

SUZUKI

VL800

SERVICE MANUAL



FOREWORD

This manual contains an introductory description on the SUZUKI VL800 and procedures for its inspection/service and overhaul of its main components. Other information considered as generally known is not included.

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

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

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

* Illustrations in this manual are used to show the basic principles of operation and work procedures. They may not represent the actual motorcycle exactly in detail.

* This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI motorcycles. If you do not have the proper knowledge and tools, ask your authorized SUZUKI motorcycle dealer to help you.

▲ WARNING

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

IMPORTANT (For USA)

All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service VL800 in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

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

SUZUKI MOTOR CORPORATION

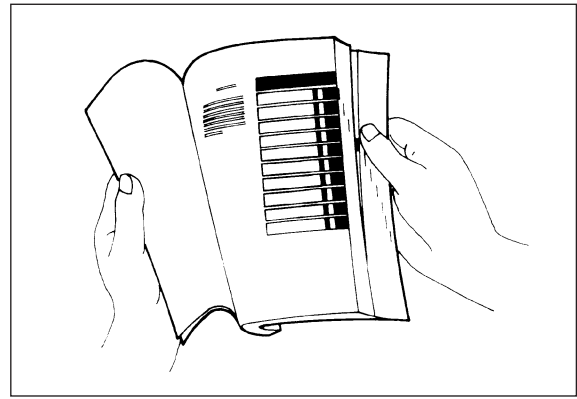
Overseas Service Department

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HOW TO USE THIS MANUAL TO LOCATE WHAT YOU ARE LOOKING FOR:

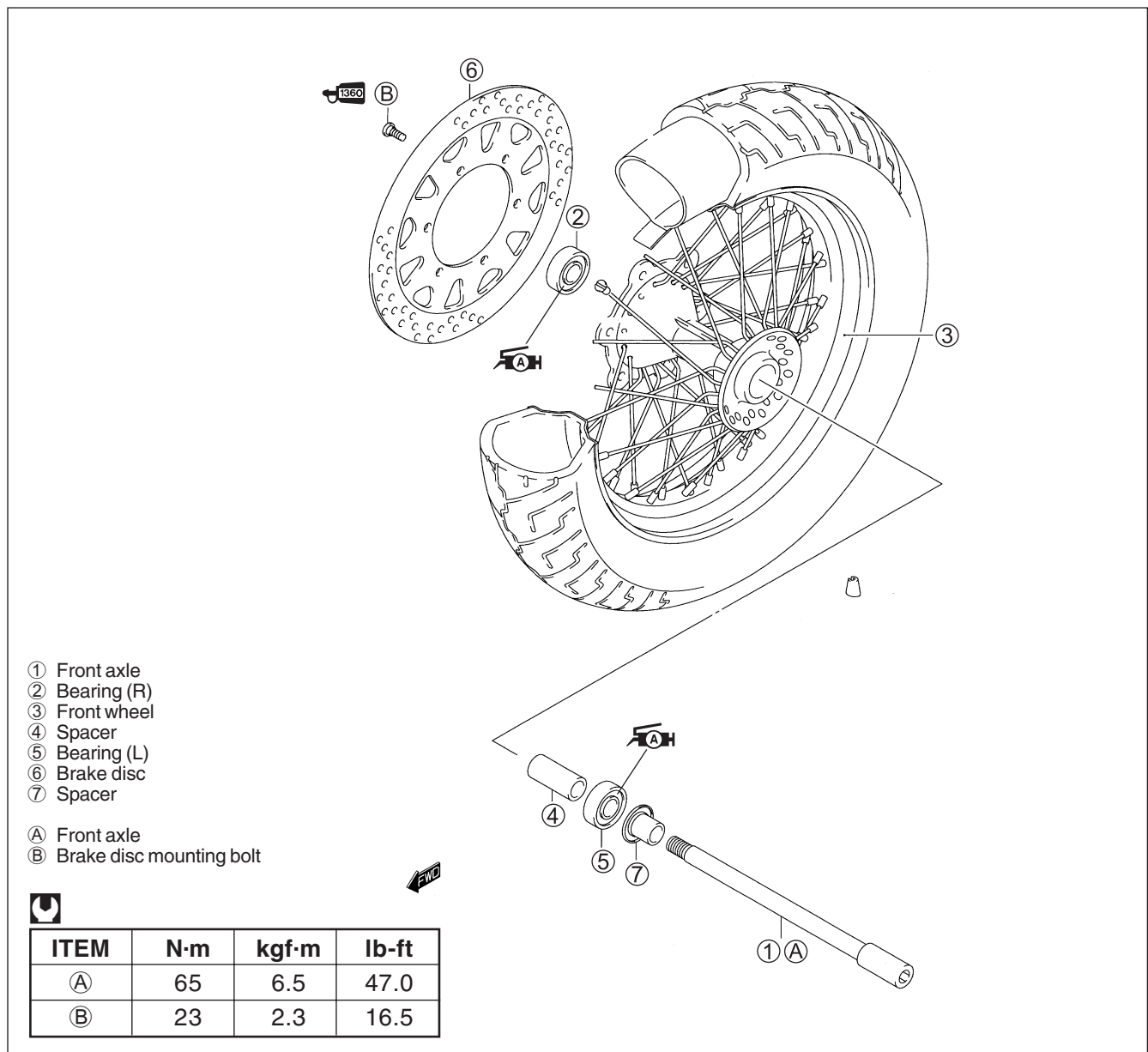
1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help find the item and page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























SYMBOL (For USA)

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.		Use engine coolant. 99000-99032-11X
	Apply oil. Use engine oil unless otherwise specified.		Use fork oil. 99000-99001-SS8
	Apply molybdenum oil solution. (Mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1:1)		Apply or use brake fluid.
	Apply SUZUKI SUPER GREASE "A". 99000-25030		Measure in voltage range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in resistance range.
	Apply SUZUKI BOND "1207B". 99104-31140		Measure in current range.
	Apply SUZUKI BOND "1216". 99104-31160		Measure in diode test range.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Measure in continuity test range.
	Apply THREAD LOCK "1342". 99000-32050		Use special tool.
	Apply THREAD LOCK SUPER "1360". 99000-32130		Indication of service data.

SYMBOL (For the other countries)

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.		Use engine coolant. 99000-99032-11X
	Apply oil. Use engine oil unless otherwise specified.		Use fork oil. 99000-99001-SS8
	Apply molybdenum oil solution. (Mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1:1)		Apply or use brake fluid.
	Apply SUZUKI SUPER GREASE "A". 99000-25010		Measure in voltage range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in resistance range.
	Apply SUZUKI BOND "1207B". 99000-31140		Measure in current range.
	Apply SUZUKI BOND "1216". 99104-31160		Measure in diode test range.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Measure in continuity test range.
	Apply THREAD LOCK "1342". 99000-32050		Use special tool.
	Apply THREAD LOCK SUPER "1360". 99000-32130		Indication of service data.

GENERAL INFORMATION

1

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WARNING/CAUTION/NOTE

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

WARNING

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

CAUTION

Indicates a potential hazard that could result in motorcycle damage.

NOTE:

Indicates special information to make maintenance easier or instructions clearer.

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

GENERAL PRECAUTIONS

WARNING

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

▲ CAUTION

- * If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
 - * When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order.
 - * Be sure to use special tools when instructed.
 - * Make sure that all parts used in reassembly are clean. Lubricate them when specified.
 - * Use the specified lubricants, bonds, or sealants.
 - * When removing the battery, disconnect the \ominus battery lead wire first and then the \oplus battery lead wire.
 - * When reconnecting the battery, connect the \oplus battery lead wire first, then the \ominus battery lead wire. Finally, cover the \oplus battery terminal with the terminal cover.
 - * When performing service to electrical parts, disconnect the \ominus battery lead wire, unless the service procedure requires the battery power.
 - * When tightening cylinder head and crankcase nuts and bolts, tighten the larger sizes first. Always tighten the nuts and bolts from the inside working out, diagonally and to the specified torque.
 - * Whenever you remove oil seals, gaskets, packing, O-rings, self-locking nuts, locking washers, cotter pins, circlips, and other specified parts, 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 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, all other fluids, batteries, and tires.
 - * To protect the earth's natural resources, properly dispose of used motorcycles and parts.

SUZUKI VL800K1 (2001-MODEL)



RIGHT SIDE

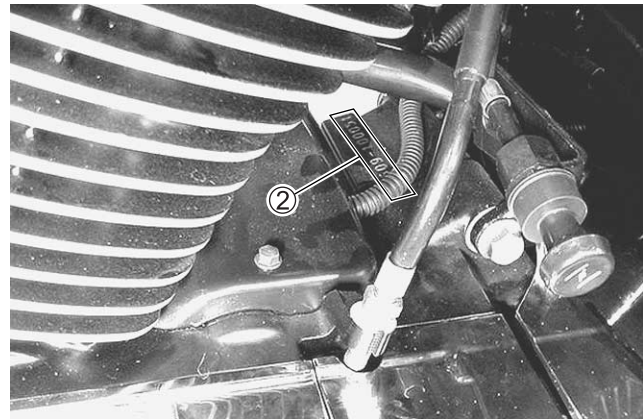
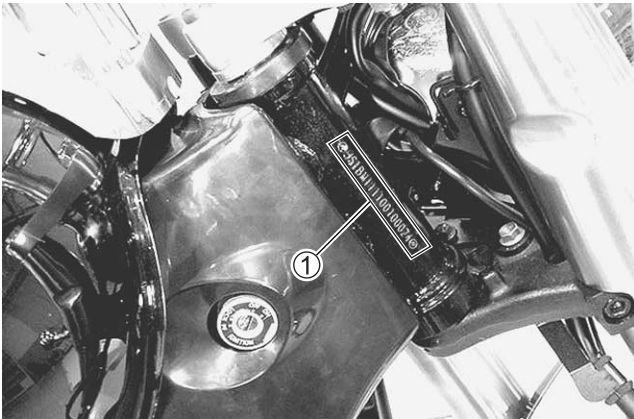


LEFT SIDE

* 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 steering head pipe. The engine serial number ② is located on the right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.



FUEL, OIL AND ENGINE COOLANT RECOMMENDATION

FUEL (For USA and CANADA)

1. Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) method or 91 octane or higher rated by the Research Method.
2. Suzuki recommends that customers use alcohol-free unleaded gasoline whenever possible.
3. Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.
4. Use of blended gasoline/alcohol fuel is permitted, provided that the fuel contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present in it.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol-free unleaded gasoline.
6. Failure to follow these guidelines could possibly void applicable warranty coverage. Check with your fuel supplier to make sure that the fuel you intend to use meets the requirements listed above.

FUEL (For the other countries)

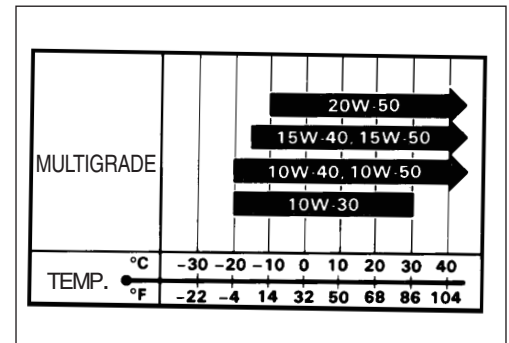
Use unleaded gasoline that is graded 91 octane or higher by the Research Method.

ENGINE OIL (For USA)

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

ENGINE OIL (For the other countries)

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



GEAR OIL (FINAL DRIVE GEAR OIL)

Use SAE 90 hypoid gear oil which is rated GL-5 under API classification system. If you operate the motorcycle where ambient temperature is below 0°C (32°F), use SAE 80 hypoid gear oil.

BRAKE FLUID



Specification and classification: DOT 4

⚠ WARNING

- * This motorcycle uses a glycol-based brake fluid. Do not use or mix other types of brake fluid such as silicone-based and petroleum-based fluids for refilling the system, otherwise serious damage will result to the brake system.
- * Do not use any brake fluid taken from old, used, or unsealed containers.
- * Do not re-use brake fluid left over from last servicing or which has been stored for a long period of time.

FRONT FORK OIL

Use SUZUKI FORK OIL SS-08 (#10) or an equivalent fork oil.

ENGINE COOLANT

Since antifreeze also has corrosion- and rust-inhibiting properties, always use engine coolant containing antifreeze, even if the atmospheric temperature does not go below the freezing point.

Use an antifreeze designed for aluminum radiators. Suzuki recommends the use of SUZUKI COOLANT antifreeze. If this is not available, use an equivalent antifreeze for aluminum radiators.

Mix only distilled water with the antifreeze. Other types of water can corrode and clog the aluminum radiator.

Mix distilled water and antifreeze at a ratio of 50 : 50 – 40 : 60.

For more information, refer to cooling system section. (📖 6-2)

⚠ CAUTION

The percentage of antifreeze in the coolant should be between 50 to 60%. If the percentage of antifreeze is above or below this range the coolant's frost protection and rust-inhibiting capacities will be reduced. Always keep the antifreeze content above 50% even if the atmospheric temperature does not go below the freezing point.

BREAK-IN PROCEDURES

During manufacturing only the best possible materials are used and all machined parts are finished to a very high standard. It is still necessary to allow the moving parts to “BREAK-IN” before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. Refer to the following break-in engine speed recommendations.

- Keep to these break-in throttle positions during the break-in period.

Break-in throttle operation

Initial 800 km (500 miles): Less than ½ throttle

Up to 1 600 km (1 000 miles): Less than ¾ throttle

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

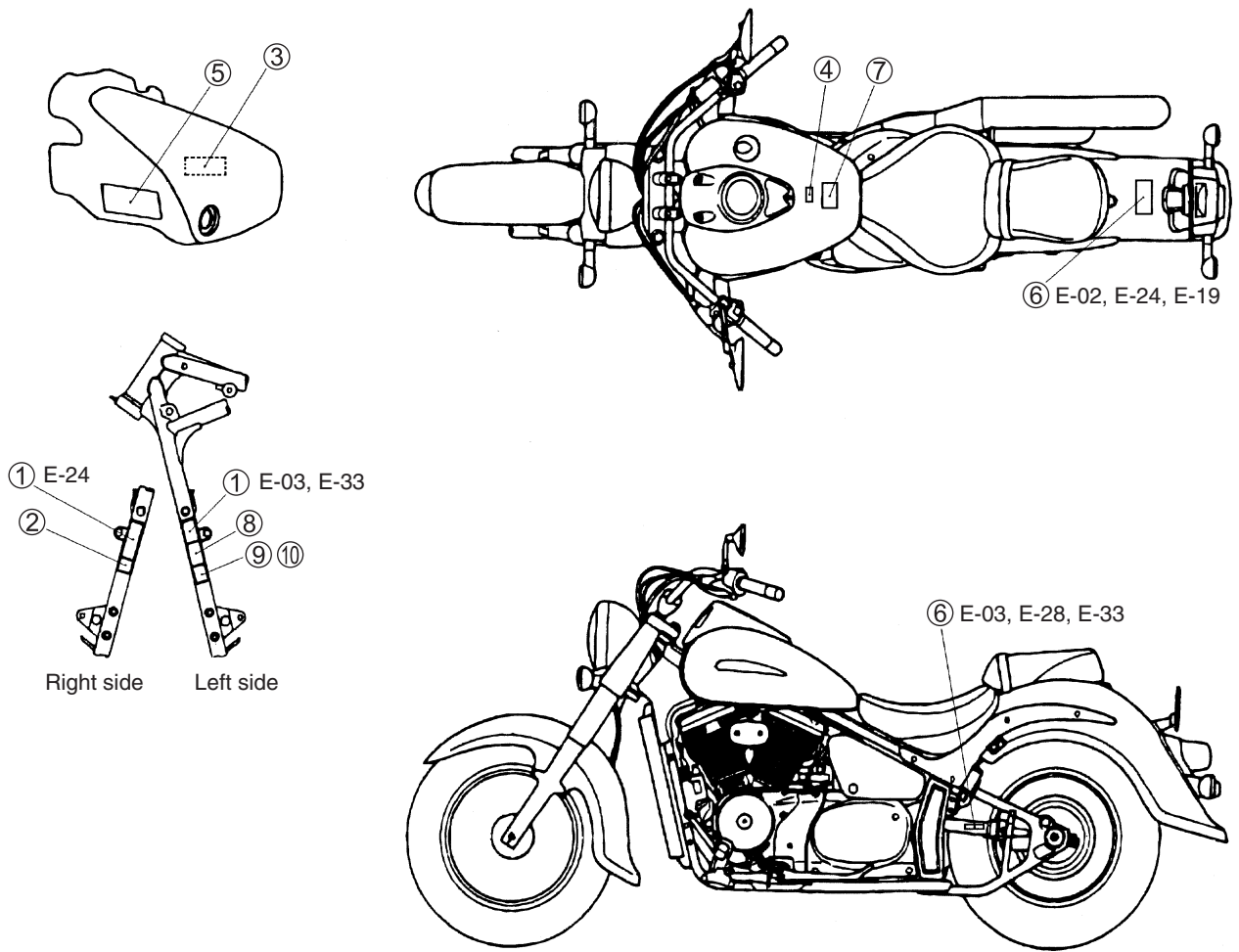
CYLINDER IDENTIFICATION

The engine cylinders are identified as #1 and #2, as counted from rear to front (as viewed by the rider on the seat).



INFORMATION LABELS

NO.	LABEL or PLATE NAME	APPLIED SPECIFICATION					
		E-02	E-03	E-19	E-24	E-28	E-33
①	Noise label	-	○	-	○	-	○
②	Information label	-	○	-	-	○	○
③	Vacuum hose routing label	-	-	-	-	-	○
④	Fuel caution label	○	-	-	○	-	-
⑤	Manual notice label	-	○	-	-	-	○
⑥	Tire air pressure label	○	○	○	○	○	○
⑦	Warning safety label	○	○	○	○	○	○
⑧	ICES Canada label	-	-	-	-	○	-
⑨	ID plate	○	-	○	○	-	-
⑩	Safety plate	-	○	-	-	○	○



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 510 mm (98.818 in)
Overall width	985 mm (38.779 in)
Overall height	1 110 mm (43.700 in)
Wheelbase	1 650 mm (64.960 in)
Ground clearance	140 mm (5.511 in)
Seat height	700 mm (27.559 in)
Dry mass	239 kg (53.727 lbs)

ENGINE

Type	Four-stroke, Liquid-cooled, OHC
Number of cylinders	2
Bore	83 mm (3.268 in)
Stroke	74.4 mm (2.929 in)
Displacement	805 cm ³ (49.1 cu. in)
Compression ratio	9.4 : 1
Carburetor	BDSR34
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 100 ± 100 r/min

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed, constant mesh
Gearshift pattern	1-down, 4-up
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)
Drive system	Shaft drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Link type, coil spring, oil damped, spring pre-load 7-way adjustable
Steering angle	38° (right & left)
Caster	33° 20'
Trail	141 mm (3.55 in)
Turning radius	3.0 m (9.8 ft)
Front brake	Disc brake
Rear brake	Drum brake
Front tire size	130/90-16 67H, tube or 130/90-16M/C 67H, tube
Rear tire size	170/80-15M/C 77H, tube
Front fork stroke	140 mm (5.5 in)
Rear wheel travel	105 mm (4.1 in)

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	5° B.T.D.C. at 1 110 r/min
Spark plug	NGK: DPR8EA-9 or DENSO: X24EPR-U9
Battery	12 V 36 kC (10 Ah)/10HR
Generator	Three-phase A.C. Generator
Main fuse	30 A
Fuse	15/15/10/10/10/10 A
Headlight	12 V 60/55 W
Position/parking light	12 V 4 W Except for E-03, 24, 28, 33
Front turn signal light	12 V 21 W E-02, 19, 24 12 V 21/5 W E-03, 28, 33
Rear turn signal light	12 V 21 W
Brake light/Taillight	12 V 21/5 W
Speedometer light	LED
Neutral indicator light	LED
High beam indicator light	LED
Turn signal indicator light	LED
Oil pressure light	LED

CAPACITIES

Fuel tank	17.0 L (4.5/3.7 US/lmp gal)
Engine oil, oil change	3 000 ml (3.2/2.6 US/lmp qt)
with filter change	3 400 ml (3.6/3.0 US/lmp qt)
overhaul	3 700 ml (3.9/3.3 US/lmp qt)
Final gear oil	200 – 220 ml (6.8/7.0 – 7.4/7.7 US/lmp qt)
Engine coolant	1 500 ml (1.5/1.3 US/lmp qt)
Front fork oil (each leg)	412 ml (13.9/14.5 US/lmp oz)

These specifications are subject to change without notice.

COUNTRY AND AREA CODES

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

CODE	COUNTRY or AREA
E-02	England (UK)
E-03	USA
E-19	EU
E-24	Australia
E-28	Canada
E-33	California

PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE SCHEDULE

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

IMPORTANT (USA only):

The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also ensure the reliability and performance of the motorcycle. The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Mileages are expressed in terms of kilometer, miles and time for your convenience.

NOTES:

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

PERIODIC MAINTENANCE CHART

Item	Interval	km	1 000	6 000	12 000	18 000	24 000
		miles	600	4 000	7 500	11 000	15 000
		months	1	6	12	18	24
Air cleaner element		-	I	I	R	I	
Spark plugs		-	I	R	I	R	
Valve clearance		I	-	I	-	I	
Engine oil		R	R	R	R	R	
Engine oil filter		R	-	-	R	-	
Fuel line		-	I	I	I	I	
Replace fuel hose every 4 years.							
Idle speed		I	I	I	I	I	
Evaporative emission control system (E-33 only)		-	-	I	-	I	
Replace vapor hose every 4 years.							
PAIR (air supply) system		-	-	I	-	I	
Throttle cable play		I	I	I	I	I	
Clutch		-	I	I	I	I	
Radiator hoses		-	I	I	I	I	
Engine coolant		Replace every 2 years.					
Final gear oil		R	-	I	-	I	
Brakes		I	I	I	I	I	
Brake hoses		-	I	I	I	I	
Replace every 4 years.							
Brake fluid		-	I	I	I	I	
Replace every 2 years.							
Tires		-	I	I	I	I	
Steering		I	-	I	-	I	
Front forks		-	-	I	-	I	
Rear suspension		-	-	I	-	I	
Exhaust pipe bolts and muffler bolt and nut		T	-	T	-	T	
Chassis bolts and nuts		T	T	T	T	T	

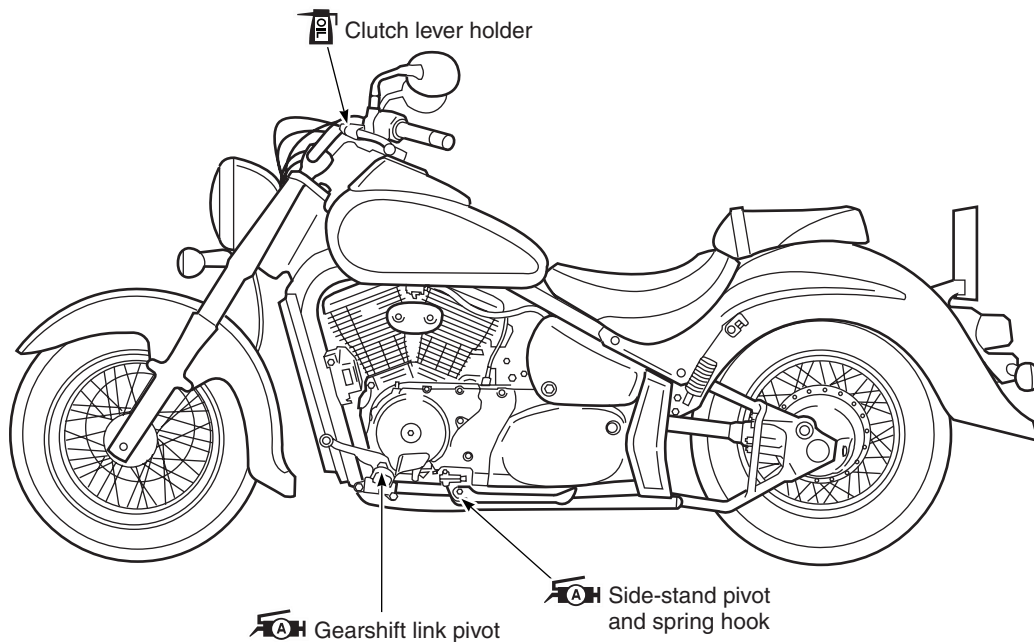
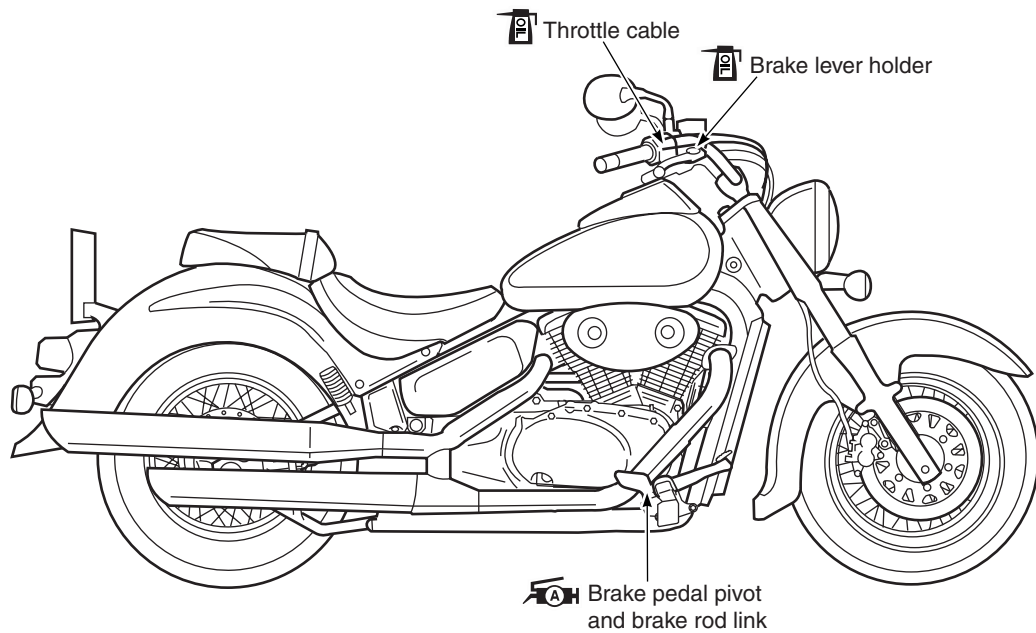
I = Inspect and adjust, clean, lubricate or replace as necessary.

R = Replace

T = Tighten

LUBRICATION POINTS

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



NOTE:

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

MAINTENANCE AND TUNE-UP PROCEDURES

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



AIR CLEANER

- Remove the screws and air cleaner case cover.
- Remove the air cleaner element.



- Carefully use air hose to blow the dust from the cleaner element.

NOTE:

Always apply air pressure on the engine side of the air cleaner element. If air pressure is applied improperly, dirt will be forced into the pores of the air cleaner element thus restricting air flow through the air cleaner element.

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



NOTE:

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

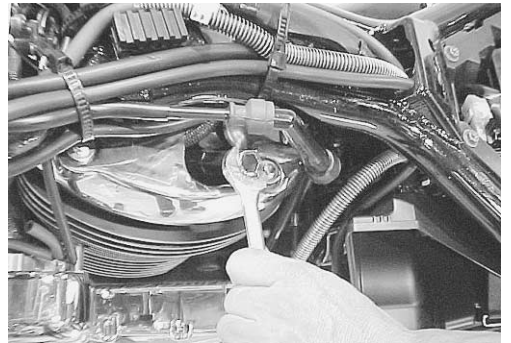
- Remove the drain plugs from the air cleaner box to allow any water to drain out.

SPARK PLUG

SPARK PLUG AND IGNITION COIL/PLUG CAP REMOVAL

- Remove the front and rear seat. (☞7-2)
- Remove the fuel tank. (☞5-3)

- Remove the spark plug caps.
- Remove the spark plugs with a spark plug wrench.



HEAT RANGE

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

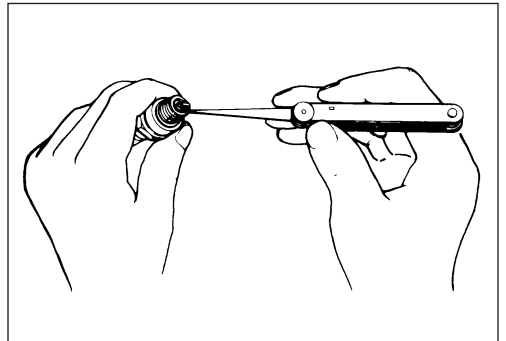
	NGK	DENSO
Standard	DPR7EA-9	X22EPR-U9
Colder type	DPR8EA-9	X24EPR-U9

NOTE:

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

CARBON DEPOSITS

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



SPARK PLUG GAP

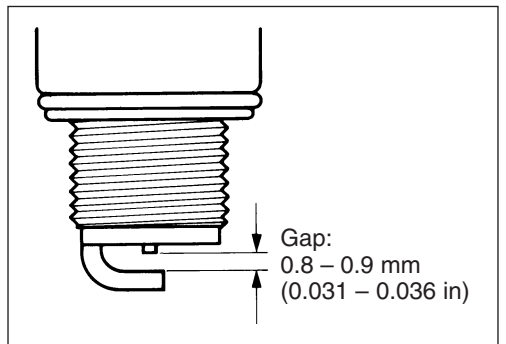
- Measure the spark plug gap with a thickness gauge.
- Adjust the spark plug gap if necessary.

DATA Spark plug gap:
Standard: 0.8 – 0.9 mm (0.031 – 0.036 in)

TOOL 09900-20803: Thickness gauge

ELECTRODE’S CONDITION

- Check the condition of the electrode.
- If it is extremely worn or burnt, replace the spark plug. Replace the spark plug if it has a broken insulator, damaged thread, etc.



▲ CAUTION

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

SPARK PLUG AND IGNITION COIL/PLUG CAP INSTALLATION

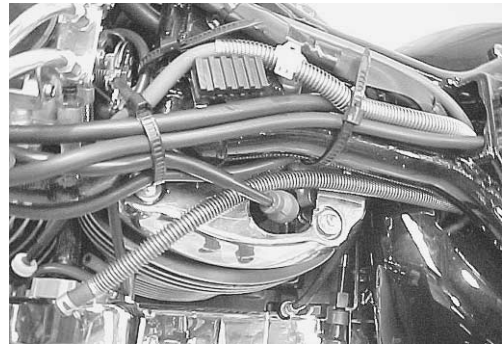
- Install the spark plugs to the cylinder head with fingers, and then tighten them to the specified torque with a wrench.

 **Spark plug: 11 N·m (1.1 kgf·m, 8.0 lb-ft)**

▲ CAUTION

Do not crossthread or over tighten the spark plug, or the spark plug will damage the aluminum threads of the cylinder head.

- Install the spark plug caps.



VALVE CLEARANCE

Valve clearance must be checked and adjusted when:

- (1) the valve mechanism is service, and
- (2) the camshafts are serviced.

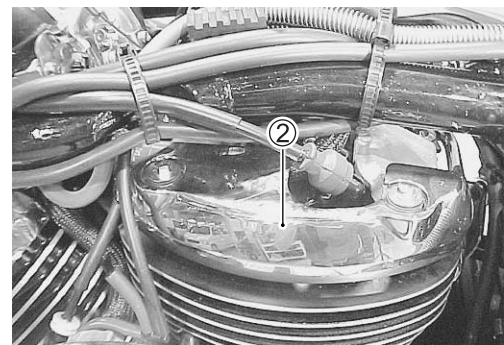
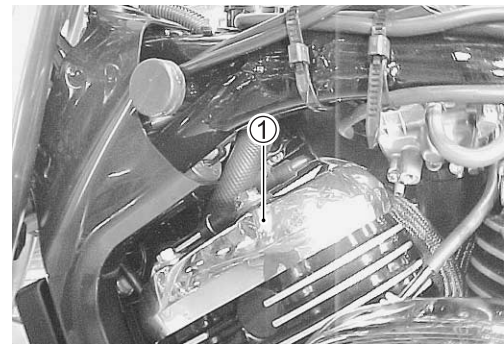
Check and adjust the clearance to the specification.

DATA **Valve clearance (when cold):** IN. 0.08 – 0.13 mm
 (0.003 – 0.005 in)
 EX. 0.17 – 0.22 mm
 (0.007 – 0.009 in)

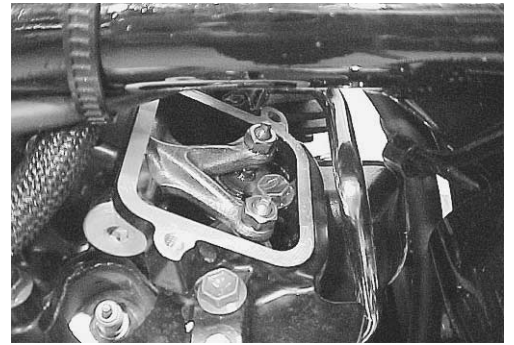
NOTE:

- * The clearance specification is for COLD state.
- * Both intake and exhaust valves must be checked and adjusted when the piston is at Top Dead Center (TDC) of the compression stroke.

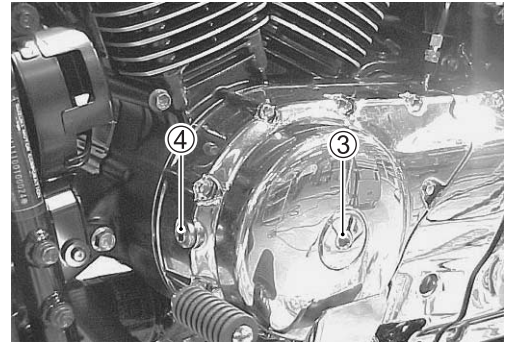
- Remove the front and rear seats. (☞ 7-2)
- Remove the fuel tank. (☞ 5-3)
- Remove the cylinder head cover caps (①, ②).
- Remove the spark plug caps.



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



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



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



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

TOOL 09900-20806: Thickness gauge

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

TOOL 09917-10410: Valve adjust driver



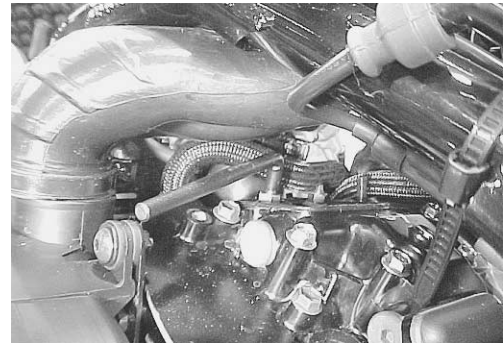
▲ CAUTION

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

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

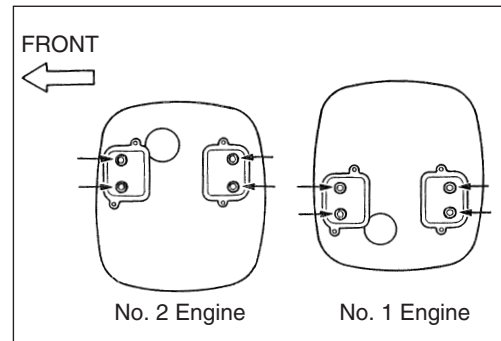


Inspect the No.2 engine's valve clearance as the same manner above.



NOTE:

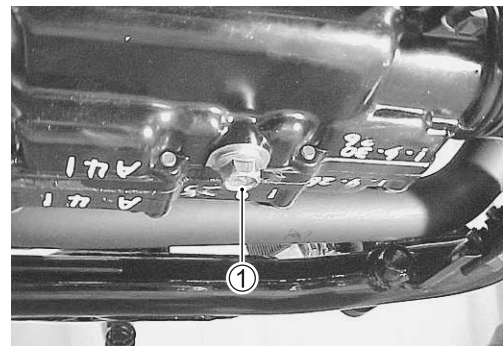
Use the thickness gauge from the arrow marks as shown in the illustration.



ENGINE OIL AND OIL FILTER

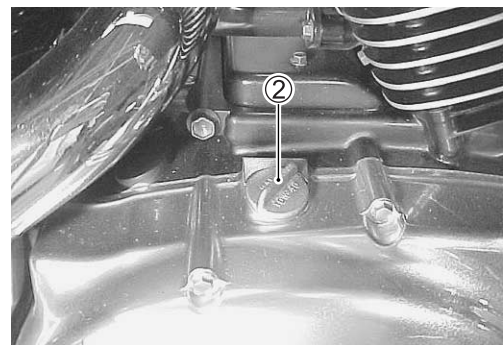
ENGINE OIL REPLACEMENT

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

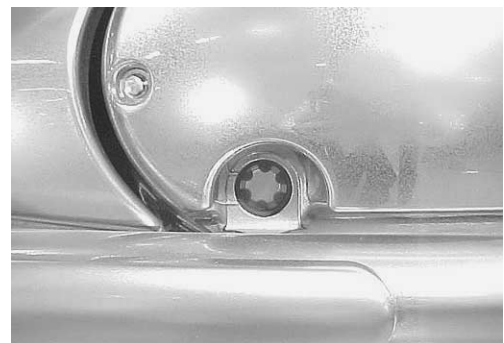


- Tighten the drain plug ① to the specified torque, and pour fresh oil through the oil filler. The engine will hold about 3.0 L (3.2/2.6 US/Imp qt) of oil. Use an API classification of SF or SG oil with SAE 10W/40 viscosity.

 **Oil drain plug: 23 N·m (2.3 kgf·m, 16.5 lb-ft)**



- 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

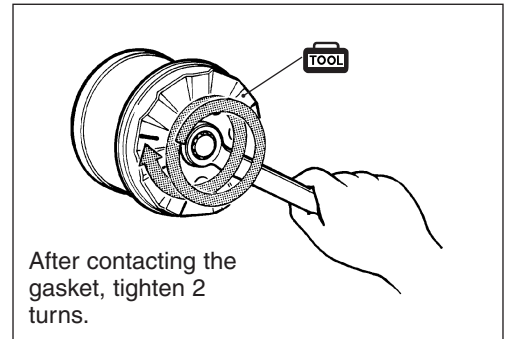
- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil filter with the special tool.

 09915-40610: Oil filter wrench

- Apply engine oil lightly to the gasket of the new oil filter before installation.
- Install the new oil filter. Turn it by hand until you feel that the oil filter gasket contacts the oil filter mounting surface. Then, tighten the oil filter two full turns with the special tool.

NOTE:

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



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

 NECESSARY AMOUNT OF ENGINE OIL:

Oil change: 3.0 L (3.2/2.6 US/Imp qt)

Oil and filter change: 3.4 L (3.6/3.0 US/Imp qt)

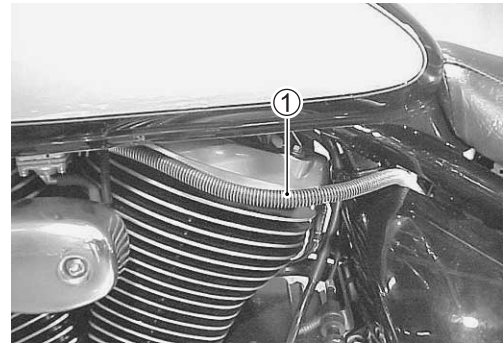
Engine overhaul: 3.7 L (3.9/3.3 US/Imp qt)

 CAUTION

ONLY USE A GENUINE SUZUKI MOTORCYCLE OIL FILTER. Other manufacturer's oil filters may differ in thread specifications (thread diameter and pitch), filtering performance and durability which may lead to engine damage or oil leaks. Also, do not use a genuine Suzuki automobile oil filter on this motorcycle.

FUEL HOSE

Inspect the fuel hose ① for damage and fuel leakage. If any defects are found, replace the fuel hose.



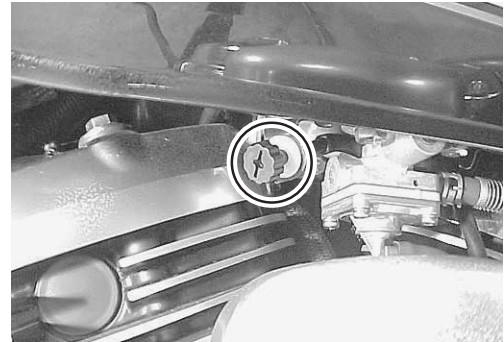
ENGINE IDLE SPEED

NOTE:

Warm up the engine before adjusting the engine idle speed.

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

DATA Engine idle speed: $1\ 100 \pm 100$ rpm

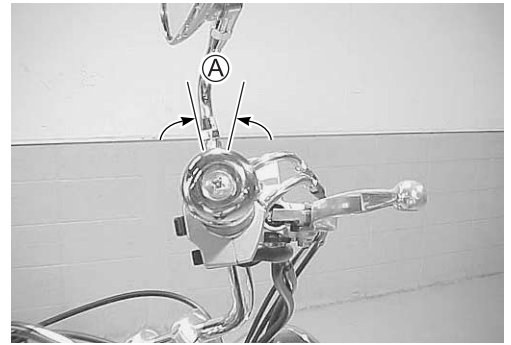


PAIR (AIR SUPPLY) SYSTEM

Inspect the PAIR (air supply) system periodically. (☞ 5-27)

THROTTLE CABLE PLAY

Adjust the throttle cable play $\text{\textcircled{A}}$ as follows.



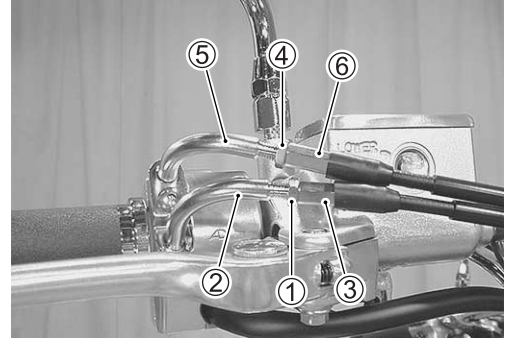
MINOR ADJUSTMENT

1st step:

- Loosen the lock nut $\text{\textcircled{1}}$ of the throttle returning cable $\text{\textcircled{2}}$ and fully turn in the adjuster $\text{\textcircled{3}}$.

2nd step:

- Loosen the lock nut $\text{\textcircled{4}}$ of the throttle pulling cable $\text{\textcircled{5}}$.
- Turn the adjuster $\text{\textcircled{6}}$ in or out until the throttle cable play (at the throttle grip) $\text{\textcircled{A}}$ is between 2.0 – 4.0 mm (0.08 – 0.16 in).
- Tighten the lock nut $\text{\textcircled{4}}$ while holding the adjuster $\text{\textcircled{6}}$.



DATA Throttle cable play $\text{\textcircled{A}}$: 2.0 – 4.0 mm (0.08 – 0.16 in)

3rd step:

- While holding the throttle grip at the fully closed position, slowly turn out the adjuster $\text{\textcircled{3}}$ of the throttle returning cable $\text{\textcircled{2}}$ until resistance is felt.
- Tighten the lock nut $\text{\textcircled{1}}$ while holding the adjuster $\text{\textcircled{3}}$.

⚠ WARNING

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

NOTE:

Major adjustment can be made at the throttle body side adjuster.

MAJOR ADJUSTMENT

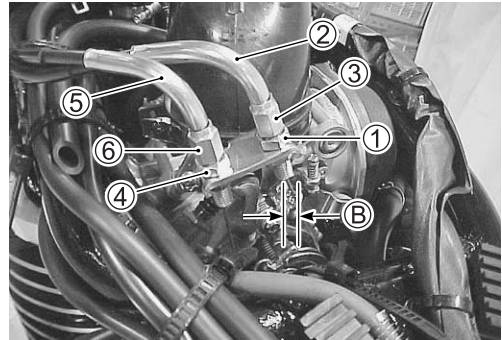
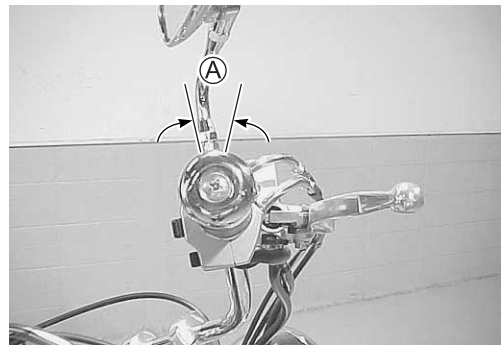
- Remove the fuel tank. (☞ 5-3)
- Loosen the lock nuts ① of the throttle returning cable ②.
- Turn the returning cable adjuster ③ to obtain proper cable play.
- Loosen the lock nuts ④ of the throttle pulling cable ⑤.
- Turn the pulling cable adjuster ⑥ in or out until the throttle cable play ① should be 2.0 – 4.0 mm (0.08 – 0.16 in) at the throttle grip.
- Tighten the lock nuts ④ securely while holding the adjuster ⑥.

DATA Throttle cable play ①: 2.0 – 4.0 mm (0.08 – 0.16 in)

- While holding the throttle grip at the fully closed position, slowly turn the returning cable adjuster ③ to obtain a cable slack ② of 1.0 mm (0.04 in).
- Tighten the lock nuts ① securely.

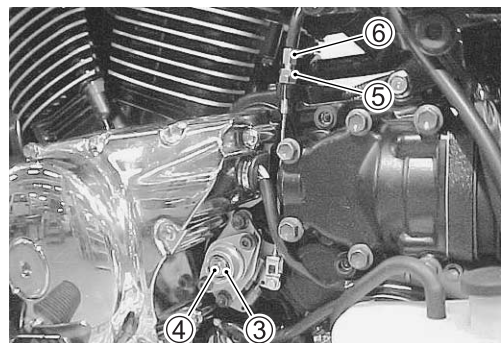
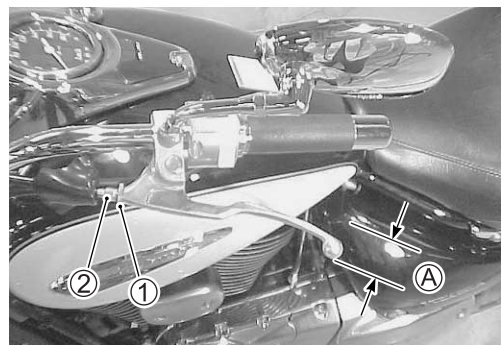
⚠ WARNING

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.

**CLUTCH**

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

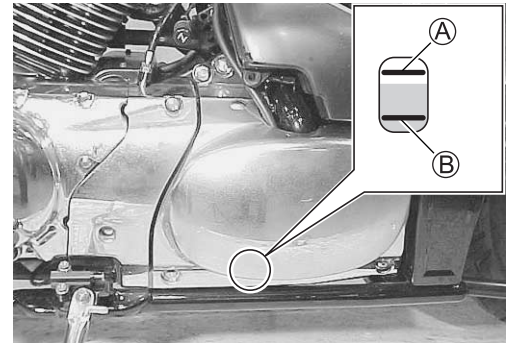
DATA Clutch lever play ①: 10 – 15 mm (0.4 – 0.6 in)
Clutch release screw: ¼ turn out



COOLING SYSTEM

ENGINE COOLANT LEVEL CHECK

- Keep the motorcycle upright.
 - Check the engine coolant level by observing the full and lower lines on the engine coolant reservoir.
- Ⓐ Full line Ⓑ Lower line
- If the level is below the lower line, add engine coolant to the full line from the engine coolant reservoir filler.



ENGINE COOLANT CHANGE

- Remove the fuel tank.
- Remove the radiator cap ①.
- Drain engine coolant by disconnecting the radiator hose ② from the pump.

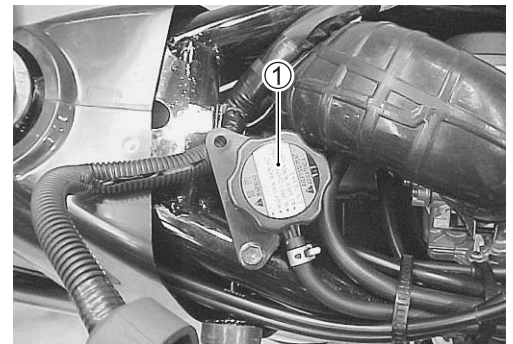
⚠ WARNING

- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- * Engine coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If engine coolant gets into the eyes or in contact with the skin, flush thoroughly with plenty of water. If swallowed, induce vomiting and call physician immediately!

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

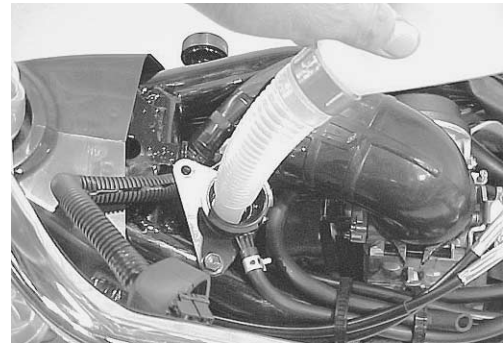
LLC Engine coolant capacity (without reservoir):
1 500 ml (1.6/1.3 Us/lmp qt)

ENGINE COOLANT INFORMATION:  6-2



AIR BLEEDING THE COOLING CIRCUIT

- Add engine coolant up to the radiator inlet.
- Support the motorcycle upright.
- Slowly swing the motorcycle, right and left, to bleed the air trapped in the cooling circuit.
- Add engine coolant up to the radiator inlet.
- Start up the engine and bleed air from the radiator inlet completely.
- Add engine coolant up to the radiator inlet.
- Repeat the above procedure until bleed no air from the radiator inlet.
- Close the radiator cap securely.
- After warming up and cooling down the engine several times, add the engine coolant up to the full level of the reservoir.



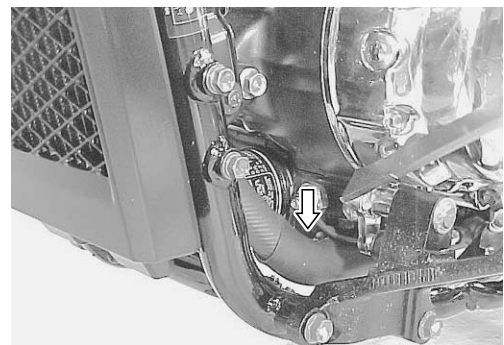
▲ CAUTION

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

**■ LLC Engine coolant capacity (Without reservoir):
1 500 ml (1.6/1.3 US/Imp qt)**

RADIATOR HOSES

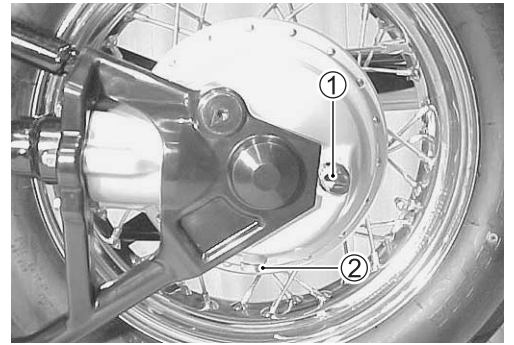
- Check to see the radiator hoses for crack, damage or engine coolant leakage.
- If any defects are found, replace the radiator hoses with new ones.



FINAL GEAR OIL

- Keep the motorcycle upright.
- Place an oil pan under the final gear case.
Remove the filler cap ① and drain plug ② to drain oil.
- Refit the drain plug ②. Pour the specified oil (SAE 90 hypoid gear oil with GL-5 under API classification) through the filler hole until the oil level reaches the filler hole.
- Refit the filler cap ①.

DATA Final gear oil: 200 – 220 ml (6.8/7.0 – 7.4/7.7 US/Imp oz)



BRAKE

BRAKE FLUID LEVEL CHECK

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

BF Specification and Classification: DOT 4



⚠ WARNING

- * The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based fluids. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period of time.
- * Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hoses and hose joints for cracks and fluid leakage before riding.

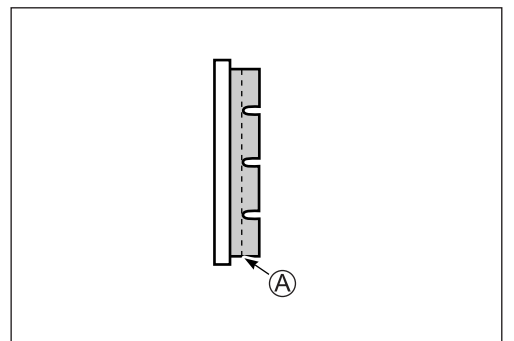
BRAKE PADS

FRONT BRAKE

- The extent of brake pad wear can be checked by observing the grooved limit line (A) on the pad. When the wear exceeds the grooved limit line, replace the pads with new ones. (👉7-10)

⚠ CAUTION

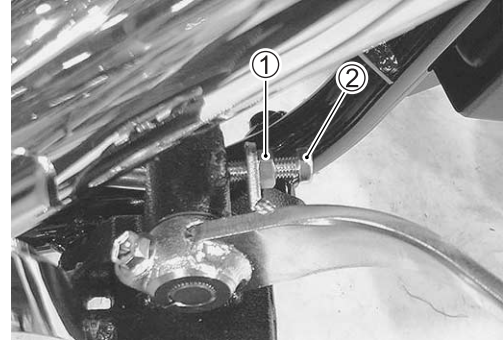
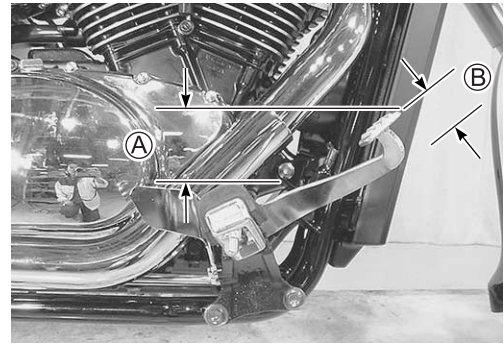
Replace the brake pads as a set, otherwise braking performance will be adversely affected.



REAR BRAKE PEDAL HEIGHT

- Loosen the lock nut ①.
- Adjust the brake pedal height ② by turning the adjuster ③.

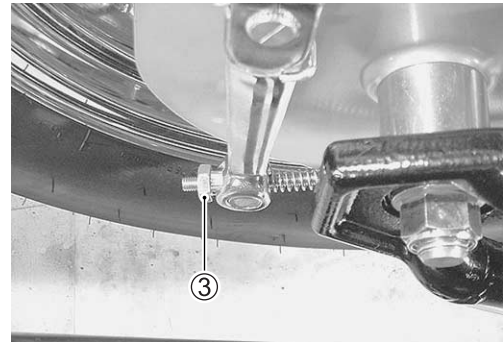
DATA Rear brake pedal height : 75 – 85 mm



REAR BRAKE ADJUSTING

- Adjust the free travel ③ to 20 – 30 mm by turning the adjusting nut ④.

DATA Rear brake pedal free travel ③: 20 – 30 mm

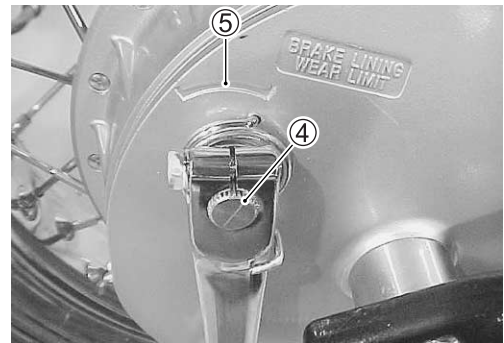


REAR BRAKE SHOE WEAR

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.



BRAKE LIGHT SWITCH

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

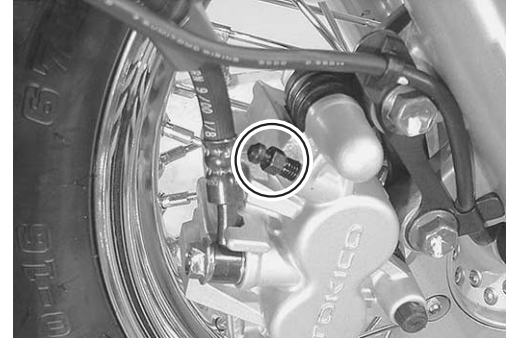


AIR BLEEDING THE BRAKE FLUID CIRCUIT

Air trapped in the 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:

FRONT BRAKE

- Fill the master cylinder reservoir to the 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.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the air 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 lever, and open the valve. Repeat this process until fluid flowing into the receptacle no longer contains air bubbles.



NOTE:

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

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

 **Air bleeder valve: 8 N·m (0.8 kgf·m, 6.0 lb-ft)**

CAUTION

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

TIRES

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 (0.06 in)
REAR 2.0 mm (0.08 in)

TIRE PRESSURE

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

DATA Cold inflation tire pressure

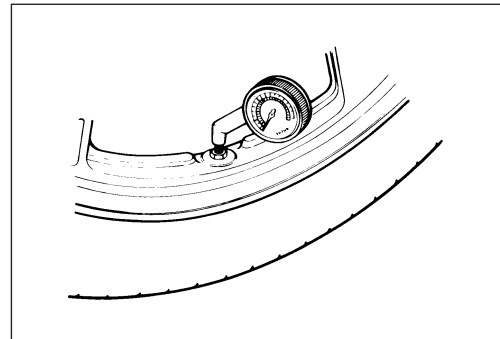
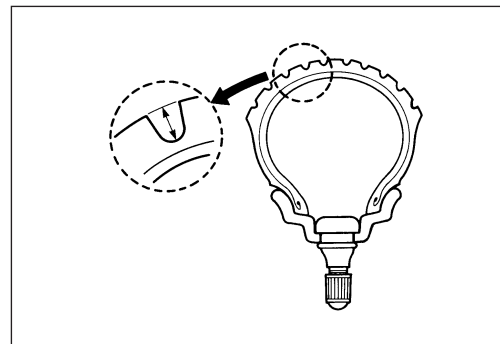
Solo riding: Front: 200 kPa (2.00 kgf/cm², 29 psi)
Rear: 250 kPa (2.50 kgf/cm², 36 psi)
Dual riding: Front: 200 kPa (2.00 kgf/cm², 29 psi)
Rear: 250 kPa (2.50 kgf/cm², 36 psi)

⚠ CAUTION

The standard tire fitted on this motorcycle is a 130/90-15 67H for the front and a 170/80-15 H/C 77H for the rear. The use of tires other than those specified may cause instability. It is highly recommended to use the specified tires.

DATA TIRE TYPE

IRC
FRONT: GS-23F
REAR : GS-23R



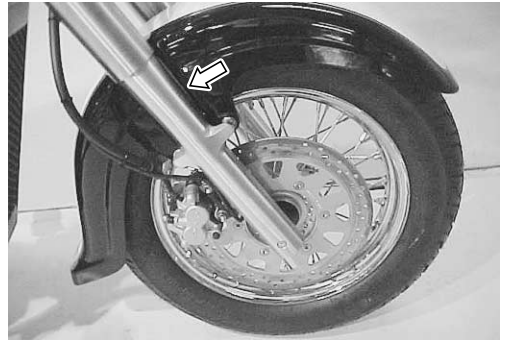
STEERING

The steering should be adjusted properly for smooth turning of the handlebars and safe operation. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork. Support the motorcycle so that the front wheel is off the ground. With the wheel facing straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, readjust the steering. (👉 7-35)



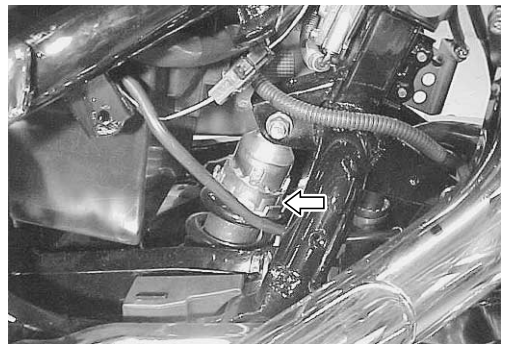
FRONT FORK

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (👉 7-18)



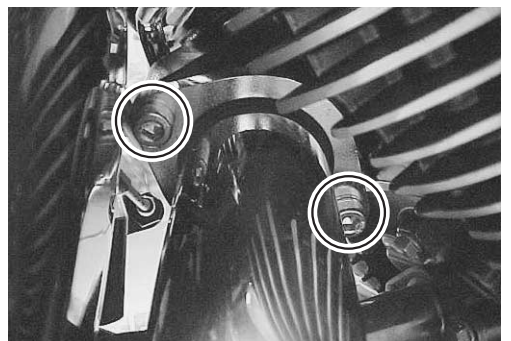
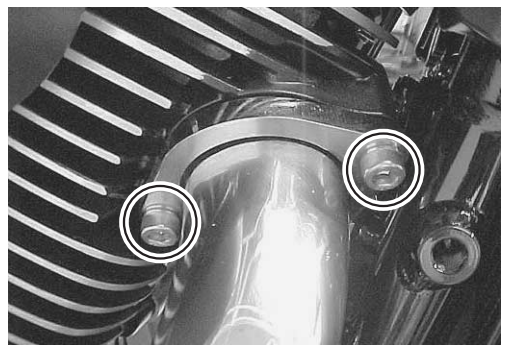
REAR SUSPENSION

Inspect the rear shock absorbers for oil leakage and check that there is no play in the swingarm. Replace any defective parts if necessary. (👉 7-46)



EXHAUST PIPE BOLT AND NUT

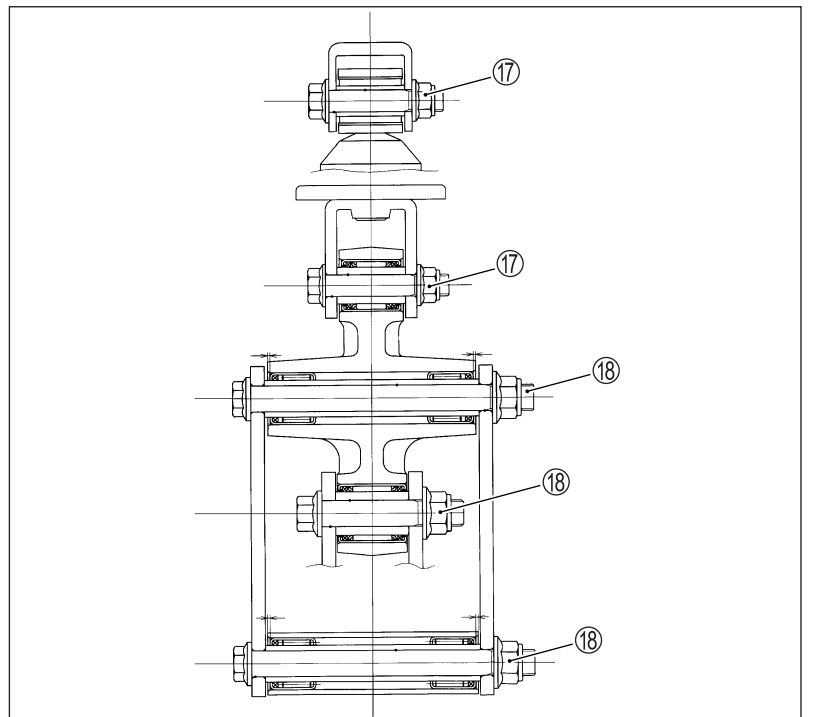
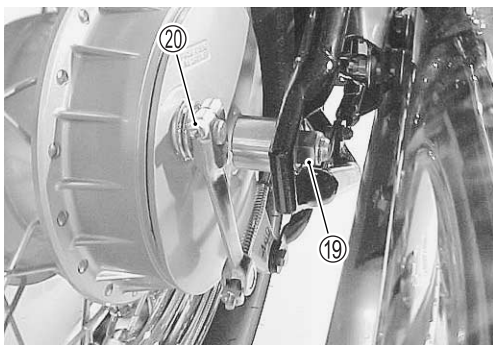
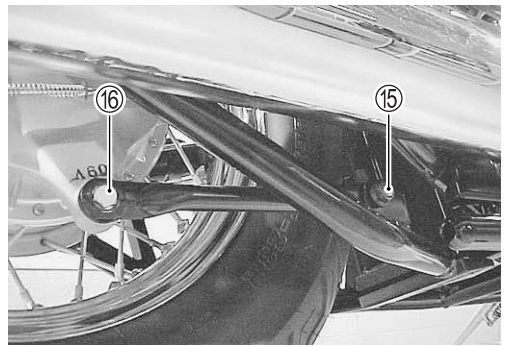
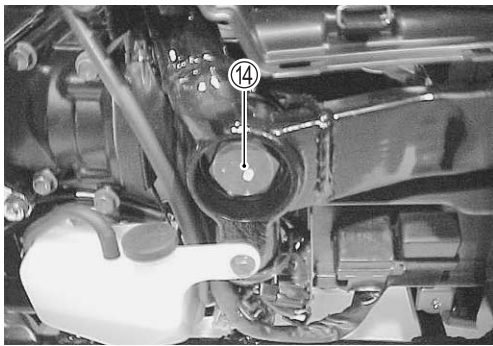
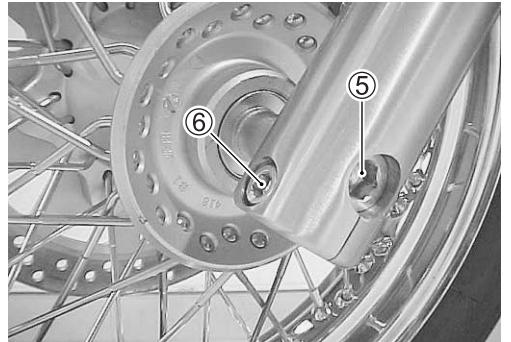
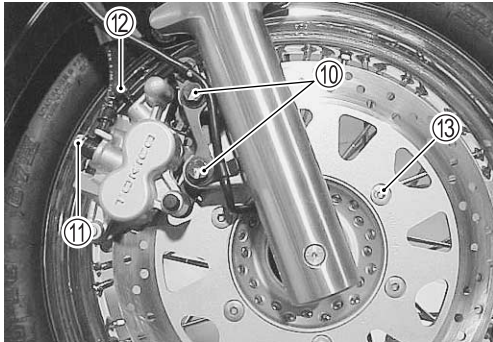
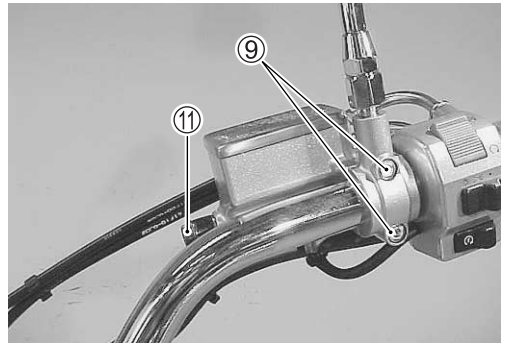
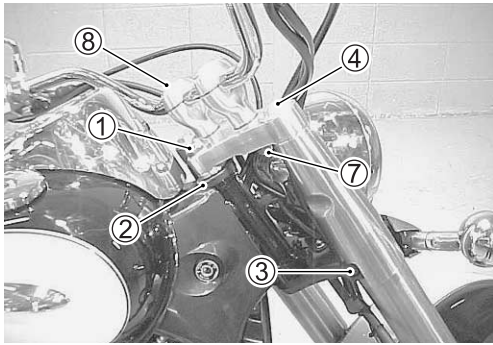
Tighten the exhaust pipe bolts and muffler bolts and nuts.



CHASSIS BOLTS AND NUTS

Check that all chassis bolts and nuts are tightened to their specified torque. The locations of the following nuts and bolts on the motorcycle.

Item	N·m	kgf·m	lb·ft
① Steering stem head nut	90	9.0	65.0
② Steering stem lock nut	80	8.0	58.0
③ Front fork lower clamp bolt	33	3.3	24.0
④ Front fork cap bolt	35	3.5	25.5
⑤ Front axle	65	6.5	47.0
⑥ Front axle pinch bolt	33	3.3	24.0
⑦ Handlebar set bolt	70	7.0	50.5
⑧ Handlebar clamp bolt	23	2.3	16.5
⑨ Front brake master cylinder mounting bolt	10	1.0	7.0
⑩ Front brake caliper mounting bolt	39	3.9	28.0
⑪ Brake hose union bolt	23	2.3	16.5
⑫ Caliper air bleeder valve	8	0.8	6.0
⑬ Brake disc bolt	23	2.3	16.5
⑭ Swingarm pivot nut	100	10.0	72.5
⑮ Torque link bolt and nut (Front)	35	3.5	25.5
⑯ Torque link bolt and nut (Rear)	25	2.5	18.0
⑰ Rear shock absorber mounting bolt/nut (Upper & Lower)	50	5.0	36.0
⑱ Rear cushion lever/rod mounting nut	78	7.8	56.5
⑲ Rear axle nut	65	6.5	47.0
⑳ Brake cam lever nut	10	1.0	7.0



COMPRESSION PRESSURE CHECK

The compression pressure reading of a cylinder is a good indicator of its internal condition.

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

COMPRESSION PRESSURE SPECIFICATION

Standard	Limit	Difference
1 300 – 1 700 kPa (13 – 17 kgf/cm ²) (185 – 242 psi)	1 100 kPa (11 kgf/cm ²) (156 psi)	200kPa (2 kgf/cm ²) (28 psi)

Low compression pressure can indicate any of the following conditions:

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

Overhaul the engine in the following cases:

- * Compression pressure in one of the cylinders is less than 900 kPa (9 kgf/cm², 128 psi).
- * The difference in compression pressure between any two cylinders is more than 200 kPa (2 kgf/cm², 28 psi).
- * All compression pressure readings are below 1 100 kPa (11 kgf/cm², 156 psi) even when they measure more than 900 kPa (9 kgf/cm², 128 psi).

COMPRESSION TEST PROCEDURE

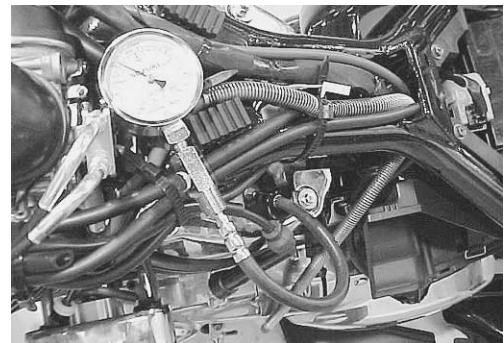
NOTE:

- * *Before testing the engine for compression pressure, make sure that the cylinder head nuts are tightened to the specified torque values and the valves are properly adjusted.*
- * *Have the engine warmed up before testing.*
- * *Make sure that the battery is fully-charged.*

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

- Remove the fuel tank. (☞ 5-3)
- Remove all the spark plugs. (☞ 2-4)
- Install the compression gauge and adaptor in the spark plug hole. Make sure that the connection is tight.
- Keep the throttle grip in the fully opened position.
- Press the starter button and crank the engine for a few seconds. Record the maximum gauge reading as the cylinder compression.
- Repeat this procedure with the other cylinders.

 **09915-64510: Compression gauge set**
09915-63210: Adaptor



OIL PRESSURE CHECK

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

OIL PRESSURE SPECIFICATION

350 – 650 kPa (3.5 – 6.5 kgf/cm², 50 – 92 psi) at 3 000 r/min., Oil temp. at 60°C (140°F)

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

LOW OIL PRESSURE

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

HIGH OIL PRESSURE

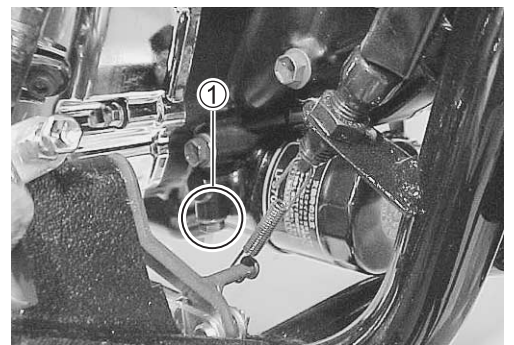
- * Engine oil viscosity is too high
- * Clogged oil passage
- * Combination of the above items

OIL PRESSURE TEST PROCEDURE

Start the engine and check if the oil pressure indicator light is turned on. If the light stays on, check the oil pressure indicator light circuit. If the circuit is OK, check the oil pressure in the following manner.

- Remove the main oil gallery plug ①.
- Install the oil pressure gauge and adaptor into the main oil gallery.
- 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. (observe the tachometer), and read the oil pressure gauge.

TOOL 09915-74510: Oil pressure gauge hose
09915-74531: Oil pressure gauge attachment
09915-77330: Meter (for high pressure)



ENGINE

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ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

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

ENGINE CENTER

PARTS	REMOVAL	INSTALLATION
Inspection cap	3-11	3-71
PAIR pipe	3-11	3-71
Starter motor	3-14	3-64
Oil filter	3-17	3-59

ENGINE LEFT SIDE

PARTS	REMOVAL	INSTALLATION
Neutral switch	3-18	3-58
Generator	3-18	3-57
Water pump	3-19	3-56
Secondary driven bevel gear	3-19	3-55

ENGINE RIGHT SIDE

PARTS	REMOVAL	INSTALLATION
Clutch	3-14	3-61
Oil pump	3-16	3-60
Gearshift	3-16	3-59
Primary drive gear	3-17	3-59
Driveshaft bolt/Secondary driven gearshaft nut	3-17	3-56

ENGINE REMOVAL AND INSTALLATION

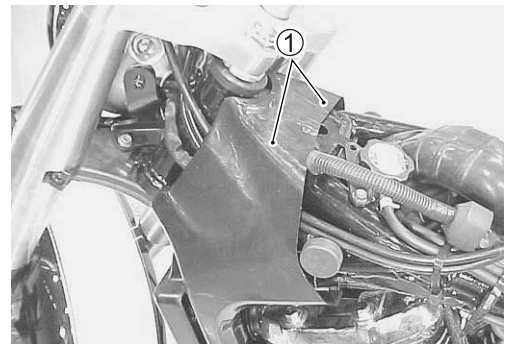
ENGINE REMOVAL

Before taking the engine out of the frame, wash the engine using a steam cleaner. Engine removal is sequentially explained in the following steps. Reinstall the engine by reversing the removal procedure.

- Drain engine oil. (☞ 2-8)
- Drain engine coolant. (☞ 2-13)
- Remove the seats. (☞ 7-2)
- Remove the fuel tank. (☞ 5-3)
- Disconnect the battery ⊖ lead wire.



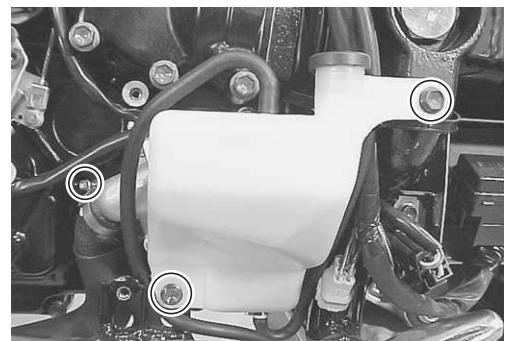
- Remove the frame head covers ①.



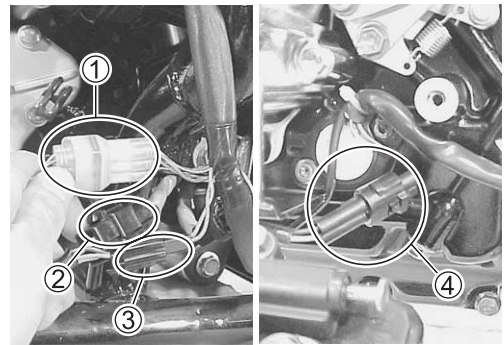
- Remove the radiator. (☞ 6-4)



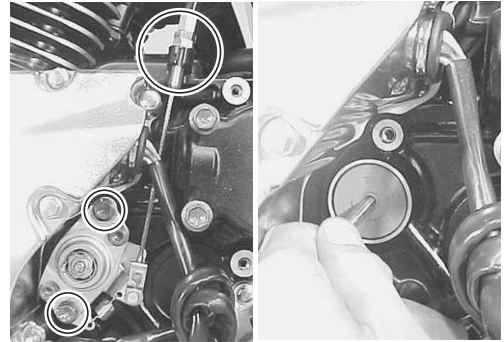
- Remove the left frame cover and the secondary gear case cover.
- Remove the engine coolant reservoir tank.



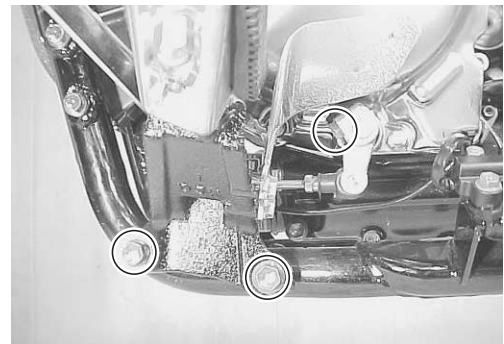
- Disconnect the neutral switch lead wire coupler ①.
- Disconnect the generator lead wire coupler ② and the signal generator lead wire coupler ③.
- Disconnect the side-stand switch lead wire coupler ④.



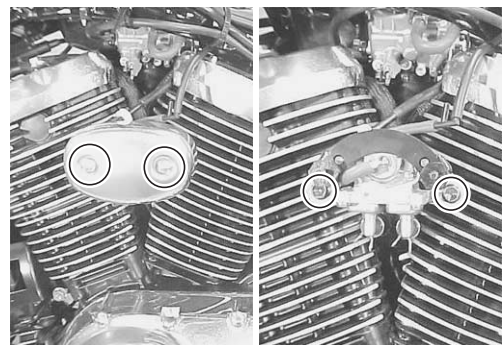
- Remove the clutch release mechanism.
- Remove the push rod.



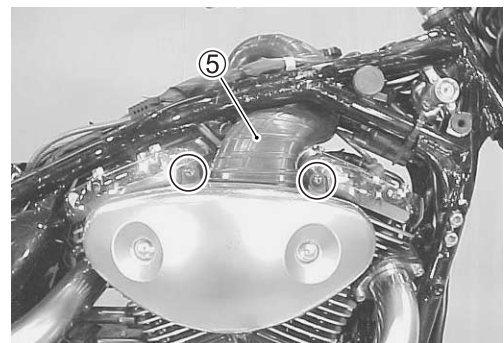
- Remove the left footrest and the gearshift lever.



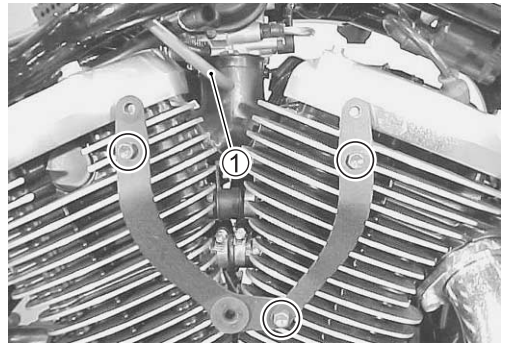
- Remove the PAIR (AIR SUPPLY) cover.
- Remove the PAIR system.




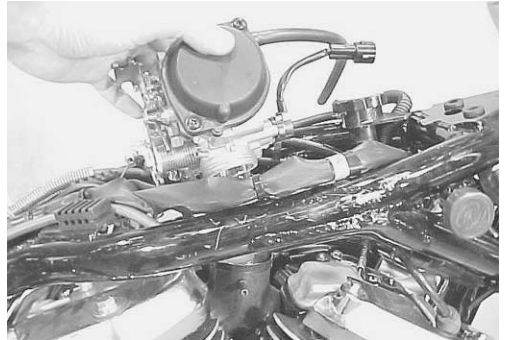
- Remove the air cleaner box and the outlet tube ⑤.



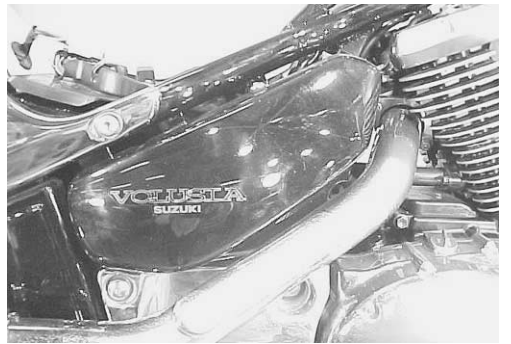
- Remove the air cleaner box bracket.
- Disconnect the negative pressure hose ①.



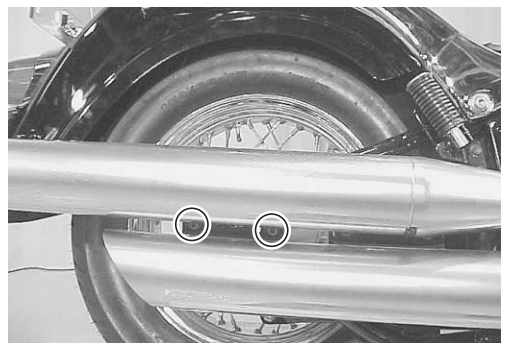
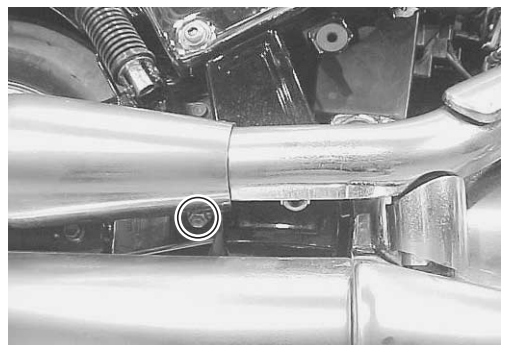
- Remove the carburetor.
Carburetor removal  5-15
- Remove the spark plug caps.



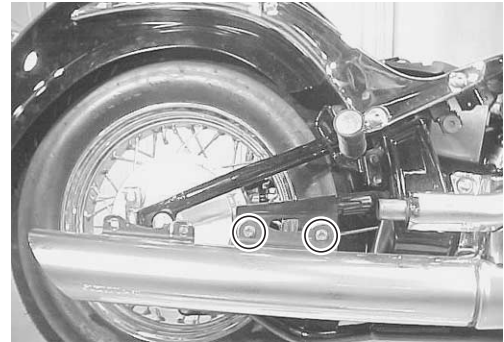
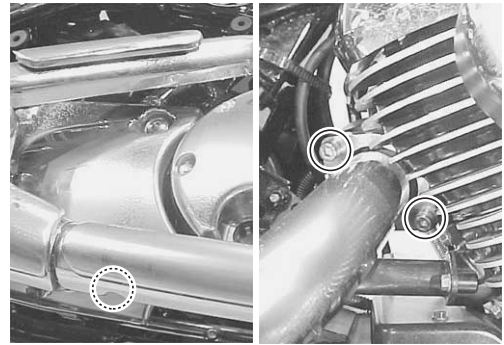
- Remove the right frame cover.



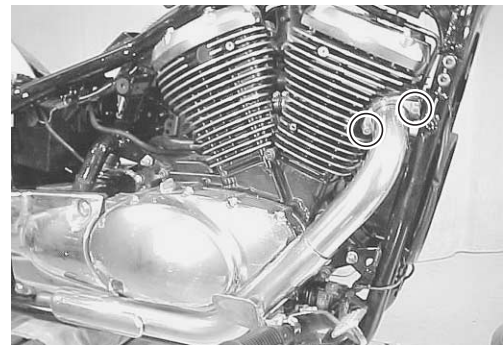
- Remove the No. 1 muffler.



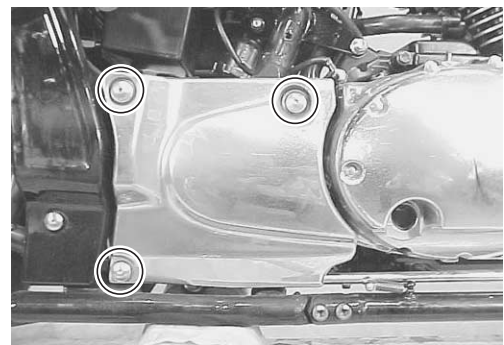
- Remove the No. 1 exhaust pipe and the No. 2 muffler.



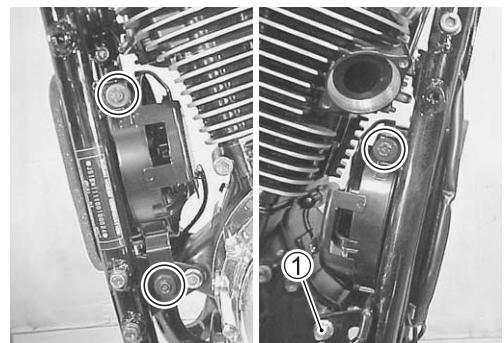
- Remove the No.2 exhaust pipe.



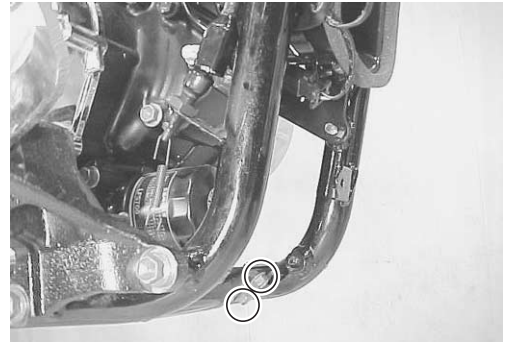
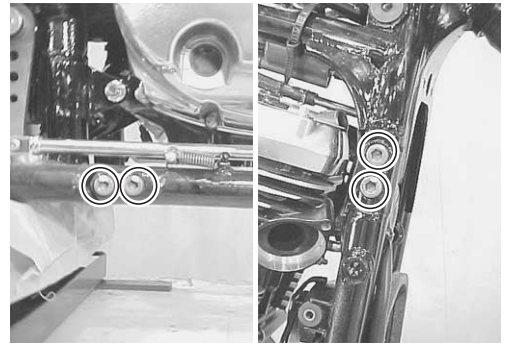
- Remove the rear clutch cover.



- Remove the cooling fan mounting bolts.
- Remove the engine mounting bolt ①.



- Remove the frame down tube.



- Support the engine with an engine jack.
- Remove the engine mounting bolts and nuts.
- Gradually lower the engine.



ENGINE INSTALLATION

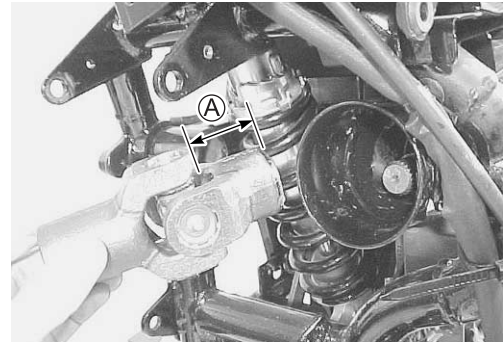
Install the engine in the reverse order of engine removal.

Pay attention to the following points:

- Install the universal joint.

NOTE:

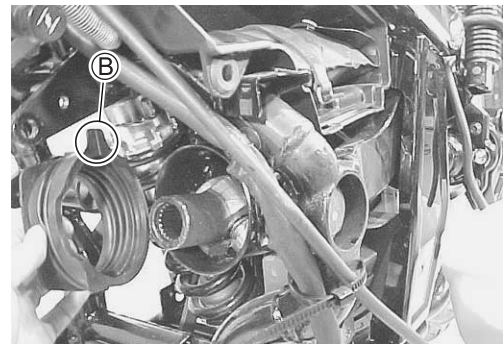
Be sure to face the short portion Ⓐ backward when installing it.



- Install the boot.

NOTE:

Make sure that the "UP" mark Ⓑ faces up.



- Gradually raise the engine, and then engage the secondary driven gear shaft to the universal joint.

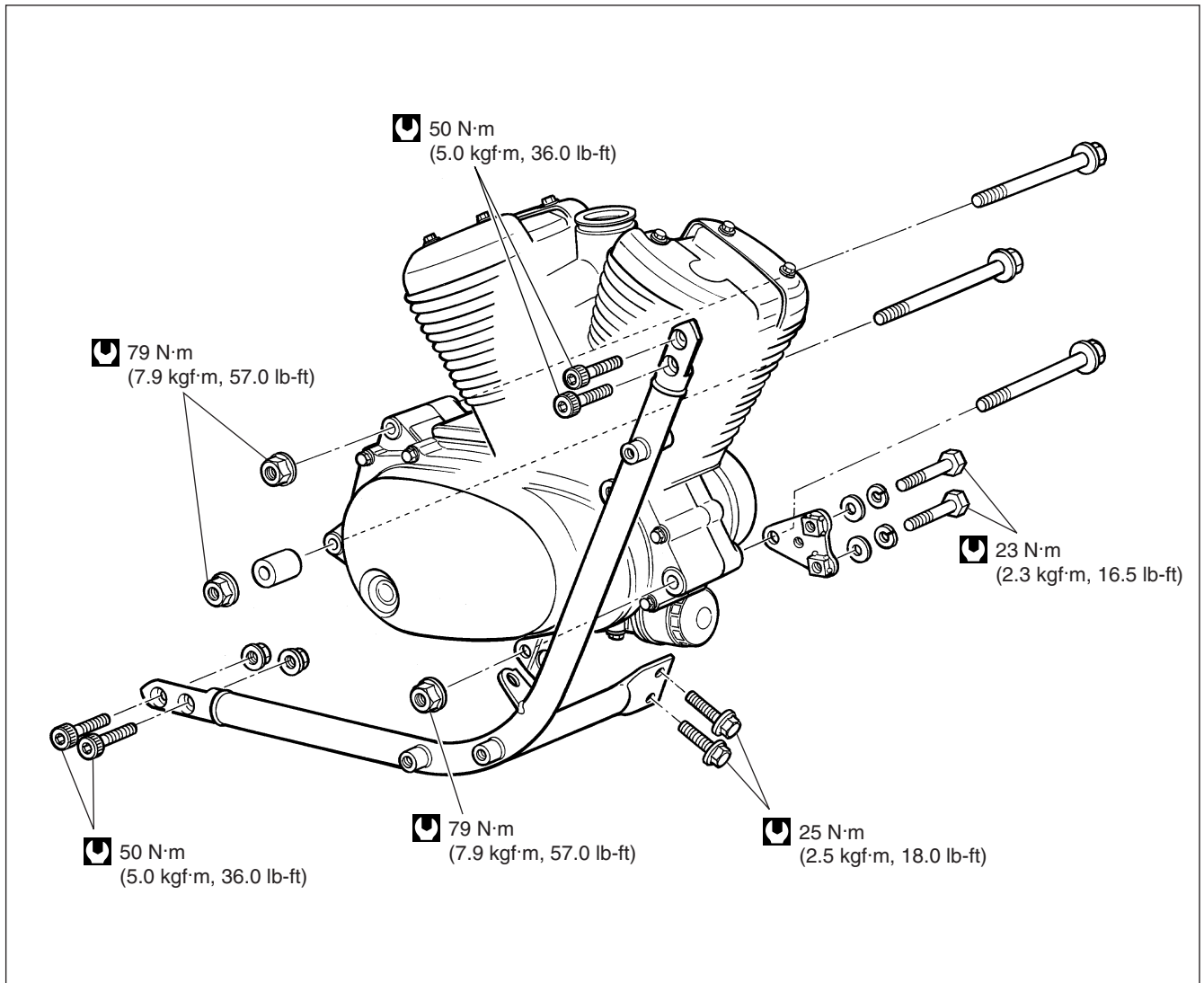


- Install the engine mounting bolts and nuts and tighten them.

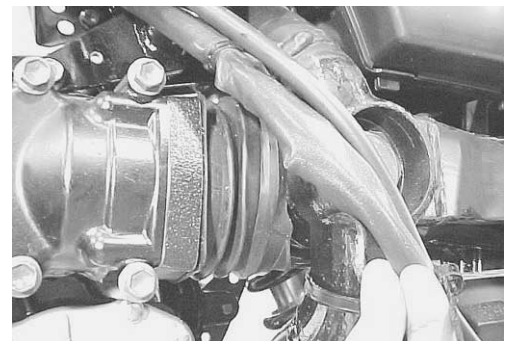


NOTE:

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

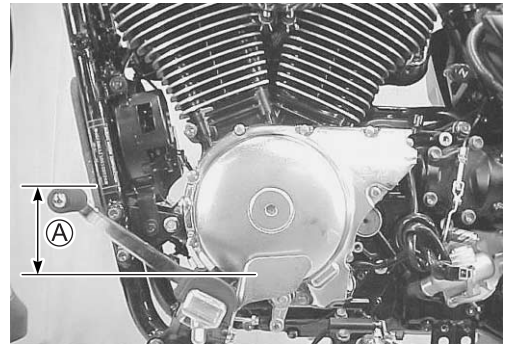


- Properly fit the boot onto the engine and the swingarm.



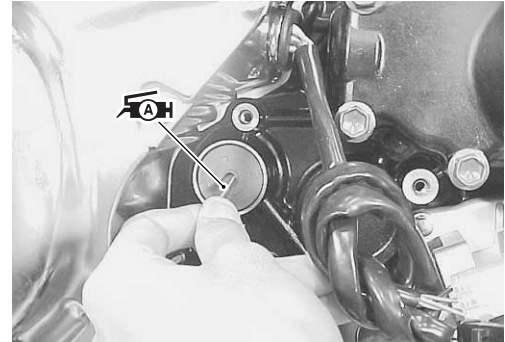
- Install the gearshift lever and the footrest in the correct position.

DATA Gearshift lever height $\text{\textcircled{A}}$
 Standard: 90 mm (3.5 in)



- Apply grease to the push rod and install it.

FAH 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
 99000-25010: SUZUKI SUPER GREASE "A"
 (For the others)

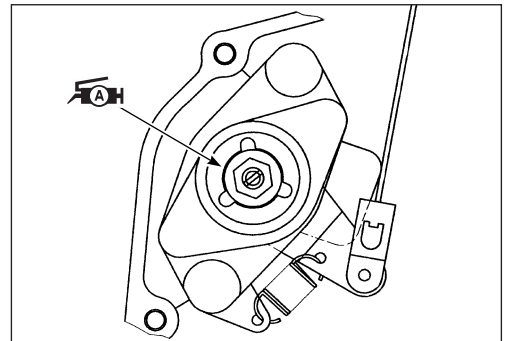


- Apply grease to the clutch release mechanism and install it.

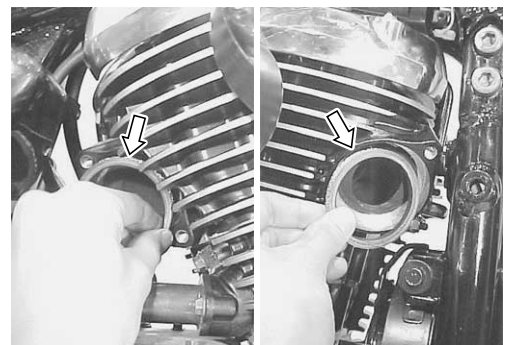
FAH 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
 99000-25010: SUZUKI SUPER GREASE "A"
 (For the others)

DATA Clutch release screw
 Standard: $\frac{1}{4}$ turn back

CLUTCH CABLE ADJUSTMENT 2-12



- Install the new gaskets.
- Install the exhaust pipes and mufflers.



- Apply gas sealer to the exhaust pipe connectors.

EXHAUST GAS SEALER: PERMATEX 1372

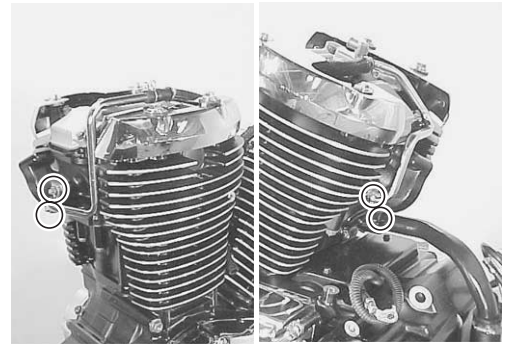
- Adjust the following items.

- * Engine oil 2-8
- * Engine coolant 2-13
- * Idling adjustment 2-10
- * Throttle cable play 2-11
- * Rear brake pedal height 2-16

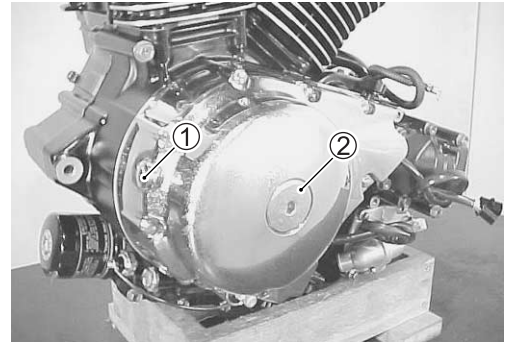
ENGINE DISASSEMBLY

- Remove the PAIR pipes.
- Remove the spark plugs.

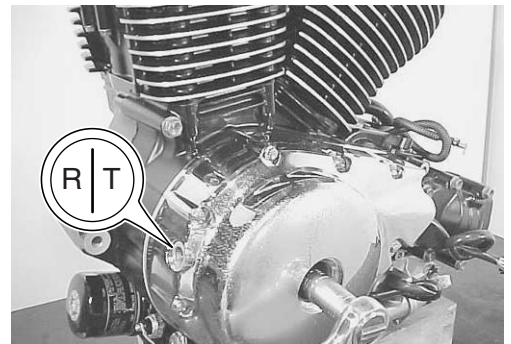
 **09930-10121: Spark plug wrench set**



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



- Position "RIT" mark on the generator with the center of the valve timing inspection hole.



CYLINDER HEAD COVER

- Remove the intake pipe.
- Remove the inspection caps.
- Remove the cylinder head covers.



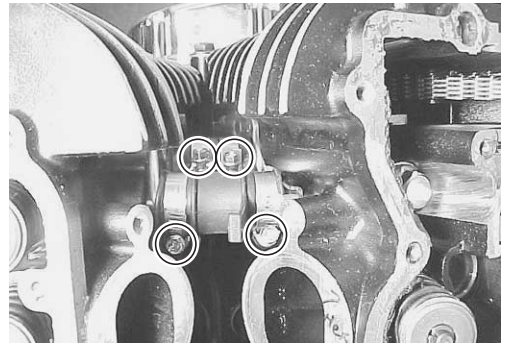
CAMSHAFT

- Flatten the lock washer.
- Remove the cam sprocket and camshaft. (Front and rear cylinders)

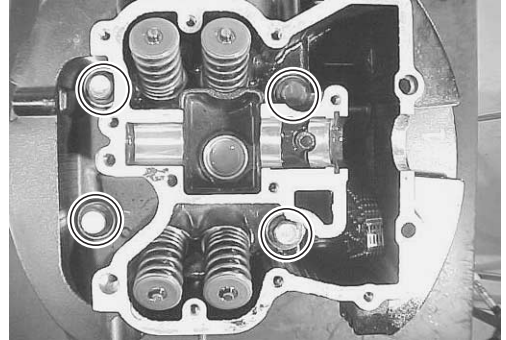


CYLINDER HEAD/CYLINDER

- Loosen the water hose clamp screws.



- Remove the cylinder head bolts. (Front cylinder)

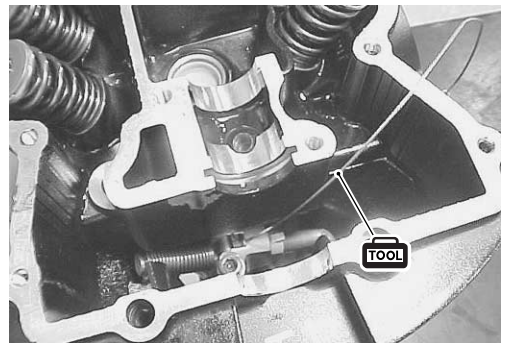


- Remove the cylinder head and cylinder. (Front cylinder)

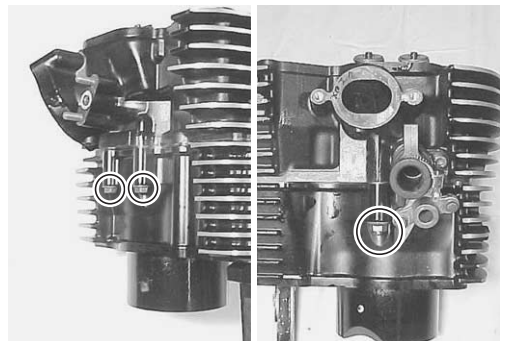


- After unlocking the ratchet, push the cam chain tension adjuster rod fully.
- Insert the special tool between the ratchet and the adjuster body.

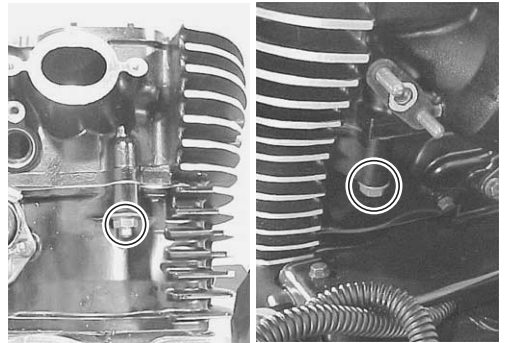
 **09918-53810: Chain tensioner lock tool**



- Separate the cylinder head/cylinder assembly. (Front cylinder)



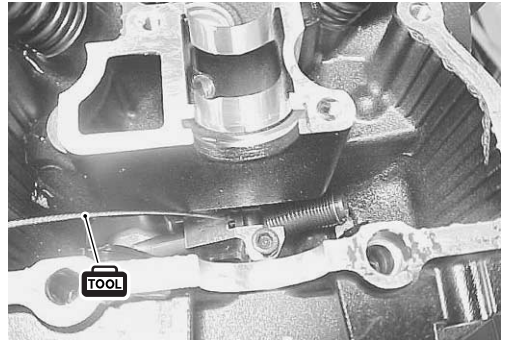
- Remove the cylinder head bolt and nut. (Rear cylinder)



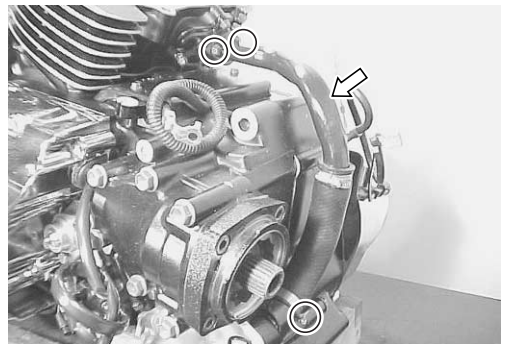
- Push the cam chain tension adjuster rod and insert the special tool.

TOOL 09918-53810: Chain tensioner lock tool

- Remove the cylinder head by removing the cylinder head bolts.



- Remove the water hose and pipe.



