

## FOREWORD

This manual contains an introductory description on the SUZUKI LT-Z250 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 vehicle and its maintenance. Use this section as well as other sections as a guide for proper inspection and service.

This manual will help you know the vehicle 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 vehicle.

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

\* This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI vehicles. 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 vehicle unsafe for the rider.**

## SUZUKI MOTOR CORPORATION

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## **SUPPLEMENTS**

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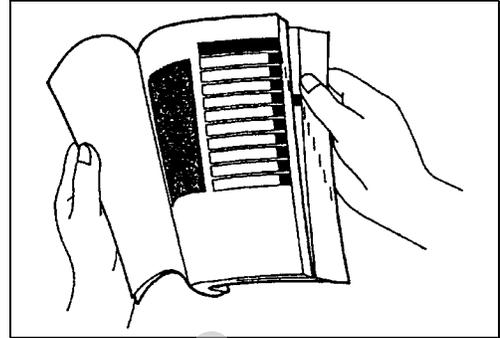
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# HOW TO USE THIS MANUAL

## 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 you find the item and page you need.



## COMPONENT PARTS AND WORK TO BE DONE

Under the name of each system or unit there is an exploded view which provides work instructions and other service information (e.g.; tightening torque, lubricating points and locking agent points).

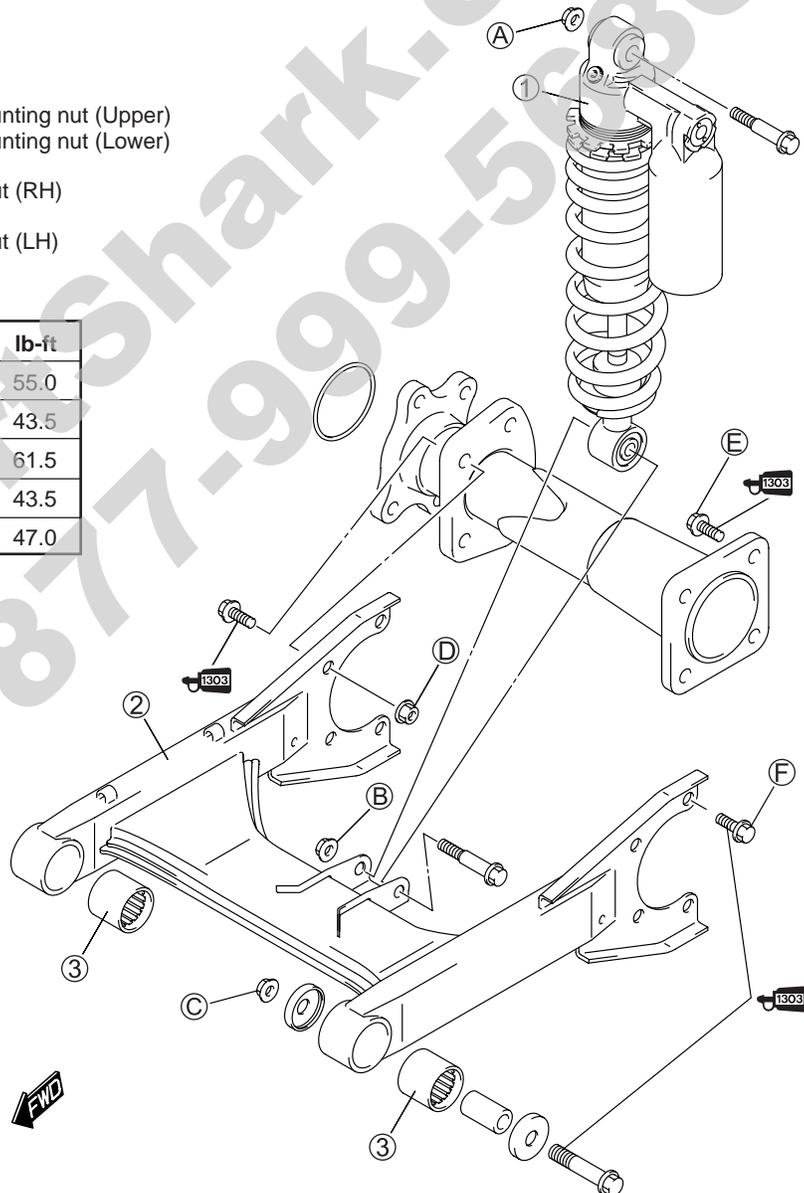
Example: Rear suspension

- ① Rear shock absorber
- ② Swingarm
- ③ Bearing

- A Rear shock absorber mounting nut (Upper)
- B Rear shock absorber mounting nut (Lower)
- C Swingarm pivot nut
- D Axle housing mounting nut (RH)
- E Axle housing bolt
- F Axle housing mounting nut (LH)



ITEM	N•m	kgf-m	lb-ft
A	78	7.8	55.0
B	60	6.0	43.5
C	85	8.5	61.5
D	60	6.0	43.5
E/F	65	6.5	47.0



## SYMBOL

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

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply THREAD LOCK SUPER 1303 . 99000-32030
	Indicates service data.		Apply THREAD LOCK SUPER 1322 . 99000-32110 (Except USA)
	Apply oil. Use engine oil unless otherwise specified.		Apply THREAD LOCK 1342 . 99000-32050
	Apply hypoid gear oil.		Apply THREAD LOCK SUPER 1360 . 99000-32130
	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 (USA) 99000-25010 (Others)		Measure in voltage range.
	Apply SUZUKI SILICONE GREASE. 99000-25100		Measure in resistance range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in current range.
	Apply WATER RESISTANCE GREASE. 99000-25160		Measure in diode test range.
	Apply SUZUKI BOND 1207B 99104-31140 (USA) 99000-31140 (Others)		Measure in continuity test range.
	Apply SUZUKI BOND 1215 . 99000-31110 (Except USA)		Use special tool.
	Apply SUZUKI BOND 1216B . 99000-31230		

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# GENERAL INFORMATION

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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 vehicle 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 vehicle. 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 vehicle.
- \* 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 handling toxic or flammable materials, make sure that the area you work in is well ventilated and that you follow all of the manufacturer's instructions.
- \* Never use gasoline as a cleaning solvent.
- \* To avoid getting burned, do not touch the engine, engine oil, radiator and exhaust system until they have cooled.
- \* After servicing the fuel, oil, exhaust or brake systems, check all of the lines, and fittings related to the system for leaks.

**CAUTION**

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

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

## SUZUKI LT-Z250K4 (2004-MODEL)



**RIGHT SIDE**

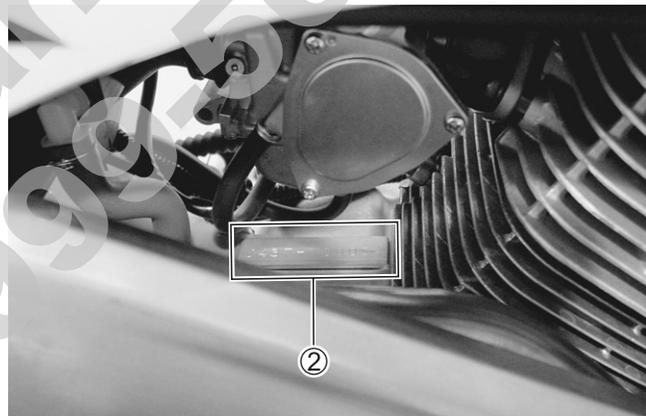
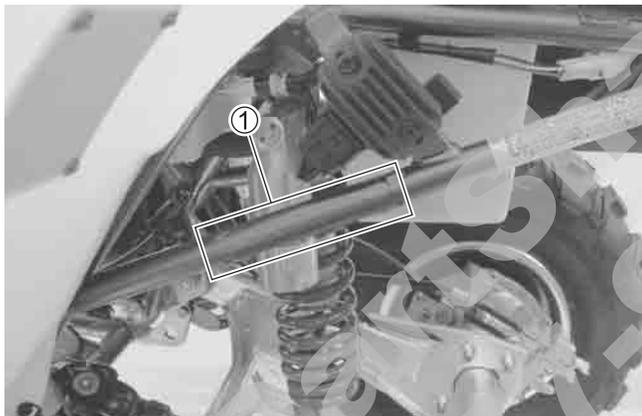


**LEFT SIDE**

\* Difference between photographs and actual vehicles depends on the markets.

### SERIAL NUMBER LOCATION

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



### FUEL AND OIL RECOMMENDATION

#### FUEL (FOR CANADA AND USA)

Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) method or 91 octane or higher rated by the Research Method.

SUZUKI recommends that customers use alcohol-free unleaded gasoline whenever possible.

Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.

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.

If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol-free unleaded gasoline.

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)

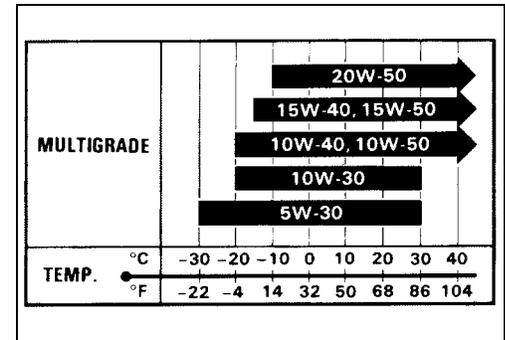
Use unleaded gasoline that is graded 91 octane or higher by the Research Method.

## ENGINE OIL (FOR USA)

SUZUKI recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or oils that meet API service classifications SF or SG and that have a viscosity rating of SAE 10W-40. If engine oil with a rating of SAE 10W-40 is not available, select an alternative according to the chart.

## ENGINE OIL (FOR THE OTHER COUNTRIES)

Use a premium quality 4-stroke motor oil to ensure longer service life of the vehicles. Use only oils that meet API service classifications SF or SG and that have a viscosity rating of SAE 10W-40. If engine oil with a rating of SAE 10W-40 is not available, select an alternative according to the chart.



## REAR DRIVE GEAR OIL

Use hypoid gear oil that meets the API service classification GL-5 and is rated SAE #90. Use a hypoid gear oil with a rating of SAE #80 if the vehicle is operated where the ambient temperature is below 0 °C (32 °F).

## BRAKE FLUID

 Specification and classification: DOT 4

### ⚠ WARNING

This vehicle uses a glycol-based brake fluid. Do not use or mix different types of brake fluid such as silicone-based and petroleum-based fluids for refilling the system, otherwise serious damage will result to the brake system.

Never use any brake fluid taken from old, used or unsealed containers.

Never reuse brake fluid left over from the last servicing or which has been stored for a long period of time.

## 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 engine speed limits.

### Break-in engine speeds

#### Initial 10 hours: Less than ¼ throttle

After the engine has been operated for 10 hours the engine to full throttle operation, for short periods of time.

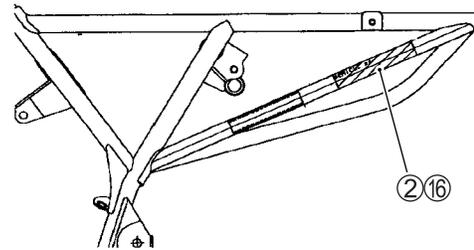
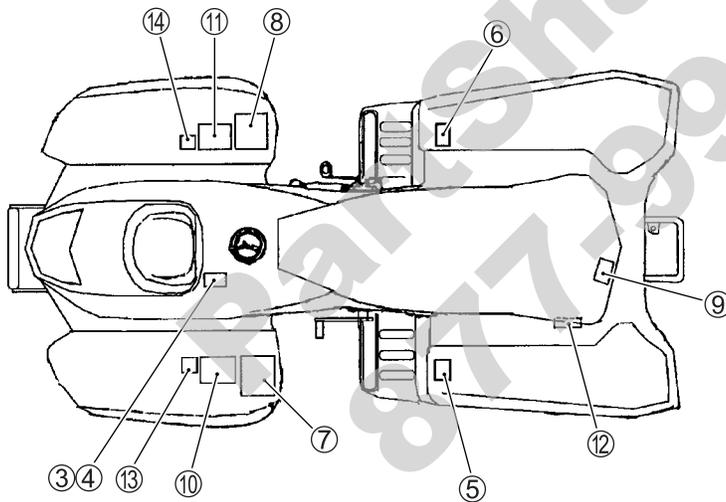
# INFORMATION LABELS

No.	LABEL or PLATE NAME	APPLIED SPECIFICATION		
		E-19	E-28	E-33
①	Certification plate (E)	A		A
②	Information label (E)			A
③	Gearshift pattern label (E)			A
④	Gearshift pattern label (E/F)		A	
⑤	Tire air pressure label (E)	A	A	A
⑥	Tire air pressure label and warning no-passenger label (F)		A	
⑦	General warning label (E)	A	A	A
⑧	General warning label (F)		A	
⑨	Warning no-passenger label (E)	A	A	A
⑩	Age, 16 label (E)	A	A	A
⑪	Age, 16 label (F)		A	
⑫	Manual notice label (E)			A
⑬	Gearshift label (E)	A	A	A
⑭	Gearshift label (F)		A	
⑮	ICES Canada label (E/F)			
⑯	Compliance label (E)		A	
⑰	EC approval mark	A	A	

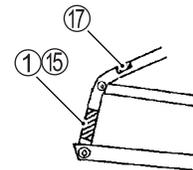
\* E-28: Fuel caution label enclosed.

(E): English      (F): French

A: Attached



Left side frame



Front of left side frame

## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length .....	1 720 mm (67.7 in)
Overall width .....	1 070 mm (42.1 in)
Overall height .....	1 090 mm (42.9 in)
Wheelbase .....	1 135 mm (44.7 in)
Front track .....	830 mm (32.7 in)
Rear track .....	810 mm (31.9 in)
Ground clearance .....	230 mm ( 9.1 in)
Seat height .....	810 mm (31.9 in)
Dry mass .....	166 kg (365 lbs)

### ENGINE

Type .....	Four-stroke, air-cooled, OHC
Number of cylinders .....	1
Bore .....	66.0 mm (2.598 in)
Stroke .....	72.0 mm (2.835 in)
Displacement .....	246 cm <sup>3</sup> (15.0 cu. in)
Compression ratio .....	9.2 : 1
Carburetor .....	MIKUNI BSR29, single
Air cleaner .....	Polyurethane foam element
Starter system .....	Electric
Lubrication system .....	Wet sump
Idle speed .....	1 500 – 100 r/min

### DRIVE TRAIN

Clutch .....	Wet multi-plate, automatic, centrifugal type
Transmission .....	5-forward and 1-reverse
Gearshift pattern, forward .....	All up, foot lever operated
reverse .....	Foot/hand operated
Primary reduction ratio .....	3.047 (64/21)
Secondary reduction ratio .....	1.133 (17/15)
Gear ratios, 1st .....	3.083 (37/12)
2nd .....	1.933 (29/15)
3rd .....	1.388 (25/18)
4th .....	1.095 (23/21)
5th .....	0.913 (21/23)
Reverse .....	2.833 (34/12)
Final reduction ratio .....	3.200 (32/10)

**CHASSIS**

Front suspension .....	Independent, double wishbone, coil spring, oil damped
Rear suspension .....	Swingarm type, coil spring, oil damped
Front wheel travel .....	160 mm (6.3 in)
Rear wheel travel .....	170 mm (6.7 in)
Caster .....	7 40 ..... 1G
Trail .....	33 mm (1.30 in) ..... 1G
Toe-in .....	5 mm (0.20 in) ..... 1G
Steering angle .....	45
Turning radius .....	2.7 m (8.9 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Drum brake
Front tire size .....	AT22 7-10 ☆☆, tubeless
Rear tire size .....	AT20 10-9 ☆, tubeless

**ELECTRICAL**

Ignition type .....	Electronic ignition (CDI)
Ignition timing .....	5 B.T.D.C. at 1 500 rpm
Spark plug .....	NGK DR7EA or DENSO X22ESR-U
Battery .....	12 V 28.8 kC (8 Ah)/10 HR
Generator .....	Three-phase A.C. generator
Main fuse .....	20/15 A
Headlight .....	12 V 40/40 W
Brake light/Taillight .....	12 V 21/5 W
Neutral indicator light .....	12 V 3 W
Reverse indicator light .....	12 V 3 W

**CAPACITIES**

Fuel tank, including reserve .....	10.6 L (2.8/2.3 US/Imp gal)
reserve .....	2.6 L (0.7/0.6 US/Imp gal)
Engine oil, oil change .....	2 200 ml (2.3/1.9 US/Imp qt)
filter change .....	2 300 ml (2.4/2.0 US/Imp qt)
overhaul .....	2 500 ml (2.6/2.2 US/Imp qt)
Final gear oil, oil change .....	190 ml (6.4/6.7 US/Imp oz)

**NOTE:**

\* These specifications are subject to change without notice.

## COUNTRY AND AREA CODES

The following codes stand for the applicable countries and areas:

CODE	COUNTRY OR AREA
E-19	EU
E-28	Canada
E-33	USA and California

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# 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 vehicle operating at peak performance and economy.

**NOTE:**

*More frequent servicing may be performed on vehicles that are use under severe conditions.*

### PERIODIC MAINTENANCE CHART

Item	Interval	Initial 1 month	Every 3 months	Every 6 months
Air cleaner			C	C
Exhaust pipe nuts and muffler bolts		T	T	T
Valve clearance		I	I	I
Spark plug				I
		Replace every 18 months.		
Spark arrester				C
Engine idle speed		I	I	I
Throttle cable play		I	I	I
Fuel line			I	I
		Replace every 4 years.		
Engine oil and oil filter		R		R
Final gear oil				I
		Replace every 2 years.		
Clutch				I
Brakes		I	I	I
Brake fluid			I	I
		Replace every 2 years.		
Brake hose				I
		Replace every 4 years.		
Tires			I	I
Suspensions				I
Steering		I	I	I
Chassis bolts and nuts		T	T	T
General lubrications		L	L	L

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

*R = Replace*

*T = Tighten*

*C = Clean*

*L = Lubricate*

## MAINTENANCE AND TUNE-UP PROCEDURES

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

### AIR CLEANER

**Clean every 3 months.**

If the air cleaner is clogged with dust, intake resistance will be increased, with a resultant decrease in power output and an increase in fuel consumption. Check and clean the air cleaner element in the following manner:

Remove the seat. (☞ 7-5)

Disconnect the air vent hose ①.

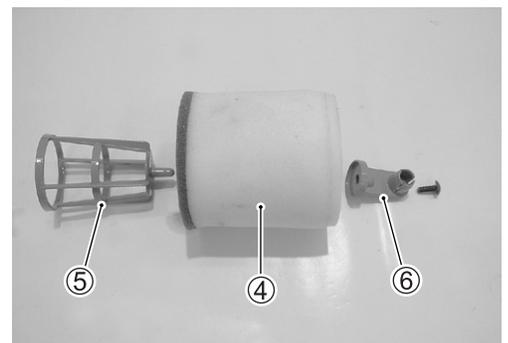
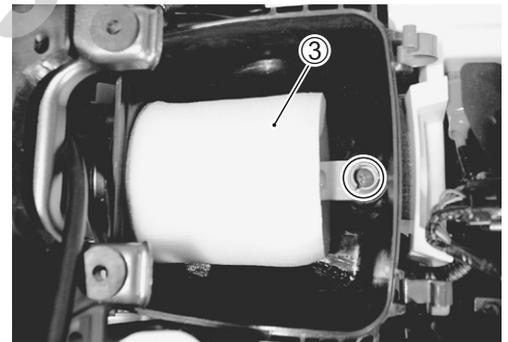
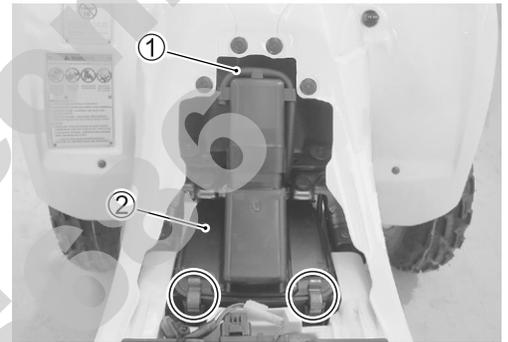
Remove the air cleaner case cover ②.

**NOTE:**

*Be careful not to drop the O-ring into the air cleaner box that is attached to the air cleaner case cover.*

Remove the air cleaner element ③.

Separate the polyurethane foam element ④, element frame ⑤ and element holder ⑥.

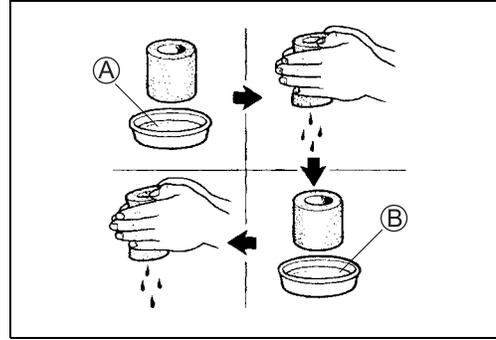


Fill a wash pan of a proper size with a non-flammable cleaning solvent. Immerse the air cleaner element in the cleaning solvent and wash it.

Press the air cleaner element between the palms of both hands to remove the excess solvent: do not twist or wring the element, or it will tear.

Immerse the element in motor oil, and then squeeze out the excess oil leaving the element slightly wet.

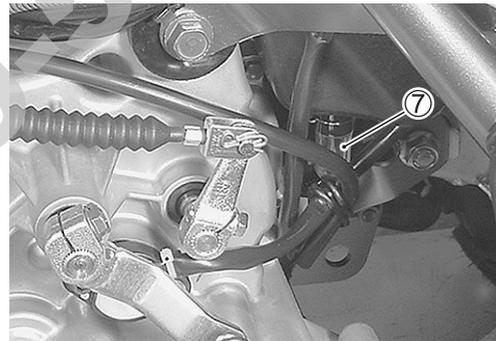
- Ⓐ Non-flammable cleaning solvent
- Ⓑ Motor oil SAE #30 or SAE 10W-40



### CAUTION

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

Remove the drain cap ⑦ of the air cleaner box to allow any water to drain out.



## EXHAUST PIPE NUTS AND MUFFLER BOLTS

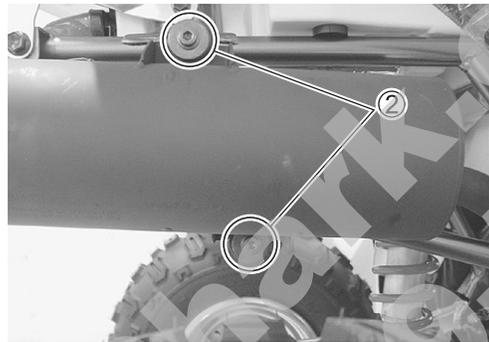
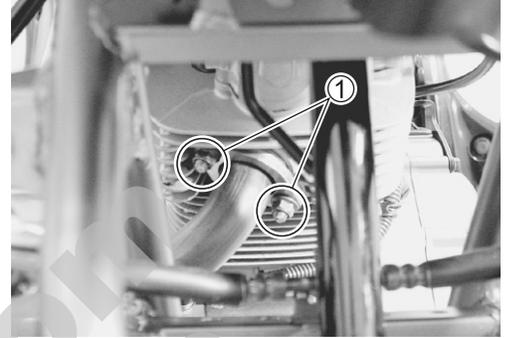
**Tighten initially at 1 month and every 3 months thereafter.**

Tighten the exhaust pipe nuts ① and muffler mounting bolts/nuts ②.

Remove the right footrest mud guard. (☞ 7-7)

Tighten the muffler connecting bolt ③.

- 🔧 Exhaust pipe nut: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**
- Muffler connecting bolt: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**
- Muffler mounting bolt/nut: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**



## VALVE CLEARANCE

**Inspect initially at 1 month and every 3 months thereafter.**

Excessive valve clearance results in valve noise and insufficient valve clearance results in valve damage and reduced power.

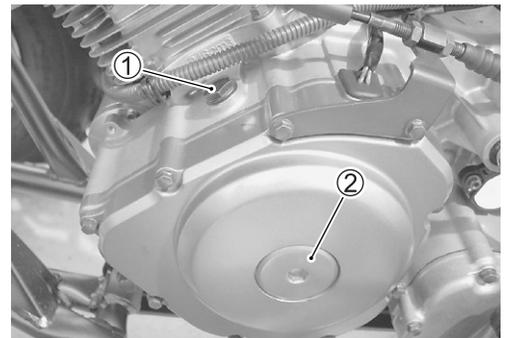
Check the intake and exhaust valve clearances at the distances indicated above and adjust the valve clearances to specification, if necessary.

