SUZUKI

VL125

SERVICE MANUAL

99500-31150-01E

FOREWORD

This manual contains an introductory description on the SUZUKI VL125 and procedures for its inspection/service and overhaul of its main components. Other information considered as generally known is not included.
Read the GENERAL INFORMATION section to familiarize yourself with the motorcycle and its maintenance. Use this section as well as other sections to use as a guide for proper inspection and service. This manual will help you know the motorcycle better so that you can assure your customers of fast and reliable service.

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

⚠ WARNING

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

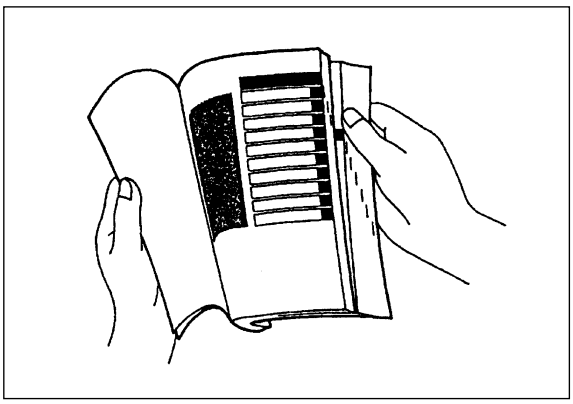
SUZUKI MOTOR CORPORATION
Motorcycle Service Department

GROUP INDEX

HOW TO USE THIS MANUAL

TO LOCATE WHAT YOU ARE LOOKING FOR:

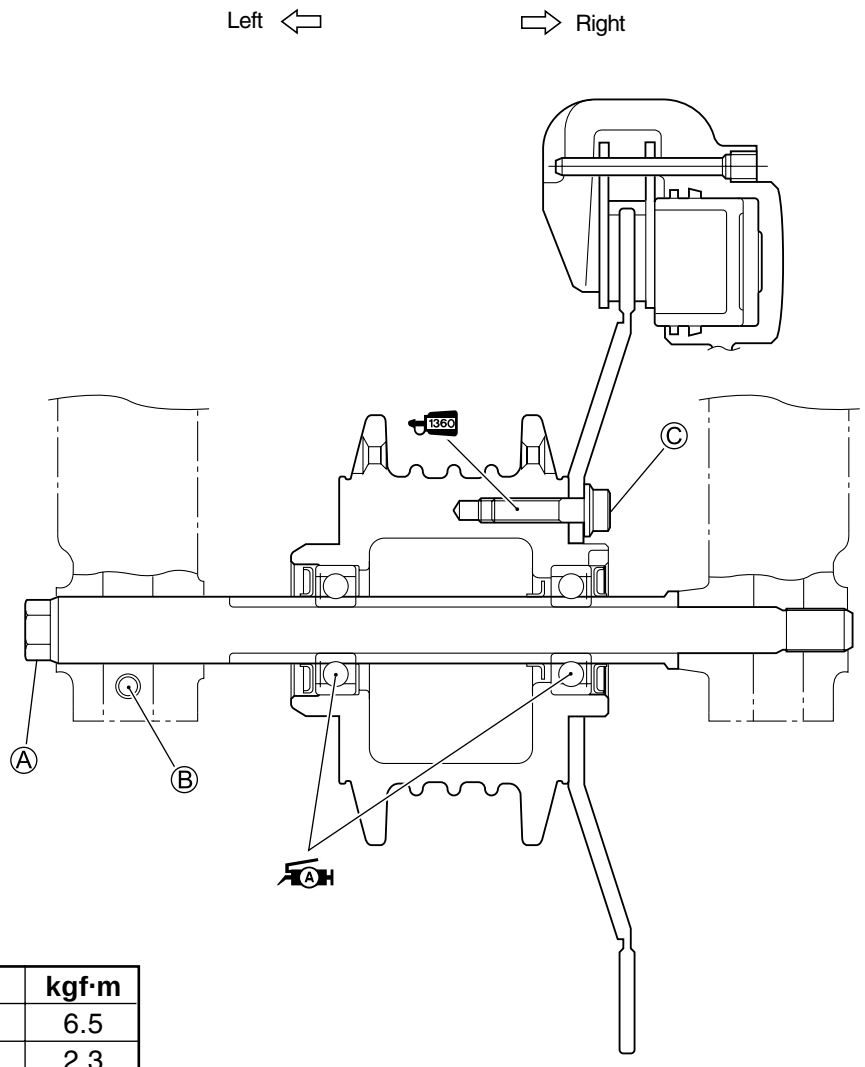
1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help find the item and page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



COMPONENT PARTS AND WORK TO BE DONE

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

Example: Front wheel

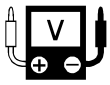
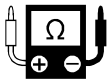
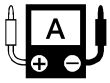
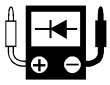
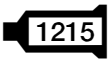
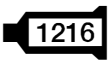


ITEM	N·m	kgf·m
Ⓐ	65	6.5
Ⓑ	23	2.3
Ⓒ	23	2.3

Ⓐ Front axle
Ⓑ Axle pinch bolt
Ⓒ Brake disc bolt

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.		Apply THREAD LOCK SUPER “1360”. 99000-32130
	Apply oil. Use engine oil unless otherwise specified.		Apply or use brake fluid.
	Apply *Molybdenum oil solution (Mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1:1)		Measure in voltage range.
	Apply SUZUKI SUPER GREASE “A”. 99000-25010		Measure in resistance range.
	Apply SUZUKI SILICONE GREASE. 99000-25100		Measure in current range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in diode test range.
	Apply THERMO GREASE “G”. 99000-25300		Measure in continuity test range.
	Apply SUZUKI BOND “1215”. 99000-31110		Use special tool.
	Apply SUZUKI BOND “1216”. 99000-31160		Use fork oil. 99000-99044-10G
	Apply THREAD LOCK SUPER “1303”. 99000-32030		Indication of service data.
	Apply THREAD LOCK “1342”. 99000-32050		

* How to make Molybdenum oil : Pour an engine oil and SUZUKI MOLY PASTE in a ratio of 1:1 by volume into such as oiler, and stir well.

GENERAL INFORMATION

1

CONTENTS

WARNING/CAUTION/NOTE

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

⚠ WARNING

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

⚠ CAUTION

Indicates a potential hazard that could result in motorcycle damage.

NOTE:
Indicates special information to make maintenance easier or instructions clearer.

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

GENERAL PRECAUTIONS

⚠ WARNING

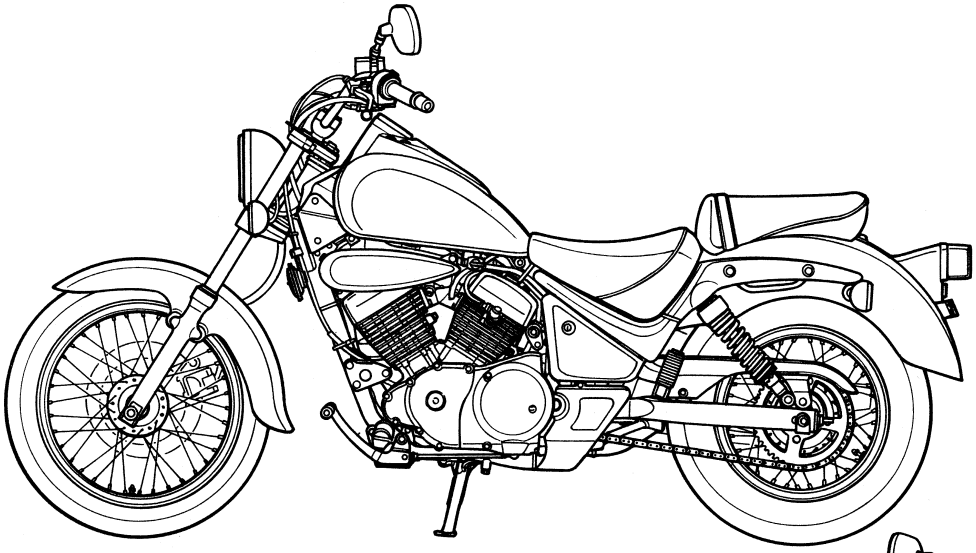
- **Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the motorcycle.**
- **When 2 or more persons work together, pay attention to the safety of each other.**
- **When it is necessary to run the engine indoors, make sure that exhaust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

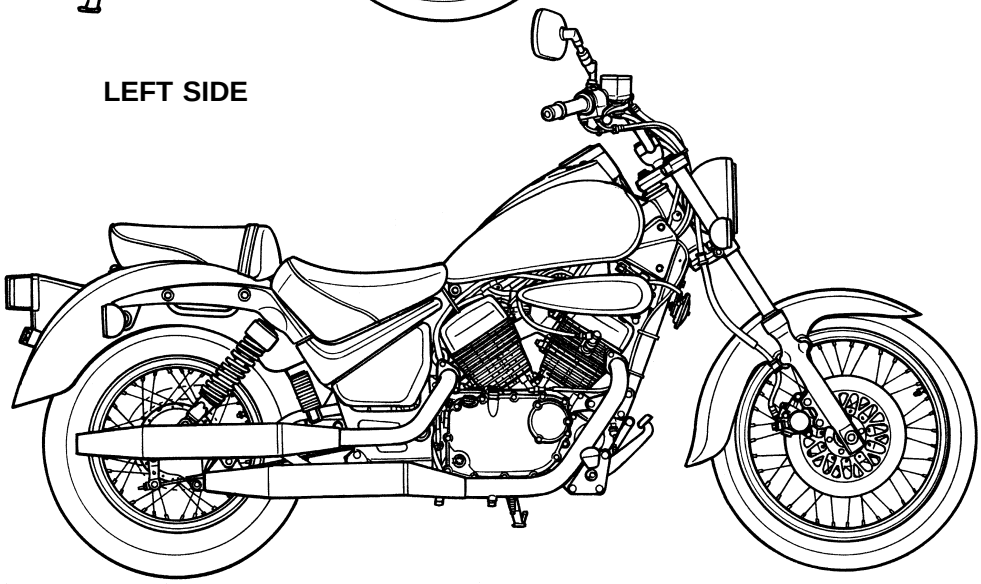
* **If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.**
* **When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.**
* **Be sure to use special tools when 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 not require use of battery power, disconnect the negative cable the battery.**
* **When tightening the cylinder head and case bolts and nuts, tighten the larger sizes first. Always tighten the bolts and nuts diagonally from the inside working out 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, engine coolant and other fluids: batteries, and tires.**
* **To protect Earth's natural resources, properly dispose of used motorcycle and parts.**

SUZUKI VL125Y (2000-MODEL)



LEFT SIDE

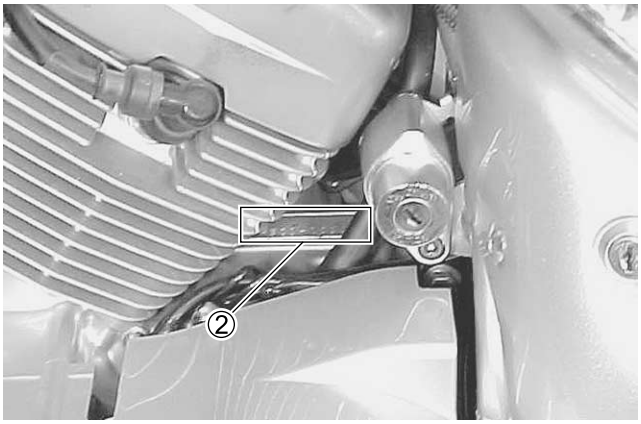


RIGHT SIDE

*Difference between photograph and actual motorcycle depends on the markets.

SERIAL NUMBER LOCATION

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



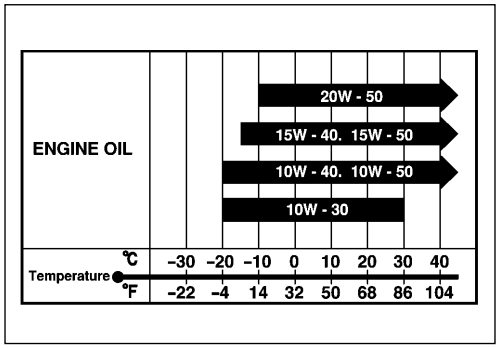
FUEL AND OIL RECOMMENDATION

FUEL

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

ENGINE OIL

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



BRAKE FLUID

Specification and classification: DOT 4

⚠ WARNING

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

FRONT FORK OIL

Use fork oil #10.

BREAK-IN PROCEDURES

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

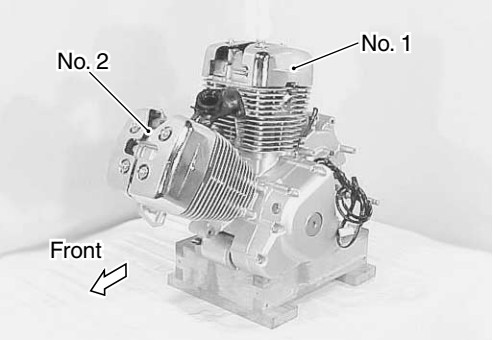
- Keep to these break-in procedures:

Initial 800 km : Less than 1/2 throttle
Up to 1 600 km : Less than 3/4 throttle

- Upon reaching an odometer reading of 1 600 km you can subject the motorcycle to full throttle operation.
- Do not maintain constant engine speed for an extended time period during any portion of the break-in. Try to vary the throttle position.

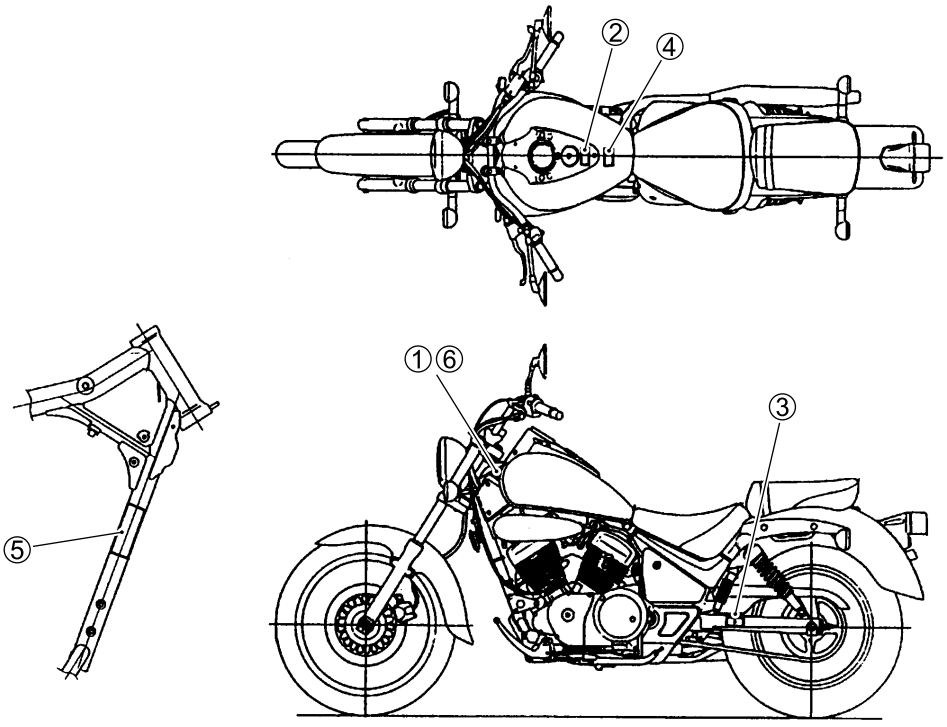
CYLINDER IDENTIFICATION

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



INFORMATION LABELS

①	Noise label	For E-34
②	Fuel caution label	For E-02
③	Tire pressure label	
④	Warning safety label	
⑤	ID plate	
⑥	ID plate	For E-18



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 240 mm
Overall width	880 mm
Overall height	1 110 mm
Wheelbase	1 520 mm
Ground clearance	150 mm
Seat height	685 mm
Dry mass	140 kg

ENGINE

Type	Four-stroke, air-cooled, OHC, pent-roof, 65°V twin
Number of cylinders	2
Bore	44.0 mm
Stroke	40.9 mm
Displacement	124 cm^3
Compression ratio	10.3 : 1
Carburetor	MIKUNI BDS26, single
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch		Wet multi-plate type
Transmission		5-speed constant mesh
Gearshift pattern		1-down, 4-up
Primary reduction ratio		3.173 (73/23)
Secondary reduction ratio		4.000 (56/14)
Gear ratios,	Low	2.636 (29/11)
	2nd	1.647 (28/17)
	3rd	1.217 (28/23)
	4th	0.952 (20/21)
	Top	0.818 (18/22)
Drive chain		RK428H0, 142 links

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	10° B.T.D.C. at 1 400 r/min
Spark plug	NGK CR8E or DENSO U24ESR-N
Battery	12 V 21.6 kC (6 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	20 A
Headlight	12 V 60/55 W
Position light	12 V 4 W
Brake light/Taillight	12 V 21/5 W
Turn signal light	12 V 21 W
Speedometer light	12 V 1.7 W
Neutral indicator light	12 V 1.7W
Turn signal indicator light	12 V 1.7 W × 2
High beam indicator light	12 V 1.7 W

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped, spring pre-load 5-way adjustable
Front fork stroke	120 mm
Rear wheel travel	90 mm
Steering angle	40° (right and left)
Caster	31° 42’
Trail	120 mm
Turning radius	2.72 m
Front brake	Disc brake
Rear brake	Drum brake
Front tire size	90/90-18 51P
Rear tire size	130/90-15M/C 66P

CAPACITIES

Fuel tank, including reserve	12.0 L
reserve	3.0 L
Engine oil, oil change	1 800 ml
with filter change	1 900 ml
overhaul	2 100 ml
Front fork oil (each leg)	406 ml

Specifications are subject to change without notice.

COUNTRY AND AREA CODES

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

CODE	COUNTRY or AREA
E-02	U.K.
E-04	France
E-17	Sweden, Finland (E-15), Norway (E-16), Denmark (E-26)
E-22	Germany
E-34	Italy, Belgium (E-21), Spain (E-53)
E-18	Switzerland, Austria (E-39)

PERIODIC MAINTENANCE

2

CONTENTS

PERIODIC MAINTENANCE SCHEDULE

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

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

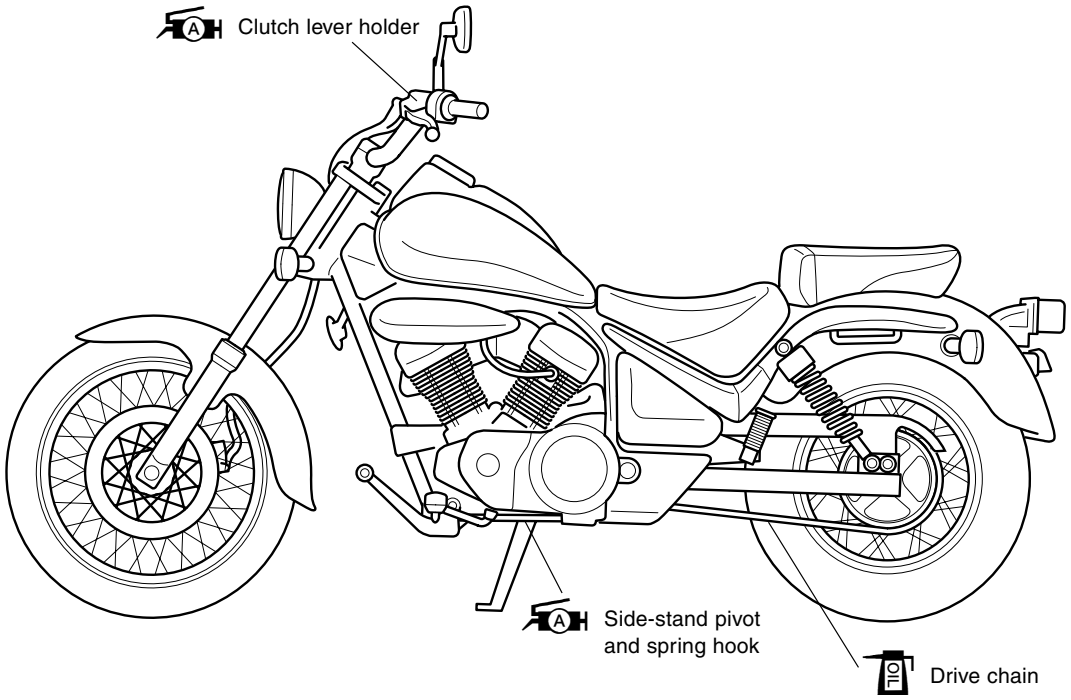
PERIODIC MAINTENANCE CHART

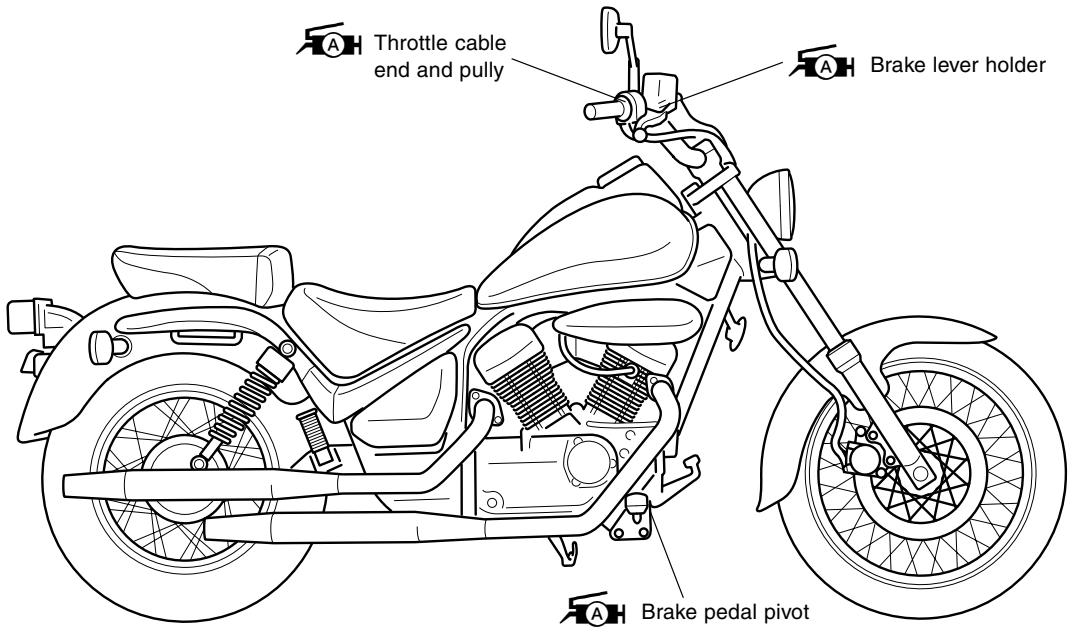
Interval / Item	km / months	1 000 / 5	4 000 / 20	8 000 / 40
Valve clearance		I	I	I
Spark plug		–	C	R
Exhaust pipe bolts and muffler bolts		T	T	T
Air cleaner element		–	C	C
Idle rpm (Carburetor)		I	I	I
Throttle cable		I	I	I
Fuel hose		–	I	I
		Replace every 4 years.		
Clutch		I	I	I
Engine oil		R	R	R
Engine oil filter		R	–	R
Drive chain		I	I	I
		Clean and lubricate every 1 000 km.		
Brake		I	I	I
Brake hose		I	I	I
		Replace every 4 years.		
Brake fluid		I	I	I
		Replace every 2 years.		
Steering		I	I	I
Front forks		–	I	I
Rear suspension		–	I	I
Tires		I	I	I
Chassis bolts and nuts		T	T	T

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

LUBRICATION POINTS

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





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 of the Periodic Maintenance requirements.

VALVE CLEARANCE

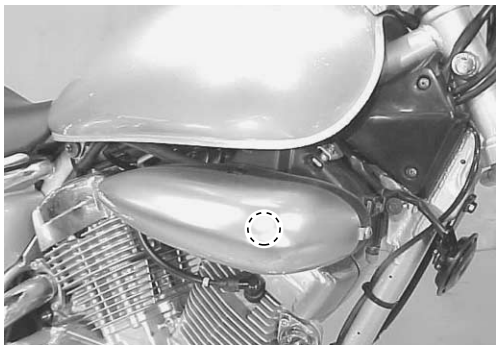
Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months).

INSPECTION

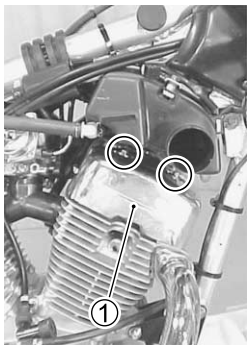
NOTE:
The clearance specification is for COLD state.

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

- Remove the spark plugs. (☞ 2-6)
- Remove the right air cleaner box.
- Remove the fuel tank. (☞ 4-3)

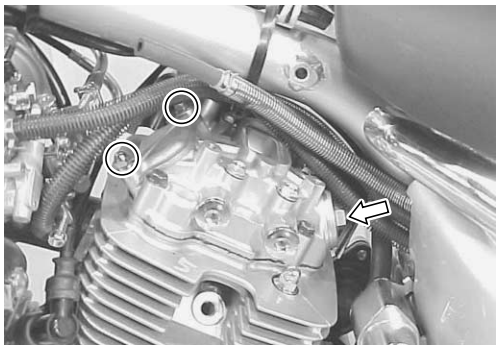


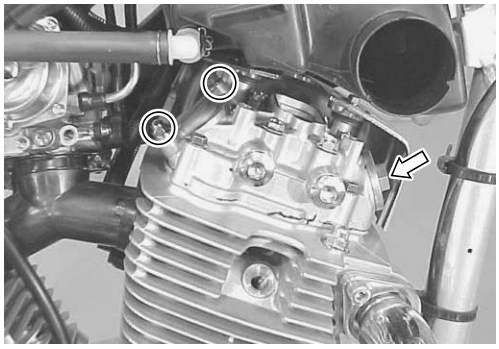
- Remove the cylinder head cover caps ① and ②.



- Remove the valve inspection caps.

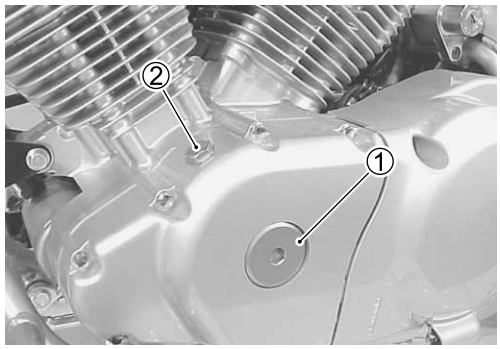
Valve inspection cap bolt and nut (intake): 10 N·m (1.0 kgf·m)
Valve inspection cap (exhaust): 18 N·m (1.8 kgf·m)





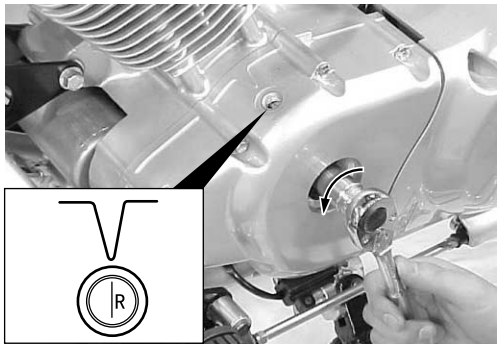
- Remove the generator cover plug ① and the timing inspection plug ②.

Generator cover plug: 15 N·m (1.5 kgf·m)
Timing inspection plug: 21 N·m (2.1 kgf·m)



NOTE:
To turn the crankshaft for clearance checking, and rotate in the normal running direction. The spark plug should be removed.

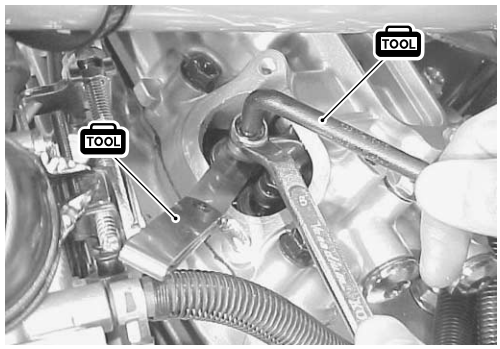
- Rotate the generator rotor to set the No.1 cylinder's piston at TDC of the compression stroke. (Rotate the rotor until the "|R" line on the rotor is aligned with the center of hole on the generator cover.)



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

DATA **Valve clearance (when cold):**
IN. : 0.10 – 0.15 mm
EX.: 0.18 – 0.23 mm

TOOL **09900-20806: Thickness gauge**



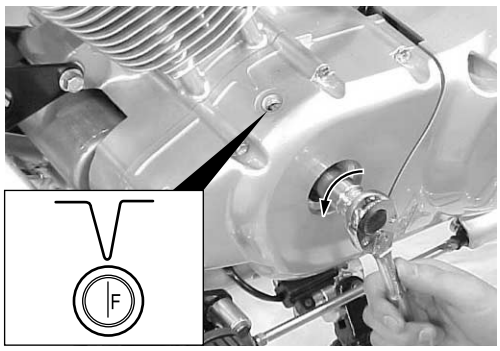
- If the clearance is out of the specification, bring it into the specified range by using the special tool.

TOOL **09917-10410: Valve adjust driver**

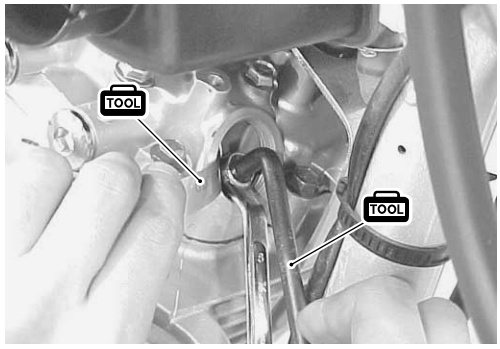
⚠ CAUTION

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

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



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



SPARK PLUG

Clean every 4 000 km (20 months) and replace every 8 000 km (40 months).

REMOVAL

- Disconnect the spark plug caps.
- Remove the spark plugs.

TOOL 09930-10121: Spark plug socket wrench set

	Standard	Cold type	Hot type
NGK	CR8E	CR9E	CR7E
DENSO	U24ESR-N	U27ESR-N	U22ESR-N

CARBON DEPOSIT

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

SPARK PLUG GAP

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

DATA Standard: Spark plug gap: 0.7– 0.8 mm

TOOL 09900-20803: Thickness gauge

ELECTRODE'S CONDITION

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

⚠ CAUTION

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

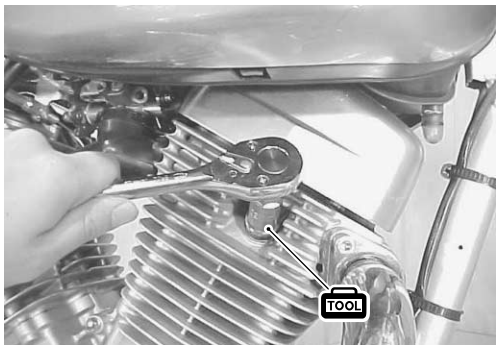
INSTALLATION

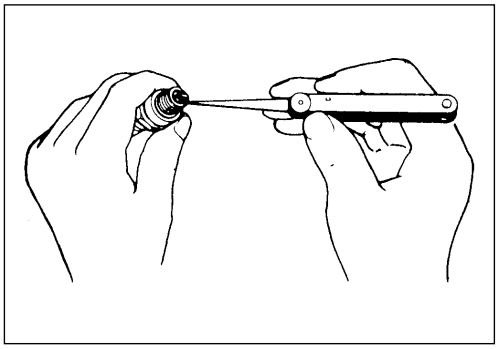
⚠ CAUTION

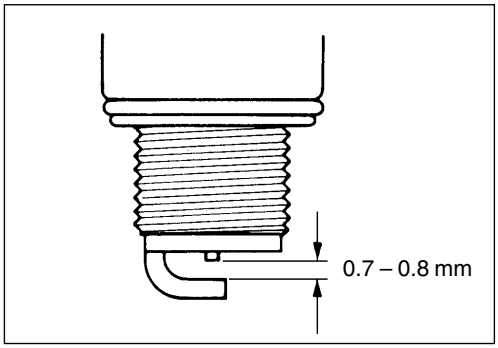
Before using a spark plug wrench, carefully turn the spark plug by finger into the threads of the cylinder head to prevent damage the aluminum threads.

- Install the spark plug to the cylinder head by finger tight, and then tighten it to the specified torque.

Spark plug: 11 N·m (1.1 kgf·m)







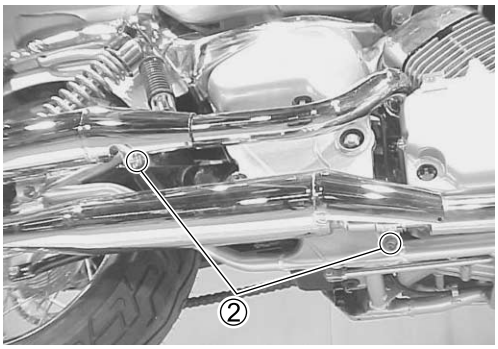
EXHAUST PIPE BOLT AND MUFFLER BOLT

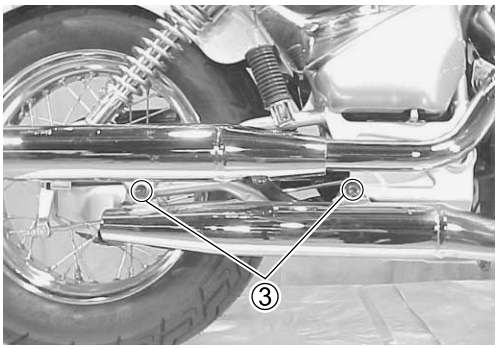
Tighten initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.

- Tighten the exhaust pipe bolts ①, muffler connecting bolts ② and muffler mounting bolts ③ to the specified torque with a torque wrench.

Exhaust pipe bolt & Muffler mounting bolt: 23 N·m (2.3 kgf·m)

Muffler connecting bolt: 23 N·m (2.3 kgf·m)



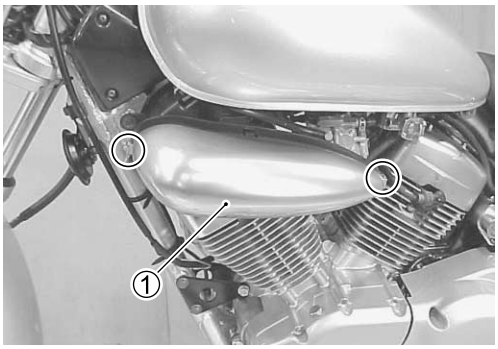


AIR CLEANER

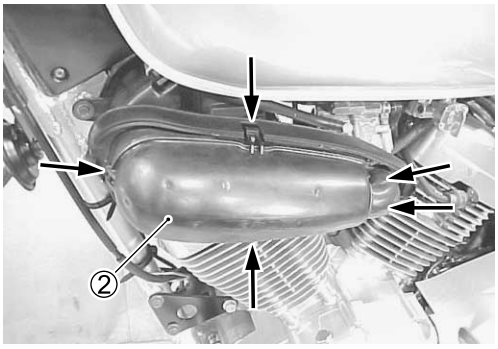
Clean every 3 000 km.

REMOVAL

- Remove the air cleaner box cover ①.



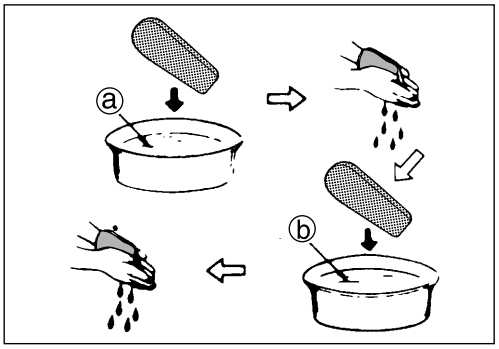
- With the hooks removed, remove the air cleaner cap ②.



- Remove the left air cleaner element ③.

CLEANING

- Fill a washing pan of a proper size with a non-flammable cleaning solvent. Immerse the element in the cleaning solvent and wash it.
- Gently squeeze the element to remove the excess solvent: do not twist or wring the element or it will develop tears.
- Immerse the element in motor oil and squeeze out the excess oil. The element should be wet but not dripping.



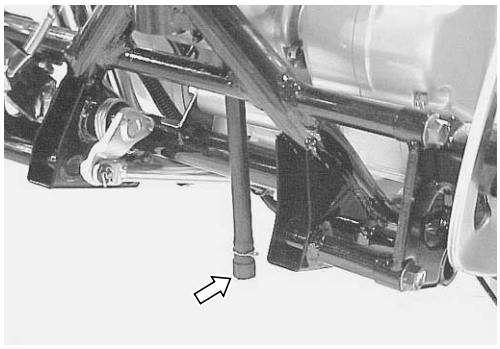
ⓐ Non-flammable cleaning solvent
ⓑ Motor oil SAE #30 or SAE 10W/40

- Reinstall the cleaned or new air cleaner element in the reverse order of removal.

⚠ CAUTION

*** Inspect the air cleaner element for tears. A torn element must be replaced.**
*** If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a torn element. Make sure that the air cleaner is in good condition at all times. Life of the engine depends largely on this component!**

NOTE:
When cleaning the air cleaner element, drain water from the air cleaner box by removing the drain plug.



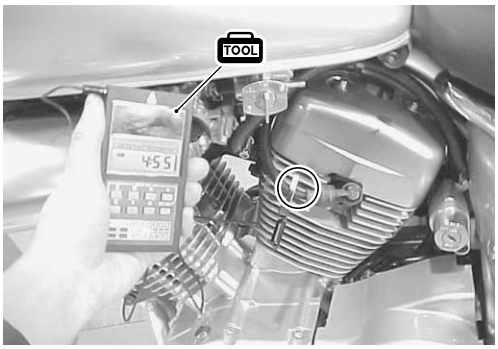
CARBURETOR

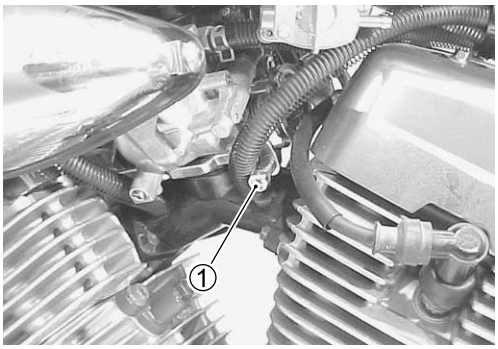
IDLE RPM (Idling adjustment)

Inspect initially at 1 000 km (5 month) and every 4 000 km (20 months) thereafter.

NOTE:
Make this adjustment when the engine is hot.

- Connect an electric tachometer to the high-tension cord.
- Start up the engine and set its speed at anywhere between 1 500 and 1 700 r/min by turning throttle stop screw ①.





DATA Engine idle speed:
1 400 ± 50 r/min ... For E-18
1 400 ± 100 r/min ... For the others

TOOL 09900-26006: Tachometer

THROTTLE CABLE PLAY

Inspect initially at 1 000 km (5 month) and every 4 000 km (20 months) thereafter.

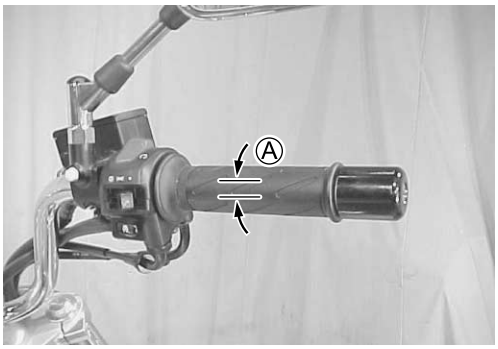
Adjust the throttle cable play Ⓐ as follows:

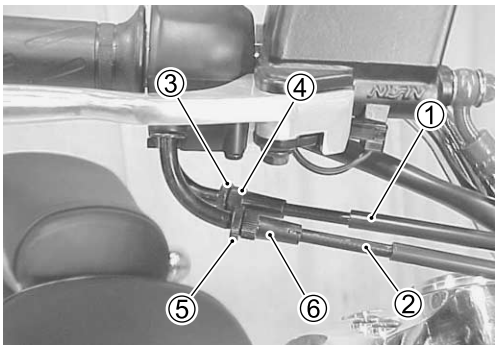
MINOR ADJUSTMENT

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

2nd step:
- Loosen the lock nut ⑤ of the throttle pulling cable ②.
- Turn the adjuster ⑥ in or out until the throttle cable play should be 2.0 – 4.0 mm at the throttle grip.
- Tighten the lock nut ⑤ while holding the adjuster ⑥.

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





DATA Throttle cable play Ⓐ: 2.0 – 4.0 mm

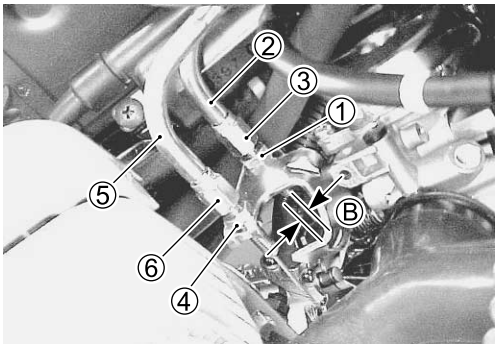
⚠ WARNING

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

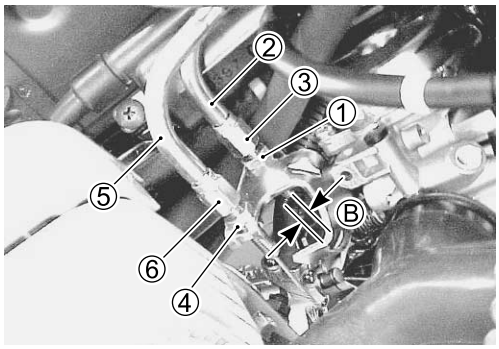
MAJOR ADJUSTMENT

- Loosen the lock nuts ① of the throttle returning cable ②.
- Turn the returning cable adjuster ③ to obtain proper cable play.

– Continued on next page –



- Loosen the lock nuts ④ of the throttle pulling cable ⑤.
- Turn the pulling cable adjuster ⑥ in or out until the throttle cable play should be 2.0 – 4.0 mm at the throttle grip.
- Tighten the lock nuts ④ securely while holding the adjuster ⑥.
- While holding the throttle grip at the fully closed position, slowly turn the returning cable adjuster ③ to obtain a cable slack Ⓑ of 1.0 mm.
- Tighten the lock nuts ① securely.

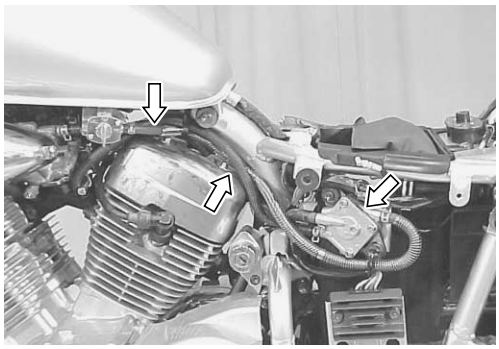


FUEL HOSE

Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months).
Replace every 4 years.

- Remove the left frame cover. (☞6-2)

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



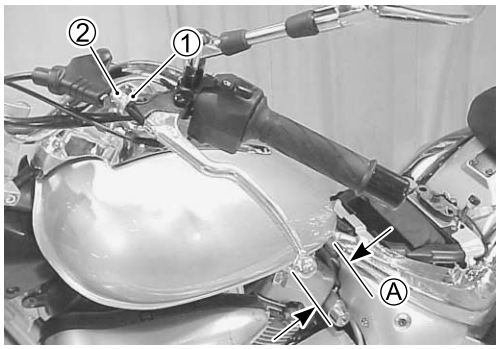
FUEL FILTER

Visually check the fuel filter. If accumulation of sediment or clogging is found, replace the fuel filter with a new one. (☞4-3)

CLUTCH

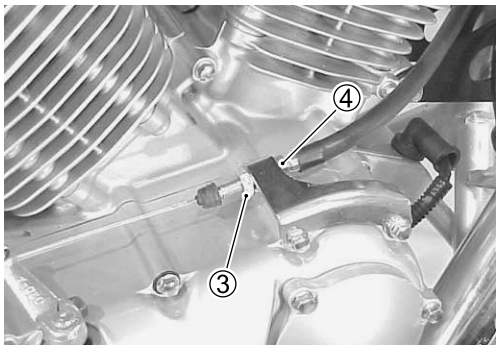
Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.

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



DATA Clutch lever play Ⓐ: 10 – 15 mm

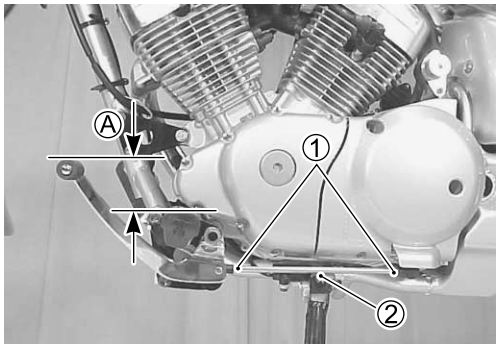
- Tighten the lock nuts ① and ③.



GEARSHIFT LEVER HEIGHT ADJUSTMENT

- Loosen the lock nuts ①.
- With the link rod ② turned, adjust the gearshift lever height Ⓐ.

DATA Gearshift lever height: 65 – 75 mm



ENGINE OIL AND OIL FILTER

(ENGINE OIL)
Replace initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.

(OIL FILTER)
Replace initially at 1 000 km (5 months) and every 8 000 km (40 months) thereafter.

DATA **NECESSARY AMOUNT OF ENGINE OIL**

Oil change	**: 1 800 ml**
Filter change	**: 1 900 ml**
Overhaul engine	**: 2 100 ml**

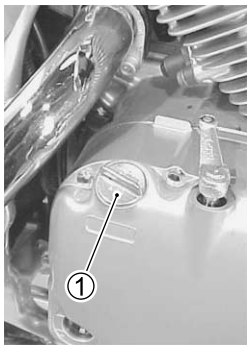
Engine oil type: SAE 10W/40, API SF or SG

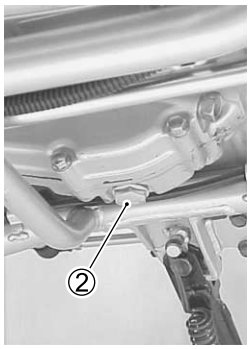
Oil should be changed while the engine is warm. Oil filter replacement at the above intervals, should be done together with the engine oil change.

ENGINE OIL REPLACEMENT

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain the oil by removing the filler cap ① and drain plug ②.
- Tighten the drain plug ② to the specified torque, and pour fresh oil through the oil filler. Use an API classification of SF or SG oil with SAE 10W/40 viscosity.

Oil drain plug: 23 N·m (2.3 kgf·m)

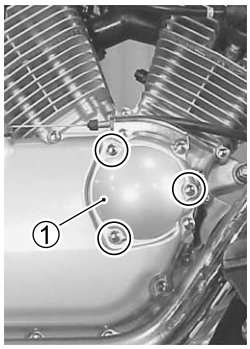


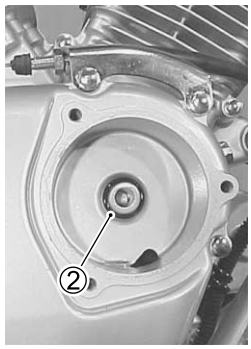


- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about three minutes, then check the oil level through the inspection window. If the level is below mark “L”, add oil to “F” level. If the level is above mark “F”, drain oil to “F” level.

OIL FILTER REPLACEMENT

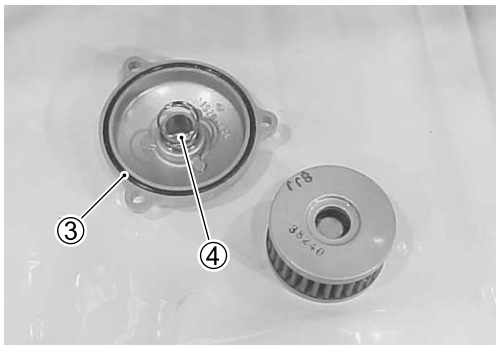
- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil filter cap ①.
- Remove the oil filter.
- Install the new O-ring ②.





- Install the new oil filter.
- Install the new O-ring ③ and spring ④ to the oil filter cap.
- Install the oil filter cap.

NOTE:
Before installing the oil filter cap, apply engine oil lightly to the new O-ring ③.



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

⚠ CAUTION

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

DRIVE CHAIN

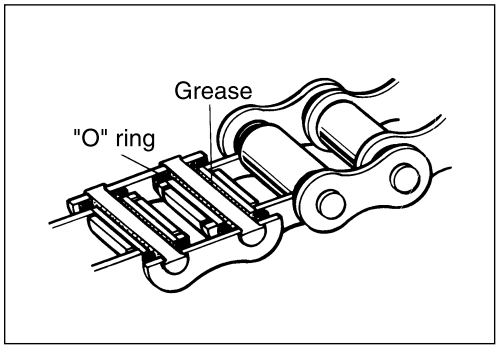
Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.
Clean and lubricate every 1 000 km.

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

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

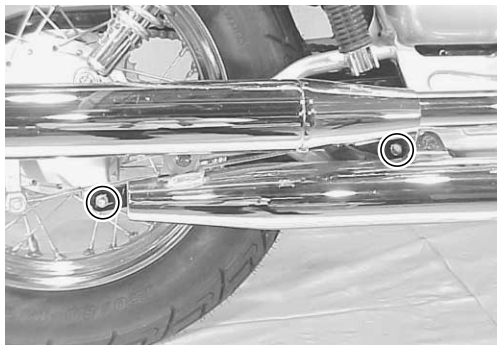
If any defects are found, the drive chain must be replaced.

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

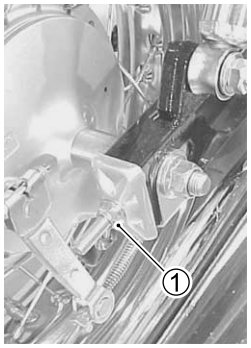


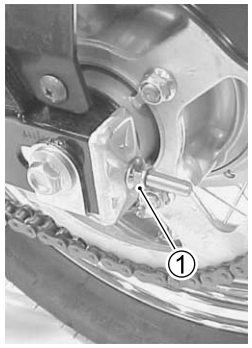
CHECKING

- Loosen the axle nut.
- Loosen the front and rear torque link nuts.



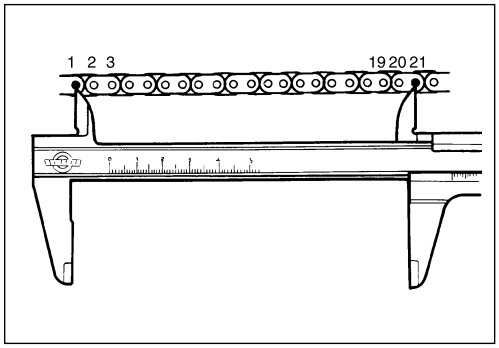
- Tense the drive chain fully by turning both chain adjusters ①.





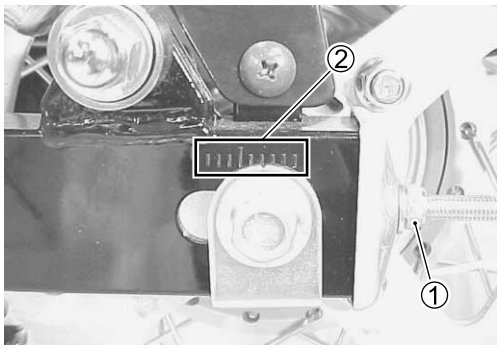
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.

DATA **Drive chain 20-pitch length:**
Service limit: 269.2 mm



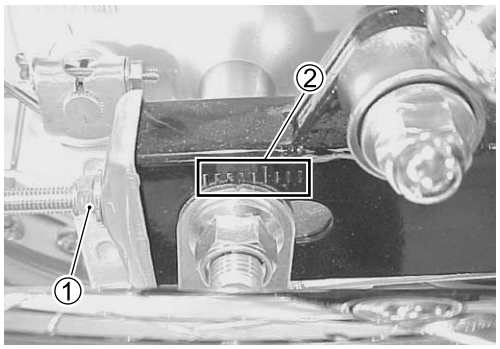
ADJUSTING

- Loosen or tighten both chain adjusters ① until the chain has 20 – 30 mm of slack in the middle between the engine and rear sprockets. The marks ② on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.



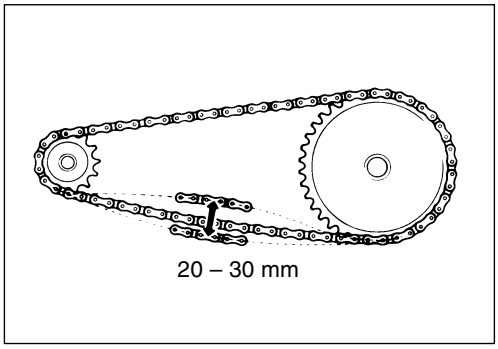
DATA Drive chain slack: Standard: 20 – 30 mm

- Place the motorcycle on its side-stand for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut and the torque link nuts to the specified torque.
- Tighten both chain adjusters ① securely.



Rear axle nut: 65 N·m (6.5 kgf·m)
Torque link nut (Front) : 13 N·m (1.3 kgf·m)
Torque link nut (Rear) : 13 N·m (1.3 kgf·m)

- Recheck the drive chain slack after tightening the axle nut.

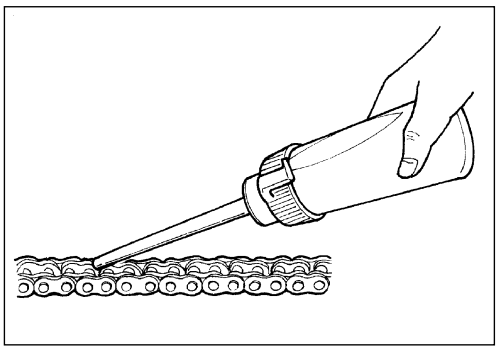


CLEANING AND LUBRICATING

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

⚠ CAUTION

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



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

⚠ CAUTION

*** Do not use any oil sold commercially as "drive chain oil". Such oil can damage the "O"-rings (or seals).**
*** The standard drive chain is a RK428 H0 Suzuki recommends that this standard drive chain should be used for the replacement.**

BRAKE SYSTEM

(BRAKE)
Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.

(BRAKE HOSE AND BRAKE FLUID)
Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months). Replace hoses every 4 years.
Replace fluid every 2 years.

BRAKE FLUID LEVEL CHECK

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

Specification and Classification: DOT 4

⚠ WARNING

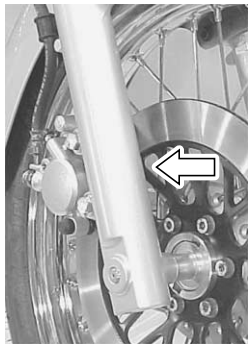
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based or petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period.

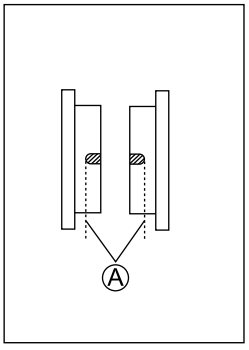
⚠ WARNING

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

BRAKE PAD WEAR

The extent of brake pad wear can be checked by observing the grooved limit Ⓐ on the pad. When the wear exceeds the grooved limit, replace the pads with new ones.





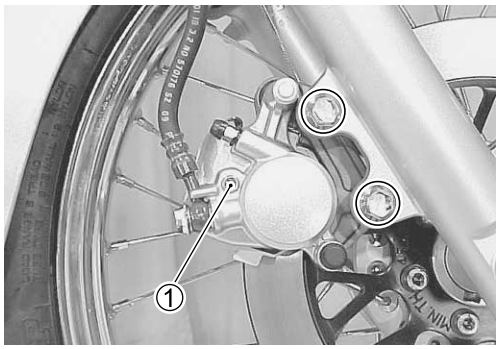
⚠ CAUTION

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

FRONT BRAKE PAD REPLACEMENT

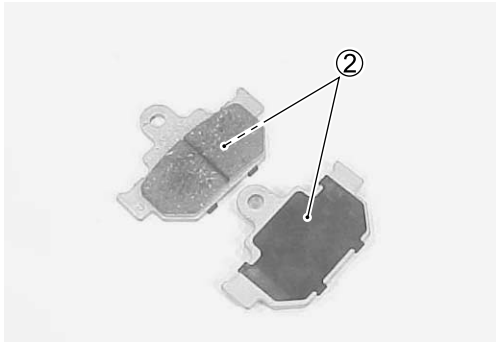
- Remove the brake caliper and brake pad pin ①.
- Remove the brake pads.
- To reassemble, reverse the above sequence.

Brake caliper mounting bolt: 39 N·m (3.9 kgf·m)
Brake pad pin: 18 N·m (1.8 kgf·m)



⚠ CAUTION

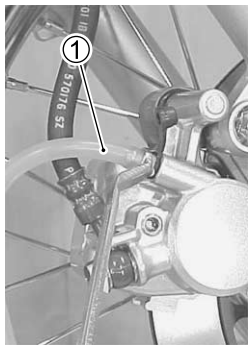
Be sure to install the shims ② properly as shown in the photograph.



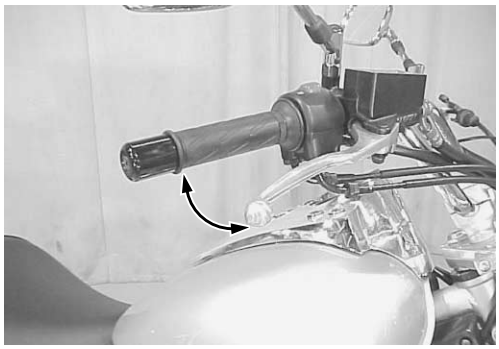
FRONT BRAKE FLUID REPLACEMENT

- 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 4

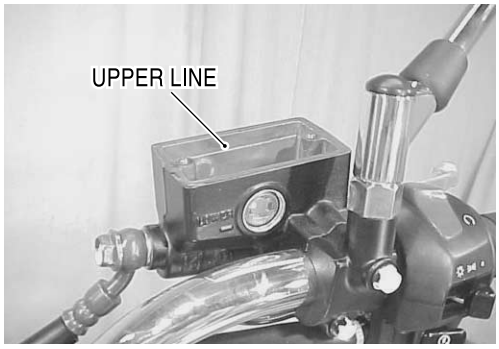


- Connect a clear hose ① to the air bleeder valve and insert the other end of the hose into a receptacle.
- Loosen the air bleeder valve and pump the brake lever until the old brake fluid is completely out of the brake system.



- Close the air bleeder valve and disconnect the clear hose. Fill the reservoir with new brake fluid to the upper line.

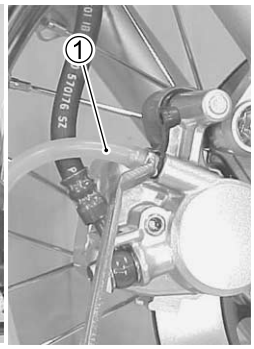
Air bleeder valve: 7.5 N·m (0.75 kgf·m)



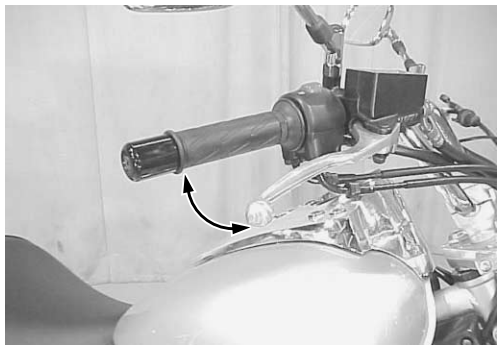
AIR BLEEDING THE BRAKE FLUID CIRCUIT

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

- Fill the master cylinder reservoir to top of the inspection window. Replace the reservoir cap to prevent dirt from entering.
- Attach a hose to the air bleeder valve, and insert the free end of the hose into a receptacle.
- Bleed air from the brake system.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle, this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the air bleeder valve, pump and squeeze the brake lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.

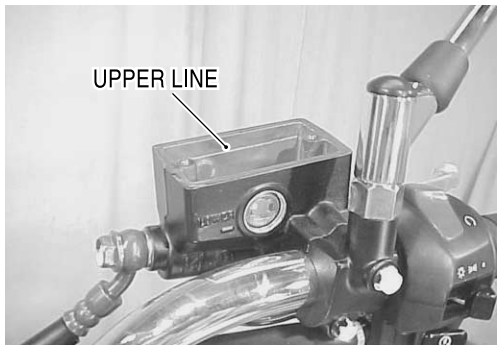


NOTE:
While bleeding the brake system, replenish the brake fluid in the reservoir as necessary. Make sure that there is always some fluid visible in the reservoir.



- Close the air bleeder valve, and disconnect the hose. Fill the reservoir with brake fluid to the upper line.

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



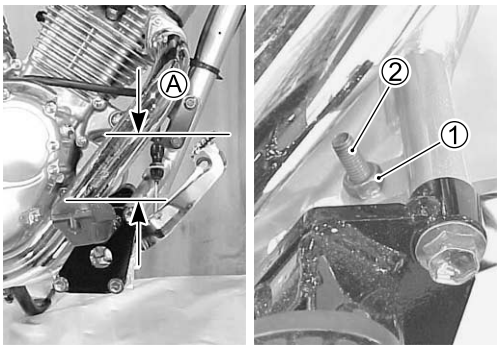
⚠ CAUTION

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

REAR BRAKE PEDAL HEIGHT

- Loosen the lock nut ①.
- Adjust the brake pedal height Ⓐ by turning the adjuster ②.

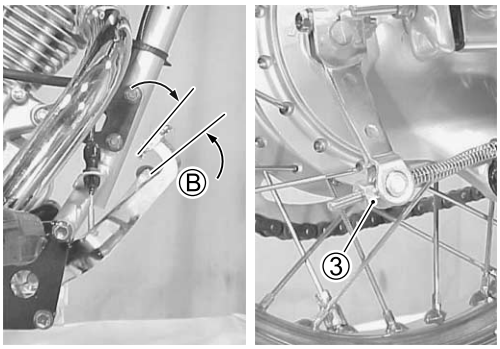
DATA Rear brake pedal height Ⓐ: 50 – 60 mm



REAR BRAKE ADJUSTING

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

DATA Rear brake pedal free travel Ⓑ: 20 – 30 mm

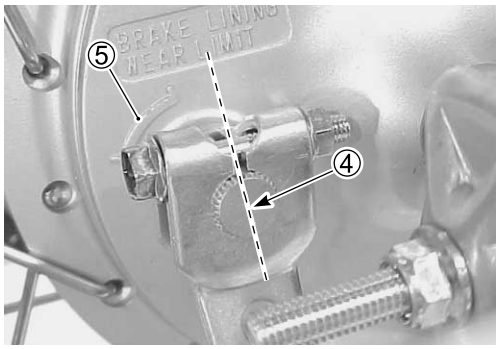


REAR BRAKE SHOE WEAR

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

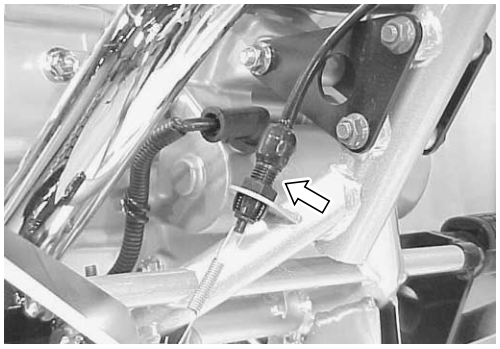
To check brake lining wear, perform the following steps.

- Make sure that the rear brake is properly adjusted.
- Depress the rear brake pedal. Make sure that the index mark ④ is within the range ⑤ 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. (☞5-42)



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.



STEERING

Inspect initially at 1 000 km (5 months) and every 8 000 km (40 months) thereafter.

Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the steering stem while grasping the lower fork tubes by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, and pull forward. If play is found, perform steering bearing adjustment as described in page 5-33 of this manual.

FRONT FORK

Inspect every 4 000 km (20 months).

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (☞5-22)

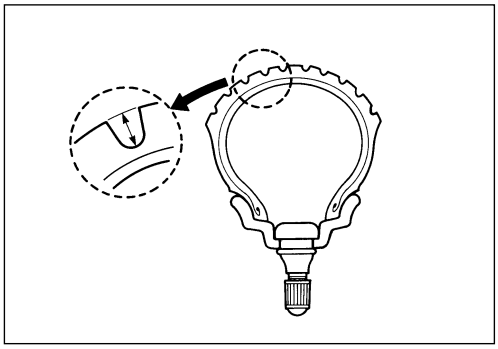
REAR SUSPENSION

Inspect every 4 000 km (20 months).

Inspect the rear shock absorber for oil leakage and mounting rubbers including engine mounting for wear and damage. Replace any defective parts, if necessary. (☞5-45)

TIRE

Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months).



TIRE TREAD CONDITION

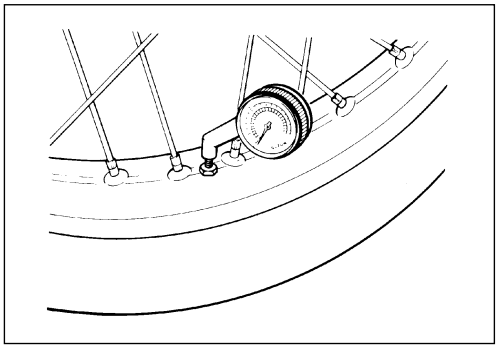
Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

TOOL 09900-20805: 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 higt or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result. Cold inflation tire pressure is as follows.



COLD INFLATION TIRE PRESSURE	SOLD RIDING			DUAL RIDING		
	kPa	kgf/cm²	psi	kPa	kgf/cm²	psi
FRONT	175	1.75	25	175	1.75	25
REAR	200	2.00	29	225	2.25	33

⚠ CAUTION

The standard tire fitted on this motorcycle is 90/90–18 51P for front and 130/90–15M/C 66P for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

TIRE TYPE
Front: IRC GS-21F
Rear: IRC NR31

CHASSIS BOLTS AND NUTS

Tighten initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.

Check that all chassis bolts and nuts are tightened to their specified torque. (☞7-26)

COMPRESSION PRESSURE CHECK

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

COMPRESSION PRESSURE SPECIFICATION

Standard
1 100 – 1 500 kPa (11 – 15 kgf/cm^2) (at about 600 rpm)

Low compression pressure can indicate any of the following conditions:

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

COMPRESSION TEST PROCEDURE

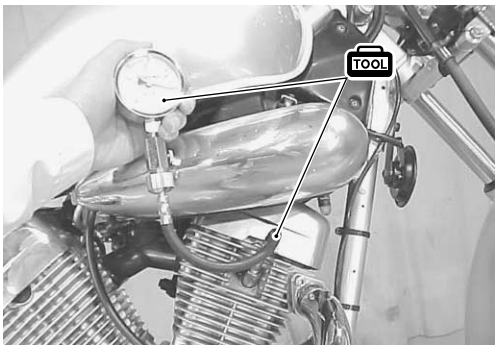
NOTE:

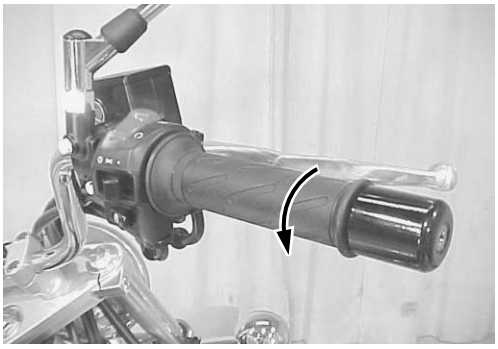
* *Before testing the engine for compression pressure, make sure that the cylinder head bolts are tightened to the specified torque values and valves are properly adjusted.*
* *Have the engine warmed up by idling before testing.*
* *Be sure that the battery used is in fully-charged condition.*

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

- Remove all the spark plugs.
- Fit the compression gauge in one of the plug hole, while taking care that the connection tight.
- Keep the throttle grip in full-open position.
- While cranking the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.

TOOL 09915-64510: Compression gauge
09915-63310: Adaptor





OIL PRESSURE CHECK

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

OIL PRESSURE SPECIFICATION

35 – 60 kPa (0.35 – 0.60 kgf/cm^2) at 3 000 r/min., Oil temp. at 60°C (140°F)

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

LOW OIL PRESSURE

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

HIGH OIL PRESSURE

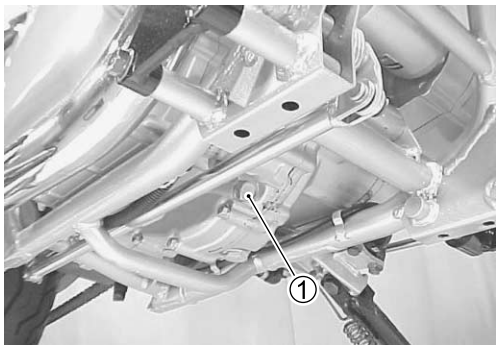
* Engine oil viscosity is too high
* Clogged oil passage
* Combination of the above items

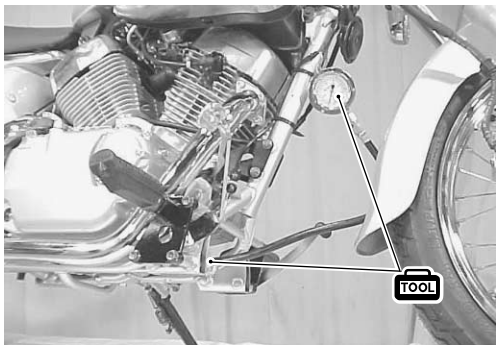
OIL PRESSURE TEST PROCEDURE

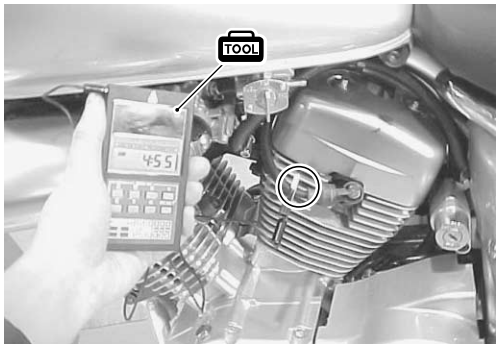
Check the oil pressure in the following manner.

- Remove the main gallery plug ①.
- Install the oil pressure gauge with adaptor in the position shown in the figure.
- Connect an electric tachometer.
- Warm up the engine as follows:
  Summer 10 min. at 2 000 r/min.
  Winter 20 min. at 2 000 r/min.
- After warming up, increase the engine speed to 3 000 r/min. (with the electric tachometer), and read the oil pressure gauge.

TOOL **09915-74510: Oil pressure gauge**
09915-74560: Adaptor
09900-26006: Tachometer







ENGINE

CONTENTS

3

⚠ CAUTION

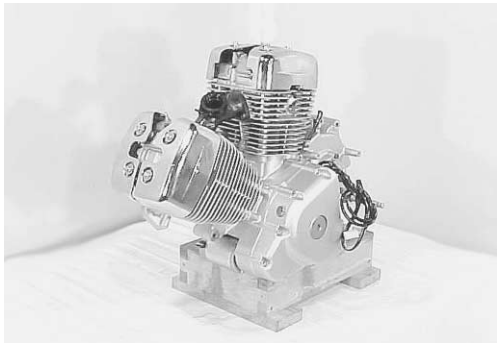
* Mark an identification of assembly location on each removed part so that each will be restored to the original position during reassembly.
* Wash clean and dry the removed parts before inspecting and measuring.
* Oil the rotating or sliding parts before assembly.
* Make sure to use the correct type of lubricant where specified.
* Check that each rotating or sliding part moves or operates smoothly after assembly.
* Make sure to follow the bolt tightening order where specified.
* If the correct length of the bolt is confused when tightening the crankcase or cover, insert all the bolts and check that the tightening margin is equal in each bolt.

ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

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

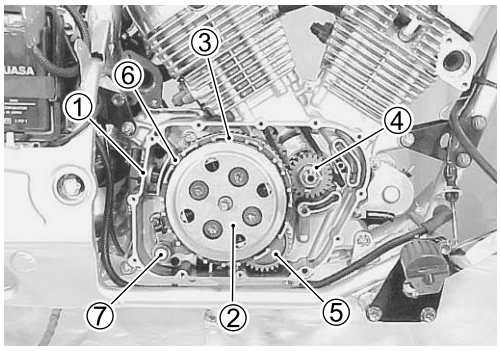
ENGINE CENTER

ITEM	REMOVAL	INSPECTION	REINSTALLATION
Air cleaner box	☞3-3	☞2-7	———
Starter motor	☞3-11	☞6-12	☞3-70
Cylinder head cover	☞3-11	☞3-20	☞3-67
Camshaft	☞3-12	☞3-22	☞3-65
Intake pipe	☞3-13	———	☞3-64
Cylinder head (only No. 2)	☞3-13	☞3-24	☞3-63
Cam chain tension adjuster	☞3-13	☞3-23	☞3-64
Cam chain guide	☞3-13	☞3-23	☞3-63
Cylinder (only No. 2)	☞3-13	☞3-33	☞3-63
Piston (only No. 2)	☞3-14	☞3-35	☞3-62



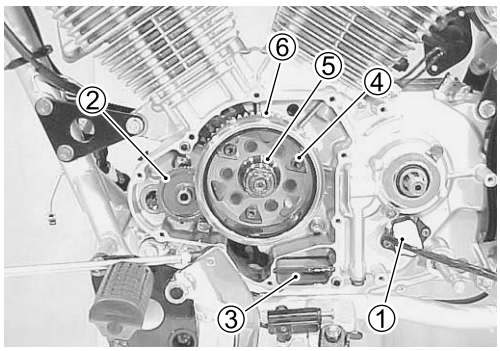
ENGINE RIGHT SIDE

ITEM	REMOVAL	INSPECTION	REINSTALLATION
Clutch cable	☞3-4	———	———
Exhaust pipe and muffler	☞3-5	———	☞3-10
① Speed sensor	☞3-11	☞6-24	☞3-69
Clutch cover	☞3-15	☞3-41	☞3-59
② Clutch (plates)	☞3-15	☞3-42	☞3-58
③ Primary driven gear	☞3-16	☞3-43	☞3-57
④ Primary drive gear	☞3-16	———	☞3-57
Rear cylinder cam chain and cam chain tensioner	☞3-16	☞3-24	☞3-57
⑤ Oil pump	☞3-17	☞3-43	☞3-56
⑥ Speed rotor	☞3-17	———	☞3-56
⑦ Gearshift shaft	☞3-18	☞3-43	☞3-56



ENGINE LEFT SIDE

ITEM	REMOVAL	INSPECTION	REINSTALLATION
Engine sprocket	☞3-6	☞5-37	☞3-9
Gearshift pedal	☞3-6	———	☞3-9
① Gear position switch	☞3-11	☞6-15	☞3-69
Generator (cover)	☞3-14	☞6-8	☞3-61
② Starter idle gear	☞3-14	———	☞3-61
③ Oil sump filter	☞3-14	———	☞3-61
④ Generator rotor	☞3-14	———	☞3-61
⑤ Starter clutch	☞3-39	☞3-39	☞3-39
⑥ Starter driven gear	☞3-15	☞3-30	☞3-61
Front cylinder cam chain and cam chain tensioner	☞3-15	☞3-24	☞3-60

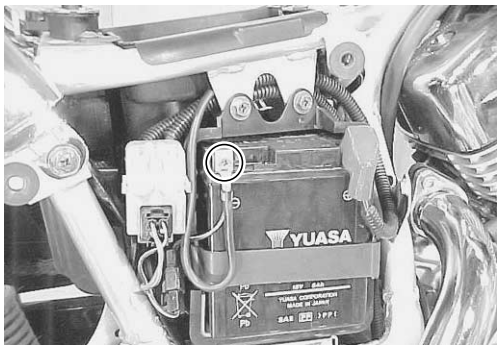


ENGINE REMOVAL AND REINSTALLATION

ENGINE REMOVAL

NOTE:
If the engine is dirtied, wash the machine with a steam cleaner before removing the engine.

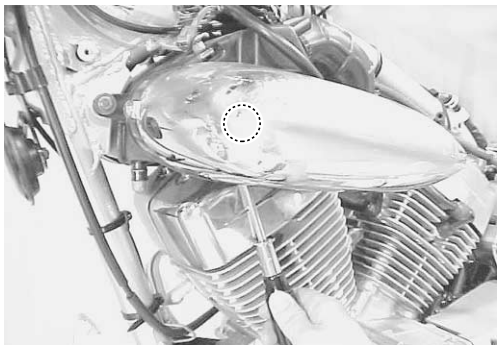
- Remove the front seat. (☞5-2)
- Remove the luggage box. (☞5-2)
- Remove the fuel tank. (☞4-3)
- Drain the engine oil. (☞ 2-11)
- Remove the right frame cover. (☞5-3)
- Disconnect the battery ⊖ lead wire.



AIR CLEANER

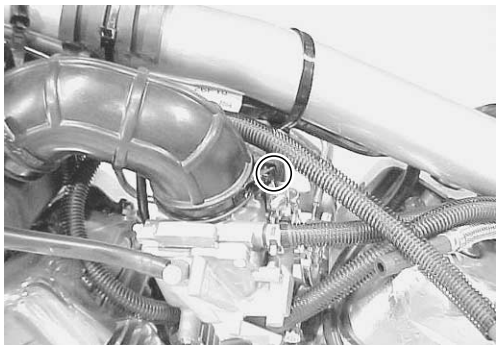
- With the clamp screw loosened, remove the right and left air cleaner boxes.

- Remove the air valve hose. (☞7-18)

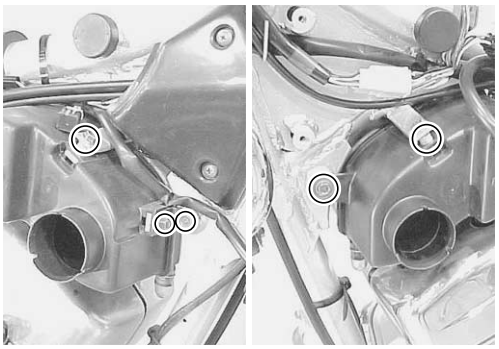


- Disconnect the breather hose.

• Loosen the clamp screw.



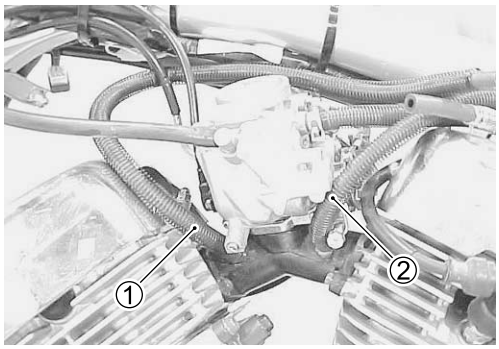
• With the bolts removed, take out the center air cleaner box.



CARBURETOR

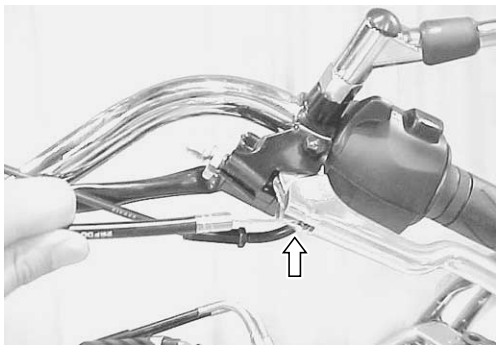
• Remove the carburetor. (☞4-12)

• Disconnect the vacuum hoses ① and ② from the intake pipe.

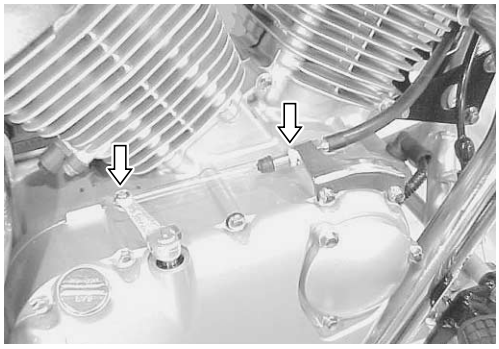


CLUTCH CABLE

• Disconnect the clutch cable end out of clutch lever.

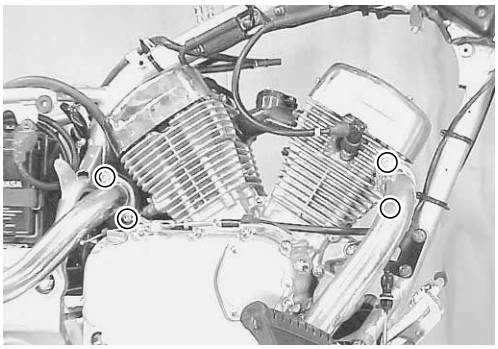


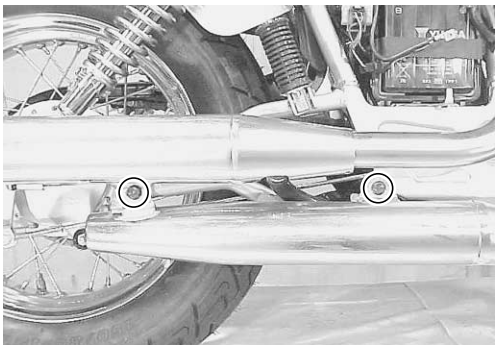
• Disconnect the clutch cable end out of clutch release arm.



EXHAUST PIPE AND MUFFLER

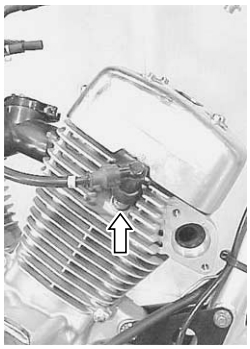
- With the exhaust pipe bolts and muffler bolts removed, remove the exhaust pipes and mufflers.





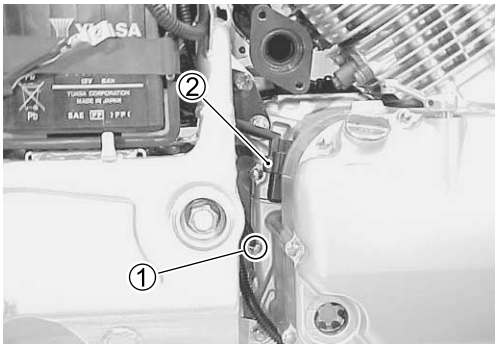
ELECTRIC PARTS

- Remove the spark plug caps.

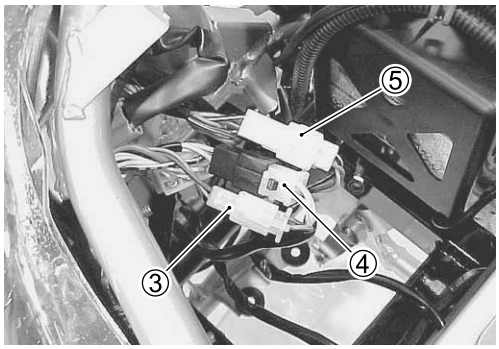


- Remove the starter motor lead wire.