- Remove the cylinder. (Rear cylinder)

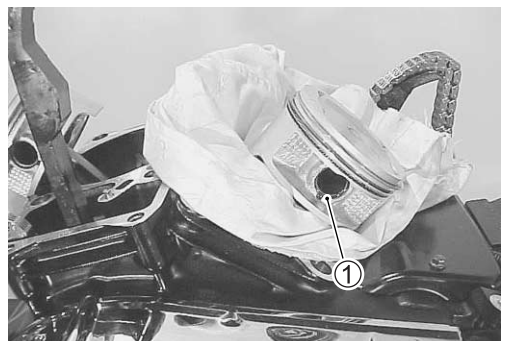


PISTON

- Place a clean rag under the piston to prevent any parts from falling into the crankcase.
- Remove the piston pin circlip ① using long-nose pliers.
- Draw out each piston pin and remove the pistons.

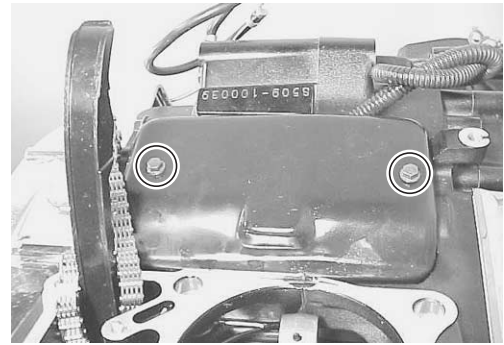
NOTE:

Scribe the cylinder position on the head.

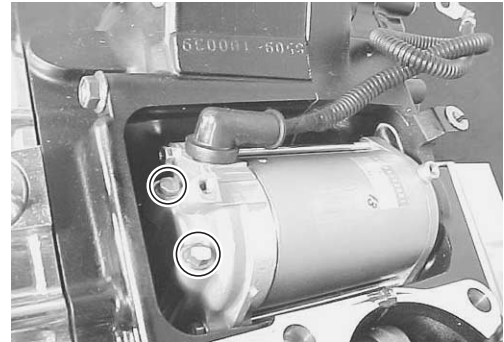


STARTER MOTOR

- Remove the starter motor cover.

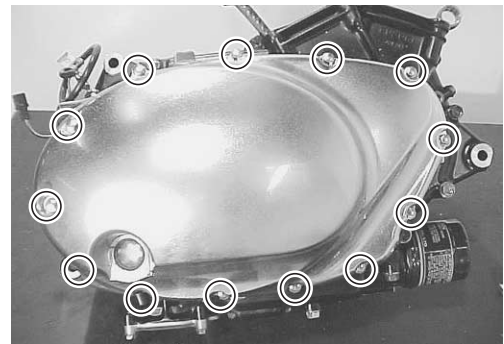


- Remove the starter motor.

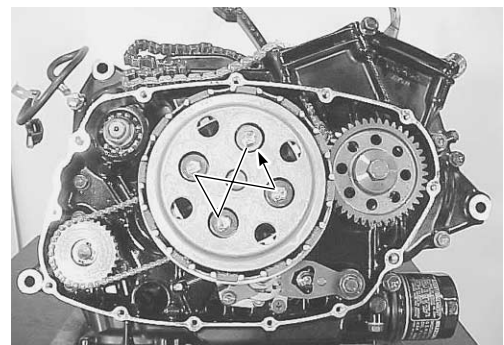


CLUTCH

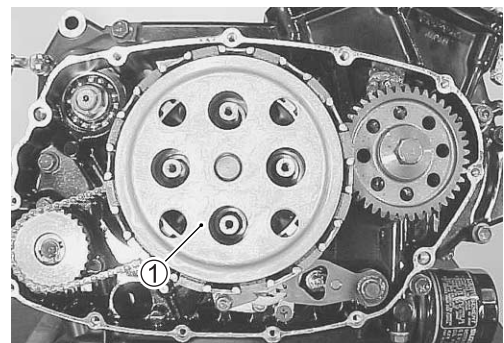
- Remove the clutch cover.



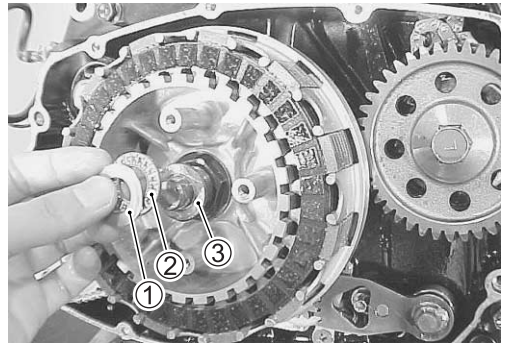
- Remove the clutch spring mounting bolts and springs diagonally.



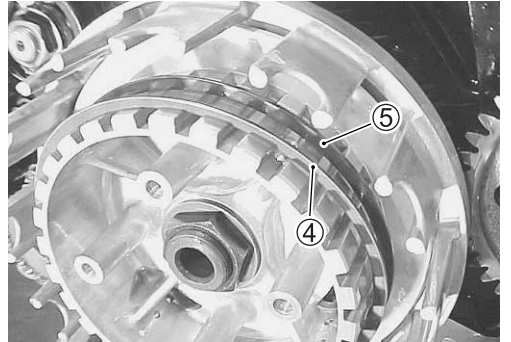
- Remove the pressure plate ①.



- Remove the thrust washer ①, bearing ②, push piece ③ and push rod.
- Remove the clutch drive and driven plates.

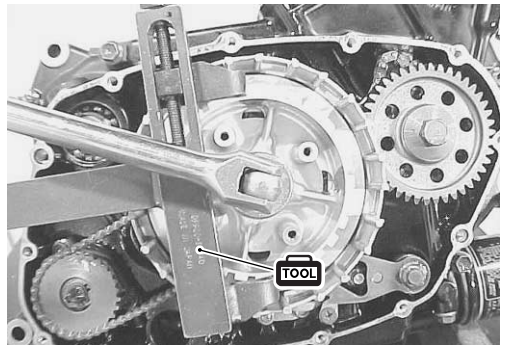


- Remove the spring washer ④ and spring washer seat ⑤.

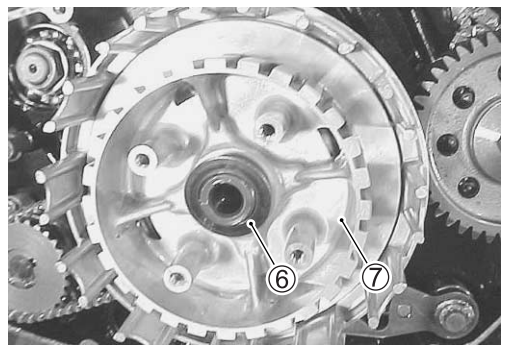


- Remove the clutch sleeve hub nut with the special tool.

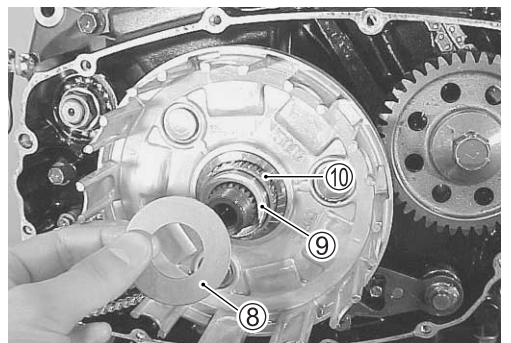
 **09920-53740: Clutch sleeve hub holder**



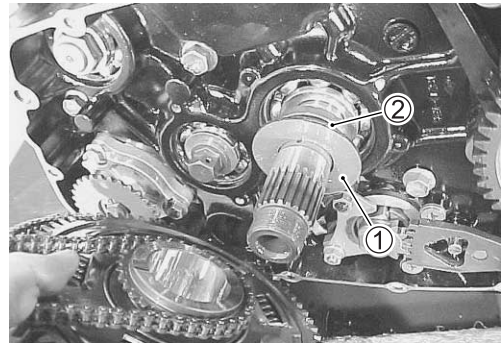
- Remove the washer ⑥ and the clutch sleeve hub ⑦.



- Remove the thrust washer ⑧, spacer ⑨, and needle roller bearing ⑩.




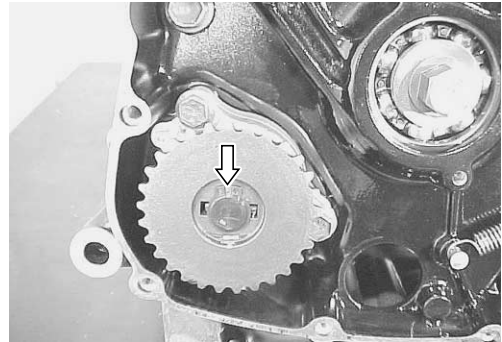
- Remove the primary driven gear assembly and the oil pump drive chain.
- Remove the thrust washer ① and spacer ②.



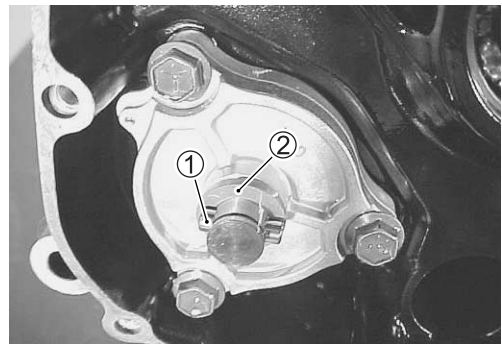
OIL PUMP

- Remove the oil pump by removing the circlip.

 09900-06107: Snap ring pliers

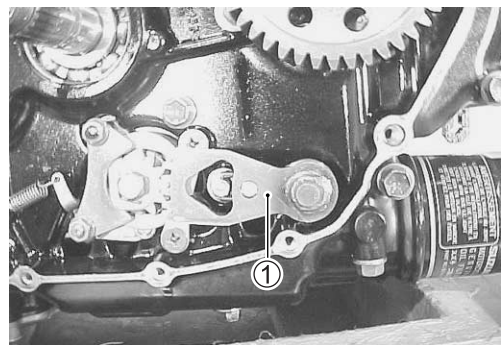


- Remove the pin ① and washer ②.

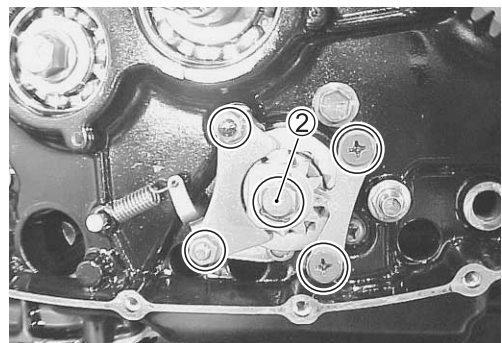


GEARSHIFT

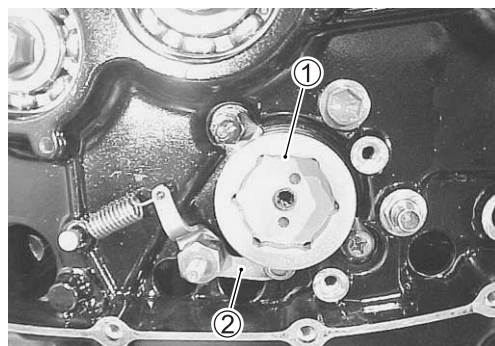
- Draw out the gearshift shaft ①.



- Remove the cam guide and the pawl lifter.
- Remove the cam driven gear assembly by removing the gearshift cam stopper bolt ②.



- Remove the gearshift cam plate ①.
- Remove the gearshift cam stopper ②.



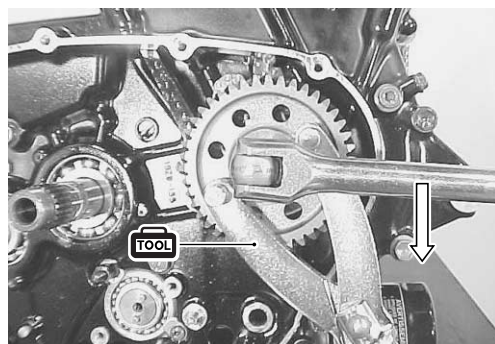
PRIMARY DRIVE GEAR

Remove the primary drive gear by removing the primary drive gear bolt with the special tool.

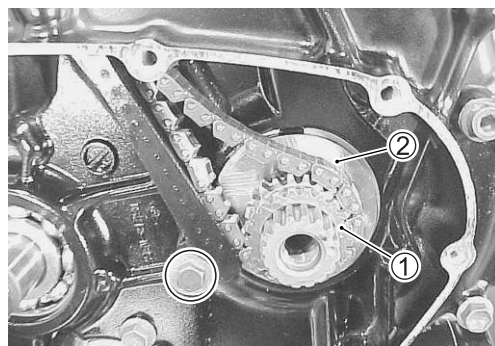
 **09930-40113: Rotor holder**

CAUTION

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



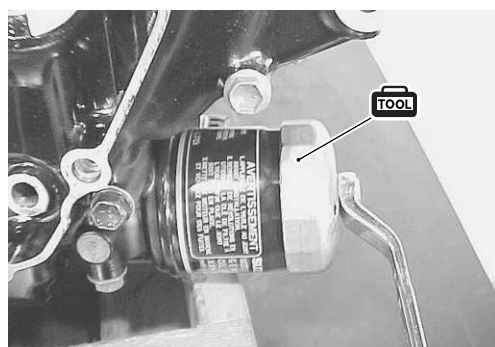
- Remove the cam chain tensioner and the chain.
- Remove the cam chain drive sprocket ① and the thrust washer ②.



OIL FILTER

- Remove the oil filter with the special tool.

 **09915-40610: Oil filter wrench**

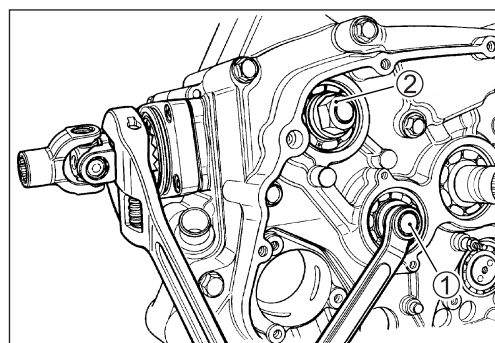


DRIVESHAFT BOLT/SECONDARY DRIVEN GEAR SHAFT NUT

- Install the universal joint on the secondary driven gear shaft.
- While holding the universal joint with an adjustable wrench, remove the driveshaft bolt ① and the secondary drive gear shaft nut ②.

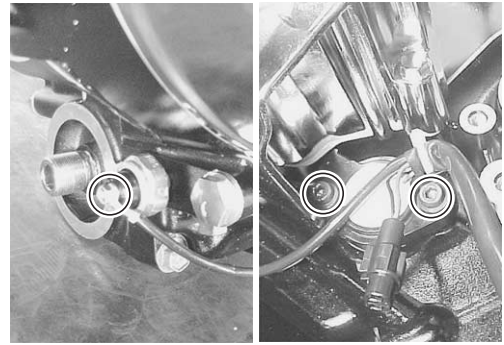
CAUTION

**The driveshaft bolt ① has left-hand thread.
Turning it counter-clockwise may cause damage.**



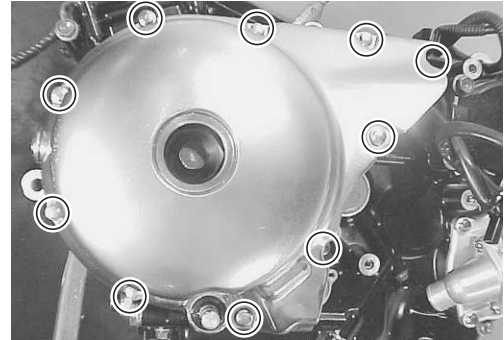
NEUTRAL SWITCH

- Remove the neutral switch assembly.
- Remove the oil pressure switch lead wire.

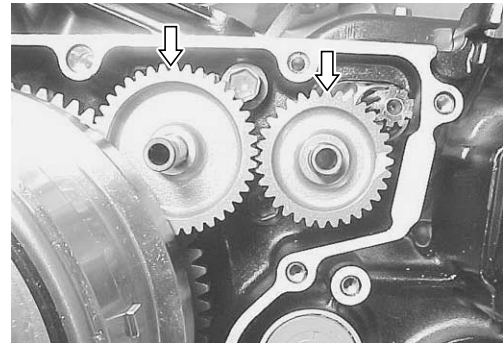


GENERATOR

- Remove the generator cover.



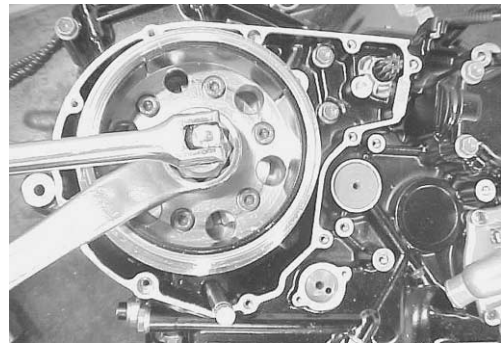
- Remove the starter motor driven gear and the idle gear.



- Loosen the generator rotor bolt.

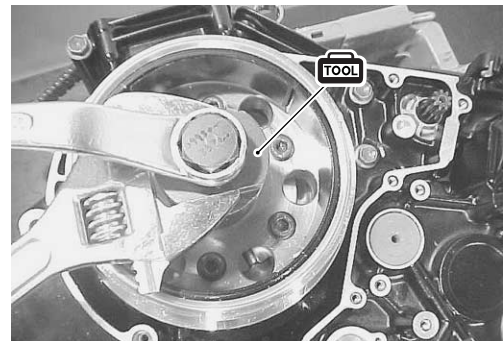
NOTE:

When loosen the rotor bolt, do not remove it. The rotor bolt is used in conjunction with the rotor remover when removing the rotor.

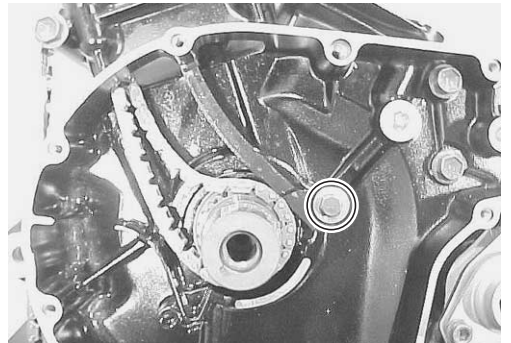


- Remove the generator rotor assembly with the special tool.
- Remove the key.

 **09930-33730: Rotor remover**

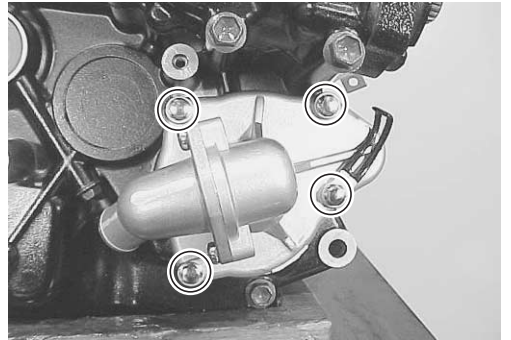


- Remove the cam chain tensioner and the chain.

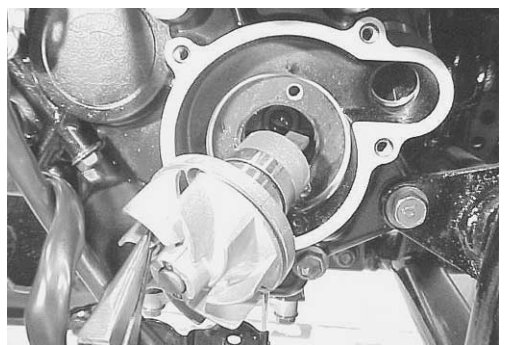
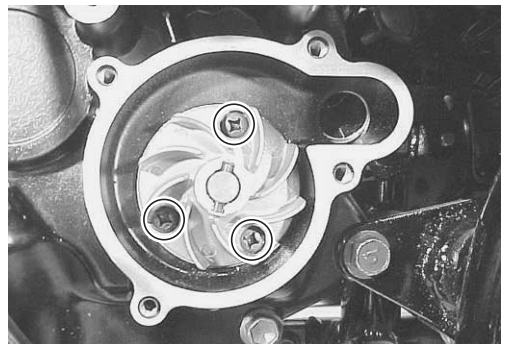


WATER PUMP

- Remove the water pump cover.

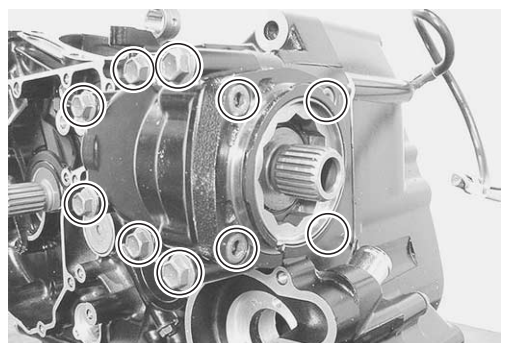


- Remove the water pump assembly.

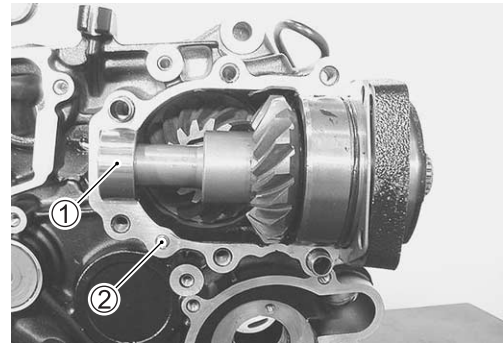


SECONDARY DRIVEN GEAR

- Remove the secondary driven gear housing bolts.
- Remove the secondary driven gear case.

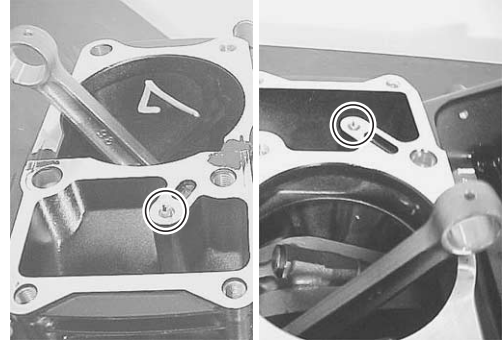


- Remove the secondary driven gear assembly.
- Remove the bearing ①.
- Remove the oil jet ②.



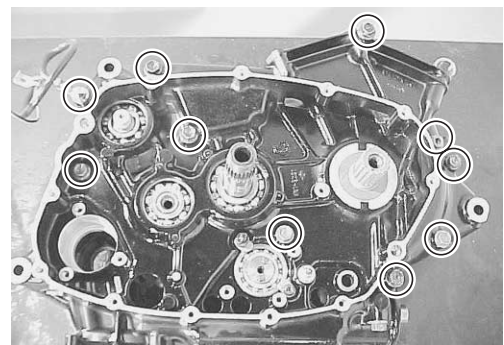
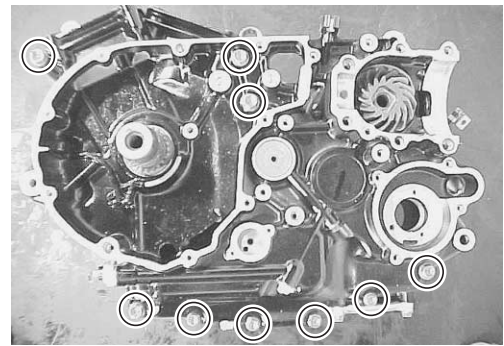
OIL JET

- Remove the oil jets.



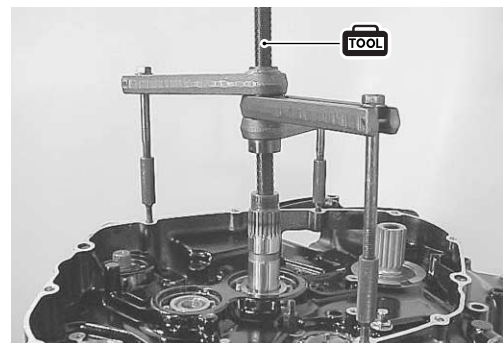
CRANKCASE

- Remove the crankcase bolts.

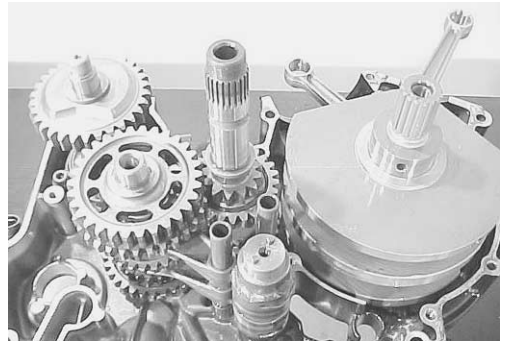


- Separate the crankcase into two parts with the special tool.

 09920-13120: Crankcase separator

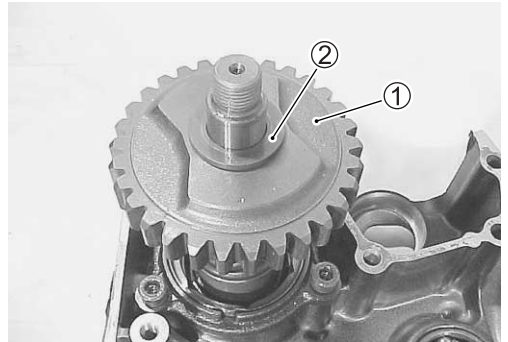


- Remove the crankshaft.
- Remove the gearshift fork shafts and gearshift forks.
- Remove the transmission.

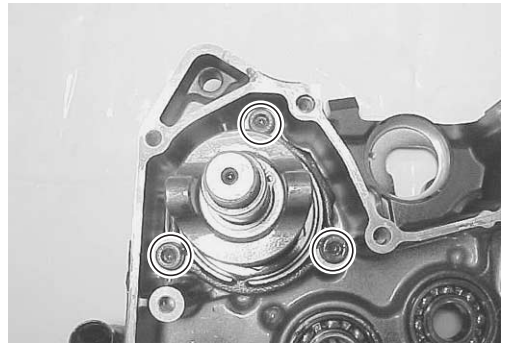


SECONDARY DRIVE BEVEL GEAR

- Remove the over driving gear ① and bush ②.



- Remove the secondary drive bevel gear assembly.



ENGINE COMPONENTS INSPECTION AND SERVICING

CYLINDER HEAD COVER

DISASSEMBLY

⚠ CAUTION

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

- Loosen the rocker arm shafts and pull out the rocker arm shafts.

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 (0.002 in)

TOOL 09900-20803: Thickness gauge

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

ROCKER ARM SHAFT O.D.

Measure diameter of rocker arm shaft.

DATA Rocker arm shaft O. D. (IN & EX)
Standard: 11.966 – 11.984 mm
(0.4711 – 0.4718 in)

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

ROCKER ARM I.D.

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

DATA Rocker arm I.D.
Standard: 12.000 – 12.018 mm
(0.4724 – 0.4731 in)

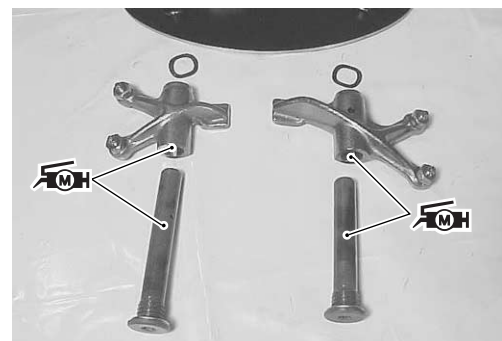
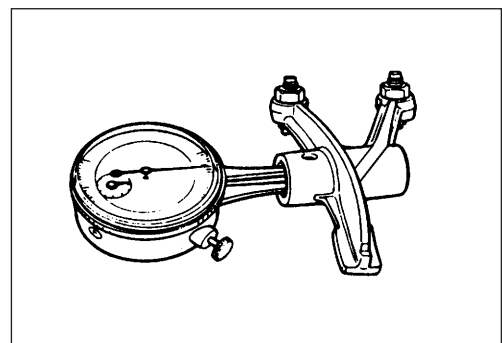
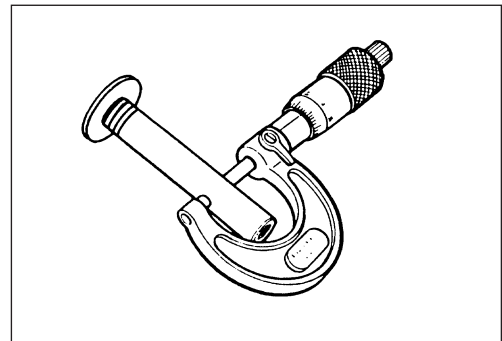
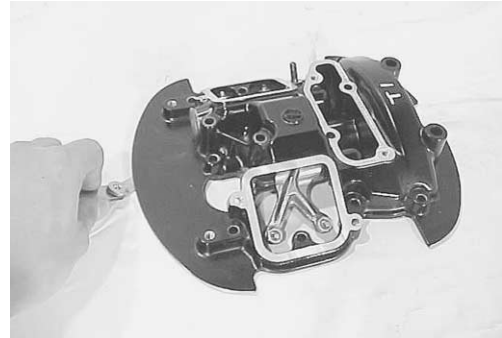
TOOL 09900-20605: Dial calipers

REASSEMBLY

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

MH 99000-25140: SUZUKI MOLY PASTE

T Rocker arm shaft: 27 N·m (2.7 kgf·m, 19.5 lb-ft)



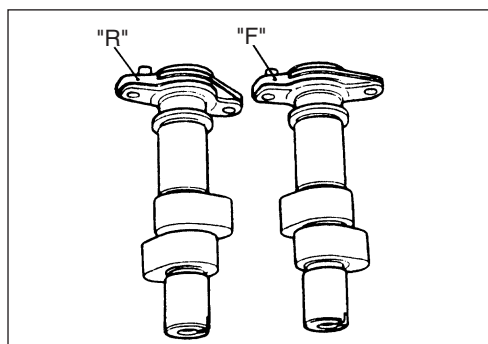
CAMSHAFT

The camshafts should be checked for wear and also for runout of cams and journals if the engine has been noted to produce abnormal noise or vibration or to lack output power. Any of these malconditions could be caused by a worn camshafts.

The camshaft can be distinguished by the embossed-letters, "F" and "R", on the camshaft.

"F" : Front (No. 2) camshaft

"R" : Rear (No. 1) camshaft



CAMSHAFT CAM WEAR

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

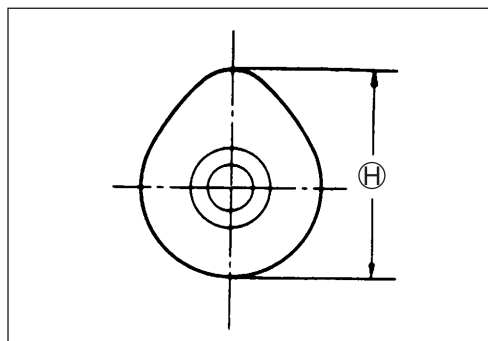
DATA Cam height H

Service Limit: Front (IN) : 35.65 mm (1.404 in)

(EX): 36.62 mm (1.442 in)

Rear (IN) : 35.20 mm (1.386 in)

(EX): 36.28 mm (1.428 in)



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

CAMSHAFT JOURNAL WEAR

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

DATA Camshaft journal oil clearance

Service Limit: 0.150 mm (0.0059 in)

TOOL 09900-22302: Plastigauge

NOTE:

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

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

TOOL Cylinder head cover bolts

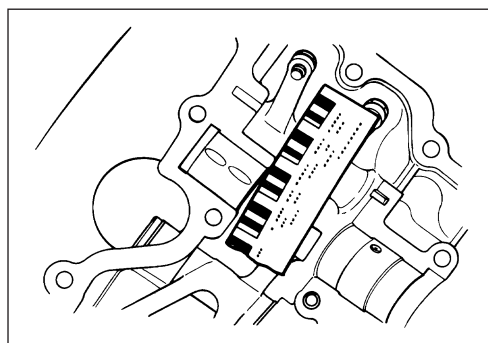
(M6): 10 N·m (1.0 kgf·m, 7.3 lb-ft)

(M8): 24.5 N·m (2.45 kgf·m, 18.0 lb-ft)

NOTE:

Do not rotate the camshafts with the plastigauge in place.

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



If the camshaft journal oil clearance measured exceeds the limit, measure the outside diameter of camshaft.

Replace either the cylinder head set or the camshaft if the clearance is incorrect.

DATA Camshaft journal O.D.

(Sprocket side): 24.959 – 24.980 mm
(0.9826 – 0.9835 in)

(Other side) : 19.959 – 19.980 mm
(0.7858 – 0.7866 in)

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

CAMSHAFT RUNOUT

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

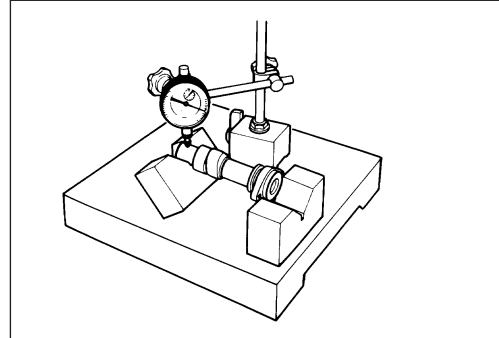
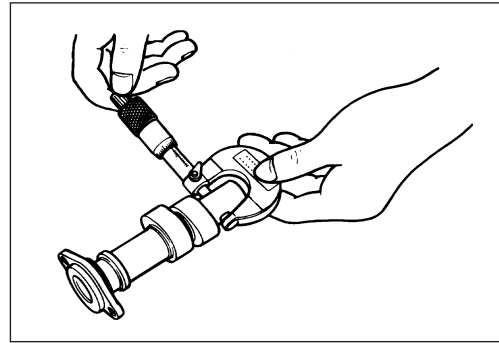
DATA Camshaft runout (IN & EX)

Service Limit: 0.10 mm (0.004 in)

TOOL 09900-20606: Dial gauge (1/100, 10 mm)

09900-20701: Magnetic stand

09900-21304: V-block (100 mm)



CAM CHAIN TENSIONER AND GUIDE

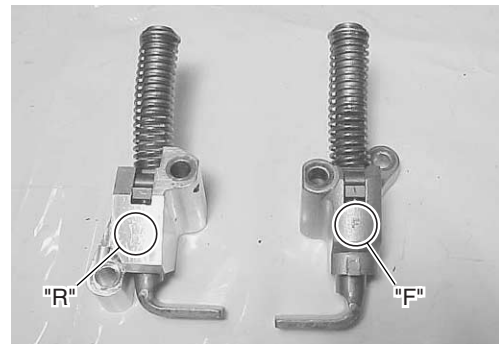
CAM CHAIN TENSIONER

For driving the camshafts, two cam chain tensioners are used on the respective cam drive chains. Unlock the ratchet mechanism, and move the push rod in place to see if it slides smoothly. If any stickiness is noted or ratchet mechanism is faulty, replace the cam chain tensioner assembly with a new one.

The cam chain tensioner can be distinguished by the embossed-letters, "F" and "R", on the cam chain tensioners.

"F": Front (No. 2) cam chain tensioner

"R": Rear (No. 1) cam chain tensioner



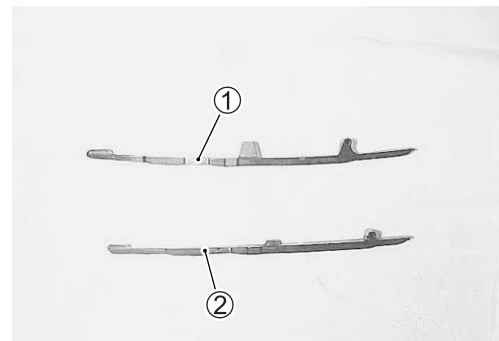
CAM CHAIN GUIDE

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

Two kinds of cam chain guide are used on the respective cam drive chains.

①: For front cylinder

②: For rear cylinder

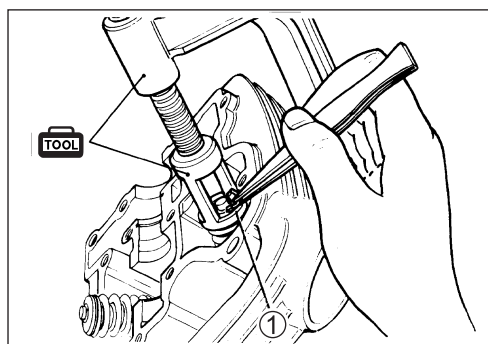


CYLINDER HEAD

VALVE AND VALVE SPRING DISASSEMBLY

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

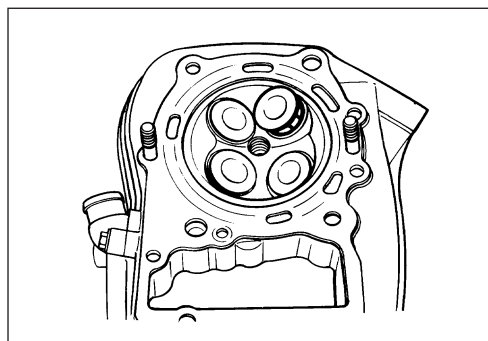
TOOL 09916-14510: Valve spring compressor
 09916-14910: Valve spring compressor attachment
 09916-84511: Tweezers



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

NOTE:

Removal of valves completes ordinary disassembling work. If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing. (3-27)



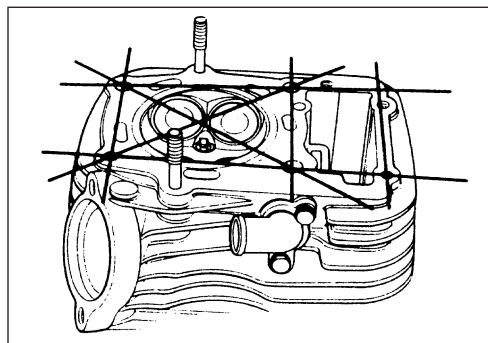
CYLINDER HEAD DISTORTION

- Decarbonize the combustion chambers.

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

DATA Cylinder head distortion
 Service Limit: 0.05 mm (0.002 in)

TOOL 09900-20803: Thickness gauge



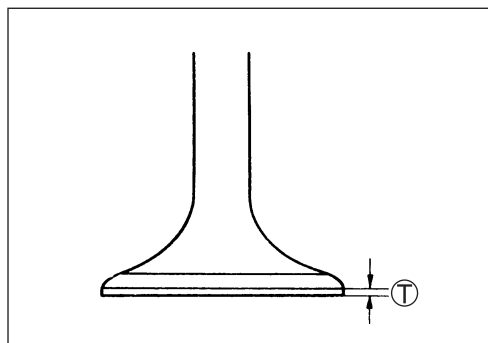
VALVE FACE WEAR

Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.

The thickness ① decreases as the wear of the face advances. Measure the thickness and, if the thickness is found to have been reduced to the limit, replace it.

DATA Valve head thickness
 Service Limit ①: 0.5 mm (0.02 in)

TOOL 09900-20102: Vernier calipers



VALVE STEM RUNOUT

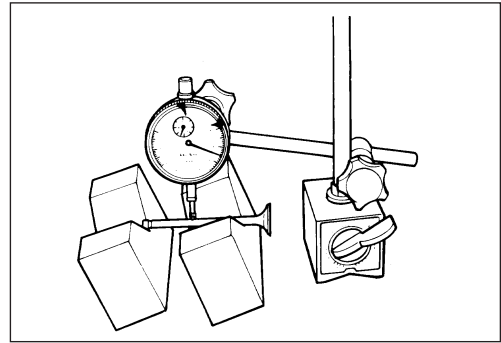
Support the valve with “V” blocks, as shown, and check its runout with a dial gauge.

The valve must be replaced if the runout exceeds the limit.

DATA Valve stem runout

Service Limit: 0.05 mm (0.002 in)

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

**VALVE HEAD RADIAL RUNOUT**

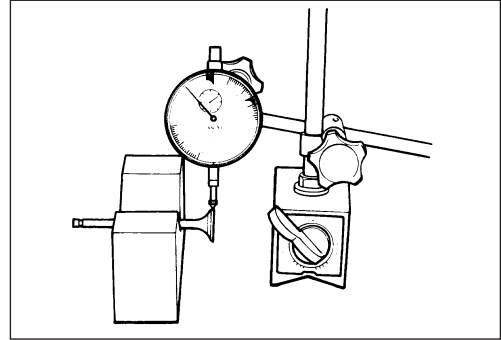
Place the dial gauge at right angles to the valve head face, and measure the valve head radial runout.

If it measures more than limit, replace the valve.

DATA Valve head radial runout

Service Limit: 0.03 mm (0.001 in)

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

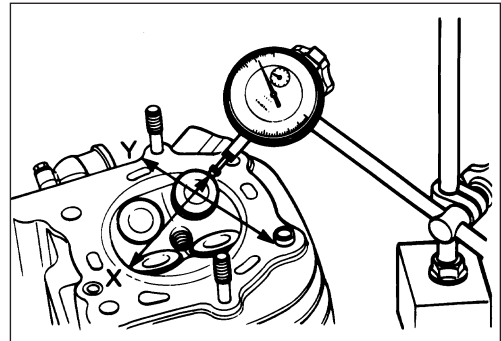
**VALVE STEM DEFLECTION**

Lift the valve about 10 mm (0.39 in) from the valve seat. Measure the valve stem deflection in two directions, “X” and “Y”, perpendicular to each other, by positioning the dial gauge as shown. If the deflection measured exceeds the limit, (see below) then determine whether the valve or the guide should be replaced with a new one.

DATA Valve stem deflection (IN & EX)

Service Limit: 0.35 mm (0.14 in)

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

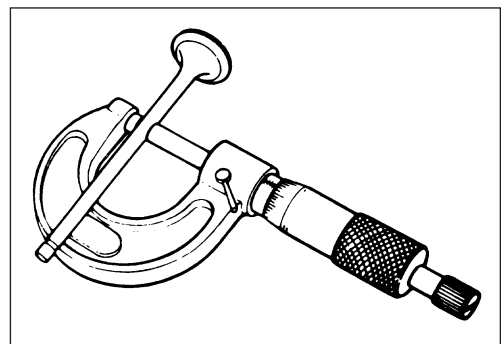
**VALVE STEM WEAR**

If the valve stem is worn down to the limit, as measured with a micrometer, where the clearance is found to be in excess of the limit indicated replace the valve, if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to re-check the clearance.

DATA Valve stem O.D.

Standard (IN) : 5.475 – 5.490 mm (0.2156 – 0.2161 in)
(EX) : 5.455 – 5.470 mm (0.2148 – 0.2154 in)

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



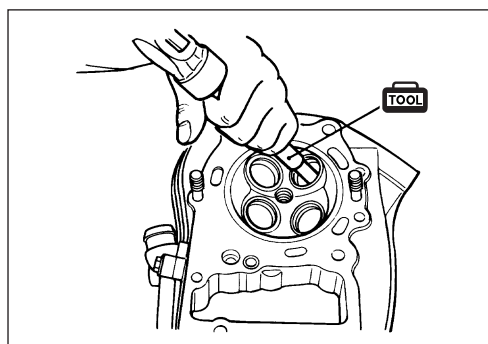
VALVE GUIDE SERVICING

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

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

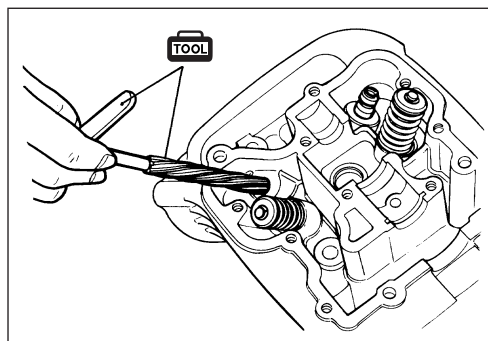
NOTE:

- Discard the removed valve guide subassemblies.*
- Only oversized valve guides are available as replacement parts. (Part No. 11115-38A71)*




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

 **09916-34580: Valve guide hole reamer**
09916-34542: Reamer handle

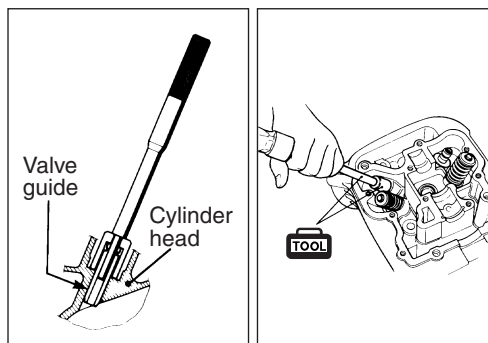


- Oil the stem hole, too, of each valve guide and drive the guide into the guide hole with the valve guide installer and attachment.

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

CAUTION

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

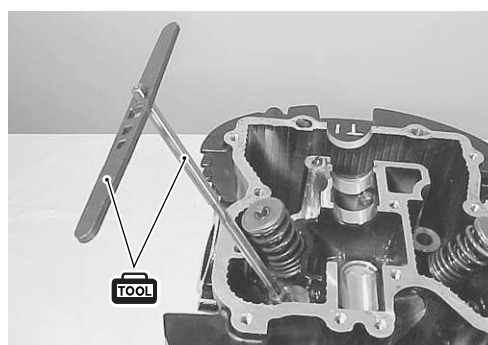


- After fitting all valve guides, re-finish their guiding bores with a 5.5 mm reamer. Be sure to clean and oil the guide after reaming.

 **09916-34550: Valve guide reamer**
09916-34542: Reamer handle

NOTE:

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



VALVE SEAT WIDTH

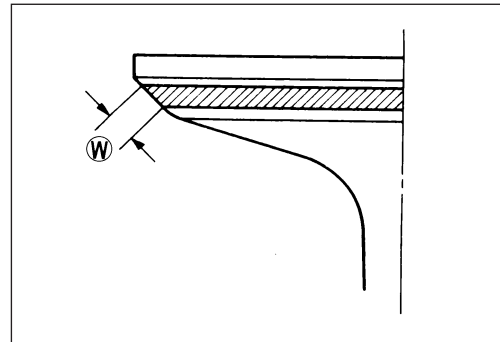
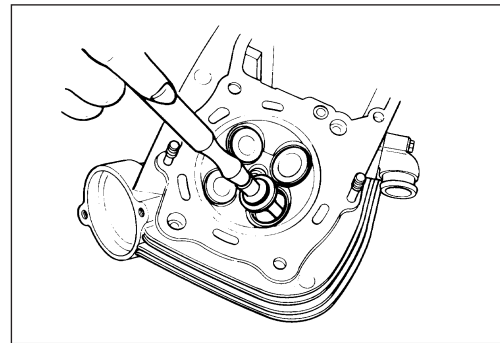
- Coat the valve seat with prussian blue uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.
- The ring-like dye impression left on the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

DATA Valve seat width $\text{\textcircled{W}}$

Standard: 0.9 – 1.1 mm (0.035 – 0.043 in)

TOOL 09916-10911: Valve lapper set

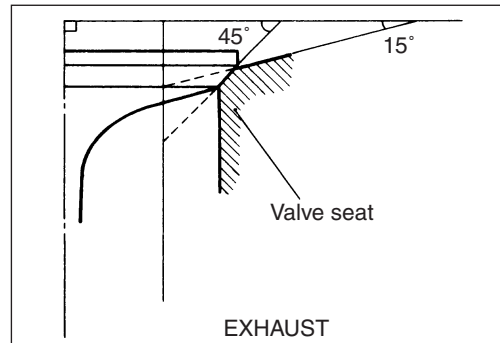
If either requirement is not met, correct the seat by servicing it as follows:



VALVE SEAT SERVICING

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

	INTAKE	EXHAUST
15°		N-121
30°	N-128	
45°	N-128	N-122
60°	N-111	

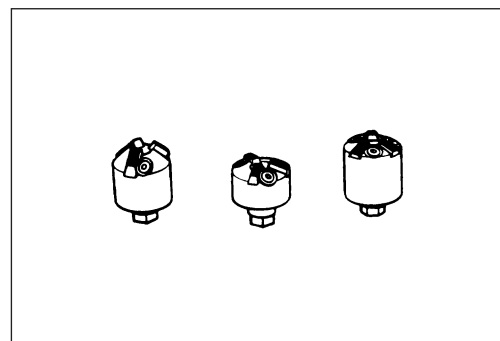
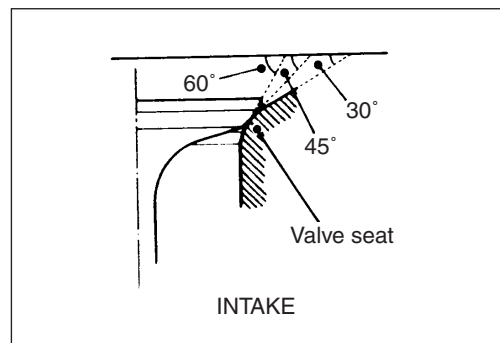


NOTE:

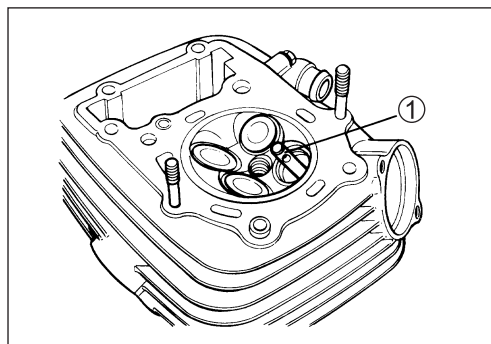
The valve seat contact area must be inspected after each cut.

TOOL 09916-21111: Valve seat cutter set

09916-22430: Valve seat cutter (N-128)

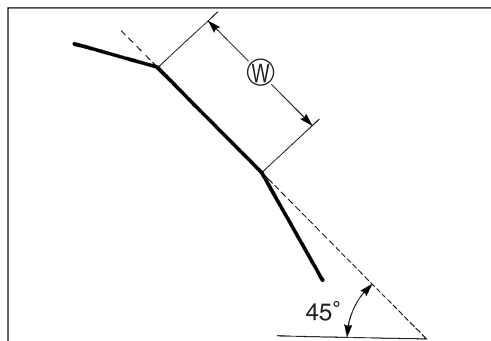


- Insert the solid pilot ① (09916-24450: N-100-5.52) with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T-handle.



INITIAL SEAT CUT

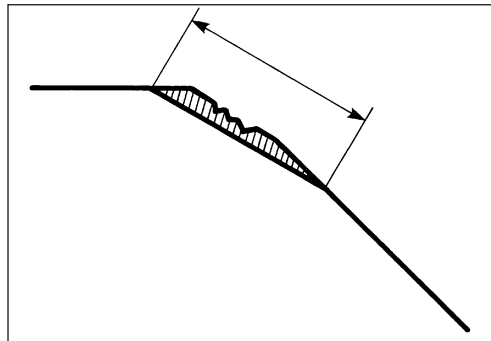
- Using the 45° cutter, descale and clean up the seat. Rotate the cutter one or two turns.
- Measure the valve seat width $\text{\textcircled{W}}$ after every cut.



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

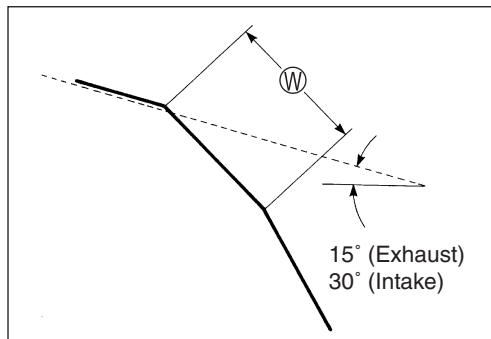
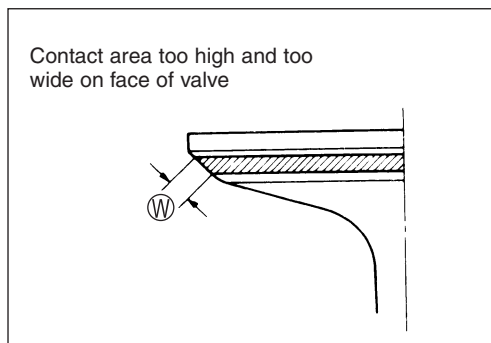
NOTE:

Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the camshaft.



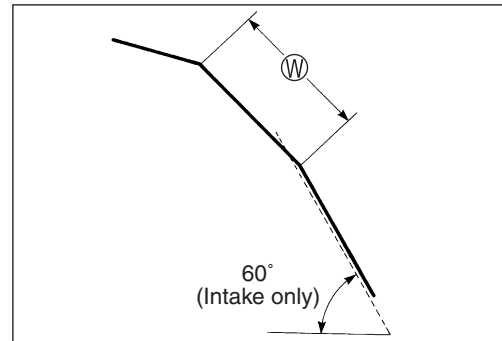
TOP NARROWING CUT

- If the contact area $\text{\textcircled{W}}$ is too high on the valve, or if it is too wide, use the 15° (for the exhaust side) and the 30° (for the intake side) to lower and narrow the contact area.



BOTTOM NARROWING CUT

- If the contact area W is too wide or too low, use the 60° (intake side only) to narrow and raise the contact area.

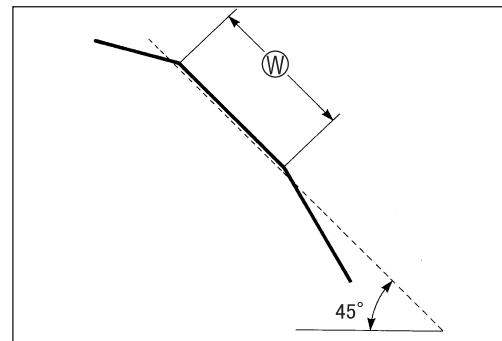
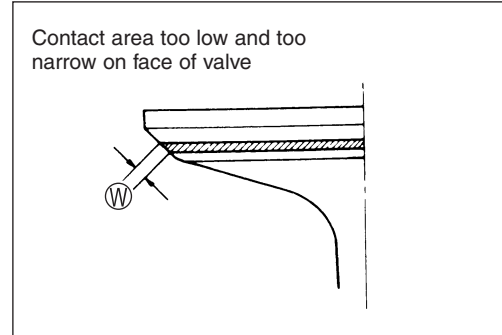


FINAL SEAT CUT

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

NOTE:

After cutting the 15° , 30° and 60° 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.

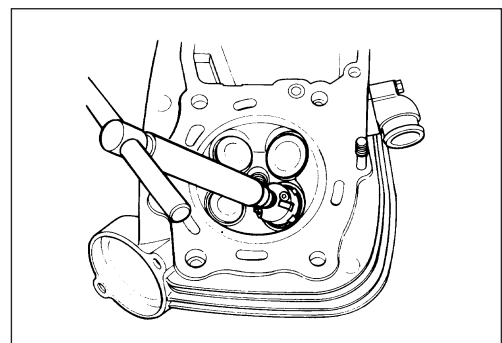
NOTE:

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

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

⚠ WARNING

Always use extreme caution when handling gasoline.

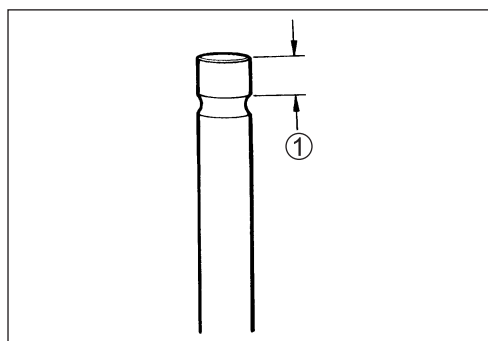


VALVE STEM END CONDITION

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

DATA Valve stem end length

Service Limit: 3.1 mm (0.12 in)

**VALVE SPRING**

The force of the coil spring keeps the valve seat tight. Weakened spring result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism. Check the valve springs for proper strength by measuring their free length and also by the force required to compress them. If the spring length is less than the service limit, or if the force required to compress the spring does not fall within the range specified, replace both the inner and outer springs as a set.

TOOL 09900-20102: Vernier calipers**DATA Valve spring free length (IN & EX)**

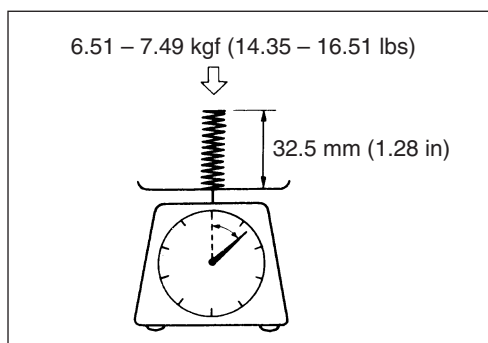
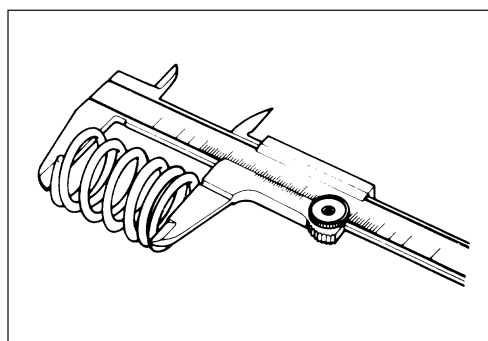
Service Limit INNER : 38.3 mm (1.51 in)

OUTER: 40.1 mm (1.58 in)

DATA Valve spring tension (IN & EX)

**Standard INNER : 6.51 – 7.49 kgf/32.5 mm
(14.35 – 16.51 lbs/1.28 in)**

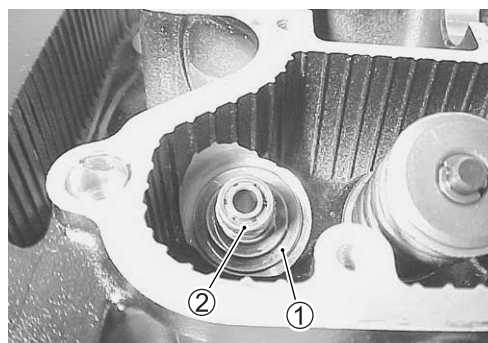
**OUTER : 12.09 – 13.91 kgf/36.0 mm
(26.65 – 30.67 lbs/1.42 in)**

**VALVE AND VALVE SPRING REASSEMBLY**

- Fit the valve spring lower seats ①.
- Oil each oil seal, and press-fit the oil seal ② into position with the valve guide installer.

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

Do not reuse the oil seal.



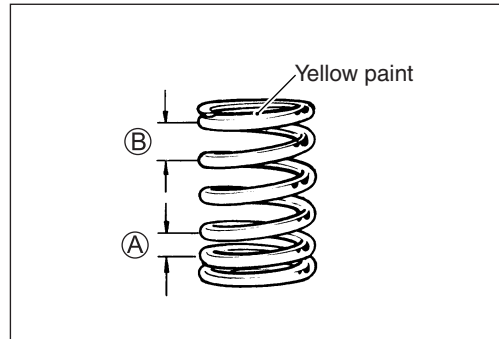
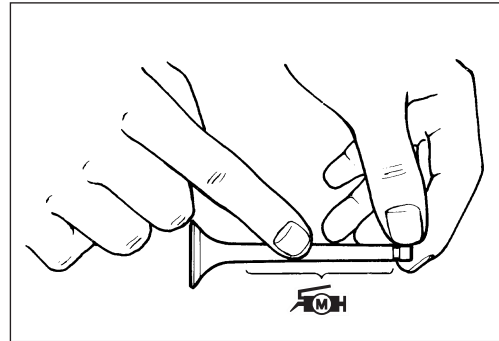
- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

 99000-25140: SUZUKI MOLY PASTE


▲ CAUTION

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

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

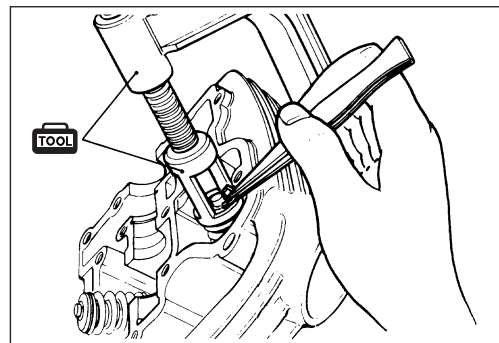
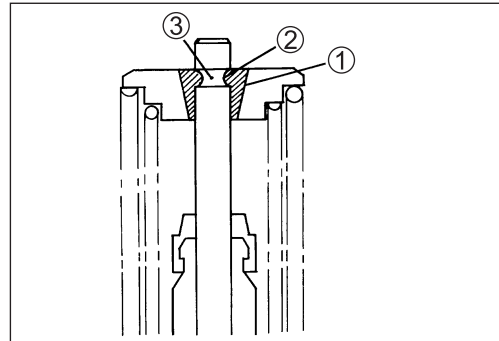


- Put on the valve spring retainer using the valve spring compressor, press down the spring, fit the two cotter halves to the stem end, and release the compressor to allow the cotter (1) to wedge in between seat and stem. Be sure that the rounded lip (2) of the cotter fits snugly into the groove (3)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

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

▲ CAUTION

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



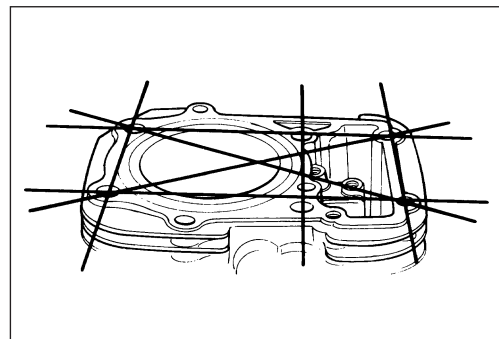
CYLINDER

CYLINDER DISTORTION

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

 **Cylinder distortion**
 Service Limit: 0.05 mm (0.002 in)

 09900-20803: Thickness gauge



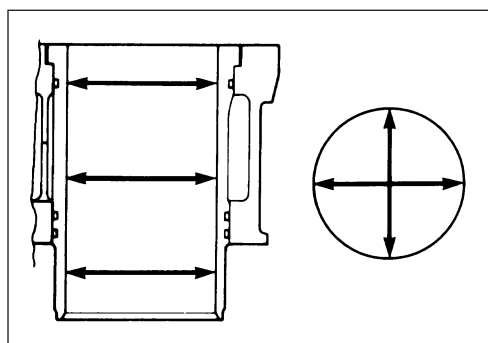
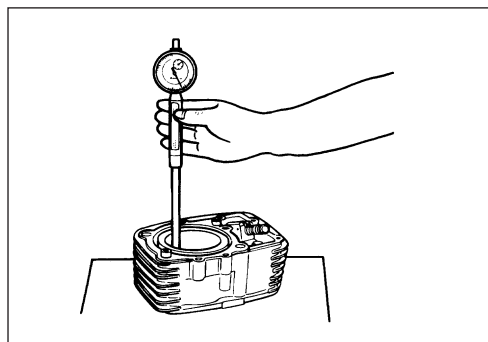
CYLINDER BORE

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

DATA Cylinder bore

Service Limit: 83.085 mm (3.2711 in)

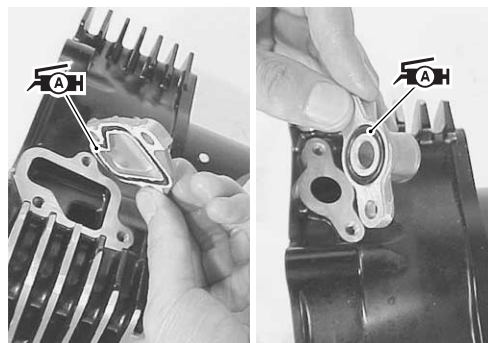
TOOL 09900-20508: Cylinder gauge set



NOTE:

When installing the water union to the cylinder, apply grease to the new O-rings.

TOOL 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
 99000-25010: SUZUKI SUPER GREASE "A"
 (For the others)



PISTON

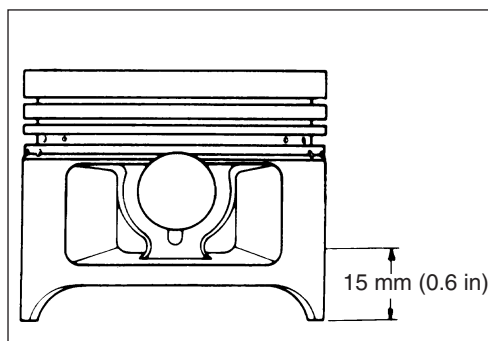
PISTON DIAMETER

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

DATA Piston diameter

Service Limit: 82.880 mm (3.2630 in)

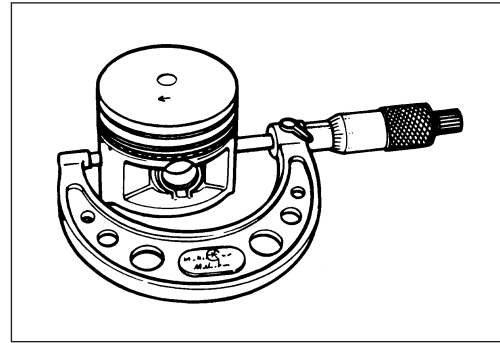
TOOL 09900-20204: Micrometer (75 – 100 mm)



PISTON-TO-CYLINDER CLEARANCE

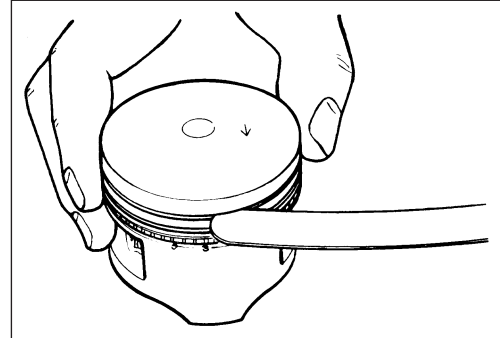
As a result of the aforesaid measurement, if the piston to cylinder clearance exceeds the following limit, overhaul the cylinder and use an oversize piston, or replace both cylinder and piston.

- DATA** Piston to cylinder clearance
 Service Limit: 0.12 mm (0.0047 in)
 Piston oversize: 0.5, 1.0 mm

**PISTON RING TO GROOVE CLEARANCE**

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

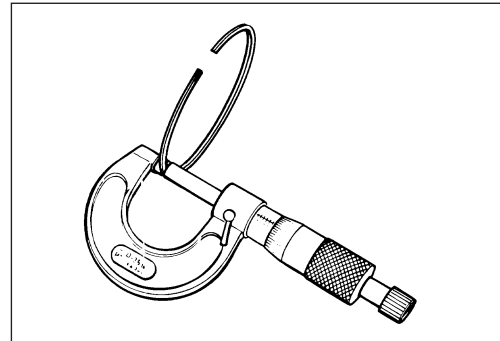
- DATA** Piston ring-groove clearance
 Service Limit (1st) : 0.18 mm (0.0071 in)
 (2nd): 0.15 mm (0.0059 in)



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

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

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

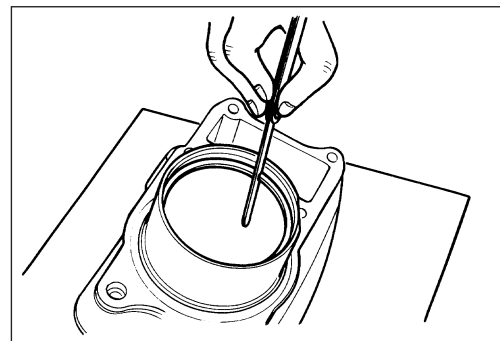
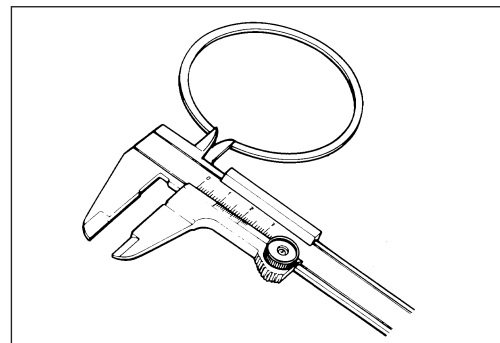
**PISTON RING FREE END GAP AND END GAP**

Before installing piston rings, measure the free end gap of each ring using vernier calipers. Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge. If any ring has an excess end gap, replace the ring.

- DATA** Piston ring free end gap
 Service Limit (1st) : 7.7 mm (0.30 in)
 (2nd): 9.4 mm (0.37 in)

- DATA** Piston ring end gap
 Service Limit(1st) : 0.70 mm (0.028 in)
 (2nd): 0.70 mm (0.028 in)

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



Oversize piston ring

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

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

Oversize oil ring

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

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

Oversize side rail

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

PISTON PIN AND PIN BORE

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

DATA Piston pin bore I.D.

Service Limit: 20.030 mm (0.7886 in)

TOOL 09900-20602: Dial gauge (1/1000 mm, 1 mm)

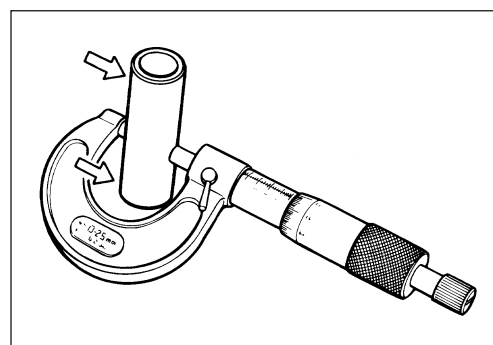
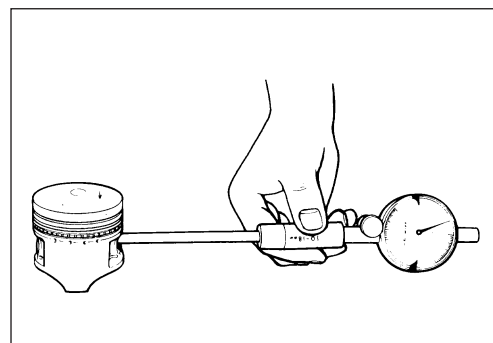
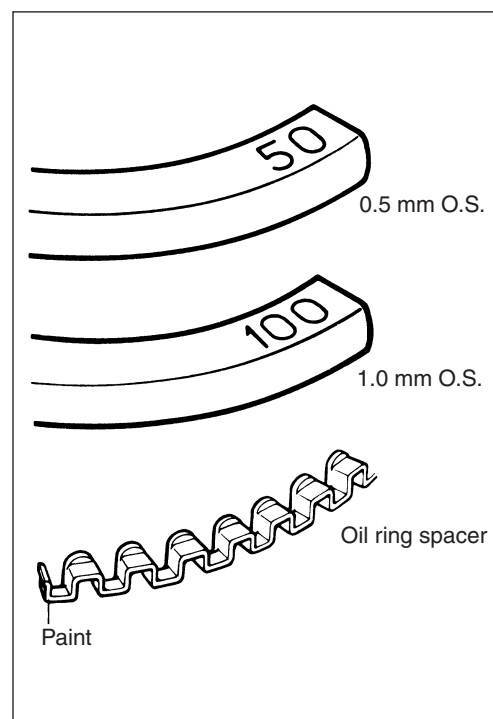
09900-22403: Small bore gauge (18 – 35 mm)

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

DATA Piston pin O.D.

Service Limit: 19.980 mm (0.7866 in)

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



PISTON RING REASSEMBLY

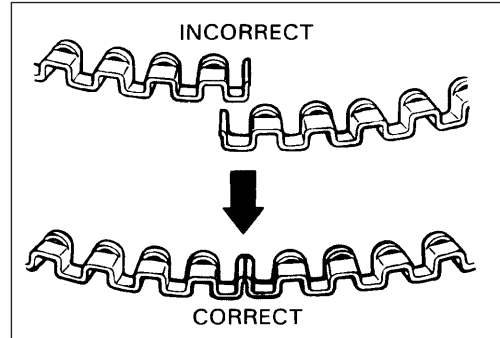
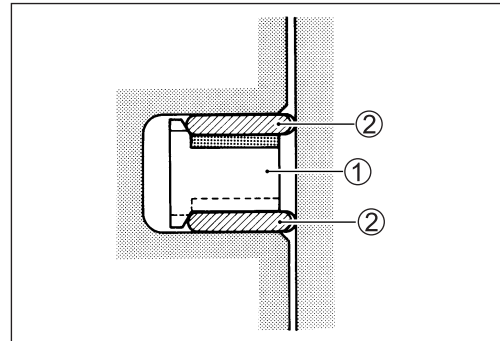
- Install the piston rings in the order of oil ring, 2nd ring and 1st ring.
- The first member to go into the oil ring groove is a spacer ①. After placing the spacer, fit the two side rails ②.

NOTE:

Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.

▲ CAUTION

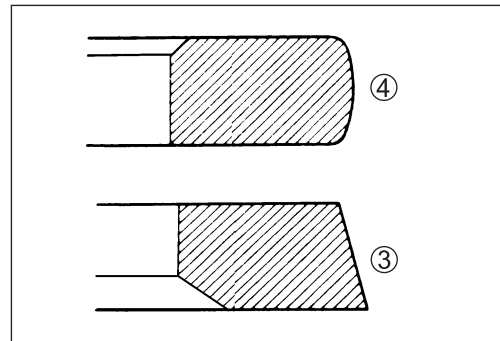
When installing the spacer, be careful not to allow its two ends to overlap in the groove.



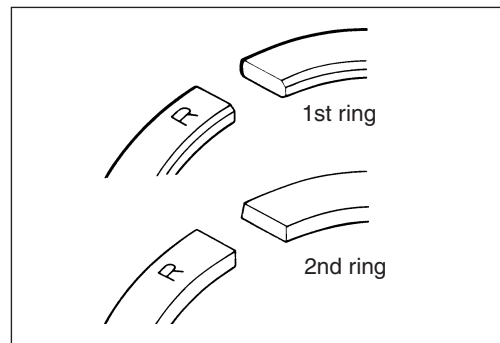
- Install the 2nd ring ③ and the 1st ring ④.

NOTE:

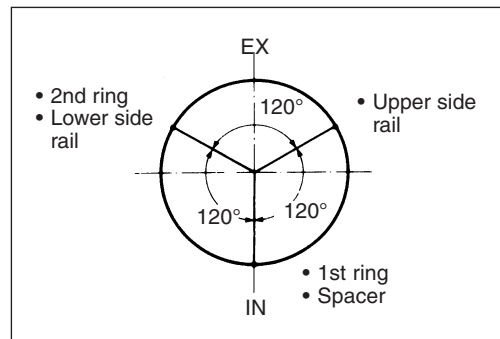
1st ring and 2nd ring differ in shape.



- 1st ring and 2nd ring have letter “R” marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.



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



CONROD/CRANKSHAFT

CONROD SMALL END I.D.

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

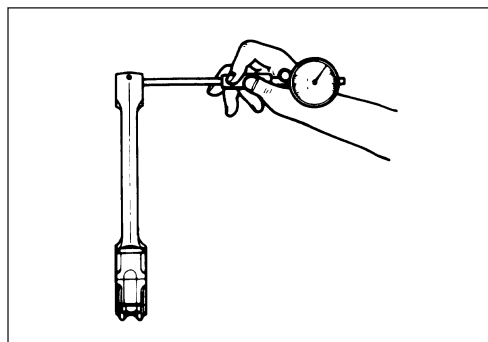
DATA Conrod small end I.D.

Service Limit: 20.040 mm (0.7890 in)

TOOL 09900-20602: Dial gauge (1/1000 mm, 1 mm)

09900-22403: Small bore gauge (18 – 35 mm)

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



CONROD BIG END SIDE CLEARANCE

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

DATA Conrod big end side clearance

Service Limit: 0.30 mm (0.012 in)

TOOL 09900-20803: Thickness gauge

DATA Conrod big end width

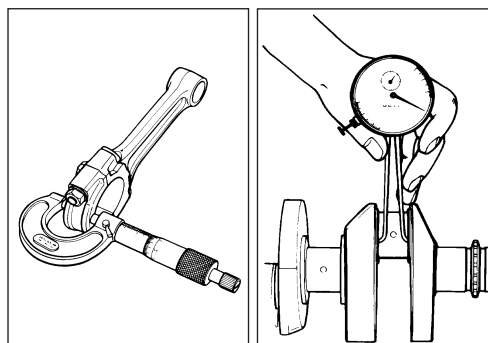
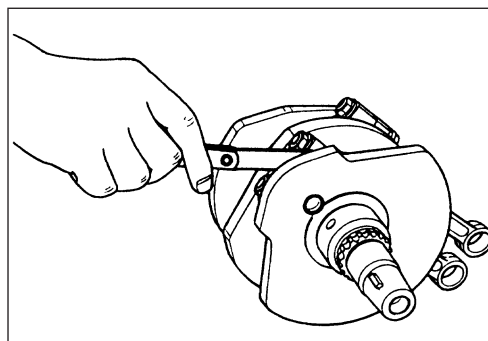
Standard: 21.95 – 22.00 mm (0.864 – 0.866 in)

DATA Crank pin width

Standard: 22.10 – 22.15 mm (0.870 – 0.872 in)

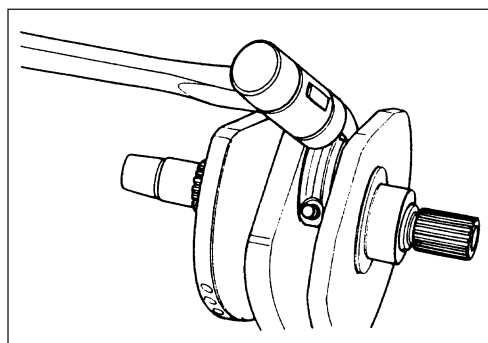
TOOL 09900-20205: Micrometer (0 – 25 mm)

09900-20605: Dial calipers (10 – 34 mm)



CONROD-CRANK PIN BEARING SELECTION

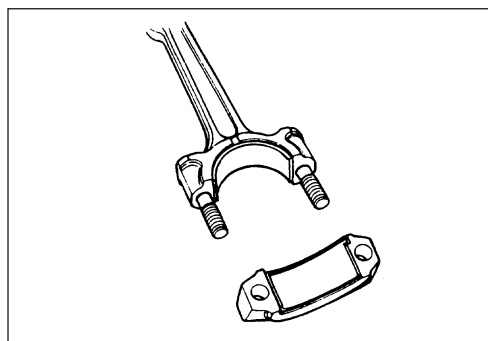
- Loosen the bearing cap nuts and tap the bolt end lightly with plastic hammer to remove the bearing cap.



- Remove the rods and mark them to identify the cylinder position.
- Inspect the bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with a specified set of bearings.

NOTE:

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



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

NOTE:

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

Conrod nut

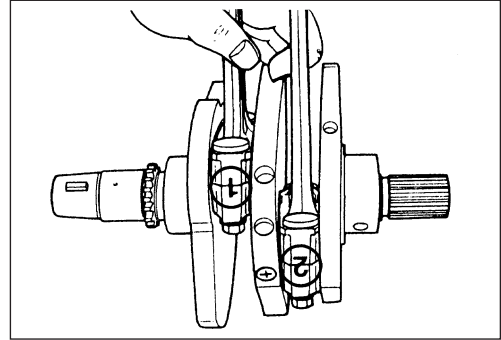
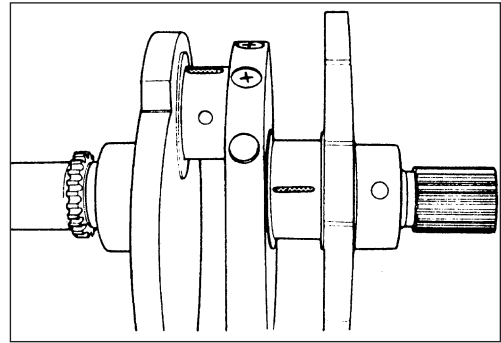
Initial tightening torque : 25 N·m (2.5 kgf·m, 18.0 lb-ft)

Final tightening torque : 51 N·m (5.1 kgf·m, 37.0 lb-ft)

TOOL 09900-22302: Plastigauge

NOTE:

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



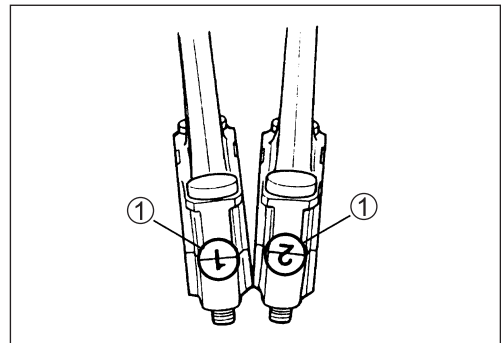
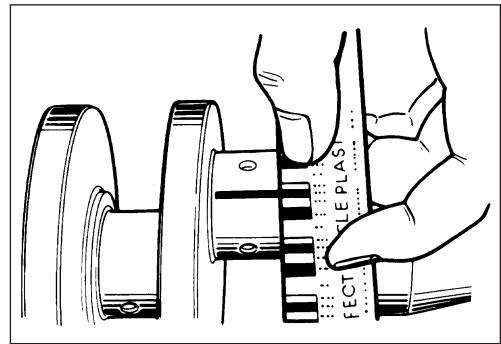
- Remove the caps and measure the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

DATA Conrod big end oil clearance

Standard: 0.024 – 0.042 mm (0.0009 – 0.0017 in)

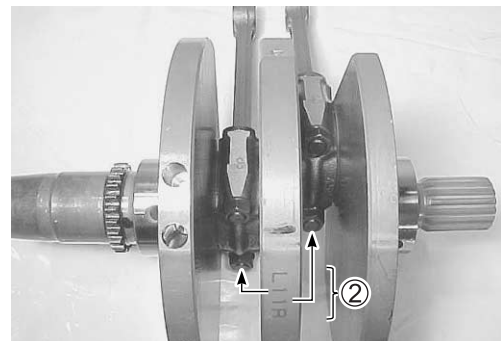
Service Limit: 0.080 mm (0.0031 in)

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



Bearing selection table

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



Conrod I.D. specification

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

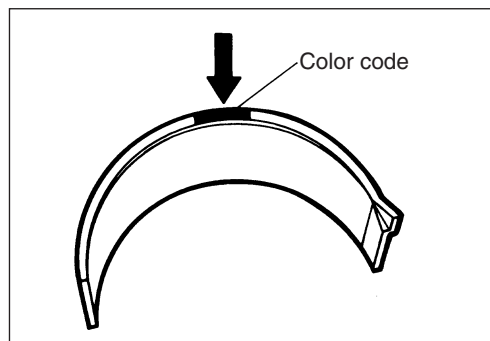
Crank pin O.D. specification

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

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

Bearing thickness specification

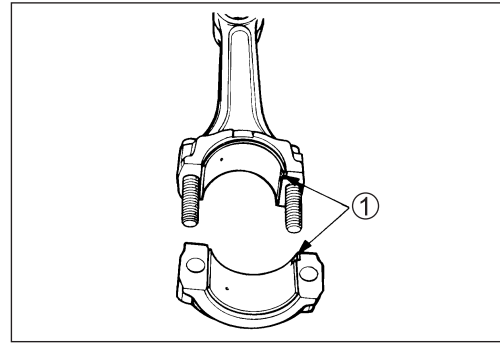
Color (Part No.)	Thickness
Green (12164-38E00-0A0)	1.485 – 1.488 mm (0.0585 – 0.0586 in)
Black (12164-38E00-0B0)	1.488 – 1.491 mm (0.0586 – 0.0587 in)
Brown (12164-38E00-0C0)	1.491 – 1.494 mm (0.0587 – 0.0588 in)
Yellow (12164-38E00-0D0)	1.494 – 1.497 mm (0.0588 – 0.0589 in)
Blue (12164-38E00-0E0)	1.497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

**▲ CAUTION**

The bearings should be replaced as a set.

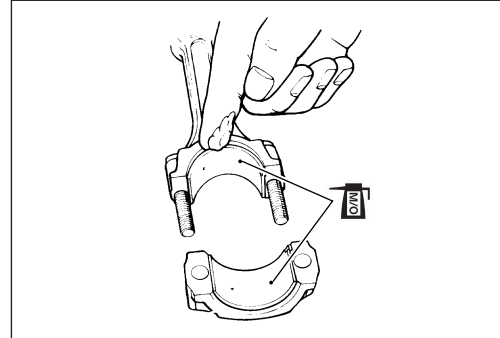
CONROD/CRANK PIN BEARING ASSEMBLY

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



- Apply molybdenum oil solution to the crank pin and bearing surface.

 99000-25140: SUZUKI MOLY PASTE



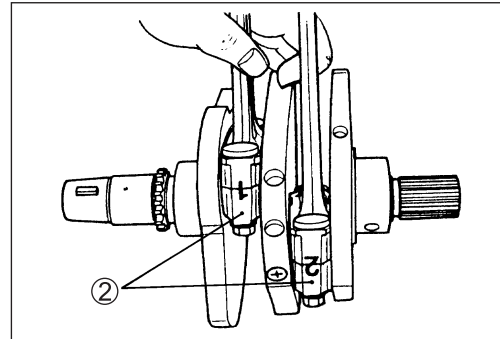
- When mounting the conrod on the crankshaft, make sure that I.D. code ② of the conrod faces rearward.
- Tighten the conrod fitting nuts with specified torque after applying engine oil to the nut thread.

Conrod nut

Initial tightening torque: 25 N·m (2.5 kgf·m, 18.0 lb-ft)

Final tightening torque: 51 N·m (5.1 kgf·m, 37.0 lb-ft)

- Check the conrod movement for smooth turning.



CRANKCASE/CRANKSHAFT BEARING SELECTION

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

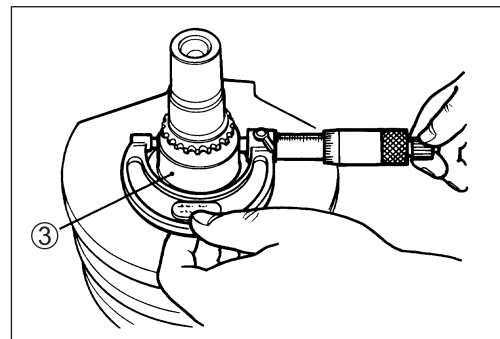


- Measure the crankshaft journal O.D. ③ by using the special tool.

 **Crankshaft journal O.D. ③**

Standard: 47.965 – 47.980 mm (1.8884 – 1.8890 in)

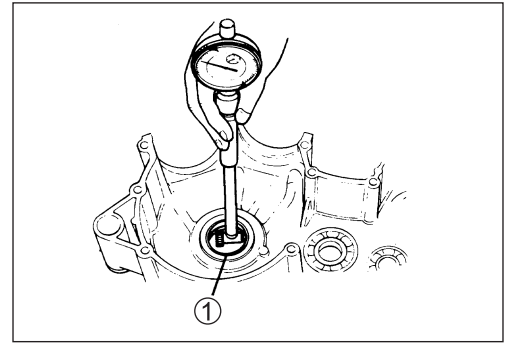
 09900-20202: Micrometer (25 – 50 mm)



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

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

TOOL 09900-20508: Cylinder gauge set



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



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



▲ CAUTION

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

CRANKSHAFT THRUST CLEARANCE

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

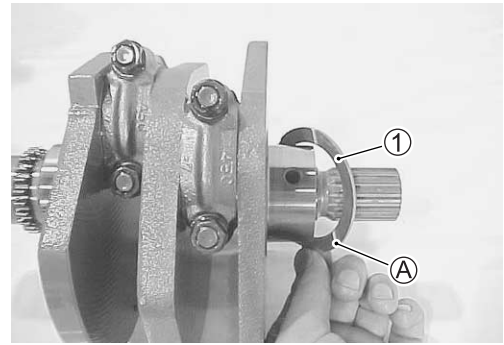
NOTE:

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

- Place the thrust washer, camshaft drive sprocket and primary drive gear on the right end of the crankshaft and tighten primary drive gear bolt to the specified torque. (☞ 3-59)

 **09930-40113: Rotor holder**

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



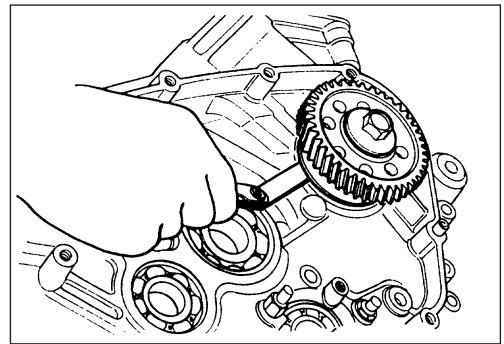
- Use a thickness gauge to measure the thrust clearance between right crankcase and thrust washer.

 **DATA Crankshaft thrust clearance**

Standard: 0.05 – 0.10 mm (0.002 – 0.004 in)

 **09900-20803: Thickness gauge**

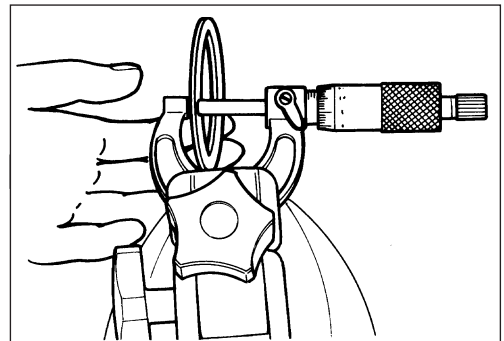
If the thrust clearance exceeds the standard range, adjust the thrust clearance by the following procedures:



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

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

Checking to make sure it is within standard



Unit: mm (in)

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

CLUTCH

CLUTCH DRIVE AND DRIVEN PLATES

NOTE:

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

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

DATA Clutch drive plate thickness

Standard (No.1): 2.92 – 3.08 mm (0.115 – 0.121 in)
(No.2): 3.42 – 3.58 mm (0.135 – 0.141 in)

TOOL 09900-20102: Vernier calipers

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

DATA Clutch drive plate claw width (No. 1 & No. 2)

Service Limit: 15.1 mm (0.594 in)

TOOL 09900-20102: Vernier calipers

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

Replace driven plates which exceed the limit.

DATA Clutch driven plate distortion

Service Limit: 0.1 mm (0.004 in)

TOOL 09900-20803: Thickness gauge

CLUTCH SPRING FREE LENGTH

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

DATA Clutch spring free length

Service Limit: 46.8 mm (1.84 in)

TOOL 09900-20102: Vernier calipers

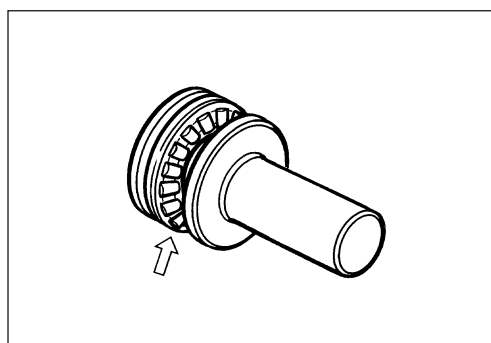
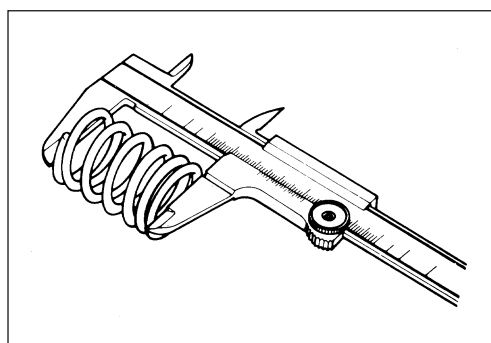
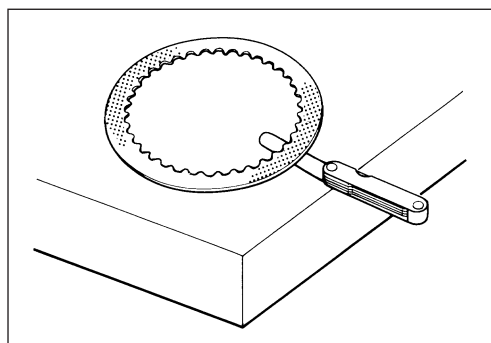
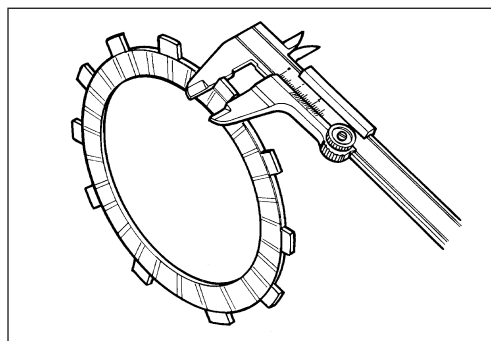
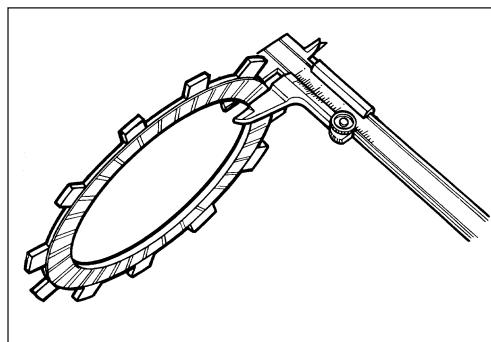
CLUTCH BEARING

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

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

NOTE:

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

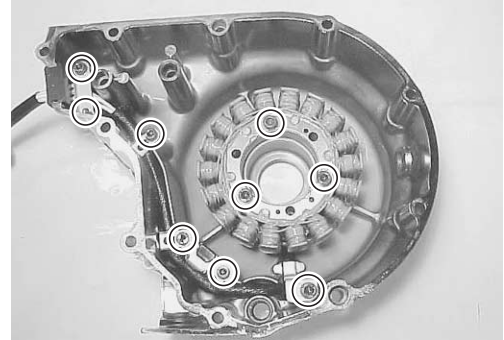


GENERATOR/SIGNAL GENERATOR/ STARTER CLUTCH

GENERATOR STATOR AND SIGNAL GENERATOR STATOR INSPECTION 8-8, 19, 20

GENERATOR STATOR AND SIGNAL GENERATOR STATOR SERVICING

When replacing the generator stator or signal generator stator, route the wire properly.



STARTER CLUTCH INSPECTION

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

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



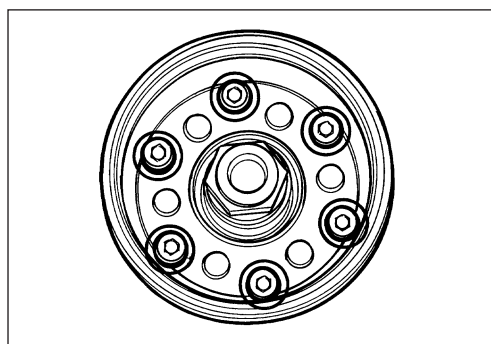
STARTER DRIVEN GEAR BEARING INSPECTION

Inspect the starter driven gear bearing for any damages.

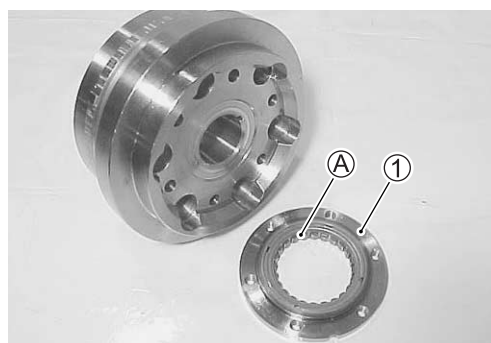


STARTER CLUTCH SERVICING

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



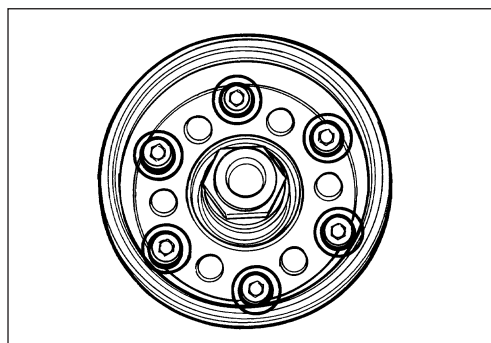
- When fitting the one way clutch to the guide ①, position flange side A of one way clutch to the rotor side.



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

 **1303 99000-32030: THREAD LOCK SUPER “1303”**

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



OIL PUMP

- Rotate the oil pump by hand and check that it moves smoothly.
- If it does not move smoothly, replace the oil pump assembly.

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



TRANSMISSION

DISASSEMBLY

- Disassemble the transmission gears as shown in the illustration.

① Driveshaft bolt
 ② Over driving gear
 ③ 1st driven gear
 ④ 4th driven gear
 ⑤ 3rd driven gear
 ⑥ Driveshaft
 ⑦ 5th driven gear
 ⑧ 2nd driven gear
 ⑨ Countershaft/1st drive gear
 ⑩ 4th drive gear
 ⑪ 3rd drive gear
 ⑫ 5th drive gear
 ⑬ 2nd drive gear

FWD

ITEM	N·m	kgf·m	lb·ft
①	65	6.5	47.0

REASSEMBLY

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

NOTE:

Always use new circlips.

NOTE:

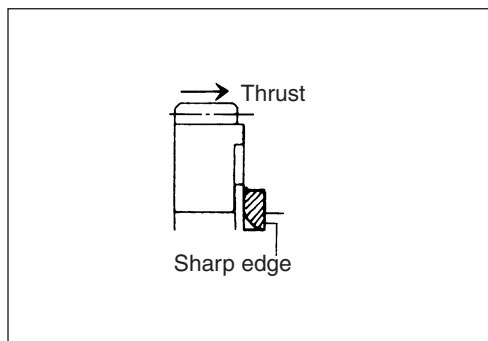
Before installing the gears, coat lightly moly paste or engine oil to the driveshaft and countershaft.

 99000-25140: SUZUKI MOLY PASTE

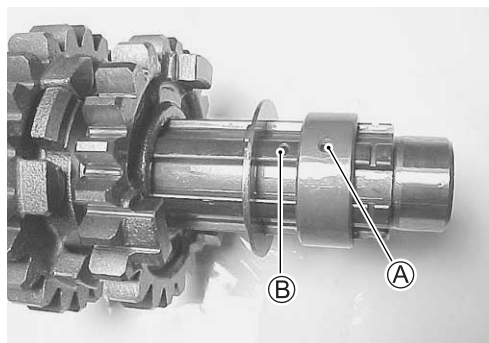
▲ CAUTION

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

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

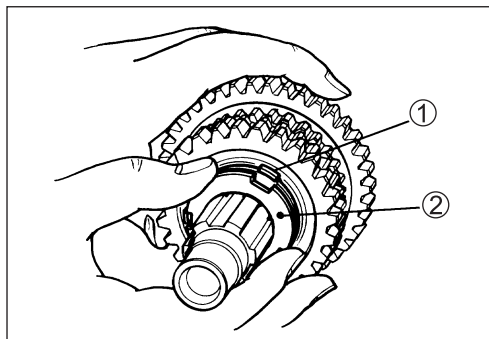
**▲ CAUTION**

When installing the top drive gear bushing, align the bushing oil hole (A) with the countershaft hole (B).



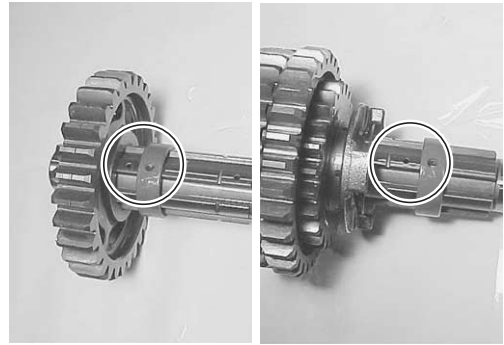
When installing the 3rd driven gear onto the driveshaft, install the lock washer No.2 ① onto the driveshaft, and turn and fit it into the groove.

Then, fit the lock washer No.1 ② in the lock washer No.2 ①.