Remove the fuel tank. (☞ 5-3)

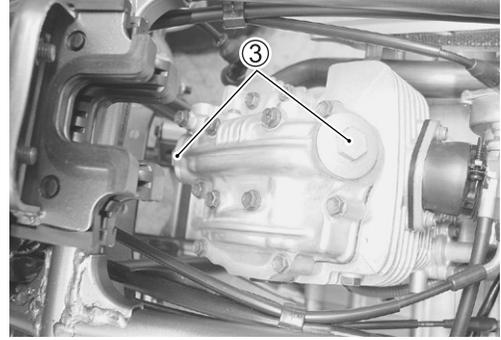
Remove the spark plug. (☞ 2-7)

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

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



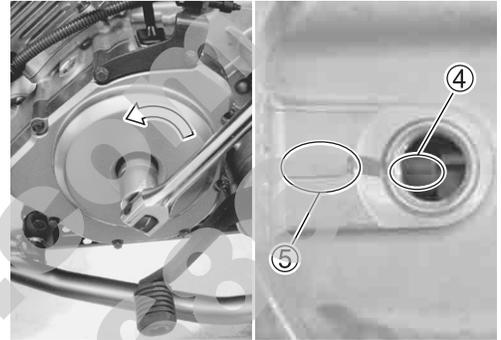
Remove the valve inspection caps ③.



**NOTE:**

Valve clearance is to be checked when the engine is cold.  
The intake and exhaust valves must be checked and adjusted when the piston is at Top-Dead-Center (TDC) on the compression stroke.

Turn the crankshaft until the TDC line ④ on the generator rotor aligns with the index mark ⑤ on the crankcase.



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

If the clearance is out of specification, bring it into the specified range.

<b>DATA</b>	<b>Valve clearance (when cold)</b>
	IN: 0.03 0.08 mm (0.001 0.003 in)
	EX: 0.08 0.13 mm (0.003 0.005 in)

<b>TOOL</b>	<b>09900-20803: Thickness gauge or</b>
	<b>09900-20804: Thickness gauge</b>



**CAUTION**

Securely tighten the locknut after completing adjustment.

<b>U</b>	<b>Valve clearance adjuster locknut:</b>
	14 N•m (1.4 kgf-m, 10.0 lb-ft)

Install the spark plug, valve timing inspection plug and generator cover cap to the specified torque of each.

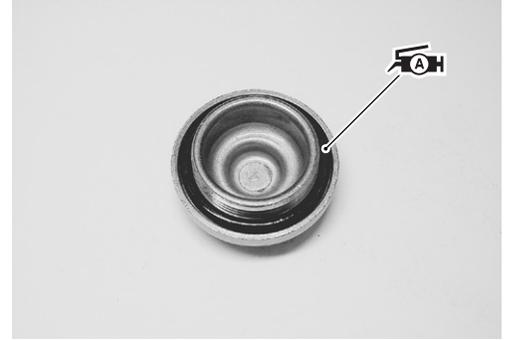
<b>U</b>	<b>Spark plug: 18 N•m (1.8 kgf-m, 13.0 lb-ft)</b>
	<b>Valve timing inspection plug:</b>
	23 N•m (2.3 kgf-m, 16.5 lb-ft)
	<b>Generator cover cap: 15 N•m (1.5 kgf-m, 11.0 lb-ft)</b>



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

-  **09900-25030: SUZUKI SUPER GREASE A (USA)**
- 09900-25010: SUZUKI SUPER GREASE A (Others)**

Tighten the valve inspection caps.



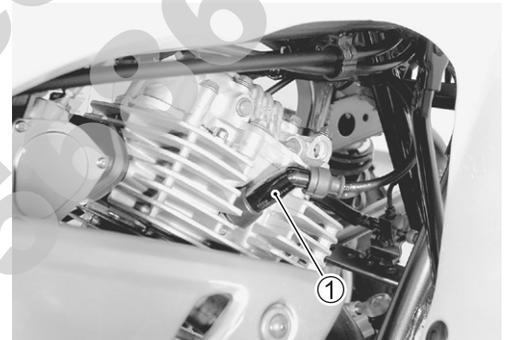
## SPARK PLUG

**Inspect every 6 months.**  
**Replace every 18 months.**

### SPARK PLUG REMOVAL

Disconnect the spark plug cap ① and remove the spark plug.

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



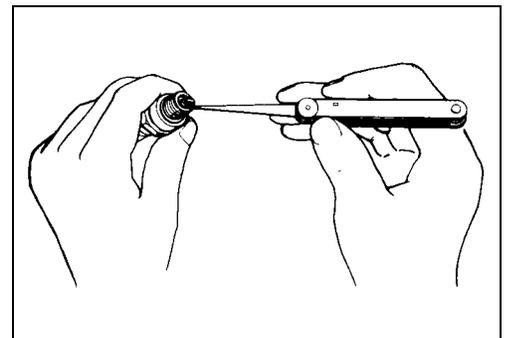
### HEAT RANGE

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

	NGK	DENSO
Standard	DR7EA	X22ESR-U
Colder type	DR8EA	X24ESR-U

### CARBON DEPOSITS

Check to see if there are 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.



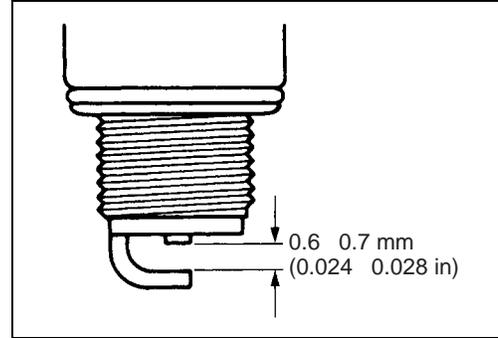
**SPARK PLUG GAP**

Measure the spark plug gap using the thickness gauge. If the spark plug gap is out of specification, adjust the gap.

**DATA Standard**

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

**TOOL** 09900-20803: Thickness gauge or  
09900-20804: Thickness gauge

**ELECTRODE**

Check the condition of the electrode.

If the electrode is extremely worn or burnt, replace the spark plug with a new one.

Also, replace the spark plug if it has a broken insulator, damaged threads, etc.

**CAUTION**

Check the thread size and reach of 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 INSTALLATION****CAUTION**

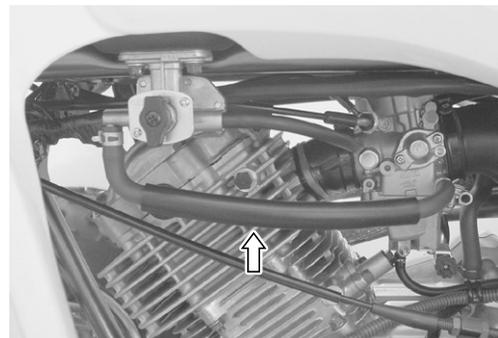
To avoid damaging the cylinder head threads; first, finger tighten the spark plug, and then tighten it to the specified torque using the spark plug wrench.

**TOOL** Spark plug: 18 N•m (1.8 kgf-m, 13.0 lb-ft)

**FUEL LINE**

Inspect every 3 months.  
Replace every 4 years.

Inspect the fuel hose for damage and fuel leakage. If any damages are found, replace the fuel hose with a new one.



## THROTTLE CABLE PLAY

Inspect initially at 1 month and every 3 months thereafter.

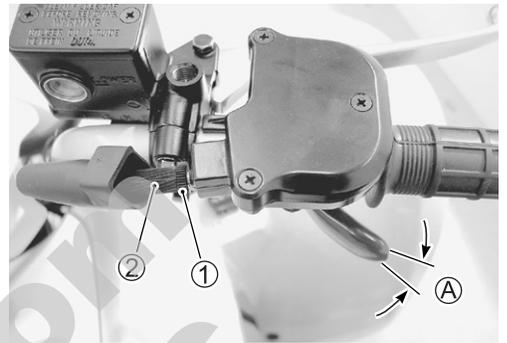
Adjust the throttle cable play  $\text{\textcircled{A}}$  as follows:

Loosen the locknut  $\text{\textcircled{1}}$  of the throttle cable.

Turn the adjuster  $\text{\textcircled{2}}$  in or out to obtain the correct play.

**DATA** Throttle cable play  $\text{\textcircled{A}}$ : 3 – 5 mm (0.12 – 0.20 in)

After adjusting the throttle cable play, tighten the locknut  $\text{\textcircled{1}}$ .



## ENGINE IDLE SPEED

Inspect initially at 1 month and every 3 months thereafter.

**NOTE:**

Make this adjustment when the engine is fully warm.

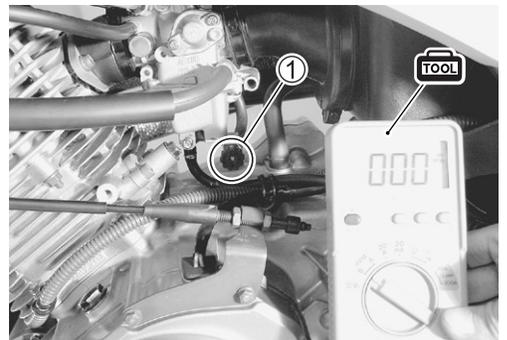
Connect the electric tachometer or the multi circuit tester to the high-tension cord.



Start the engine and set the engine idle speed between 1 400 and 1 600 r/min by turning the throttle stop screw knob  $\text{\textcircled{1}}$ .

**DATA** Engine idle speed: 1 500 – 100 r/min

**TOOL** 09900-25008: Multi circuit tester set or  
09900-26006: Tachometer



## ENGINE OIL AND OIL FILTER

Replace initially at 1 month and every 6 months thereafter.

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

### ENGINE OIL REPLACEMENT

Place an oil pan under the engine oil drain plug ①, and then drain out the engine oil by removing the engine oil drain plug ① and engine oil filler cap ②.

Tighten the engine oil drain plug ① to the specified torque, and then pour new engine oil through the oil filler hole. When performing an oil change (without oil filter replacement), the engine will hold about 2.2 L (2.3 US qt, 1.9 Imp qt) of oil. Use the engine oil that meets the API service classifications SF or SG and that has the viscosity rating of SAE 10W-40.

#### Engine oil drain plug: 21 N•m (2.1 kgf-m, 15.0 lb-ft)

Install the oil filler cap ②.

Start the engine and allow the engine to run for a few minutes at idling speed.

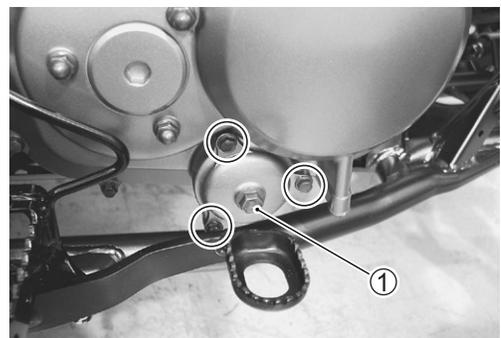
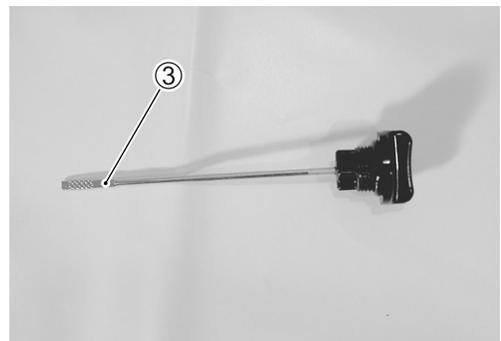
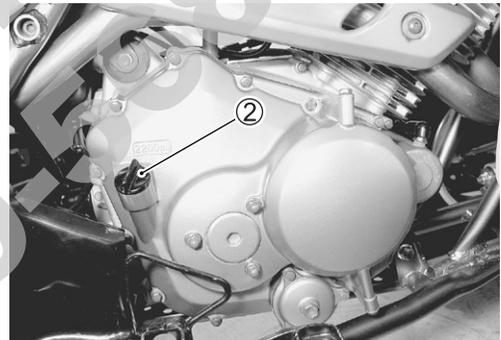
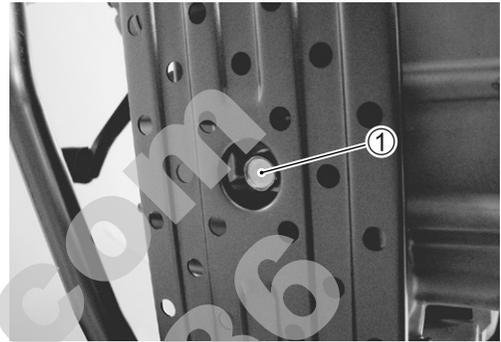
Turn off the engine and wait about three minutes, and then check the oil level on the dipstick ③. If the level is below upper line, add oil to that level. The vehicle must be in a level position for an accurate measurement.

### OIL FILTER REPLACEMENT

Drain engine oil. (➡ Above)

Remove the oil filter cap ①.

Remove the oil filter and O-rings.



Apply engine oil lightly to new O-rings **A** and **B** before installing the oil filter cap.

Install the new O-ring **A** onto the oil filter fitting boss of the clutch cover.

Install the new O-ring **B** to the groove of the oil filter cap.

Install new oil filter **2**.

Install the spring **3** and oil filter cap **4**.

Pour new engine oil through the oil filler. When performing the oil filter change, the engine will hold about 2.3 L (2.4 US qt, 2.0 Imp qt) of oil.

After three minutes of engine idling, check the oil level.  
( 2-10)

#### **DATA** Engine oil capacity

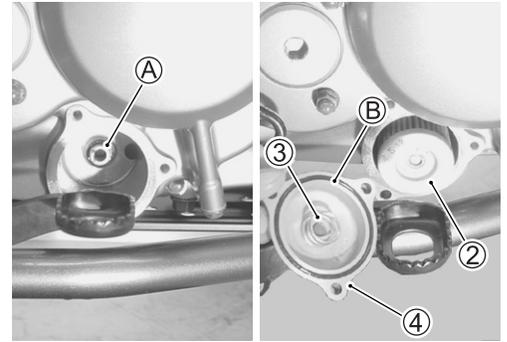
Oil change: 2.2 L (2.3 US qt, 1.9 Imp qt)

Oil and filter change: 2.3 L (2.4 US qt, 2.0 Imp qt)

Engine overhaul: 2.5 L (2.6 US qt, 2.2 Imp qt)

#### **CAUTION**

When reassembling the oil filter, make sure that the oil filter is installed as shown above. If the filter is installed improperly, serious engine damage may result.

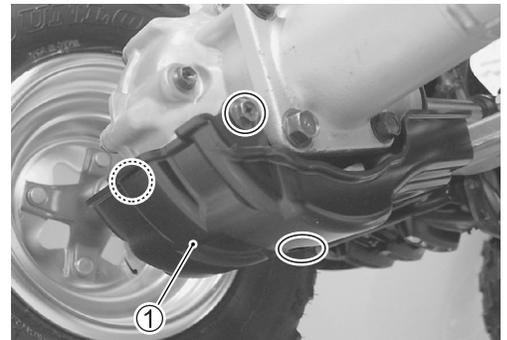


## FINAL GEAR OIL

Inspect every 6 months.  
Replace every 2 years.

To change the final gear oil, locate the vehicle on a level position and carry out the following steps. Use SAE #90 hypoid gear oil which is rated GL-5 under the API classification system. Use hypoid gear oil SAE #80, API grade GL-5, if the vehicle is ridden where the ambient temperature is below 0 °C or 32 °F.

Remove the final gear case under cover **1** by removing three bolts.



Place an oil pan under the final gear case, and then drain oil by removing the drain plug ② and filler plug ③.

Tighten the drain plug ②.

Remove the oil level check plug ④ and pour the specified oil through the filler hole until the oil over flows from the oil level check hole.

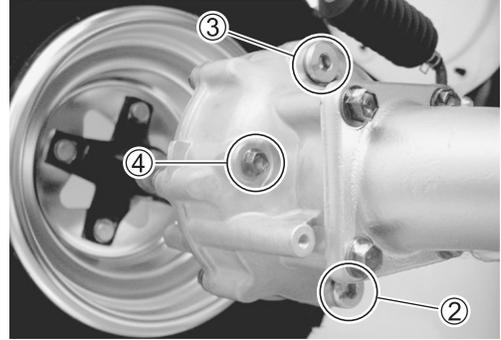
Tighten the filler plug ③ and the oil level check plug ④.

**DATA** Final gear oil capacity:

190 ml (6.42 US oz, 6.69 Imp oz)

**U** Final gear oil drain plug: 26 N•m (2.6 kgf-m, 19.0 lb-ft)

Final gear oil filler plug: 26 N•m (2.6 kgf-m, 19.0 lb-ft)

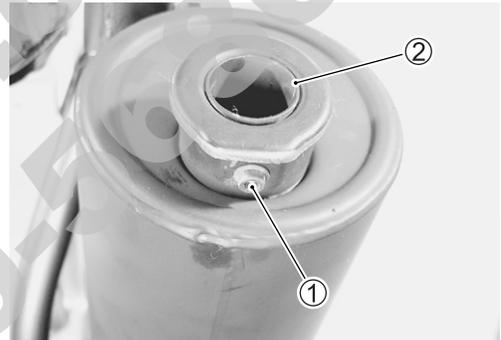


## SPARK ARRESTER

Clean every 6 months.

Remove the spark arrester bolt ①.

Extract the spark arrester ② from the muffler.



Clean the spark arrester ② with a brush.

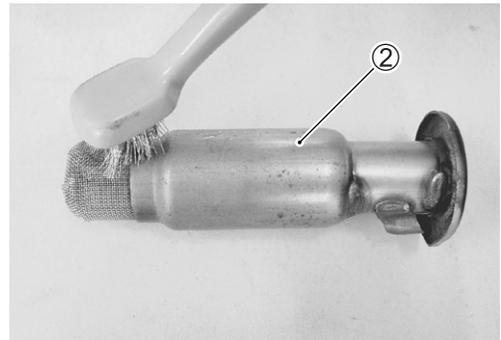
### **⚠ WARNING**

Only clean the spark arrester in an open area away from combustible materials. Exhausted hot carbon particles can start a fire.

Reinstall the spark arrester ②.

Tighten the spark arrester bolt to the specified torque.

**U** Spark arrester bolt: 11 N•m (1.1 kgf-m, 8.0 lb-ft)



## CLUTCH

**Adjust every 6 months.**

Remove the clutch adjuster cap ①.

*NOTE:*

*Adjust the clutch release, when the engine is cold.*

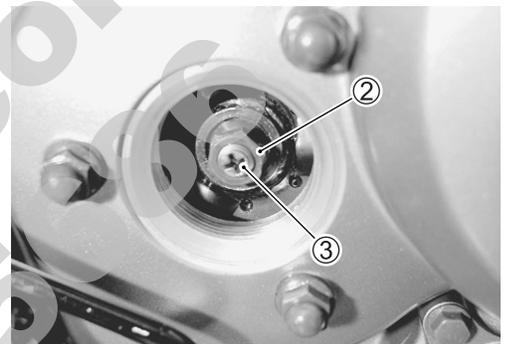


Loosen the locknut ②.

Tighten the adjusting screw ③ until it stops.

Loosen the adjusting screw ③ 1/16 - 1/8 turn.

Tighten the locknut ② to the specified torque while holding the adjusting screw ③.



**🔧 Locknut ②: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**

Apply engine oil to the O-ring and cap thread lightly.

Tighten the clutch adjuster cap to the specified torque.

**🔧 Clutch adjuster cap: 15 N•m (1.5 kgf-m, 11.0 lb-ft)**



## BRAKES

Inspect initially at 1 month and every 3 months thereafter.

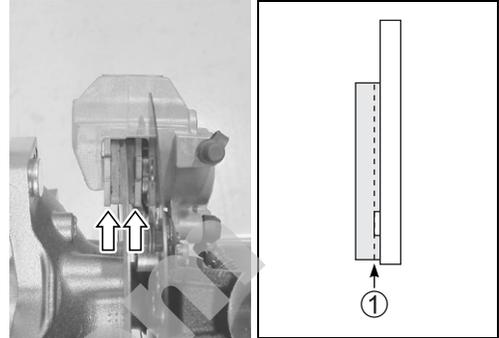
### BRAKE PADS

Remove the front wheels. (☞ 7-11)

The extent of brake pad wear can be checked by observing the limit line ① on the side of brake pads. When the wear reaches the limit line, replace the pads with new ones. (☞ 7-19)

#### CAUTION

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



### BRAKE SHOES

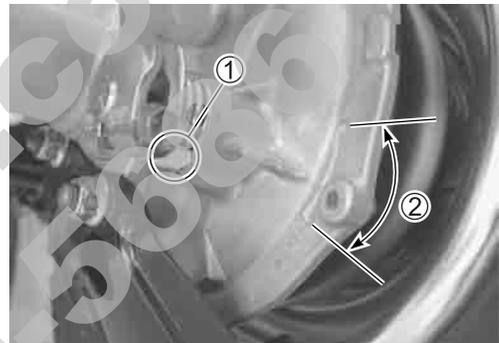
This vehicle is equipped with the brake lining indicator on the rear brake.

To check the wear of the rear brake lining, perform the following steps:

Make sure that the rear brake system is properly adjusted.

With fully applying the rear brake, check if the indicator plate ① is within the range ② embossed on the brake panel.

If the indicator plate ① is out of the range ②, the brake shoe assembly should be replaced with new ones. (☞ 7-46)



### REAR BRAKE PEDAL AND LEVER

The procedure for adjusting the rear brake pedal and brake lever is as follows:

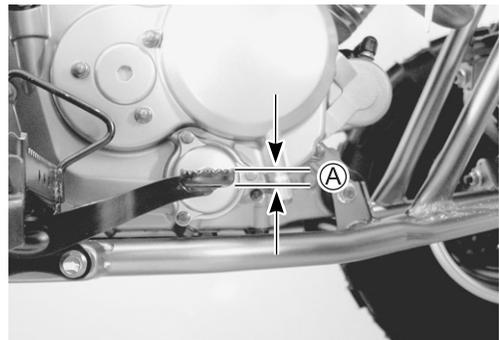
#### NOTE:

First adjust the brake pedal and next adjust the brake lever.

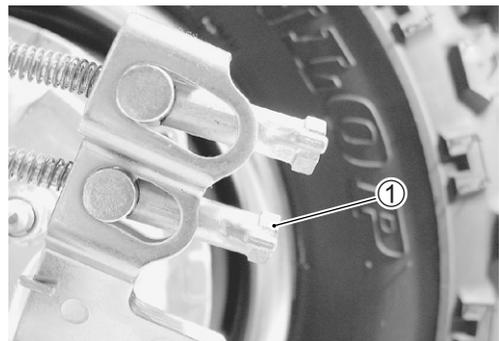
#### Brake pedal (Major brake adjustment)

Check that the brake pedal play ① is within the specified range. If the play is not within the specified range, make adjustments.

**DATA** Brake pedal play ①: 20 – 30 mm (0.8 – 1.2 in)



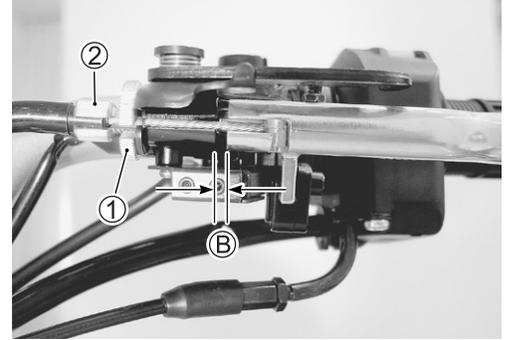
Turn the adjuster ① until the play ① reaches 20 – 30 mm (0.8 – 1.2 in).



**Rear brake lever (Minor brake adjustment)**

After adjusting the brake pedal, check the rear brake lever play. The brake lever play **B** as measured at the lever holder should be between 3 – 5 mm (0.1 – 0.2 in) when the lever is lightly pulled in towards the grip. If adjustment is necessary, slacken the cable by loosening the locknut **1** and screwing the adjuster **2** on the brake lever holder all the way in. After adjusting the play, tighten the locknut **1**.

**DATA** Rear brake lever play **B**: 3 – 5 mm (0.1 – 0.2 in )

**BRAKE FLUID**

Inspect every 3 months.  
Replace every 2 years.

**BRAKE FLUID LEVEL**

Place the handlebar straight.

Check the brake fluid level by observing the lower limit line on the front brake fluid reservoir.

When the brake fluid 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 vehicle 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 reuse 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 oil leakage before riding.



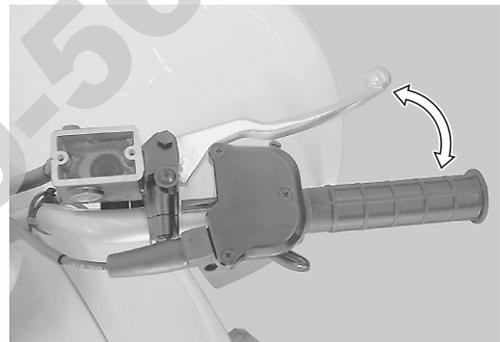
### AIR BLEEDING THE BRAKE FLUID CIRCUIT

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

Fill the front brake reservoir with the specified brake fluid to the top of the inspection window or the upper limit line. 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 hold the lever fully squeezed. Loosen the air bleeder valve for about 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 the fluid flowing into the receptacle contains no 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 or the upper limit line.