- Remove the engine ground lead wire ①.
- Disconnect the speed sensor coupler ②.

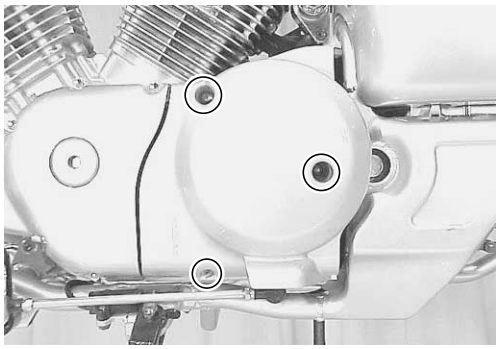


- Disconnect the signal generator coupler ③, generator coupler ④ and gear position switch coupler ⑤.

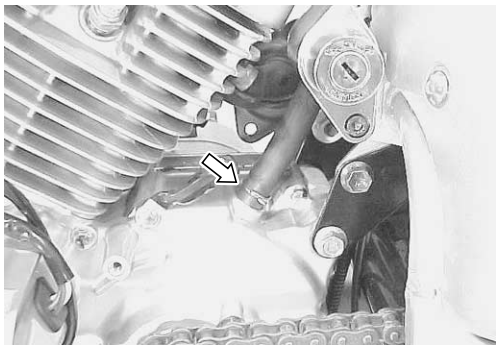


ENGINE SPROCKET

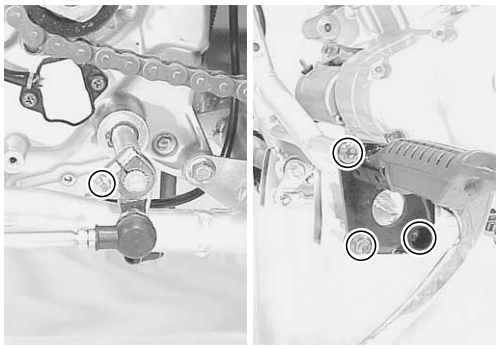
- Remove the engine sprocket cover.



- Remove the breather hose.

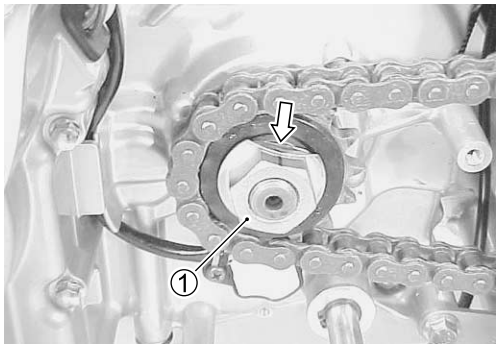


- With the bolt removed, disconnect the gearshift arm.
- Remove the left footrest.



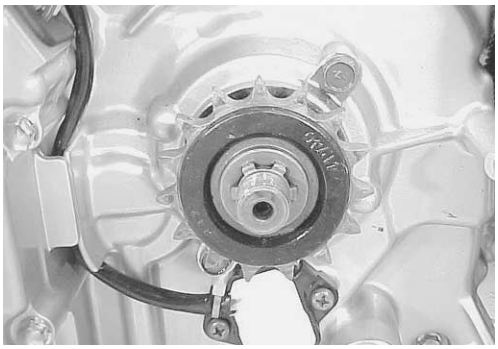
- Flatten the lock washer.
- Remove the engine sprocket nut ① and washer.

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

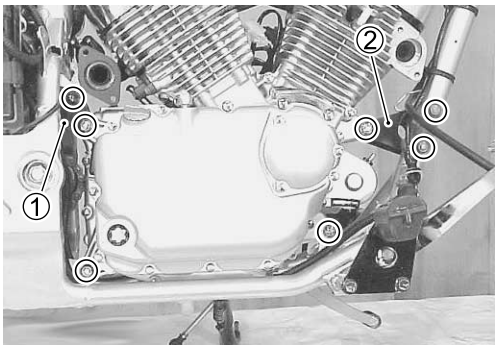


- Remove the engine sprocket.

NOTE:
If it is difficult to remove the engine sprocket, loosen the rear axle nut, rear torque link nuts and chain adjusters to provide additional chain slack. (☞2-13)



- Support the engine using an engine jack.
- Remove the engine mounting brackets ① and ②.
- Remove the engine mounting nuts and bolts.
- Remove the engine from the frame.



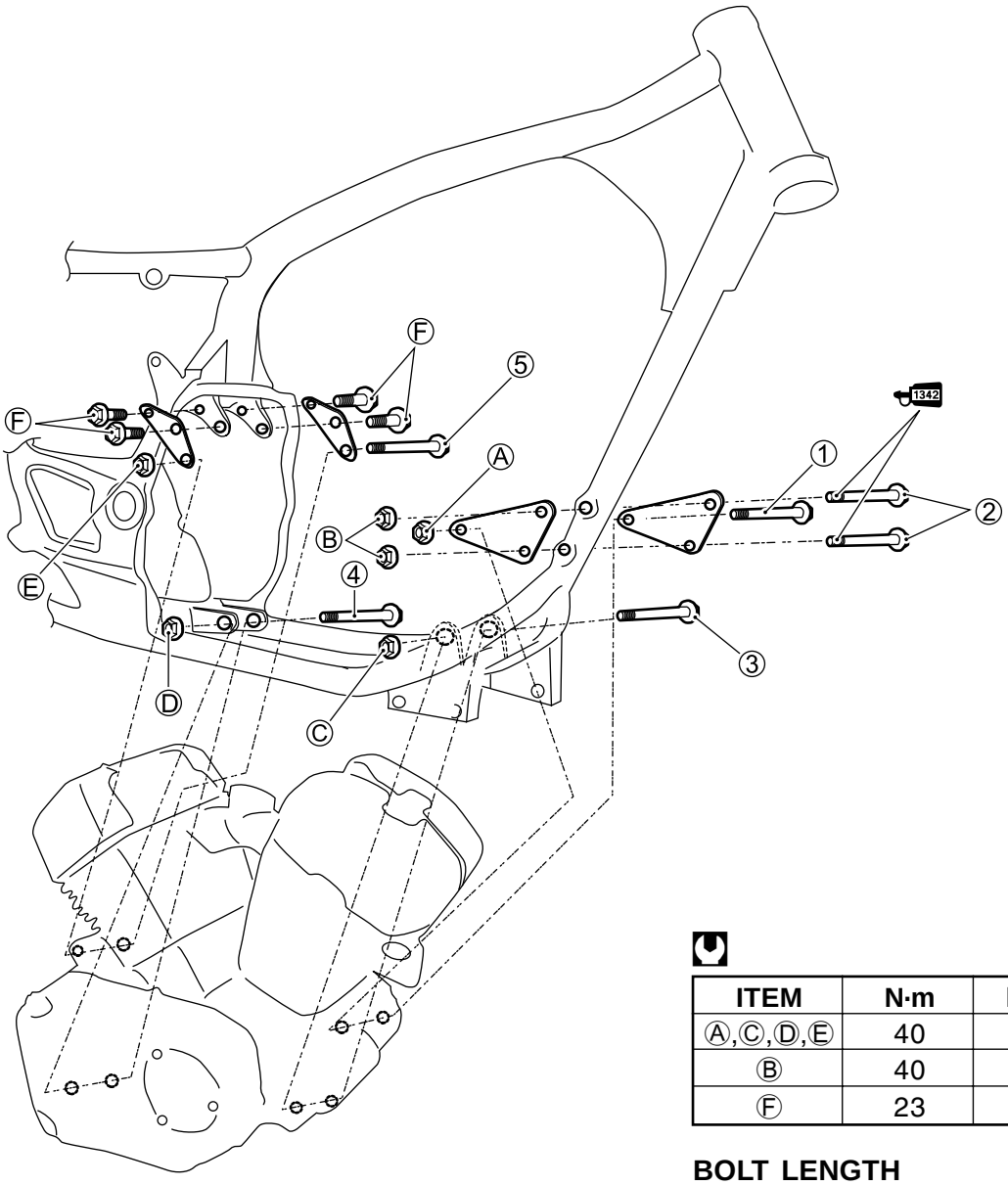
ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

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

NOTE:

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



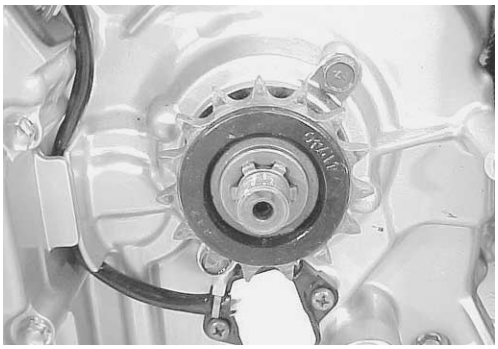
ITEM	N·m	kgf·m
Ⓐ,Ⓒ,Ⓓ,Ⓔ	40	4.0
Ⓑ	40	4.0
Ⓕ	23	2.3

BOLT LENGTH

①	67 mm
②	65 mm
③,④,⑤	102 mm

ENGINE SPOCKET

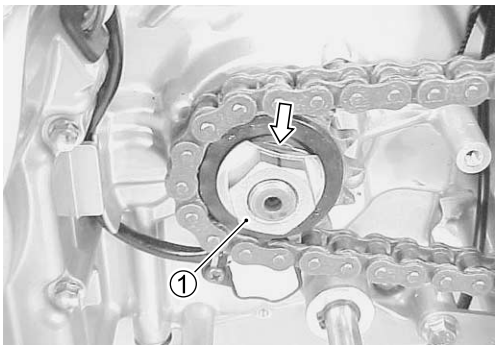
- Loosen the rear axle nut, rear torque link nuts and chain adjusters.
- Install the engine sprocket.



- Tighten the engine sprocket nut ① to the specified torque.

Engine sprocket nut: 90 N·m (9.0 kgf·m)

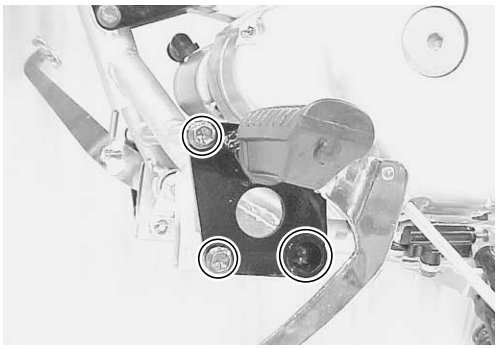
NOTE:
When tightening the engine sprocket nut, depress the rear brake pedal.



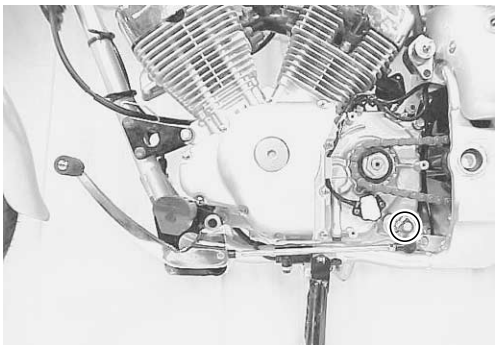
- Bend the lock washer securely.

- Tighten the left footrest bolts to the specified torque.

Footrest bolt: 23 N·m (2.3 kgf·m)

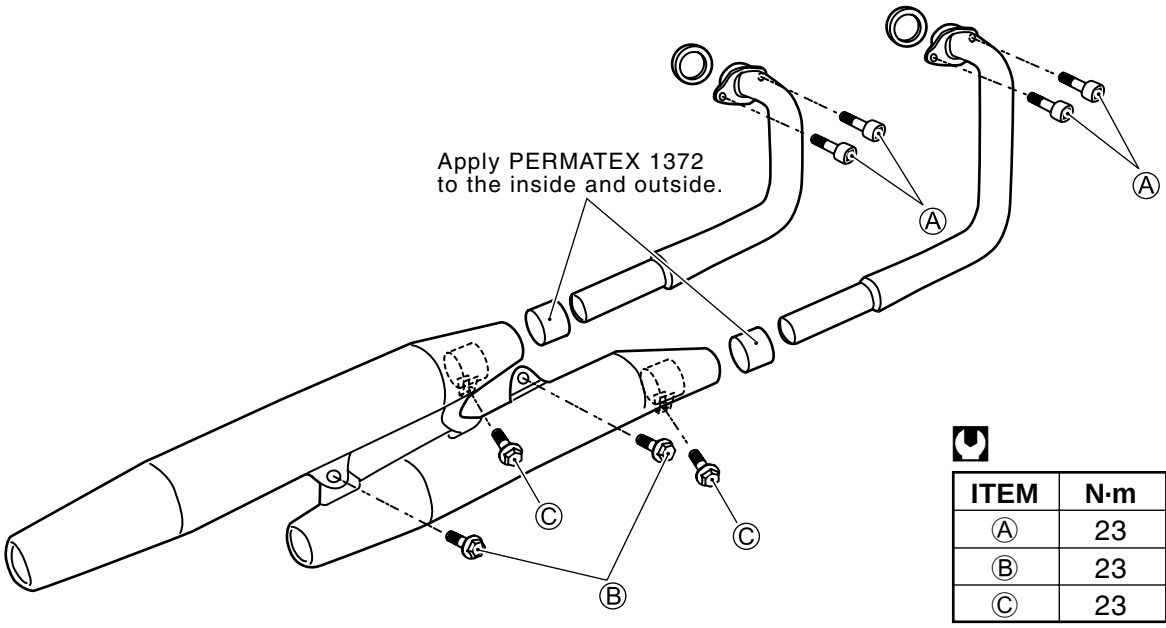


- Install the gearshift arm and adjust the gearshift lever hight. (☞2-10)



- Connect each electric part and its couplers. (☞7-10 – 12)

• Install the exhaust pipes and mufflers as shown in the following illustration.

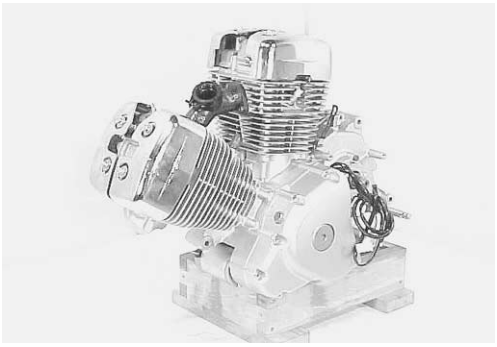


ITEM	N·m	kgf·m
Ⓐ	23	2.3
Ⓑ	23	2.3
Ⓒ	23	2.3

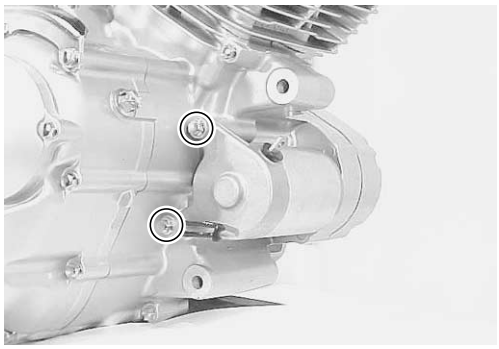
• Install the carburetor and air cleaner. (☞4-6)

• After remounting the engine, the following adjustments are necessary.
  * Engine idling speed ..... ☞2-9
  * Throttle cable play ..... ☞2-9
  * Clutch lever play ..... ☞2-10
  * Drive chain ..... ☞2-13
  * Rear brake pedal height and free travel .... ☞2-18
  * Gearshift lever height ..... ☞2-10
  * Engine oil level ..... ☞2-11

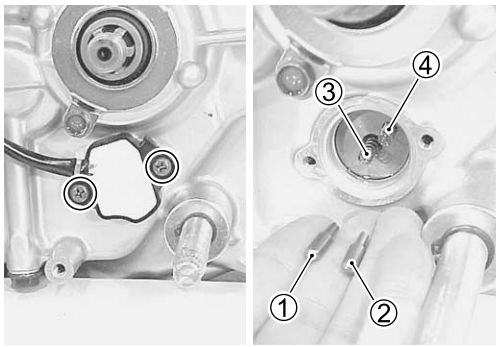
ENGINE DISASSEMBLY



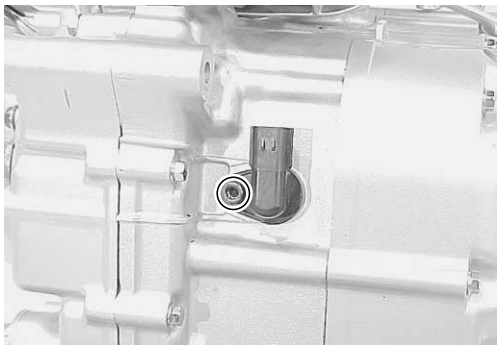
STARTER MOTOR
- Remove the starter motor.



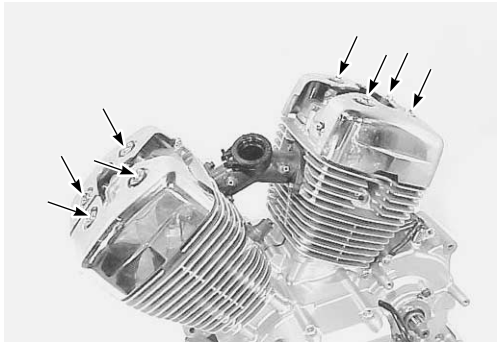
GEAR POSITION SWITCH
- Remove the gear position switch.
- Remove the contacts ①, ② and springs ③, ④.



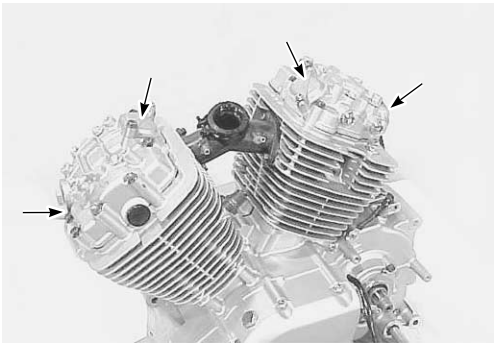
SPEED SENSOR
- Remove the speed sensor.



CYLINDER HEAD COVER
- Remove the spark plugs. (☞2-6)
- Remove the head cover caps.

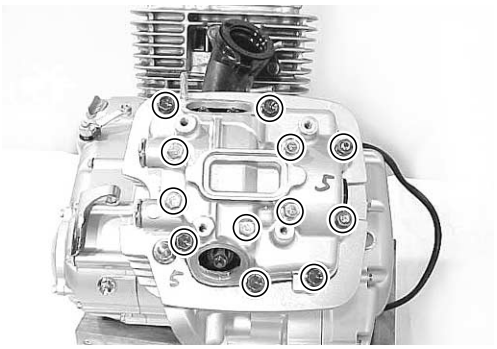


- Remove the valve inspection caps.



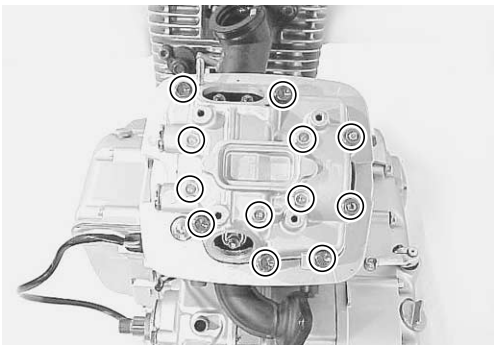
- Remove the front cylinder head cover.

NOTE:
When removing the cylinder head covers, the piston must be at top dead center on the compression stroke. (☞2-4)



No. 2 (FRONT)

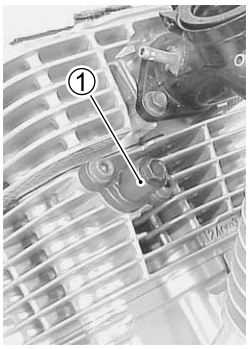
- Remove the rear cylinder head cover.

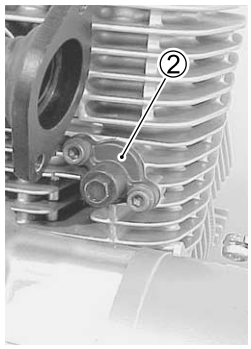


No. 1 (REAR)

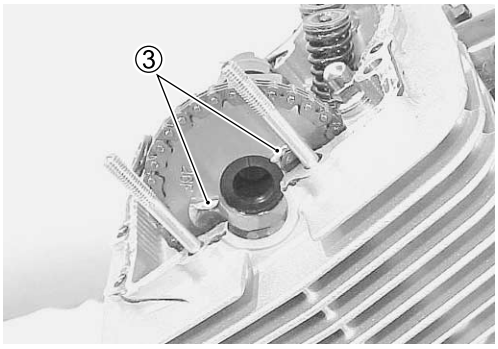
CAM SHAFT AND SPROCKET

- Remove the cam chain tension adjusters ① and ②.



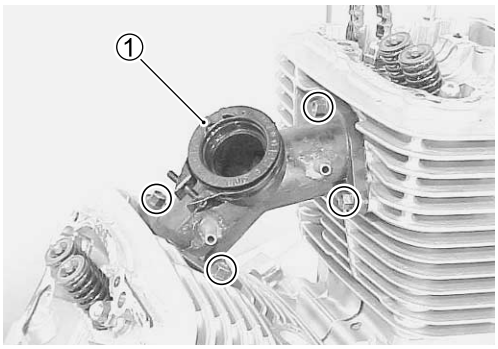


- Remove the camshaft sprocket bolts ③.
- Remove the camshafts and sprockets.



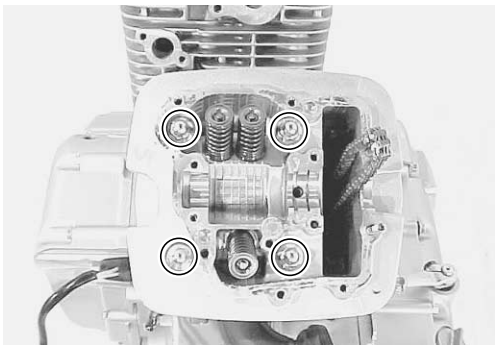
INTAKE PIPE

- Remove the intake pipe ①.

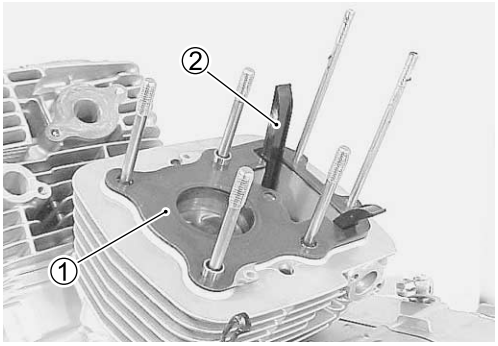


CYLINDER HEAD AND CYLINDER

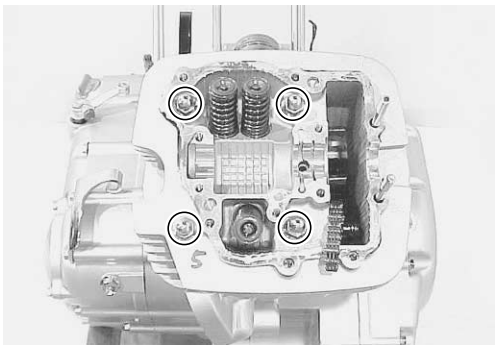
- With the cylinder head nuts removed, remove the No. 1 (Rear) cylinder.

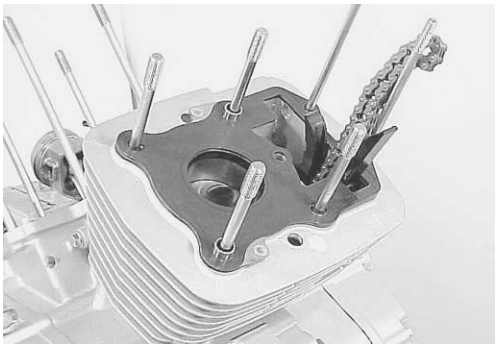


- Remove the gasket ①, cam chain guide ② and cylinder.



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





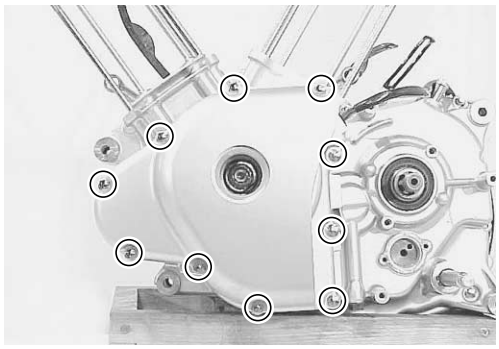
PISTON

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

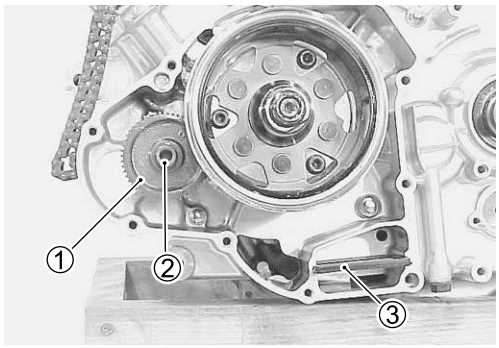
NOTE:
Scribe the cylinder position on the head of the respective pistons.

GENERATOR COVER

- Remove the generator cover.



- Remove the starter idle gear ① and shaft ②.
- Remove the oil sump filter ③.

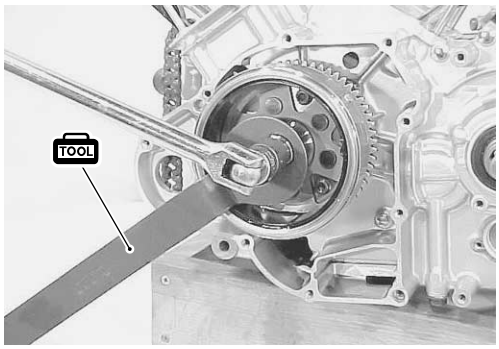


GENERATOR ROTOR

NOTE:
When removing the primary drive gear nut (☞3-17), do not remove the generator rotor. The generator rotor is used when removing the primary drive gear nut.

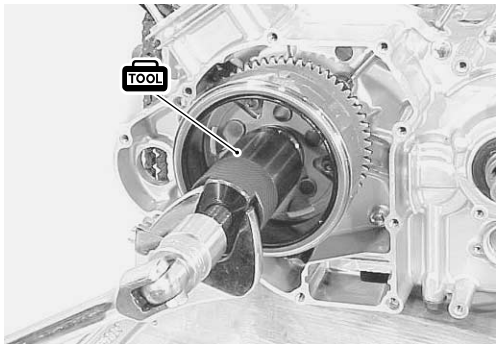
- With the rotor held immovable using the special tool, loosen the rotor bolt.

TOOL 09930-44530: Rotor holder

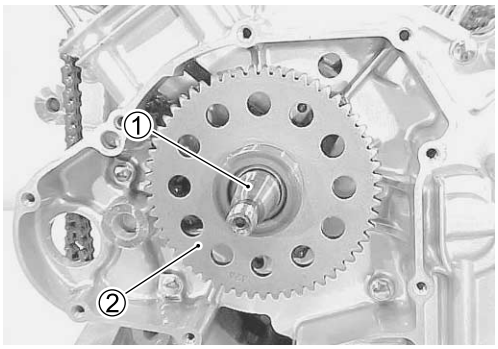


- Remove the rotor by using the special tool.

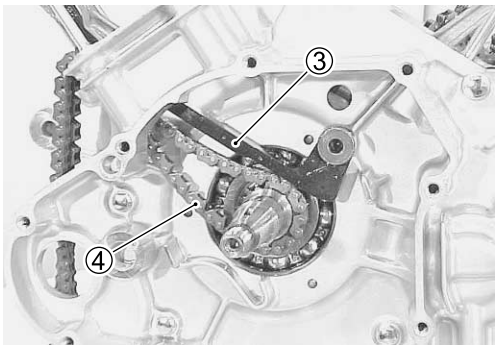
TOOL 09930-32610: Rotor remover



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

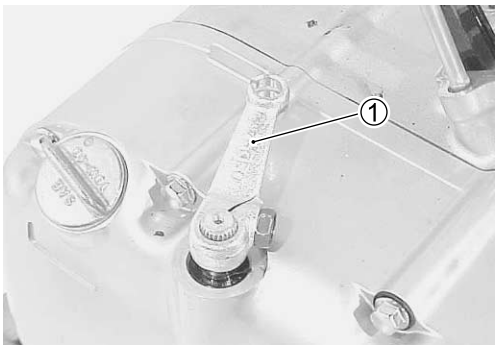


- Remove the cam chain tensioner ③ and cam chain ④.

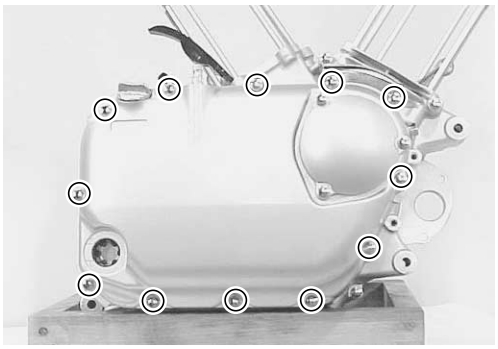


CLUTCH COVER

- Remove the clutch release arm ①.

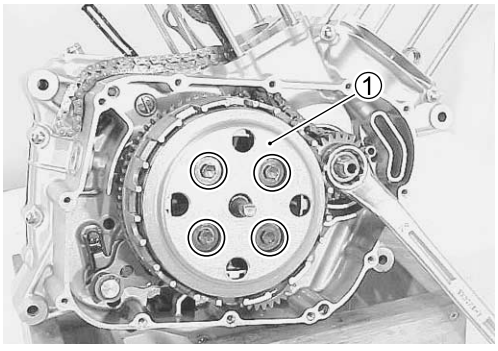


- Remove the clutch cover bolts.
- Remove the clutch cover.

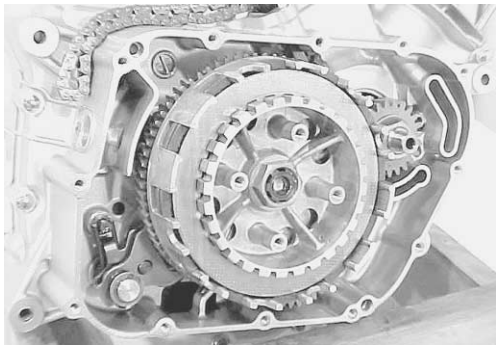


CLUTCH

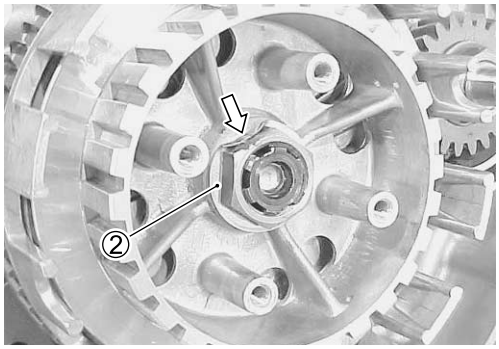
- With the primary drive gear nut held immovable, remove the clutch spring mounting bolts diagonally.
- Remove the pressure plate ①.



- Remove the clutch drive and driven plates.

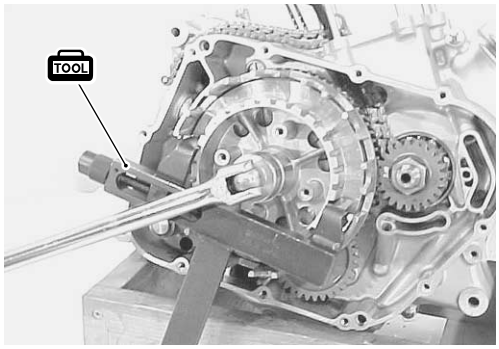


- Flatten the lock washer ②.

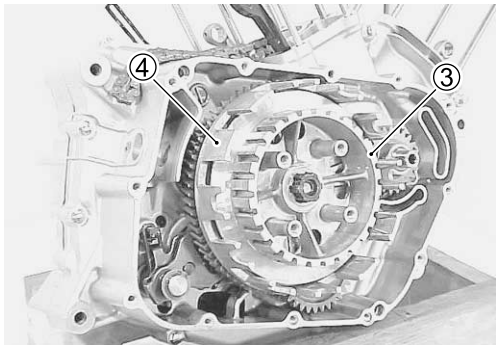


- With the clutch sleeve hub held immovable using special tool, remove the clutch sleeve hub nut.

09920-53740: Clutch sleeve hub holder



- Remove the clutch sleeve hub ③ and primary driven gear assembly ④.



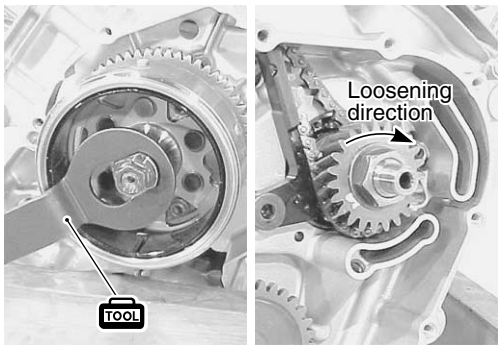
PRIMARY DRIVE GEAR

- With the generator rotor held immovable using special tool, remove the primary drive gear nut.

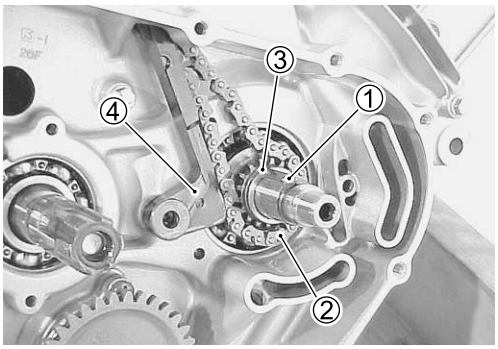
TOOL 09930-44530: Rotor holder

⚠ CAUTION

This bolt has left-hand thread. Turning it counterclockwise, it may cause damage.



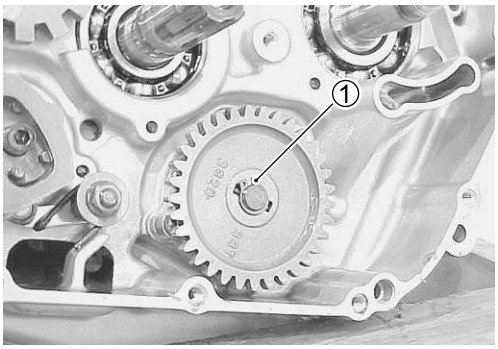
- Remove the key ①, cam chain ② and cam chain drive sprocket ③.
- Remove the cam chain tensioner ④.



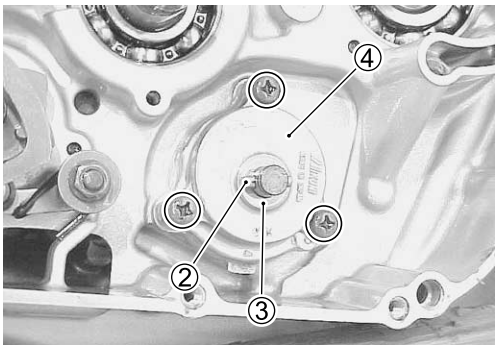
OIL PUMP

- Remove the circlip ① and oil pump drive gear.

TOOL 09900-06107: Snap ring pliers



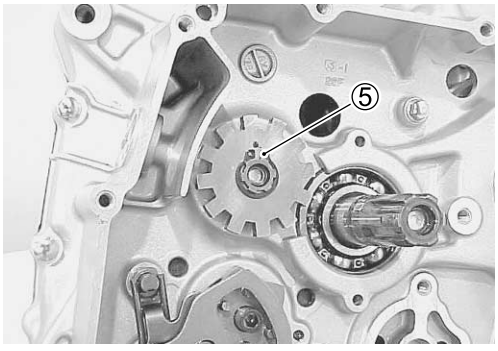
- Remove the pin ② and the washer ③.
- Remove the oil pump ④.



SPEED ROTOR

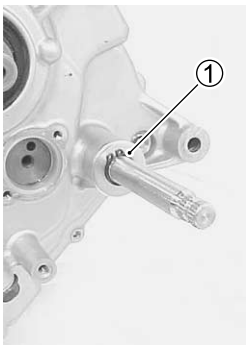
- Remove the circlip ⑤ and speed rotor.

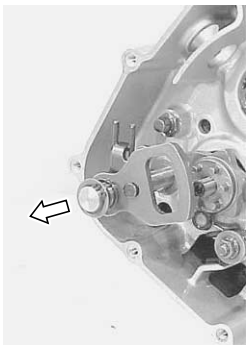
TOOL 09900-06107: Snap ring pliers



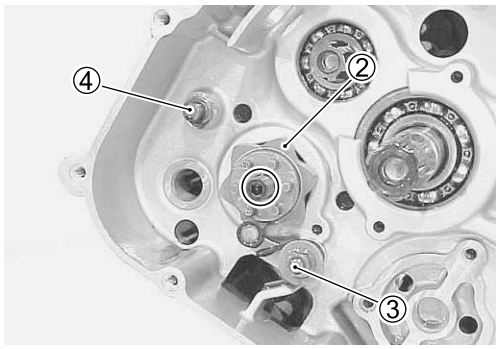
GEARSHIFT SHAFT

- With the circlip ① removed, draw out the gearshift shaft.

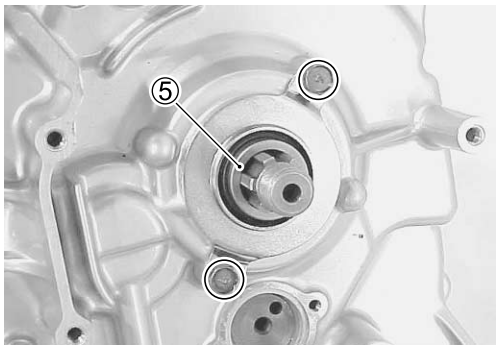




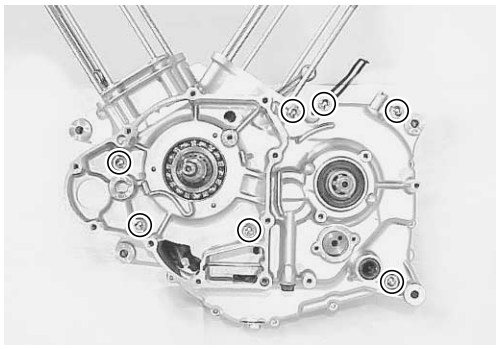
- Remove the gearshift cam stopper plate ②.
- Remove the gearshift cam stopper ③ with spring.
- Remove the gearshift arm stopper ④.

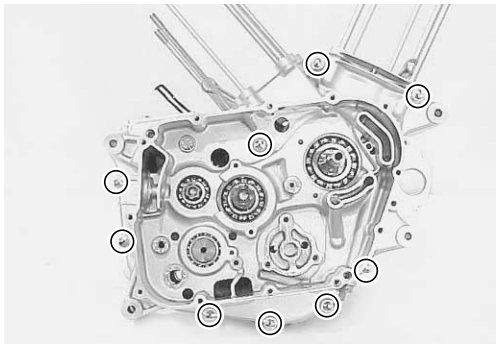


- Remove the oil seal retainer and drive shaft spacer ⑤.



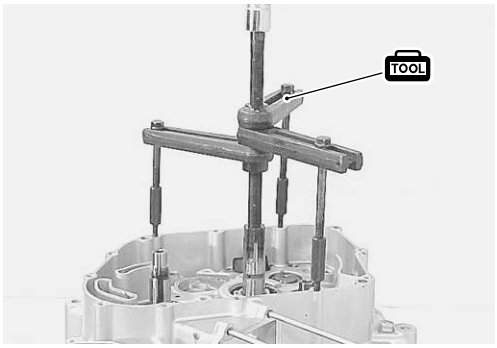
- Remove the crankcase securing bolts.





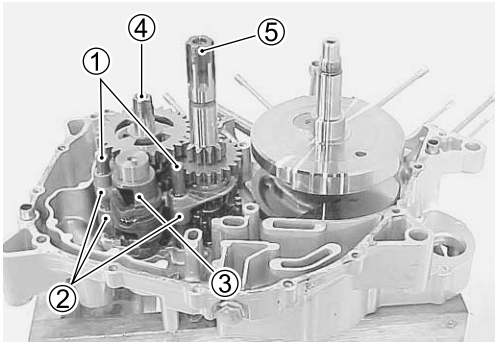
- Separate the crankcase into 2 parts, right and left, with a crankcase separating tool.

TOOL 09920-13120: Crankcase separator



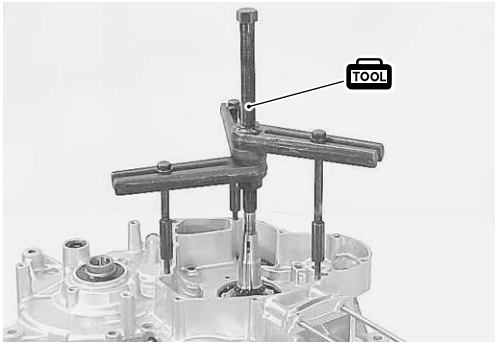
NOTE:
Fit the crankcase separating tool, so that the tool arms parallel the side of the crankcase. The crankshaft and transmission components must remain in the left crankcase half.

- Remove the gearshift fork shafts ① and gearshift forks ②.
- Remove the gearshift cam ③.
- Remove the driveshaft assembly ④, countershaft assembly ⑤.



- Remove the crankshaft by using the special tool.

TOOL 09920-13120: Crankcase separator



ENGINE COMPONENT INSPECTION AND SERVICE

⚠ CAUTION

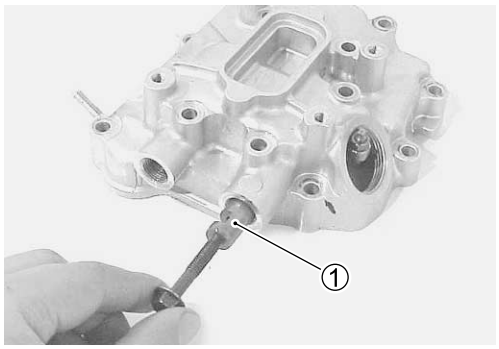
Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "No. 1 cylinder", "No. 2 cylinder", "Exhaust", "Intake", so that each will be restored to the original location during assembly.

CYLINDER HEAD COVER

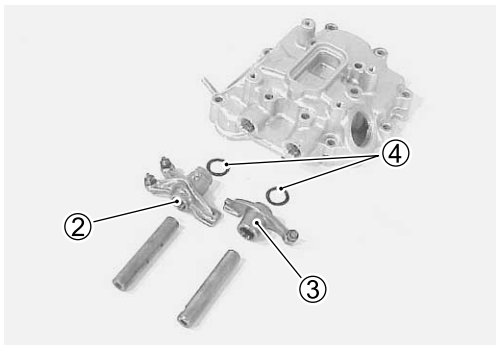
DISASSEMBLY

- Loosen the rocker arm shaft bolts.

- Draw out the rocker arm shaft ① using 6 mm bolt.



- Remove the intake rocker arm ②, exhaust rocker arm ③ and spring washers ④.



INSPECTION

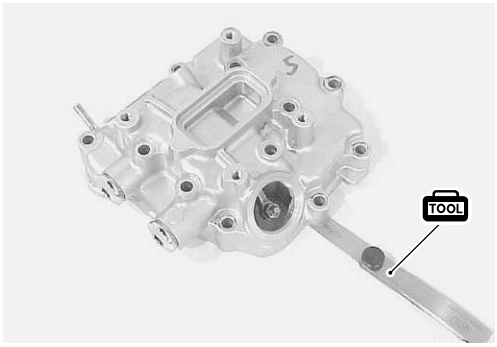
CYLINDER HEAD COVER DISTORTION

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

DATA Cylinder head cover distortion:
Service Limit: 0.05 mm

TOOL 09900-20803: Thickness gauge

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

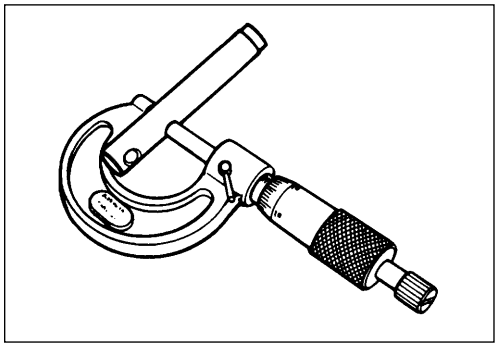


ROCKER ARM SHAFT O.D.

Measure diameter of rocker arm shaft.

DATA Rocker arm shaft O.D.:
Standard: 11.973 – 11.984 mm

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

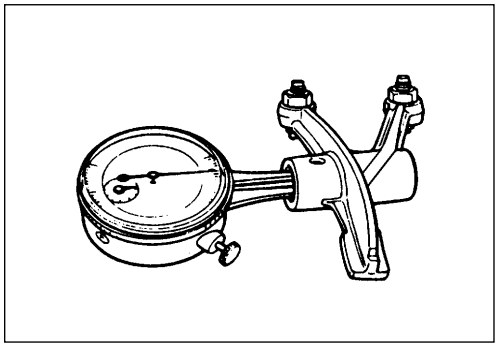


ROCKER ARM I.D.

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

DATA Rocker arm I.D.: Standard: 12.000 – 12.018 mm

TOOL 09900-20605: Dial calipers

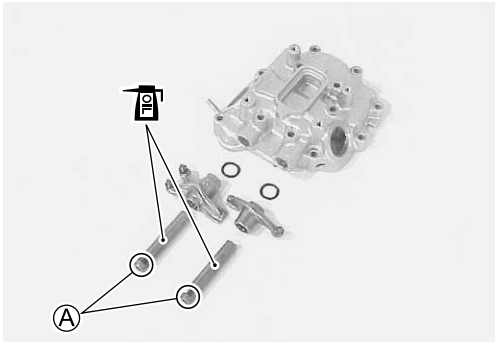


REASSEMBLY

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

- Apply engine oil to the rocker arm shafts.

NOTE:
Align the cutaway Ⓐ of rocker arm shaft with the hole of cylinder head cover bolt.



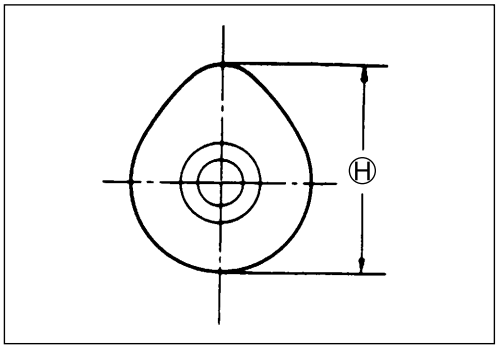
- After inserting the shafts, tighten the rocker arm shaft bolts.

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

⚠ CAUTION

Use a new gasket Ⓑ on the rocker arm shaft bolt to prevent oil leakage.

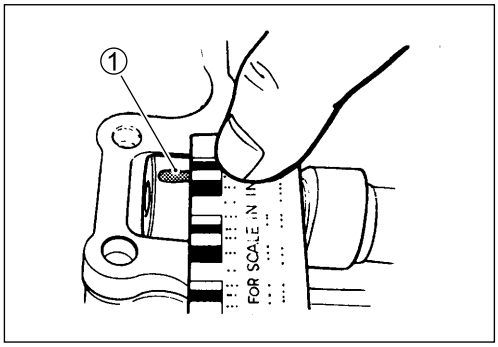
CAMSHAFT



CAM WEAR INSPECTION

Check for abnormal surface damage or wear on the cam face.
Measure the cam height Ⓗ with a micrometer.
Replace the camshaft if found worn down to the service limit.

DATA Cam height Ⓗ: Service Limit: (IN) 32.57 mm
(EX) Front: 32.60 mm
Rear : 32.33 mm



CAMSHAFT JOURNAL WEAR INSPECTION

Place the Plastigauge ① between the camshaft and cylinder head cover and tighten the cylinder head cover bolts to the speified torque.

TOOL 09900-22302: Plastigauge

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

NOTE:
Do not rotate the camshaft after the cylinder head cover has been tightened with the Plastigauge in place.

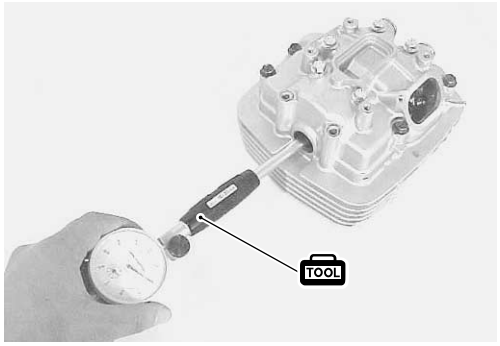
- Remove the cylinder head cover and take the measurement at the widest part of the crashed Plastigauge.

DATA Camshaft journal oil clearance: Service Limit: 0.150 mm

If the clearance exceeds the service limit, measure the inside diameter of camshaft journal holder using a cylinder gauge.

DATA Camshaft journal holder I.D.:
Standard: 22.012 – 22.025 mm

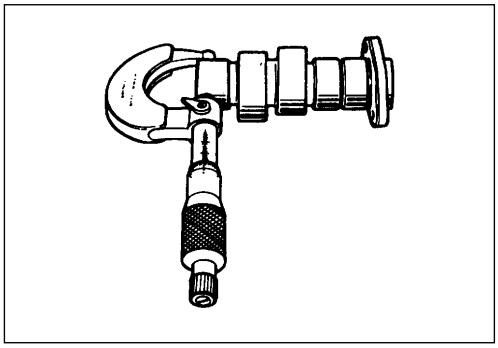
TOOL 09900-20602: Dial gauge (1/1000 mm)
09900-22403: Small bore gauge (18 – 35 mm)



Measure the outside diameter of camshaft journal using a micrometer.

DATA Camshaft journal O.D.:
Standard: 21.959 – 21.980 mm

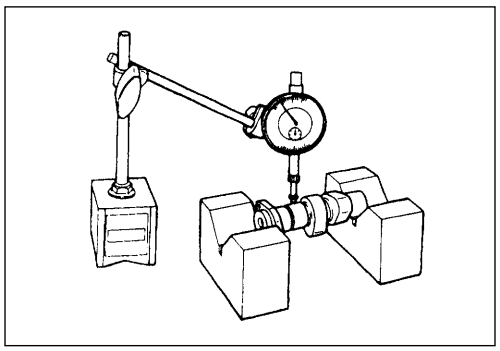
TOOL 09900-20205: Micrometer (0 – 25 mm)



Calculate from the measurement to determine if the clearance falls within the standard range when the camshaft is replaced with a new one. If the clearance does not come to the standard range, replace both the camshaft and cylinder head with new ones.

CAMSHAFT RUNOUT

With the camshaft held on the V-blocks, measure the runout with a dial gauge. If the runout exceeds the service limit, replace the camshaft.



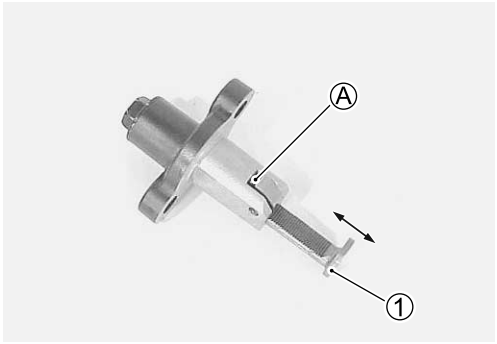
DATA Camshaft runout: Service Limit: 0.10 mm

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

CAM CHAIN TENSION ADJUSTER

INSPECTION

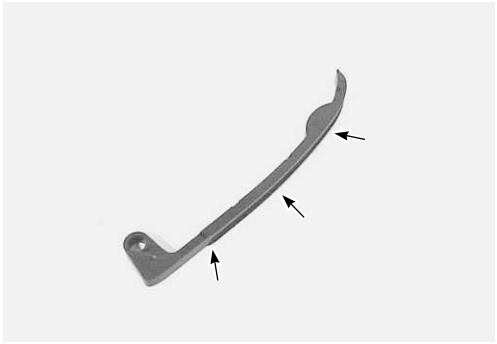
Check that the push rod ① slides smoothly with the lock Ⓐ of the ratchet mechanism released. If it does not slide smoothly or the ratchet mechanism is worn or damaged, replace the cam chain tension adjuster with a new one.



CAM CHAIN TENSIONER

INSPECTION

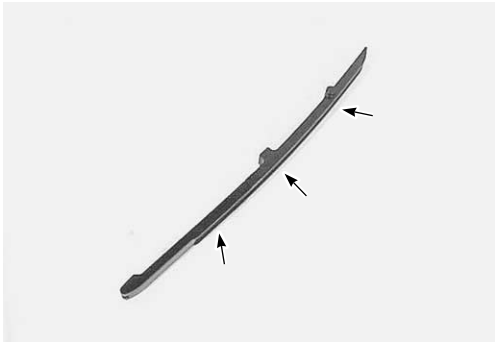
Check the contacting surface of the cam chain tensioner.
If it is worn or damaged, replace it with a new one.



CAM CHAIN AND CAM CHAIN GUIDE

INSPECTION

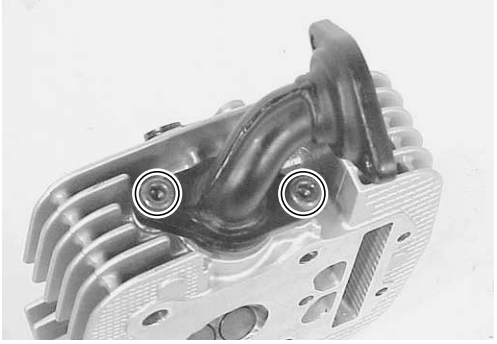
Check the cam chain for wear, damage and kinked or binding links. If any defects are found, replace it with a new one.
Check the cam chain guide for wear and damage. If it is found to be damaged, replace it with a new one.



CYLINDER HEAD

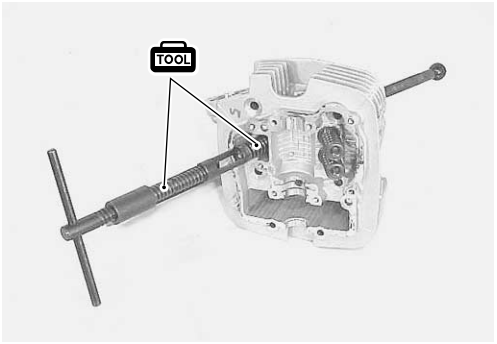
DISASSEMBLY

- Remove the exhaust pipe and gasket.

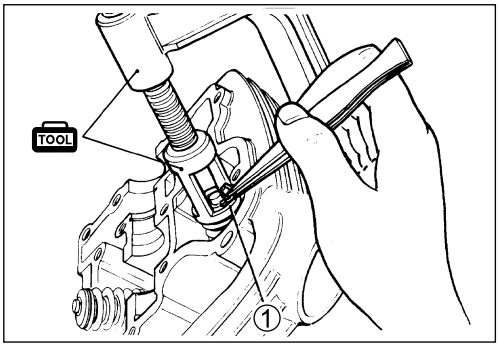


- Compress the valve spring using the special tool.

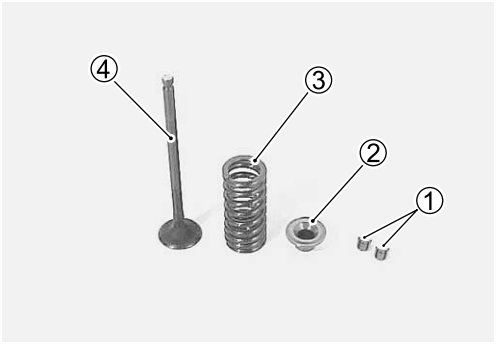
TOOL **09916-14510: Valve lifter**
09916-14910: Attachment
09916-84511: Tweezers



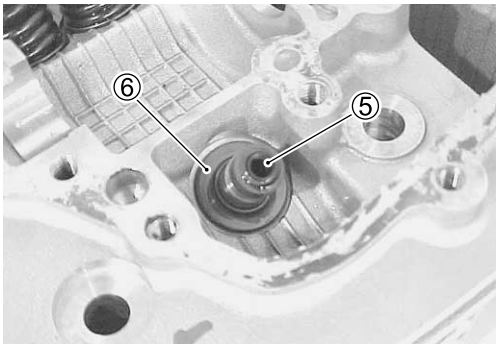
- Remove the valve cotter halves ①.



- Remove the valve spring retainer ②.
- Remove the valve spring ③.
- Remove the valve ④ from the other side.



- Remove the valve stem seal ⑤.
- Remove the spring seat ⑥.



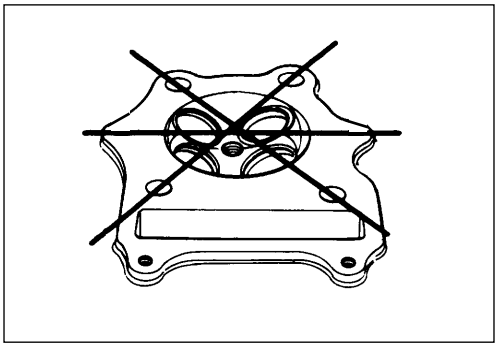
INSPECTION

CYLINDER HEAD DISTORTION

Check for distortion of the mating surface diagonally with a straightedge and thickness gauge as shown.
If distortion exceeds the service limit, repair or replace the cylinder head.

DATA Cylinder head distortion: Service Limit: 0.05 mm

TOOL 09900-20803: Thickness gauge

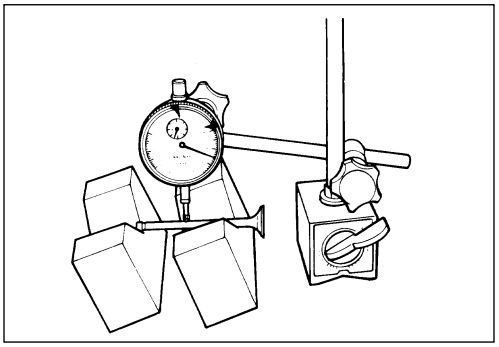


VALVE STEM RUNOUT

Check the valve stem for abnormal wear or bend.
Place the valve on V-blocks and measure runout.
If the service limit is exceeded or abnormal condition exists, replace the valve.

DATA Valve stem runout: Service Limit: 0.05 mm

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

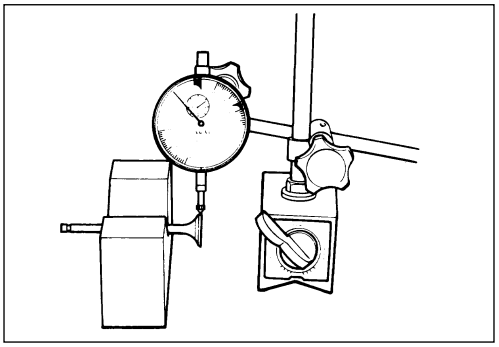


VALVE HEAD RADIAL RUNOUT

Place a dial gauge as shown and measure valve head radial runout.
If the service limit is exceeded, replace the valve.

DATA Valve head radial runout: Service Limit: 0.03 mm

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

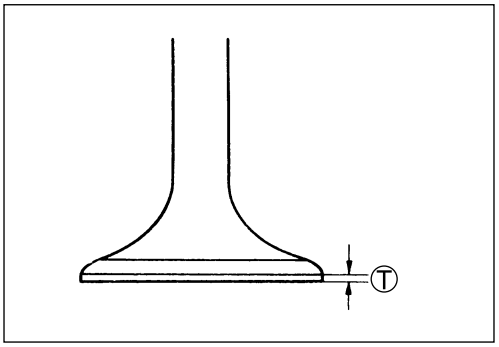


VALVE FACE WEAR

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

DATA Valve head thickness Ⓣ: Service Limit: 0.5 mm

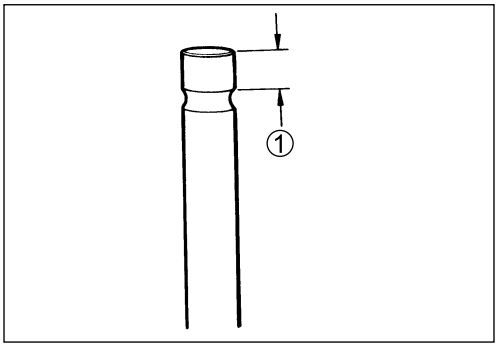
TOOL 09900-20102: Vernier calipers



VALVE STEM END CONDITION

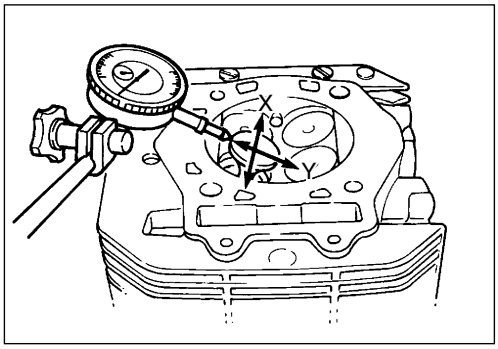
Inspect the valve stem end face for pitting and wear. If pitting or wear is present, resurface the valve stem end. Make sure that the length ① is not less than the service limit. If this length becomes less than the service limit, replace the valve.

DATA Valve stem end length:
Service Limit (IN & EX): 2.2 mm



VALVE STEM DEFLECTION

With the valve inserted into the valve guide, lift the valve head 10 mm from the valve seat and measure the deflection in X and Y directions.

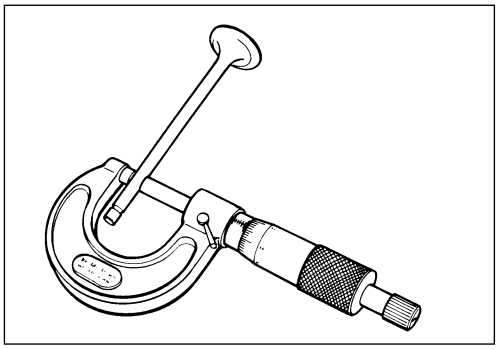


DATA Valve stem deflection (IN & EX): Service Limit: 0.35 mm

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

VALVE STEM DIAMETER

If the valve stem deflection exceeds the service limit, measure the valve stem outside diameter. If the diameter measured is within the standard range, replace the valve guide. (☞3-27)
For each of upper, middle and lower sections within the sliding range, two measurements, each in crosswise direction must be taken.



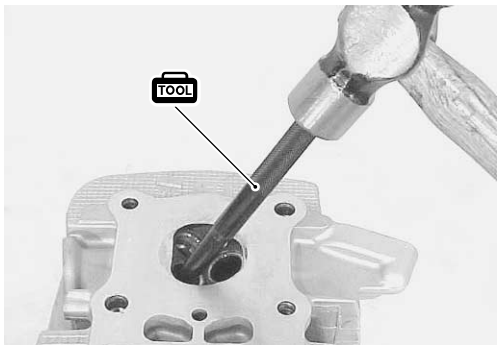
DATA Valve stem O.D.: Standard (IN) : 4.475 – 4.490 mm
(EX): 4.455 – 4.470 mm

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

VALVE GUIDE SERVICING

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

TOOL 09916-43210: Valve guide remover/installer



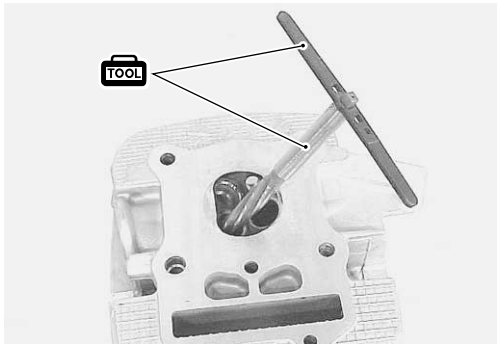
NOTE:

* *Discard the remove valve guide subassemblies.*

* *Only oversized valve guides are available as replacement parts. (Part No. 11115-33D71)*

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

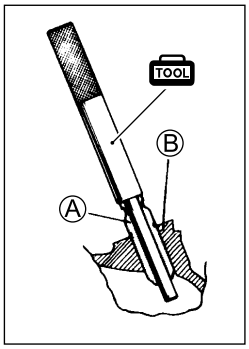
TOOL 09916-34580: Valve guide reamer
09916-34542: Valve guide reamer handle

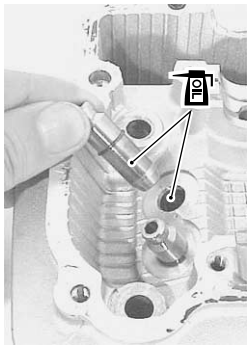


- Apply engine oil to the stem hole of each valve guide and drive the guide into the guide hole using the valve guide installer.

Ⓐ Valve guide
Ⓑ Cylinder head

TOOL 09916-43210: Valve guide remover/installer



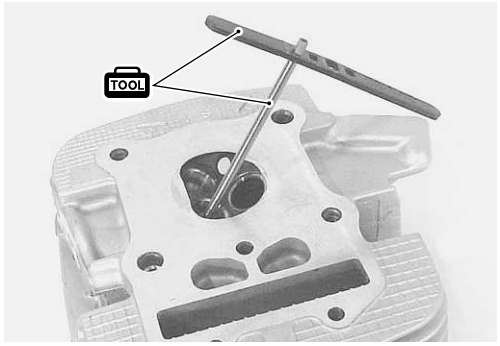


⚠ CAUTION

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

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

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

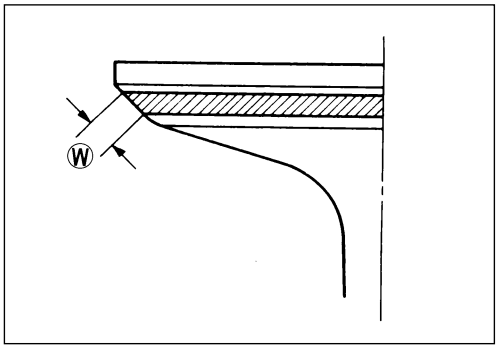


NOTE:

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

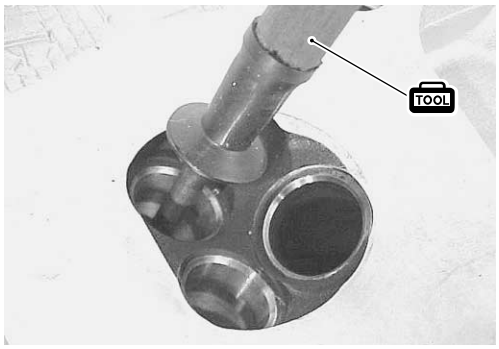
VALVE SEAT WIDTH INSPECTION

Visually check for valve seat width on each valve face.
If the valve face has worn abnomally, 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 Ⓦ measured exceeds the standard value, or seat width is not uniform reface the seat using the seat cutter.



DATA Valve seat width Ⓦ
Standard: 0.9 – 1.1 mm
Service Limit: Reface if measurement does not agree with standard value.

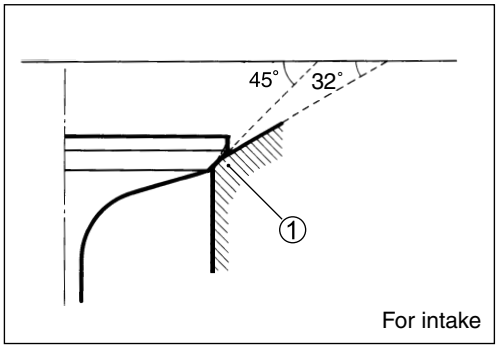
TOOL 09916-10911: Valve lapper set



VALVE SEAT SERVICING

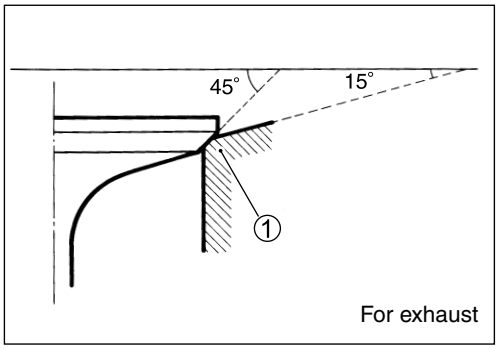
The valve seats ① for both the intake and exhaust valves are machined to four different angles. The seat contact surface is cut at 45°.

	INTAKE	EXHAUST
45°	N-131	N-131
15°		N-130
32°	N-144	



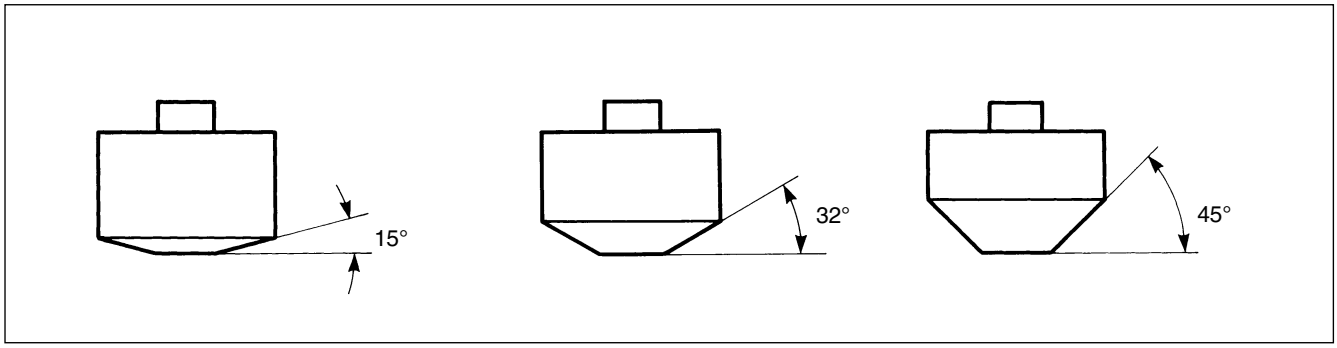
TOOL 09916-21111: Valve seat cutter set
09916-24470: Valve seat cutter (N-131)
09916-24460: Valve seat cutter (N-130)
09916-22610: Valve seat cutter (N-144)
09916-20460: Solid pilot (N-100-4.5)

NOTE:
Use the solid pilot along with the valve seat cutter.

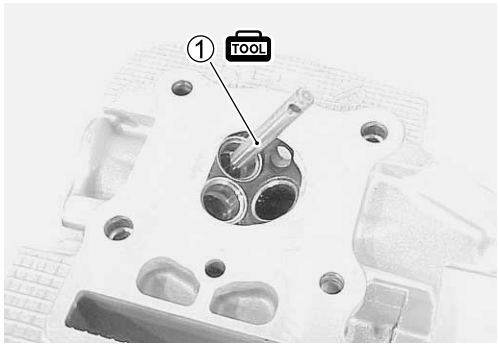


⚠ CAUTION

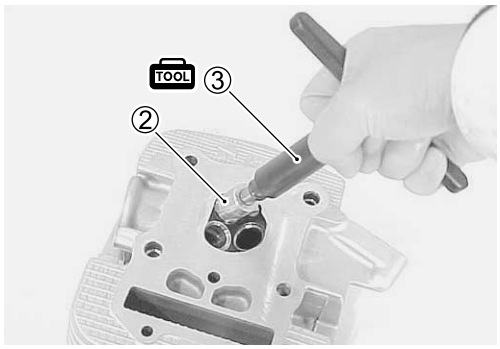
The valve seat contact area must be inspected after each cut.



- When installing the solid pilot ①, rotate it slightly.

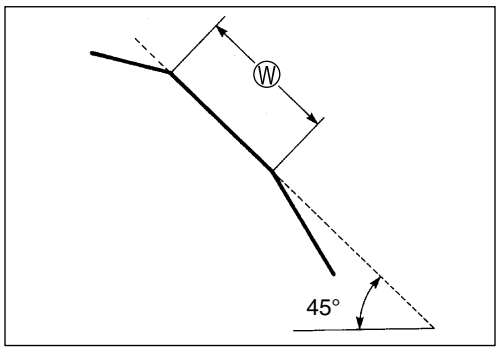


- Seat the pilot snugly. Install the 45° cutter ② and T-handle ③.

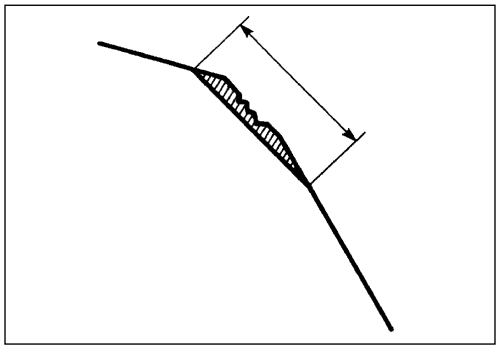


INITIAL SEAT CUT

- Using the 45° cutter, descale and clean up the seat. Rotate the cutter one or two turns.
- Measure the valve seat width Ⓦ after every cut.



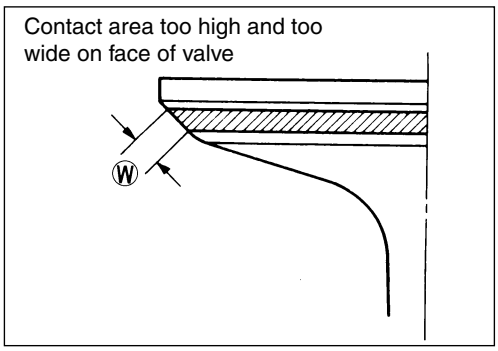
- If the valve seat is pitted or burned, use the 45° cutter to condition the seat some more.



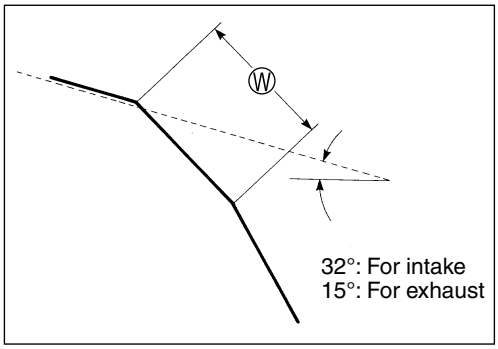
NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.

TOP NARROWING CUT

- If the contact area is too high on the valve, or if it is too wide, use the 15° or 32° cutter to lower and narrow the contact area.



(Use the 32° cutter for intake.)
(Use the 15° cutter for exhaust.)

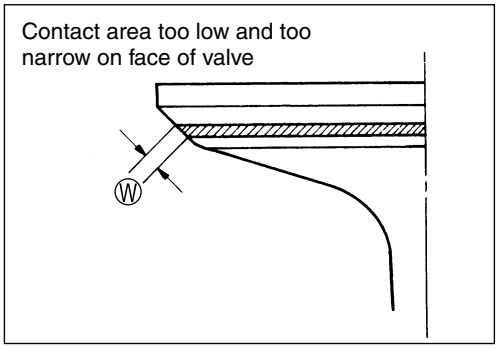


FINAL SEAT CUT

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

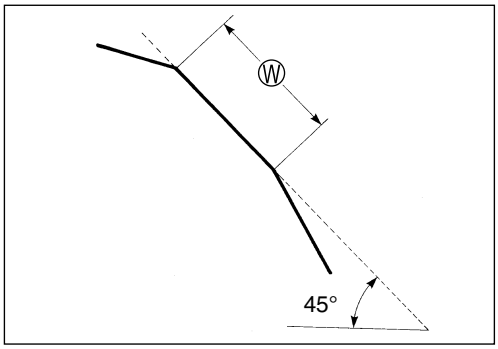
NOTE:
After cutting the 15° and 32° angles, it is possible that the valve seat (45°) is too narrow. If so, re-cut the valve seat to the correct width.

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



⚠ CAUTION

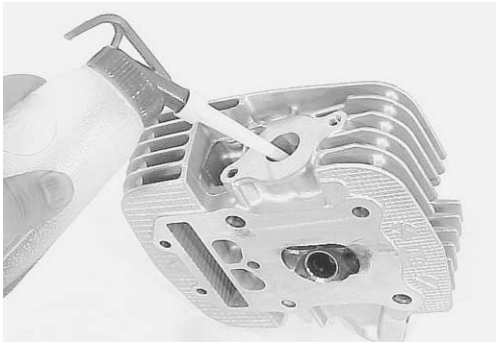
Do not use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish but not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.



NOTE:
After servicing the valve seats, be sure to check the valve clearance after the cylinder head has been reinstalled. (☞2-4)

VALVE SEAT SEALING CONDITION INSPECTION

With the valve and valve spring assembled, pour a small quantity of gasoline into the intake or exhaust port.
Check that no gasoline leaks though the valve seat. If leakage is found, correct the sealing surface.



⚠ WARNING

Always use extreme caution when handling gasoline.

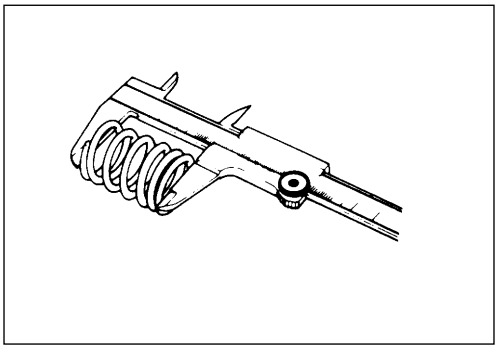
VALVE SPRING INSPECTION

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.

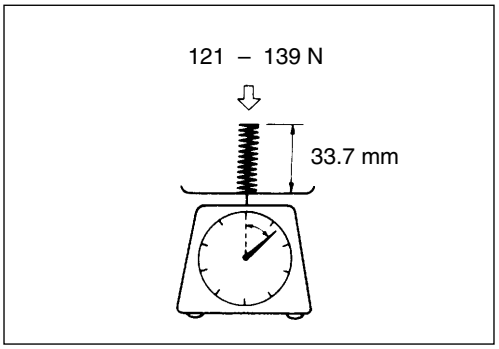
Check the valve springs for proper strength by measuring their free length and also by the force required to compress them. If the spring length is less than the service limit or if the force required to compress the spring does not fall within the specified range, replace both the inner and outer springs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

DATA Valve spring free length (IN & EX)
Service Limit: 37.2 mm

TOOL 09900-20102 : Vernier calipers

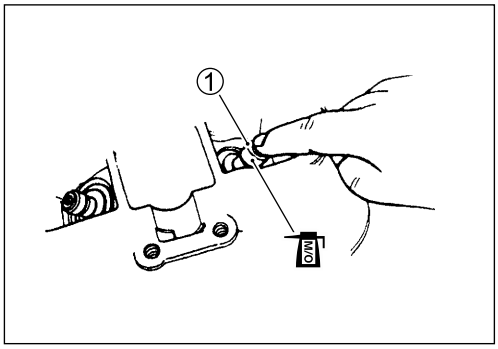


DATA Valve spring tension (IN & EX)
Standard: 121 – 139 N (12.1 – 13.9 kgf) at length 33.7 mm



REASSEMBLY

- Apply molybdenum oil on the stem seal ① and install it onto the valve guide by hand.

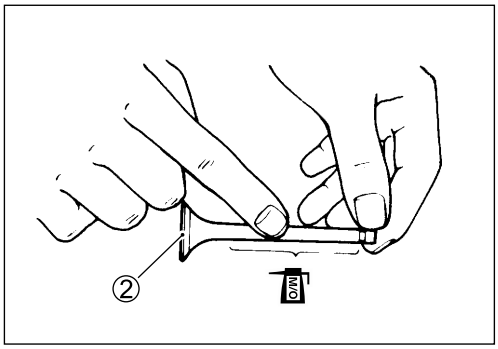


⚠ CAUTION

Replace the stem seal with new one.

M/O **MOLYBDENUM OIL**

- With the entire surface of the valve stem coated with molybdenum oil, insert the valve ② into the valve guide.



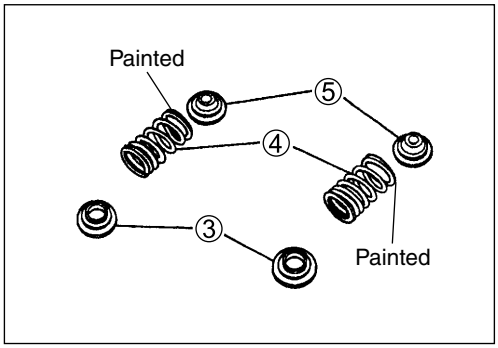
⚠ CAUTION

When installing the valve, insert the stem slowly while rotating and taking care not to cause damage to the oil seal lip.

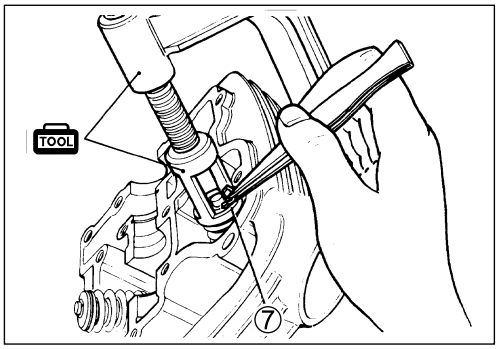
- Install the spring seat ③, valve spring ④ and spring retainer ⑤.

⚠ CAUTION

Install the valve spring with the small-pitch side down (facing the cylinder head) and the large-pitch side (painted side) up.



- Compress the valve spring using the valve lifter and the attachment.



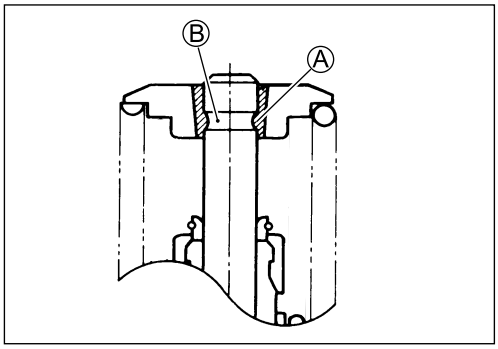
TOOL **09916-14510: Valve lifter**
09916-14910: Attachment (ϕ 22)
09916-84511: Tweezers

⚠ CAUTION

Compressing of the valve spring must be limited to the extent only necessary to prevent the spring from fatigue.

- Install the valve cotter halves ⑦.

NOTE:
To facilitate assembly, apply a little grease to the valve cotter when fitting into the valve stem groove.



⚠ CAUTION

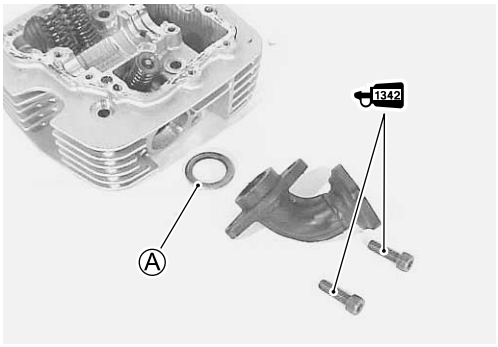
Check that the rounded lip Ⓐ of the cotter is securely fitted in the groove Ⓑ in the valve stem end.

EXAUST PIPE

- Fit the new exhaust pipe gasket Ⓐ.
- When installing the exhaust pipe, apply the THREAD LOCK to the exhaust pipe bolts and tighten them.