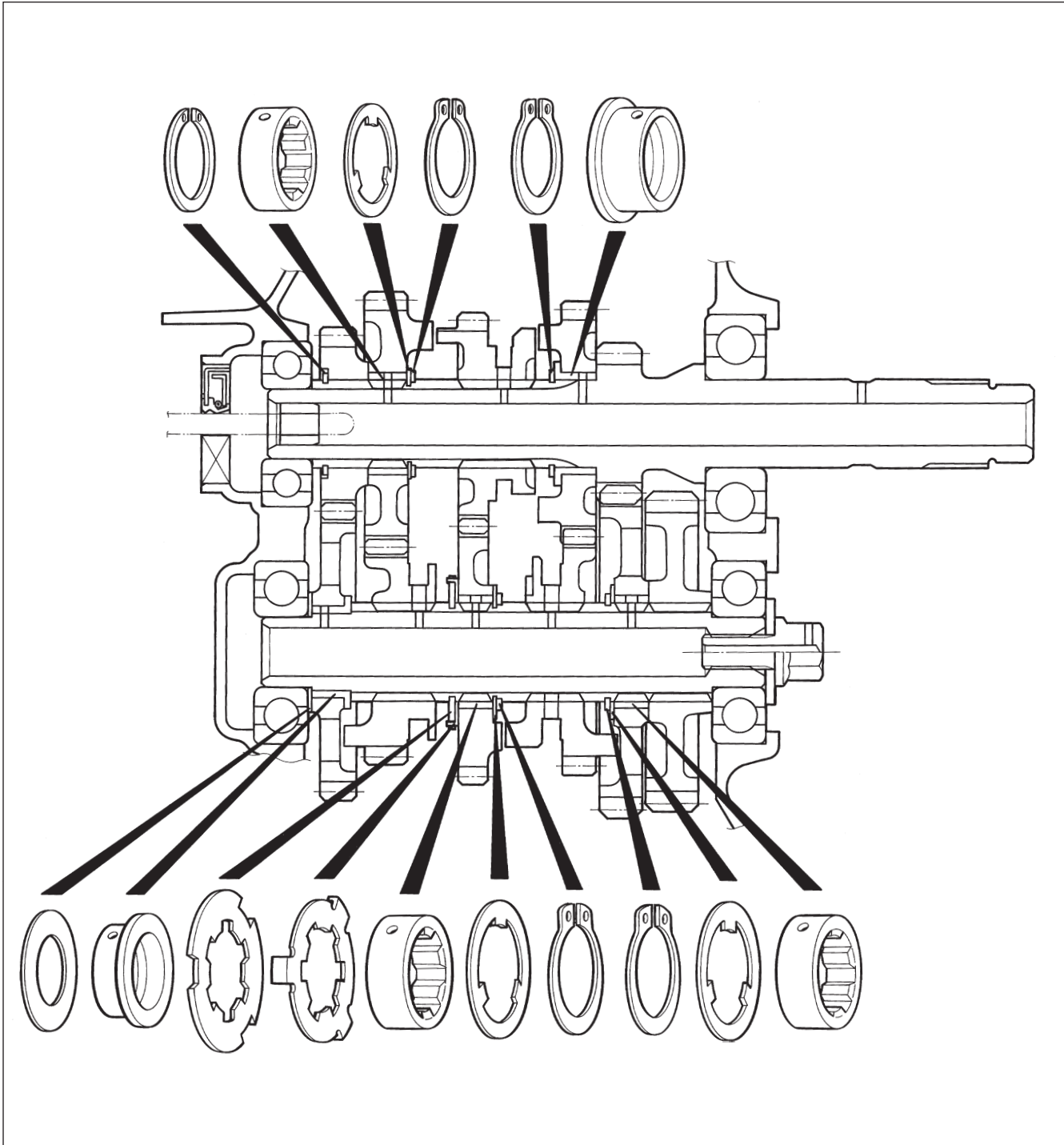


▲ CAUTION

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



TRANSMISSION GEARS AND RELATED PARTS



GEARSHIFT FORK

GEARSHIFT FORK TO GROOVE CLEARANCE

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

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

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

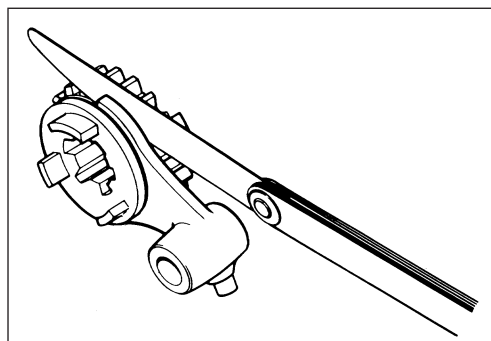
DATA Gearshift fork to groove clearance

Standard: 0.10 – 0.30 mm (0.004 – 0.012 in)

Service Limit: 0.50 mm (0.020 in)

TOOL 09900-20803: Thickness gauge

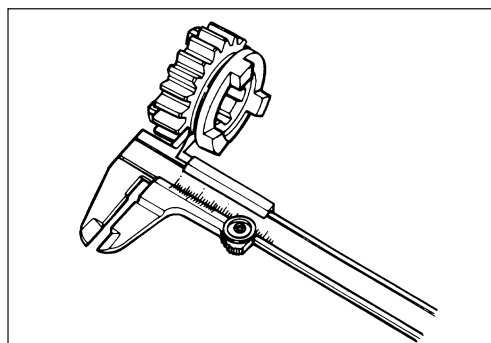
09900-20102: Vernier calipers



DATA Shift fork groove width

Standard (No. 1): 5.50 – 5.60 mm (0.217 – 0.220 in)

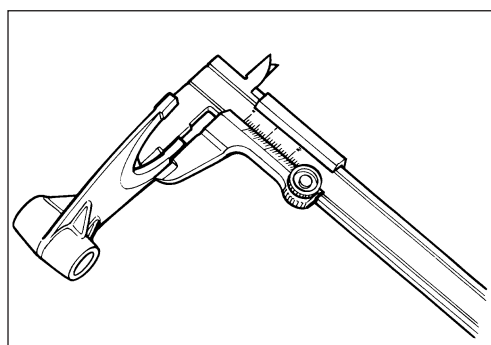
(No. 2): 4.50 – 4.60 mm (0.177 – 0.181 in)



DATA Shift fork thickness

Standard (No. 1): 5.30 – 5.40 mm (0.209 – 0.213 in)

(No. 2): 4.30 – 4.40 mm (0.169 – 0.173 in)



OIL JET

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

CAUTION

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

NOTE:

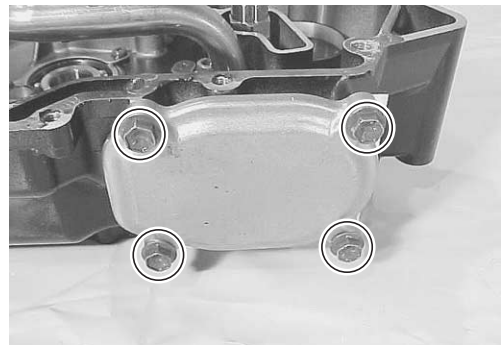
When installing the oil jets apply oil to the O-rings.



CRANKCASE

OIL SUMP FILTER

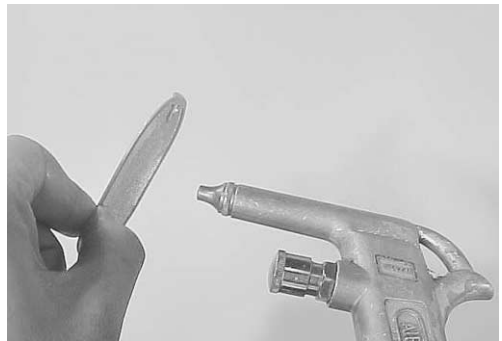
- Remove the oil sump filter cover.




- Remove the oil sump filter.

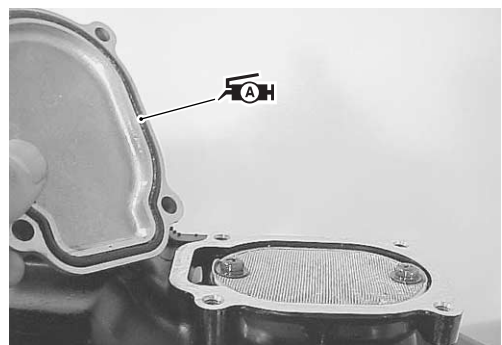


- Clean the oil sump filter using compressed air.



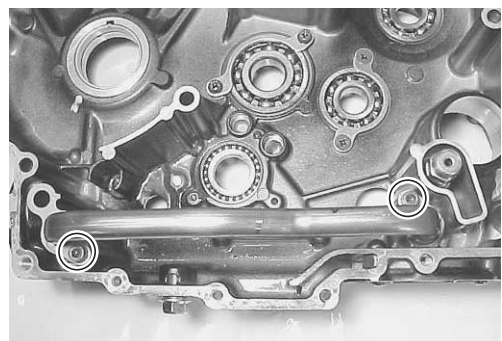
- When installing the O-ring, apply grease to it.

 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)



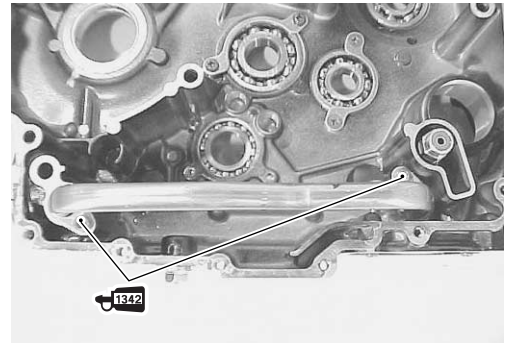
OIL PIPE

- Remove the oil pipe.



- When installing the oil pipe, use the new O-rings.
- Apply a small quantity of the THREAD LOCK “1342” to the oil pipe retainer bolts and tighten them securely.


 99000-32050: THREAD LOCK “1342”

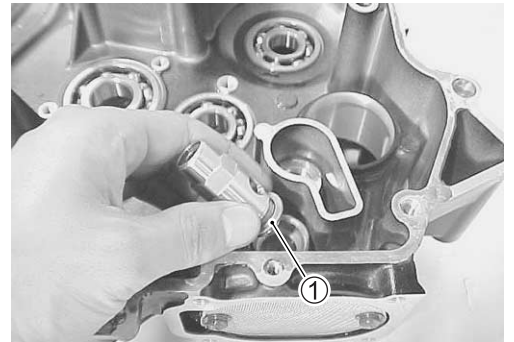


OIL PRESSURE REGULATOR

- Remove the oil pressure regulator.
- Check the operation of the oil pressure regulator by pushing on the piston with an appropriately shaped tool. If the piston does not operate, replace the oil pressure regulator with a new one.



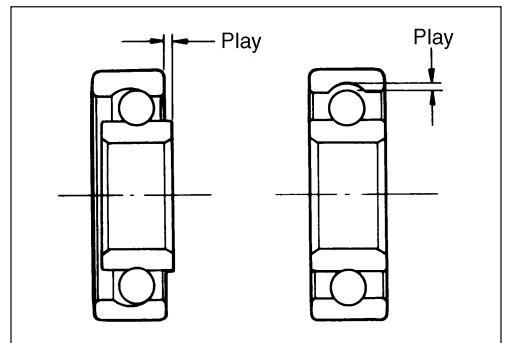
- When installing the oil pressure regulator, install the new washer .



BEARING INSPECTION

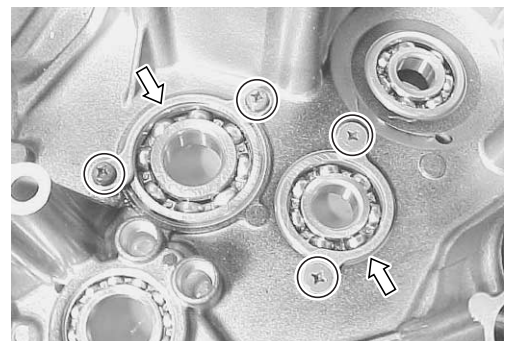
Rotate the bearing inner race by finger to inspect for abnormal play, noise and smooth rotation while the bearings are in the crankcase.

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



BEARING DISASSEMBLY

- Remove the bearing retainers.

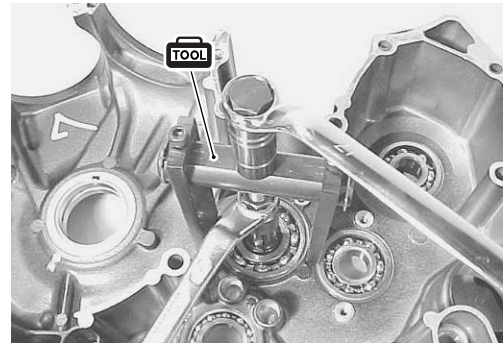


- Remove the bearing with the special tool.

 **09921-20220: Bearing remover set**

NOTE:

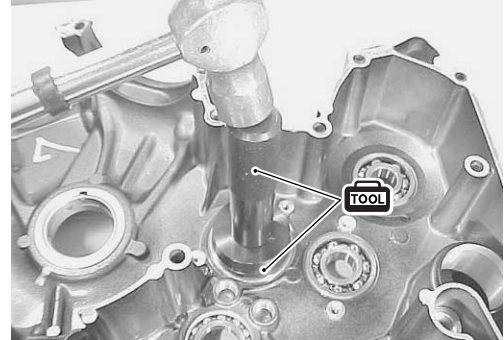
If abnormal noise does not occur, it is not necessary to remove the bearing.



BEARING REASSEMBLY

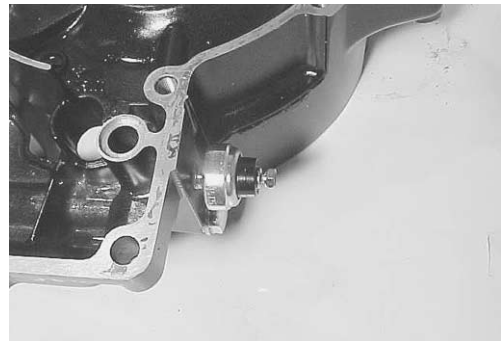
- Install the bearing into the crankcase with the special tool.

 **09913-70210: Bearing installer set**



OIL PRESSURE SWITCH

- Remove the oil pressure switch.

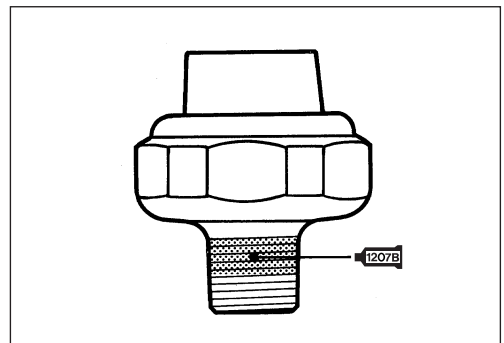


- When installing the switch, apply SUZUKI BOND “1207B”.

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

 **99104-31140: SUZUKI BOND “1207B” (For USA)**

99000-31140: SUZUKI BOND “1207B” (For the others)



OIL SEAL

- Remove the oil seal.

- Install the oil seal with the special tool.

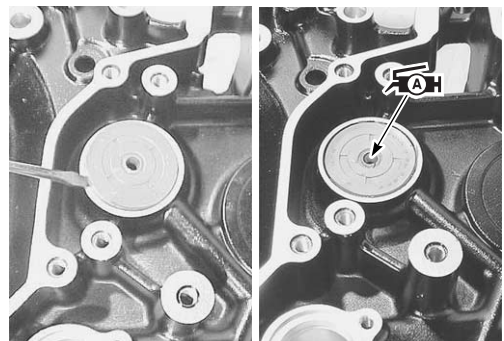
- Apply grease to the oil seal lip.

 **99000-25030: SUZUKI SUPER GREASE “A” (For USA)**

99000-25010: SUZUKI SUPER GREASE “A”

(For the others)

 **09913-70210: Bearing installer set**



ENGINE REASSEMBLY

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

NOTE:

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

SECONDARY DRIVE BEVEL GEAR

- Install the secondary drive bevel gear shim(s).

SHIM SELECTION 4-6

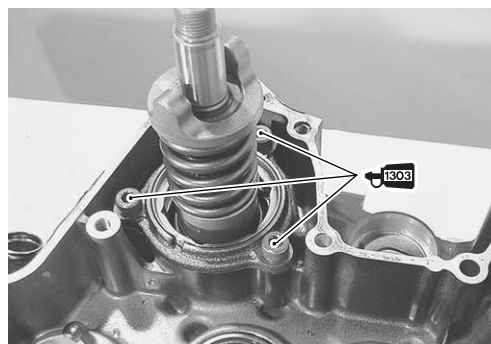
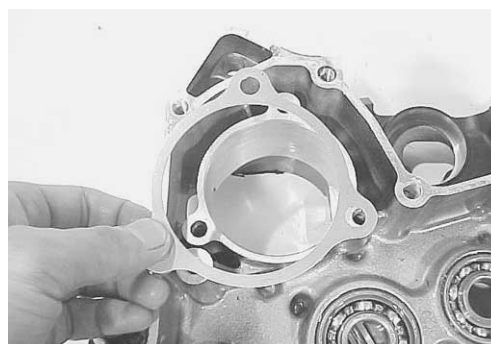
- Install the secondary drive bevel gear assembly and tighten the retainer bolts to the specified torque.

NOTE:

Apply **THREAD LOCK SUPER "1303"** to the thread of the bolts.

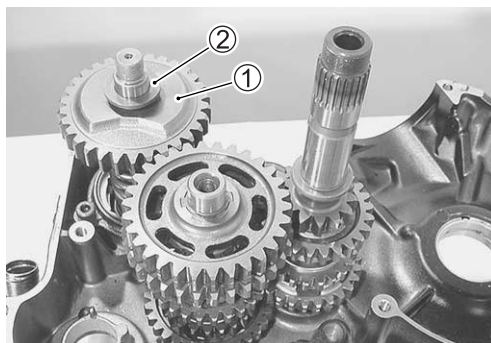
 **99000-32030: THREAD LOCK SUPER "1303"**

 **Secondary drive gear bearing retainer bolt: 23 N·m
(2.3 kgf·m, 16.5 lb-ft)**



COUNTERSHAFT/DRIVESHAFT

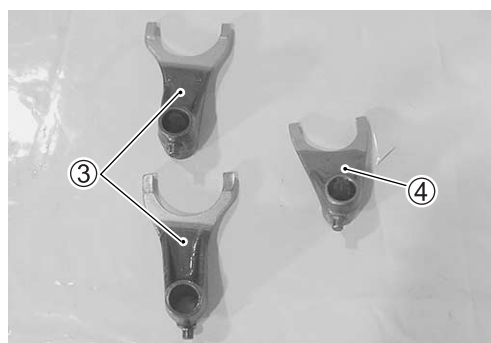
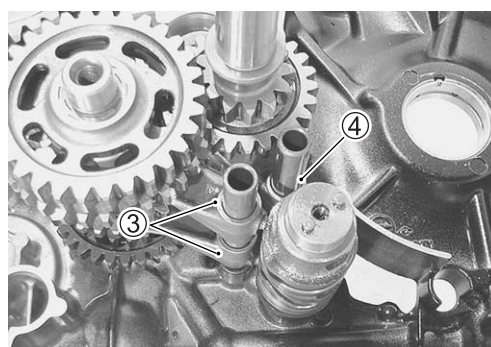
- Install the countershaft assembly and driveshaft assembly.
- Install the over driving gear ① and bush ②.



- Install the gearshift forks ③④, gearshift fork shafts and gearshift cam.

③ No. 1 shift forks (For 4th and 5th driven gears)

④ No. 2 shift fork (For 3rd drive gear)

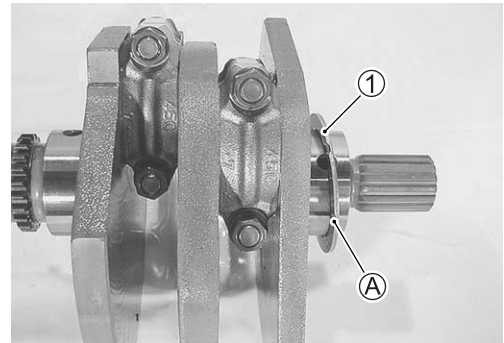


CRANKSHAFT

- Install the thrust shim ① on the crankshaft.

NOTE:

- * The grooved face (A) of thrust shim ① faces to crankshaft web side.
- * The thrust shim is selected by the crankshaft thrust clearance. (3-42)



- Install the crankshaft into the left crankcase half.

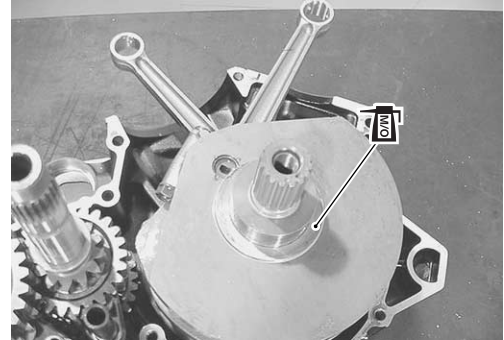
NOTE:

Coat lightly moly paste to the crankshaft journal bearings and the thrust shim.

 99000-25140: SUZUKI MOLY PASTE

CAUTION


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



- Install the dowel pins and O-ring on the left crankcase half.

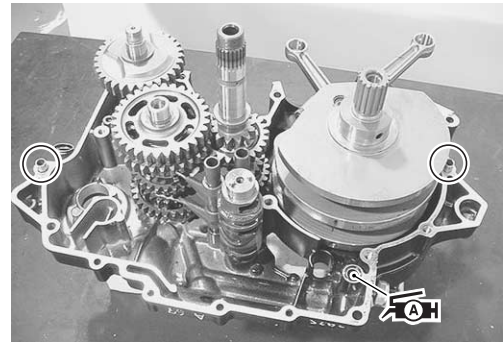
NOTE:

Apply grease to the O-ring.


 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)

CAUTION

Use the new O-ring to prevent oil leakage.



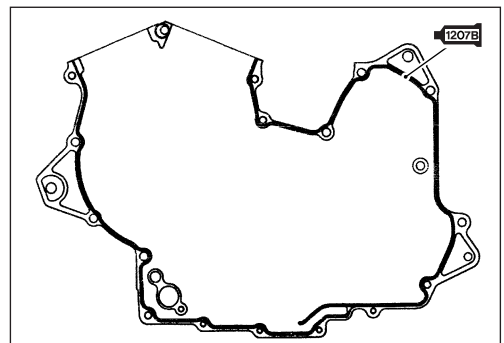
- Clean the mating surfaces of the left and right crankcase halves.
- Apply SUZUKI BOND "1207B" to the mating surface of the right crankcase.

 99104-31140: SUZUKI BOND "1207B" (For USA)
99000-31140: SUZUKI BOND "1207B" (For the others)

NOTE:

Use of SUZUKI BOND "1207B" is as follows:

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



- Fit the gasket to the bolt (A).
- When securing the right and left crankcase halves, tighten each bolt a little at a time to equalize the pressure. Tighten all the securing bolts to the specified torque values.

**🔧 Crankcase 8mm bolt: (Initial) 15 N·m (1.5 kgf·m, 11.0 lb-ft)
(Final) 22 N·m (2.2 kgf·m, 16.0 lb-ft)
Crankcase 6mm bolt: 11 N·m (1.1 kgf·m, 8.0 lb-ft)**

⚠ CAUTION

Do not drop the O-ring into the crankcase when assembling the right and left crankcase halves.

NOTE:

After the crankcase bolts have been tightened, check if the crankshaft, secondary drive bevel gear shaft, countershaft and the driveshaft rotate smoothly.

SECONDARY DRIVEN BEVEL GEAR

- Install the secondary driven bevel gear bearing and the pin (1).

NOTE:

Align the hole (A) of the secondary driven bevel gear bearing with the pin (1).

- Install the secondary driven bevel gear assembly, shim(s) (2) and O-ring (3).
- Install the dowel pins and the oil jet (4).

⚠ CAUTION

Use the new O-ring to prevent oil leakage.

NOTE:

* Refer to the section 4 for shim selection.

* Apply grease to the O-ring.

**🔧 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"**

(For the others)

- Clean the mating surfaces of the crankcase and the secondary gear case.
- Apply SUZUKI BOND "1207B" to the mating surface of the secondary gear case.

🔧 1207B 99104-31140: SUZUKI BOND "1207B" (For USA)

99000-31140: SUZUKI BOND "1207B" (For the others)

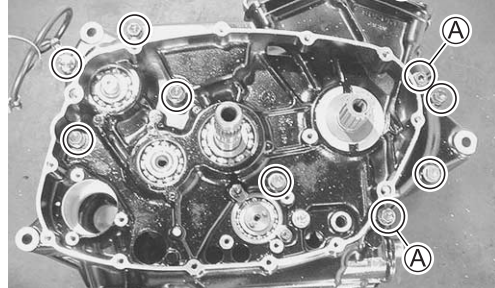
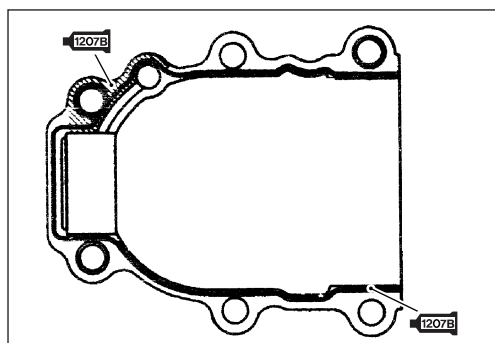
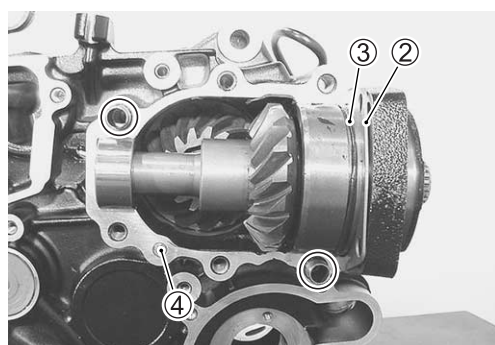
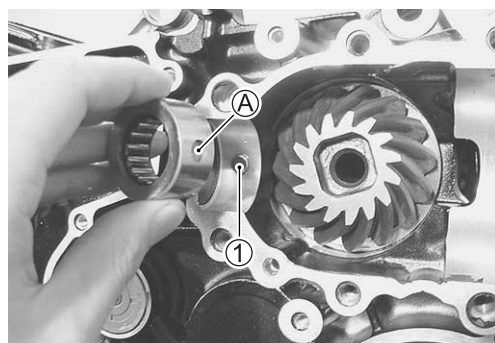
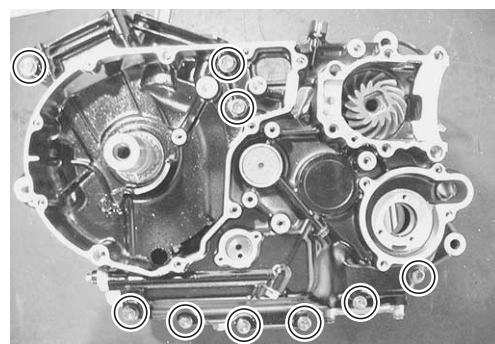
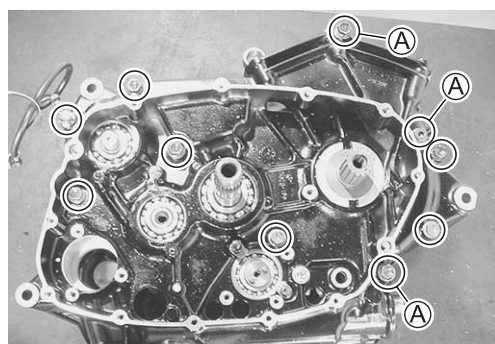
NOTE:

* Make surfaces free from moisture, oil, dust and other foreign materials.


* Spread on surfaces thinly to form an even layer, and assemble the crankcases within few minutes.

* Take extreme care not to apply any BOND "1207B" to the oil hole, oil groove and bearing.

* Apply to distorted surfaces as it forms a comparatively thick film.



- Tighten the secondary gear case bolts to the specified torque.

 **Secondary gear case bolt (Initial): 15 N·m**
(1.5 kgf·m, 11.0 lb-ft)
(Final) : 22 N·m
(2.2 kgf·m, 16.0 lb-ft)

NOTE:

Fit the washer to the bolt **(A)**.

- Tighten the secondary driven bevel gear bolt to the specified torque.

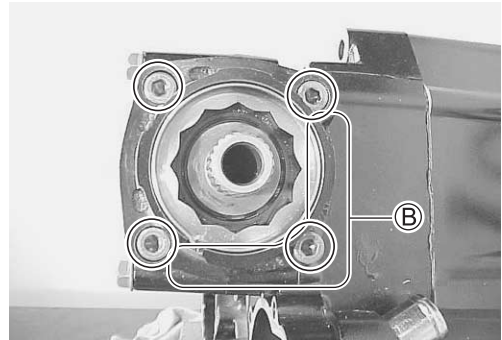
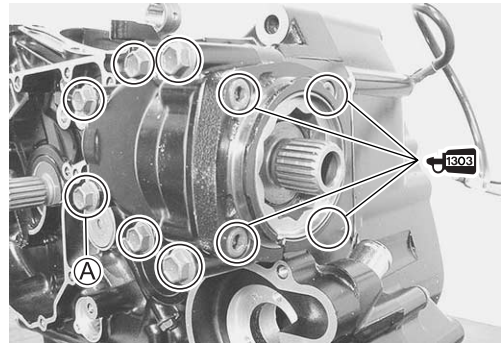
NOTE:

* Hollow portion **(B)** of the secondary driven gear assembly faces inside.

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

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

 **Secondary driven bevel gear bolt: 23 N·m**
(2.3 kgf·m, 16.5 lb-ft)




DRIVESHAFT BOLT/SECONDARY DRIVEN GEAR SHAFT NUT

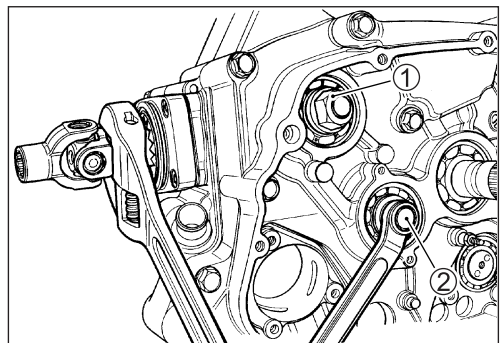
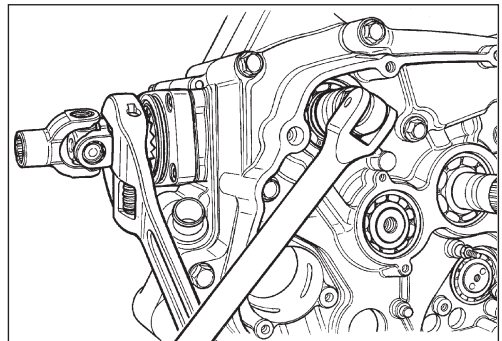
- Install the universal joint on the secondary driven gear shaft.
- While holding the universal joint with an adjustable wrench, tighten the secondary drive gear shaft nut **(1)** and driveshaft bolt **(2)** to the specified torque.

CAUTION

Driveshaft bolt **(2)** has left-hand thread.

 **09900-18710: Hexagon socket (12 mm)**

 **Secondary drive gear shaft nut: 105 N·m**
(10.5 kgf·m, 76.0 lb-ft)
Driveshaft bolt: 65 N·m (6.5 kgf·m, 47.0 lb-ft)

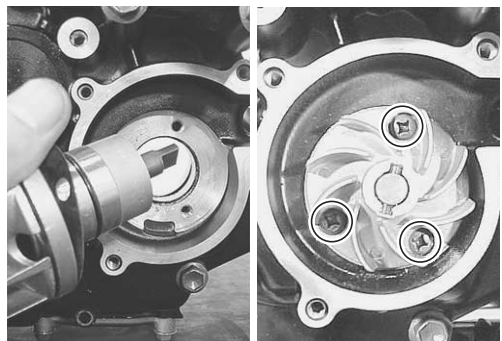


WATER PUMP

- Install the new O-ring and new gasket.
- Tighten the water pump mounting screws.

CAUTION

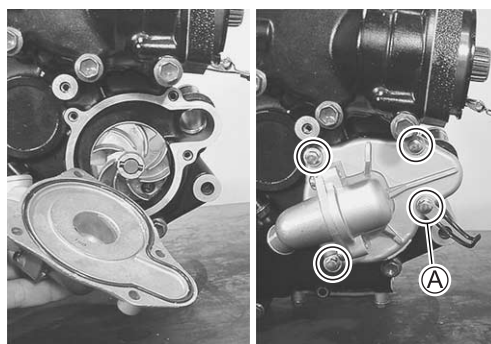
Use the new O-ring to prevent oil leakage.



- Install the new O-ring.
- Install the water pump cover.

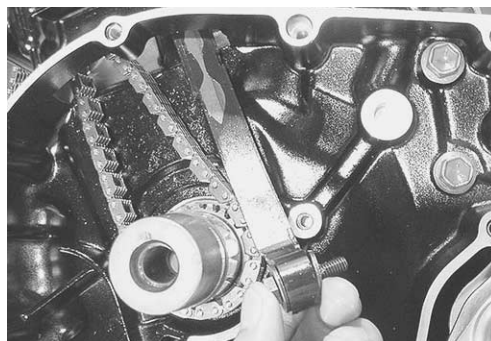
NOTE:

Fit the clamp to the bolt (A).

**CAM CHAIN/CAM CHAIN TENSIONER**

- Install the cam chain tensioner and cam chain.

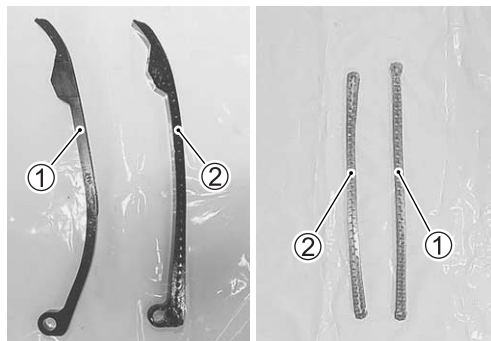
 **Cam chain tensioner bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)**



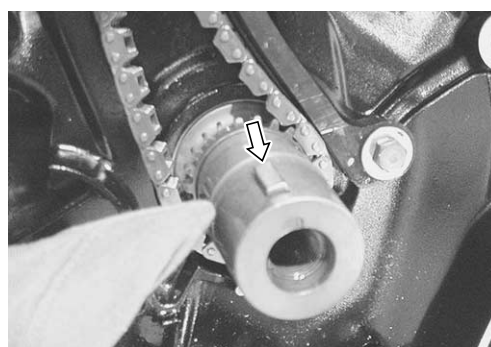
- ① For front cylinder
- ② For rear cylinder

NOTE:

The No. 2 cam chain (For front cylinder) is a little longer than the No. 1 cam chain.

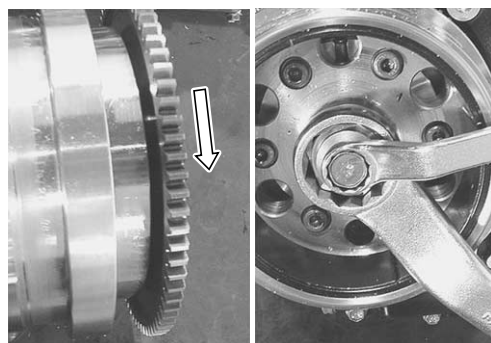
**GENERATOR**

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

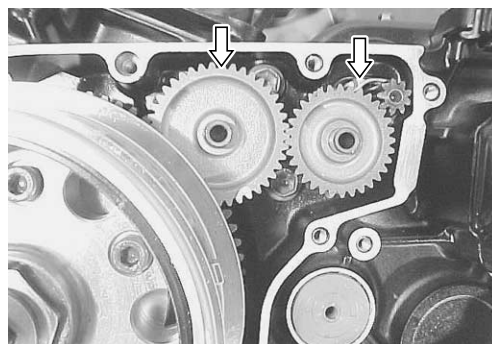


- Install the starter driven gear to the rotor.
- Install the generator rotor assembly and tighten its bolt to the specified torque.

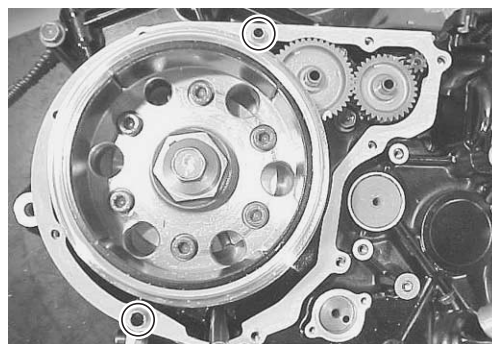
 **Generator rotor bolt: 160 N·m (16.0 kgf·m, 115.5 lb-ft)**



- Install the starter driven gear and the idle gear.



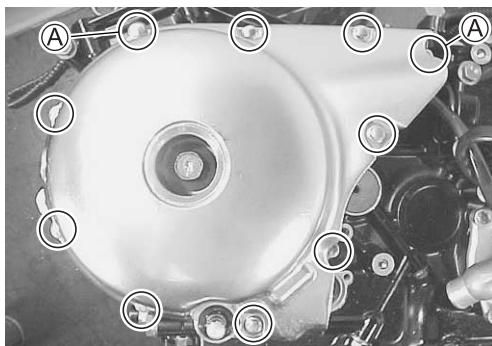
- Install the new gasket and dowel pins.



- Install the generator cover.

NOTE:

Fit the new gaskets to the bolts (A).

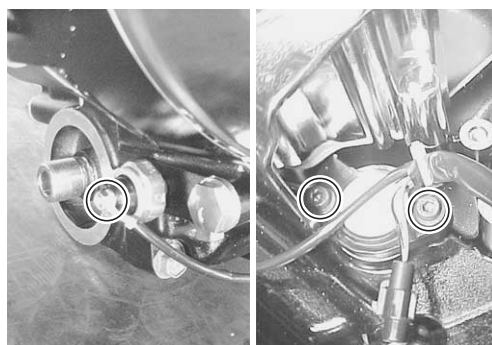


NEUTRAL SWITCH

- Install the springs and switch contacts.



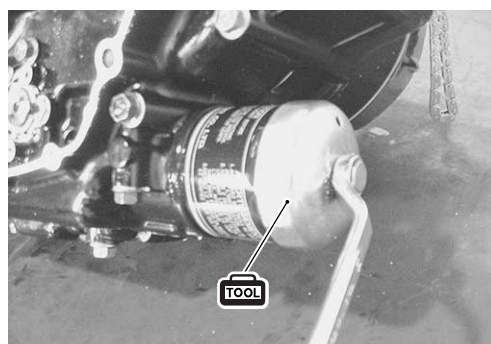
- Install the neutral switch.
- Install the oil pressure switch lead wire.



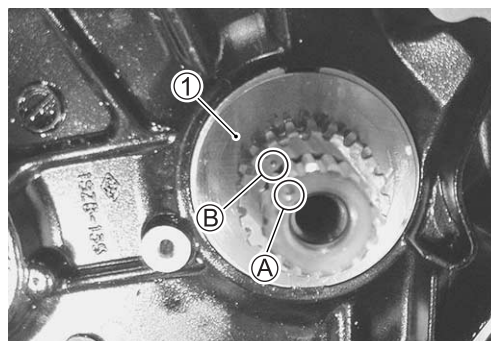
OIL FILTER

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

 **09915-40610: Oil filter wrench**

**PRIMARY DRIVE GEAR**

- Install the thrust washer ① onto the crankshaft.
- Align the punch mark ① on the crankshaft with the punch mark ② on the camshaft drive sprocket.



- Install the cam chain and cam chain tensioner.
- Tighten the cam chain tensioner bolt to the specified torque.

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



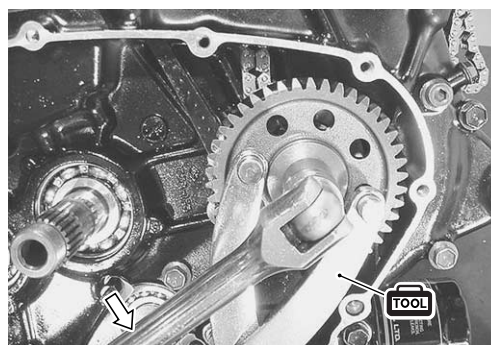
- Install the primary drive gear and tighten the primary drive gear bolt to the specified torque with the special tool.

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

 **09930-40113: Rotor holder**

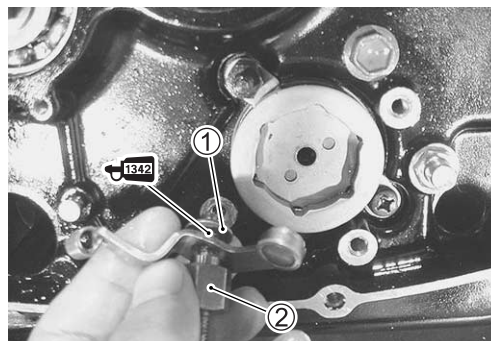
NOTE:

This bolt has left-hand thread.

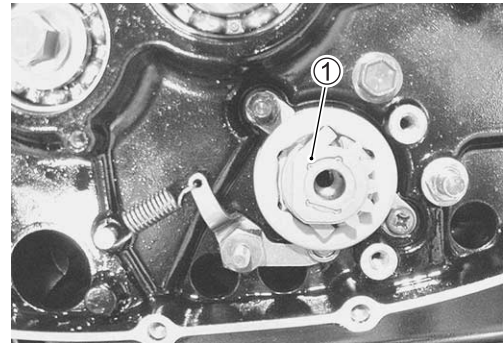
**GEARSHIFT**

- Install the washer ①.
- Apply a small quantity of THREAD LOCK "1342" to the gearshift cam stopper bolt ② and tighten it.

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

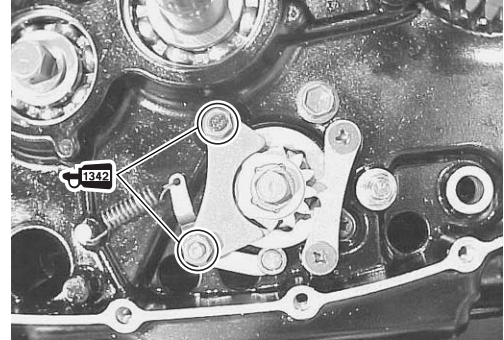


- Install the cam driven gear ① after installing the springs, pins and gearshift pawls.

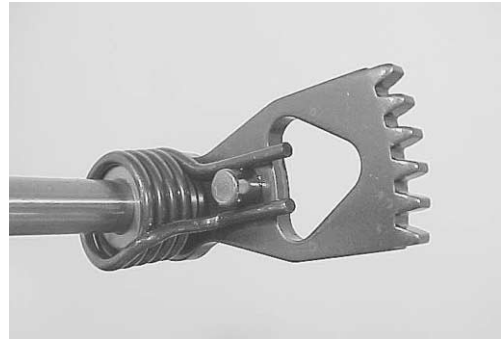


- Install the cam guide and the pawl lifter.
- Apply a small quantity of THREAD LOCK “1342” to the nuts.

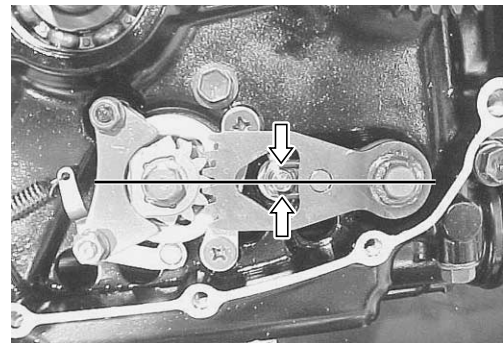
 99000-32050: THREAD LOCK “1342”



- Install the gearshift return spring properly.



- Install the gearshift shaft with the center of shift gear on the shaft aligned the center of gearshift cam driven gear.



OIL PUMP

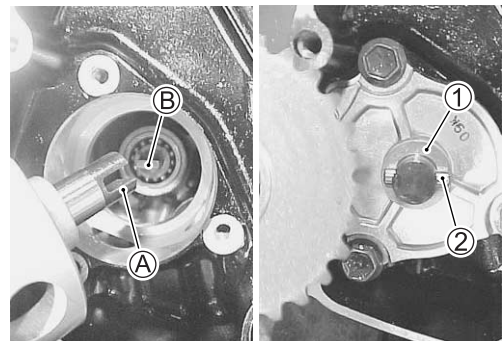
- Install the oil pump.

 Oil pump mounting bolt: 11 N·m (1.1 kgf·m, 8 lb-ft)


NOTE:

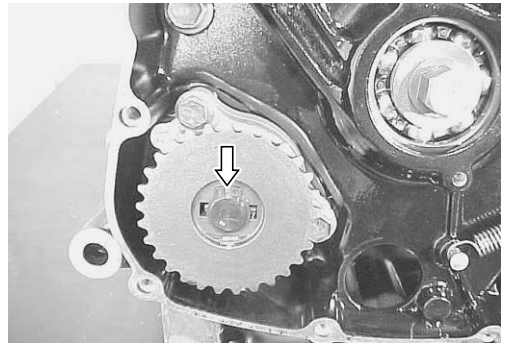
Set the oil pump shaft end ① to the water pump shaft ②.

- Install the washer ① and pin ②.



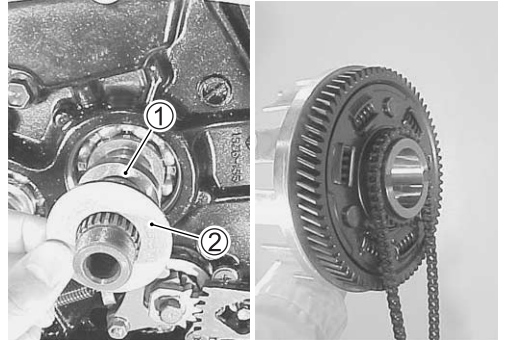
- Install the oil pump driven gear and the circlip.

 **09900-06107: Snap ring pliers**

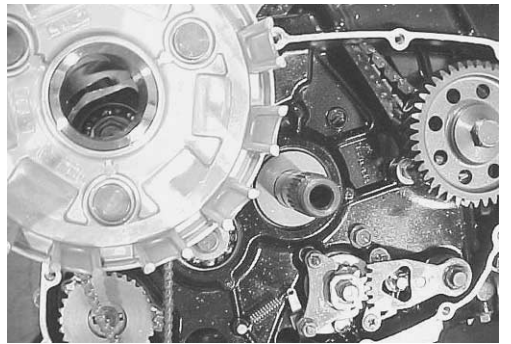


CLUTCH

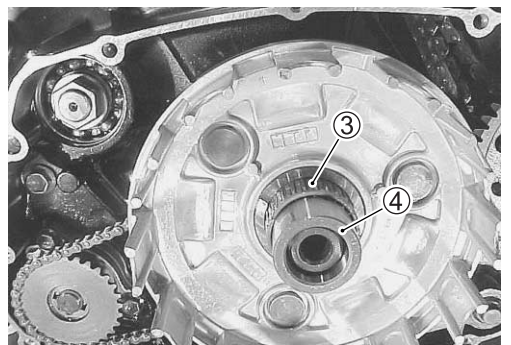
- Install the spacer ① and the thrust washer ②.
- Engage the chain with the oil pump drive gear.



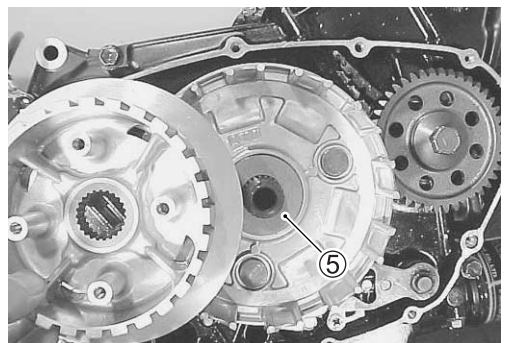
- Install the primary driven gear assembly and engage the chain with the oil pump driven gear.



- Apply engine oil to the primary driven gear bearing ③ and install it.
- Install the collar ④.



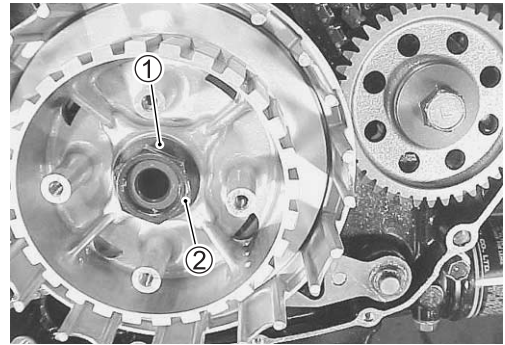
- Install the thrust washer ⑤ and the clutch sleeve hub.



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

NOTE:

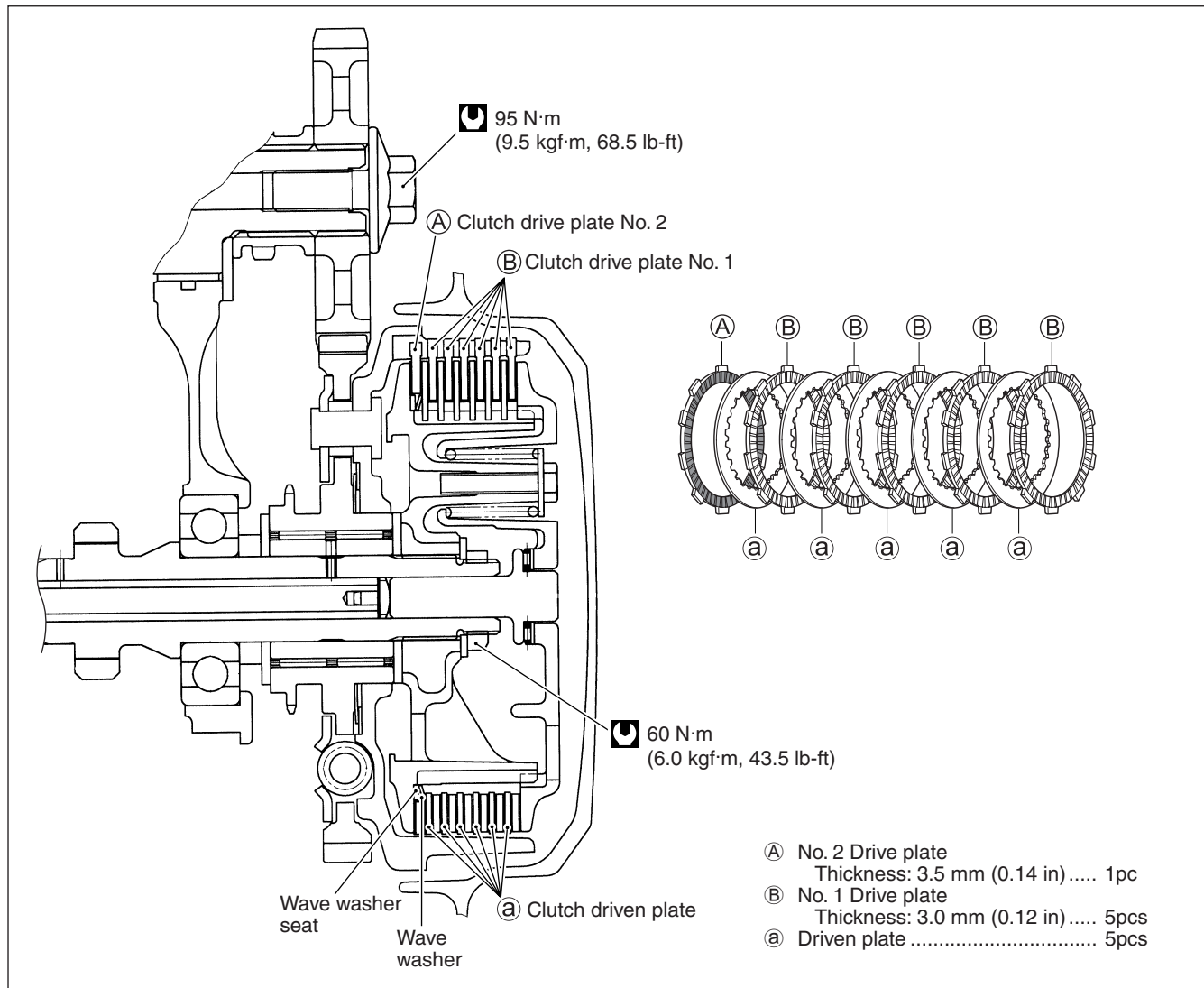
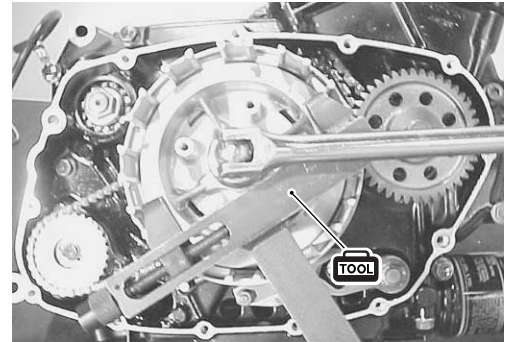
The convex side of the washer faces outside.



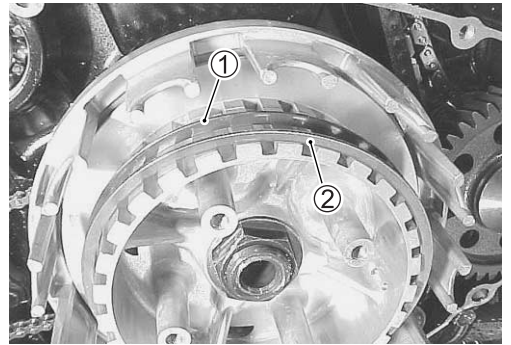
- Tighten the clutch sleeve hub nut to the specified torque with the special tool.

 **Clutch sleeve hub nut: 60 N·m (6.0 kgf·m, 43.5 lb-ft)**

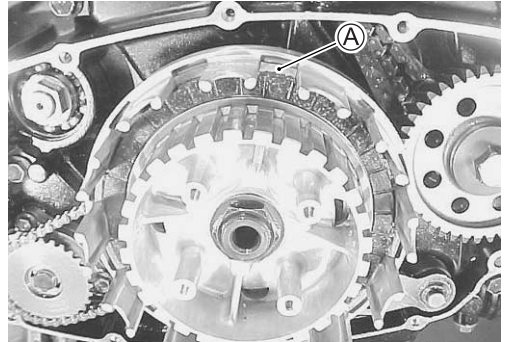
 **09920-53740: Clutch sleeve hub holder**



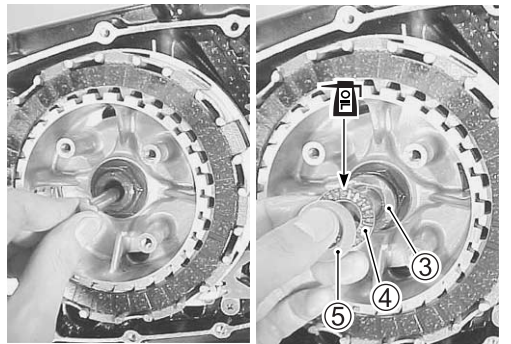
- Install the wave washer seat ① and the wave washer ②.



- Install the clutch drive plate No.2 (A) first.
- Install the drive and driven plate one by one into the clutch sleeve hub.

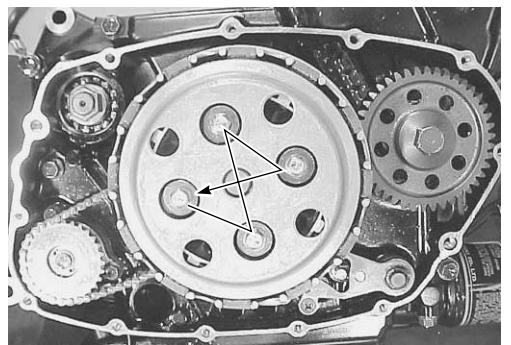


- Install the push rod.
- Install the clutch push piece ③, bearing ④ and thrust washer ⑤.
- Apply engine oil to the bearing.

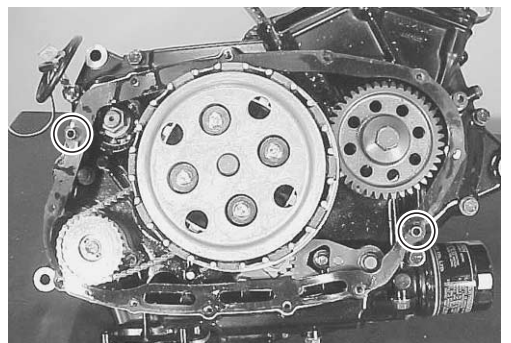


- Install the springs and tighten the clutch spring set bolts diagonally to the specified torque.

 **Clutch spring set bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)**



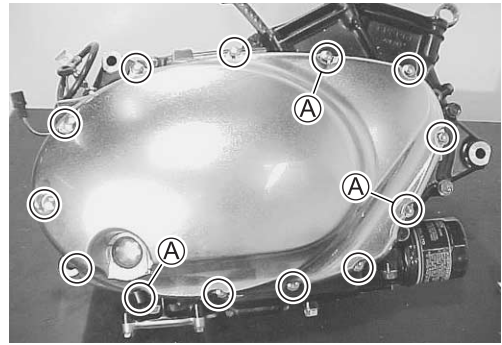
- Install the new clutch cover gasket and dowel pins.



- Install the clutch cover and tighten the bolts.

NOTE:

Fit the new gasket to the bolt .




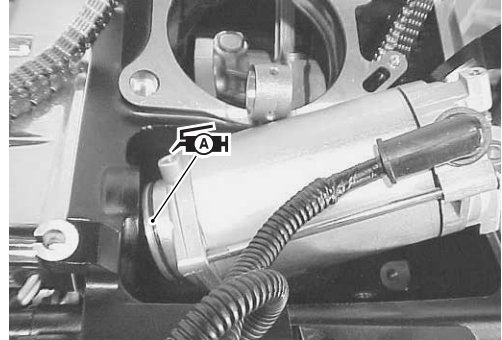
STARTER MOTOR

- Install the starter motor.

NOTE:

Apply grease to the new O-ring.

 **99000-25030: SUZUKI SUPER GREASE "A" (For USA)**
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)



- Install the starter motor cover.



OIL JET

- Apply engine oil to the new O-ring and install the oil jets.

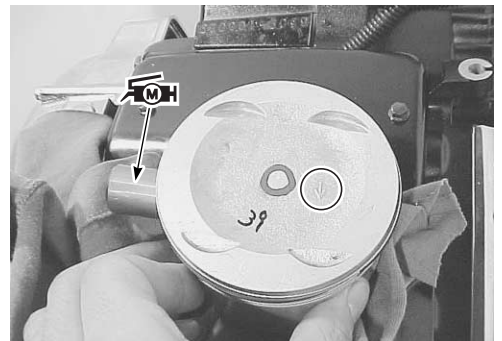


PISTON

- Apply a light coat of SUZUKI MOLY PASTE to the piston pins.

 **99000-25140: SUZUKI MOLY PASTE**

- When installing the piston, the arrow mark on the piston head is located to the exhaust side.



- Place a cloth beneath the piston, and install the circlip ①.

▲ CAUTION

When turning the crankshaft, pull the cam chains upward, or the chains will be caught between the crankcase and the cam drive sprocket.



CYLINDER

- Install the cam chain tension adjuster to the cylinder.
- After unlocking the ratchet, push the cam chain tension adjuster rod.
- Insert the special tool between the ratchet and the adjuster body.

TOOL 09918-53810: Chain tensioner lock tool

TOOL Cam chain tension adjuster mounting bolt: 10 N·m
(1.0 kgf·m, 7.0 lb-ft)



- Coat SUZUKI BOND “1207B” lightly to the mating surfaces among the crankcase mating surfaces.

1207B 99104-31140: SUZUKI BOND “1207B” (For USA)

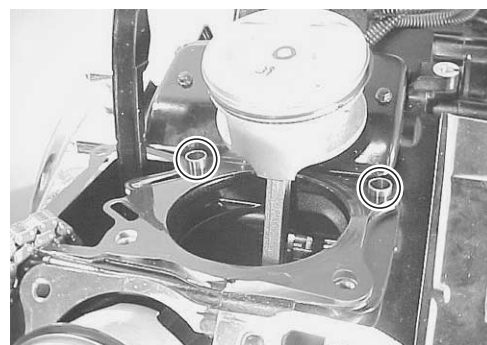
99000-31140: SUZUKI BOND “1207B” (For the others)



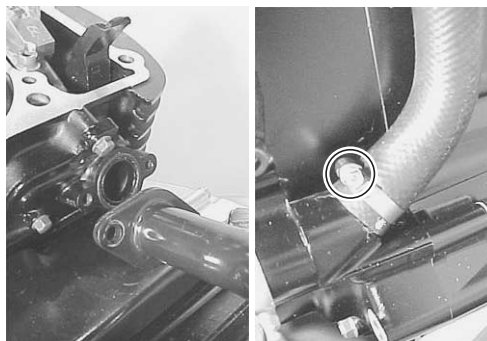
- Fit the dowel pins and the new gasket.

▲ CAUTION

Use a new gasket to prevent gas leakage.

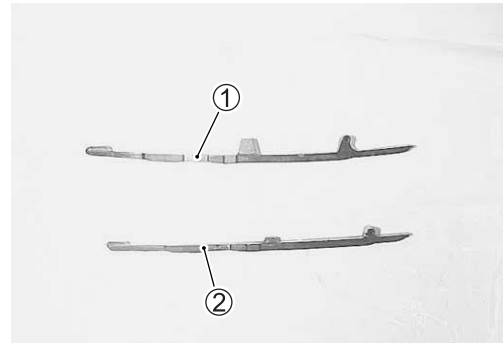


- Install the cylinder. (Rear cylinder)
- Install the water hose and pipe.



CYLINDER HEAD

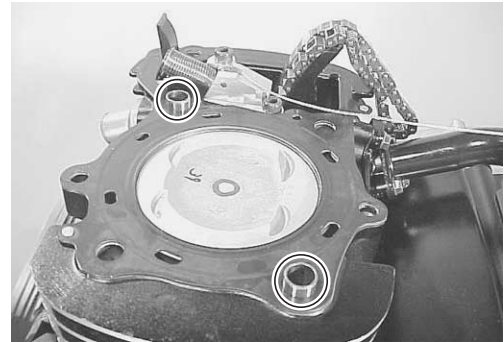
- Install the cam chain guide.
 - ① For front cylinder
 - ② For rear cylinder



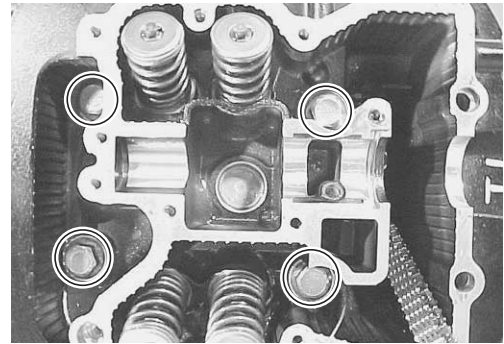
- Fit the dowel pins and the new cylinder head gasket.

▲ CAUTION

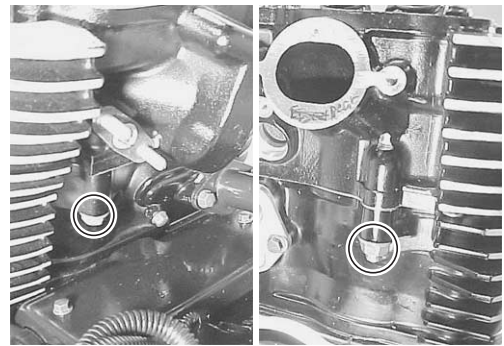
Use a new gasket to prevent gas leakage.



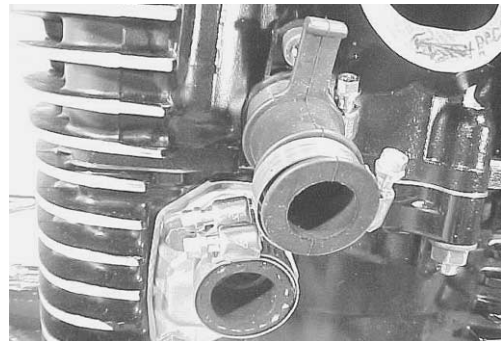
- Install the cylinder head and tighten the cylinder head bolts diagonally to the specified torque. (Rear cylinder)



- Tighten the cylinder head bolt and nut.




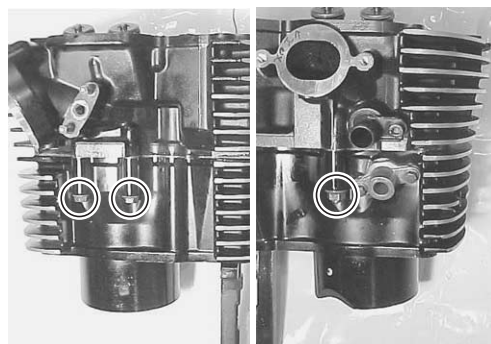
- Install the water hoses to the front cylinder.



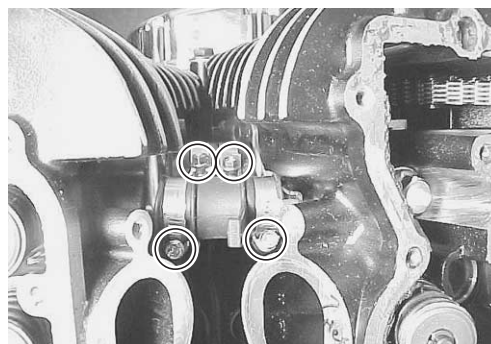
FRONT CYLINDER

- Assemble the front cylinder and the cylinder head.
- Tighten the cylinder head bolts and nut.


 **Cylinder head bolt and nut (M8): 25 N·m**
(2.5 kgf·m, 18.0 lb-ft)



- Install the front cylinder assembly to the crankcase.
- Connect the water hoses.



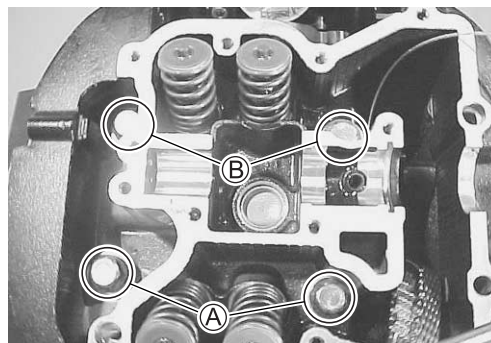
- Tighten the cylinder head bolts to the specified torque.

 **Cylinder head bolt (M10): Initial: 25 N·m**
(2.5 kgf·m, 18.0 lb-ft)
Final: 38 N·m
(3.8 kgf·m, 27.5 lb-ft)

NOTE:

Bolt (A): 165 mm (6.5 in)

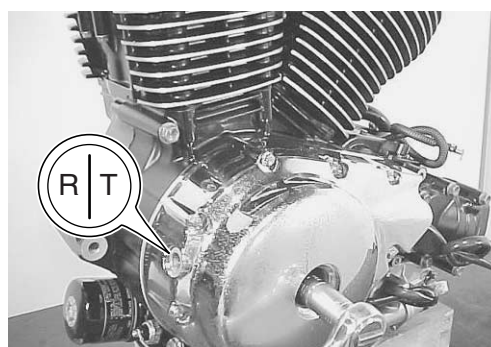
Bolt (B): 155 mm (6.1 in)

**CAMSHAFT**

- Position "RIT" mark on the generator rotor with the center of the valve timing inspection hole.

▲ CAUTION

Pull the cam chains upward, or the chain will be caught between crankcase and cam drive sprocket.



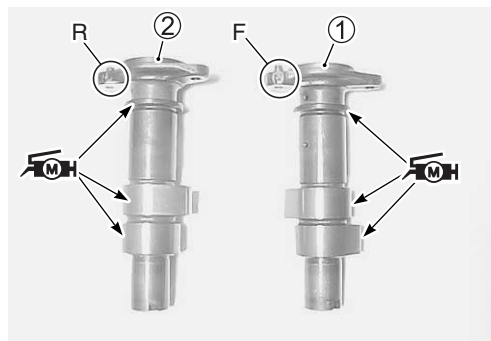
- Before installing the camshafts onto each cylinder head, apply SUZUKI MOLY PASTE onto the camshaft journals. Also, apply engine oil onto the camshaft journal holders.

 **99000-25140: SUZUKI MOLY PASTE**

NOTE:

The camshaft is identified by the embossed letters "F" and "R".

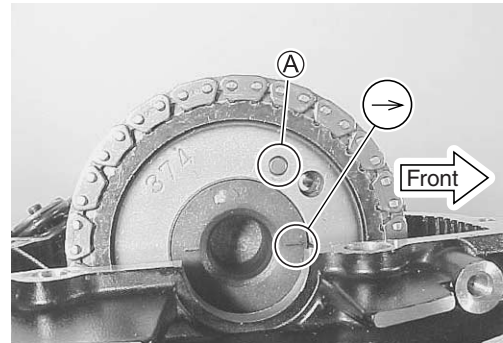
- ① Front cam shaft
- ② Rear cam shaft



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

NOTE:

Arrow marks are located to forward.



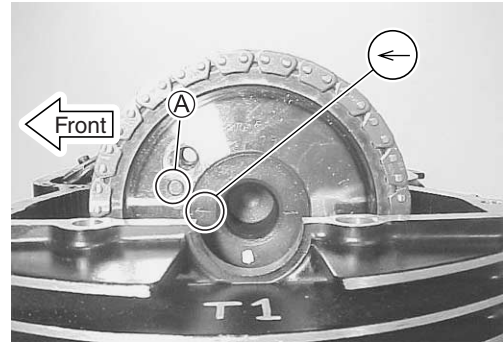
Rear (No. 1) cylinder head

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

NOTE:

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

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



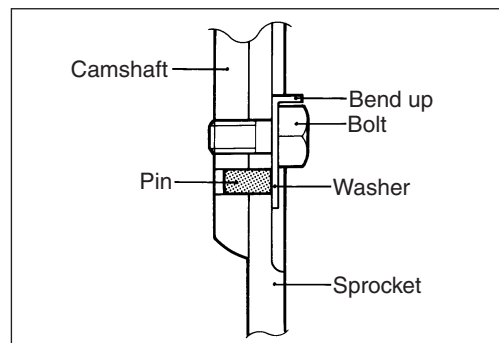
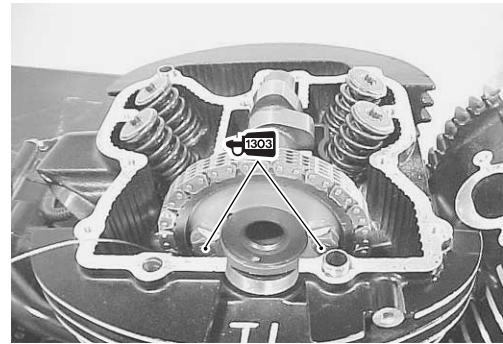
Front (No. 2) cylinder head

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

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

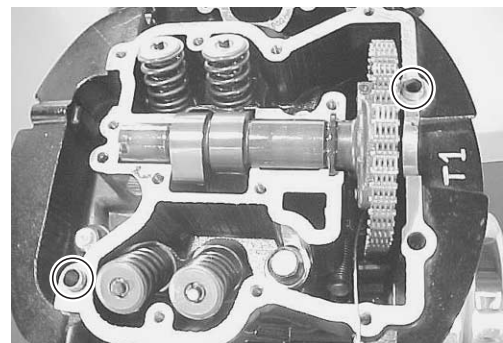
 **99000-32030: THREAD LOCK SUPER "1303"**

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




CYLINDER HEAD COVER

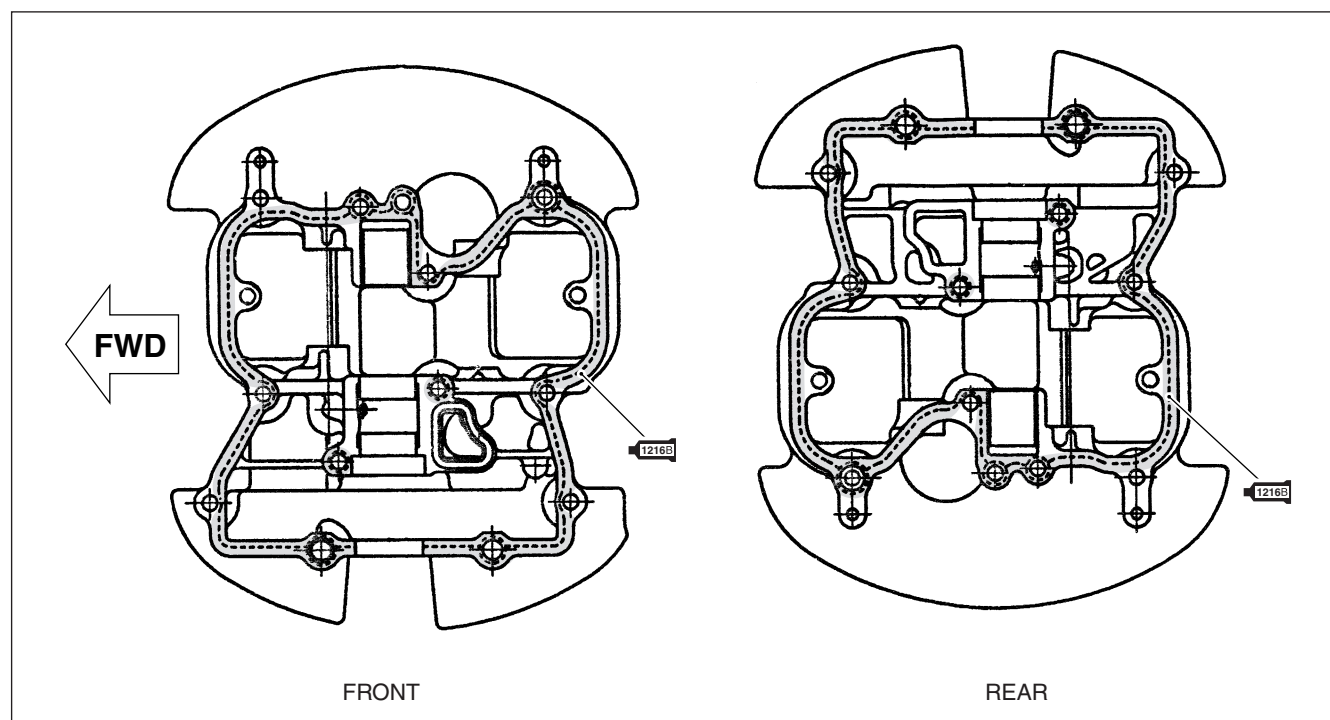
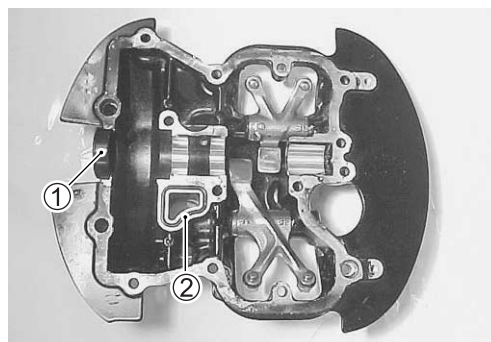
- Clean the mating surfaces of the cylinder head and head cover before matching.
- Install the dowel pins to the cylinder head.




- Apply SUZUKI BOND “1216B” to the mating surface of the cylinder head cover.
- Fit the camshaft end caps ①.
- Apply grease to the O-ring ② and install it. (Front cylinder only)

 99000-31230: SUZUKI BOND “1216B”

 99000-25030: SUZUKI SUPER GREASE “A” (For USA)
99000-25010: SUZUKI SUPER GREASE “A”
(For the others)

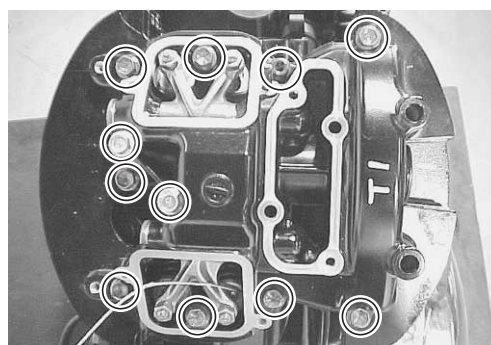
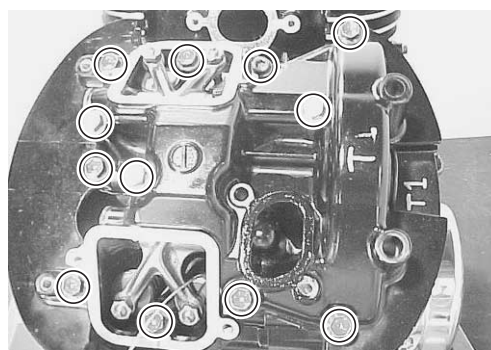


- Lightly tighten the cylinder head cover bolts diagonally, and then if everything is satisfactory, tighten securely with a torque wrench to the specified torque.

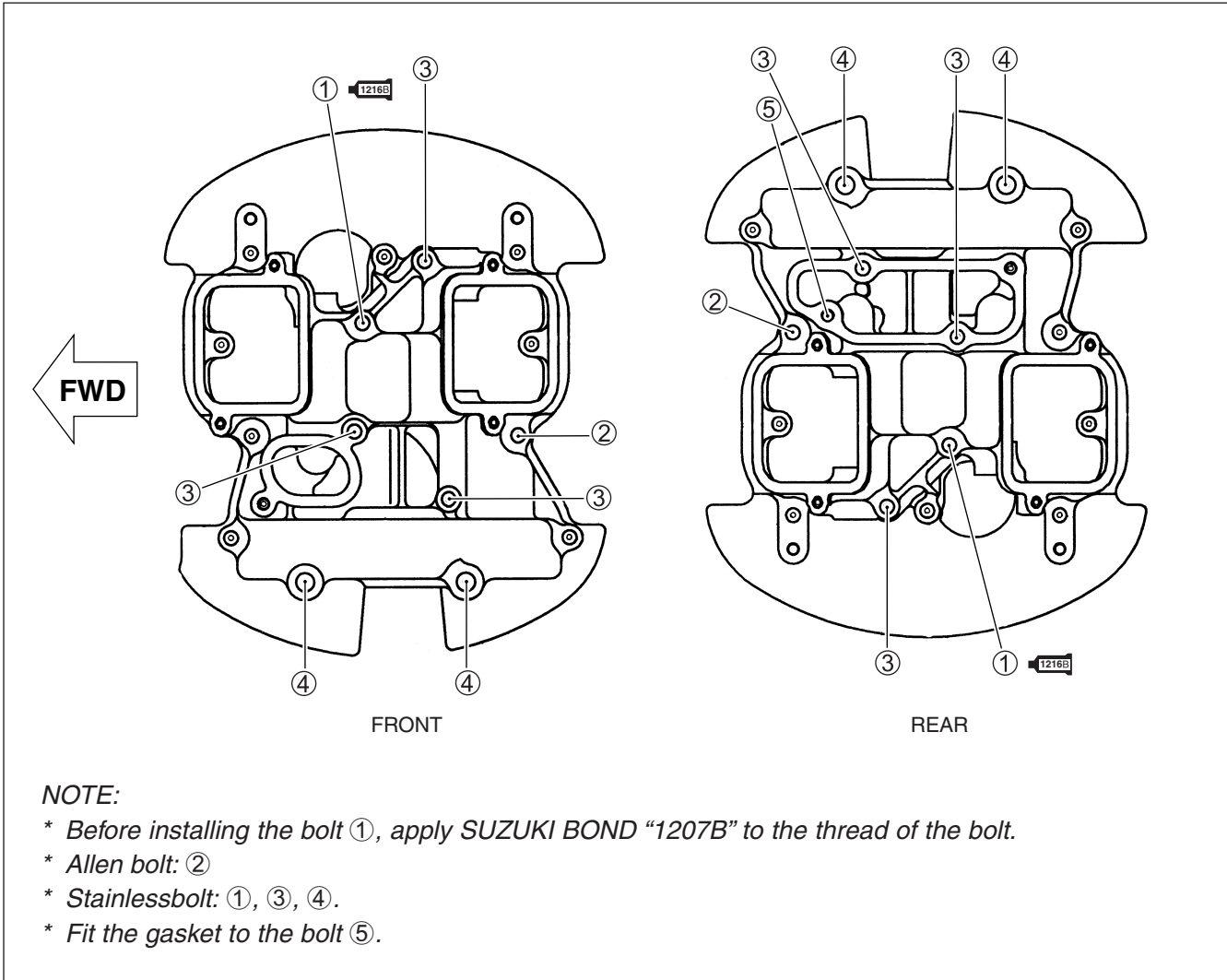
 **Cylinder head cover bolt (M6): 10 N·m (1.0 kgf·m, 7.0 lb-ft)**
(M8): 25 N·m
(2.5 kgf·m, 18.0 lb-ft)

NOTE:

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



LOCATION OF CYLINDER HEAD COVER BOLT



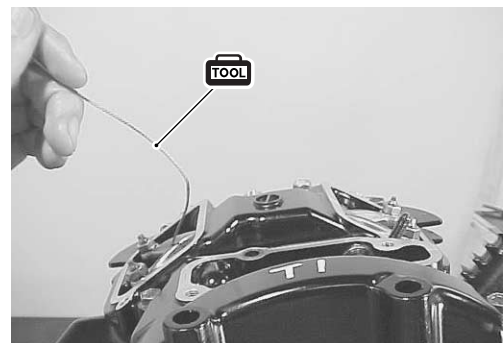
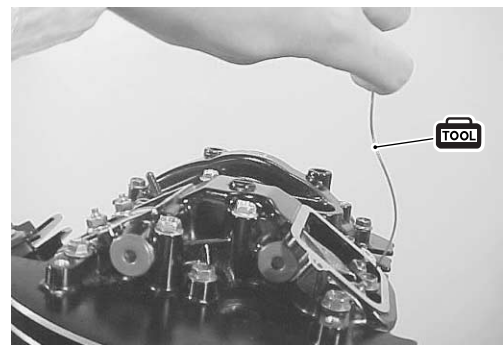
NOTE:

- * Before installing the bolt ①, apply SUZUKI BOND “1207B” to the thread of the bolt.
- * Allen bolt: ②
- * Stainlessbolt: ①, ③, ④.
- * Fit the gasket to the bolt ⑤.

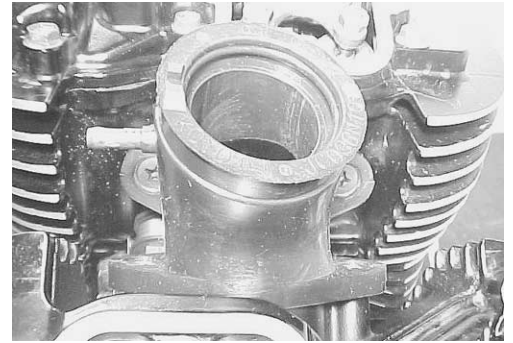
- Remove the tensioner lock tools.

NOTE:


Click sound is heard when the cam chain tension adjuster is released.

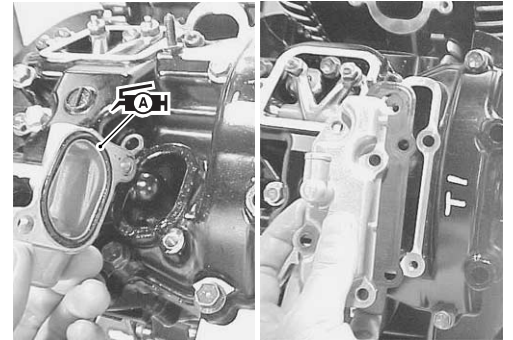


- Install the intake pipe.




- Apply grease to the new O-ring and install the water outlet union.

 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)



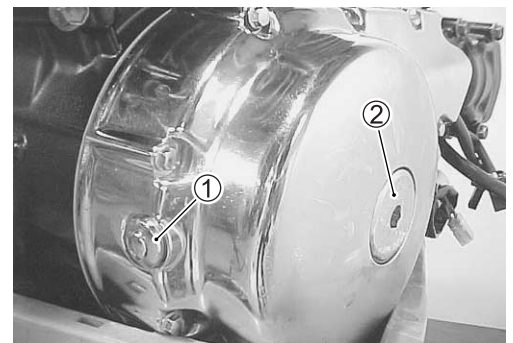
- Install the gasket and the breather cover.
- Apply grease to the new O-rings and install the valve inspection caps.

 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"

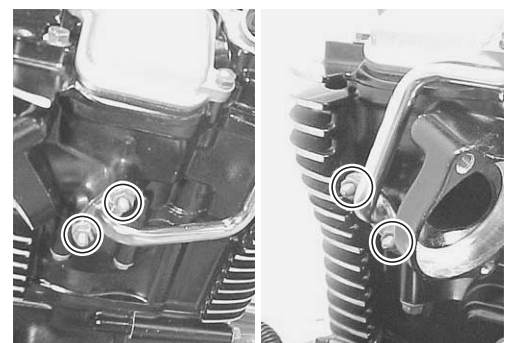


(For the others)

- Install the valve timing inspection plug ① and the generator

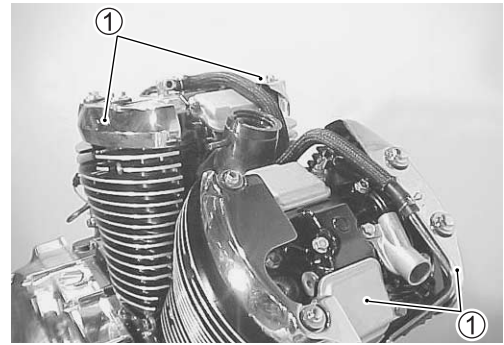


cover cap ②.



- Install the PAIR pipes.
- Install the head cover caps ①.
- Install the spark plugs.

 **09930-10121: Spark plug wrench set**



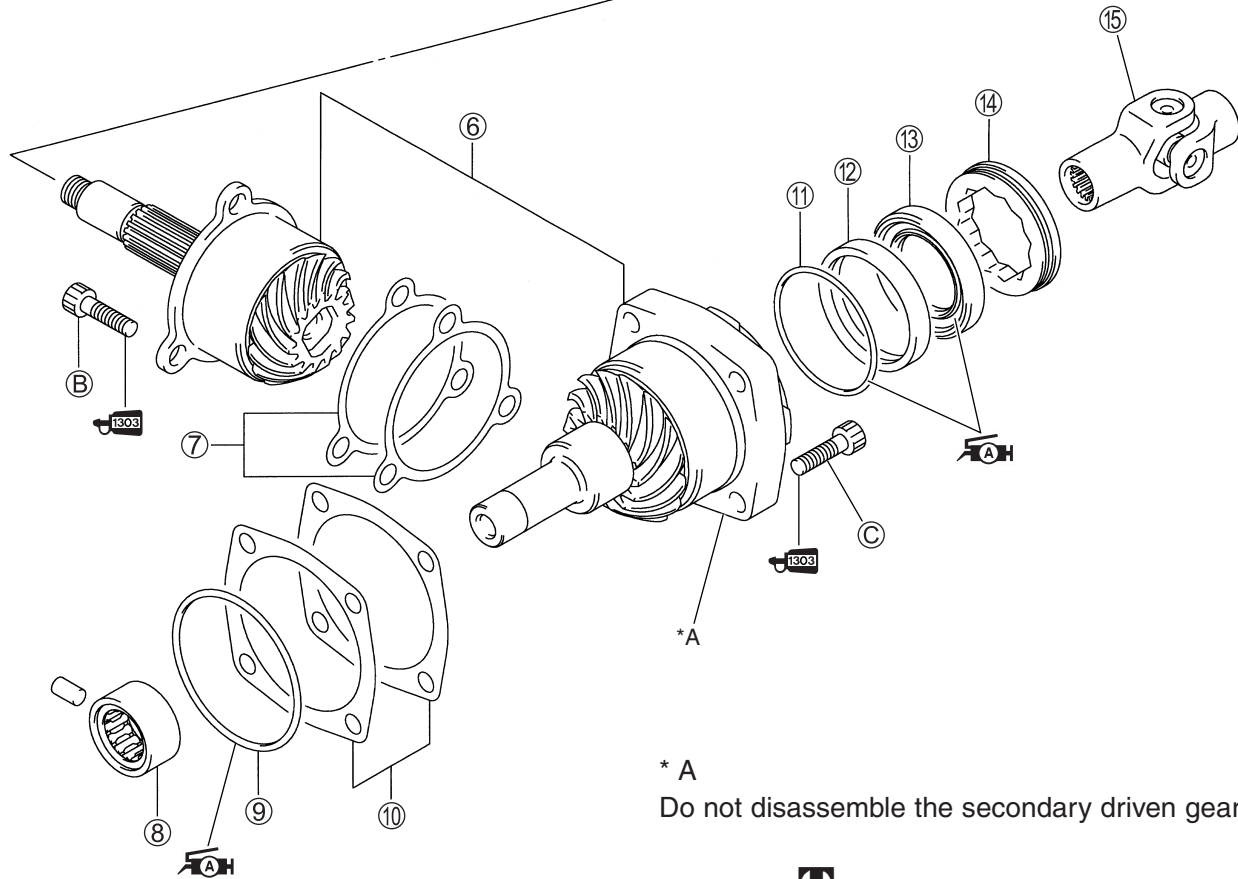
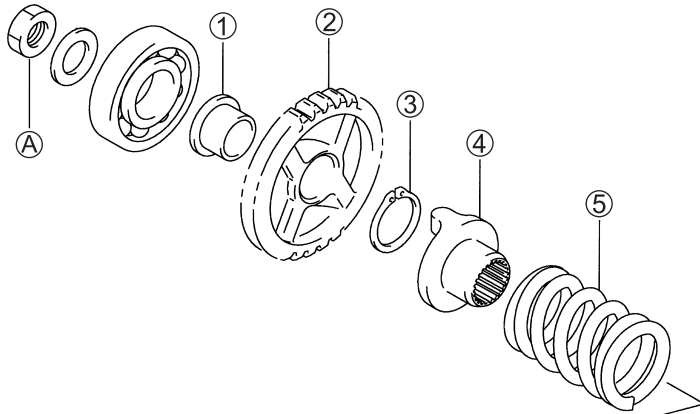
SHAFT DRIVE

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SECONDARY BEVEL GEARS CONSTRUCTION

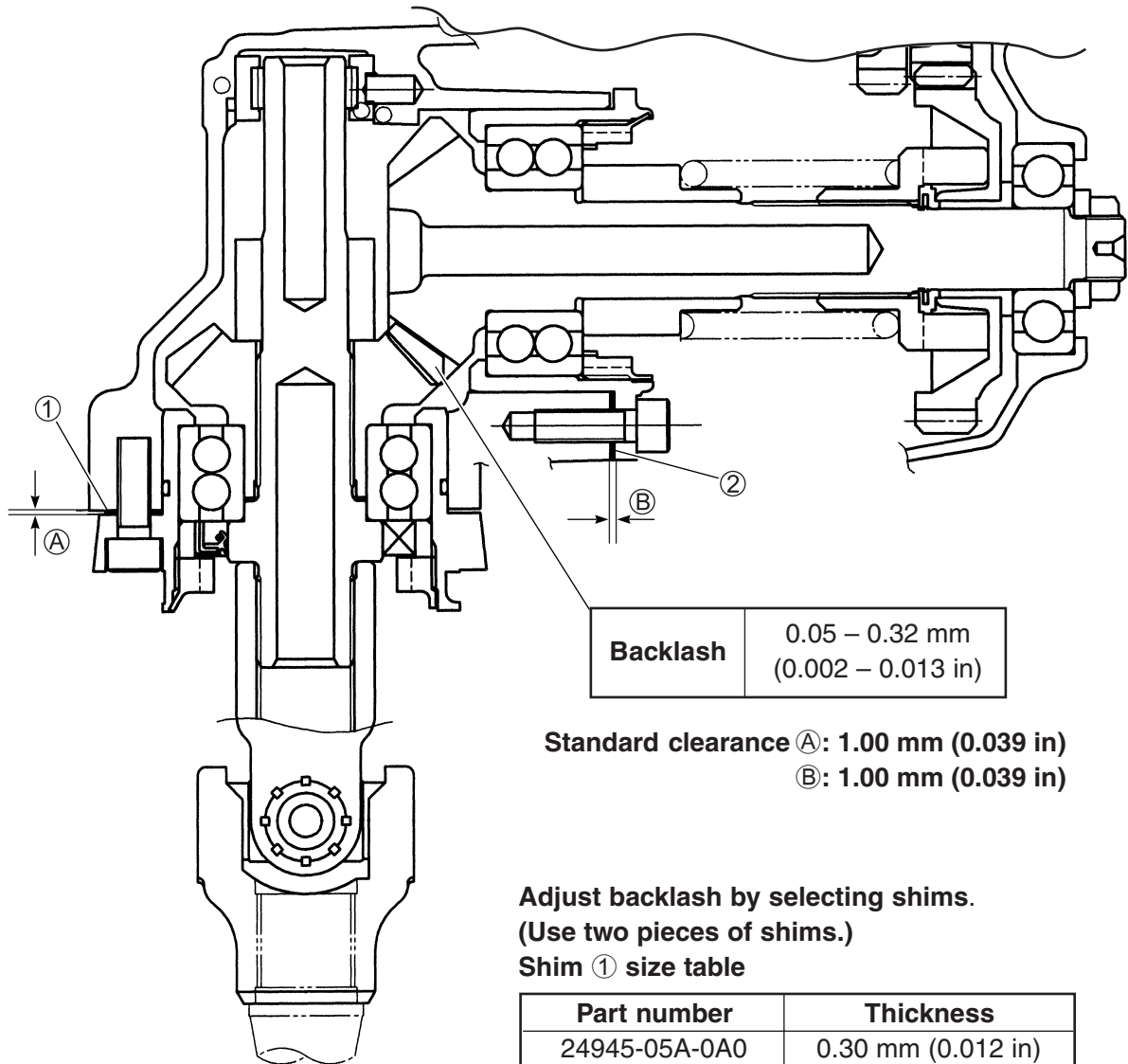
- (A) Secondary drive gear shaft nut
- (B) Secondary drive bevel gear bearing retainer bolt
- (C) Secondary driven bevel gear bolt
- ① Bush
- ② Overdriving driven gear
- ③ Circlip
- ④ Output cam dog
- ⑤ Damper spring
- ⑥ Secondary bevel gear set
- ⑦ Shims (5 kinds)
- ⑧ Driven bevel gear bearing
- ⑨ O-ring
- ⑩ Shims (5 kinds)
- ⑪ O-ring
- ⑫ Oil seal housing
- ⑬ Oil seal
- ⑭ Bearing stopper
- ⑮ Universal joint



* A
Do not disassemble the secondary driven gear.



ITEM	N-m	kgf-m	lb-ft
(A)	105	10.5	76.0
(B, C)	23	2.3	16.5



Backlash	0.05 – 0.32 mm (0.002 – 0.013 in)
-----------------	--------------------------------------

Standard clearance **A**: 1.00 mm (0.039 in)
B: 1.00 mm (0.039 in)

Adjust backlash by selecting shims.
 (Use two pieces of shims.)

Shim ① size table

Part number	Thickness
24945-05A-0A0	0.30 mm (0.012 in)
24945-05A-0B0	0.35 mm (0.014 in)
24945-05A-0C0	0.40 mm (0.016 in)
24945-05A-0D0	0.50 mm (0.020 in)
24945-05A-0E0	0.60 mm (0.024 in)

The shims ① are available as a set (24945-05810).

Shim ② size table


Part number	Thickness
24935-38A01-030	0.30 mm (0.012 in)
24935-38A01-035	0.35 mm (0.014 in)
24935-38A01-040	0.40 mm (0.016 in)
24935-38A01-050	0.50 mm (0.020 in)
24935-38A01-060	0.60 mm (0.024 in)

The shims ② are available as a set (24935-38810).

REMOVAL

SECONDARY DRIVE BEVEL GEAR

The crankcase must be separated to service the secondary drive bevel gear. The secondary drive bevel gear service requires engine removal and disassembly. Refer to the engine removal and the engine disassembly sections for secondary drive bevel gear assembly removal.

Engine removal  3-3

Engine disassembly  3-11





SECONDARY DRIVEN BEVEL GEAR

The following components must be removed in the described order before removing the secondary driven bevel gear.

NOTE:

Refer to the following pages for the details of each step.

- Remove the rear wheel. ( 7-38)
- Remove the swingarm. ( 7-48)
- Remove the universal joint.
- Remove the secondary driven bevel gear.



DISASSEMBLY

SECONDARY DRIVE BEVEL GEAR

- Compress the damper spring with a vice, and remove the circlip with the special tool.

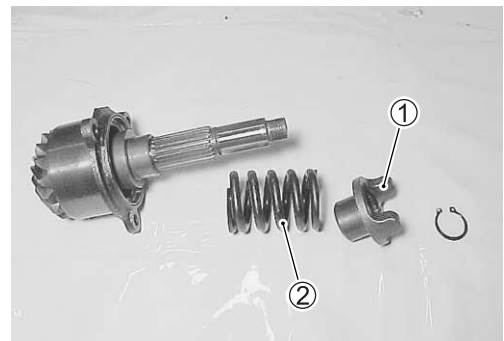
 09900-06107: Snap ring pliers



- Remove the cam dog ① and damper spring ②.

CAUTION

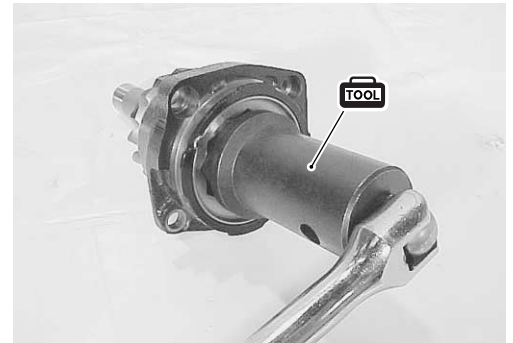
Do not attempt to remove the secondary drive bevel gear bearing. The secondary drive bevel gear and its bearing are available only as an assembly.



SECONDARY DRIVEN BEVEL GEAR

- Remove the bearing stopper with the special tool.

 **09921-21820: Bearing retainer wrench**



- Remove the oil seal.


**INSPECTION**

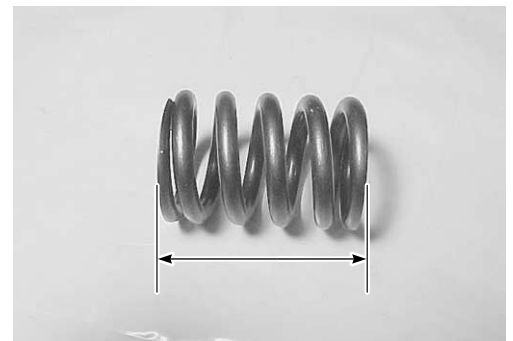
Inspect the removed parts for the following abnormalities.

- * Drive and driven bevel gears damage or wear
- * Improper tooth contact
- * Abnormal noise of bearings
- * Bearing damage or wear
- * Oil seal damage or wear
- * Output cam dog wear or damage
- * Universal joint spline damage or wear

**DAMPER SPRING**

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

 **Damper spring free length**
Service limit: 58.5 mm (2.30 in)



SECONDARY GEAR SHIMS ADJUSTMENT

BACKLASH

- Install the secondary drive bevel gear assembly with the removed shims and tighten the bolts to the specified torque.

 **Secondary drive bevel gear bearing retainer bolt:**
23 N·m (2.3 kgf·m, 16.5 lb-ft)

NOTE:

When replacing the secondary drive and driven bevel gears, install the removed shims to the secondary drive bevel gear assembly and tighten the bolts to the specified torque.

- Install the secondary driven bevel gear assembly with removed shims, the driven bevel gear bearing and secondary gear case.

NOTE:


Do not install the O-ring on the driven gear housing at this stage. O-ring is installed after backlash and tooth contact are correct.

- Tighten the secondary bevel gear case bolts and secondary driven bevel gear bolts to the specified torque.

 **Secondary bevel gear case bolt:**
22 N·m (2.2 kgf·m, 16.0 lb-ft)

Secondary driven bevel gear bolt:
23 N·m (2.3 kgf·m, 16.5 lb-ft)

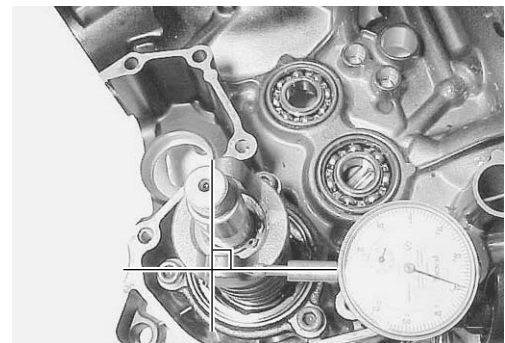
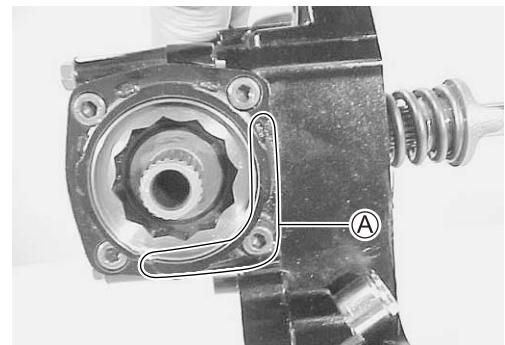
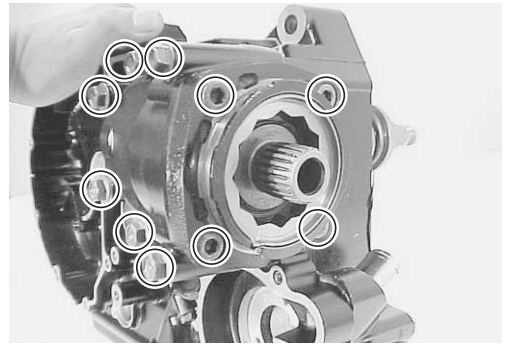
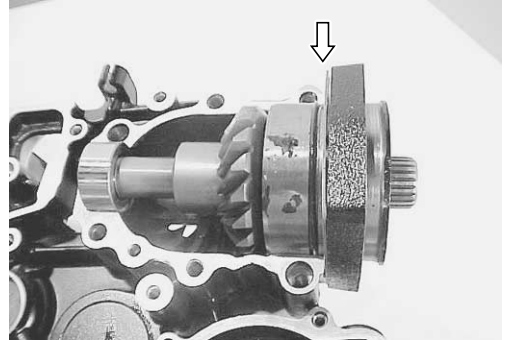
NOTE:

* Hollow portion  of the secondary driven bevel gear assembly faces inside.

* It is not necessary to apply SUZUKI BOND "1207B" to the matching surface at this stage.

- Measure the backlash as follows.
- Set-up a dial gauge as shown in photo.

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



- Adjust the dial gauge so that it touches the secondary drive bevel gear cam dog; hold the driven bevel gear securely, and turn the drive bevel gear in each direction, reading the total backlash on the dial gauge.

DATA Secondary bevel gear backlash
Standard: 0.05 – 0.32 mm (0.002 – 0.013 in)

NOTE:

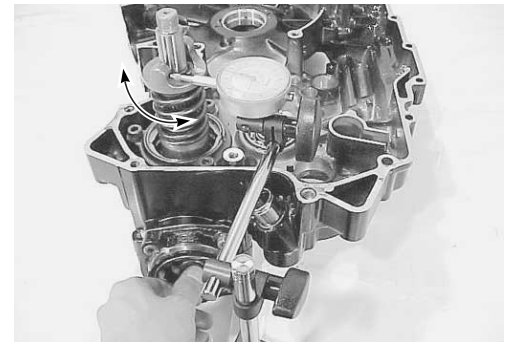
When measuring backlash, hold the left crankcase horizontally pull the secondary drive gear to take the bearing play out.

- If the backlash is not within specification, the shims (Driven bevel gear side) must be changed and the backlash should be re-checked until correct.

Refer to the chart for appropriate changes.

NOTE:

When changing the shims (Driven bevel gear side), measure the thickness of old shims. Using the thickness of the old shims as a guide, adjust the backlash by referring to the chart.



Backlash	Shim adjustment
Under 0.05 mm (0.002 in)	Increase shim thickness
0.05 – 0.32 mm (0.002 – 0.013 in)	Correct
Over 0.32 mm (0.013 in)	Decrease shim thickness

SHIM SPECIFICATIONS

Drive bevel gear side

Part No.	Shim thickness
24935-38A01-030	0.30 mm (0.012 in)
24935-38A01-035	0.35 mm (0.014 in)
24935-38A01-040	0.40 mm (0.016 in)
24935-38A01-050	0.50 mm (0.020 in)
24935-38A01-060	0.60 mm (0.024 in)

NOTE:

The shims (drive bevel gear side) are available as a set (24935-38810).

Driven bevel gear side

Part No.	Shim thickness
24945-05A00-0A0	0.30 mm (0.012 in)
24945-05A00-0B0	0.35 mm (0.014 in)
24945-05A00-0C0	0.40 mm (0.016 in)
24945-05A00-0D0	0.50 mm (0.020 in)
24945-05A00-0E0	0.60 mm (0.024 in)

NOTE:

The shims (driven bevel gear side) are available as a set (24945-05810).



TOOTH CONTACT

After bringing the backlash within specification by changing the secondary driven bevel gear shims, it will be necessary to check tooth contact.

