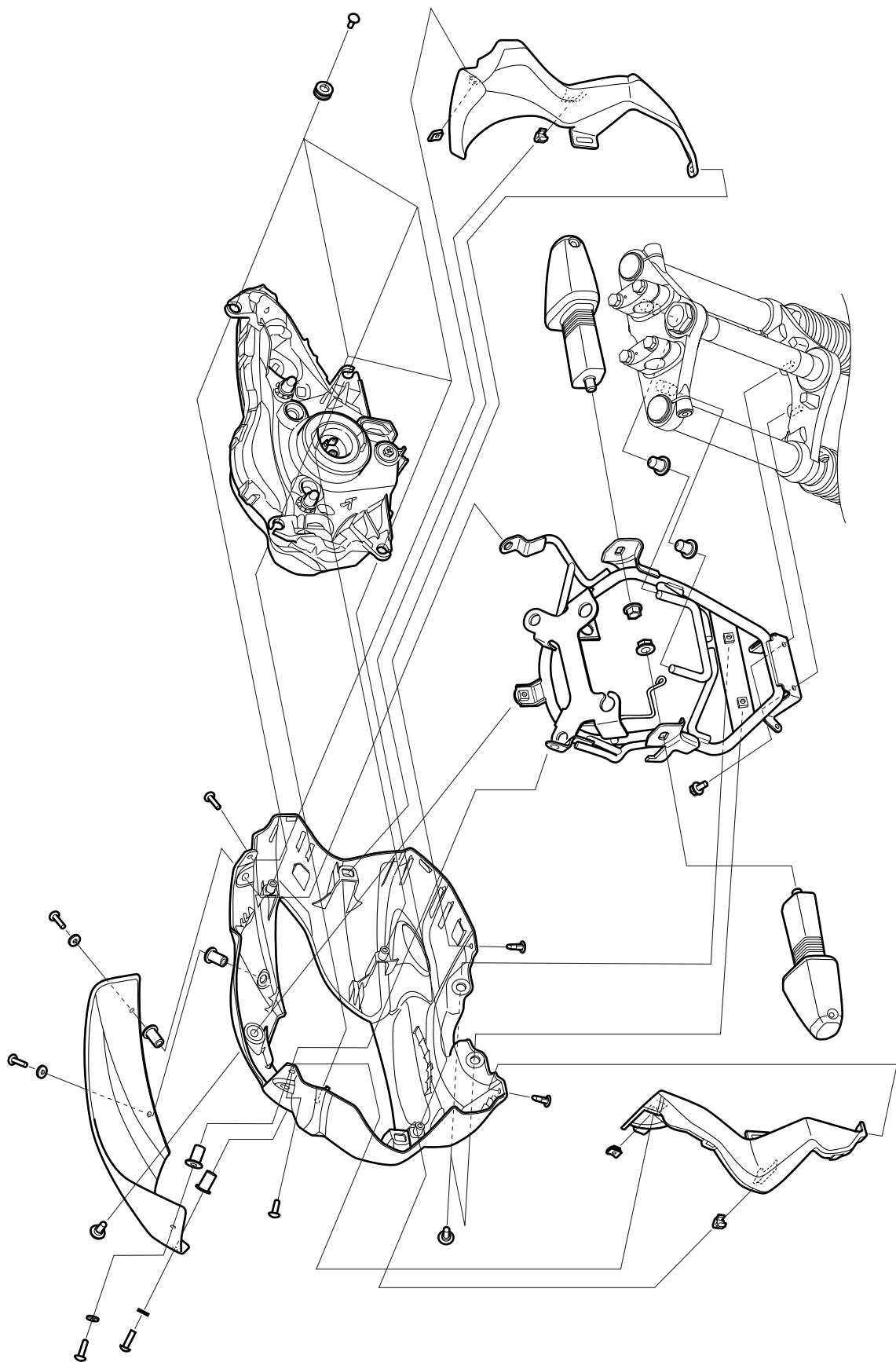
CENTER STAND INSTALLATION



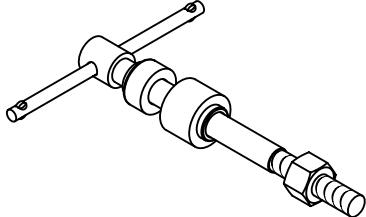
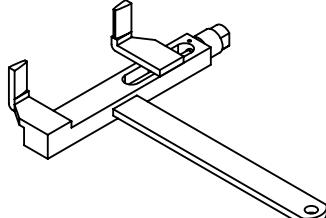
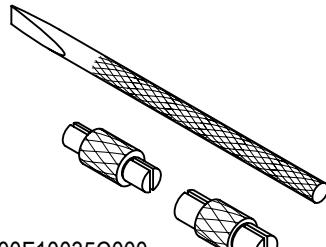
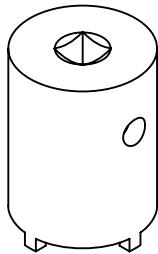
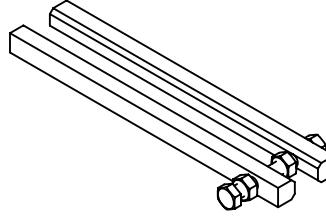
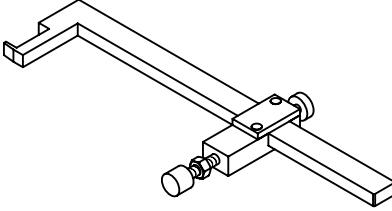
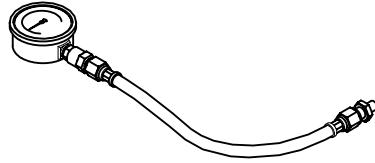