**🔧 Air bleeder valve: 6 N•m (0.6 kgf-m, 4.4 lb-ft)**

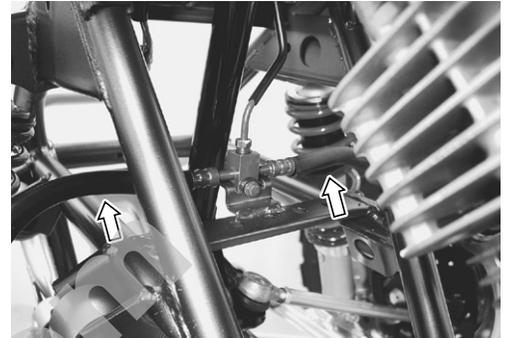
**CAUTION**

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

## BRAKE HOSE

**Inspect every 6 months.  
Replace every 4 years.**

Check the brake hoses for leakage, cracks, wear and damage. If any damages are found, replace the brake hoses with new ones.



## TIRES

**Inspect every 3 months.**

### TIRE TREAD CONDITION

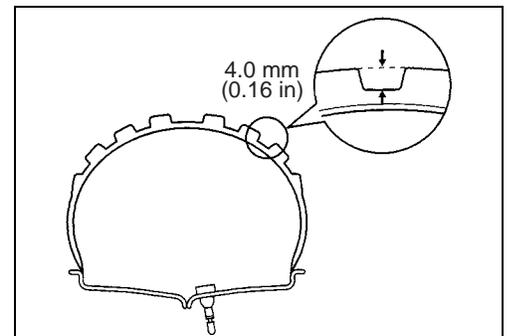
Operating the vehicle with excessively worn tires will decrease riding stability and consequently cause a dangerous situation. It is highly recommended to replace a tire when the remaining depth of the tire tread reaches the following specification.

#### **DATA** Service Limit

**Tire tread depth: Front 4.0 mm (0.16 in)**

**Rear 4.0 mm (0.16 in)**

**TOOL** 09900-20805: Tire depth gauge



**TIRE PRESSURE**

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

COLD INFLATION TIRE PRESSURE	kPa	kgf/cm <sup>2</sup>	psi
FRONT	30	0.30	4.4
REAR	25	0.25	3.6

VEHICLE LOAD CAPACITY LIMIT: 110 kg (243 lbs)

**CAUTION**

To minimize the possibility of tire damage from over-inflation, we strongly recommended that a manual type air pump be used rather than a high pressure air compressor as found in service stations. When filling air into the tires, never exceed 70 kPa (0.7 kgf/cm<sup>2</sup>, 10 psi).

**CAUTION**

The standard tire fitted on this vehicle is an AT22 7-10 ☆☆ for the front and a AT20 10-9 ☆ for the rear. The use of tires other than those specified may cause instability. It is highly recommended to use the specified tires.

PartShare.com  
877-999-5686

## STEERING

**Inspect initially at 1 month and every 3 months thereafter.**

Steering system should be adjusted properly for smooth handling of the handlebars and safe running.

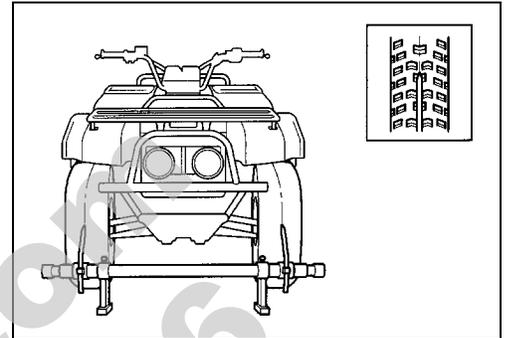
### TOE-IN

Place the vehicle on level ground.

Make sure the tire pressure for right and left tires is same and set to the proper specification.

Set the front wheels in the straight position.

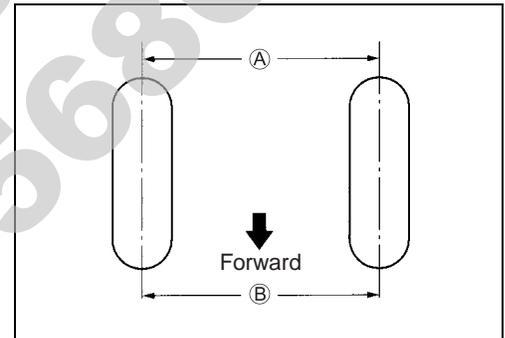
Place a load of 75 kg (165 lbs) on the seat.



Measure the distance **A** and **B** of the front wheels with a toe-in gauge as shown and calculate the difference **A** - **B**.

**DATA** Toe-in: 5 – 4 mm (0.20 – 0.16 in)

If the toe-in is out of specification, bring it into the specified range. (☞7-43)



## SUSPENSIONS

**Inspect every 6 months.**

Inspect the suspension arms and bushings for scratches, wear or damage. If any damages are found, replace the suspension arm or bushing with a new one. (☞7-32)

Inspect the swingarm and rear axle for scratches, wear or damage. If any damages are found, replace them with a new one. (☞7-56)

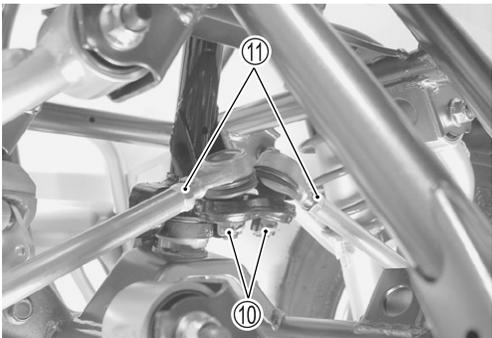
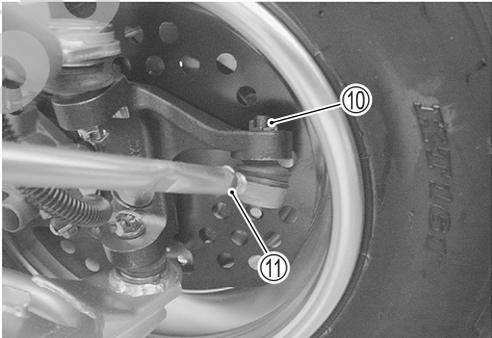
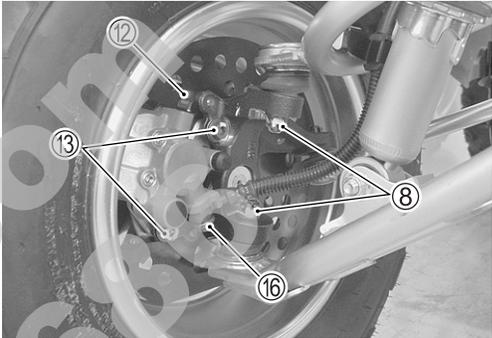
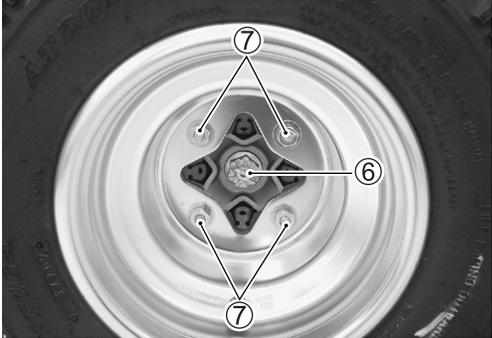
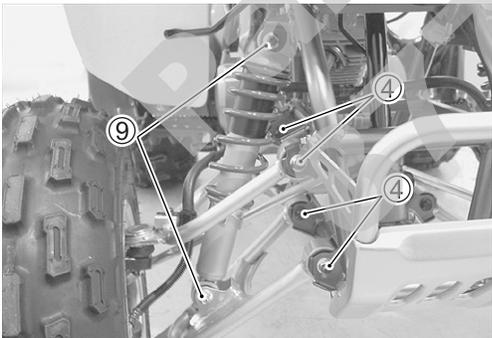
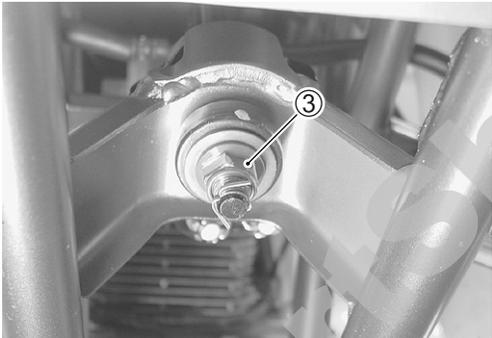
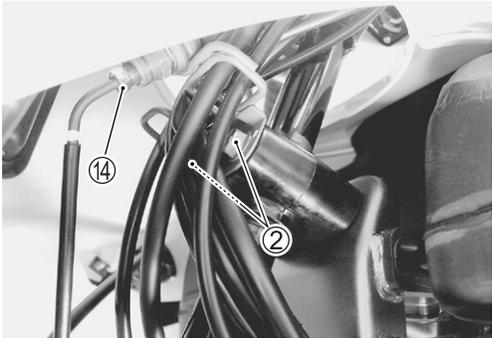
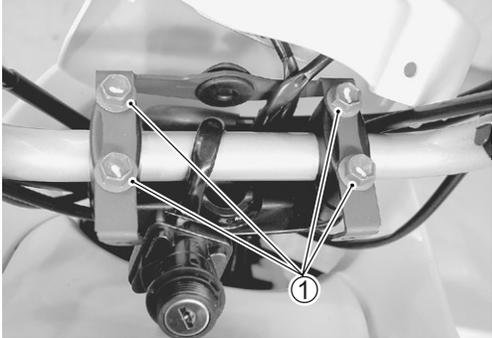
Inspect the front and rear shock absorbers for oil leakage or damage. If any damages are found, replace them with a new one. (☞7-31 and -53)

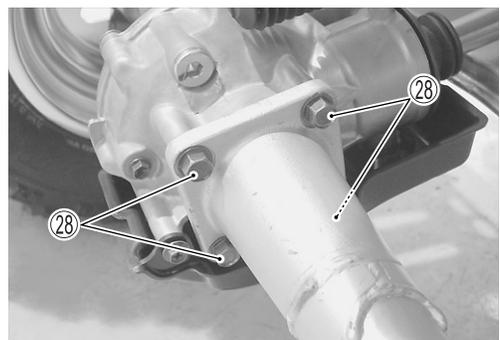
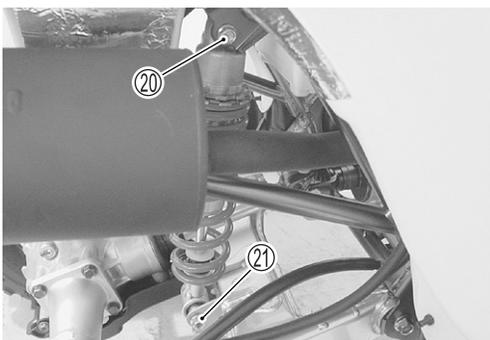
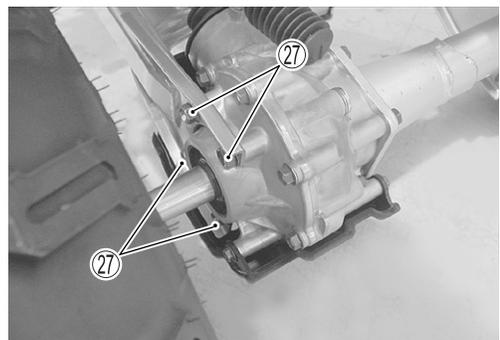
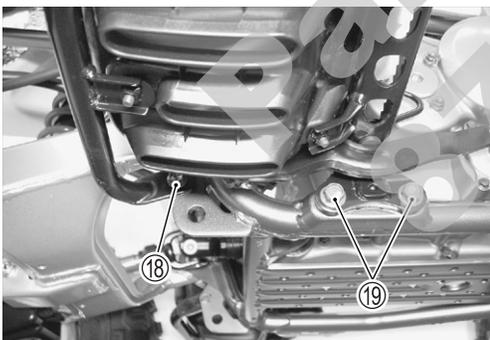
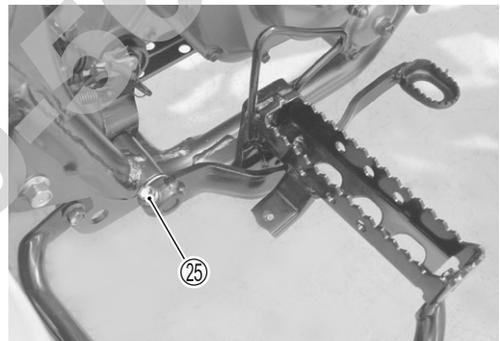
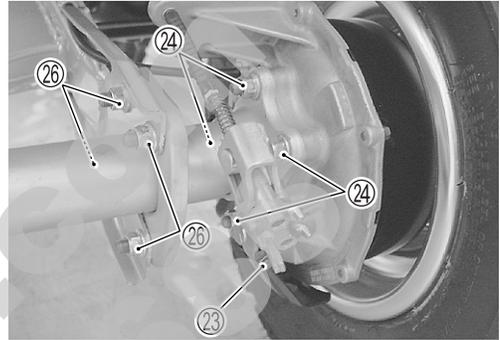
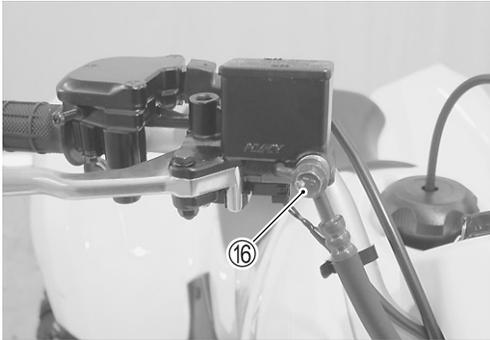
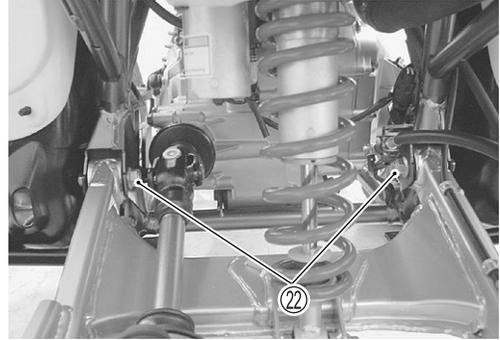
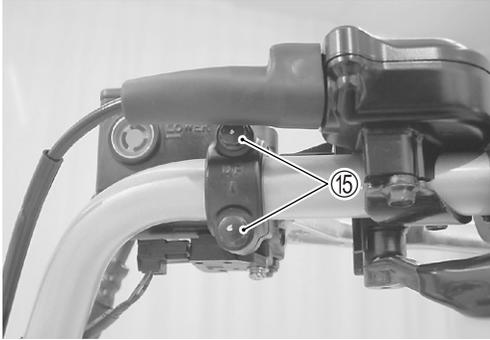
## CHASSIS BOLTS AND NUTS

**Tighten initially at 1 month and every 3 months thereafter.**

Check that all chassis nuts and bolts are tightened to their specified torque. (Refer to page 2-21 and 2-22 for the locations of the following nuts and bolts.)

Item	N•m	kgf-m	lb-ft
① Handlebar clamp bolt	23	2.3	16.5
② Steering shaft holder bolt	23	2.3	16.5
③ Steering shaft nut	49	4.9	35.5
④ Wishbone arm pivot bolt/nut (Upper and lower)	65	6.5	47.0
⑤ Wheel hub nut (Front)	65	6.5	47.0
⑥ Wheel hub nut (Rear)	138	13.8	99.9
⑦ Wheel set nut (Front and rear)	50	5.0	36.0
⑧ Steering knuckle nut (Upper and lower)	29	2.9	21.0
⑨ Front shock absorber mounting bolt/nut (Upper and lower)	60	6.0	43.5
⑩ Tie rod end nut	29	2.9	21.0
⑪ Tie rod lock nut	29	2.9	21.0
⑫ Front brake air bleeder valve	6	0.6	4.4
⑬ Front brake caliper mounting bolt	26	2.6	19.0
⑭ Front brake pipe nut (Upper and lower)	16	1.6	11.6
⑮ Front brake master cylinder mounting bolt	10	1.0	7.0
⑯ Front brake hose union bolt (Upper and lower)	23	2.3	16.5
⑰ Front brake disc plate mounting bolt	23	2.3	16.5
⑱ Footrest bolt (M8)	26	2.6	19.0
⑲ Footrest bolt (M10)	55	5.5	40.0
⑳ Rear shock absorber mounting bolt/nut (Upper)	78	7.8	55.0
㉑ Rear shock absorber mounting bolt/nut (Lower)	60	6.0	43.5
㉒ Swingarm pivot bolt/nut	85	8.5	61.5
㉓ Rear brake cam lever bolt/nut	11	1.1	8.0
㉔ Rear brake panel mounting nut	60	6.0	43.5
㉕ Rear brake pedal mounting bolt	11	1.1	8.0
㉖ Rear axle housing set bolt/nut (RH)	60	6.0	43.5
㉗ Rear axle housing set bolt/nut (LH)	65	6.5	47.0
㉘ Rear axle housing/final gear case bolt	65	6.5	47.0





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## GENERAL LUBRICATION

Lubricate initially at 1 month and every 3 months thereafter.

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



- ① Brake lever holder
- ② Throttle lever and cable
- ③ Steering shaft holder
- ④ Brake pedal and cable

- ⑤ Brake cam
- ⑥ Brake cable
- ⑦ Starter cable
- ⑧ Gearshift shaft

-  Grease
-  Motor oil

**NOTE:**

\* Before lubricating each part, remove any rust 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 vehicle has been operated under wet or rainy conditions.

## 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.

### **DATA** Compression pressure:

**Standard: 1 400 kPa (14.0 kgf/cm<sup>2</sup>, 199 psi)**

**Service Limit: 1 200 kPa (12.0 kgf/cm<sup>2</sup>, 171 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

### NOTE:

When the compression pressure goes below specification, check the engine for conditions listed above.

## 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.
- \* Warm up the engine before testing.
- \* Make sure that the battery is fully charged.

Test the compression pressure in the following manner:

Remove the spark plug. (☞ 2-7)

Install the compression gauge and adaptor in the spark plug hole. Make sure that the connection is tight.

Keep the throttle lever in the fully open position.

Press the starter button and crank the engine for a few seconds. Record the maximum gauge reading as the cylinder compression.

- TOOL** 09915-64510: Compression gauge set
- 09918-02410: Adaptor or
- 09918-03810: Adaptor



## OIL PRESSURE CHECK

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

### **DATA** Oil pressure:

Above 30 kPa (0.3 kgf/cm<sup>2</sup>, 4.3 psi)

Below 70kPa (0.7 kgf/cm<sup>2</sup>, 9.9 psi)

at 3 000 r/min, oil temp. at 60 C (140 F)

Low or high oil pressure can indicate any of the following conditions:

#### 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

Connect the tachometer onto the spark plug high-tension cord.

Remove the oil plug ①.



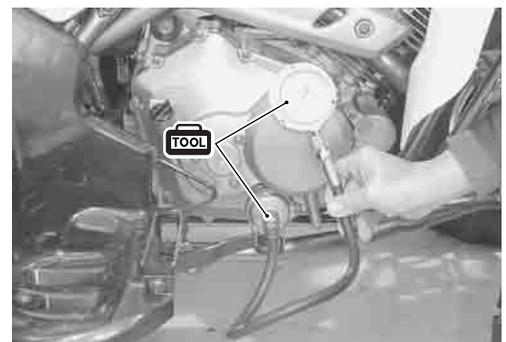
Install the oil pressure gauge and adaptor into the main oil gallery.

Warm up the engine as follows:

Summer: 10 minutes at 2 000 r/min

Winter: 20 minutes at 2 000 r/min

After warming up the engine, increase the engine speed to 3 000 r/min (observe the tachometer), and read the oil pressure gauge.



**TOOL** 09915-74511: Oil pressure gauge

09915-74512: Oil pressure gauge adaptor

## INITIAL ENGAGEMENT AND CLUTCH LOCK-UP INSPECTION

The LT-Z250 is equipped with a centrifugal type automatic clutch.

To insure proper performance and longevity of the clutch assemblies, it is essential that the clutches engage smoothly and gradually. Before checking the initial engagement and clutch lock-up, two inspection checks must be performed to thoroughly check the operation of the drive train. Perform the following:

- Check the oil level. (☞ 2-10)
- Warm up the engine.

### INITIAL ENGAGEMENT INSPECTION

- Connect the tachometer or the multi circuit tester onto the spark plug high-tension cord.
- Start the engine.
- Shift the gear shift lever to the 1st position.
- Slowly open the throttle and note the engine speed (r/min) when the vehicle begins to move forward.

**TOOL** 09900-25008: Multi circuit tester set or  
09900-26006: Tachometer

**DATA** Engagement speed: 1 700 2 100 r/min

If the engagement speed does not coincide with the standard range, inspect the following items for any abnormalities.

- \* Clutch shoes ..... ☞ 3-40
- \* Clutch wheel ..... ☞ 3-40



### CLUTCH LOCK-UP INSPECTION

Perform this inspection to determine if the clutch is engaging fully and not slipping.

- Connect a tachometer onto the spark plug high-tension code.
- Start the engine.
- Shift the gear shift lever to the 5th position.
- Apply the front and rear brakes as firmly as possible.
- Fully open the throttle for a brief period and note the maximum engine speed sustained during the test cycle.

**DATA** Lock-up speed: 3 100 3 700 r/min

**CAUTION**

**Do not apply full power for more than 5 seconds or damage to the clutch or engine may occur.**

If the lock-up speed (r/min) does not coincide with the standard range, inspect the following items for any abnormalities.

- \* Clutch shoes ..... ☞ 3-40
- \* Clutch wheel ..... ☞ 3-40

# ENGINE

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## ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

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

### ENGINE LEFT SIDE

PARTS	REMOVAL	INSTALLATION
Neutral switch	3-15	3-70
Secondary driven bevel gear	3-15	3-69
Generator cover	3-15	3-69
Starter idle gear	3-15	3-69
Generator	3-19	3-63

### ENGINE RIGHT SIDE

PARTS	REMOVAL	INSTALLATION
Oil filter	3-16	3-69
Clutch cover	3-16	3-68
Clutch	3-16	3-65
Gearshift	3-18	3-64
Oil pump drive gear	3-18	3-64
Oil pump	3-18	3-64

### ENGINE CENTER

PARTS	REMOVAL	INSTALLATION
Starter motor	3-12	3-76
Cam chain tension adjuster	3-13	3-75
Cylinder head cover	3-13	3-75
Camshaft	3-13	3-73
Cylinder head	3-14	3-72
Cylinder	3-14	3-72
Piston	3-14	3-70
Cam chain	3-20	3-63

## ENGINE REMOVAL AND INSTALLATION

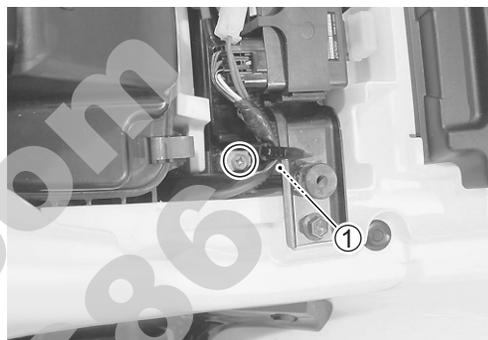
### ENGINE REMOVAL

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.

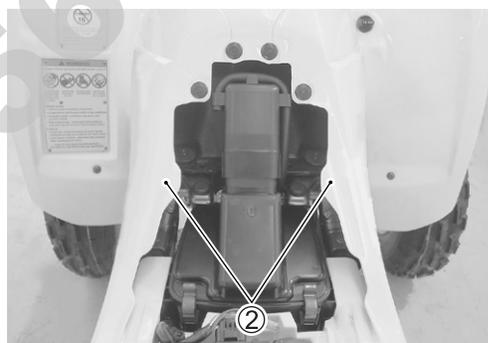
Drain engine oil. (☞ 2-10)

Remove the seat. (☞ 7-5)

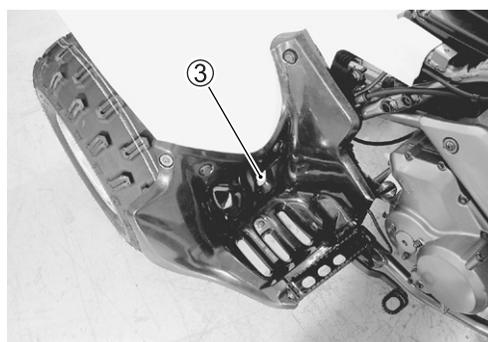
Disconnect the ⊖ battery lead wire ①.