- Remove the drive bevel gear assembly from the crankcase.
- Clean and degrease the secondary drive bevel gear teeth, and apply a coating of machinist’s layout dye or paste to several teeth.
- Reinstall the secondary drive bevel gear assembly, with correct shim, onto the secondary gear housing.
- Rotate the secondary driven bevel gear several turns in both directions.
- Remove the secondary drive bevel gear from the crankcase, and observe the tooth contact pattern made in the dye or paste.
- Compare the tooth contact pattern to the examples as shown in ①, ② and ③.
- If tooth contact is found to be incorrect, the shims of the secondary drive bevel gear and secondary driven bevel gear must be changed, tooth contact should be re-checked until correct.

▲ CAUTION

After the tooth contact adjustment is made, the backlash must be re-checked, as it may change. Refer to the backlash checking sub-section, and readjust until both backlash and tooth contact are correct.

Tooth contact	Shim adjustment
Contact at tooth top ①	Decrease thickness of shims ④ or ⑤
Contact at tooth root ③	Increase thickness of shims ④ or ⑤

SHIM SPECIFICATIONS

Drive bevel gear side

Part No.	Shim thickness
24935-38A01-030	0.30 mm (0.012 in)
24935-38A01-035	0.35 mm (0.014 in)
24935-38A01-040	0.40 mm (0.016 in)
24935-38A01-050	0.50 mm (0.020 in)
24935-38A01-060	0.60 mm (0.024 in)

NOTE:

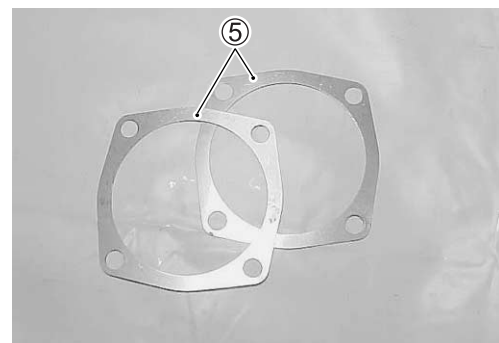
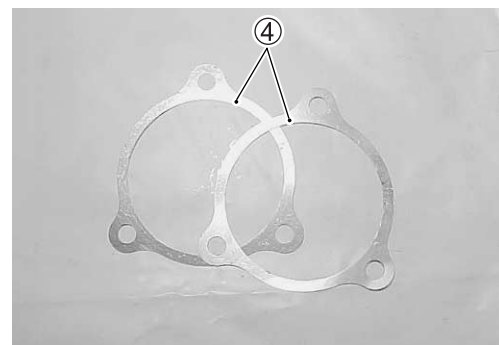
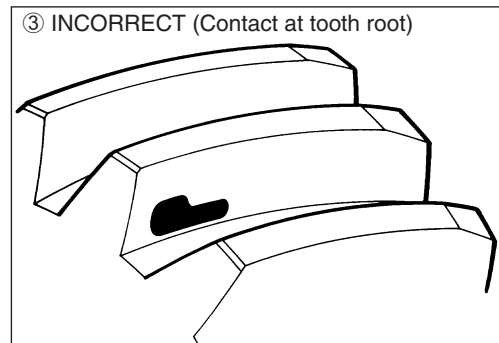
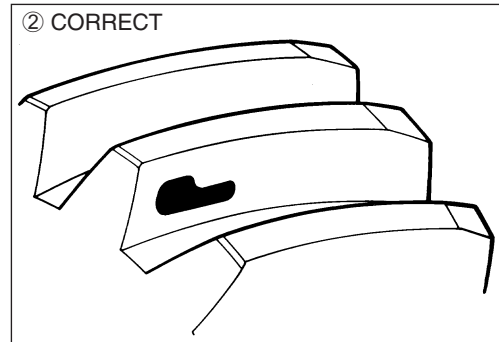
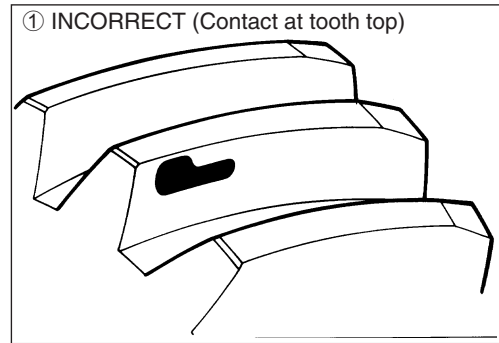
The shims (drive bevel gear side) are available as a set (24935-38810).

Driven bevel gear side

Part No.	Shim thickness
24945-05A00-0A0	0.30 mm (0.012 in)
24945-05A00-0B0	0.35 mm (0.014 in)
24945-05A00-0C0	0.40 mm (0.016 in)
24945-05A00-0D0	0.50 mm (0.020 in)
24945-05A00-0E0	0.60 mm (0.024 in)

NOTE:


The shims (driven bevel gear side) are available as a set (24945-35810).



REASSEMBLY

SECONDARY DRIVEN BEVEL GEAR

- Apply grease to the lip of oil seal.

 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)



- Tighten the bearing stopper to the specified torque with the special tool.

 Bearing stopper: 105 N·m (10.5 kgf·m, 76.0 lb-ft)

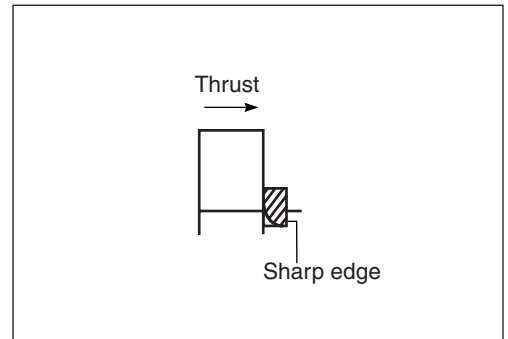
 09921-21820: Bearing retainer wrench



SECONDARY DRIVE BEVEL GEAR

Reassemble the secondary drive bevel gear in the reverse order of disassembly. Pay attention to the following points.

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




CAUTION

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

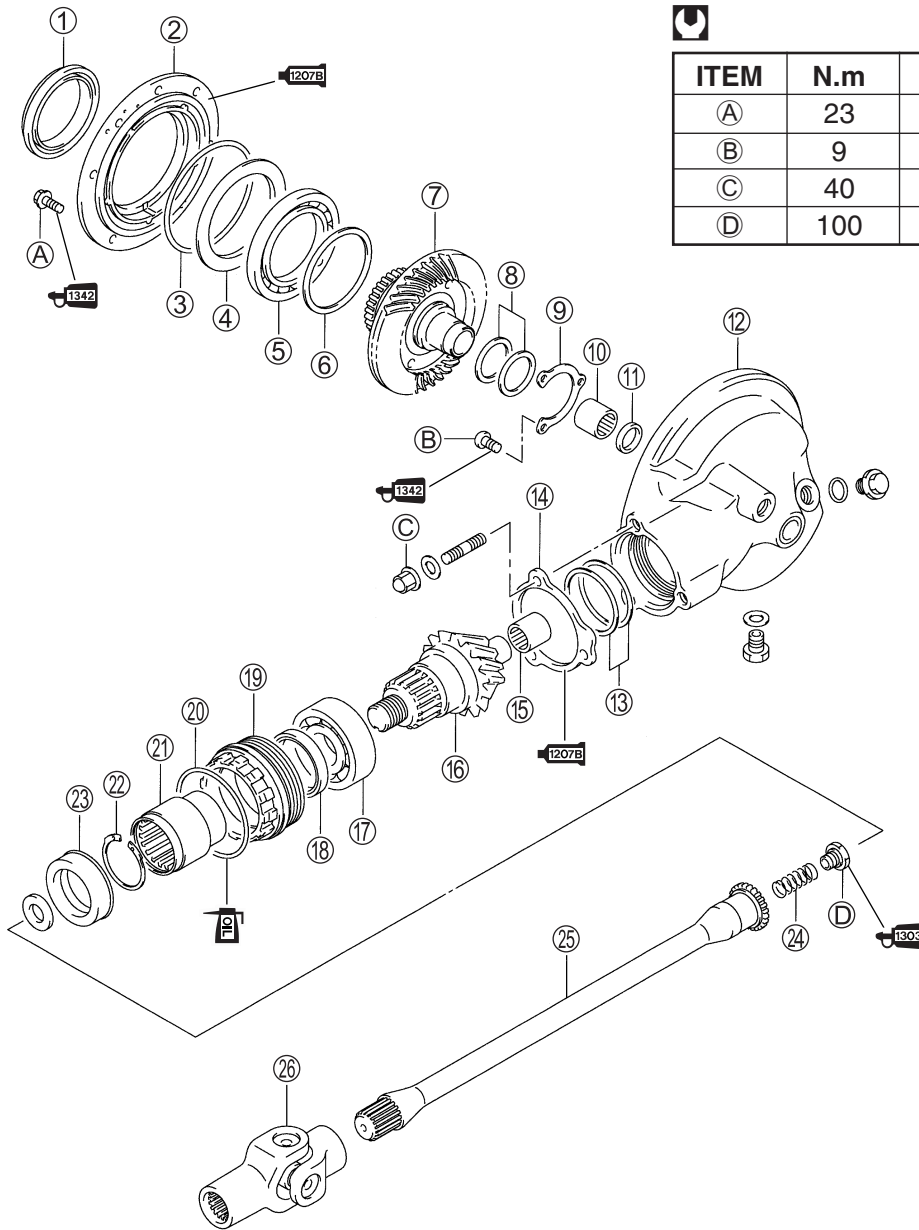


INSTALLATION

SECONDARY DRIVEN BEVEL GEAR/ SECONDARY DRIVE BEVEL GEAR

- Refer to the engine reassembly sections.
Engine reassembly  3-53

FINAL BEVEL GEARS CONSTRUCTION



ITEM	N.m	kgf.m	lb-ft
A	23	2.3	16.5
B	9	0.9	6.5
C	40	4.0	29.0
D	100	10.0	72.5

- A Final gear case bolt
- B Final driven bevel gear bearing retainer screw
- C Final gear case nut
- D Final driven bevel gear coupling nut
- 1 Oil seal
- 2 Final gear bearing case
- 3 O-ring
- 4 Plate
- 5 Final driven gear bearing
- 6 Shims (4 kinds)
- 7 Final driven bevel gear
- 8 Shims (8 kinds)
- 9 Bearing retainer
- 10 Final driven gear bearing
- 11 Oil seal
- 12 Final gear case
- 13 Shims (5 kinds)
- 14 Stopper plate (2 kinds)
- 15 Final drive gear bearing
- 16 Final drive bevel gear
- 17 Final drive bevel gear bearing
- 18 Oil seal
- 19 Bearing stopper
- 20 O-ring
- 21 Final drive coupling
- 22 Circlip
- 23 Oil seal
- 24 Spring
- 25 Propeller shaft
- 26 Universal joint

Standard clearance **Ⓐ**: 1.00 mm (0.039 in)

Shim **①** size table

Part number	Thickness
27445-38A00-030	0.30 mm (0.012 in)
27445-38A00-035	0.35 mm (0.014 in)
27445-38A00-040	0.40 mm (0.016 in)
27445-38A00-050	0.50 mm (0.020 in)
27445-38A00-060	0.60 mm (0.024 in)

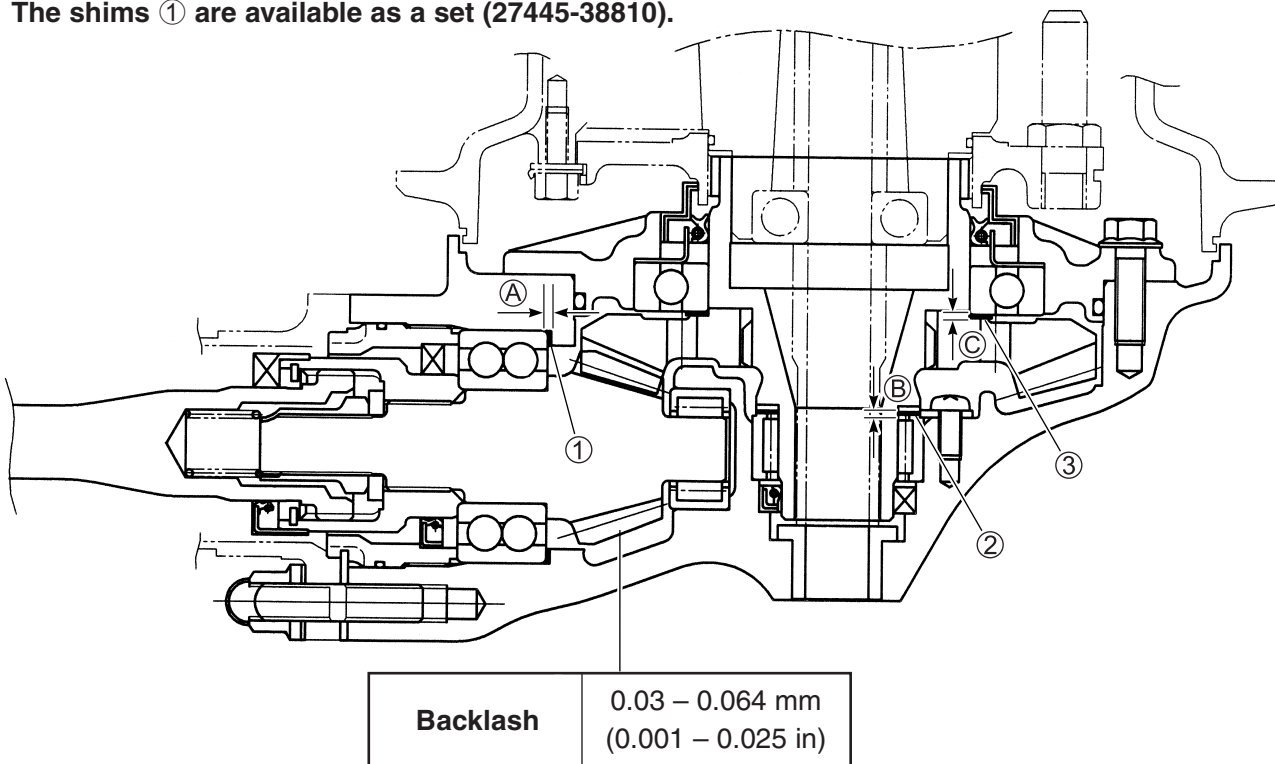
The shims **①** are available as a set (27445-38810).

Standard clearance **Ⓒ**: 1.00 mm (0.039 in)

Shim **③** size table

Part number	Thickness
27327-34200	0.35 mm (0.014 in)
27327-34210	0.40 mm (0.016 in)
27327-34220	0.50 mm (0.020 in)
27327-34230	0.60 mm (0.024 in)

The shims **③** are available as a set (27327-34810).



Standard clearance **Ⓑ**: 2.3 mm (0.091 in)

Shim **②** size table

Part number	Thickness
27326-34201	1.05 mm (0.041 in)
27326-34211	1.10 mm (0.043 in)
27326-34221	1.20 mm (0.047 in)
27326-34231	1.25 mm (0.049 in)
27326-34241	1.35 mm (0.053 in)
27326-34201-140	1.40 mm (0.055 in)
27326-34201-145	1.45 mm (0.057 in)
27326-34201-150	1.50 mm (0.059 in)

The shims **②** are available as a set {27326-34810 (1.40 – 1.50), 27326-34820 (1.05 – 1.35)}.

FINAL GEAR CASE REMOVAL

After draining final gear oil, the following components must be removed in the described order before removing the final gear case.

NOTE:

Refer to the following pages for the details of each step.

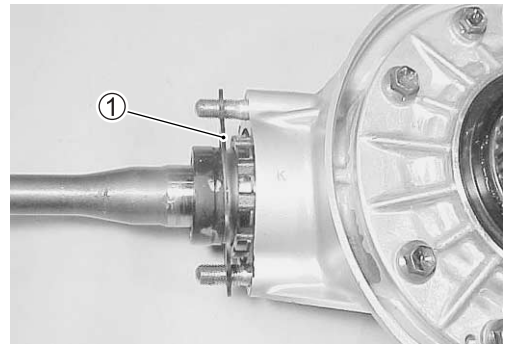
- Drain final gear oil. (☞ 2-15)
- Remove the rear wheel. (☞ 7-38)

- Remove the final gear case.



FINAL GEAR CASE DISASSEMBLY

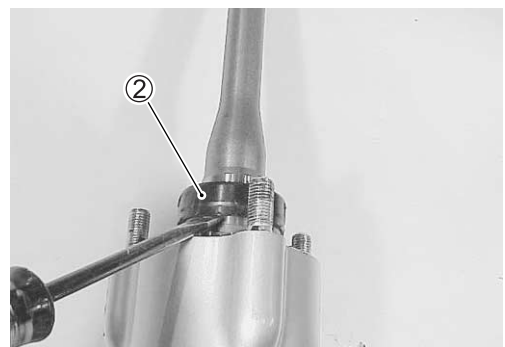
- Remove the plate ①.



- Remove the oil seal ②.

▲ CAUTION

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

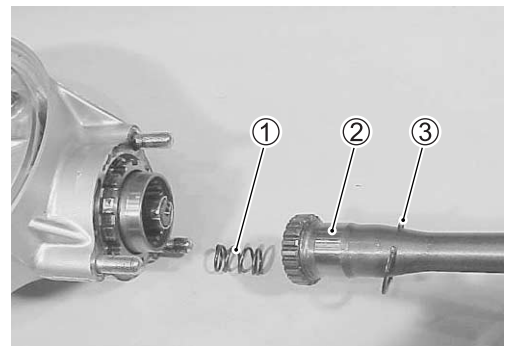


- Remove the circlip with the special tool and take off the propeller shaft and spring.

TOOL 09900-06108: Snap ring pliers

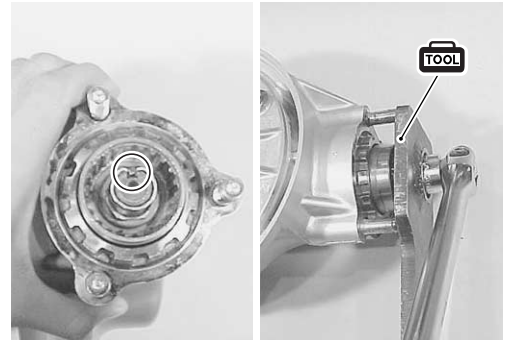


- ① Spring
- ② Propeller shaft
- ③ Circlip

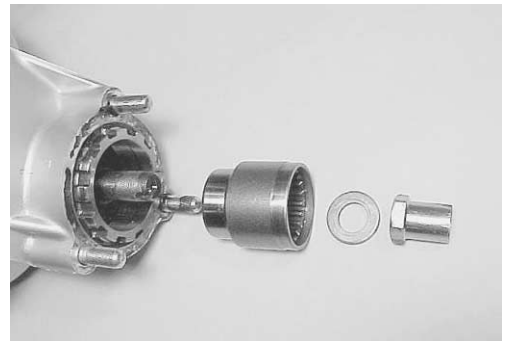


- Using a chisel, unlock the nut.
- Remove the final drive bevel gear coupling nut with the special tool.

TOOL 09924-62430: 22 mm Long socket
 09924-64510: Final drive gear coupling holder

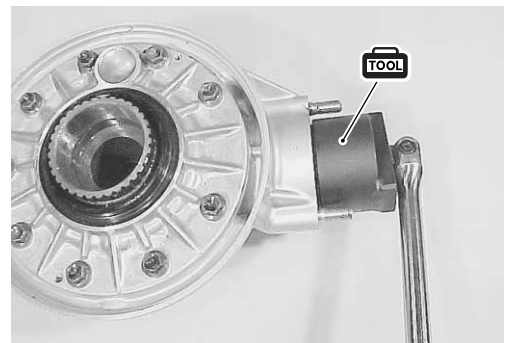


- Remove the washer and the final drive coupling.

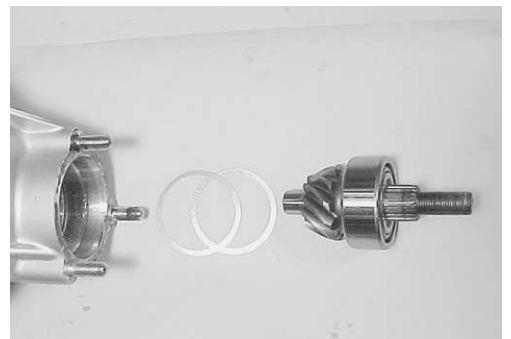


- Remove the bearing stopper by using the special tool.

TOOL 09924-62410: Final drive gear bearing holder wrench



- Remove the final drive bevel gear and shims.



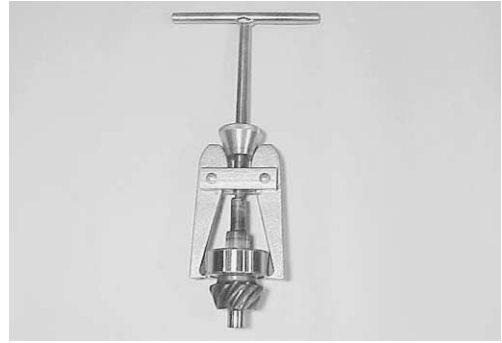
- Remove the bearing from the final drive bevel gear with the bearing puller.

⚠ CAUTION

The removed bearing must be replaced with a new one.

NOTE:

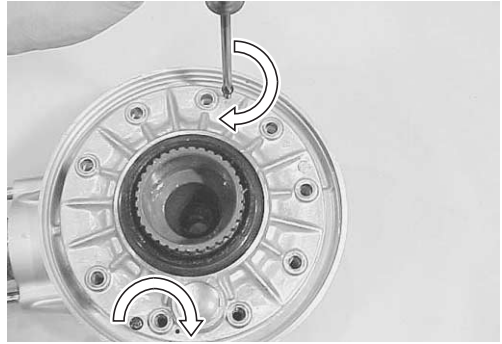
If no abnormal noise, the bearing removal is not necessary.



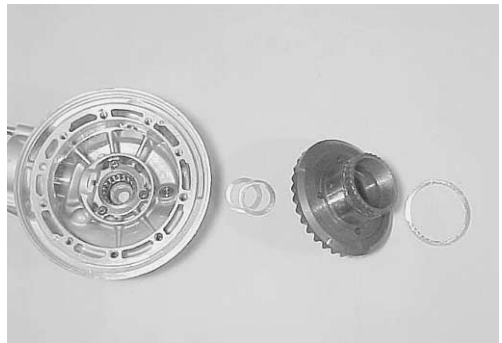
- Remove the final gear bearing case bolts.



- Remove the final gear bearing case from the final gear case, by using two 5 mm screws.



- Remove the final driven bevel gear and shims.



- Remove the oil seal with the special tool.

TOOL 09913-50121: Oil seal remover

NOTE:

If no oil leakage, the oil seal removal is not necessary.



- Remove the bearing retainer screws, using an impact driver set.

TOOL 09900-09004: Impact driver set



- Remove the final driven gear bearing and oil seal with the special tools.

TOOL 09941-64511: Bearing remover
09930-30102: Sliding shaft

CAUTION

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

NOTE:

If no abnormal noise, the bearing removal is not necessary.

- Remove the final drive gear bearing with the special tools.

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

CAUTION

The removed bearing must be replaced with a new one.

NOTE:

If no abnormal noise, the bearing removal is not necessary.

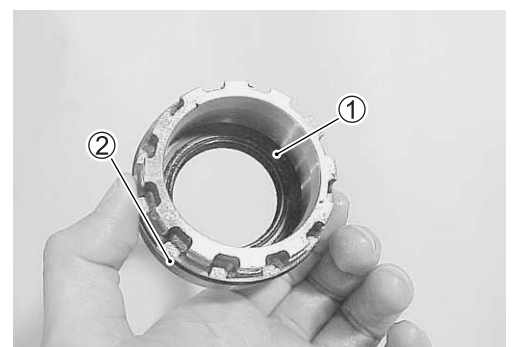
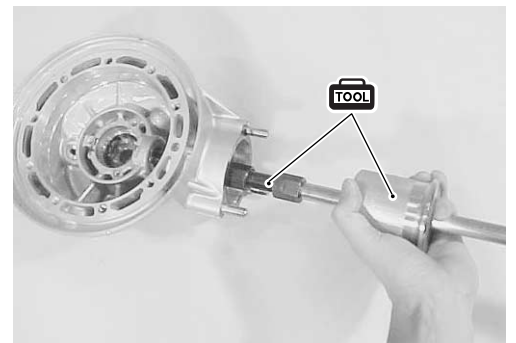
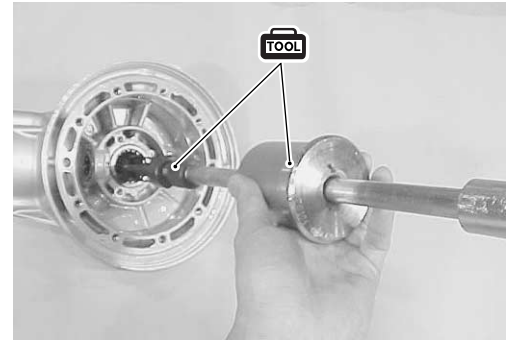
- Remove the oil seal ① and O-ring ② from the bearing stopper.

CAUTION

The removed oil seal and O-ring must be replaced with new ones.

NOTE:

If no oil leakage, the oil seal removal is not necessary.



INSPECTION

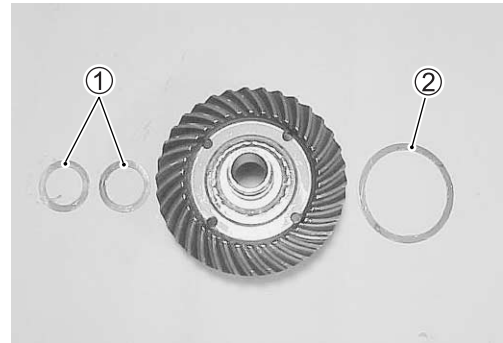
Inspect the removed parts for the following abnormalities.

- * Drive and driven bevel gear damage or wear
- * Improper tooth contact
- * Abnormal noise of bearings
- * Bearing damage or wear
- * Oil seal damage or wear
- * Propeller shaft spline damage or wear

FINAL GEAR SHIMS ADJUSTMENT

FINAL GEAR BEARING CASE SHIM CLEARANCE

- Install the final driven gear, shims (① and ②) and final gear bearing case to the final gear case.



- Tighten the final gear case bolts to the specified torque.

 **Final gear case bolt: 23 N·m (2.3 kgf·m, 16.5 lb-ft)**

NOTE:

It is not necessary to apply SUZUKI BOND "1207B" to the matching surface at this stage.

- Measure the clearance between the shims and bearing. If it is not within the specification, the shims must be changed.



Standard

 **Final gear case shim clearance**
Standard: 1.00 mm (0.039 in)

Shims ② specifications

Part No.	Shim thickness
27327-34200	0.35 mm (0.014 in)
27327-34210	0.40 mm (0.016 in)
27327-34220	0.50 mm (0.020 in)
27327-34230	0.60 mm (0.024 in)


NOTE:

The shims ② are available as a set (27327-34810).

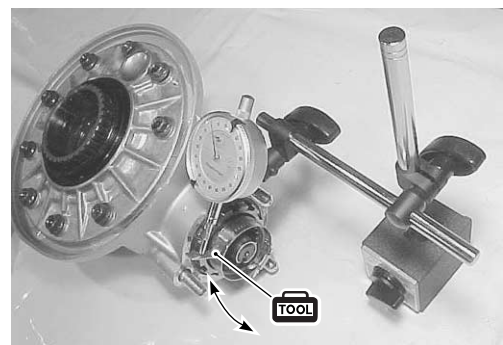
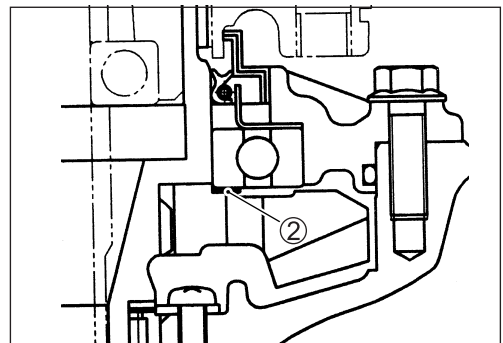
BACKLASH

After assembling the final gear case, measure the final bevel gear backlash as follows.

- Install the backlash measuring tool on the drive bevel gear coupling, and set-up a dial gauge as shown in photo.

 **09924-34510: Backlash measuring tool (27 – 50 mm)**
09900-20606 : Dial gauge (1/100 mm, 10 mm)
09900-20701 : Magnetic stand

- Adjust the dial gauge so that it touches the backlash measuring tool arm at the mark; hold the final driven bevel gear securely, and turn the final drive bevel gear coupling slightly in each direction, reading the total backlash on the dial gauge.



 **Final bevel gear backlash**
Standard: 0.03 – 0.64 mm (0.001 – 0.025 in)

If the backlash is not within the specification, adjust the shim thickness as follows:

- Remove shims from final gear bearing case and final gear case, and measure total thickness.
- In order not to change the clearance between final driven bevel gear and bearing, the total thickness of the shims installed after a change is made must equal the original total thickness of shims.
- If backlash is too large:
 - a) Install a thinner shim pack ① between final driven bevel gear and final gear case.
 - b) Increase thickness of shims ② between final driven bevel gear bearing and bearing case by an amount equal to decrease above.
- If backlash is too small:
 - a) Install a thicker shim pack ① between final driven bevel gear and final gear case.
 - b) Decrease thickness of shims ② between final driven gear bearing and bearing case by an amount equal to increase above.

EXAMPLE:

Final gear to case shims ①; $1.45 \text{ mm} + 1.40 \text{ mm} = 2.85 \text{ mm}$

Final gear bearing to bearing case shims ②,

$$0.35 \text{ mm} + 0.60 \text{ mm} = 0.95 \text{ mm}$$

$$\text{Original total measurement} = 3.80 \text{ mm}$$

Backlash too large:

Final gear to case shims ①; $1.35 \text{ mm} + 1.45 \text{ mm} = 2.80 \text{ mm}$

Final gear bearing to bearing case shims ②,

$$0.60 \text{ mm} + 0.40 \text{ mm} = 1.00 \text{ mm}$$

$$\text{Total thickness} = 3.80 \text{ mm}$$

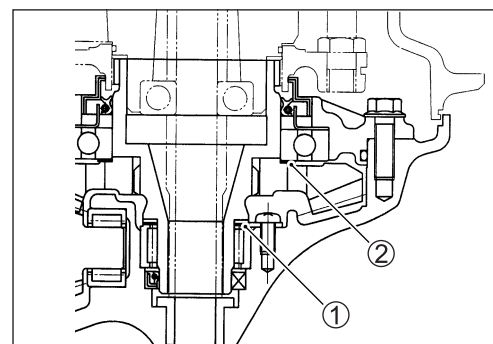
Backlash too small:

Final gear to case shims ①; $1.50 \text{ mm} + 1.40 \text{ mm} = 2.90 \text{ mm}$

Final gear bearing to bearing case shims ②;

$$0.50 \text{ mm} + 0.40 \text{ mm} = 0.90 \text{ mm}$$

$$\text{Total thickness} = 3.80 \text{ mm}$$



Shims ① specifications

Part No.	Shim thickness
27326-34201	1.05 mm (0.041 in)
27326-34211	1.10 mm (0.043 in)
27326-34221	1.20 mm (0.047 in)
27326-34231	1.25 mm (0.049 in)
27326-34241	1.35 mm (0.053 in)
27326-34201-140	1.40 mm (0.055 in)
27326-34201-145	1.45 mm (0.057 in)
27326-34201-150	1.50 mm (0.059 in)

The shims ① are available as a set {27326-34810 (1.40 – 1.50), 27326-34820 (1.05 – 1.35)}.

Shims ② specifications

Part No.	Shim thickness
27327-34200	0.35 mm (0.014 in)
27327-34210	0.40 mm (0.016 in)
27327-34220	0.50 mm (0.020 in)
27327-34230	0.60 mm (0.024 in)

The shims ② are available as a set (27327-34810).

TOOTH CONTACT

After backlash adjustment is carried out, the tooth contact must be checked.

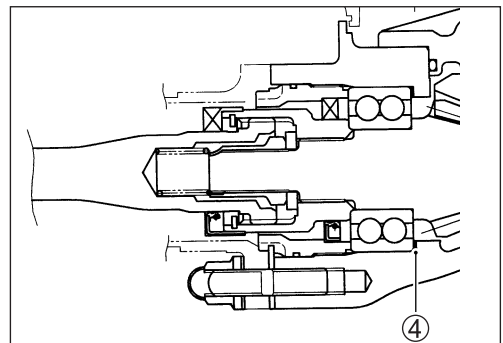
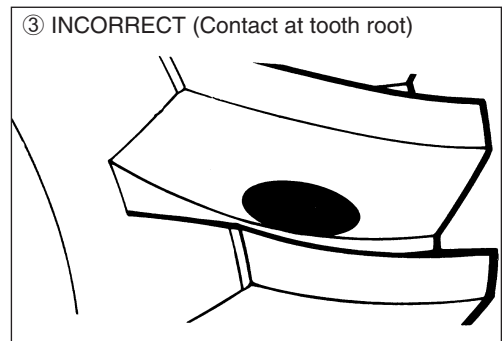
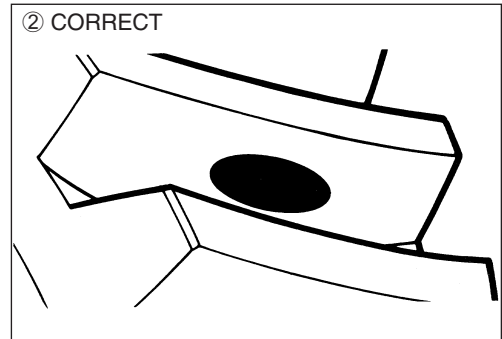
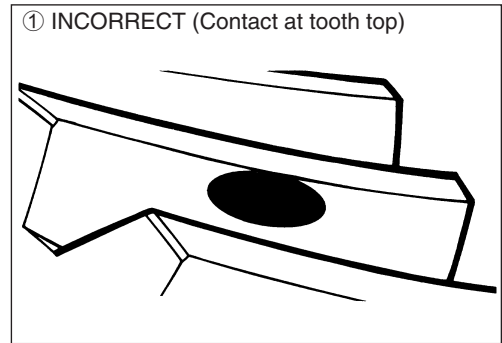
- Remove the bolts from the final gear bearing case, and remove the case with the two 5 mm screws. (☞ 4-14) Do not misplace the shims. Remove the final driven bevel gear.
- Clean and de-grease several teeth on the final driven bevel gear. Coat these teeth with machinist's dye or paste, preferably of a light color.
- Re-install the final driven bevel gear with shims in place, positioning the coated teeth so that they are centered on the final drive bevel gear.
- Re-install the final gear bearing case and bolts, and tighten to specification.

Final gear case bolt: 23 N-m (2.3 kgf-m, 16.5 lb-ft)

- Using a socket and handle on the final drive bevel gear coupling nut, rotate the final drive bevel gear several turns in each direction, while loading the final driven bevel gear. This will provide a contact pattern on the coated teeth of the driven bevel gear.
- Remove the final gear bearing case and final driven bevel gear, and inspect the coated teeth of the driven bevel gear. The contact patch should be as shown at right:
- If the tooth contact pattern is incorrect, as shown in ①, a thinner shim ④ is needed between the final drive bevel gear bearing and final gear case.
- If the tooth contact pattern is incorrect, as shown in ③, a thicker shim ④ is needed between the final drive bevel gear bearing and final gear case.
- If the tooth contact pattern is incorrect for either reason, the appropriate shim must be installed, and the tooth contact pattern rechecked by repeating the tooth coating procedure above.

NOTE:

If it is necessary to adjust the shim ④ thickness between final drive bevel gear bearing and final gear case, the final gear backlash may change, and should be re-checked according to the procedure outlined under the Backlash Measurement sub-section. Both adjustments may be needed until both backlash and tooth contact are correct.



Shims ④ specification

Part No.	Shim thickness
27445-38A00-030	0.30 mm (0.012 in)
27445-38A00-035	0.35 mm (0.014 in)
27445-38A00-040	0.40 mm (0.016 in)
27445-38A00-050	0.50 mm (0.020 in)
27445-38A00-060	0.60 mm (0.024 in)

The shims ④ are available as a set (27445-38810).

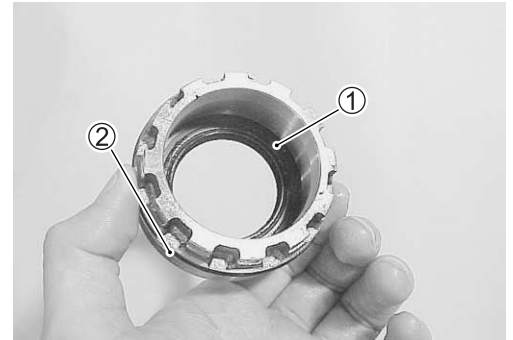
FINAL GEAR CASE REASSEMBLY

Reassemble the final gear case in the reverse order of disassembly. Pay attention to the following points.

- Install a new oil seal ① and O-ring ② to the bearing stopper.

▲ CAUTION

Use new O-ring and oil seal to prevent oil leakage.

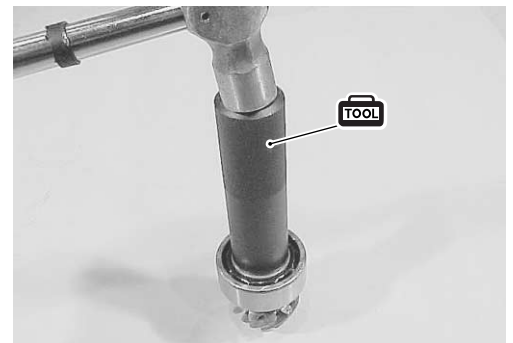


- Install the bearing to the final drive bevel gear with the special tool.


 09913-84510: Bearing installer

▲ CAUTION

When replacing the drive bevel gear, replace the driven bevel gear also, as they must be replaced together.



- Install the needle roller bearing for the final drive bevel gear into the final gear case with the special tool.

 09913-75821 : Bearing installer



- Install the oil seal into the final gear case.

▲ CAUTION

- * Use a new oil seal to prevent oil leakage.
- * The lip and spring of the oil seal should face to the driven bevel gear side.



- Install the needle roller bearing for the final driven bevel gear into the final gear case with the special tool.

 **09913-76010: Bearing installer**

NOTE:

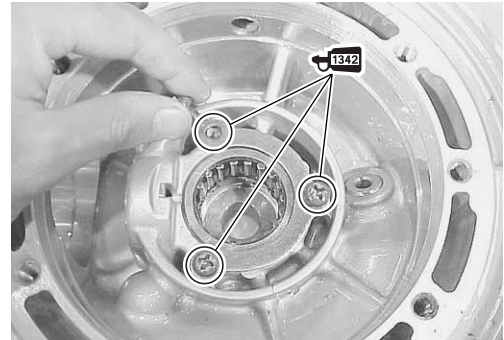
The stamped ward on the bearing end should face to the driven bevel gear side.



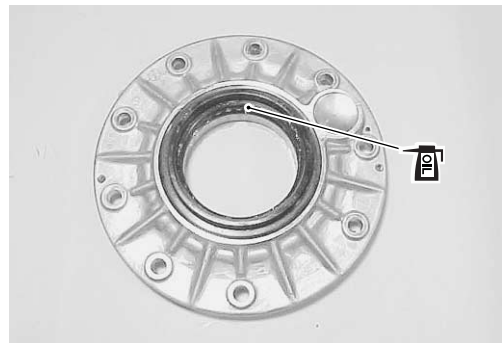
- Install the bearing retainer. Apply a small quantity of the THREAD LOCK “1342” on the screws, and tighten them to the specified torque.

 **99000-32050: THREAD LOCK “1342”**

 **Bearing retainer screw: 9 N·m (0.9 kgf·m, 6.5 lb·ft)**



- Install a new oil seal to the final gear bearing case.
- Apply final gear oil to the lip of the oil seal.



- Apply SUZUKI BOND “1207B” to the mating surface of the final gear case and final gear bearing case.

▲ CAUTION

Do not block the breather passage when applying SUZUKI BOND “1207B”.

 99000-31140: SUZUKI BOND “1207B”



- Apply THREAD LOCK “1342” to the final gear case bolts and tighten them to the specified torque.

 Final gear case bolt: 23 N·m (2.3 kgf·m, 16.5 lb·ft)

 99000-32050: THREAD LOCK “1342”

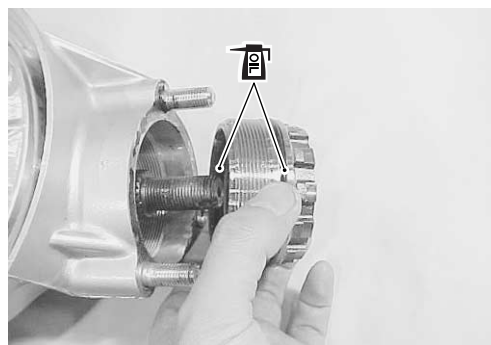


- Install the correct shims to the final drive bevel gear and install the bevel gear to the final gear case.

Shim adjustment (📄 4-16)



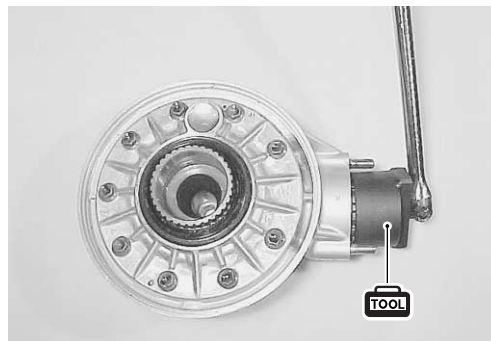
- Apply oil to the O-ring and the oil seal.
- Install the bearing stopper.



- Tighten the bearing stopper to the specified torque with the special tool.

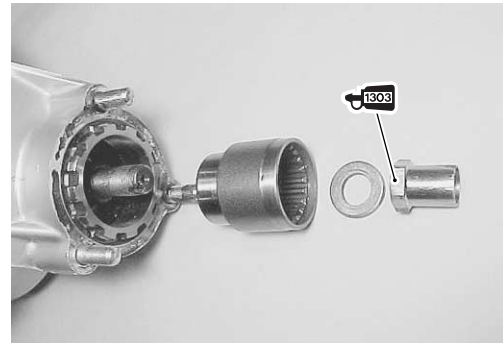
 09924-62410: Final drive gear bearing holder wrench

 Final drive bevel gear bearing stopper: 110 N·m
(11.0 kgf·m, 79.5 lb·ft)



- Apply a small quantity of the THREAD LOCK “1303” to the final drive bevel gear coupling nut.

 99000-32030: THREAD LOCK “1303”

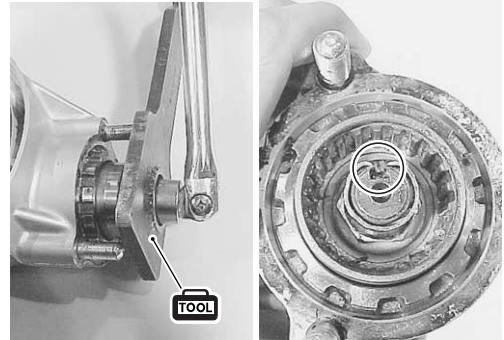


- Tighten the nut to the specified torque with the special tool.

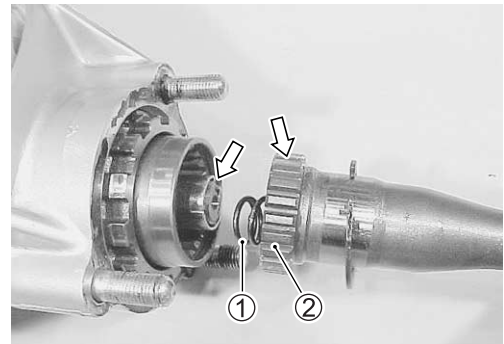
 **Final drive bevel gear coupling nut: 100 N·m
(10.0 kgf·m, 72.5 lb-ft)**

 09924-62430: 22 mm Long socket
09924-64510: Final drive gear coupling holder

- Lock the final drive bevel gear coupling nut with a center punch.

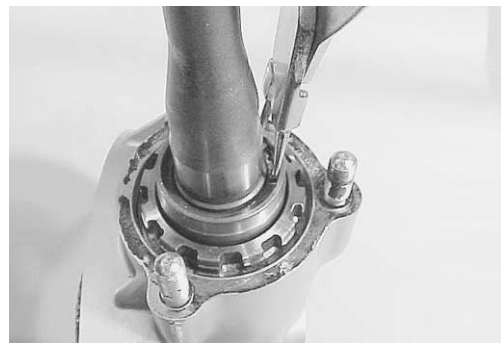


- Apply Lithium Base Molybdenum grease (NLGI #2) to the propeller shaft splines and final drive bevel gear coupling.
- Install the spring ① and propeller shaft ②.



- Install the circlip.
- After installing the propeller shaft with a new circlip, make sure that the propeller shaft turns smoothly without any hitch or bearing noise.


 09900-06108: Snap ring pliers

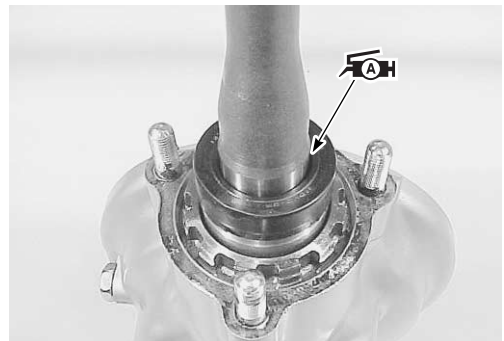


- Apply grease to the lip of the oil seal and install it to the final drive bevel gear coupling.

▲ CAUTION

Use a new oil seal to prevent oil leakage.

 99000-25030: SUZUKI SUPER GREASE “A” (For USA)
99000-25010: SUZUKI SUPER GREASE “A”
(For the others)



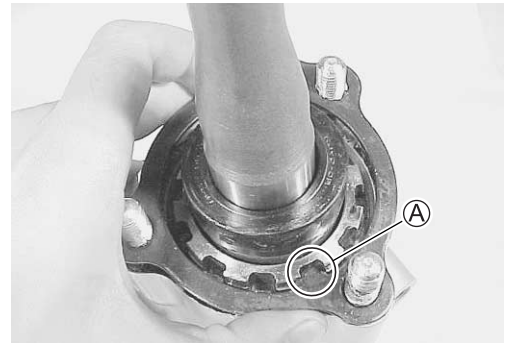
- Install the stopper plate.

▲ CAUTION

When installing the plate, fit the protrusion (A) of plate to the one of the bearing stopper grooves.

NOTE:

Two kinds of plates are available to lock the stopper at the proper position.



FINAL GEAR CASE INSTALLATION

Installation is in the reverse order of removal.

NOTE:

Refer to the following pages for the details of each step.

- Install the final gear case.
- Tighten the final gear case bolts to the specified torque.

🔧 Final gear case nut: 40 N-m (4.0 kgf-m, 29.0 lb-ft)



- Install the rear wheel. (👉 7-41)
- Pour final gear oil. (👉 2-15)

FUEL AND LUBRICATION SYSTEM

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⚠ WARNING

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

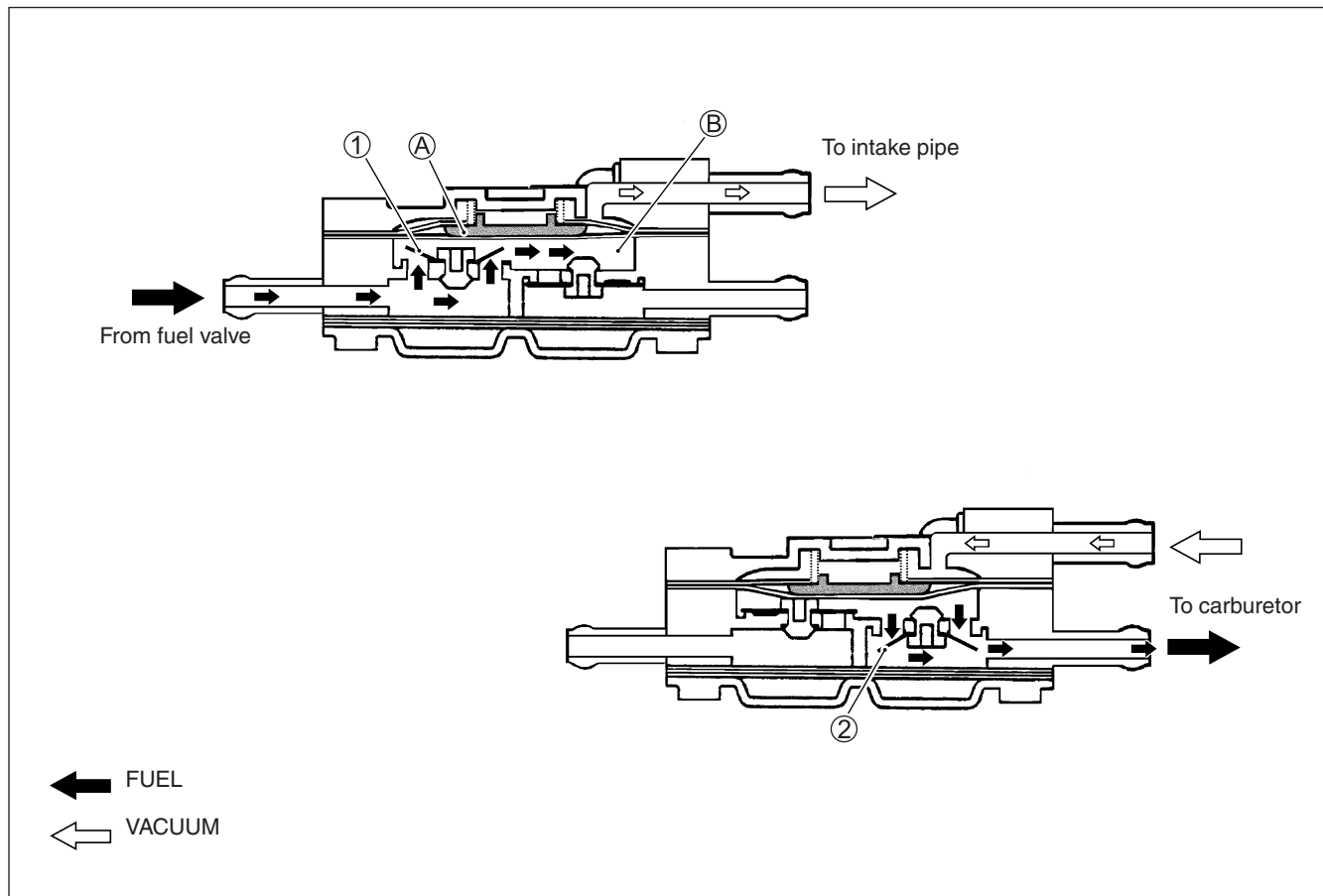
FUEL SYSTEM

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.

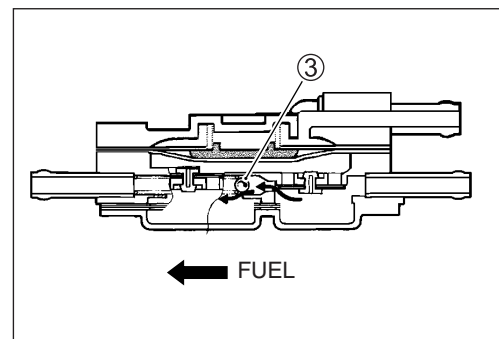
FUEL PUMP

Vacuum pulsations from the carburetor intake pipe are used to operate the pump diaphragm (A). When vacuum is applied to the diaphragm (A), fuel is drawn from the tank into the diaphragm's chamber (B). 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 VALVE REMOVAL

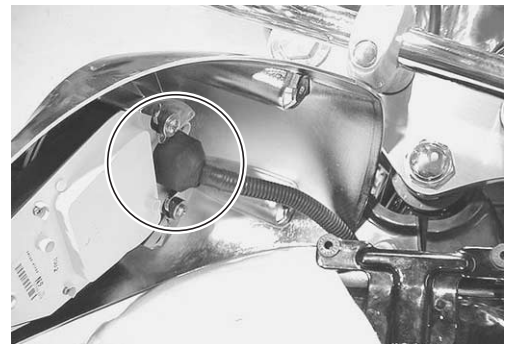
⚠ WARNING

Gasoline is highly flammable and explosive. Keep heat, sparks, and flames away from gasoline.

- Remove the front seat. (☞ 7-2)
- Remove the speedometer.
- Disconnect the speedometer coupler.

⚠ CAUTION

Be careful not to scratch the fuel tank.



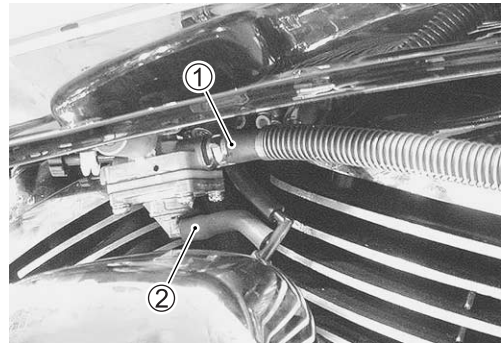
- Remove the fuel tank mounting bolt.



- Disconnect the fuel level gauge coupler.



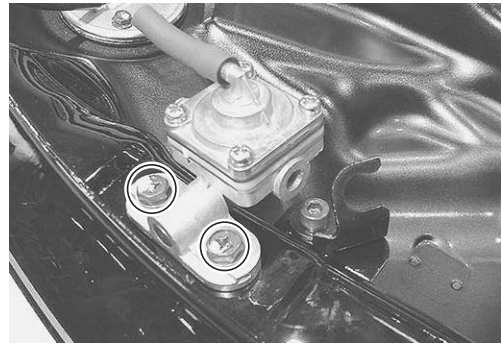
- Disconnect the fuel hose ① and vacuum hose ②.



- Remove the throttle stop screw.
- Remove the fuel tank.



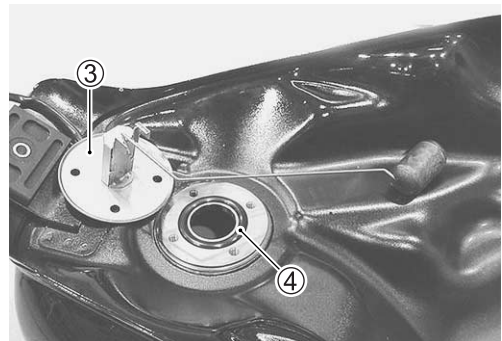
- Remove the fuel valve.



- Remove the fuel level gauge mounting bolts.



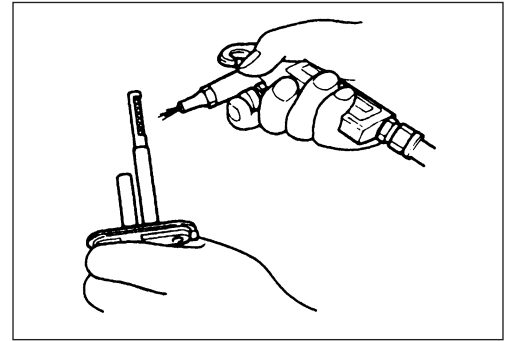
- Remove the fuel level gauge ③.
- Remove the O-ring ④.



INSPECTION

FUEL VALVE

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

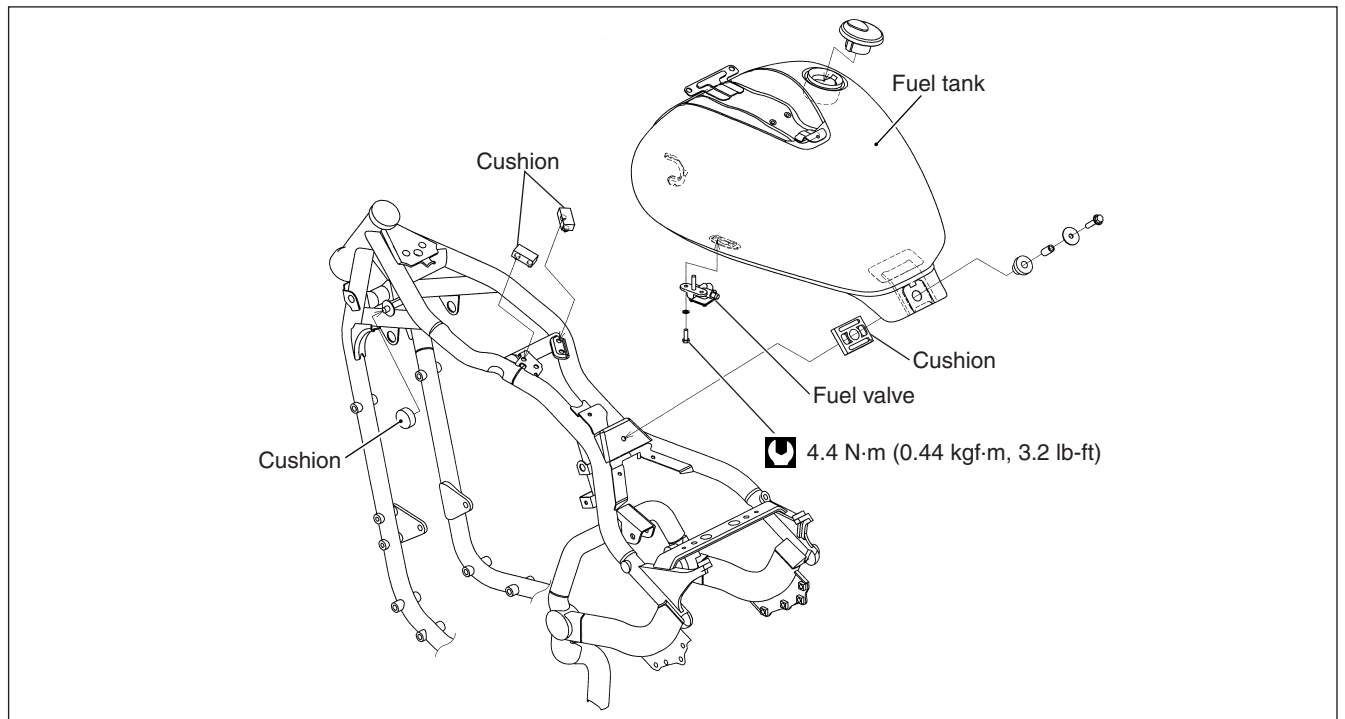
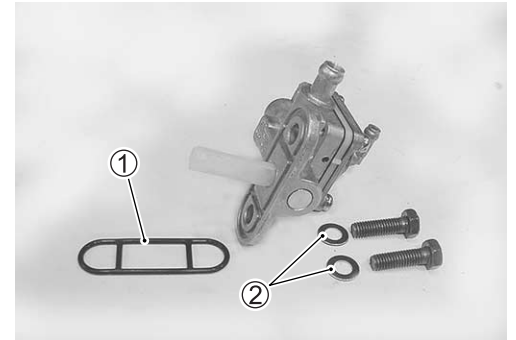


REMOUNTING

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

⚠ WARNING

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

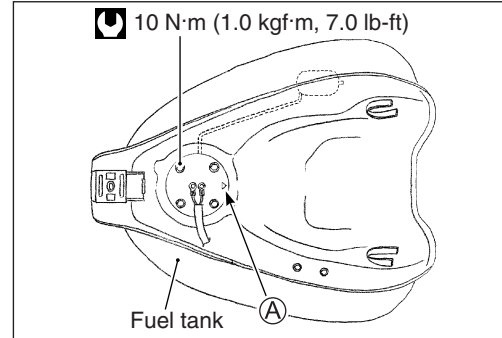
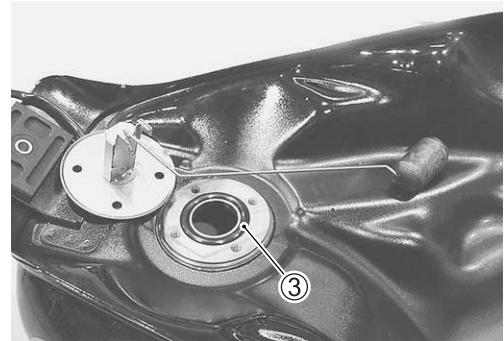


⚠ WARNING

- * Gasket ③ must be replaced with new ones to prevent fuel leakage.
- * Tighten the fuel level gauge bolts evenly.

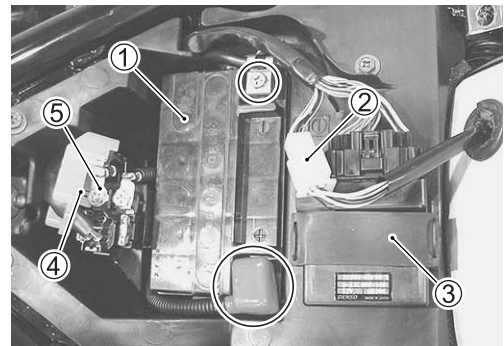
NOTE:

Face Δ mark (A) on the fuel level gauge forward.

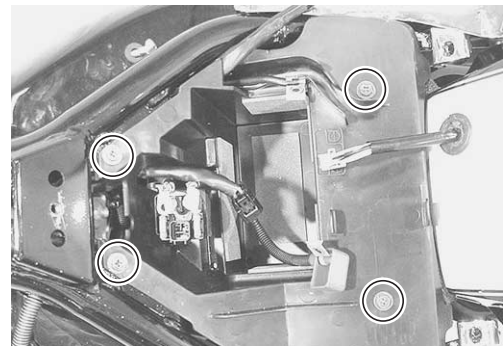


**FUEL PUMP
REMOVAL**

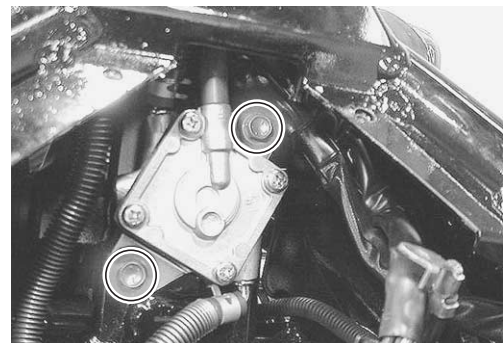
- Remove the battery ①.
- Disconnect the lead wire coupler ②.
- Remove the ignitor ③.
- Disconnect the fuse case coupler ④.
- Remove the starter lead wire ⑤.



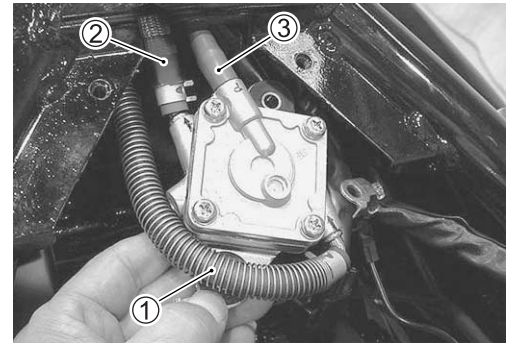
- Remove the battery case.



- Remove the fuel pump mounting bolts.



- Disconnect the fuel hoses ①, ② and vacuum hose ③.

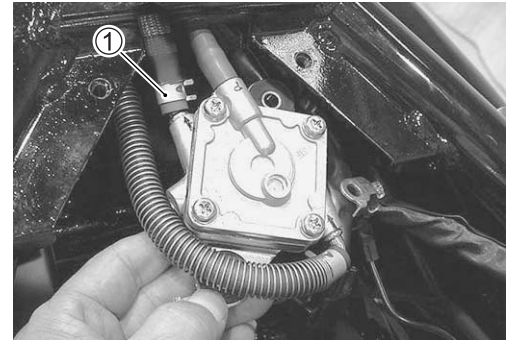


INSPECTION

⚠ WARNING

Gasoline is highly flammable and explosive. Keep heat, sparks, and flames away from gasoline.

- Disconnect the fuel hose ①, 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 valve. (☞ 5-5)
- If the fuel valve and hoses are not fault, replace the fuel pump.



REASSEMBLY

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

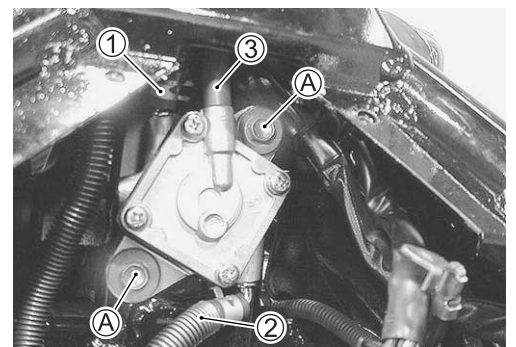
- Connect the fuel hoses ①, ② and vacuum hose ③ securely.
- Tighten the bolts ①.

FUEL HOSE ROUTING: ☞ 9-17

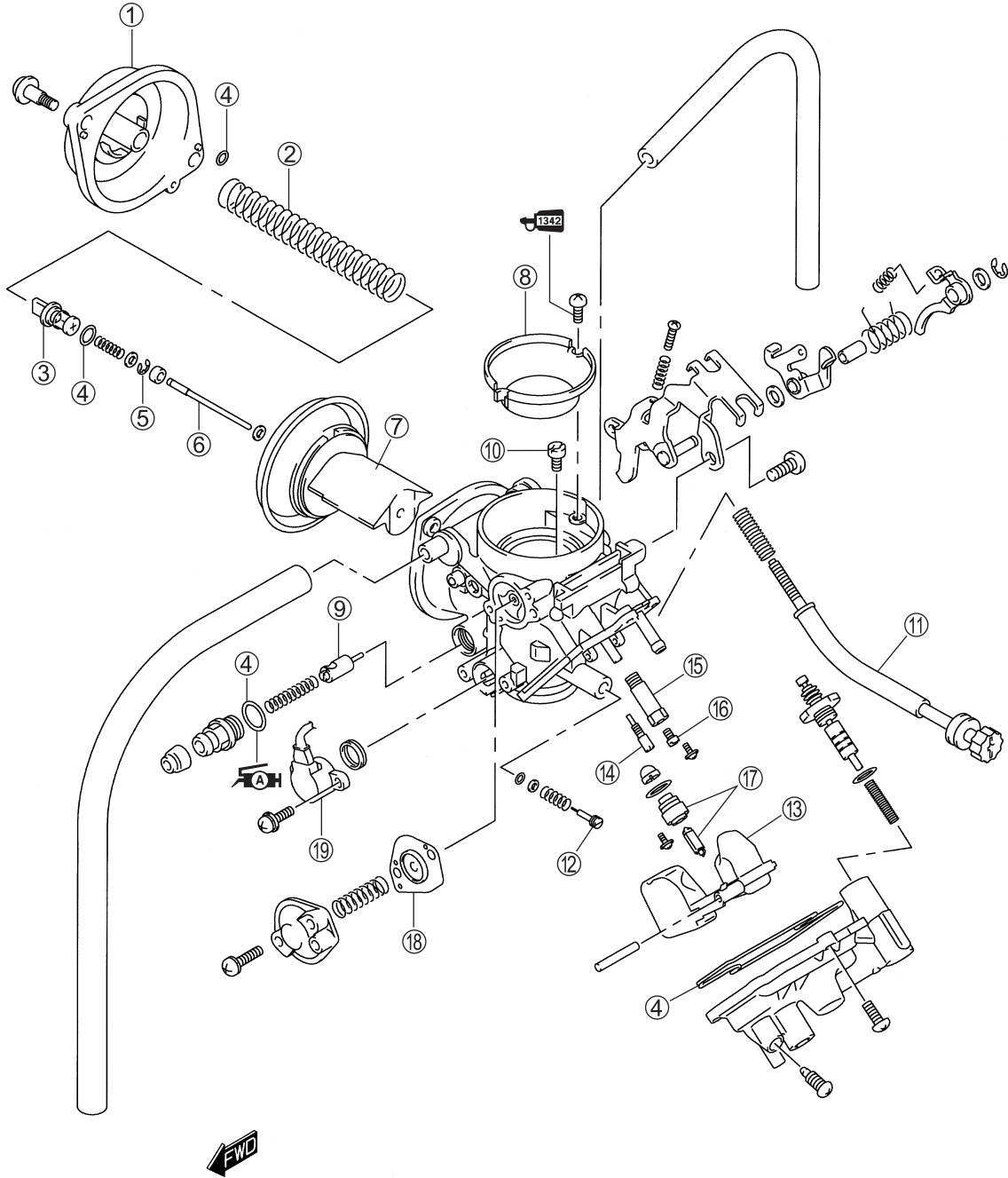
Fuel hose ① (To carburetor)

Fuel hose ② (To fuel valve)

Vacuum hose ③ (To intake pipe)



CARBURETOR CONSTRUCTION



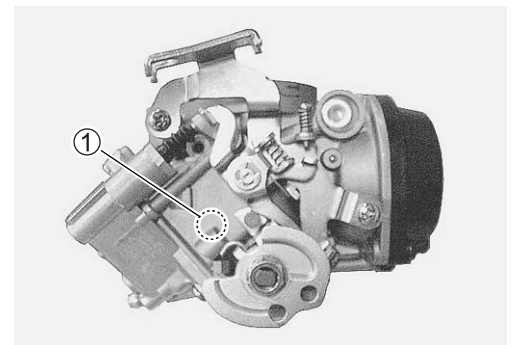
- | | |
|--------------------------|----------------------------|
| ① Top cap | ⑪ Throttle stop screw |
| ② Spring | ⑫ Pilot screw |
| ③ Jet needle stopper | ⑬ Float |
| ④ O-ring | ⑭ Pilot jet |
| ⑤ E-ring | ⑮ Main jet holder |
| ⑥ Jet needle | ⑯ Main jet |
| ⑦ Diaphragm/Piston valve | ⑰ Needle valve |
| ⑧ Funnel | ⑱ Coasting valve |
| ⑨ Starter plunger | ⑲ Throttle position sensor |
| ⑩ Pilot air jet | |

SPECIFICATIONS

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)	←	←

LOCATION OF CARBURETOR I.D. NO.

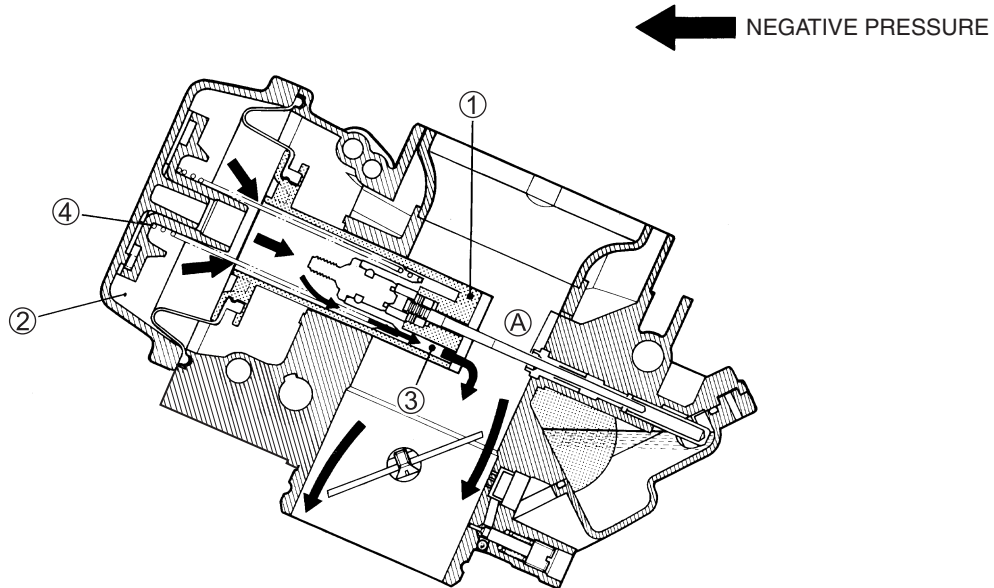
The carburetor I.D. is stamped on the location ① on the carburetor as shown in the right photo.



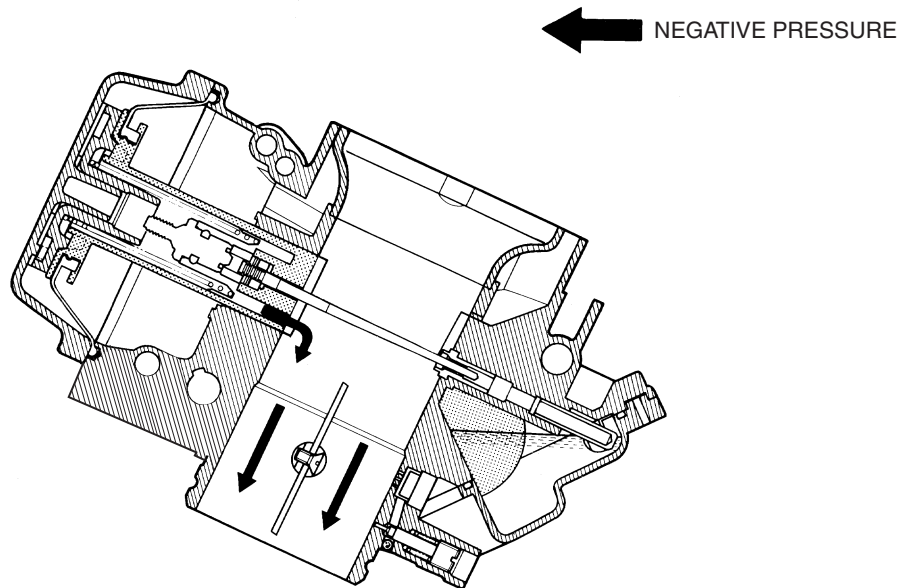
DIAPHRAGM AND PISTON OPERATION

The carburetor is a variable-venturi type, whose venturi cross sectional area is increased or decreased automatically by the piston valve ①. The piston valve moves according to the negative pressure present on the downstream side of the venturi (A). Negative pressure is admitted into the diaphragm chamber ② through an orifice ③ provided in the piston valve ①.

Rising negative pressure overcomes the spring ④ force, causing the piston valve ① to rise into the diaphragm chamber and prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and the precise air/fuel mixture.



LOWER POSITION OF THE PISTON VALVE



UPPER POSITION OF THE PISTON VALVE

SLOW SYSTEM

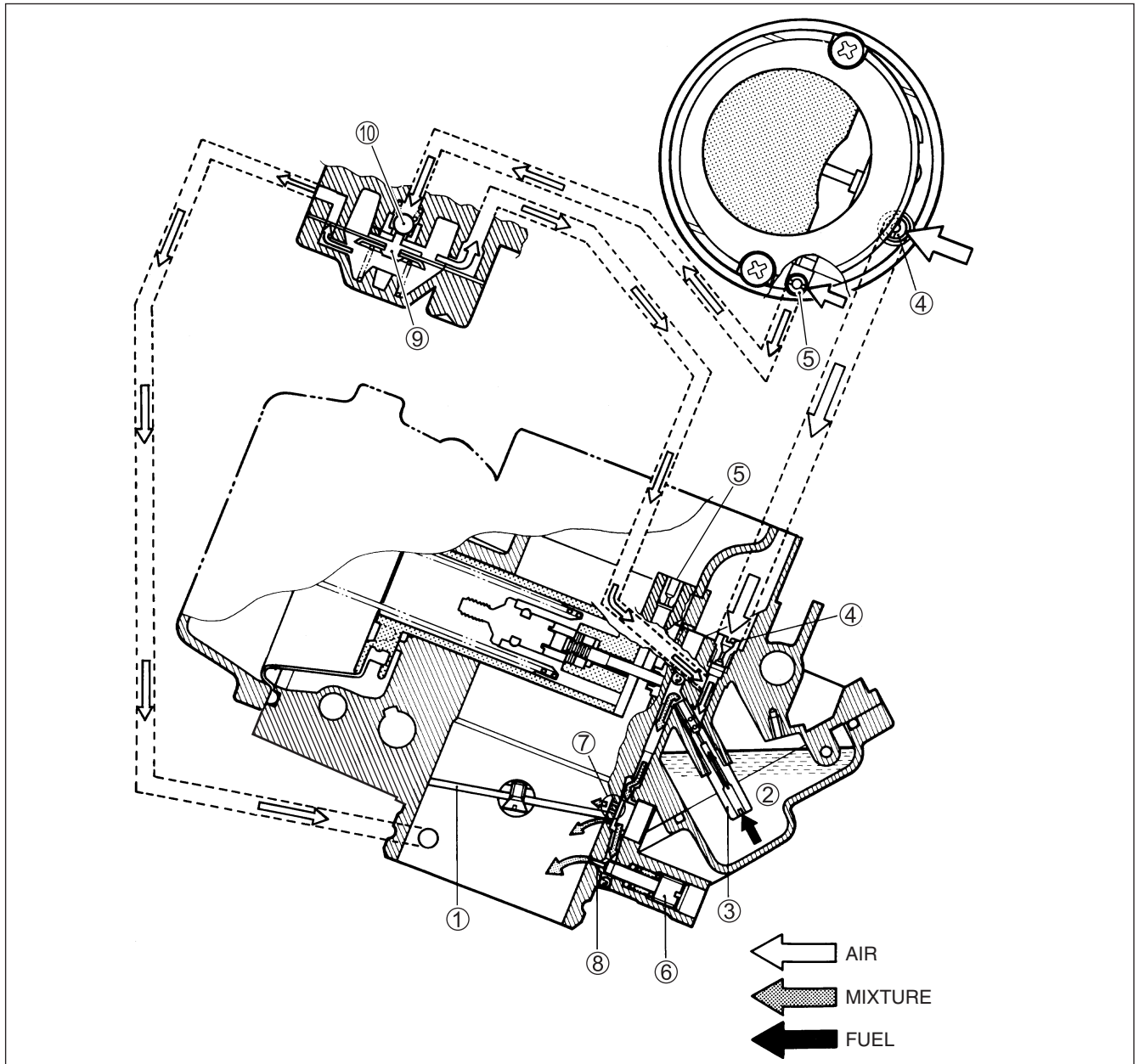
This system supplies fuel to the engine during engine operation with throttle valve ① closed or slight opened. The fuel from the float chamber ② is first passage and metered by the pilot jet ③ where it mixes with air coming in through #1 pilot air jet ④ and #2 pilot air jet ⑤.

This mixture, rich with fuel, then goes up through pilot pipe to pilot screw ⑥. A part of the mixture is discharged into the main bore out of by-pass ports ⑦. The remainder is then metered by pilot screw and sprayed out into the main bore through pilot outlet ⑧.

TRANSIENT ENRICHMENT SYSTEM

The transient enrichment system is a device which keeps fuel/air mixture ratio constant in order not to generate unstable combustion when the throttle grip is returned suddenly during high speed driving. For normal operation, sum of the air from the #1 pilot air jet ④ and #2 pilot air jet ⑤ keeps proper fuel/air mixture ratio. But when the throttle valve is closed suddenly, a large negative pressure generated on cylinder side works on to a diaphragm ⑨. The ball ⑩ held by the diaphragm ⑨ closes the air passage from #2 pilot air jet ⑤, therefore, the fuel/air mixture becomes rich with fuel.

This system is to keep the combustion condition constant by varying the fuel/air mixture ratio by controlling air flow from the pilot air jet.



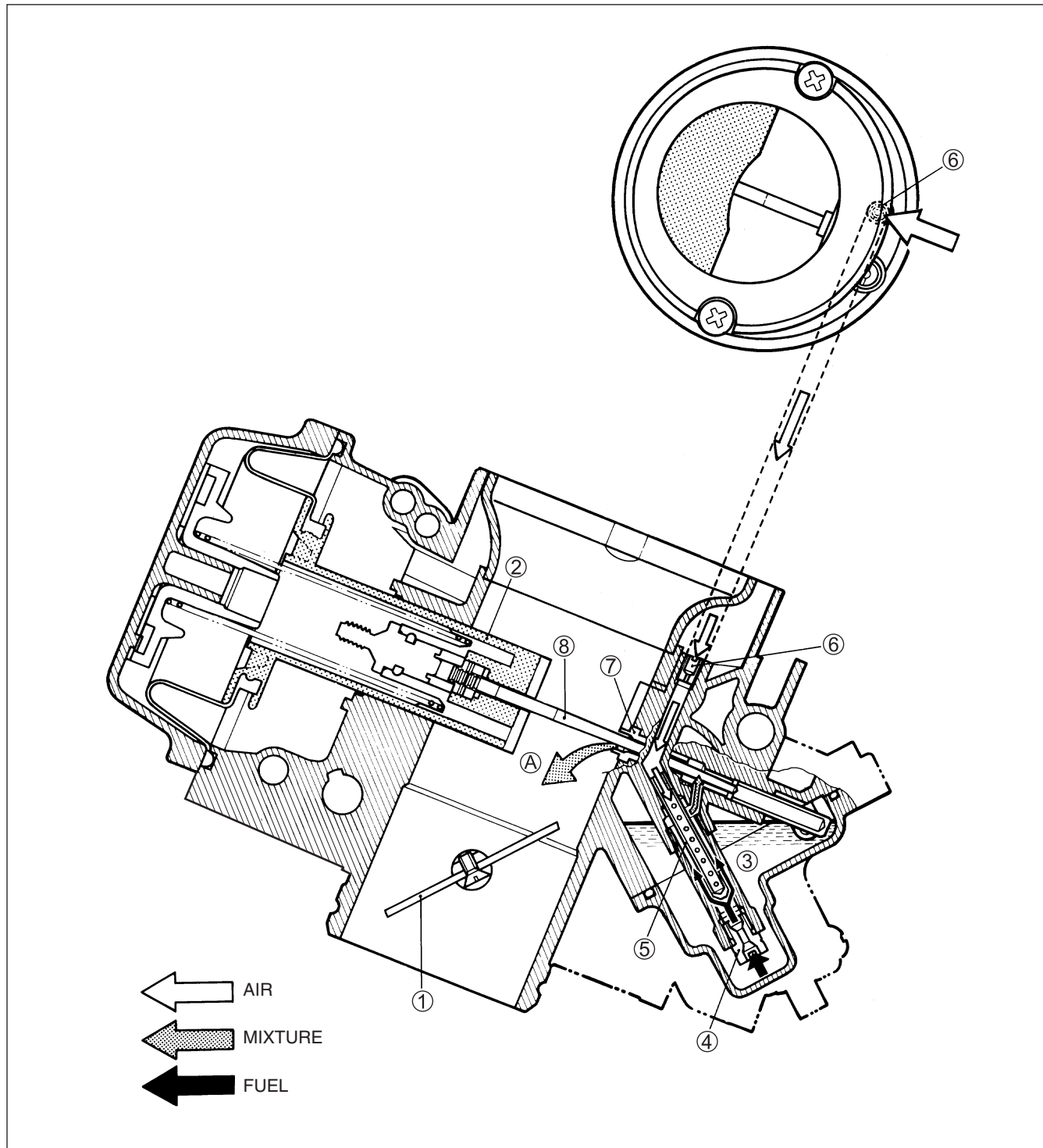
MAIN SYSTEM

As the throttle valve ① is opened, engine speed rises and negative pressure in the venturi ⑩ increases. This causes the piston valve ② moves upward.

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

The emulsified fuel then passes through the clearance between the needle jet ⑦ and jet needle ⑧ and is discharged into the venturi ⑩, where it meets the main air stream being drawn by the engine.

Mixture proportioning is accomplished in the needle jet ⑦. The clearance through which the emulsified fuel must flow ultimately depends on throttle position.



STARTER (ENRICHER) SYSTEM

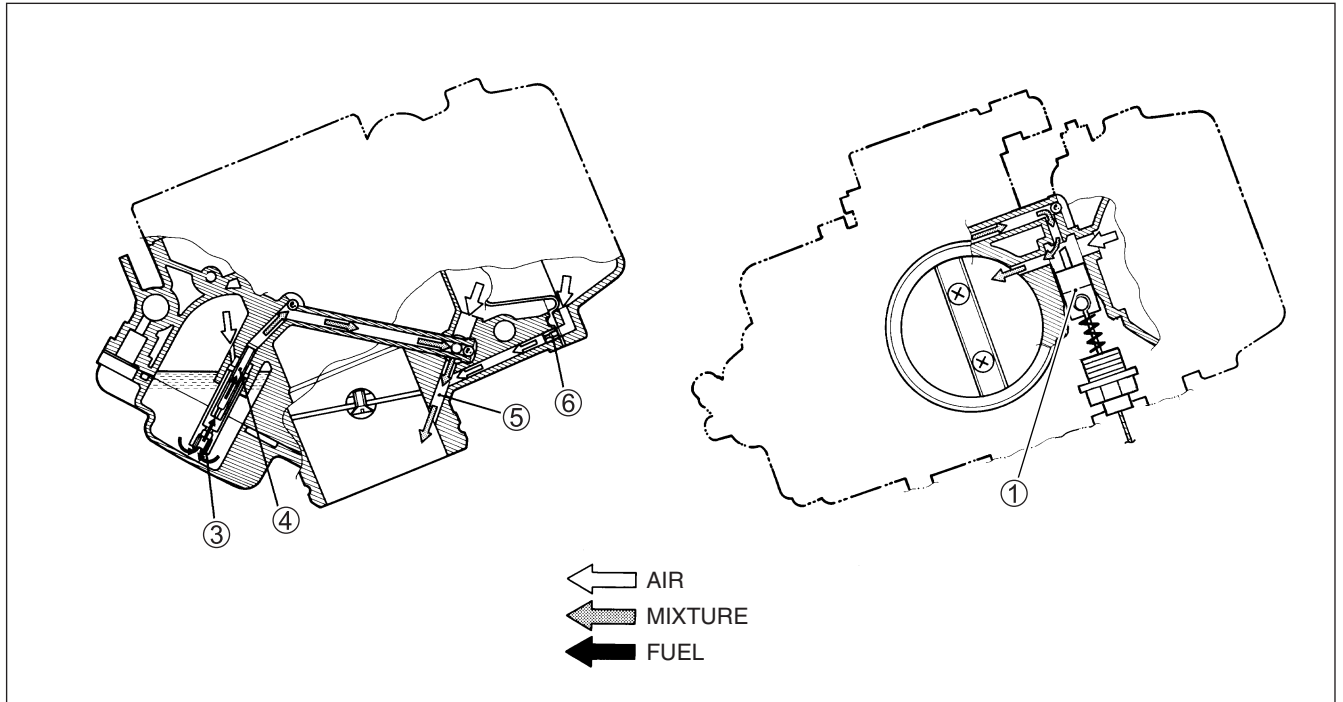
Pulling the starter (enricher) plunger ① causes fuel to be drawn into the starter circuit from the float chamber ②.

The starter jet ③ meters this fuel. The fuel then flows into the fuel pipe ④ and mixes with the air coming from the float chamber ②. The mixture, rich in fuel, reaches starter plunger ① and mixes again with the air coming through starter air jet ⑥ from the diaphragm chamber.

The three successive mixings of the fuel with the air provided the proper fuel/air mixture for starting. This occurs when the mixture is sprayed through the starter outlet port ⑤ into the main bore.

NOTE:

A starter (enricher) system is operated almost the same way as a choke.



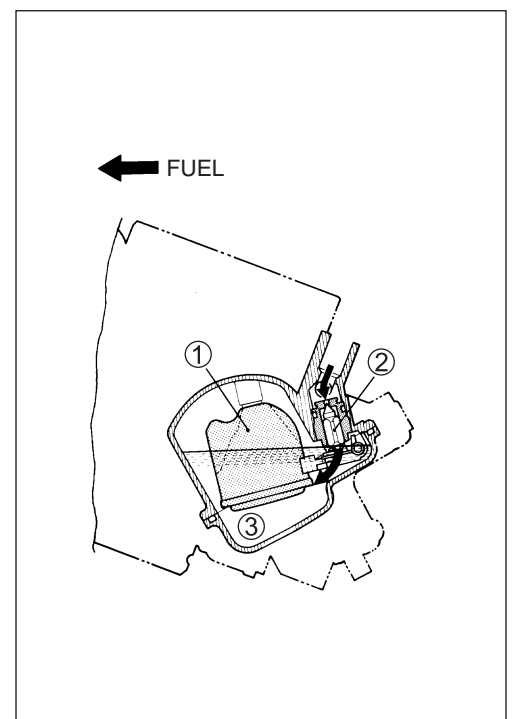
FLOAT SYSTEM

The float ① and needle valve ② work in conjunction with one another. As the float ① moves up and down, so does the needle valve ②.

When there is a high fuel level in float chamber ③, the float ① rises and the needle valve ② pushes up against the valve seat. When this occurs, no fuel enters the float chamber ③.

As the fuel level falls, the float ① lowers and the needle valve ② unseats itself; admitting fuel into the float chamber ③.

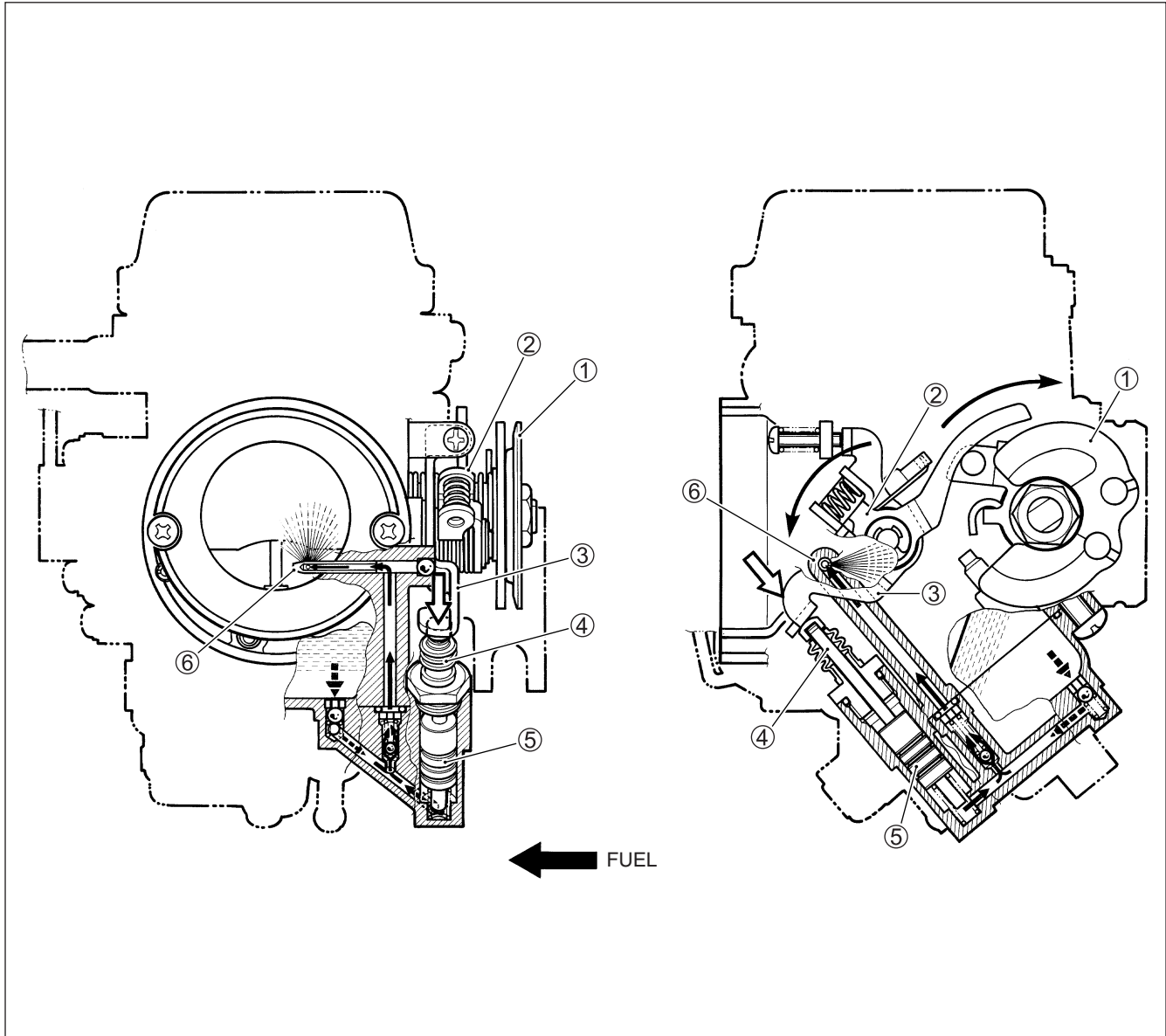
In this manner, the needle valve ② admits and shuts off fuel to maintain the appropriate fuel level inside the float chamber ③.



ACCELERATOR PUMP SYSTEM

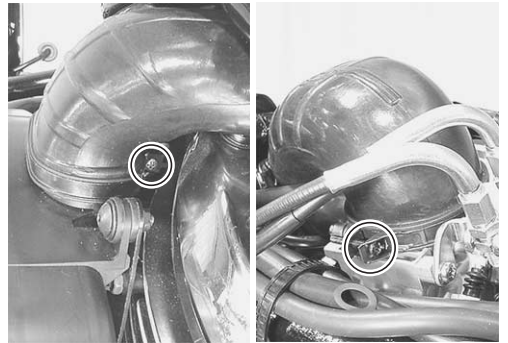
This system works only when the rider opens throttle grip quickly as pump send the necessary amount of fuel to the carburetor bore for correcting fuel/air mixture ratio. When the rider open the throttle grip quickly, the intaken air volume becomes large and air velocity at the bottom of the throttle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

The throttle valve lever ① turns lever ②, and lever ② 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.

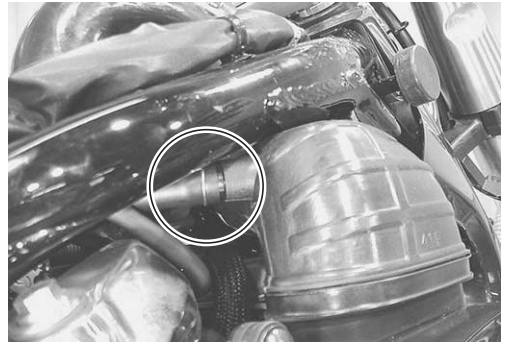


REMOVAL

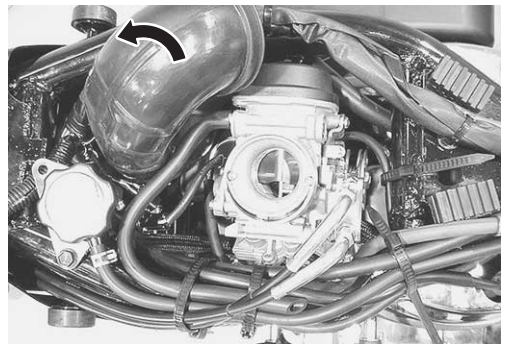
- Remove the fuel tank. (☞ 5-3)
- Loosen the air intake pipe clamp screws.



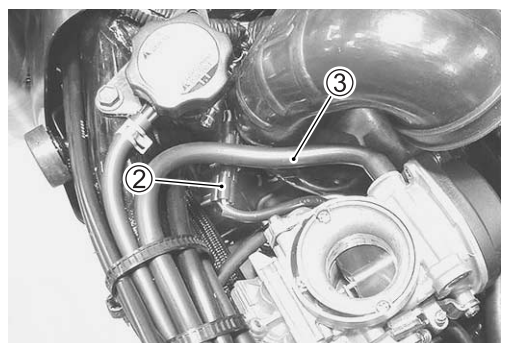
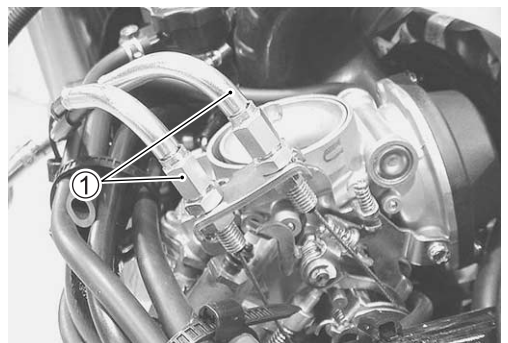
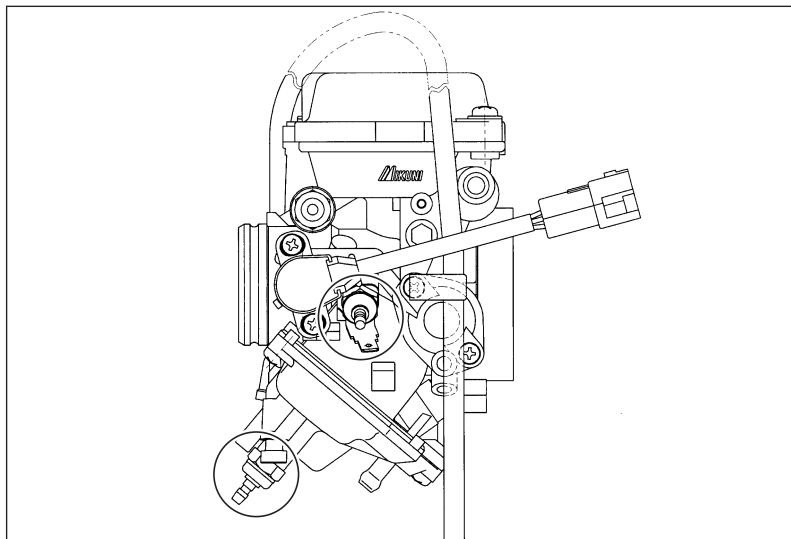
- Disconnect the breather hose.



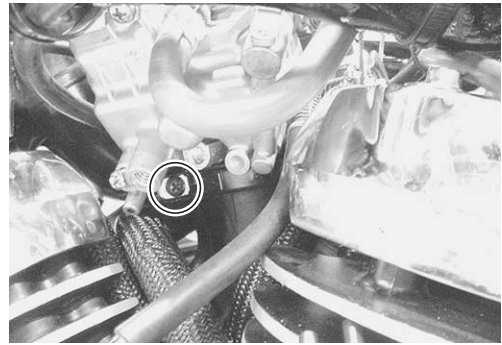
- Move the air inlet pipe to forward.



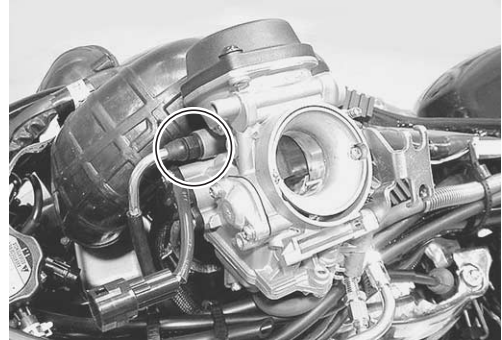
- Remove the throttle cables ①.
- Disconnect the throttle position sensor coupler ②.
- Disconnect the air vent hose ③.
- Disconnect the carburetor heater terminal lead wire.



- Loosen the clamp screw and remove the carburetor.

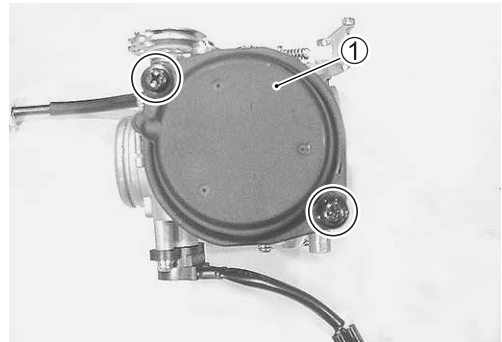


- Remove the starter plunger.

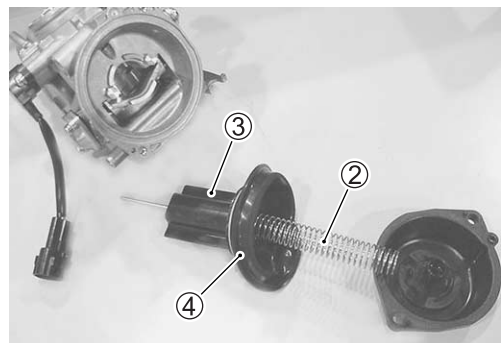


DISASSEMBLY

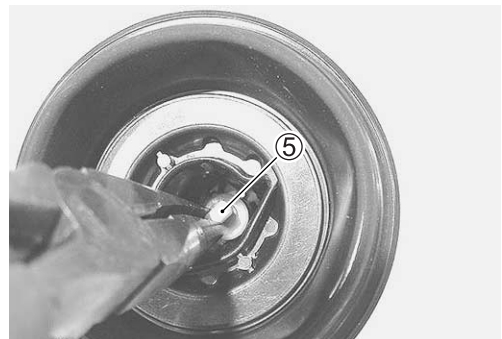
- Remove the carburetor top cap ①.



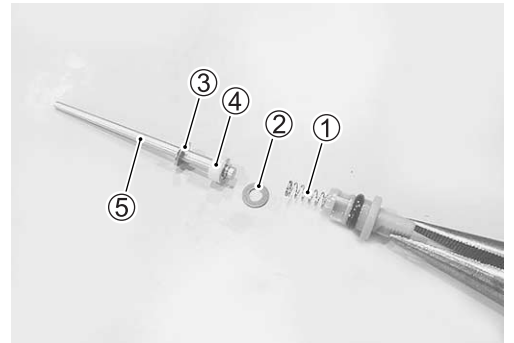
- Remove the spring ② and piston valve ③ along with diaphragm ④.



- Pull out the jet needle holder ⑤.

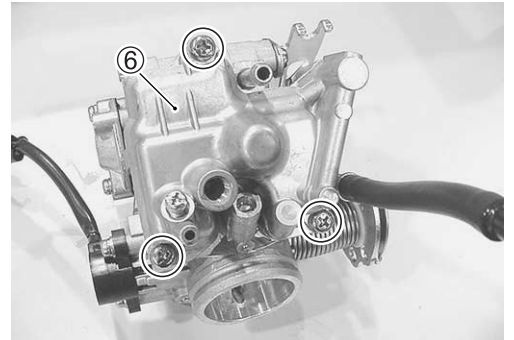


- Remove the spring ①, washers ②, ③, retainer ④ and jet needle ⑤.



- Remove the float chamber ⑥.

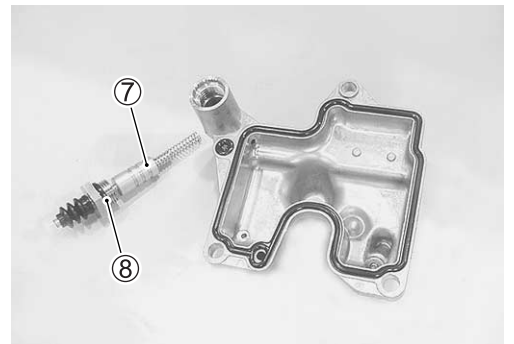
TOOL 09900-09004: Impact driver set



- Remove the accelerator pump plunger ⑦.
- Remove the O-ring ⑧.