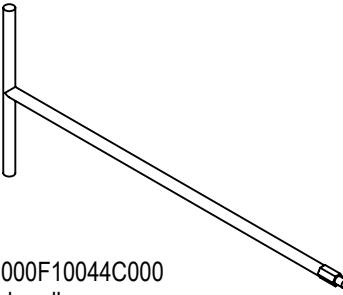
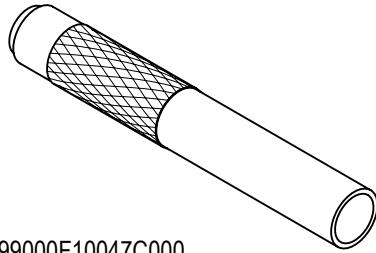
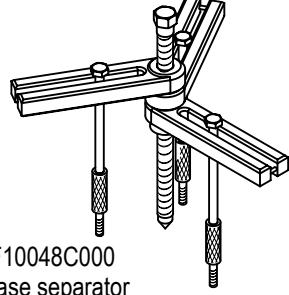
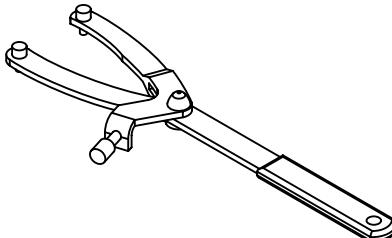
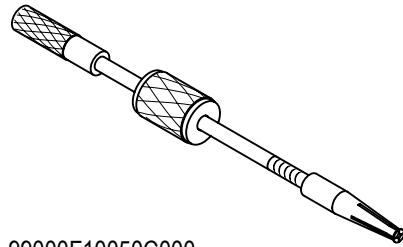
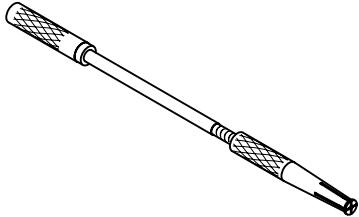
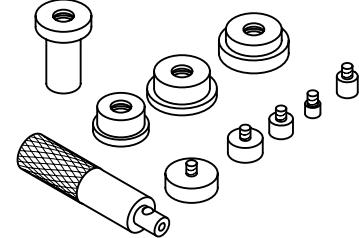
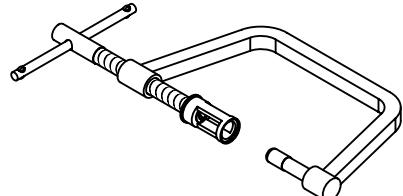
FRAME COVER INSTALLATION