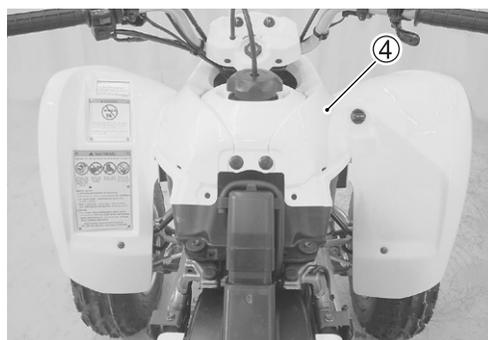
Remove the left and right side covers ②. (☞ 7-5)



Remove the left and right footrest mud guards ③. (☞ 7-7)



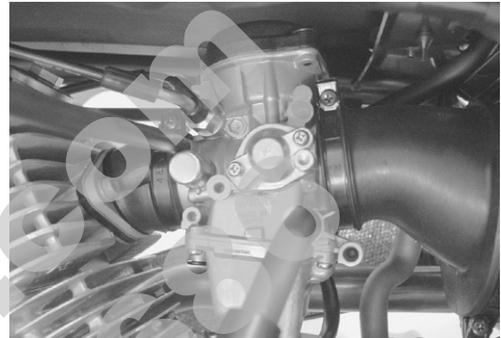
Remove the fuel tank center cover and front fender ④. (☞ 7-6)



Turn the fuel valve to the ON position.  
Disconnect the fuel and vacuum hoses.



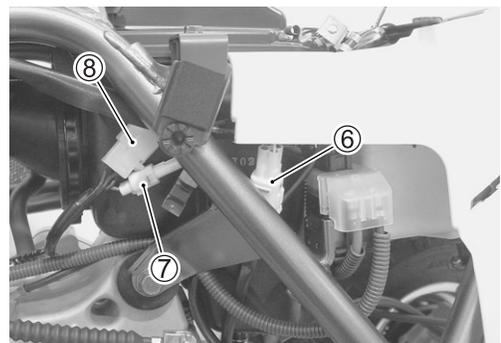
Remove the carburetor. (☞ 5-7)



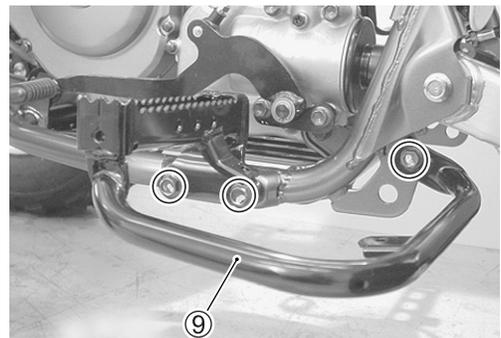
Disconnect the engine ground lead wire ⑤.



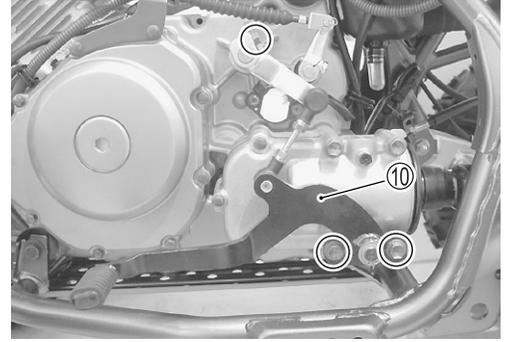
Disconnect the neutral switch lead wire coupler ⑥, signal generator lead wire coupler ⑦ and generator lead wire coupler ⑧.



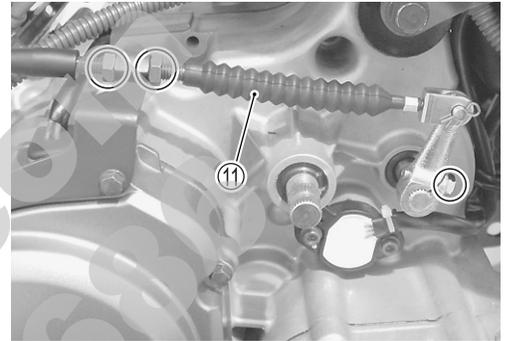
Remove the left footrest ⑨.



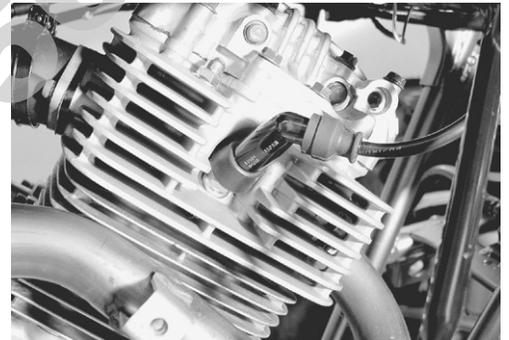
Remove the gearshift lever link ⑩.



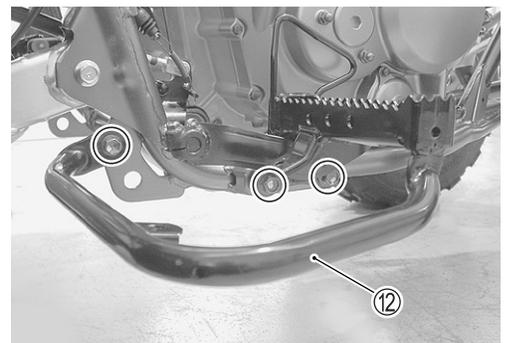
Remove the reverse lock release cable ⑪.



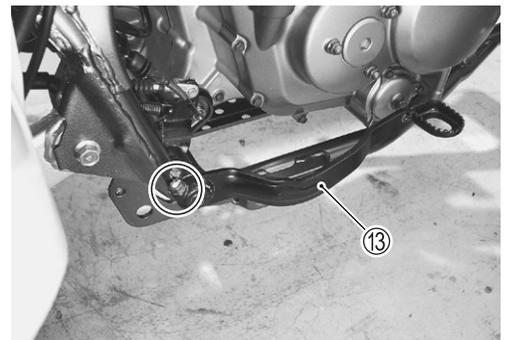
Disconnect the spark plug cap.



Remove the right footrest ⑫.



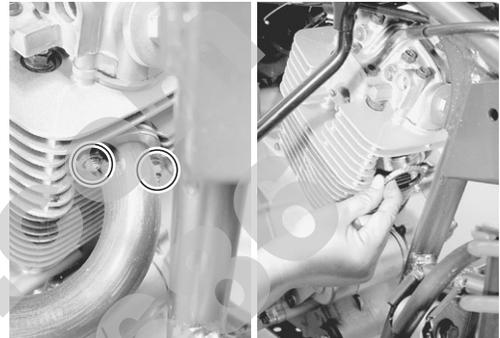
Remove the brake pedal ⑬.



Loosen the muffler connecting bolt.



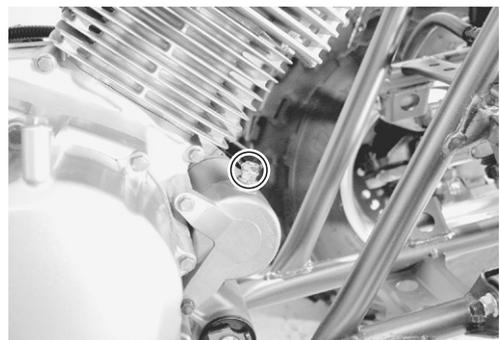
Remove the exhaust pipe and gasket.



Disconnect the breather hose ⑭.



Remove the starter motor lead wire.



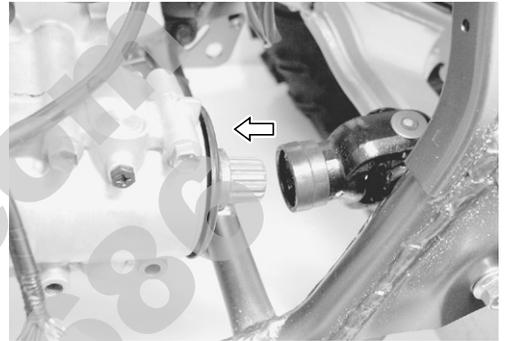
Remove the rear upper engine mounting nut, bolts and bracket ⑮.



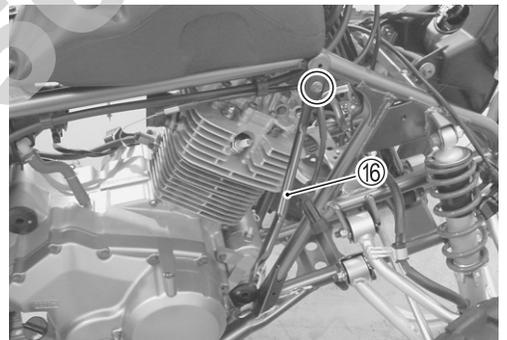
Remove the front and rear lower engine mounting nuts and bolts.



Disengage the secondary driven gear shaft from the universal joint.



Remove the right front fender bracket ⑩.  
Dismount the engine to the right side.



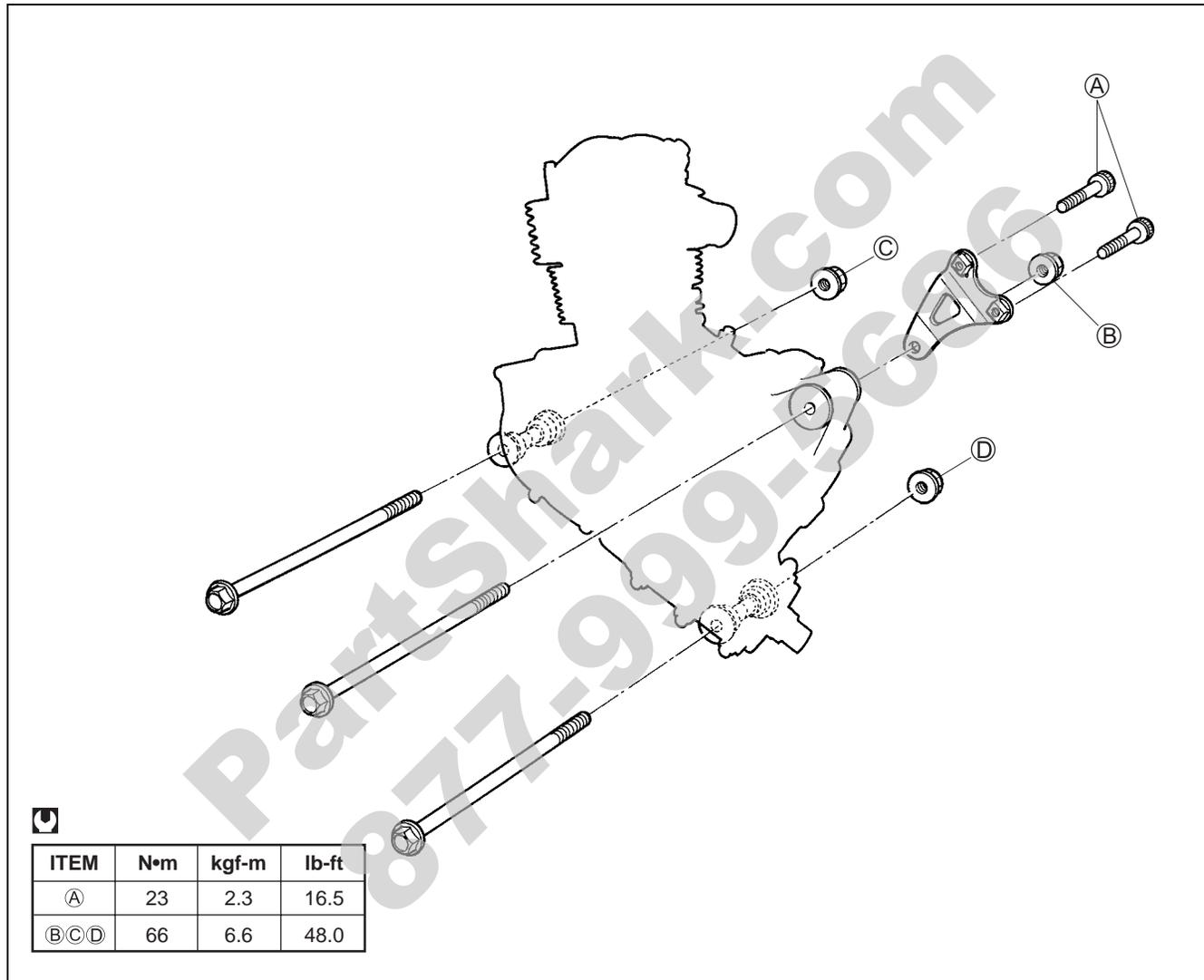
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## ENGINE INSTALLATION

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

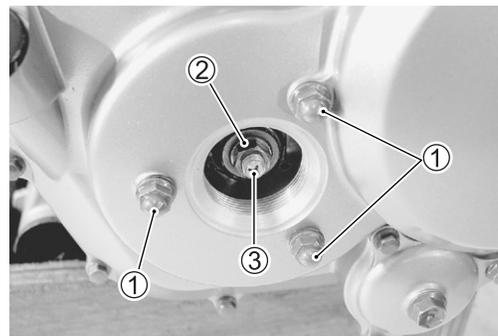
### NOTE:

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



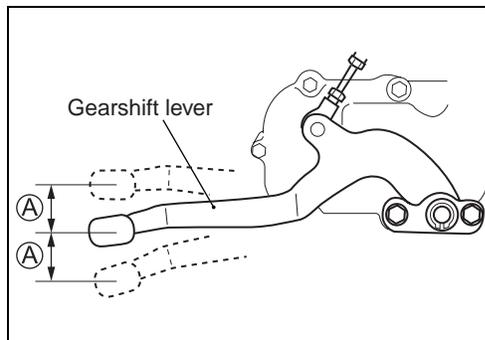
## CLUTCH RELEASE ADJUSTMENT

- Temporarily install the gear shift lever.
- Remove the clutch adjuster cap.
- Loosen the clutch release outer guide nuts ①.
- Loosen the locknut ②.
- Turn the adjusting screw ③ clockwise until it stops.



Check that the gearshift lever plays  $\textcircled{A}$ , up and down, are same. If not, set the clutch release outer guide in suitable position.

Fix the clutch release outer guide by tightening the clutch release outer guide nuts  $\textcircled{1}$ .



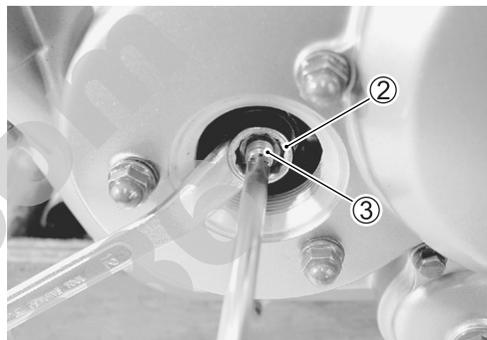
Loosen the locknut  $\textcircled{2}$ .

Tighten the adjusting screw  $\textcircled{3}$  until it stops.

Loosen the adjusting screw  $\textcircled{3}$  1/16 1/8 turn.

Tighten the locknut  $\textcircled{2}$  to the specified torque while holding the adjusting screw  $\textcircled{3}$ .

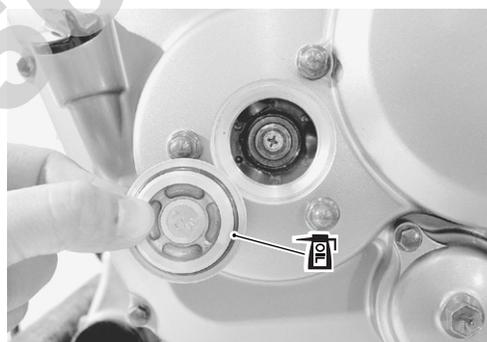
 **Locknut  $\textcircled{2}$ : 23 N•m (2.3 kgf-m, 16.5 lb-ft)**



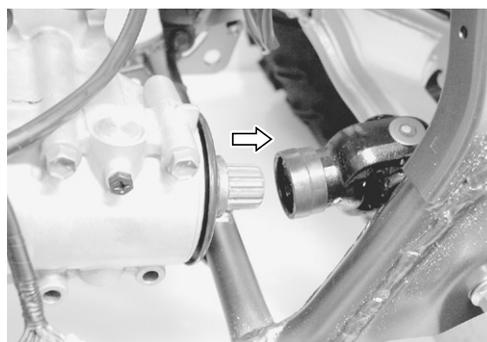
Apply engine oil to the O-ring and cap thread lightly.

Tighten the clutch adjuster cap to the specified torque.

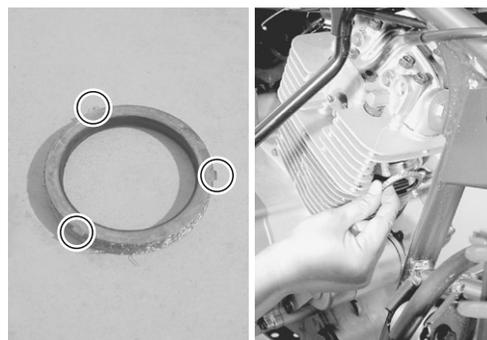
 **Clutch adjuster cap: 15 N•m (1.5 kgf-m, 11.0 lb-ft)**



Engage the secondary driven gear shaft to the universal joint.



Install new gasket as its projections face outside.



Install a new exhaust pipe/muffler connector ④ into the muffler lip.

**NOTE:**

Exhaust gas sealer should be applied to both of the inside and outside of the connector ④.

**EXHAUST GAS SEALER: PERMATEX 1372**

Apply SUZUKI SUPER GREASE to the O-rings.

 99000-25030: SUZUKI SUPER GREASE A (USA)

99000-25010: SUZUKI SUPER GREASE A (Others)

Install the washer ⑤.

Install the brake pedal as its slit matches with the punched mark on the shaft.

Tighten the brake pedal mounting bolt to the specified torque.

 **Brake pedal mounting bolt: 11 N•m (1.1 kgf-m, 8.0 lb-ft)**

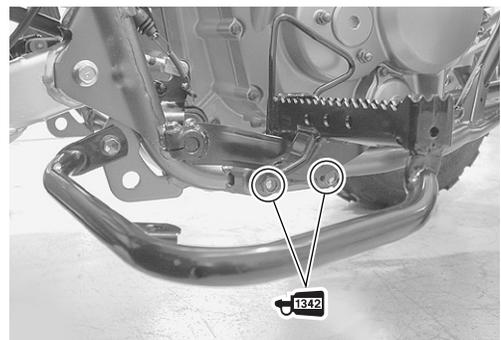
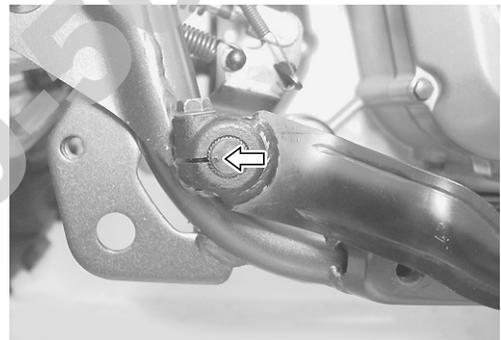
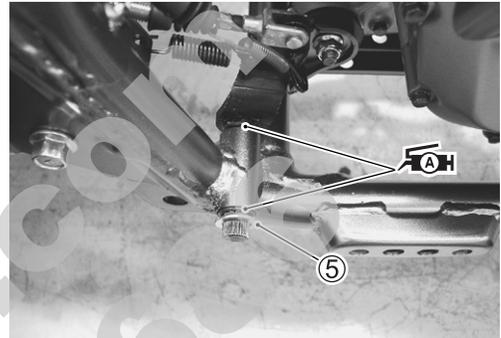
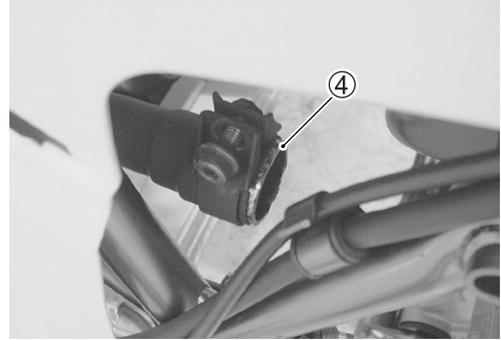
Apply THREAD LOCK to the bolts and tighten each bolt to the specified torque.

 **99000-32050: THREAD LOCK 1342**

 **Footrest bolt: 10 mm: 55 N•m (5.5 kgf-m, 40.0 lb-ft)**

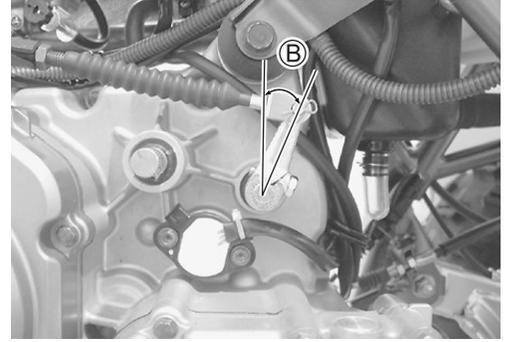
Adjust the brake pedal play ①.

 **Brake pedal play ①: 20 30 mm (0.8 1.2 in)**



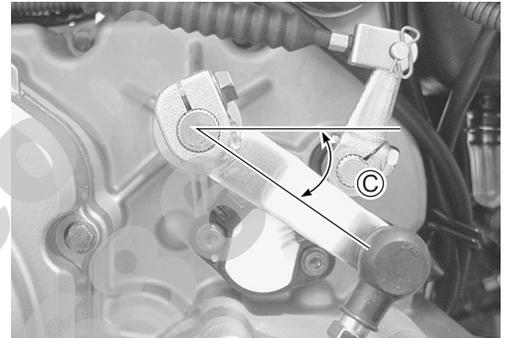
Install the reverse gearshift arm.

**DATA** Reverse gearshift arm angle  $\textcircled{B}$ : 20



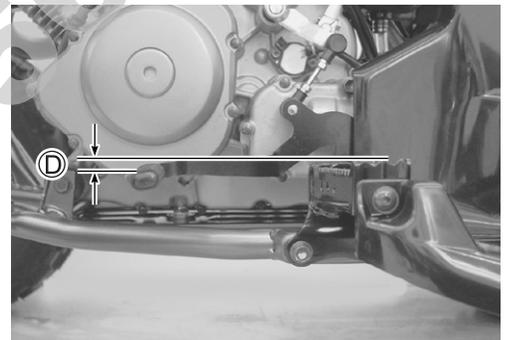
Install the gearshift lever.

**DATA** Gearshift arm angle  $\textcircled{C}$ : 35

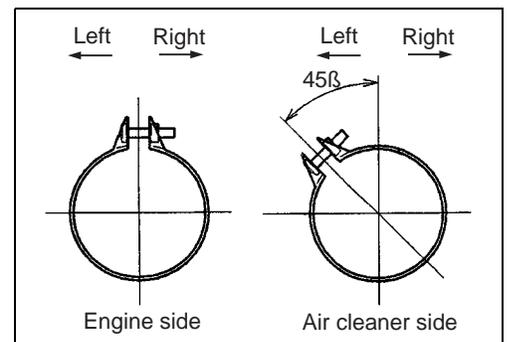


Adjust the gearshift lever height  $\textcircled{D}$ .

**DATA** Gearshift lever height  $\textcircled{D}$ : 0 10 mm (0 0.4 in)



Position the carburetor clamps as shown in the illustration.



After installing the engine, route the wire harness, cables and hoses properly. (➔ 9-11 to -14)

Check the followings.

- \* Engine oil ➔ 2-10
- \* Engine idle speed ➔ 2-9
- \* Throttle cable play ➔ 2-9

## ENGINE DISASSEMBLY

### ENGINE TOP SIDE

#### SPARK PLUG

Remove the spark plug.

 09930-10121: Spark plug wrench set

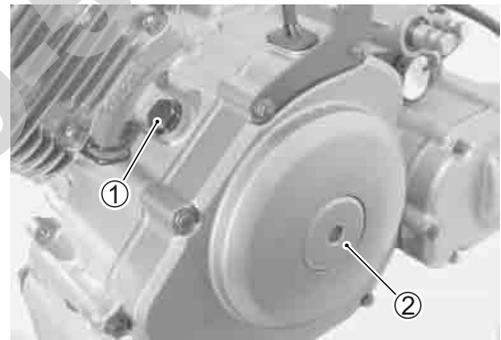


#### STARTER MOTOR

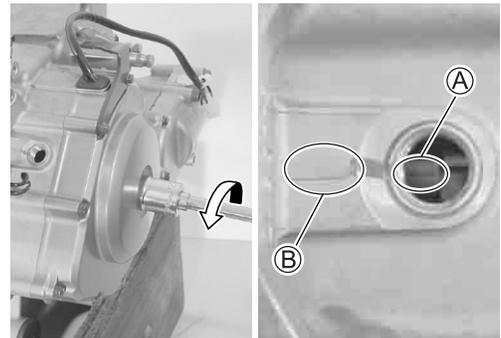
Remove the starter motor.