▲ CAUTION

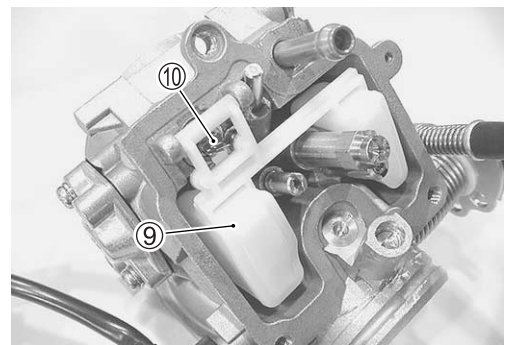
Use a new O-ring to prevent fuel leakage.



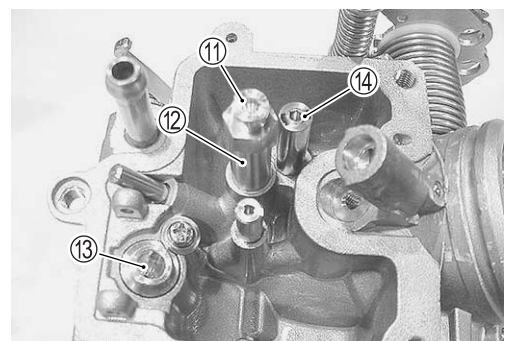
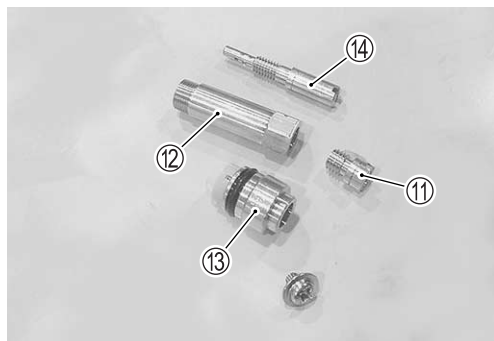
- Remove the float ⑨ and needle valve ⑩ by removing the float pin.

▲ CAUTION

Do not use a wire to clean the valve seat.



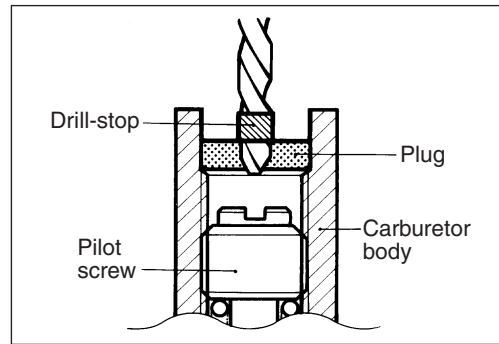
- Remove the main jet ⑪, main jet holder ⑫, valve seat ⑬ and pilot jet ⑭.



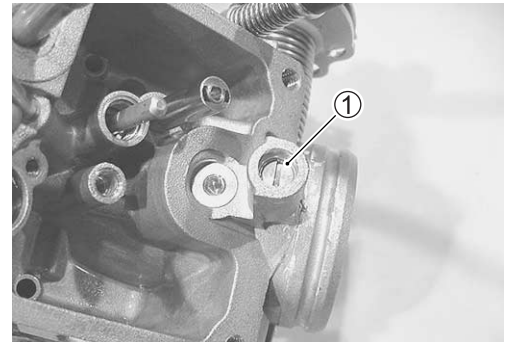
- Use a 1/8" size drill bit with a drill-stop to remove the pilot screw plug. Set the drill-stop 6 mm from the end of the bit to prevent drilling into the pilot screw. Carefully drill through the plug. Thread a self-tapping sheet metal screw into the plug. Pull on the screw head with pliers to remove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

▲ CAUTION

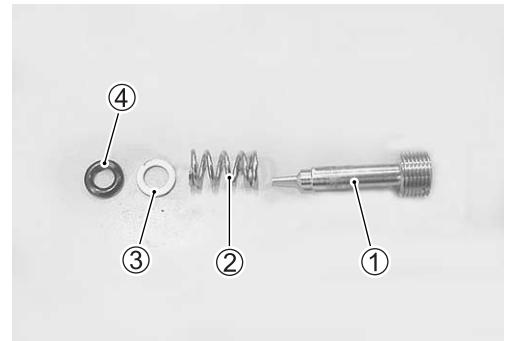
Replace the plug with a new one.



- Slowly turn the pilot screw ① in clockwise and count the number of turns until the screw is lightly seated. Make a note of how many turns were made so the screw can be reset correctly after cleaning.



- Remove the pilot screw ① with the spring ②, washer ③, and O-ring ④.



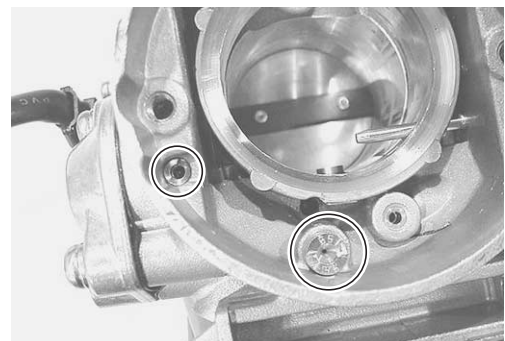
- Remove the funnel ⑤.



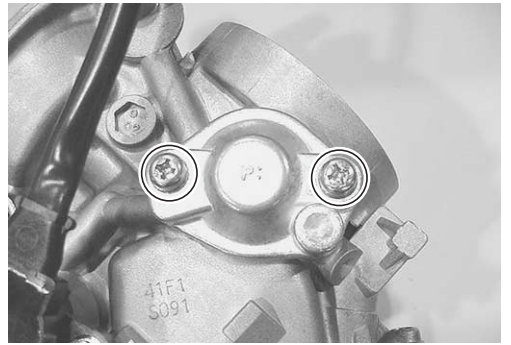
- Remove the pilot air jets ⑥.

▲ CAUTION

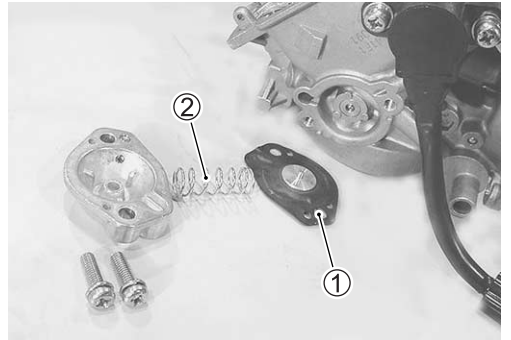
Do not use a wire for cleaning the passage and jets.



- Remove the casting valve cover.



- Remove the casting valve ① and the spring ②.



CARBURETOR CLEANING

⚠ WARNING

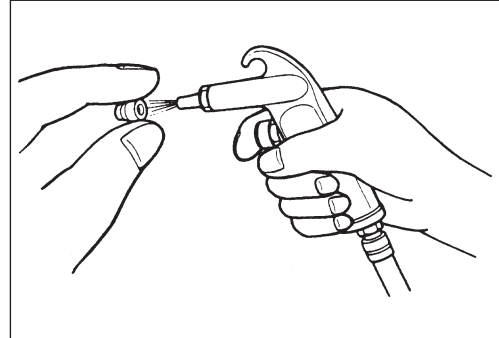
Some carburetor cleaning chemicals, especially diptype soaking solutions, are very corrosive and must be handled carefully. Always follow the chemical manufacturer's instructions on proper use, handling and storage.

- 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.



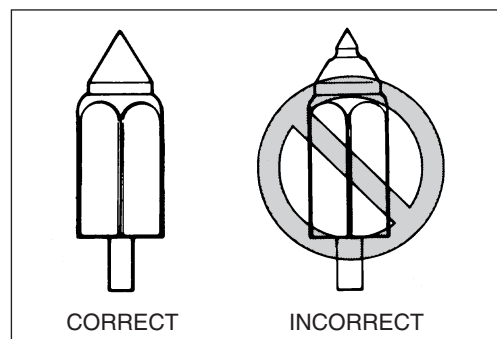
CARBURETOR INSPECTION

Check the following items for any damage or clogging.

- | | | |
|--------------------------------|----------------|----------------------------------|
| * Pilot jet | * Float | * Starter (enricher) jet |
| * Main jet | * Needle valve | * Gasket and O-ring |
| * Main air jet | * Jet needle | * Throttle shaft oil seal |
| * Pilot air jets | * Valve seat | * Pilot outlet and by-pass ports |
| * Needle jet air bleeding hole | * Piston valve | * Coasting valve |

NEEDLE VALVE INSPECTION

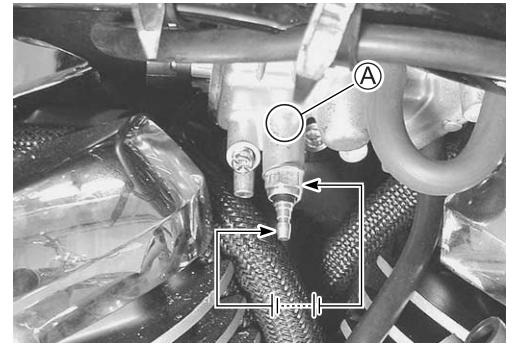
If foreign matter is caught between the valve seat and the needle valve, the gasoline will continue flowing and overflow. If the valve seat and needle valve are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle valve sticks, the gasoline will not flow into the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



CARBURETOR HEATER INSPECTION

(for E02, E19)

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



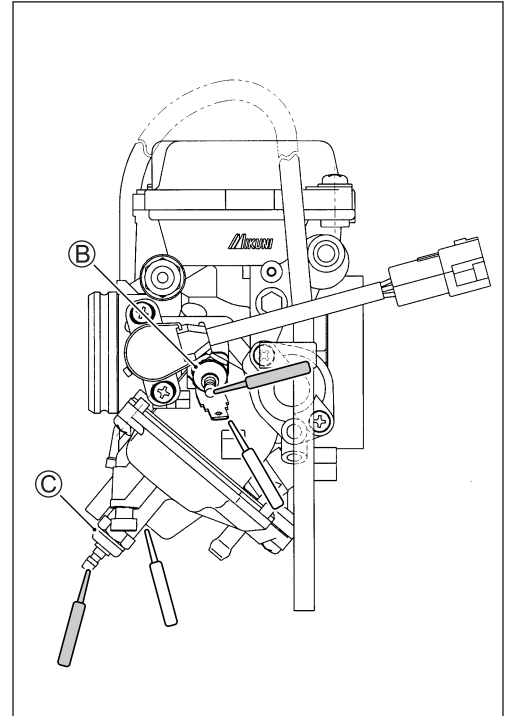
- Measure the resistance between the terminals.

TOOL 09900-25008: Multi-circuit tester

DATA Carburetor heater resistance: STD:

\textcircled{B} 35 W: 4 – 12 Ω

\textcircled{C} 25 W: 4.6 – 13.3 Ω



THERMO-SWITCH INSPECTION

(for E02, E19)

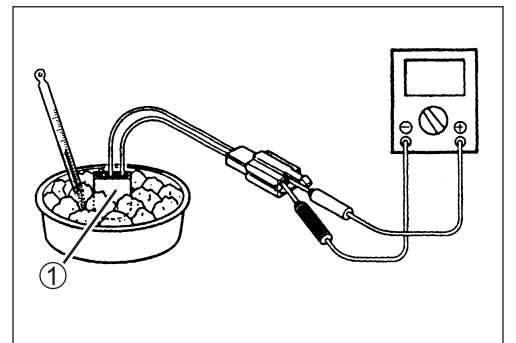
- Cool the thermo-switch $\textcircled{1}$ with ice water and check for continuity.

TOOL 09900-25008: Multi-circuit tester

DATA Thermo-switch continuity:

Below 8 – 14°C Yes

Above 13 – 25°C No



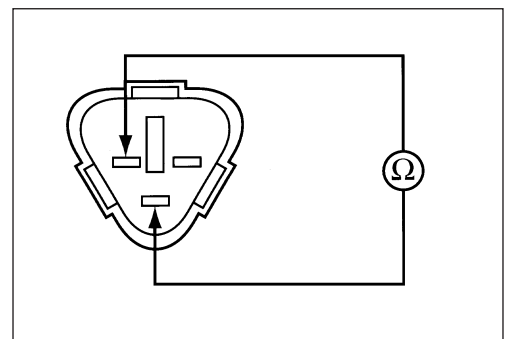
THROTTLE POSITION SENSOR INSPECTION

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

DATA Throttle position sensor resistance: Approx. 5 k Ω

NOTE:

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

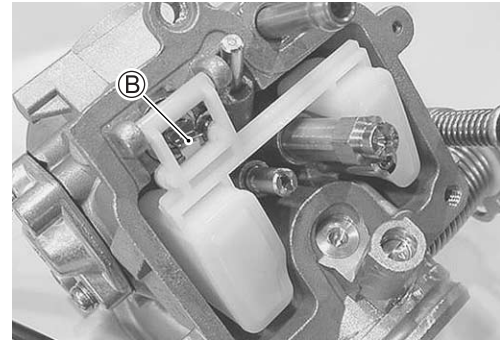
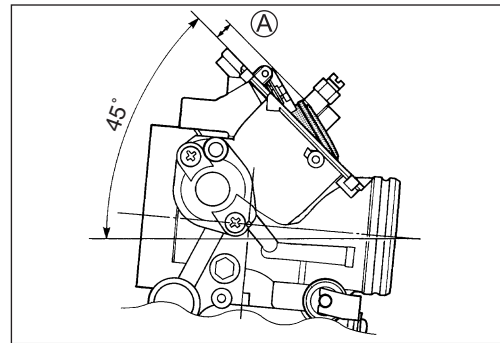


FLOAT HEIGHT ADJUSTMENT

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

DATA Float height (A): 7.0 ± 0.5 mm (0.28 ± 0.02 in)

TOOL 09900-20102: Vernier calipers



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 (A) 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 (A) with a new one.

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

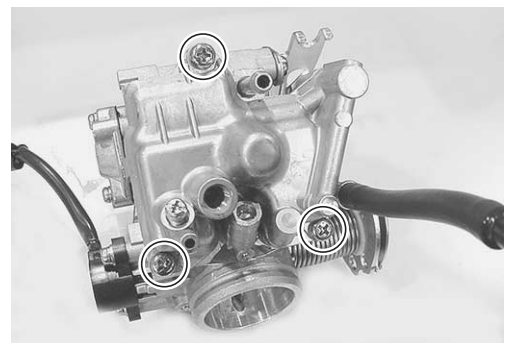
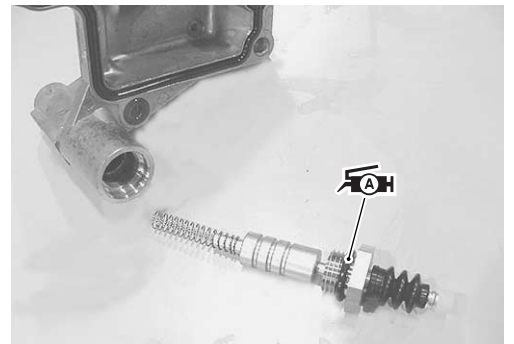
For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

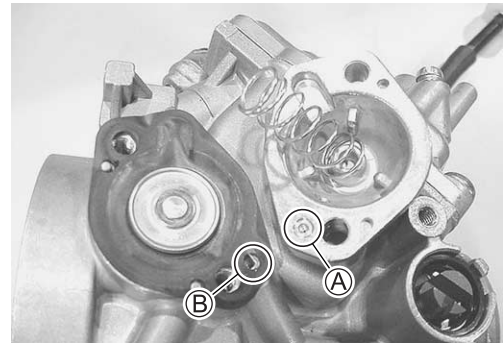
 99000-25010: SUZUKI SUPER GREASE "A"

- Fit the seal rings securely to the float chamber and install the float chamber to the throttle body.



COASTING VALVE

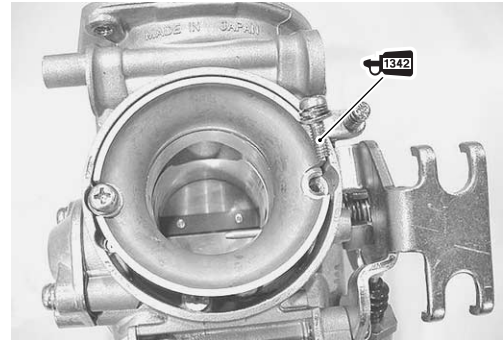
- When installing the coasting valve to the body, align the hole ① of the diagram and air hole ② of the cover.



FUNNEL

- Apply a small quantity of THREAD LOCK “1342” to the funnel stopper screws and tighten them.

 99000-3250: THREAD LOCK “1342”

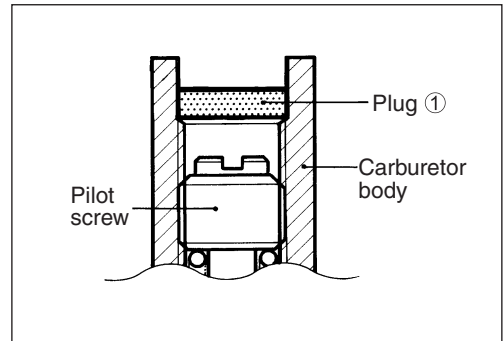


PILOT SCREW

- After cleaning, reinstall the pilot screw to the original setting by turning the screw in until it lightly seats, and then backing it out the same number of turns counted during disassembly.
- Install new plug ① by tapping it into place with a punch. (For E-03, 28, 33)

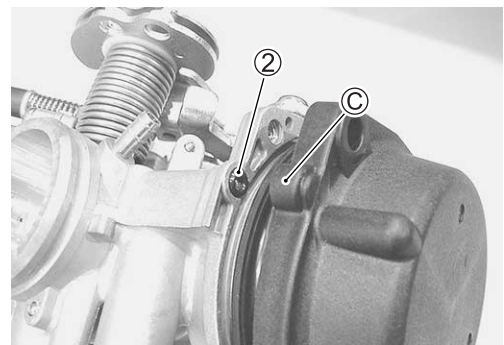
CAUTION

Replace the O-ring with a new one.



CARBURETOR TOP CAP

- Before installing the carburetor top cap, install the O-ring ②.
- Align the protrusion ③ of the carburetor top cap with the O-ring ②.



STARTER PLUNGER

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

For USA

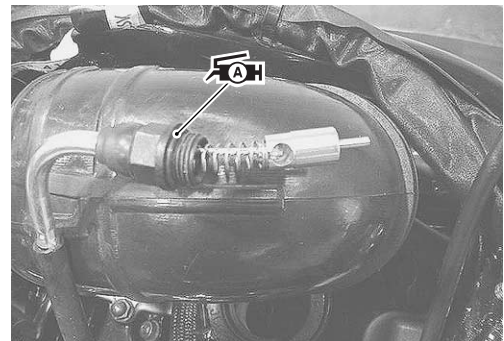
 99000-25030: SUZUKI SUPER GREASE “A”

For the other countries

 99000-25010: SUZUKI SUPER GREASE “A”

CAUTION

Replace the O-rings with new ones.



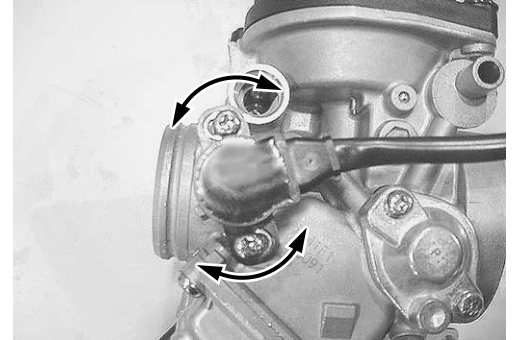
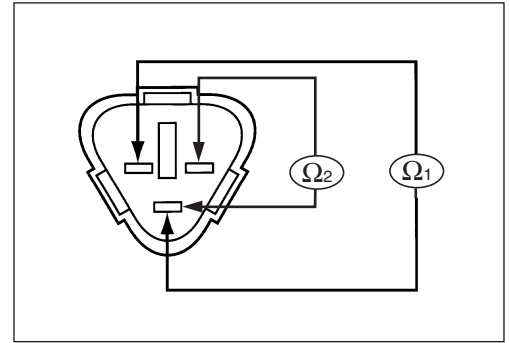
THROTTLE POSITION SENSOR POSITIONING

- 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 $\Omega 1$ between the throttle position sensor terminals as shown in the illustration.

DATA Throttle position sensor resistance $\Omega 1$: Approx. 5 k Ω

- Measure the resistance $\Omega 2$ 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 $\Omega 2$ is 3.09 – 4.63 k Ω .
- When the resistance $\Omega 2$ is within specification, tighten the throttle position sensor mounting screws.

DATA Throttle position sensor resistance $\Omega 2$:
3.09 – 4.63 k Ω



- After the assembly and installation on the engine have been completed, perform the following adjustment.
 - * Throttle cable adjustment (☞ 2-11)
 - * Idle speed adjustment (☞ 2-10)

CARBURETOR HEATER

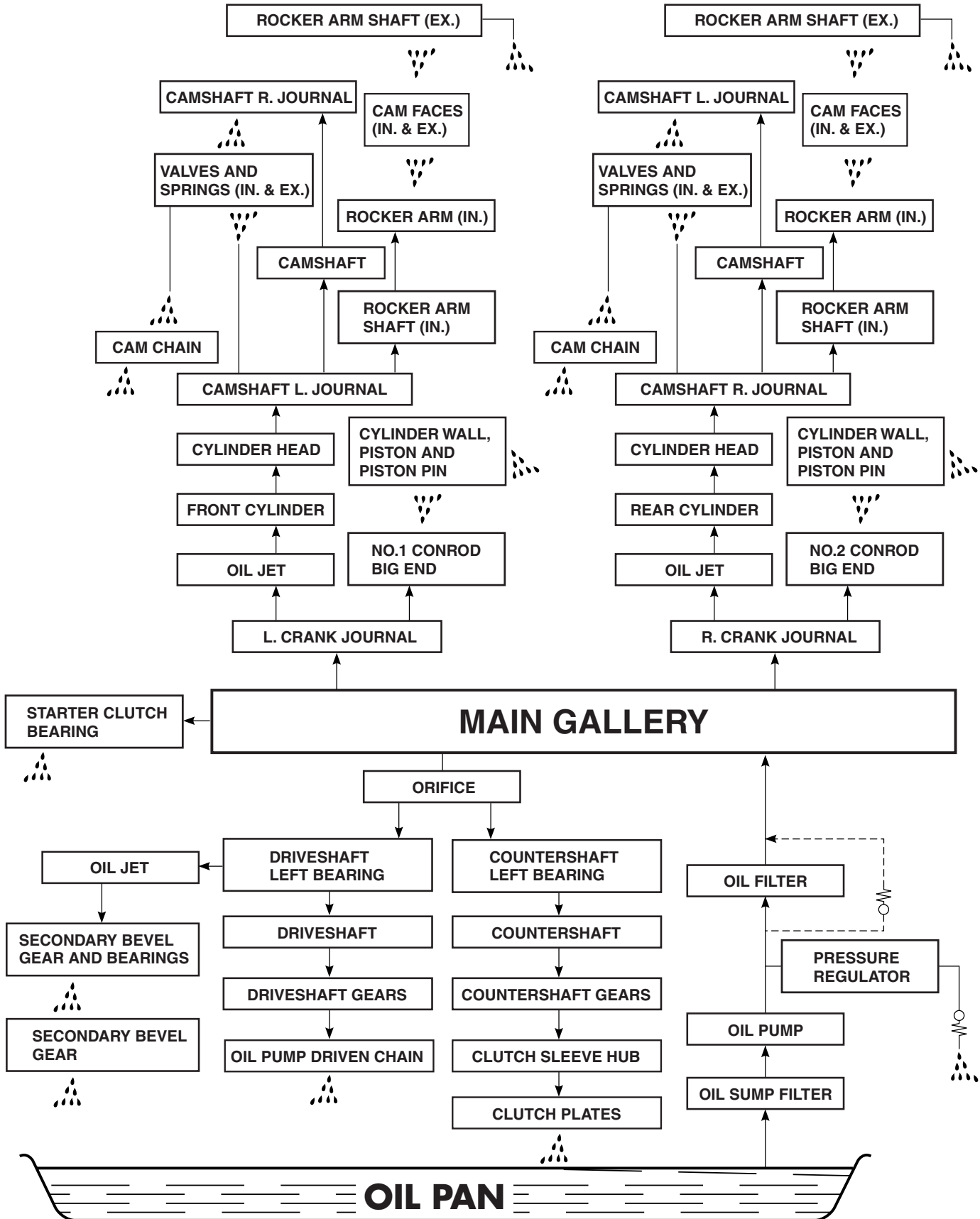
- Apply thermo-grease to the threads and tighten the carburetor heater. (for E-02, 19)

GH 99000-59029: THERMO-GREASE

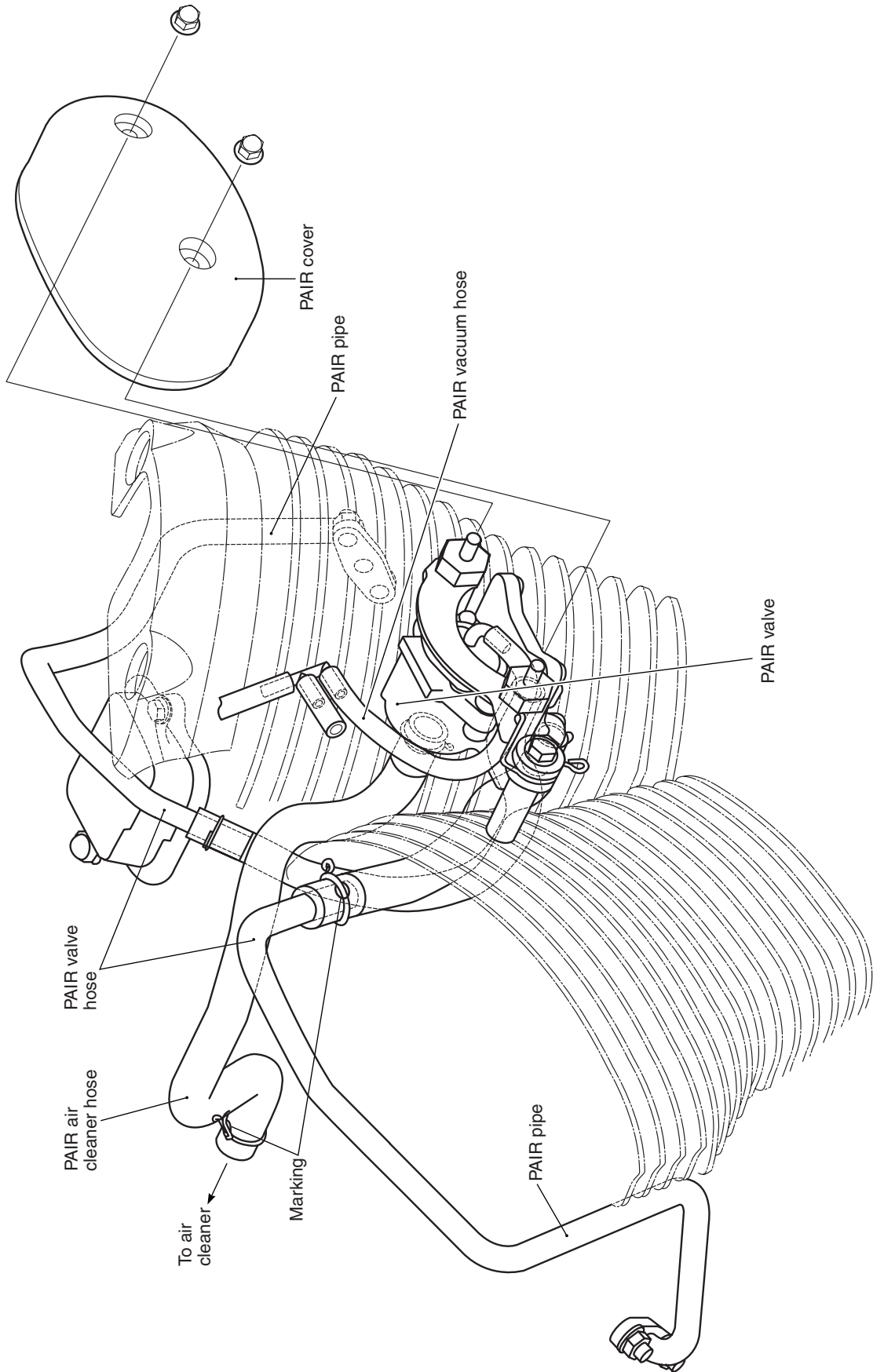
U Carburetor heater: 3 N·m (0.3 kgf·m)



LUBRICATION SYSTEM CHART



PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING



PAIR (AIR SUPPLY) SYSTEM INSPECTION

HOSES

- Inspect the hoses for wear or damage.
- Inspect that the hoses and pipes are securely connected.

PAIR REED VALVE

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



PAIR CONTROL VALVE

- Inspect that air flows through the PAIR control valve air inlet port to the air outlet ports.
- If air does not flow out, replace the PAIR valve with a new one.



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

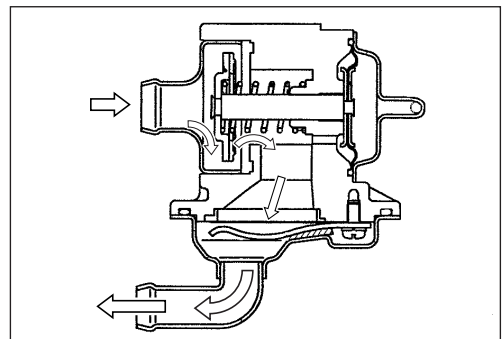


DATA Negative pressure range: More than 72 kPa
(540 mmHg)

TOOL 09917-47010: Vacuum pump gauge

▲ CAUTION

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



COOLING SYSTEM

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ENGINE COOLANT

At the time of manufacture, the cooling system is filled with a 50:50 mixture of distilled water and ethylene glycol anti-freeze. This 50:50 mixture will provide the optimum corrosion protection and excellent heat protection, and will protect the cooling system from freezing at temperatures above -31°C (-24°F).

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

⚠ CAUTION

- * Use a high quality ethylene glycol base anti-freeze, mixed with distilled water. Do not mix an alcohol base anti-freeze and different brands of anti-freeze.
- * Do not put in more than 60% anti-freeze or less than 50%. (Refer to Right figure.)
- * Do not use a radiator anti-leak additive.

50% Engine coolant including reserve tank capacity

Anti-freeze	750 ml (1.6/1.3 US/Imp. pt)
Water	750 ml (1.6/1.3 US/Imp. pt)

Anti-freeze density	Freezing point
50%	-30°C (-24°F)
55%	-40°C (-44°F)
60%	-55°C (-67°F)

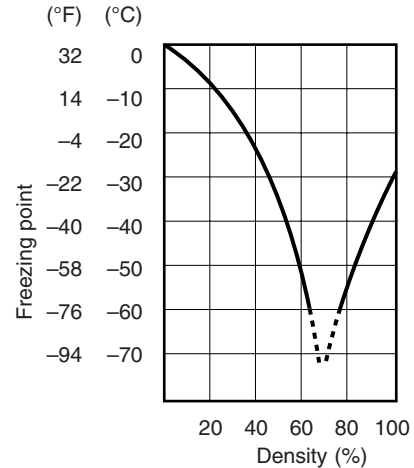


Fig.1 Engine coolant density-freezing point curve.

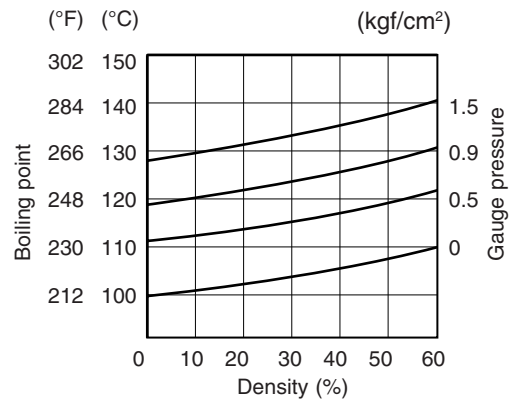


Fig.2 Engine coolant density-boiling point curve.

⚠ WARNING

- * You can be injured by scalding fluid or steam if you open the radiator cap when the engine is hot. After the engine cools, wrap a thick cloth around cap and carefully remove the cap by turning it a quarter turn to allow pressure to escape and then turn the cap all the way off.
- * The engine must be cool before servicing the cooling system.
- * Coolant is harmful;
 - If it comes in contact with skin or eyes, flush with water.
 - If swallowed accidentally, induce vomiting and call physician immediately.
 - Keep it away from children.

RADIATOR AND WATER HOSE

COOLING CIRCUIT INSPECTION

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

- Remove the fuel tank. (→ 5-3)
- Remove the radiator cap ① and connect the tester to the filler.

⚠ WARNING

Do not remove the radiator cap when the engine is hot.

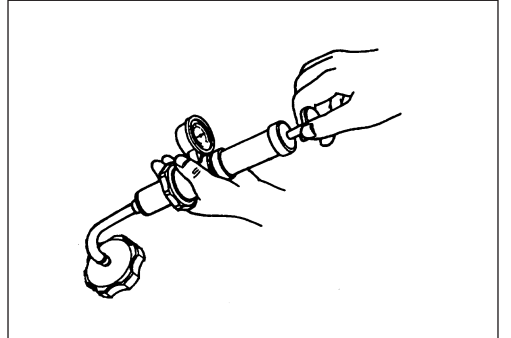
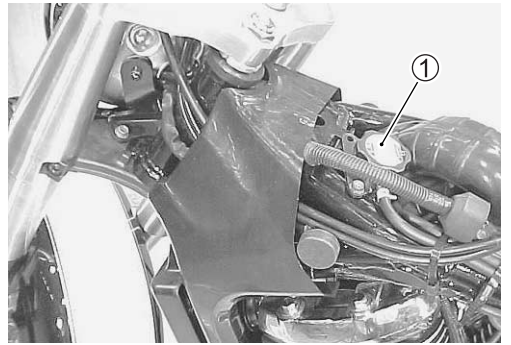
- Give a pressure of about 120 kPa (1.2 kgf/cm², 17 psi) and see if the system holds this pressure for 10 seconds.
- If the pressure should fall during this 10-second interval, it means that there is a leaking point in the system. In such a case, inspect the entire system and replace the leaking component or part.

⚠ WARNING

When removing the radiator cap tester, put a rag on the filler to prevent spouting of engine coolant.

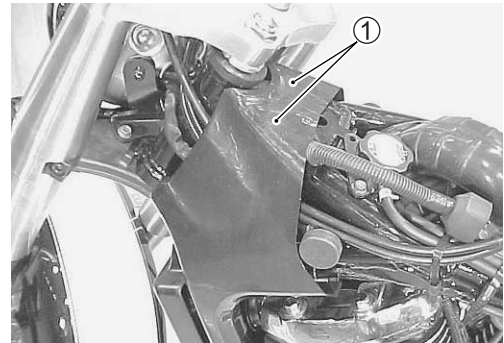
⚠ CAUTION

Do not allow the pressure to exceed the radiator cap release pressure, or the radiator can be damaged.

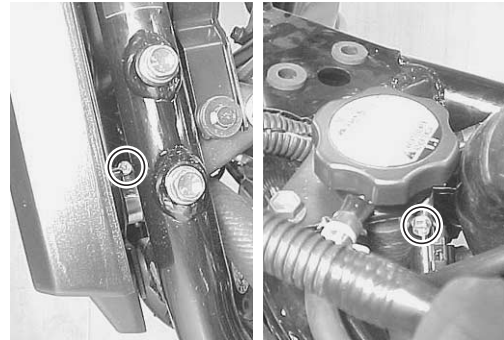


RADIATOR REMOVAL

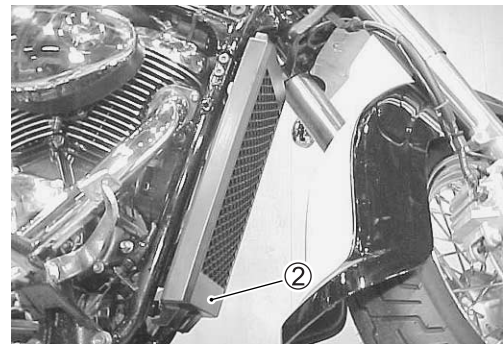
- Remove the fuel tank. (☞ 5-3)
- Remove the frame head covers ①.



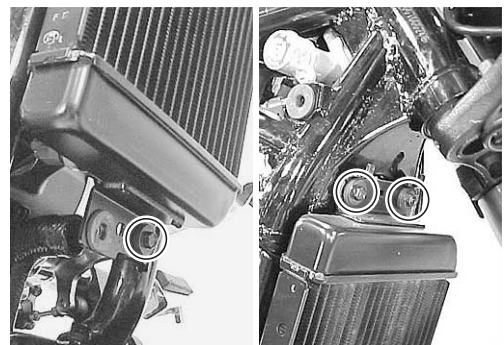
- Disconnect the water hoses.
- Drain engine coolant.



- Remove the radiator cover ②.



- Remove the radiator mounting bolts.



- Remove the radiator.



RADIATOR CAP INSPECTION

- Fit the cap ① to the radiator cap tester ②.
- Build up pressure slowly by operating the tester. Make sure that the pressure build-up stops at 95–125 kPa (0.95–12.5 kgf/cm², 13.5–17.8 psi) and that, with the tester held standstill, the cap is capable of holding that pressure for at least 10 seconds.
- Replace the cap if it is found not to satisfy either of these two requirements.

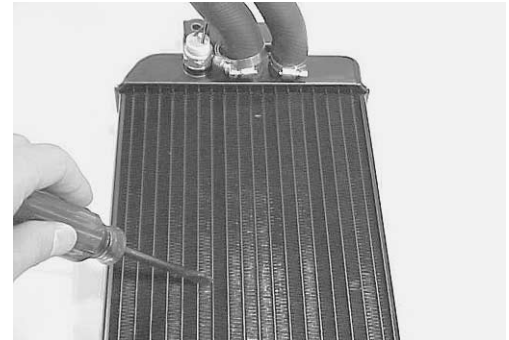
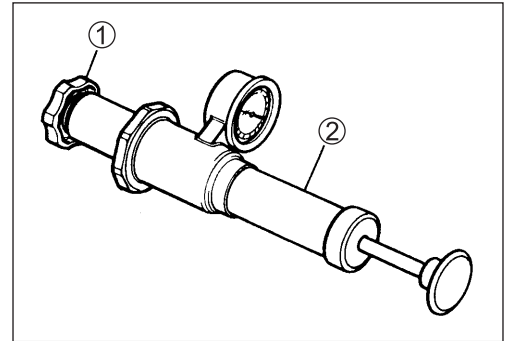
DATA Radiator cap valve opening pressure

Standard: 95 – 125 kPa

(0.95 – 1.25 kgf/cm², 13.5 – 17.8 psi)

RADIATOR INSPECTION AND CLEANING

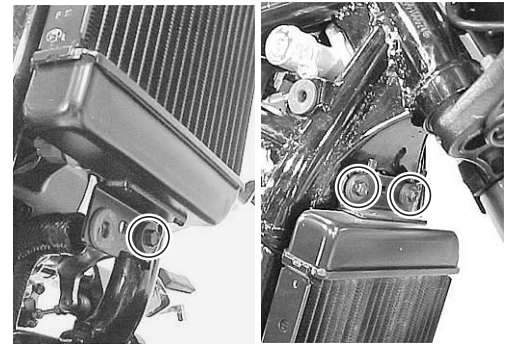
- Road dirt or trash stuck to the fins must be removed. Use of compressed air is recommended for this cleaning.
- Fins bent down or dented can be repaired by straightening them with the blade of a small screwdriver.



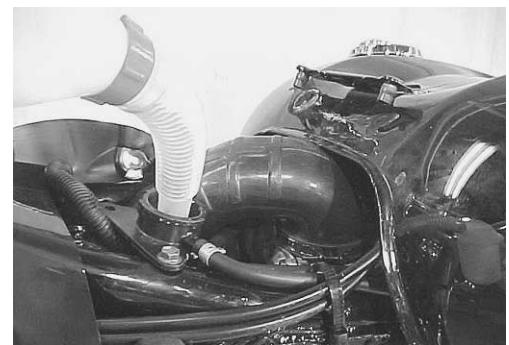
RADIATOR REMOUNTING

The radiator is to be installed in the reverse order of the removal procedure.

- Install the radiator.
- Route the radiator hoses. (☞ 9-18)



- Pour engine coolant and bleed the air from the cooling circuit.
- Install the frame head covers and fuel tank. (☞ 5-5)



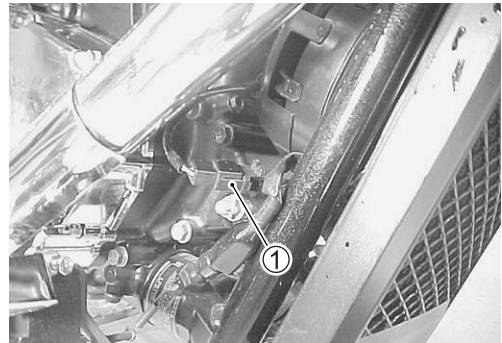
WATER HOSE INSPECTION

- Any water hose found in a cracked condition or flattened must be replaced.
- Any leakage from the connecting section should be corrected by proper tightening.

COOLING FAN

INSPECTION

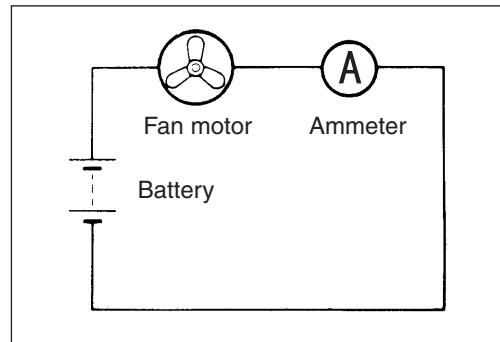
- Disconnect the cooling fan lead wire coupler ①.
- Test the cooling fan motor for load current with an ammeter connected as shown in the illustration.



- The voltmeter is for making sure that the battery applies 12 volts to the motor. With the motor with electric motor fan running at full speed, the ammeter should be indicating not more than 5 amperes.
- If the fan motor does not turn, replace the motor assembly with a new one.

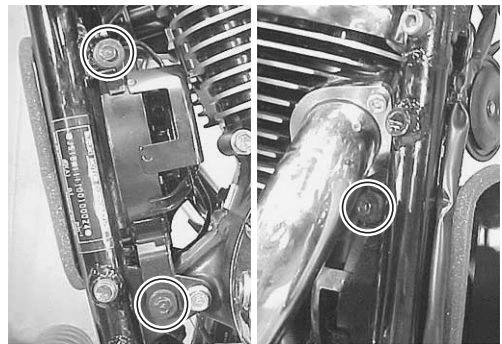
NOTE:

When making above test, it is not necessary to remove the cooling fan.

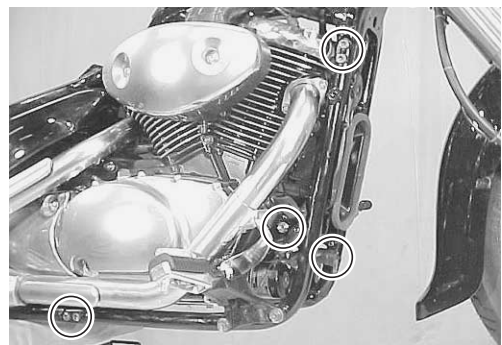


REMOVAL

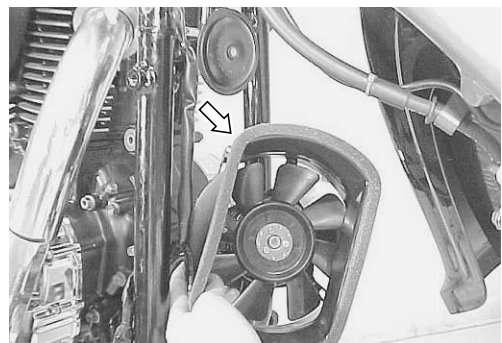
- Remove the radiator. (☞ 6-4)
- Remove the cooling fan mounting bolts.



- Slightly move the down tube by removing its mounting bolts.

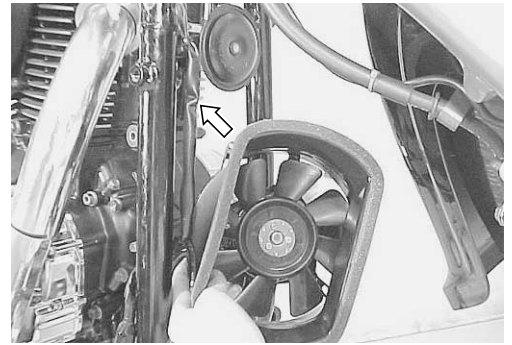


- Remove the cooling fan by disconnecting the cooling fan lead wire.

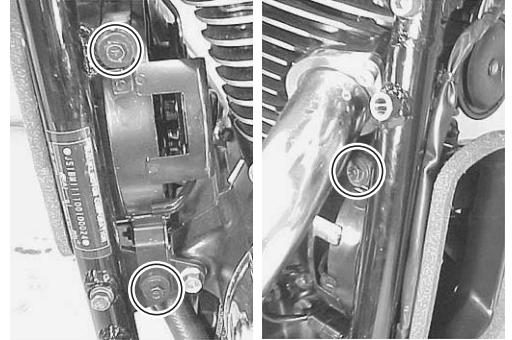


INSTALLATION

- Put the cooling fan between the down tube and the engine.
- Tighten the down tube mounting bolts. (☞ 3-9)



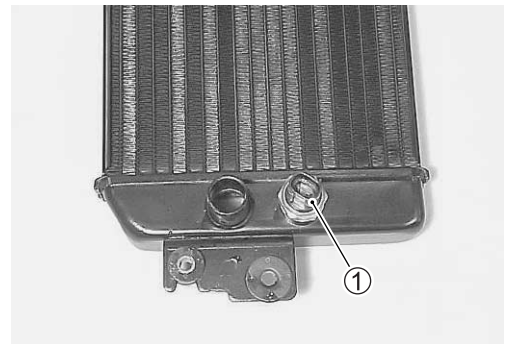
- Tighten the cooling fan mounting bolts.
- Install the radiator. (☞ 6-5)



COOLING FAN THERMO-SWITCH

REMOVAL

- Remove the radiator. (☞ 6-4)
- Remove the cooling fan thermo-switch ①.



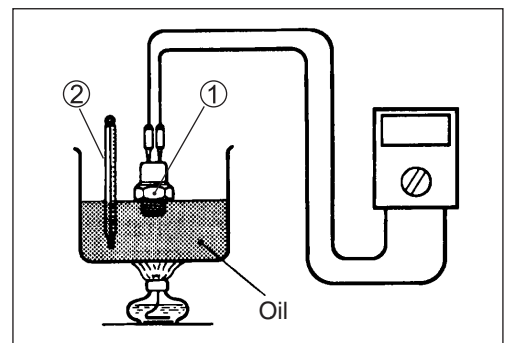
INSPECTION

- Check the thermo-switch closing or opening temperatures by testing it at the bench as shown in the figure. Connect the thermo-switch to a circuit tester and place it in the oil contained in a pan, which is placed on a stove.
- Heat the oil to raise its temperature slowly, and read the column thermometer when the switch closes or opens.

DATA Cooling fan thermo-switch operating temperature
 Standard (OFF→ON): Approx. 105°C (221°F)
 (ON→OFF): Approx. 100°C (212°F)

 Tester knob indication: Continuity test (•)))

TOOL 09900-25008: Multi circuit tester set



⚠ CAUTION

- * Take special care when handling the thermo-switch. It may cause damage if it gets a sharp impact.
- * Do not contact the cooling fan thermo-switch ① and the column thermometer ② with a pan.

INSTALLATION

- Install the O-ring ①.
- Tighten the cooling fan thermo-switch to the specified torque.

**🔧 Cooling fan thermo-switch: 17 N·m
(1.7 kgf·m, 12.5 lb-ft)**

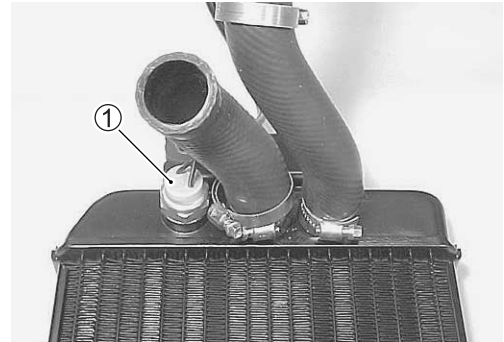
- Install the radiator.



ENGINE COOLANT TEMPERATURE SWITCH

REMOVAL

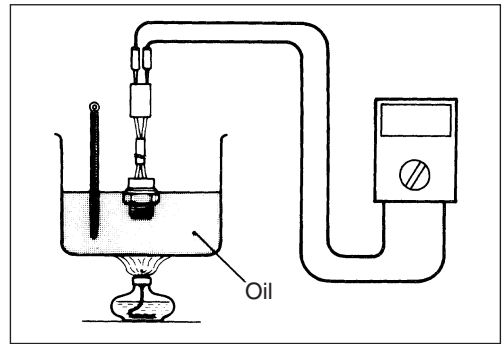
- Remove the radiator. (🔧 6-4)
- Remove the engine coolant temperature switch ①.



INSPECTION

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

📊 DATA Engine coolant temp. switch operating temperature
Standard (OFF → ON): Approx. 120°C (248°F)
(ON → OFF): Approx. 113°C (235.4°F)



⚠ CAUTION

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

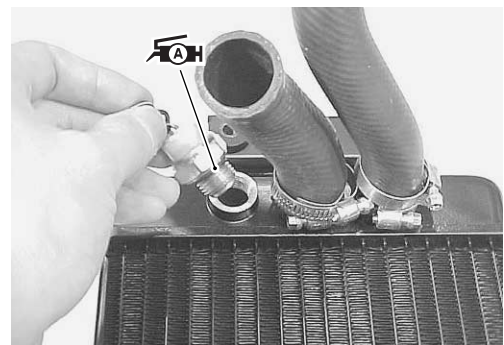
- Apply grease to the O-ring.

🔧 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)

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

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

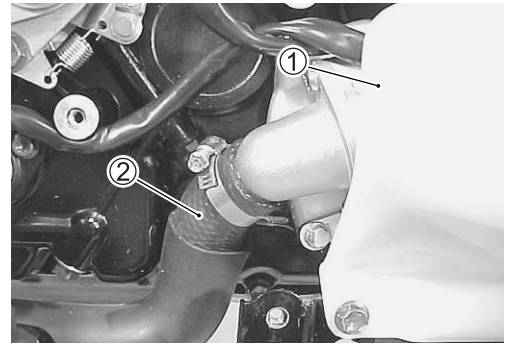
- Install the radiator. (🔧 6-5)



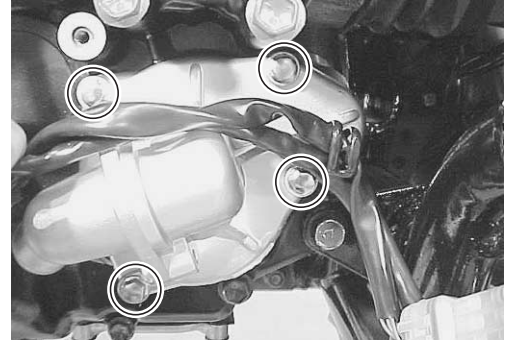
THERMOSTAT

REMOVAL

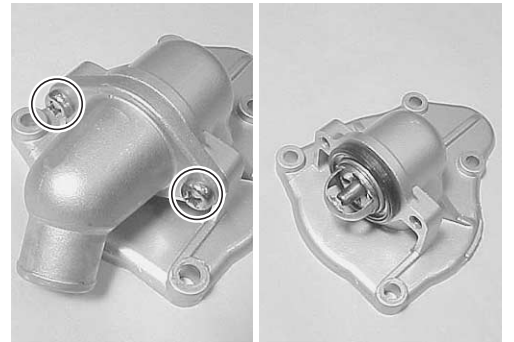
- Drain engine coolant. (☞ 2-13)
- Remove the secondary gear case cover.
- Remove the reserve tank ① and water hose ②.



- Remove the water pump case.



- Remove the thermostat case.
- Remove the thermostat.

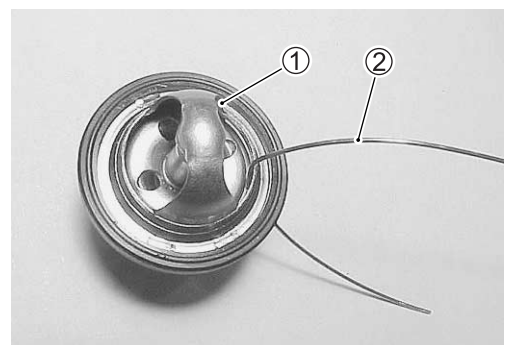


INSPECTION

Inspect the thermostat pellet for signs of cracking.

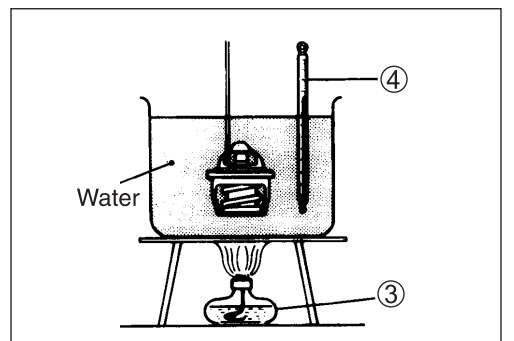
Test the thermostat at the bench for control action, in the following manner.

- Pass a string between flange, as shown in the illustration.
- Immerse the thermostat in the water contained in a beaker, as shown in the illustration. Note that the immersed thermostat is in suspension. Heat the water by placing the beaker on a stove and observe the rising temperature on a thermometer.
- Read the thermometer just when opening the thermostat. This reading, which is the temperature level at which the thermostat valve begins to open, should be within the standard value.



① Thermostat ② String

DATA Thermostat valve opening temperature
Standard: Approx. 75°C (167°F)



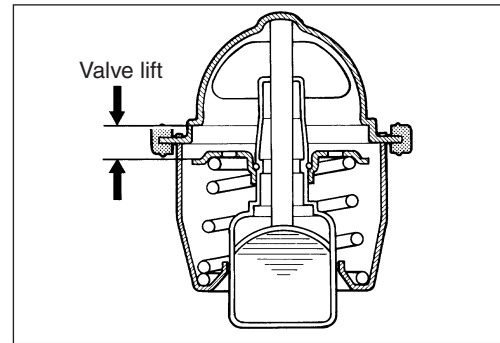
③ Stove ④ Thermometer

- Keep on heating the water to raise its temperature.
- Just when the water temperature reaches specified value, the thermostat valve should have lifted by at least 6.0 mm (0.24 in).

DATA Thermostat valve lift

Standard: Over 6.0 mm at 90°C (Over 0.24 in at 194°F)

- A thermostat failing to satisfy either of the two requirements (start-to-open temperature and valve lift) must be replaced.



INSTALLATION

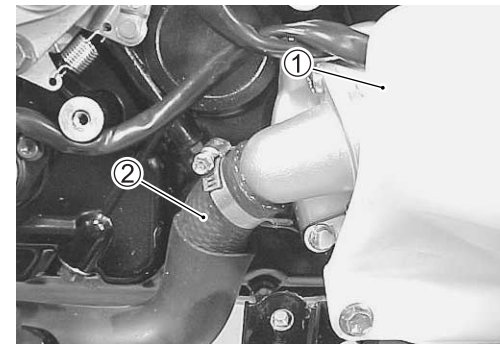
Install the thermostat in the reverse order of removal.



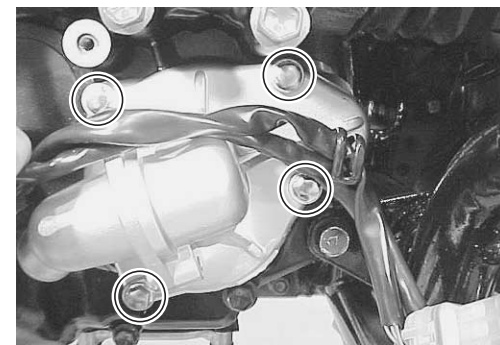
WATER PUMP

REMOVAL AND DISASSEMBLY

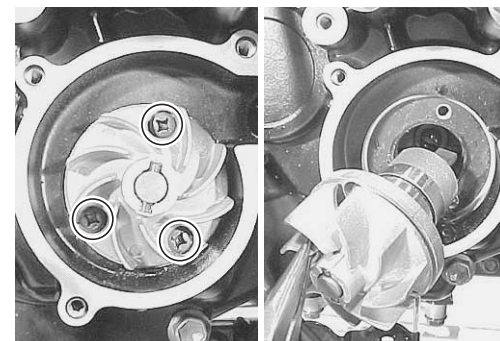
- Drain engine coolant. (☞ 2-13)
- Remove the secondary gear case cover.
- Remove the reserve tank ① and the water hose ②.



- Remove the water pump case.



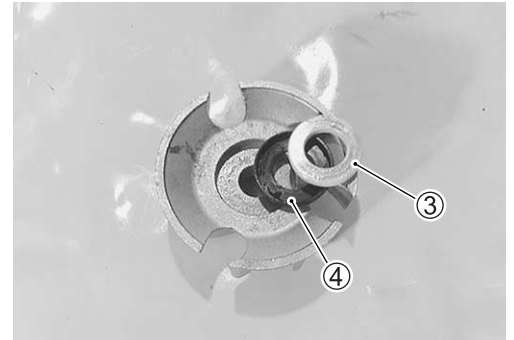
- Remove the water pump.



- Remove the pin ① and draw out the impeller shaft ②.



- Remove the mechanical seal ring ③ and rubber seal ④.



- Remove the bearing with the special tool.

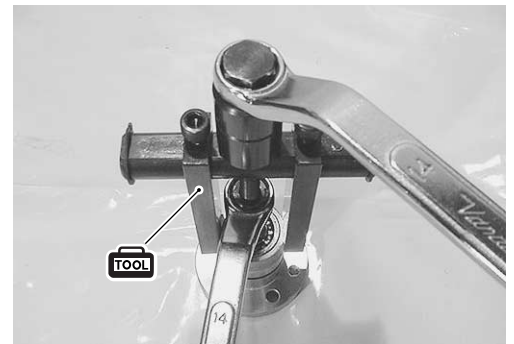
TOOL 09921-20220: Bearing remover set

NOTE:

If no abnormal noise, bearing removal is not necessary.

▲ CAUTION

The removed bearing must be replaced with a new one.



- Remove the mechanical seal with the special tool.

TOOL 09921-20220: Bearing remover set

NOTE:

If no abnormal noise, bearing removal is not necessary.

▲ CAUTION

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



- Remove the oil seal with a suitable bar.

NOTE:

If no abnormal, the oil seal removal is not necessary.

▲ CAUTION

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



INSPECTION

BEARING

- Inspect the play of the bearing by hand while it is in the water pump case.
- Rotate the inner race by hand to inspect for abnormal noise and smooth rotation.
- Replace the bearing if there is anything unusual.



MECHANICAL SEAL

- Visually inspect the mechanical seal for damage, with particular attention given to the sealing face.
- Replace the mechanical seal that shows indications of leakage. Also replace the seal ring if necessary.



OIL SEAL

- Visually inspect the oil seal for damage, with particular attention given to the lip.
- Replace the oil seal that shows indications of leakage.



REASSEMBLY AND INSTALLATION


- Install the oil seal.

NOTE:

The stamped mark on the oil seal faces outside.



- Apply a small quantity of the SUZUKI SUPER GREASE "A" to the oil seal lip.

 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
 99000-25010: SUZUKI SUPER GREASE "A"
 (For the others)

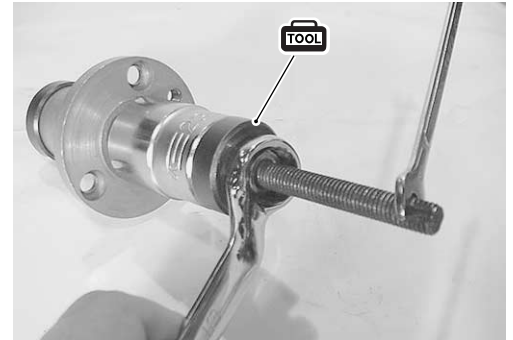
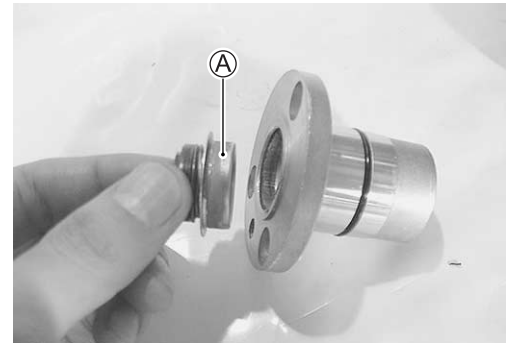


- Install the new mechanical seal with a suitable size socket wrench and the special tool.

NOTE:

The new mechanical seal has been applied the sealer ①.

 **09924-84521: Bearing installer**



- Install the new bearing with the special tool.

 **09924-84521: Bearing installer**

NOTE:

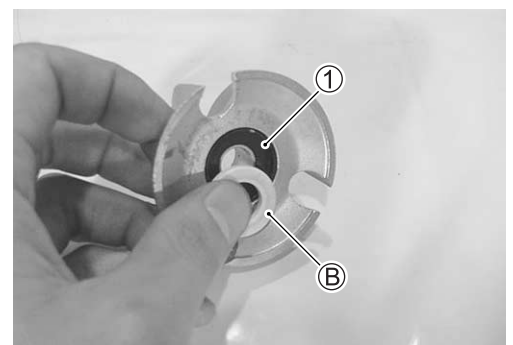
The stamped mark on the bearing faces crankcase side.



- Install the rubber seal ① into the impeller.
- After wiping off the oily or greasy matter from the mechanical seal ring, install it into the impeller.

NOTE:


The marked side ② of the mechanical seal ring faces the impeller.

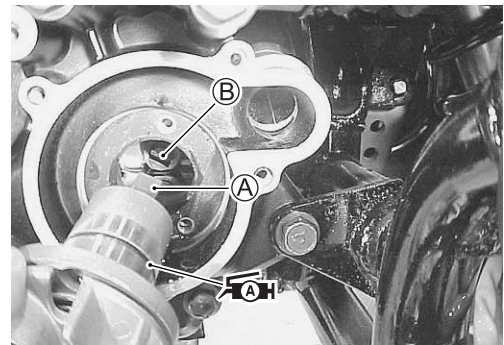


- Install the impeller and impeller shaft to the water pump body.
- Install the pin ②.

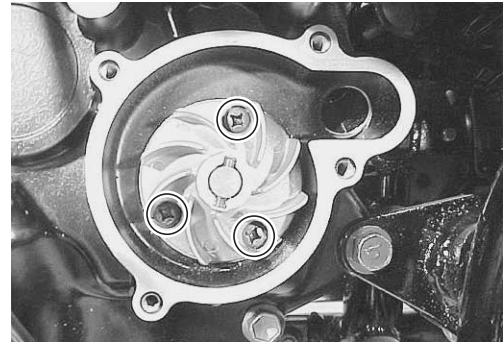


- Apply grease to the O-ring.
- Set the water pump shaft end (A) to the oil pump shaft (B).

 99000-25030: SUZUKI SUPER GREASE "A" (For USA)
99000-25010: SUZUKI SUPER GREASE "A"
(For the others)



- Install the water pump screws.



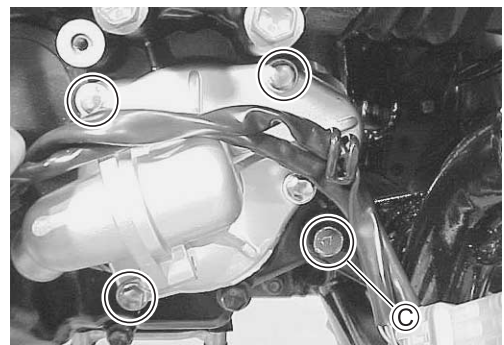
- Apply engine coolant to the O-ring and install the water pump cover.




- Tighten the water pump cover bolts.

NOTE:

Fit the clamp to the bolt (C).



- Connect the water hose.
- Install the reserve tank.
- Install the secondary gear case cover.
- Pour engine coolant. ( 2-13)

CHASSIS

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EXTERIOR PARTS

REMOVAL

SEAT

- Remove the rear seat by removing the bolts.

▲ CAUTION

Be careful not to scratch the rear fender.



- Remove the rear seat grip band by removing the bolts.



- Remove the seat.

▲ CAUTION

Be careful not to scratch the rear fender.

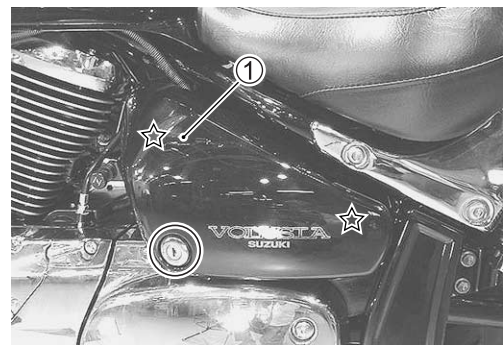


FRAME COVER

- Remove the left frame cover ① with the ignition key.
- Remove the right frame covers ② by removing the bolts.

▲ CAUTION

- * Wait until the engine and exhaust pipe are cool enough to touch with bare hands before draining oil.
- * Be careful not to scratch the frame covers.



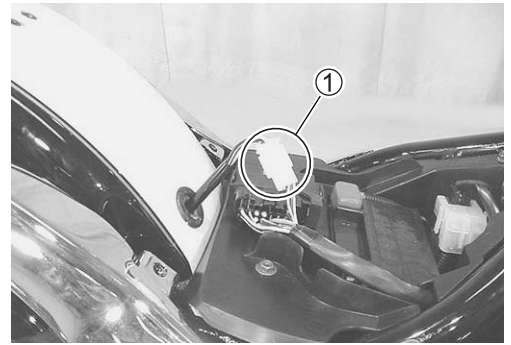
☆ : hooked part



☆ : hooked part

REAR FENDER

- Remove the seat. (☞ 7-2)
- Disconnect the coupler ①.



- Remove the left or right side frame handle grip.
- Remove the rear fender ②.

▲ CAUTION

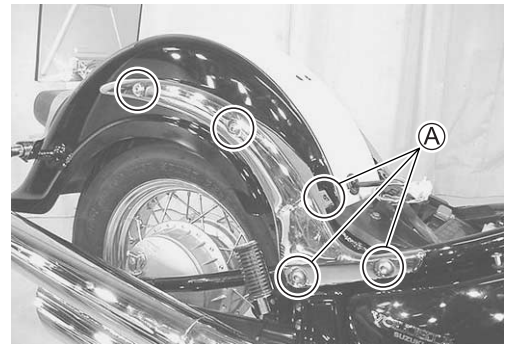
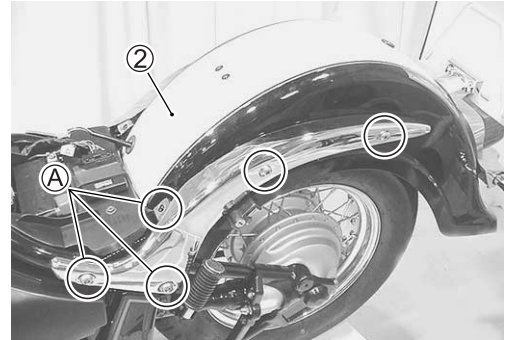
Be careful not to scratch the rear fenders.

NOTE:

When installing the frame handle grip bolts, apply a small quantity of THREAD LOCK “1303” to its mounting bolts and tighten them to the specified torque.

 99000-32030: THREAD LOCK SUPER “1303”

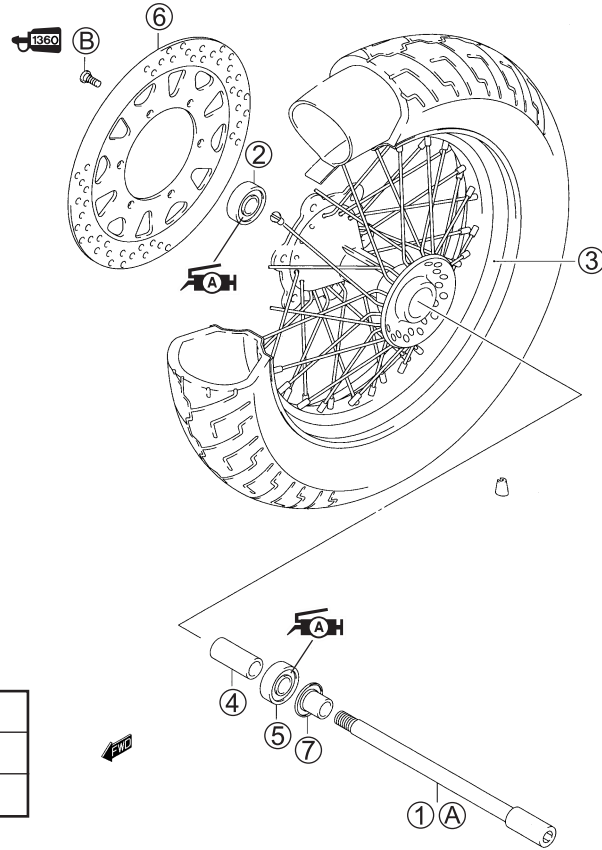
 Frame handle grip mounting bolt **A** (M10): 50 N·m
(5.0 kgf·m, 36.0 lb-ft)



REMOUNTING

Remount the seats, covers and rear fender in the reverse order of removal.

FRONT WHEEL CONSTRUCTION



- ① Front axle
- ② Bearing (R)
- ③ Front wheel
- ④ Spacer
- ⑤ Bearing (L)
- ⑥ Brake disc
- ⑦ Spacer

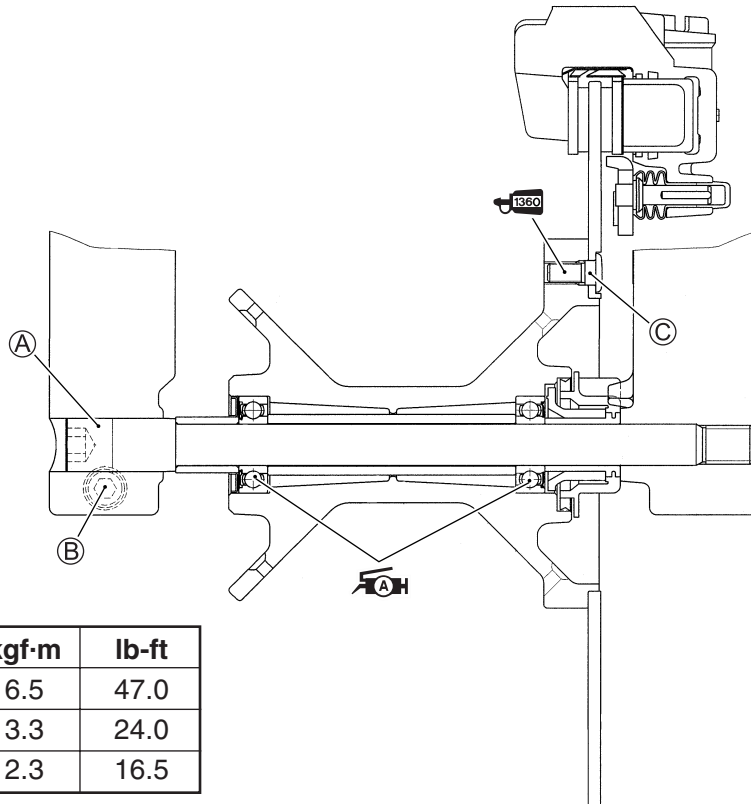
- Ⓐ Front axle
- Ⓑ Brake disc mounting bolt



ITEM	N·m	kgf·m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	23	2.3	16.5

Left ←

→ Right



ITEM	N·m	kgf·m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	33	3.3	24.0
Ⓒ	23	2.3	16.5

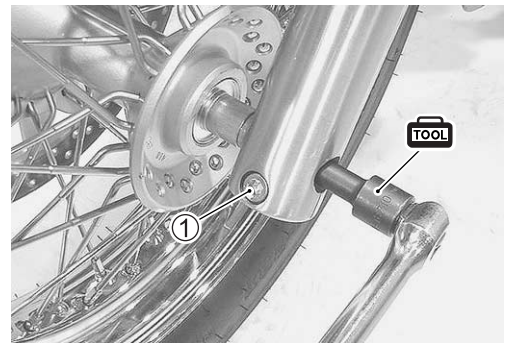
- Ⓐ Front axle
- Ⓑ Axle pinch bolt
- Ⓒ Brake disc bolt

REMOVAL AND DISASSEMBLY

- Loosen the front axle pinch bolt ①.
- Loosen the front axle ② by using the special tool.

TOOL 09900-18710: Hexagon socket (12 mm)

- Raise the front wheel off the ground with a jack or a wooden block.



- Remove the front axle ②, spacers ③ and front wheel.

⚠ CAUTION

Do not operate the brake lever during or after front wheel removal.



- Remove the brake disc by removing its bolts.

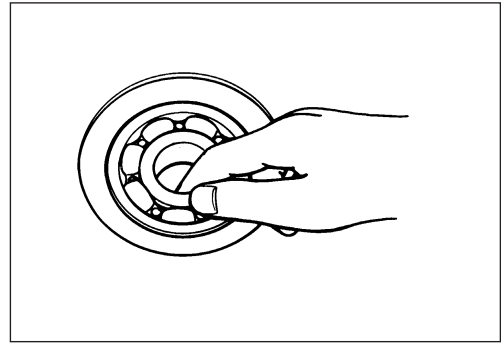


INSPECTION

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.



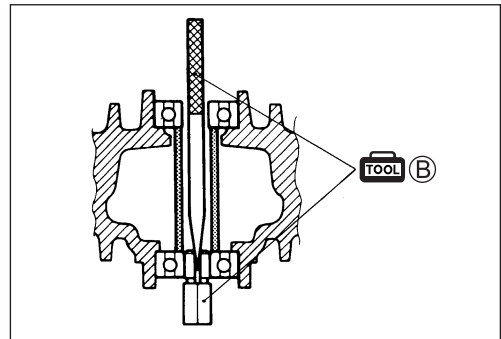
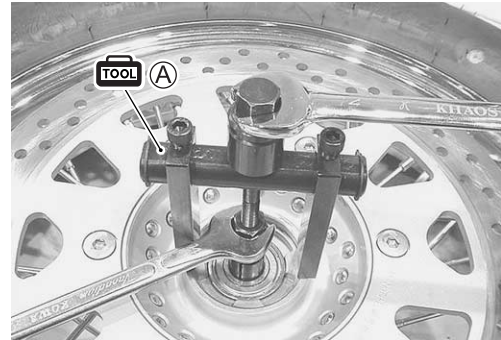
WHEEL BEARINGS REMOVAL

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

TOOL 09921-20220: (A) Bearing remover set (17 mm)
or 09941-50111: (B) Wheel bearing remover

⚠ CAUTION

The removed bearings should be replaced with new ones.



FRONT 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 with a new one.

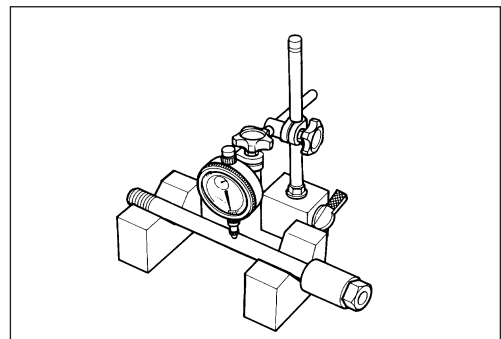
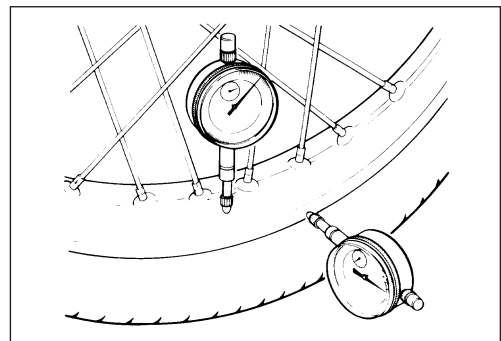
DATA Wheel rim runout (axial and radial)
Service Limit: 2.0 mm (0.08 in)

FRONT AXLE

Measure the front axle runout using the dial gauge. If the runout exceeds the service limit, replace the front axle with a new one.

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

DATA Wheel axle runout
Service Limit: 0.25 mm (0.010 in)



TIRE 2-18

REASSEMBLY AND REMOUNTING

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

WHEEL BEARING

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

For USA

 99000-25030: SUZUKI SUPER GREASE “A”

For the other countries

 99000-25010: SUZUKI SUPER GREASE “A”

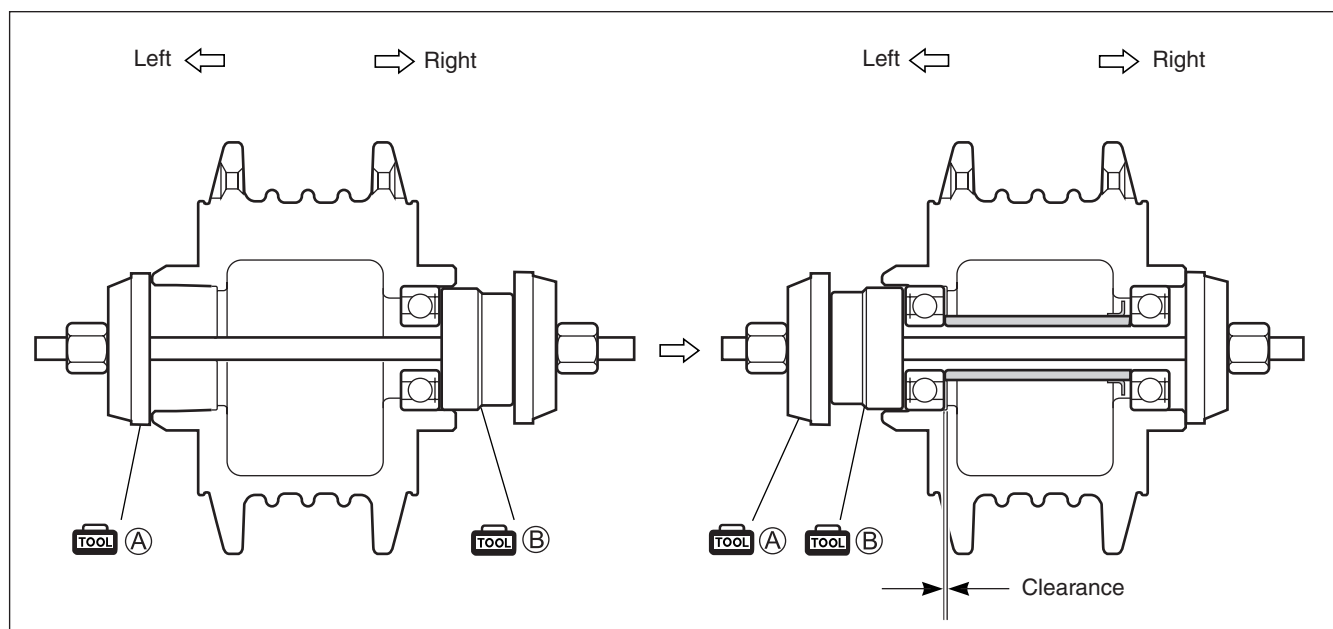
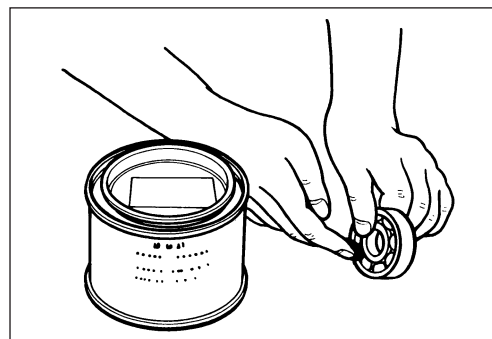
- Install the wheel bearings using the used bearings and special tool as described below.

 (A) 09941-34513: Bearing installer set

(B) 09913-70210: Bearing installer set (40 mm)

⚠ CAUTION

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

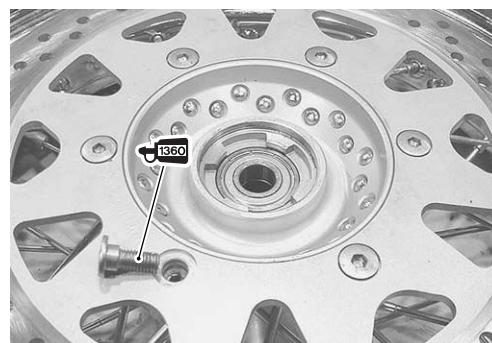


BRAKE DISC

- Make sure that the brake disc is clean and free of any grease. Apply THREAD LOCK SUPER “1360” to the brake disc bolts and tighten them to the specified torque.

 1360 99000-32130: THREAD LOCK SUPER “1360”

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



SPEED SENSOR

- Apply SUZUKI SUPER GREASE “A” to the speed sensor dust seal.

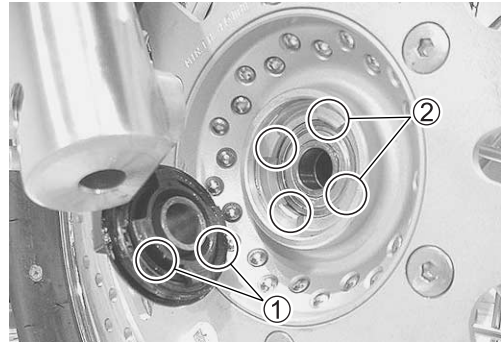
For USA

 99000-25030: SUZUKI SUPER GREASE “A”

For the other countries

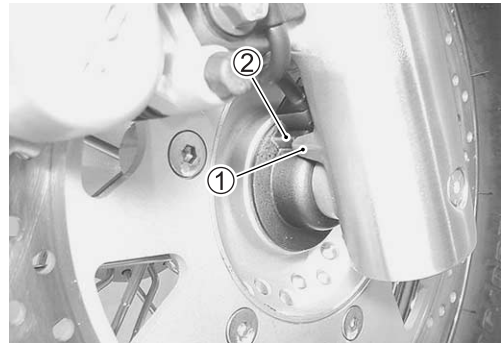
 99000-25010: SUZUKI SUPER GREASE “A”

- Align the grooves ① on the speed sensor with the lugs ② on the wheel hub.



FRONT WHEEL

- Make sure that the front fork stopper ① and the speed sensor stopper ② are installed as shown.



⚠ CAUTION

When installing the front wheel, position the brake disc between the brake pads. Be careful not to damage the brake pads.

- Tighten the front axle to the specified torque.
- Tighten the front axle pinch bolt ③ on the specified torque.

 **Front axle: 65 N·m (6.5 kgf·m, 47.0 lb-ft)**

Front axle pinch bolt: 33 N·m (3.3 kgf·m, 24 lb-ft)

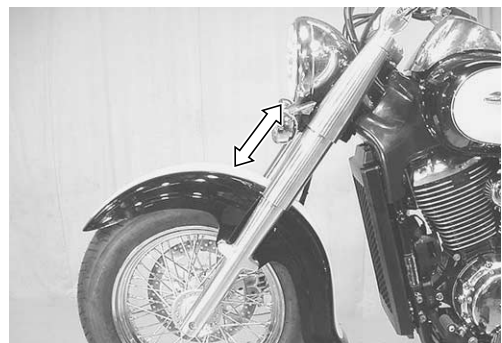
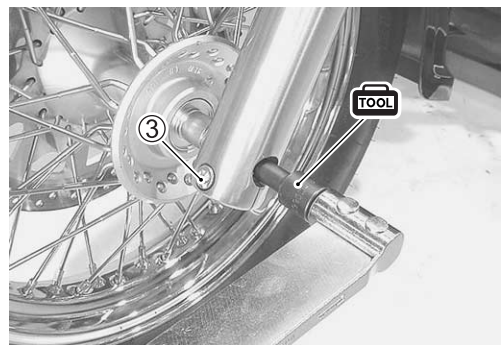
 **09900-18710: Hexagon socket (12 mm)**

NOTE:

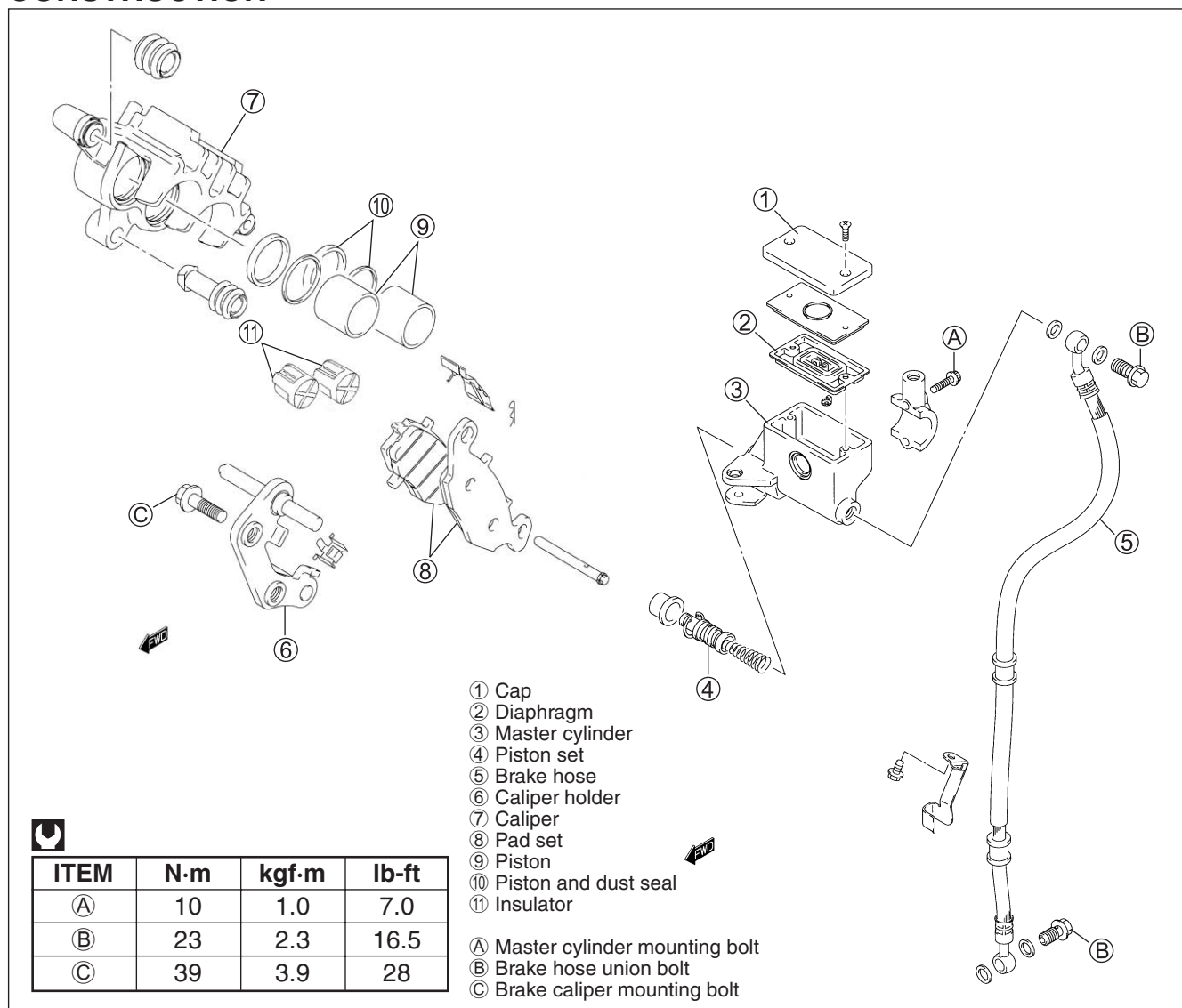
Before tightening the front axle pinch bolts ③, move the front fork up and down four or five times.

NOTE:

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



FRONT BRAKE CONSTRUCTION



▲ WARNING

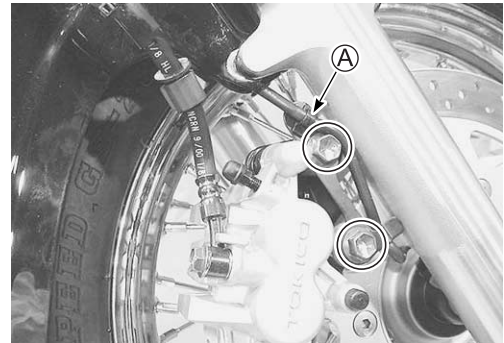
- * The brake system is filled with an glycol-based brake fluid, which is classified DOT 4. Do not use or mix other types of brake fluid, such as silicone-based and petroleum-based brake fluids when refilling the brake system, otherwise serious damage to the brake system will result.
- * Do not use any brake fluid taken from old, used, or unsealed containers.
- * Do not reuse brake fluid left over from the last servicing or which has been stored for a long period of time.
- * When storing brake fluid, be sure to seal the container completely and keep it out of the reach of children.
- * When replenishing brake fluid, be sure not to get any dust or other foreign materials in the fluid.
- * When washing brake components, always use new brake fluid. Do not use cleaning solvent.
- * A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the brake disc with high-quality brake cleaner or a neutral detergent.

▲ CAUTION

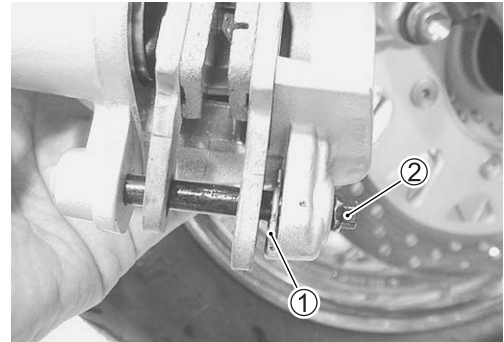
Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber material, etc.

BRAKE PAD REPLACEMENT

- Remove the guide hook (A).
- Remove the brake caliper by removing the brake caliper mounting bolts.



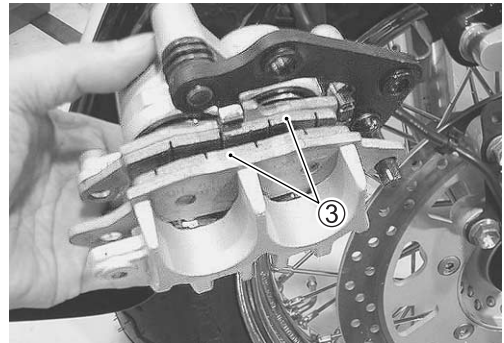
- Remove the pin (1).
- Remove the pad pin (2).



- Remove the brake pads (3).

⚠ CAUTION

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



- Install the new brake pads.



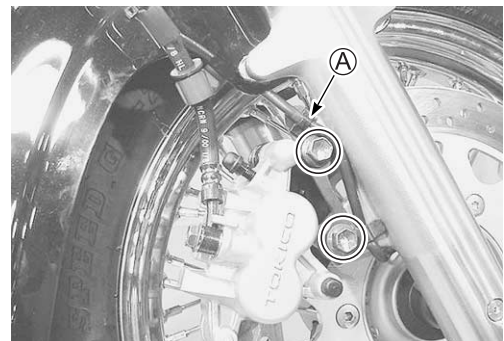
- Tighten the brake caliper mounting bolts to the specified torque.

🔧 Brake caliper mounting bolts: 39 N·m (3.9 kgf·m, 28 lb·ft)

- Install the guide hook (A).

NOTE:

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



BRAKE FLUID REPLACEMENT

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

Specification and classification: DOT 4

- Connect a clear hose 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 end of the inspection window.

CAUTION

Bleed air from the brake system.

 2-17

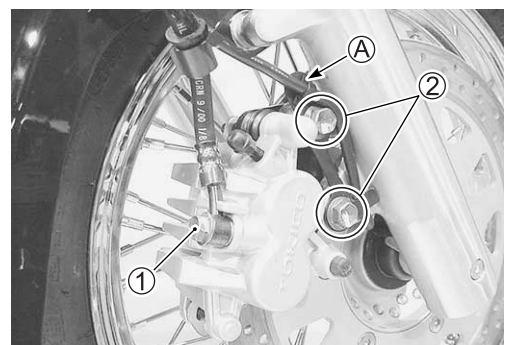


BRAKE CALIPER REMOVAL AND DISASSEMBLY

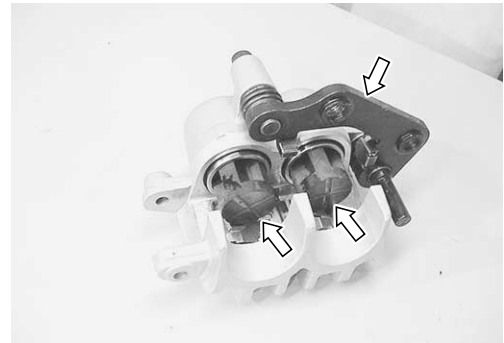
- Remove the guide hook (A).
- Disconnect the brake hose from the brake caliper by removing the brake hose union bolt (1) and allow the brake fluid to drain into a suitable receptacle.
- Remove the brake caliper by removing the brake caliper mounting bolts (2).

WARNING

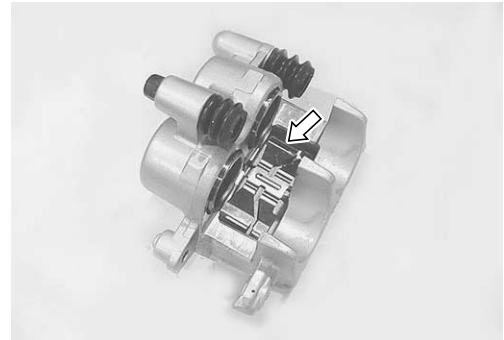
- * Do not reuse the brake fluid left over from the last servicing or which has been stored for a long period of time, otherwise serious damage to the brake system will result.
- * Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and oil leakage.



- Remove the brake pads. (7-10)
- Remove the insulator.
- Remove the brake caliper holder.



- Remove the spring.



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



▲ CAUTION

Do not use extremely high pressure to remove the brake caliper pistons, otherwise damage to the pistons will result.

- Remove the dust seals and piston seals.

▲ CAUTION

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



BRAKE CALIPER INSPECTION

BRAKE CALIPER

Inspect each brake caliper cylinder wall for nicks, scratches or other damage. If any damages are found, replace the brake caliper with a new one.

BRAKE CALIPER PISTONS

Inspect the brake caliper pistons for any scratches or other damage. If any damages are found, replace the piston with a new one.



RUBBER PARTS

Replace the removed rubber parts with new ones.



BRAKE CALIPER REASSEMBLY AND REMOUNTING

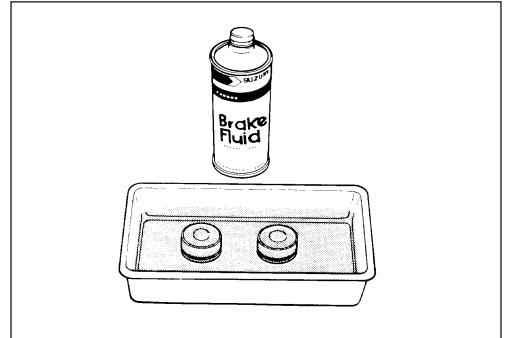
Reassemble and remount the brake caliper in the reverse order of removal and disassembly. Pay special attention to the following points:

- Wash the caliper bores and pistons with the specified brake fluid. Thoroughly wash the dust seal grooves and piston seal grooves.

 **Specification and classification: DOT 4**

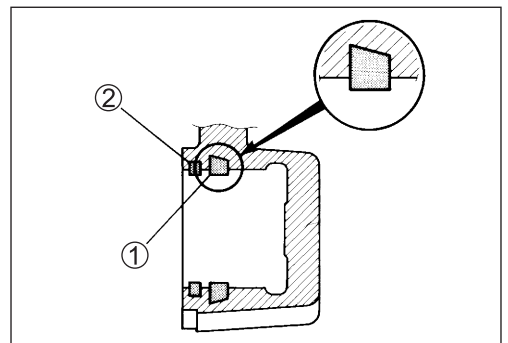
CAUTION

- * Wash the brake caliper components with new brake fluid before reassembly.
- * Do not wipe the brake fluid off after washing the components.
- * When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.
- * Replace the removed piston seals and dust seals with new ones.
- * Apply brake fluid to all of the seals, brake caliper bores and pistons before reassembly.



PISTON SEALS

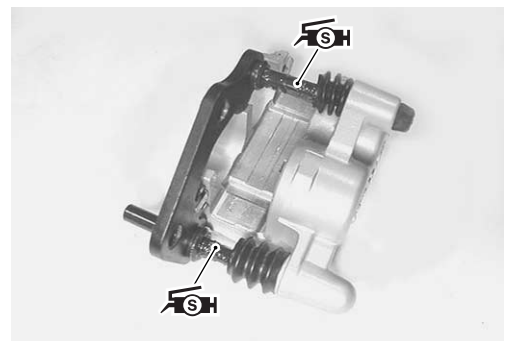
- Install the piston seals ① and dust seals ② as shown.



BRAKE CALIPER HOLDER

- Apply SUZUKI SILICON GREASE to the brake caliper holder.

 99000-25100: SUZUKI SILICONE GREASE



- Tighten the brake caliper mounting bolts ①, and brake hose union bolt ② to the specified torque.

🔧 Brake caliper mounting bolt: 39 N·m (3.9 kgf·m, 28 lb-ft)
Brake hose union bolt: 23 N·m (2.3 kgf·m, 16.5 lb-ft)

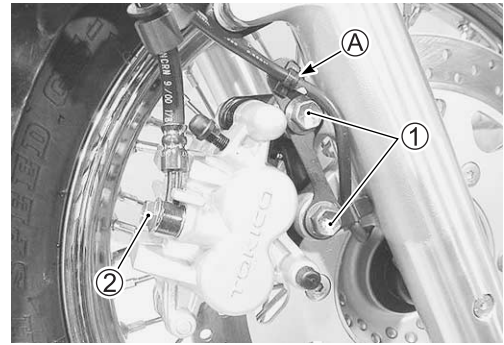
- For assembly procedure of brake hose: 📄 9-18
- Install the guide hook ①.

NOTE:

Before remounting the brake caliper, push the brake caliper pistons all the way into the caliper.

⚠ CAUTION

Bleed air from the system after reassembling the brake caliper. (📄 2-17)



BRAKE DISC INSPECTION

Check the brake disc for cracks or damage and measure the thickness using the micrometer. If any damages are found or if the thickness is less than the service limit, replace the brake disc with a new one.

🔧 09900-20205: Micrometer (0 – 25 mm)

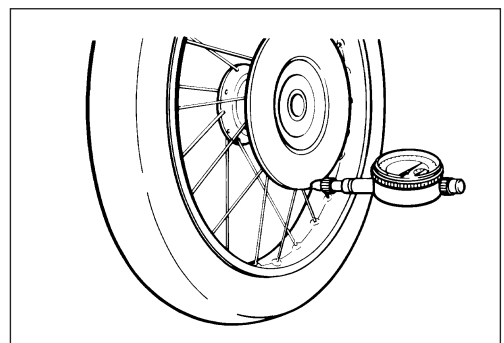
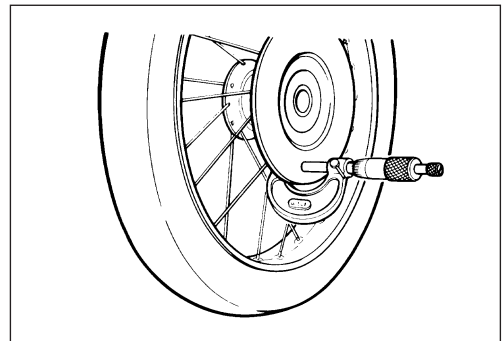
📊 Brake disc thickness
Service Limit: 4.5 mm (0.098 in)

Measure the runout using the dial gauge. If the runout exceeds the service limit, replace the brake disc with a new one.

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

📊 Brake disc runout
Service Limit: 0.3 mm (0.012 in)

- If either measurement exceeds the service limit, replace the brake disc with a new one. (📄 7-5)



MASTER CYLINDER REMOVAL AND DISASSEMBLY

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

▲ CAUTION

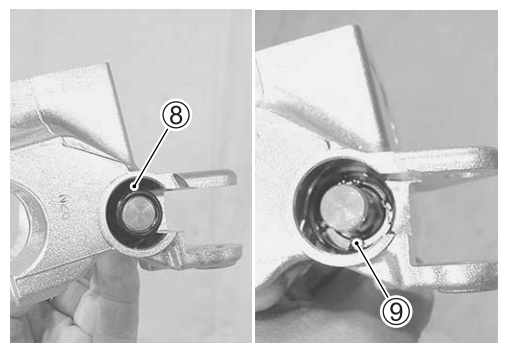
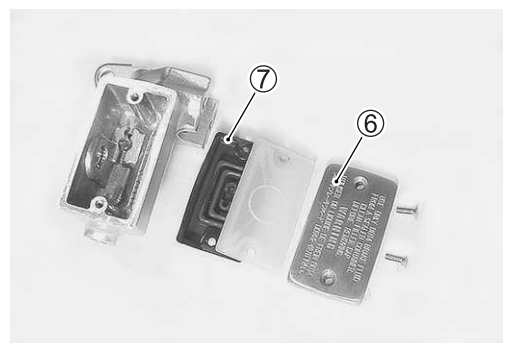
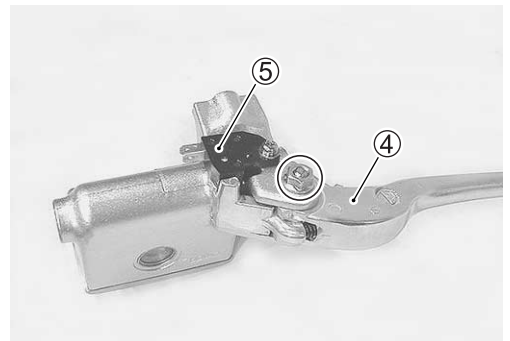
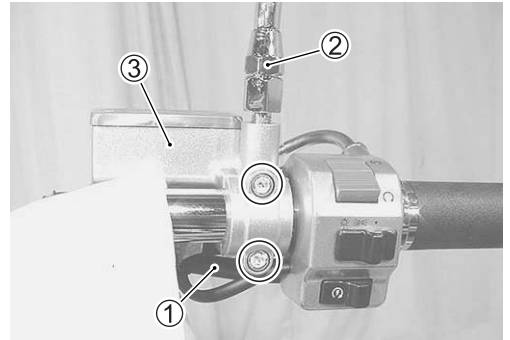
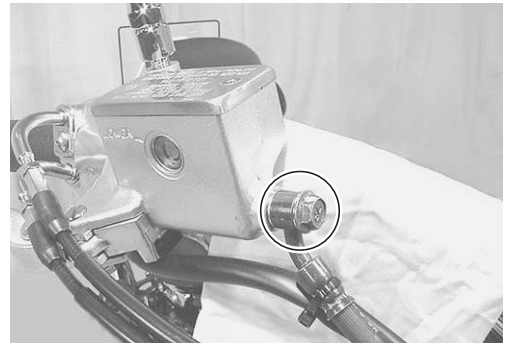
Immediately wipe off any brake fluid contacting any part of the motorcycle. The brake fluid reacts chemically with paint, plastics, rubber materials, etc., and will damage them severely.