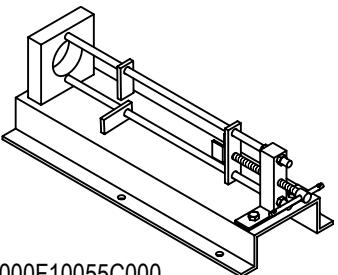
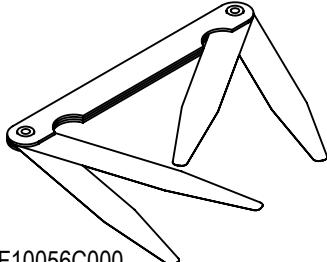
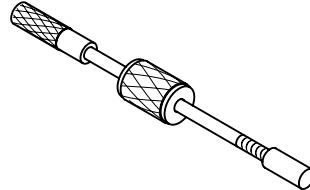
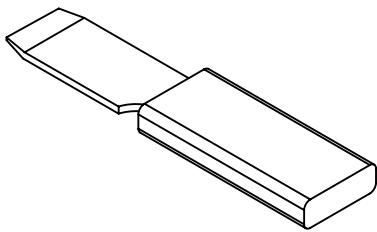
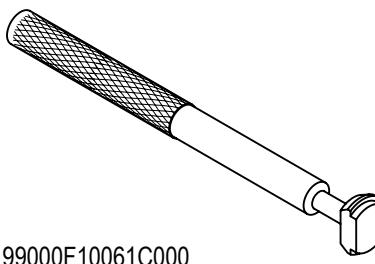
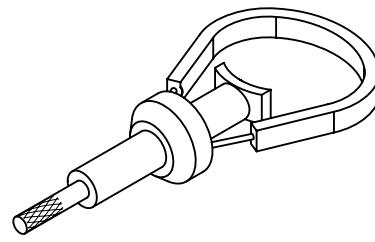
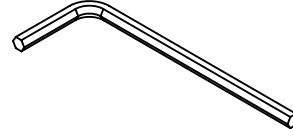
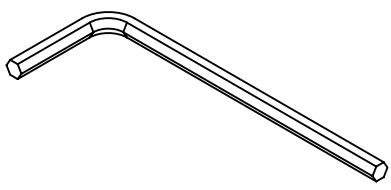
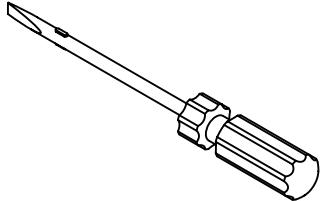
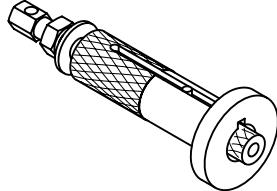
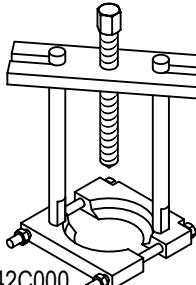
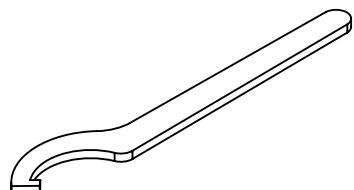
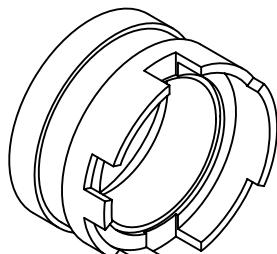
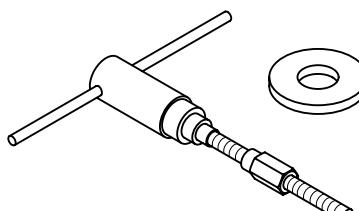


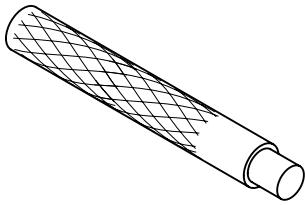
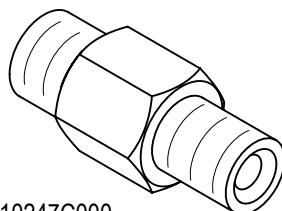
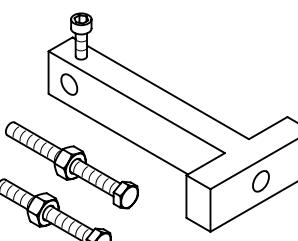
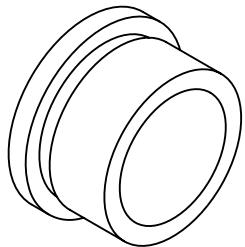
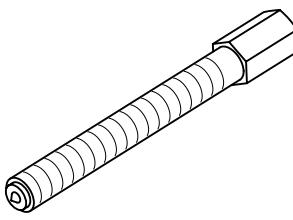
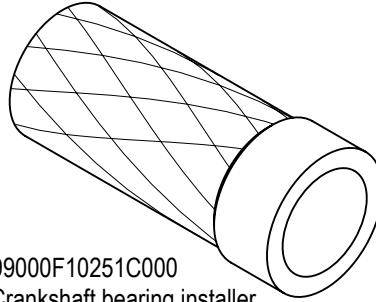
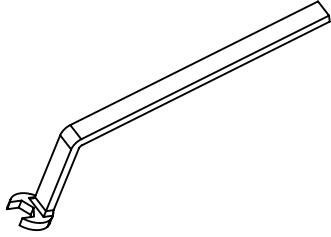
COWLING INSTALLATION