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

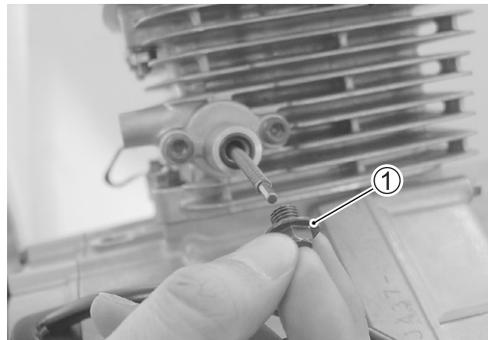


Turn the crankshaft until the TDC line ① on the generator rotor aligns with the index mark ② on the crankcase.



**CAM CHAIN TENSION ADJUSTER**

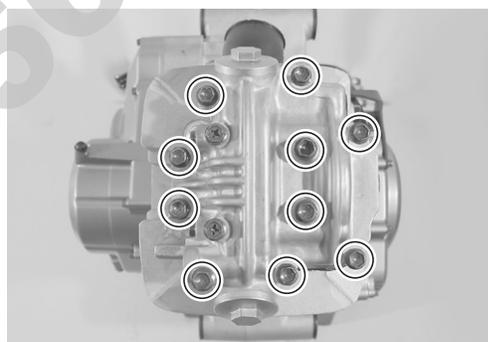
Remove the spring holder bolt ①, pin and spring.



Remove the cam chain tension adjuster.

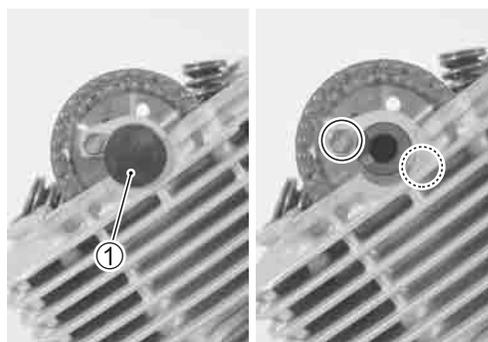
**CYLINDER HEAD COVER**

Remove the cylinder head cover.

**CAMSHAFT**

Remove the camshaft end cap ①.

Flatten the lock washer and remove the camshaft sprocket bolts.

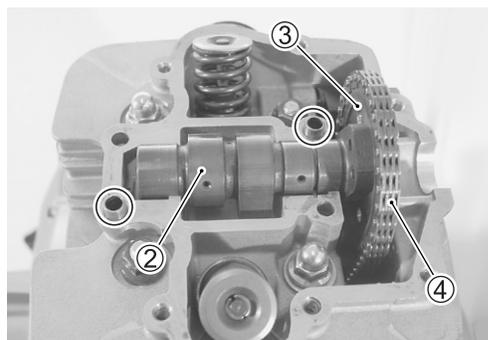


Remove the dowel pins.

Remove the camshaft ② and camshaft sprocket ③.

**CAUTION**

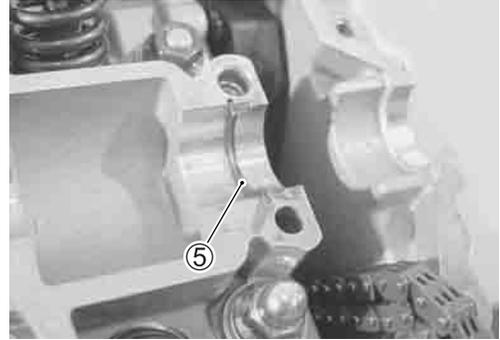
Do not drop the cam chain ④ into the crankcase.



Remove the C-ring ⑤.

**CAUTION**

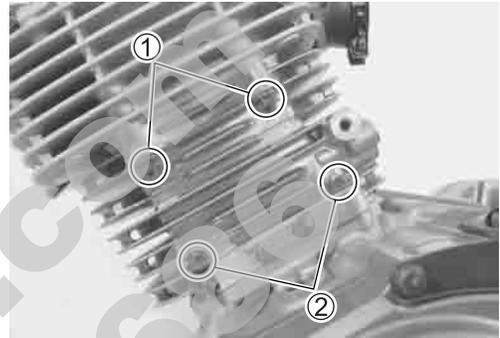
**Do not drop the C-ring ⑤ into the crankcase.**



**CYLINDER HEAD**

Remove the cylinder head nuts (M6) ①.

Loosen the cylinder base nuts (M6) ②.

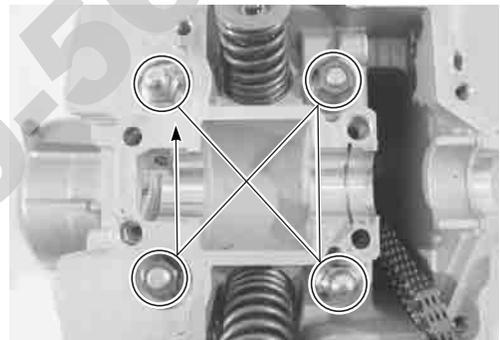


Remove the cylinder head nuts (M8) diagonally.

Remove the cylinder head.

**NOTE:**

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



**CYLINDER**

Remove the dowel pins, cylinder head gasket and cam chain guide ①.

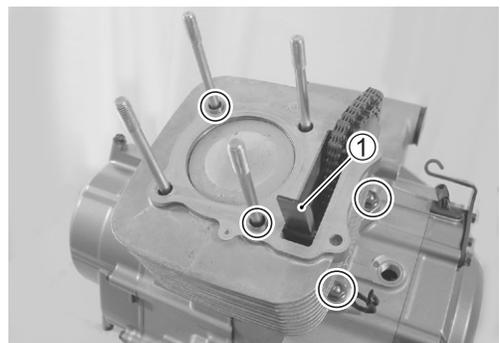
Remove the cylinder base nuts (M6).

Remove the cylinder.

**NOTE:**

*\* Be careful not to drop the dowel pins into the crankcase.*

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



**PISTON**

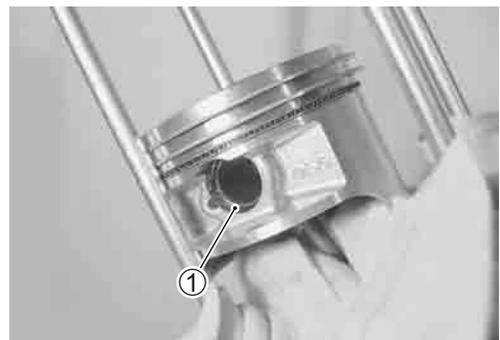
Remove the piston pin circlip ①.

Remove the piston pin and piston.

**NOTE:**

*Place a rag under the piston so as not to drop the piston pin circlip into the crankcase.*

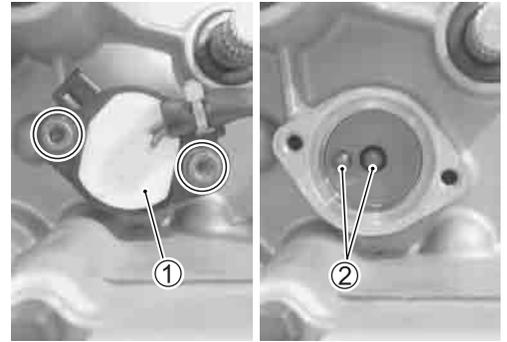
Remove the cylinder gasket and dowel pins.



**ENGINE BOTTOM SIDE****NEUTRAL SWITCH**

Remove the neutral switch ①.

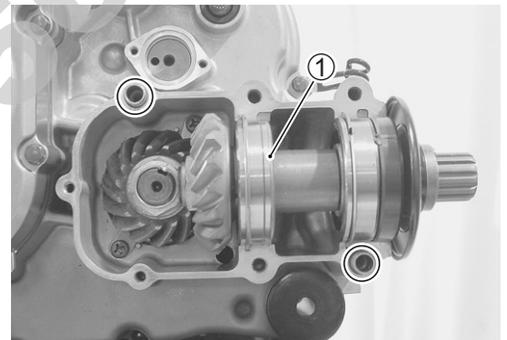
Remove the switch contacts ② and springs.

**SECONDARY DRIVEN BEVEL GEAR**

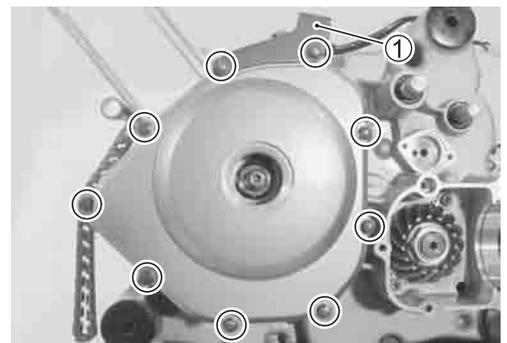
Remove the secondary driven bevel gear cover.



Remove the dowel pins and secondary driven bevel gear assembly ①.

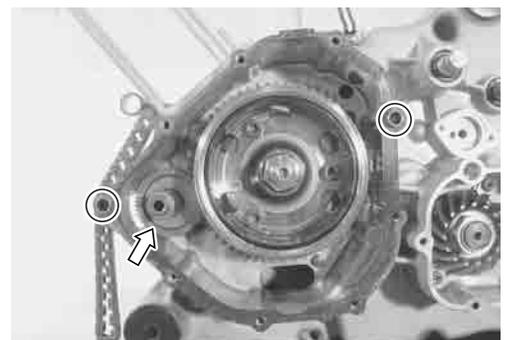
**GENERATOR COVER**

Remove the generator cover and reverse lock release cable holder ①.

**STARTER IDLE GEAR**

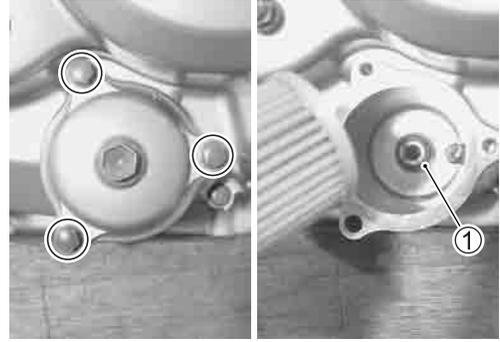
Remove the dowel pins and gasket.

Remove the starter idle gear with its shaft and spacer.



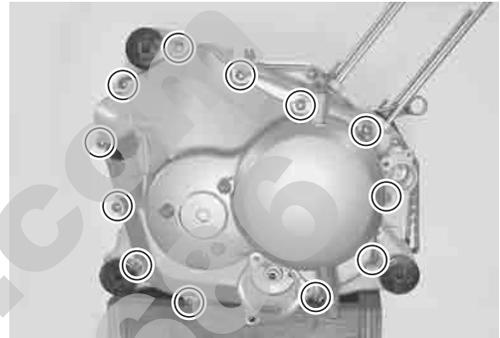
**OIL FILTER**

Remove the oil filter cover.  
Remove the oil filter and O-ring ①.

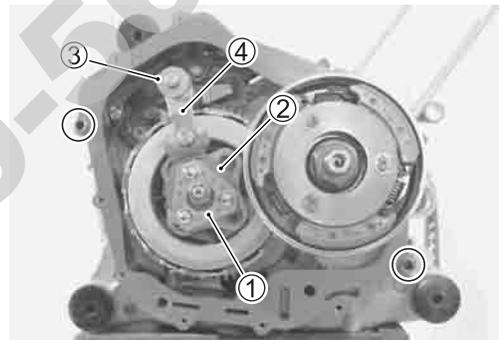


**CLUTCH COVER**

Remove the clutch cover.



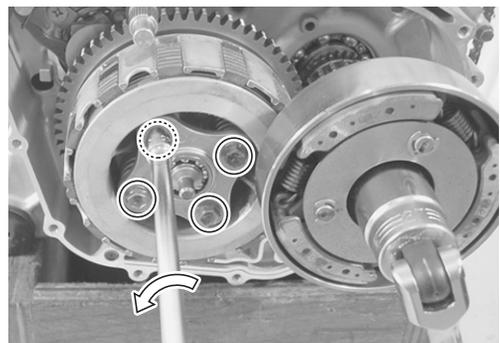
Remove the dowel pins and gasket.  
Remove the clutch release ball assembly ①, inner ball guide ②, washer ③ and clutch release arm ④.



**CLUTCH**

**NOTE:**

*Slightly loosen the clutch spring bolts with holding the clutch shoe nut to facilitate later disassembly.*



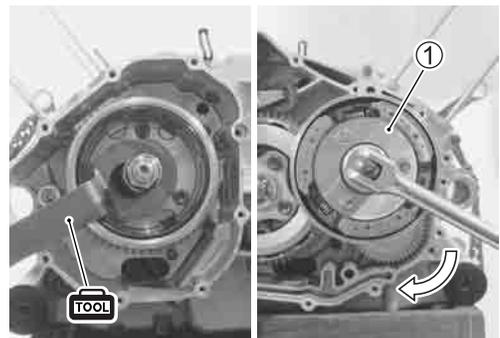
While holding the generator rotor with the special tool, remove the clutch shoe nut.

**TOOL** 09930-44520: Rotor holder

**CAUTION**

**Clutch shoe nut has left-hand threads.**

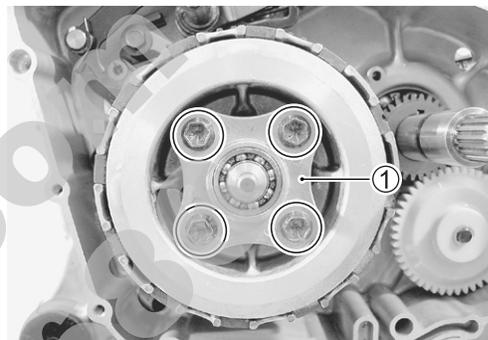
Remove the clutch shoes ① and washer.



Remove the clutch wheel assembly ①.



Remove the clutch bolts.  
Remove the clutch release plate ① and springs.

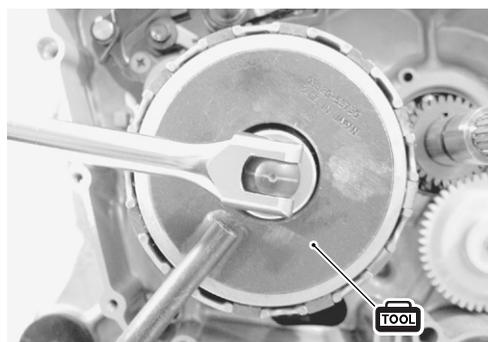


Using a chisel, unlock the nut.

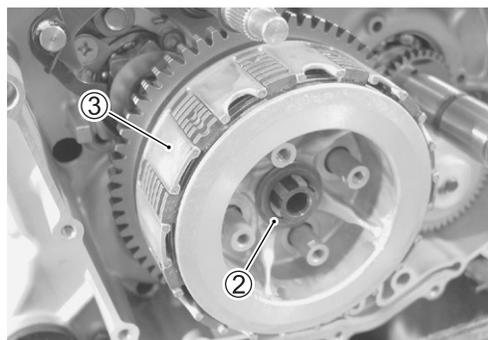


Remove the clutch sleeve hub nut with the special tool.

 09920-53730: Clutch sleeve hub holder

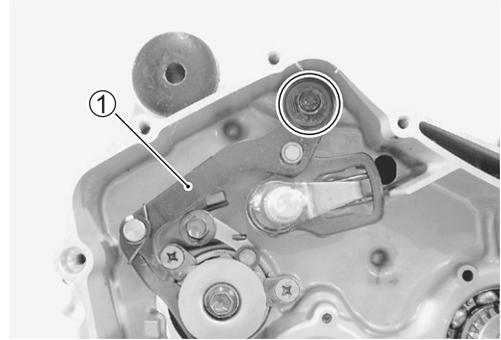


Remove the washer ② and primary driven gear assembly ③.

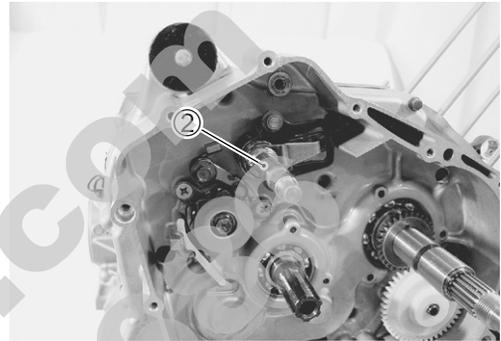


### GEARSHIFT

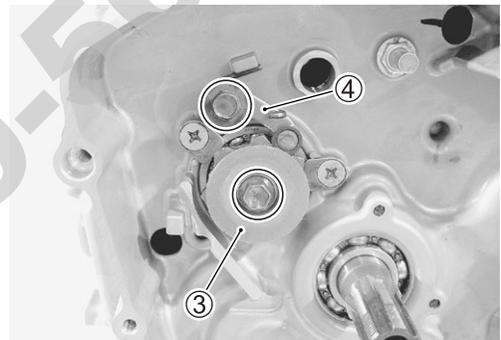
Remove the gearshift arm ①.



Remove the shift cam shaft assembly ②.

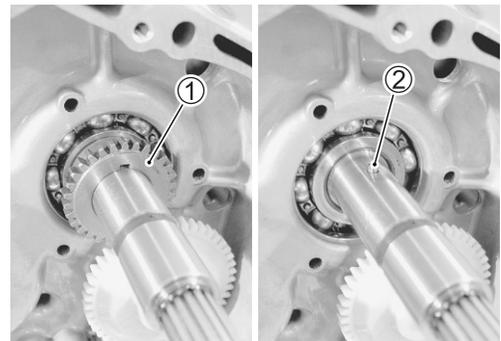


Remove the gearshift cam plate ③ and stopper ④.



### OIL PUMP DRIVE GEAR

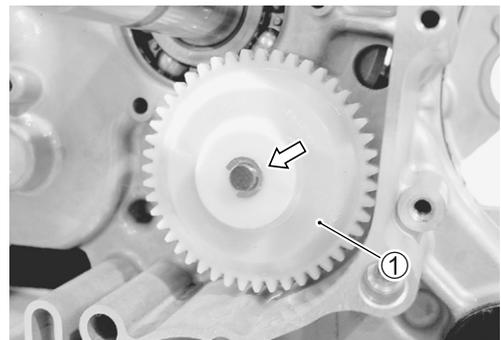
Remove the oil pump drive gear ① and pin ②.



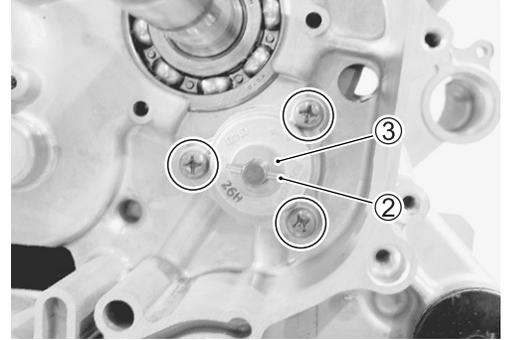
### OIL PUMP

Remove the E-ring.

Remove the oil pump driven gear ①.



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



## GENERATOR

Remove the generator rotor nut with the special tool.

**TOOL** 09930-44520: Rotor holder



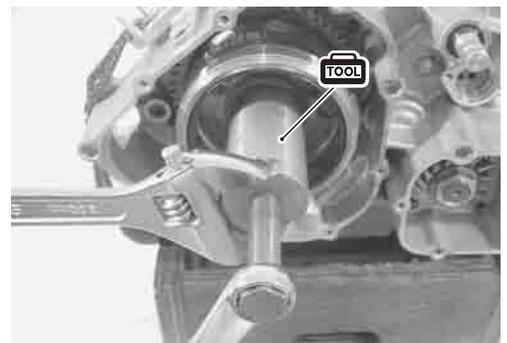
Install the special tool to the crankshaft end.

**TOOL** 09930-31921: Rotor remover attachment



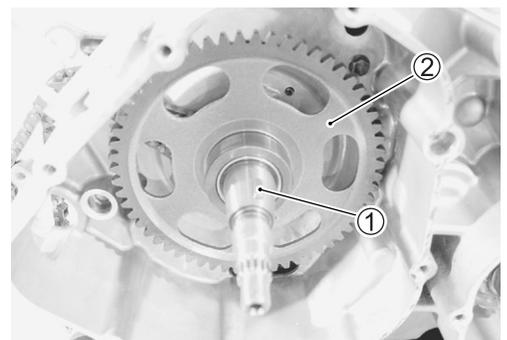
Remove the generator rotor with the special tool.

**TOOL** 09930-35010: Rotor remover



Remove the key ①.

Remove the starter driven gear ②.



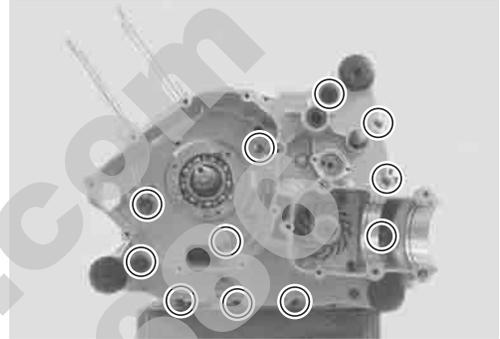
### CAM CHAIN

Remove the cam chain.

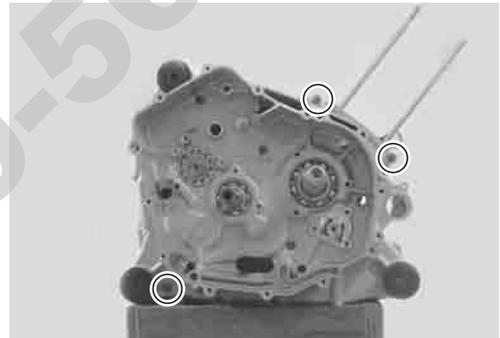


### CRANKCASE

Remove the left crankcase bolts.



Remove the right crankcase bolts.

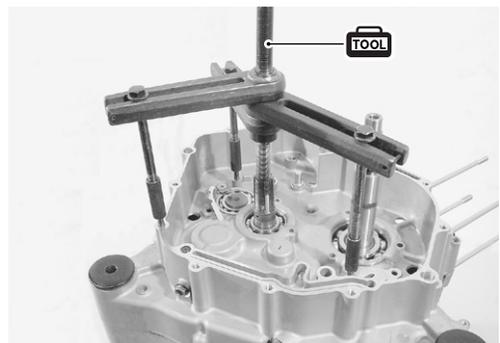


Separate the crankcase with the special tool.

#### NOTE:

- \* The crankcase separator arms should be parallel with the end face of the crankcase.
- \* The crankshaft must remain in the left crankcase half.

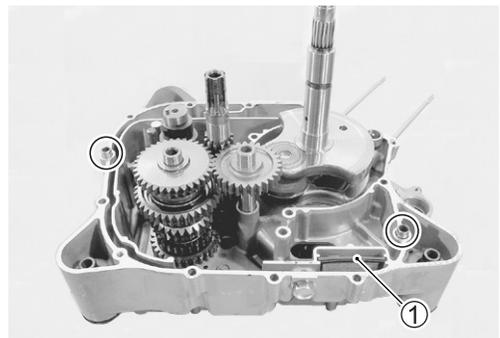
 **09920-13120: Crankcase separator**



### OIL SUMP FILTER

Remove the dowel pins.

Remove the oil sump filter ①.



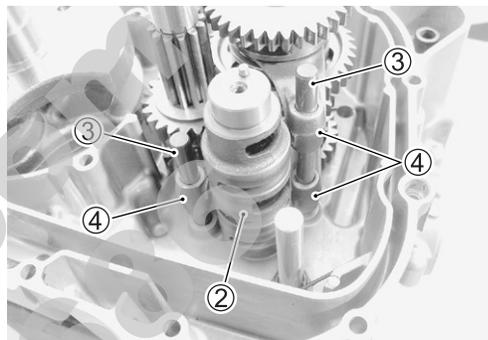
**DRIVE TRAIN/GEARSHIFT CAM**

Remove the reverse idle gear assembly ①.

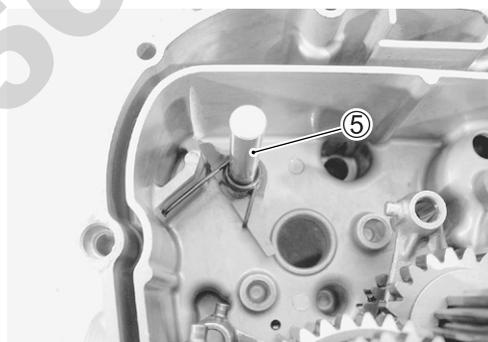


Remove the gearshift cam ②

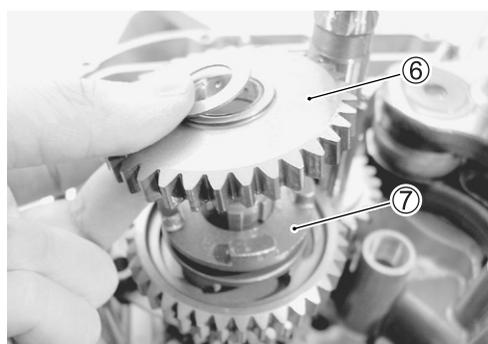
Remove the shafts ③ and forks ④.