- Disconnect the front brake light switch lead wire ①.
- Remove the right rear view mirror ② and master cylinder assembly ③.

- Remove the brake lever ④ and front brake light switch ⑤.

- Remove the reservoir cap ⑥ and diaphragm ⑦.
- Drain the brake fluid.

- Pull the dust boot ⑧ out and remove the circlip ⑨.



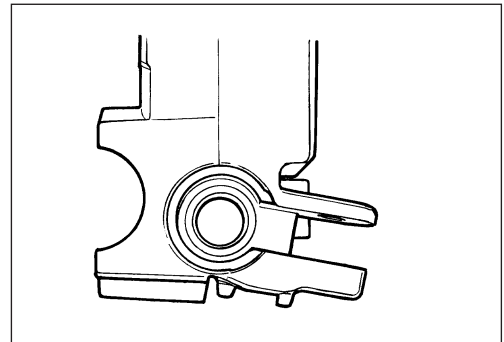
- Remove the piston assembly.



MASTER CYLINDER INSPECTION

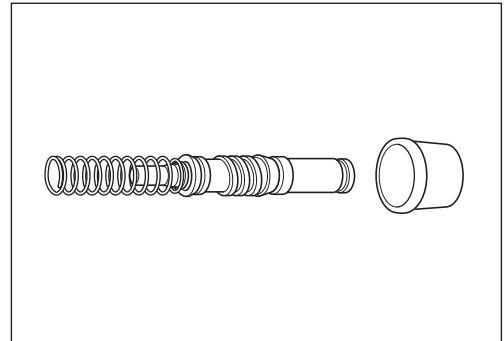
MASTER CYLINDER

Inspect the master cylinder bore for any scratches or damage. If any damages are found, replace the master cylinder with a new one.



PISTON AND RUBBER PARTS

Inspect the piston surface, primary/secondary cup, and dust boot for any scratches, wear or damage. If any damages are found, replace the piston set with a new one.

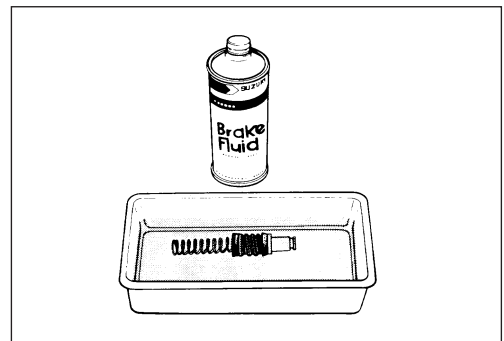


MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

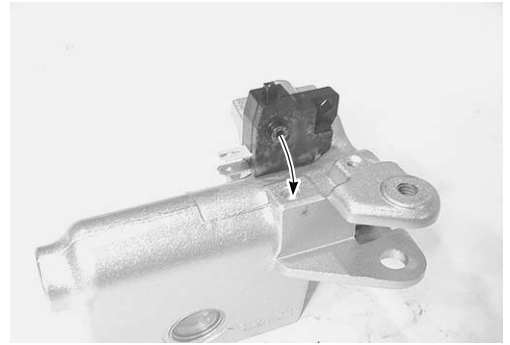
⚠ CAUTION

- * 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.



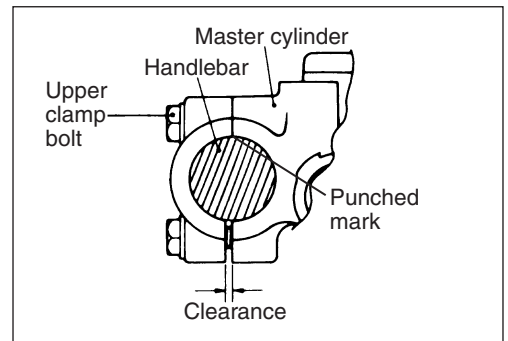
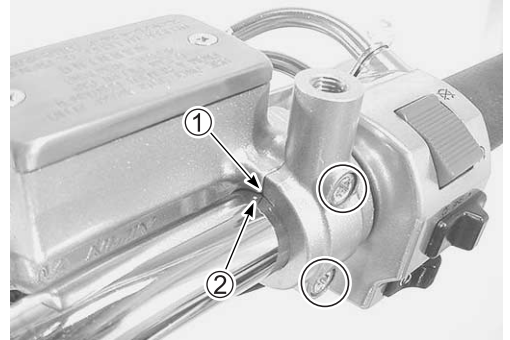
Specification and classification: DOT 4


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




- When remounting the master cylinder onto the handlebars, align the master cylinder holder's mating surface ① with the punch mark ② on the handlebars and tighten the upper clamp bolt first.

 **Master cylinder mount bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)**



- Tighten the brake hose union bolt to the specified torque.
- For assembly procedure of brake hose. ( 9-18)

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

▲ CAUTION

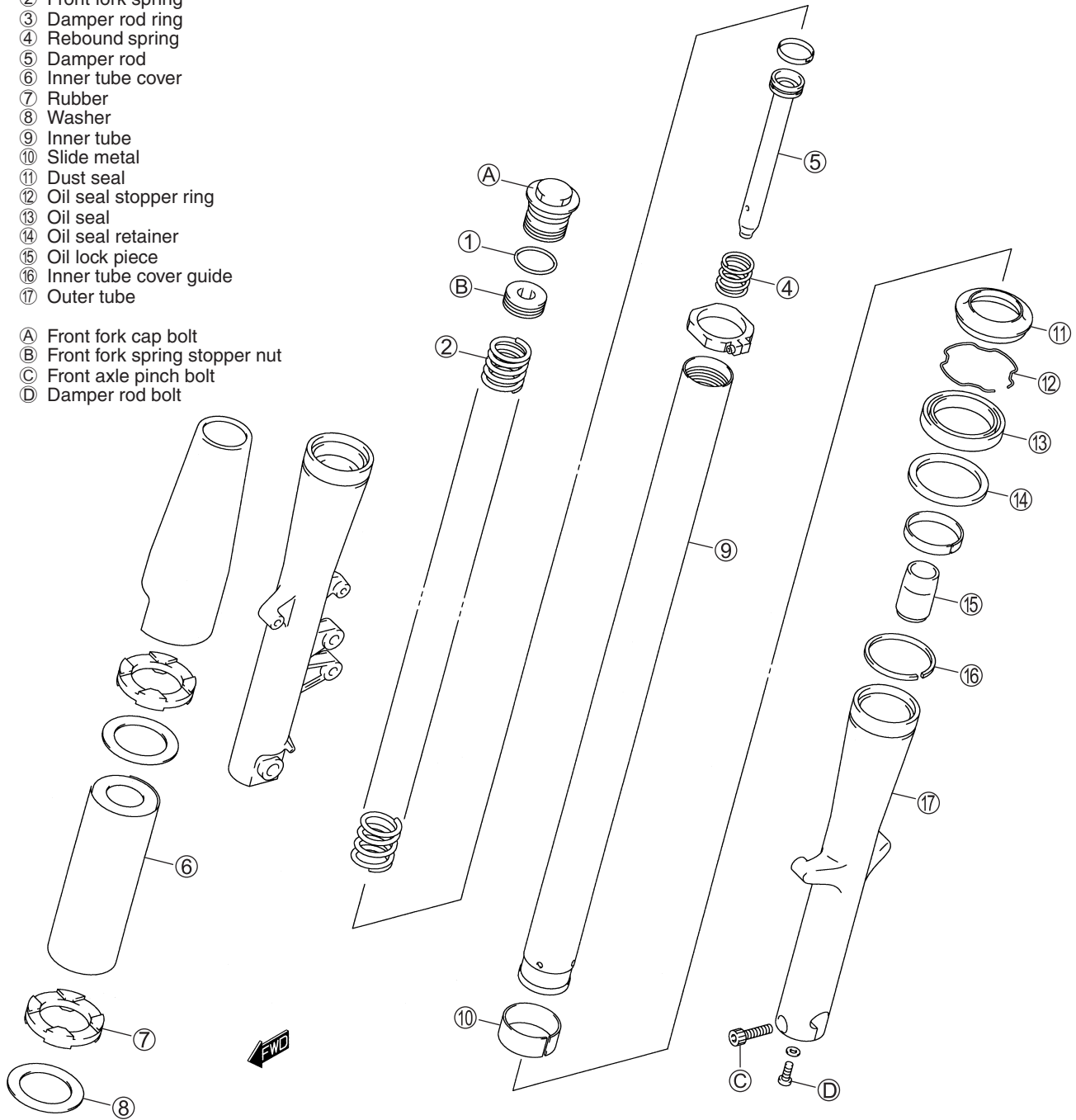
Bleed air from the brake system after installing the master cylinder. ( 2-17)



FRONT FORK CONSTRUCTION

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

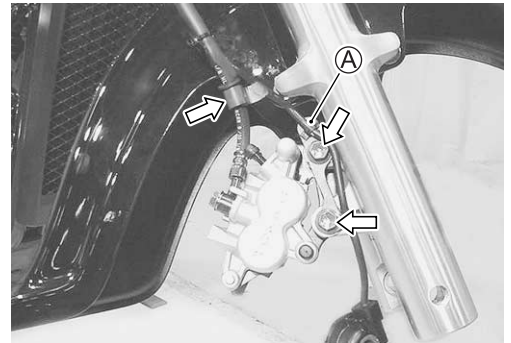
- A Front fork cap bolt
- B Front fork spring stopper nut
- C Front axle pinch bolt
- D Damper rod bolt



ITEM	N·m	kgf·m	lb-ft
A	45	4.5	32.5
B	35	3.5	25.5
C	33	3.3	24
D	20	2.0	14.5

REMOVAL AND DISASSEMBLY

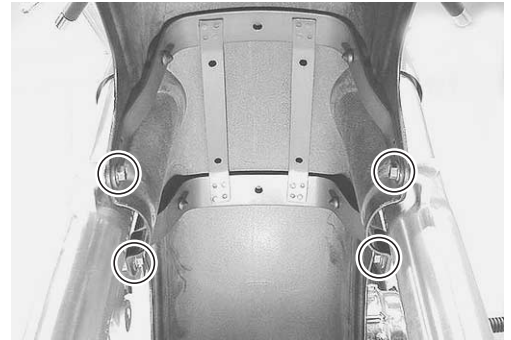
- Remove the front wheel. (☞ 7-5)
- Remove the brake hose from the hose guide.
- Remove the guide hook (A).
- Remove the front brake caliper by removing the bolts.



- Remove the front fender by removing its mounting bolts.

▲ CAUTION

Be careful not to scratch the front fender.

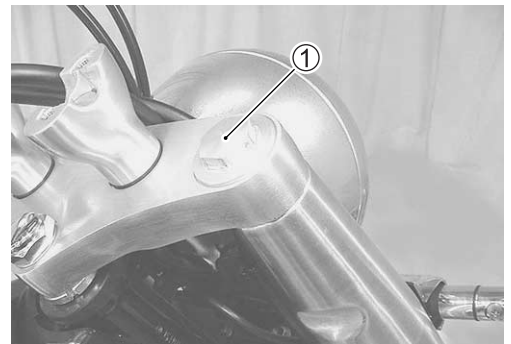


- Remove the handlebars. (☞ 7-27)
- Remove the front fork cap bolts (1).

NOTE:

Slightly loosen the front fork spring stopper nut to facilitate later disassembly.

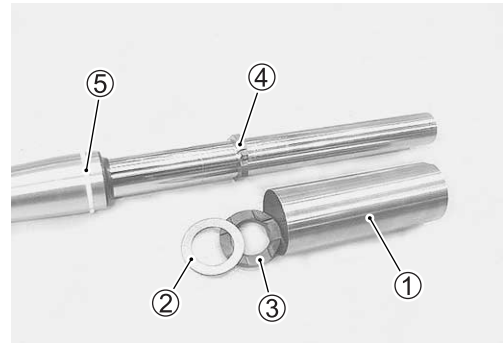
 09900-18720: Hexagon socket (14 mm)



- Remove the front forks after loosening the front fork lower clamp bolts.

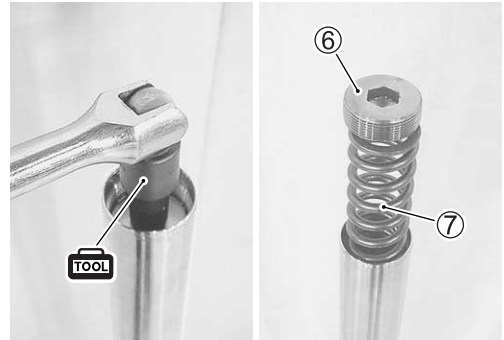


- Remove the front fork inner tube cover ①, washer ② and rubber ③.
- Remove the inner tube cover stopper ④ by loosening the bolt.
- Remove the inner tube cover guide ⑤.

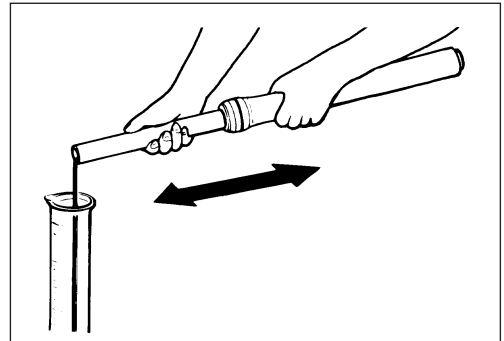


- Remove the front fork spring stopper nut ⑥ and fork spring ⑦.

TOOL 09900-18720: Hexagon socket (14 mm)



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

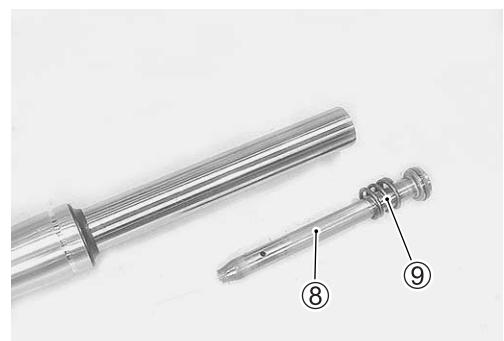


- Remove the damper rod bolt using a 6-mm hexagon wrench and the special tools.

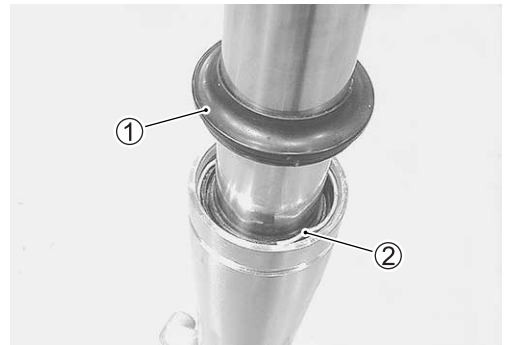
TOOL 09940-34520: "T" handle
09940-34531: Attachment "A"



- Remove the damper rod ⑧ and Rebound spring ⑨.



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



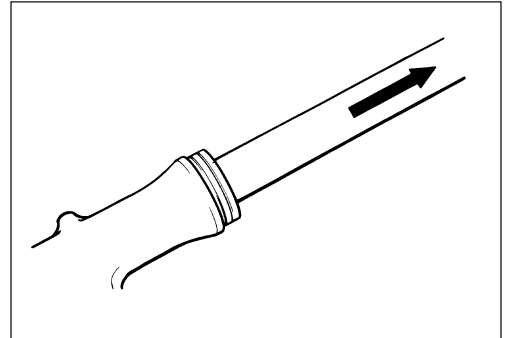
- Remove the oil seal by slowly pulling out the inner tube.

NOTE:

Be careful not to damage the inner tube.

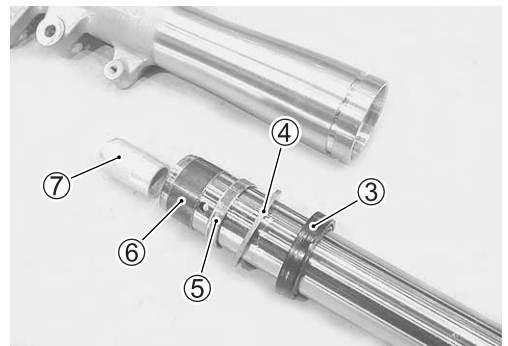
▲ CAUTION

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



- Remove the following parts.

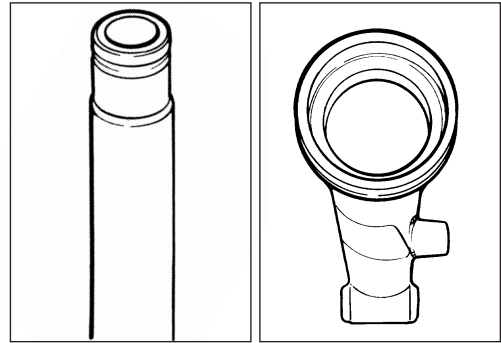
- ③ Oil seal
- ④ Oil seal retainer
- ⑤ Outer tube slide metal
- ⑥ Inner tube slide metal
- ⑦ Oil lock piece



INSPECTION

INNER AND OUTER TUBES

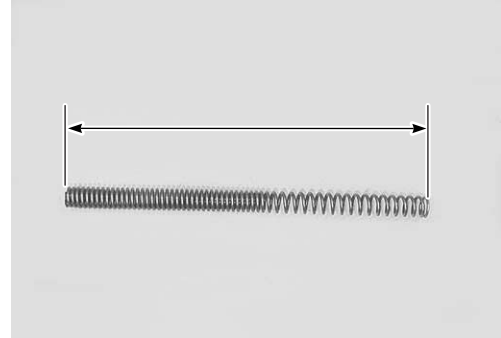
Inspect the inner tube sliding surface and outer tube sliding surface for scuffing.



FORK SPRING

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

DATA Front fork spring free length
Service Limit: 540 mm (21.26 in)



DAMPER ROD RING

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



REASSEMBLY AND REMOUNTING

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

SLIDE METALS AND OIL AND DUST SEALS

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

⚠ CAUTION

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

- Install the oil lock piece ①, slide metals ②, oil seal retainer ③ and oil seal ④ onto the inner tube.

NOTE:

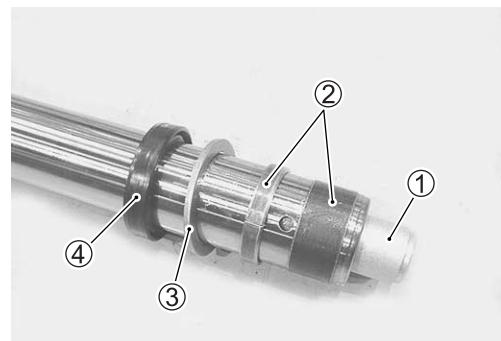
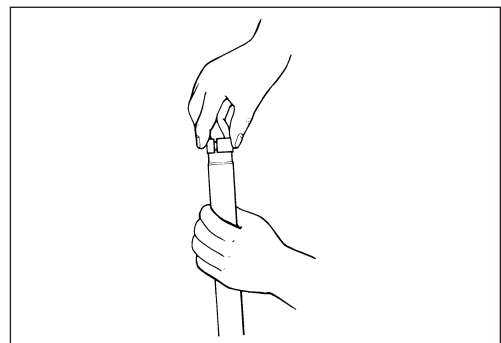
Apply grease to the oil seal ④ lip lightly before installing it.

For USA

 99000-25030: SUZUKI SUPER GREASE "A"

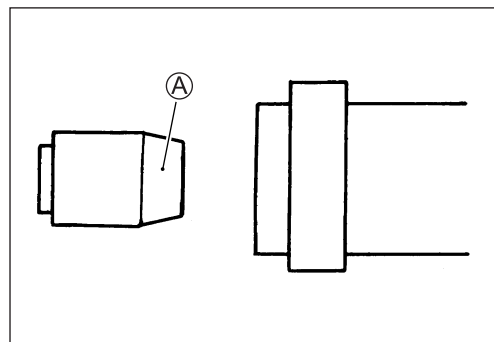
For the other countries

 99000-25010: SUZUKI SUPER GREASE "A"



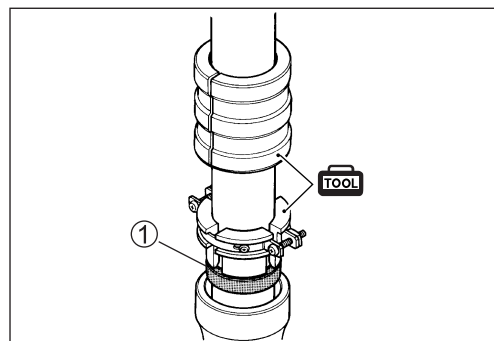
NOTE:

When installing the oil lock piece, insert the tapered end (A) of oil lock piece into the inner tube.



- Insert the inner tube into the outer tube and install the oil seal ① using the special tool.

 **09940-52861: Front fork oil seal installer**

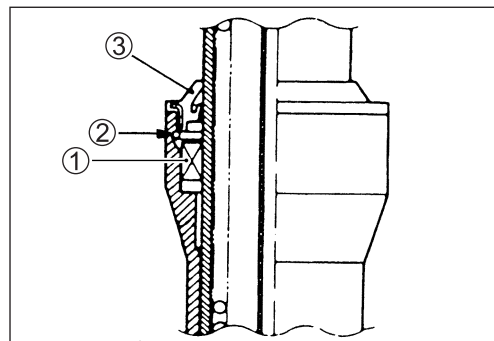


- Install the oil seal stopper ring ②.


▲ CAUTION

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

- Install the dust seal ③.

**DAMPER ROD**

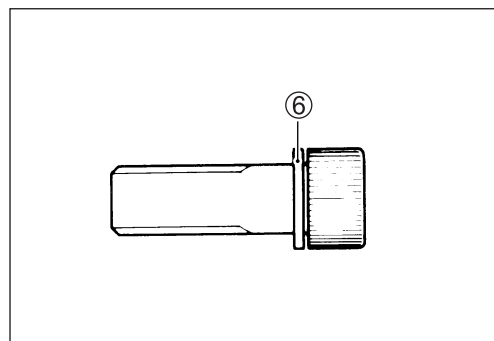
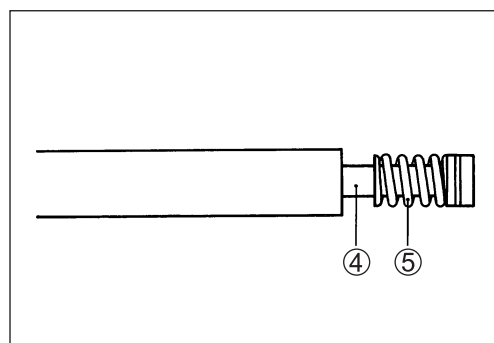
- Install the damper rod ④ and rebound spring ⑤ as shown. Tighten the damper rod bolt to the specified torque using a 6-mm hexagon wrench and the special tools.

 **09940-34520: "T" handle**
09940-34531: Attachment "A"

 **Damper rod bolt: 20 N·m (2.0 kgf·m, 14.5 lb-ft)**

▲ CAUTION

Use a new damper rod bolt gasket ⑥ to prevent oil leakage.



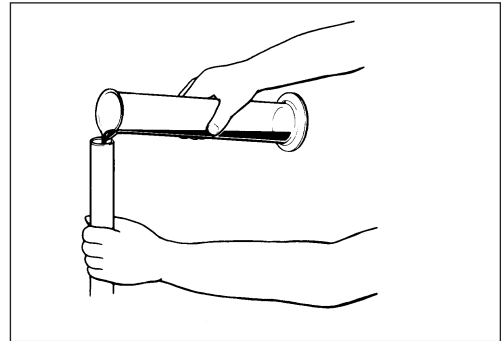
FORK OIL

- Pour the specified fork oil into the inner tube.

Fork oil type: **SUZUKI FORK OIL SS-08 (#10)** or equivalent fork oil

FORK 99000-99001-SS8: SUZUKI FORK OIL SS-08

DATA Front fork oil capacity (each leg): 412 ml
(13.9/14.5 US/Imp oz)



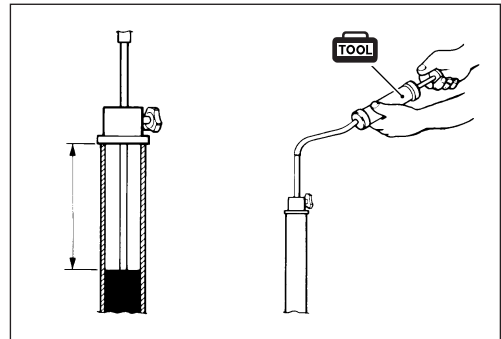
- Hold the front fork in a vertical position and adjust the fork oil level using the special tool.

TOOL 09943-74111: Front fork oil level gauge

DATA Front fork oil level
Service Limit: 177 mm (6.96 in)

NOTE:

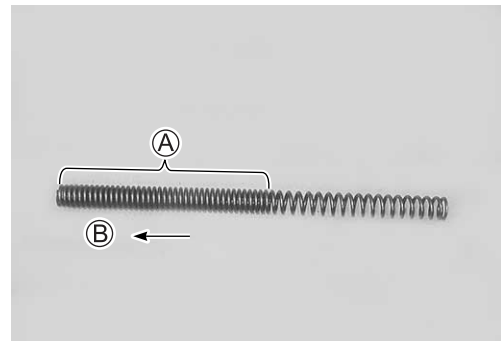
When adjusting the oil level, remove the fork spring and compress the inner tube fully.

**FORK SPRING**

- Install the fork spring as shown.

NOTE:

The end of the fork spring with the widely close pitch **A** side should be at the bottom **B** of the front fork.



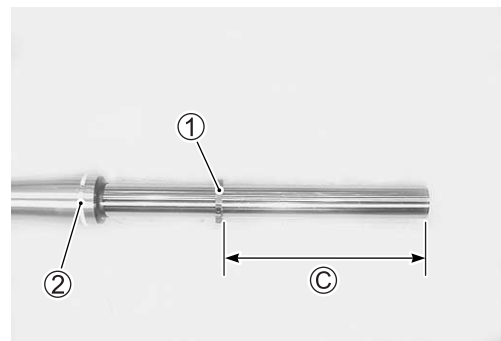
- Install the front fork spring stopper nut temporarily.

TOOL 09900-18720: Hexagon socket (14 mm)

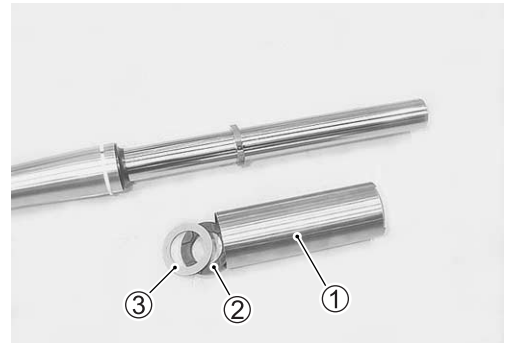
**REMountING**

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

- Install the inner tube cover stopper **①** at 246.6 mm (9.70 in) **C** from the upper surface of the inner tube.
- Install the inner tube cover guide **②**.



- Install the inner tube cover ①, rubber ② and washer ③.




- Remount the front fork and tighten the front fork lower clamp bolts temporarily.

NOTE:

Install the inner tube ① until it seats to the flange part ② of the steering stem upper bracket.

- Tighten the front fork spring stopper nut to the specified torque.

 **Front fork spring stopper nut: 35 N·m**
(3.5 kgf·m, 25.5 lb-ft)

 **09900-18720: Hexagon socket (14 mm)**

- After loosening the front fork lower clamp bolts slightly, tighten the front fork cap bolt to the specified torque.

 **Front fork cap bolt: 45 N·m (4.5 kgf·m, 32.5 lb-ft)**

CAUTION

Replace the front fork cap bolt's O-ring to prevent oil leakage.

- Tighten the front fork lower clamp bolts to the specified torque.

 **Front fork lower clamp bolt: 33 N·m (3.3 kgf·m, 24 lb-ft)**

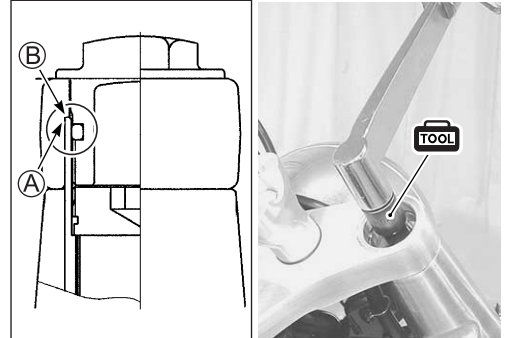
- Tighten the front brake caliper mounting bolts to the specified torque.

 **Front brake caliper mounting bolt: 39 N·m**
(3.9 kgf·m, 28 lb-ft)

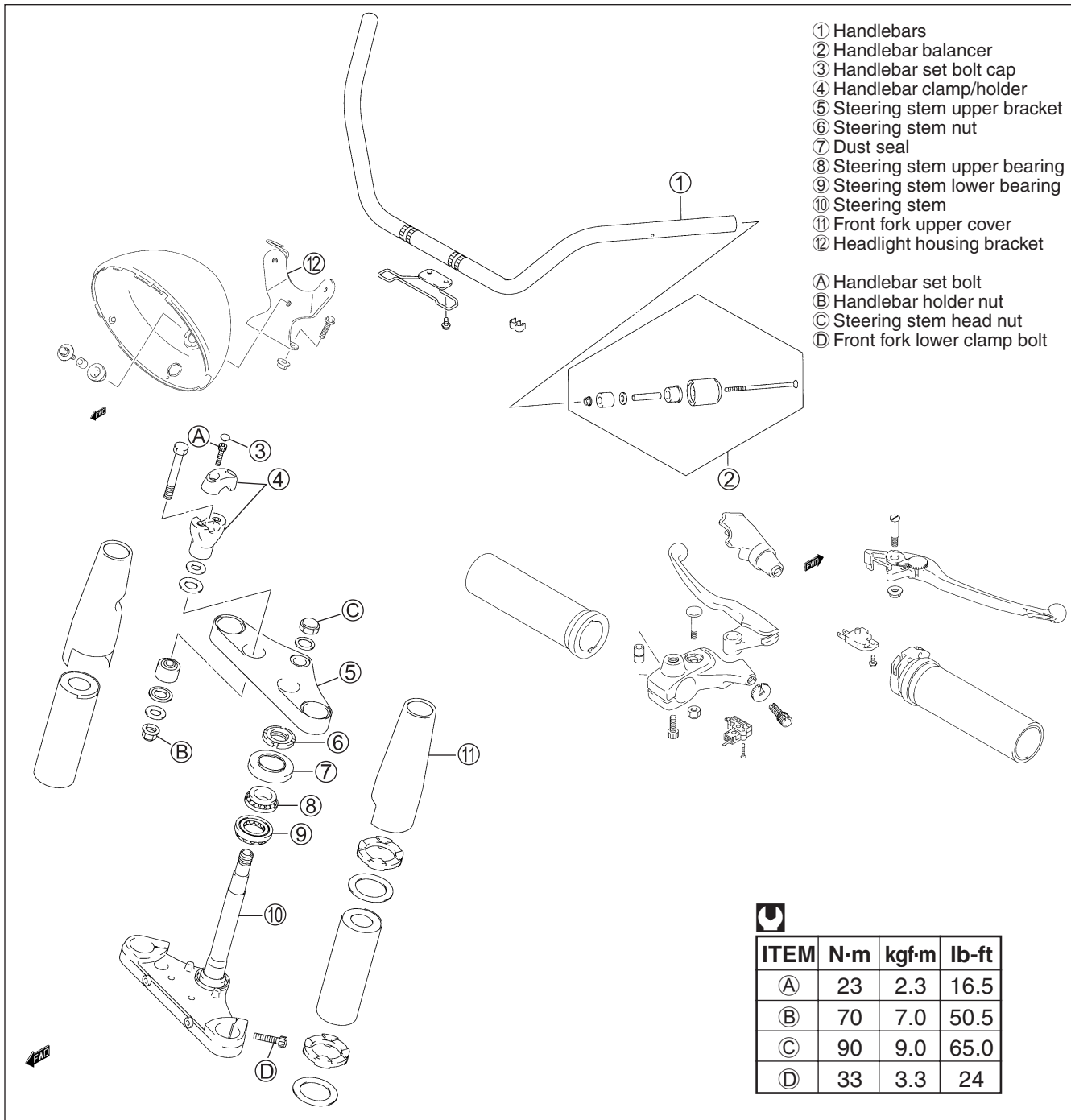
- Install the front wheel. (➡ 7-7)

NOTE:

Before tightening the front axle and front axle pinch bolts, move the front fork up and down four or five times.

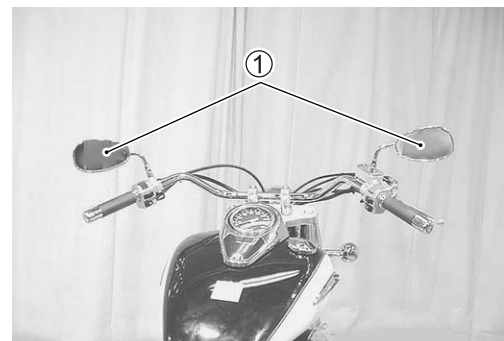


STEERING CONSTRUCTION

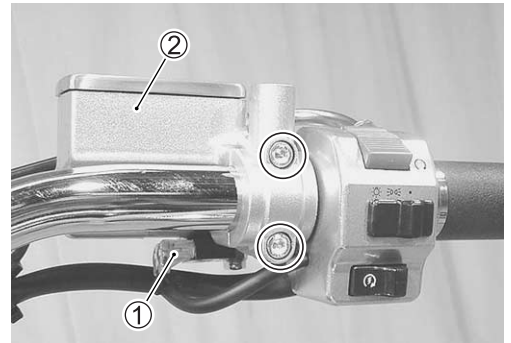


REMOVAL AND DISASSEMBLY

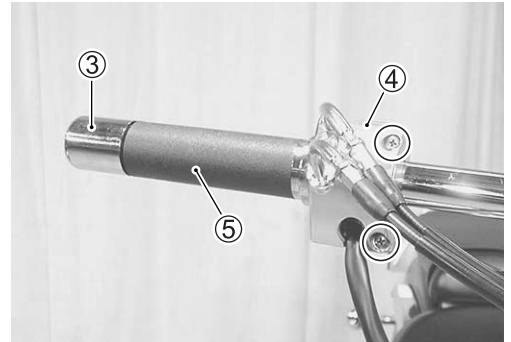
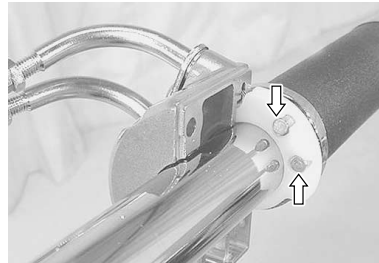
- Remove the front wheel. (7-5)
- Remove the front fork. (7-19)
- Remove the rear view mirrors ①.



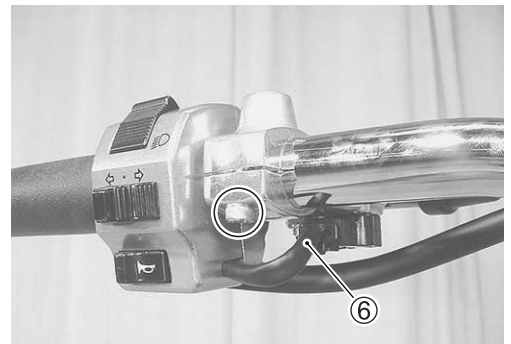
- Disconnect the front brake light switch lead wires ①.
- Remove the front brake master cylinder ②.



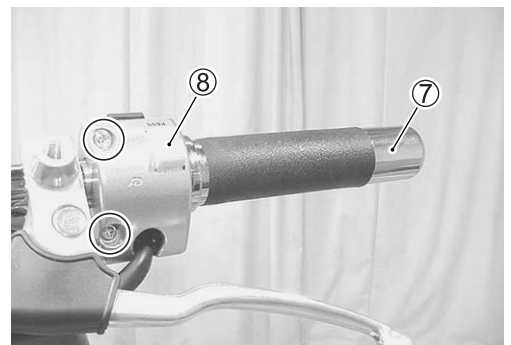
- Remove the right handlebar balancer ③, the right handlebar switch ④ and the throttle grip ⑤.



- Disconnect the clutch lever position switch lead wires ⑥.
- Loosen the clutch lever holder bolt.



- Remove the left handlebar balancer ⑦ and the left handlebar switch ⑧.



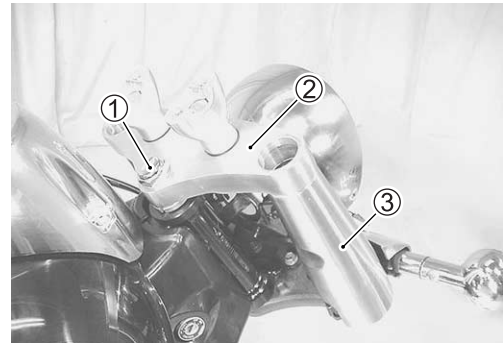
- Remove the handlebars by removing the handlebar clamp bolt caps, handlebar clamp bolts and handlebar clamps.



- Remove the steering stem head nut ① and washer.
- Remove the steering stem upper bracket ② and the front fork upper cover ③.

NOTE:

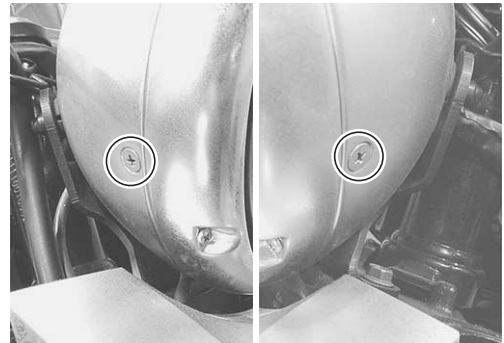
Hold the front fork upper cover to prevent it from falling.



- Remove the cable guide ④.



- Remove the headlight.



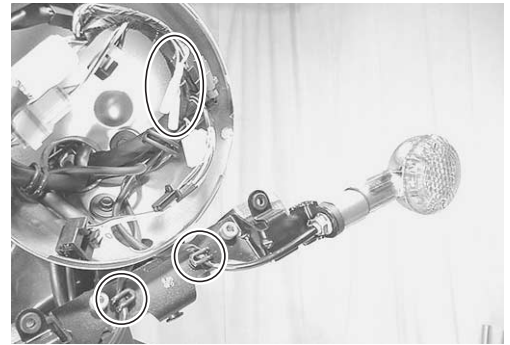
- Remove the cooling air guide.



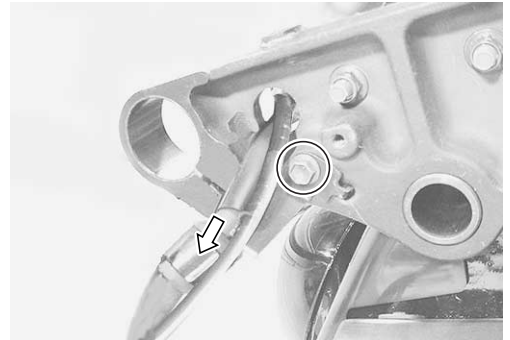
- Remove the steering stem cover.



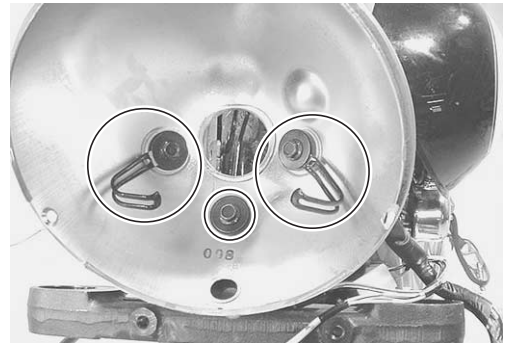
- Remove the front turn signal light bracket.
- Disconnect the front turn signal light lead-wire connector.



- Remove the brake hose guide.
- Remove the brake hose and speedo sensor lead-wire. (➡ 9-21)



- Remove the head light housing.



- Remove the head light housing bracket.



- Remove the steering stem nut using the special tool.

 **09940-14911: Steering stem nut wrench**

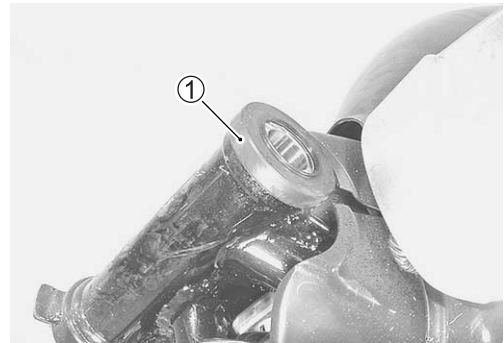
- Remove the steering stem lower bracket.

NOTE:

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



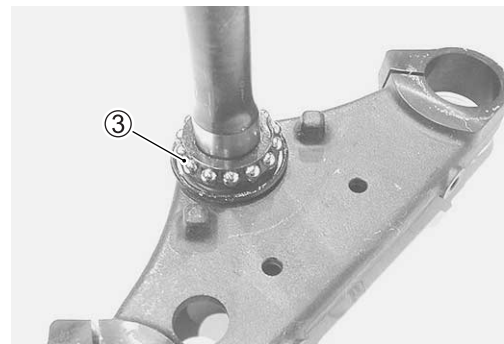
- Remove the dust seal ①.



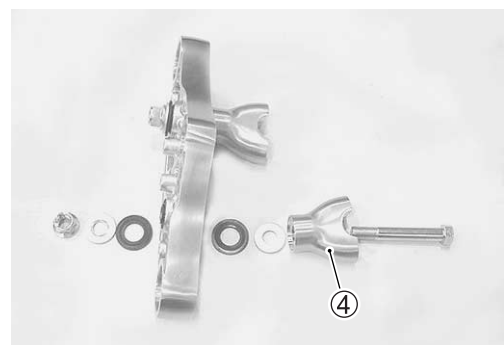
- Remove the steering stem upper bearing ②.



- Remove the steering stem lower bearing ③.



- Remove the handlebar holders ④ from the steering stem upper bracket.



- Remove the handlebar bushes by using the proper tool and special tools.

 09941-34513: Steering outer race installer



INSPECTION AND DISASSEMBLY

Inspect the removed parts for the following abnormalities.

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

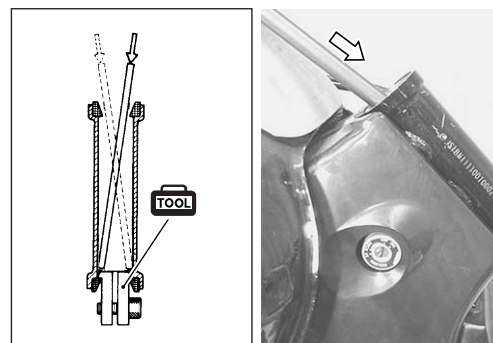
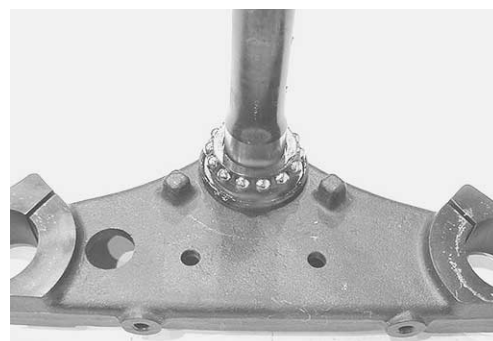
- Remove the steering stem lower bearing inner race by using a chisel.

▲ CAUTION

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

- Drive out the steering stem upper and lower bearing races by using the special tools and suitable bar.

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



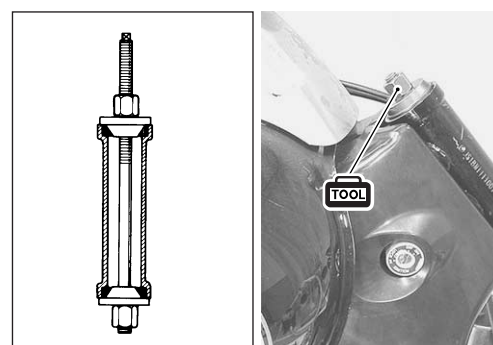
REASSEMBLY AND REMOUNTING

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

OUTER RACES

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

 **09941-34513: Steering outer race installer**



BEARINGS

- Press in the lower bearing using the special tool.

 **09941-74911: Steering bearing installer**



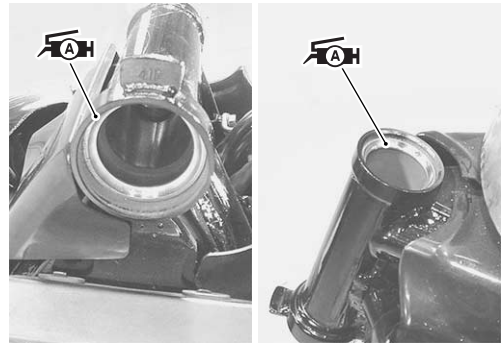
- Apply grease to the upper and lower bearings before remounting the steering stem.

For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

 99000-25010: SUZUKI SUPER GREASE "A"



- Install the bearings inner race and the dust seal.



STEERING STEM NUT

- Install the steering stem.
- Install the steering stem nut as shown.


NOTE:

The flange side  of the steering stem must face down.



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

 09940-14911: Steering stem nut wrench

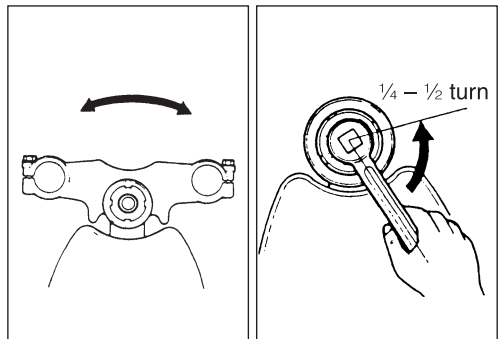
 Stem nut: 45 N·m (4.5 kgf·m, 32.5 lb-ft)



- Turn the steering stem lower bracket about five or six times to the left and right so that the bearings seat properly.
- Loosen the steering stem nut by $\frac{1}{4}$ – $\frac{1}{2}$ of a turn.

NOTE:

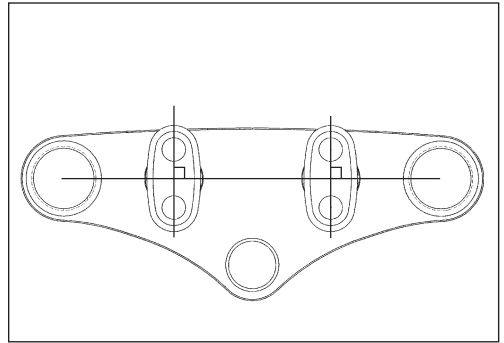
This adjustment will vary from motorcycle to motorcycle.



HANDLEBAR HOLDER

- Install the handlebar holders and related parts to the steering stem head.
- Tighten the handlebar holder nuts to the specified torque.

 **Handlebar holder nut: 70 N·m (7.0 kgf·m, 50.5 lb-ft)**



STEERING STEM UPPER BRACKET

- Install the front fork upper cover, steering stem upper bracket, washer and steering stem head nut.

NOTE:

When installing the right side of the cover, face the dent part **A** to back ward.



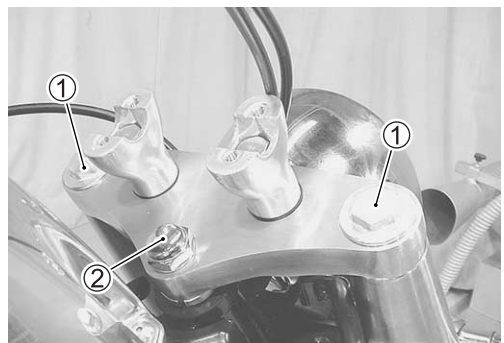
FRONT FORK AND STEERING STEM HEAD NUT

- Tighten the front fork cap bolts **①**, steering stem head nut **②** and front fork lower clamp bolts **③** to the specified torque.

 **Front fork cap bolt ①: 45 N·m (4.5 kgf·m, 32.5 lb-ft)**

Steering stem head nut ②: 90 N·m (9.0 kgf·m, 65.0 lb-ft)

Front fork lower clamp bolt ③: 33 N·m (3.3 kgf·m, 24 lb-ft)

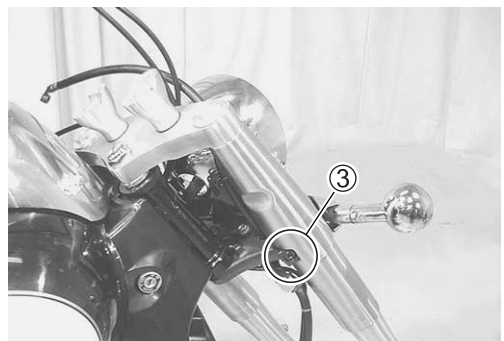


NOTE:

* Tighten the front fork cap bolts and steering stem head nut first, and the lower clamp bolts finally.

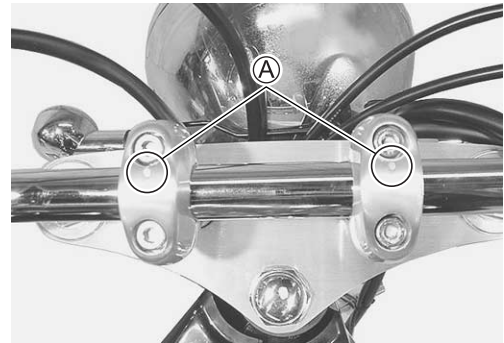
* Rout the brake hose, throttle cables and handlebar switch lead wires, before installing the front forks. (➡ 7-25)

- Speed sensor lead-wire routing. (➡ 9-20)

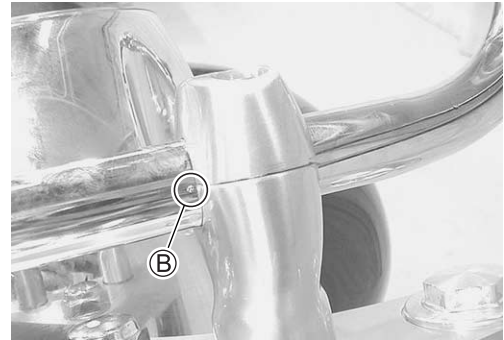


HANDLEBARS

- When setting the handlebar clamp to the handlebar holder of the steering upper bracket, face the punched mark **(A)** on its clamp forward.



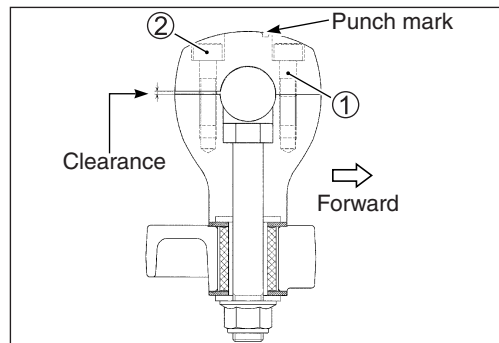
- Install the handlebars with the punch mark **(B)** aligned with the handlebar clamp as shown.



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

🔧 Handlebar set bolt: 23 N·m (2.3 kgf·m, 16.5 lb-ft)

- Install the handlebar set bolt cap.



- Apply grease to the throttle cable end.

For USA

🔧 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

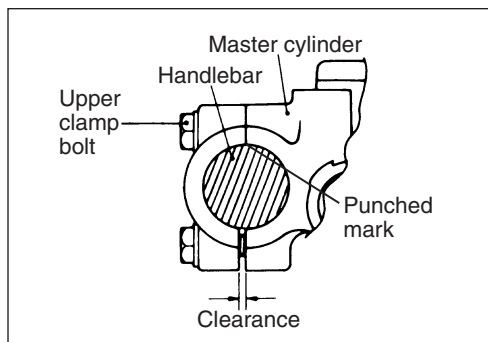
🔧 99000-25010: SUZUKI SUPER GREASE "A"



- Install the front brake master cylinder. (🔧7-17)

🔧 Front master cylinder mounting bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)





- Install the clutch lever holder with the punch mark (A) aligned with the clutch lever holder clamp as shown.

**Clutch lever holder clamp bolt: 10 N·m
(1.0 kgf·m, 7.3 lb-ft)**

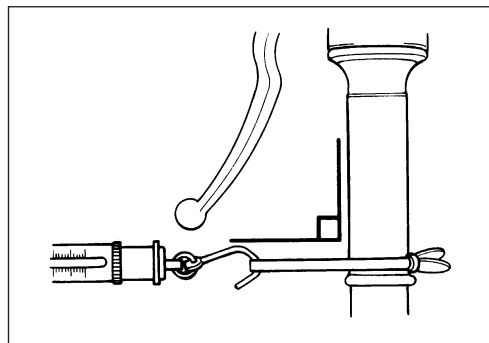
- Install the front wheel. (➔7-5)
- Adjust the throttle cable play. (➔2-10)



STEERING TENSION ADJUSTMENT

Check the steering movement in the following procedure.

- By supporting the motorcycle with a jack, lift the front wheel until it is off the floor by 20 – 30 mm (0.8 – 1.2 in).
- Check to make sure that the cables and wire harnesses are properly routed.
- With the front wheel in the straight ahead state, hitch the spring scale (special tool) on one handlebar grip end as shown in the figure and read the graduation when the handlebar starts moving. Do the same on the other grip end.



DATA Initial force: 200 – 500 grams

TOOL 09940-92720: Spring scale

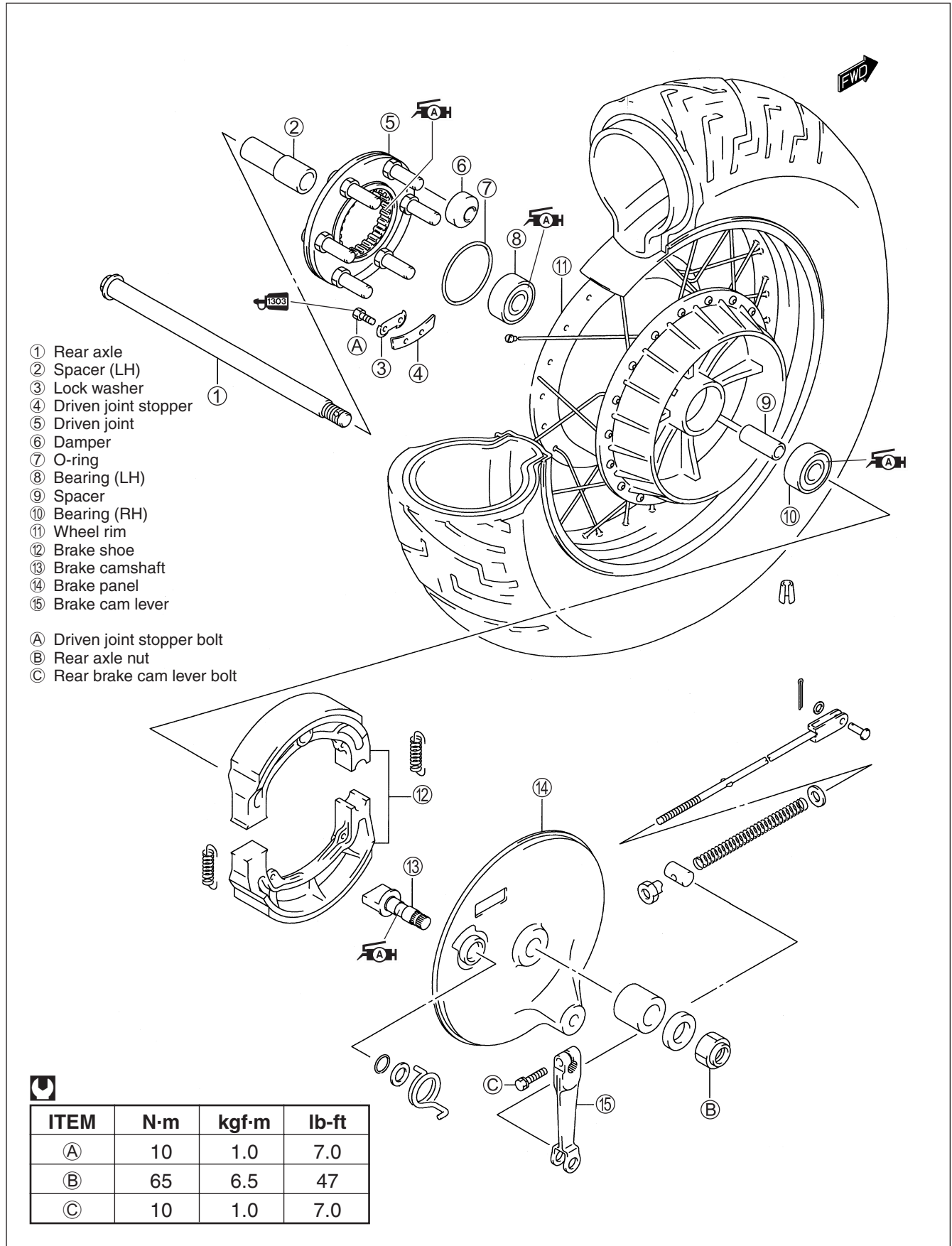
- If the initial force read on the scale when the handlebar starts turning is either too heavy or too light, adjust it till it satisfies the specification.
- 1) First, loosen the front fork upper and lower clamp bolts, steering stem head nut and steering stem lock nut, and then adjust the steering stem nut by loosening or tightening it.
 - 2) Tighten the steering stem lock nut, stem head nut and front fork upper and lower clamp bolts to the specified torque and re-check the initial force with the spring scale according to the previously described procedure.
 - 3) If the initial force is found within the specified range, adjustment has been completed.

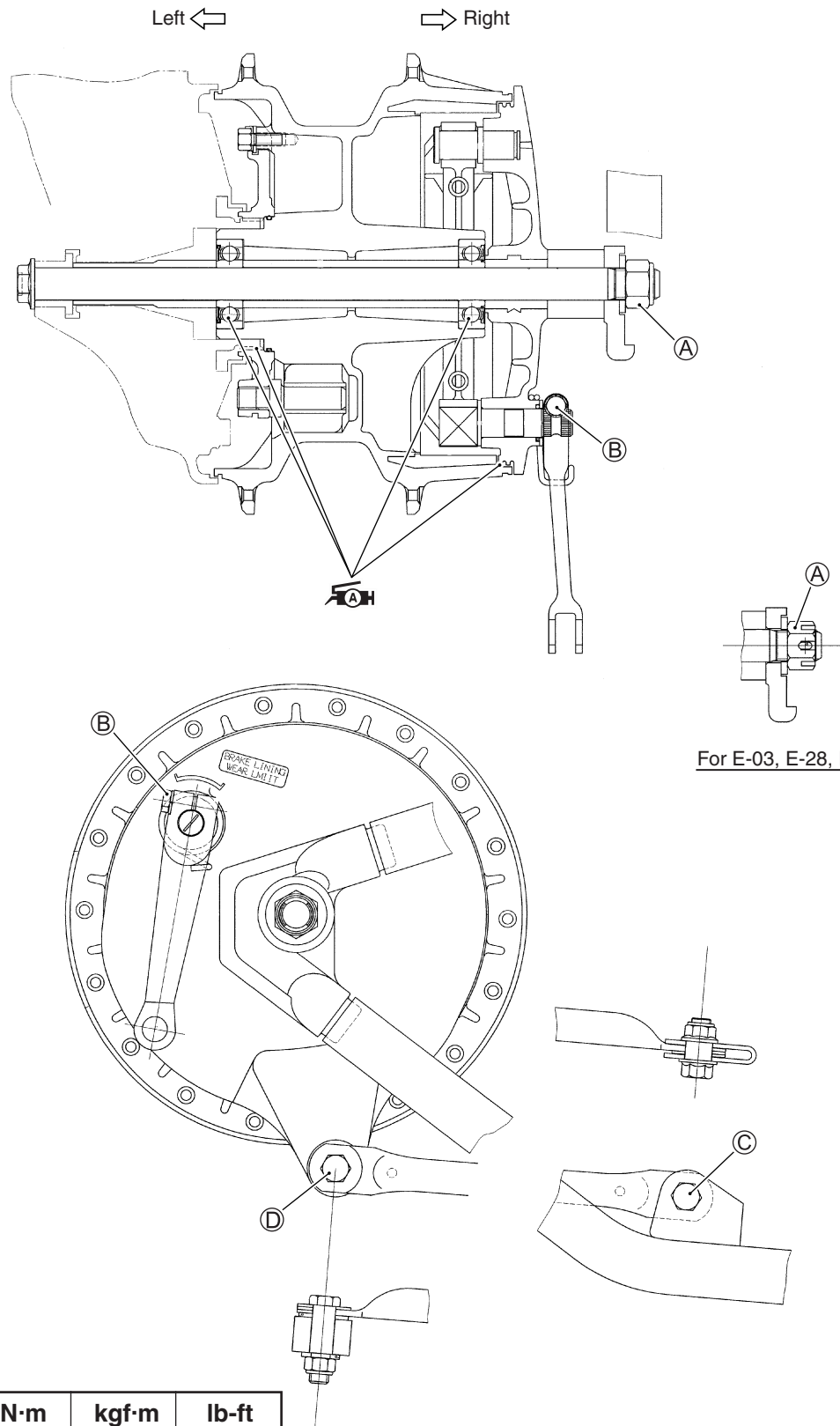
NOTE:

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



REAR WHEEL CONSTRUCTION





ITEM	N·m	kgf·m	lb·ft
Ⓐ	65	6.5	47
Ⓑ	10	1.0	0.73
Ⓒ	35	3.5	25.5
Ⓓ	25	2.5	18.0

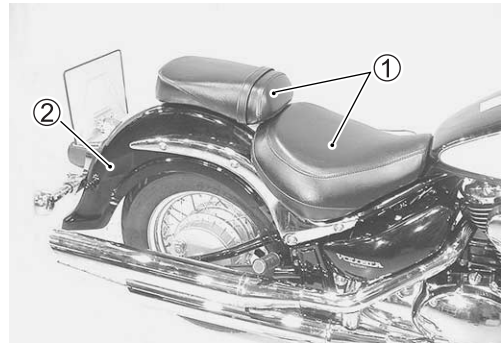
- Ⓐ Rear axle nut
- Ⓑ Brake cam lever nut
- Ⓒ Rear torque link nut (F)
- Ⓓ Rear torque link nut (R)

REMOVAL

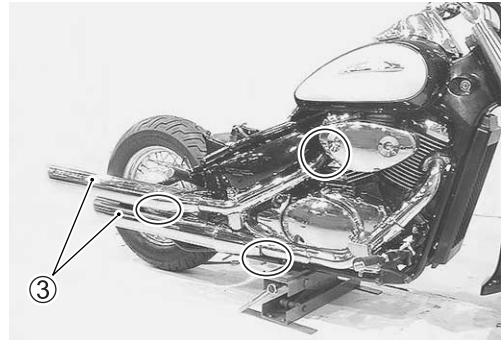
- Remove the seat ①. (☞7-2)
- Remove the rear fender ②. (☞7-3)

NOTE:

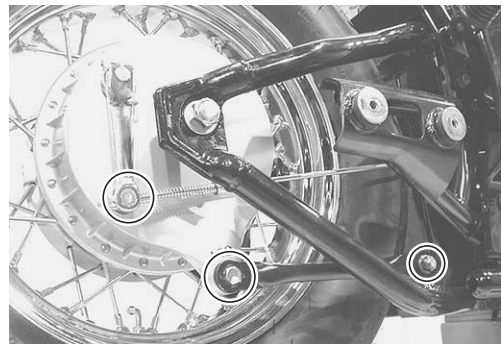
The rear fender removal is not necessary when the rear part of motorcycle can be lifted high enough to take the rear wheel out smoothly.



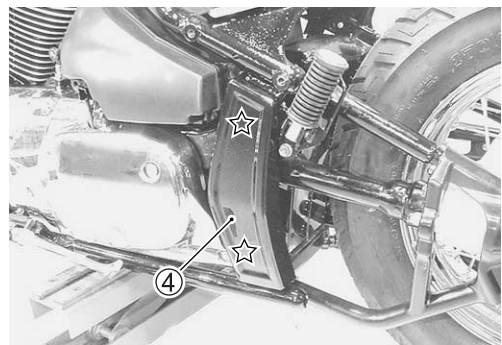
- Remove the exhaust pipes and mufflers assembly ③. (☞3-5)



- Remove the rear brake rod.
- Remove the torque link rod.

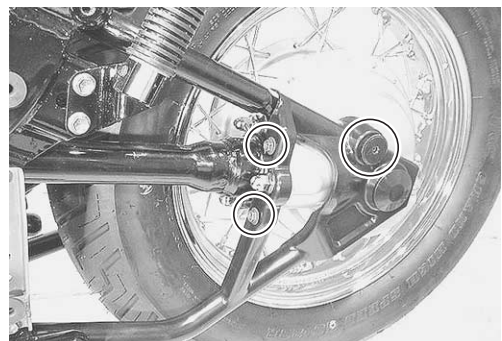


- Remove the left frame cover. (☞7-2)
- Remove the left frame lower cover ④.

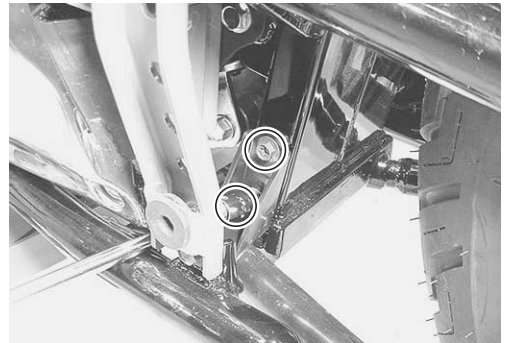


☆ : hooked part

- Remove the rear swingarm left cover mounting bolts.



- Remove the rear swingarm left cover.

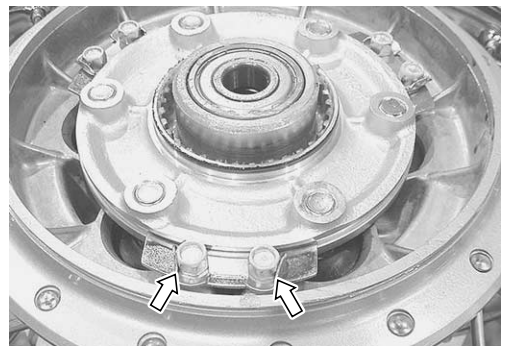


- Remove the rear axle shaft.

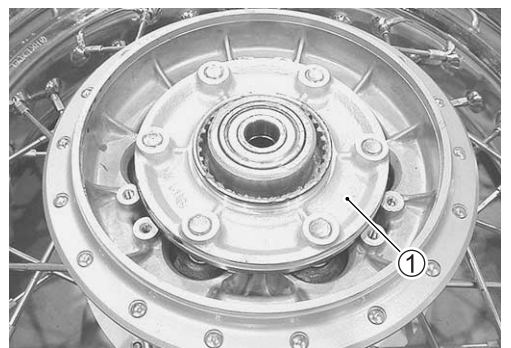


DISASSEMBLY

- Flatten the lock washers.
- Remove the fitting bolts, washers and plates.



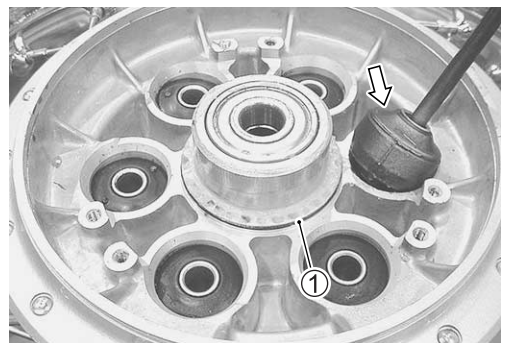
- Pull off the driven joint ①.



- Remove the O-ring ①.
- Remove the dampers with a screw driver.

▲ CAUTION

The removed O-ring must be replaced with a new one.

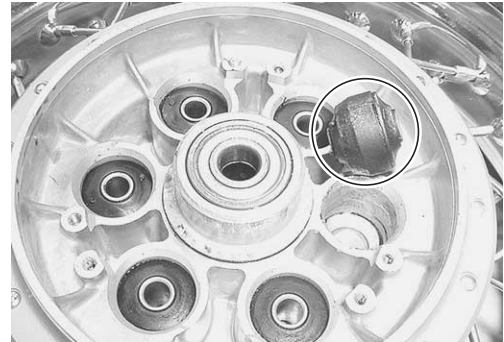


INSPECTION AND DISASSEMBLY

WHEEL BEARING 7-6
 WHEEL AXLE 7-6
 WHEEL RIM 7-6
 TIRE 2-18

WHEEL DAMPER

Inspect the wheel dampers for damage or wear.



REASSEMBLY AND REMOUNTING

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

WHEEL BEARING

- Apply grease to the bearings before installation.

For USA

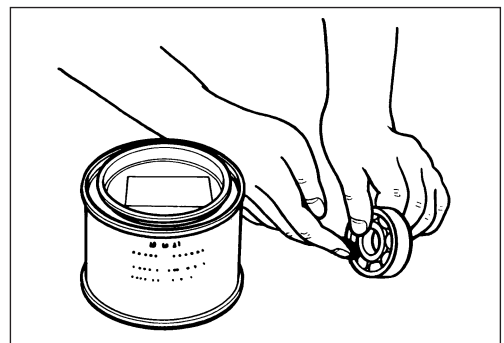
99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

99000-25010: SUZUKI SUPER GREASE "A"

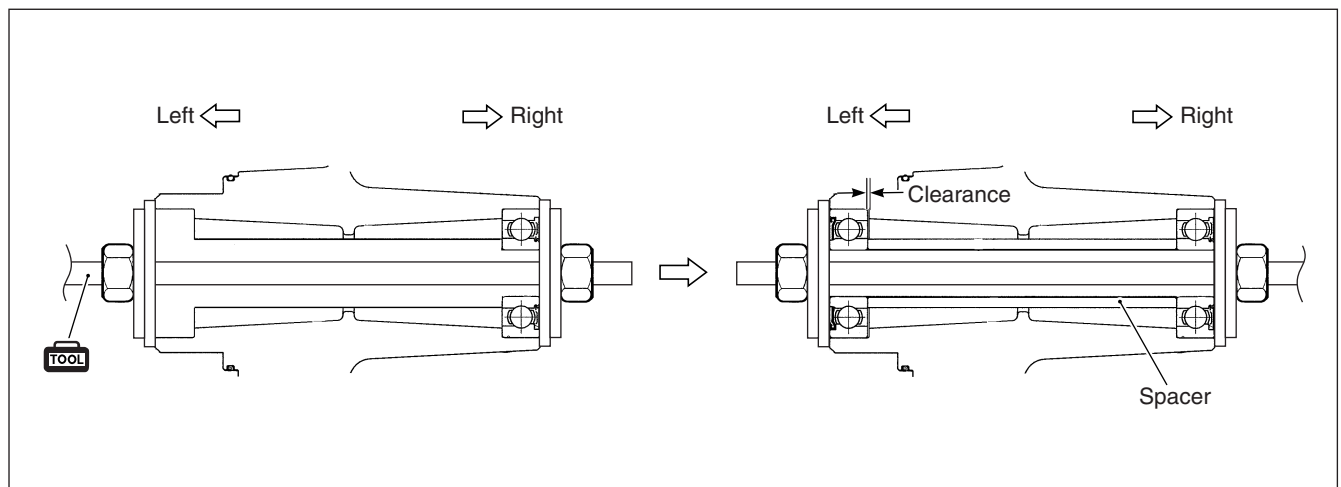
- Install the wheel bearings using the special tool.

09941-34513: Bearing installer set



CAUTION

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

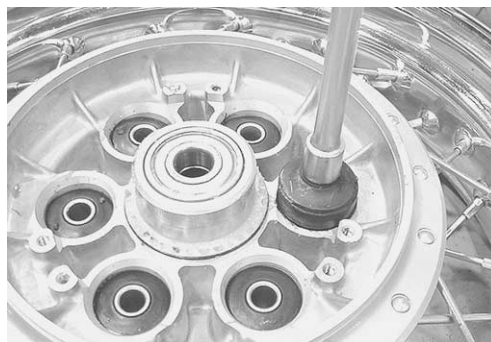


WHEEL DAMPER

- Install the dampers.

NOTE:

If soap water is applied around the damper, it makes the job easier.

**DRIVEN JOINT**

- Install the driven joint.

NOTE:

Apply grease to the O-ring and the final gear spline before installing the driven joint.

For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

 99000-25010: SUZUKI SUPER GREASE "A"

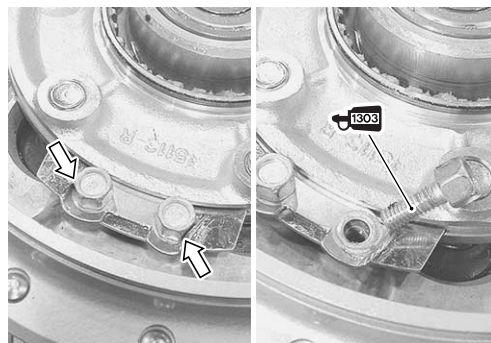
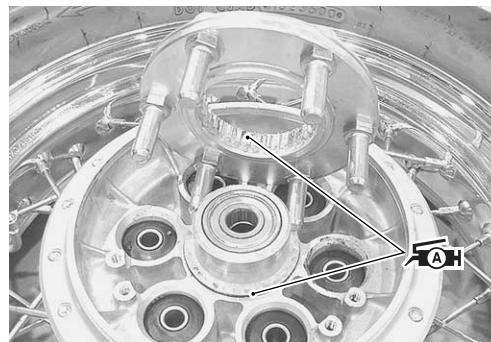
- Apply THREAD LOCK SUPER "1303" to the thread of driven joint stopper bolts.

 99000-32030: THREAD LOCK SUPER "1303"

- Tighten the driven joint stopper bolts to the specified torque.

 **Driven joint stopper bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)**

- Bend up the washer to lock the bolts.

**REAR WHEEL**

- Install the spacer ①.
- Apply grease to the final gear spline before installing the rear wheel.

For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

 99000-25010: SUZUKI SUPER GREASE "A"

- Remount the rear wheel spacer and rear axle.

NOTE:



Refer to the page 7-37 for the spacer positioning.

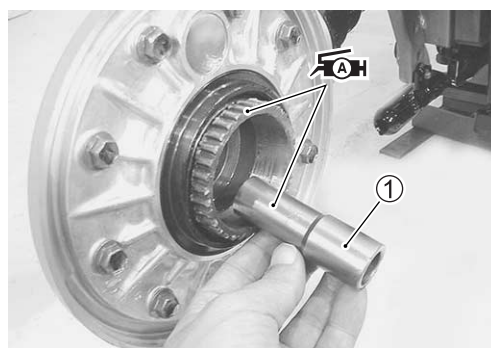
- Tighten the rear axle nut to the specified torque.

 **Rear axle nut: 65 N·m (6.5 kgf·m, 47 lb-ft)**

NOTE:

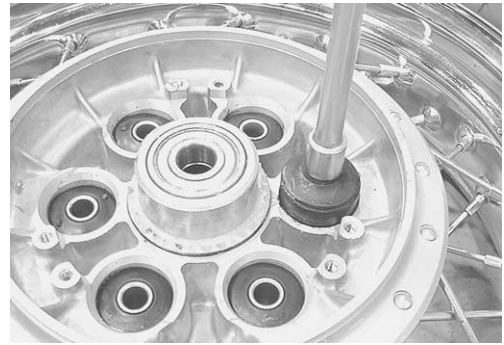
After remounting the rear wheel, check for proper brake operation.

- Install the exhaust pipe and muffler. ( 3-5)
- Install the rear fender ( 7-3)



REAR BRAKE REMOVAL AND DISASSEMBLY

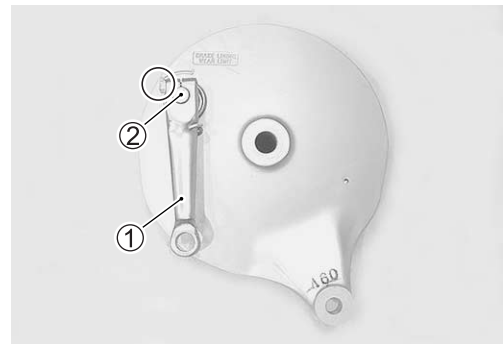
- Remove the rear wheel. (☞ 7-38)
- Remove the rear brake panel.



- Remove the brake shoes.



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



- Remove the washer ③, O-ring ④ and spring ⑤.



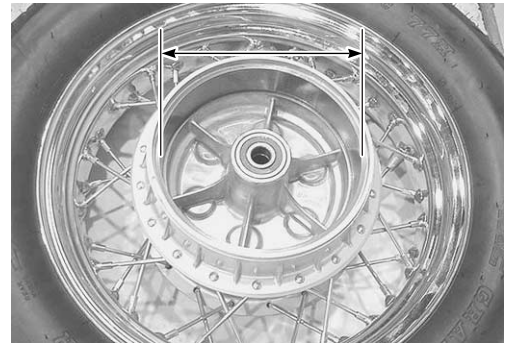
INSPECTION

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.

 **09900-20102: Vernier calipers**

 **Brake drum I.D.: Service Limit: 180.7 mm**



BRAKE SHOES

Check the brake shoe wear ( 2-16) 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.

For USA

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

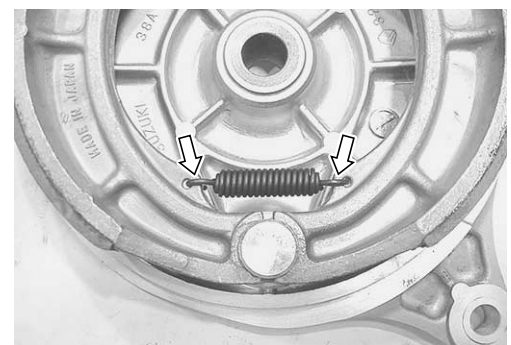
For the other countries

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

- Install the brake shoes with spring hooks faced inside.

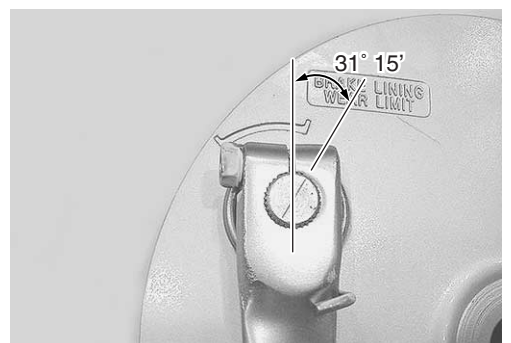
CAUTION

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 bolt to the specified torque.

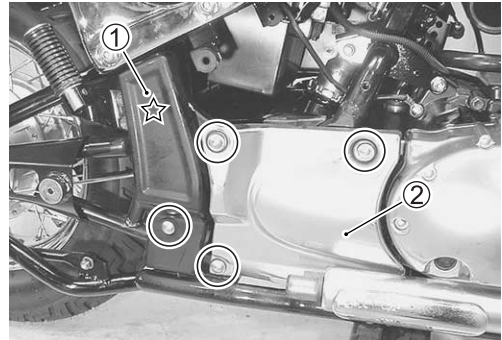
 **Brake cam lever nut: 10 N·m (1.0 kgf·m, 7.0 lb-ft)**

- Install the rear wheel. ( 7-41)
- Adjust the rear brake pedal free travel. ( 2-16)



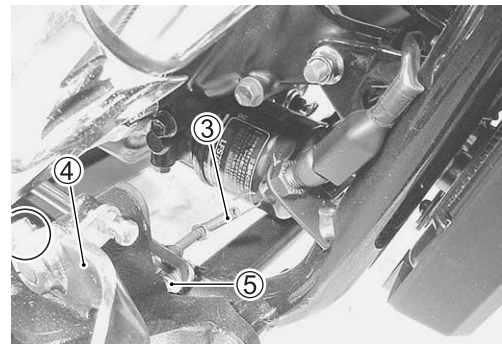
REAR BRAKE ROD REMOVAL AND DISASSEMBLY

- Remove the exhaust pipes and mufflers assembly. ( 3-5)
- Remove the right frame LOWER cover ①, clutch rear cover ②.

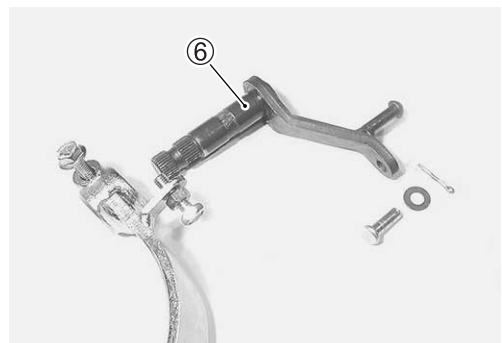


☆ : hooked part

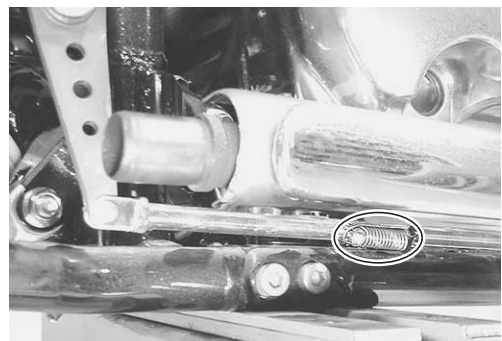
- Remove the rear brake switch spring ③.
- Remove the rear brake pedal ④.
- Remove the cotter pin ⑤.



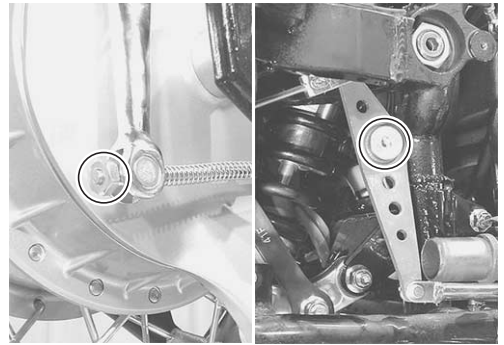
- Remove the rear brake pedal shaft ⑥.



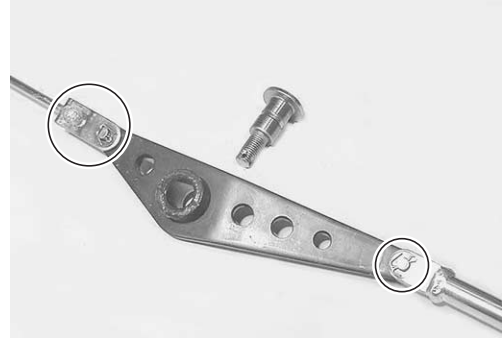
- Remove the return spring.



- Remove the rear brake adjust nut, spring and washer.
- Remove the rear brake link.



- Remove the cotter pins.



REASSEMBLY REMOUNTING

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

- Apply grease to the rear brake link pivot bolt and tighten it to the specified torque.

For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

 99000-25010: SUZUKI SUPER GREASE "A"

 **Rear brake link pivot bolt: 29 N·m (2.9 kgf·m, 21 lb-ft)**

- Apply grease to the rear brake pedal shaft.

For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

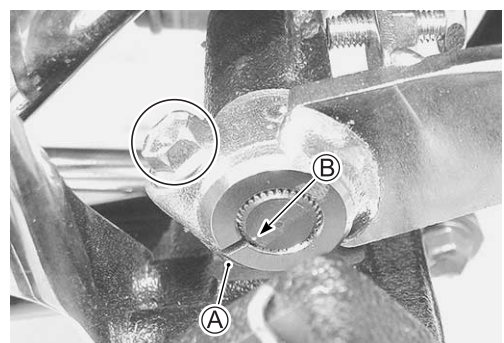
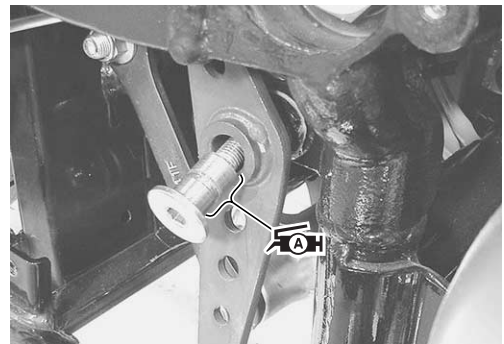
 99000-25010: SUZUKI SUPER GREASE "A"

- Tighten the rear brake pedal mount bolt to the specified torque.

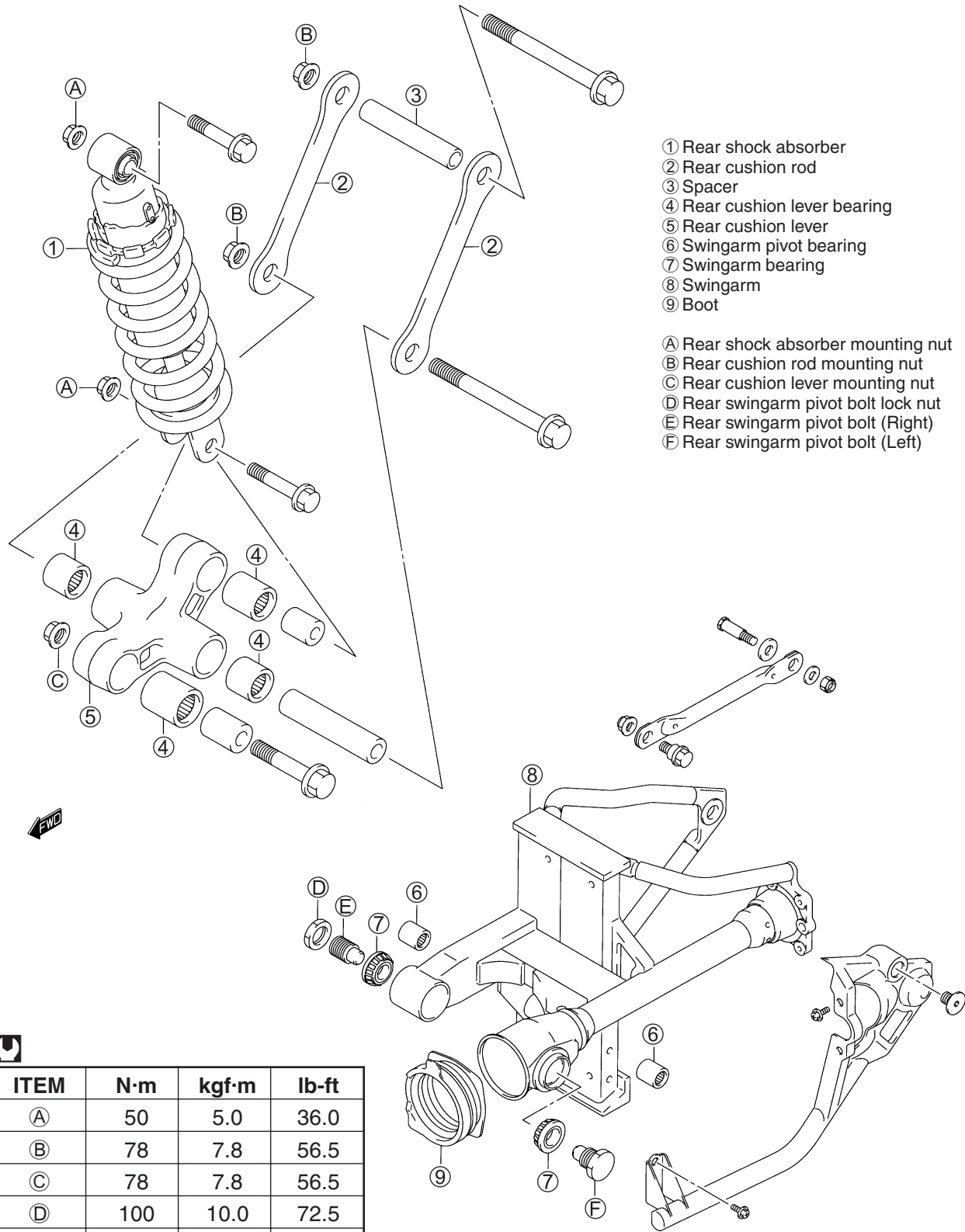
 **Rear brake pedal mount bolt: 11 N·m (1.1 kgf·m, 8.0 lb-ft)**

NOTE:

*When remounting the rear brake pedal onto the rear brake pedal shaft, align the rear brake pedal mounting surface **Ⓐ** with the punch mark **Ⓑ**.*

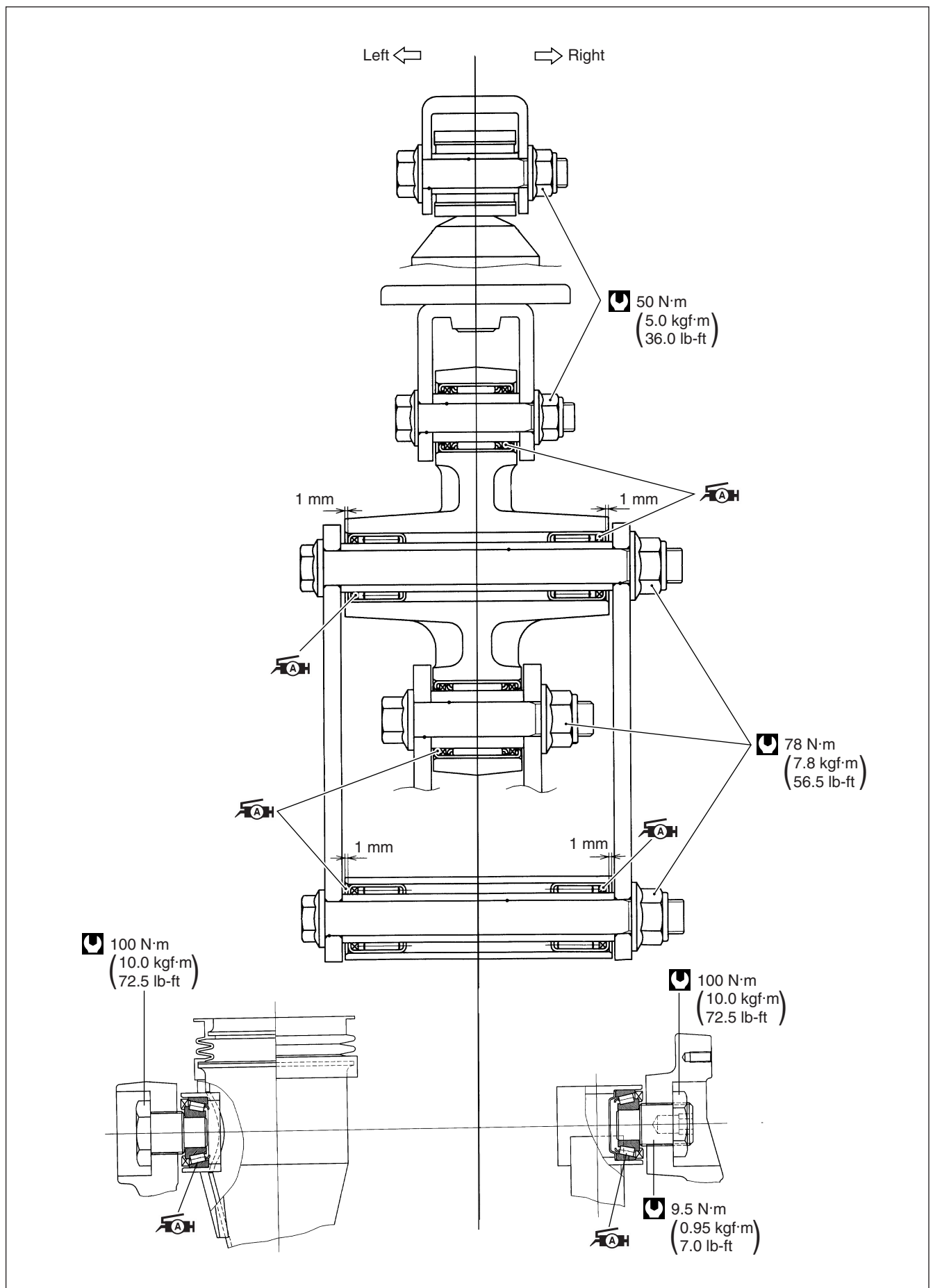


REAR SUSPENSION CONSTRUCTION



ITEM	N·m	kgf·m	lb·ft
A	50	5.0	36.0
B	78	7.8	56.5
C	78	7.8	56.5
D	100	10.0	72.5
E	9.5	0.95	7.0
F	100	10.0	72.5



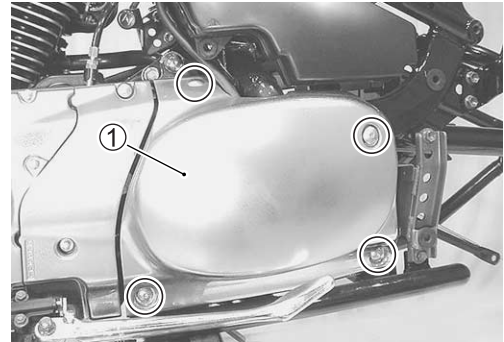


REMOVAL

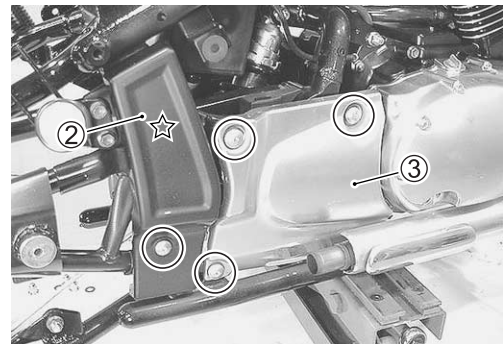
- Remove the rear wheel. (☞ 7-41)
- Remove the final gear case with propeller shaft.



- Remove the secondary gear case cover ①.

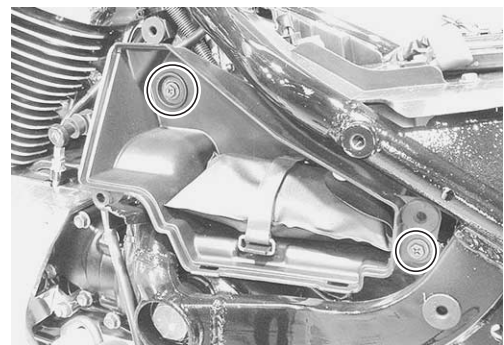


- Remove the right frame lower cover ②, clutch rear cover ③.

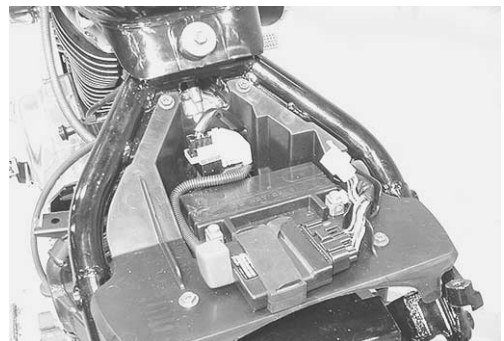


☆ : hooked part

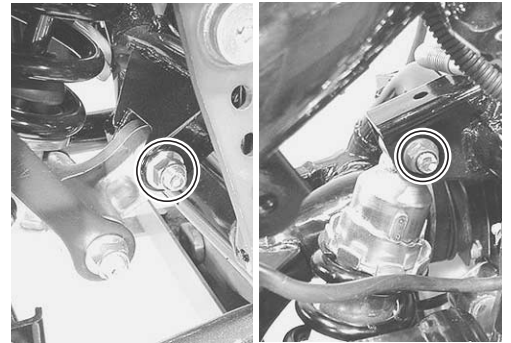
- Remove the tool box.



- Remove the battery case. (☞ 5-6)



- Remove the cushion lever mounting bolt and nut.
- Remove the shock absorber upper mounting bolt and nut.

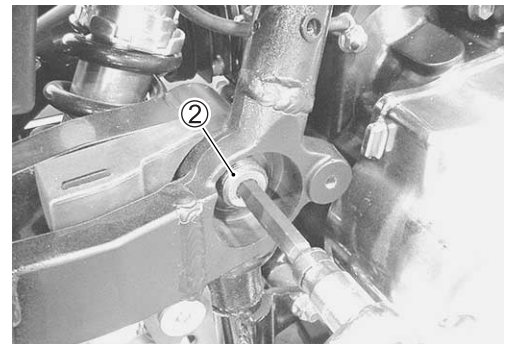
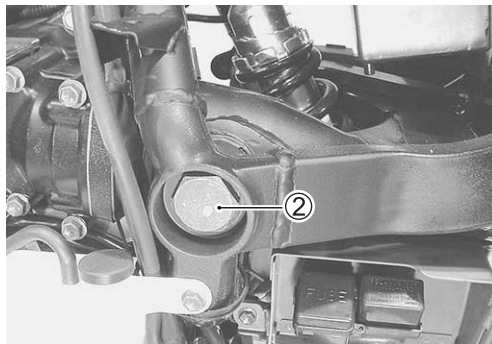
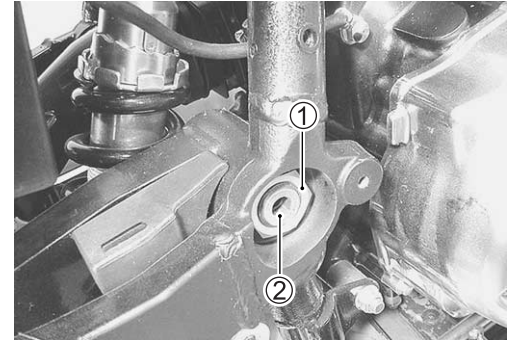


- Remove the right side swingarm pivot bolt lock nut ①.
- Remove the left and right side swingarm pivot bolts ②.

NOTE:

Slightly loosen the cushion rod mounting nuts and the shock absorber lower mounting nut before removing the swingarm to facilitate later disassembly.

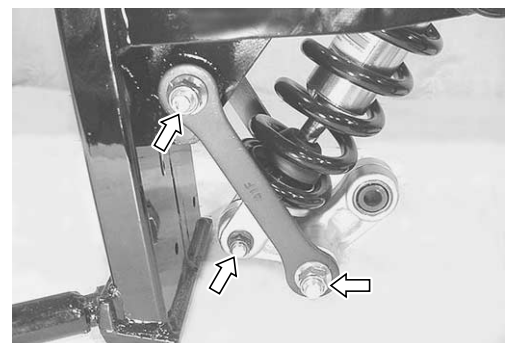
- Remove the rear suspension assembly.



- Remove the tapered roller bearings.



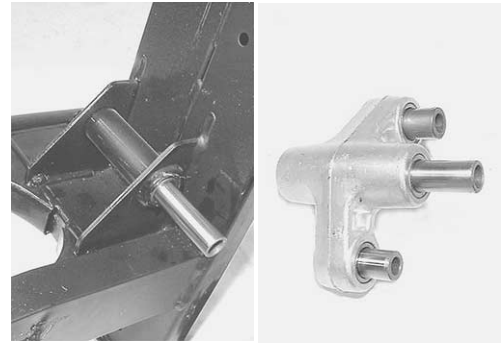
- Remove the shock absorber, cushion lever and cushion rod.



INSPECTION AND DISASSEMBLY

SPACER

- Remove spacer from swingarm.
- Remove the spacers from the cushion lever.
- Inspect the spacers for any flaws or other damage. If any defects are found, replace the spacers with new ones.



SWINGARM BEARING

Insert the spacer into swingarm cushion rod upper side bearing and check the play to move the spacer up and down.

If excessive play is noted, replace the bearing with a new one.

Inspect the swingarm pivot bearing, its race and dust seal for wear or damage. If any defects are found, replace the bearing with a new one.

- Remove the swingarm pivot right side bearing plate ① and bearing races ② by using a suitable bar and so on.

NOTE:

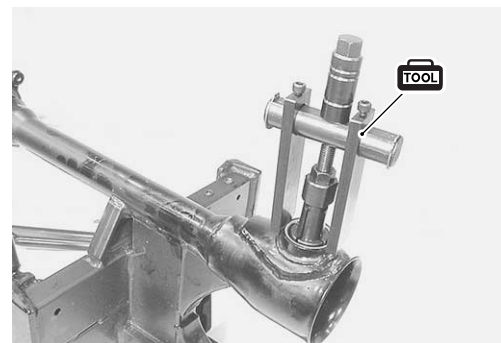
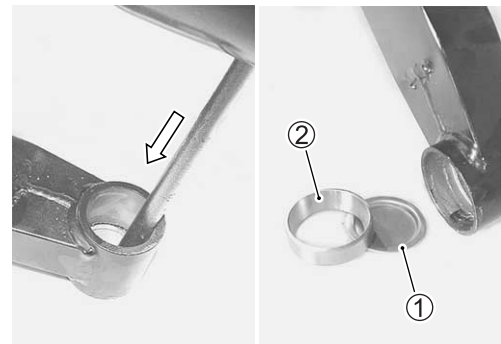
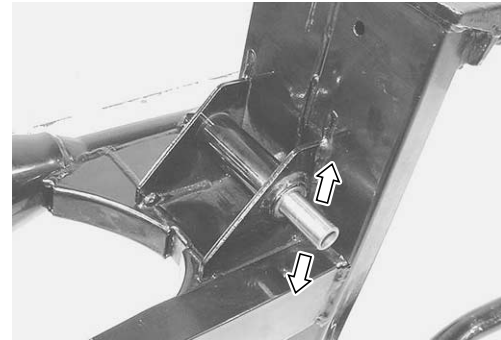
The swingarm pivot right side bearing and its plate are available as one component.