SPECIAL TOOLS

 <p>99000F10033C000 Steering race installer</p>	 <p>99000F10034C000 Clutch sleeve hub holder</p>	 <p>99000F10035C000 Wheel bearing remover set for brg. 6302 & 6301 of 3 pieces</p>
 <p>99000F10036C000 Steering stem nut socket wrench</p>	 <p>99000F10037C000 Con rod holder</p>	 <p>99000F10040C000 Oil seal remover</p>
 <p>99000F10041C000 Oil pressure gauge</p>	 <p>99000F10044C000 T - handle</p>	 <p>99000F10047C000 Steering bearing installer</p>
 <p>99000F10048C000 Crankcase separator</p>	 <p>99000F10049C000 Engine sprocket holder</p>	 <p>99000F10050C000 N.R.B. remover</p>
 <p>99000F10051C000 Cylinder head bearing remover</p>	 <p>99000F10053C000 Engine bearing installer</p>	 <p>99000F10054C000 Valve spring compressor</p>

 99000F10055C000 Shock absorber fixture with base	 99000F10056C000 Thickness gauge	 99000F10059C000 Speedometer pinion outer remover
 99000F10060C000 Scraper	 99000F10061C000 Steering race remover	 99000F10098C000 Rotor holder
 99000F10124C000 Engine bearing installer 15 mm	 99000F10125C000 Allen key 6 mm	 99000F10126C000 Allen key 14 mm (for TFF)
 99000F10127C000 Screwdriver 903	 99000F10128C000 Crankshaft installer with spacer	 99000F10242C000 Crankshaft bearing puller
 99000F10243C000 Shocker adjuster C spanner	 99000F10244C000 Crankshaft installer spacer	 99000F10245C000 Engine bearing puller with plate

 99000F10246C000 Piston pin replacer	 99000F10247C000 Adapter oil pressure gauge	 99000F10248C000 Engine mounting bracket
 99000F10249C000 TFF oil seal installer	 99000F10250C000 Magneto puller bolt	 99000F10251C000 Crankshaft bearing installer
 99000F10254C000 Steering nut tightening tool - 28 mm		

NOTE:

When ordering a special tool, please confirm whether it is available or not.

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kgf·m
Cylinder head cover bolt	10	1.0
Cylinder head bolt	25	2.5
Cylinder head nut	10	1.0
Cylinder head cover cap bolt	10	1.0
Cylinder base nut	10	1.0
Primary drive gear nut	50	5.0
Crankcase bolt	10	1.0
Exhaust pipe bolt	23	2.3
Muffler mounting nut	60	6.0
Cam chain tension adjuster mounting bolt	10	1.0
Air cleaner box mounting bolt	10	1.0
Cam chain tensioner bolt	10	1.0
Camshaft sprocket bolt	11	1.1
Rocker arm shaft plug	28	2.8
Clutch sleeve hub nut	40	4.0
Magneto rotor nut	100	10.0
Gearshift arm stopper bolt	19	1.9
Intake pipe mounting bolt	10	1.0
Valve timing inspection plug	21	2.1
Valve clearance adjust lock-nut	15	1.5
Oil pump mounting bolt	10	1.0
Oil drain plug	23	2.3
Oil gallery plug	10	1.0
Engine mounting nut	40	4.0
Engine mounting upper bracket nut	31	3.1
Engine mounting lower bracket nut	40	4.0
Spark plug	11	1.1
Crankshaft oil seal retainer screw	9	0.9
Crank balancer shaft nut	50	5.0
Starter clutch cover bolt	10	1.0
Oil sump filter cap bolt	10	1.0
Valve inspection cap bolt	10	1.0
Cylinder head plug	10	1.0
Oil gallery plug plate bolt	10	1.0
Clutch cover bolt	10	1.0
Main oil gallery plug	23	2.3
Magneto cover bolt	10	1.0
Magneto cover plug	5	0.5
Starter idle gear cover bolt	10	1.0
Exhaust pipe cover bolt	10	1.0
Muffler cover bolt	10	1.0
Oil filter cap bolt	10	1.0