1342 99000-32050: THREAD LOCK "1342"

Exhaust pipe bolt: 23 N·m (2.3 kgf·m)



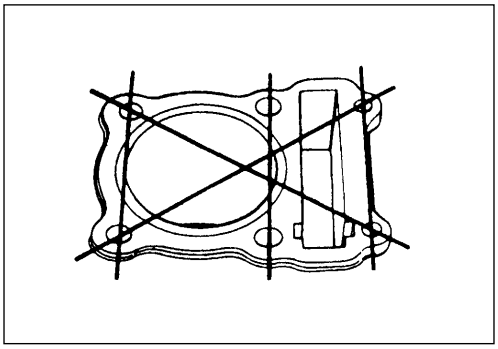
CYLINDER

CYLINDER DISTORTION

Measure the distortion in diagonal directions on the cylinder upper surface. If the distortion exceeds the service limit, replace the cylinder.

DATA Cylinder distortion: Service limit: 0.05 mm

TOOL 09900-20803: Thickness gauge



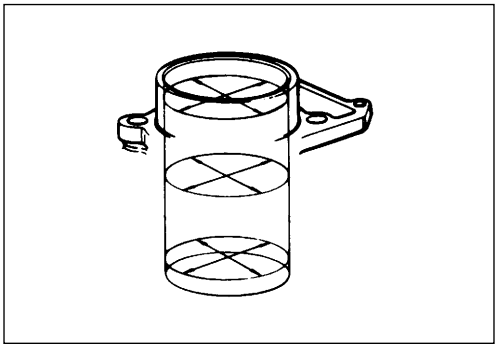
CYLINDER BORE DIAMETER INSPECTION

Check that there is not abnormal surface damage or wear on the cylinder wall.

At three positions, top, middle and bottom, measure the bore diameter. At each position, take two measurements, one parallel with and the other perpendicular to the crankshaft axis.

DATA Cylinder bore:
Standard: 44.000 – 44.015 mm
Limit: 44.100 mm

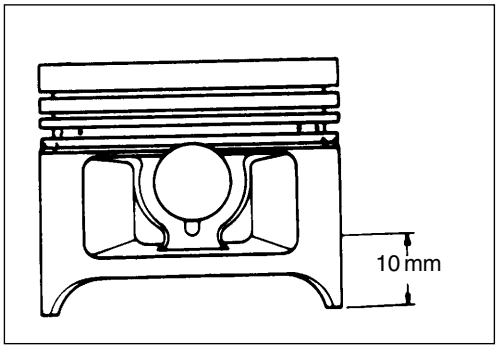
TOOL 09900-20508: Cylinder gauge set



PISTON

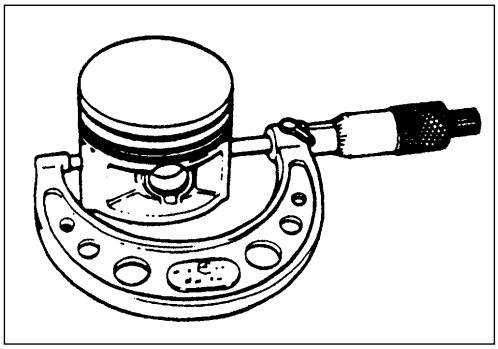
PISTON DIAMETER INSPECTION

Measure the piston outside diameter in the direction perpendicular to the piston pin axis at the height from the skirt as shown in the illustration using a micrometer.
If the measurement is found less than the service limit, replace the piston.



DATA Piston diameter:
Standard: 43.965 – 43.980 mm
Service Limit: 43.880 mm
Piston oversize: 0.5, 1.0 mm

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



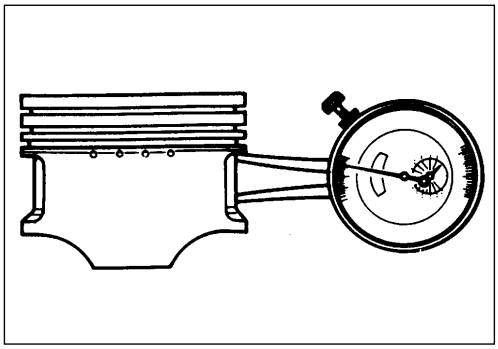
PISTON-TO-CYLINDER CLEARANCE

To determine the piston-to-cylinder clearance, calculate the difference between the cylinder bore and the piston outside diameter.

DATA Piston-to-cylinder clearance
Standard: 0.03 – 0.04 mm
Service Limit: 0.120 mm

PISTON PIN BORE

Using a small bore dial gauge, measure the piston pin bore both in the vertical and horizontal directions.
If the measurement exceeds the service limit, replace the piston.

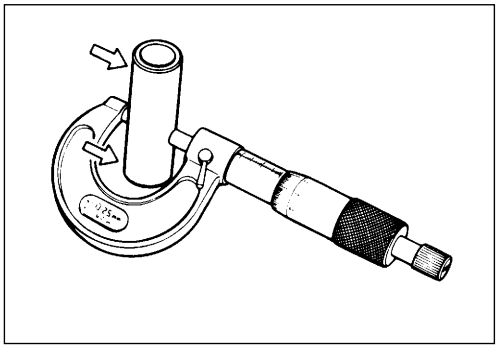


DATA Piston pin bore:
Standard: 12.002 – 12.008 mm
Service Limit: 12.030 mm

TOOL 09900-20605: Dial calipers

PISTON PIN DIAMETER INSPECTION

Using a micrometer, measure the piston pin outside diameter at three positions, both the ends and the center.
If any of the measurements is found less than the service limit, replace the pin.



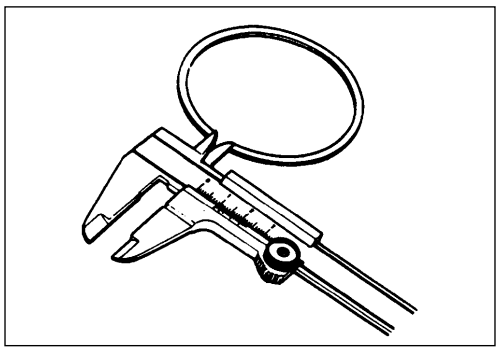
DATA Piston pin O.D.:
Standard: 11.996 – 12.000 mm
Service Limit: 11.980 mm

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

PISTON RING

PISTON RING FREE END GAP INSPECTION

Before installing piston rings, measure the free end gap of each ring using vernier calipers. If the gap is less than the service limit, replace the ring.

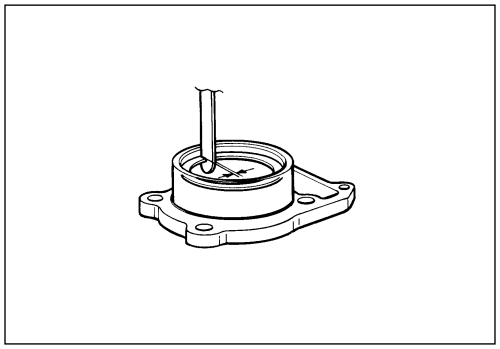


DATA Piston ring free end gap:
Standard: (1st) Approx. 4.3 mm
(2nd) Approx. 5.4 mm
Service Limit: (1st) 3.4 mm
(2nd) 4.3 mm

TOOL 09900-20102: Vernier calipers

PISTON RING END GAP INSPECTION

Insert the piston ring squarely into the cylinder using the piston head.
Measure the end gap with a thickness gauge.
If the gap exceeds the service limit, replace the piston ring.

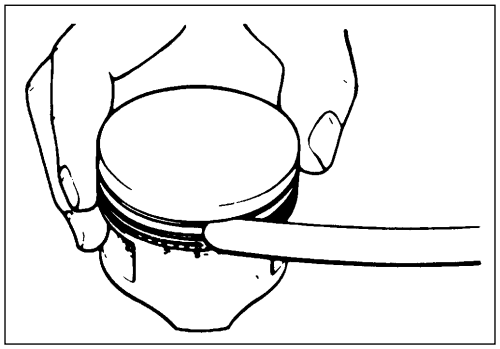


DATA Piston ring end gap:
Standard: (1st) 0.10 – 0.25 mm
(2nd) 0.10 – 0.25 mm
Service Limit: (1st) 0.5 mm
(2nd) 0.5 mm

TOOL 09900-20803: Thickness gauge

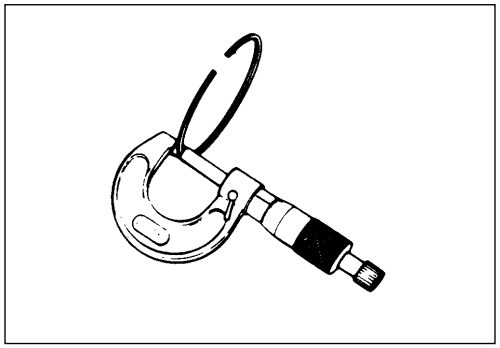
PISTON RING-TO-GROOVE CLEARANCE INSPECTION

Remove carbon deposit both from the piston ring and its groove. Fit the piston ring into the groove. With the ring compressed and lifted up, measure the clearance on the bottom side of the ring using a thickness gauge.



DATA Piston ring-to-Groove clearance:
Limit: (1st) 0.18 mm
(2nd) 0.15 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) 0.97 – 0.99 mm
(2nd) 0.97 – 0.99 mm

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

OVERSIZE RINGS

- **Oversize piston ring**

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

Piston ring 1st and 2nd

0.5 mm: 50

1.0 mm: 100

- **Oversize oil ring**

  The following two types of oversize oil ring are used. They bear the following identification marks.

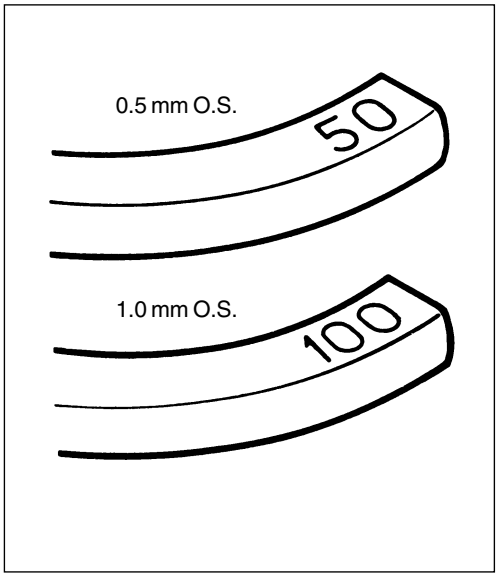
Oil ring side rail

0.5 mm: Painted red

1.0 mm: Painted yellow

- **Oil ring spacer**

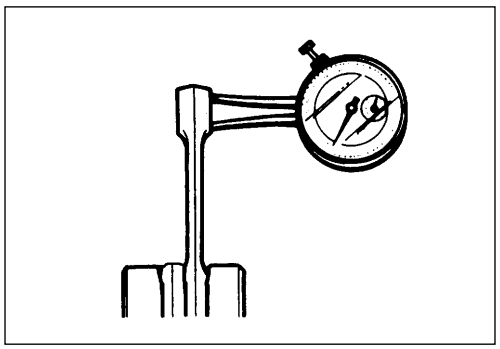
  Just measure outside diameter to identify the oil ring spacer as there is no mark or numbers on it.



CONROD AND CRANKSHAFT

CONROD SMALL END INSIDE DIAMETER INSPECTION

Using a small bore dial gauge, measure the conrod small end inside diameter both in vertical and horizontal directions. If any of the measurements exceeds the service limit, replace the conrod.

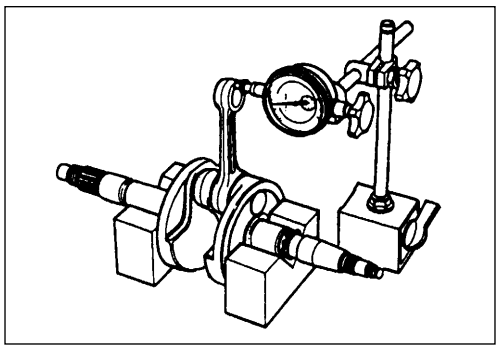


DATA Conrod small end I.D.:
Standard: 12.006 – 12.014 mm
Service Limit: 12.040 mm

TOOL 09900-20605: Dial calipers

CONROD DEFLECTION INSPECTION

Move the small end sideways while holding the big end immovable in thrust direction.
Measure the amount of deflection.
Turn the conrod and see if it moves smoothly without play and noise.
This method can check the extent of wear on the parts of the conrod's big end.

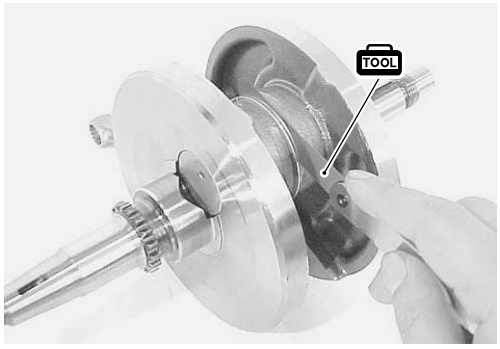


DATA Conrod deflecition: Service Limit: 3.0 mm

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

CONROD BIG END SIDE CLEARANCE INSPECTION

Using a thickness gauge, measure the side clearance at the conrod big end. If the measurement is out of standard value, measure the conrod big end and the crank pin widths individually to determine which one is to be replaced.

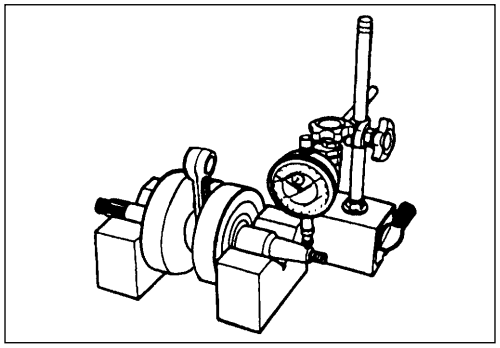


DATA Conrod big end side clearance
Standard: 0.10 – 0.56 mm
Service Limit: 1.00 mm

TOOL 09900-20803: Thickness gauge

CRANKSHAFT RUNOUT INSPECTION

With the right and left crank journals supported with V-block, turn the crankshaft slowly. At this time, measure the crankshaft end runout using a dial gauge. If the runout exceeds the service limit, replace the crankshaft.



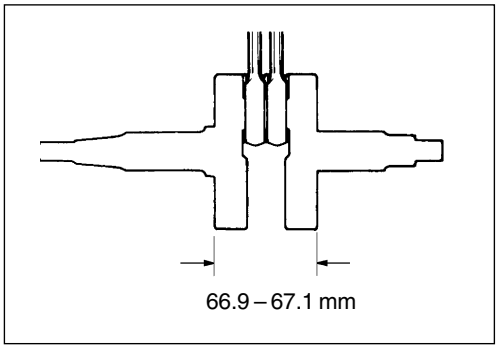
DATA Crankshaft runout: Service Limit: 0.08 mm

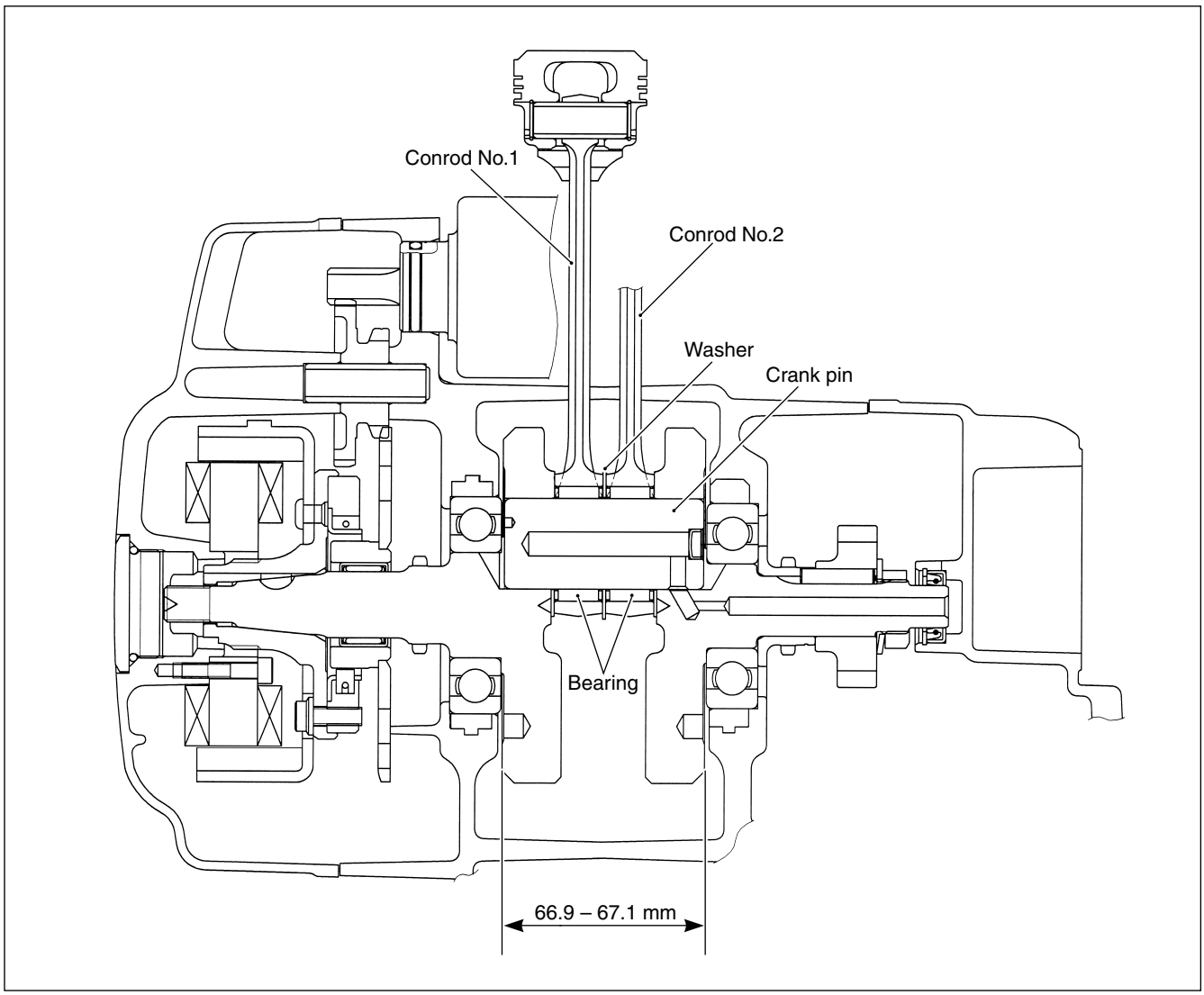
TOOL 09900-20701: Magnetic stand
09900-20606: Dial gauge (1/100 mm)
09900-21304: V-block

CRANKSHAFT REASSEBLY

- Decide the width between the webs referring to the figure below when rebuilding the crankshaft.

DATA STD width between webs: 66.9 – 67.1 mm



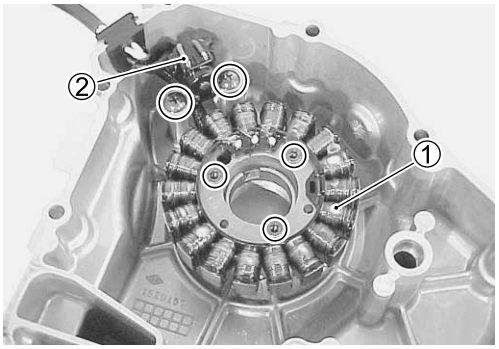


GENERATOR COVER

GENERATOR INSPECTION: ☞6-8
SIGNAL GENERATOR INSPECTION: ☞6-19

DISASSEMBLY

- Remove the generator ① and signal generator ②.



STARTER CLUTCH

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

DISASSEMBLY

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

TOOL 09930-44530: Rotor holder

REASSEMBLY

- Assemble the starter clutch with its stamp mark facing outside.

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

1342 99000-32050: THREAD LOCK “1342”

TOOL 09930-44530: Rotor holder

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

STARTER DRIVEN GEAR

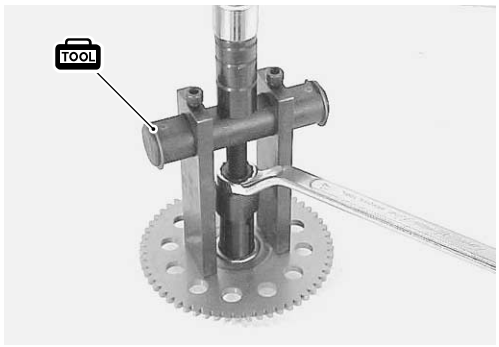
STARTER DRIVEN GEAR BEARING

Install the starter driven gear bearing ① and gear ② onto the crankshaft and turn the starter driven gear by hand. Inspect the starter driven gear bearing for smooth rotation and any abnormal noise. If the bearing does not turn smoothly or there is any abnormal noise, replace it.

DISASSEMBLY

- Remove the bearing using the special tool.

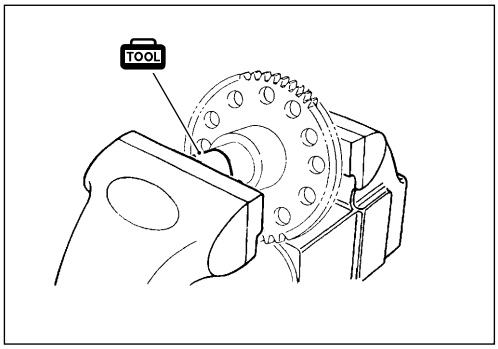
TOOL 09921-20220: Bearing remover set (ϕ 20)



REASSEMBLY

- Press in the needle bearing using a vice and bearing installer.

TOOL 09913-70210: Bearing installer set (ϕ 30)



CLUTCH COVER

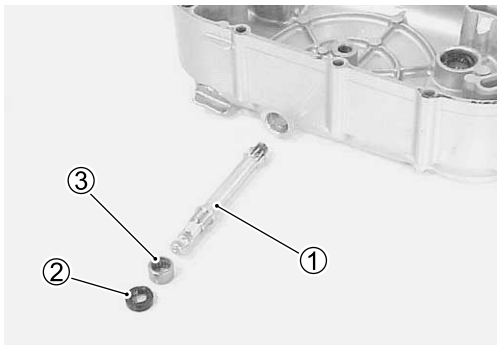
OIL FILTER REPIACEMENT: ☞2-12

DISASSEMBLY

- Remove the circlip and right crankshaft oil seal.

TOOL 09913-50121: Oil seal remover

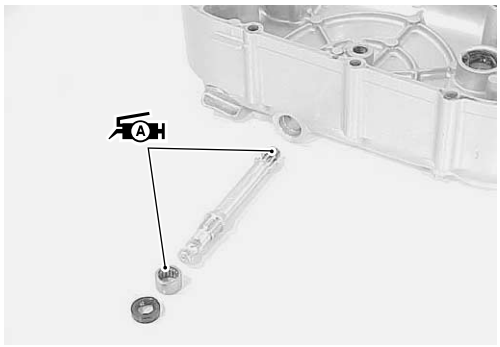
- Draw out the clutch release camshaft ①, oil seal ② and bearing ③.

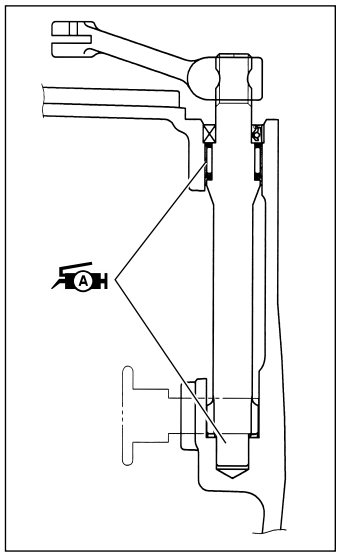


REASSEMBLY

- With the grease to the clutch release camshaft and bearing applied, install them.

A 99000-25010: SUZUKI SUPER GREASE "A"

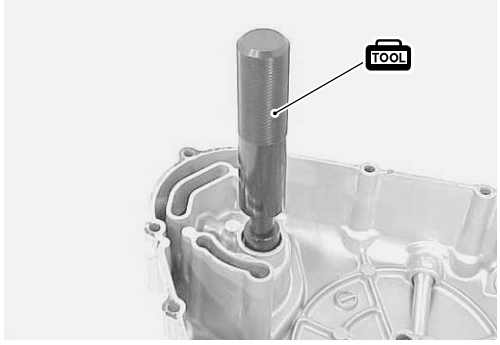




- Drive in the oil seal using the special tool.

TOOL 09913-70210: Bearing installer set

- Install the circlip.



CLUTCH

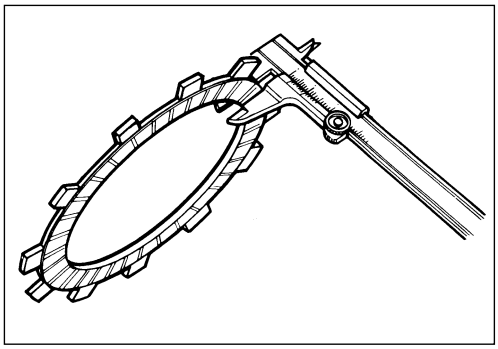
CLUTCH DRIVE PLATES

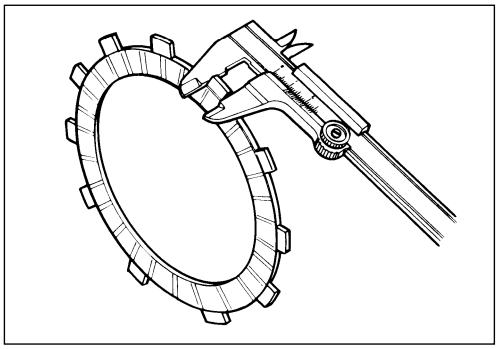
Measure the thickness and claw width of the clutch drive plates using vernier calipers. If a clutch drive plate is not within the service limit, replace the clutch plates as a set.

TOOL 09900-20101: Vernier calipers

DATA Thickness: Service Limit: No. 1 2.6 mm
No. 2 3.1 mm

Claw width: Service Limit: No. 1 15.1 mm
No. 2 15.1 mm



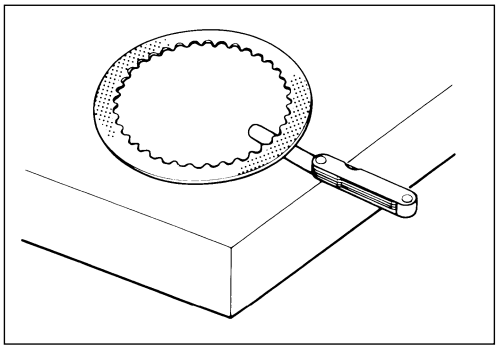


CLUTCH DRIVEN PLATES

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.

TOOL 09900-20803: Thickness gauge

DATA Clutch driven plate distortion:
Service Limit: 0.10 mm

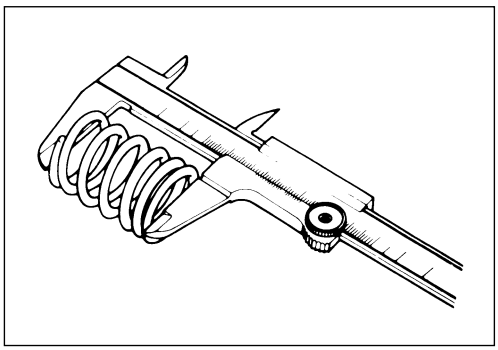


CLUTCH SPRING FREE LENGTH

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.

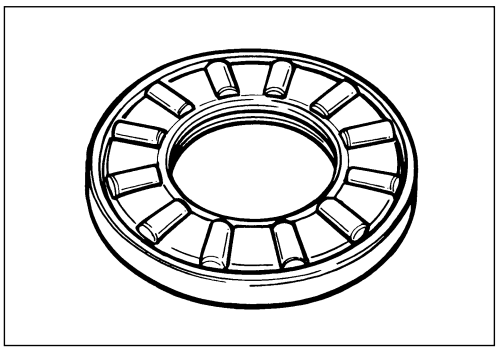
TOOL 09900-20101: Vernier calipers

DATA Clutch spring free length:
Service Limit: 38.5 mm



CLUTCH RELEASE BEARING

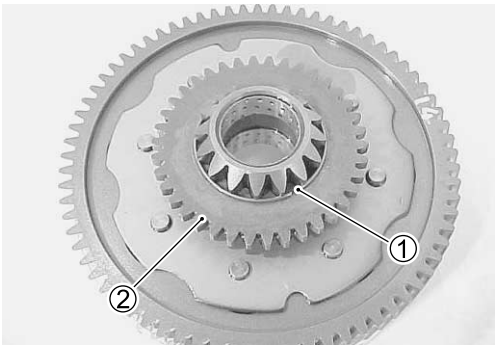
Inspect the clutch release bearing for any abnormality, especially cracks. When removing the bearing from the clutch, decide whether it can be reused or if it should be replaced.
Smooth engagement and disengagement of the clutch depends on the condition of this bearing.



PRIMARY DRIVEN GEAR

DISASSEMBLY

- Remove the ring ① and oil pump drive gear ②.

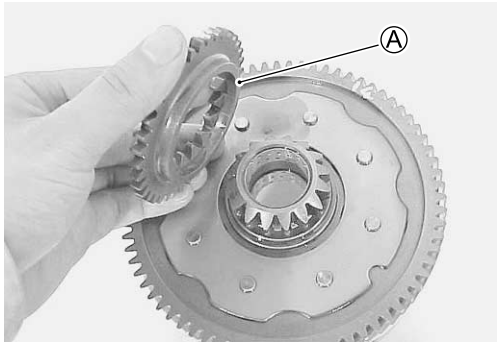


INSPECTION

Inspect the primary driven gear bearing for any damage. If any abnormal condition are found, replace the primary driven gear.

REASSEMBLY

- Install the oil pump drive gear with its flanged side Ⓐ facing inside.



OIL PUMP

⚠ CAUTION

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

INSPECTION

Turn the oil pump shaft and check that rotation is smooth. If any abnormal condition is found, replace the oil pump with a new one.

GEARSHIFT SHAFT

Disassemble and reassemble the gearshift shaft as shown in right picture.

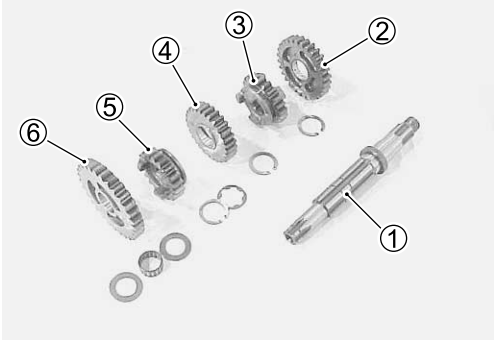
TRANSMISSION

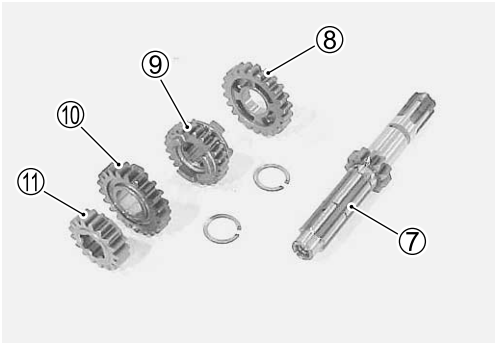
DISASSEMBLY

- Disassemble the transmission gears as shown in right pictures.

① Drive shaft
  ② 2nd driven gear
  ③ 4th driven gear
  ④ 3rd driven gear
  ⑤ 5th driven gear
  ⑥ 1st driven gear

⑦ Countershaft
  ⑧ 5th drive gear
  ⑨ 3rd drive gear
  ⑩ 4th drive gear
  ⑪ 2nd drive gear





INSPECTION

GEAR-SHIFTING FORK

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

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

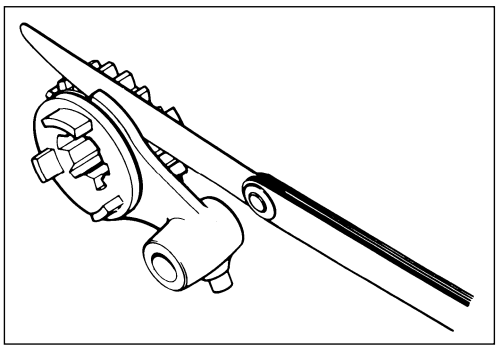
If the clearance checked is noted to exceed the limit specified, replace the fork or its gear, or both.

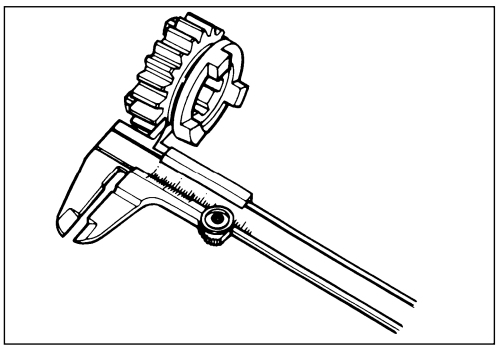
TOOL 09900-20803: Thickness gauge
09900-20101: Vernier calipers

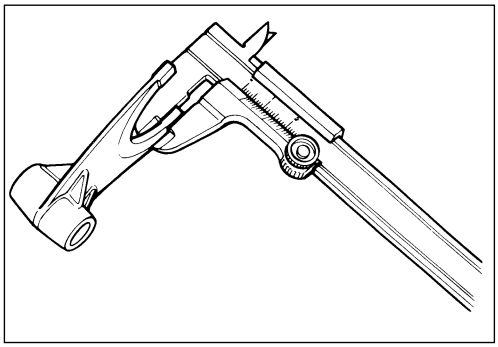
DATA Shift fork – Groove clearance:
Standard: 0.20 – 0.40 mm
Service Limit: 0.60 mm

DATA Shift fork groove width:
Standard: 4.25 – 4.35 mm

DATA Shift fork thickness:
Standard: 3.95 – 4.05 mm







REASSEMBLY

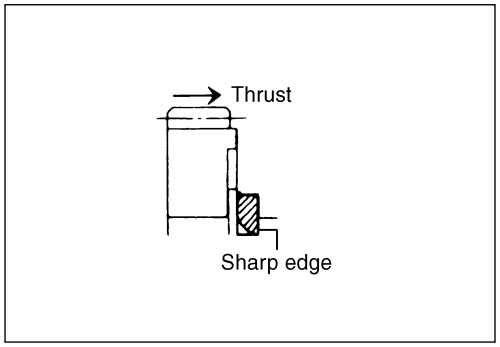
Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to following points:

NOTE:
Always use new circlips.

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

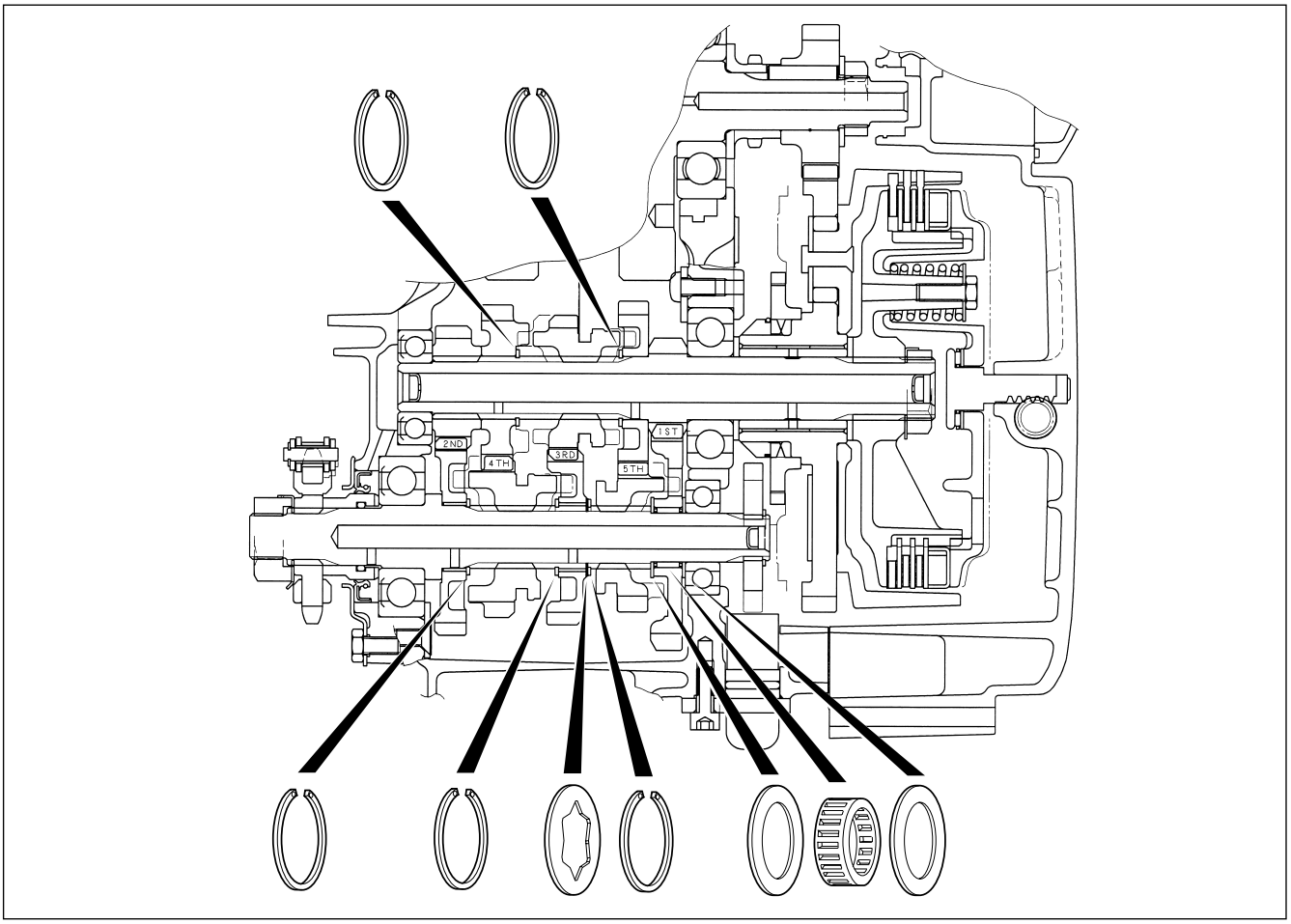
⚠ CAUTION

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



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

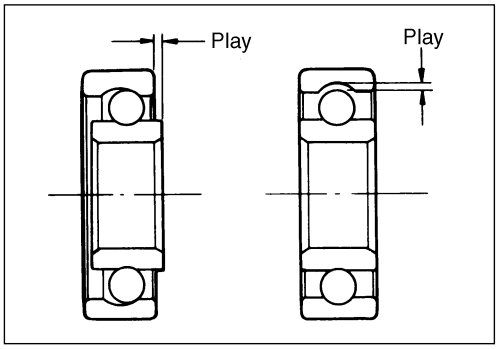
TRANSMISSION GEARS AND RELATED PARTS



CRANKCASE

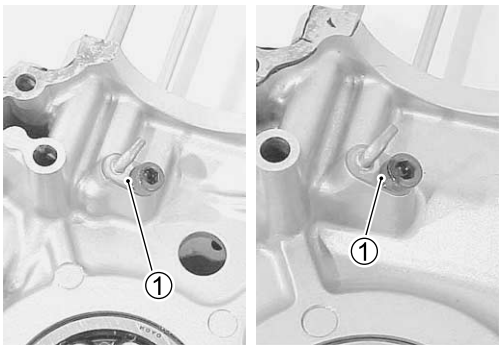
BEARING INSPECTION

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.



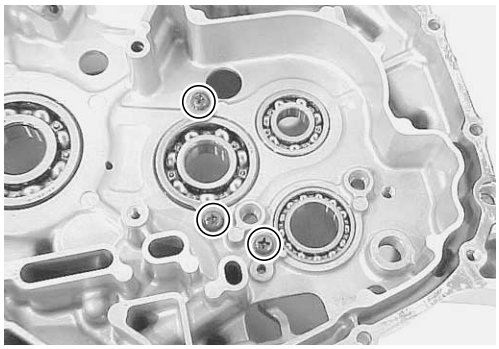
DISASSEMBLY

- Remove the oil nozzle ①.



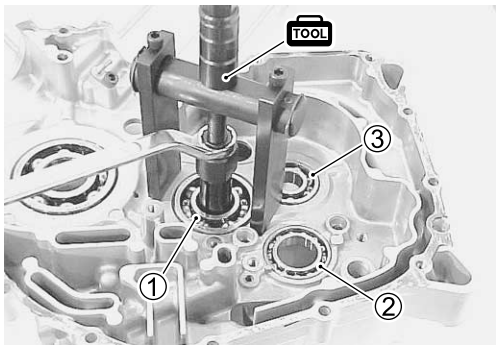
RIGHT CRANKCASE BEARING

- Remove the bearing retainer.



- Remove the bearings ①, ② and ③.

TOOL 09921-20220: Bearing remover set (①: ϕ 20, ②: ϕ 25, ③: ϕ 17)



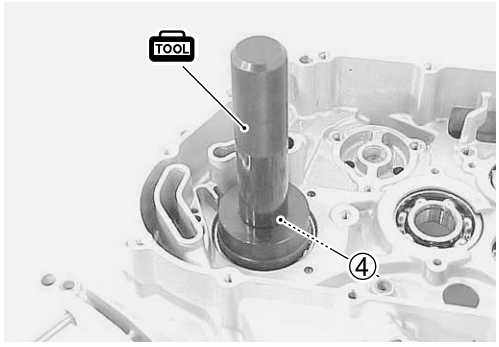
- Remove the bearing ④.

TOOL 09913-75520: Bearing installer set (ϕ 55)

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

⚠ CAUTION

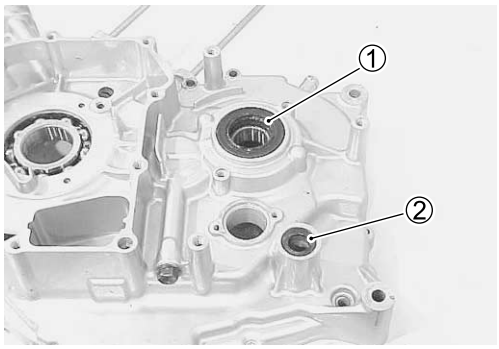
The removed bearing should be replaced with a new one.



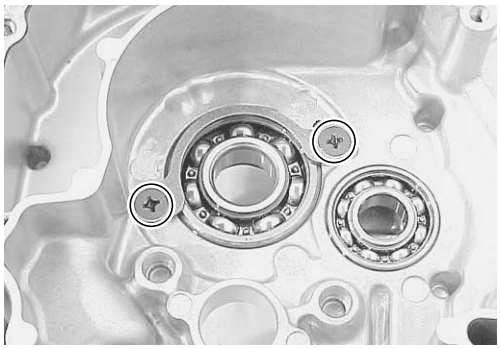
LEFT CRANKCASE BEARING

- Remove the oil seals ① and ②.

TOOL 09913-50121: Oil seal remover

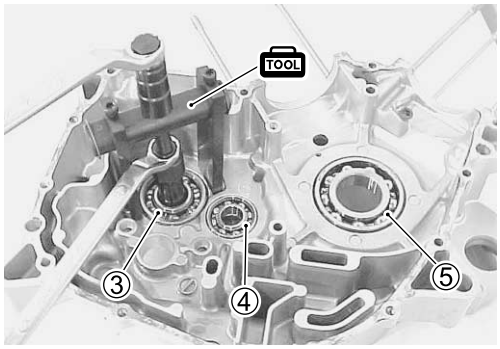


- Remove the bearing retainer.



- Remove the bearings ③, ④ and ⑤.

TOOL 09921-20220: Bearing remover set
(③: ϕ 20, ④: ϕ 17, ⑤: ϕ 35)



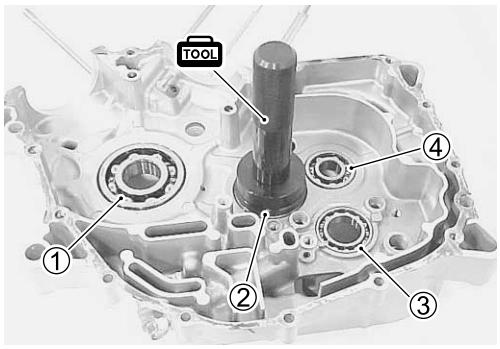
REASSEMBLY

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

RIGHT CRANKCASE BEARING

- Drive in the bearings ①, ②, ③ and ④.

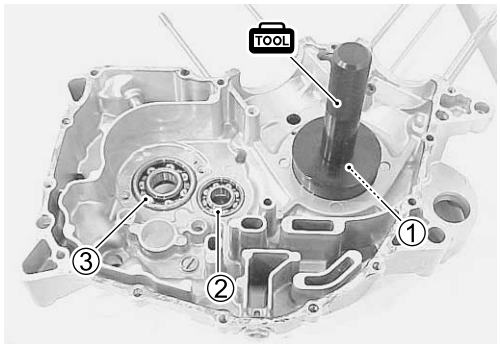
TOOL 09913-70210: Bearing installer set
(①: ϕ 68, ②: ϕ 55, ③: ϕ 42, ④: ϕ 42)



LEFT CRANKCASE BEARING

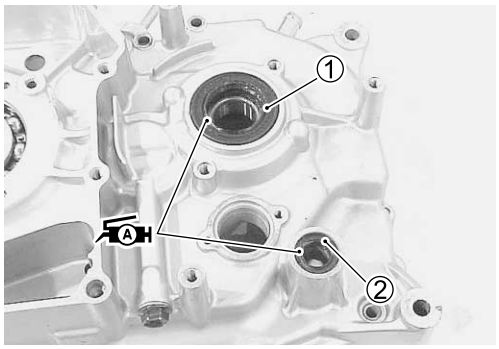
- Drive in the bearings ①, ② and ③.

TOOL 09913-70210: Bearing installer set
(①: ϕ 72, ②: ϕ 40, ③: ϕ 55)



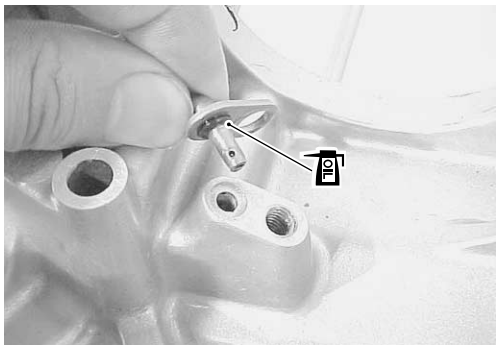
- Install the oil seals ① and ②.
- Apply grease on the lip of oil seal.

99000-25010: SUZUKI SUPER GREASE "A"

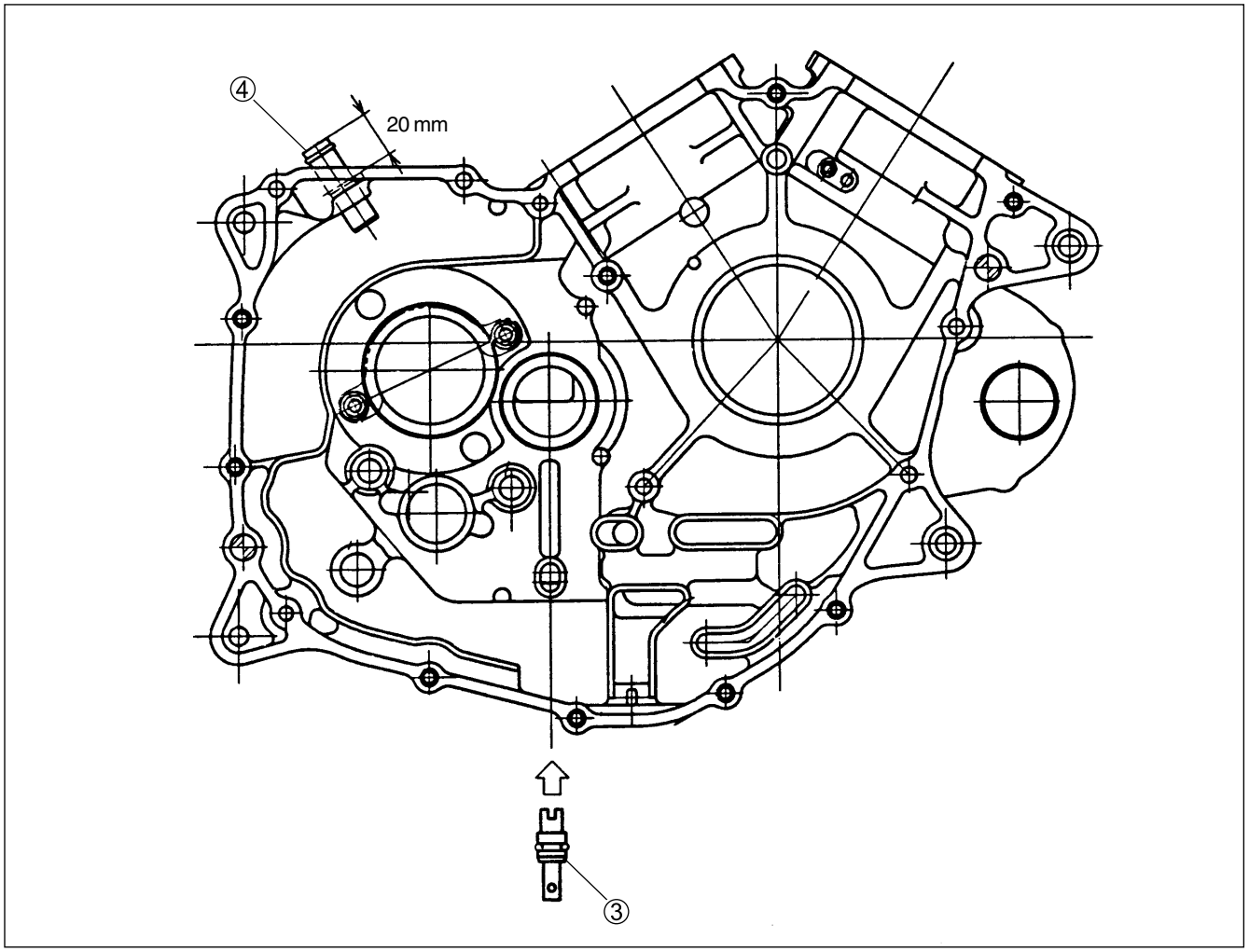


- Apply the engine oil to the O-ring.
- Install the oil nozzle.

NOTE:
Before installing the oil nozzle, check or clean its oil passage.



- Install the oil jet ③ as shown in illustration.
- Depress the breather union pipe ④ as shown in illustration.

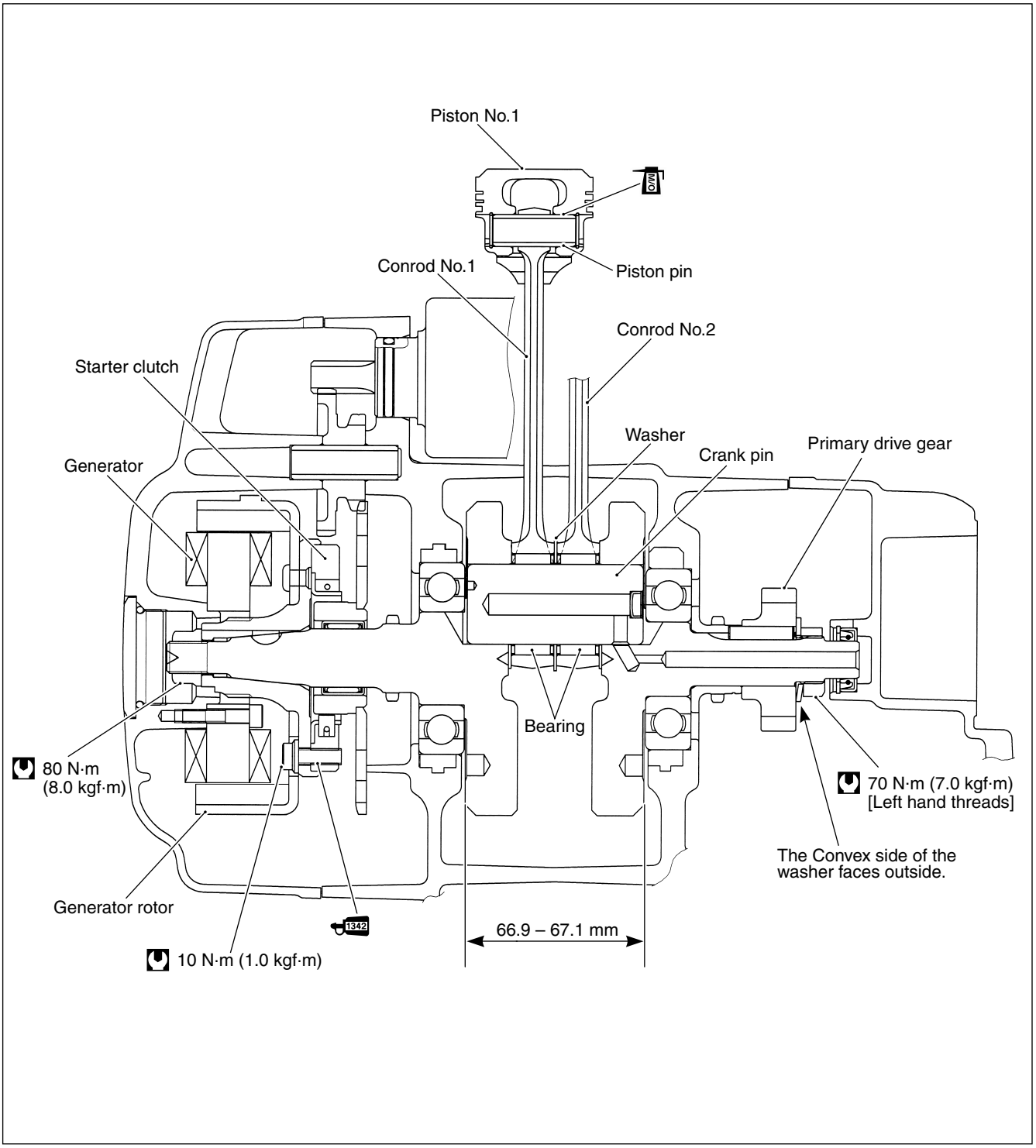


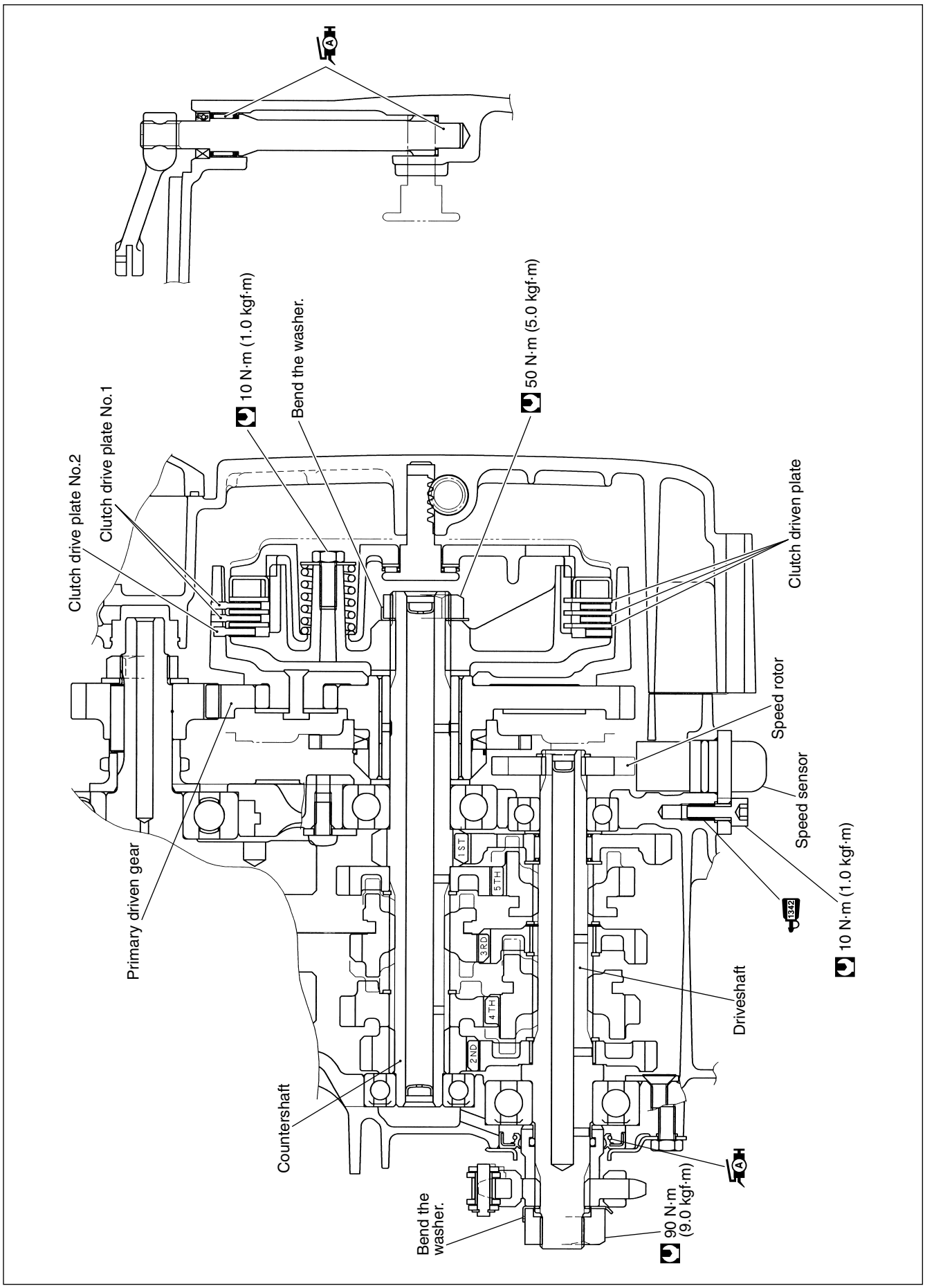
ENGINE REASSEMBLY

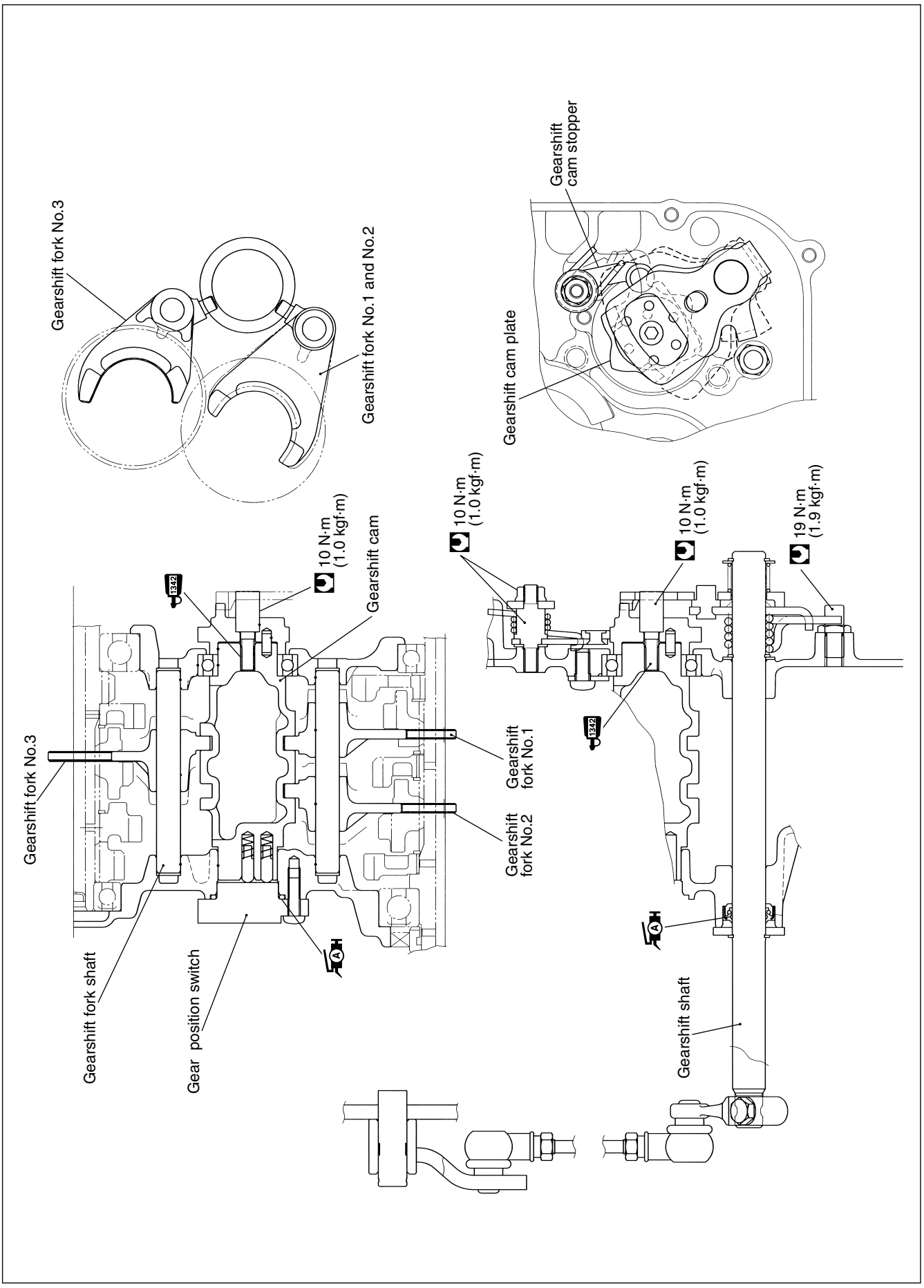
The engine reassembly can be performed in the reverse order of disassembly procedures. However, the following points must be observed in the reassembly operation.

⚠ CAUTION

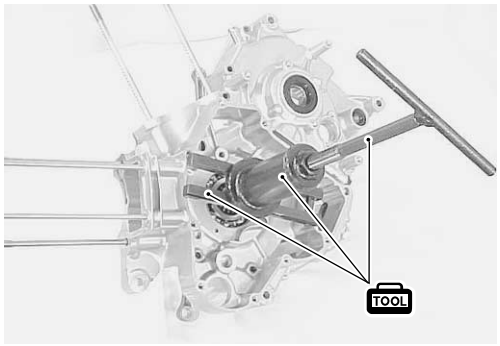
*** Make sure to coat the rotating and sliding sections with engine oil.**
*** Care must be taken so that the drive belt, drive face and driven face are completely free from oil and grease.**







CRANKSHAFT



- Using the special tool, press in the crankshaft into the left crankcase.

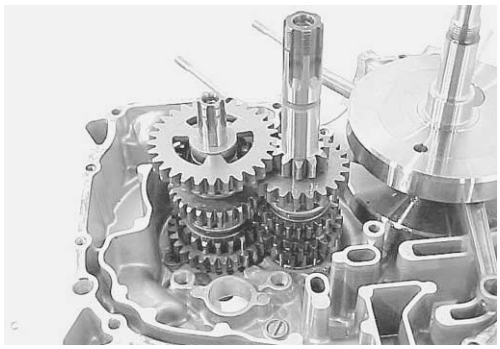
NOTE:
Fit steel plates between the crankcase and the special tool when installing the crankshaft with the special tool.

TOOL **09910-32812: Crankshaft installer**
09910-11310: Crankshaft installer attachment
09910-20116: Conrod holder

⚠ CAUTION

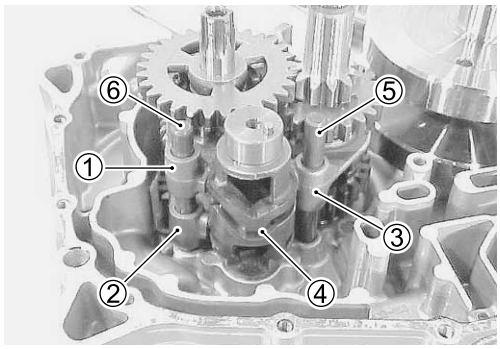
*** Do not hit the crankshaft with a plastic hammer or the like to install it into the crankcase.**
*** Do not contact the conrod holder with the crankshaft when installing the crankshaft.**
*** Align the conrods position before installing the crankshaft.**

TRANSMISSION



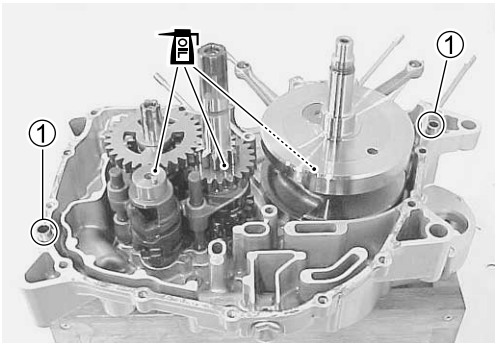
- Install the transmission.

GEARSHIFT CAM AND GEARSHIFT FORKS



- Install the geashift forks No. 1 ①, No. 2 ② and No. 3 ③.
- Install the geashift cam ④ and gearshift fork shafts ⑤, ⑥.

- Install the dowel pins ①.
- Before assembling the crankcase, apply the engine oil to each gears and bearings.



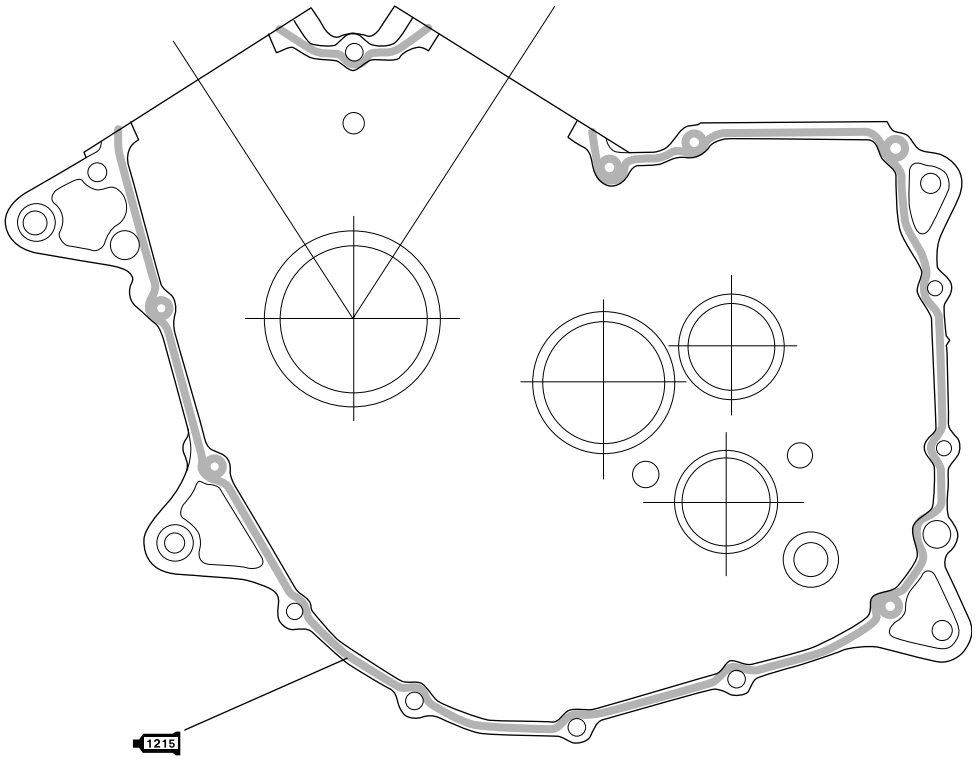
- Apply sealant to the right crankcase.

1215 **99000-31110: SUZUKI BOND "1215"**

⚠ CAUTION

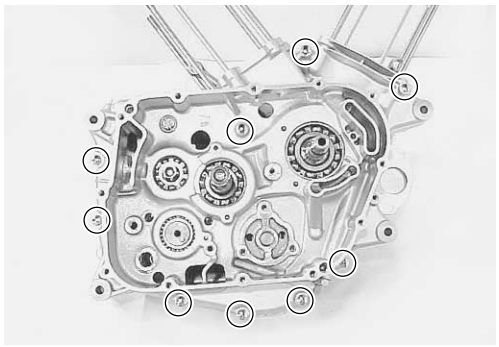
*** Coat the sealant evenly without break.**
*** Application of sealant must be performed within a short period of time.**
*** Take extreme care not to let sealant enter into the oil hole or bearing.**

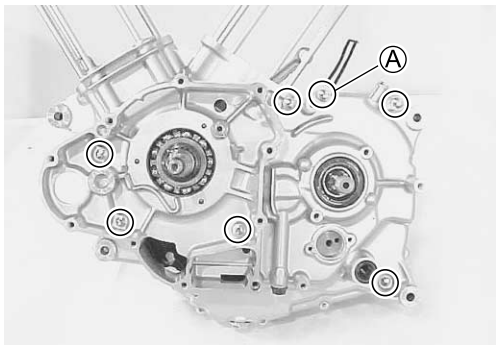
Right crankcase



- Assemble the crankcases with in few minutes.
- Install the clamp Ⓐ.
- Tighten the crankcase bolts.

Crankcase bolt: 11 N·m (1.1 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.*

- Apply the grease to the driveshaft O-ring and oil seal lip.
- Install the driveshaft spacer.

99000-25010: SUZUKI SUPER GREASE "A"

- Install the oil seal retainer.

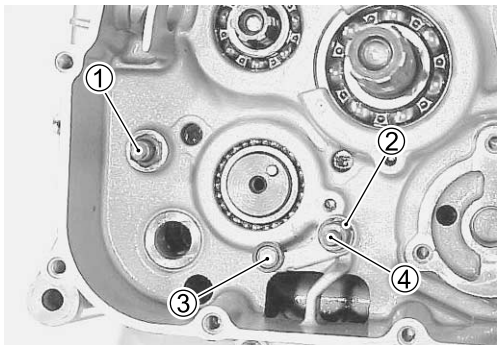
GEARSHIFT SHAFT

- Install the gearshift arm stopper ①.

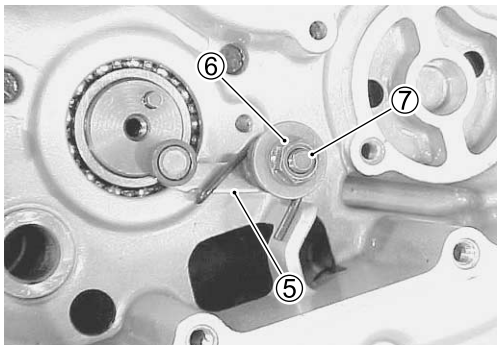
Gearshift arm stopper: 19 N·m (1.9 kgf·m)

- Install the washer ② and gearshift cam stopper ③, and tighten the gearshift cam stopper bolt ④.

Gearshift cam stopper bolt: 10 N·m (1.0 kgf·m)



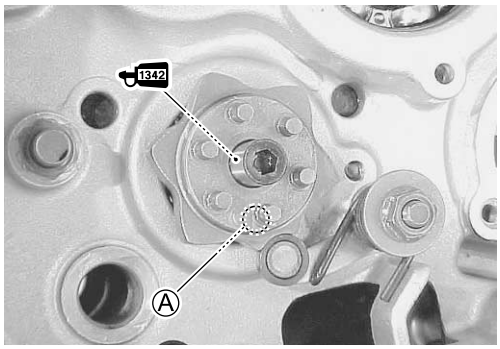
- Hook the gearshift cam stopper spring ⑤.
- Install the washer ⑥ and nut ⑦.



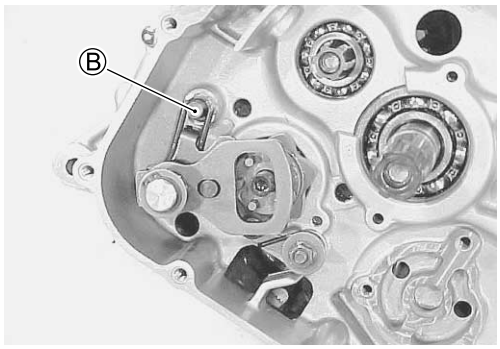
- Check the neutral position.
- Install the gearshift cam stopper plate after aligning the gearshift cam pins Ⓐ with the gearshift cam stopper plate holes.
- Apply a small quantity of THREAD LOCK to the gearshift cam stopper plate bolt and tighten it to the specified torque.

1342 99000-32050: THREAD LOCK "1342"

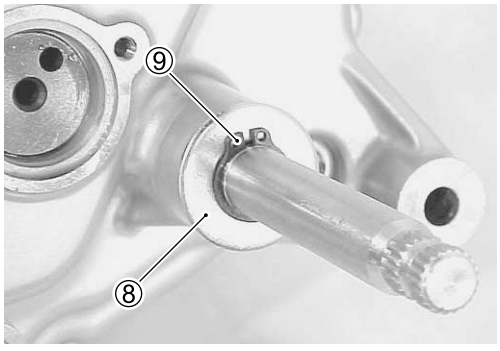
Gearshift cam stopper plate bolt: 10 N·m (1.0 kgf·m)



- Install the gearshift shaft after aligning the return spring with the gearshift arm stopper Ⓑ.

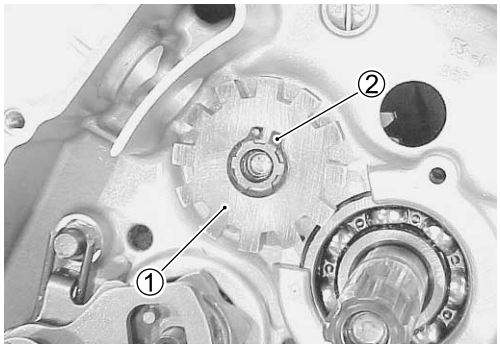


- Install the washer ⑧ and circlip ⑨.



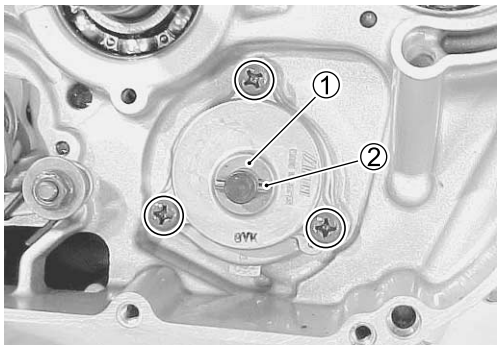
SPEED SENSOR ROTOR

- Install the speed sensor rotor ① and circlip ②.

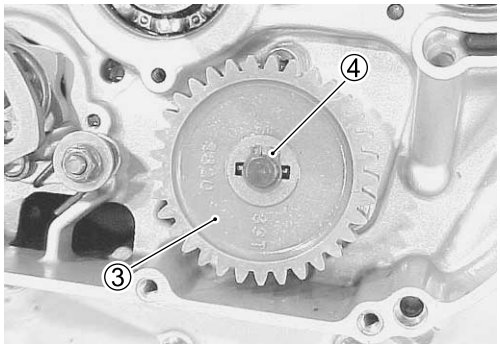


OIL PUMP

- Install the oil pump.
- Install the washer ① and pin ②.



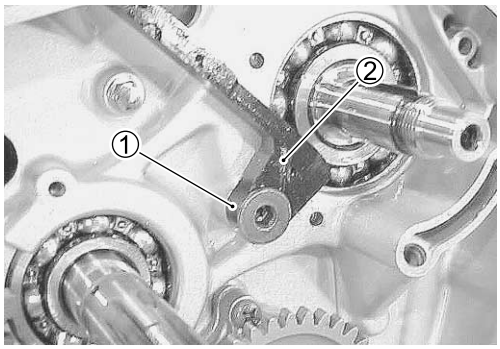
- Install the oil pump driven gear ③ and circlip ④.



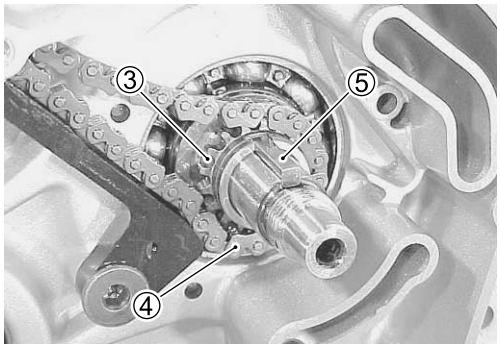
CAM CHAIN TENSIONER

- Install the washer ① and cam chain tensioner ②, and tighten the cam chain tensioner bolt.

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



- Install the cam chain drive sprocket ③, cam chain ④ and key ⑤.



PRIMARY DRIVE GEAR

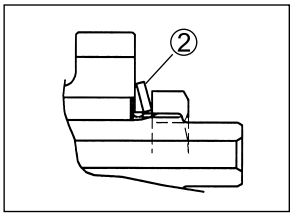
- Install the primary drive gear ①, washer ② and primary drive gear nut.

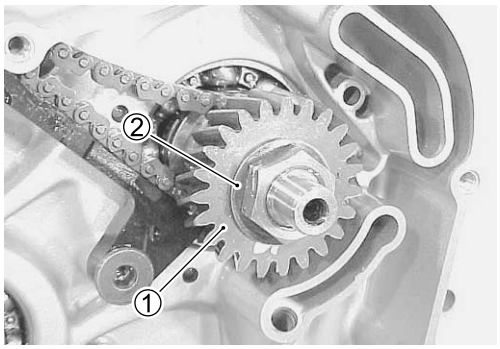
NOTE:

** The convex side of the washer ② faces outside.*

** The primary drive gear nut has left hand threads.*

** When tightening the primary drive gear nut, install the key and generator rotor temporarily.*

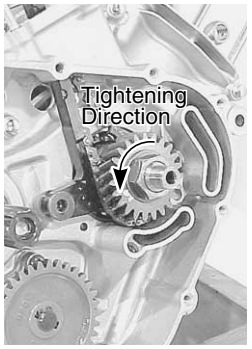




- With the generator rotor held immovable using special tool, tighten the primary drive gear nut.

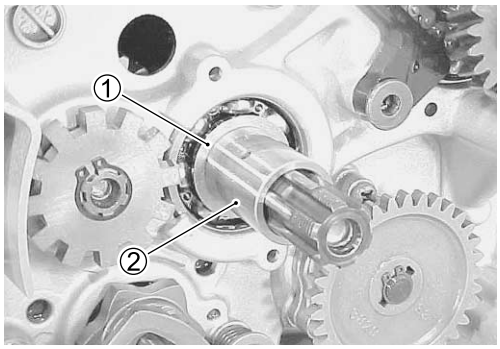
TOOL 09930-44530: Rotor holder

Primary drive gear nut: 70 N·m (7.0 kgf·m)



PRIMARY DRIVEN GEAR

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



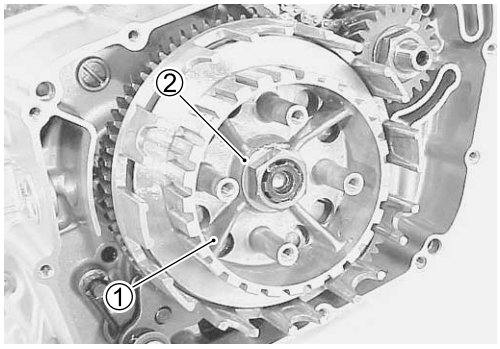
NOTE:

Apply engine oil to the inside surface of the primary driven gear bearing.

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

CLUTCH

- Install the clutch sleeve hub ①, lock washer ② and clutch sleeve hub nut.

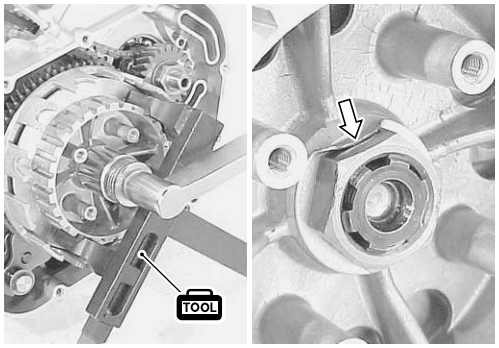


- Install the clutch sleeve hub nut, and tighten it to the specified torque using the special tool.

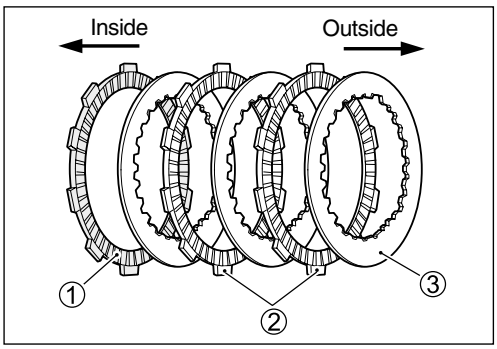
TOOL 09920-53740: Clutch sleeve hub holder

Clutch sleeve hub nut: 50 N·m (5.0 kgf·m)

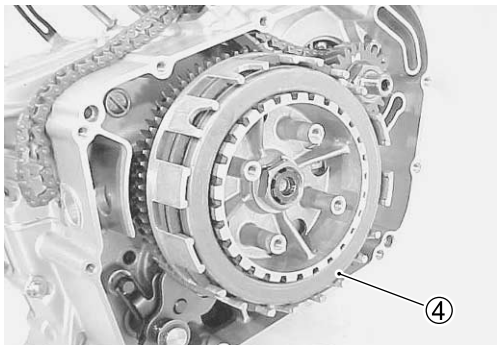
- Bend the lock washer securely.



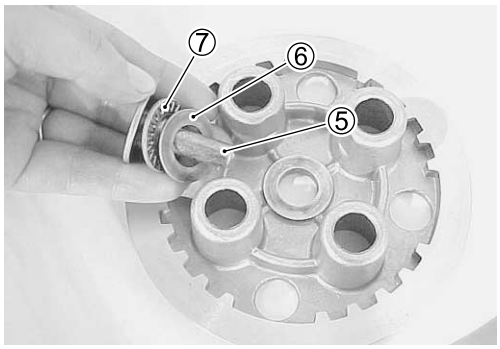
- Install the clutch drive plates and driven plates.
  ① Clutch drive plate No. 2
  ② Clutch drive plate No. 1 (×2)
  ③ Clutch driven plate (×3)



- Install the clutch plate spacer ④.



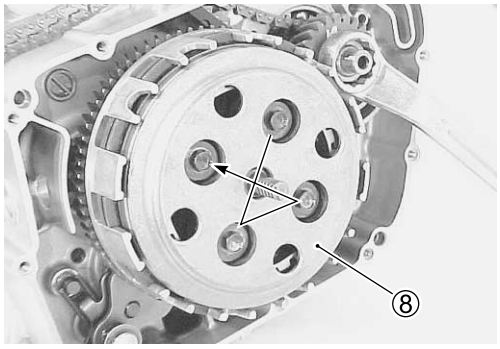
- Install the clutch release rack ⑤, bearing ⑥ and washer ⑦.



- Install the clutch pressure plate ⑧, clutch springs and clutch spring mounting bolts.
- Hold the primary drive gear nut and tighten the clutch spring mounting bolts in a crisscross pattern.

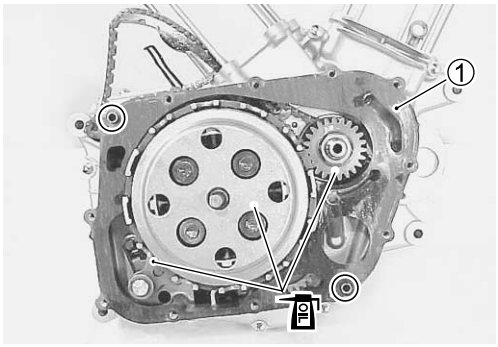
NOTE:
Make sure that the clutch pressure plate is installed correctly.