- Remove the swingarm pivot bearing races by using the special tools.

 09921-20220: Bearing remover set (30 mm)

CAUTION

The removed bearings must be replaced with new ones.

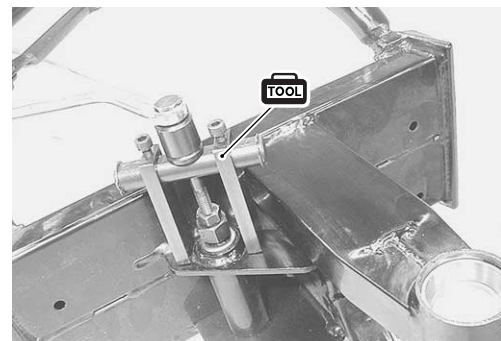


- Remove the swingarm cushion rod upper side bearing by using the special tools.

 09921-20220: Bearing remover set (17 mm)

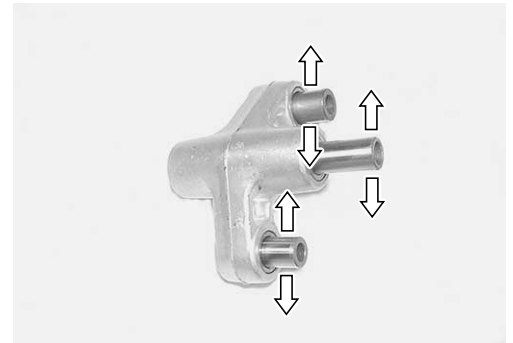
CAUTION

The removed bearings must be replaced with new ones.



CUSHION LEVER BEARING

Insert the spacer into bearing and check the play to move the spacer up and down. If an excessive play is noted, replace the bearing with a new one.

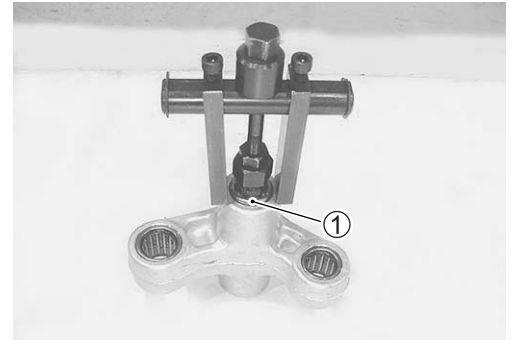


- Remove the cushion rod lower side bearing ① by using the special tools.

TOOL 09921-20220: Bearing remover set (17 mm)

▲ CAUTION

The removed bearings must be replaced with new ones.

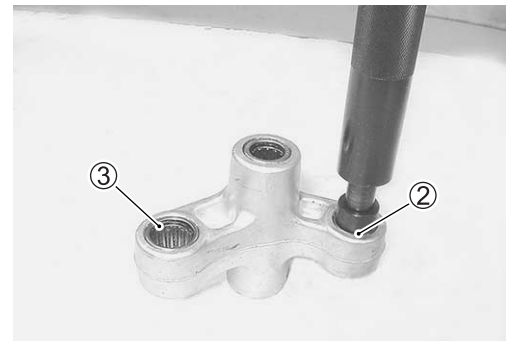


- Remove the cushion lever mounting bearing ② and shock absorber lower side bearing ③ by using the special tools.

TOOL 09913-70210: Bearing installer set

▲ CAUTION

The removed bearings must be replaced with new ones.

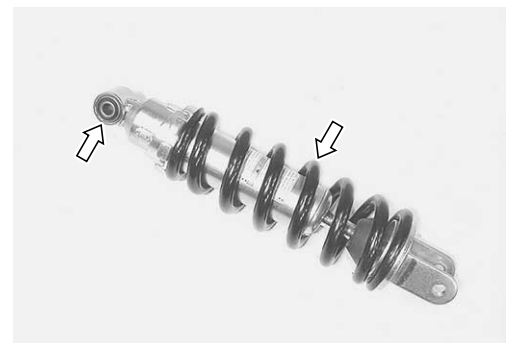


SHOCK ABSORBER

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

▲ CAUTION

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



REASSEMBLY

Reassemble the swingarm and shock absorber in the reverse order of disassembly and removal, and pay attention to the following points:

SWINGARM BEARING

- Install the swingarm pivot bearing races by using the special tool.

 **09913-70210: Bearing installer set (40 mm)**

NOTE:

The swingarm pivot bearing race with plate is positioned right side.

- Install the swingarm cushion rod upper side bearing with the special tool.

 **09924-84521: Bearing installer set**

NOTE:

When reinstalling the bearing, stamped mark of bearing must face outside.

CUSHION LEVER BEARING

- Install the bearings into the cushion lever by using the special tool.

 **09924-84521: Bearing installer**

NOTE:

When installing the bearings, stamped mark of bearing must face outside.

- Apply grease to the spacers and bearings.


For USA

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

For the other countries

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

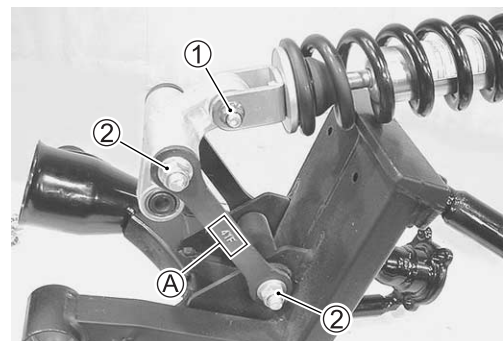
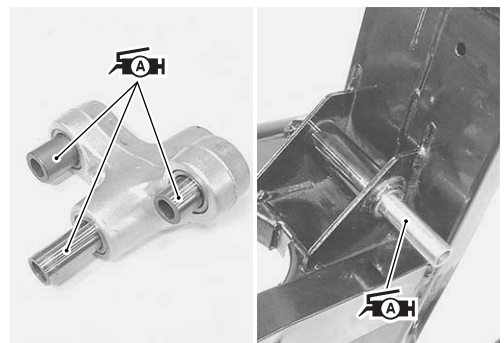
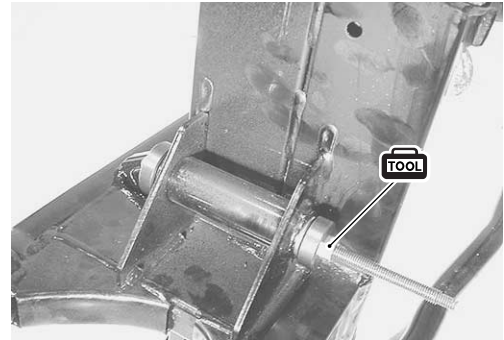
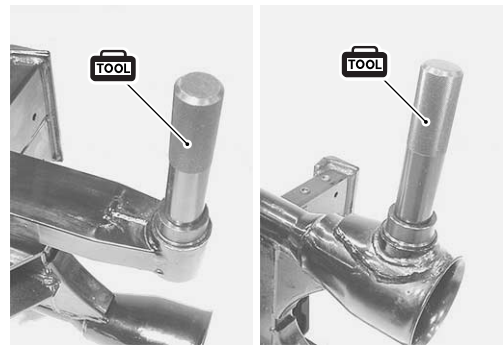
- Assemble the shock absorber, cushion lever and cushion rods onto the swingarm. (☞ 7-47)

 **Shock absorber mounting nut ①: 50 N·m**
(5.0 kgf·m, 36.0 lb-ft)

Cushion rod mounting nut ②: 78 N·m
(7.8 kgf·m, 56.5 lb-ft)

NOTE:

The stamped marks Ⓐ on the cushion rod should be face outside.



REMountING

Remount the swingarm and shock absorber in the reverse order of disassembly and removal, and pay attention to the following points.

SWINGARM

- Before installing the swingarm, install the boot and the universal joint.

NOTE:

Make sure that the "UP" mark  on the boot faces up.

- Install the swingarm assembly, its pivot bearings and bolts (①, ②).

NOTE:

Apply grease to the swingarm pivot bearings.

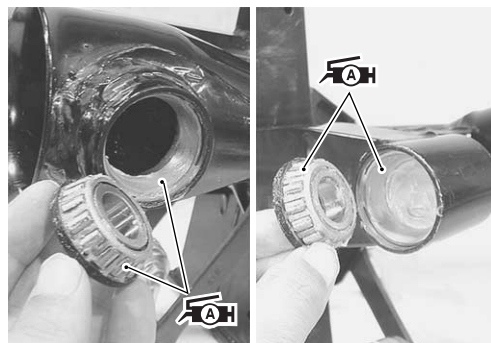
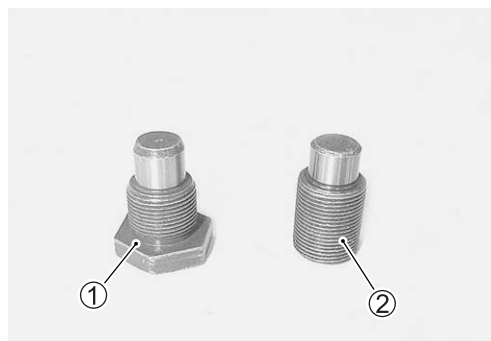
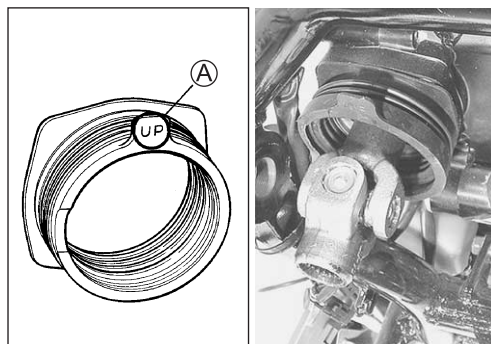
For USA

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

 99000-25010: SUZUKI SUPER GREASE "A"

- ①: For left side swingarm pivot bolt
- ②: For right side swingarm pivot bolt



- Tighten the left side swingarm pivot bolt ① to the specified torque.

 **Swingarm pivot bolt (left side): 100 N·m
(10.0 kgf·m, 72.5 lb-ft)**

NOTE:

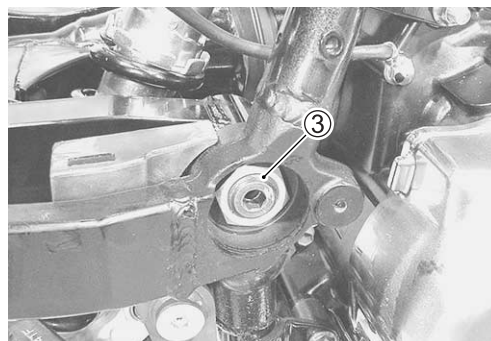
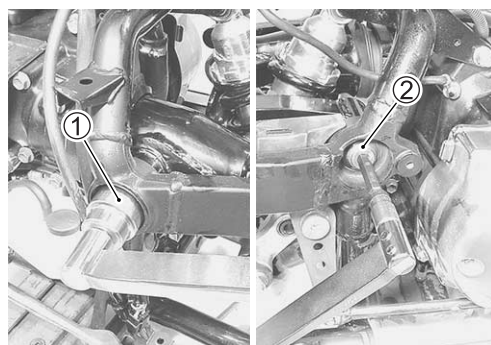
Before tightening the left side swingarm pivot bolt ①, loosen the right side one ②.

- Tighten the right side swingarm pivot bolt ② to the specified torque.

 **Swingarm pivot bolt (right side): 9.5 N·m
(0.95 kgf·m, 7.0 lb-ft)**

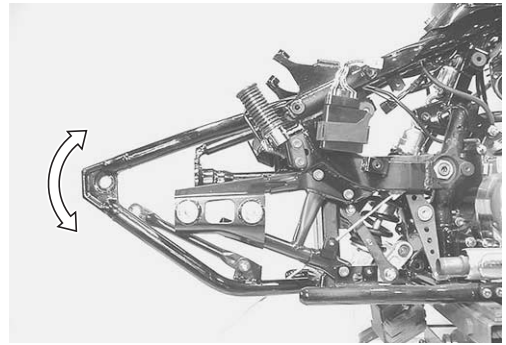
- Tighten the swingarm pivot lock nut ③ to the specified torque.

 **Swingarm pivot lock nut: 100 N·m (10.0 kgf·m, 72.5 lb-ft)**




NOTE:

After tightening the swingarm pivot lock nut, be sure to check the swingarm operation.



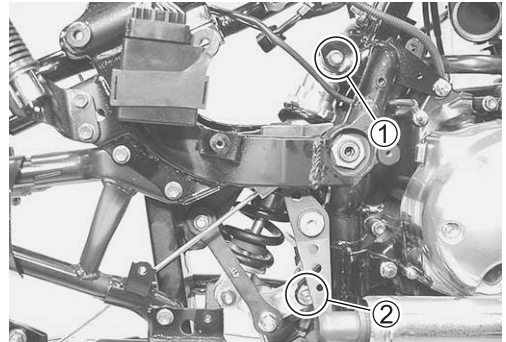
SHOCK ABSORBER AND CUSHION LEVER MOUNTING NUT

- Tighten the shock absorber upper mounting nut ① to the specified torque.

 **Shock absorber mounting nut: 50 N·m
(5.0 kgf·m, 36.0 lb-ft)**

- Tighten the cushion lever mounting nut ② to the specified torque.

 **Cushion lever mounting nut: 78 N·m (7.8 kgf·m, 56.5 lb-ft)**



FINAL GEAR CASE

- Install the plate to the final gear case ①. Apply SUZUKI BOND “1207B” to the mating surface of swingarm and final gear case.

For USA

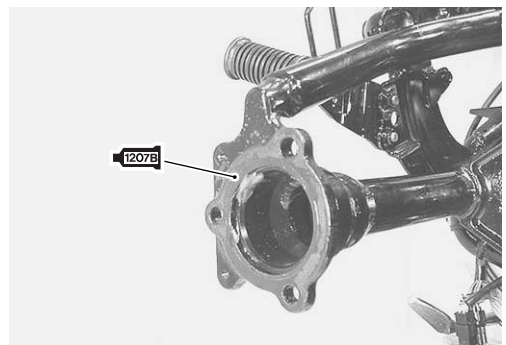
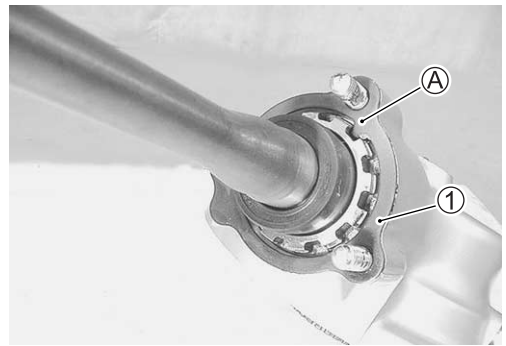
 99104-31140: SUZUKI BOND “1207B”

For the other countries

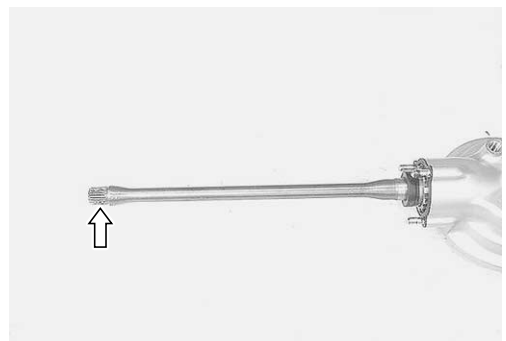
 99000-31140: SUZUKI BOND “1207B”

CAUTION

When installing the plate ①, align the lug  of the plate ① to the bearing retainer groove.

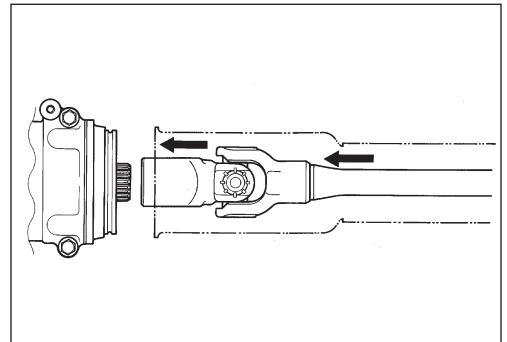
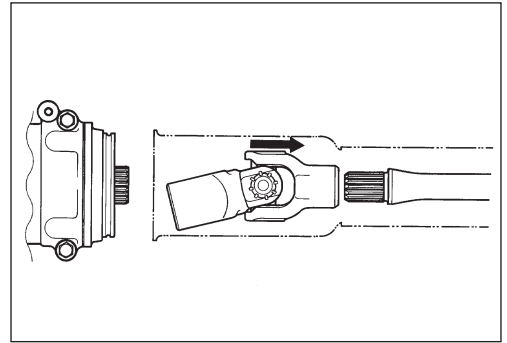


- Apply Lithium Base Molybdenum grease (NLGI #2) to the propeller shaft spline.




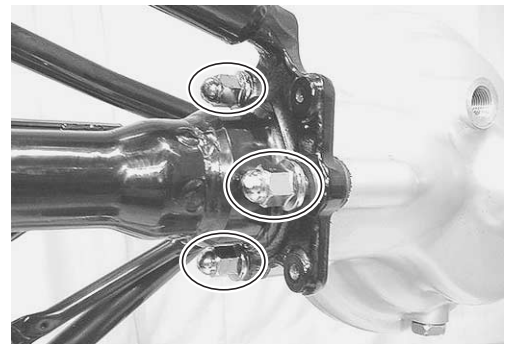
NOTE:



To install the final gear case easily, move the dust boot front and the universal joint back. Engage the universal joint to the propeller shaft first and then engage it to the secondary driven bevel gear shaft.

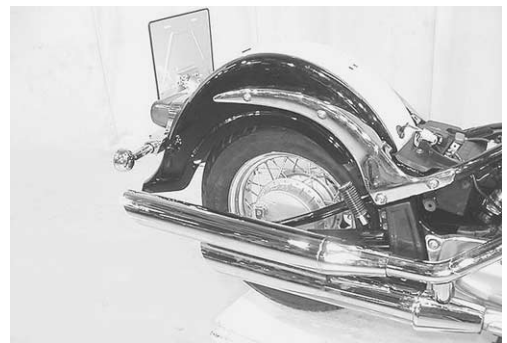


- Tighten the final gear case mounting nuts to the specified torque.

 **Final gear case mounting nut: 40 N·m**
(4.0 kgf·m, 29.0 lb-ft)



- Install the rear wheel. ( 7-41)
- Install the exhaust pipes and mufflers. ( 3-5)



ELECTRICAL SYSTEM

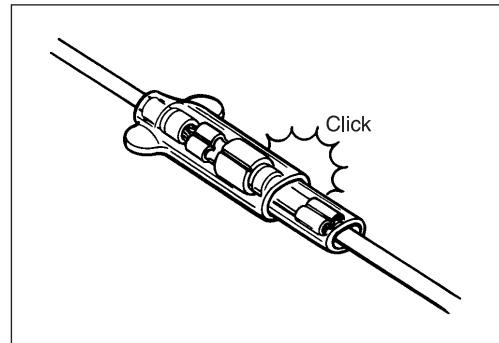
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CAUTIONS IN SERVICING

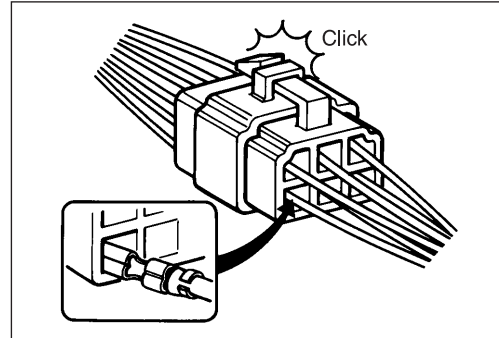
CONNECTORS

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



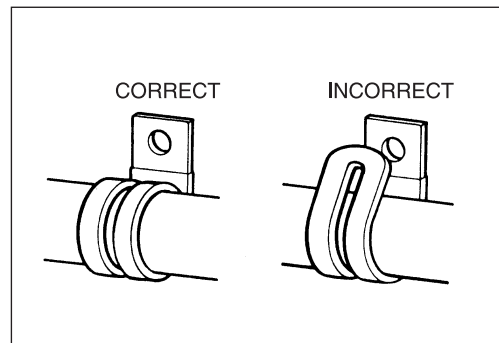
COUPLERS

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



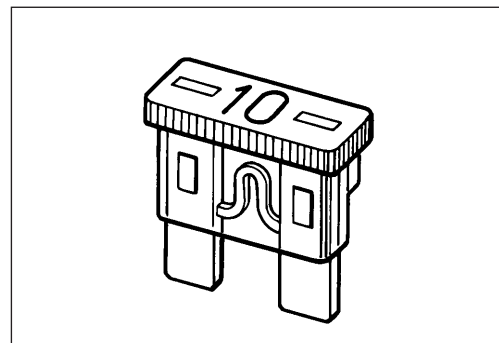
CLAMPS

- Refer to the "WIRE HARNESS ROUTING" section for proper clamping procedures. (9-13 and 9-14)
- Bend the clamp properly, as shown in the illustration.
- When clamping the wire harness, do not allow it to hang down.
- Do not use wire or any substitutes for the band-type clamp.



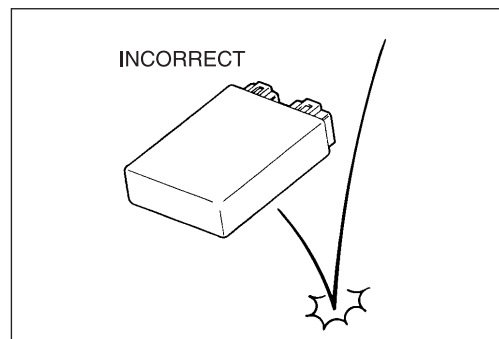
FUSES

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



SEMICONDUCTOR EQUIPPED PARTS

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



BATTERY

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

CONNECTING THE BATTERY

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

WIRING PROCEDURE

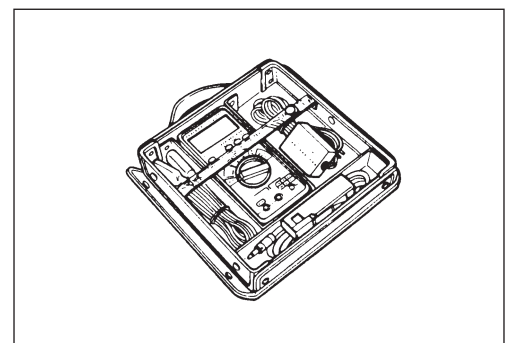
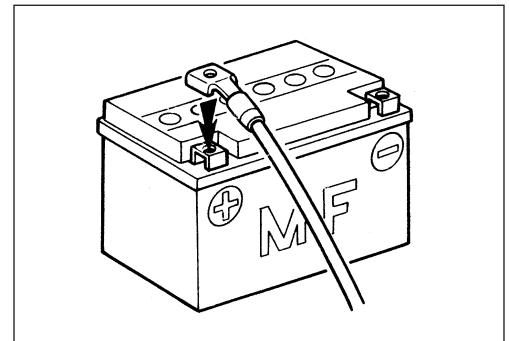
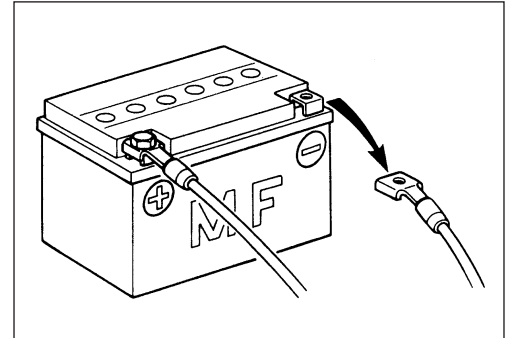
- Properly route the wire harness according to the “WIRE ROUTING” section. (➡ 9-13 to 9-14)

USING THE MULTI CIRCUIT TESTER

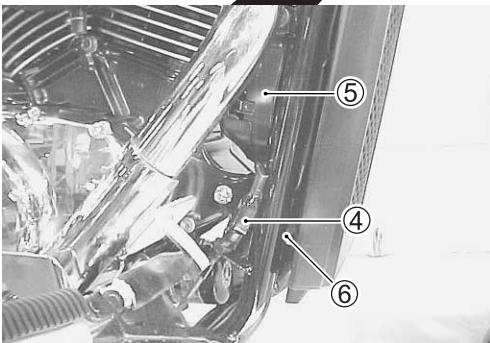
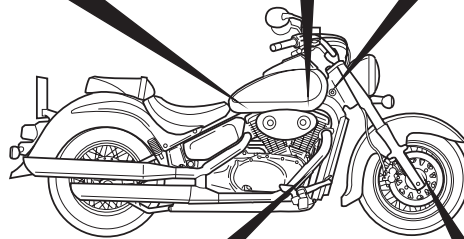
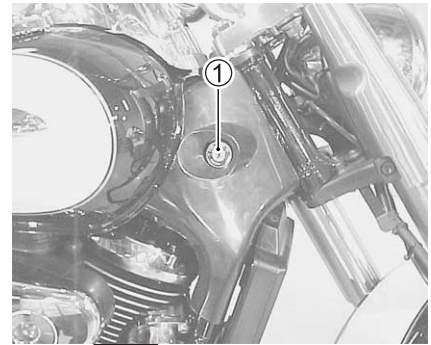
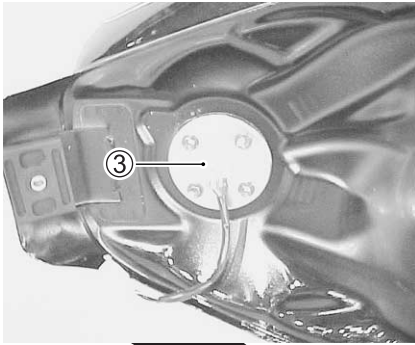
- Properly use the multi circuit tester \oplus and \ominus probes. Improper use can cause damage to the motorcycle and tester.
- If the voltage and current values are not known, begin measuring in the highest range.
- When measuring the resistance, make sure that no voltage is applied. If voltage is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

▲ CAUTION

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

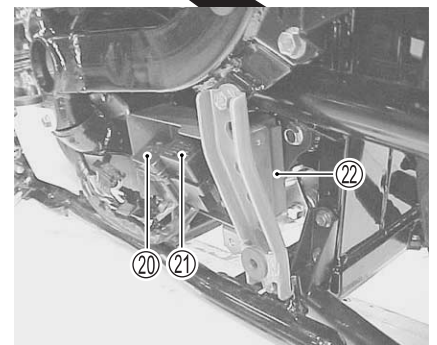
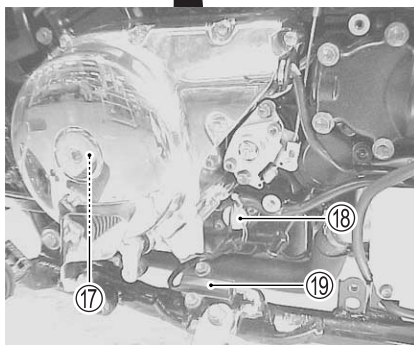
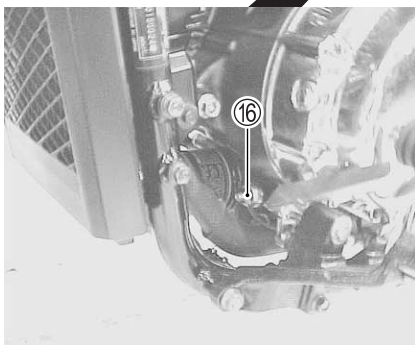
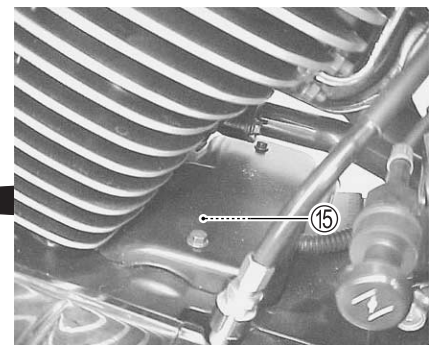
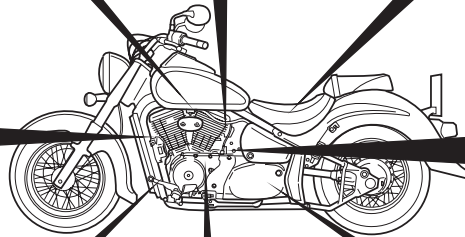
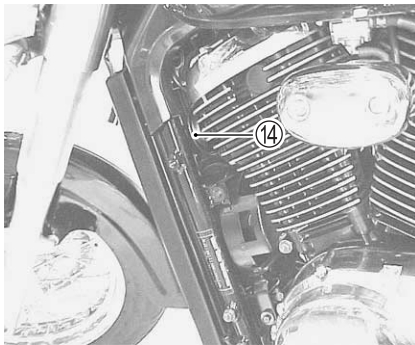
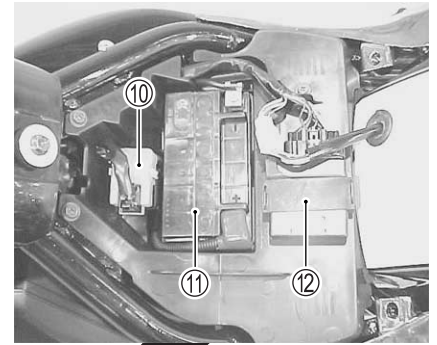
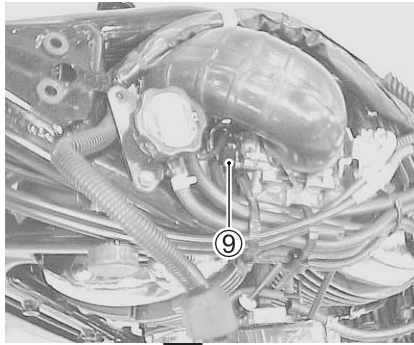
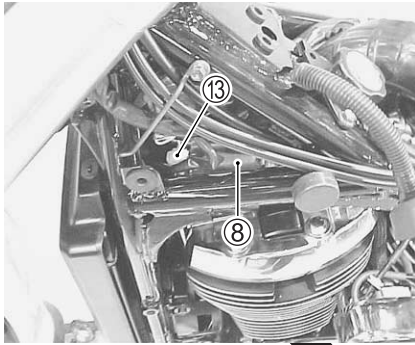


LOCATION OF ELECTRICAL COMPONENTS



- ① Ignition switch
- ② Ignition coil #2
- ③ Fuel level gauge
- ④ Rear brake switch

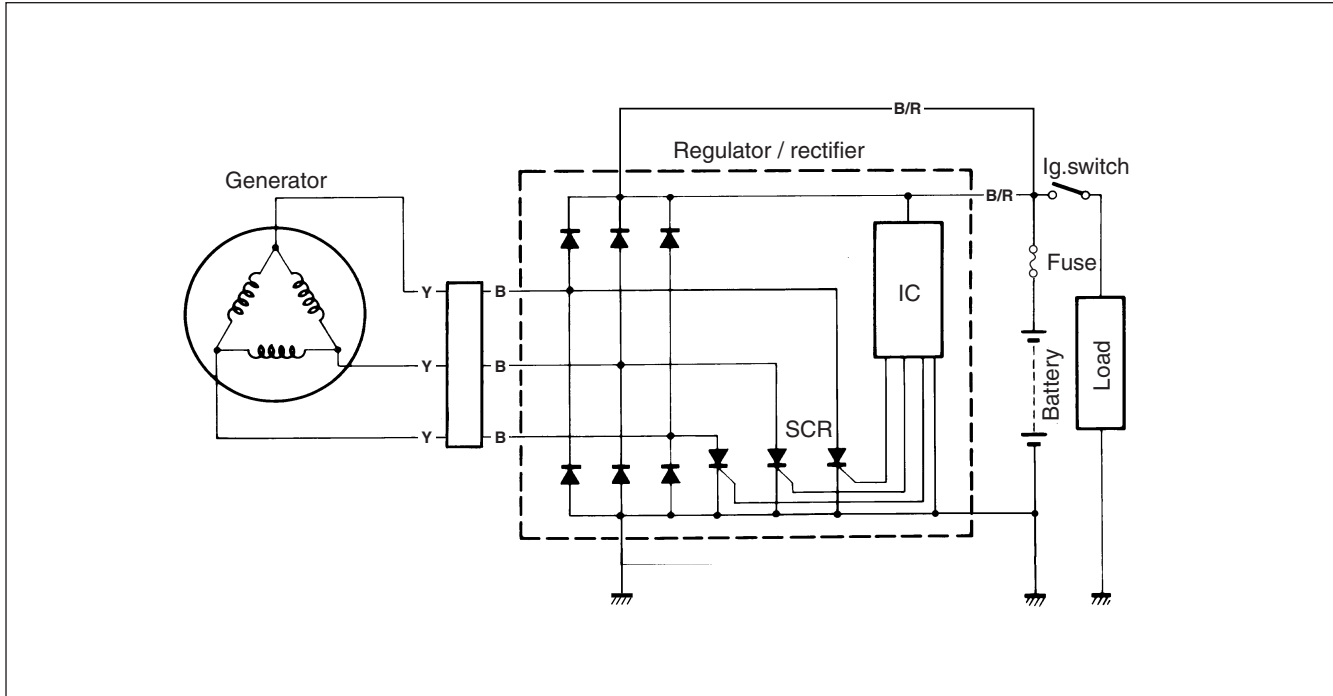
- ⑤ Cooling fan
- ⑥ Cooling fan thermo-switch
- ⑦ Speedometer sensor



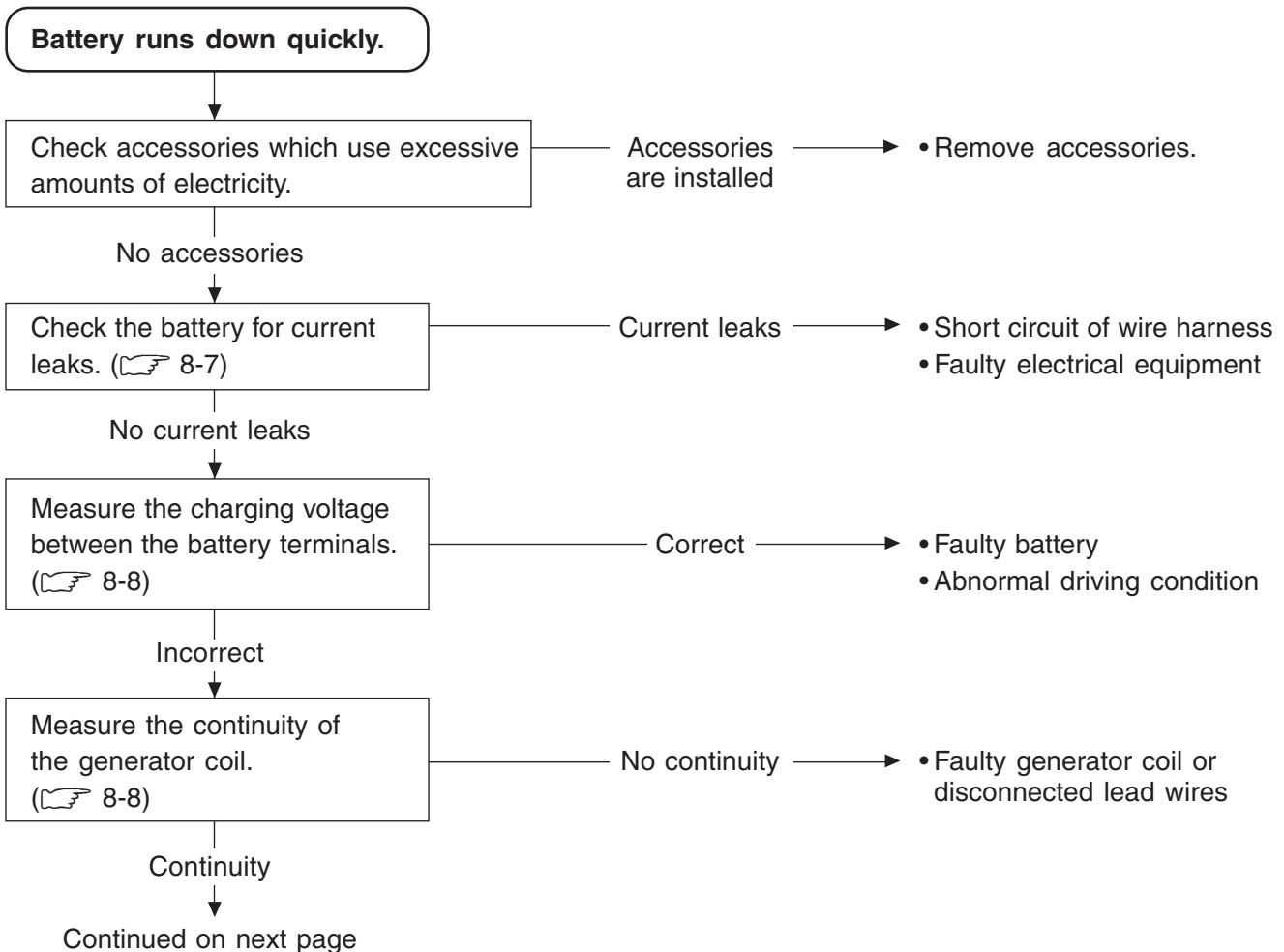
- ⑧ Ignition coil #1
- ⑨ Throttle position sensor
- ⑩ Starter relay/main fuse
- ⑪ Battery
- ⑫ Ignitor
- ⑬ Engine coolant temperature sensor
- ⑭ Horn
- ⑮ Starter motor

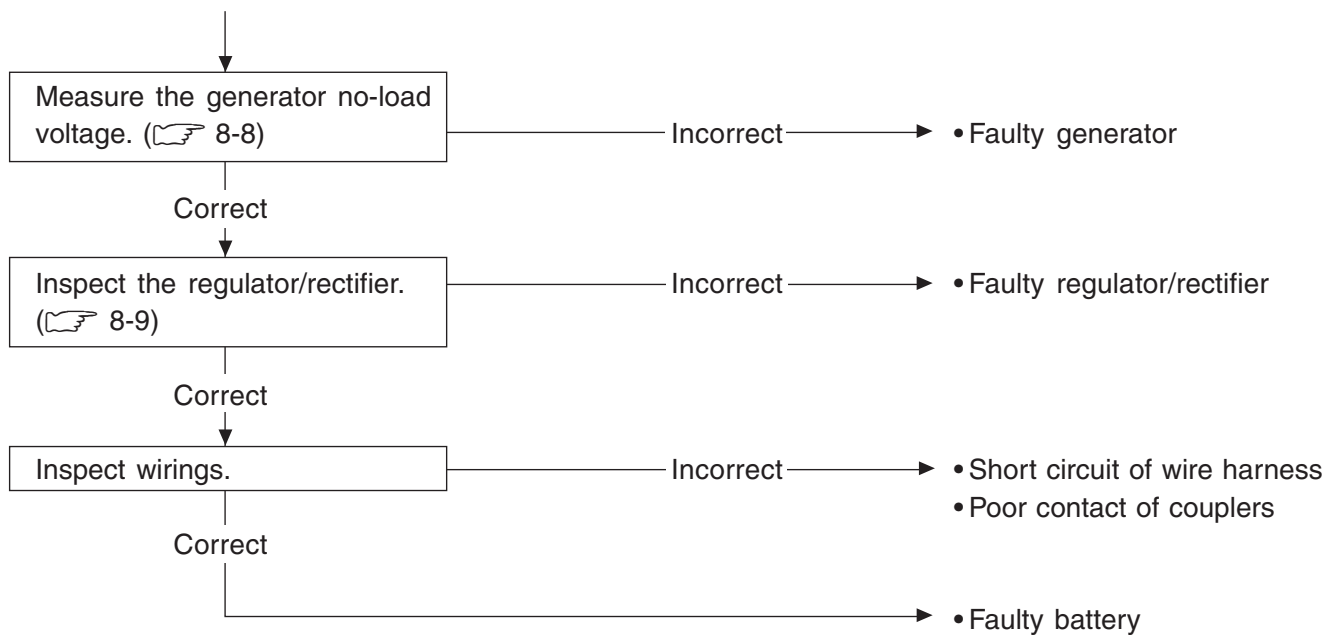
- ⑯ Oil pressure switch
- ⑰ Generator
- ⑱ Gear position switch
- ⑲ Side-stand switch
- ⑳ Fuse box
- ㉑ Turn signal side-stand relay
- ㉒ Regulator/rectifier

CHARGING SYSTEM



TROUBLESHOOTING





Others

Battery overcharge	<ul style="list-style-type: none"> • Faulty regulator/rectifier • Faulty battery • Poor contact of generator lead wire coupler
--------------------	---

INSPECTION

BATTERY CURRENT LEAKAGE

- Remove the two seats. (☞ 7-2)
- Turn the ignition switch to the OFF position.
- Disconnect the battery \ominus lead wire.

Measure the current between \ominus battery terminal and the \ominus battery lead wire using the multi circuit tester. If the reading exceeds the specified value, leakage is evident.

TOOL 09900-25008: Multi circuit tester set

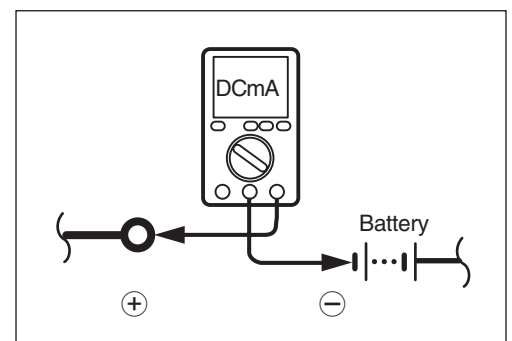
DATA Battery current (leak): Under 3 mA

TESTER Tester knob indication: Current (---, 20 mA)

CAUTION

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

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



REGULATED VOLTAGE

- Remove the two seats. (☞ 7-2)
- Start the engine and keep it running at 5 000 r/min. with lighting switch turned ON (except for E-03, 28, 24, 33 models) and dimmer switch turned HI position.

Measure the DC voltage between the ⊕ and ⊖ battery terminals using the multi circuit tester. If the voltage is not within the specified value, inspect the generator and regulator/rectifier. (☞ 8-8 and 8-9)

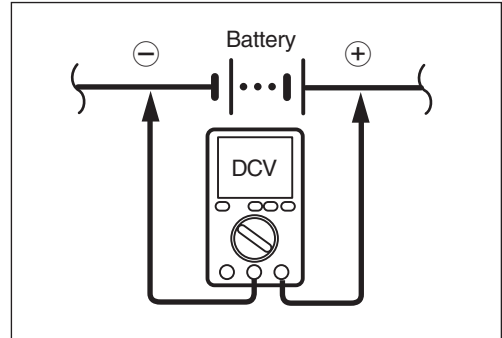
NOTE:

When making this test, be sure that the battery is in fully-charged condition.

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (DCV)

DATA Charging output (Regulated voltage):
14.0 – 15.5 V at 5 000 r/min.



GENERATOR COIL RESISTANCE

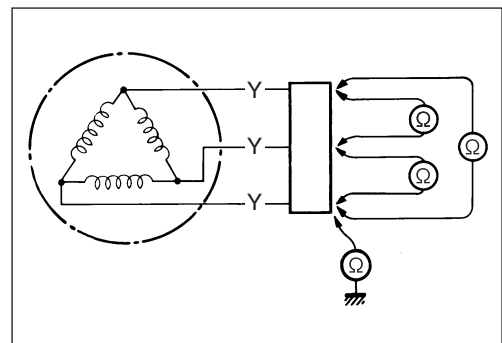
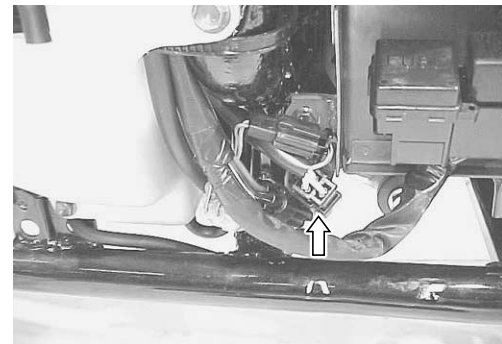
- Remove the secondary gear case cover.
- Disconnect the generator coupler.

Measure the resistance between the three lead wires. If the resistance is not specified value, replace the stator with a new one. Also, check that the generator core is insulated.

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Generator coil resistance: 0.2 – 1.5 Ω (Yellow – Yellow)
∞ Ω (Yellow – Ground)



NOTE:

When making above test, it is not necessary to remove the generator.

GENERATOR NO-LOAD PERFORMANCE

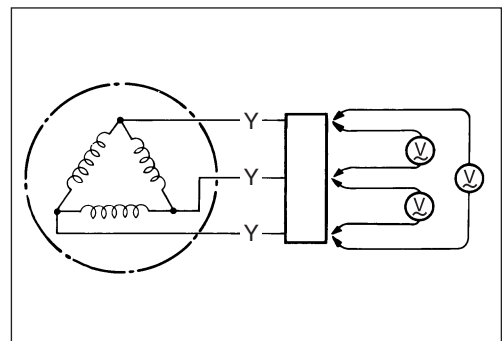
- Start the engine and keep it running at 5 000 r/min. Using the multi circuit tester, measure the voltage between three lead wires.

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 (When engine is cold): More than 70 V at 5 000 r/min



REGULATOR/RECTIFIER

- Remove the secondary gear case cover.
- Disconnect the regulator/rectifier couplers.

Measure the voltage between the lead wires using the multi circuit tester as indicated in the table below. If the voltage is not within the specified value, replace the regulator/rectifier with a new one.

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

 **Tester knob indication: Diode test (↔)**

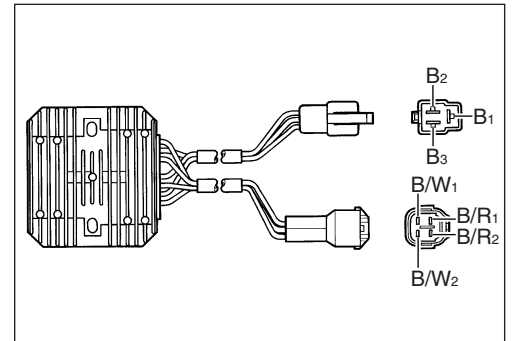
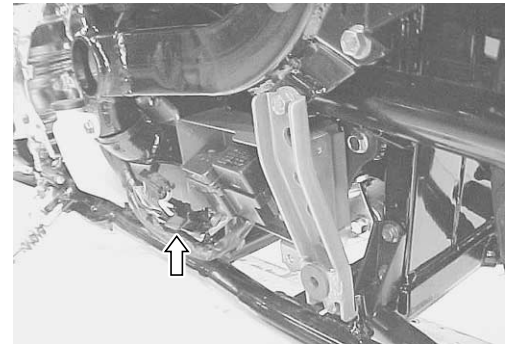
Unit: V

		⊕ Tester probe						
		B/R ₁	B/R ₂	B ₁	B ₂	B ₃	B/W ₁	B/W ₂
Ⓛ Tester probe	B/R ₁		0	0.4 - 0.7	0.4 - 0.7	0.4 - 0.7	0.5 - 1.2	0.5 - 1.2
	B/R ₂	0		0.4 - 0.7	0.4 - 0.7	0.4 - 0.7	0.5 - 1.2	0.5 - 1.2
	B ₁	*	*		*	*	0.4 - 0.7	0.4 - 0.7
	B ₂	*	*	*		*	0.4 - 0.7	0.4 - 0.7
	B ₃	*	*	*	*		0.4 - 0.7	0.4 - 0.7
	B/W ₁	*	*	*	*	*		0
	B/W ₂	*	*	*	*	*	0	

* More than 1.4 V (tester's battery voltage)

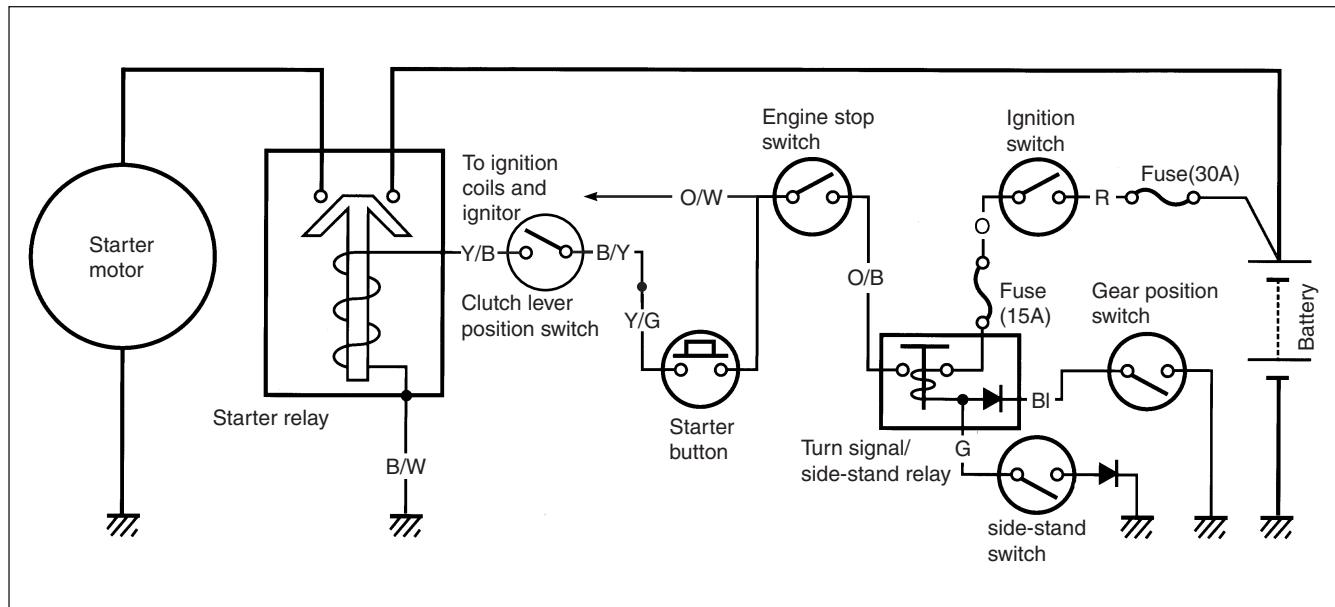
NOTE:

If the tester reads under 1.4 V when the tester probes are not connected, replace the battery of multi circuit tester.

**WIRE COLOR**

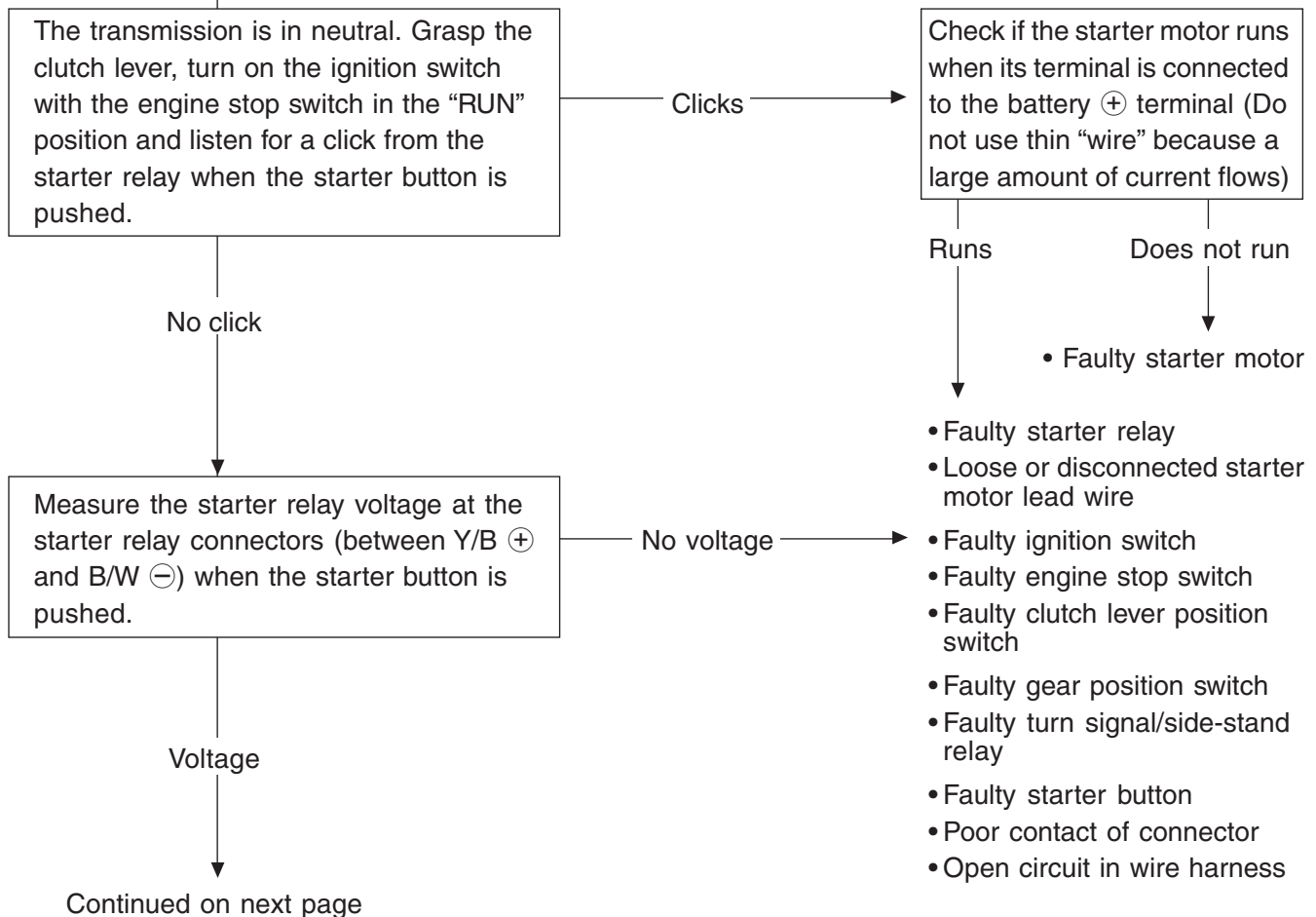
B: Black, B/R: Black with Red tracer,
B/W: Black with White tracer

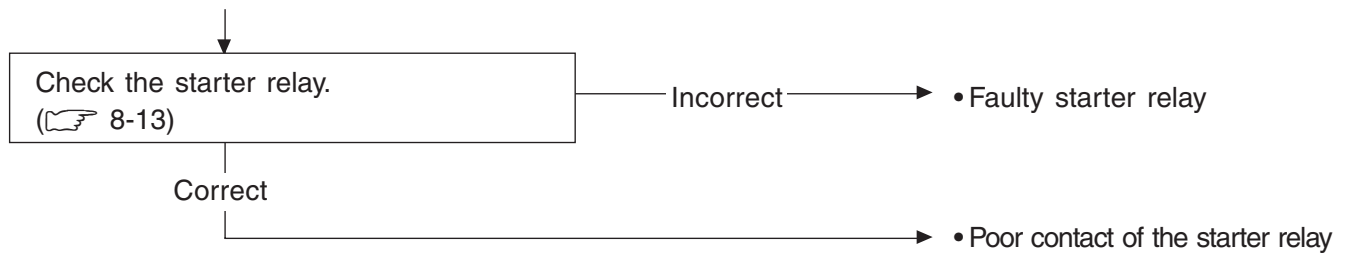
STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM



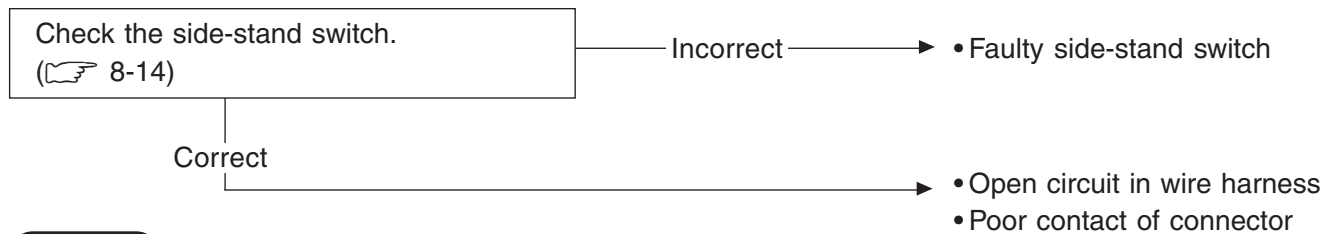
TROUBLESHOOTING

Starter motor will not run.





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.



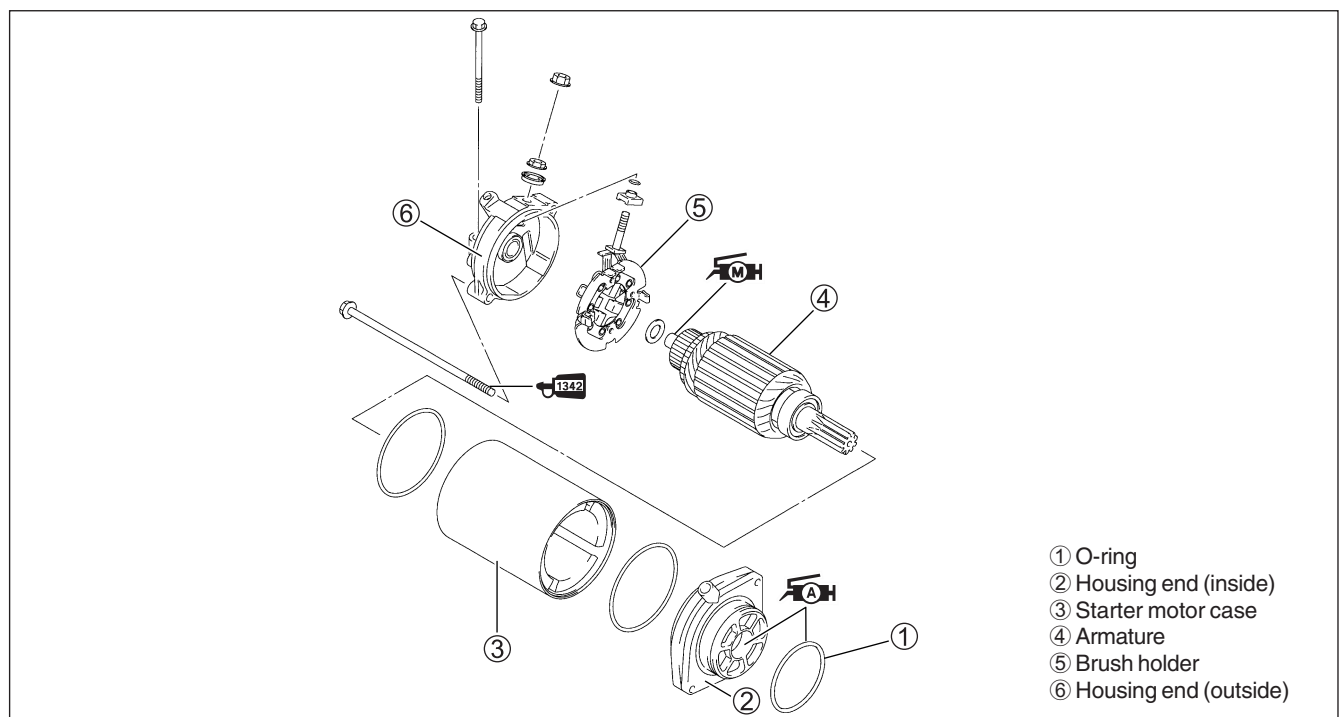
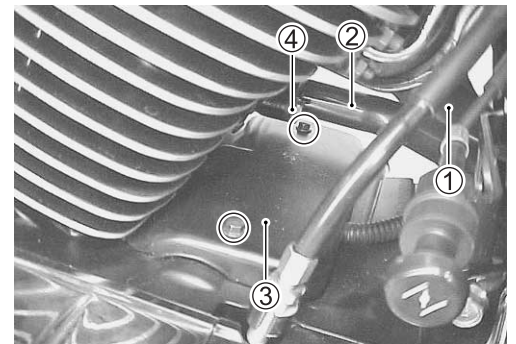
Others

Engine does not turn though the starter motor runs.

- Faulty starter clutch

STARTER MOTOR REMOVAL AND DISASSEMBLY

- Drain engine coolant. (☞ 2-13)
- Remove the muffler (No.1) ①. (☞ 3-5)
- Remove the engine coolant pipe ②. (☞ 3-13)
- Remove the starter motor cover ③.
- Remove the engine coolant inlet ④.
- Remove the starter motor. (☞ 3-14)
- Disassemble the starter motor as shown in the illustration.

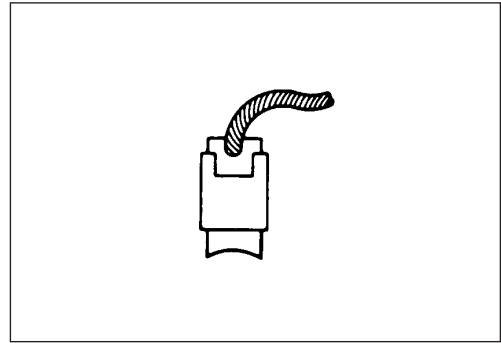


STARTER MOTOR INSPECTION

CARBON BRUSH

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

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

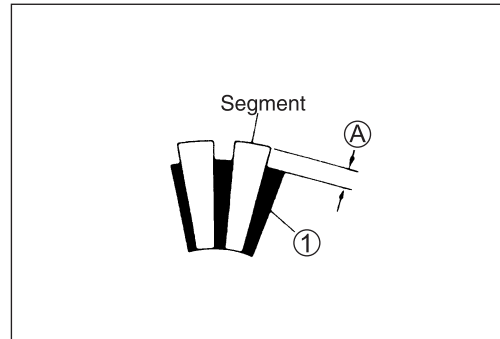


COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut (A).

If abnormal wear is found, replace the armature with a new one. If the commutator surface is discolored, polish it with #400 sand paper and wipe it using a clean dry cloth.

If there is no undercut, scrape out the insulator ① with a saw blade.



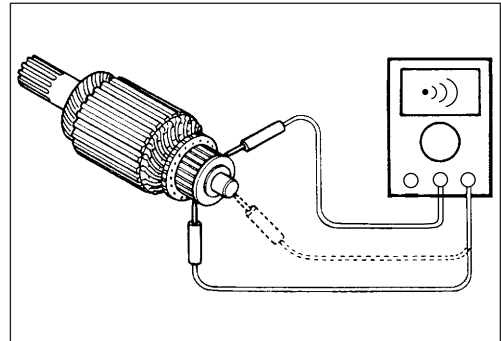
ARMATURE COIL INSPECTION

Check for continuity between each segment and between each segment and the armature shaft using the multi circuit tester.

If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.

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

- Apply grease to the lip of the oil seal.

For U.S.A.

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

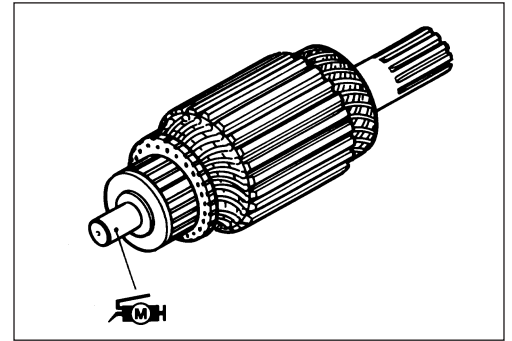
For the other countries

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



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

 99000-25140: SUZUKI MOLY PASTE



- Align the tonque ① on the brush holder with the groove ② on the housing end.
- Align the threaded parts ③ on the housing end.
- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing bolts.

 99000-32050: THREAD LOCK "1342"

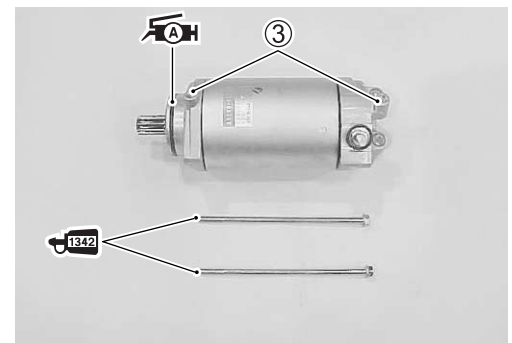
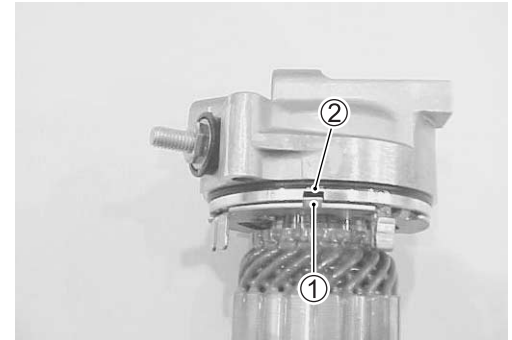
- Apply SUZUKI SUPER GREASE "A" to the O-ring.

For U.S.A.

 99000-25030: SUZUKI SUPER GREASE "A"

For the others

 99000-25010: SUZUKI SUPER GREASE "A"



STARTER RELAY INSPECTION

- Remove the two seats. (7-2)
- Disconnect the battery \ominus lead wire from the battery.
- Remove the starter relay cover.
- Disconnect the starter motor lead wire ①, battery lead wire ② and starter relay coupler ③.
- Remove the starter relay ④.

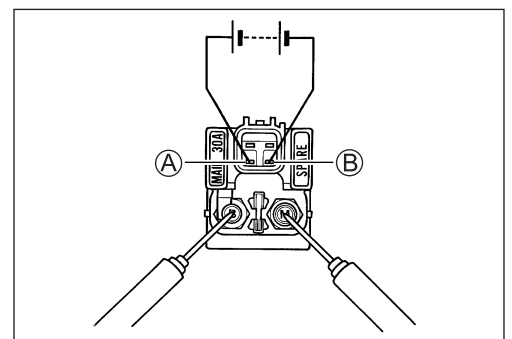
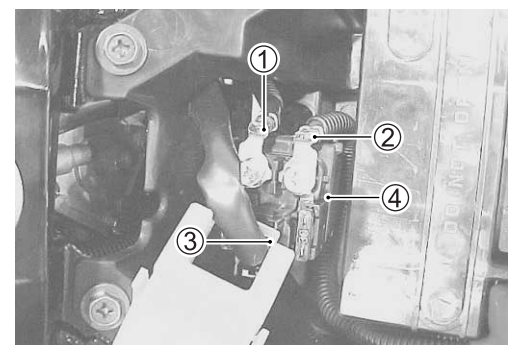
Apply 12 V to (A) and (B) terminals and check for continuity between the positive and negative terminals using the multi circuit tester. If the starter relay clicks and continuity is found, the relay is ok.

 09900-25008: Multi circuit tester set

 Tester knob indication: Continuity test (•••)

▲ CAUTION

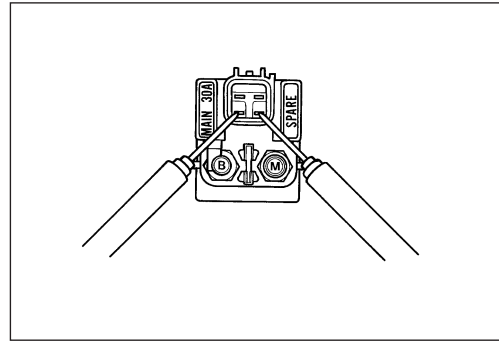
Do not apply a battery voltage to the starter relay for more than five seconds, since the relay coil may overheat and damaged.



Measure the relay coil resistance between the terminals using the multi circuit tester. If the resistance is not within the specified value, replace the starter relay with a new one.

TOOL 09900-25008: Multi circuit tester set

DATA Starter relay resistance: 3 – 7 Ω



SIDE STAND/IGNITION INTERLOCK SYSTEM PARTS INSPECTION

Check the interlock system for proper operation. If the interlock system does not operate properly, check each component for damage or abnormalities. If any abnormality is found, replace the component with a new one.

SIDE-STAND SWITCH

- Remove the secondary gear case cover.
- 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 (→←)

	Green (+ Probe)	Black/White (− Probe)
ON (Side-stand up)	0.4–0.6 V	
OFF (Side-stand down)	More than 1.4 V (Tester's battery voltage)	

NOTE:

If the tester reads under 1.4V when the tester probes are not connected, replace its battery.

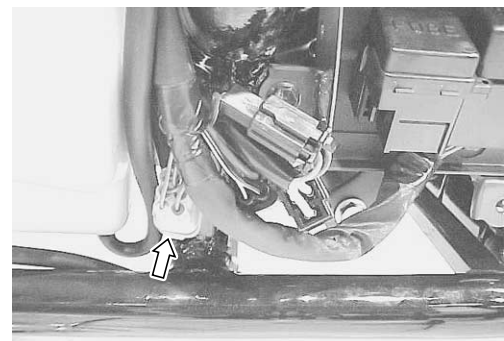
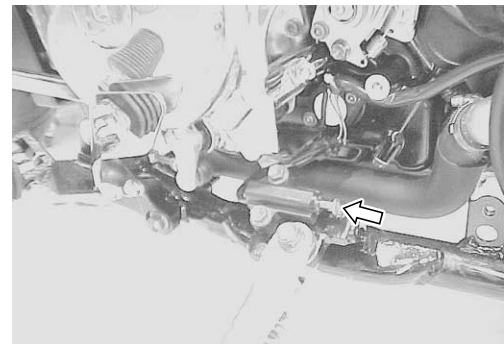
GEAR POSITION SWITCH

- Remove the secondary gear case cover.
- Disconnect the gear position switch coupler and check the continuity between Blue and Black/White with the transmission in “NEUTRAL”.

	Blue	Black/White
ON (Neutral)	○	○
OFF (Except neutral)		

CAUTION

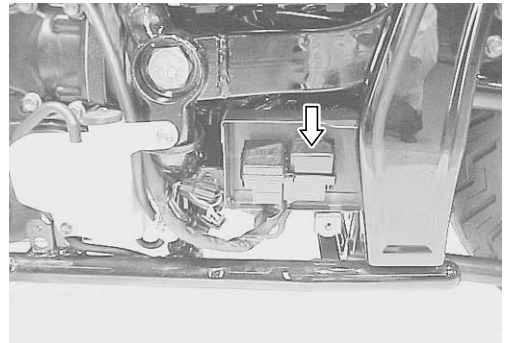
When disconnecting and connecting the gear position switch coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.



TURN SIGNAL/SIDE-STAND RELAY

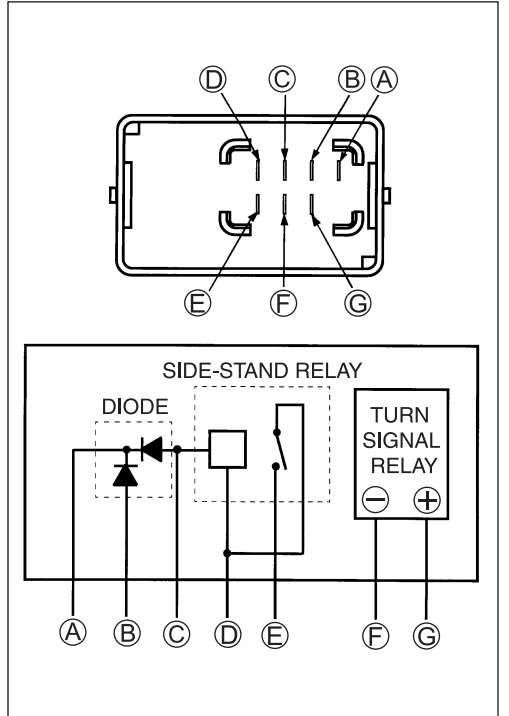
The turn signal/side-stand relay is composed of the turn signal relay, and the side-stand relay and diode.

- Remove the secondary gear case cover.
- Remove the turn signal/side-stand relay.



SIDE-STAND RELAY INSPECTION

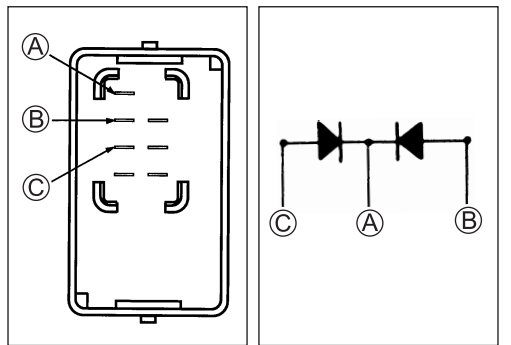
First check the insulation between ④ and ⑤ terminals with the tester. Then apply 12V to terminals ④ and ③ (+ to ④ and - to ③) and check the continuity between ④ and ⑤. If there is no continuity, replace the turn signal/side-stand relay with a new one.



DIODE INSPECTION

Measure the voltage between the terminals using the multi circuit tester. Refer to the following table.

⊖ Probe of tester to:	⊕ Probe of tester to:	
	③, ②	①
③, ②		More than 1.4 V (Tester's battery voltage)
①	0.4–0.6 V	



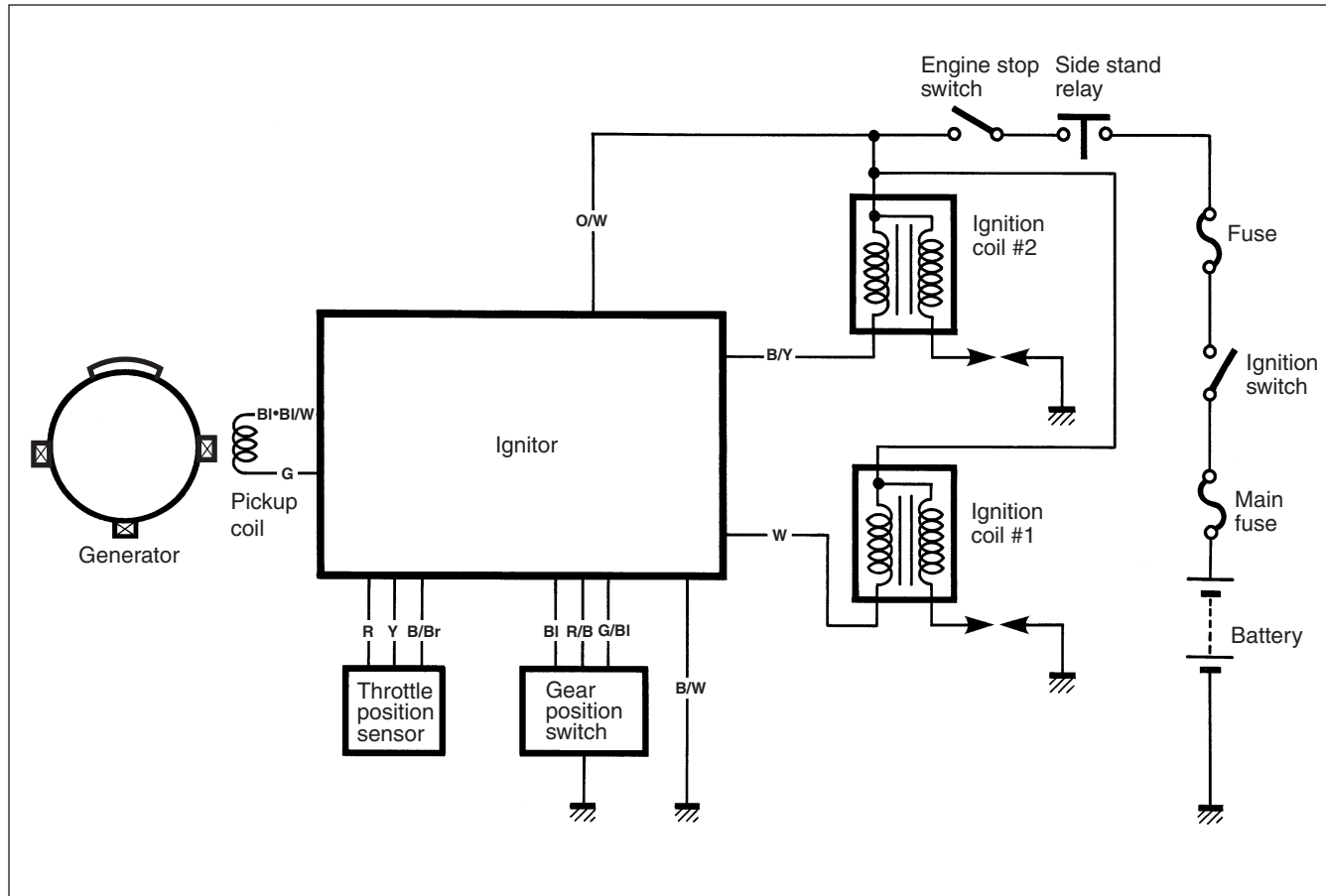
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Diode test (→←)

NOTE:

If the multi circuit tester reads under 1.4V when the tester probes are not connected, replace its battery.

IGNITION SYSTEM



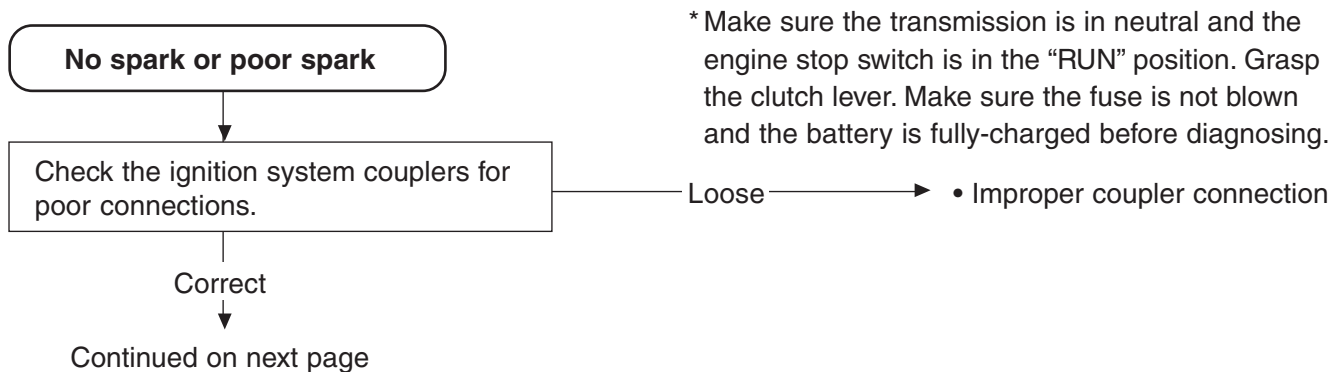
NOTE:

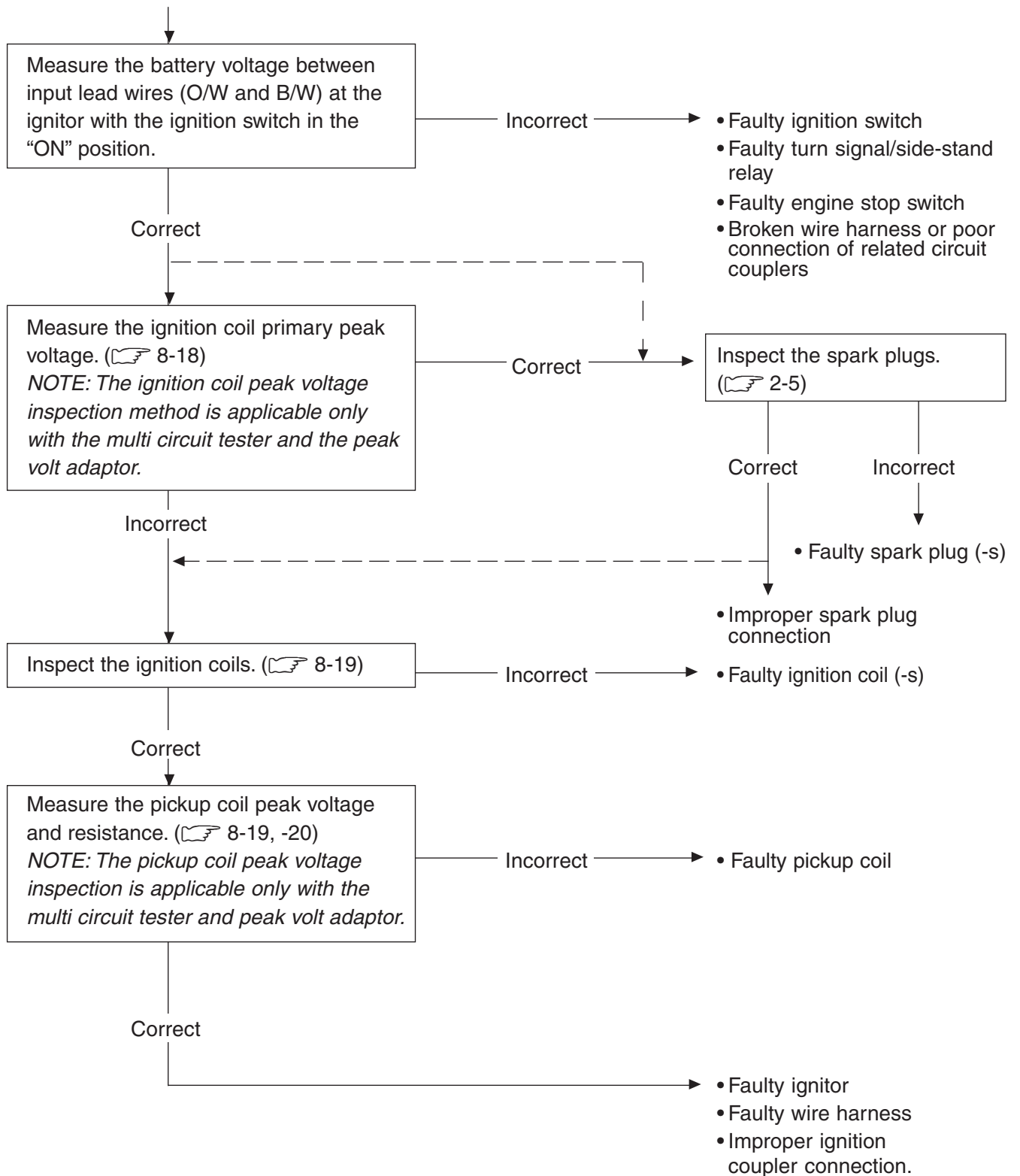
The ignition cut-off circuit is incorporated in this ignitor to prevent over-running of engine. If engine rpm reaches 8 000 r/min., this circuit cuts off the ignition primary current for all spark plugs.

⚠ CAUTION

Under no load, the engine can run over 8 000 r/min, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 8 000 r/min at anytime.

TROUBLESHOOTING





INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the fuel tank. (☞ 5-3)
- Disconnect the two spark plug caps.
- Connect the new spark plugs to the each spark plug cap and ground them on the cylinder head.

NOTE:

Make sure that the each spark plug cap and spark plug are connected properly.

Measure the ignition coil primary peak voltage using the multi circuit tester in the following procedure.

- Connect the multi circuit tester with the peak volt adaptor as follows.

No.1 ignition coil ⊕ Probe: White lead wire connector
 ⊖ Probe: Ground

No.2 ignition coil ⊕ Probe: Black/Yellow lead wire connector
 ⊖ Probe: Ground

NOTE:

Do not disconnect the ignition coil primary lead wires.

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

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.

- Shift the transmission into neutral, and then turn the ignition switch to the "ON" position.
- Pull the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.

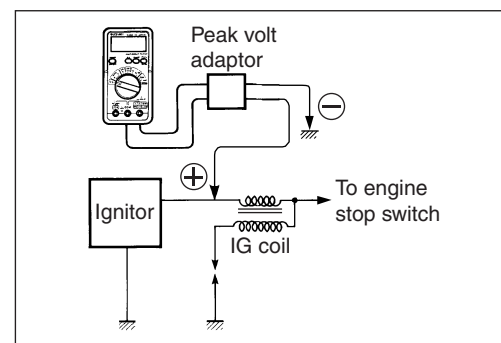
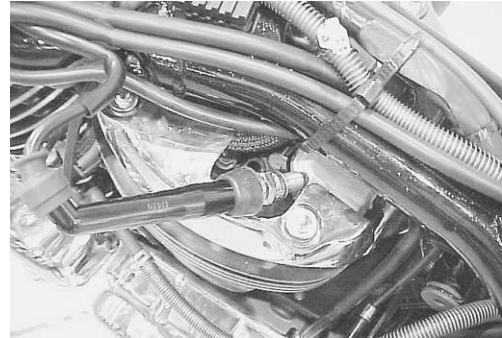
 **Tester knob indication: voltage (V)**

 **Ignition coil primary peak voltage: More than 200 V**

WARNING

While testing, do not touch the tester probes and spark plugs to prevent receiving an electric shock.

If the peak voltage is lower than the specified values, inspect the ignition coil. (☞ 8-19)



IGNITION COIL RESISTANCE

- Remove the fuel tank. (☞ 5-3)
 - Disconnect the ignition coil lead wires and plug caps.
- Measure the ignition coil resistance in both the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil with a new one.

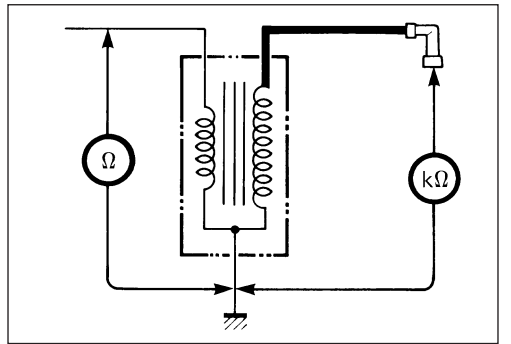
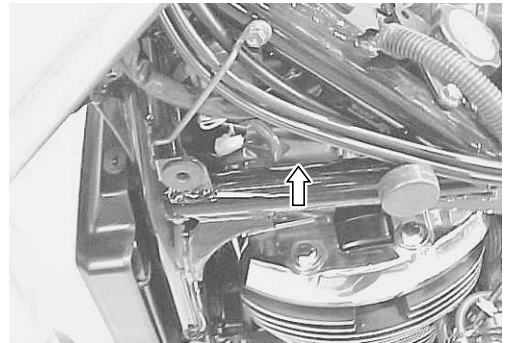
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Ignition coil resistance

Primary : 2 – 6 Ω (Terminal – Terminal)

Secondary : 15 – 30 k Ω (Plug cap – Terminal)

**PICKUP COIL PEAK VOLTAGE**

- Remove the two seats. (☞ 7-2)
- Disconnect the wire harness coupler ① at the ignitor.

NOTE:

Make sure that all of the couplers are connected properly.

Measure the pickup coil peak voltage in the following procedure.

- Connect the multi circuit tester with the peak volt adaptor as follows.

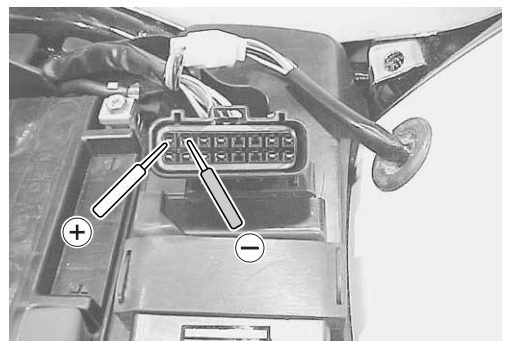
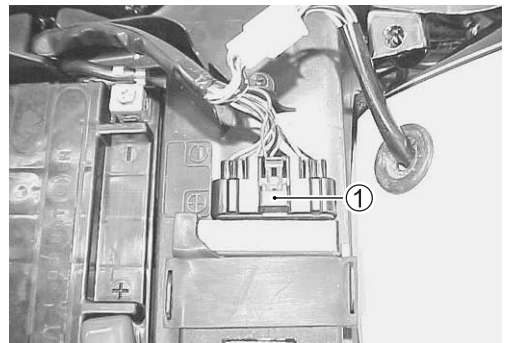
⊕ Probe: Blue/White lead wire

⊖ Probe: Green lead wire

TOOL 09900-25008: Multi circuit tester set

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.

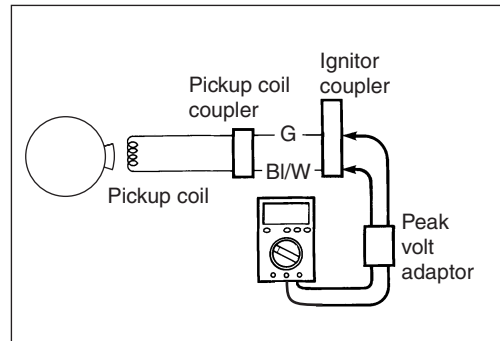


- Shift the transmission into the neutral, and then turn the ignition switch to the “ON” position.
- Pull the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the pickup coil peak voltage.
- Repeat the above procedure a few times and measure the highest peak voltage.

 **Tester knob indication: Voltage (---)**

DATA Pickup coil peak voltage: **More than 1.5 V**

If the peak voltage is lower than the specified values, check the peak voltage at the pickup coil lead wire coupler.



- Remove the secondary gear case cover.
- Disconnect the pickup coil lead wire coupler and connect the multi circuit tester with the peak volt adaptor.

⊕ Probe: Blue lead wire

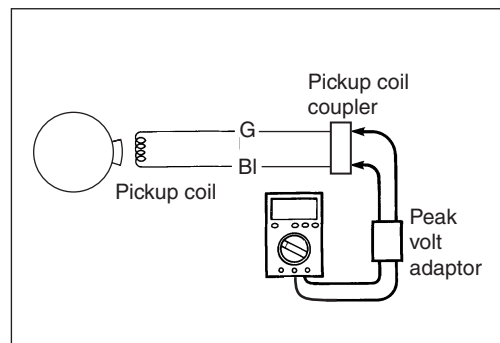
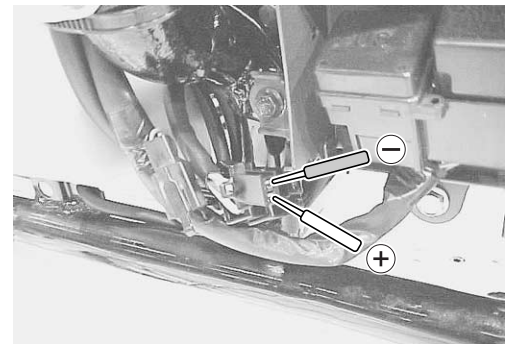
⊖ Probe: Green lead wire

Measure the pickup coil peak voltage at the pickup coil lead wire coupler, in the same manner as on the ignitor coupler.

 **Tester knob indication: Voltage (---)**

DATA Pickup coil peak voltage: **More than 1.5 V**

If the peak voltage on the pickup coil lead wire coupler is ok but on the ignitor coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the generator must be replaced and re-checked.



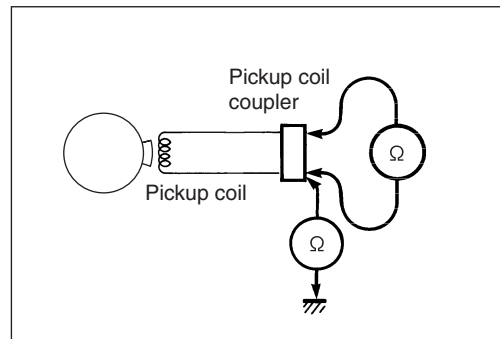
PICKUP COIL RESISTANCE

Measure the resistance between the lead wires and ground. If the resistance is not specified value, the pickup coil must be replaced.

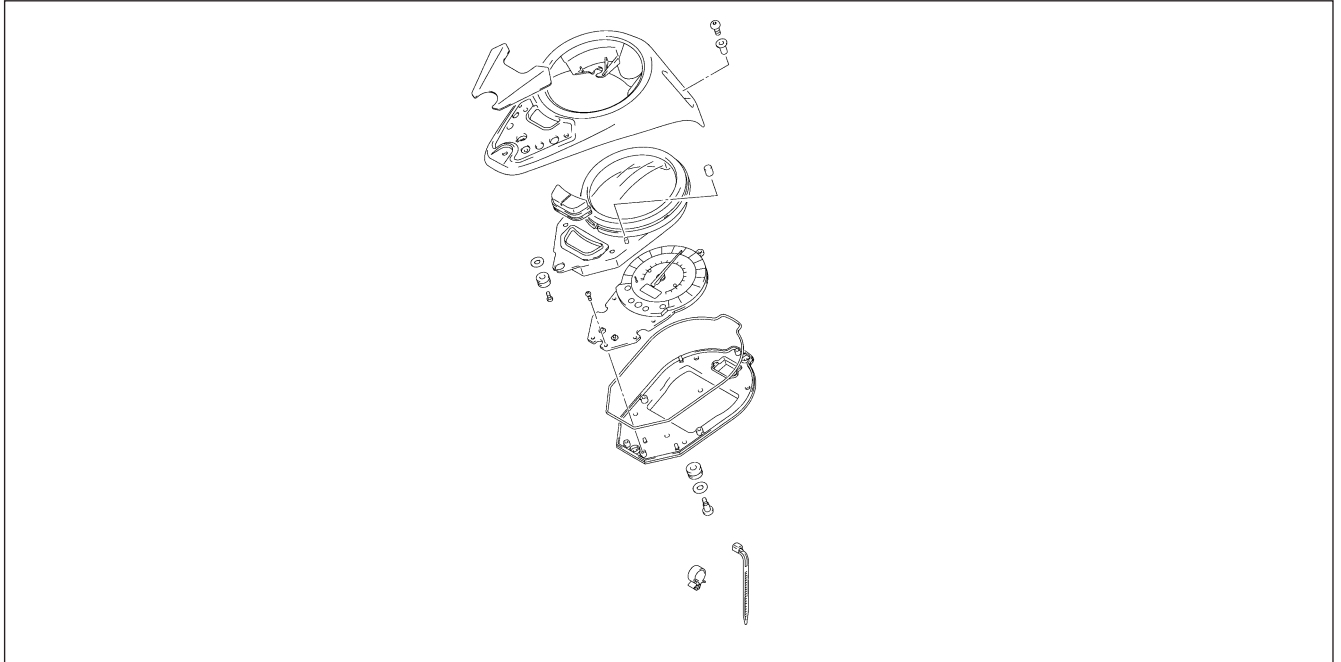
 **09900-25008: Multi circuit tester set**

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

DATA Pickup coil resistance : 160 – 300 Ω (Green – Blue)
: ∞ Ω (Green – Ground)



SPEEDOMETER



REMOVAL

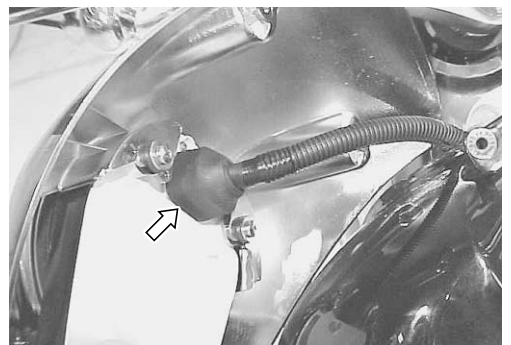
- Remove the screws.



- Disconnect the cover and coupler.

▲ CAUTION

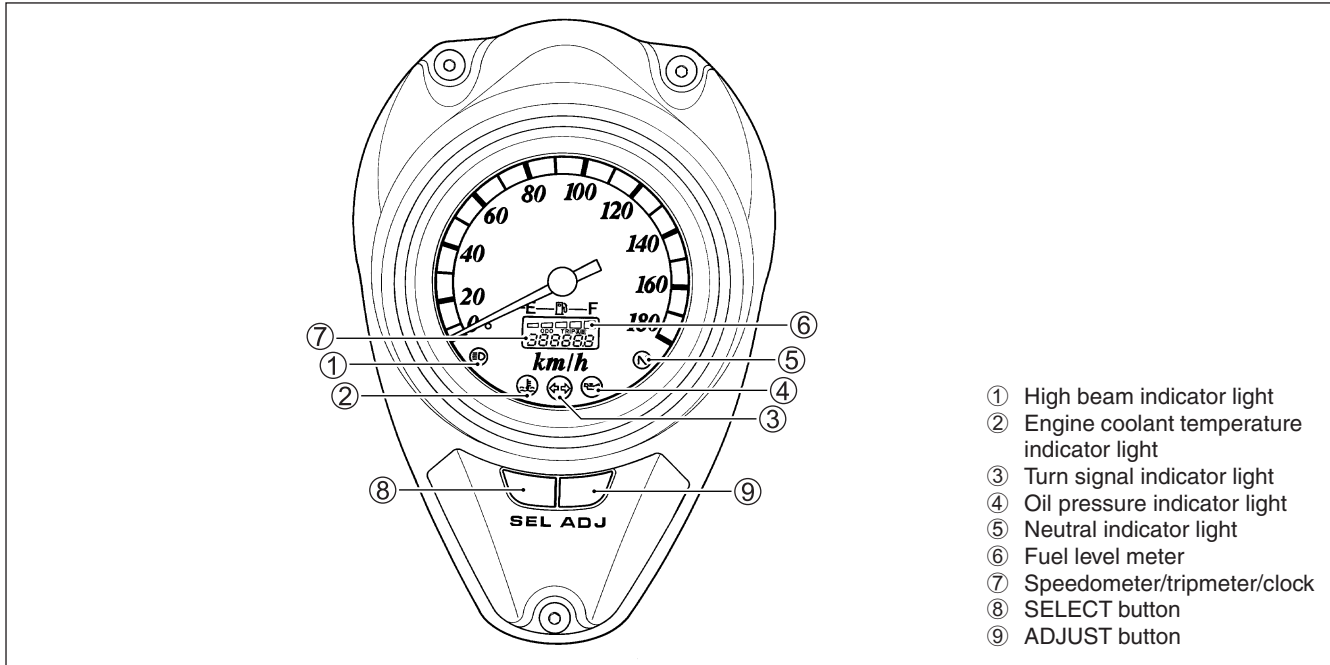
When disconnecting and connecting the combination meter coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.



- Remove the speedometer.



PARTS NAMES



OPERATING PROCEDURE

INITIAL DISPLAY

When the ignition switch is set to ON, all LCD light up for three seconds.

NOTE:

If the power supply is cut (e, g, when the battery is replaced):

* The odometer, tripmeter and clock are displayed after the initial display appears.

* Since the clock resets to "1:00", it will need to be readjusted.

CHANGE THE DISPLAY MODE

With each press of the SELECT button, the display changes between odometer, tripmeter A, tripmeter B and clock as shown.



⚠ WARNING

To avoid riding with only one hand, do not operate the buttons while riding.

ODOMETER

- Displays the total distance travelled.

TRIPMETER

- Displays the distance travelled since the tripmeter was last reset.

NOTE:

The tripmeters A and B can be used independently.

- Hold down the ADJUST button for two seconds to reset the tripmeter.

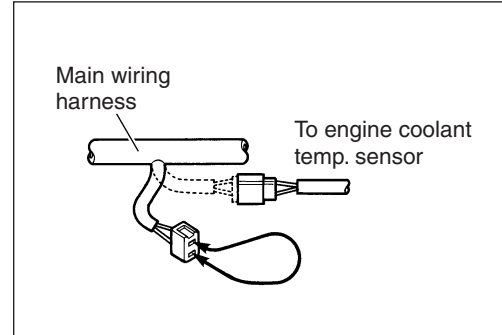
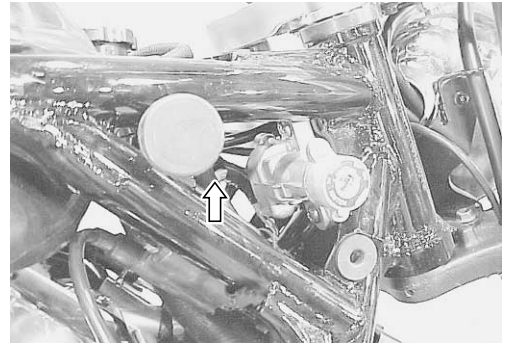
INSPECTION

ENGINE COOLANT TEMPERATURE INDICATOR LIGHT

Engine coolant temperature sensor inspection: (👉 6-8)

- Remove the fuel tank. (👉 5-3)
- Disconnect the engine coolant temperature sensor coupler.
- Connect the jumper wire to the wire harness coupler.

Check that the LED light immediately after turning the ignition switch on. If the LED fail in operation, replace the speedometer unit with a new one.



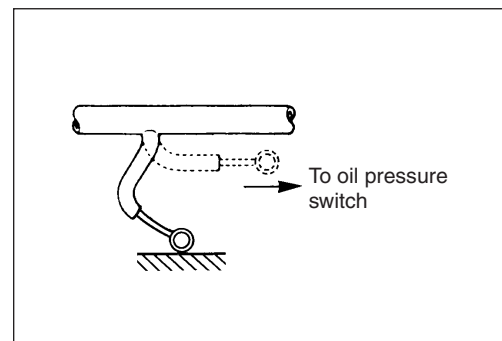
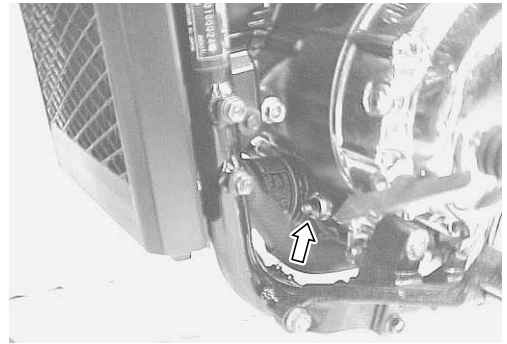
OIL PRESSURE INDICATOR LIGHT

NOTE:

Before inspecting the oil pressure switch, check if the engine oil level is enough. (👉 2-8)

- Disconnect the oil pressure switch lead wire from the oil pressure switch.
- Turn the ignition switch “ON” position.

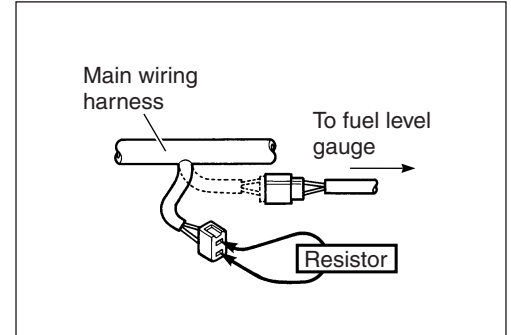
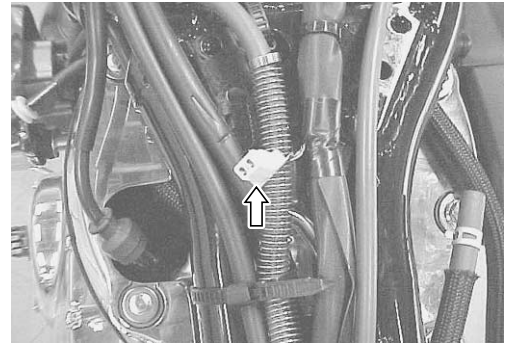
Check if the oil pressure indicator will light, when grounding the lead wire.