ITEM	N·m	kgf·m
Gear position switch mounting bolt	3	0.3
Starter clutch bolt	10	1.0
Starter motor mounting bolt	10	1.0
Starter motor lead wire nut	4	0.4
Stator coil set bolt	6	0.6
Pickup coil set bolt	6	0.6
Magneto lead wire set bolt	6	0.6
Starter motor brush holder mounting nut	6	0.6
Starter motor housing bolt	4	0.4
Starter relay lead wire nut	5	0.5
Speed sensor rotor bolt	23	2.3
Speedometer mounting nut	4.5	0.45
Neutral switch mounting bolt	3	0.3

FUEL AND LUBRICATION SYSTEM

ITEM	N·m	kgf·m
Fuel valve bolt	4.4	0.44
Throttle position sensor mounting screw	3.5	0.35
Starter plunger	4	0.4

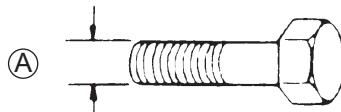
CHASSIS

ITEM	N·m	kgf·m
Handlebar clamp bolt	16	1.6
Steering stem head nut	90	9.0
Front fork upper clamp bolt	23	2.3
Front fork lower clamp bolt	29	2.9
Front fork cap bolt	24	2.4
Damper rod bolt	23	2.3
Front axle nut	44	4.4
Front footrest nut	55	5.5
Swingarm pivot nut	65	6.5
Rear axle nut	65	6.5
Rear torque link nut (Front and Rear)	16	1.6
Rear shock absorber mounting nut & bolt (Upper & Lower)	29	2.9
Rear sprocket drum nut	80	8.0
Brake cam lever nut	7	0.7
Side-stand nut	40	4.0
Side-stand bolt	10	1.0
Brake caliper mounting bolt	25	2.5
Brake hose union bolt	23	2.3
Air breeder valve	7.5	0.75
Brake master cylinder bolt	10	1.0
Brake disc bolt	23	2.3
Brake lever pivot nut	6	0.6
Front bumper upper mounting nut	10	1.0
Front bumper lower mounting nut	40	4.0
Front footrest bracket mounting bolt	35	3.5

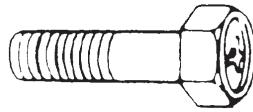
TIGHTENING TORQUE CHART

For other bolts and nuts not listed in the preceding page, refer to this chart:

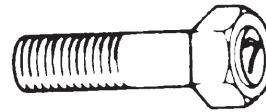
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt		"7" marked bolt	
	N·m	kgf·m	N·m	kgf·m
4	1.5	0.15	2.3	0.23
5	3	0.3	4.5	0.45
6	5.5	0.55	10	1.0
8	13	1.3	23	2.3
10	29	2.9	50	5.0
12	45	4.5	85	8.5
14	65	6.5	135	13.5
16	105	10.5	210	21.0
18	160	16.0	240	24.0



Conventional bolt



4 marked bolt



7 marked bolt

SERVICE DATA**VALVE + GUIDE**

Unit: mm

ITEM	STANDARD		LIMIT
Valve diam.	IN.	27.5	—
	EX.	24.5	—
Valve clearance (when cold)	IN.	0.04 – 0.07	—
	EX.	0.10 – 0.15	—
Valve guide to valve stem clearance	IN.	0.010 – 0.037	—
	EX.	0.030 – 0.057	—
Valve guide I.D.	IN. & EX.	5.000 – 5.012	—
Valve stem O.D.	IN.	4.975 – 4.990	—
	EX.	4.955 – 4.970	—
Valve stem deflection	IN. & EX.	—	0.35
Valve stem runout	IN. & EX.	—	0.05
Valve head thickness	IN. & EX.	—	0.5
Valve seat width	IN. & EX.	0.9 – 1.1	—
Valve head radial runout	IN. & EX.	—	0.03
Valve spring free length (IN. & EX.)	INNER	—	33.0
	OUTER	—	35.2
Valve spring tension (IN. & EX.)	INNER	53.9 N (5.5 kgf) at length 26.8 mm	—
	OUTER	128.4 N (13.1 kgf) at length 29.8 mm	—