Clutch spring mounting bolt: 10 N·m (1.0 kgf·m)

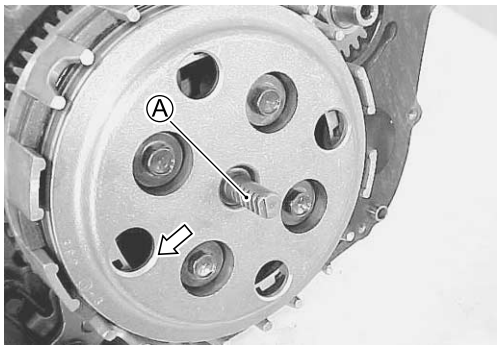


CLUTCH COVER

- Install the two dowel pins and new gasket ①.
- Apply engine oil to each gears, bearings and clutch plates.

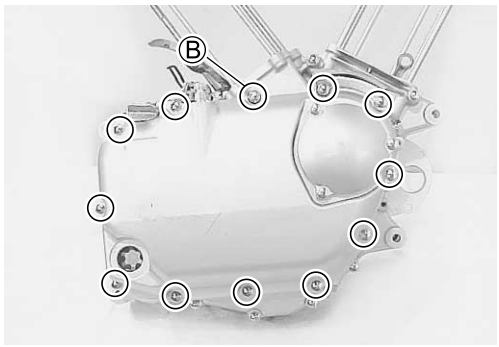


- Face the rack teeth Ⓐ backward and align the clutch release rack with the pinion gear.

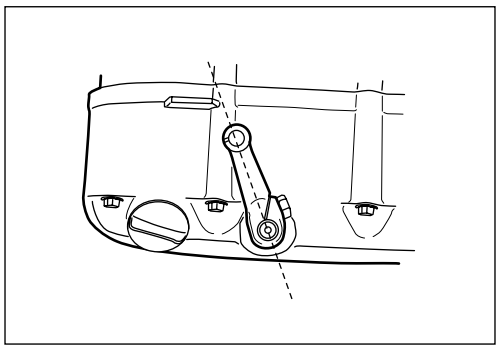


- Tighten the clutch cover bolts securely.

NOTE:
Install the new gasket washer to the bolt Ⓑ.



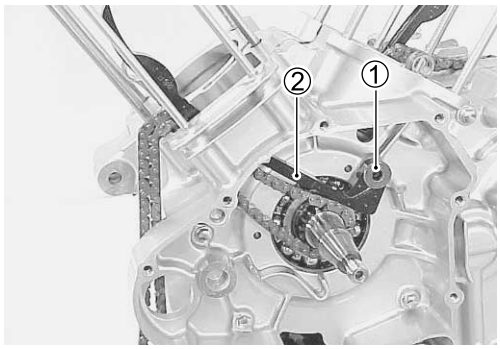
- Install the clutch release arm as shown in right illustration.



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

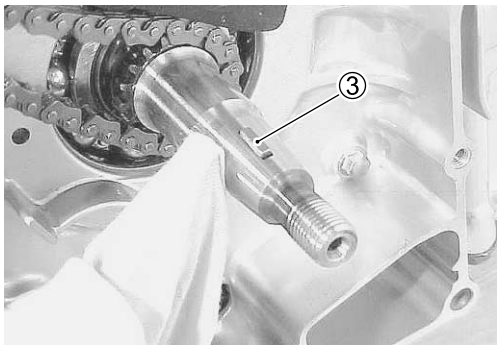
Cam chain tensioner bolt: 10 N·m (1.0 kgf·m)

- Install the cam chain.

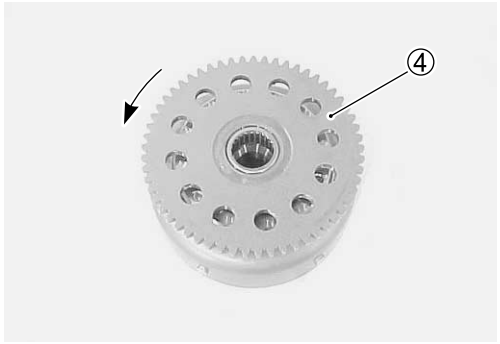


STARTER CLUTCH AND GENERATOR ROTOR

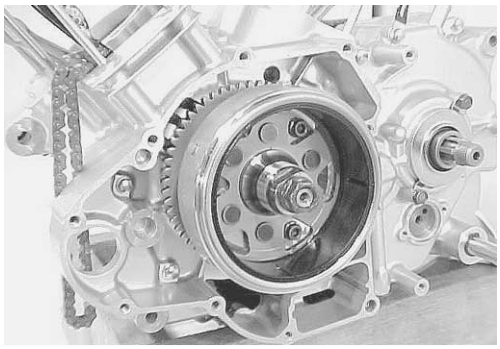
- Fit the key ③ in the slot on the crankshaft.
- Degrease the tapered portion of the rotor and also the crankshaft. Use nonflammable cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.



- Install the starter driven gear ④ to the starter clutch rotating the starter driven gear.



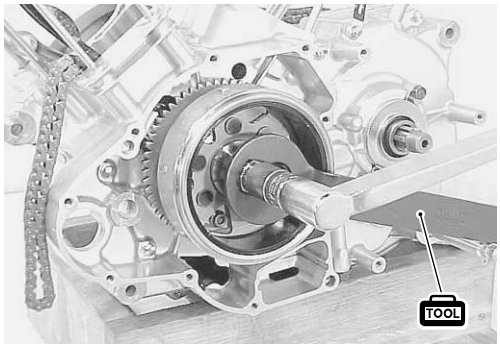
- Install the rotor with the starter driven gear onto the crankshaft securely.



- With the generator rotor held immovable using special tool, tighten the generator rotor nut to the specified torque.

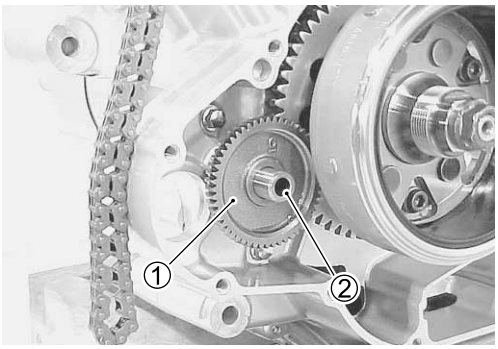
Generator rotor nut: 80 N·m (8.0 kgf·m)

09930-44530: Rotor holder



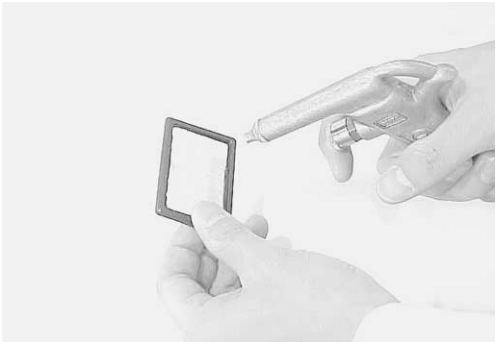
STARTER IDLE GEAR

- Install the starter idle gear ① and its shaft ②.



OIL SUMP FILTER

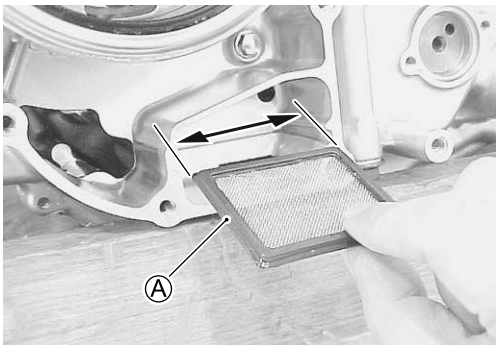
- Before installing the oil sump filter, clean it.



NOTE:

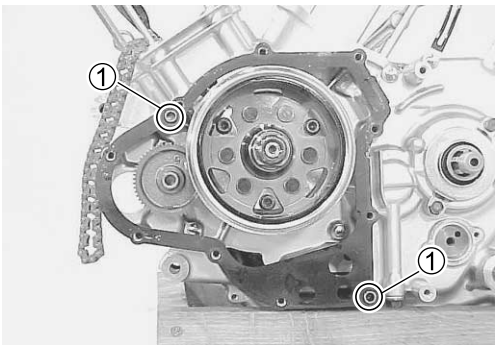
** The thinner side of the oil sump filter should be positioned inside.*

** The lip Ⓐ of the oil sump filter should be faced down ward.*



GENERATOR COVER

- Install the new gasket and dowel pins ①.
- Apply oil to the each gears, bearing and starter clutch.

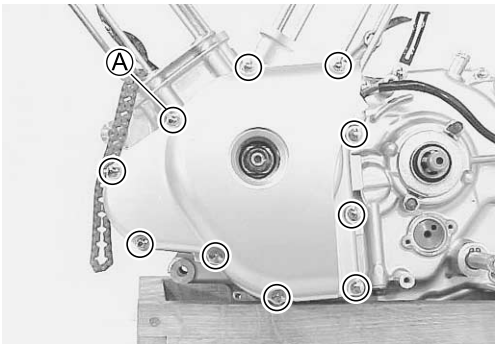


- Install the generator cover and tighten the generator cover bolts.

Generator cover bolt: 10 N·m (1.0 kgf·m)

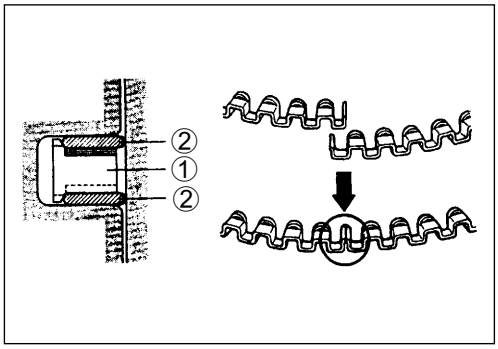
NOTE:

Install the new gasket washer to the bolt Ⓐ.



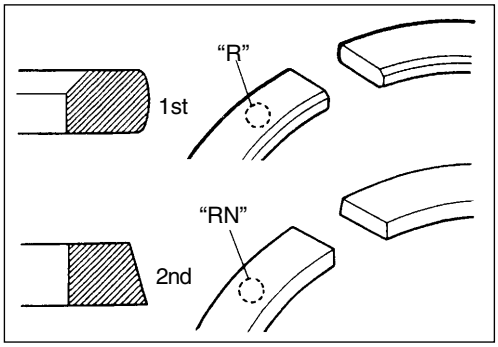
PISTON RING

- Install the piston rings in the order of oil ring, 2nd ring and top ring.
- To install the oil ring, fit the spacer ① first and then the side rails ②.

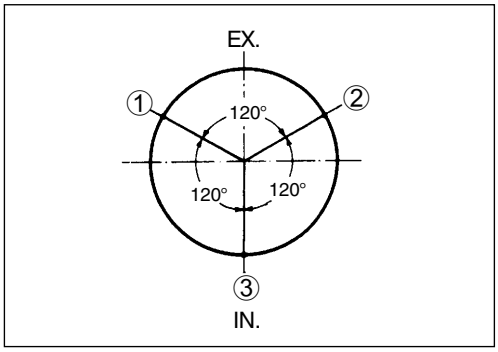


⚠ CAUTION

*** When inserting the spacer, take care not to have the ends overlapped.**
*** The top and 2nd rings have a stamped mark on the side. Be sure to bring the stamped mark side to the top when assembling to the piston.**
*** Be careful not to cause scratch on the piston when inserting the piston ring to the piston. Also, do not expand the piston ring more than necessary as the ring can break.**



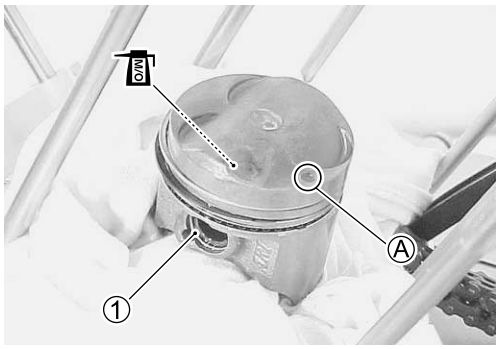
- When all the piston rings have been assembled, check that each can turn smoothly.
- To minimize compression and oil leaks, locate each piston ring end gap in the position as shown in the right illustration.
  - ① 2nd ring/side rail (lower side)
  - ② Side rail (upper side)
  - ③ Top ring/spacer



PISTON

- Apply MOLYBDENUM OIL to the piston pin.

MOLYBDENUM OIL



- When installing the piston, turn the mark Ⓐ on the piston head to exhaust side.
- After the piston pin has been inserted through the conrod, install the circlip ①.

⚠ CAUTION

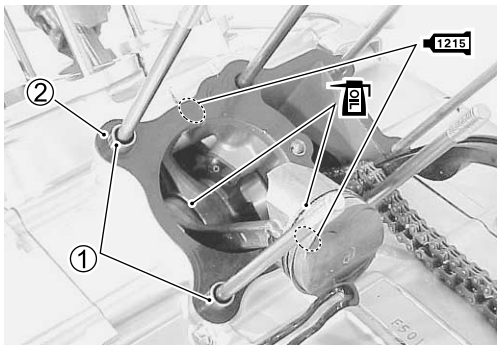
*** Replace the circlip with a new one.**
*** Place a piece of rag under the piston when installing the circlip to prevent it from falling into the crankcase.**
*** The circlip end gap must be positioned so as not to coincide with the piston pin bore cutaway.**

CYLINDER

- Apply sealant to parting line of crankcase.

1215 99000-31110: SUZUKI BOND "1215"

- Place the dowel pins ① and a new gasket ② on the crankcase.

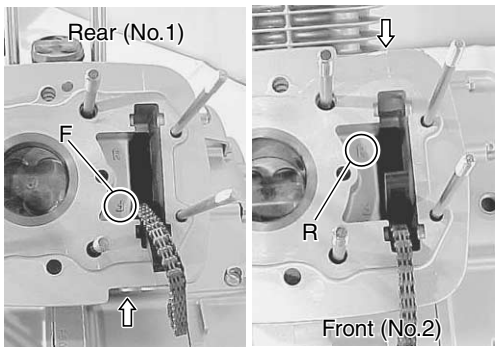


⚠ CAUTION

Make sure to replace the gasket with a new one.

- Apply the engine oil to the conrod big end, piston and the piston rings.
- Coat the cylinder wall with oil.
- Install the cylinder.

NOTE:
Rear (No. 1) cylinder has cam chain tension adjuster hole "F" side.
Front (No. 2) cylinder has cam chain tension adjuster hole "R" side.

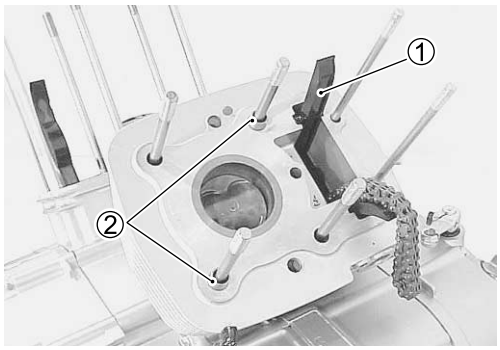


⚠ CAUTION

When inserting the piston into the cylinder, use care not to break the piston ring.

CAM CHAIN GUIDE

- Install the cam chain guide ① and dowel pins ②.

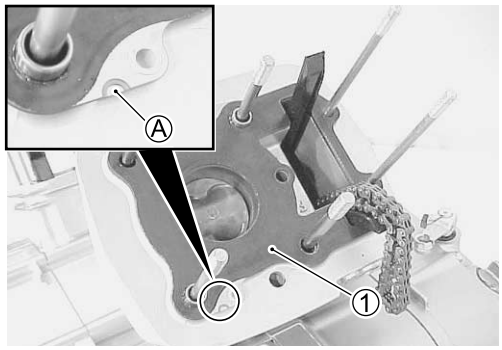


⚠ CAUTION

When installing the cam chain guide, check that the chain is properly engaged with the crankshaft sprocket.

CYLINDER HEAD

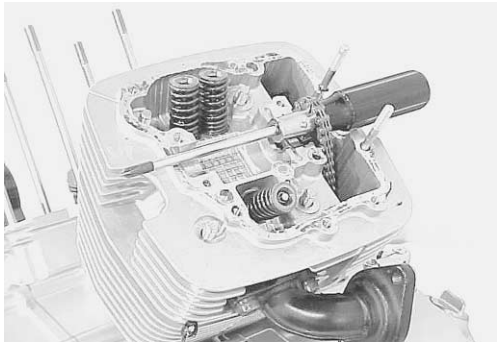
- Place a new cylinder gasket ① facing the mark Ⓐ upward.



⚠ CAUTION

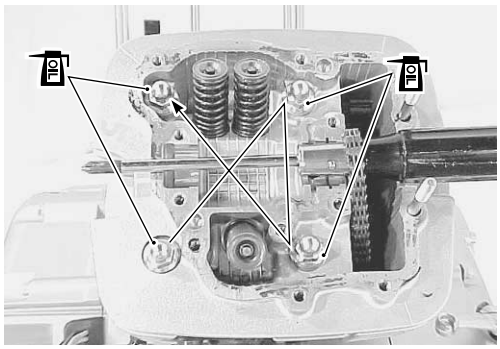
Make sure to replace the gasket with a new one.

- Install the cylinder head.

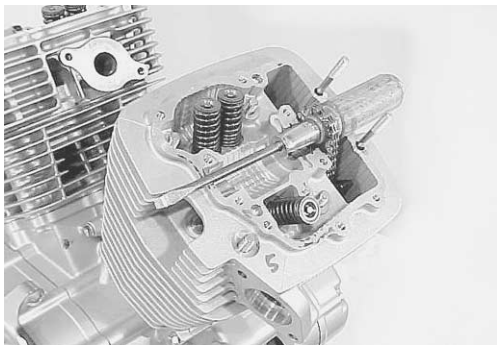


- Apply the engine oil to the copper washers.
- Install the copper washer and cylinder head nuts.
- Tighten the cylinder head nuts diagonally and evenly.
- The nuts tightening must be performed in two stages; initial and final tightening.

Cylinder head nut: 25 N·m (2.5 kgf·m)



- Install the front piston, cylinder and cylinder head in the same manner of rear ones installation.

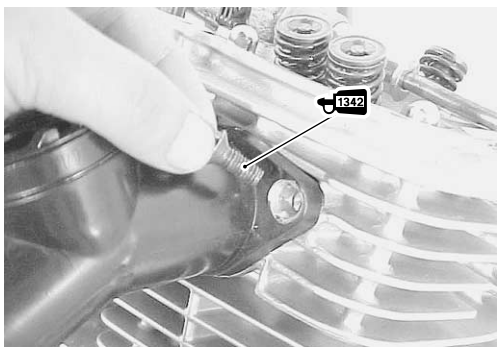


INTAKE PIPE

- Fit the intake pipe as shown in right picture.

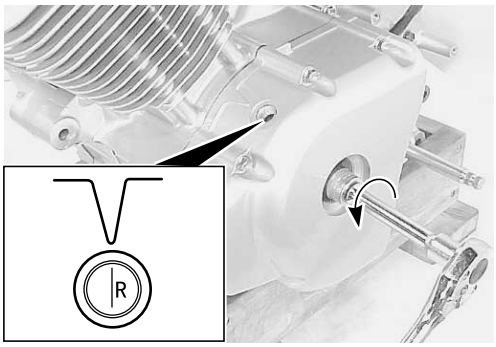
- Apply the THREAD LOCK to the bolts and tighten them.

1342 99000-32050: THREAD LOCK "1342"



CAMSHAFT

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



⚠ CAUTION

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

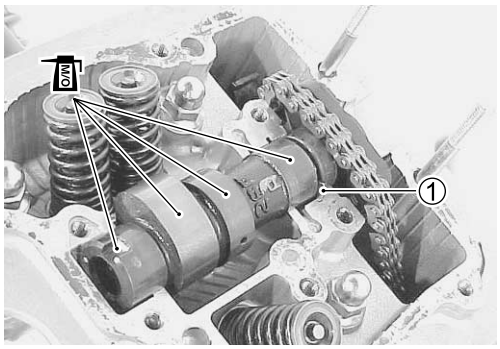
- Install the cam shafts to each cylinder head.

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

- Apply MOLYBDENUM OIL to the camshaft journals and cam faces.

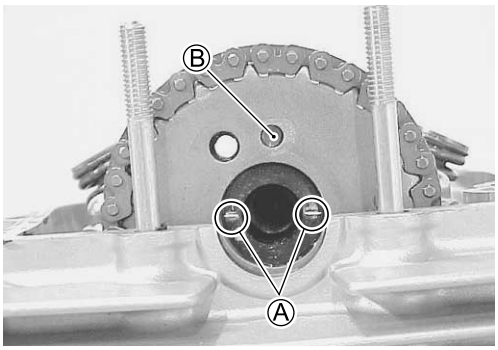
MOLYBDENUM OIL

- Install the C-ring ①.

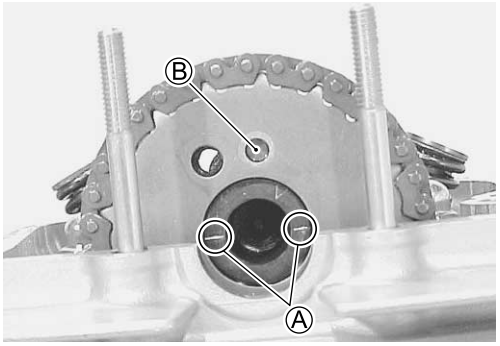


- Align the engraved lines Ⓐ on the front and rear camshafts so they are parallel with the surface of the cylinder heads.
- Engage the chains on the cam sprockets with the locating pin holes Ⓑ as shown in the photograph.

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



No. 1 (REAR) CYLINDER

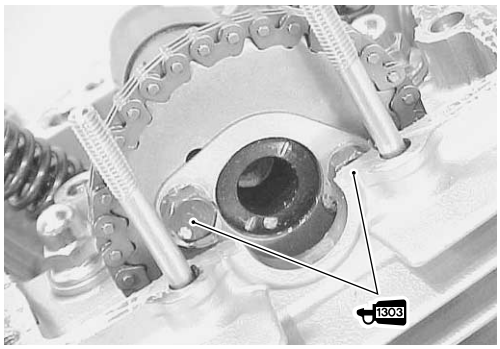


No. 2 (FRONT) CYLINDER

- Apply THREAD LOCK SUPER “1303” to the bolts and tighten them to the specified torque.

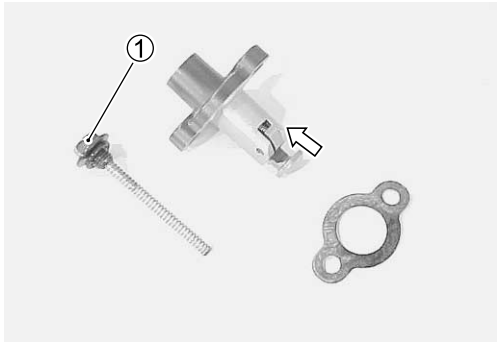
Cam chain sprocket bolt: 15 N·m (1.5 kgf·m)

1303 99000-32030: THREAD LOCK SUPER “1303”



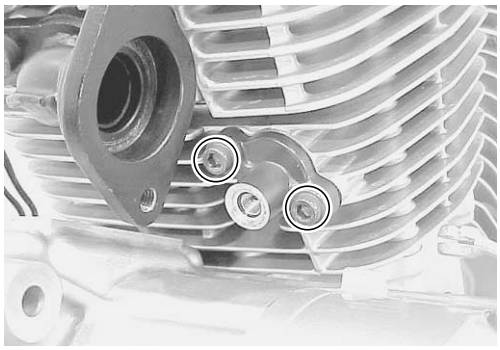
CAM CHAIN TENSION ADJUSTER

- Remove the cam chain tension adjuster set bolt ①.
- Compress the tensioner shaft by releasing ratchet.



- Install a new gasket and cam chain tension adjuster.
- Tighten the cam chain tension adjuster bolts.

Cam chain tension adjuster bolt: 10 N·m (1.0 kgf·m)

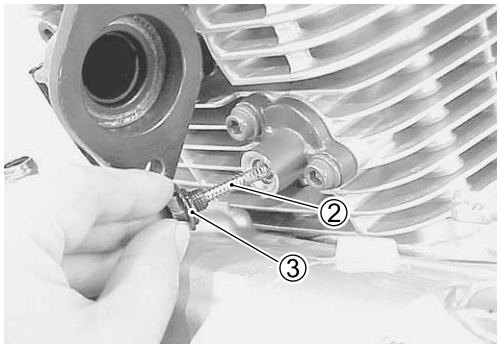


- Install the cam chain tension adjuster set bolt with spring ② and O-ring ③.

Cam chain tension adjuster set bolt: 7 N·m (0.7 kgf·m)

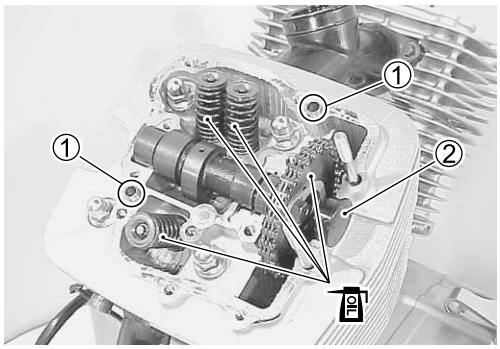
⚠ CAUTION

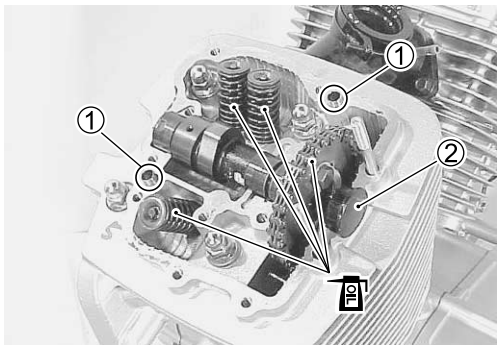
*** When the cam chain tension adjuster has been installed, check for cam chain tension to determine if the tension adjuster is functioning properly.**
*** Turn the crankshaft and check that all the moving parts work properly.**



CYLINDER HEAD COVER

- Apply engine oil to the valve springs and cam chain.
- Install the dowel pins ① and caps ②.



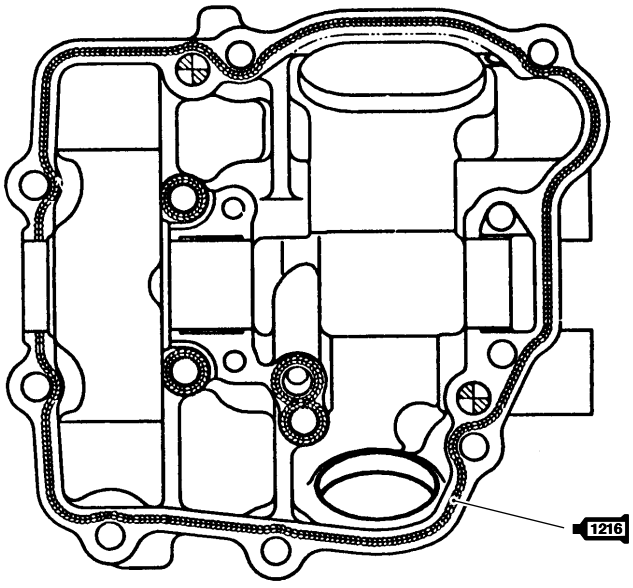


- Thoroughly wipe off oil from the mating surfaces of cylinder head and cover.
- Uniformly apply SUZUKI BOND to the cylinder head surfaces.

1216 99000-31160: SUZUKI BOND "1216"

⚠ CAUTION

Do not apply SUZUKI BOND to the camshaft journals.



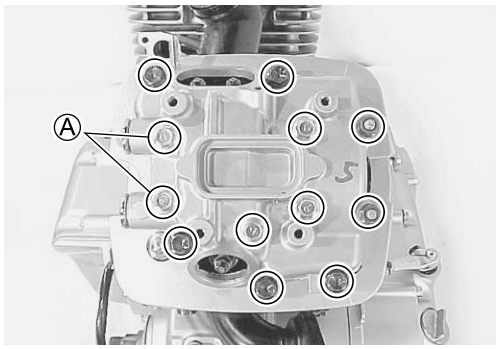
- Install the cylinder head cover

NOTE:

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

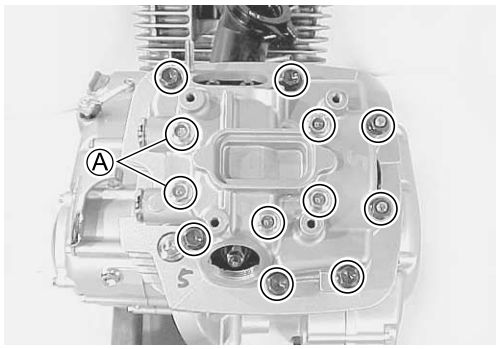
** Install the new gasket washer to the bolts Ⓐ.*

** Align the cutaway of rocker arm shaft with the bolts Ⓐ.*

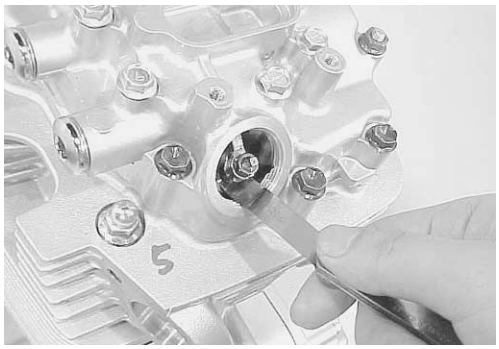


- Tighten the cylinder head cover bolts diagonally, and then if everything is satisfactory, tighten securely with a torque wrench to the specified torque.

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



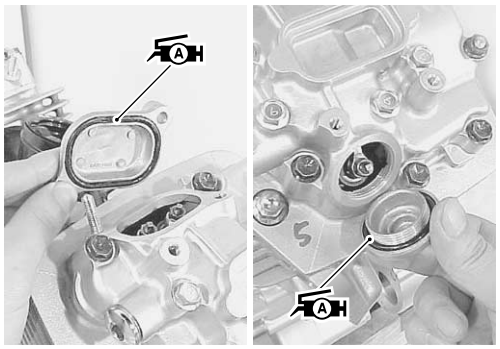
- Check and adjust the valve clearance. (☞2-4)



- Apply grease to the new O-ring and install the valve inspection caps.

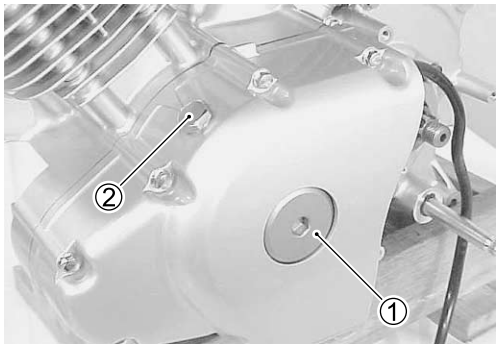
99000-25010: SUZUKI SUPER GREASE "A"

Valve inspection cap (EX side): 18 N·m (1.8 kgf·m)
Valve inspection cap bolt and nut: 10 N·m (1.0 kgf·m)



- Install the generator cover plug ① and timing inspection plug ②.

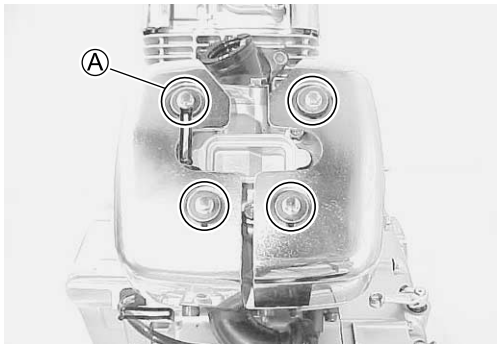
Generator cover plug: 15 N·m (1.5 kgf·m)
Timing inspection plug: 21 N·m (2.1 kgf·m)



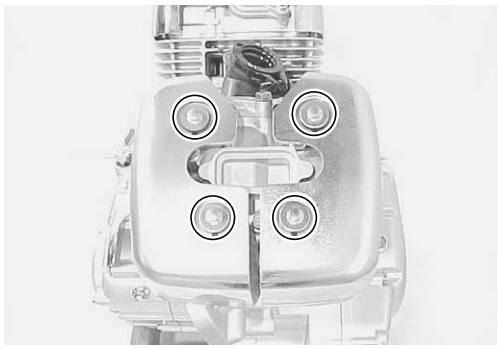
- Install the cylinder head cover caps.

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

NOTE:
Install the clamp to the bolt Ⓐ.



Rear (No.1)



Front (No.2)

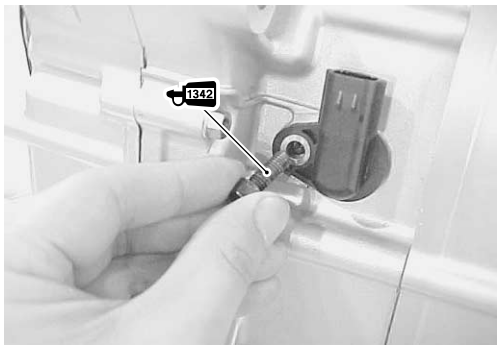
SPEED SENSOR

- Apply the grease to the O-ring and install the speed sensor.

99000-25010: SUZUKI SUPER GREASE "A"

- Apply the THREAD LOCK to the speed sensor bolt and tighten it.

1342 99000-32050: THREAD LOCK "1342"



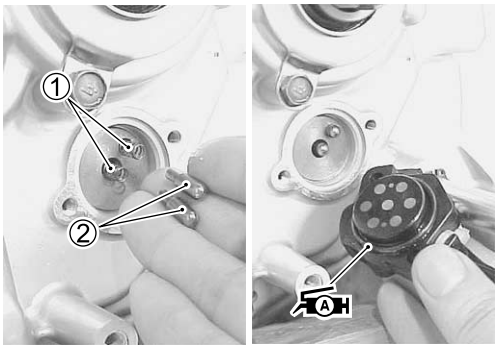
SPARK PLUG

- Install the spark plugs. (☞2-6)

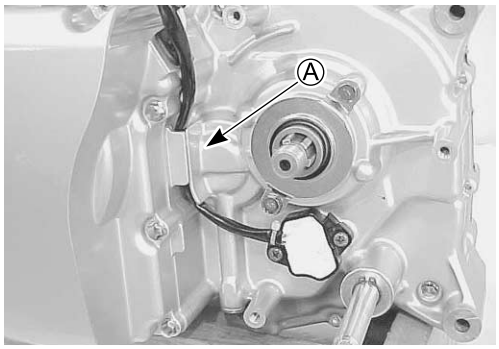
GEAR POSITION SWITCH

- Install the springs ① and contacts ②.
- Apply the grease to the O-ring and install the gear position switch.

99000-25010: SUZUKI SUPER GREASE "A"



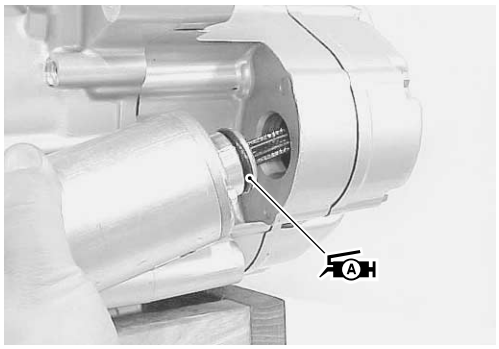
- Pass through the gear position switch wire harness into the guide Ⓐ.



STARTER MOTOR

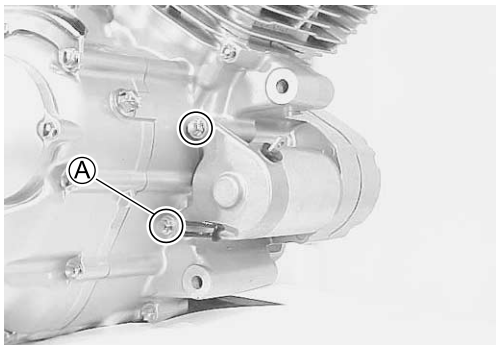
- Apply the grease to the O-ring.

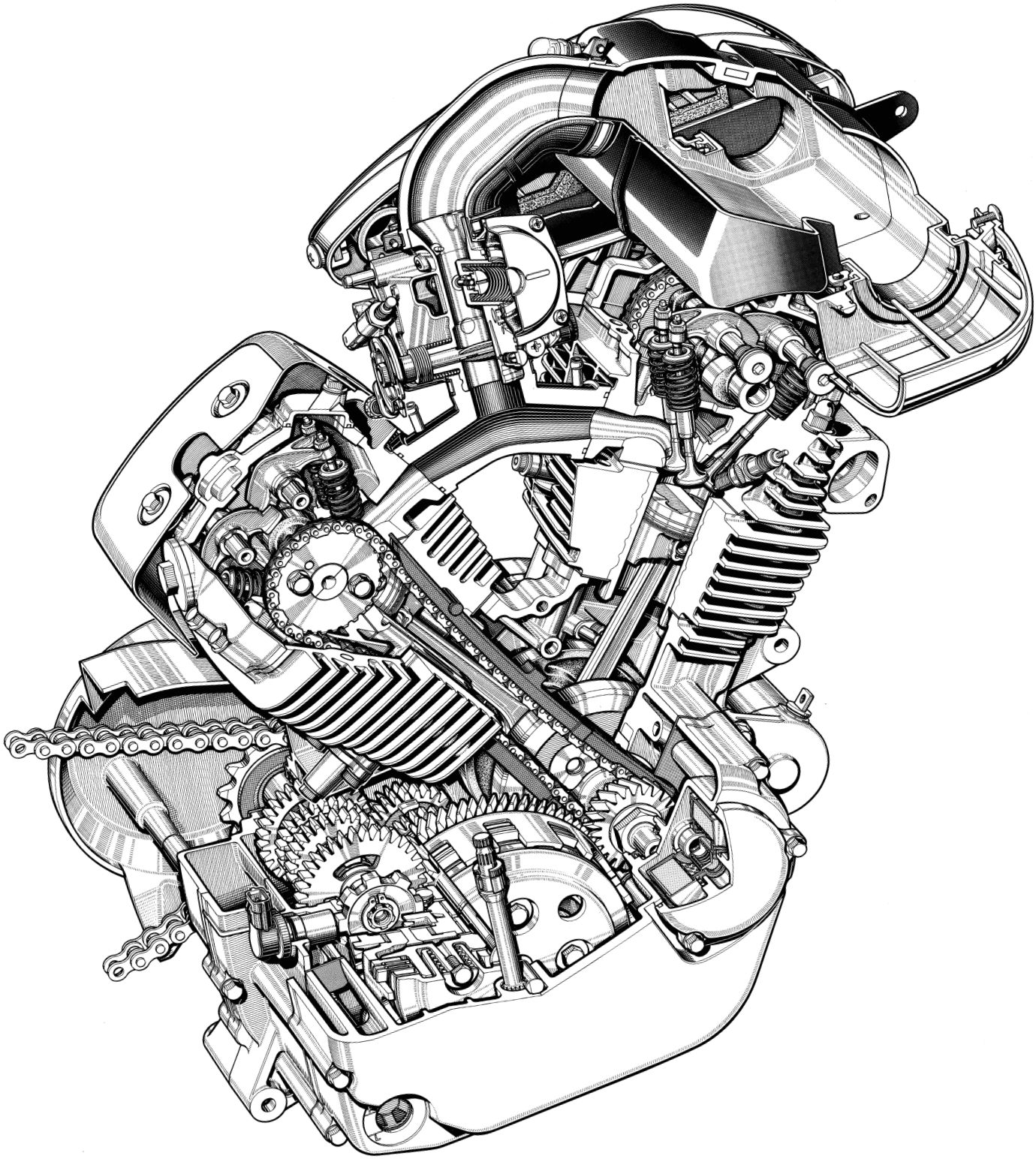
99000-25010: SUZUKI SUPER GREASE "A"



- Mount the starter motor on the engine.

NOTE:
Install the clamp to the bolt Ⓐ.





FUEL AND LUBRICATION SYSTEM

CONTENTS

⚠ WARNING

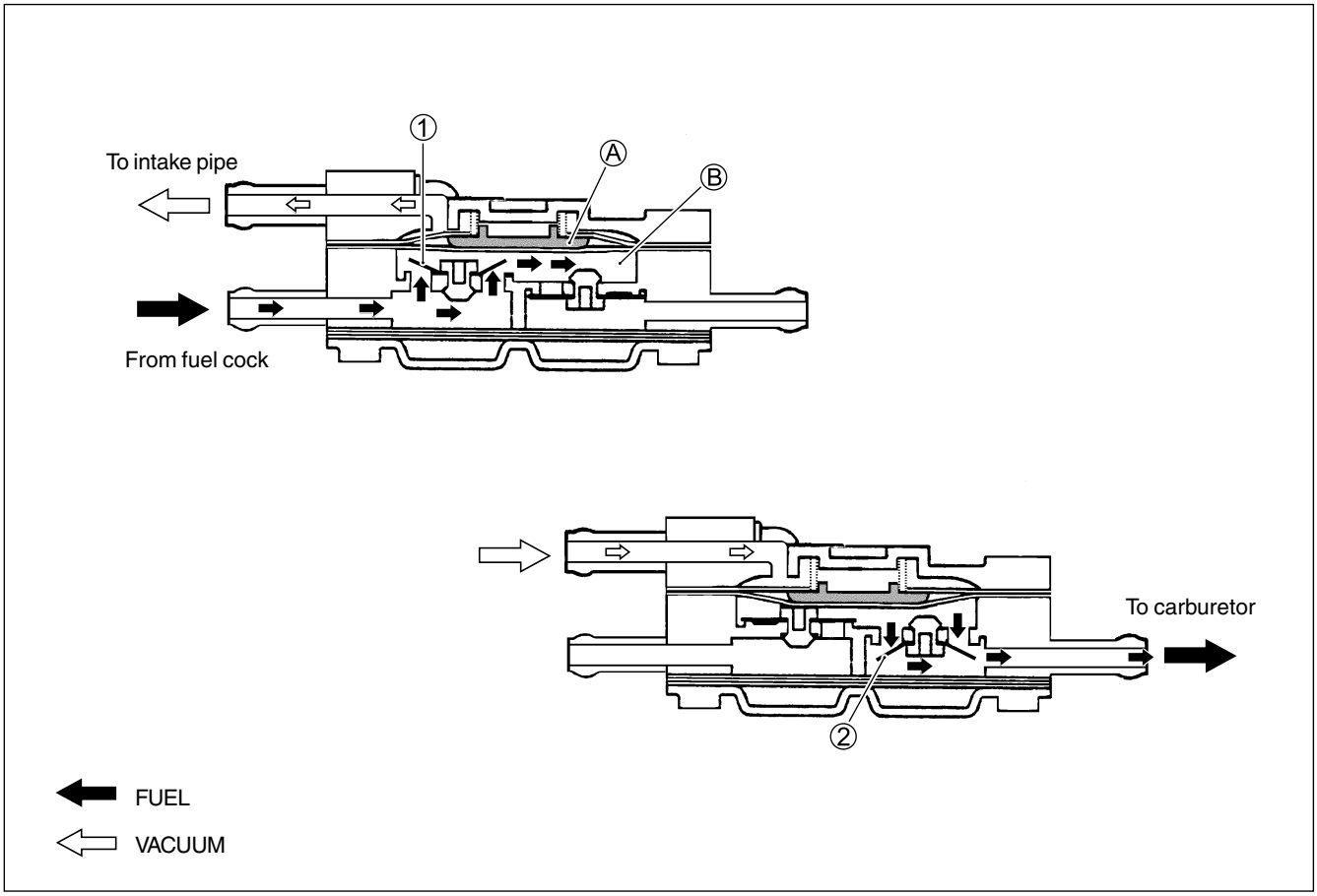
Gasoline must be handled carefully in an area well ventilated and away from fire or sparks.

FUEL SYSTEM

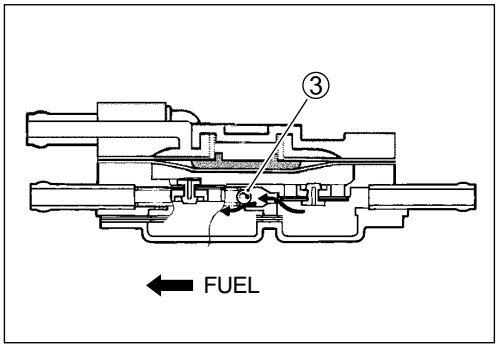
The fuel pump is operated by a vacuum force which is supplied from the carburetor intake pipe. The fuel sent under pressure by the fuel pump flows into the float chamber when the float of the carburetor has dropped and the needle valve is open. When the needle valve closes, the pressure of the fuel in the hose connecting the carburetor and the fuel pump increases, and when the set pressure is reached, the operation of the fuel pump is stopped by the fuel pressure to prevent excessive supply.

FUEL PUMP

Vacuum pulsations from the carburetor intake pipe are used to operate the pump diaphragm Ⓐ. When vacuum is applied to the diaphragm Ⓐ, fuel is drawn from the tank into the diaphragm's chamber Ⓑ. As positive pressure is applied, the diaphragm backs, pushing the fuel through the outlet to the carburetor.
A series of check valves (① and ②) is used in the fuel flow route to allow the fuel to move in only one direction, through the pump body.



If the fuel pressure in the chamber of carburetor side is too high, the return valve ③ is opened so that the fuel pressure is released to the chamber of fuel cock side.



FUEL TANK/FUEL COCK

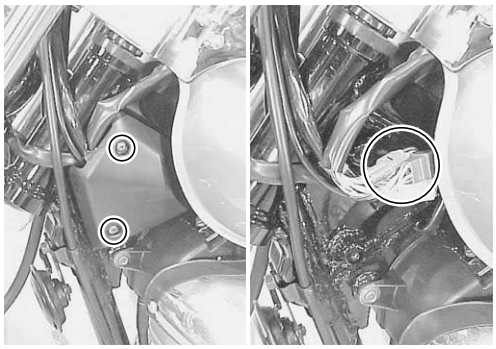
REMOVAL

⚠ WARNING

Gasoline is very explosive. Extreme care must be taken.

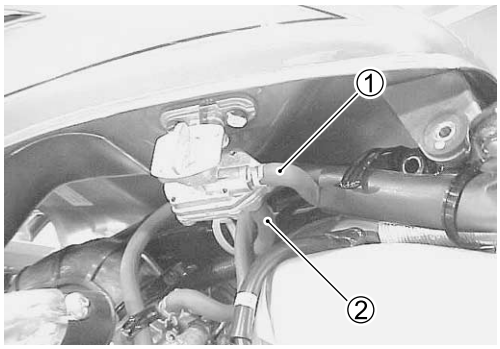
- Remove the front seat. (☞5-2)

- Remove the frame head cover. (☞5-3)
- Disconnect the speedometer couplers.



- Remove the fuel tank mounting nut and bolt.

- Turn the fuel cock to “ON” and disconnect the fuel hose ① and vacuum hose ②.
- Remove the fuel tank.



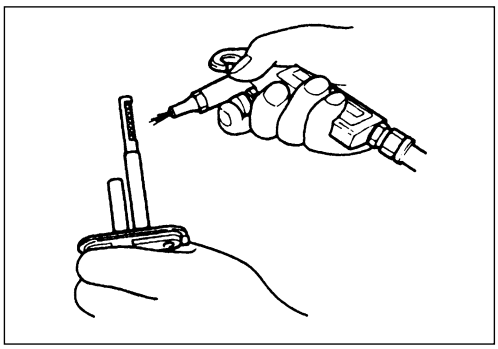
- Remove the fuel tank cap.
- Remove the speedometer.

- Remove the fuel cock.

INSPECTION

FUEL COCK

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 cock for cracks.

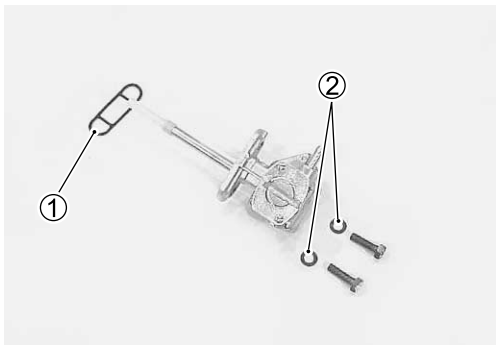


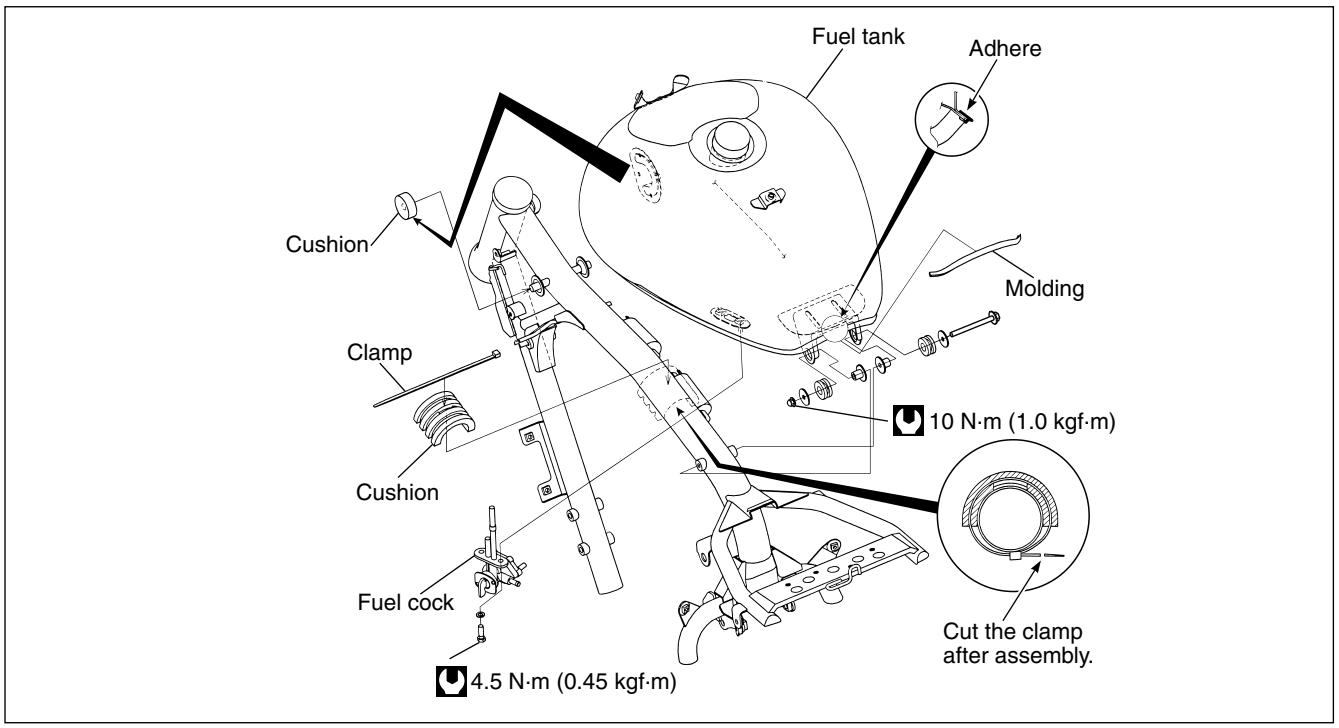
REMOUNTING

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

⚠ WARNING

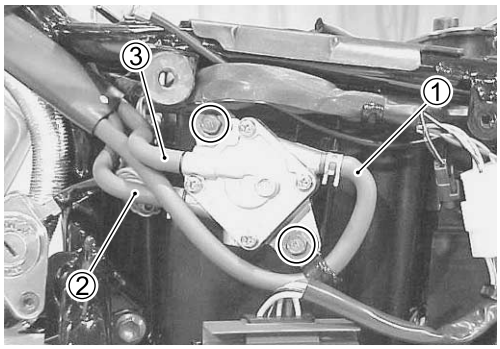
*** Gaskets ① and ② must be replaced with new ones to prevent fuel leakage.**
*** Tighten the fuel cock bolts evenly.**





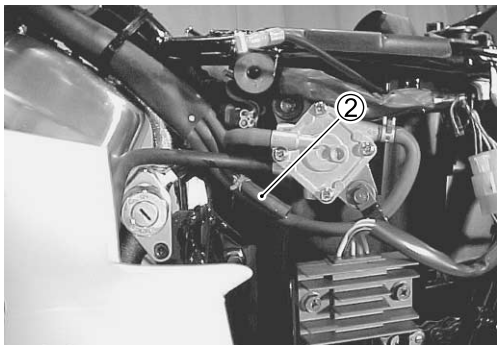
FUEL PUMP

REMOVAL



- Remove the left frame cover. (☞ 5-3)
- Turn the fuel cock to “ON”
- Disconnect the fuel hoses ①, ② and vacuum hose ③.
- Remove the fuel pump mounting bolts.

INSPECTION



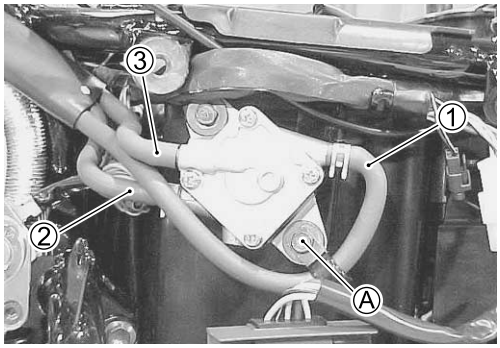
⚠ WARNING

Gasoline is very explosive. Extreme care must be taken.

- Disconnect the fuel hose ②, connect the suitable hose and insert the free end of the hose into a receptacle.

Check the fuel flow when cranking the engine for few seconds by pressing the starter button.
If the fuel flow is not found, check the fuel cock. (☞4-4)
If the fuel cock and hoses are not fault, replace the fuel pump.

REASSEMBLY



Carry out the assembly procedure in the reverse order of disassembly.

- Install the clamp to the bolt Ⓐ and tighten the bolts.
- Connect the fuel hoses ①, ② and vacuum hose ③ securely.

FUEL HOSE ROUTING: ☞7-18
Fuel hose ① (To fuel cock)
Fuel hose ② (To carburetor)
Vacuum hose ③ (To intake pipe)

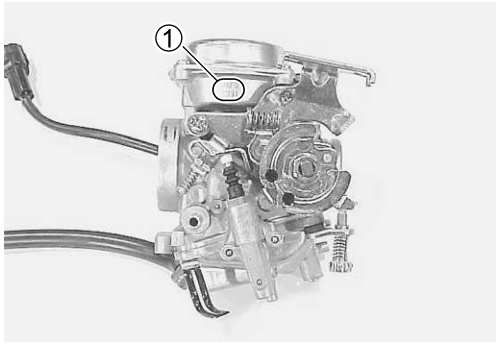
CARBURETOR

SPECIFICATIONS

ITEM	SPECIFICATIONS			
	E-02, 04, 34	E-17, 22	E-22 (U-type)	E-18
Carburetor type	MIKUNI BDS26	←	←	←
Bore size	26 mm	←	←	←
I.D. No.	26F0	26F1	←	26F2
Idle r/min.	1 400 ± 100 r/min.	←	←	1 400 ± 50 r/min.
Fuel level	11 ± 1.0 mm	←	←	←
Float height	9.9 ± 1.0 mm	←	←	←
Main jet (M.J.)	#102.5	←	←	←
Main air jet (M.A.J.)	#35	←	←	←
Jet needle (J.N.)	4DM9-4	←	←	←
Needle jet (N.J.)	O-1	←	←	←
Throttle valve (Th.V.)	#140	←	←	#145
Pilot jet (P.J.)	# 20	←	←	#17.5
Pilot screw (P.S.)	PRE-SET (3-1/4 turns out)	←	←	PRE-SET (3 turns out)
Throttle cable play	2 – 4 mm	←	←	←

LOCATION OF CARBURETOR I.D. NO.

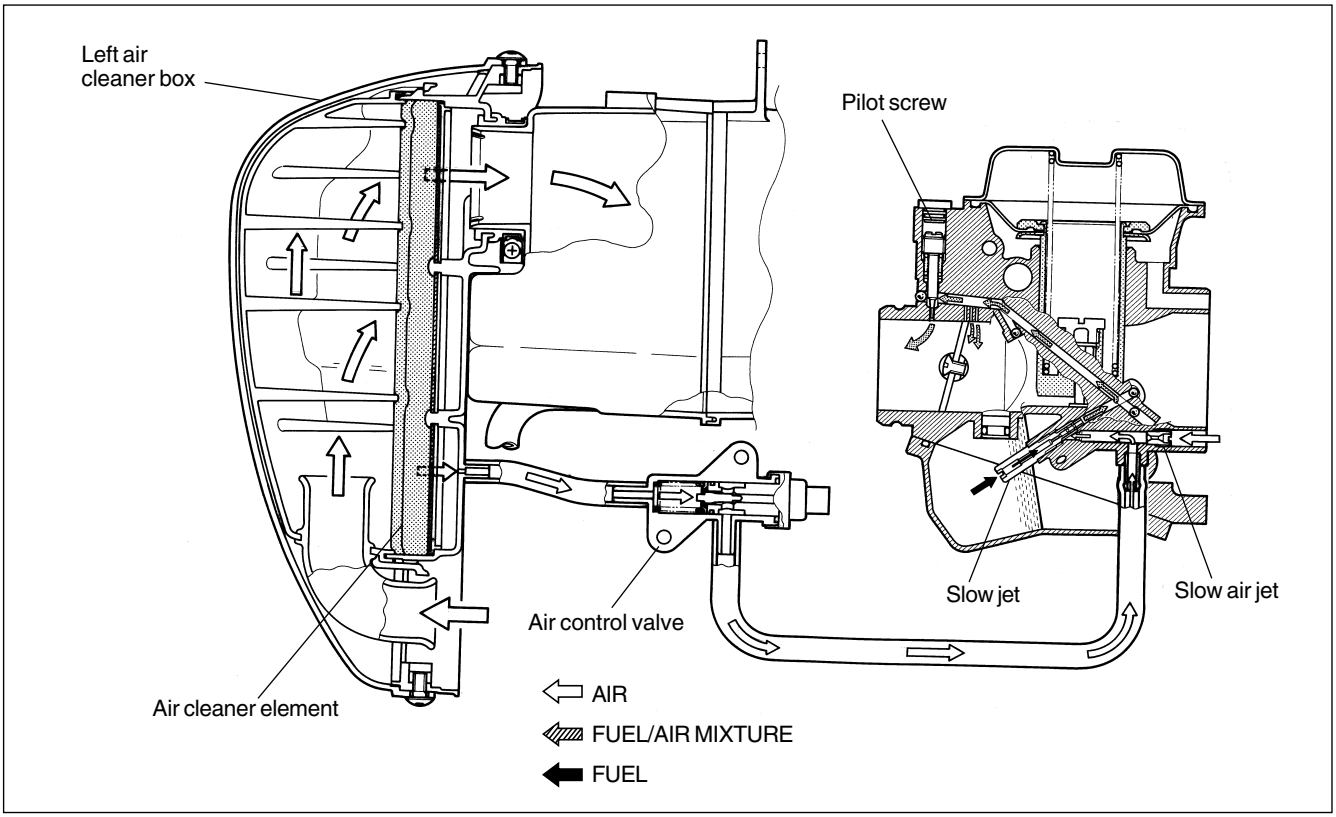
The carburetor I.D. is stamped on the location ① on the carburetor as shown in the right photo.



AIR CONTROLE VALVE

- The air control valve changes the valve opening area to adjust the air volume for slow system in accordance with temperature variation, thereby supplying the optimum air/fuel mixture for idling operation.

In this system, air is taken in from the clean side of air cleaner and guided into the slow system through the air control valve.
Air supplied both from the slow air jet and the air control valve is metered by the pilot screw to produce air/fuel mixture most appropriate for the current atmospheric temperature, and then jetted into the main bore.

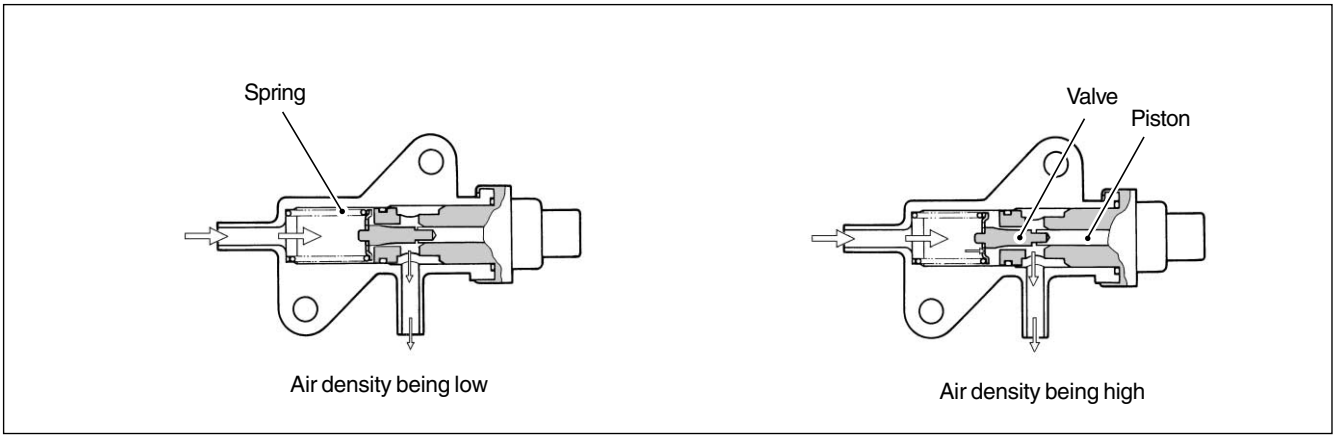


When temperature is low (air density being high):

- The thermo-wax inside the air control valve shrinks and the valve opening area is narrowed due to spring force.

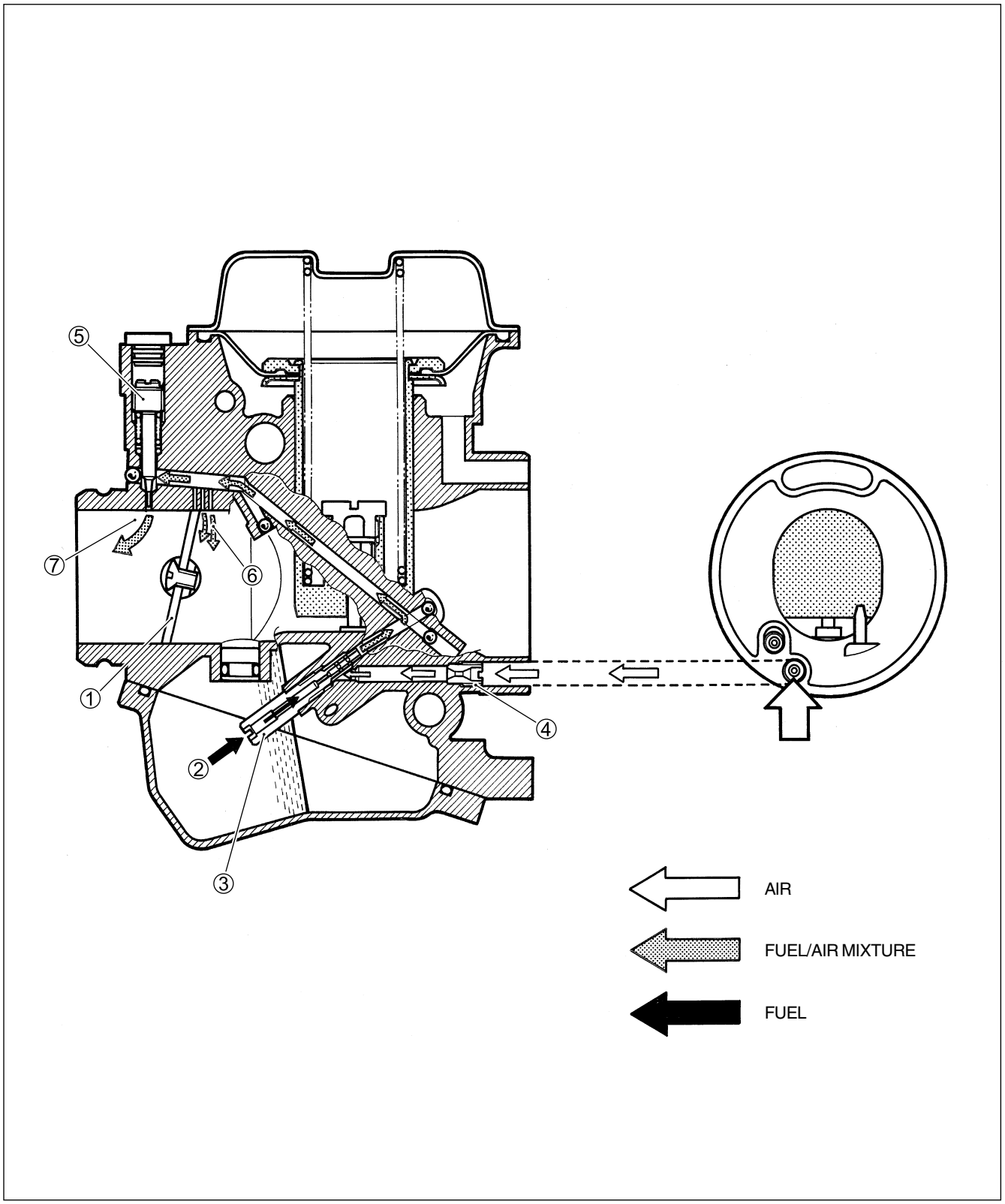
When temperature is high (air density being low):

- The thermo-wax inside the air control valve expands causing the piston to push the valve resulting in widened opening area.



SLOW SYSTEM

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



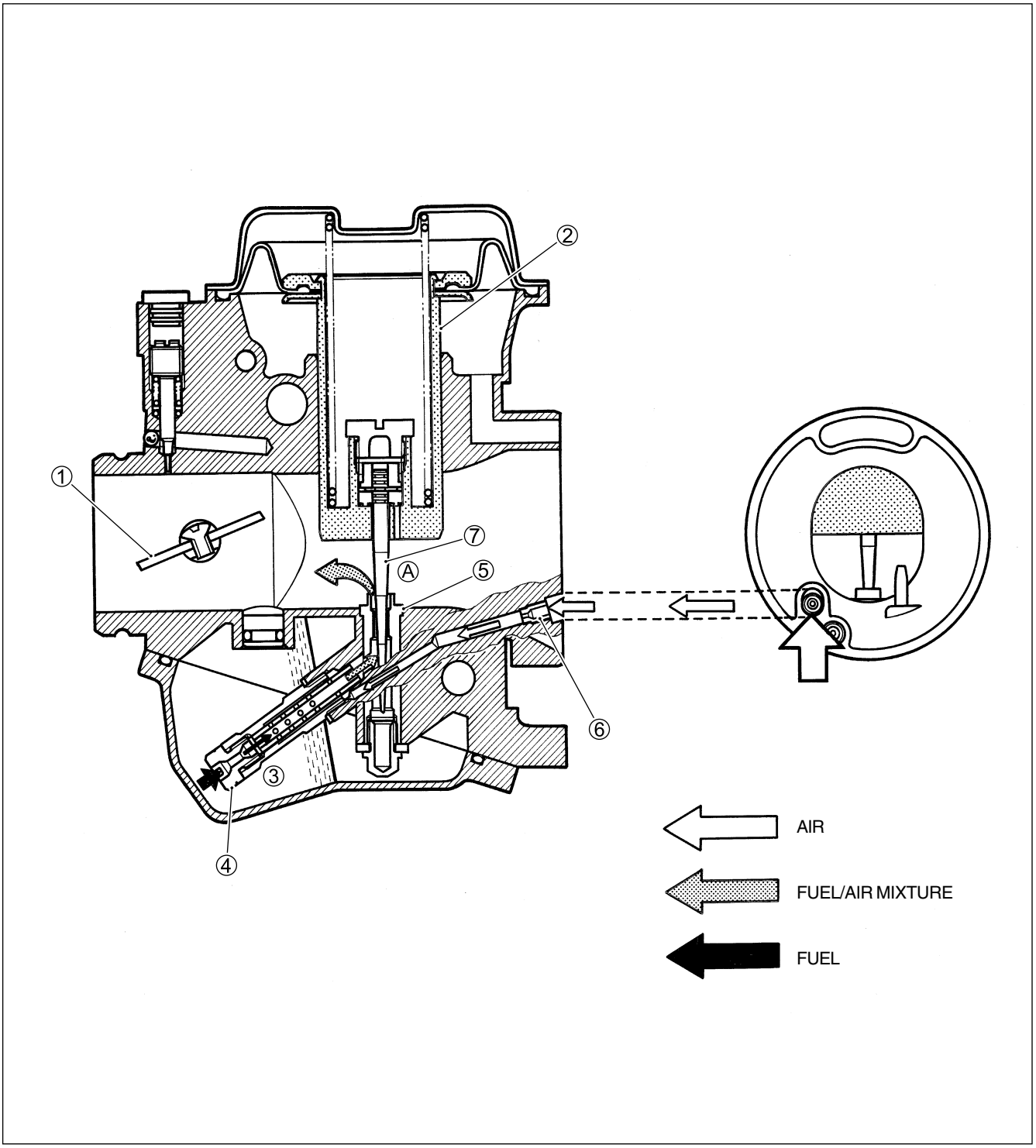
MAIN SYSTEM

As the throttle valve ① is opened, engine speed rises and negative pressure in the venturi Ⓐ increases. This causes the piston valve ② to move upward.

The fuel in the float chamber ③ is metered by the main jet ④. The metered fuel enters the needle jet ⑤, mixes with the air admitted through the main air jet ⑥ and forms an emulsion.

The emulsified fuel then passes through the clearance between the needle jet ⑤ and jet needle ⑦ and is discharged into the venturi Ⓐ, where it meets the main air stream being drawn by the engine.

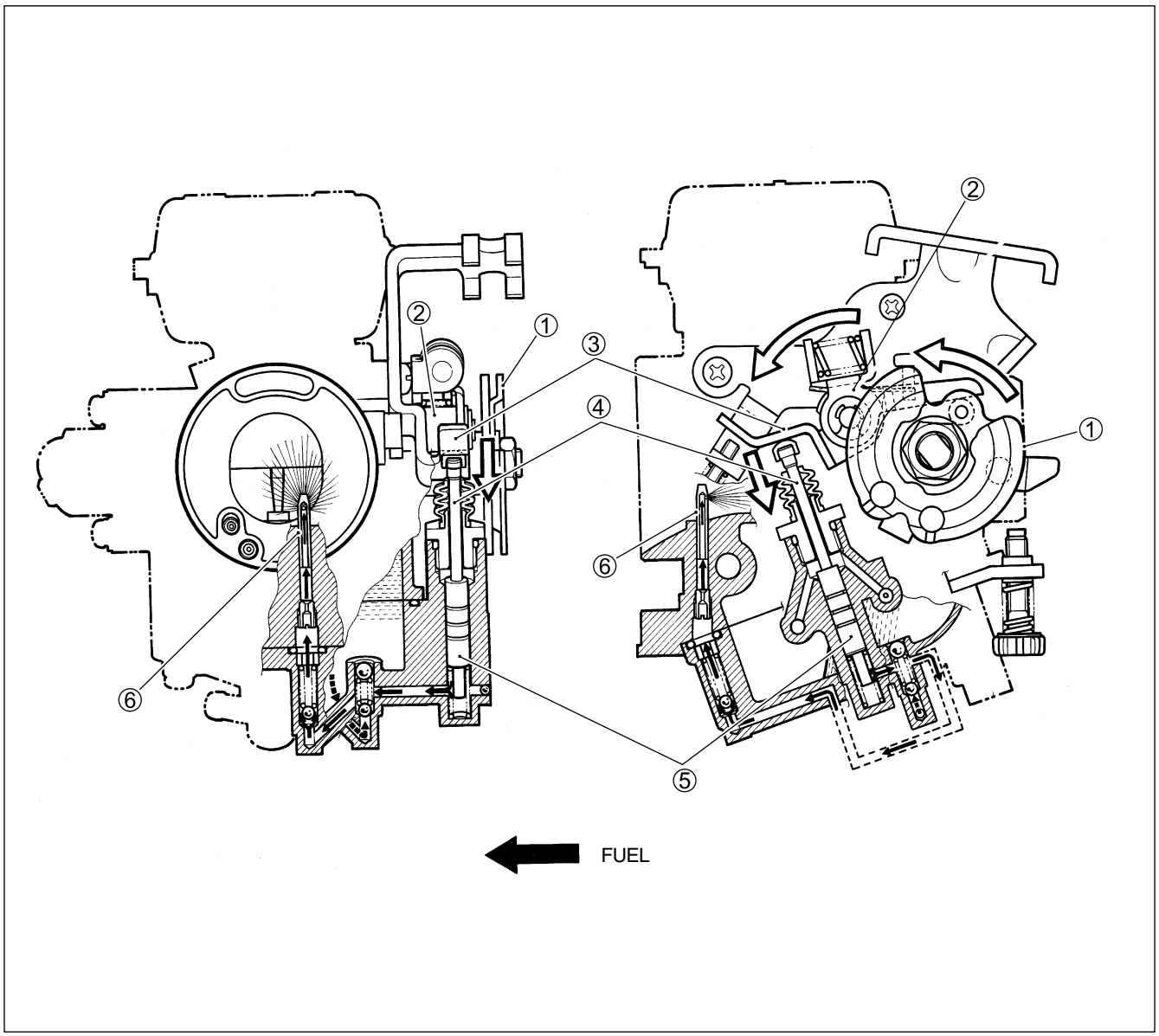
Mixture proportioning is accomplished in the needle jet ⑤. The clearance through which the emulsified fuel must flow ultimately depends on throttle position.



ACCELERATOR PUMP SYSTEM

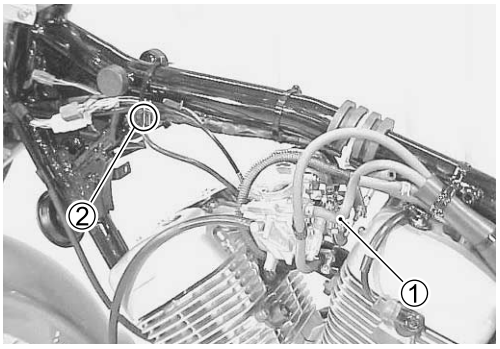
This system works only when the rider opens throttle grip quickly as pump send the necessary amount of fuel to the carburetor bore for correcting fuel/air mixture ratio. When the rider open the throttle grip quickly, the intaken air volume becomes large and air velocity at the bottom of the throttle valve (piston valve) is slow and sucking volume of fuel is less.

The throttle valve lever ① turns lever ②, and lever ③ turns and pushes rod ④. The rod ④ pushes plunger ⑤. This plunger pushes out the fuel through outlet pipe ⑥, spraying fuel into the main bore.

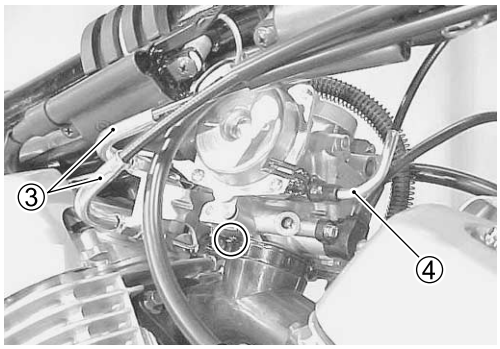


REMOVAL

- Remove the fuel tank. (☞4-3)
- Remove the air cleaner box. (☞3-3)
- Remove the fuel hose ①.
- Disconnect the throttle position sensor coupler ②.

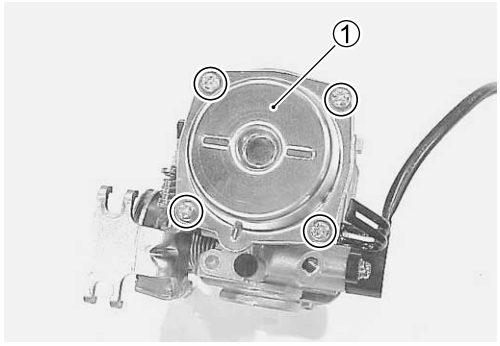


- Remove the throttle cables ③ and starter plunger ④.
- Loosen the clamp screw and remove the carbureter.

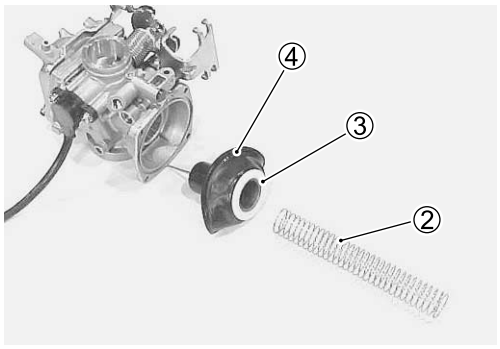


DISASSEMBLY

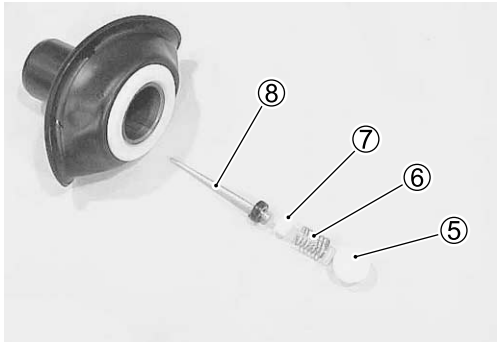
- Remove the carburetor top cap ①.



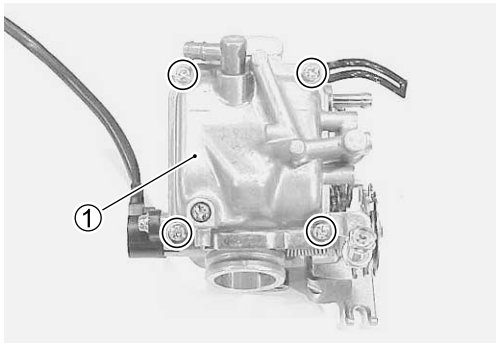
- Remove the spring ② and piston valve ③ along with diaphragm ④.



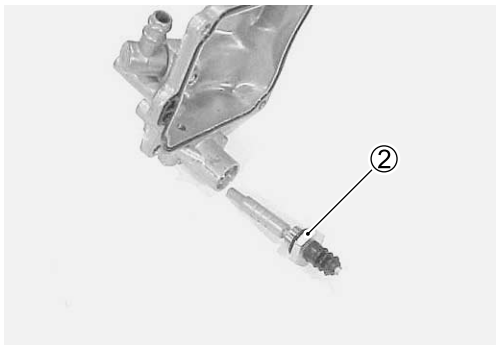
- Remove the jet needle cap ⑤, spring ⑥, retainer ⑦ and jet needle ⑧.



- Remove the float chamber body ①.



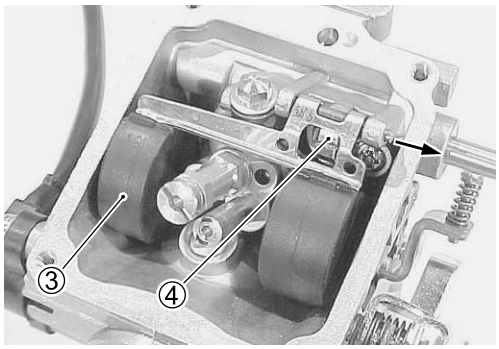
- Remove the accelerator pump plunger ②.



- Remove the float assembly ③ along with the needle valve ④ by removing the pin.

⚠ CAUTION

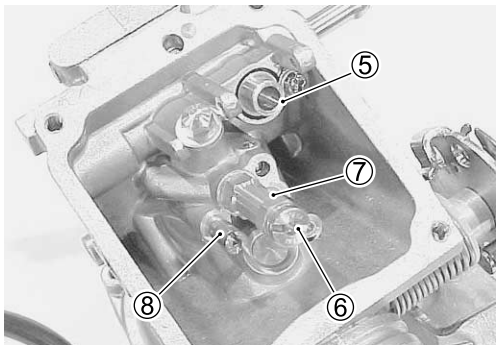
Do not use a wire to clean the valve seat.



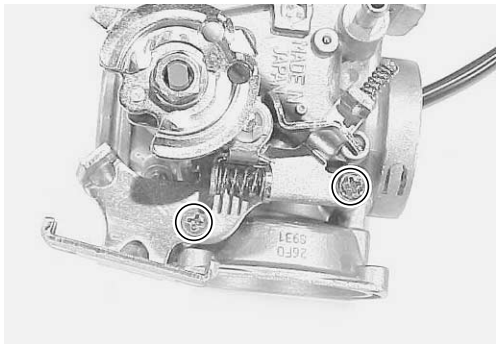
- Remove the valve seat ⑤.
- Remove the main jet ⑥, jet holder ⑦ and pilot jet ⑧.

⚠ CAUTION

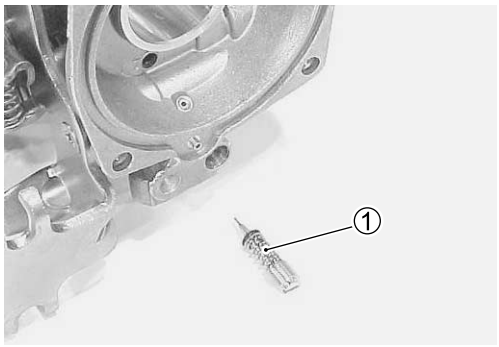
Do not use a wire to clean the passage and jets.



- Remove the throttle cable bracket.



- Remove the pilot screw ①.
  (Except for E-18.)

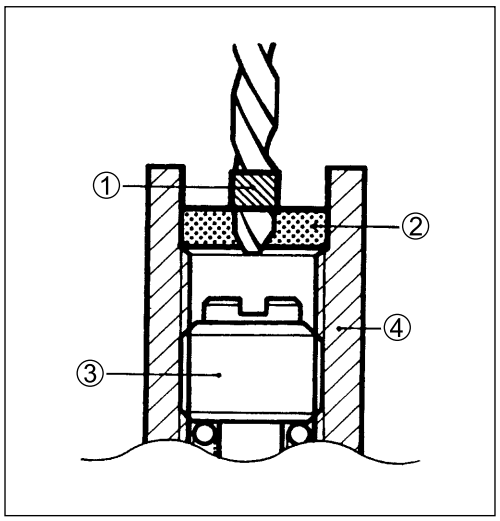


NOTE:
Before removing the pilot screw, determine the setting by slowly turning it clockwise and count the number of turns required to lightly seat the screw. This counted number is important when reassembling pilot screw to original position.