Remove the shift cam lock shaft ⑤.

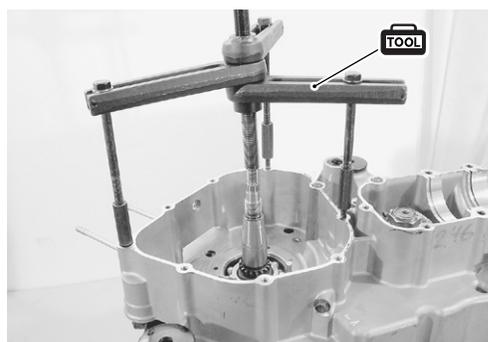


Remove the washers, reverse driven gear ⑥ and reverse dog ⑦.

**CRANKSHAFT**

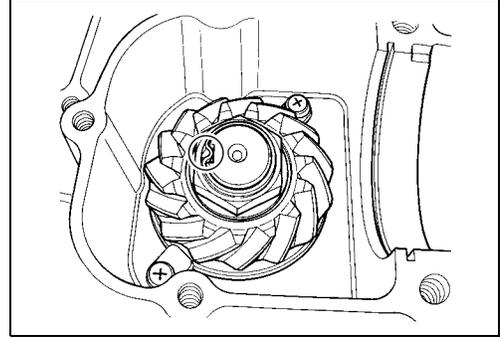
Remove the crankshaft with the special tool.

 **09920-13120: Crankcase separator**



### DRIVE BEVEL GEAR

Using a chisel, unlock the nut.



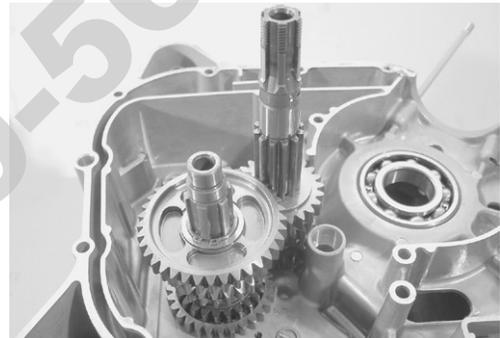
Fit the special tool onto the driveshaft.

 **09930-73150: Output shaft holder**

Loosen the secondary drive bevel gear and nut by holding the special tool with a vise.



Remove the secondary drive bevel gear and driveshaft assembly, countershaft assembly.



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## ENGINE COMPONENTS INSPECTION AND SERVICE

### CYLINDER HEAD COVER

#### DISASSEMBLY

##### CAUTION

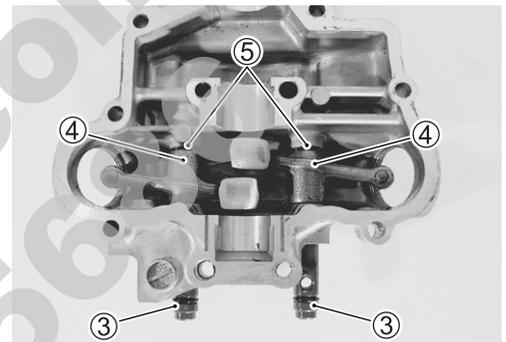
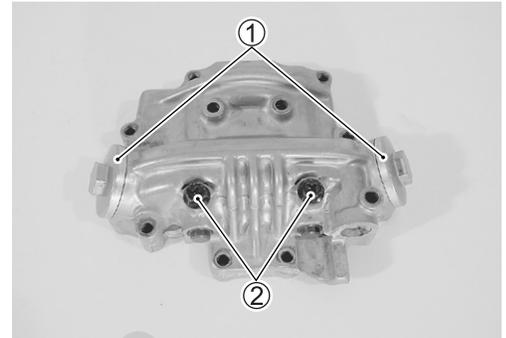
Be sure to identify each removed part as to its location, and lay the parts out in groups designated as Exhaust , Intake , so that each will be restored to the original location during assembly.

Remove the valve inspection caps ①.

Remove the rocker arm shaft bolts ②.

Remove the rocker arm shafts ③.

Remove the rocker arms ④ and wave washers ⑤.



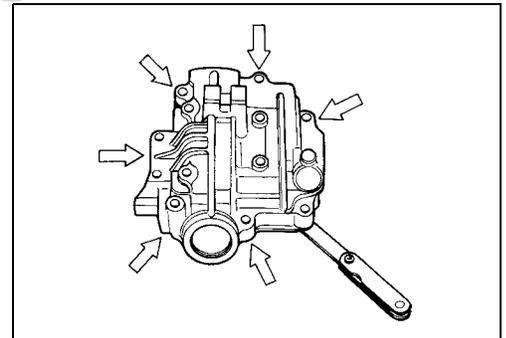
#### CYLINDER HEAD COVER DISTORTION

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.

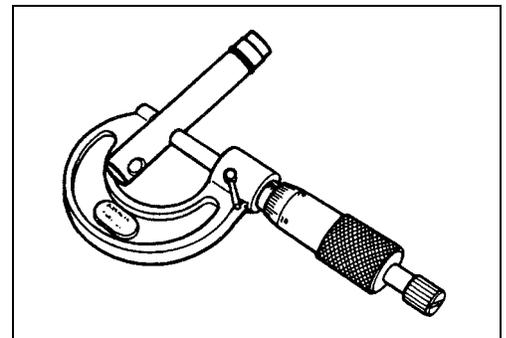


#### ROCKER ARM SHAFT O.D.

Measure diameter of rocker arm shaft.

**DATA** Rocker arm shaft O.D. (IN & EX)  
Standard: 11.977 11.995 mm (0.4715 0.4722 in)

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



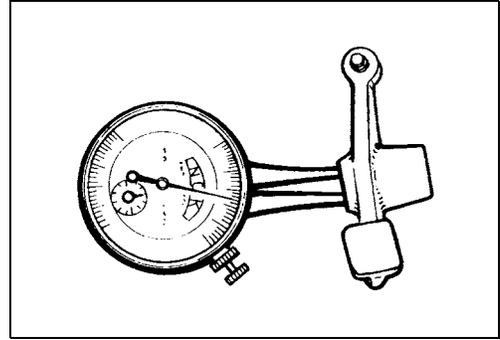
**ROCKER ARM I.D.**

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

**DATA** Rocker arm I.D.

Standard: 12.000 1 2.018 mm (0.4724 0 .4731 in)

**TOOL** 09900-20605: Dial calipers

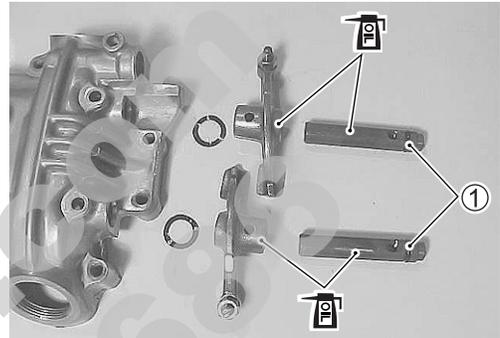
**REASSEMBLY**

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

Install new O-rings ① to the rocker arm shafts.

Apply engine oil to the rocker arms and shafts.

Install the rocker arms, wave washers and shafts to the cylinder head cover.



Tighten the rocker arm shaft bolts to the specified torque.

**W** Rocker arm shaft bolt: 9 N•m (0.9 kgf-m, 6.5 lb-ft)

**CAUTION**

Install the gasket washers to prevent oil leakage.



Install new O-rings to the valve inspection caps.

Apply SUZUKI SUPER GREASE to the O-rings.

**AH** 09900-25030: SUZUKI SUPER GREASE A (USA)  
09900-25010: SUZUKI SUPER GREASE A (Others)



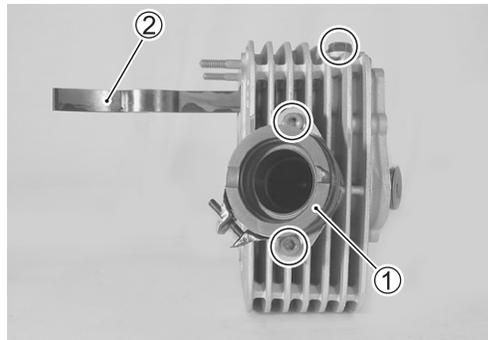
## CYLINDER HEAD

### DISASSEMBLY

Remove the intake pipe ①.

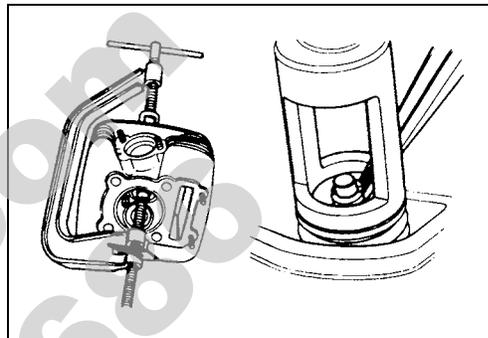
Remove the cam chain tensioner ②.

Cam chain tensioner inspection (☞ 3-34)

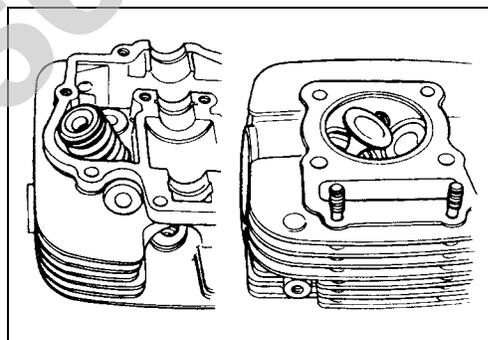


Compress the valve spring and remove the valve cotter from the valve stem with the special tools.

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



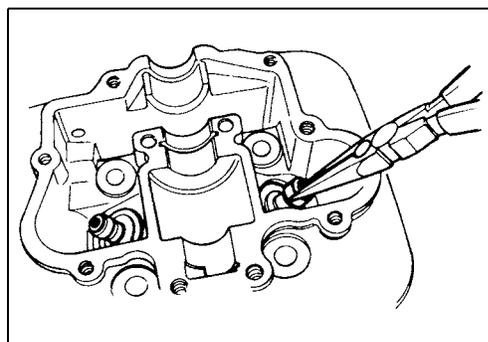
Remove the valve spring retainer and valve spring.  
 Remove the valve from the other side.



Remove the valve stem seal with long-nose pliers.  
 Remove the valve spring seat.

#### NOTE:

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



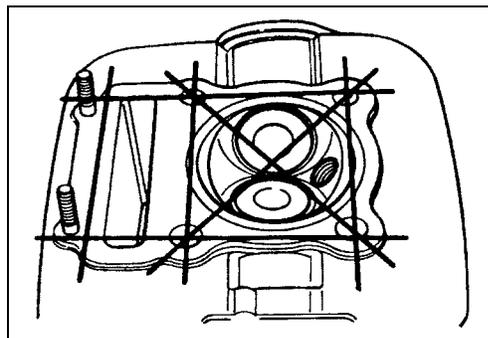
### CYLINDER HEAD DISTORTION

Decarbonize the combustion chamber.

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

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

**TOOL** 09900-20803: Thickness gauge



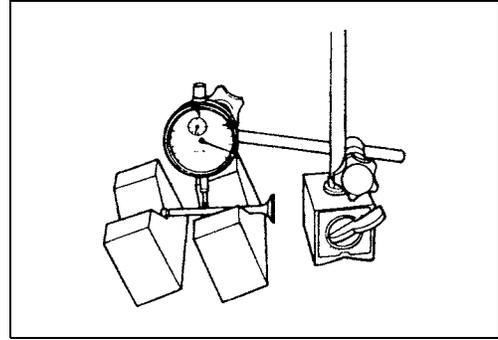
**VALVE STEM RUNOUT**

Support the valve with the V-blocks and measure the valve stem runout with the dial gauge, as shown. If the runout exceeds the service limit, replace the valve with a new one.

**DATA** Valve stem runout

Service Limit: 0.05 mm (0.002 in)

- TOOL** 09900-20701: Magnetic stand  
 09900-20607: Dial gauge (1/100 mm)  
 09900-21304: V-block

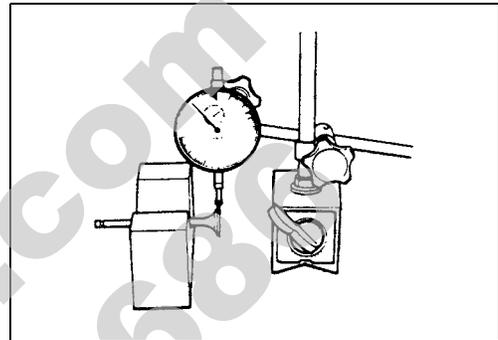
**VALVE HEAD RADIAL RUNOUT**

Support the valve with the V-blocks and measure the valve head radial runout with the dial gauge, as shown. If the runout exceeds the service limit, replace the valve with a new one.

**DATA** Valve head radial runout

Service Limit: 0.03 mm (0.001 in)

- TOOL** 09900-20701: Magnetic stand  
 09900-20607: Dial gauge (1/100 mm)  
 09900-21304: V-block

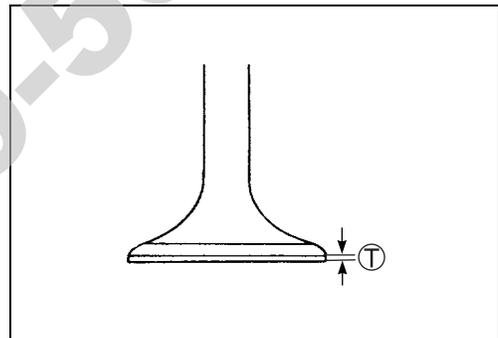
**VALVE FACE WEAR**

Visually inspect each valve face for wear or damage. If any abnormal wear is found, replace the respective valve with a new one. Measure the valve head thickness  $\text{Ⓜ}$ . If the valve head thickness is not within the specified value, replace the valve with a new one.

**DATA** Valve head thickness  $\text{Ⓜ}$ 

Service Limit: 0.5 mm (0.02 in)

- TOOL** 09900-20101: Vernier calipers

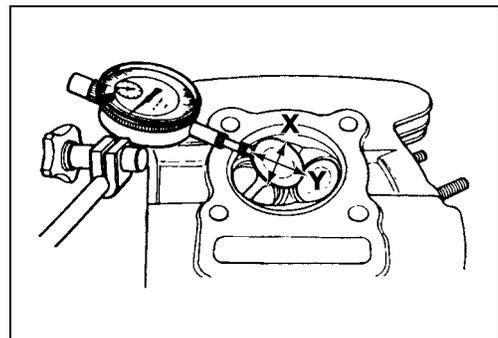
**VALVE STEM DEFLECTION**

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 exceeds the service limit, 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** 09900-20607: Dial gauge (1/100 mm)  
 09900-20701: Magnetic stand



**VALVE STEM WEAR**

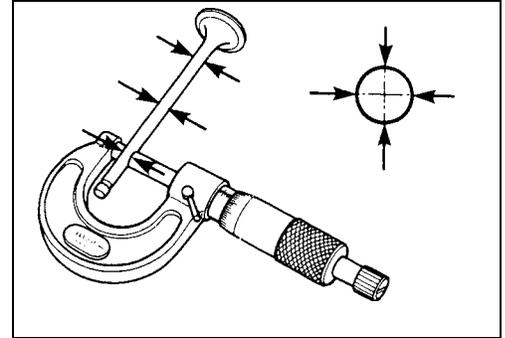
Measure the valve stem outside diameter with the micrometer. If the outside diameter is not within the specified value, replace the valve with a new one. If the valve stem outside diameter is within specification, but the valve stem deflection is not, replace the valve guide with a new one. After replacing the valve or valve guide, check the deflection and.

**DATA** Valve stem O.D.

Standard (IN) : 5.475 5.4 90 mm (0.2156 0.2 161 in)

(EX) : 5.455 5.4 70 mm (0.2148 0.2 154 in)

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

**VALVE GUIDE SERVICING**

Drive the valve guide out toward the intake or exhaust rocker arm side with the valve guide remover.

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

**NOTE:**

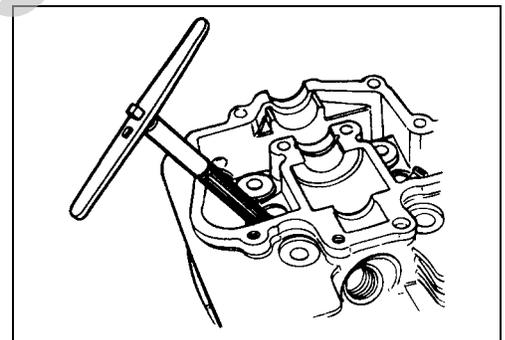
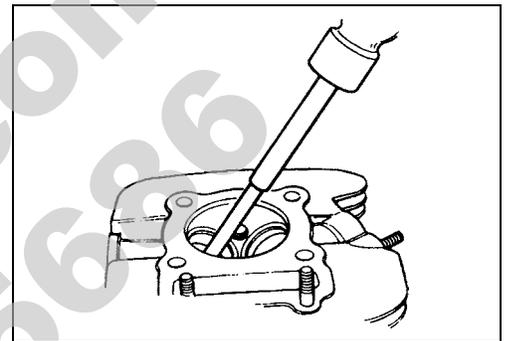
\* Discard the removed valve guide.

\* Only oversized valve guides are available as replacement parts. (Part No. 11115-05270)

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

**TOOL** 09916-34561: Valve guide reamer (11.3 mm)

09916-34542: Reamer handle

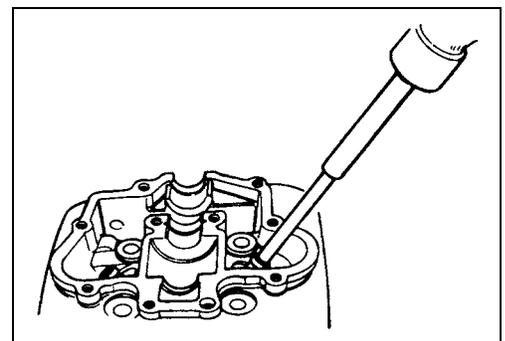


Install a ring onto each valve guide. Be sure to use new rings. Oil the stem hole of each valve guide and drive the guide into the guide hole with the valve guide installer.

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

**CAUTION**

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

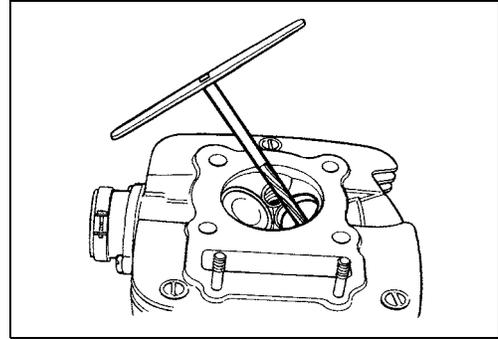


After fitting all valve guides, re-finish their guiding bores with the valve guide reamer. Be sure to clean and oil the guide after reaming.

**TOOL** 09916-34550: Valve guide reamer (5.5 mm)  
09916-34542: Reamer handle

**NOTE:**

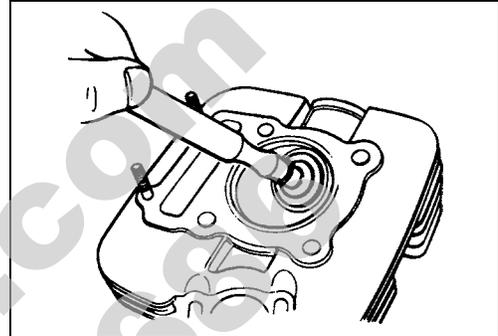
Insert the reamer from the combustion chamber and always turn the reamer handle clockwise.



**VALVE SEAT WIDTH**

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

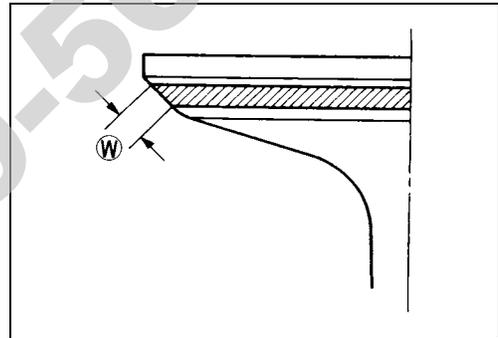
**TOOL** 09916-10911: Valve lapper set



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

**DATA** Valve seat width  $\text{\textcircled{W}}$   
Standard: 0.88 1.08 mm (0.035 0.043 in)

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

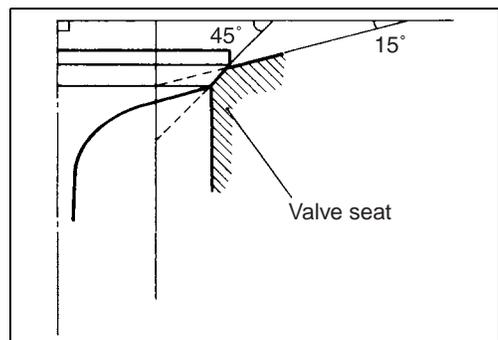


**VALVE SEAT SERVICE**

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

	INTAKE	EXHAUST
15	N-212	N-121
45	N-608	N-122

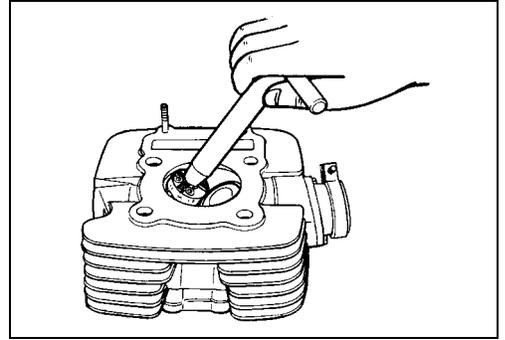
**TOOL** 09916-21111: Valve seat cutter set  
09916-24900: Valve seat cutter set  
09916-22480: Solid pilot (N-140-5.5)  
09916-24450: Solid pilot (N-100-5.52)  
09916-24935: Valve seat cutter (N-608)



**CAUTION**

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

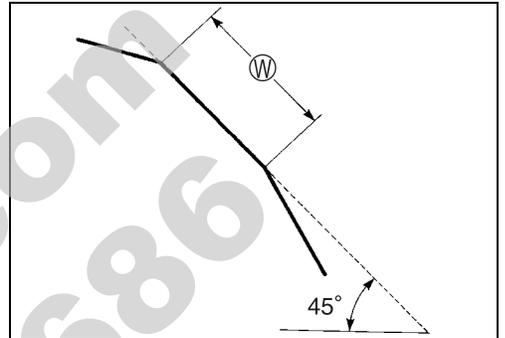
When installing the solid pilot, rotate it slightly. Seat the pilot snugly. Install the 45° cutter, attachment and T-handle.



### INITIAL SEAT CUT

Descal and clean up the seat with the 45° cutter. Rotate the cutter one or two turns.

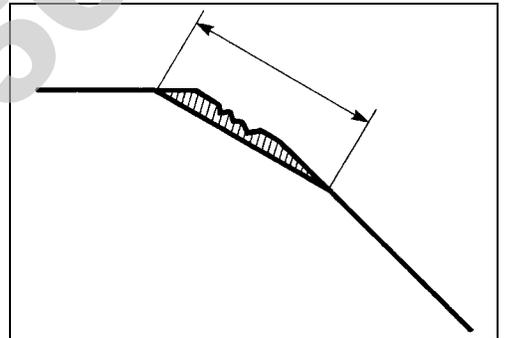
Measure the valve seat width  $\text{W}$  after every cut.



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

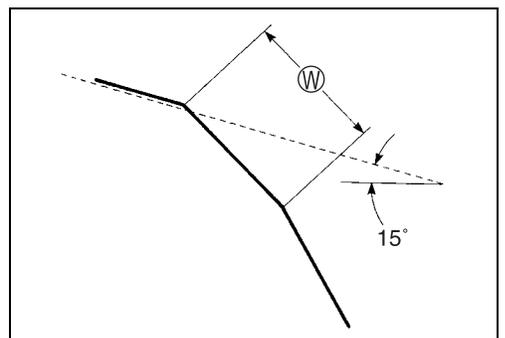
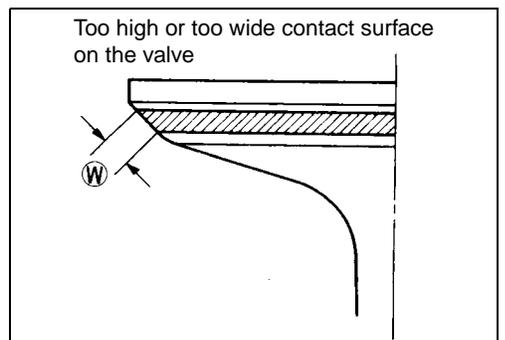
### NOTE:

*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  $\text{W}$  is too high on the valve, or if it is too wide, use the 15° cutter to lower and narrow the contact area.