CAMSHAFT + CYLINDER HEAD

Unit: mm

ITEM	STANDARD		LIMIT
Cam height	IN.	33.90 – 34.00	33.60
	EX.	33.41 – 33.51	33.11
Rocker arm I.D.	IN. & EX.	12.000 – 12.018	—
Rocker arm shaft O.D.	IN. & EX.	11.986 – 11.994	—
Cylinder head distortion	—		0.05

CYLINDER + PISTON + PISTON RING

Unit: mm

ITEM	STANDARD			LIMIT
Compression pressure	500 – 1 600 kPa (5 – 16 kgf/cm ²)			—
Piston-to-cylinder clearance	0.04 – 0.05			0.120
Cylinder bore	57.000 – 57.015			57.090
Piston diam.	56.955 – 56.970 Measure at 8 mm from the skirt end.			56.880
Cylinder distortion	—			0.05
Piston ring free end gap	1st	1R	Approx. 5.8	4.6
	2nd	2R	Approx. 5.7	4.5
Piston ring end gap	1st		0.10 – 0.25	0.50
	2nd		0.10 – 0.25	0.50
Piston ring-to-groove clearance	1st		—	0.180
	2nd		—	0.150
Piston ring groove width	1st		1.01 – 1.03	—
	2nd		1.01 – 1.03	—
	Oil		2.01 – 2.03	—
Piston ring thickness	1st		0.97 – 0.99	—
	2nd		0.97 – 0.99	—
Piston pin bore	15.002 – 15.008			15.030
Piston pin O.D.	14.996 – 15.000			14.980

CONROD + CRANKSHAFT

Unit: mm

ITEM	STANDARD			LIMIT
Conrod small end I.D.	15.006 – 15.014			15.040
Conrod deflection	—			3.0
Conrod big end side clearance	0.10 – 0.45			1.0
Conrod big end width	15.95 – 16.00			—
Crank web to web width	52.90 – 53.10			—
Crankshaft thrust clearance	– 0.02 – 0.07			—
Crankshaft runout	—			0.08
Balancer spring free length	9.9 – 10.1			9.6

OIL PUMP

ITEM	STANDARD			LIMIT
Oil pressure (at 60 °C)	20 – 50 kPa (0.2 – 0.5 kgf/cm ²) at 3 000 r/min			—

CLUTCH

Unit: mm

ITEM	STANDARD	LIMIT
Clutch cable play	10 – 15	—
Clutch drive plate thickness	2.9 – 3.1	2.6
Clutch drive plate claw width	11.8 – 12.0	11.0
	11.9 – 12.0 (Concave parts)	11.1
Clutch driven plate distortion	—	0.10
Clutch spring free length	32.5	30.9

DRIVE TRAIN + DRIVE CHAIN

Unit: mm Except ratio

ITEM	STANDARD	LIMIT
Primary reduction ratio	3.476 (73/21)	—
Final reduction ratio	2.929 (41/14)	—
Gear ratios	Low	3.000 (33/11)
	2nd	1.750 (28/16)
	3rd	1.300 (26/20)
	4th	1.091 (24/22)
	5th	0.957 (22/23)
	Top	0.833 (20/24)
Shift fork to groove clearance	0.10 – 0.30	0.50
Shift fork groove width	No. 1 & 2	5.0 – 5.1
	No. 3	5.5 – 5.6
Shift fork thickness	No. 1 & 2	4.8 – 4.9
	No. 3	5.3 – 5.4
Countershaft length (Low to 2nd)	90.5 – 90.6	—
Drive chain	Links	124
	20-pitch length	—
Drive chain slack	10 – 20	—

CARBURETOR

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS26
Bore size	26 mm
I.D. No.	30H0
Idle r/min	1 400 ± 100 r/min
Float height	10.5 ± 0.5 mm
Main jet (M.J.)	#110
Jet needle (J.N.)	4DN22-2
Needle jet (N.J.)	E-3M
Throttle valve (Th.V.)	#110
Pilot jet (P.J.)	#15
Pilot air screw (P.A.J.)	1.4
Pilot screw (P.S.)	2 turns out
Throttle cable play	2.0 – 4.0 mm