PILOT SCREW REMOVAL (Only for E-18)

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

- Use a 1/8" size drill bit with a drill-stop to remove the pilot screw plug. Set the drill-stop 6 mm from the end of the bit to prevent drilling into the pilot screw. Carefully drill through the plug.
- Thread a self-tapping sheet metal screw into the plug. Pull on the screw head with pliers to remove the plug. Carefully clean any metal shavings from the area.
- Slowly turn the pilot screw clockwise and count the number of turns until the screw is lightly seated. Make a note of how many turns were made so the screw can be reset correctly after cleaning.
- Remove the pilot screw along with the spring, washer, and O-ring.
- After cleaning, reinstall the pilot screw to the original setting by turning the screw in until it lightly seats, and then backing it out the same number of turns counted during disassembly.
- Install a new plug by tapping it into place with a punch.

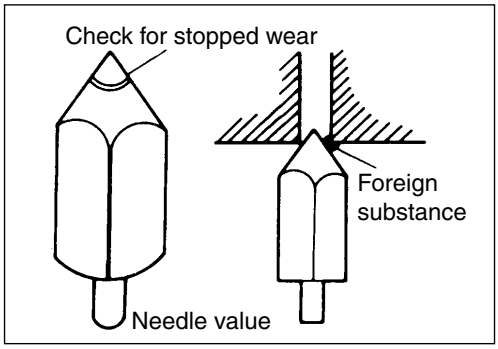


①Drill-stop
②Plug
③Pilot screw
④Carburetor body

INSPECTION

Check the following parts for damage and clogging.

* Pilot jet
* Main jet
* Main air jet
* Pilot air jet
* Needle jet holder
* Float
* Jet needle
* Piston valve
* Starter jet
* Gaskets and O-rings
* Pilot outlet and bypass
* Coasting enrichement valve
* Needle valve
* Valve seat

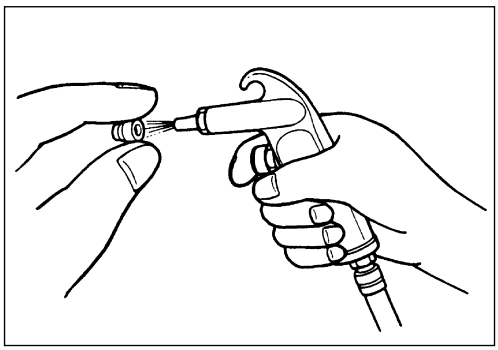


If any abnormal condition is found, wash the part clean. If damage or clogging is found, replace the part with a new one.

CARBURETOR CLEANING

⚠ WARNING

Some carburetor cleaning chemicals, especially diptype 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.

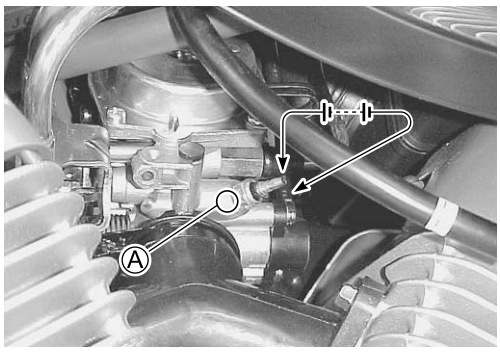
⚠ CAUTION

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

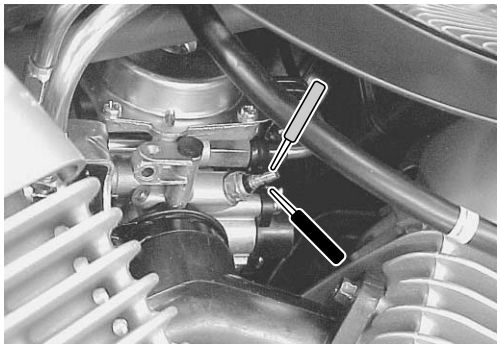
- After cleaning, reassemble the carburetor with new seals and gaskets.

CARBURETOR HEATER

(Only for E-02)



- Disconnect the carburetor heater terminal lead wires.
- Connect the positive ⊕ terminal of a 12V battery to the terminal of the carburetor heater and the battery negative ⊖ terminal to the terminal.
- Check that the heater section Ⓐ is heated in 5 minutes after the battery has been connected.



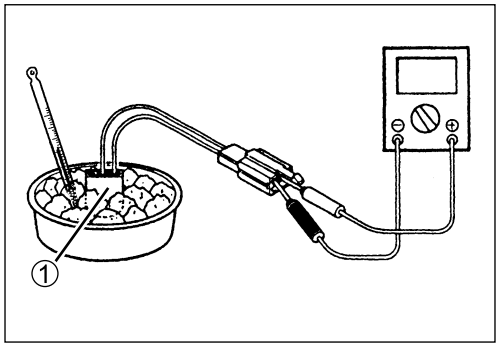
- Measure the resistance between the terminals.

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

DATA **Carbaretor heater resistance: STD: 12 – 18 Ω**

THERMO-SWITCH INSPECTION

(Only for E-02)



- Cool the thermo-switch ① with ice water and check for continuity.

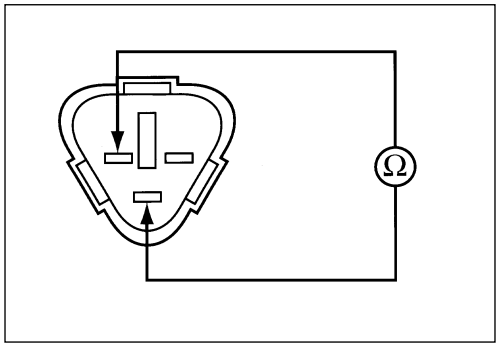
TOOL **09900-25008: Multi-circuit tester**

DATA **Thermo-switch continuity:**

Below 8 – 14°C	**Yes**
Above 15 – 21°C	**No**

THROTTLE POSITION SENSOR

Measure the resistance between the terminals as shown in the illustration.



DATA **Throttle position sensor resistance: Approx. 5 kΩ**

NOTE:
When performing this test, it is not necessary to remove the throttle position sensor.

FUEL LEVEL

⚠ WARNING

This inspection must be performed in an area well ventilated, away from fire or sparks since gasoline, an explosive fluid, is used in this operation.

- Remove the carburetor.
- Install the special tool to the carburetor drain outlet.
- Loosen the drain bolt ①.

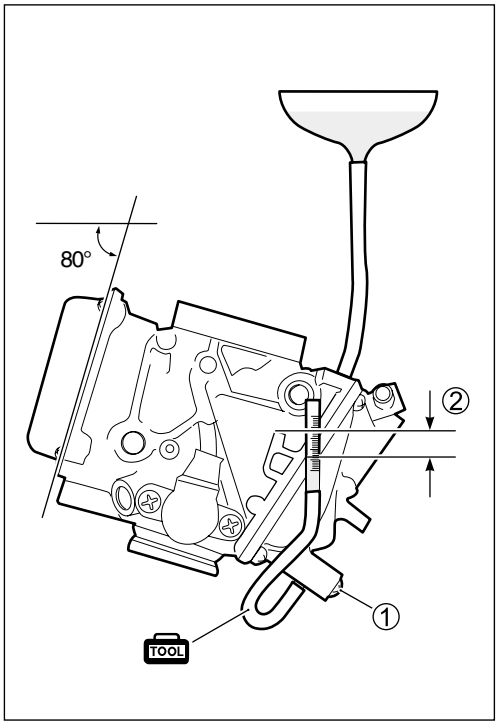
TOOL 09913-10760: Fuel level gauge

- Adjust the carburetor to the proper angle holding the body with a vice or the like.

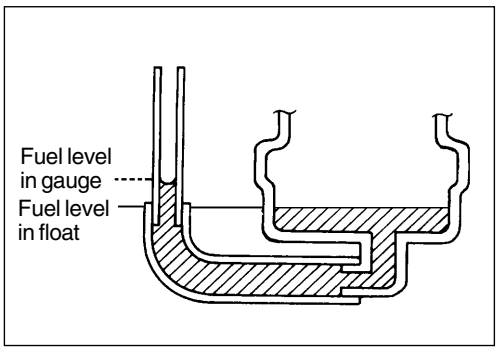
Carburetor set position: Lateral direction : Horizontal
Longitudinal direction: 80°

- Fill gasoline in the carburetor.
- Remove air completely from the fuel level gauge.
- With the level gauge held vertical, lower the gauge slowly and align the datum point ② with the gauge graduation.
- Wait until the fuel level stabilizes.
- Determine the zero point on the gauge graduation and after waiting again for level stabilization, measure the height from the datum point.

DATA Fuel level: 11 ± 1 mm under from datum point



NOTE:
The apparent fuel level measured in the level gauge is higher than the actual level in the float chamber because of meniscus effect. (Meniscus is approximately 1 mm.)

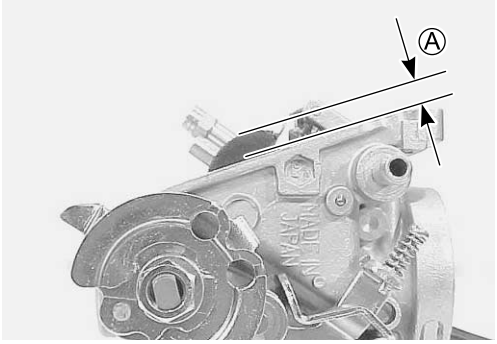


FLOAT HEIGHT ADJUSTMENT

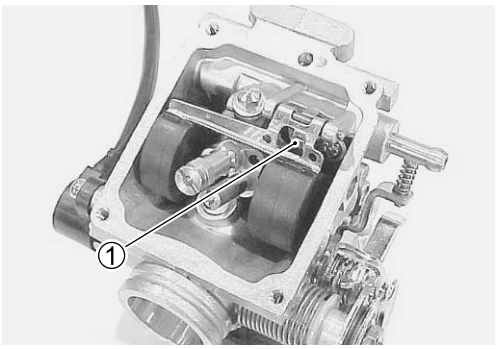
To check the float height, turn the carburetor upside down. Measure the float height Ⓐ while the float arm is just contacting the needle valve using vernier calipers.

09900-20102: Vernier calipers

Float height Ⓐ : 9.9 ± 1.0 mm



- Bend the float arm ① as necessary to bring the float height Ⓐ to the specified level.
- After adjustment, check the float height and the fuel level again.



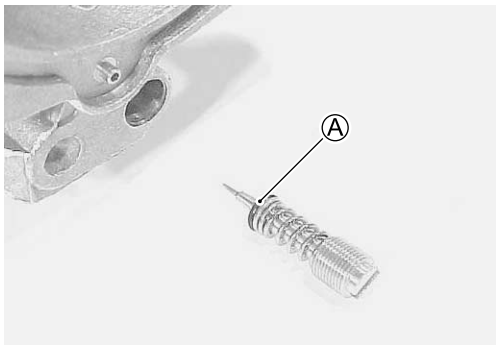
REASSEMBLY AND REINSTALLATION

Carburetor reassembly can be performed in the reverse order of disassembly. When reassembling, carefully observe the following instructions.

⚠ CAUTION

*** Assemble the parts taking consideration of their function.**
*** Replace O-rings and seals with new ones.**

- After cleaning, reinstall the pilot screw to the original setting by turning the screw in until it lightly seats, and then backing it out the same number of turns counted during disassembly.



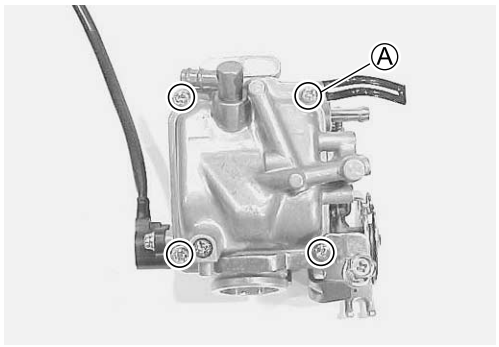
⚠ CAUTION

Replace the O-ring Ⓐ with a new one.

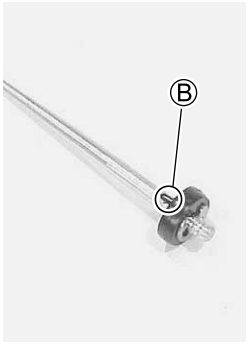
- Apply grease to the O-ring and install the accelerating plunger.

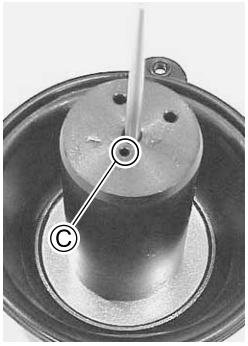
99000-25010: SUZUKI SUPER GREASE "A"

- Fit the seal rings securely to the float chamber and install the float chamber to the throttle body.
- Install the clamp to the screw Ⓐ and tighten the screws.

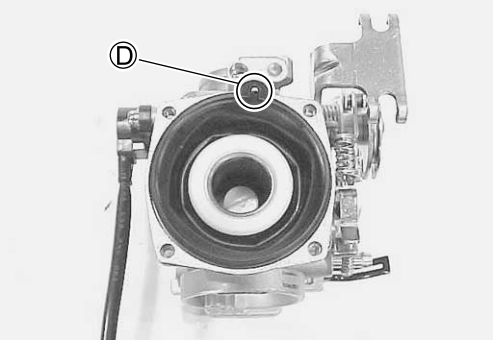


- Install the jet needle with the pin Ⓑ on the spacer securely engaged with the hole Ⓒ on the piston valve.

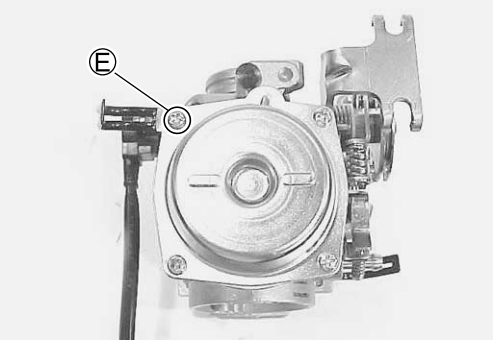




- Align the hole Ⓓ of the diaphragm with the passage way on the carburetor body.



- Install the clamp to the screw Ⓔ and tighten the screws.

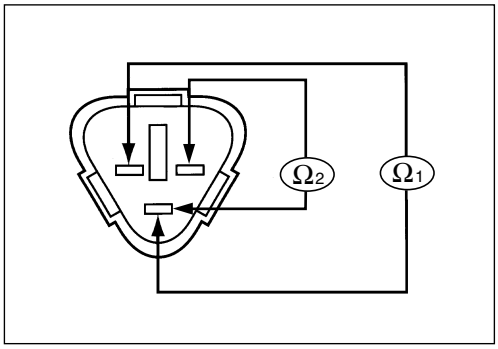


- Apply thermo-grease to the threads and tighten the carburetor heater. (Only for E-02)

99000-59029: THERMO-GREASE

Carburetor heater: 3 N·m (0.3 kgf·m)

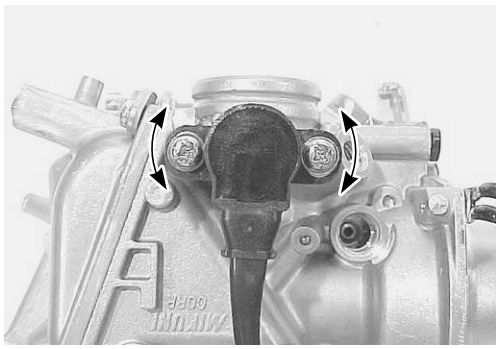
THROTTLE POSITION SENSOR POSITIONING



- Install the throttle position sensor with the flats on the throttle shaft end securely engaged with the slot on the throttle position sensor.
- Measure the resistance (Ω1) between the throttle position sensor terminals as shown in the illustration.

DATA Throttle position sensor resistance (Ω1): Approx. 5 kΩ

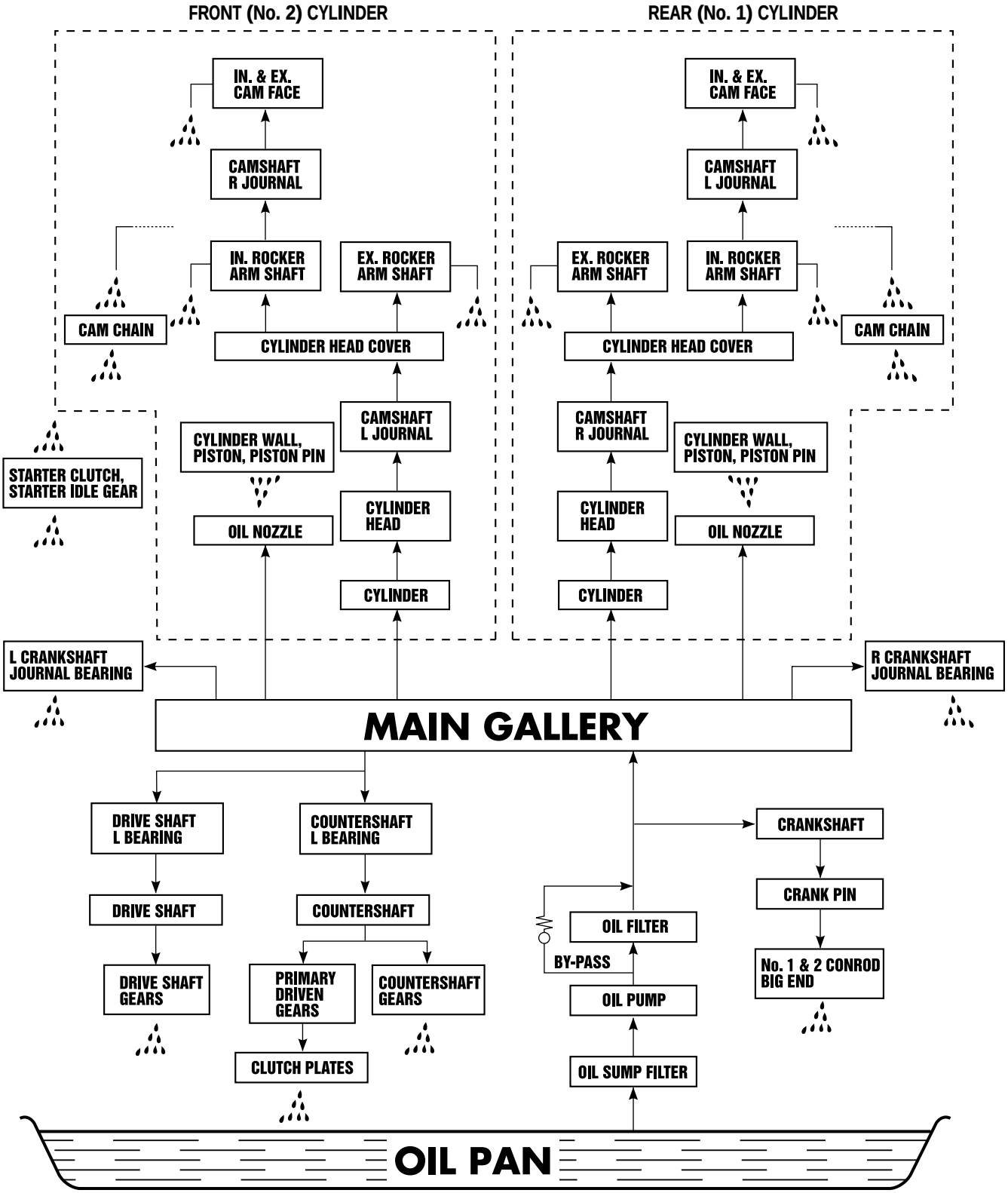
- Measure the resistance (Ω2) between the throttle position sensor terminals as shown in the illustration.
- Fully open the throttle valve with the throttle lever.
- Position the throttle position sensor until resistance (Ω2) is 3.09 – 4.63 kΩ.
- When the resistance (Ω2) is within specification, tighten the throttle position sensor mounting screws.



DATA Throttle position sensor resistance (Ω2):
3.09 – 4.63 kΩ

- After the assembly and installation on the engine have been completed, perform the following adjustment.
  * Throttle cable adjustment (☞ 2-9)
  * Idle speed adjustment (☞ 2-9)

LUBRICATION SYSTEM



CHASSIS

CONTENTS

5

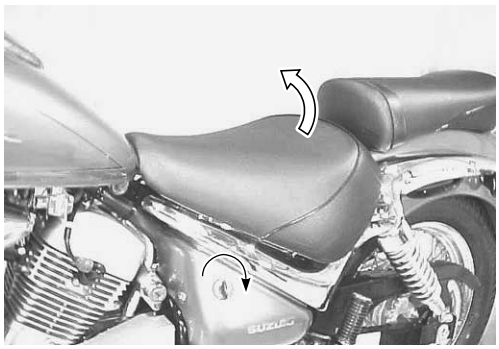
EXTERIOR PARTS REMOVAL AND REMOUNTING

FRONT FENDER

- With the bolts removed, remove the front fender.

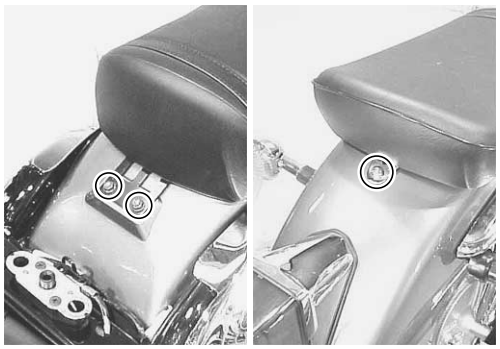
FRONT SEAT

- Remove the front seat with the ignition key.



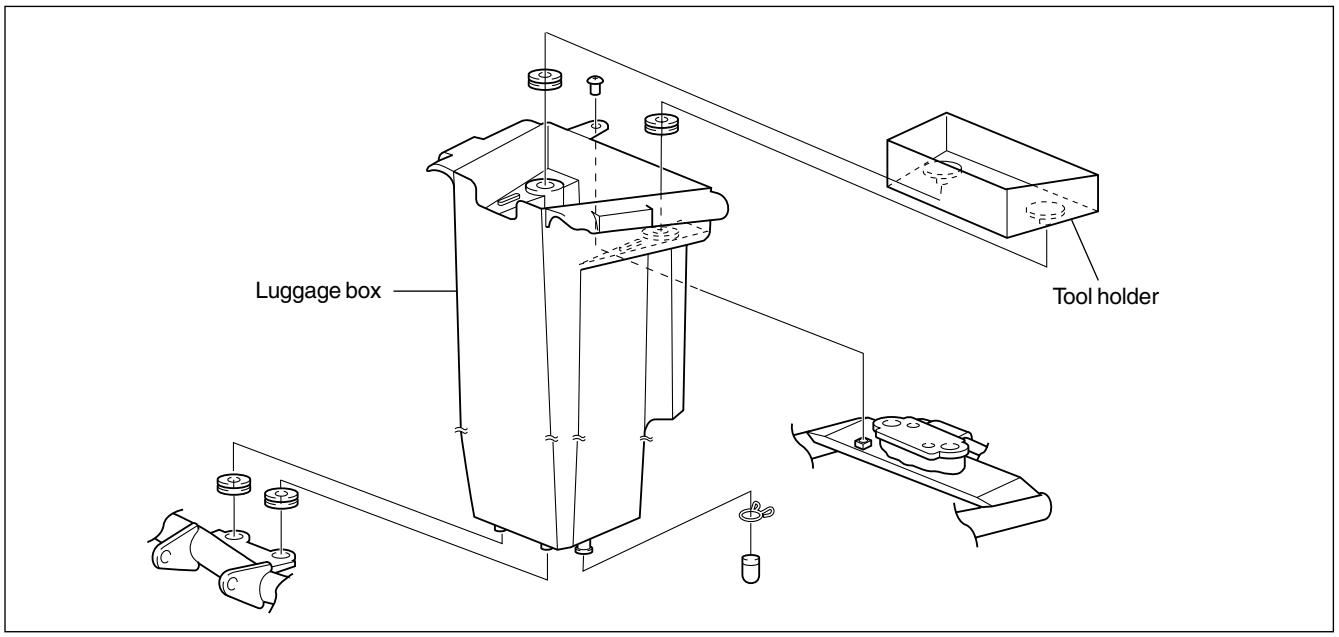
REAR SEAT

- Remove the front seat.
- With the bolts removed, remove the rear seat.

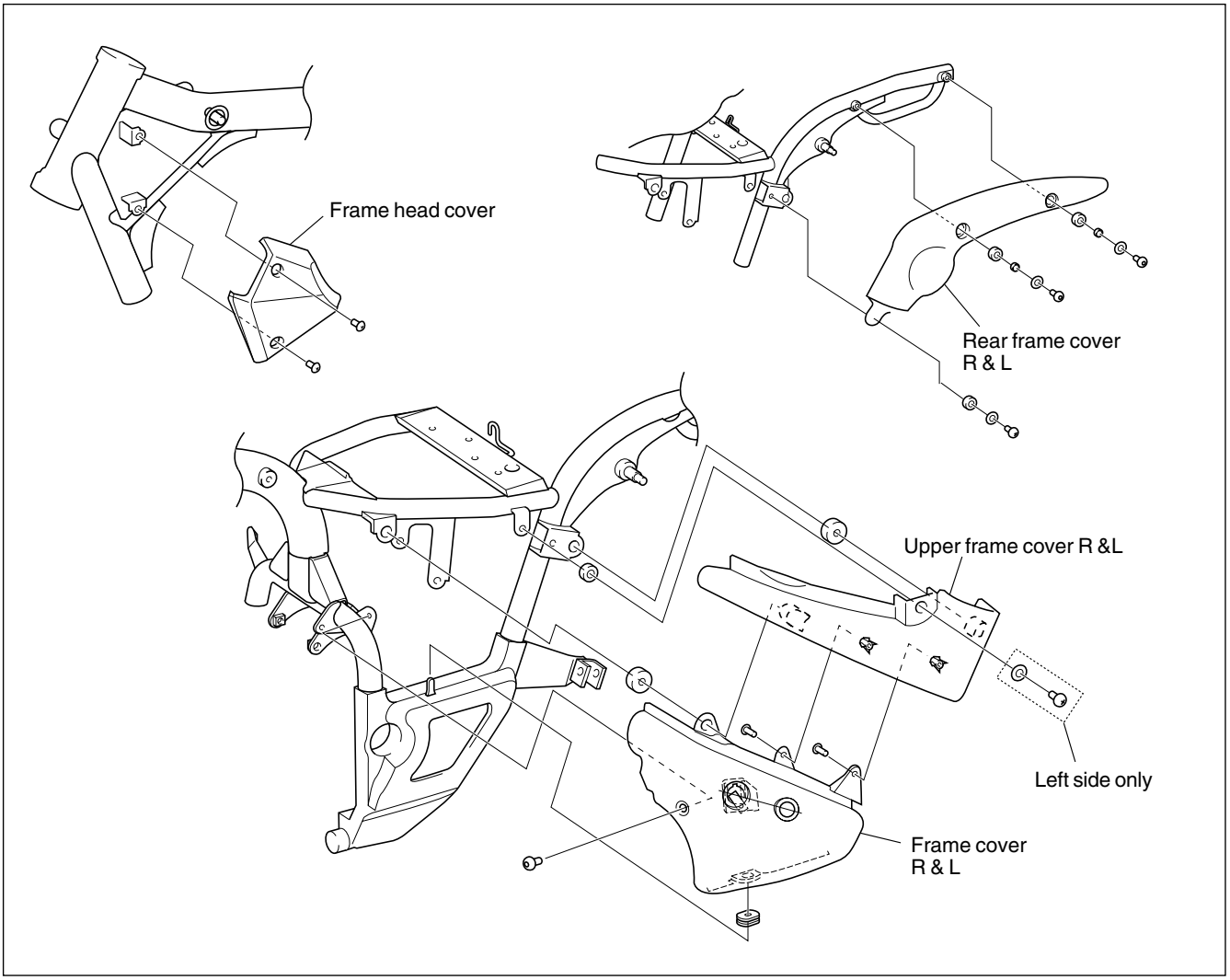


LUGGAGE BOX

- Remove the luggage box as shown in illustration.



FRAME COVER



RIGHT FRAME COVER

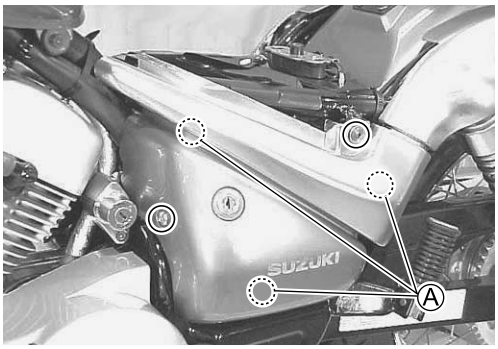
- Remove the bolt.
- With the hooks Ⓐ removed, remove the right frame cover.

RIGHT REAR FRAME COVER

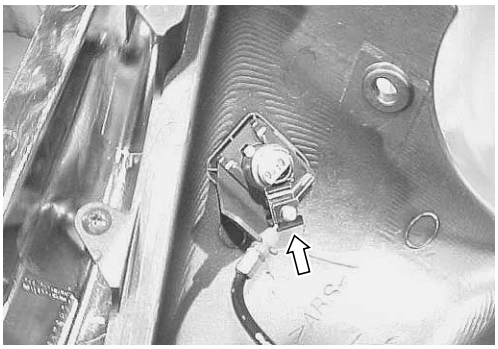
- Remove the right frame cover.
- With the screw and bolts removed, remove the right rear frame cover.

LEFT FRAME COVER

- Remove the screw and bolts.
- Remove the hook Ⓐ.

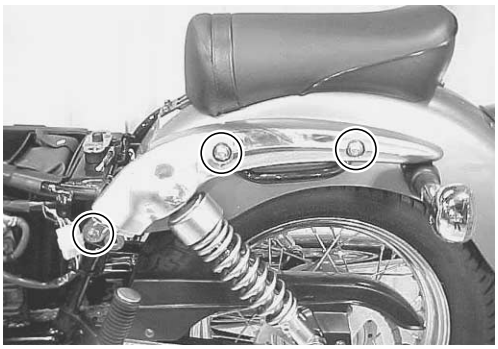


- With the seat lock cable disconnected, remove the left frame cover.

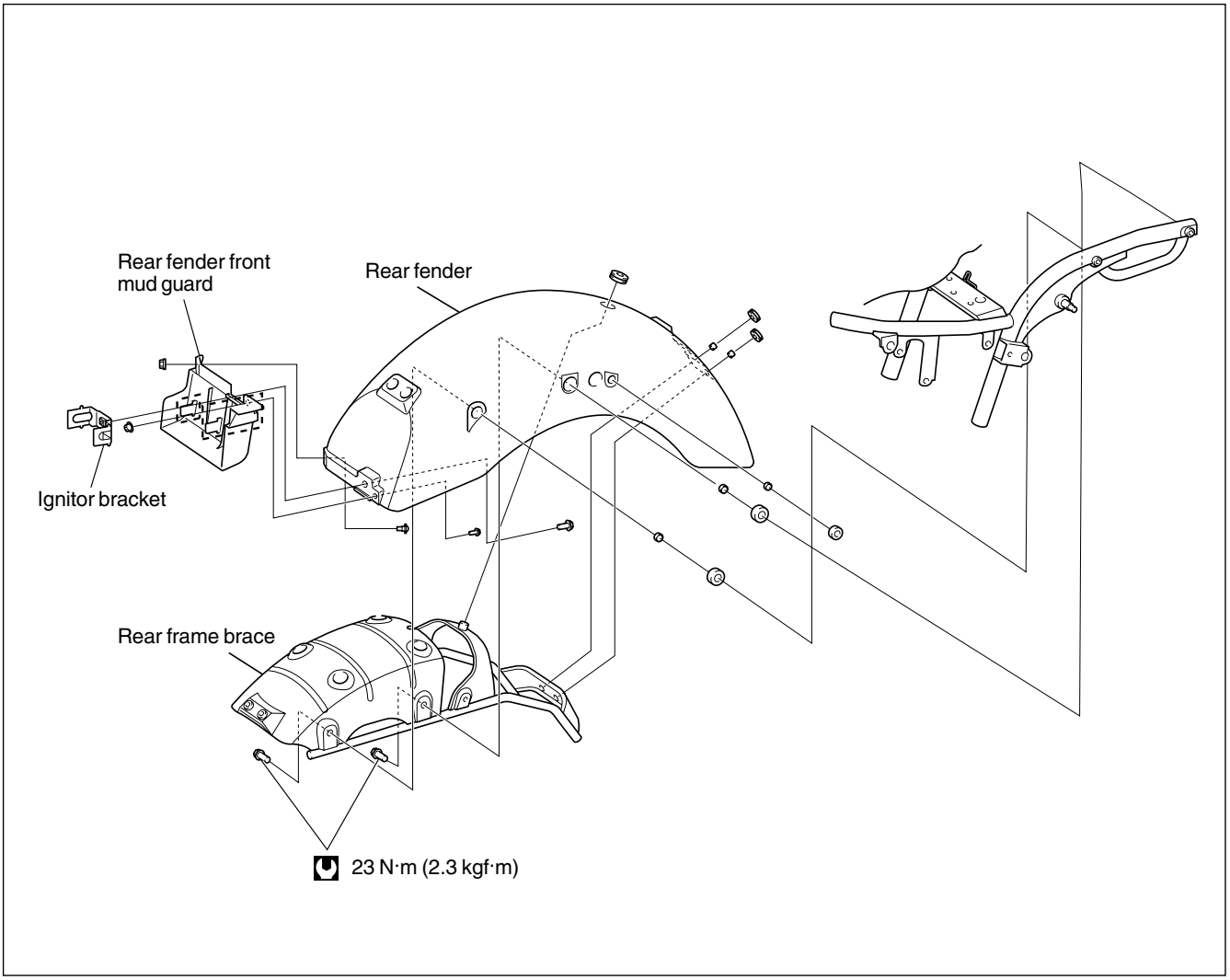


LEFT REAR FRAME COVER

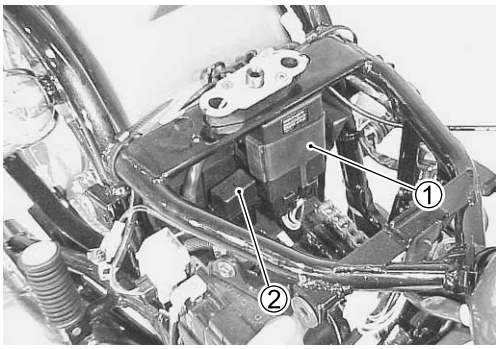
- Remove the left frame cover
- With the screw and bolts removed, remove the left rear frame cover.



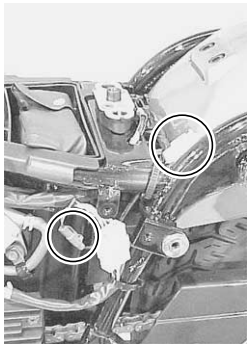
REAR FENDER



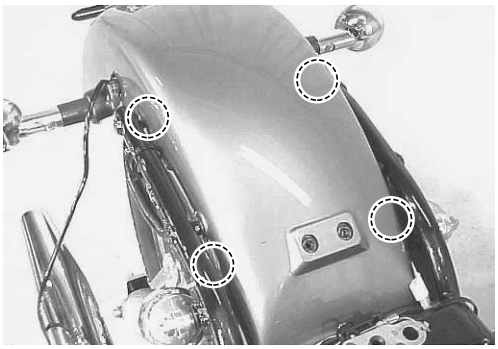
- Remove the front and rear seats.
- Remove the frame covers and luggage box.
- Remove the ignitor unit ① and turn signal relay assembly ②.



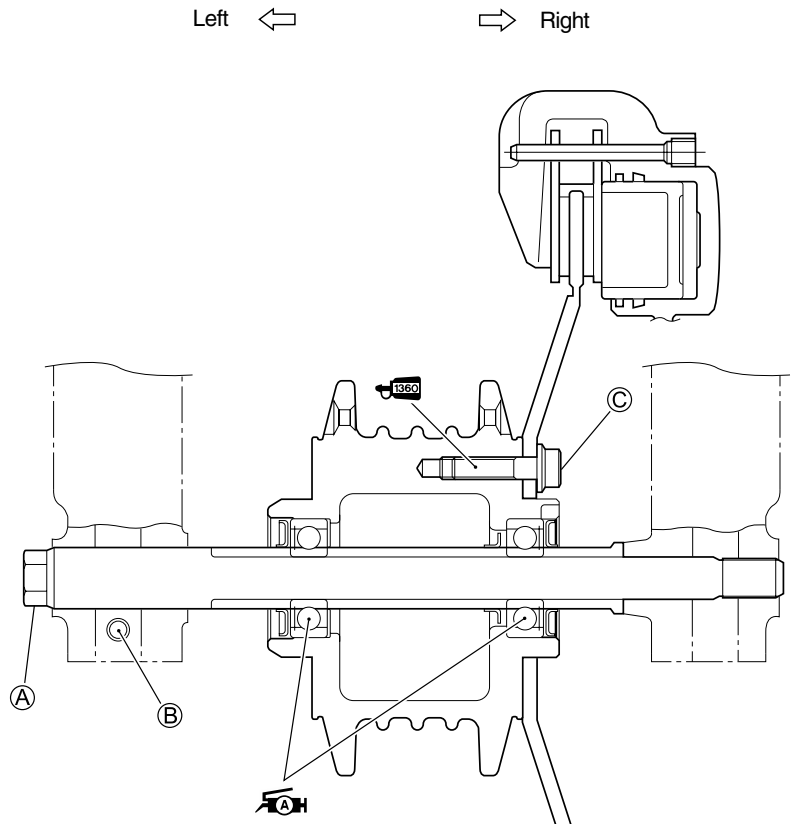
- Disconnect the rear turn signal light couplers and rear combination light coupler.



- With the bolt removed, remove the rear fender.



FRONT WHEEL



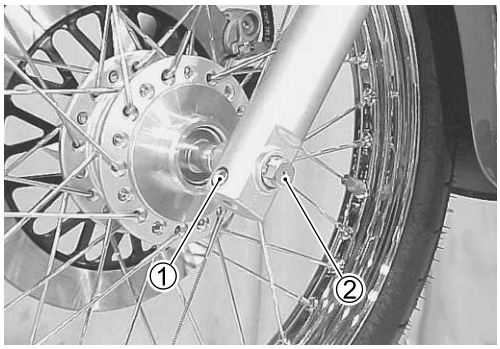
ITEM	N·m	kgf·m
Ⓐ	65	6.5
Ⓑ	23	2.3
Ⓒ	23	2.3

REMOVAL

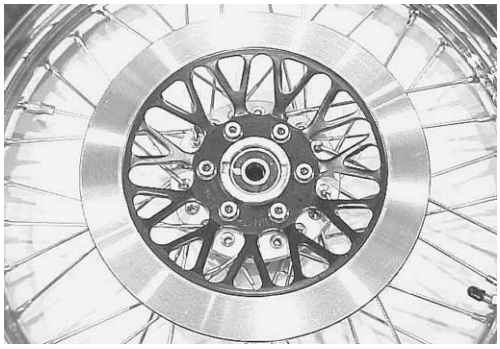
- Loosen the axle pinch bolt ①.
- Loosen the front axle ②.
- Raise the front wheel off the ground with a jack.
- Remove the front wheel by removing the front axle ②.

⚠ CAUTION

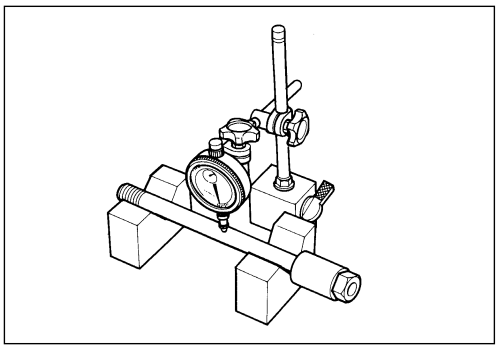
When using a jack, take care not to cause scratches on the chassis.



- Remove the brake disc.



INSPECTION AND DISASSEMBLY



TIRE

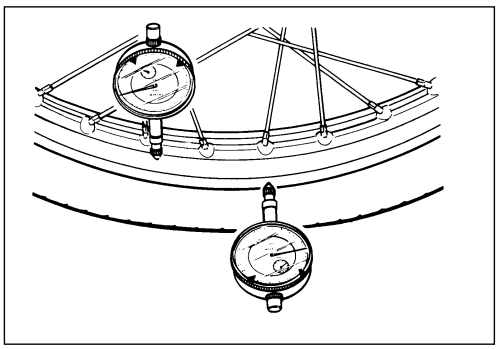
For inspection of the tire: ☞2-16

FRONT AXLE

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

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

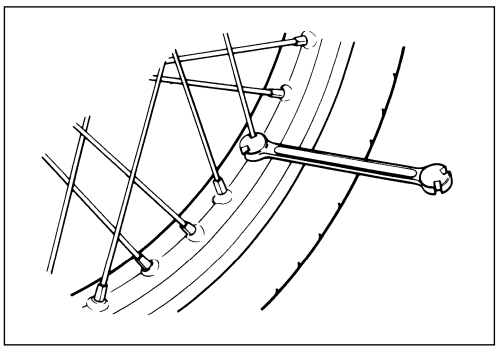
DATA Front axle shaft runnout:
Service Limit: 0.25 mm



WHEEL

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

DATA Wheel runout:
Service Limit (axial and radial): 2.0 mm



SPOKE NIPPLE

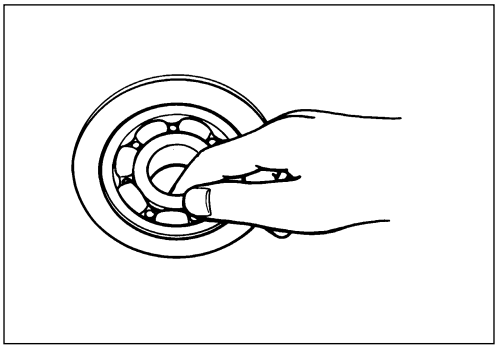
Check to be sure that all nipples are tight, and retighten them as necessary using a spoke nipple wrench.

TOOL 09940-60113: Spoke nipple wrench

Spoke nipple: 4.5 N·m (0.45 kgf·m)

WHEEL BEARINGS

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



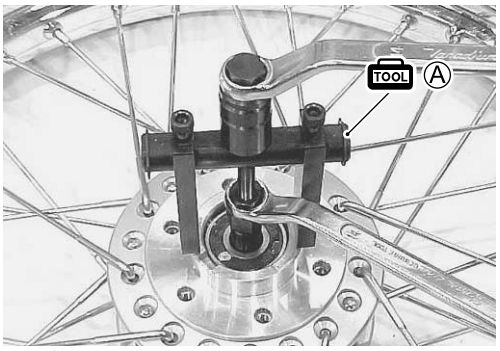
WHEEL BEARINGS REMOVAL

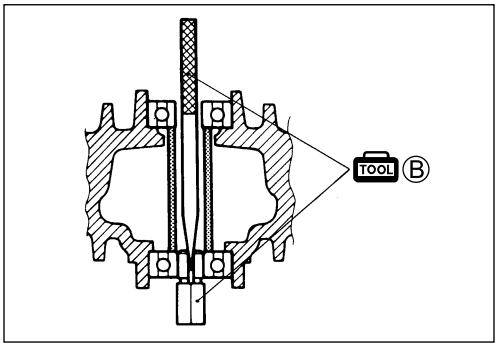
- Remove the wheel bearings by using the special tool Ⓐ or Ⓑ.

TOOL 09921-20220: Ⓐ Bearing remover set
or 09941-50111: Ⓑ Wheel bearing remover

⚠ CAUTION

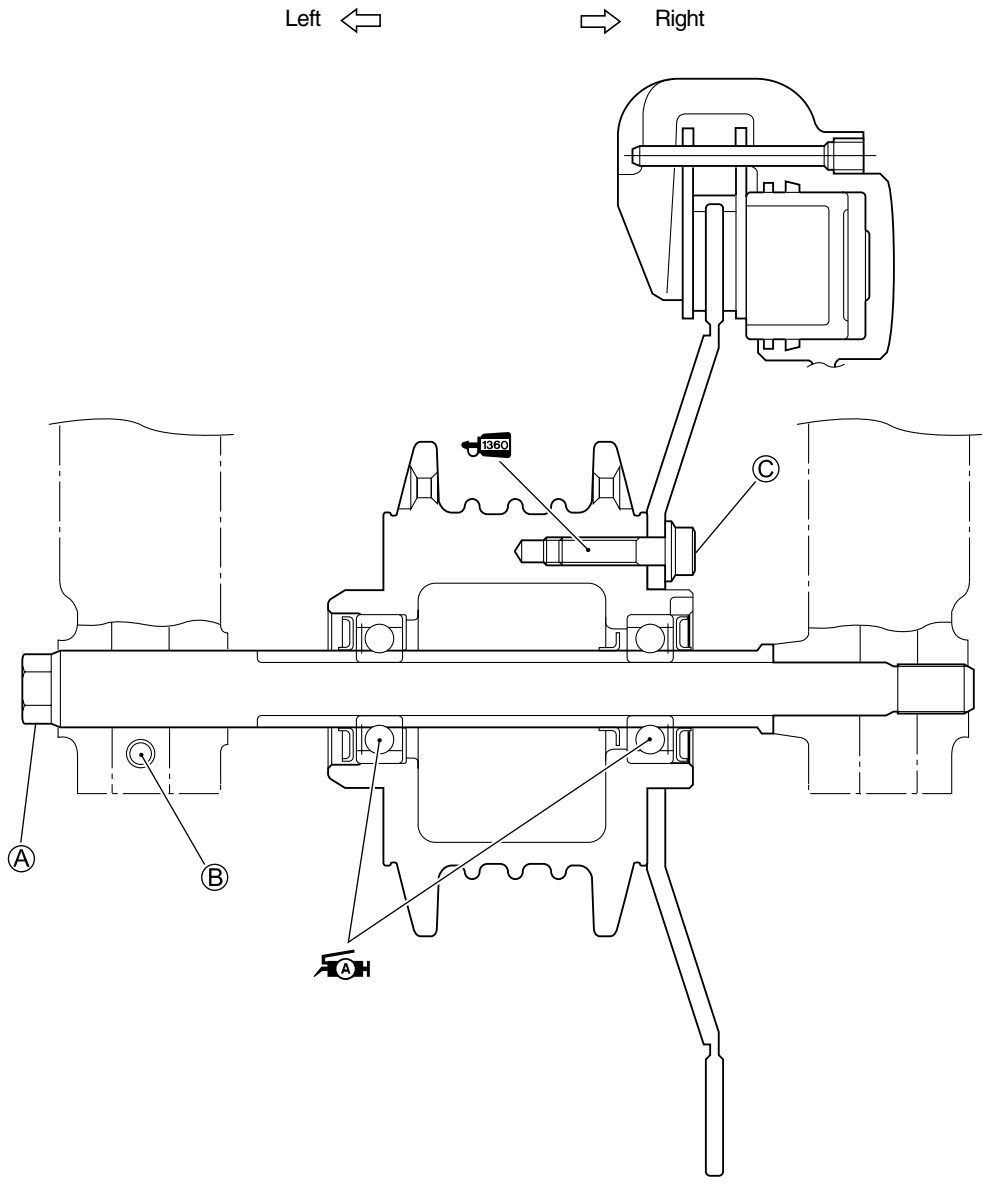
The removed bearings should be replaced with new ones.





REASSEMBLY

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



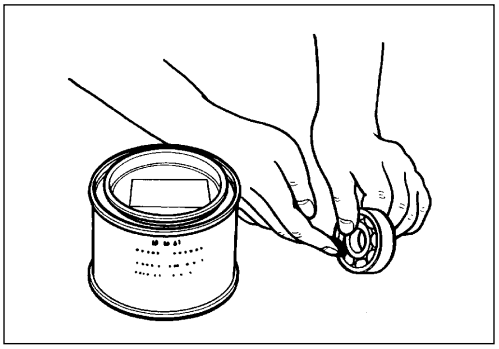
ITEM	N·m	kgf·m
Ⓐ	65	6.5
Ⓑ	23	2.3
Ⓒ	23	2.3

Ⓐ Front axle
Ⓑ Axle pinch bolt
Ⓒ Brake disc bolt

WHEEL BEARING

- Apply grease to the wheel bearings.

99000-25010: SUZUKI SUPER GREASE "A"

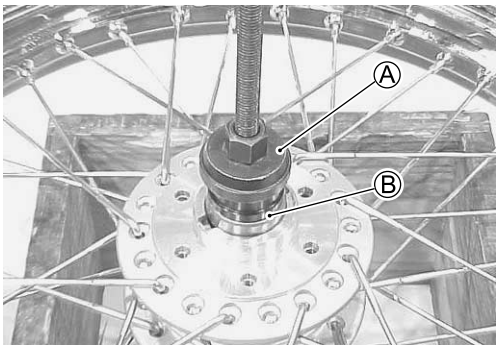


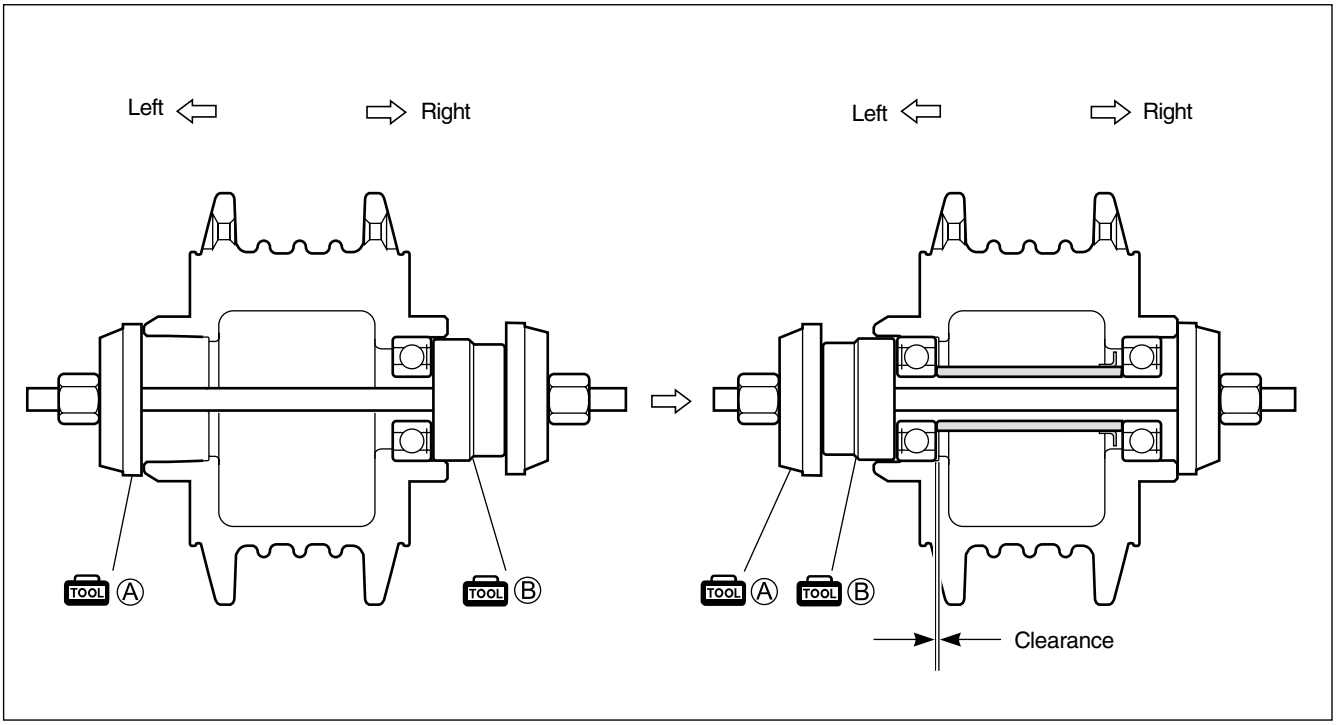
- Install the wheel bearings as follows by using the special tools.

09941-34513: Bearing/Steering race installer Ⓐ
09913-70210: Bearing installer set (ϕ 40 mm) Ⓑ

⚠ CAUTION

First install the right wheel bearing, then install the left wheel bearing.
The sealed cover of the bearing must face outside.





BRAKE DISC

Make sure that the brake disc is clean and free of any greasy matter.

- Apply THREAD LOCK SUPER "1360" to the disc mounting bolts and tighten them to the specified torque.

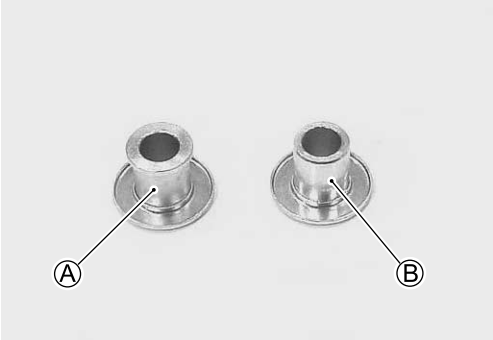
Brake disc bolt: 23 N·m (2.3 kgf·m)

1360 99000-32130: THREAD LOCK SUPER "1360"

REMOUNTING

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

- Set the wheel spacer and install the front wheel with the front axle.
  Spacer Ⓐ: Right side
  Spacer Ⓑ: Left side

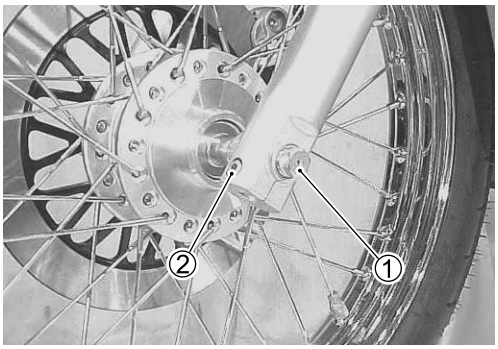


- Tighten the front axle ① to the specified torque.

Front axle: 65 N·m (6.5 kgf·m)

- Tighten the axle pinch bolt ② to the specified torque.

Axle pinch bolt: 23 N·m (2.3 kgf·m)



FRONT BRAKE

⚠ WARNING

*** Do not mix with brake fluid of different brand.**
*** Do not use a brake fluid kept in a open container or stored for long period of time.**
*** To store brake fluid, make sure to seal the container and keep it in a safe place to be out of reach of children.**
*** When filling brake fluid, take care not to allow water or dirt to enter the system.**
*** To wash the brake system parts, use brake fluid and not any other material.**
*** Do not allow dirt and fluids to contact the brake disc or pad.**

⚠ CAUTION

Do not allow brake fluid to contact the paint surface, plastic or rubber parts, or its chemical reaction can cause discoloration or crack.

BRAKE FLUID REPLACEMENT

- For replacing procedure of brake fluid: ☞2-14

BRAKE PAD REPLACEMENT

- For replacing procedure of brake pad: ☞2-14

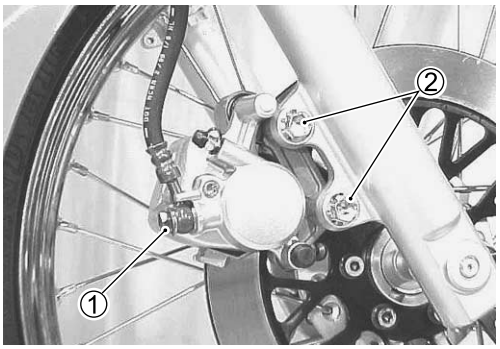
CALIPER REMOVAL AND DISASSEMBLY

- Drain brake fluid. (☞2-14)

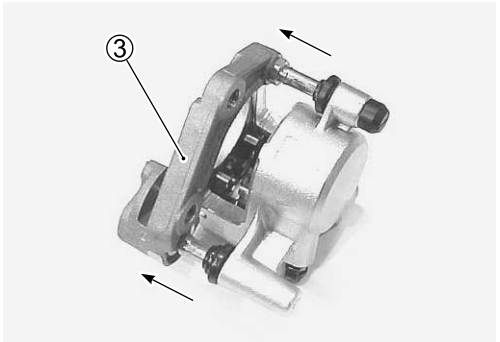
⚠ CAUTION

To prevent brake fluid from splashing on the parts nearby, cover the parts with cloth.

- Remove the union bolt ① and caliper mounting bolts ②.



- Remove the brake pad. (☞2-14)
- Remove the brake caliper holder ③.

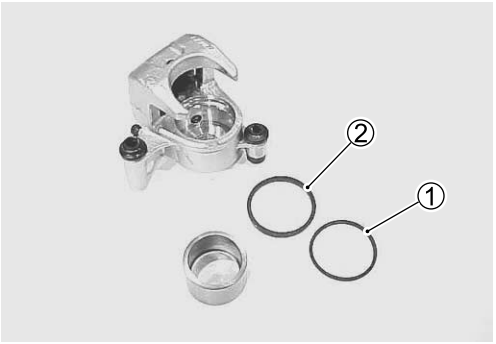


- Using an air blow gun, pressurize the caliper fluid chamber to push out the piston.

⚠ WARNING

*** Place a rag over the piston to prevent it from popping out and flying and keep hand off the piston.**
*** Be careful of brake fluid which can possibly splash.**
*** Do not use high pressure air but increase the pressure gradually.**

- Remove the dust seal ① and piston seal ②.



⚠ CAUTION

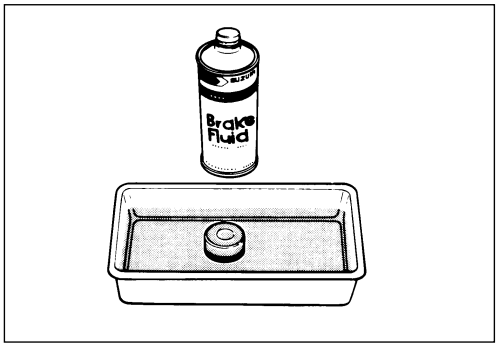
*** Use care not to cause scratch on the cylinder bore.**
*** Do not reuse the piston seal and dust seal that have been removed.**

CALIPER INSPECTION

Inspect the caliper cylinder wall and piston surface for scratch, corrosion or other damages.
If any abnormal condition is noted, replace the caliper.

CALIPER REASSEMBLY

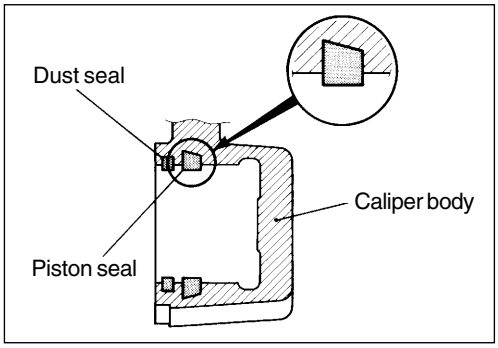
Reassemble the caliper in the reverse order of disassembly procedures and observe the following points.



⚠ CAUTION

*** Wash the caliper components with fresh brake fluid before reassembly. Do not wipe off brake fluid after washing the components.**
*** Replace the piston seal and dust seal with new ones with brake fluid applied.**

BF Brake fluid specification and classification: DOT 4

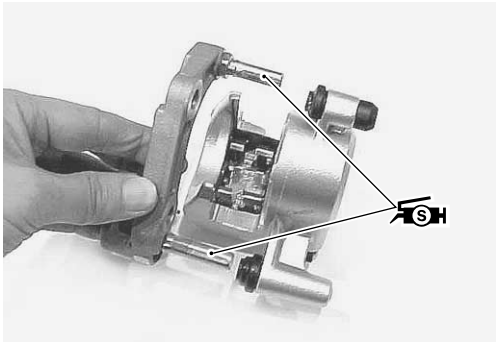


- Install the brake pad spring.

- Apply grease to the brake caliper holder.

99000-25100: SUZUKI SILICONE GREASE

- Install the brake pads. (☞2-14)

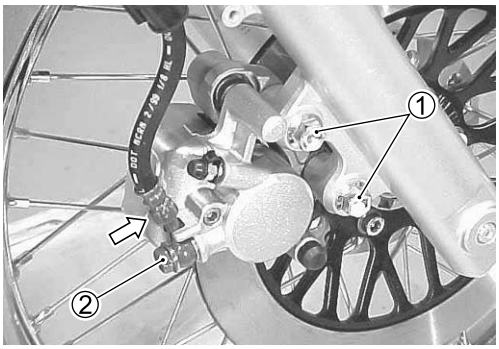


CALIPER REMOUNTING

- Tighten the caliper mounting bolts ①.
- With the hose end seted to the stopper, tighten the union bolt ②.

Caliper mounting bolt: 39 N·m (3.9 kgf·m)
Union bolt: 23 N·m (2.3 kgf·m)

- For assembly procedure of brake hose: ☞7-16



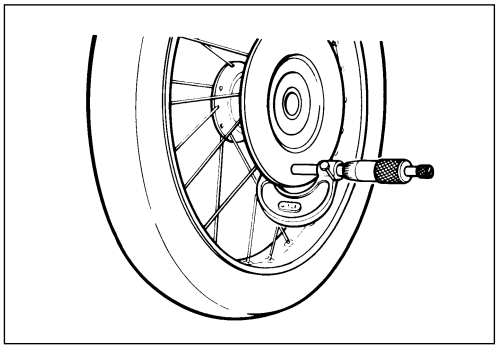
- Fill the system with brake fluid and bleed air. (☞2-14)

INSPECTION AFTER REASSEMBLY

Brake (☞2-13)

BRAKE DISC INSPECTION

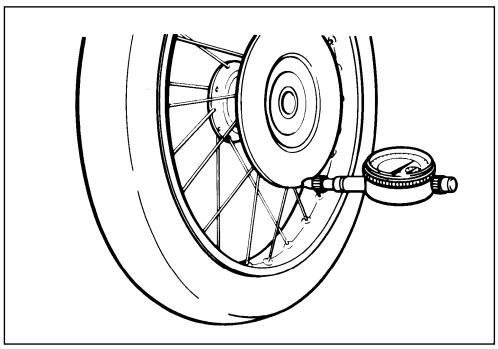
Check the brake disc for damage or cracks. Measure the thickness using the micrometer.
Replace the brake disc (☞5-7) if the thickness is less than the service limit or if damage is found.



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

DATA Brake disc thickness: Service Limit: 4.5 mm

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



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

DATA Brake disc runout: Service Limit: 0.30 mm

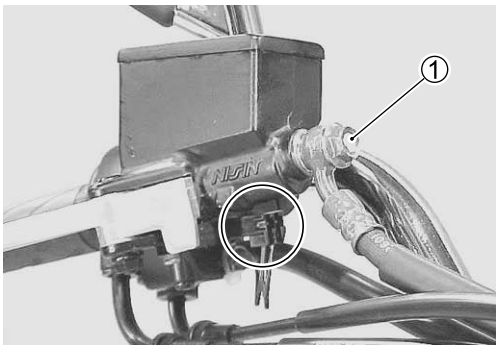
- If either measurement exceeds the service limit, replace the brake disc. (☞5-7)

MASTER CYLINDER REMOVAL AND DISASSEMBLY

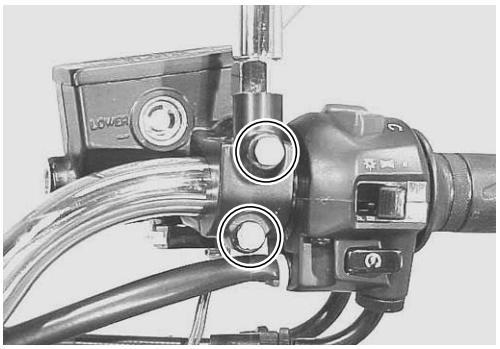
- Drain brake fluid from the front brake side reservoir. (☞2-14)
- Disconnect the brake light switch lead wire coupler.
- Remove the union bolt ①.

⚠ CAUTION

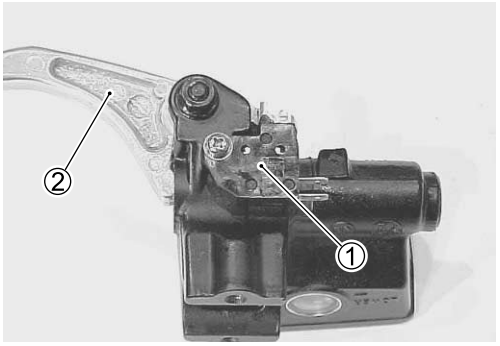
Place a rag under the union bolt so that brake fluid may not contact the parts.



- Remove the master cylinder.

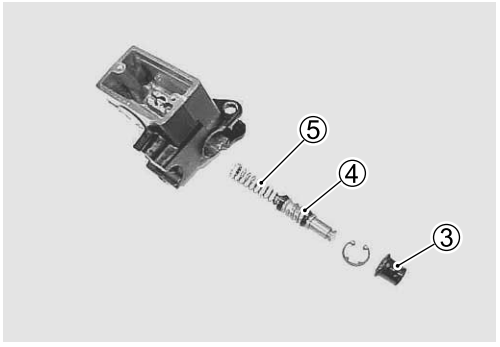


- Remove the brake light switch ① and brake lever ②.



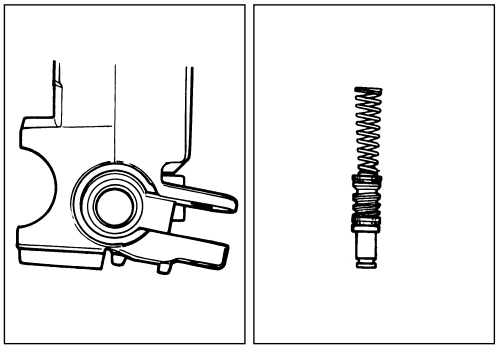
- Remove the reservoir tank cap.

- Detach the dust seal boot ③ and remove the circlip.
- Pull out the piston/cup set ④ and spring ⑤.



MASTER CYLINDER INSPECTION

Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the primary cup, secondary cup and dust seal for wear or damage.

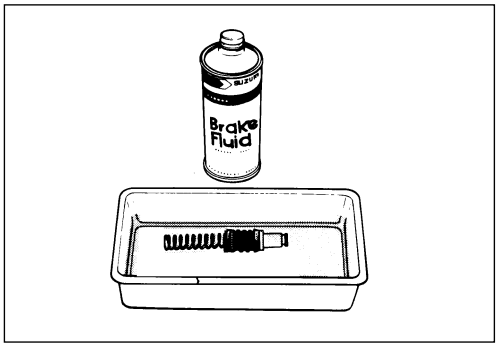


MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

⚠ CAUTION

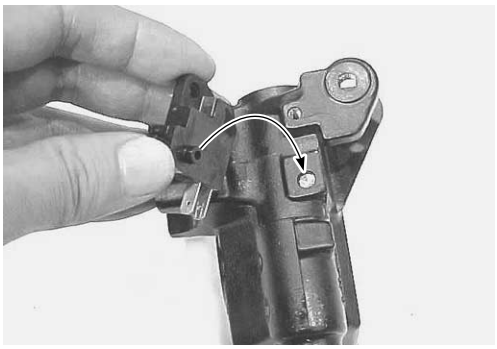
- *** Wash the master cylinder components with new brake fluid before reassembly.**
- *** Do not wipe the brake fluid off after washing the components.**
- *** When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.**
- *** Apply brake fluid to the master cylinder bore and all of the master cylinder components before reassembly.**



BF **Specification and Classification: DOT 4**

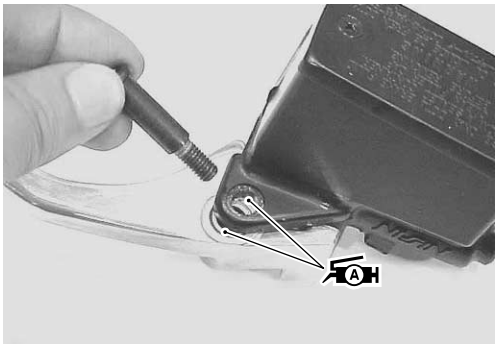
NOTE:
When installing the circlip, make sure that the sharp edge of the circlip faces outside.

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



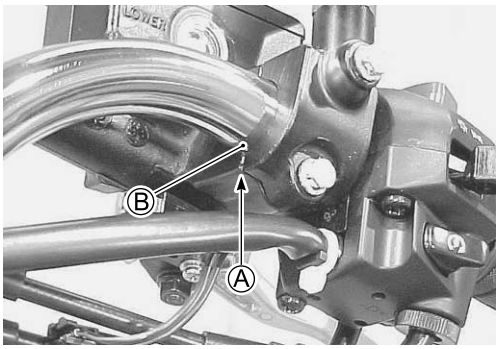
- Apply the grease to the brake lever pivot.

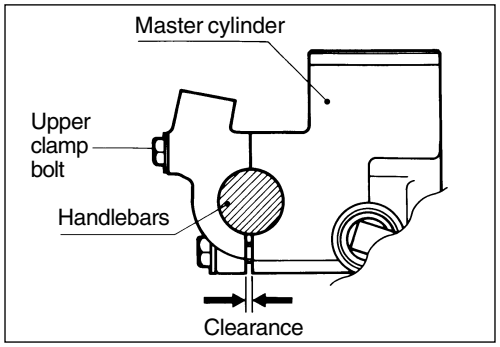
A H **99000-25010: SUZUKI SUPER GREASE "A"**



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

Master cylinder bolt: 10 N·m (1.0 kgf·m)



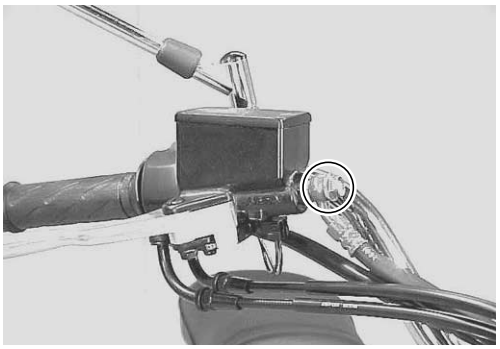


- Install the brake hose union (☞7-16), tighten the union bolt to the specified torque.

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

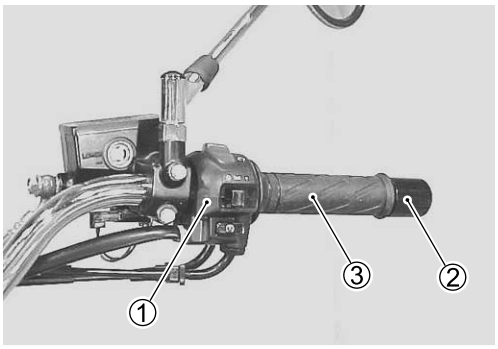
⚠ CAUTION

Bleed air from the brake system after reassembling the master cylinder. (☞2-14)



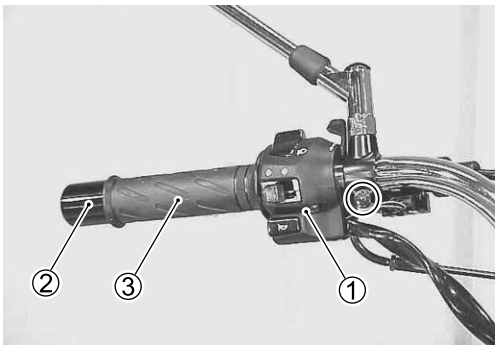
HANDLEBARS

HANDLEBAR RIGHT SIDE PARTS REMOVAL

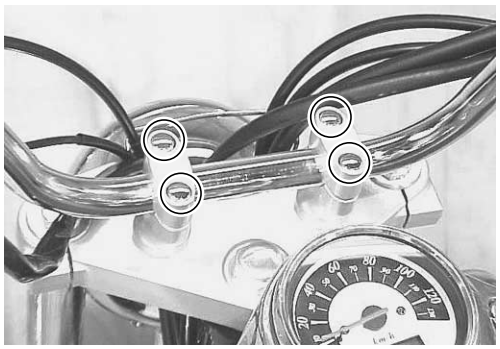


- Remove the right handlebar switches ①.
- Disconnect the brake light switch lead wires and remove the master cylinder. (☞5-17)
- Remove the handlebar balancer ② and grip ③.

HANDLEBAR LEFT SIDE PARTS REMOVAL



- Remove the left handlebar switches ①.
- Remove the handlebar balancer ② and grip ③.
- Remove the clutch lever holder.



- Remove the clamp bolts and detach the handlebar holders.
- Remove the handlebars.

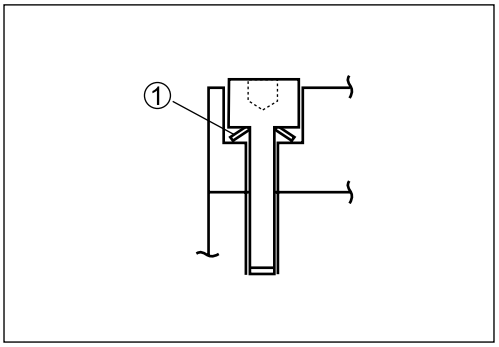
REMOUNTING

Perform the remounting work in the reverse order of the removal procedures while observing the following instructions.

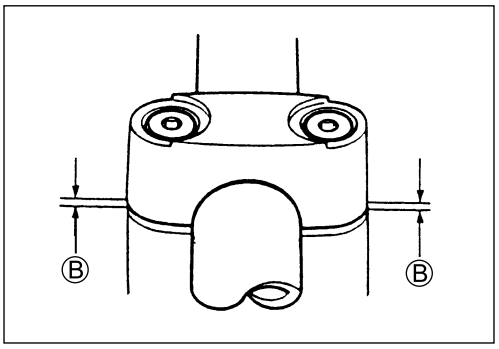
- Install the handlebers with the punch mark Ⓐ aligned with the handleber clamp as shown.
- Tighten the handlebar clamp bolts to the specified torque.

Handlebar clamp bolt: 23 N·m (2.3 kgf·m)

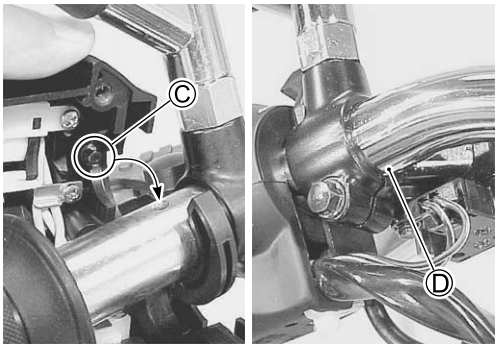
NOTE:
The convex side of the washer ① faces downward.



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



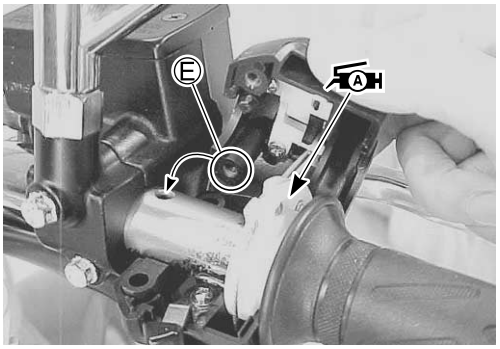
- With the stopper Ⓒ engaged with the handlebar hole, assemble the handlebar switch.
- Align the mating face of clutch lever holders with the respective punch marks Ⓓ and tighten the bolt.



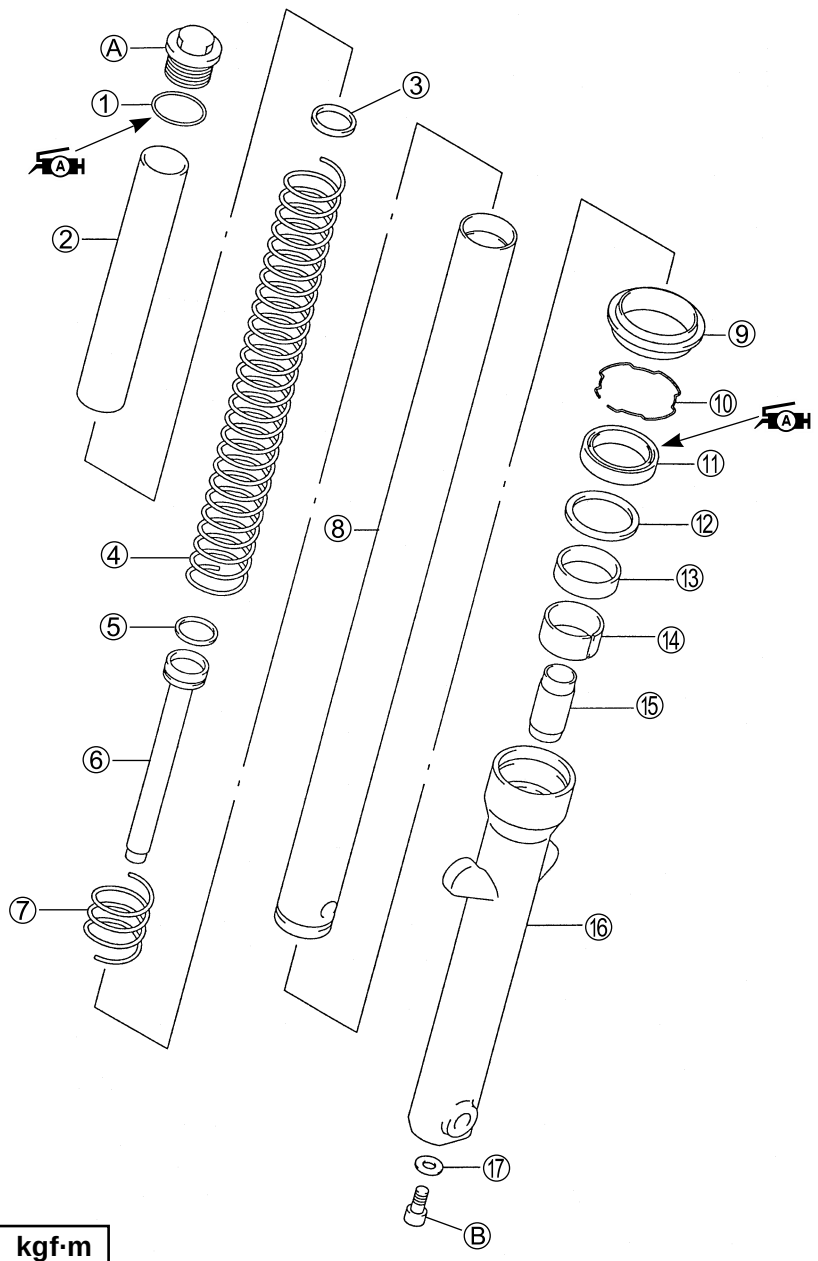
- Install the brake master cylinder. (☞5-18)
- Apply the grease to the throttle cables and assemble them to the pulley.

99000-25010: SUZUKI SUPER GREASE "A"

- With the stopper Ⓔ engaged with the handlebar hole, assemble the handlebar switch.



FRONT FORK



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

Ⓐ Front fork cap bolt
Ⓑ Damper rod bolt

ITEM	N·m	kgf·m
Ⓐ	23	2.3
Ⓑ	30	3.0

REMOVAL AND DISASSEMBLY

- Remove the front wheel. (☞5-7)
- Remove the brake caliper. (☞5-13)

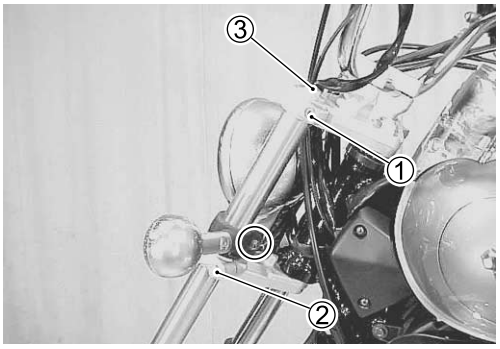
⚠ CAUTION

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

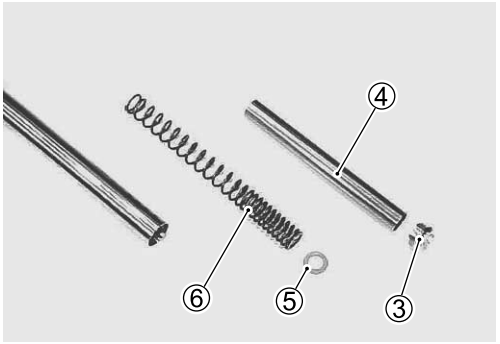
- Remove the front fender. (☞5-2)

- Remove the turn signal light.
- Remove the front fork after loosening the front fork upper and lower clamp bolts (①, ②)

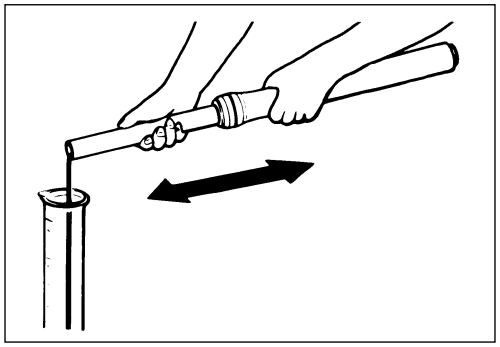
NOTE:
Slightly loosen the front fork cap bolt ③ to facilitate later disassembly.



- Remove the front fork cap bolt ③, spacer ④, washer ⑤ and spring ⑥.

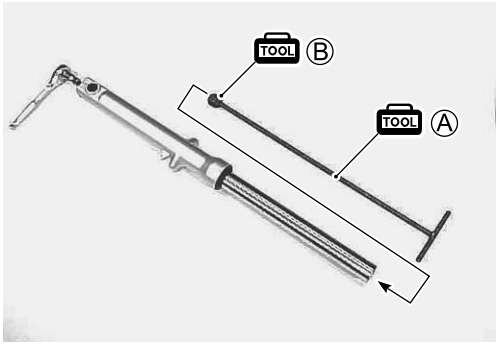


- Invert the front fork and stroke it several times to drain out the fork oil.
- Hold the front fork in the inverted position for a few minutes to allow the fork oil to fully drain.

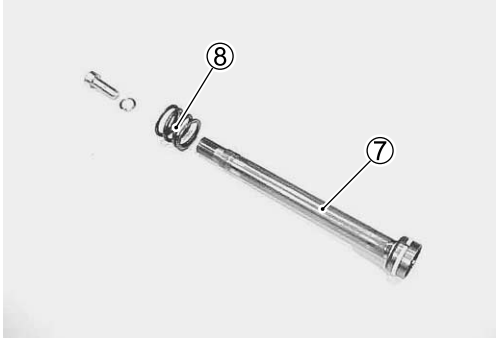


- With the damper rod held immovable, remove the damper rod bolt.

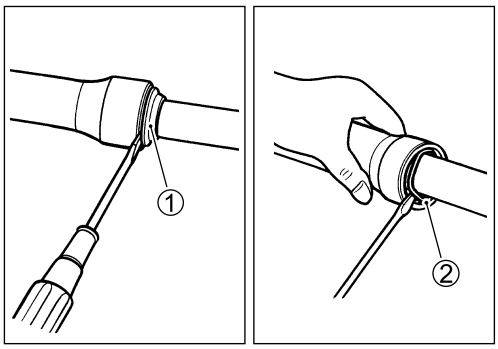
TOOL **09940-34520: "T" handle** Ⓐ
09940-34581: Attachment Ⓑ



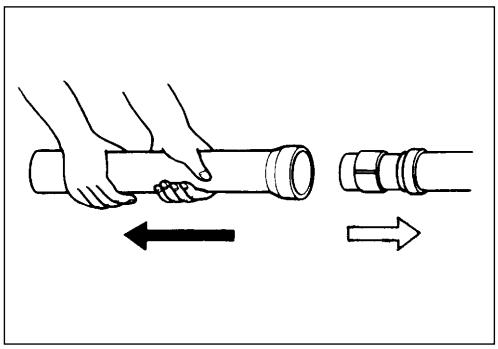
- Remove the damper rod ⑦ and rebound spring ⑧ from the inner tube.