FUEL LEVEL METER

- Remove the fuel tank. (☞ 5-3)
- Connect the speedometer.
- Connect each resistor between the Yellow/Black and Black/White lead wire at the wire harness.
- Turn the ignition switch “ON” position and wait for approx, 13 seconds.

Check the display of fuel meter as shown below. If any abnormality is found, replace the speedometer with a new one.



Resistance	Less than 17 Ω	22 – 28 Ω	33 – 49 Ω	54 – 69 Ω	74 – 83 Ω	More than 94 Ω
Fuel level meter						

FUEL LEVEL GAUGE INSPECTION

- Remove the fuel tank. (☞ 5-3)
- Remove the fuel level gauge.

Measure the resistance at each fuel level gauge float position. If the resistance is incorrect, replace the fuel level gauge with a new one.

Float position	Resistance
Ⓐ "F" (Full)	4 – 10 Ω
Ⓑ "E" (Empty)	90 – 100 Ω

Remount the fuel level gauge in the reverse order of removal. Pay attention to the following points.

- Install the O-ring and apply grease to it.

For U.S.A.

 99000-25030: SUZUKI SUPER GREASE "A"

For the other countries

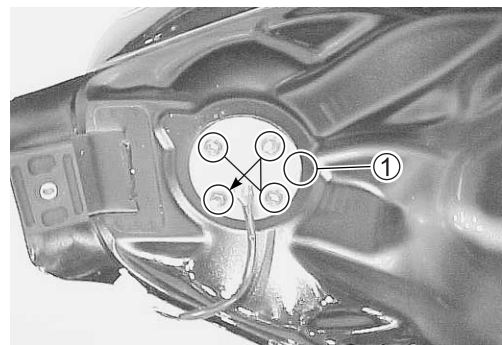
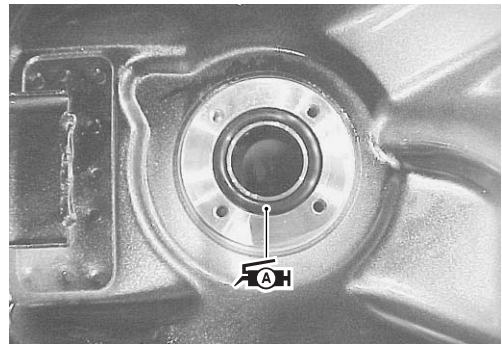
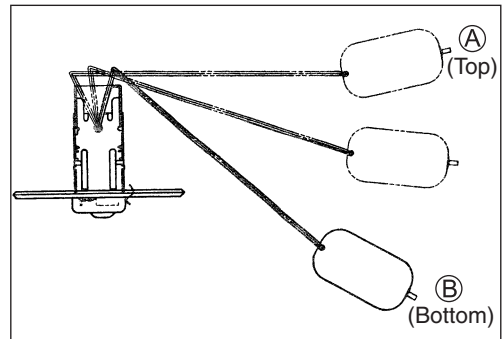
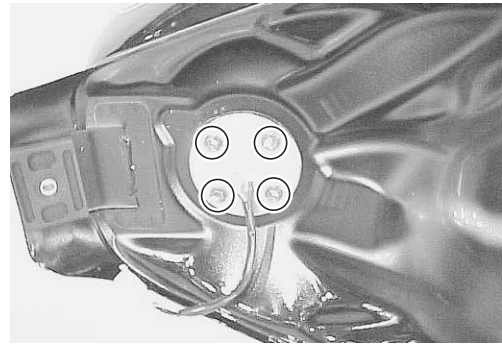
 99000-25010: SUZUKI SUPER GREASE "A"

▲ CAUTION

Use a new O-ring to prevent fuel leakage.

- Face the "△" mark ① on the fuel level gauge forward.
- Lightly tighten the bolts in a crisscross pattern, and then tighten them to the specified torque in the above manner.

 **Fuel level gauge bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)**



SPEED SENSOR INSPECTION

If the speedometer, odometer or tripmeter does not function properly. Inspect the speed sensor and connection of couplers. If the speed sensor and connection is all right, replace the unit with a new one.

- Remove the front wheel. (☞ 7-4)
- Remove the head light.
- Disconnect the speed sensor lead wire coupler.
- Remove the speed sensor.
- Connect 12V battery (between O/R and B/W), 10 k Ω resistor (between O/R and P) and the multi circuit tester (\oplus probe of tester to O/R and \ominus to P) as shown right illustration.

O/R : Orange with Red tracer

B/W: Black with White tracer

P : Pink

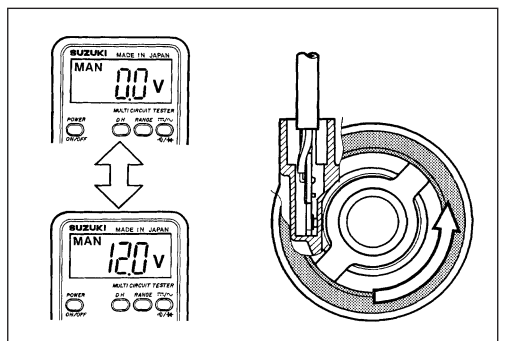
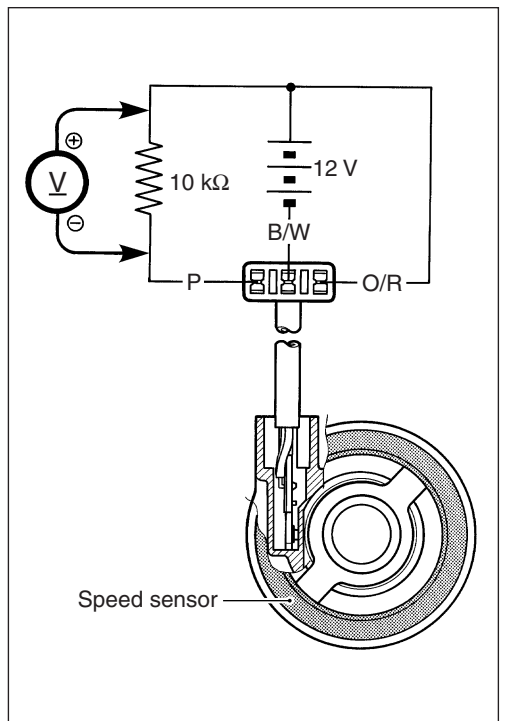
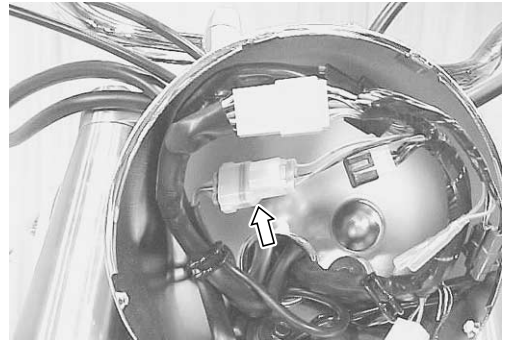
 **09900-25008: Multi circuit tester set**

 **Tester knob indication: Voltage (---)**

Under above condition, by rotating the drive lugs of speed sensor slowly, the tester reading voltage relatively changes (0V \rightarrow 12V or 12V \rightarrow 0V). If the tester reading voltage does not change, replace the speed sensor with a new one.

NOTE:

The highest tester reading voltage (12V) while testing is same as battery voltage.



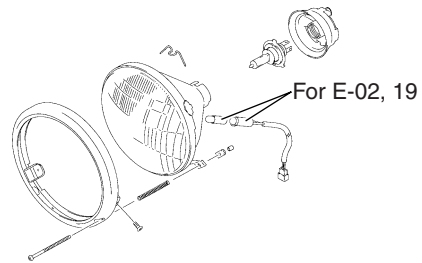
LAMPS

HEADLIGHT, BRAKE LIGHT/TAILLIGHT AND TURN SIGNAL LIGHT

HEADLIGHT

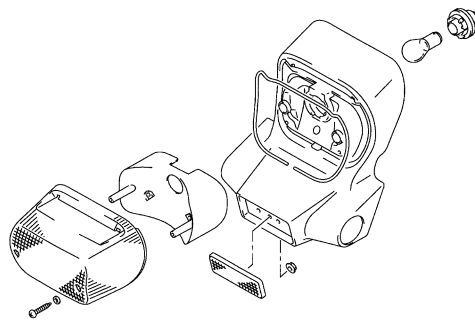
12 V 60/55 W For E-03, 24, 28, 33

12 V 60/55 W + 4 W For E-02,19



BRAKE LIGHT/TAILLIGHT

12 V 21/5 W



TURN SIGNAL LIGHT

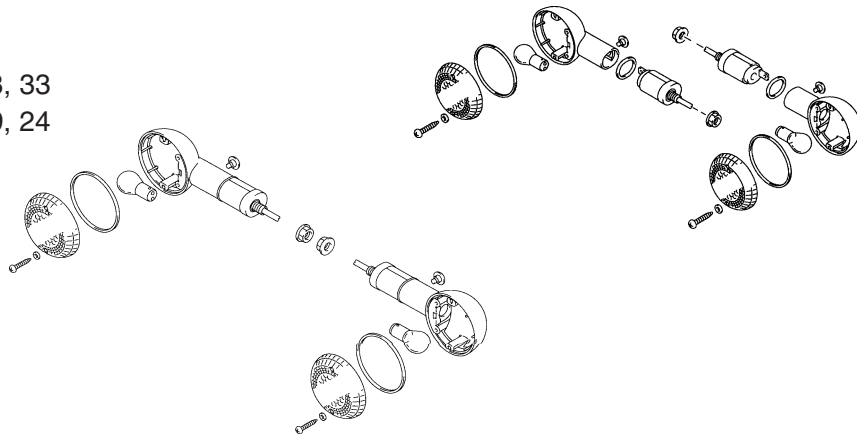
Front

12 V 21/5 W For E-03, 28, 33

12 V 21 W For E-02, 19, 24

Rear

12 V 21 W



▲ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

HEADLIGHT BEAM ADJUSTMENT

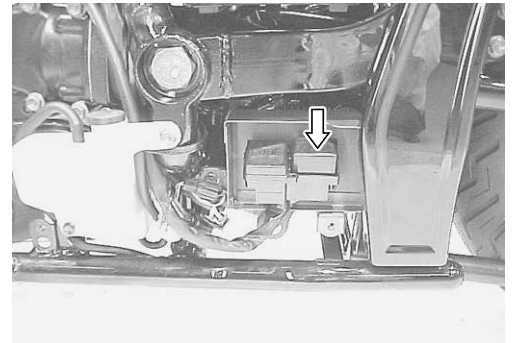
- Adjust the headlight beam, both vertical and horizontal.



RELAYS

TURN SIGNAL/SIDE-STAND RELAY

The turn signal/side-stand relay is composed of the turn signal relay, side-stand relay and diode.



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.

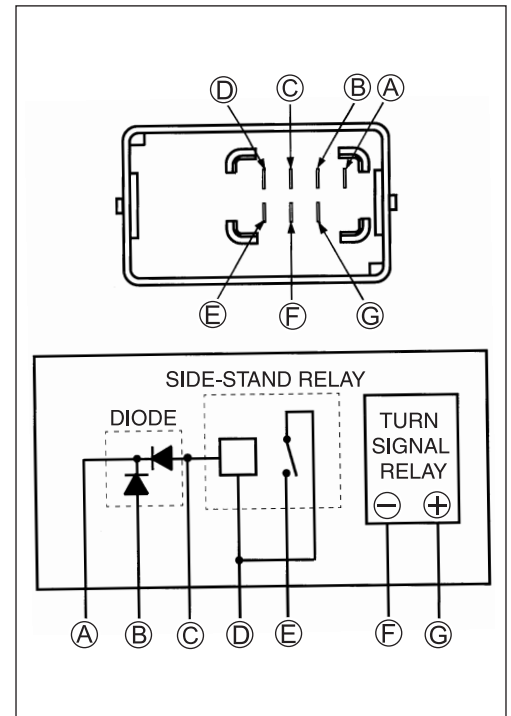
If the bulb, turn signal switch and circuit connection are OK, the turn signal relay may be faulty; therefore, replace the turn signal/side-stand relay with a new one.

NOTE:

- * Make sure that the battery is fully charged.
- * Refer to the page 8-15 for the side-stand relay and diode inspection.



STARTER RELAY


 8-13



SWITCHES

IGNITION SWITCH REMOVAL

- Remove the fuel tank. ( 5-3)
- Remove the frame head covers. ( 6-4)
- Disconnect the coupler.
- Remove the ignition switch mounting bolts using the special tool.

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

CAUTION

When reusing the ignition switch bolt, clean thread and apply the **THREAD LOCK SUPER "1303"**

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



Inspect each switch for continuity with a tester. If any abnormality is found, replace the respective switch assemblies with new ones.

IGNITION SWITCH

(For E-24)

Color Position	R	O	O/Y	B/W
ON				
OFF				
LOCK				

(For Others)

Color Position	R	O	O/Y	B/W	Gr	Br
ON						
OFF						
LOCK						
P						

LIGHTING SWITCH

(Except for E-03, 24, 28 and 33)

Color Position	O/Bl	Gr	O/R	Y/W
OFF (•)				
S (☹)				
ON (☺)				

DIMMER SWITCH

Color Position	W	Y	Y/W
HI (≡▷)			
LO (▷≡)			

TURN SIGNAL SWITCH

Color Position	Lg	Lbl	B
L			
PUSH			
R			

PASSING LIGHT SWITCH

(Except for E-03, 28 and 33)

Color Position	O/R	Y
•		
PUSH		

ENGINE STOP SWITCH

Color Position	O/B	O/W
OFF (⊗)		
RUN (⊙)		

STARTER BUTTON

Color Position	O/W	Y/G
•		
PUSH		

HORN BUTTON

Color Position	B/Bl	B/W
•		
PUSH		

FRONT BRAKE SWITCH

Color Position	B/R	B
OFF		
ON		

REAR BRAKE SWITCH

Color Position	Terminal	Terminal
OFF		
ON		

CLUTCH LEVER POSITION SWITCH

Color Position	B/Y	B/Y
OFF		
ON		

OIL PRESSURE SWITCH

Color Position	G/Y	Ground
ON (engine is stopped)		
OFF (engine is running)		

NOTE:

Before inspecting the oil pressure switch, check if the engine oil level is enough. (☞ 2-8)

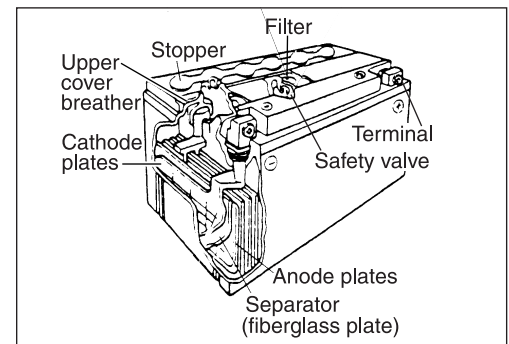
WIRE COLOR

B : Black Lbl : Light blue R : Red
 Br : Brown Lg : Light green Y : Yellow
 Gr : Gray O : Orange W : White

B/Bl : Black with Blue tracer
 B/W : Black with White tracer
 B/Y : Black with Yellow tracer
 B/R : Black with Red tracer
 G/Y : Green with Yellow tracer
 O/B : Orange with Black tracer
 O/Bl : Orange with Blue tracer
 O/R : Orange with Red tracer
 O/W : Orange with White tracer
 O/Y : Orange with Yellow tracer
 Y/G : Yellow with Green tracer
 Y/W : Yellow with White tracer

BATTERY SPECIFICATIONS

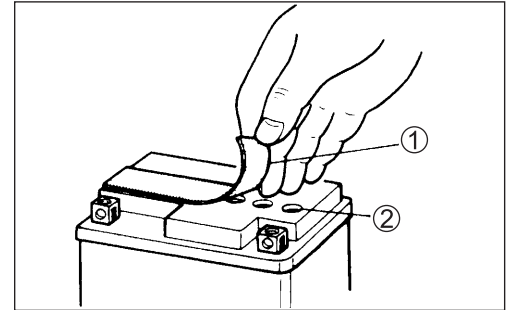
Type designation	FTX12-BS
Capacity	12V, 36 kC (10 Ah)/10HR



INITIAL CHARGING

FILLING ELECTROLYTE

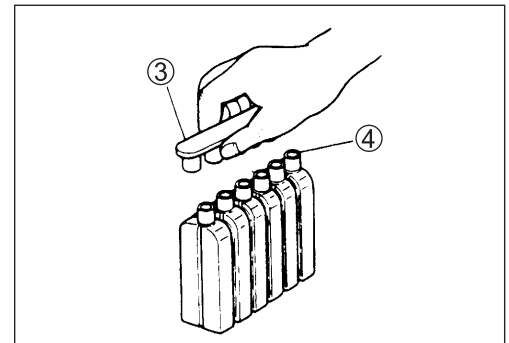
- Remove the aluminum tape ① which seals the battery filler holes ②.



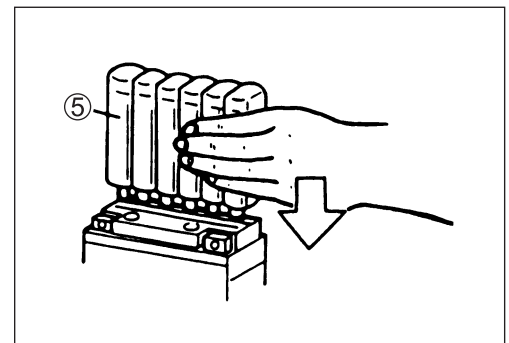
- Remove the caps ③ from the electrolyte container.

NOTE:

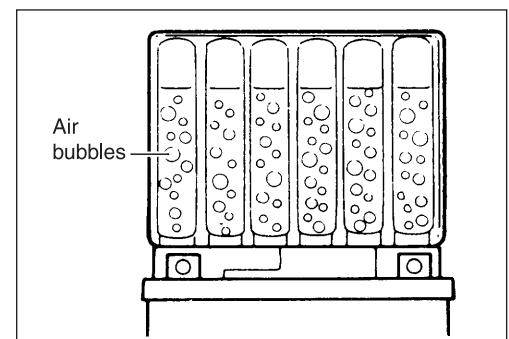
- * Do not remove or pierce the sealed areas ④ of the electrolyte container.
- * After completely filling the battery with electrolyte, use the caps ③ from the electrolyte container to seal the battery filler holes.



- Insert the nozzles of the electrolyte container ⑤ into the electrolyte filler holes of the battery. Hold the electrolyte container firmly so that it does not fall. Do not allow any of the electrolyte to spill.



- Make sure the air bubbles rise to the top of each electrolyte container and leave the electrolyte container in this position for more than 20 minutes.



NOTE:

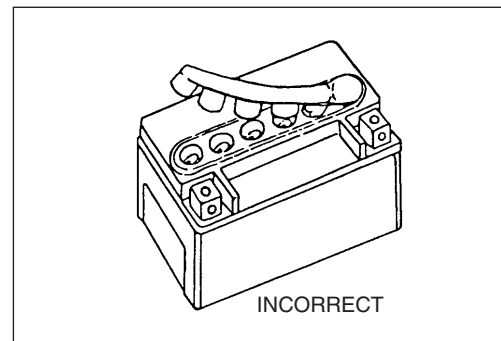
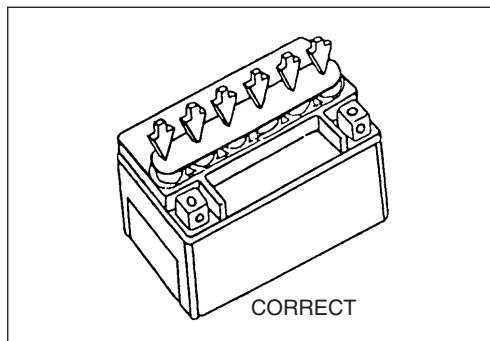
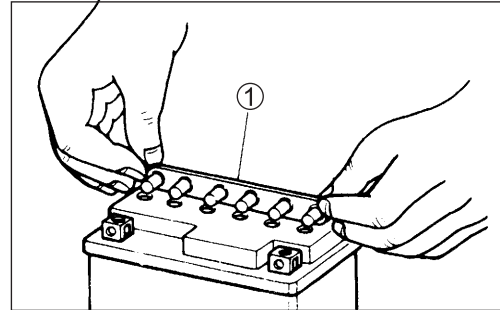
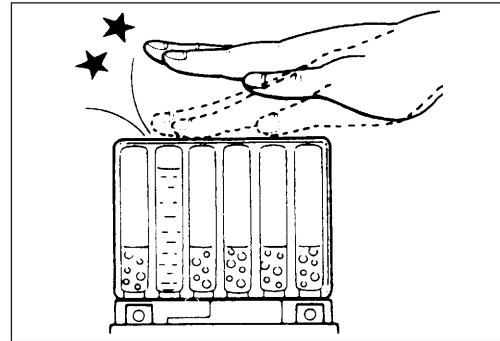
If air bubbles do not rise from any one of the filler ports, tap the bottom of the electrolyte container two or three times.

Never remove the electrolyte container from the battery while there is still electrolyte in the container.

- After the electrolyte container is completely empty, remove it from the battery and wait about 20 minutes.
- Insert the caps ① firmly into the filler holes, so that the top of the caps do not protrude above the upper surface of the top cover of the battery.

CAUTION

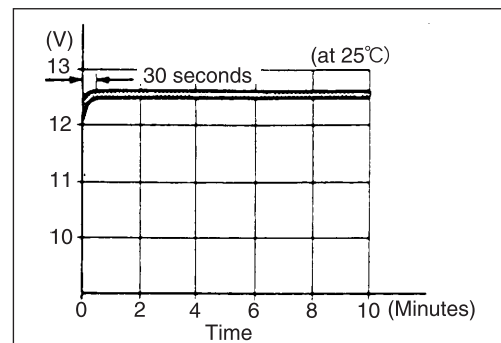
- * Never use anything except the specified battery.
- * Do not remove the caps once they are installed in the battery.
- * Do not tap the caps with a hammer when installing them.



- Measure the battery voltage using multi circuit tester. 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)

CAUTION

Do not remove the caps on the battery top while charging.

**NOTE:**

Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.

SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, clean the battery terminals with sandpaper.

RECHARGING OPERATION

- Measure the battery voltage using the multi circuit tester. If the voltage reading is less than the 12.0V (DC), recharge the battery with a battery charger.

▲ CAUTION

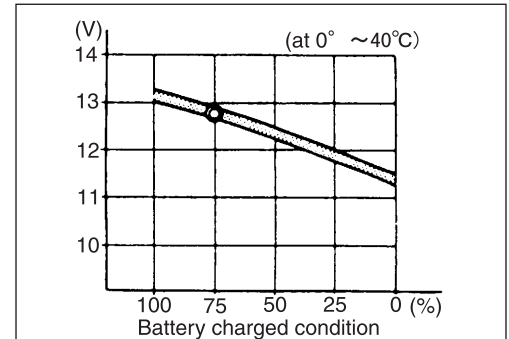
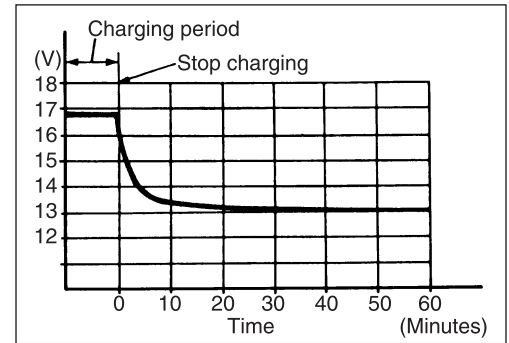
- * When recharging the battery, remove the battery from the motorcycle.
- * Do not remove the caps on the battery top while recharging.

Recharging time: 1.2A for 5 to 10 hours or 5A for one hour

▲ CAUTION

Be careful not to permit the charging current to exceed 5A at any time.

- After recharging, wait at least 30 minutes and then measure the battery voltage using the multi circuit tester. If the battery voltage is less than 12.5V, recharge the battery again. If battery voltage is still less than 12.5V after recharging, replace the battery with a new one. When a battery is left unused for a long time, its voltage needs to be regularly measured. When the motorcycle is not used for more than one month (especially during the winter season), measure the battery voltage at least once a month.



SERVICING INFORMATION

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TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start.	<p>Compression too low</p> <ol style="list-style-type: none"> 1. Worn cylinder. 2. Worn piston ring. 3. Worn valve guide or improper valve seating. 4. Loose spark plug. 5. Broken, cracked, or damaged piston. 6. Slow cranking starter motor. 7. Mistimed valves. 8. Valve clearance out of adjustment. <p>Spark plug not sparking</p> <ol style="list-style-type: none"> 1. Damaged spark plug. 2. Damaged spark plug cap. 3. Fouled spark plug. 4. Wet spark plug. 5. Defective ignition coil. 6. Open or short in high-tension cord. 7. Defective pick-up coil or ignitor unit. <p>No fuel reaching the carburetor</p> <ol style="list-style-type: none"> 1. Clogged hole in the fuel tank cap. 2. Defective fuel pump. 3. Clogged or defective fuel valve. 4. Defective carburetor needle valve. 5. Clogged fuel hose. 6. Clogged fuel filter. 	<p>Replace. Replace. Repair or replace. Tighten. Replace. See electrical section. Adjust. Adjust.</p> <p>Replace. Replace. Clean or replace. Clean and dry or replace. Replace. Replace. Replace.</p> <p>Clean or replace. Replace. Clean or replace. Replace. Clean or replace. Clean or replace.</p>
Engine stalls easily.	<ol style="list-style-type: none"> 1. Fouled spark plug. 2. Defective signal coil or ignitor unit. 3. Defective fuel pump. 4. Clogged or defective fuel valve. 5. Clogged carburetor jet. 6. Valve clearance out of adjustment. 	<p>Clean or replace. Replace. Replace. Clean or replace. Clean. Adjust.</p>

Complaint	Symptom and possible causes	Remedy
Engine is noisy.	<p>Excessive valve chatter</p> <ol style="list-style-type: none"> 1. Excessive valve clearance. 2. Weak or broken valve spring. 3. Worn camshaft. 4. Worn or burnt camshaft journal. <p>Noise seems to come from the piston</p> <ol style="list-style-type: none"> 1. Worn piston. 2. Worn cylinder. 3. Carbon buildup in combustion chamber. 4. Worn piston pin or piston pin bore. 5. Worn piston ring or ring groove. <p>Noise seems to come from the cam chain</p> <ol style="list-style-type: none"> 1. Stretched cam chain. 2. Worn cam chain sprocket. 3. Improperly working cam chain tensioner. <p>Noise seems to come from the clutch</p> <ol style="list-style-type: none"> 1. Worn countershaft spline. 2. Worn clutch hub spline. 3. Worn clutch plate teeth. 4. Distorted clutch plate. 5. Weak clutch damper. 6. Weak clutch spring. <p>Noise seems to come from the crankshaft</p> <ol style="list-style-type: none"> 1. Rattling bearing. 2. Worn or burnt crank pin bearing. 3. Worn or burnt journal bearing. 4. Excessive thrust clearance. <p>Noise seems to come from the transmission</p> <ol style="list-style-type: none"> 1. Worn or rubbing gear. 2. Worn countershaft spline. 3. Worn driveshaft spline. 4. Worn or rubbing primary gear. 5. Worn bearing. 	<p>Adjust. Replace. Replace. Replace.</p> <p>Replace. Replace. Clean. Replace. Replace.</p> <p>Replace cam chain and sprockets. Replace cam chain and sprockets. Repair or replace.</p> <p>Replace countershaft. Replace clutch hub. Replace clutch plate. Replace. Replace primary driven gear. Replace.</p> <p>Replace. Replace. Replace. Replace thrust bearing.</p> <p>Replace. Replace countershaft. Replace driveshaft. Replace. Replace.</p>
Clutch drags.	<ol style="list-style-type: none"> 1. Clutch out of adjustment. 2. Clutch release screw out of adjustment. 3. Some clutch springs are weak, while others are not. 4. Worn or distorted clutch pressure plate. 5. Distorted clutch plate. 	<p>Adjust. Adjust. Replace. Replace. Replace.</p>
Transmission will not shift.	<ol style="list-style-type: none"> 1. Broken gearshift cam. 2. Distorted gearshift fork. 3. Worn gearshift pawl. 	<p>Replace. Replace. Replace.</p>
Transmission will not shift back.	<ol style="list-style-type: none"> 1. Broken gearshift shaft return spring. 2. Rubbing or stuck gearshift shaft. 3. Worn or distorted gearshift fork. 	<p>Replace. Repair or replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
Transmission jumps out of gear.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<p>Clean. Check level and add. Replace. Clean. Adjust float height. Tighten or replace. Change.</p>

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Starting difficulty.	<ol style="list-style-type: none"> 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. 	<p>Clean. Clean. Tighten or replace defective part. Adjust.</p>
Idling or low-speed trouble.	<ol style="list-style-type: none"> 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. 	<p>Clean or tighten. Clean or tighten. Tighten or replace defective part. Clean. Clean. Adjust.</p>
Medium or high-speed trouble.	<ol style="list-style-type: none"> 1. Clogged main jet. 2. Clogged main air jet. 3. Clogged needle jet. 4. Improperly working throttle valve. 5. Clogged fuel filter. 	<p>Clean. Clean. Clean. Adjust. Clean or replace.</p>
Overflow and fuel level fluctuations.	<ol style="list-style-type: none"> 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. 	<p>Replace. Replace. Adjust or replace. Clean or replace with needle valve seat. Adjust float height.</p>

SHAFT DRIVE

Complaint	Symptom and possible causes	Remedy
Noisy shaft drive.	<p>Noise seems to come from secondary bevel gear and final bevel gear assemblies.</p> <ol style="list-style-type: none"> 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. 	<p>Refill. (Check oil jet/replace oil seal) Replace. Adjust. Adjust. Replace.</p>
	<p>Noise seems to come from propeller shaft area.</p> <ol style="list-style-type: none"> 1. Propeller shaft universal joint damaged. 2. Propeller shaft splines damaged or worn. 3. Insufficient lubricant. 4. Cam dog contacting surface damaged or worn. 	<p>Replace. Replace. Refill. (Replace oil seal) Replace.</p>

CHASSIS

Complaint	Symptom and possible causes	Remedy
Steering is heavy.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Weak spring. 2. Insufficient fork oil. 	Replace. Check level and add.
Front suspension too stiff.	<ol style="list-style-type: none"> 1. Excessively viscous fork oil. 2. Excessive fork oil. 	Replace. Check level and drain.
Front suspension too noisy.	<ol style="list-style-type: none"> 1. Insufficient fork oil. 2. Loose front suspension fastener. 	Check level and add. Tighten.
Rear wheel wobbles.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Weak rear shock absorber spring. 2. Rear shock absorber leaks oil. 3. Improper suspension setting. 	Replace. Replace. Adjust.
Rear suspension too stiff.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Loose connection joint. 2. Cracked hose. 3. Worn piston seal. 4. Worn secondary cup. 	Tighten. Replace. Replace. Replace.
Brake drags.	<ol style="list-style-type: none"> 1. Rusty part. 2. Insufficient brake lever or brake pedal pivot lubrication. 	Clean and lubricate. Lubricate.

ELECTRICAL

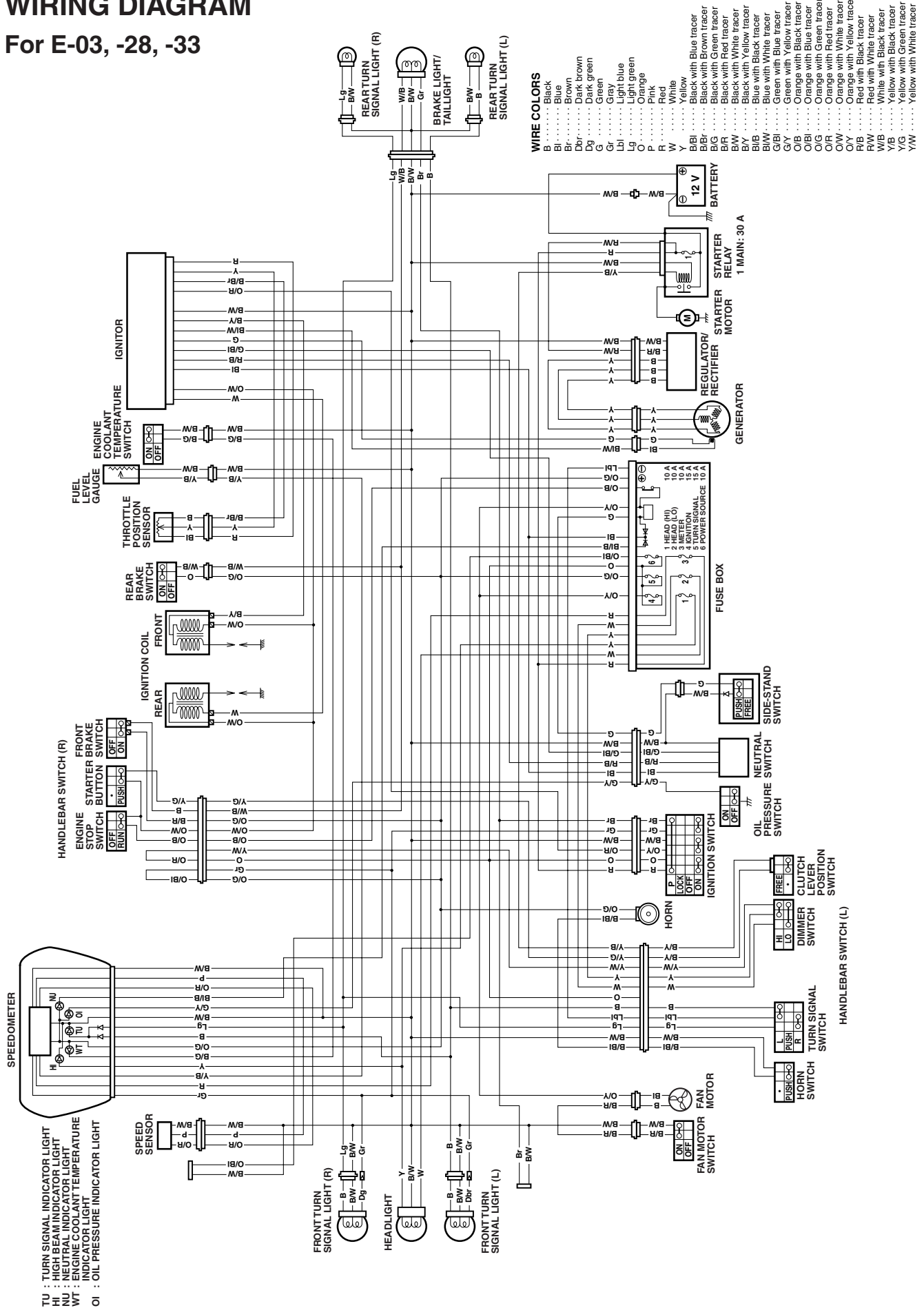
Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> 1. Defective ignition coil. 2. Defective spark plug. 3. Defective pick-up coil. 4. Defective ignitor unit. 	Replace. Replace. Replace. Replace.
Spark plug is wet or quickly becomes fouled with carbon.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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

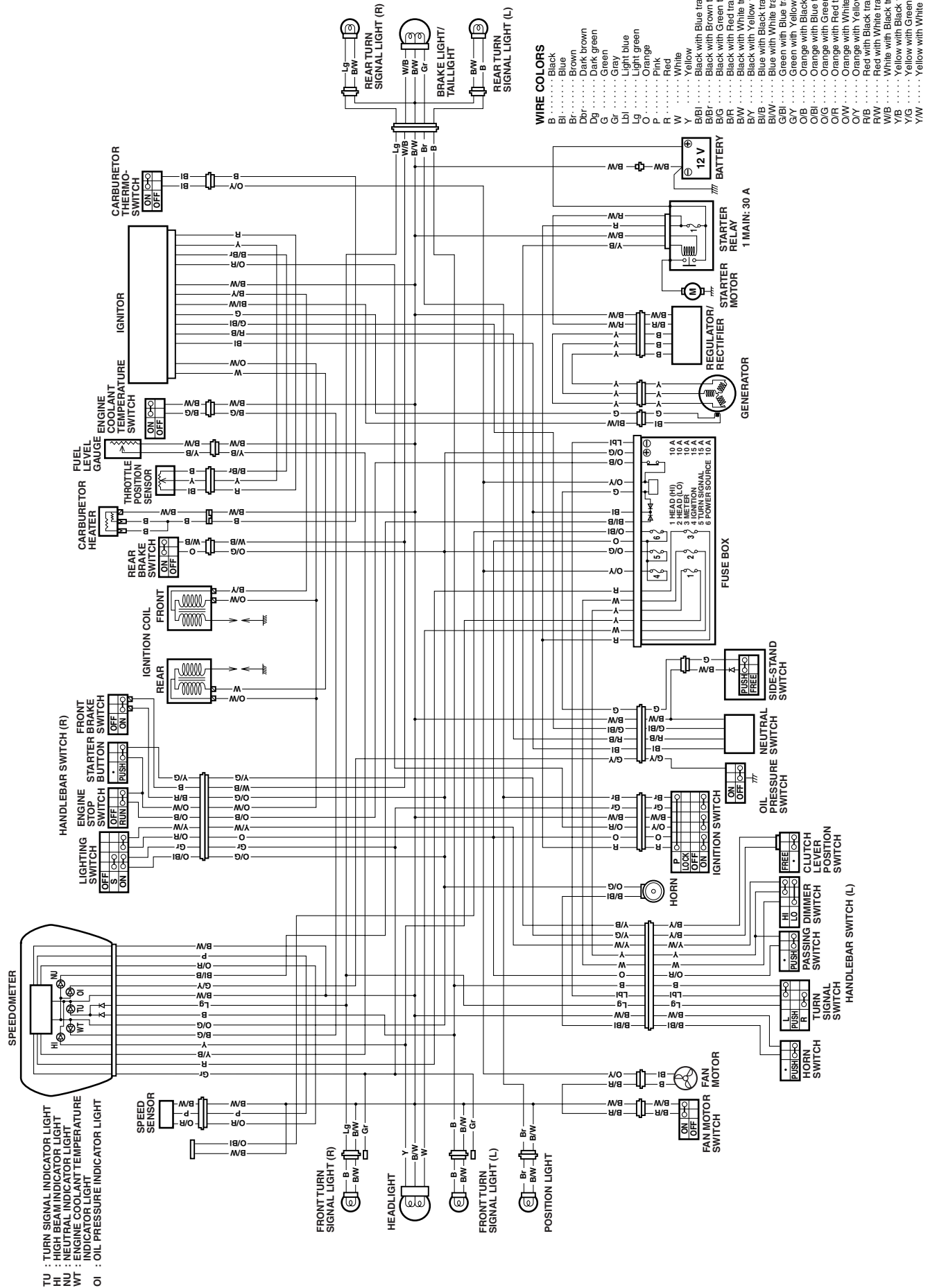
Complaint	Symptom and possible causes	Remedy
Sulfation or spots on surfaces of cell plates.	<ol style="list-style-type: none"> 1. Cracked battery case. 2. Battery has been left in a run-down condition for a long time. 	<p>Replace. Replace.</p>
Battery runs down quickly.	<ol style="list-style-type: none"> 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. 	<p>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.</p>
Battery sulfation.	<ol style="list-style-type: none"> 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. 	<p>Replace. Replace the battery if badly sulfated.</p>

WIRING DIAGRAM

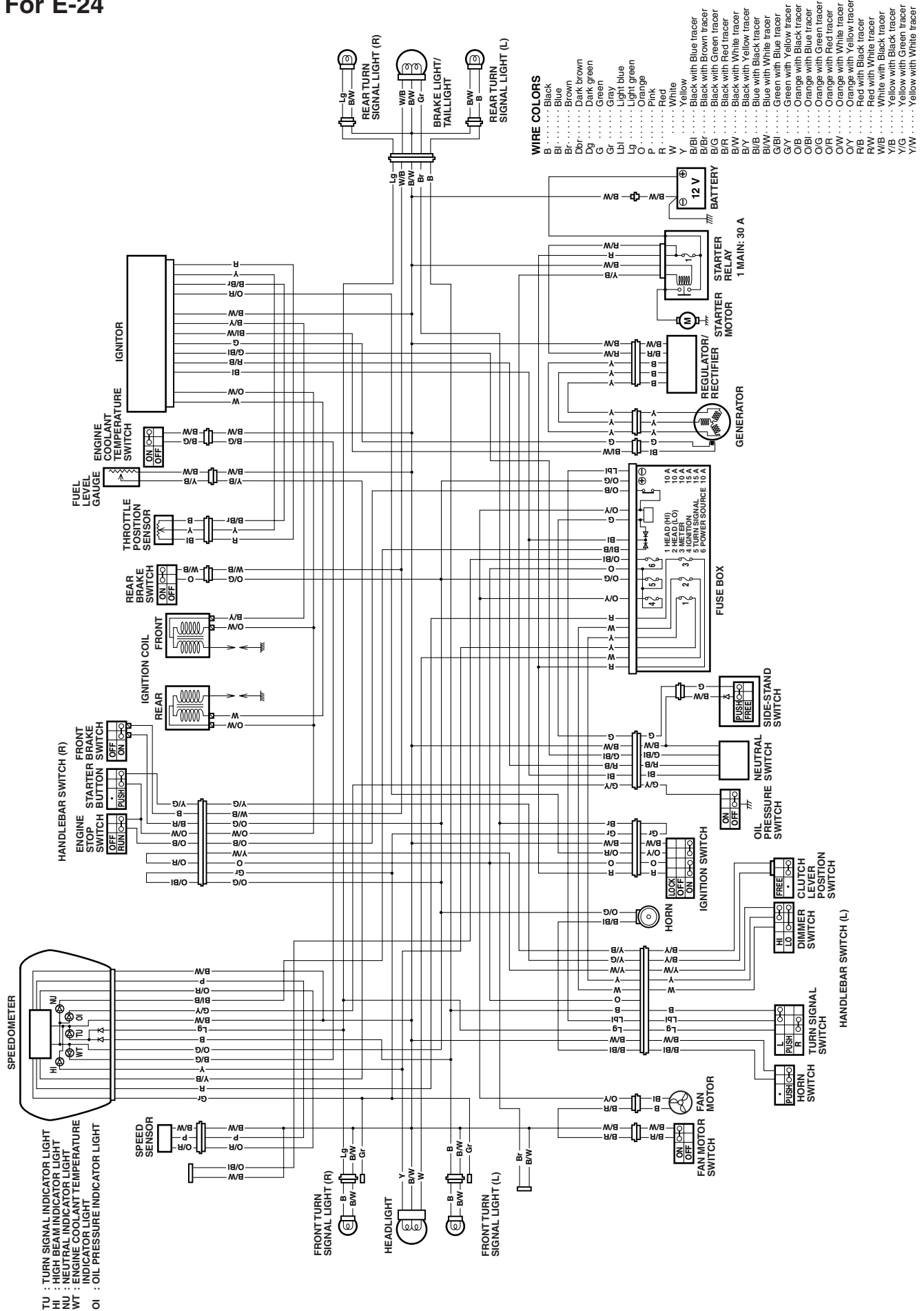
For E-03, -28, -33



For E-02, -19

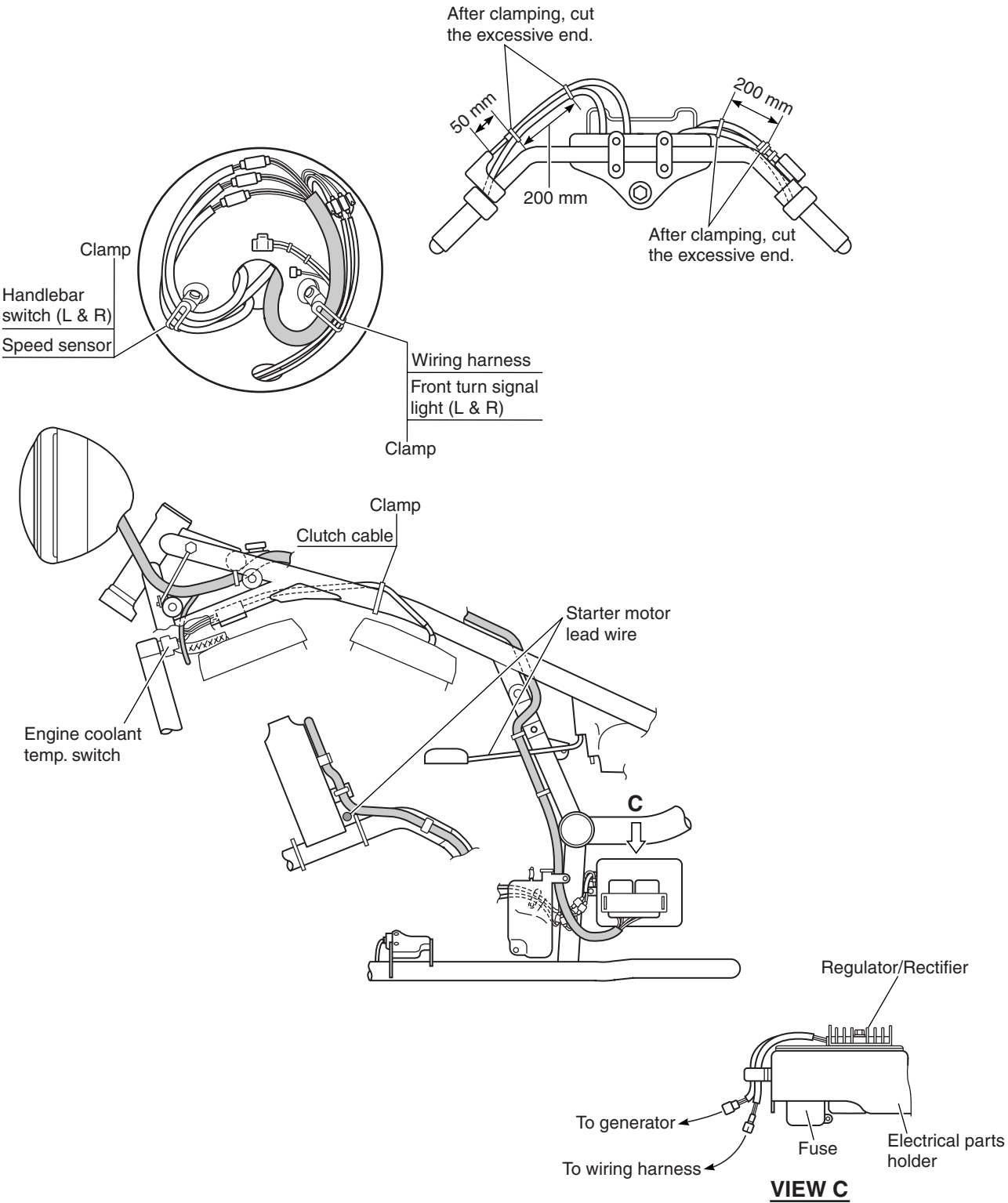


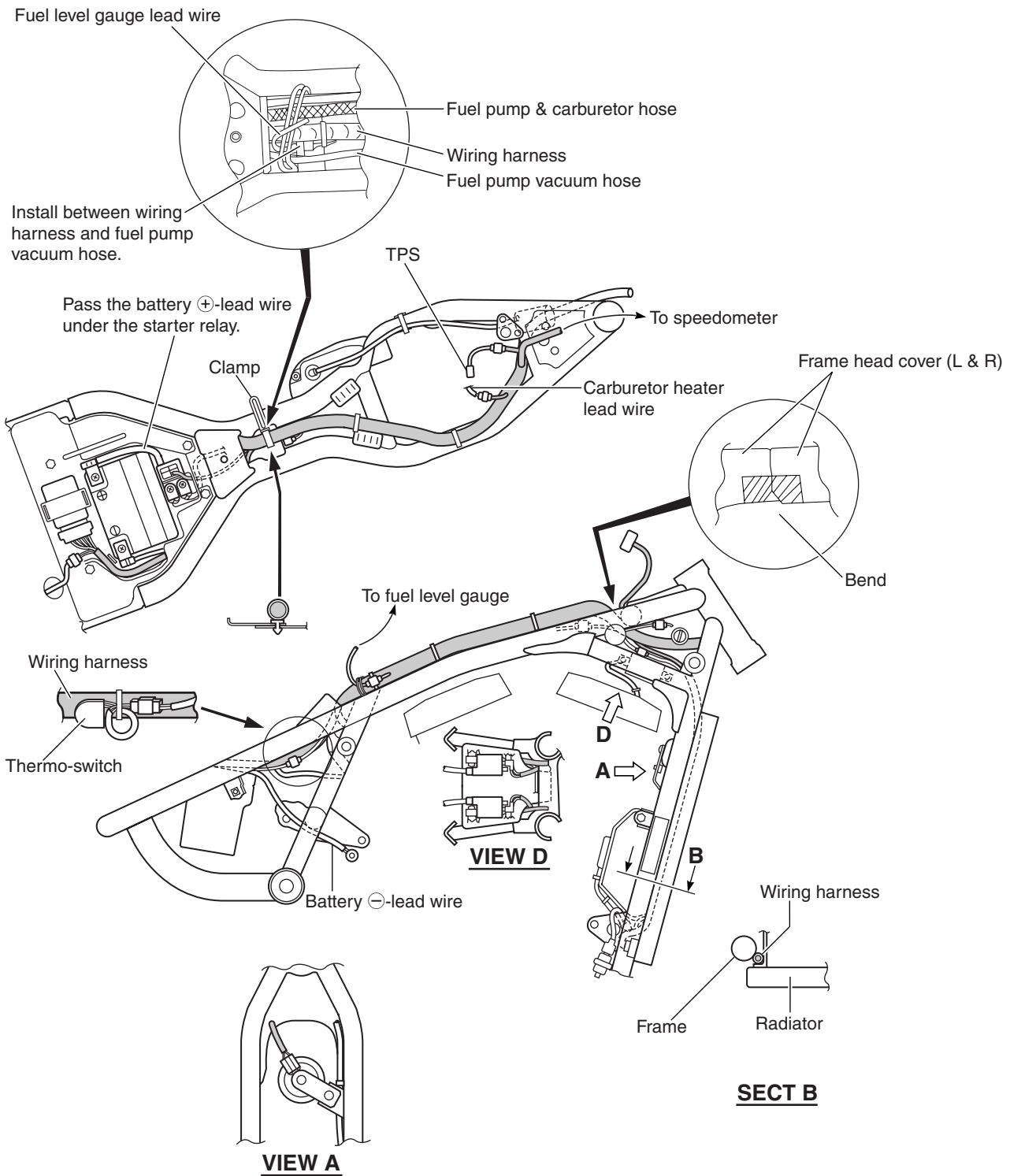
For E-24

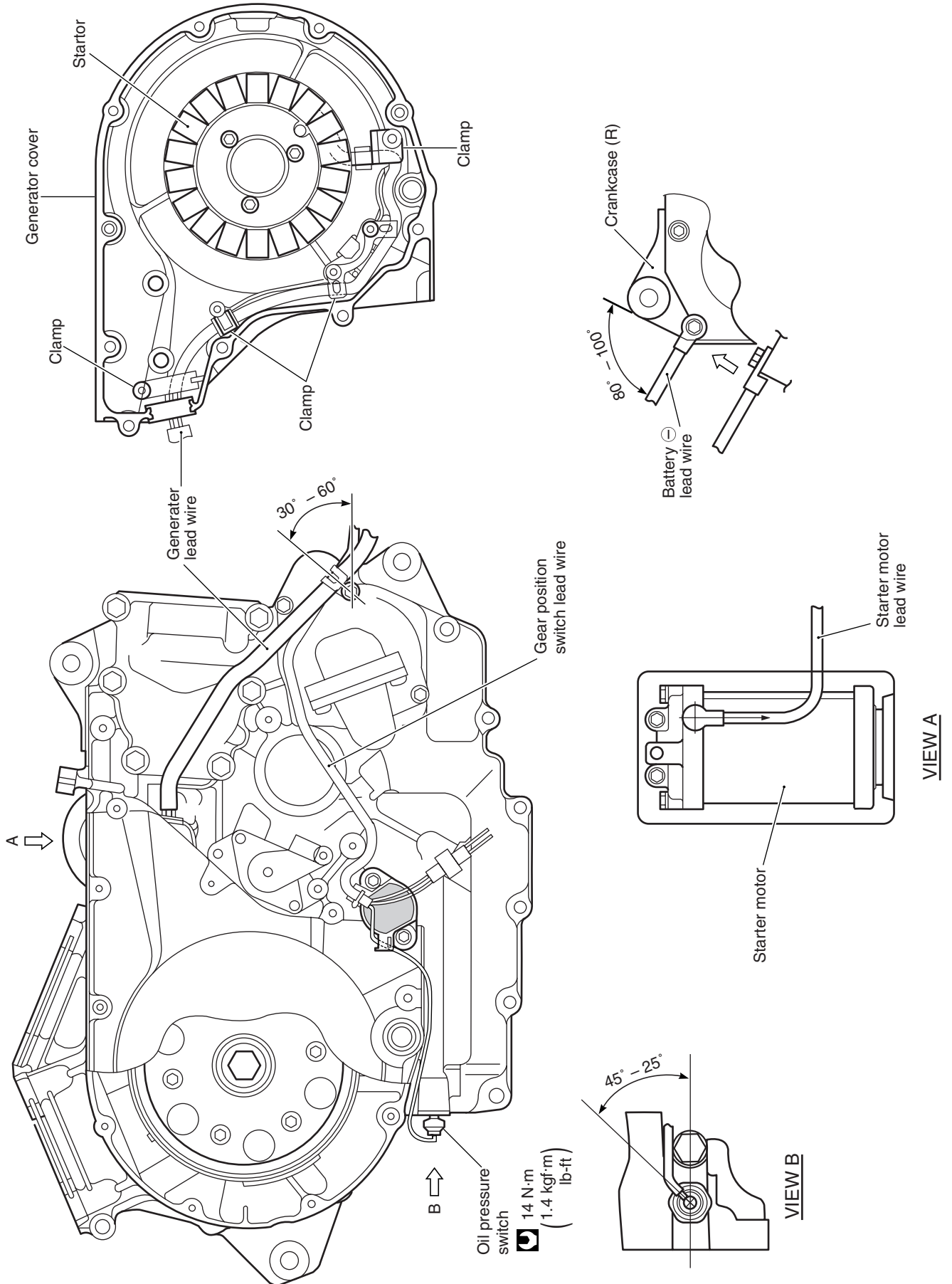


WIRE HARNESS, CABLE AND HOSE ROUTING

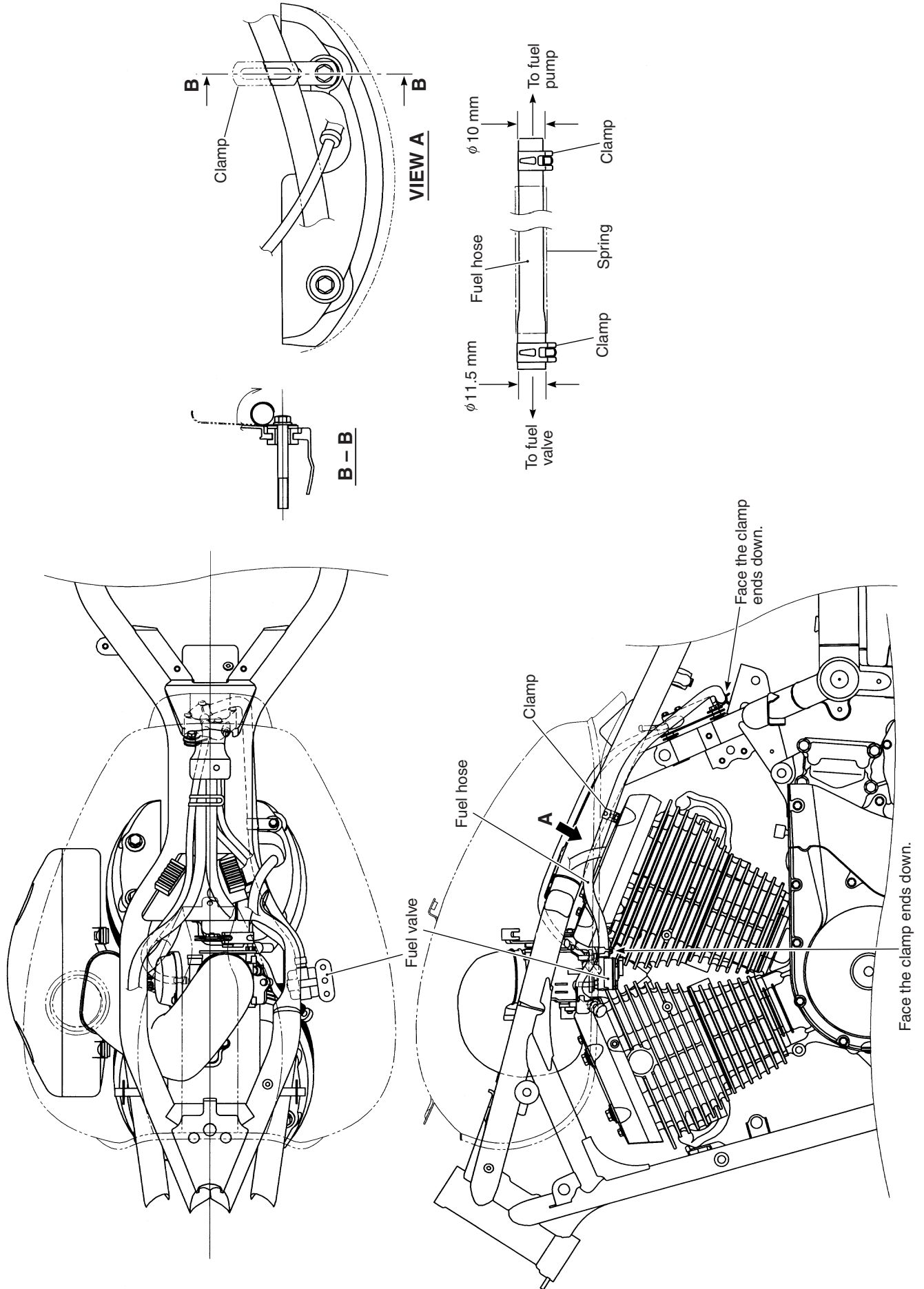
WIRE HARNESS ROUTING



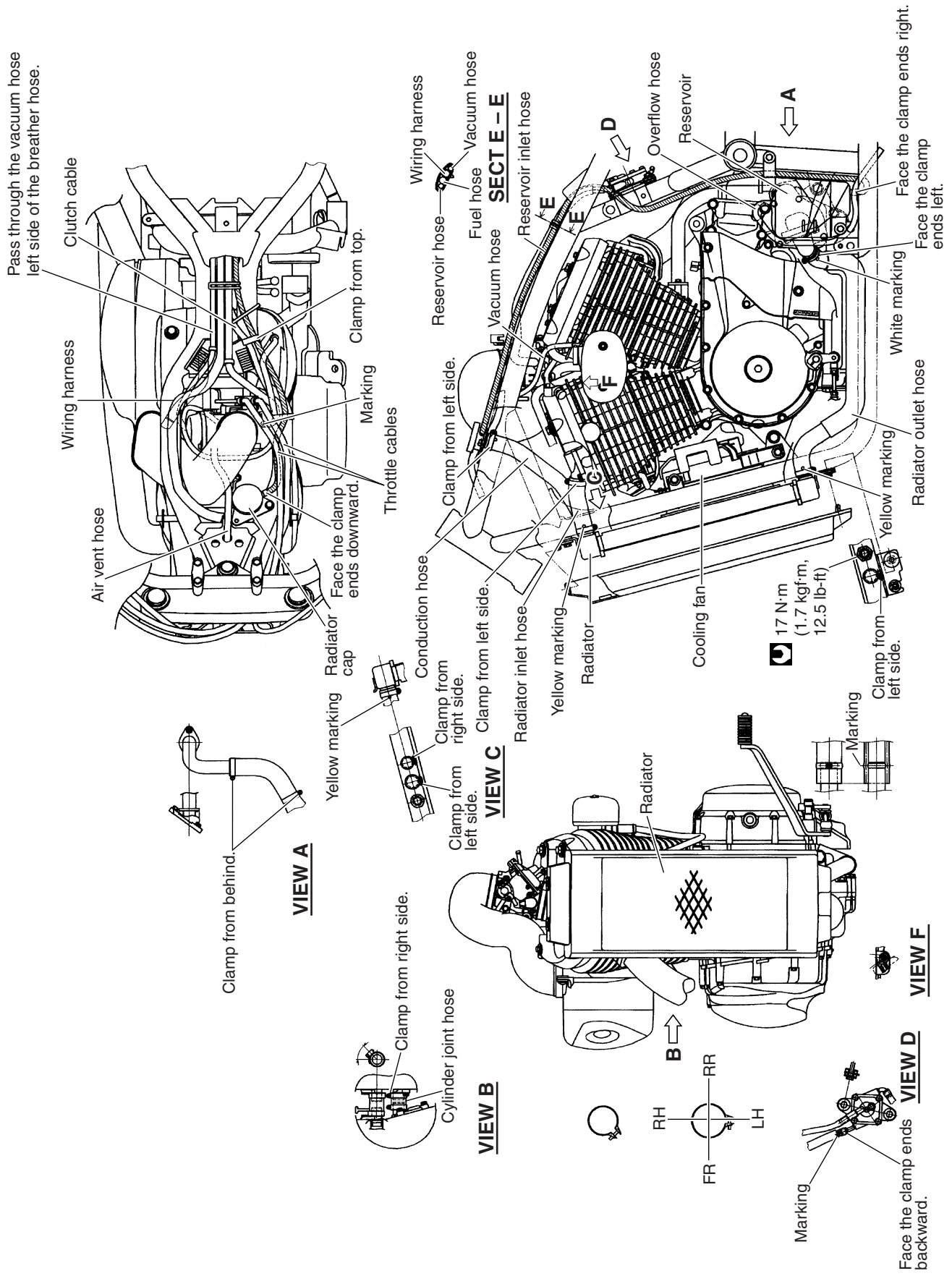




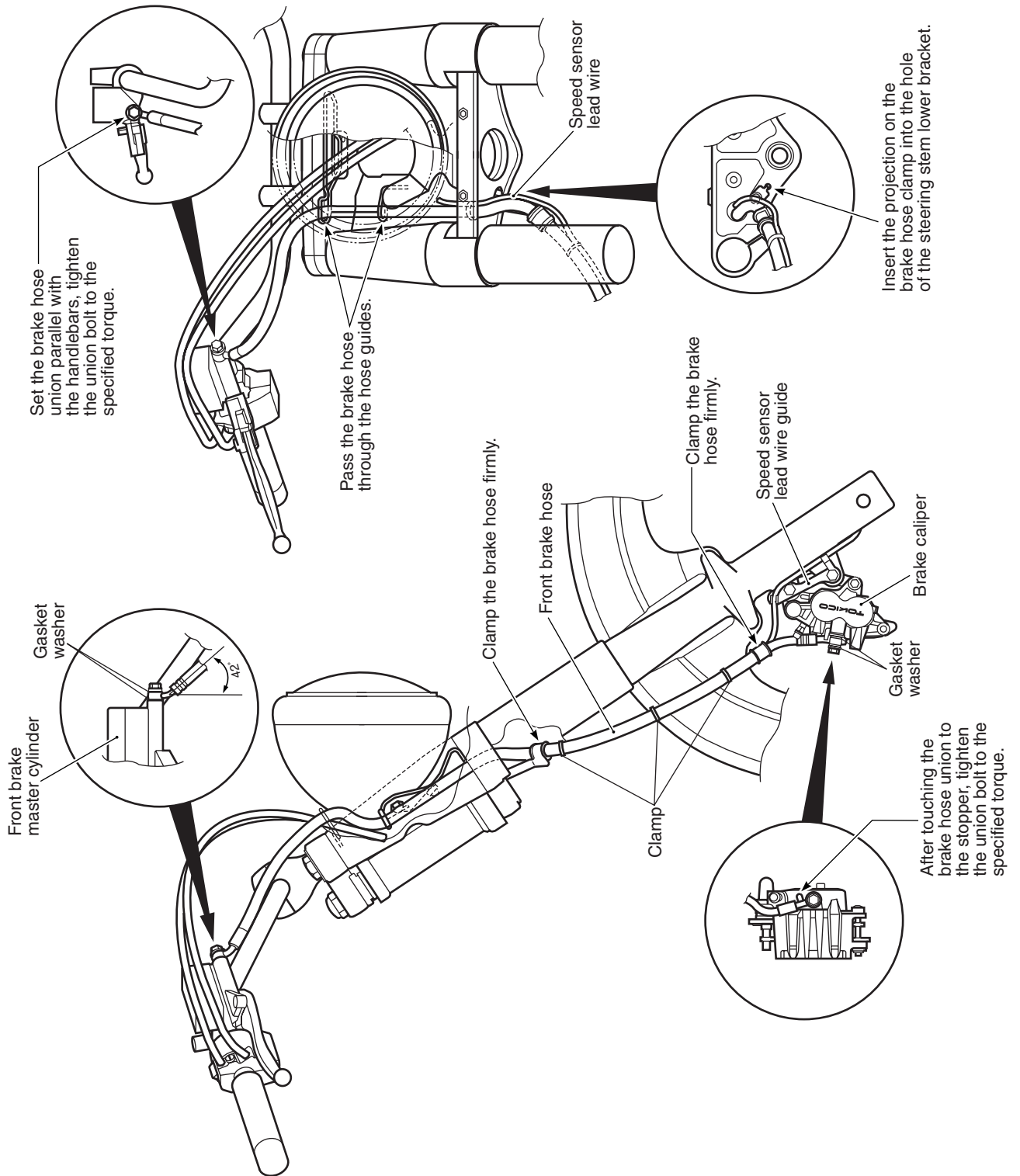
FUEL HOSE ROUTING



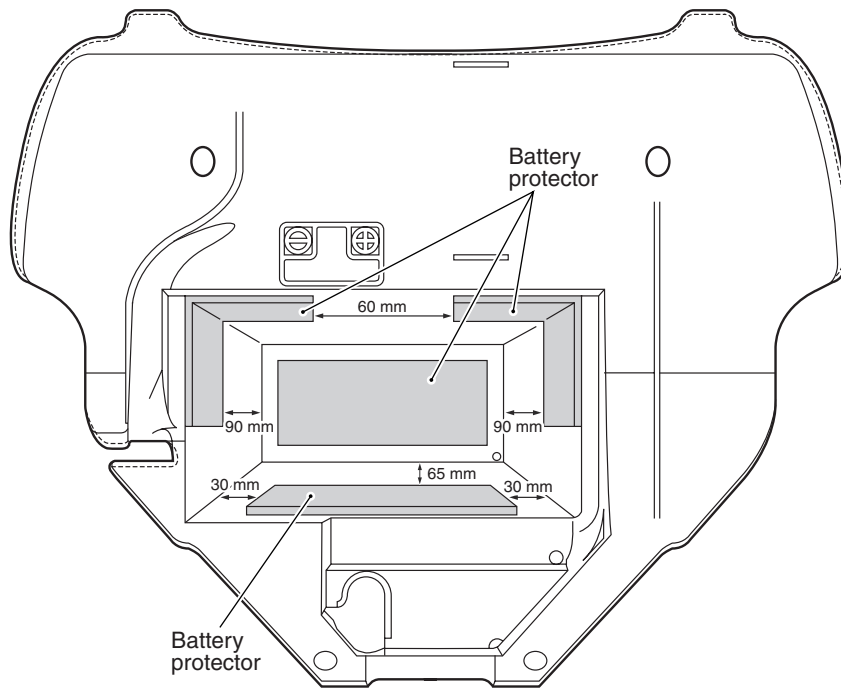
COOLING HOSE ROUTING



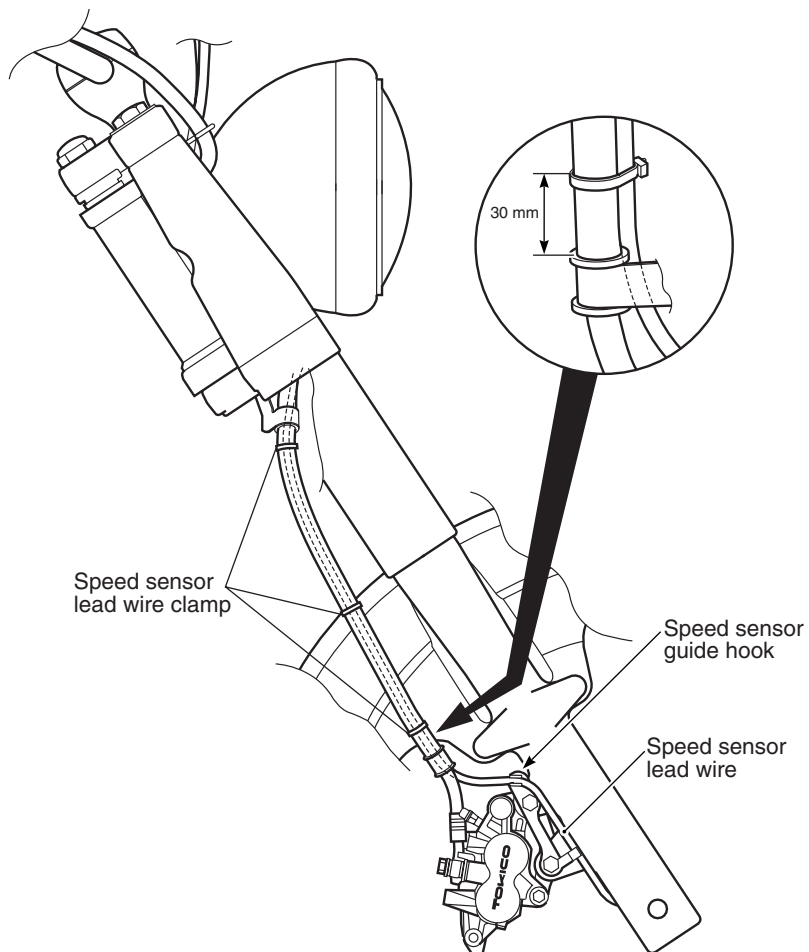
FRONT BRAKE HOSE ROUTING



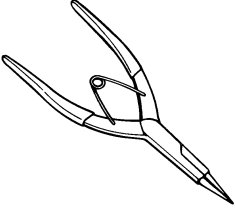
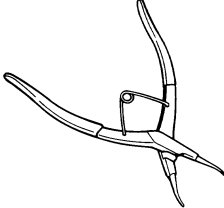
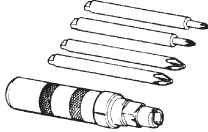
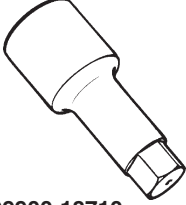
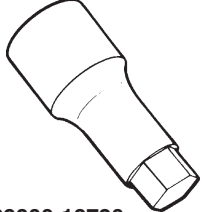
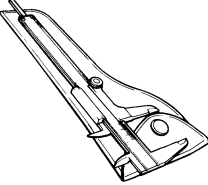
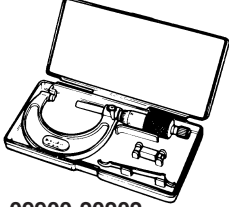
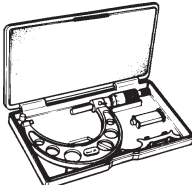
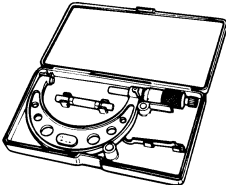

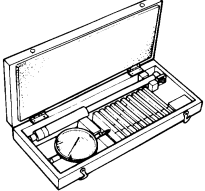
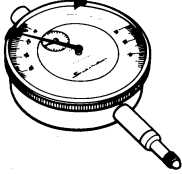
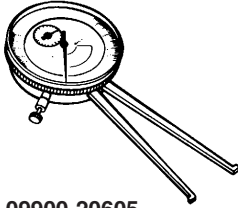
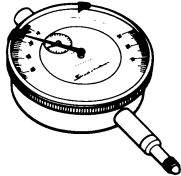
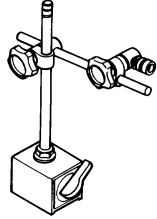
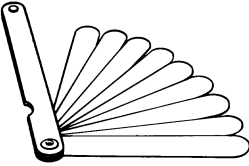
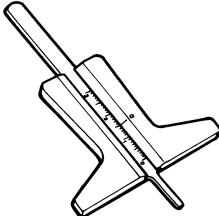
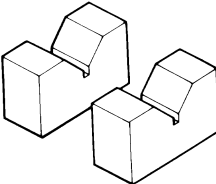
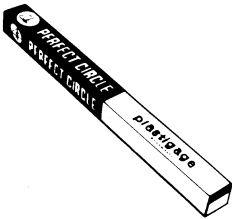
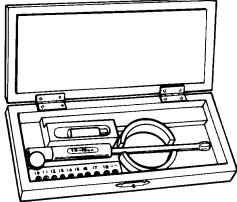
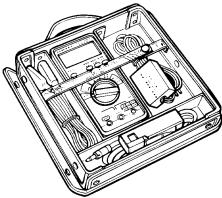
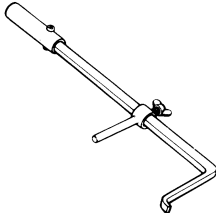
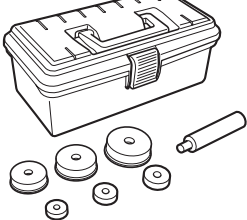
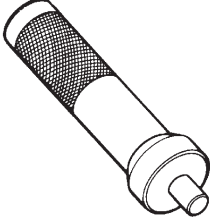
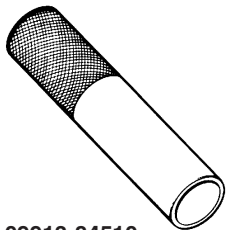
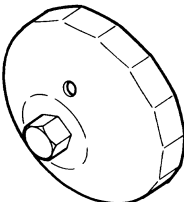
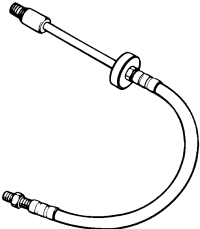
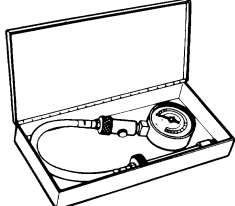
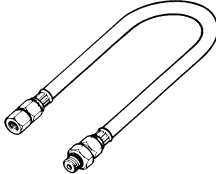
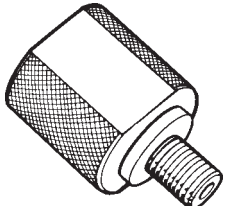
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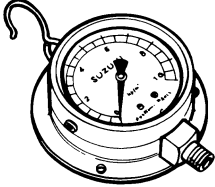
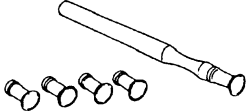
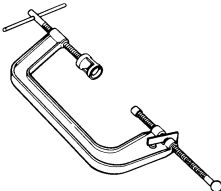
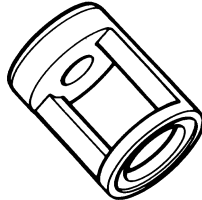
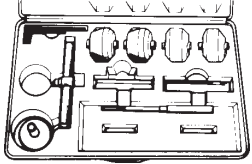
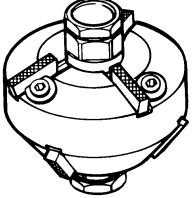




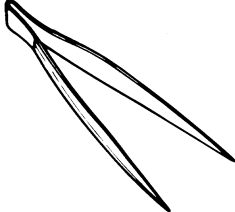
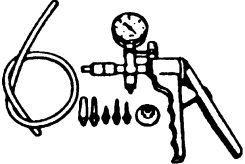
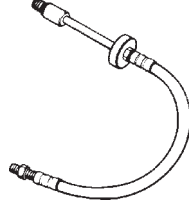

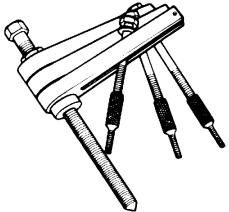
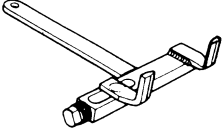
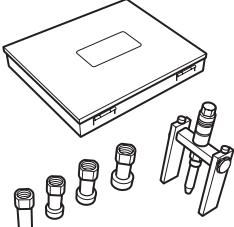
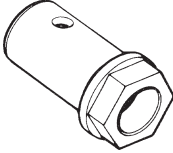
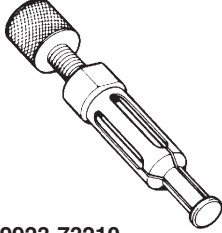
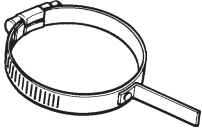
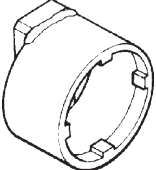
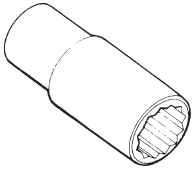
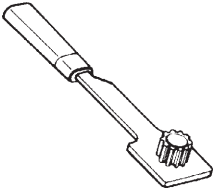
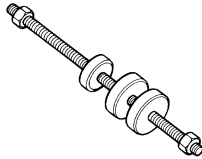
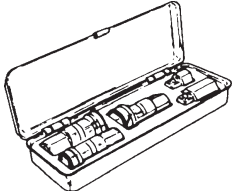
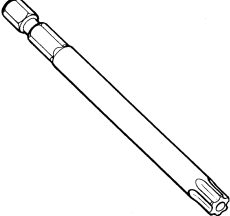
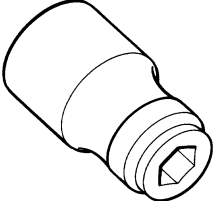
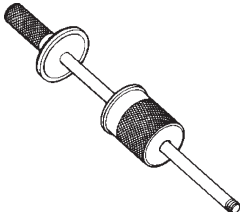
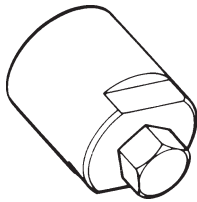
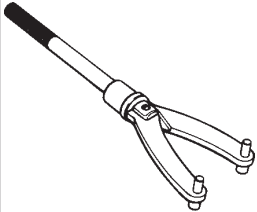


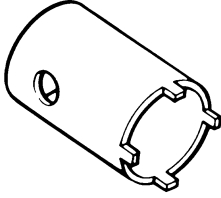
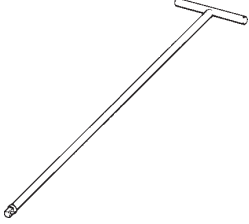
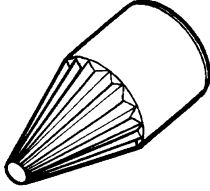
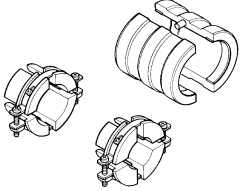
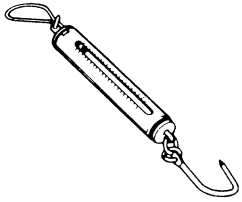
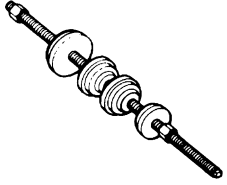
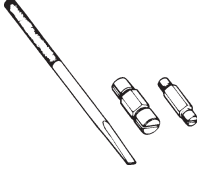
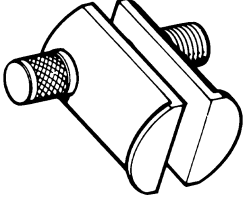



SPEED SENSOR LEAD WIRE ROUTING



SPECIAL TOOLS

 <p>09900-06107 Snap ring pliers</p>	 <p>09900-06108 Snap ring pliers</p>	 <p>09900-09004 Impact driver set</p>	 <p>09900-18710 Hexagon socket (12 mm)</p>	 <p>09900-18720 Hexagon socket (14 mm)</p>
 <p>09900-20102 Vernier calipers (200 mm)</p>	 <p>09900-20202 Micrometer (25 - 50 mm)</p>	 <p>09900-20203 Micrometer (50 - 75 mm)</p>	 <p>09900-20204 Micrometer (75 - 100 mm)</p>	 <p>09900-20205 Micrometer (0 - 25 mm)</p>
 <p>09900-20508 Cylinder gauge set</p>	 <p>09900-20602 Dial gauge (1/1000 mm, 1 mm)</p>	 <p>09900-20605 Dial calipers (10 - 34 mm)</p>	 <p>09900-20606 Dial gauge (1/100, mm, 10 mm)</p>	 <p>09900-20701 Magnetic stand</p>
 <p>09900-20803 Thickness gauge</p>	 <p>09900-20805 Tire depth gauge</p>	 <p>09900-21304 V-block (100 mm)</p>	 <p>09900-22302 Plastigauge</p>	 <p>09900-22403 Small bore gauge (18 - 35 mm)</p>
 <p>09900-25008 Multi circuit tester set</p>	 <p>09913-50121 Oil seal remover</p>	 <p>09913-70210 Bearing installer set</p>	 <p>09913-75821 Bearing installer</p>	 <p>09913-84510 Bearing installer</p>
 <p>09915-40610 Oil filter wrench</p>	 <p>09915-63210 Adaptor</p>	 <p>09915-77330 Compression gauge</p>	 <p>09915-74510 Oil pressure gauge hose</p>	 <p>09915-74532 Oil pressure gauge adaptor</p>

 <p>09915-77330 Meter (For high pressure)</p>	 <p>09916-10911 Valve lapper set</p>	 <p>09916-14510 Valve lifter</p>	 <p>09916-14910 Valve lifter attachment</p>	 <p>09916-21111 Valve seat cutter set</p>
 <p>09916-22430 Valve seat cutter (N-128)</p>	 <p>09916-34550 Valve guide reamer (5.5 mm)</p>	 <p>09916-34580 Valve guide reamer (10.8 mm)</p>	 <p>09916-44910 Valve guide remover/installer</p>	 <p>09916-44920 Valve guide installer attachment</p>
 <p>09916-84511 Tweezers</p>	 <p>09917-47010 Vacuum pump gauge</p>	 <p>09918-03810 Compression gauge adaptor</p>	 <p>09918-53810 Chain tensioner lock tool</p>	 <p>09920-13120 Crankcase & Shaft remover</p>
 <p>09920-53740 Clutch sleeve hub holder</p>	 <p>09921-20240 Bearing remover set</p>	 <p>09921-21820 Bearing retainer wrench</p>	 <p>09923-73210 Bearing remover</p>	 <p>09924-34510 Backlash measuring tool (27 - 50)</p>
 <p>09924-62410 Final drive gear bearing holder wrench</p>	 <p>09924-62430 22 mm Long socket</p>	 <p>09924-64510 Final drive gear coupling holder</p>	 <p>09924-84521 Bearing installer</p>	 <p>09930-10121 Spark plug wrench set</p>
 <p>09930-11920 Torx bit JT40H</p>	 <p>09930-11940 Bit holder</p>	 <p>09930-30102 Sliding shaft</p>	 <p>09930-33730 Rotor remover</p>	 <p>09930-40113 Rotor holder</p>

 <p>09940-14911 Steering stem nut wrench</p>	 <p>09940-34520 T handle</p>	 <p>09940-34531 Attachment "A"</p>	 <p>09940-52861 Front fork oil seal installer</p>	 <p>09940-92720 Spring scale</p>
 <p>09941-34513 Steering outer race installer</p>	 <p>09941-50111 Bearing remover set</p>	 <p>09941-54911 Bearing outer race remover</p>	 <p>09941-64511 Bearing remover</p>	 <p>09941-74911 Steering bearing installer</p>
 <p>09943-74111 Front fork oil level gauge</p>				

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		
		8 mm	25	2.5		
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

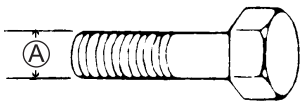
CHASSIS

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

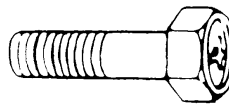
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

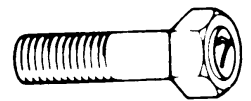
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kgf·m	lb-ft	N·m	kgf·m	lb-ft
4	1.5	0.15	1.0	2.3	0.23	1.5
5	3	0.3	2.0	4.5	0.45	3.0
6	5.5	0.55	4.0	10	1.0	7.0
8	13	1.3	9.5	23	2.3	16.5
10	29	2.9	21.0	50	5.0	36.0
12	45	4.5	32.5	85	8.5	61.5
14	65	6.5	47.0	135	13.5	97.5
16	105	10.5	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. $\frac{9.6}{(0.38)}$	7.7 (0.30)
	2nd	R	Approx. $\frac{11.8}{(0.46)}$
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/cm ² , 50 psi) Below 650 kPa (6.5 kgf/cm ² , 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 thermostwitch 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 k Ω	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 – BI	
		Charging coil	0.2 – 1.5 Ω	Y – Y	
Pickup coil peak voltage		More than 1.5 V		⊕: BI, ⊖: 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	
			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	←	←
	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)		

EMISSION CONTROL INFORMATION

CONTENTS

EMISSION CONTROL CARBURETOR COMPONENTS	10- 2
EVAPORATIVE EMISSION CONTROL SYSTEM	10- 3
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EVAPORATIVE EMISSION CONTROL SYSTEM INSPECTION	10- 4

EMISSION CONTROL CARBURETOR COMPONENTS

VL800 motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

There are several carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard machined carburetor jets. These three (3) particular jets—MAIN JET, NEEDLE JET, PILOT JET—must not be replaced by standard jets. To aid in identifying these three (3) jets a different design of letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type close tolerance jets marked as in the examples shown below.

The jet needle is also of special manufacture. Only one clip position is provided on the jet needle. If replacement becomes necessary the jet needle may only be replaced with an equivalent performing replacement component. Suzuki recommends that Genuine Suzuki Parts be utilized whenever possible for the best possible performance and durability.

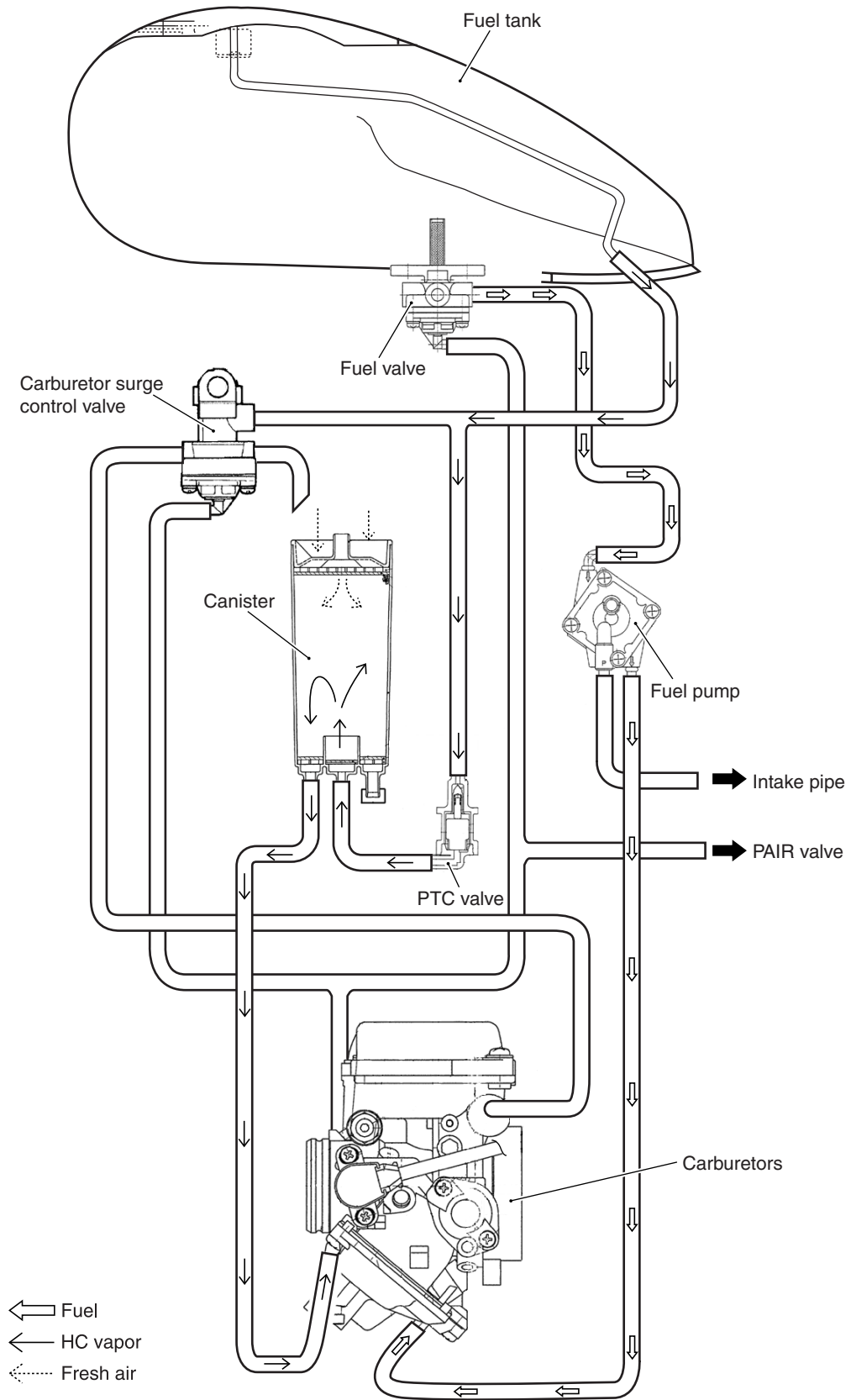
Conventional Figures Used on Standard Tolerance Jet Components

Emission Type Figures Used on Close Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
The carburetor specifications for the emission-controlled VL800 are as follows.	<i>1 2 3 4 5 6 7 8 9 0</i>

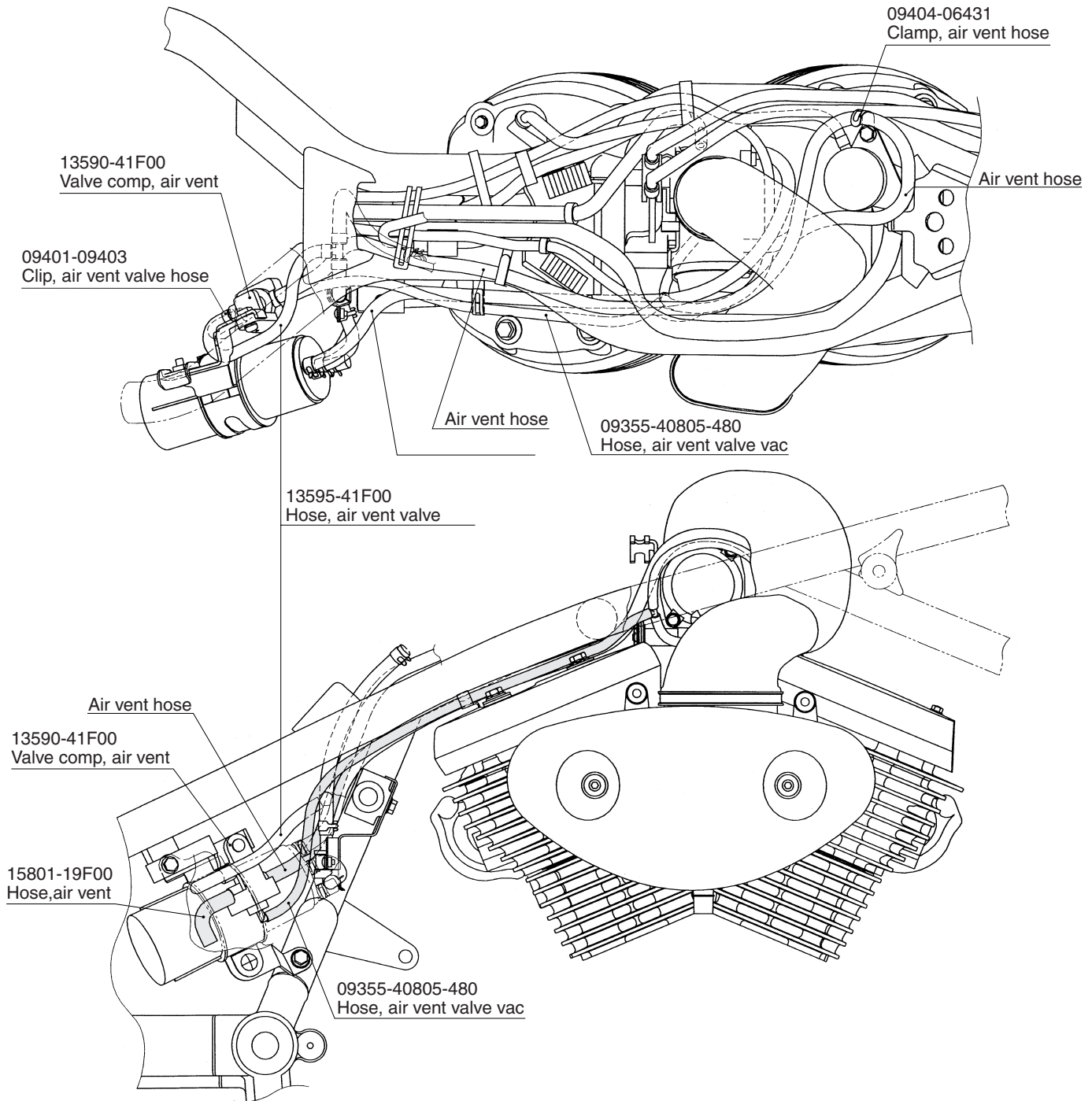
Carburetor I. D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
41F3 (California model only)	# 32.5	<i>P-DM</i>	5E23	# 27.5	PRE-SET DO NOT ADJUST
41F2					

Adjusting, interfering with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If unable to effect repairs, contact the distributors representative for further technical information and assistance.

EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA MODEL ONLY)



CANISTER HOSE ROUTING



EVAPORATIVE EMISSION CONTROL SYSTEM INSPECTION

HOSES

Inspect the hoses and pipes for wear or damage.
Inspect the hoses and pipes for connection.

CANISTER

Inspect the canister for damage of the body.

CARBURETOR SURGE CONTROL VALVE

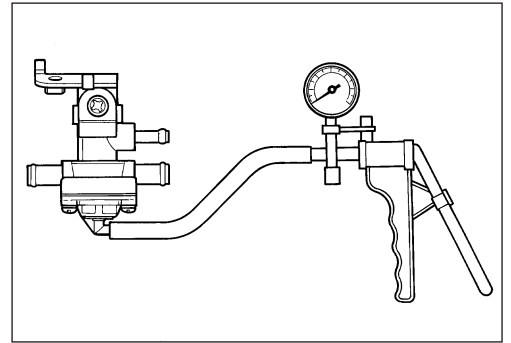
- Remove the carburetor surge control valve.
- Connect the vacuum pump to the vacuum port as shown.
- Apply the specified negative pressure to the carburetor surge control valve.
- The specified negative pressure must be maintained.
- Replace the carburetor surge control valve if negative pressure is not maintained.

DATA Negative pressure: 2.7 kPa (20 mm Hg)

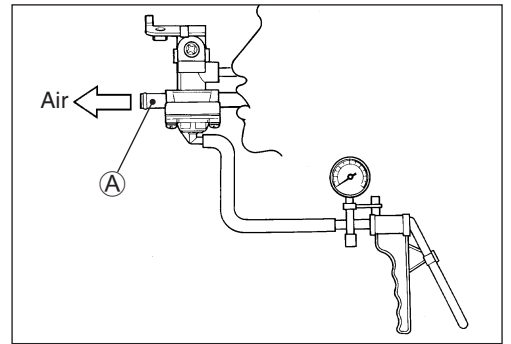
TOOL 09917-47010: Vacuum pump gauge

CAUTION

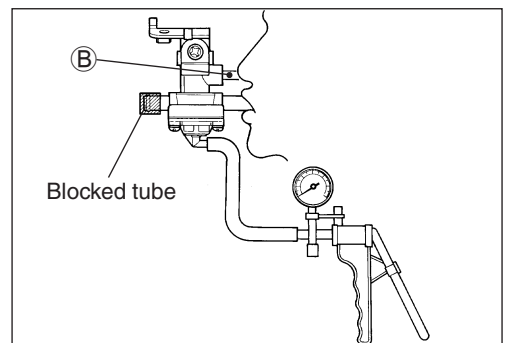
Use a hand operated vacuum pump to prevent the control valve damage.



- While applying the specified negative pressure to the carburetor surge control valve vacuum port, blow air through the open air port.
- Air should flow through the carburetor surge control valve and out the air vent port (A).
- Replace the carburetor surge control valve if air does not flow out air vent port (A).

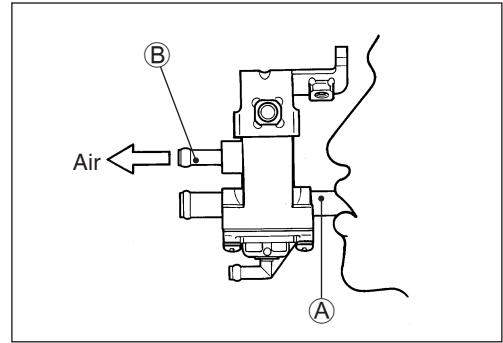


- Plug the air vent port (A).
- While applying the specified negative pressure to the carburetor surge control valve vacuum port, blow air through the open air port.
- Air should not flow through the carburetor surge control valve and out the canister port (B).
- Replace the carburetor surge control valve if air leaks out the canister port (B).

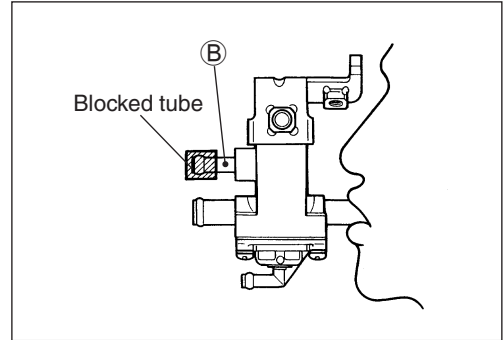


10-6 EMISSION CONTROL INFORMATION

- Remove the vacuum pump and blow air through the air vent port (A).
- Air should flow through the carburetor surge control valve and out the canister port (B).
- Replace the carburetor surge control valve if air does not flow out the canister port (B).



- Plug the canister port (B).
- Air should not flow through the carburetor surge control valve and out the open air port.
- Replace the carburetor surge control valve if air leaks out the open air port.



VL800K2 ('02-MODEL)

CONTENTS

<i>SPECIFICATIONS</i>	<i>11- 2</i>
<i>SERVICE DATA</i>	<i>11- 4</i>

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 510 mm (98.818 in)
Overall width	985 mm (38.779 in)
Overall height	1 110 mm (43.700 in)
Wheelbase	1 650 mm (64.960 in)
Ground clearance	140 mm (5.511 in)
Seat height	700 mm (27.559 in)
Dry mass	239 kg (53.727 lbs)

ENGINE

Type	Four-stroke, Liquid-cooled, OHC
Number of cylinders	2
Bore	83 mm (3.268 in)
Stroke	74.4 mm (2.929 in)
Displacement	805 cm ³ (49.1 cu. in)
Compression ratio	9.4 : 1
Carburetor	BDSR34
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 100 ± 100 r/min

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed, constant mesh
Gearshift pattern	1-down, 4-up
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)
Drive system	Shaft drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Link type, coil spring, oil damped, spring pre-load 7-way adjustable
Steering angle	38° (right & left)
Caster	33° 20'
Trail	141 mm (3.55 in)
Turning radius	3.0 m (9.8 ft)
Front brake	Disc brake
Rear brake	Drum brake
Front tire size	130/90-16 67H, tube or 130/90-16M/C 67H, tube
Rear tire size	170/80-15M/C 77H, tube
Front fork stroke	140 mm (5.5 in)
Rear wheel travel	105 mm (4.1 in)

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	5° B.T.D.C. at 1 110 r/min
Spark plug	NGK: DPR8EA-9 or DENSO: X24EPR-U9
Battery	12 V 36 kC (10 Ah)/10HR
Generator	Three-phase A.C. Generator
Main fuse	30 A
Fuse	15/15/10/10/10/10 A
Headlight	12 V 60/55 W
Position/parking light	12 V 4 W Except for E-03, 24, 28, 33
Front turn signal light	12 V 21 W E-02, 19, 24 12 V 21/5 W E-03, 28, 33
Rear turn signal light	12 V 21 W
Brake light/Taillight	12 V 21/5 W
Speedometer light	LED
Neutral indicator light	LED
High beam indicator light	LED
Turn signal indicator light	LED
Oil pressure light	LED

CAPACITIES

Fuel tank	17.0 L (4.5/3.7 US/lmp gal)
Engine oil, oil change	3 000 ml (3.2/2.6 US/lmp qt)
with filter change	3 400 ml (3.6/3.0 US/lmp qt)
overhaul	3 700 ml (3.9/3.3 US/lmp qt)
Final gear oil	200 – 220 ml (6.8/7.0 – 7.4/7.7 US/lmp qt)
Engine coolant	1 500 ml (1.5/1.3 US/lmp qt)
Front fork oil (each leg)	412 ml (13.9/14.5 US/lmp oz)

These specifications are subject to change without notice.

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. $\frac{9.6}{(0.38)}$	7.7 (0.30)
	2nd	R Approx. $\frac{11.8}{(0.46)}$	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/cm ² , 50 psi) Below 650 kPa (6.5 kgf/cm ² , 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	9 ± 1.0 mm (0.35 ± 0.04 in)	←	←
Float height	7.0 ± 0.5 mm (2.76 ± 0.02 in)	←	←
Main jet (M.J.)	#132.5	#132.5	←
Jet needle (J.N.)	5E22-3rd	5E23	←
Needle jet (N.J.)	P-0M	P-0M	←
Throttle valve (Th.V.)	#95	←	←
Pilot jet (P.J.)	#27.5	#27.5	←
Pilot air jet (P.A.J.)	#55	←	←
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 thermostwitch 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 k Ω	Plug cap – Terminal
Ignition coil primary peak voltage		More than 200 V		#1 \oplus :W, \ominus :Ground #1 \oplus :B/Y, \ominus :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		\oplus : Bl, \ominus : G
Signal coil peak voltage				\oplus : B, \ominus : W
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	
		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	←	←
	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 or 130/90-16M/C 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)		

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