ELECTRICAL

ITEM	SPECIFICATION		NOTE
Spark plug	Type	NGK: CPR7HSA	
	Gap	0.6 – 0.7 mm	
Spark performance	Over 8 mm at 1 atm.		
Ignition coil resistance	Primary	0.5 – 1.3 Ω	⊖ Terminal – Ground
	Secondary	8.1 – 15.4 kΩ	Plug cap – ⊖ Terminal
Stator coil resistance	0.6 – 2.0 Ω		B – Ground
Ignition coil primary peak voltage	150 V and more		⊕: Ground ⊖: W/Bl
Pickup coil resistance	180 – 280 Ω		G – Bl/Y
	∞ Ω		G – Ground
Pickup coil peak voltage	1.2 V and more		⊕: G, ⊖: Bl/W
Stator no-load voltage (When engine is cold)	30 V (AC) and more at 5 000 r/min		
Starter motor brush length	Limit	6.5 mm	
Regulated voltage	13.5 – 15.5 V at 5 000 r/min		
Starter relay resistance	3 – 6 Ω		
Stator Max. output	100 W and more at 5 000 r/min		
Throttle position sensor input voltage	4.5 – 5.5 V		
Throttle position sensor resistance	4 – 6 kΩ		
	Closed	Approx. 1.76 kΩ	
	Opened	Approx. 5.12 kΩ	
Battery	Type designation	12MX9-B	
	Capacity	12 V 32.4 kC (9 Ah)/10 HR	
	Standard electrolyte S.G	1.280 at 20 °C or 1.230 at 27 °C	
Fuse size	10 A		

WATTAGE

Unit: W

ITEM	STANDARD/SPECIFICATION	
Headlight	HI	35
	LO	35
Position light	5	
Turn signal light	10	
Brake light/Taillight	LED	
Tachometer light	LED	
Turn signal indicator light	LED	
High beam indicator light	LED	
Neutral indicator light	LED	
License light	5	

BRAKE + WHEEL

Unit: mm

ITEM	STANDARD		LIMIT
Rear brake pedal free travel	20 – 30		—
Rear brake pedal height	15		—
Brake drum I.D.	Rear	—	130.7
Brake disc thickness	Front	4.0 ± 0.2	3.5
Brake disc runout	Front	—	0.3
Master cylinder piston diam.	Front	12.000	—
Brake caliper piston diam.	Front	26.000	—
Brake fluid type	DOT 3 or DOT 4		—
Wheel rim runout	Axial	—	2.0
	Radial	—	2.0
Wheel rim size	Front	18 × 1.60	—
	Rear	18 × 2.15	—
Wheel axle runout	Front	—	0.25
	Rear	—	0.25

SUSPENSION

Unit: mm

ITEM	STANDARD		LIMIT
Front fork stroke	120		—
Front fork inner tube O.D.	31		—
Front fork spring free length	438.1		—
Front fork oil level (without spring, inner tube fully compressed)	200		—
Front fork oil type	TELESHOCAB OIL or equivalent fork oil		—
Front fork oil capacity (each leg)	145 ml		—
Rear shock absorber spring adjuster	3rd position		—
Rear wheel travel	97		—
Swingarm pivot shaft runout	—		0.3

TIRE

ITEM	STD/SPEC.		LIMIT
Cold inflation pressure	Solo riding	Front	175 kPa (1.75 kgf/cm ²)
		Rear	200 kPa (2.00 kgf/cm ²)
	Dual riding	Front	175 kPa (1.75 kgf/cm ²)
		Rear	225 kPa (2.25 kgf/cm ²)
Tire size	Front	2.75 – 18 42P	—
	Rear	100/90 – 18 M/C 56P	—
Tire type	Front	MRF: NYLOGRIP ZAPPER – FS	—
	Rear	MRF: NYLOGRIP ZAPPER – Y	—
Tire tread depth	Front	—	1.6 mm
	Rear	—	1.6 mm

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 91 octane or higher. An unleaded gasoline type is recommended.		
Fuel tank capacity	including reserve	15.5 L	
	reserve	3.1 L	
Engine oil type	SAE 20W-40, API SF/SG or SH/SJ with JASO MA		
Engine oil capacity	Change	1 000 ml	
	Filter change	1 100 ml	
	Overhaul	1 400 ml	