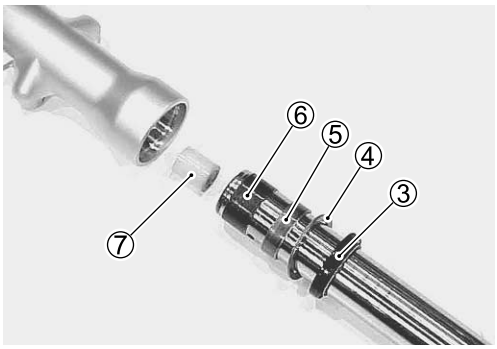
- Remove the dust seal ① and oil seal stopper ring ②.



- Separate the inner tube from the outer tube.



- Remove the following parts.
  ③ Oil seal
  ④ Oil seal retainer
  ⑤ Slide metal
  ⑥ Guide bushing
  ⑦ Oil lock piece



⚠ CAUTION

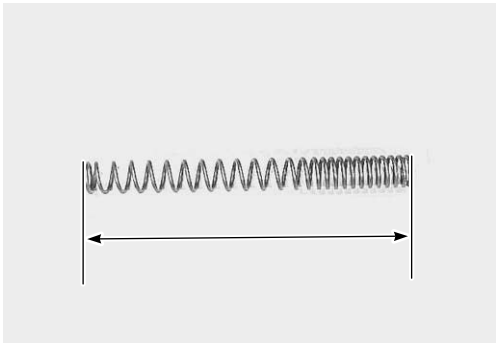
The removed oil seal, slide metal and guide bushing should be replaced with new ones.

INSPECTION

FRONT FORK SPRING

Measure the free length of the front fork spring.
If the length is found shorter than the service limit, replace the spring.

DATA Front fork spring free length: Limit: 284 mm



INNER TUBE AND OUTER TUBE

Check the sliding surface of the inner tube, outer tube and damper rod ring for scratch, wear, bending, or other abnormal condition.

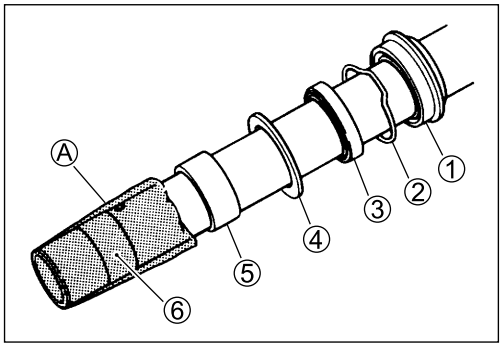
REASSEMBLY AND REMOUNTING

Perform the reassembly and remounting work in the reverse order of the disassembly and removal procedures while observing the following instructions.

⚠ CAUTION

*** Thoroughly wash all the component parts being assembled.**
Insufficient washing can result in oil leakage or premature wear of the parts.
*** When reassembling the front fork, use new fork oil.**
*** Use the specified fork oil for the front fork.**
*** When reassembling, replace the slide metals, oil seal, dust seal and damper rod bolt gasket with new ones.**
*** Use care not to cause damage to the slide metal surfaces since the surfaces are TEFLON coated.**

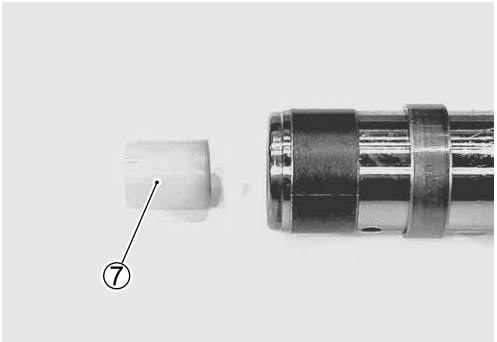
- On the inner tube, assemble the following parts.
  ① Dust seal
  ② Oil seal stopper ring
  ③ Oil seal
  ④ Oil seal retainer
  ⑤ Slide metal
  ⑥ Guide bushing



⚠ CAUTION

To prevent the lip of oil seal ③ from being damaged, cover the inner tube with vinyl sheet Ⓐ during installation.

- With the oil lock piece ⑦ fitted to the inner tube so that its taper side face upward, assemble the inner tube to the outer tube.



- Apply grease to the lip of the oil seal ③ and install it into the outer tube using the front fork oil seal installer.

99000-25010: SUZUKI SUPER GREASE "A"

09940-52861: Front fork oil seal installer set

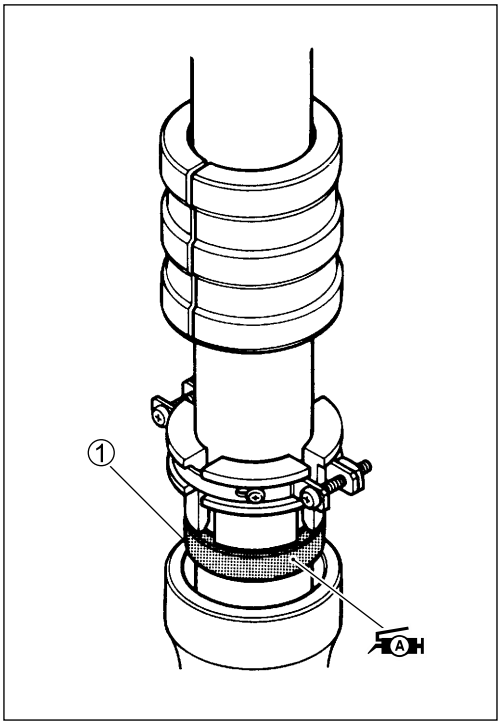
⚠ CAUTION

Wash clean the front fork oil seal installer before using. If dirt is on the installer, the inner tube may possibly be damaged during press-fitting work.

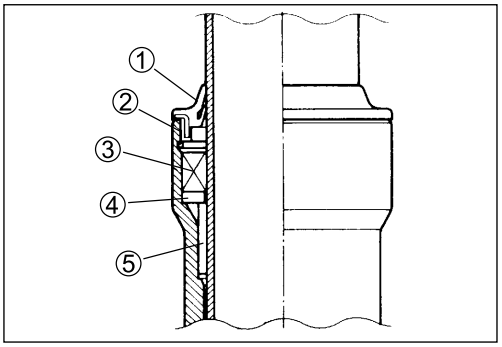
- Fit the stopper ring ② and dust seal ①.

⚠ CAUTION

Make sure that the stopper ring is securely fitted into the groove on the outer tube.



① Dust seal
② Oil seal stopper ring
③ Oil seal
④ Oil seal retainer
⑤ Slide metal

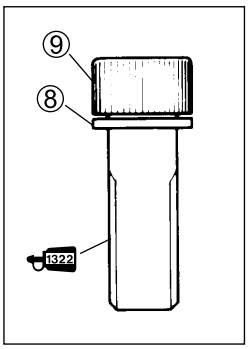


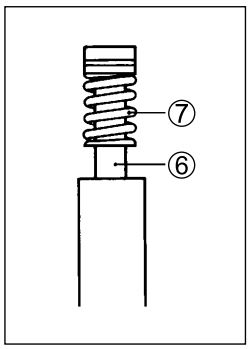
- Fit the rebound spring ⑦ on the damper rod ⑥ and install them together to the inner tube.
- Apply the thread lock to the damper rod bolt ⑨.
- With the damper rod held immovable, with the gasket ⑧ fitted, tighten the damper rod bolt ⑨.

Damper rod bolt: 30 N·m (3.0 kgf·m)

99000-32110: THREAD LOCK "1322"

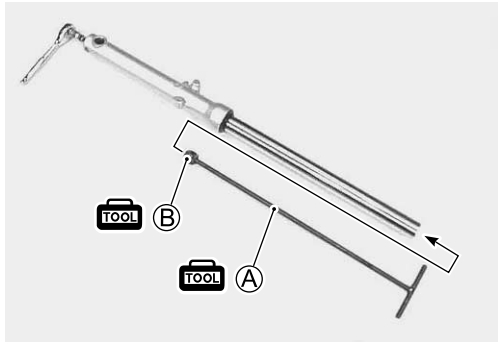
09940-34520: "T" handle Ⓐ
09940-34581: Attachment Ⓑ





⚠ CAUTION

Replace the gasket with a new one.

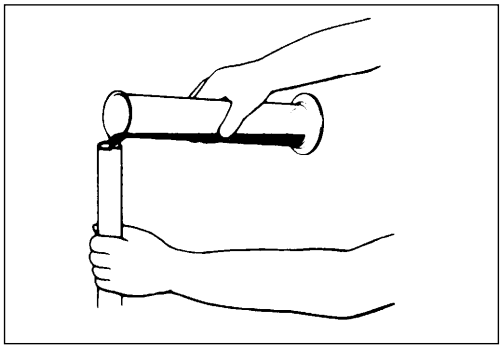


FRONT FORK OIL

- With the inner tube in fully compressed position, pour the specified amount of fork oil and stroke the tube several times to expel air.

FORK 99000-99044-10G: FORK OIL #10

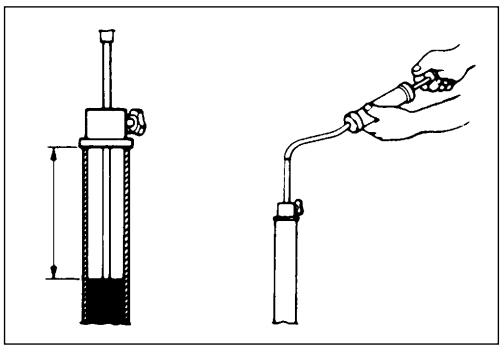
DATA Front fork oil capacity (each leg): 406 ml



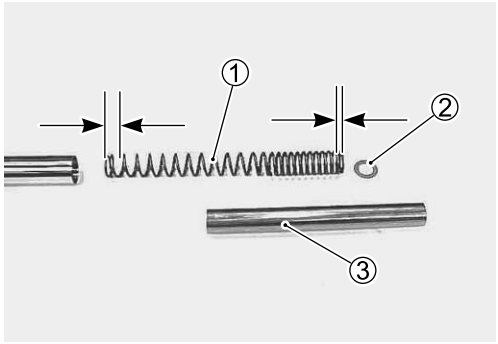
- With the front fork held in vertical position, compress the inner tube all the way.
- Wait until the fluid level stabilizes, measure and adjust the level to specification using the special tool.

DATA Front fork oil level (without spring): 88 mm

TOOL 09943-74111: Front fork oil level gauge



- When installing the front fork spring ①, closed pitch end should position upside.
- Assemble the washer ② and spacer ③.

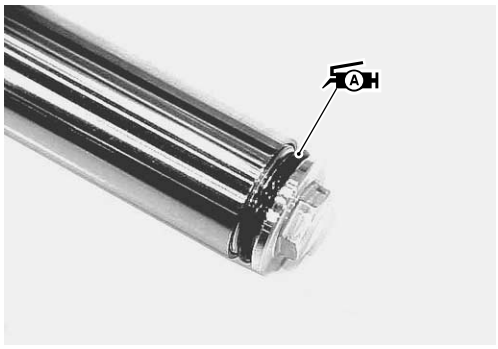


- Fit the O-ring to the front fork cap bolt and apply grease.

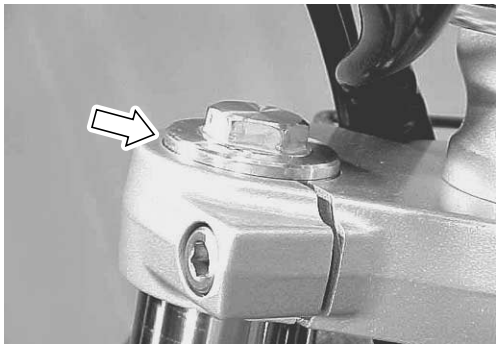
A 99000-25010: SUZUKI SUPER GREASE "A"

⚠ CAUTION

Use a new O-ring to prevent oil leakage.

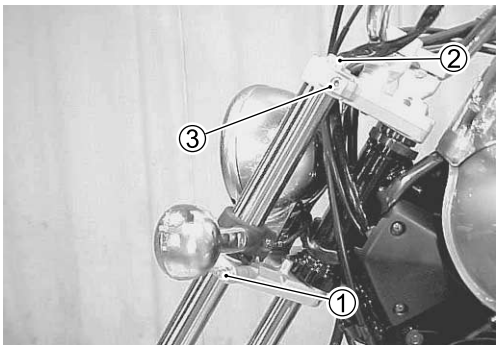


- Install the front fork to the motorcycle.
- Align the upper surface of the inner tube with the upper surface of the steering stem upper bracket.

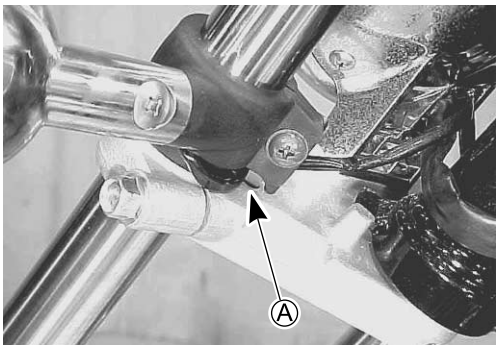


- Tighten the front fork lower clamp bolts ① and front fork cap bolts ② to the specified torque.
- Tighten the front fork upper clamp bolts ③ to the specified torque.

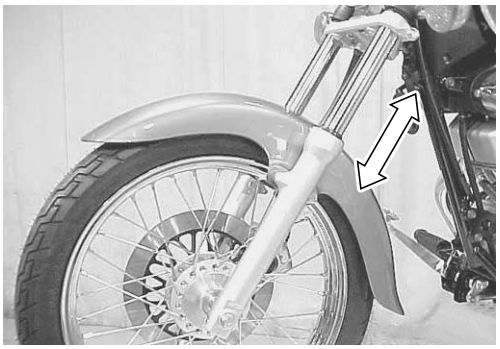
Front fork upper clamp bolt: 23 N·m (2.3 kgf·m)
Front fork lower clamp bolt: 33 N·m (3.3 kgf·m)
Front fork cap bolt: 23 N·m (2.3 kgf·m)



- With the stopper nut installed to the stearing stem hole Ⓐ, assemble the turn signal light.



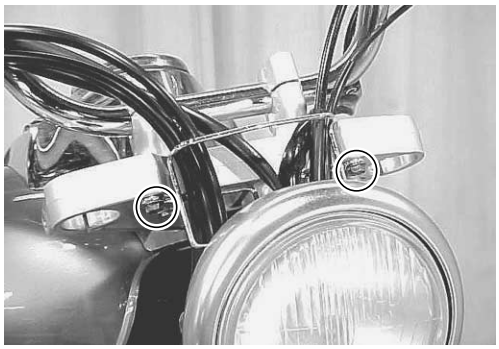
- Install the front fender and tighten the mounting bolts temporarily.
- Install the front brake caliper. (☞5-15)
- Install the front wheel. (☞5-12)
- Move the front fork up and down several times.
- Tighten the front fender mounting bolts securely.



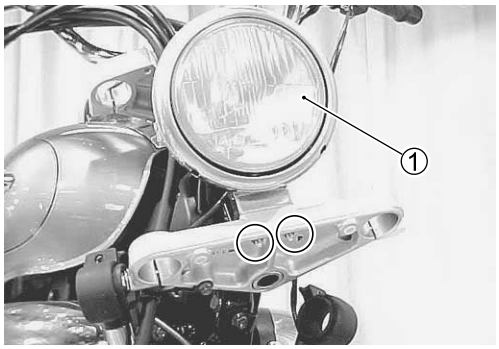
STEERING

REMOVAL AND DISASSEMBLY

- Remove the front wheel. (☞5-7)
- Remove the front fork. (☞5-22)
- Remove the cable guide.

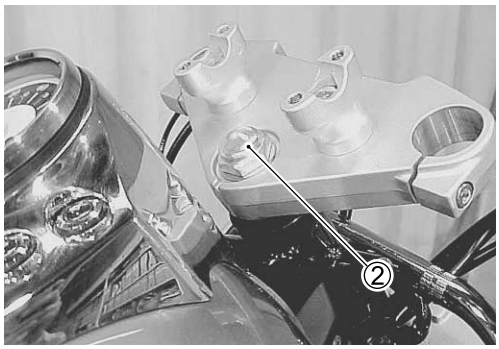


- With the nuts removed, remove the headlight housing ①.
- Remove the handlebars. (☞5-20)



- Remove the brake hose clamp bolt.

- Remove the steering stem head nut ②.
- Remove the steering stem upper bracket.



- Remove the steering stem nut ③ using the special tool.

TOOL 09940-14911: Steering stem nut wrench

- Draw out the steering stem lower bracket.

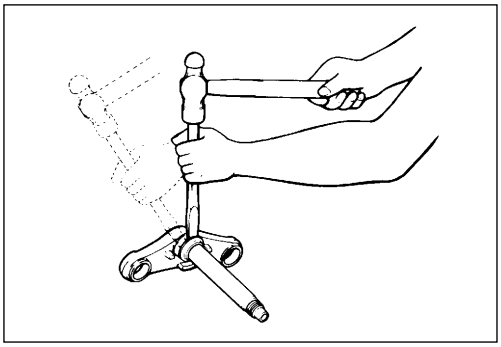
NOTE:
Hold the steering stem lower bracket to prevent from falling.

- Remove the handlebar holders by removing the nuts.

- To remove the lower inner race, use a chisel like, plain head steel rod.

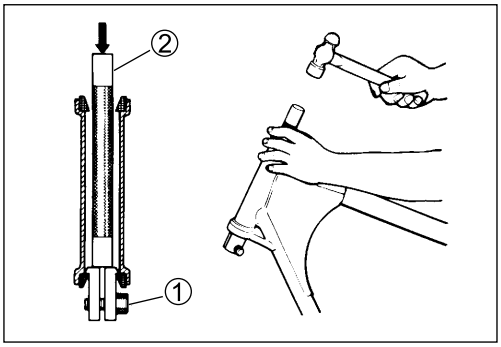
⚠ CAUTION

*** Unless corrosion, damage or other abnormal condition is found, the bearing race need not be replaced.**
*** Once the lower inner race has been removed, replace it with a new one.**



- Drive out the steering stem bearing outer races using the special tools ① and a suitable wedge bar ②.

TOOL **09941-54911: Bearing outer race remover ①**



INSPECTION

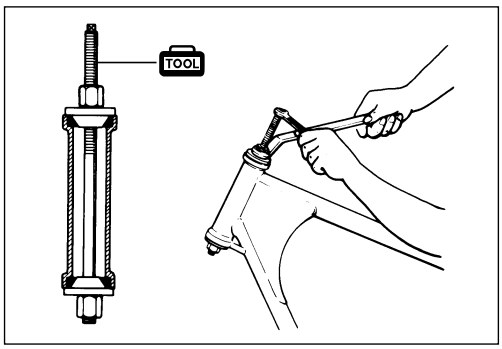
Check the steering stem and steering stem head for any damage.
Check the bearing and race for corrosion, nick or other damage.

REASSEMBLY AND REMOUNTING

Reassembly and reinstallation can be performed in the reverse order of removal and disassembly procedures. However, operate the work taking care for the following points.

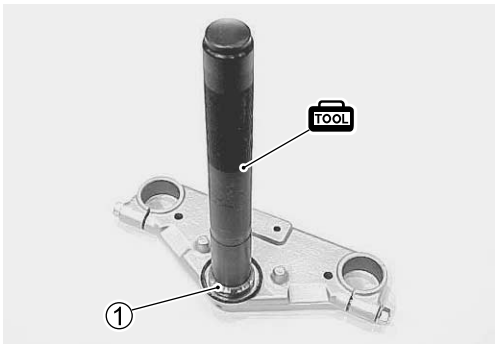
- Press in the upper and lower outer race using the special tool.

TOOL **09941-34513: Bearing/Steering race installer**



- Press in the lower inner race ①.

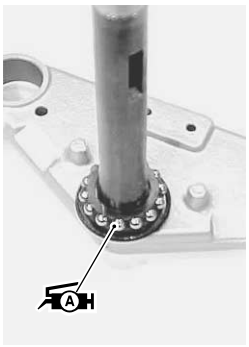
TOOL **09941-74911: Steering bearing installer**

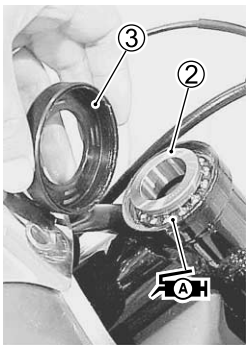


- Apply grease to the upper bearing, lower bearing and outer races prior to installing the steering stem.

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

- Install the upper inner race ② and dust cover ③.





- Install the handlebar holders and tighten their nuts temporarily.

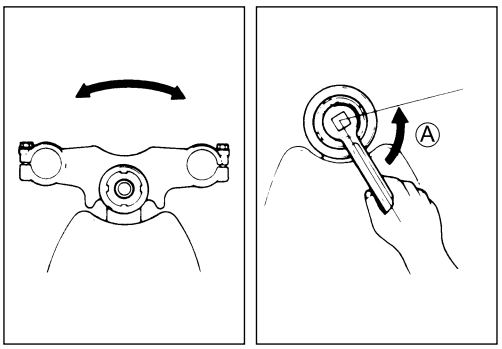
- Install the steering stem.
- Tighten the steering stem nut.

Steering stem nut: 45 N·m (4.5 kgf·m)

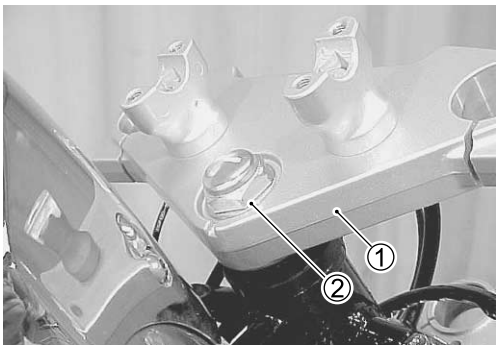
09940-14911: Steering socket wrench

- Turn the steering stem lower bracket about five or six times to the left and right.
- Loosen the steering stem nut ¼ – ½ of a turn Ⓐ.

NOTE:
This adjustment will vary from motorcycle to motorcycle. Make sure that the steering turns smoothly and easily in both directions without play.



- Install the steering stem upper bracket ① and washer ②.
- Tighten the steering stem head nut temporarily.



- Install the handlebars. (☞5-21)
- Tighten the handlebar holder nuts to the specified torque.

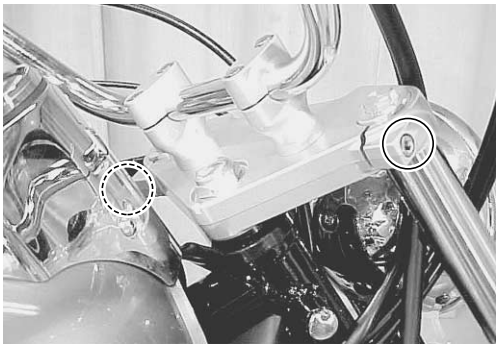
Handlebar holder nut: 45 N·m (4.5 kgf·m)

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

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

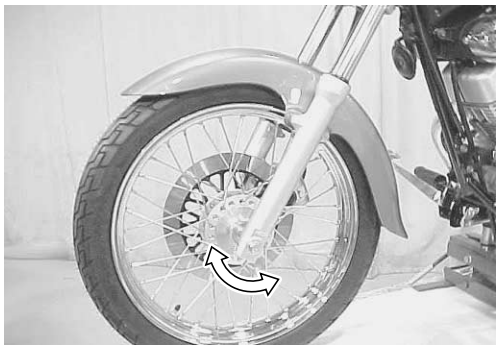
- Tighten the steering stem head nut to the specified torque.

Steering stem head nut: 65 N·m (6.5 kgf·m)



- Install the cable guide.
- Install the front forks. (☞5-26)
- Install the front wheel. (☞5-10)

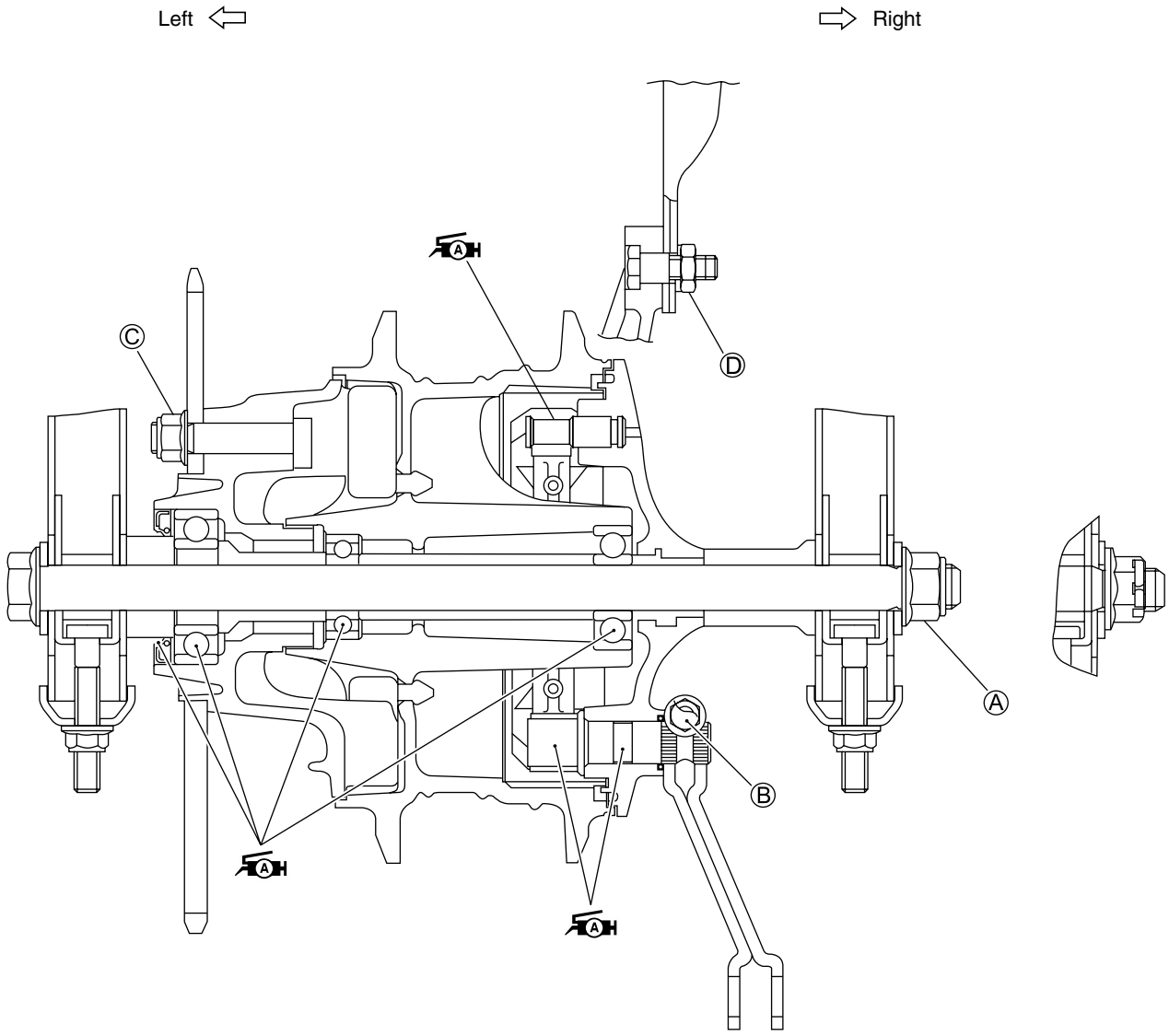
NOTE:
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.



⚠ 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 stiffeness is noticeable, readjust the steering stem nut.

REAR WHEEL

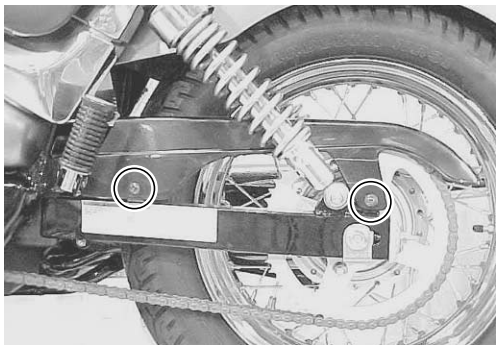


Ⓐ Rear axle nut
Ⓑ Rear brake cam lever nut
Ⓒ Rear sprocket nut
Ⓓ Rear torque link nut

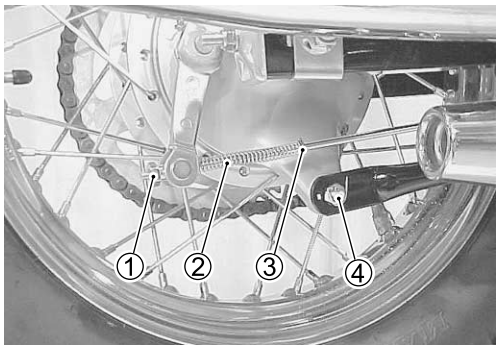
ITEM	N·m	kgf·m
Ⓐ	78	7.8
Ⓑ	10	1.0
Ⓒ	50	5.0
Ⓓ	13	1.3

REMOVAL

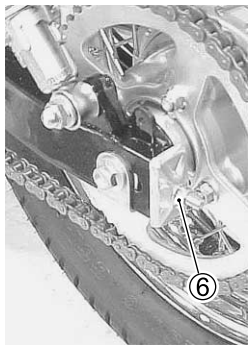
- Remove the drive chain cover.

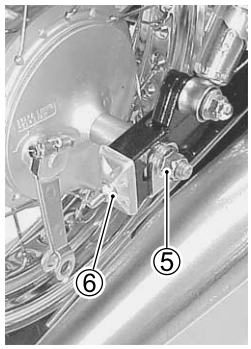


- Remove the rear brake adjusting nut ①, spring ② and washer ③.
- Remove the cotter pin, torque link nut ④ and bolt.

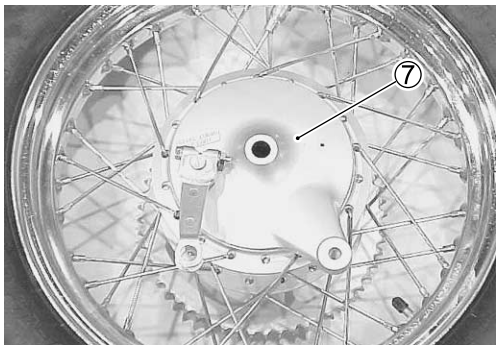


- Remove the rear axle nut ⑤.
- Raise the rear wheel off the ground with a jack or wooden block.
- Loosen the drive chain adjusters ⑥, left and right.
- Remove the rear axle.
- Disengage the drive chain from the rear sprocket.
- Remove the rear wheel.





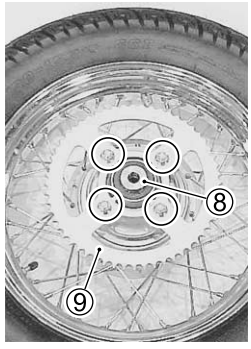
- Remove the rear brake panel ⑦.
  (Rear brake: ☞5-42)

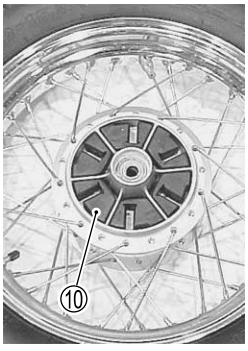


- Remove the spacer ⑧.
- Remove the rear sprocket ⑨ with mounting drum from the rear wheel.

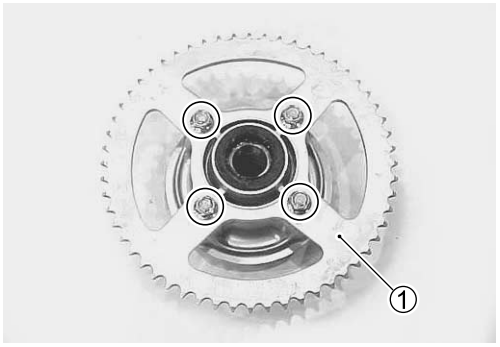
NOTE:
Before separating the rear sprocket and mounting drum, slightly loosen the rear sprocket bolts.

- Remove the rear sprocket damper ⑩.





- Remove the rear sprocket ① from the rear sprocket mounting drum.



- Remove the dust seal.

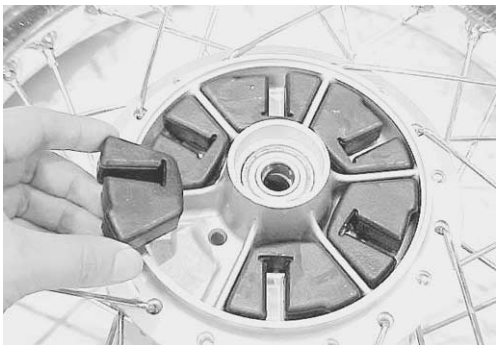
TOOL **09913-50121: Oil seal remover**

INSPECTION AND DISASSEMBLY

WHEEL AXLE: ☞5-8
WHEEL: ☞5-8
SPOKE NIPPLE: ☞5-8
WHEEL BEARING: ☞5-8
REAR SPOROCKET MOUNTING DRUM BEARING: ☞5-8
BRAKE DRUM: ☞5-43

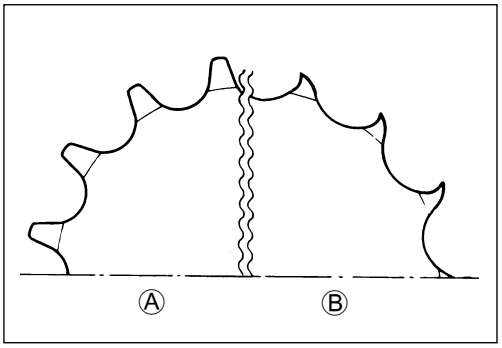
REAR SPROCKET DAMPER

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



SPROCKET

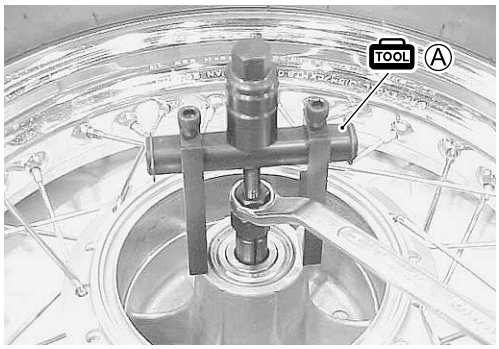
Inspect the sprocket's teeth for wear. If they are worn, replace the sprocket and drive chain as a set.
Ⓐ Normal wear
Ⓑ Excessive wear



WHEEL BEARING REMOVAL

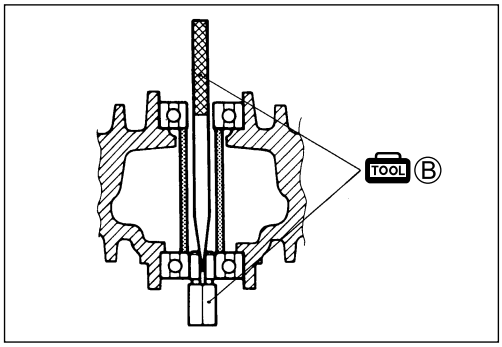
- Remove the bearings by using the special tool Ⓐ or Ⓑ.

TOOL 09921-20220: Bearing remover set Ⓐ
or 09941-50111: Wheel bearing remover Ⓑ



⚠ CAUTION

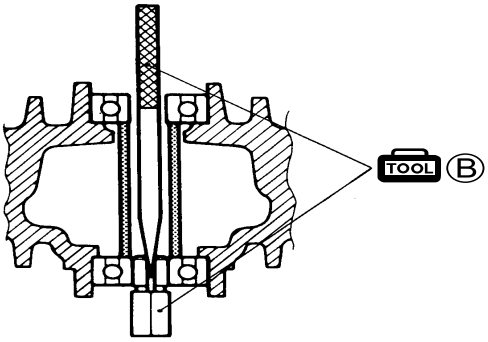
The removed bearings should be replaced with new one.



REAR SPROCKET MOUNTING DRUM BEARING

- Remove the bearing by using special tool.

TOOL 09921-20220: Bearing remover set

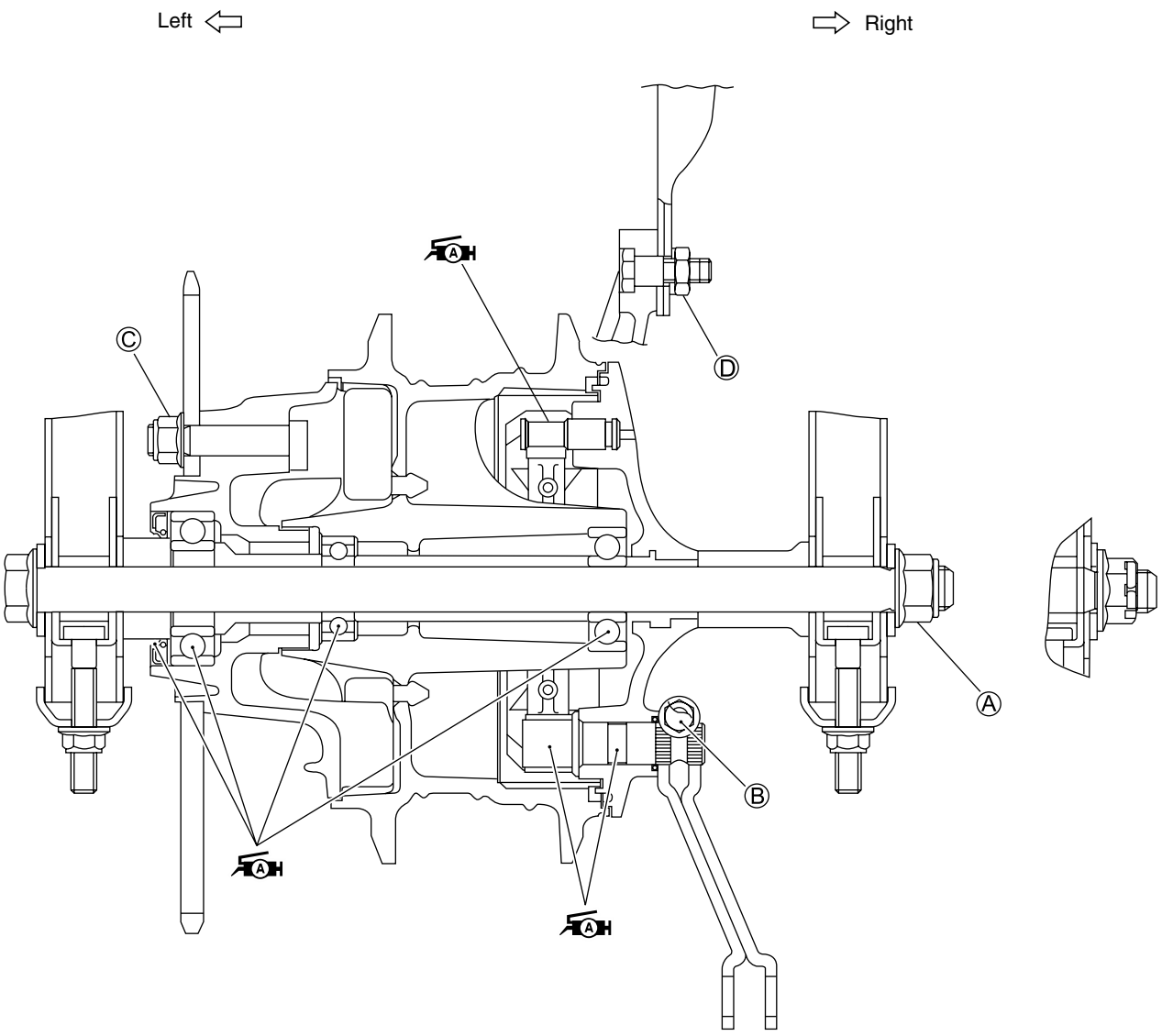


⚠ CAUTION

The removed bearings should be replaced with new one.

REASSEMBLY AND REMOUNTING

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



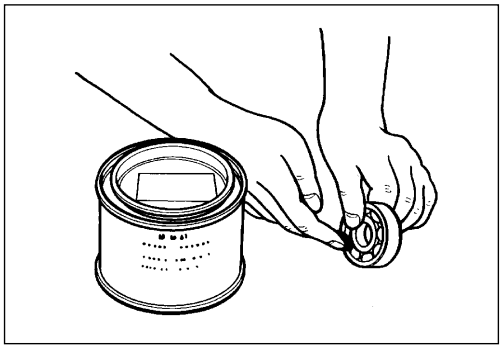
Ⓐ Rear axle nut
Ⓑ Rear brake cam lever nut
Ⓒ Rear sprocket nut
Ⓓ Rear torque link nut

ITEM	N·m	kgf·m
Ⓐ	78	7.8
Ⓑ	10	1.0
Ⓒ	50	5.0
Ⓓ	13	1.3

WHEEL BEARING

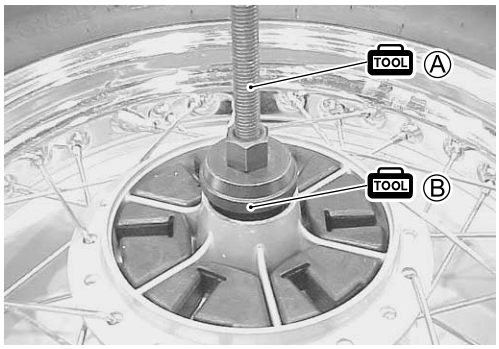
- Apply SUZUKI SUPER GREASE "A" to the bearing before installation.

99000-25010: SUZUKI SUPER GREASE "A"



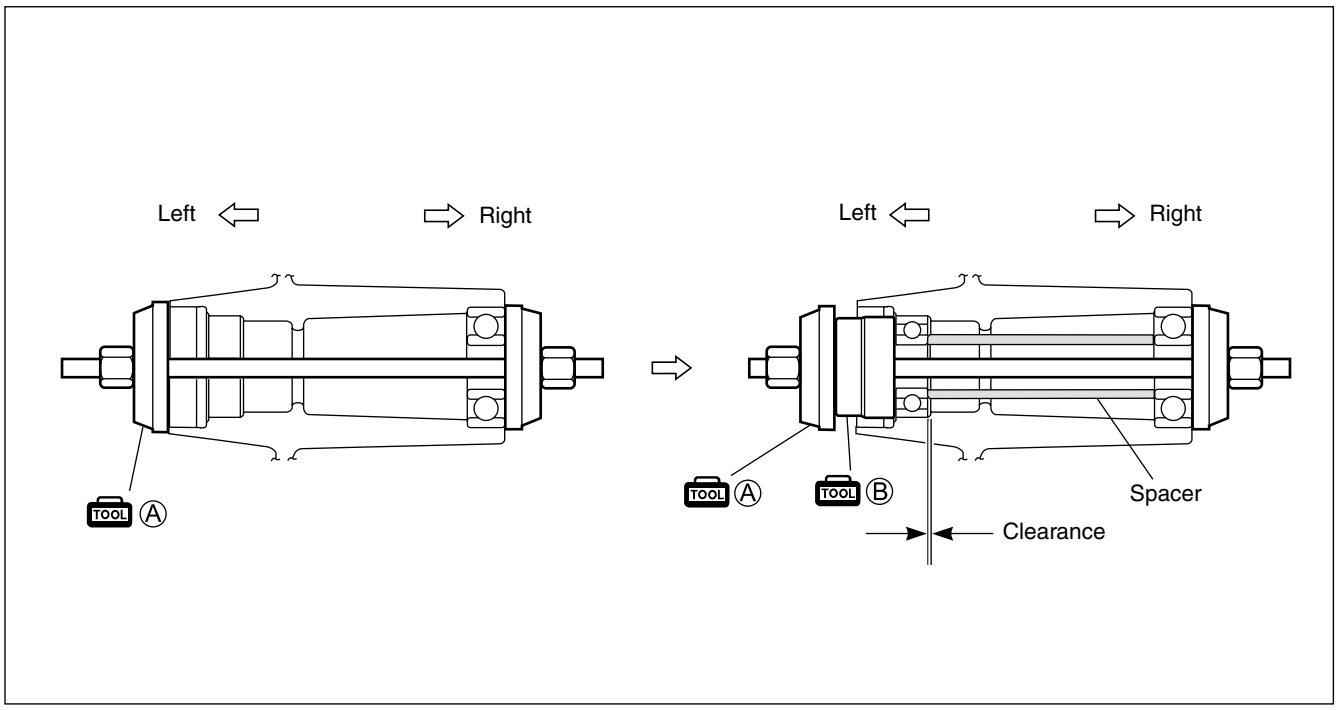
- Press fit the bearing to the wheel using the special tools.

09941-34513: Bearing/steering race installer Ⓐ
09913-70210: Bearing installer set (ϕ 35 mm) Ⓑ



⚠ CAUTION

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



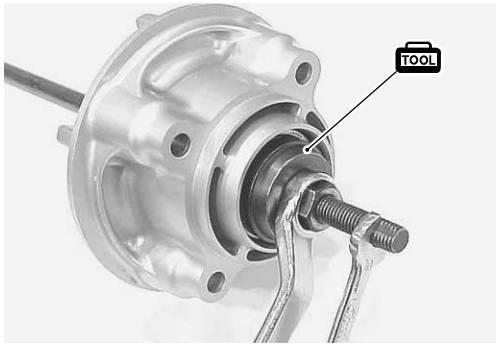
REAR SPROCKET MOUNTING DRUM BEARING

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

09941-34513: Bearing/steering race installer

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

99000-25010: SUZUKI SUPER GREASE "A"

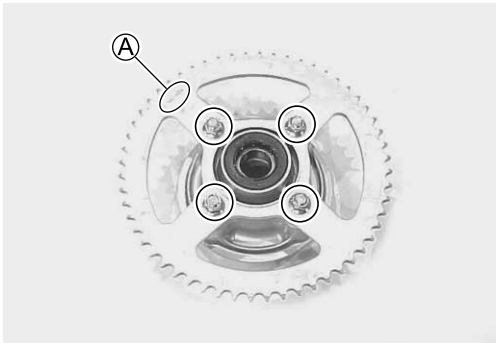


REAR SPROCKET

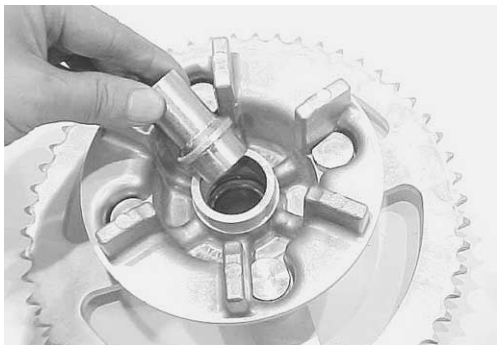
- Tighten the rear sprocket nuts to the specified torque.

Rear sprocket nut: 50 N·m (5.0 kgf·m)

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



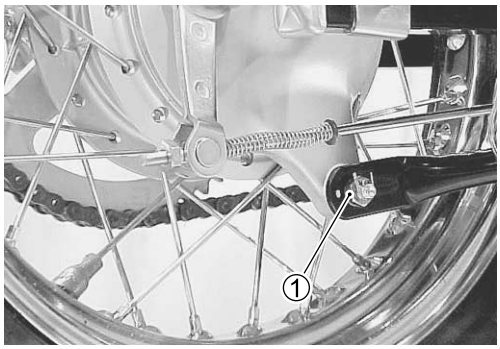
- Install the retainer to the mounting drum as shown.



REAR WHEEL

- Tighten the rear torque link nut ① to the specified torque and install the new cotter pin.

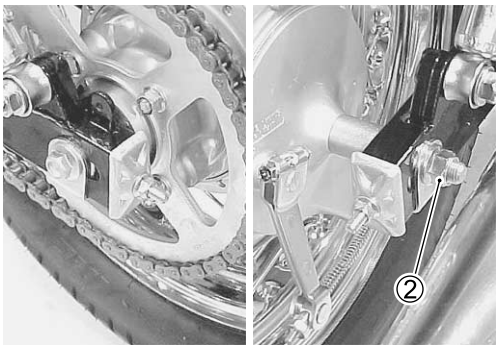
Rear torque link nut: 13 N·m (1.3 kgf·m)



- Adjust the drive chain slack after installing the rear wheel. (☞2-13)
- Tighten the rear axle nut ② to the specified torque.

Rear axle nut: 78 N·m (7.8 kgf·m)

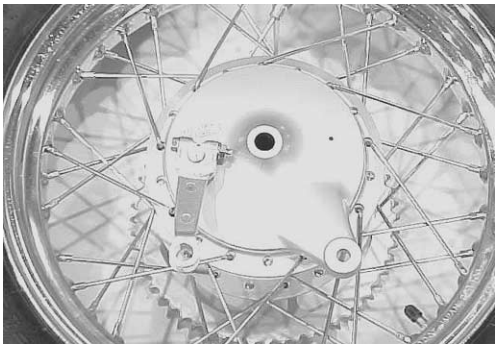
- Tighten both chain adjusting nuts securely.
- Adjust the rear brake pedal free travel. (☞2-18)



REAR BRAKE

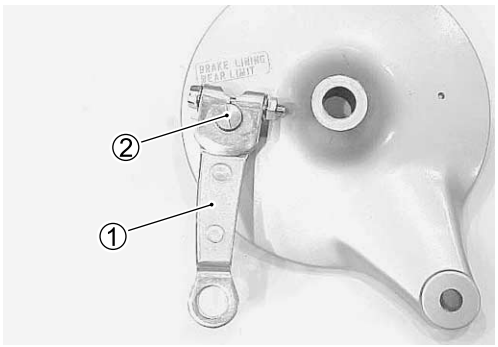
REMOVAL AND DISASSEMBLY

- Remove the rear wheel. (☞5-36)
- Remove the rear brake panel.

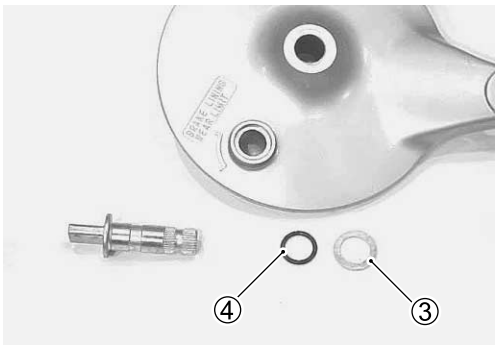


- Remove the brake shoes.

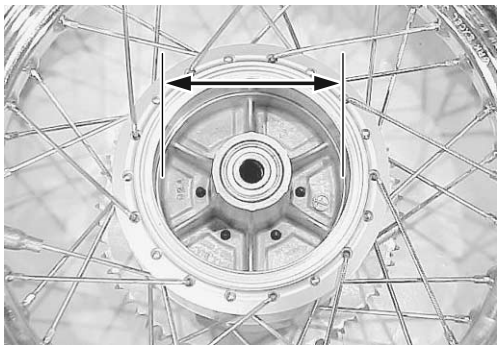
- Remove the rear brake cam lever ① and rear brake cam ② by removing nut.



- Remove the washer ③ and O-ring ④.



INSPECTION



BRAKE DRUM

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

TOOL 09900-20102: Vernier calipers

DATA Brake drum I.D.: Service Limit: 130.7 mm

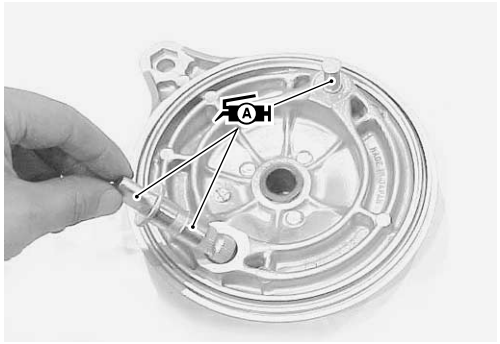
BRAKE SHOES

Check the brake shoe wear (☞2-18) and decide whether it should be replaced or not.

⚠ CAUTION

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

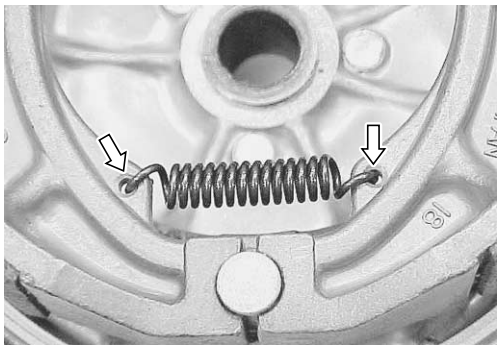
REASSEMBLY AND REMOUNTING



BRAKE CAMSHAFT

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

A 99000-25010: SUZUKI SUPER GREASE "A"

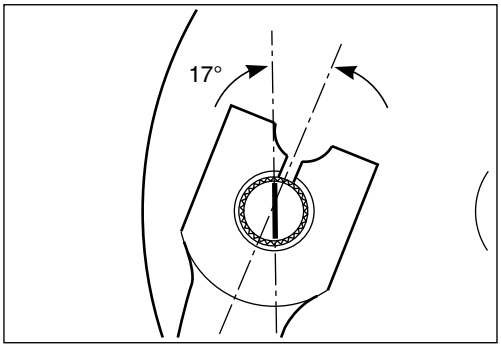


- Install the brake shoes with spring hooks faced inside.

⚠ CAUTION

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

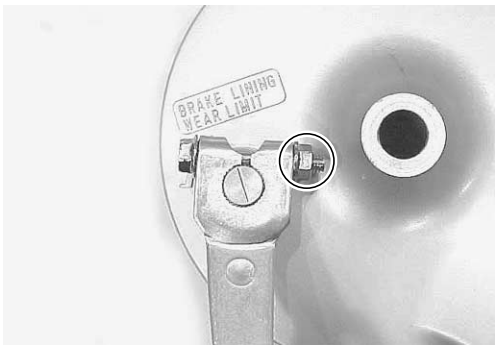
BRAKE CAM LEVER



- Install the new O-ring and washer.
- Install the brake cam lever to the brake camshaft as shown.

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

Brake cam lever nut: 10 N·m (1.0 kgf·m)

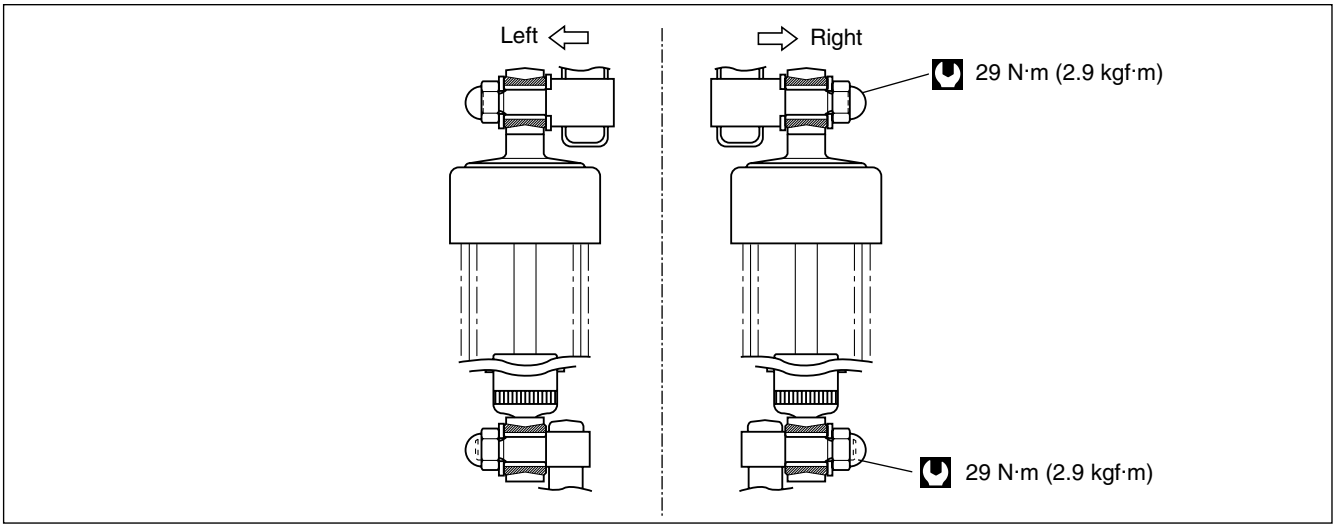


- Install the rear wheel. (☞5-39)
- Adjust the rear brake pedal free travel. (☞2-18)

REAR SHOCK ABSORBER

REMOVAL

- Remove the right and left rear frame covers. (☞5-3)
- Remove the right and left rear shock absorbers by removing their nuts.



INSPECTION

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

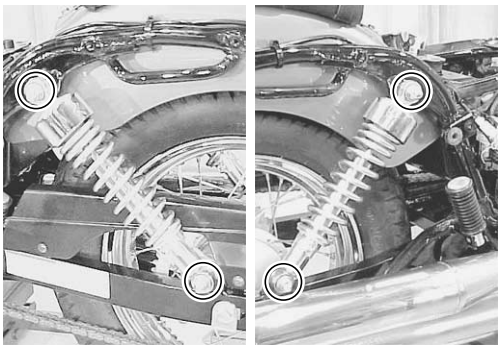
⚠ CAUTION

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

REMOUNTING

- Install the rear shock absorber and tighten the nuts to the specified torque.

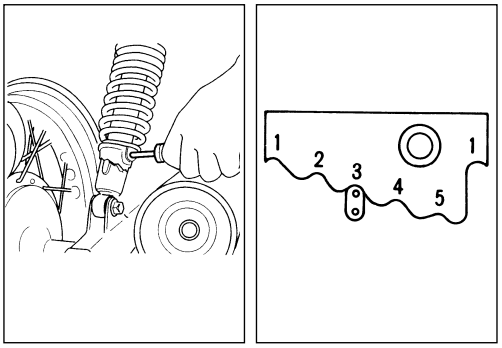
Shock absorber mounting nut: 29 N·m (2.9 kgf·m)



SPRING PRE-LOAD ADJUSTMENT

- Adjist the rear shock absorber spring pre-load.

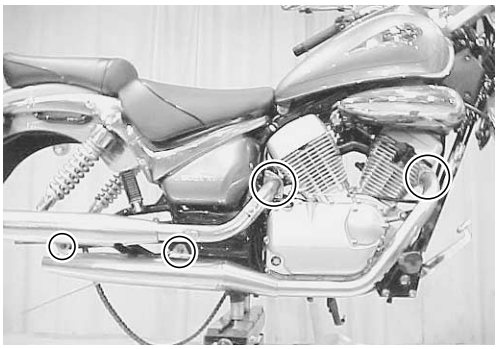
DATA Spring pre-load: Standard: 3/5 position



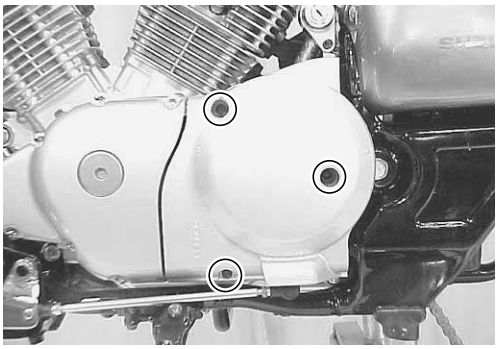
SWINGARM

REMOVAL

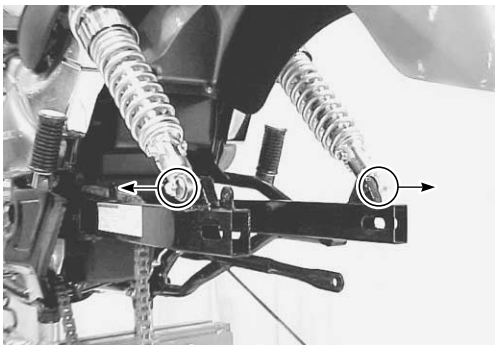
- Remove the rear wheel. (☞5-36)
- Remove the exhaust pipes and mufflers. (☞3-5)



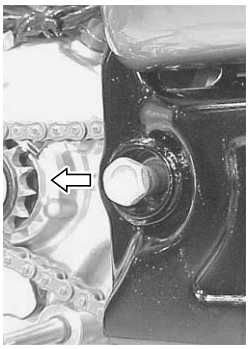
- Remove the engine sprocket cover.



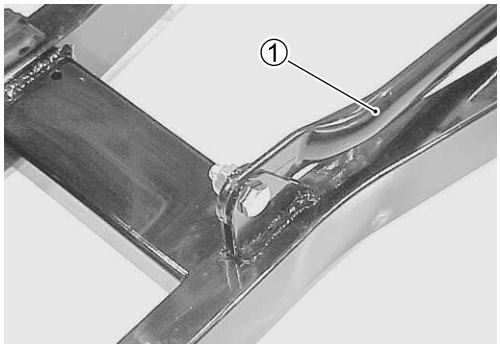
- Remove the rear shock absorber lower bolts and disconnect the rear shock absorber from swingarm.



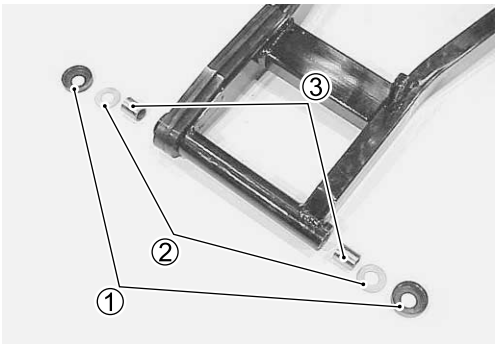
- Remove the swingarm pivot nut and washer.
- Remove the swingarm by removing the pivot shaft.



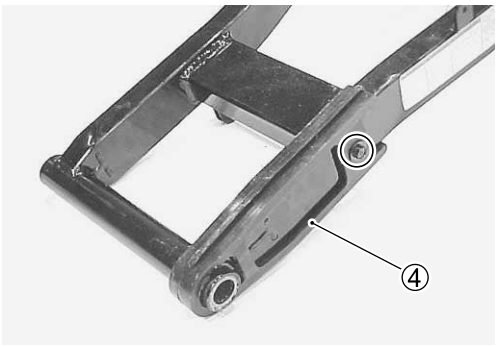
- Remove the rear torque link ① from the swingarm.



• Remove the dust covers ①, washers ② and spacers ③.



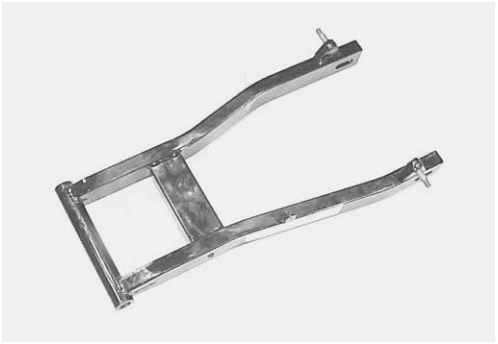
• Remove the chain buffer ④ from the swingarm.



INSPECTION AND DISASSEMBLY

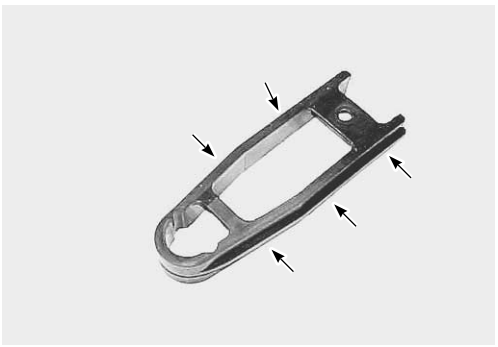
SWINGARM

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



CHAIN BUFFER

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

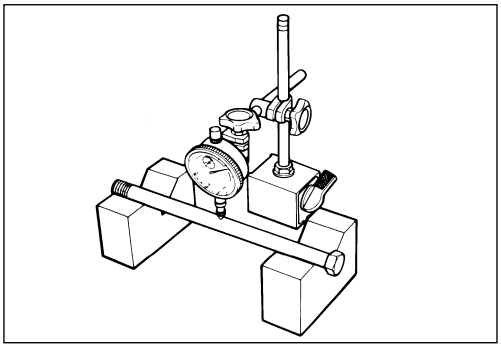


SWINGARM PIVOT SHAFT

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

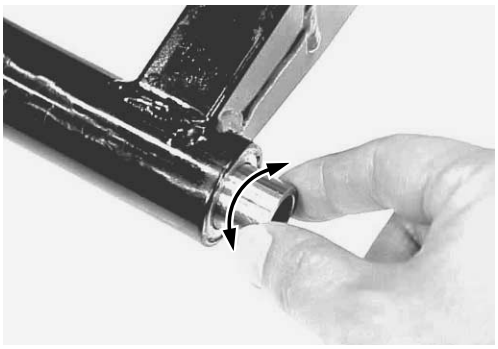
TOOL **09900-20606: Dial gauge (1/100 mm)**
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

DATA **Swingarm pivot shaft runout: Service Limit: 0.3 mm**



SWINGARM PIVOT SPACERS AND DUST SEALS

Inspect the swingarm pivot spacers and dust seals for damage. If any defects are found, replace the spacer with a new one.

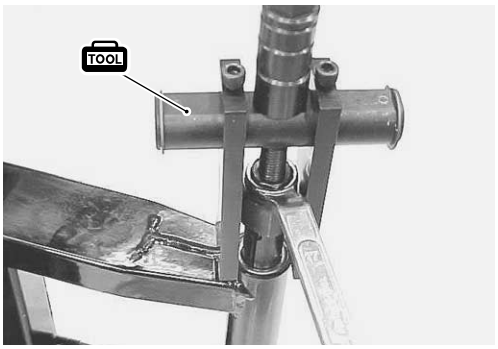


SWINGARM NEEDLE BEARINGS

Insert the spacers into the needle bearings, rotate the spacer and check for abnormal noise and smooth rotation.
If there is anything usual, replace the bearing(-s) with a new one.

- Remove the swingarm needle bearings using the special tool.

TOOL 09921-20220: Bearing remover set (ϕ 20 mm)

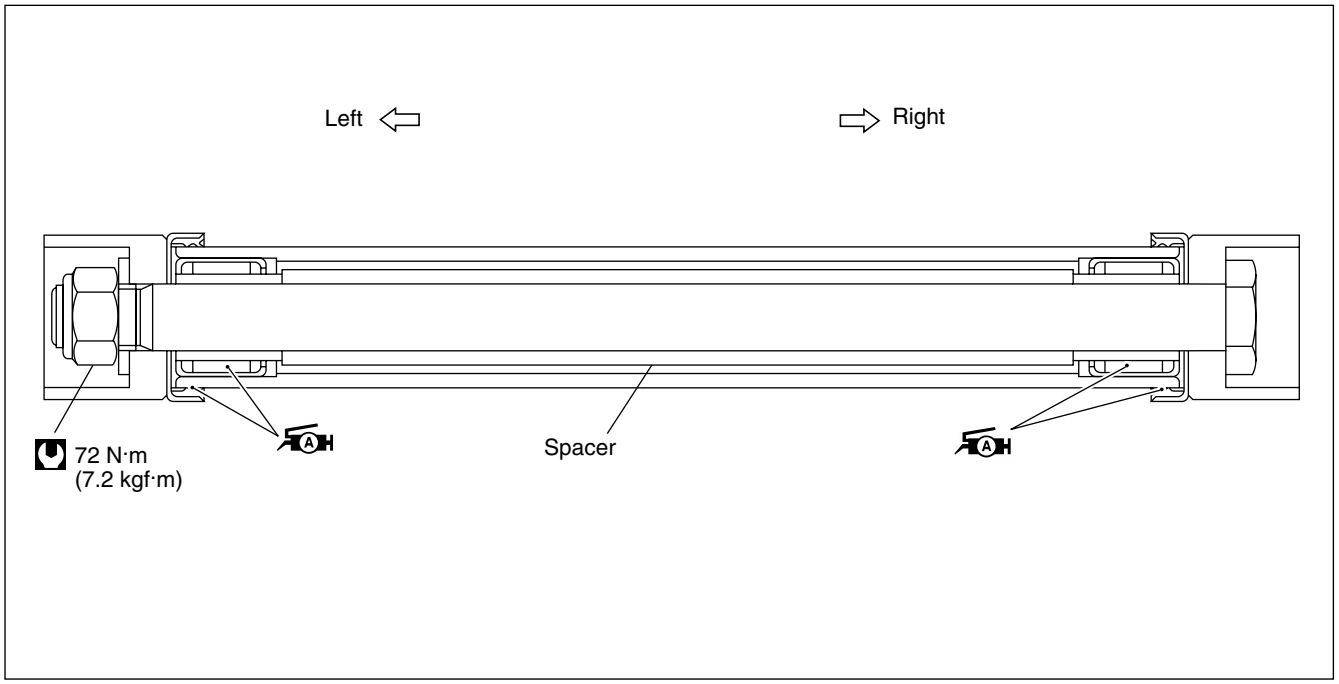


⚠ CAUTION

The removed bearings should be replaced with new ones.

REASSEMBLY AND REMOUNTING

Reassemble and remount the swingarm and rear shock absorber in the reverse order of removal and disassembly.
Pay attention to the following points:

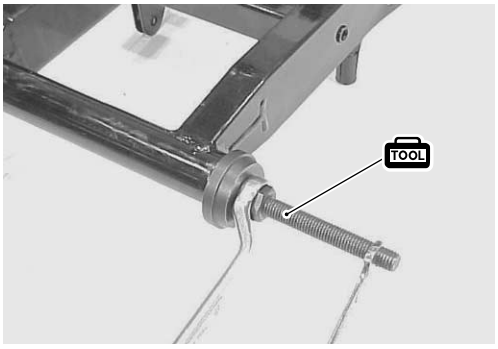


- Press the needle bearings into the swingarm pivot using the special tool.

TOOL 09941-34513: Bearing/Steering race installer

- Apply the grease to the needle bearings and spacers.

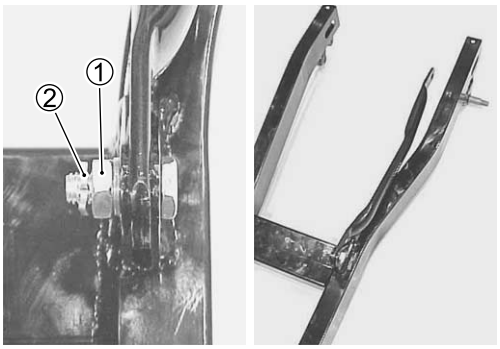
A 99000-25010: SUZUKI SUPER GREASE "A"



- Install the torque link and washer ①, tighten the torque link nut to the specified torque.

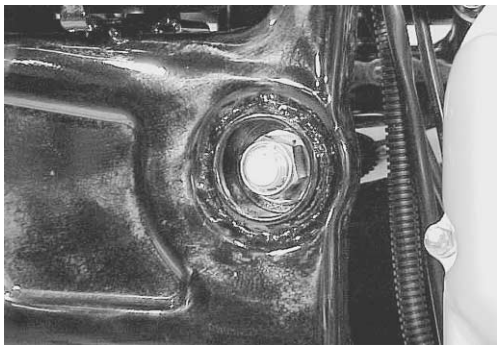
Torque link nut (Front): 13 N·m (1.3 kgf·m)

- Install the new cotter pin ②.



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

Swingarm pivot nut: 72 N·m (7.2 kgf·m)



- Install the rear shock absorber. (☞5-45)
- Install the rear wheel. (☞5-39)
- Adjust the following points:
  Drive chain slack: ☞2-13
  Rear brake pedal free travel: ☞2-18

ELECTRICAL SYSTEM

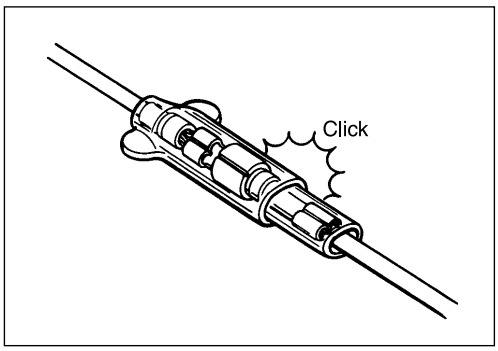
CONTENTS

6

CAUTIONS IN SERVICING

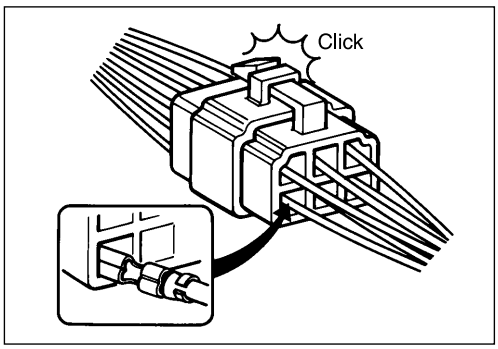
CONNECTOR

- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.



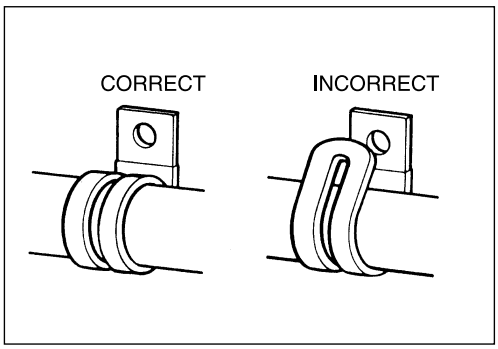
COUPLER

- With a lock type coupler, be sure to release the lock before disconnecting it and push it in fully till the lock works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler itself and do not pull the lead wires.
- Inspect each terminal on the coupler for being loose or bent.
- Inspect each terminal for corrosion and contamination.



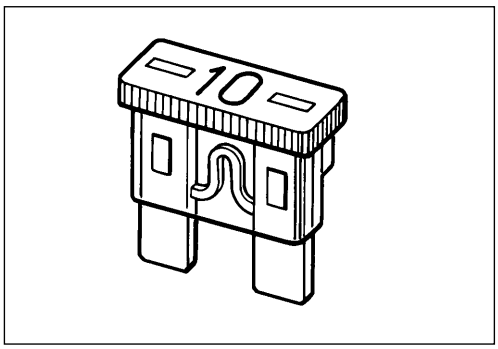
CLAMP

- Clamp the wire harness at such positions as indicated in “WIRE HARNESS ROUTING”. (☞7-10 – 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.



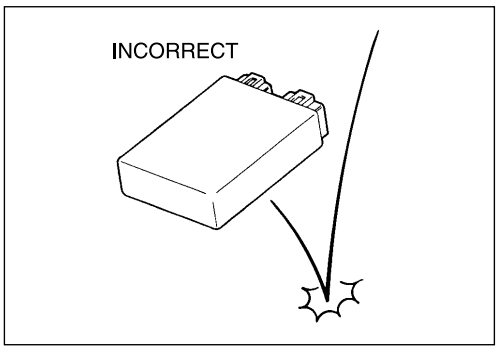
FUSE

- When a fuse blows, always investigate the cause, correct it and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use wire or any other substitute for the fuse.



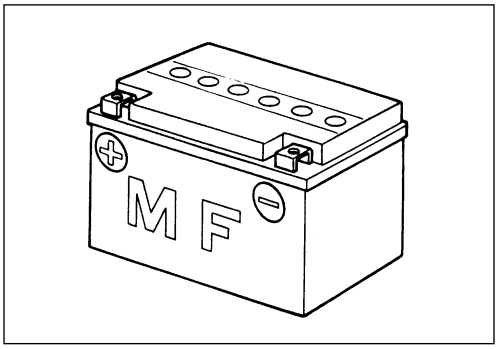
SEMI-CONDUCTOR EQUIPPED PART

- Be careful not to drop the part with a semi-conductor built in such as an ignitor.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.



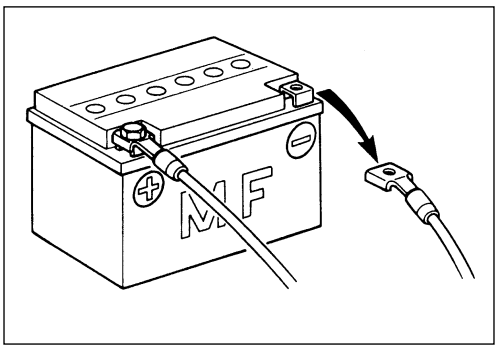
BATTERY

- The MF battery used in this vehicle does not require maintenance as inspection of electrolyte level and replenishment of water.
- No hydrogen gas is produced during normal charging of the battery, but such gas may be produced when it is overcharged. Therefore, do not bring fire near the battery while it is being charged.
- Note that the charging system for the MF battery is different from that of an ordinary battery. Do not replace with an ordinary battery.



CONNECTING BATTERY

- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the negative (⊖) terminal first.
- When connecting terminals to the battery, be sure to connect the positive (⊕) terminal first.
- If the terminal is found corroded, remove the battery, pour warm water over it and clean with a wire brush.
- Upon completion of connection, apply grease lightly.
- Put a cover over the positive (⊕) terminal.

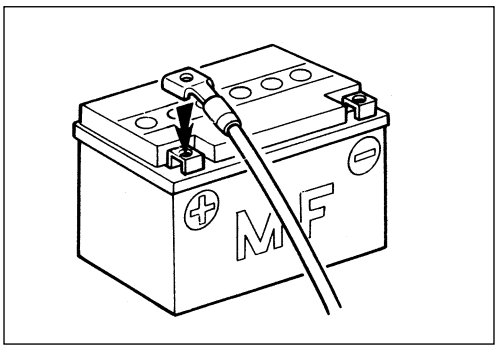


WIRING PROCEDURE

- Route the wire harness properly according to “WIRE HARNESS ROUTING”. (☞7-10)

USING MULTI CIRCUIT TESTER

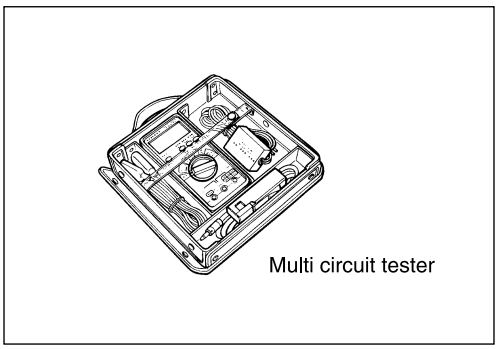
- Use the Suzuki multi-circuit tester (09900-25008).
- Use well-charged batteries in the tester.
- Be sure to set the tester to the correct testing range.



Using the tester

- Incorrectly connecting the ⊕ and ⊖ probes may cause the inside of the tester to burnout.
- If the voltage and current are not known, make measurements using the highest range.
- When measuring the resistance with the multi-circuit tester, also measure the resistance with no-load. Sub-tract that resistance from the resistance measured under load in order to get the true resistance.

[Measured resistance] – [No load resistance] = [True resistance]



- When measuring the resistance with the multi-circuit tester, ∞ becomes 10.00 MΩ and “1” flashes in the display.
- Check that no voltage is applied before making the measurement. If voltage is applied, the tester may be damaged.
- After using the tester, turn the power off.