**FINAL SEAT CUT**

If the contact area  $\textcircled{W}$  is too low or too narrow, use the 45° cutter to raise and widen the contact area.

**NOTE:**

After cutting the 15° angle, 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. (↗ 2-5)

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**

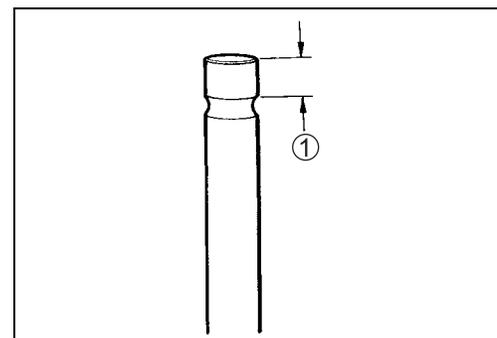
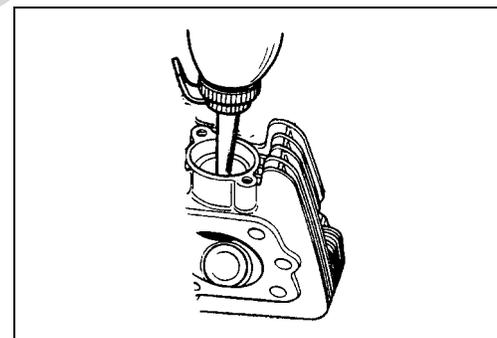
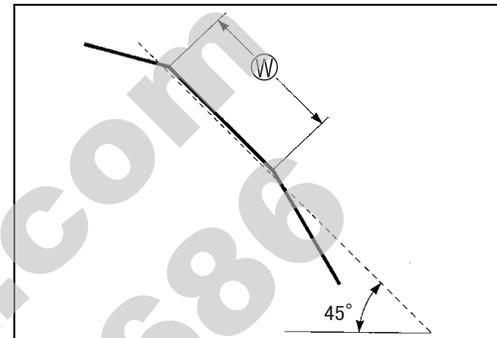
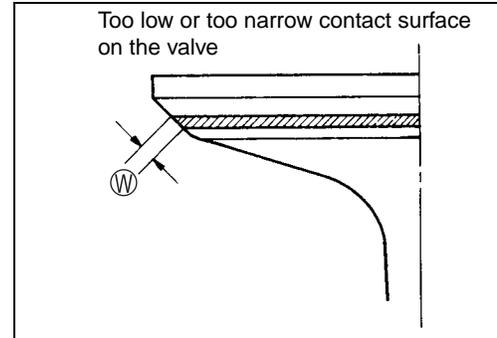
Always use extreme caution when handling gasoline.

**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  $\textcircled{1}$  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: 2.5 mm (0.10 in)



## VALVE SPRING

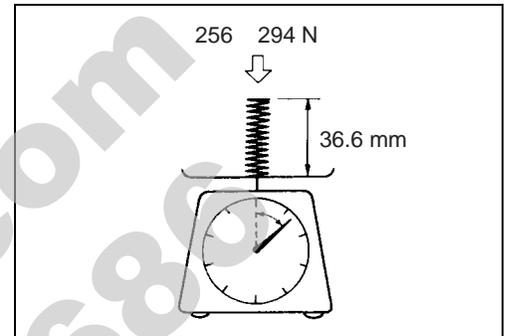
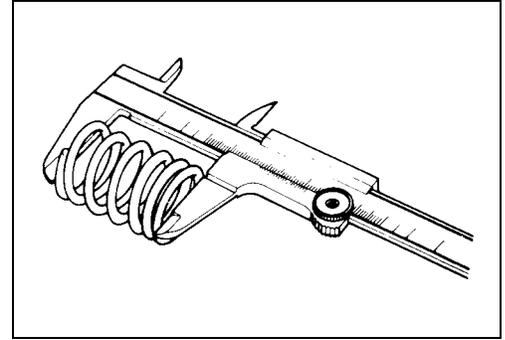
The force of the coil spring keeps the valve seat tight. Weakened spring result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.

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 valve spring is not within specification, replace both the inner and outer springs as a set.

**DATA** Valve spring free length (IN & EX)  
Service Limit: 43.0 mm (1.69 in)

**DATA** Valve spring tension (IN & EX)  
Standard: 256 294 N/36.6 mm  
(26.1 30.0 kgf/36.6 mm,  
57.5 66.1 lbs/1.44 in)

**TOOL** 09900-20101: Vernier calipers



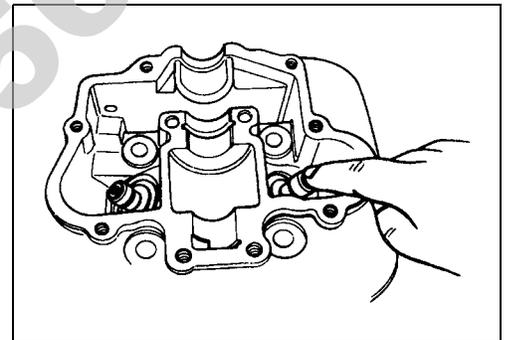
## REASSEMBLY

Install each valve spring seat.

Apply engine oil to each oil seal and press-fit them into position.

### CAUTION

Do not reuse the oil seal.

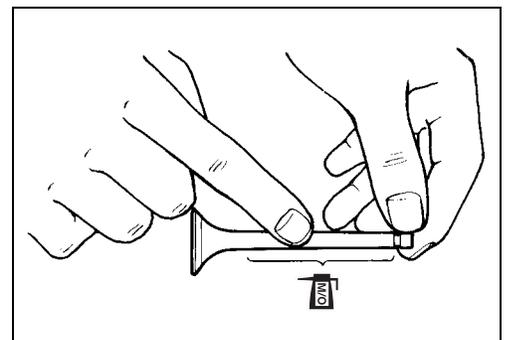


Insert the valves, with their stems coated with molybdenum oil solution all around and along the full stem length without any break.

### **OLIO** MOLYBDENUM OIL SOLUTION

### CAUTION

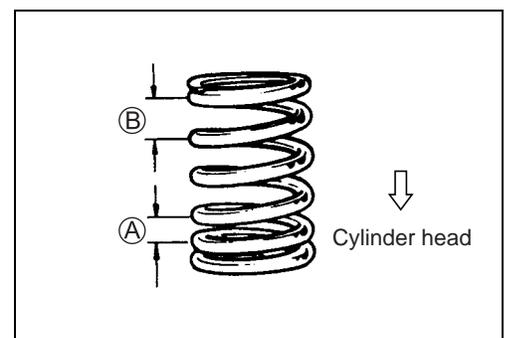
When inserting each valve into the valve guides, make sure not to damage the lip of the oil seal.



Install the valve spring with the smaller pitch portion (A) facing the cylinder head.

(A) Smaller pitch portion.

(B) Larger pitch portion.



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

**TOOL** 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.

**INTAKE PIPE**

When installing the intake pipe, apply SUZUKI SUPER GREASE to the O-ring.

**AH** 99000-25030: SUZUKI SUPER GREASE A (USA)  
 99000-25010: SUZUKI SUPER GREASE A (Others)

**CAUTION**

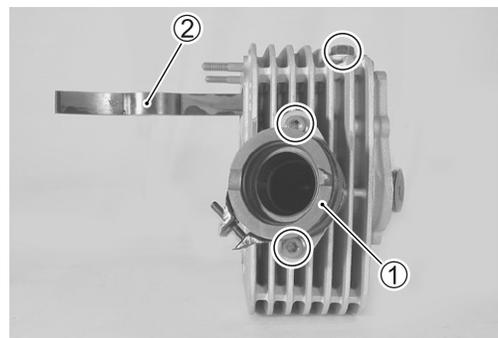
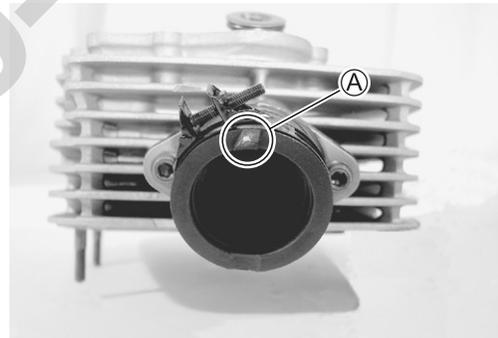
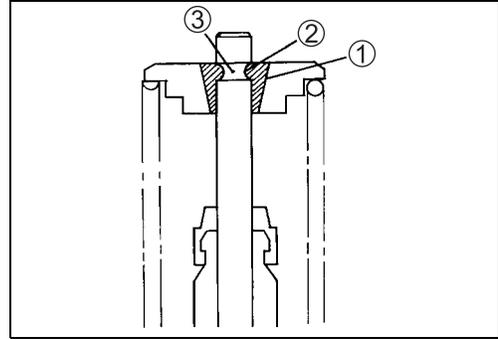
Use the new O-ring to prevent sucking air from the joint.

**NOTE:**

Make sure that the protrusion **A** faces upward.

Install the intake pipe ① and cam chain tensioner ②.  
 Tighten the cam chain tensioner mounting bolt to the specified torque.

**W** Cam chain tensioner mounting bolt:  
 13 N•m (1.3 kgf-m, 9.5 lb-ft)



## CAMSHAFT

The camshaft 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 camshaft.

### CAMSHAFT CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced power output.

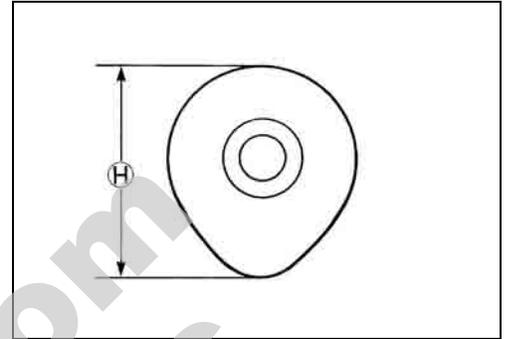
Measure the cam height  $\ominus$  with the micrometer. If the cams are worn to the service limit, replace the camshaft with a new one.

#### **DATA** Cam height $\ominus$

**Service Limit (IN) : 33.480 mm (1.3181 in)**

**(EX) : 32.690 mm (1.2870 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 the 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 until after the oil clearance has been determined.

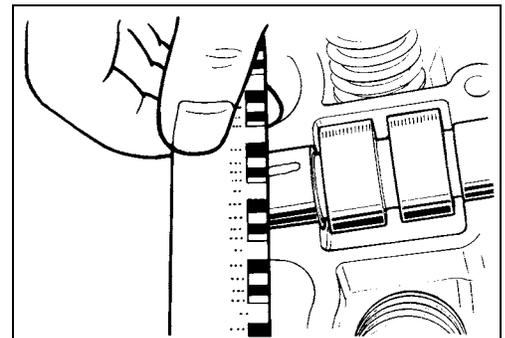
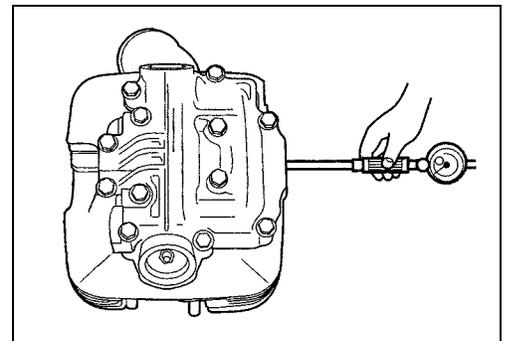
Tighten the cylinder head cover bolts evenly and diagonally to the specified torque.

**🔧** **Cylinder head cover bolt: 10 N•m (1.0 kgf-m, 7.3 lb-ft)**

#### NOTE:

Do not rotate the camshafts with the plastigauge in place.

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



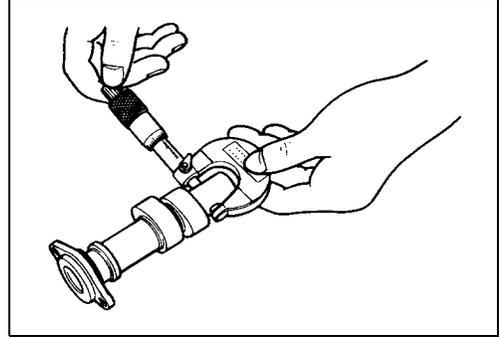
If the camshaft journal oil clearance measured exceeds the limit, measure the outside diameter of camshaft.

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

**DATA** Camshaft journal O.D.

Standard: 21.959 21.976 mm  
(0.8645 0.8652 in)

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



**CAMSHAFT RUNOUT**

Measure the camshaft runout with the special tools. If the runout exceeds the service limit, replace the camshaft with a new one.

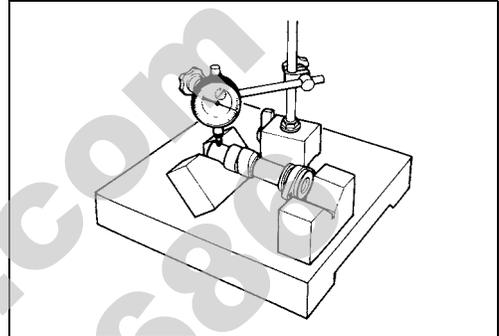
**DATA** Camshaft runout (IN & EX)

Service Limit: 0.10 mm (0.004 in)

**TOOL** 09900-20607: Dial gauge (1/100, 10 mm)

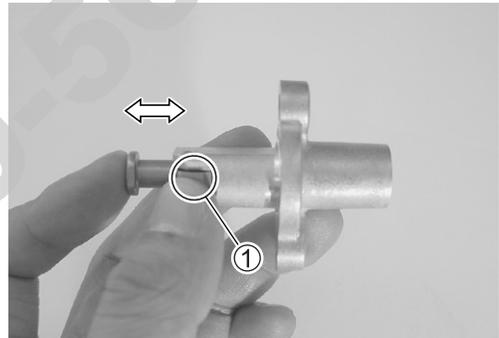
09900-20701: Magnetic stand

09900-21304: V-block (100 mm)



**CAM CHAIN TENSION ADJUSTER**

Check that the push rod slides smoothly with unlocking the ratchet mechanism ①. If any stickiness is noted or ratchet mechanism is faulty, replace the cam chain tension adjuster with a new one.



**CAM CHAIN TENSIONER AND CAM CHAIN GUIDE**

Check the contacting surface of the cam chain tensioner/guide for wear and damage. If it is worn or damaged, replace it with a new one.



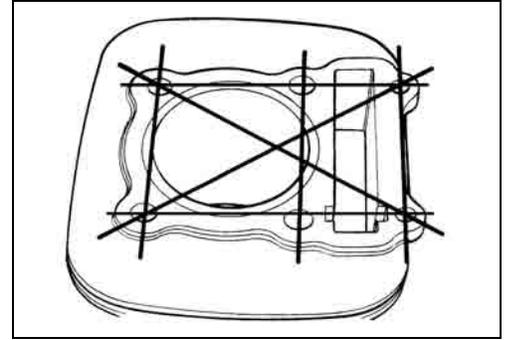
## CYLINDER

### CYLINDER DISTORTION

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

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

**TOOL** 09900-20803: Thickness gauge

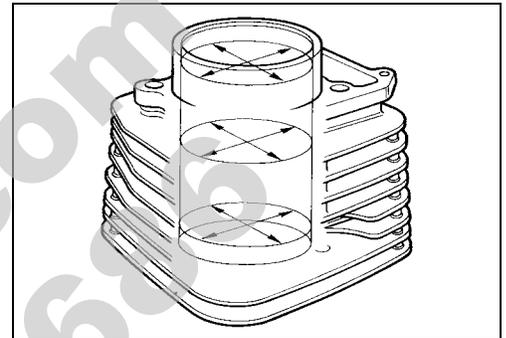


### CYLINDER BORE

Inspect the cylinder wall for any scratches, nicks or other damage. Measure the cylinder bore diameter at six places.

**DATA** Cylinder bore  
Service Limit: 66.090 mm (2.6020 in)

**TOOL** 09900-20508: Cylinder gauge set



## PISTON AND PISTON RING

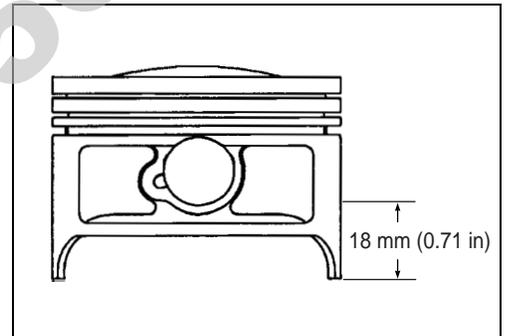
### PISTON DIAMETER

Measure the piston diameter with the micrometer at 18 mm (0.71 in) from the skirt end.

If the piston diameter is less than the service limit, replace the piston with a new one.

**DATA** Piston diameter  
Service Limit: 65.880 mm (2.5937 in)

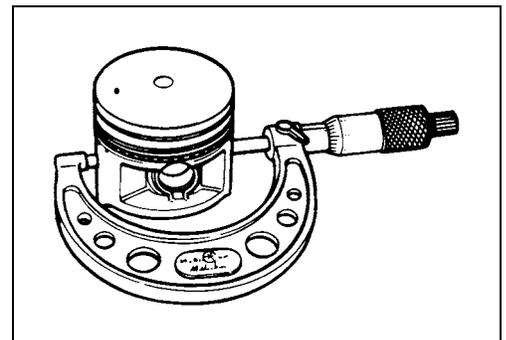
**TOOL** 09900-20203: Micrometer (50 - 75 mm)



### 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 of the cylinder and piston.

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



**PISTON RING TO GROOVE CLEARANCE**

Measure the side clearances of the 1st and 2nd piston rings with the thickness gauge. If any clearance reading exceeds the service limit, replace both the piston and piston rings.

**DATA** Piston ring to groove clearance

Service Limit (1st) : 0.18 mm (0.0071 in)  
(2nd): 0.15 mm (0.0059 in)

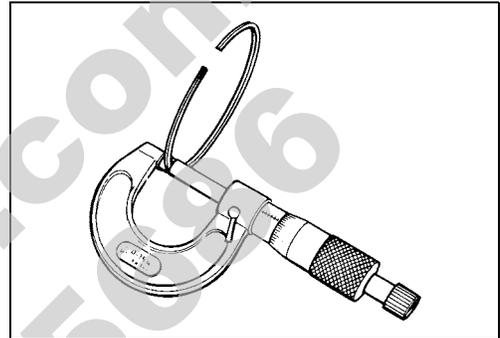
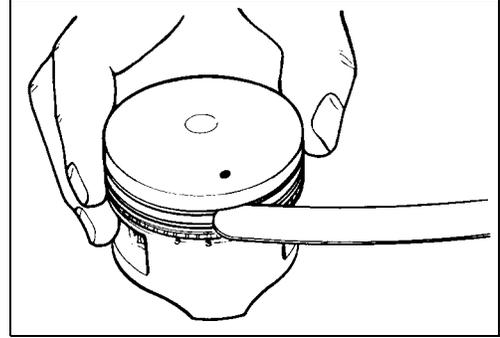
**DATA** Piston ring groove width

Standard (1st) : 1.01 1.03 mm (0.0398 0.0406 in)  
(2nd): 1.21 1.23 mm (0.0476 0.0484 in)  
(Oil) : 2.01 2.03 mm (0.0791 0.0799 in)

**DATA** Piston ring thickness

Standard (1st) : 0.97 0.99 mm  
(0.038 0.039 in)  
(2nd): 1.17 1.19 mm  
(0.046 0.047 in)

**TOOL** 09900-20803: Thickness gauge  
09900-20205: Micrometer (0 2 5 mm)

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

At first measure the piston ring free end gap with the vernier calipers and then fit the piston ring squarely into the cylinder and measure the piston ring end gap with the thickness gauge.

If any measurement exceeds the service limit, replace the piston ring with a new one.

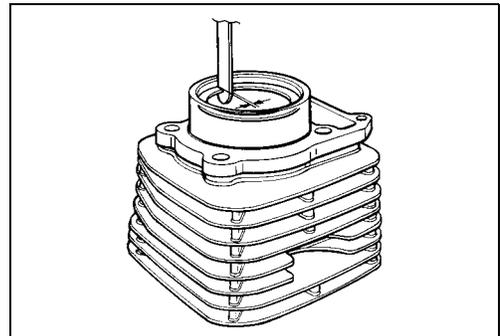
**DATA** Piston ring free end gap

Service Limit (1st) : 7.0 mm (0.28 in)  
(2nd): 6.1 mm (0.24 in)

**DATA** Piston ring end gap

Service Limit (1st) : 0.50 mm (0.020 in)  
(2nd): 0.50 mm (0.020 in)

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



**Oversize piston ring**

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

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

**Oversize oil ring**

The following oversize oil ring is available as optional parts. They bear the following identification mark.

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

**Oversize side rail**

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

**PISTON PIN AND PIN BORE**

Measure the piston pin bore diameter with the small bore gauge. If the diameter exceeds the service limit, replace the piston with a new one.

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

Service Limit: 16.030 mm (0.6311 in)

**TOOL** 09900-20602: Dial gauge (1/1 000 mm, 1 mm)

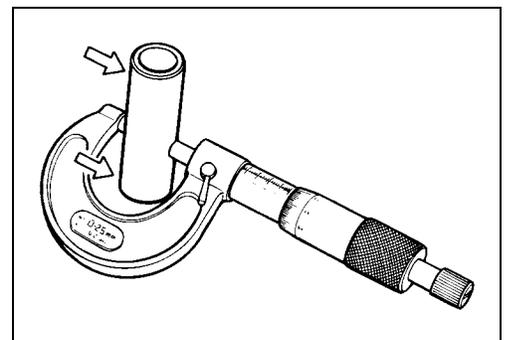
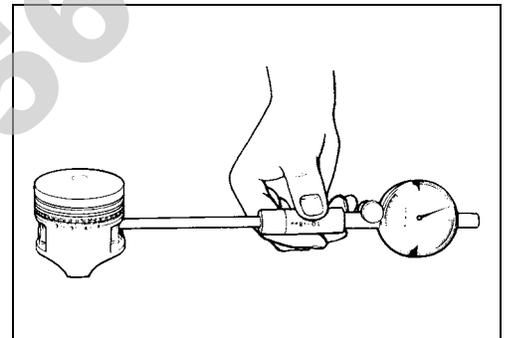
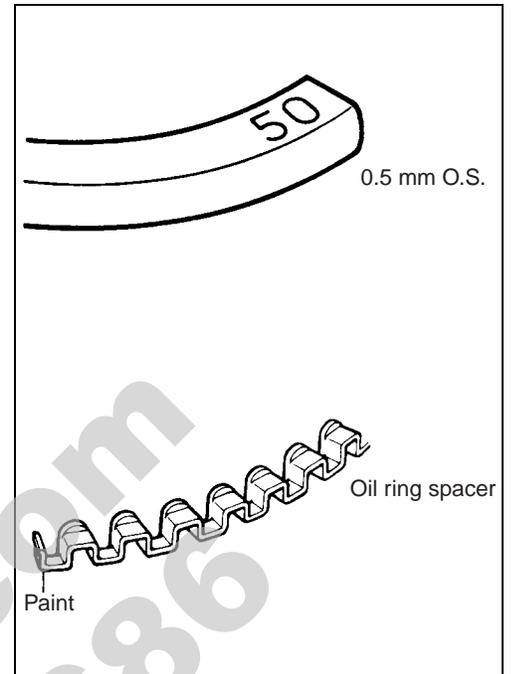
09900-22401: Small bore gauge (10 1 8 mm)

Measure the piston pin outside diameter at three positions with the micrometer. If any measurement exceeds the service limit, replace the piston pin with a new one.

**DATA Piston pin O.D.**

Service Limit: 15.980 mm (0.6291 in)

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



## CONROD AND CRANKSHAFT

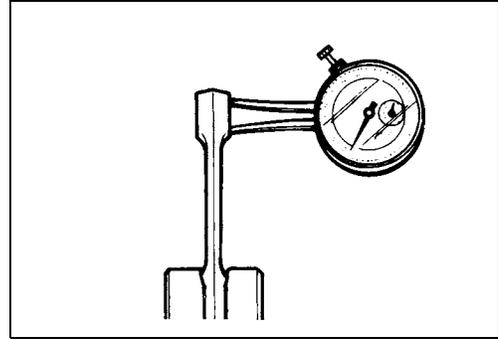
### CONROD SMALL END I.D.

Measure the conrod small end inside diameter with the small bore gauge. If the conrod small end inside diameter exceeds the service limit, replace the conrod with a new one.