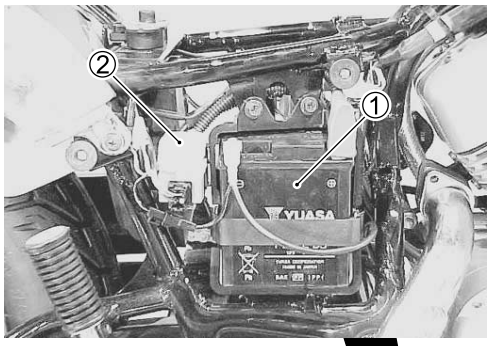
TOOL 09900-25008: Multi-circuit tester

NOTE:

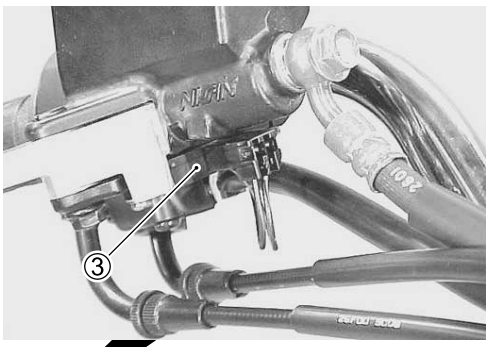
* *When connecting the multi circuit tester, install fine copper wires (O.D is below 0.5 mm) to the back side of the lead wire coupler and connect the probes of tester to them.*

* *Use a fine copper wire, the outer diameter being below 0.5 mm, to prevent the rubber of the water proof coupler from damage.*

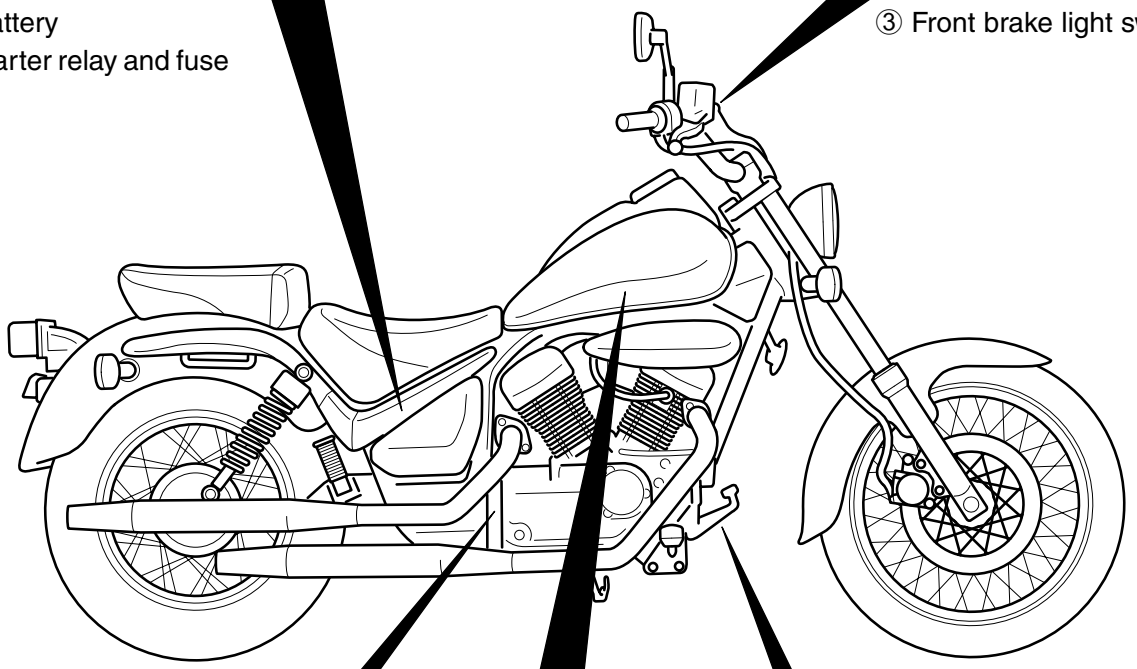
LOCATION OF ELECTRICAL COMPONENTS

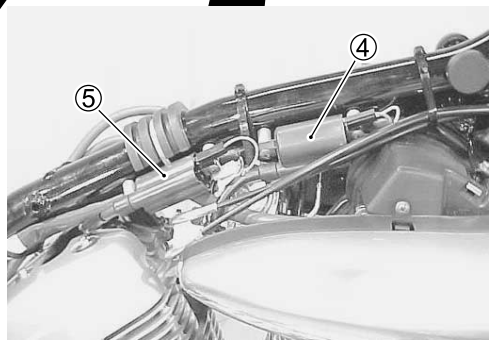


① Battery
② Starter relay and fuse

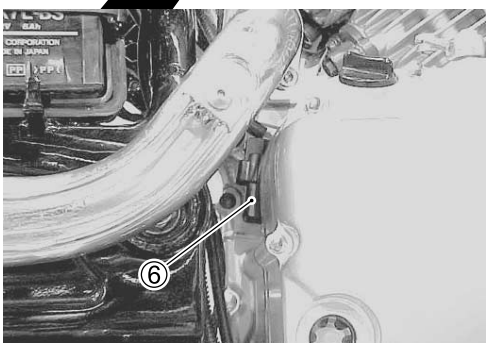


③ Front brake light switch

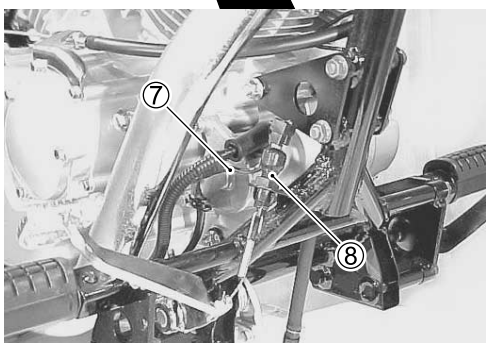




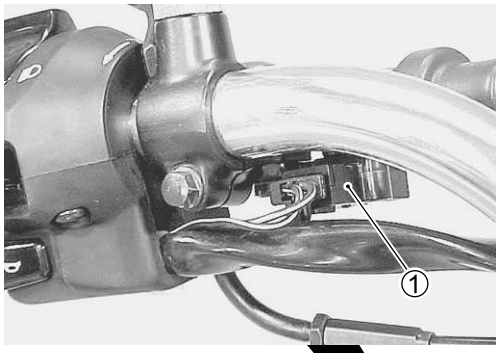
④ Ignition coil (No. 2)
⑤ Ignition coil (No. 1)



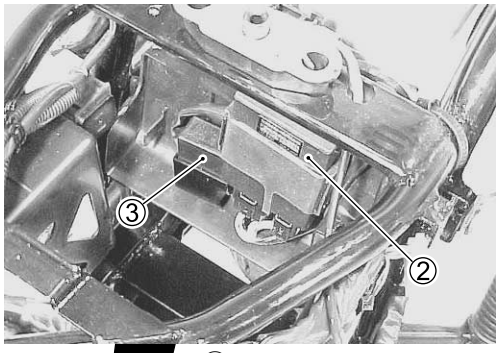
⑥ Speed sensor



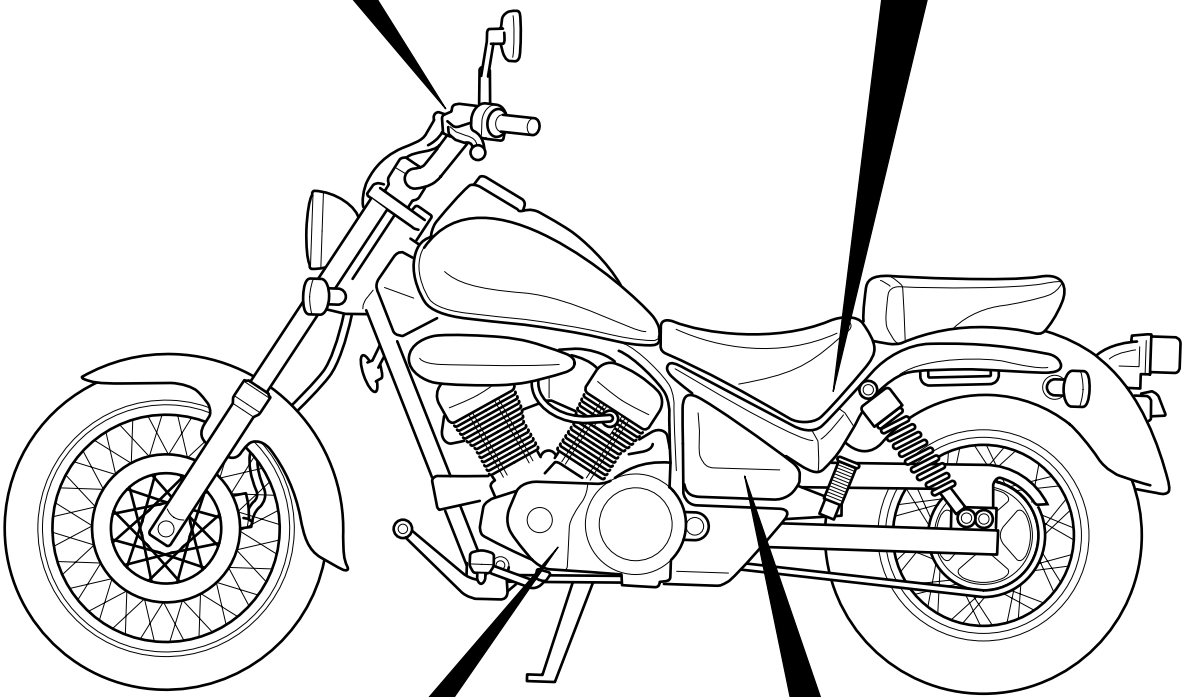
⑦ Starter motor
⑧ Rear brake light switch

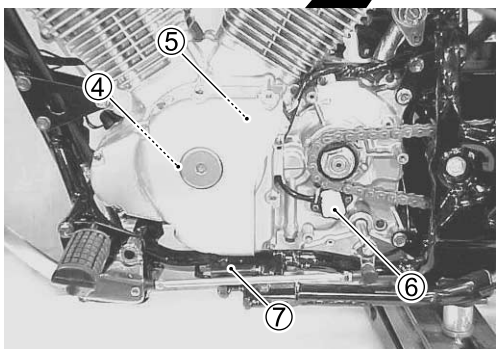


① Clutch position switch

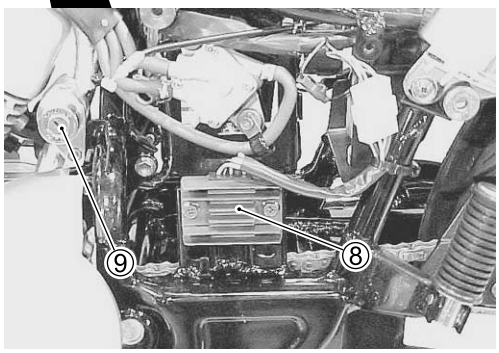


② Ignitor
③ Turn signal/
side-stand relay





④ Generator
⑤ Signal generator
⑥ Gear position switch
⑦ Side-stand switch



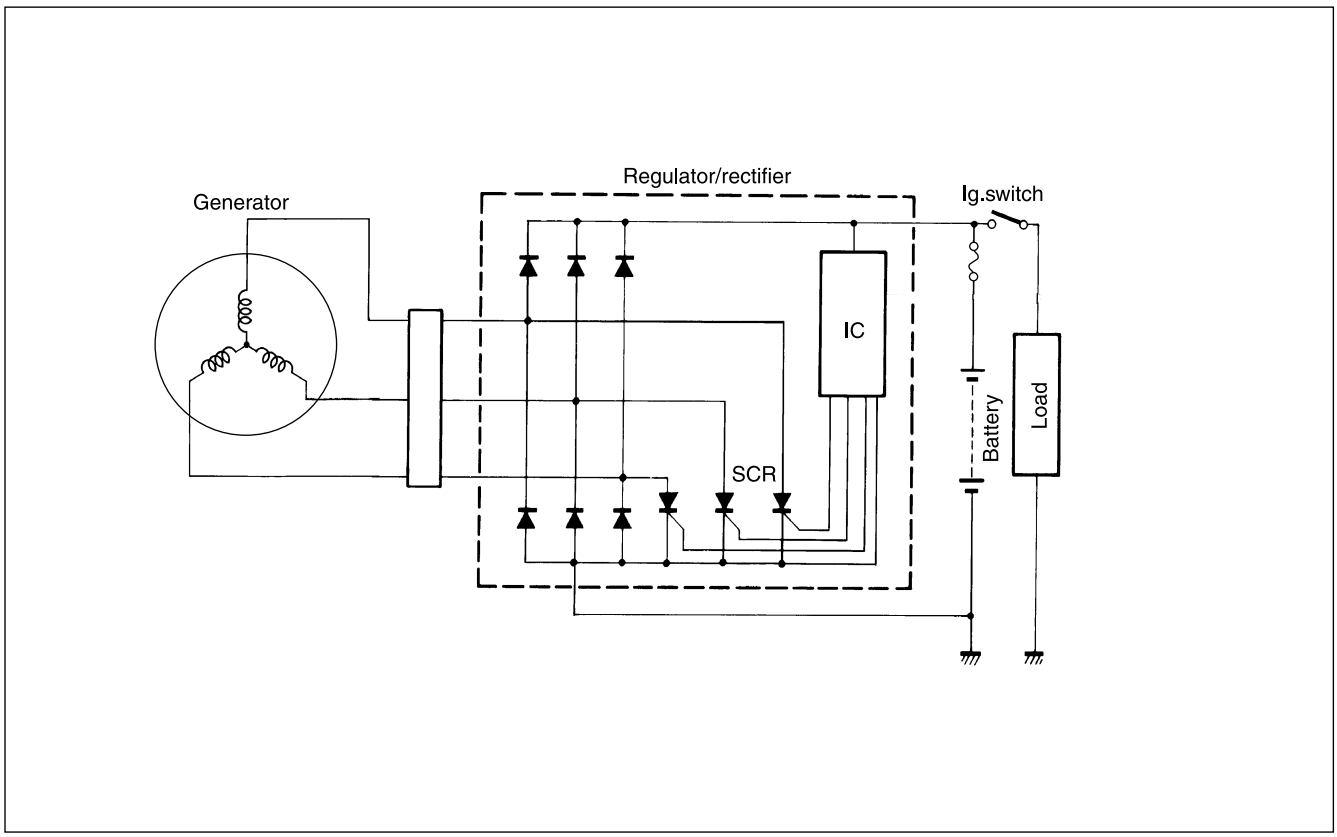
⑧ Regulator/Rectifier
⑨ Ignition switch

CHARGING SYSTEM

DESCRIPTION

The circuit of the charging system is indicated in the figure, which is composed of the generator, regulator/rectifier unit and battery.

The AC current generated from the generator is rectified by the rectifier and is turned into DC current, then it charges the battery.



TROUBLESHOOTING

Battery runs down quickly.

Check accessories which use excessive amounts of electricity.
- Accessories are installed → • Remove accessories.

No accessories

Check the battery for current leaks. (☞ 6-8)
- Current leaks → • Short circuit of wire harness
  • Loose or disconnected wires
  • Faulty battery

No current leaks

Measure the charging voltage between the battery terminals. (☞ 6-8)
- Correct → • Faulty battery
  • Abnormal driving condition

Incorrect

Measure the continuity of the generator coil. (☞ 6-9)
- No continuity → • Faulty generator coil or disconnected lead wires

Continuity

Measure the generator no-load voltage. (☞ 6-9)
- No good → • Faulty generator

OK

Inspect the regulator/rectifier. (☞ 6-9)
- No good → • Faulty regulator/rectifier

OK

Inspect wirings.
- No good → • Short circuit of wire harness
  • Poor contact of couplers

OK

• Faulty battery

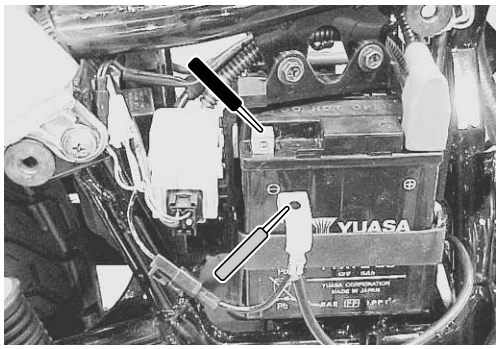
Others

Battery overcharge	• Faulty regulator/rectifier • Faulty battery • Poor contact of generator lead wire coupler

INSPECTION

BATTERY CURRENT LEAK INSPECTION

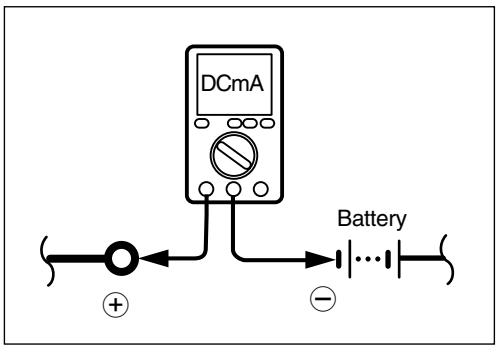
- Remove the right frame cover. (☞5-3)
- Turn the ignition switch to the OFF position.
- Disconnect the battery ⊖ lead wire.
- Connect the multi circuit tester between the ⊖ terminal and ⊖ lead wire of the battery.



TOOL 09900-25008: Multi circuit tester set

DATA Battery current leak: Under 3 mA

Tester knob indication: Current (⎓, 20mA)



⚠ 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.**

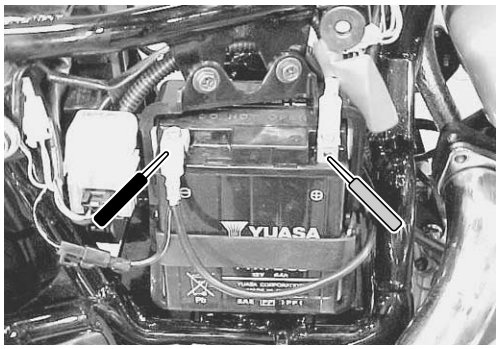
When leakage is found, look for the part where the tester reads under 3 mA through the couplers and connectors by removing them one by one.

CHARGING OUTPUT INSPECTION

- Remove the right frame cover. (☞5-3)
- Start the engine and keep it running at 5 000 r/min. with lighting switch turned ON and dimmer switch turned HI position.

Measure the DC voltage between the battery terminals ⊕ and ⊖ with the multi circuit tester. If the tester reads under 13.4 V or over 15.1 V, inspect the generator coil and regulator/rectifier.

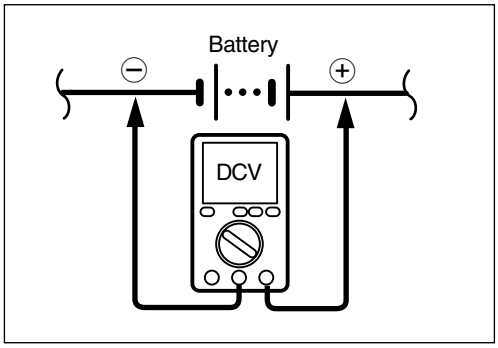
NOTE:
When making this test, be sure that the battery is in fully-charged condition.



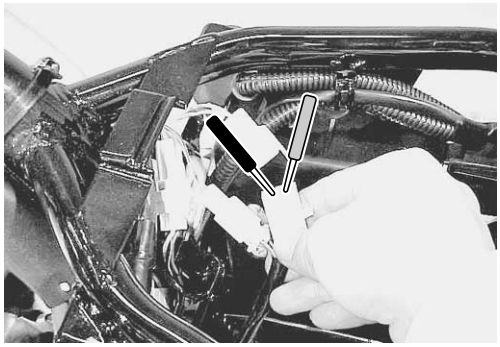
TOOL 09900-25008: Multi circuit tester set
09900-25006: Engine tacho tester

DATA Charging output (Regulated voltage):
13.5 – 15.0 V at 5 000 r/min.

Tester knob indication: Voltage (⎓)



GENERATOR COIL RESISTANCE INSPECTION



- Remove the luggage box. (☞5-2)
- Disconnect the generator coupler.

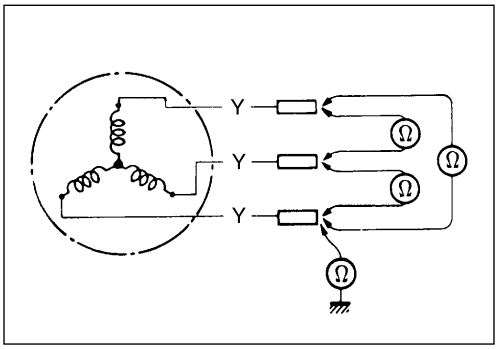
Measure the resistance between the three lead wires.
Also check that the stator core is insulated.
If the resistance is not specified value, replace the stator with a new one.

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Generator coil resistance: 0.3 – 1.1 Ω

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



GENERATOR NO-LOAD PERFORMANCE INSPECTION

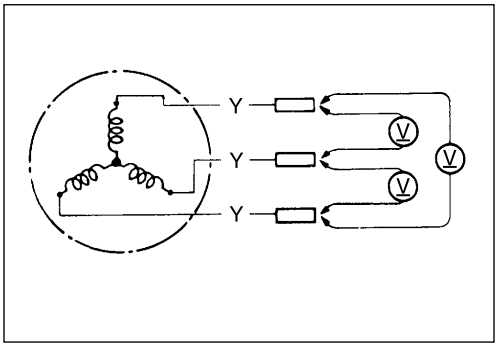
- Start the engine and keep it running at 5 000 r/min.

Using the multi circuit tester, measure the voltage between three lead wires.
If the tester reads under the specified value, replace the generator with a new one.

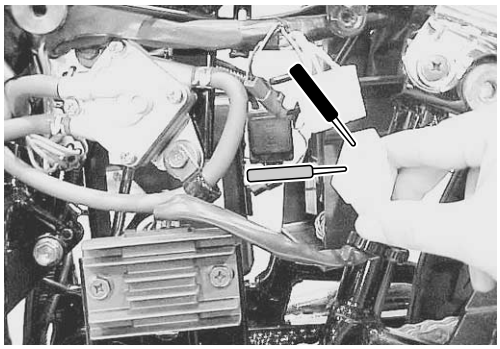
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (~)

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



REGULATOR/RECTIFIER INSPECTION



- Remove the left frame cover. (☞5-3)
- Disconnect the regulator/rectifier couplers.

Using the multi circuit tester, measure the voltage between the lead wires in the following table.
If voltage is incorrect, replace the regulator/rectifier.

TOOL 09900-25008: Multi circuit tester set

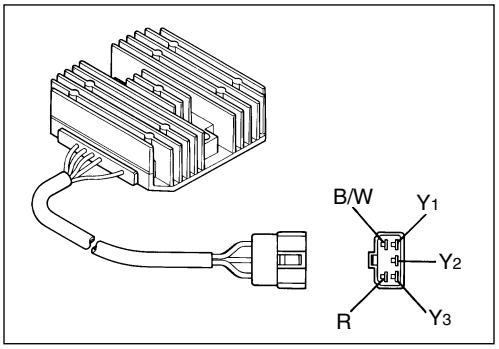
Tester knob indication: Diode test (⊣◀)

Unit: V

⊖ Probe of tester to: / ⊕ Probe of tester to:	R	Y1	Y2	Y3	B/W
R		0.4 – 0.7	0.4 – 0.7	0.4 – 0.7	0.5 – 1.2
Y1	Approx. 1.5		Approx. 1.5	Approx. 1.5	0.4 – 0.7
Y2	Approx. 1.5	Approx. 1.5		Approx. 1.5	0.4 – 0.7
Y3	Approx. 1.5	Approx. 1.5	Approx. 1.5		0.4 – 0.7
B/W	Approx. 1.5	Approx. 1.5	Approx. 1.5	Approx. 1.5	

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

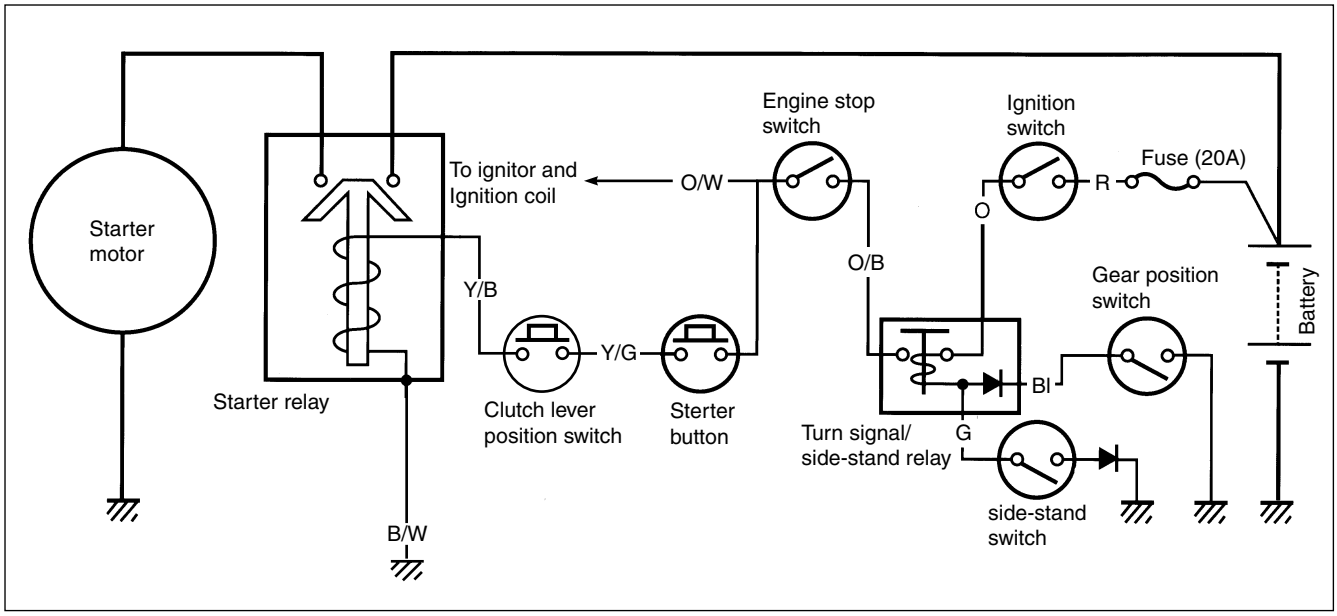
NOTE:
If the tester reads under 1.4 V when the tester probes are not connected, replace the battery of multi circuit tester.



STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM

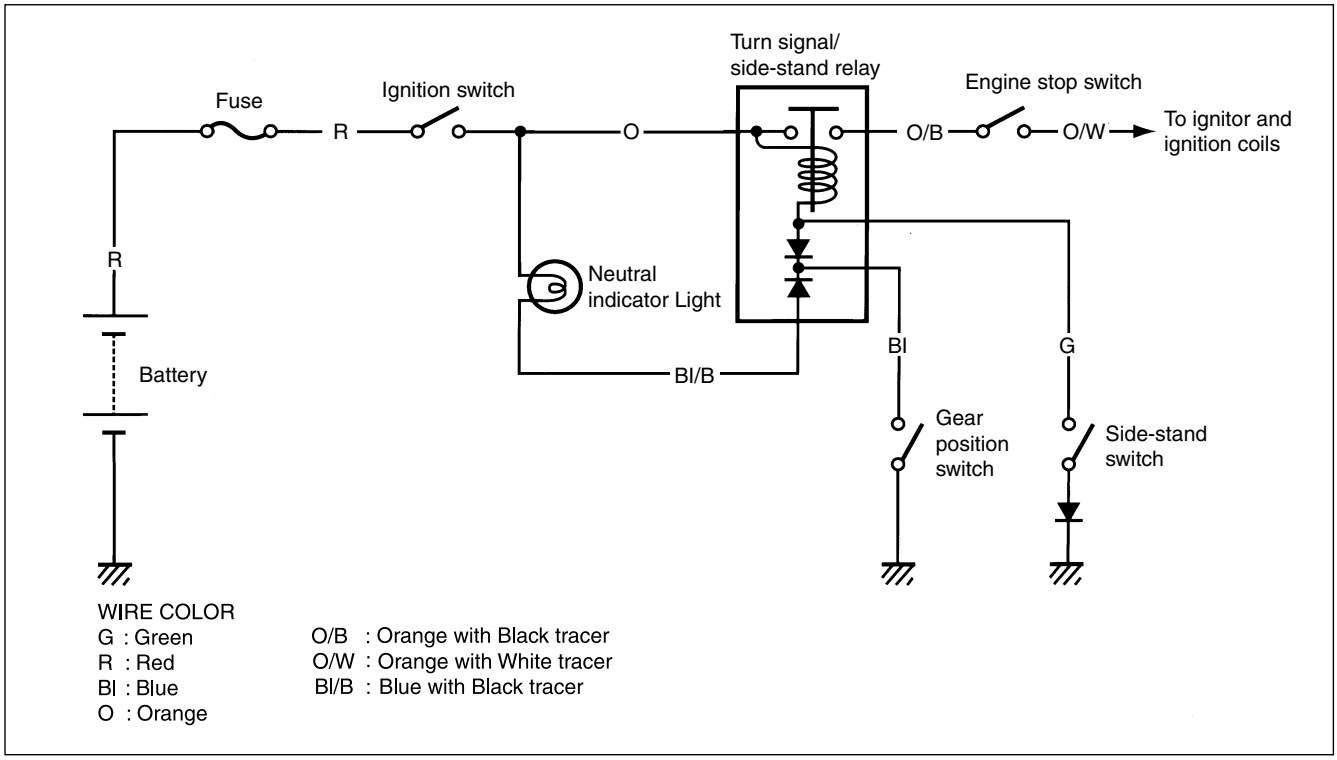
STARTER SYSTEM DESCRIPTION

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



SIDE-STAND/IGNITION INTERLOCK SYSTEM DESCRIPTION

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



TROUBLESHOOTING

Starter motor will not run.

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

→ Clicks → Check if the starter motor runs when its terminal is connected to the battery ⊕ terminal (Do not use thin "wire" because a large amount of current flows)

- Runs → • Faulty starter relay
  • Loose or disconnected starter motor lead wire
- Does not run → • Faulty starter motor

No click ↓

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

→ No voltage →
- • Faulty ignition switch
- • Faulty engine stop switch
- • Faulty clutch lever position switch
- • Faulty gear position switch
- • Faulty turn signal/side-stand relay
- • Faulty starter button
- • Poor contact of connector
- • Open circuit in wire harness

Voltage ↓

Check the starter relay. (☞ 6-14)

→ No good → • Faulty starter relay

OK ↓

→ • Poor contact of the starter relay

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

Check the side-stand switch. (☞6-15)

→ No good → • Faulty side-stand switch

OK ↓

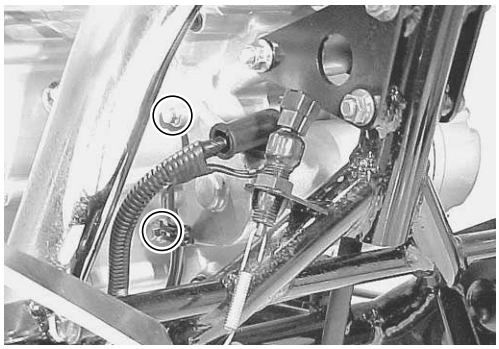
→
- • Open circuit in wire harness
- • Poor contact of connector

Others

Engine does not turn though the starter motor runs.	• Faulty starter clutch

STARTER MOTOR REMOVAL AND DISASSEMBLY

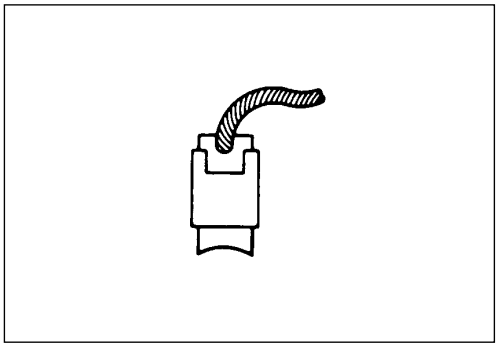
- Disconnect the starter motor lead wire. (☞3-5)
- Remove the starter motor. (☞3-11)
- Disassemble the starter motor.



STARTER MOTOR INSPECTION

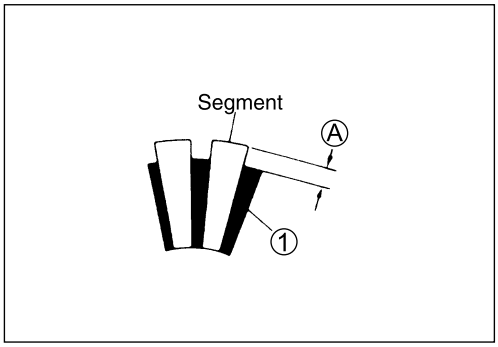
CARBON BRUSH

Inspect the brushes for abnormal wear, crack or smoothness in the brush holder.
If the brush has failed, replace the brush sub assy.



COMMUTATOR

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

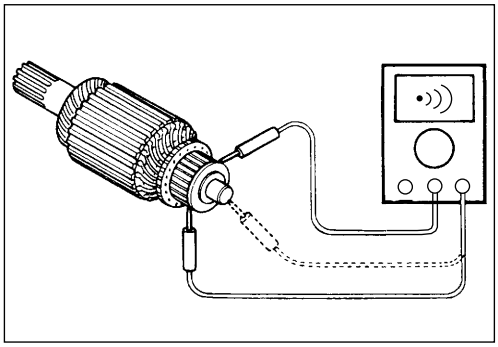


ARMATURE COIL INSPECTION

Check for continuity between each segment.
Check for continuity between each segment and the armature shaft.
If there is no continuity between the segments or there is continuity between the segments and shaft, replace the starter motor with a new one.

TOOL 09900-25008: Multi circuit tester set

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



OIL SEAL INSPECTION

Check the oil seal lip for damage or leakage.
If any damage is found, replace the housing end.

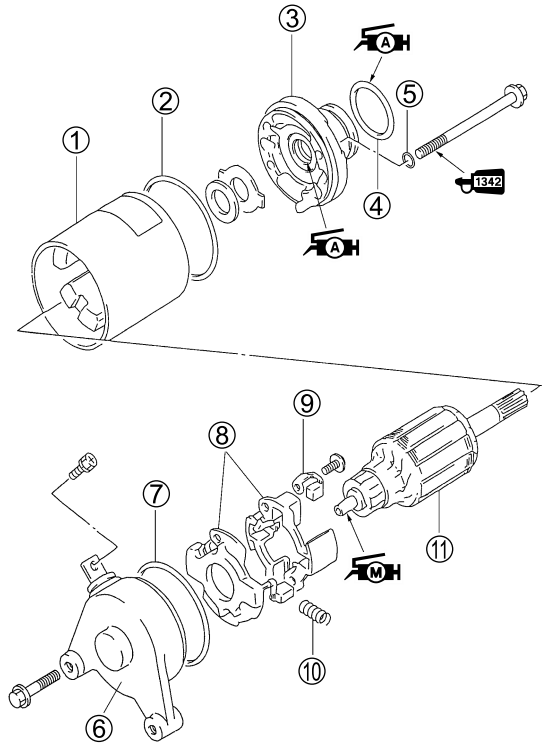
STARTER MOTOR REASSEMBLY

Reassemble the starter motor. Pay attention to the following points:

⚠ CAUTION

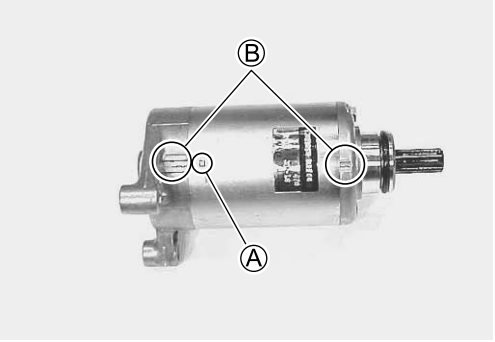
Replace the O-ring with a new one to prevent oil leakage and moisture.

- Reassemble the starter motor as shown in the illustration.



① Starter motor case
② O-ring
③ Housing end (inside)
④ O-ring
⑤ O-ring (2 pcs)
⑥ Housing end (Outside)
⑦ O-ring
⑧ Brush holder
⑨ Brush (4 pcs)
⑩ Brush spring (4 pcs)
⑪ Armature

- Align the mark Ⓐ on the housing with the line Ⓑ on the housing end.

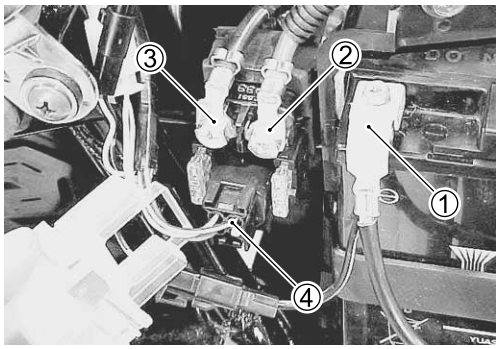


- Apply grease to the O-ring, and remount the starter motor.

A 99000-25010: SUZUKI SUPER GREASE "A"

STARTER RELAY INSPECTION

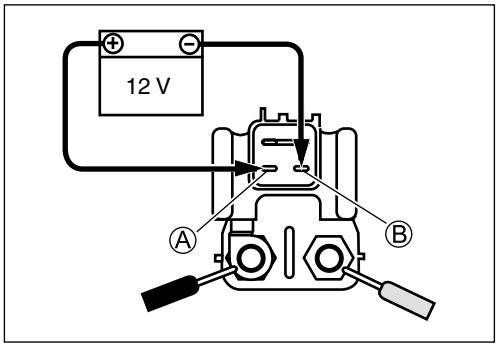
- Remove the right frame cover. (☞5-3)
- Disconnect the battery ⊖ lead wire ①, and starter relay cover.
- Disconnect the starter motor lead wire ②, and battery lead wire ③ and starter relay coupler ④ from the starter relay.
- Remove the starter relay.



Apply 12 volts to Ⓐ and Ⓑ terminals, inspect the continuity between the terminals, positive and negative.
If continuity is found, the starter relay is in sound condition.

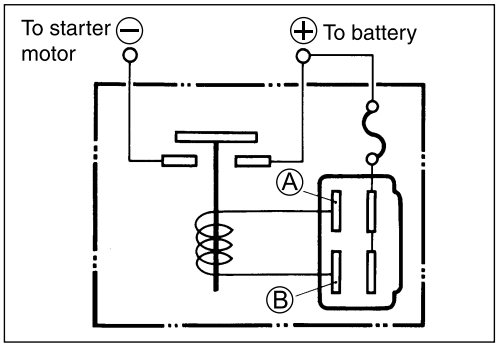
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Continuity test (•)))



⚠ CAUTION

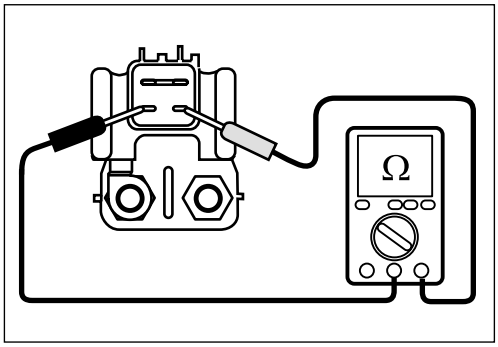
Do not apply a battery voltage more than 5 seconds to the starter relay as it may overheat and cause damage to the relay coil.



- Check the coil for “open”, “ground” and ohmic resistance. The coil is in good condition if the resistance is as follows.

TOOL 09900-25008: Multi circuit tester set

DATA Starter relay resistance: 3 – 5 Ω



SIDE-STAND/IGNITION INTERLOCK SYSTEM PART INSPECTION

If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with a new one.

SIDE-STAND SWITCH

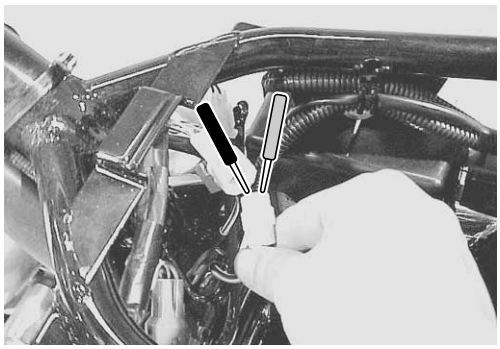
- Remove the luggage box. (☞5-2)
- Disconnect the side-stand switch coupler and measure the voltage between Green and Black/White lead wires.

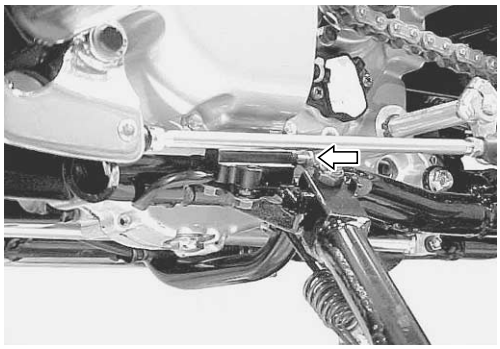
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀)

	Geen (⊕ Probe)	Black/White (⊖ Probe)
ON (Side-stand up)	0.4 – 0.6 V	
OFF (Side-stand down)	1.4 – 1.5 V	

NOTE:
If the tester reads under 1.4 V when the tester probes are not connected, replace its battery.

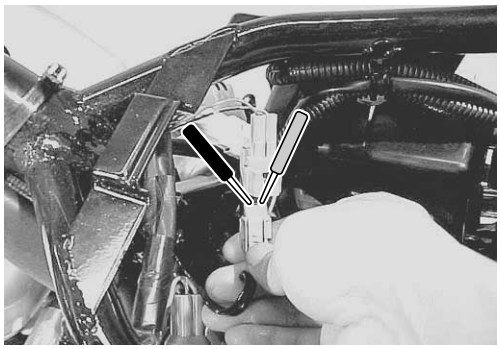




GEAR POSITION SWITCH

- Remove the luggage box. (☞5-2)
- Disconnect the gear position switch lead wire and check the continuity between Blue and Black/White with the transmission in “NEUTRAL”.

	Blue	Black / White
ON (Neutral)	○———	———○
OFF (Except neutral)		



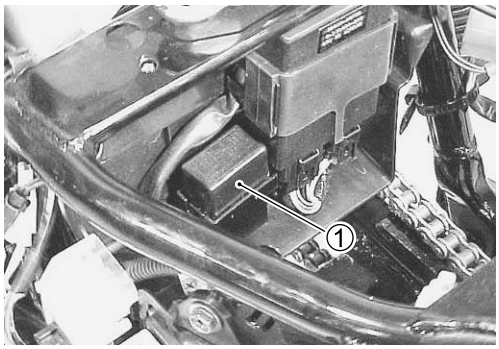
⚠ CAUTION

When disconnecting and connecting the gear position switch lead wire coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.

TURN SIGNAL/SIDE-STAND RELAY REMOVAL

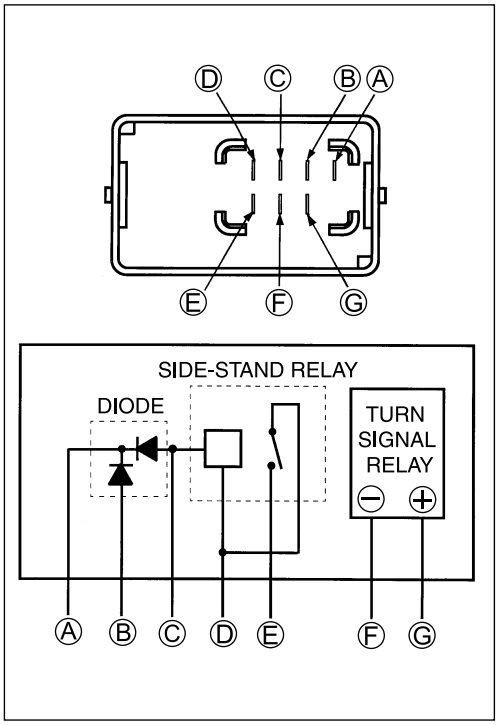
The turn signal/side-stand relay is composed of the turn signal relay, and the side-stand relay and diode.

- Remove the luggage box. (☞5-2)
- Remove the turn signal/side-stand relay ①.



SIDE-STAND RELAY INSPECTION

First check the insulation between Ⓓ and Ⓔ terminals with the tester. Then apply 12V to terminals Ⓓ and Ⓒ (⊕ to Ⓓ and ⊖ to Ⓒ) and check the continuity between Ⓓ and Ⓔ. If there is no continuity, replace the turn signal/side-stand relay with a new one.

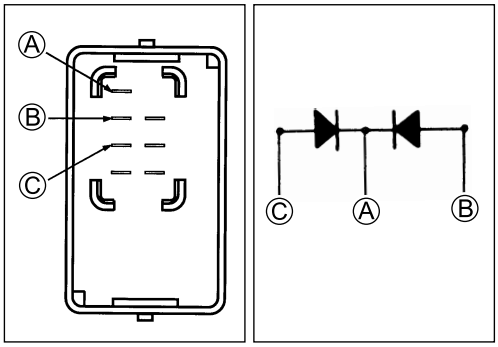


DIODE INSPECTION

Measure the voltage between the terminals using the multi circuit tester. Refer to the following table.

Unit: V

⊕ Probe of tester to: / ⊖ Probe of tester to:	Ⓒ, Ⓑ	Ⓐ
Ⓒ, Ⓑ		1.4–1.5
Ⓐ	0.4–0.6	



09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀)

NOTE:

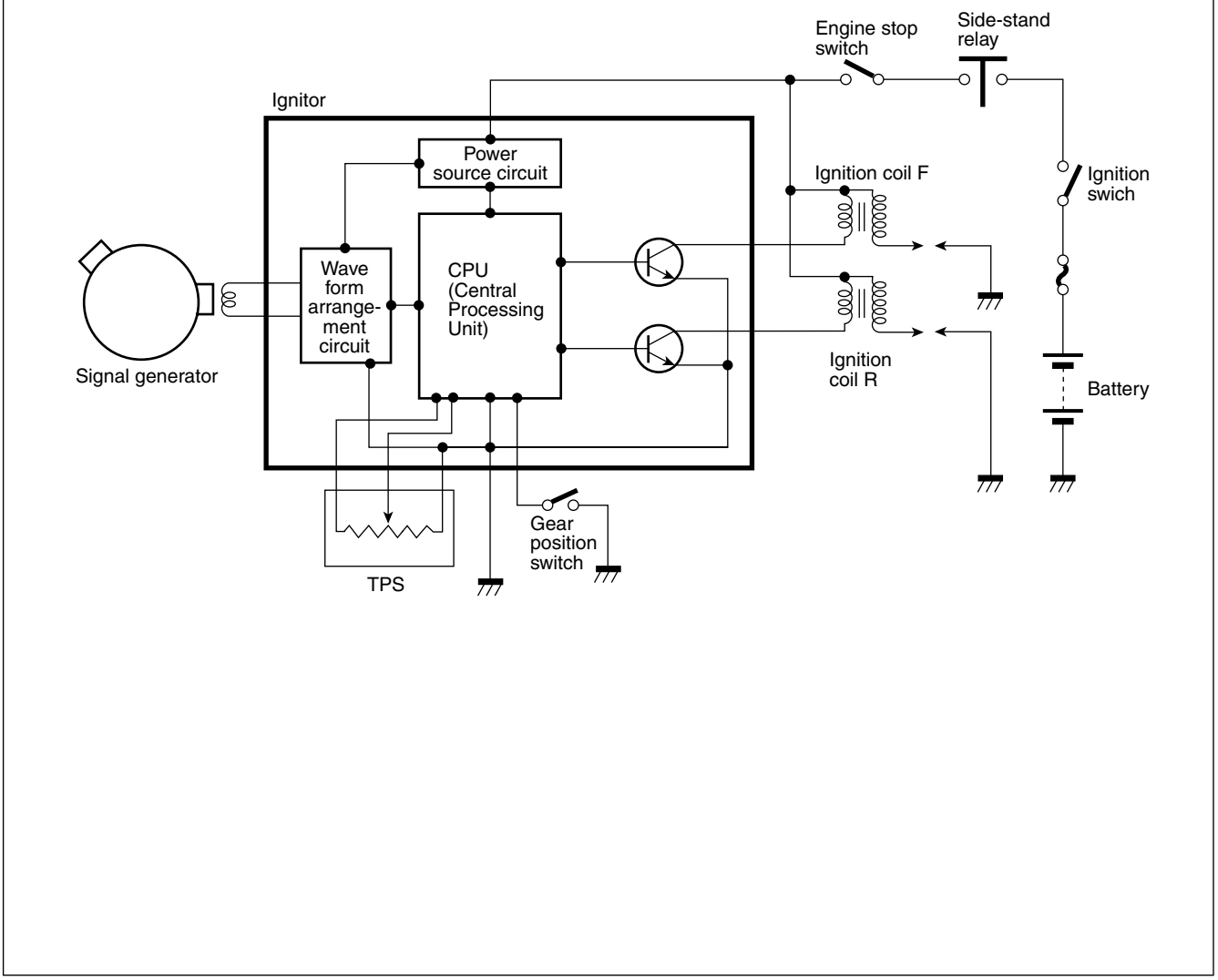
If the multi circuit tester reads under 1.4 V when the tester probes are not connected, replace its battery.

IGNITION SYSTEM

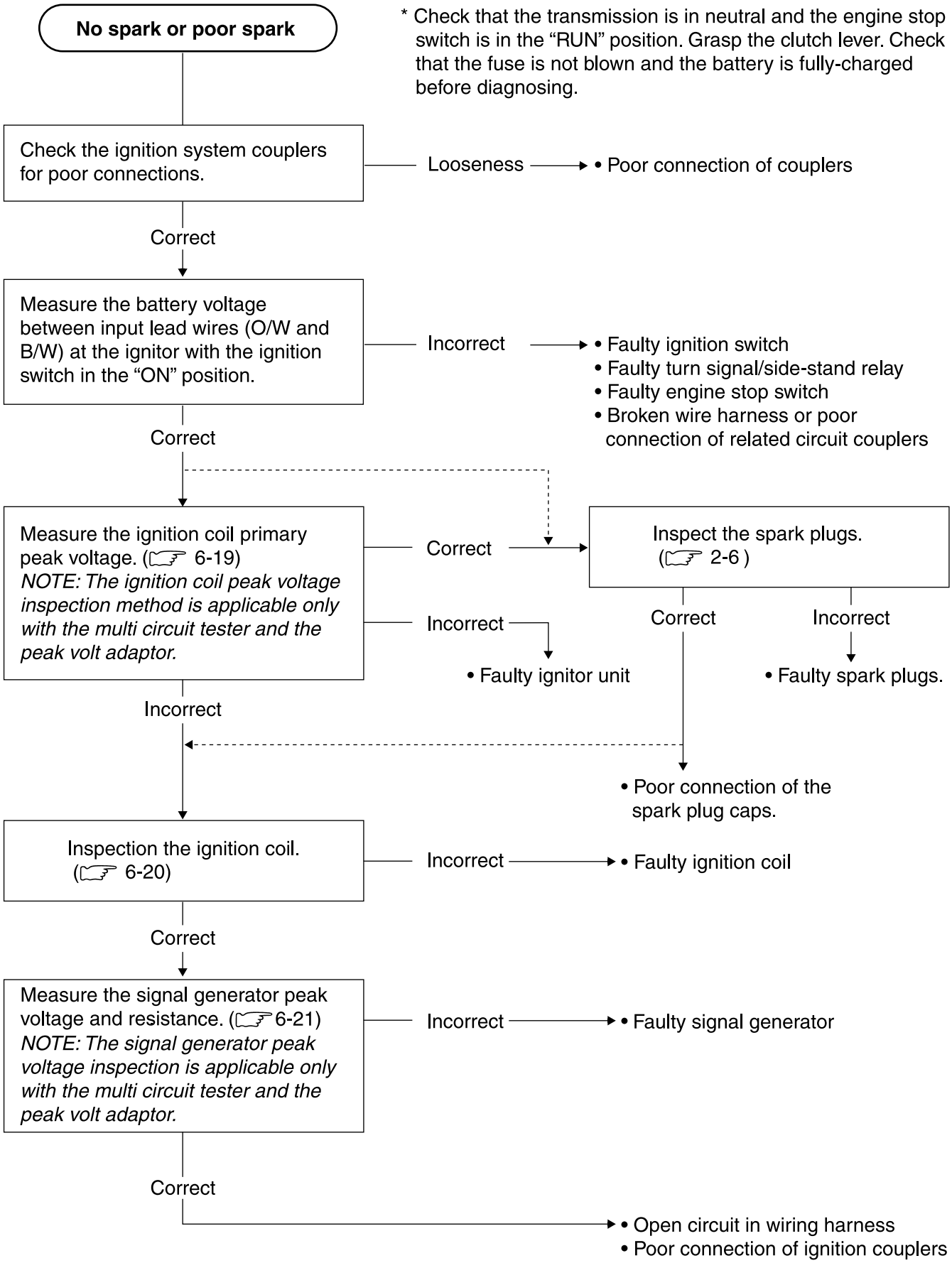
DESCRIPTION

The fully transistorized ignition system consists of the following components: a generator, ignitor, throttle position sensor, neutral switch, ignition coil and spark plug. The ignition timing is programmed and stored in the ignitor.

The pick-up coil is mounted in the generator. The induced signal in the pick-up coil is sent to the wave-form arrangement circuit and the CPU receives this signal and calculates the best ignition timing, throttle position sensed by throttle position sensor and data stored in the ROM. The CPU outputs the signal to the transistor of the ignition coil output circuit which is connected to the primary windings of the ignition coil which is turned "off" and "on" accordingly. Thus, it induces the secondary current in the ignition coil's secondary winding and produces the spark between the spark plug gap.



TROUBLESHOOTING

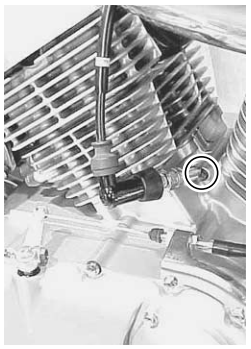


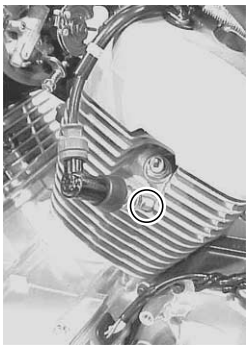
INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the fuel tank. (☞4-3)
- Remove the two spark plug caps.
- Connect new two spark plugs to the each spark plug cap and ground them.

NOTE:
Be sure that all couplers and spark plugs are connected properly and the battery used is in fully-charged condition.

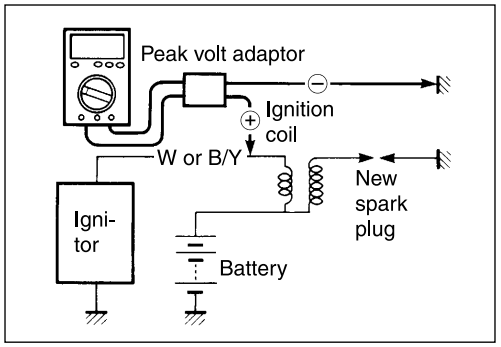




Inspect the No. 1 ignition coil primary peak voltage in the following procedure.

- Connect the multi circuit tester with peak voltage adaptor as follow.

No. 1 ignition coil: White terminal – Ground
(⊕ Probe) (⊖ Probe)

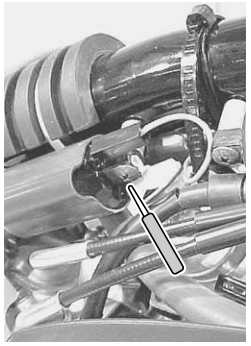


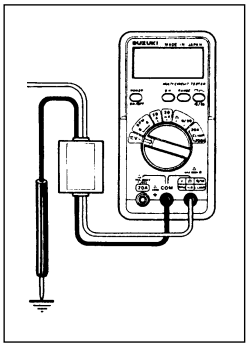
NOTE:
Do not disconnect the ignition coil primary wire.

TOOL 09900-25008: Multi circuit tester set

⚠ CAUTION

When using the multi circuit tester and peak volt adaptor, follow the instruction manual.





- Shift the transmission into the neutral and turn ignition switch "ON".
- Crank the engine a few seconds with starter motor by depressing starter button and then check the ignition coil primary peak voltage.
- Repeat the above inspection a few times and measure the highest ignition coil primary peak voltage.

Tester knob indication: Voltage (⎓)

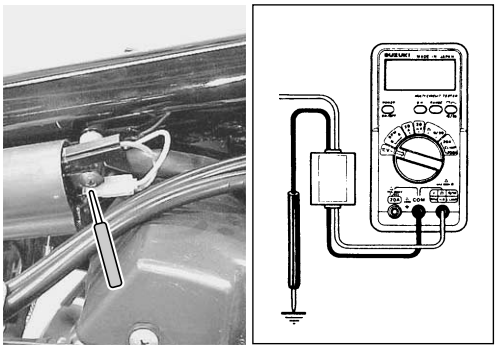
DATA Ignition coil primary peak voltage: More than 250 V

⚠ WARNING

Do not touch the tester probes and speak plugs to prevent an electric shock while testing.

Inspect No. 2 ignition coil primary peak voltage in the same manner of No. 1 ignition coil inspection.
No. 2 ignition coil: B/Y terminal – Ground
(⊕ Probe) (⊖ Probe)
B/Y: Black with Yellow tracer

NOTE:
Do not disconnect the ignition coil primary wire.



Tester knob indication: Voltage (⎓)

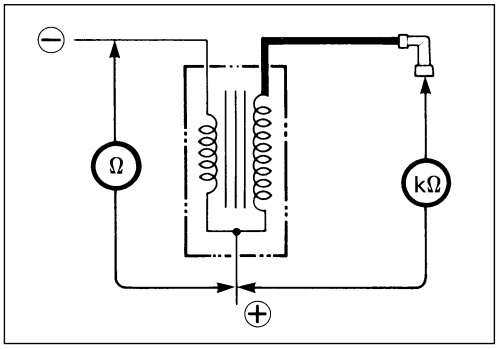
DATA Ignition coil primary peak voltage: More than 250 V

If they are lower than the specified values, inspect the ignition coil, signal generator.

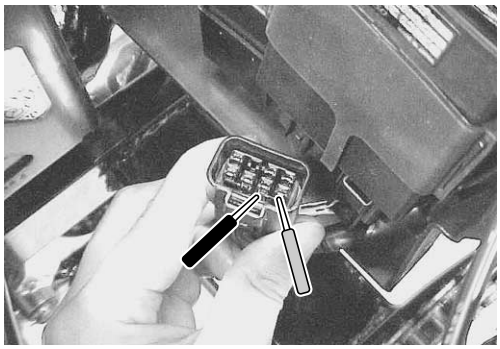
IGNITION COIL RESISTANCE

Measure the ignition coil resistance in both the primary and secondary windings. If the windings are in sound condition, their resistance should be close to the specified values.

DATA Ignition coil resistance
Primary: 1.8 – 3.0 Ω (⊕ terminal – ⊖ terminal)
Secondary: 18 – 28 kΩ (⊕ terminal – Spark plug cap)



SIGNAL GENERATOR PEAK VOLTAGE



- Remove the luggage box. (☞5-2)

NOTE:
Be sure that all couplers are connected properly and the battery used is in fully-charged condition.

- Connect the multi circuit tester with peak volt adaptor as follows.
- Measure the signal generator peak voltage between White and Green lead wires at the ignitor coupler.

Bl/B (⊕ Probe) – Green (⊖ Probe)

TOOL 09900-25008: Multi circuit tester set

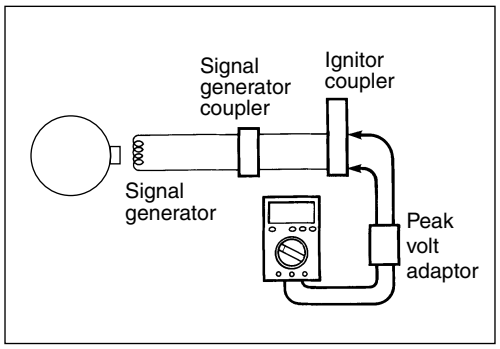
Tester knob indication: Voltage (⎓)

⚠ CAUTION

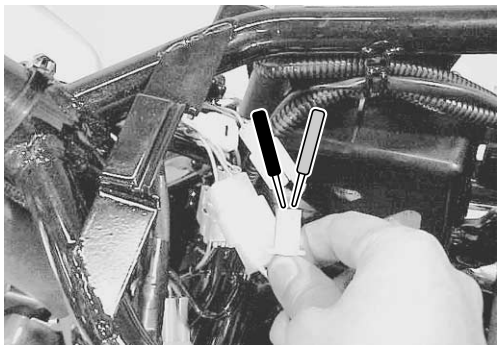
When using the multi circuit tester and peak volt adaptor, follow the instruction manual.

- Shift the transmission into the neutral and turn ignition switch "ON".
- Crank the engine a few seconds with the starter motor by depressing starter button and check the signal generator peak voltage.
- Repeat the above test procedure a few times and measure the highest peak voltage.

DATA Signal generator peak voltage:
More than 4.5 V (Bl/B – Green)



If the peak voltage is lower than the standard range, check the peak voltage at the signal generator lead wire coupler.



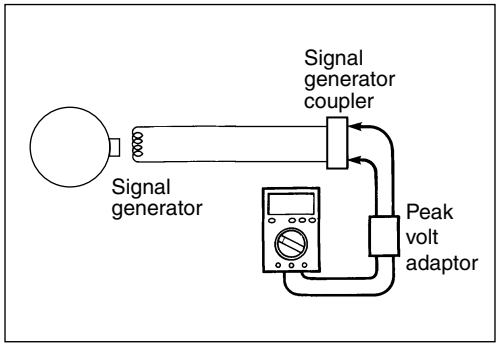
- Remove the luggage box. (☞5-2)
- Disconnect the signal generator lead wire coupler and connect the multi circuit tester with the peak volt adaptor.

Blue (⊕ Probe) – Green (⊖ Probe)

- Measure the signal generator peak voltage at the signal generator lead wire coupler.

Tester knob indication: Voltage (⎓)

DATA Signal generator peak voltage:
More than 4.5 V (Blue – Green)



If the peak voltage is lower than the standard range, check each coupler at both ends of the circuit or replace the signal generator and inspect it again.

SIGNAL GENERATOR RESISTANCE

- Measure the resistance between the lead wires and ground. If the resistance is not specified value, the signal generator must be replaced.

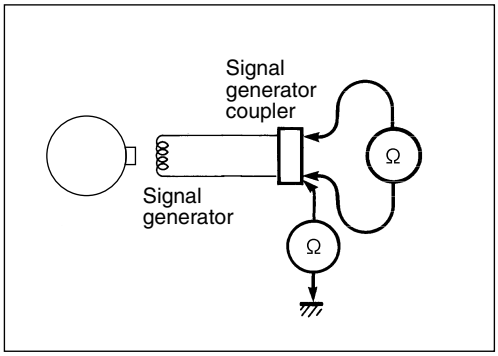
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Signal generator resistance

: 180 – 280 Ω (Green – Blue)

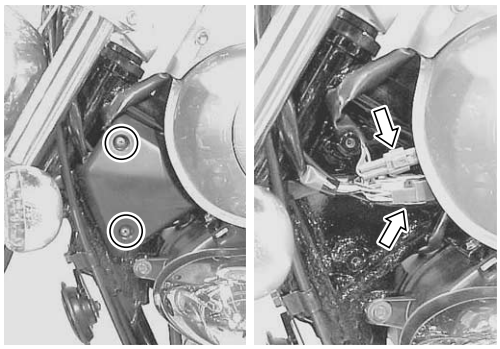
: ∞Ω (Green – Ground)



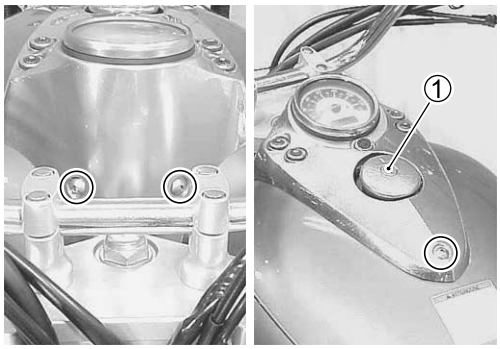
SPEEDOMETER

REMOVAL AND DISASSEMBLY

- Remove the frame head pipe cover.
- Remove the speedometer couplers.



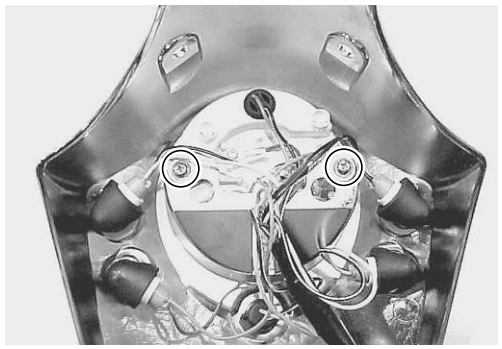
- Remove the speedometer bolts, and fuel tank cap ①.
- Remove the speedometer cover.



- Remove the bulb socket and pick up the indicator bulbs.

- Remove the speedometer from speedometer cover by removing the screws.

SPEED SENSOR REMOVAL: ☞3-11



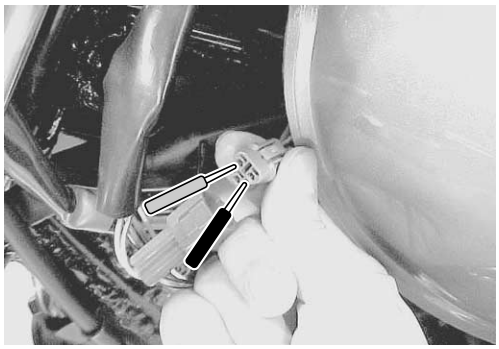
SPEED SENSOR INSPECTION

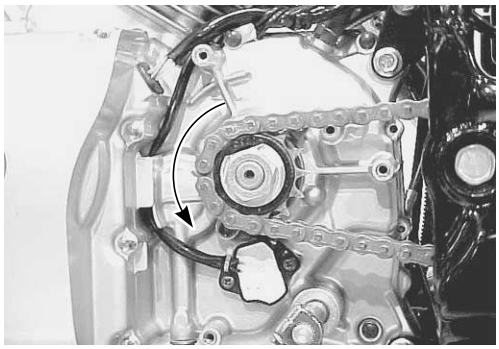
- Disconnect the speed sensor coupler, and connect the tester to the speed sensor lead wire coupler.
  ⊕ → Pink
  ⊖ → Pink/Black

Tester knob indication: Voltage (~)

- Lift the rear wheel.

Check that voltage varies between about 0 – 2 V when turning the rear wheel by hand.
If any abnormal condition is noted, check each coupler at both end of circuit or replace the sensor or wiring harness.



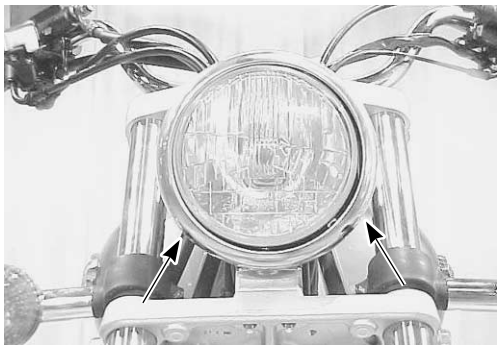


LAMPS

HEADLIGHT AND POSITION LIGHT

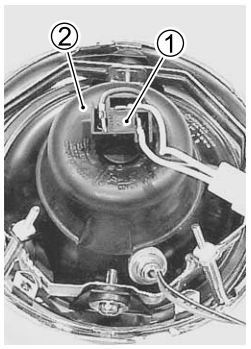
HEADLIGHT BULB REPLACEMENT

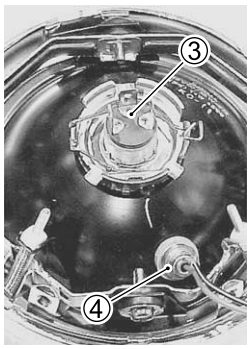
- Remove the headlight.



- Disconnect the coupler.

- Remove the socket ①.
- Remove the rubber boot ②.
- Remove the bulb ③ by removing the bulb holder spring.
- Remove the position light bulb ④.
- Reassemble the bulb in the reverse order of removal.

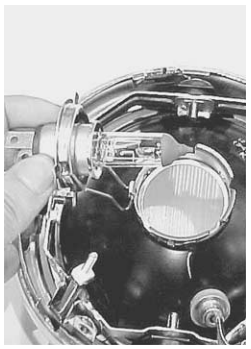


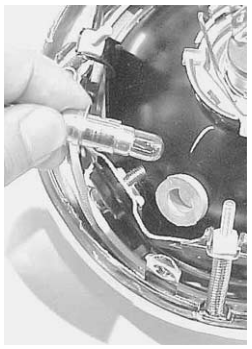


⚠ CAUTION

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.

Headlight: 12 V 60/55 W (H4)
Position light: 12 V 4 W





⚠ WARNING

The headlight uses a halogen bulb which operates at a high temperature. Therefore, handle the bulb after sufficiently cooled.

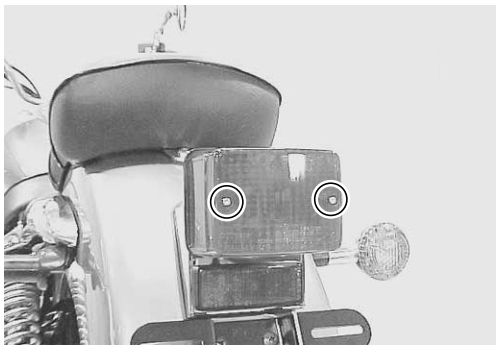
⚠ CAUTION

*** A fouled glass can cause damage to the bulb when lit. If the bulb is contacted with bare hand, wipe clean with a cloth damped with alcohol or detergent.**
*** Do not use the bulb of a wattage other than specification.**
*** When installing the rubber boot, turn its "TOP" mark pointing upward.**

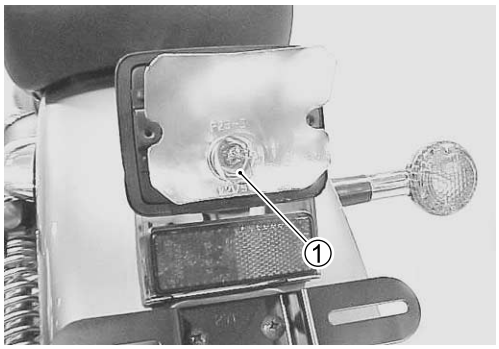
BRAKE LIGHT/TAILLIGHT

BRAKE LIGHT/TAILLIGHT BULB REPLACEMENT

- Remove the lens by removing the screws.



- Push in on the bulb ①, turn it counterclockwise, and pull it out.



⚠ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

- Reassemble the bulb in the reverse order of removal.

Brake light/Taillight: 12 V 21/5 W

TURN SIGNAL LIGHT

TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the lens by removing the screws.
- Remove the bulb.

⚠ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

- Reassemble the bulb in the reverse order of removal.

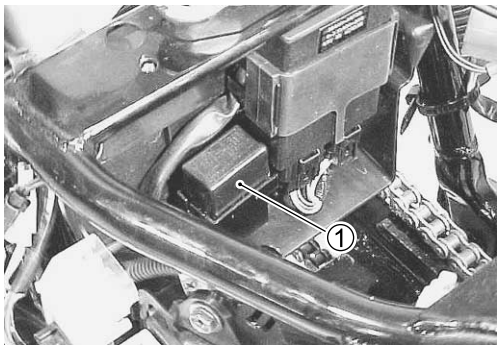
⚠ CAUTION

Do not overtighten the lens fitting screws.

TURN SIGNAL/SIDE-STAND RELAY

The turn signal/side-stand relay ① is composed of the turn signal relay, side-stand relay and diode.

- Remove the luggage box. (☞6-7)



INSPECTION

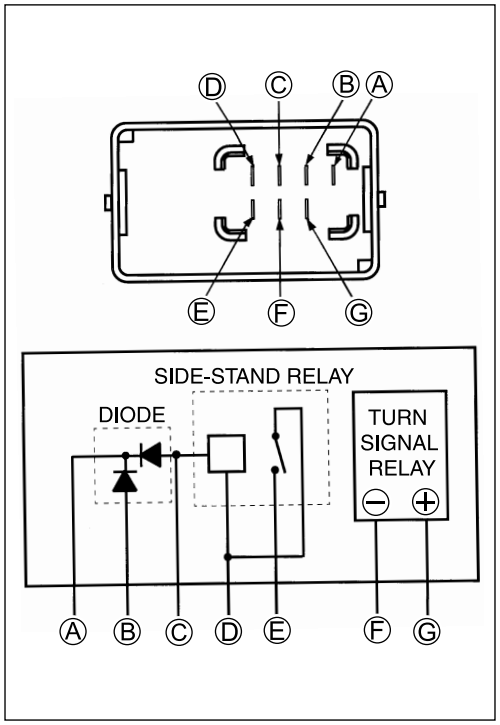
Before removing the turn signal/side-stand relay, check the operation of the turn signal light.

If the turn signal light does not illuminate, inspect the bulb, turn signal switch and circuit connection.

If the bulb, turn signal switch and circuit connection are OK, the turn signal relay may be faulty; therefore, replace the turn signal/side-stand relay with a new one.

NOTE:

* *Make sure that the battery is fully charged.*
* *Refer to the page 6-16 for the side-stand relay and diode inspection.*

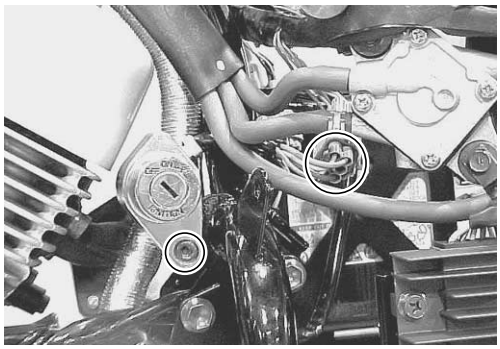


SWITCHES

IGNITION SWITCH REMOVAL

- Remove the left frame cover. (☞5-3)
- Disconnect the coupler.
- Remmove the ignition switch by removing the bolt.

Ignition switch bolt: 10 N·m (1.0 kgf·m)



INSPECTION

Measure each switch for continuity using a tester. If any abnormality is found, replace the respective switch assemblies with new ones.

IGNITION SWITCH

Position \ Color	R	O	O/Y	B/W	Gr	Br
ON	○—○		○—○		○—○	
OFF						
LOCK						
P	○—					—○

LIGHTING SWITCH

Position \ Color	O/Bl	Gr	O/R	Y/W
OFF (●)				
(≥00≤)	○—	—○		
ON (☼)	○—	—○	○—	—○

DIMMER SWITCH

Position \ Color	W	Y	Y/W
HI (≡▷)		○—	—○
LO (≡▷)	○—	—	—○

TURN SIGNAL SWITCH

Position \ Color	Lg	Lbl	B
L (⇦)		○—	—○
PUSH			
R (⇨)	○—	—○	

ENGINE STOP SWITCH

Position \ Color	O/B	O/W
OFF (⊗)		
RUN (∩)	○—	—○

STARTER BUTTON

Position \ Color	O/W	Y/G
•		
PUSH	○—	—○

HORN BUTTON

Position \ Color	B/Bl	B/W
•		
PUSH	○—	—○

FRONT BRAKE LIGHT SWITCH

Position \ Color	B/R	B/Bl
OFF		
ON	○—	—○

REAR BRAKE LIGHT SWITCH

Position \ Color	O	W/B
OFF		
ON	○—	—○

CLUTCH LEVER POSITION SWITCH

Position \ Color	B/Y	B/Y
FREE		
•	○—	—○

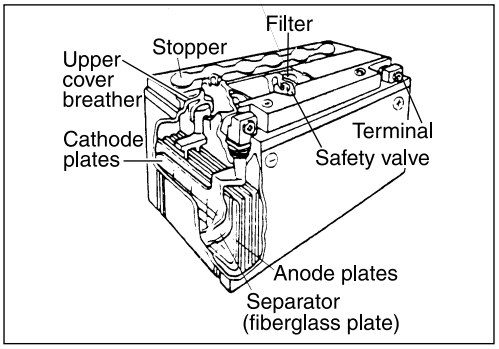
WIRE COLOR

B : Black
Br : Brown
Gr : Gray
Lbl : Light blue
Lg : Light green
O : Orange
R : Red
Y : Yellow
W : White
B/Bl : Black with Blue tracer
B/W : Black with White tracer
B/Y : Black with Yellow tracer
B/R : Black with Red tracer
O/B : Orange with Black tracer
O/Bl : Orange with Blue tracer
O/R : Orange with Red tracer
O/W : Orange with White tracer
O/Y : Orange with Yellow tracer
W/B : White with Black tracer
Y/W : Yellow with White tracer
Y/G : Yellow with Green tracer

BATTERY

SPECIFICATIONS

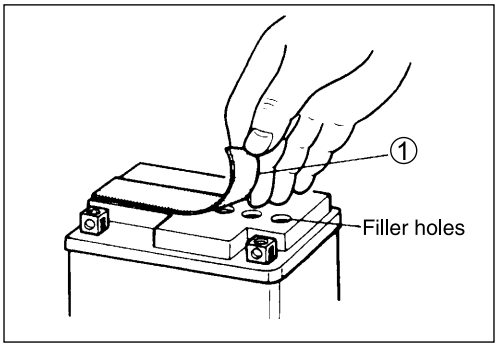
Type designation	YTX7L-BS
Capacity	12V, 21.6 kC (6 Ah)/10HR



INITIAL CHARGING

Filling electrolyte

- Remove the aluminum tape ① sealing the battery electrolyte filler holes.

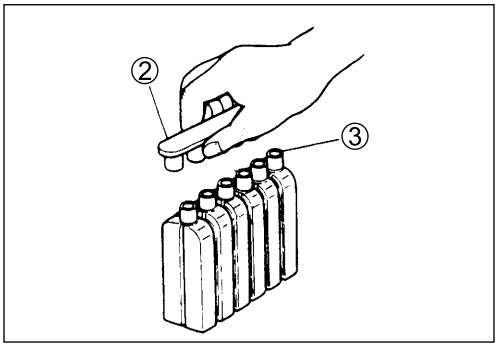


- Remove the caps ②.

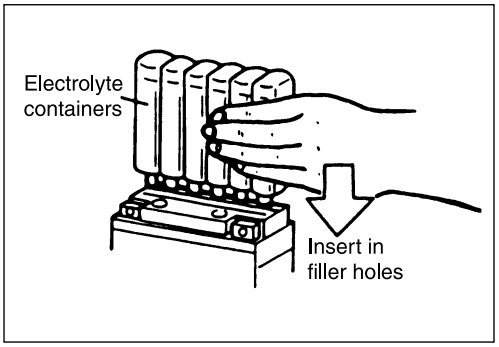
NOTE:

* *After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.*

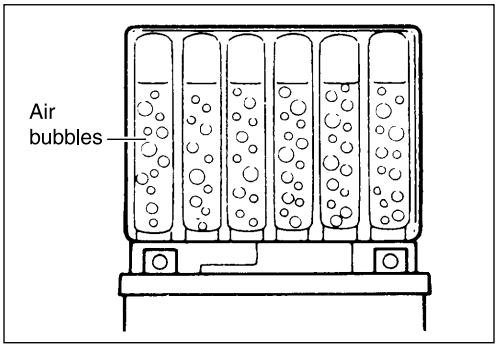
* *Do not remove or pierce the sealed areas ③ of the electrolyte container.*



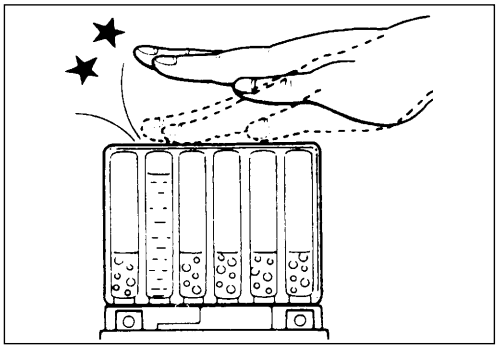
- Insert the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall. Take precaution not to allow any of the fluid to spill.



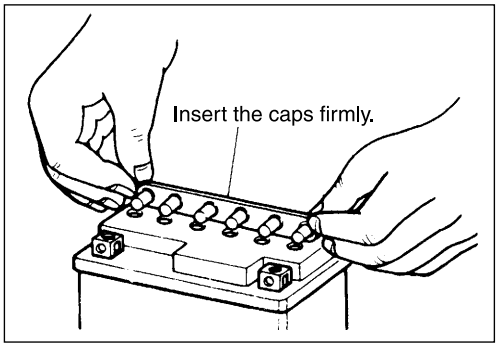
- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.



NOTE:
If no air bubbles are coming up from a filler port, tap the bottom of the two or three times.
Never remove the container from the battery.

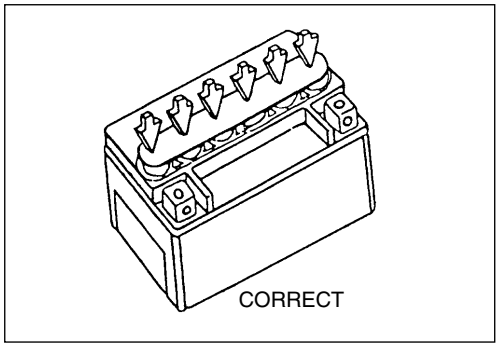


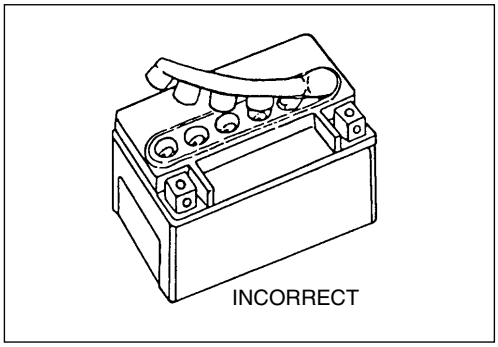
- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for around 20 minutes.
- Insert the caps into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.



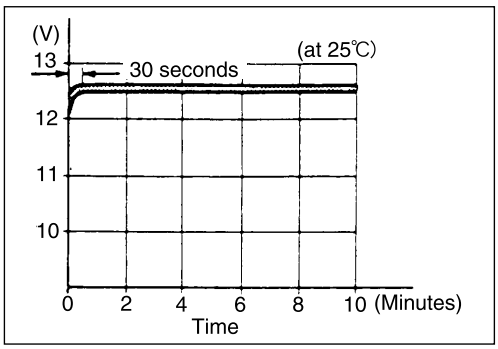
⚠ CAUTION

*** Never use anything except the specified battery.**
*** Once install the caps to the battery; do not remove the caps.**





- Using multi circuit tester, measure the battery voltage. The tester should indicate more than 12.5 – 12.6V (DC) as shown in the Fig. If the battery voltage is lower than the specification, charge the battery with a battery charger. (Refer to the recharging operation)



NOTE:
Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.

SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

RECHARGING OPERATION

- Using the multi circuit tester, check the battery voltage. If the voltage reading is less than the 12.0 V (DC), recharge the battery with a battery charger.

⚠ CAUTION

When recharging the battery, remove the battery from the motorcycle.

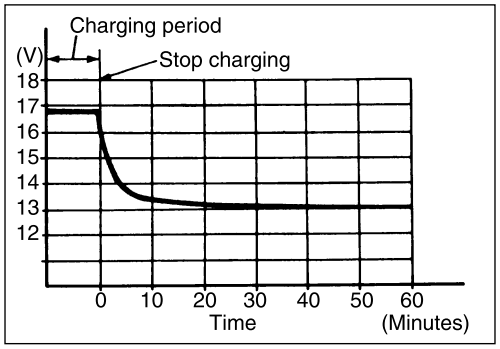
NOTE:
Do not remove the caps on the battery top while recharging.

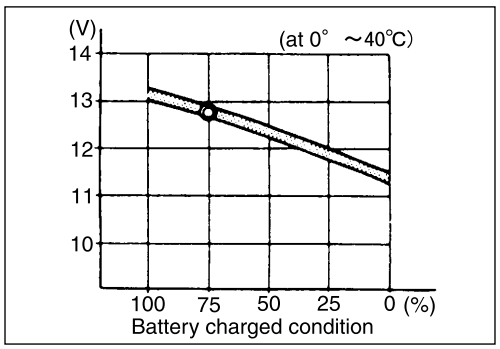
Recharging time: 3 A for one hour or 0.7 A for 5 to 10 hours

⚠ CAUTION

Be careful not to permit the charging current to exceed 5 A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a multi circuit tester.
- If the battery voltage is less than the 12.5 V, recharge the battery again.
- If battery voltage is still less than 12.5 V, after recharging, replace the battery with a new one.
- When the motorcycle is not used for a long period, check the battery every 1 month to prevent the battery discharge.





SERVICING INFORMATION

CONTENTS

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start.	**Compression too low**	
	1. Worn cylinder.	Replace.
	2. Worn piston ring.	Replace.
	3. Worn valve guide or improper valve seating.	Repair or replace.
	4. Loose spark plug.	Tighten.
	5. Broken, cracked, or damaged piston.	Replace.
	6. Slow cranking starter motor.	See electrical section.
	7. Mistimed valves.	Adjust.
	8. Valve clearance out of adjustment.	Adjust.
	Spark plug not sparking	
	1. Damaged spark plug.	Replace.
	2. Damaged spark plug cap.	Replace.
	3. Fouled spark plug.	Clean or replace.
	4. Wet spark plug.	Clean and dry or replace.
	5. Defective ignition coil.	Replace.
	6. Open or short in high-tension cord.	Replace.
	7. Defective pick-up coil or ignitor unit.	Replace.
	No fuel reaching the carburetor	
	1. Clogged hole in the fuel tank cap.	Clean or replace.
	2. Defective fuel pump.	Replace.
	3. Clogged or defective fuel valve.	Clean or replace.
	4. Defective carburetor needle valve.	Replace.
	5. Clogged fuel hose.	Clean or replace.
	6. Clogged fuel filter.	Clean or replace.
Engine stalls easily.	1. Fouled spark plug.	Clean or replace.
	2. Defective signal coil or ignitor unit.	Replace.
	3. Defective fuel pump.	Replace.
	4. Clogged or defective fuel valve.	Clean or replace.
	5. Clogged carburetor jet.	Clean.
	6. Valve clearance out of adjustment.	Adjust.

Complaint	Symptom and possible causes	Remedy
Engine is noisy.	**Excessive valve chatter**	
	1. Excessive valve clearance.	Adjust.
	2. Weak or broken valve spring.	Replace.
	3. Worn camshaft.	Replace.
	4. Worn or burnt camshaft journal.	Replace.
	Noise seems to come from the piston	
	1. Worn piston.	Replace.
	2. Worn cylinder.	Replace.
	3. Carbon buildup in combustion chamber.	Clean.
	4. Worn piston pin or piston pin bore.	Replace.
	5. Worn piston ring or ring groove.	Replace.
	Noise seems to come from the cam chain	
	1. Stretched cam chain.	Replace cam chain and sprockets.
	2. Worn cam chain sprocket.	Replace cam chain and sprockets.
	3. Improperly working cam chain tensioner.	Repair or replace.
	Noise seems to come from the clutch	
	1. Worn countershaft spline.	Replace countershaft.
	2. Worn clutch hub spline.	Replace clutch hub.
	3. Worn clutch plate teeth.	Replace clutch plate.
	4. Distorted clutch plate.	Replace.
	5. Weak clutch damper.	Replace primary driven gear.
	6. Weak clutch spring.	Replace.
	Noise seems to come from the crankshaft	
	1. Rattling bearing.	Replace.
	2. Worn or burnt crank pin bearing.	Replace.
	3. Worn or burnt journal bearing.	Replace.
	4. Excessive thrust clearance.	Replace thrust bearing.
	Noise seems to come from the transmission	
	1. Worn or rubbing gear.	Replace.
	2. Worn countershaft spline.	Replace countershaft.
	3. Worn driveshaft spline.	Replace driveshaft.
	4. Worn or rubbing primary gear.	Replace.
	5. Worn bearing.	Replace.
Clutch drags.	1. Clutch out of adjustment.	Adjust.
	2. Clutch release screw out of adjustment.	Adjust.
	3. Some clutch springs are weak, while others are not.	Replace.
	4. Worn or distorted clutch pressure plate.	Replace.
	5. Distorted clutch plate.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift fork.	Replace.
	3. Worn gearshift pawl.	Replace.
Transmission will not shift back.	1. Broken gearshift shaft return spring.	Replace.
	2. Rubbing or stuck gearshift shaft.	Repair or replace.
	3. Worn or distorted gearshift fork.	Replace.

Complaint	Symptom and possible causes	Remedy
Transmission jumps out of gear.	1. Worn gear. 2. Worn or distorted gearshift fork. 3. Weakened gearshift stopper spring. 4. Worn gearshift pawl.	Replace. Replace. Replace. Replace.
Engine idles poorly.	1. Valve clearance out of adjustment. 2. Improper valve seating. 3. Worn valve guide. 4. Worn camshaft. 5. Excessive spark plug gap. 6. Defective ignition coil. 7. Defective generator. 8. Defective ignitor unit. 9. Incorrect float chamber fuel level. 10. Clogged carburetor jet.	Adjust. Repair or replace. Replace. Replace. Adjust or replace. Replace. Replace. Replace. Adjust float height. Clean.
Engine runs poorly in high-speed range.	1. Weak valve spring. 2. Worn camshaft. 3. Insufficient spark plug gap. 4. Mistimed valves. 5. Ignition not advanced sufficiently due to poorly working timing advance circuit. 6. Defective ignition coil. 7. Defective generator. 8. Defective ignitor 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 ignitor unit. Replace. Replace. Replace. Adjust float height. Clean or replace. Clean and prime.
Exhaust smoke is dirty or thick.	1. Excessive amount of engine oil. 2. Worn cylinder. 3. Worn piston ring. 4. Worn valve guide. 5. Scored or scuffed cylinder wall. 6. Worn valve stem. 7. Defective valve stem oil seal. 8. Worn oil ring side rail.	Check level and drain. Rebore or replace. Replace. Replace. Replace. Replace valve. Replace. Replace oil ring.
Engine lacks power.	1. Insufficient valve clearance. 2. Weak valve spring. 3. Mistimed valves. 4. Worn cylinder. 5. Worn piston ring. 6. Improper valve seating. 7. Fouled spark plug. 8. Incorrect spark plug. 9. Clogged carburetor jet. 10. Incorrect float chamber fuel level. 11. Dirty air cleaner element. 12. Air leakage from intake pipe. 13. Excessive amount of engine oil.	Adjust. Replace. Adjust. Replace. Replace. Repair or replace. Clean or replace. Replace. Clean. Adjust float height. Clean or replace. Tighten or replace. Check level and drain.

Complaint	Symptom and possible causes	Remedy
Engine overheats.	1. Carbon buildup on piston crown. 2. Insufficient amount of engine oil. 3. Defective oil pump. 4. Clogged oil circuit. 5. Float chamber fuel level too low. 6. Air leakage from intake pipe. 7. Incorrect engine oil.	Clean. Check level and add. Replace. Clean. Adjust float height. Tighten or replace. Change.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Starting difficulty.	1. Clogged starter jet. 2. Clogged starter jet passage. 3. Air leaking from carburetor joint or vacuum hose joint. 4. Improperly working starter (enricher) plunger.	Clean. Clean. 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, vacuum pipe joint, or starter. 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.

SHAFT DRIVE

Complaint	Symptom and possible causes	Remedy
Noisy shaft drive.	**Noise seems to come from secondary bevel gear and final bevel gear assemblies.** 1. Oil level too low. 2. Drive and driven bevel gears damaged or worn. 3. Excessive backlash. 4. Improper tooth contact. 5. Damage to bearings.	 Refill. (Check oil jet/replace oil seal) Replace. Adjust. Adjust. Replace.
	Noise seems to come from propeller shaft area. 1. Propeller shaft universal joint damaged. 2. Propeller shaft splines damaged or worn. 3. Insufficient lubricant. 4. Cam dog contacting surface damaged or worn.	 Replace. Replace. Refill. (Replace oil seal) Replace.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Steering is heavy.	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. 4. Twisted tire.	Adjust or replace. Repair or replace. Replace. Replace.
Front wheel wobbles.	1. Distorted wheel rim. 2. Worn front wheel bearing. 3. Defective or incorrect tire. 4. Loose front axle nut. 5. Incorrect fork oil level.	Replace. Replace. Replace. Tighten. 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 bearing. 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 bearing and rear suspension related bearing.	Adjust. Replace. Replace.
Rear suspension too noisy.	1. Loose rear suspension fastener. 2. Worn swingarm bearing and rear suspension related bearing.	Tighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Brake power insufficient.	1. Leakage of brake fluid. 2. Worn brake pad/shoe. 3. Oil on brake pad surface. 4. Worn brake disc. 5. Air in hydraulic system.	Repair or replace. Replace. Clean brake disc and brake pads. Replace. Bleed.
Brake squeaks.	1. Carbon adhesion on brake pad/shoe surface. 2. Tilted brake pad. 3. Damaged wheel bearing. 4. Worn brake pad/shoe. 5. Foreign material in brake fluid. 6. Clogged return port of master cylinder. 7. Loose front or rear axle nut.	Clean surface with sandpaper. Readjust brake pad position or replace. Replace. Replace. Change brake fluid. Disassemble and clean master cylinder. Tighten.
Brake lever or pedal stroke excessive.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Incorrect brake fluid.	Bleed. Check level and add. Bleed any air. Change.
Brake fluid leaks.	1. Loose connection joint. 2. Cracked hose. 3. Worn piston seal. 4. Worn secondary cup.	Tighten. Replace. Replace. Replace.
Brake drags.	1. Rusty part. 2. Insufficient brake lever or brake pedal pivot lubrication.	Clean and lubricate. Lubricate.

ELECTRICAL

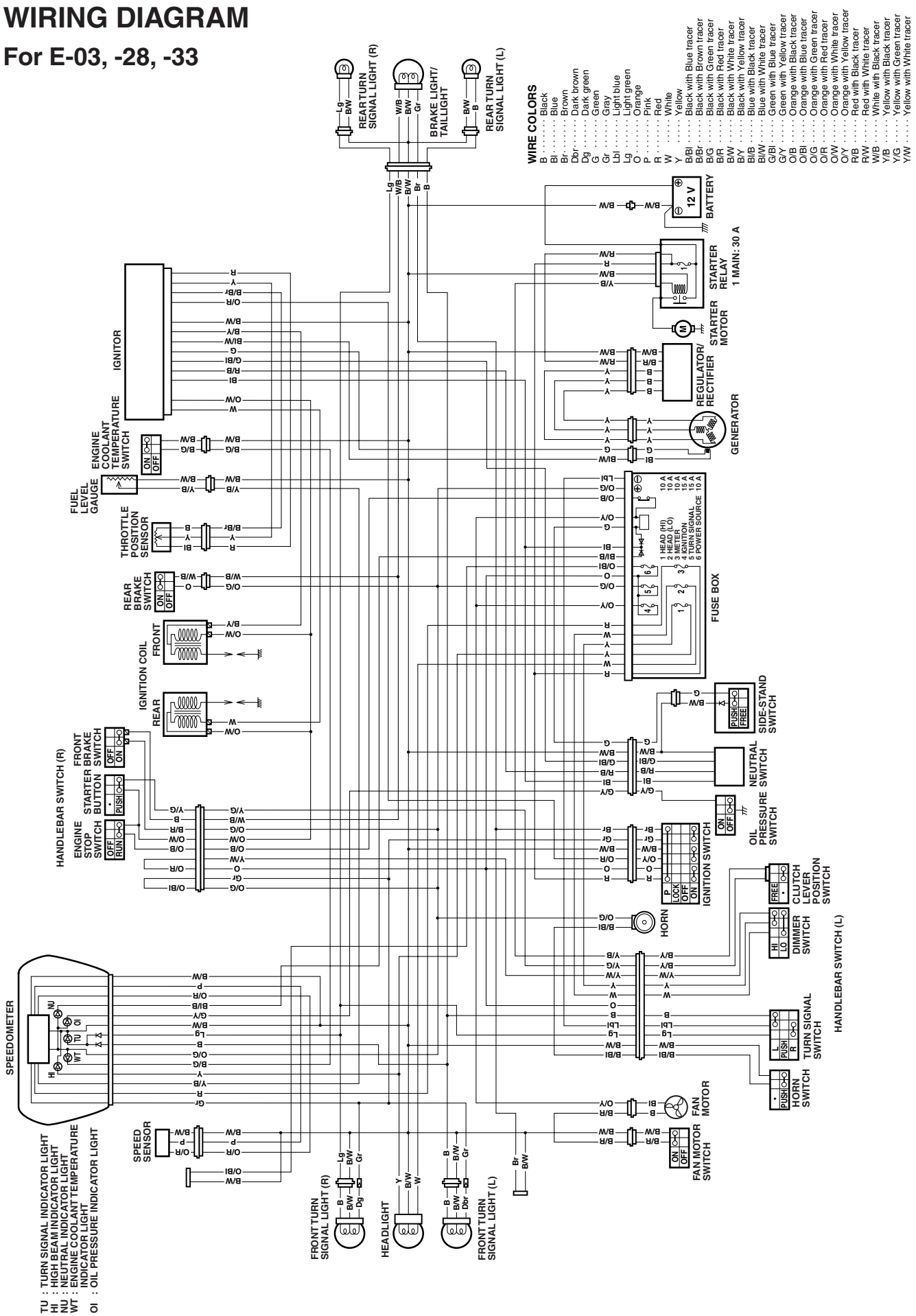
Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plug. 3. Defective pick-up coil. 4. Defective ignitor unit.	Replace. Replace. Replace. Replace.
Spark plug is wet or quickly becomes fouled with carbon.	1. Excessively rich air/fuel mixture. 2. Excessively high idling speed. 3. Incorrect gasoline. 4. Dirty air cleaner element. 5. Incorrect spark plug (cold type).	Adjust carburetor. Adjust carburetor. Change. Clean or replace. Change to hot type spark plug.
Spark plug quickly becomes fouled with oil or carbon.	1. Worn piston ring. 2. Worn piston. 3. Worn cylinder. 4. Excessive valve-stem-to-valve-guide clearance. 5. Worn valve stem oil seal.	Replace. Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Incorrect spark plug (hot type). 2. Overheated engine. 3. Loose spark plug. 4. Excessively lean air/fuel mixture.	Change to cold type spark plug. Tune-up. Tighten. Adjust carburetor.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded, or open generator coil. 3. Shorted or punctured regulator/rectifier.	Repair, replace, or connect properly. Replace. Replace.
Generator charges but charging rate is below the specifications.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminal. 2. Grounded or open-circuited stator coils or generator. 3. Defective regulator/rectifier. 4. Defective battery cell plates.	Repair or tighten. Replace. Replace. Replace battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Damaged or defective regulator/rectifier. 3. Poorly grounded regulator/rectifier.	Replace battery. Replace. Repair, replace, or connect properly.
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Internally shorted generator. 3. Defective regulator/rectifier.	Repair or replace. Replace. Replace.
Starter button does not work.	1. Run down battery. 2. Defective switch contact. 3. Brushes do not seat properly on the commutator in the starter motor. 4. Defective starter relay. 5. Defective turn signal/side stand relay. 6. Wiring connections loose or disconnected.	Recharge or replace. Replace. Repair or replace. Replace. Replace. Tighten or repair.

BATTERY

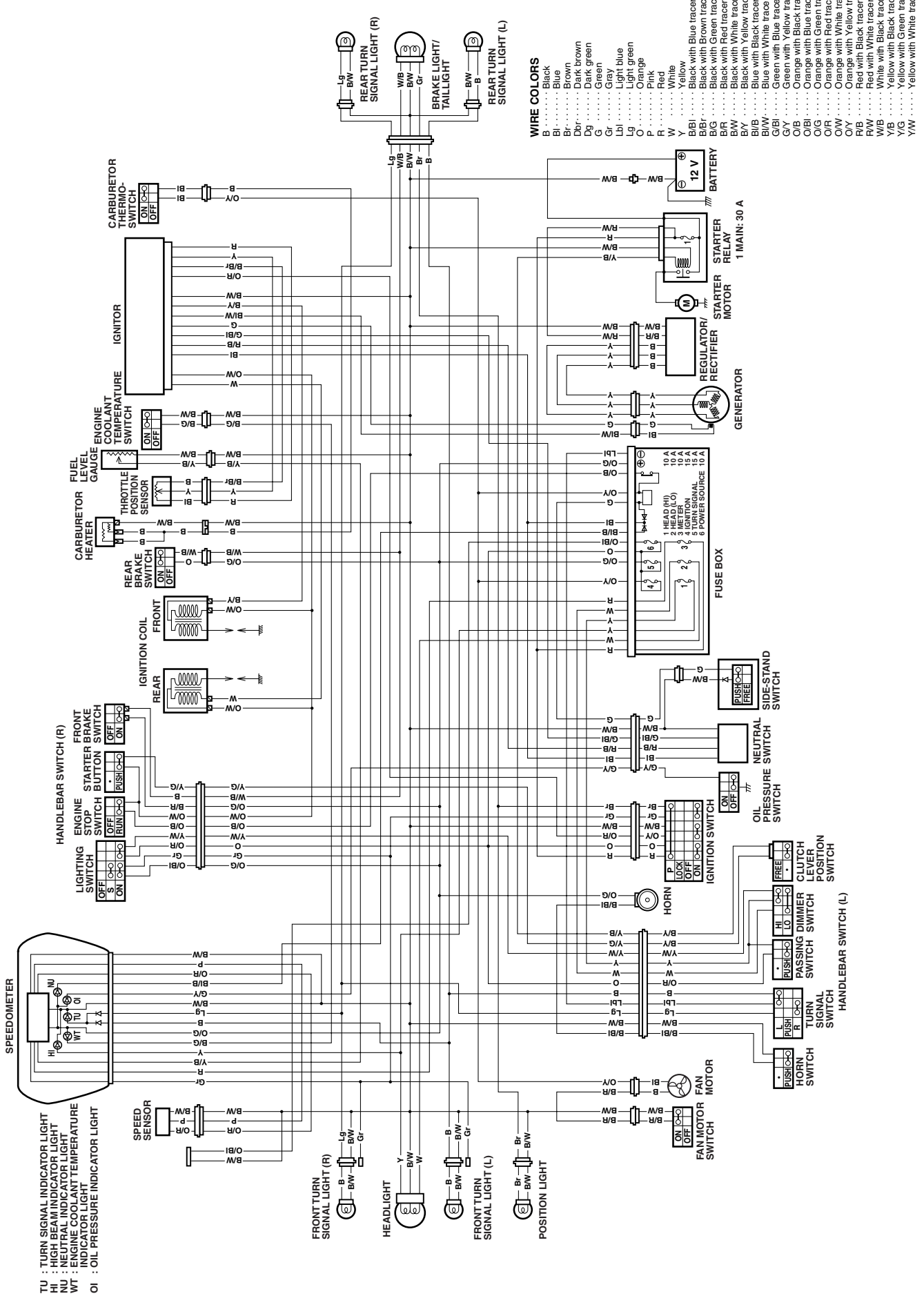
Complaint	Symptom and possible causes	Remedy
Sulfation or spots on surfaces of cell plates.	1. Cracked battery case. 2. Battery has been left in a run-down condition for a long time.	Replace. Replace.
Battery runs down quickly.	1. Incorrect charging method. 2. Battery cell plates have lost much of their active material as a result of overcharging. 3. Internally shorted battery. 4. Excessively low battery voltage. 5. Battery is too old. 6. Dirty container top and sides.	Check generator, regulator/rectifier circuit connections, and make necessary adjustment to obtain specified charging operation. Replace battery and correct charging system. Replace. Charge. Replace. Clean.
Battery sulfation.	1. Incorrect charging rate. (When not in use, the battery should be checked at least once a month and properly charged if necessary, to avoid sulfation.) 2. The battery was left unused in a cold climate for too long.	Replace. Replace the battery if badly sulfated.

WIRING DIAGRAM

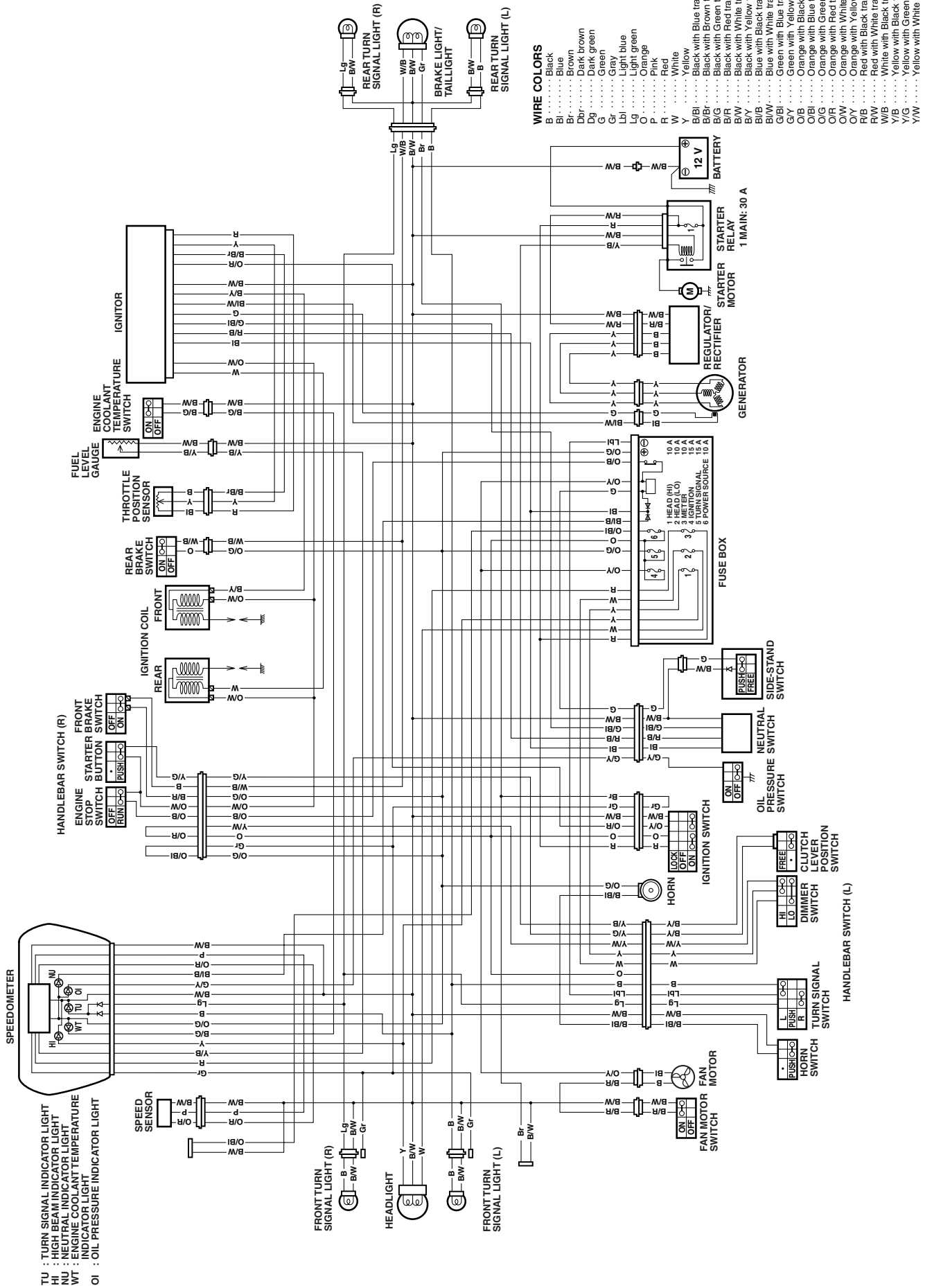
For E-03, -28, -33



For E-02, -19

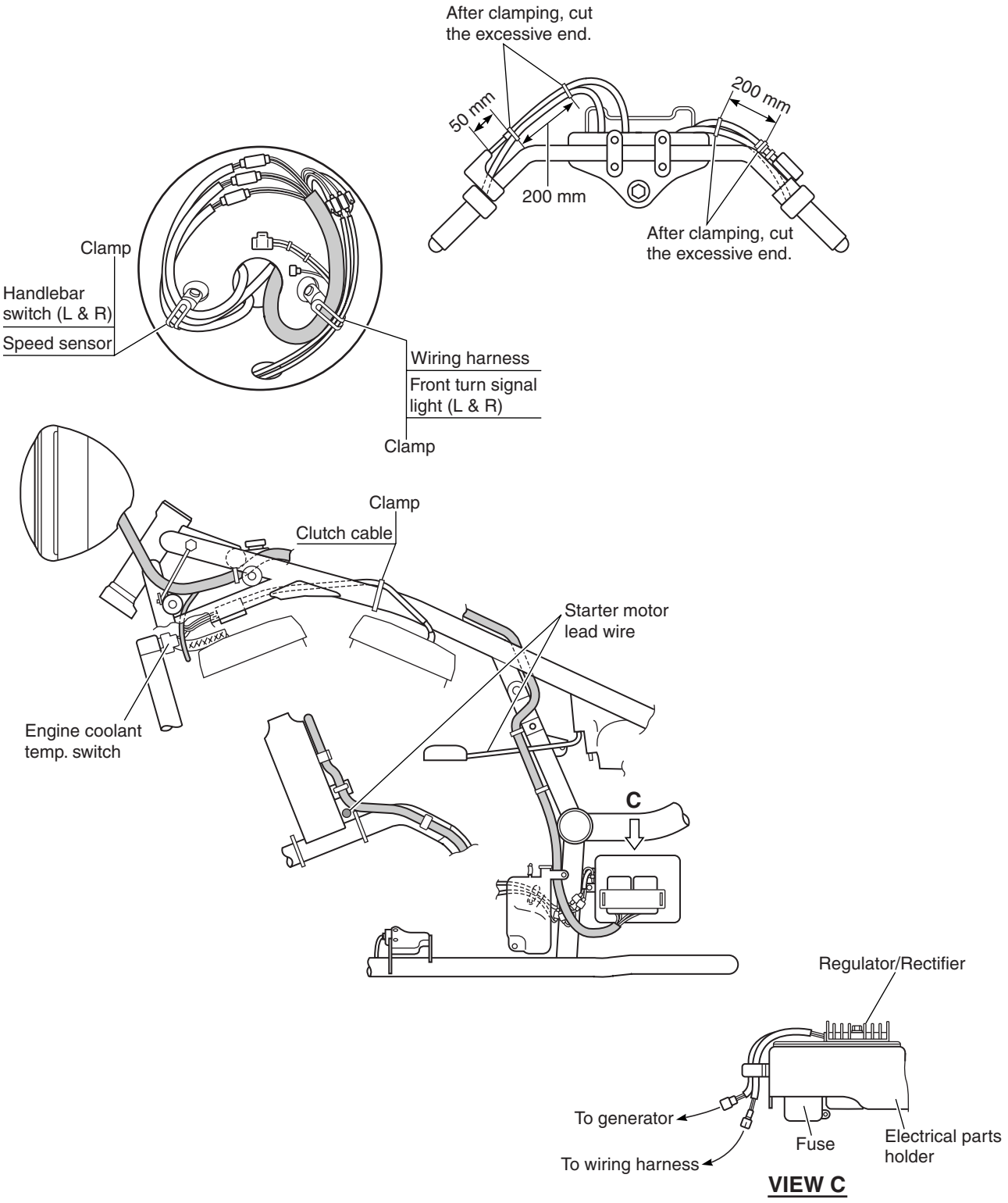


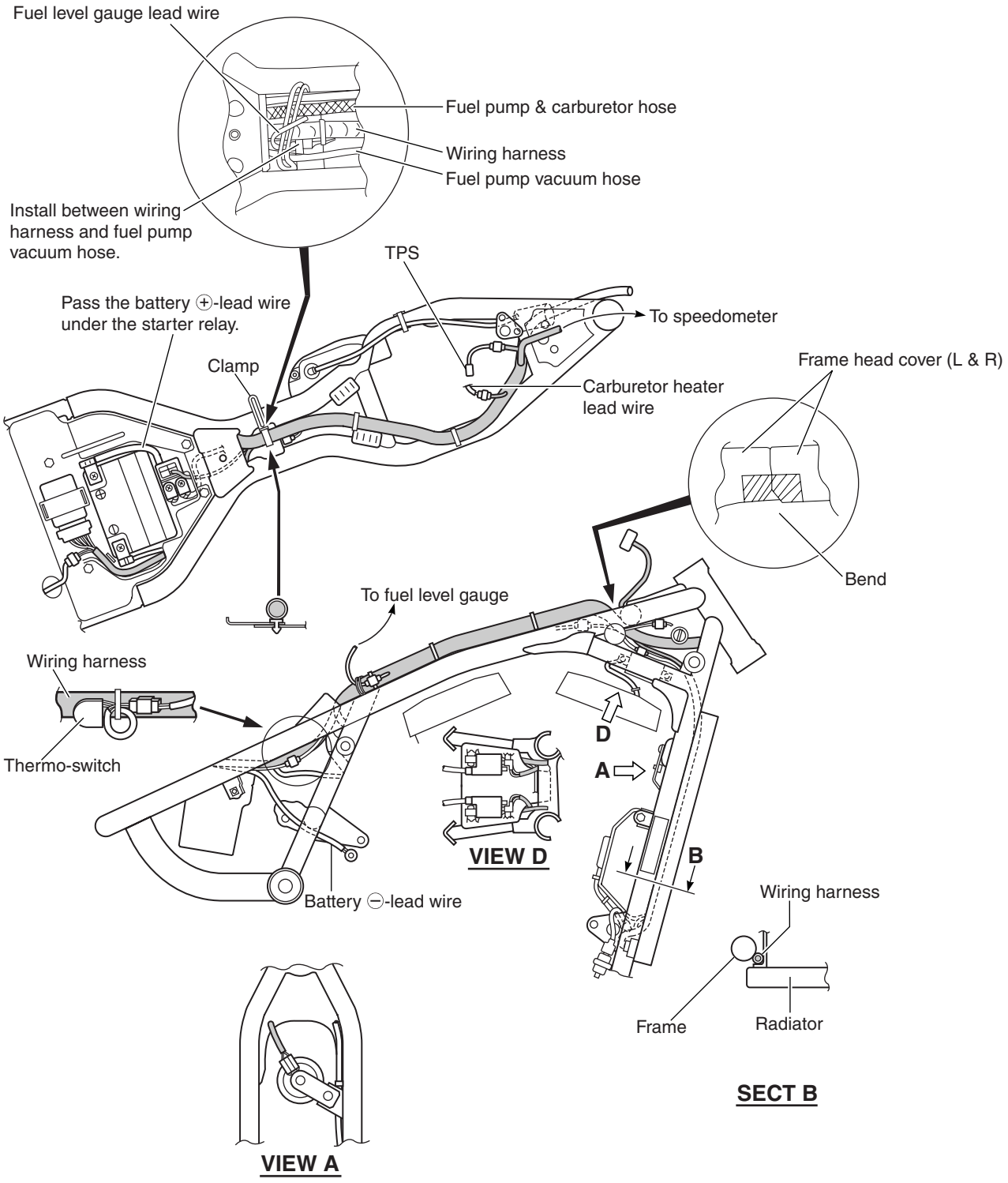
For E-24

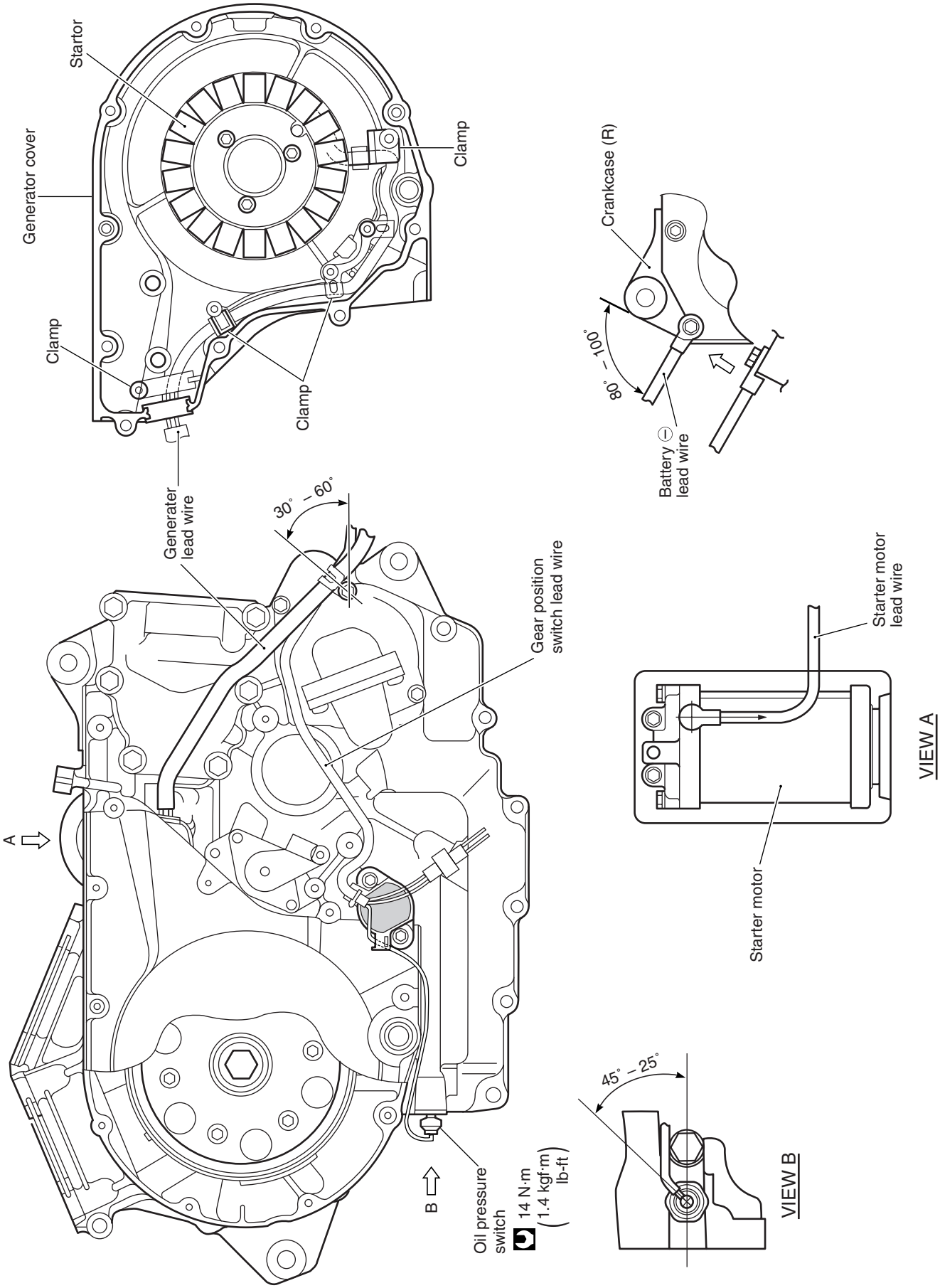


WIRE HARNESS, CABLE AND HOSE ROUTING

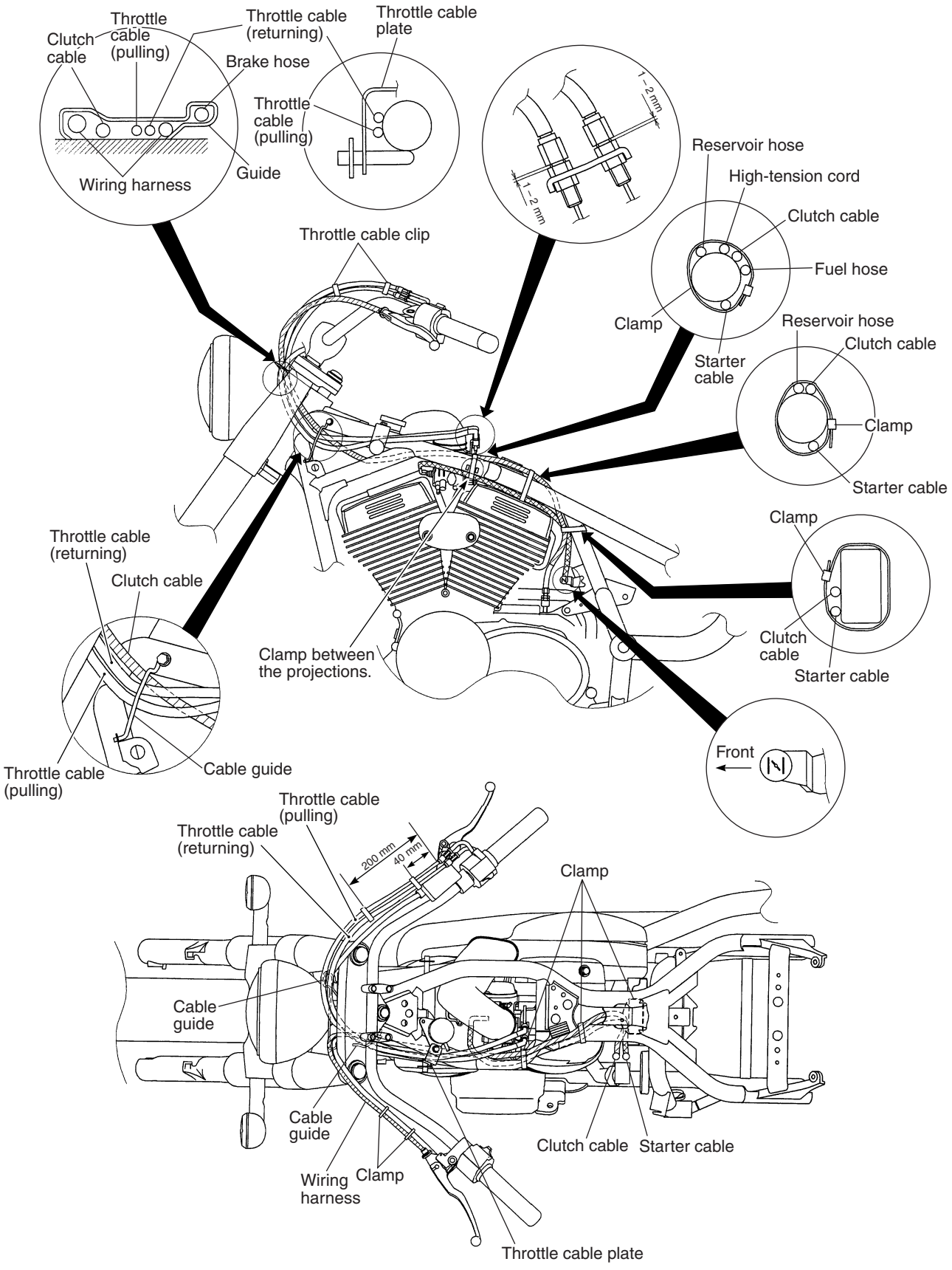
WIRE HARNESS ROUTING



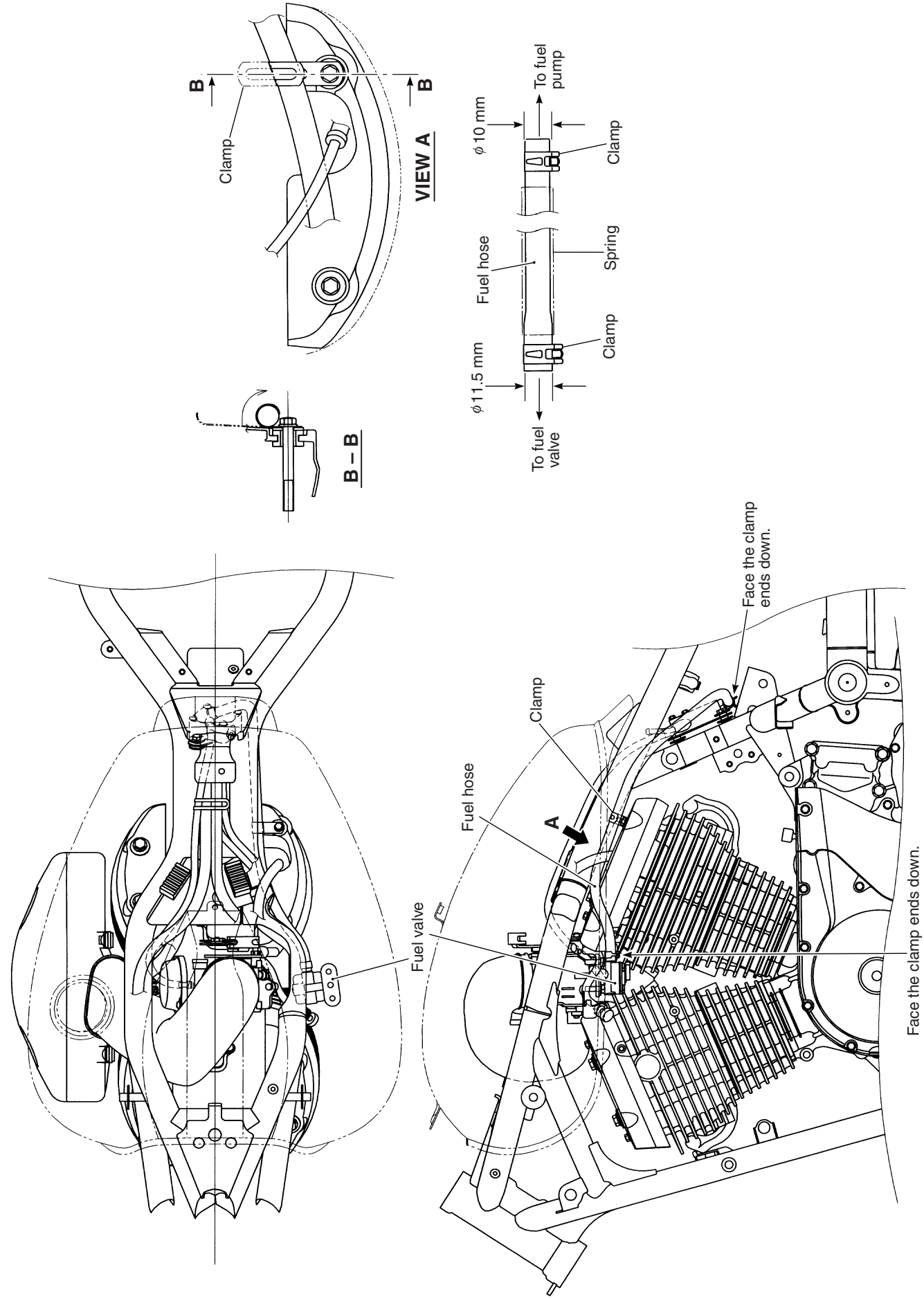




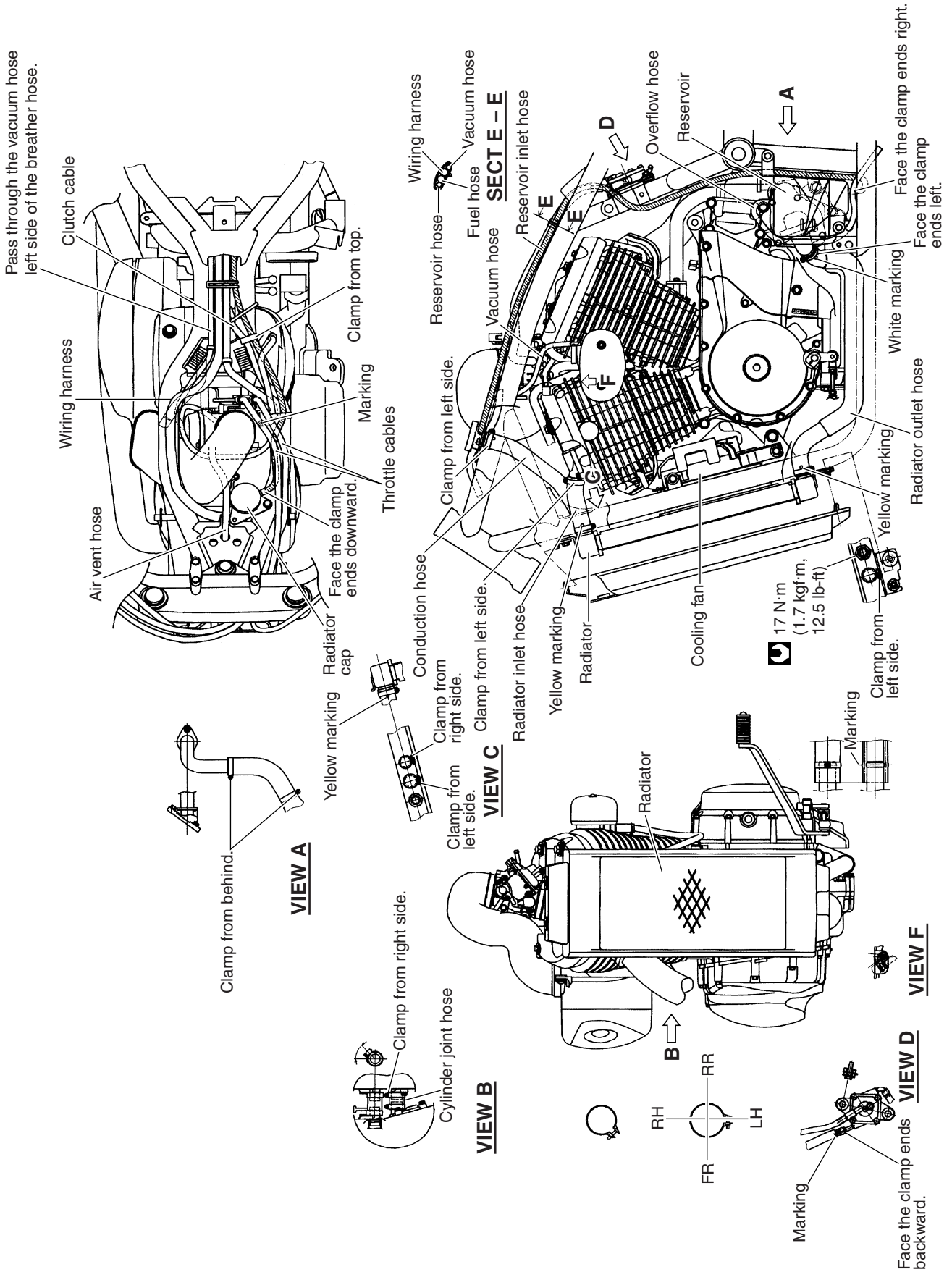
CABLE ROUTING



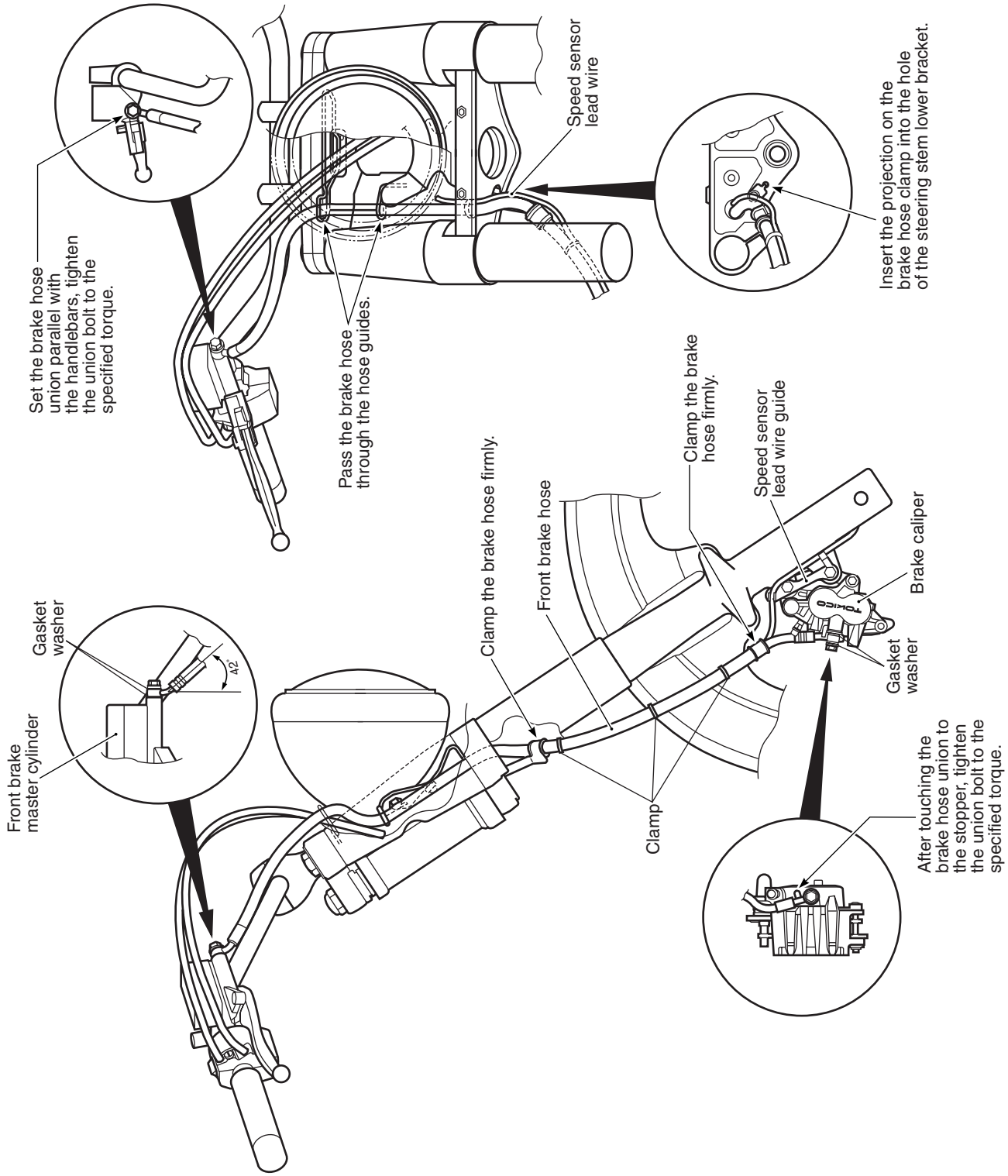
FUEL HOSE ROUTING



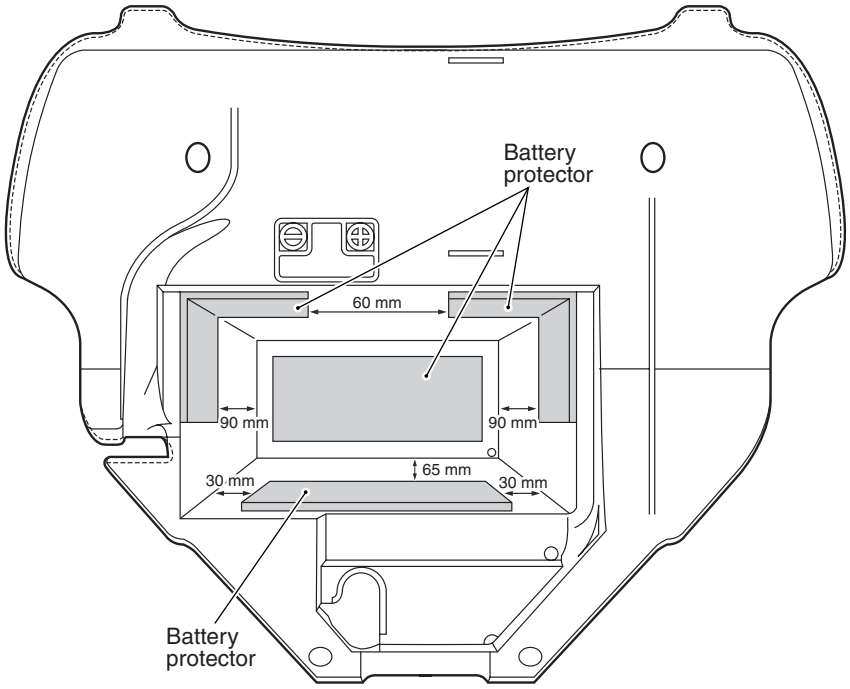
COOLING HOSE ROUTING



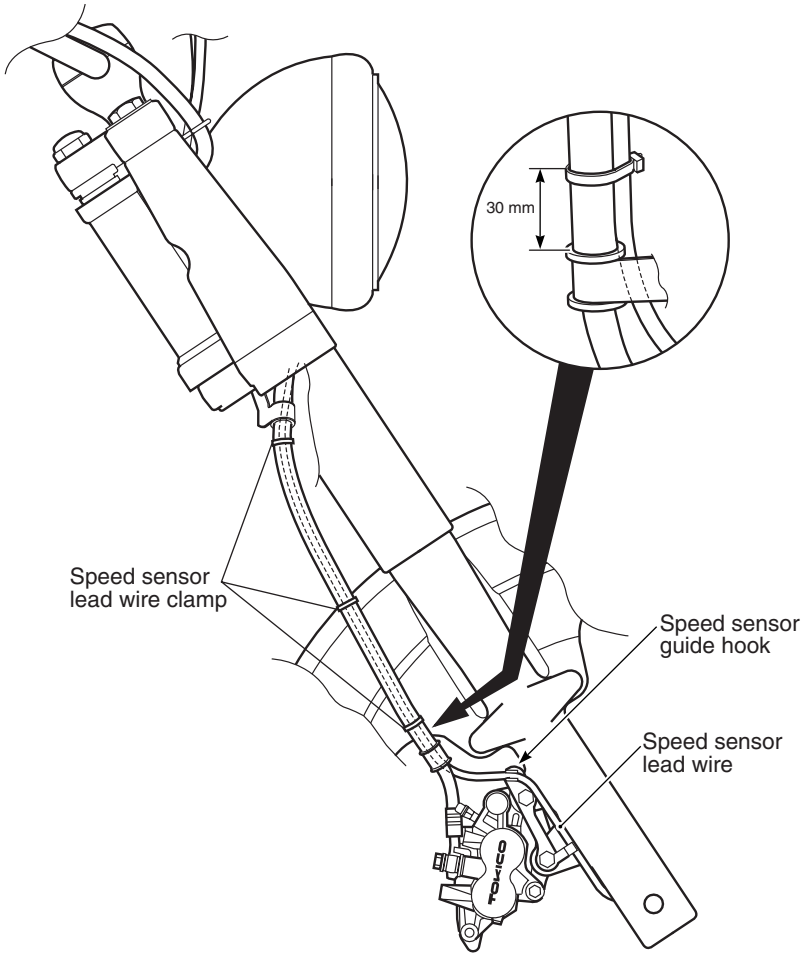
FRONT BRAKE HOSE ROUTING



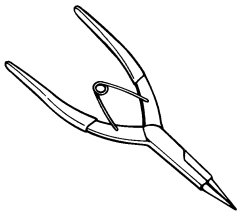
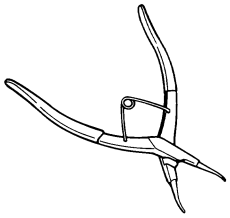
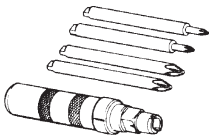
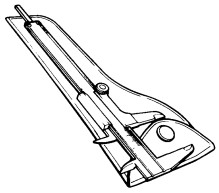
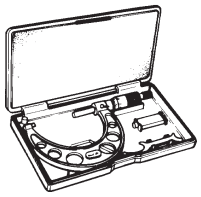
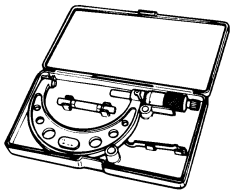
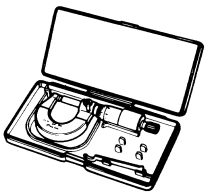
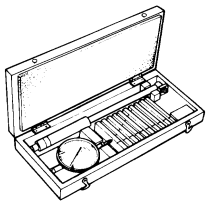
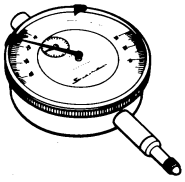
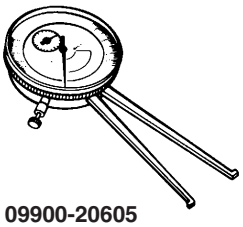
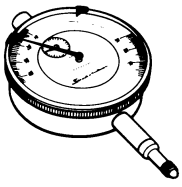
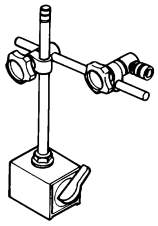
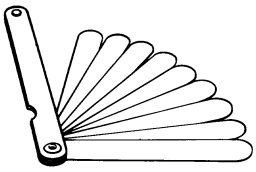
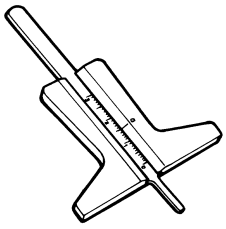
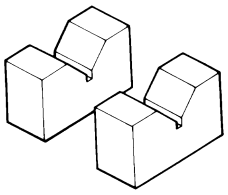
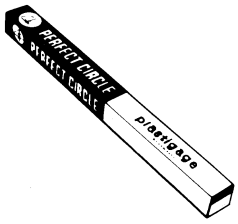
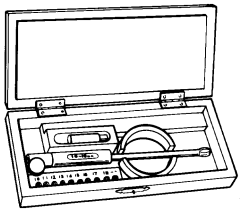
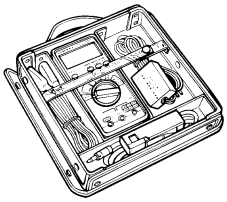
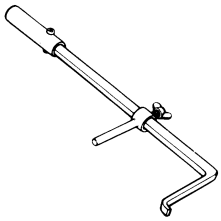
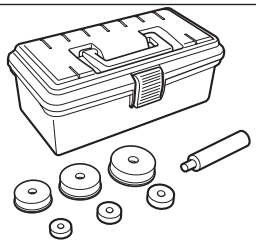
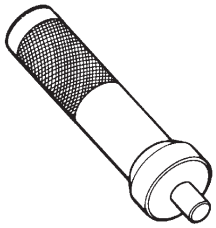
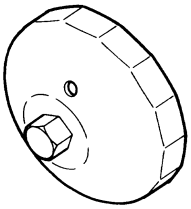
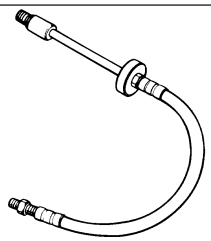
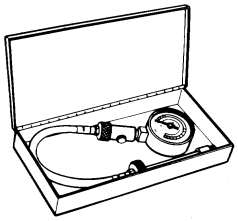
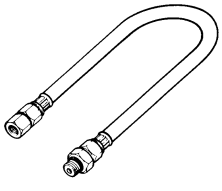
BATTERY PROTECTOR

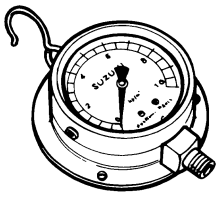
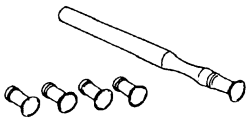
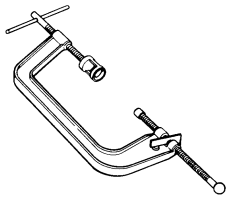
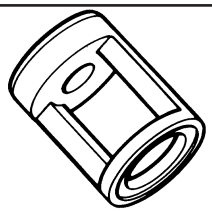
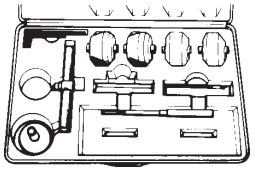
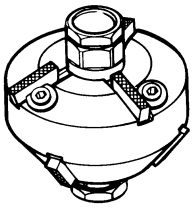
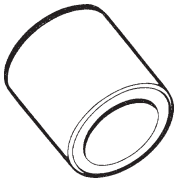
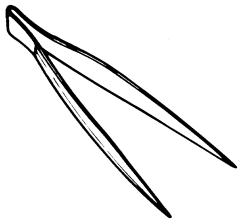
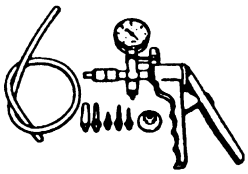
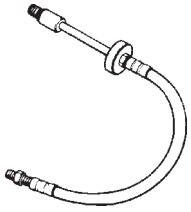
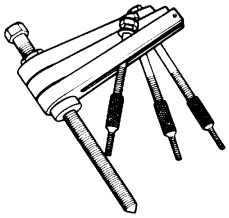
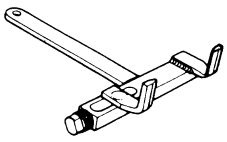
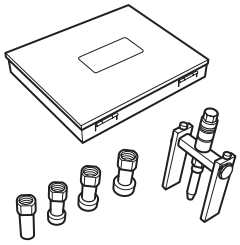
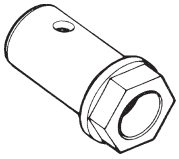
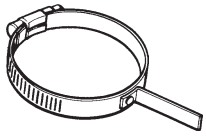
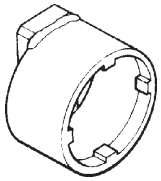
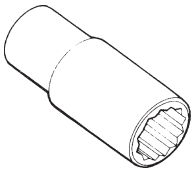
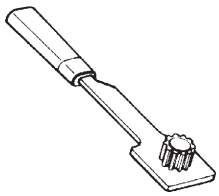
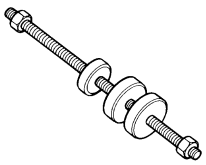
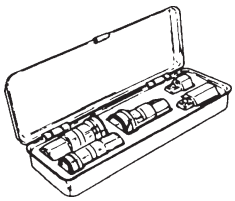
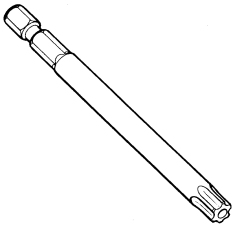
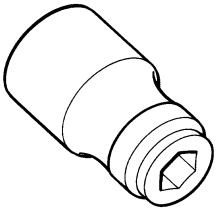
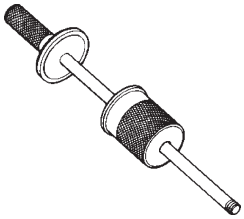
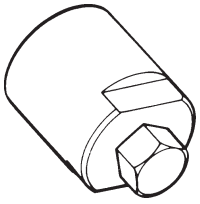
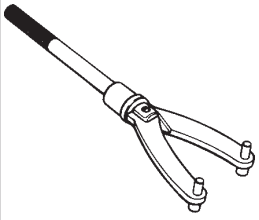


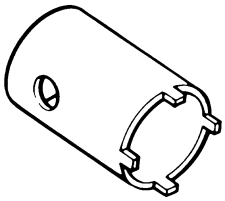
SPEED SENSOR LEAD WIRE ROUTING



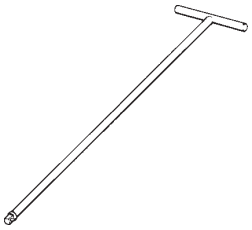
SPECIAL TOOLS

 09900-06107 Snap ring pliers	 09900-06108 Snap ring pliers	 09900-09004 Impact driver set	 09900-18710 Hexagon socket (12 mm)	 09900-18720 Hexagon socket (14 mm)
 09900-20102 Vernier calipers (200 mm)	 09900-20202 Micrometer (25 – 50 mm)	 09900-20203 Micrometer (50 – 75 mm)	 09900-20204 Micrometer (75 – 100 mm)	 09900-20205 Micrometer (0 – 25 mm)
 09900-20508 Cylinder gauge set	 09900-20602 Dial gauge (1/1000 mm, 1 mm)	 09900-20605 Dial calipers (10 – 34 mm)	 09900-20606 Dial gauge (1/100, mm, 10 mm)	 09900-20701 Magnetic stand
 09900-20803 Thickness gauge	 09900-20805 Tire depth gauge	 09900-21304 V-block (100 mm)	 09900-22302 Plastigauge	 09900-22403 Small bore gauge (18 – 35 mm)
 09900-25008 Multi circuit tester set	 09913-50121 Oil seal remover	 09913-70210 Bearing installer set	 09913-75821 Bearing installer	 09913-84510 Bearing installer
 09915-40610 Oil filter wrench	 09915-63210 Adaptor	 09915-77330 Compression gauge	 09915-74510 Oil pressure gauge hose	 09915-74532 Oil pressure gauge adaptor

 09915-77330 Meter (For high pressure)	 09916-10911 Valve lapper set	 09916-14510 Valve lifter	 09916-14910 Valve lifter attachment	 09916-21111 Valve seat cutter set
 09916-22430 Valve seat cutter (N-128)	 09916-34550 Valve guide reamer (5.5 mm)	 09916-34580 Valve guide reamer (10.8 mm)	 09916-44910 Valve guide remover/installer	 09916-44920 Valve guide installer attachment
 09916-84511 Tweezers	 09917-47010 Vacuum pump gauge	 09918-03810 Compression gauge adaptor	 09918-53810 Chain tensioner lock tool	 09920-13120 Crankcase & Shaft remover
 09920-53740 Clutch sleeve hub holder	 09921-20240 Bearing remover set	 09921-21820 Bearing retainer wrench	 09923-73210 Bearing remover	 09924-34510 Backlash measuring tool (27 – 50)
 09924-62410 Final drive gear bearing holder wrench	 09924-62430 22 mm Long socket	 09924-64510 Final drive gear coupring holder	 09924-84521 Bearing installer	 09930-10121 Spark plug wrench set
 09930-11920 Torx bit JT40H	 09930-11940 Bit holder	 09930-30102 Sliding shaft	 09930-33730 Rotor remover	 09930-40113 Rotor holder



09940-14911
Steering stem nut wrench



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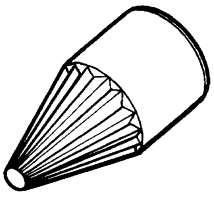
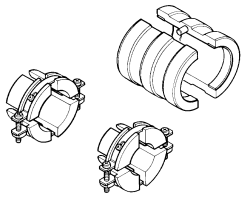
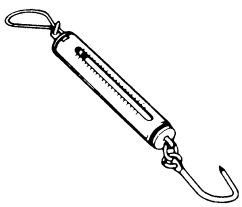


09940-34531
Attachment "A"



09940-52861
Front fork oil seal installer



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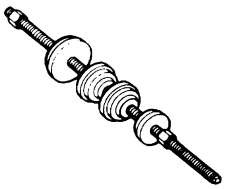
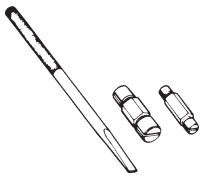
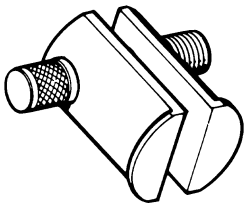


09941-34513
Steering outer race installer



09941-50111
Bearing remover set



09941-54911
Bearing outer race remover

09941-64511
Bearing remover

09941-74911
Steering bearing installer

09943-74111
Front fork oil level gauge

TIGHTENING TORQUE

ENGINE

ITEM			N·m	kgf·m	lb-ft
Rocker arm shaft			27	2.7	19.5
Cylinder head cover bolt		6 mm	10	1.0	7.0
		8 mm	25	2.5	18.0
Cylinder head bolt and nut	8 mm	Initial	10	1.0	7.0
		Final	25	2.5	18.0
	10 mm	Initial	25	2.5	18.0
		Final	38	3.8	27.5
Cam sprocket bolt			15	1.5	11.0
Cam chain tension adjuster mounting bolt			10	1.0	7.0
Cam chain tensioner bolt			10	1.0	7.0
Primary drive gear bolt			95	9.5	68.5
Clutch spring set bolt			10	1.0	7.0
Clutch sleeve hub nut			60	6.0	47.0
Driveshaft bolt			65	6.5	44.2
Secondary drive gear shaft nut			105	10.5	76.0
Secondary gear case bolt		Initial	15	1.5	11.0
		Final	22	2.2	16.0
Generator rotor bolt			160	16.0	115.5
Starter clutch allen bolt			26	2.6	19.0
Crankcase bolt	6 mm		11	1.1	8.0
	8 mm	Initial	15	1.5	11.0
		Final	22	2.2	16.0
Conrod cap nut		Initial	25	2.5	18.0
		Final	51	5.1	37.0
Oil pressure regulator			28	2.8	20.0
Oil pump mounting bolt			11	1.1	8.0
Oil pressure switch			14	1.4	10.0
Oil drain plug			21	2.1	15.0

ITEM		N·m	kgf·m	lb-ft
Oil plug	6 mm	6	0.6	4.3
	8 mm	18	1.8	13.0
	10 mm	15	1.5	11.0
	14 mm	23	2.3	16.5
	16 mm	35	3.5	25.5
Engine mounting bolt		79	7.9	57.0
Engine mounting bracket bolt		23	2.3	16.5
Frame mounting bolt/nut	8 mm	23	2.3	16.5
	10 mm	50	5.0	36.0
Exhaust pipe clamp bolt		23	2.3	16.5
Muffler mounting bolt		23	2.3	16.5
Speed sensor rotor bolt		100	10.0	72.5
Spark plug		18	1.8	13.0

SECONDARY AND FINAL

ITEM		N·m	kgf·m	lb-ft
Secondary drive bevel gear bearing retainer bolt		23	2.3	16.5
Secondary driven bevel gear bolt		23	2.3	16.5
Secondary driven bevel gear bearing stopper		105	10.5	76.0
Final gear case mounting nut		40	4.0	29.0
Final drive bevel gear coupling nut		100	10.0	72.5
Final drive bevel gear bearing stopper		110	11.0	79.5
Final gear case oil drain plug		23	2.3	16.5
Final gear case bolt	8 mm	23	2.3	16.5
	10 mm	50	5.0	36.0
Final driven bevel gear bearing retainer screw		9	0.9	6.5

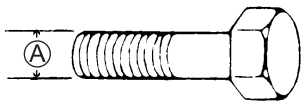
CHASSIS

ITEM	N·m	kgf·m	lb-ft
Front axle	65	6.5	47.0
Front axle pinch bolt	33	3.3	24.0
Brake disc bolt	23	2.3	16.5
Front fork cap bolt	45	4.5	33.1
Front fork spring stopper nut	35	3.5	25.5
Front fork damper rod bolt	20	2.0	14.5
Front fork lower clamp bolt	33	3.3	24.0
Steering stem head nut	90	9.0	65.0
Front master cylinder mounting bolt	10	1.0	7.0
Front brake caliper mounting bolt	39	3.9	28.0
Brake hose union bolt	23	2.3	16.5
Air bleeder valve	7.5	0.75	5.5
Handlebar set bolt	23	2.3	16.5
Handlebar holder nut	70	7.0	50.5
Front footrest bolt	55	5.5	40.0
Frame down tube mounting bolt (M8)	23	2.3	16.5
Frame down tube mounting bolt (M10)	50	5.0	36.0
Rear brake pedal bolt	11	1.1	8.0
Rear swingarm pivot bolt (Left)	100	10.0	72.5
Rear swingarm pivot bolt (Right)	9.5	0.95	7.0
Rear swingarm pivot bolt lock nut	100	10.0	72.5
Rear shock absorber mounting nut (Upper and Lower)	50	5.0	36.0
Rear cushion lever/rod mounting nut	78	7.8	57.5
Rear axle nut	65	6.5	47.0
Rear torque link nut (front)	35	3.5	25.5
Rear torque link nut (rear)	25	2.5	18.0
Rear brake cam lever bolt	10	1.0	7.3
Driven joint stopper bolt	10	1.0	7.0
Frame handle grip mounting bolt (M10)	50	5.0	36.0
Fuel level gauge mounting bolt	10	1.0	7.0

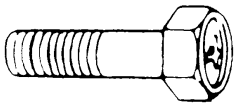
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

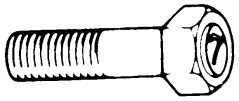
Bolt Diameter Ⓐ (mm)	Conventional or “4” marked bolt			“7” marked bolt		
	N·m	kgf·m	lb-ft	N·m	kgf·m	lb-ft
4	1.5	0.15	1.0	2.3	0.23	1.5
5	3	0.3	2.0	4.5	0.45	3.0
6	5.5	0.55	4.0	10	1.0	7.0
8	13	1.3	9.5	23	2.3	16.5
10	29	2.9	21.0	50	5.0	36.0
12	45	4.5	32.5	85	8.5	61.5
14	65	6.5	47.0	135	13.5	97.5
16	105	10.5	76.0	210	21.0	152.0
18	160	16.0	115.5	240	24.0	173.5



Conventional bolt



“4” marked bolt



“7” marked bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	30 (1.18)	———
	EX.	26 (1.02)	———
Valve clearance (when cold)	IN.	0.08 – 0.13 (0.003 – 0.005)	———
	EX.	0.17 – 0.22 (0.007 – 0.009)	———
Valve guide to valve stem clearance	IN.	0.010 – 0.037 (0.0004 – 0.0015)	———
	EX.	0.030 – 0.057 (0.0012 – 0.0022)	———
Valve stem deflection	IN. & EX.	———	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500 – 5.512 (0.2165 – 0.2170)	———
Valve stem O.D.	IN.	5.475 – 5.490 (0.2156 – 0.2161)	———
	EX.	5.455 – 5.470 (0.2148 – 0.2154)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve stem end length	IN. & EX.	———	3.1 (0.12)
Valve seat width	IN. & EX.	0.9 – 1.1 (0.035 – 0.043)	———
Valve head radial runout	IN. & EX.	———	0.03 (0.001)
Valve spring free length	INNER	———	38.3 (1.51)
	OUTER	———	40.1 (1.58)
Valve spring tension	INNER	6.51 – 7.49 kgf (14.35 – 16.51 lbs) at length 32.5 mm (1.28 in)	———
	OUTER	12.09 – 13.91 kgf (26.65 – 30.67 lbs) at length 36.0 mm (1.42 in)	———

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD			LIMIT
Cam height	Front	IN.	35.95 – 35.99 (1.415 – 1.417)	35.65 (1.404)
		EX.	36.92 – 36.96 (1.454 – 1.455)	36.62 (1.442)
	Rear	IN.	35.50 – 35.54 (1.398 – 1.399)	35.20 (1.386)
		EX.	36.58 – 36.62 (1.440 – 1.442)	36.28 (1.428)
Camshaft journal oil clearance	0.032 – 0.066 (0.0013 – 0.0026)			0.150 (0.0059)
Camshaft journal holder I.D.	No.1 Left side No.2 Right side		20.012 – 20.025 (0.7879 – 0.7884)	———
	No.1 Right side No.2 Left side		25.012 – 25.025 (0.9847 – 0.9852)	———
Camshaft journal O.D.	No.1 Left side No.2 Right side		19.959 – 19.980 (0.7858 – 0.7866)	———
	No.1 Right side No.2 Left side		24.959 – 24.980 (0.9826 – 0.9835)	———
Camshaft runout	———			0.10 (0.004)
Rocker arm I.D.	IN. & EX.		12.000 – 12.018 (0.4724 – 0.4731)	———
Rocker arm shaft O.D.	IN. & EX.		11.966 – 11.984 (0.4711 – 0.4718)	———
Cylinder head distortion	———			0.05 (0.002)
Cylinder head cover distortion	———			0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD	LIMIT
Compression pressure	1 300 – 1 700 kPa (13 – 17 kgf/cm^2 185 – 242 psi)	1 100 kPa (11 kgf/cm^2 156 psi)
Compression pressure difference	———	200 kPa (2 kgf/cm^2 28 psi)
Piston to cylinder clearance	0.045 – 0.055 (0.0018 – 0.0022)	0.120 (0.0047)
Cylinder bore	83.000 – 83.015 (3.2677 – 3.2683)	83.085 (3.2711)
Piston diam.	82.950 – 82.965 (3.2657 – 3.2663) Measure at 15 mm (0.6 in) from the skirt end.	82.880 (3.2630)
Cylinder distortion	———	0.05 (0.002)

ITEM	STANDARD		LIMIT
Piston ring free end gap	1st	Approx. 9.6 (0.38)	7.7 (0.30)
	2nd R	Approx. 11.8 (0.46)	9.4 (0.37)
Piston ring end gap	1st	0.20 – 0.35 (0.008 – 0.014)	0.70 (0.028)
	2nd	0.20 – 0.35 (0.008 – 0.014)	0.70 (0.028)
Piston ring groove clearance	1st	———	0.180 (0.007)
	2nd	———	0.150 (0.006)
Piston ring groove width	1st	1.01 – 1.03 (0.0398 – 0.0406)	———
	2nd	1.21 – 1.23 (0.0476 – 0.0484)	———
	Oil	2.51 – 2.53 (0.0988 – 0.0996)	———
Piston ring thickness	1st	0.970 – 0.990 (0.0382 – 0.0390)	———
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	———
Piston pin bore	20.002 – 20.008 (0.7875 – 0.7877)		20.030 (0.7886)
Piston pin O.D.	19.992 – 20.000 (0.7871 – 0.7874)		19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	20.010 – 20.018 (0.7878 – 0.7881)	20.040 (0.7890)
Conrod big end side clearance	0.10 – 0.20 (0.004 – 0.008)	0.30 (0.012)
Conrod big end width	21.95 – 22.00 (0.864 – 0.866)	———
Crank pin width	22.10 – 22.15 (0.870 – 0.872)	———
Conrod big end oil clearance	0.024 – 0.042 (0.0009 – 0.0017)	0.080 (0.0031)
Crank pin O.D.	40.982 – 41.000 (1.6135 – 1.6142)	———
Crankshaft journal oil clearance	0.020 – 0.050 (0.0008 – 0.0020)	0.080 (0.0031)
Crankshaft journal O.D.	47.965 – 47.980 (1.8884 – 1.8890)	———
Crankshaft thrust bearing thickness	1.925 – 2.175 (0.0758 – 0.0856)	———
Crankshaft thrust clearance	0.05 – 0.10 (0.002 – 0.004)	———
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C,140°F)	Above 350 kPa (3.5 kgf/cm², 50 psi) Below 650 kPa (6.5 kgf/cm², 92 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD		LIMIT
Clutch cable play	10 – 15 (0.4 – 0.6)		———
Clutch release screw	1/4 turn back		
Drive plate thickness	No.1	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
	No.2	3.42 – 3.58 (0.135 – 0.141)	3.12 (0.123)
Drive plate claw width	15.9 – 16.0 (0.626 – 0.630)		15.1 (0.594)
Driven plate distortion	———		0.10 (0.004)
Clutch spring free length	49.2 (1.94)		46.8 (1.84)

TRANSMISSION

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		1.690 (71/42)		———
Secondary reduction ratio		1.133 (17/15)		———
Final reduction ratio		3.090 (34/11)		———
Gear ratios	Low	2.461 (32/13)		———
	2nd	1.631 (31/19)		———
	3rd	1.227 (27/22)		———
	4th	1.000 (25/25)		———
	Top	0.814 (22/27)		———
Shift fork to groove clearance		No.1	0.10 – 0.30 (0.004 – 0.012)	0.50 (0.020)
		No.2	0.10 – 0.30 (0.004 – 0.012)	0.50 (0.020)
Shift fork groove width		No.1	5.50 – 5.60 (0.217 – 0.220)	———
		No.2	4.50 – 4.60 (0.177 – 0.181)	———
Shift fork thickness		No.1	5.30 – 5.40 (0.209 – 0.213)	———
		No.2	4.30 – 4.40 (0.169 – 0.173)	———

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Secondary bevel gear backlash	0.05 – 0.32 (0.002 – 0.013)		———
Final bevel gear backlash	Drive side	0.03 – 0.064 (0.001 – 0.025)	———
Damper spring free length	———		58.5 (2.30)

CARBURETOR

ITEM	SPECIFICATION		
	E-02, 19, 24	E-03, 28	E-33
Carburetor type	MIKUNI BDSR34	←	←
Bore size	34 mm	←	←
I.D. No.	41F1	41F2	41F3
Idle r/min.	1 100 ± 100 r/min.	←	←
Fuel level	—	—	—
Float height	7.0 ± 0.5 mm (2.76 ± 0.02 in)	←	←
Main jet (M.J.)	#132.5	#132.5	←
Main air jet (M.A.J.)	ϕ 1.8	←	←
Jet needle (J.N.)	5E22-3	5E23	←
Needle jet (N.J.)	P-0M	P-0M	←
Throttle valve (Th.V.)	#95	←	←
Pilot jet (P.J.)	#27.5	#27.5	←
Pilot screw (P.S.)	PRE-SET (3.0 turns back)	PRE-SET	←
Throttle cable play	2 – 4 mm (0.08 ± 0.16 in)	←	←

THERMOSTAT + RADIATOR + FAN + ENGINE COOLANT

ITEM	STANDARD/SPECIFICATION		LIMIT
Thermostat valve opening temperature	Approximately 75 °C (167 °F)		———
Thermostat valve lift	Over 6 mm (0.24 in) at 90 °C (194 °F)		———
Engine coolant temp. switch operating temperature	OFF → ON	Approximately 120°C (248°F)	———
	ON → OFF	Approximately 113°C (235.4°F)	———
Radiator cap valve opening pressure	95 – 125 kPa (0.95 – 1.25 kgf/cm^2, 13.5 – 17.8 psi)		———
Cooling fan thermoswitch operating temperature	OFF → ON	Approximately 105°C (221°F)	———
	ON → OFF	Approximately 100°C (212°F)	———
Engine coolant type	Use an antifreeze/coolant compatible with aluminum radiators, mixed with distilled water only, at the ratio of 50:50		———
Engine coolant capacity	1 500 ml (1.6 US qt, 1.3 Imp qt)		———

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Firing order	1·2		
Spark plug	Type	NGK: DPR7EA-9 DENSO: X22EPR-U9	
	Gap	0.8 – 0.9 (0.031 – 0.035)	
Spark performance	Over 8 (0.3) at 1 atm.		
Ignition coil resistance	Primary	2 – 6 Ω	Terminal – Terminal
	Secondary	15 – 30 kΩ	Plug cap – Terminal
Ignition coil primary peak voltage	More than 200 V		#1⊕:W, ⊖:Ground #2⊕:B/Y, ⊖:Ground
Generator coil resistance	Pickup coil	160 – 300 Ω	G – Bl
	Charging coil	0.2 – 1.5 Ω	Y – Y
Pickup coil peak voltage	More than 1.5 V		⊕: Bl, ⊖: G
Generator no-load voltage (When engine cold)	More than 70 V (AC) at 5 000 r/min.		Y – Y
Regulated voltage	14.0 – 15.5 V at 5 000 r/min.		
Generator maximum output	375 W at 5 000 r/min.		
Starter relay resistance	3 – 7 Ω		
Battery	Type designation	FTX12-BS	
	Capacity	12 V 36 kC (10Ah)/10HR	
Fuse size	Headlight HI	10 A	
	Headlight LO	10 A	
	Signal	15 A	
	Ignition	15 A	
	Meter	10 A	
	Main	30 A	
	Power source	10 A	

WATTAGE

Unit: W

ITEM	SPECIFICATION		
	E-03, 28, 33	E-24	The others
Headlight HI	60	←	←
Headlight LO	55	←	←
Position/Parking light			4
Brake light/Taillight	21/5	←	←
Turn signal light	21/5 (Front), 21 (Rear)	21	←
Speedometer light	LED	←	←
Water temp. meter light	LED	←	←
Turn signal indicator light	LED	←	←
High beam indicator light	LED	←	←
Neutral indicator light	LED	←	←
Oil pressure indicator light	LED	←	←

SUSPENSION

Unit: mm (in)

ITEM	STANDARD/SPECIFICATION	LIMIT
Front fork stroke	140 (5.51)	———
Front fork spring free length	551.7 (21.73)	540.6 (21.29)
Front fork oil level (without spring)	177 (6.96)	———
Front fork oil type	SUZUKI FORK OIL SS-08 or an equivalent fork oil	———
Front fork oil capacity (each leg)	412 ml (24.0 US oz, 25.0 Imp oz)	
Front fork spring adjuster	———	———
Rear shock absorber spring adjuster	4	———
Rear wheel travel	105 (4.13)	———
Swingarm pivot shaft runout	———	0.3 (0.01)

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal free travel		20 – 30 (0.8 – 1.2)	———
Rear brake pedal height		75 – 85 (3.0 – 3.3)	———
Brake drum I.D.	Rear	———	180.7 (7.11)
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.01)	4.5 (0.18)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	———
Master cylinder piston diam.	Front	12.657 – 12.684 (0.4983 – 0.4993)	———
Brake caliper cylinder bore	Front	30.230 – 30.306 (1.1901 – 1.1931)	———
Brake caliper piston diam.	Front	30.150 – 30.200 (1.1870 – 1.1889)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Wheel rim size	Front	J16 × MT3.00 or J16M/C × MT3.00	———
	Rear	J15 M/C × MT4.00	———

TIRE

Unit: mm (in)

ITEM	STANDARD/SPECIFICATION		LIMIT
Cold inflation tire pressure (Solo riding)	Front	200 kPa (2.00 kgf/cm^2, 29 psi)	———
	Rear	250 kPa (2.50 kgf/cm^2, 36 psi)	———
Cold inflation tire pressure (Dual riding)	Front	200 kPa (2.00 kgf/cm^2, 29 psi)	———
	Rear	250 kPa (2.50 kgf/cm^2, 36 psi)	———
Tire size	Front	130/90-16 67H	———
	Rear	170/80-15 M/C 77H	———
Tire type	Front	IRC GS-23F	———
	Rear	IRC GS-23R	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

FUEL + OIL + COOLANT

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane or 91 octane ($\frac{R+M}{2}$) or higher rated by the Research Method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		Other models
Fuel tank including reserve	17.0 L (4.5/3.7 US/Imp gal)		
reserve (flicker)	1.5 L (0.4/0.3 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	3 000 ml (3.2/2.6 US/Imp qt)	
	Filter change	3 400 ml (3.6/3.0 US/Imp qt)	
	Overhaul	3 700 ml (3.9/3.3 US/Imp qt)	
Final bevel gear oil type	SAE 90 hypoid gear oil with GL-5 under API classification		
Final bevel gear oil capacity	200 – 220 ml (6.8/7.0 – 7.4/7.7 US/Imp oz)		
Brake fluid type	DOT 4		
Coolant capacity	1 500 ml (1.6/1.3 US/Imp qt)		