**DATA** Conrod small end I.D.

**Service Limit: 16.040 mm (0.6315 in)**

**TOOL** 09900-20605: Dial calipers (10 34 mm)  
09900-22401: Small bore gauge (10 18 mm)



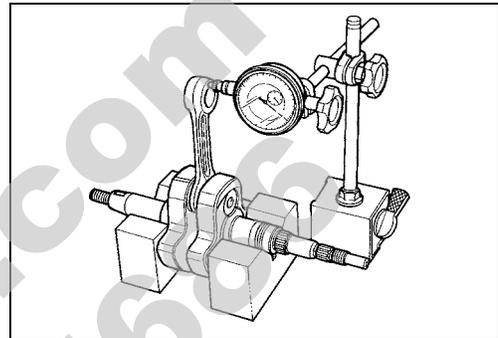
### CONROD DEFLECTION

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

**DATA** Conrod deflection

**Service Limit: 3.0 mm (0.12 in)**

**TOOL** 09900-20701: Magnetic stand  
09900-20607: Dial gauge (1/100 mm)  
09900-21304: V-block

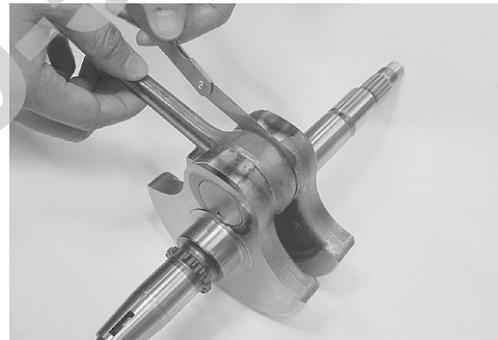


### CONROD BIG END SIDE CLEARANCE

Slide the conrod big end to one side and measure the side clearance with the thickness gauge. If the clearance exceeds the service limit, replace the crankshaft assembly with a new one or bring the deflection and the side clearance within the service limit by replacing the worn parts (conrod, big end bearing, crank pin, etc.) with new ones.

**DATA** Conrod big end side clearance  
**Service Limit: 1.0 mm (0.04 in)**

**TOOL** 09900-20803: Thickness gauge



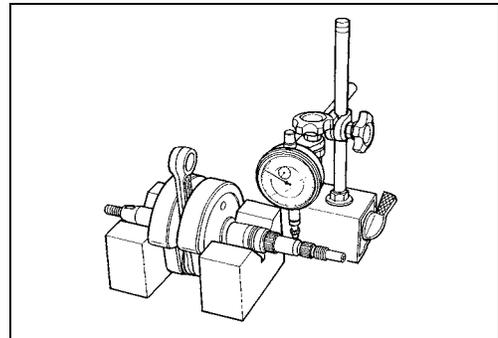
### CRANKSHAFT RUNOUT

Support the crankshaft with the V-blocks and measure the crankshaft runout with the dial gauge. If the runout exceeds the service limit, correct or replace the crankshaft with a new one.

**DATA** Crankshaft runout

**Service Limit: 0.08 mm (0.003 in)**

**TOOL** 09900-20607: Dial gauge (1/100 mm)  
09900-20701: Magnetic stand  
09910-21304: V-block set (100 mm)



## CLUTCH

### CLUTCH DRIVE PLATES

#### NOTE:

Wipe off engine oil from the clutch drive 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** Drive plate thickness

Standard: 2.7 2.9 mm (0.106 0.114 in)

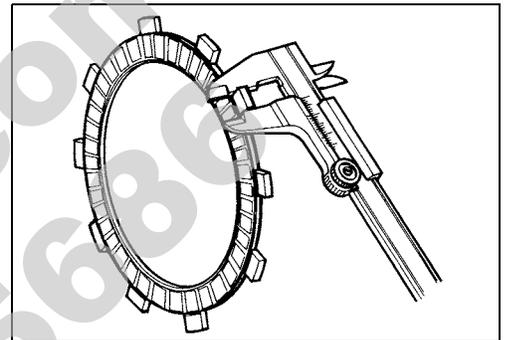
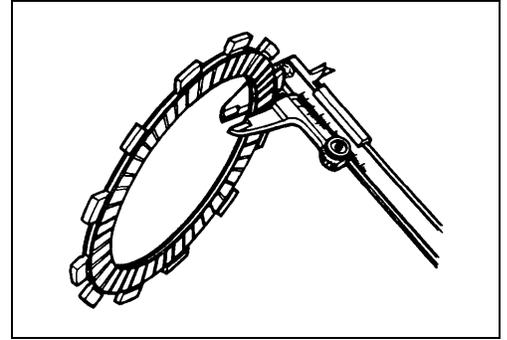
#### **TOOL** 09900-20101: Vernier calipers

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

#### **DATA** Drive plate claw width

Service Limit: 11.0 mm (0.43 in)

#### **TOOL** 09900-20101: Vernier calipers



### CLUTCH DRIVEN PLATES

#### NOTE:

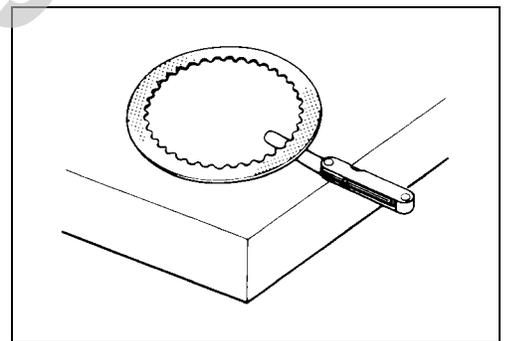
Wipe off engine oil from the clutch driven plates with a clean rag.

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

#### **DATA** Driven plate distortion

Service Limit: 0.10 mm (0.004 in)

#### **TOOL** 09900-20803: Thickness gauge



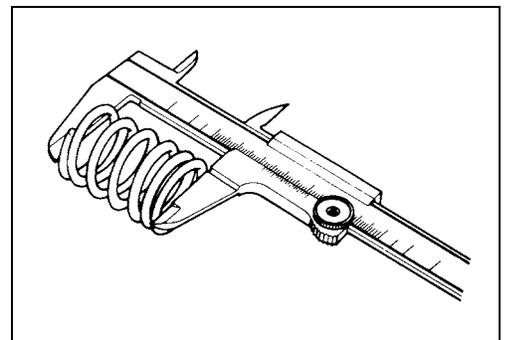
### CLUTCH SPRING

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

#### **DATA** Clutch spring free length

Service Limit: 27.5 mm (1.08 in)

#### **TOOL** 09900-20101: Vernier calipers

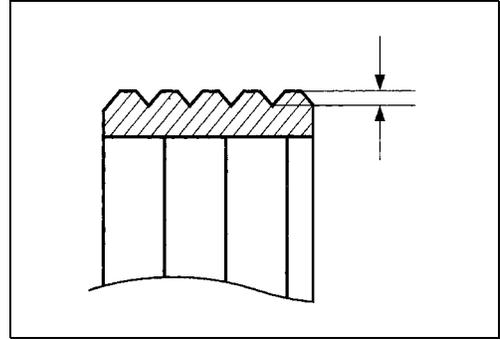


**CLUTCH SHOES**

Inspect the clutch shoes for chips, cracks, uneven wear, and heat discoloration. Also, check the depth of the grooves on the clutch shoes. If there is no groove at any part of the shoes, replace the shoes as a set.

**NOTE:**

*The clutch shoes must always be changed as a set.*

**ONE-WAY CLUTCH**

Rotate the inner race by hand to inspect that the inner race turns in one direction only and never turns in the opposite direction. If the inner race turns in both directions or is locked, replace the one-way clutch with a new one.

**CLUTCH WHEEL**

Remove the inner race and one-way clutch.

Inspect the condition of the clutch wheel inner surface for scuffs, scratches, cracks or uneven wear. If any damages are found, replace the clutch wheel with a new one.

**STARTER CLUTCH**

Remove the starter clutch securing bolts by holding the rotor with the special tool.

 **09930-44520: Rotor holder**

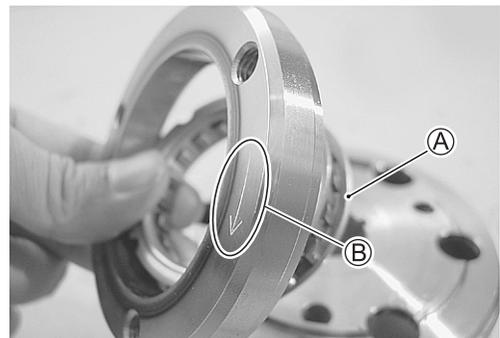


Install the starter clutch in the proper direction.

**NOTE:**

- \* When installing the starter clutch onto the rotor, make sure that the flange side (A) of the one way clutch faces to the rotor.
- \* The arrow mark (B) must face to the engine side.

Apply engine oil to the starter clutch.

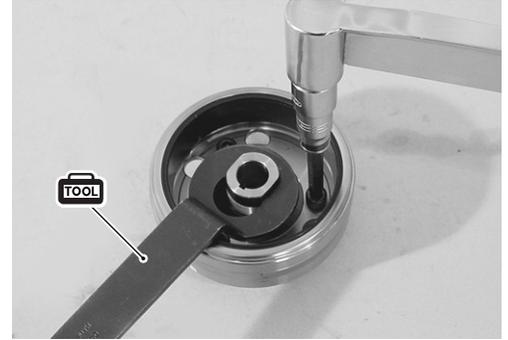


Apply THREAD LOCK SUPER to the bolts, and then tighten them to the specified torque with a offset wrench.

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

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

 **09930-44520: Rotor holder**



Install the starter driven gear to the starter clutch.  
Check that the starter driven gear turns only in counter clock-wise.  
If there is anything unusual, replace the one way clutch.



Check the starter driven gear bearing. If there is anything unusual, replace the bearing.  
Remove the bearing with the special tool.

 **09913-70210: Bearing installer set**



Install the bearing with the special tool.

 **09913-70210: Bearing installer set**



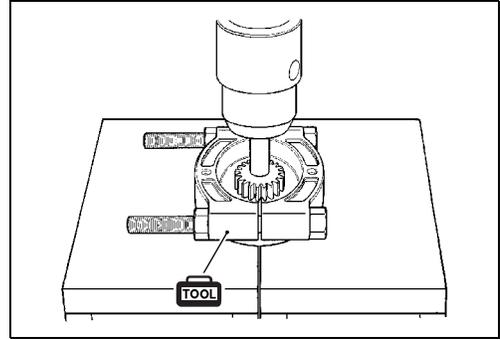
## TRANSMISSION

### DISASSEMBLY

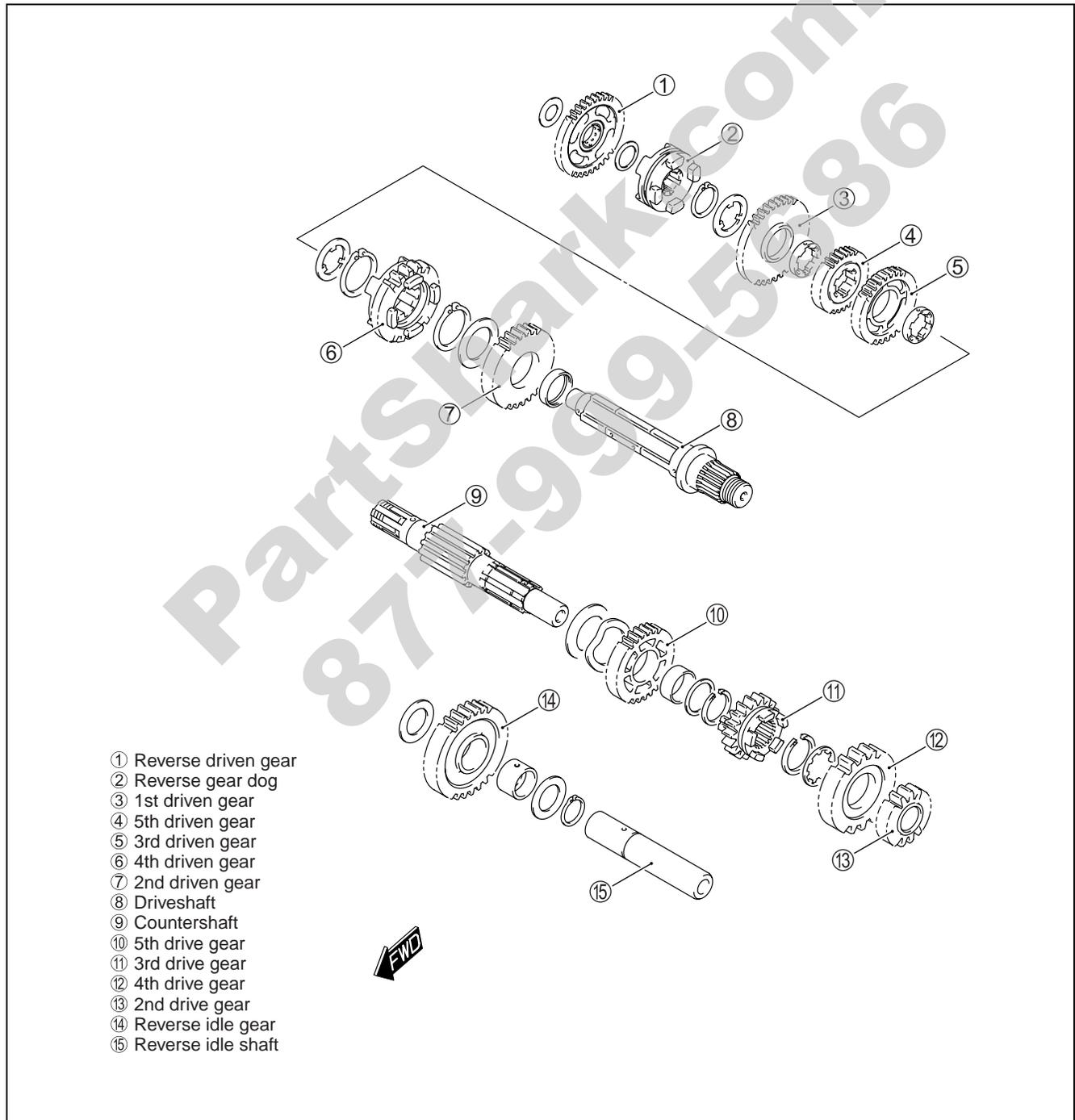
Insert the special tool between the 2nd drive gear and 4th drive gear.

Remove the 2nd drive gear by a hydraulic press.

 **09950-81910: Remover**



Disassemble the transmission as shown.



- ① Reverse driven gear
- ② Reverse gear dog
- ③ 1st driven gear
- ④ 5th driven gear
- ⑤ 3rd driven gear
- ⑥ 4th driven gear
- ⑦ 2nd driven gear
- ⑧ Driveshaft
- ⑨ Countershaft
- ⑩ 5th drive gear
- ⑪ 3rd drive gear
- ⑫ 4th drive gear
- ⑬ 2nd drive gear
- ⑭ Reverse idle gear
- ⑮ Reverse idle shaft

**REASSEMBLY**

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

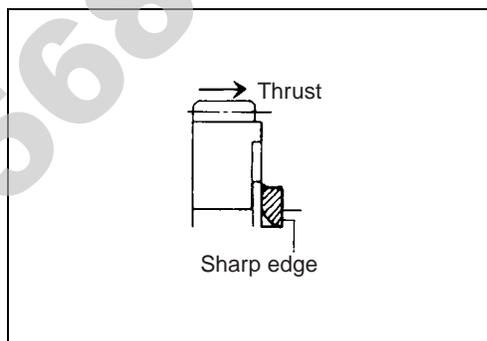
**NOTE:**

- \* Always use new snap rings.
- \* Before installing the gears, coat lightly engine oil to the shafts and gears.

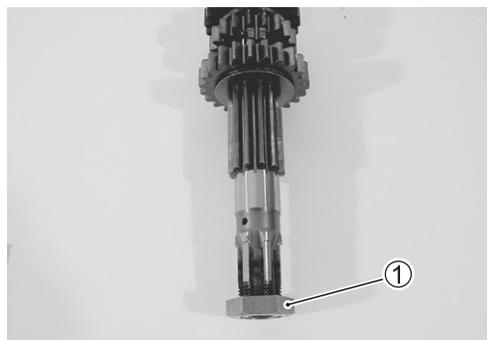
**CAUTION**

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

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



Install the clutch sleeve hub nut ① onto the right end of the countershaft.



Apply THREAD LOCK SUPER to the internal face of the 2nd drive gear.

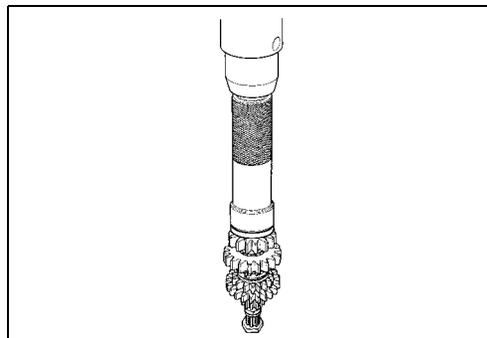
Install the 2nd drive gear by a hydraulic press and special tool.

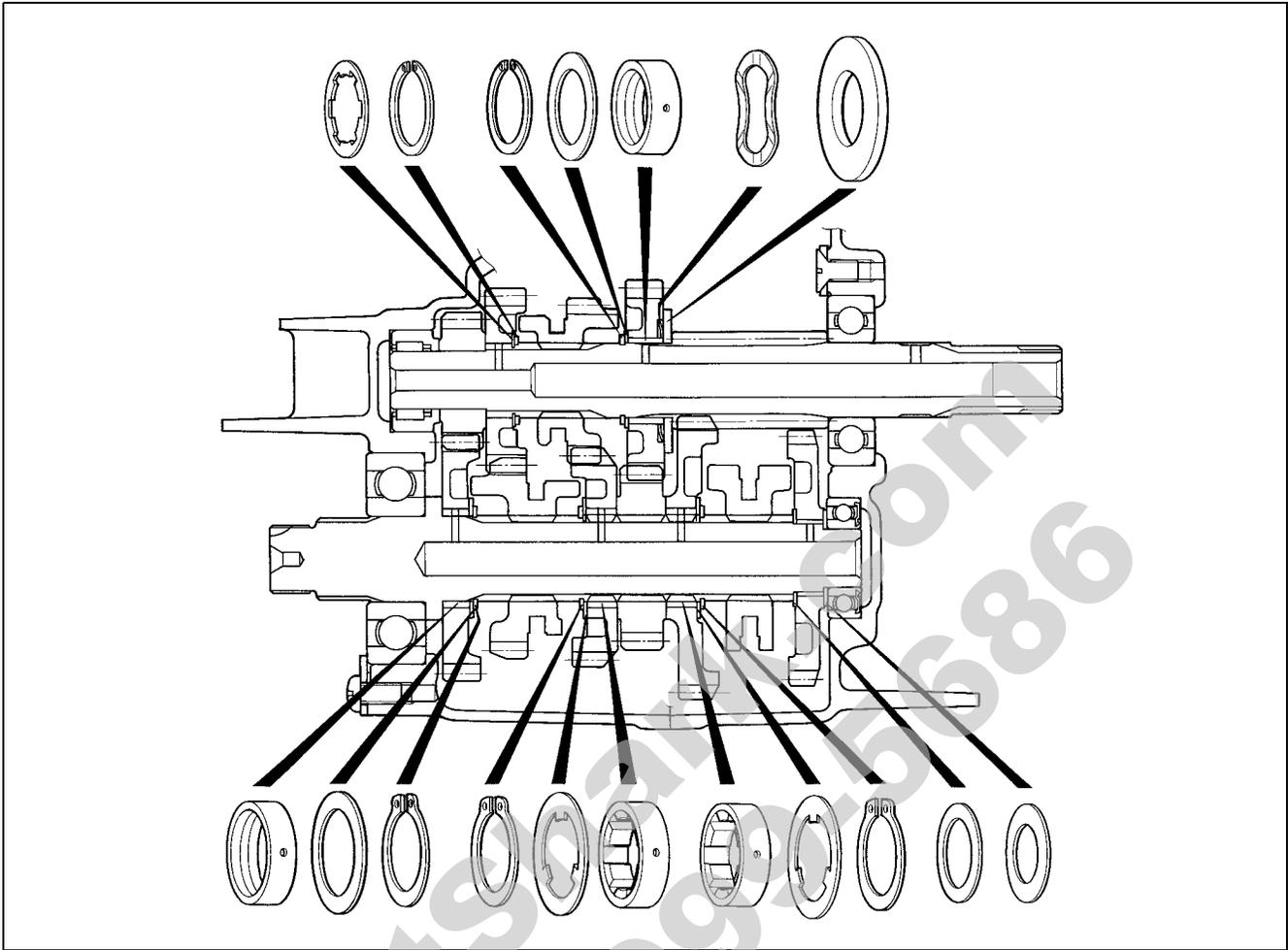
 **99000-32030: THREAD LOCK SUPER 1303**

 **09913-70210: Bearing installer set**

**NOTE:**

After installing the 2nd drive gear, check the 4th drive gear spins smoothly with your fingers.





When installing the bushings, align the shaft hole with the bushing hole.



## GEARSHIFT FORK

### SHIFT FORK TO GROOVE CLEARANCE

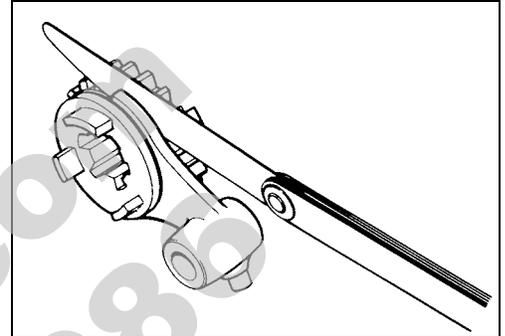
Clearance for each gearshift fork plays an important role in the smoothness and positiveness of the shifting process.

Measure the gearshift fork clearance in the groove of its respective gear with the thickness gauge.

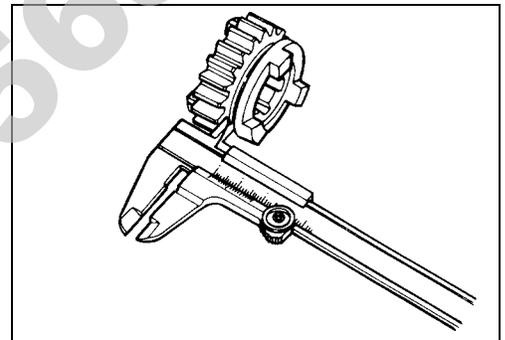
If the clearance exceeds specification, replace the fork, its respective gear, or both.

**DATA** Shift fork to groove clearance  
 Standard: 0.10 - 0.30 mm (0.004 - 0.012 in)  
 Service Limit: 0.50 mm (0.020 in)

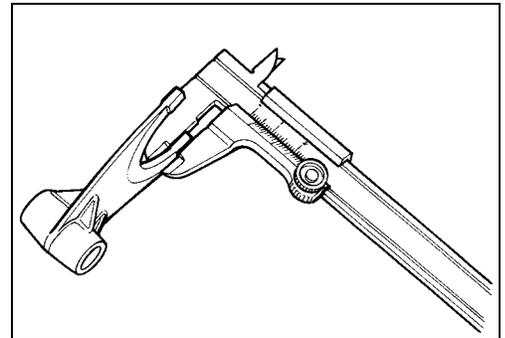
**TOOL** 09900-20803: Thickness gauge  
 09900-20101: Vernier calipers



**DATA** Shift fork groove width  
 Standard: 4.50 - 4.60 mm (0.177 - 0.181 in)



**DATA** Shift fork thickness  
 Standard: 4.30 - 4.40 mm (0.169 - 0.173 in)



## GENERATOR COVER

### DISASSEMBLY

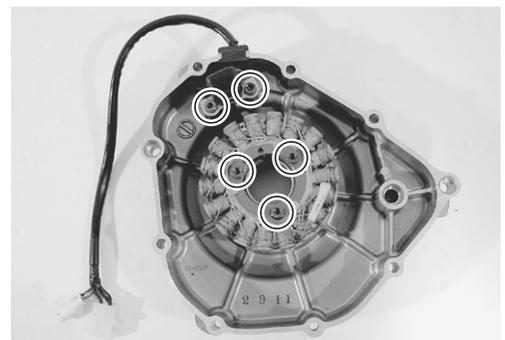
Remove the generator stator.

### REASSEMBLY

Install the generator stator.

Tighten the generator stator bolts in the specified torque.

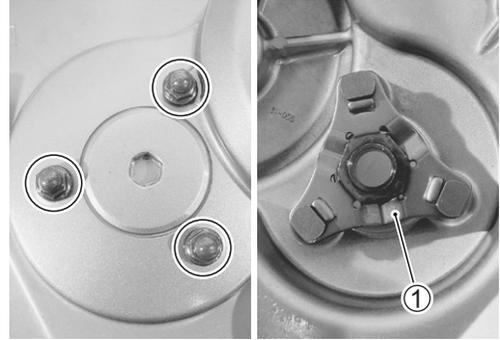
**Generator stator bolt: 7 N•m (0.7 kgf-m, 5.0 lb-ft)**



## CLUTCH COVER

### DISASSEMBLY

Remove the clutch release outer guide ①.

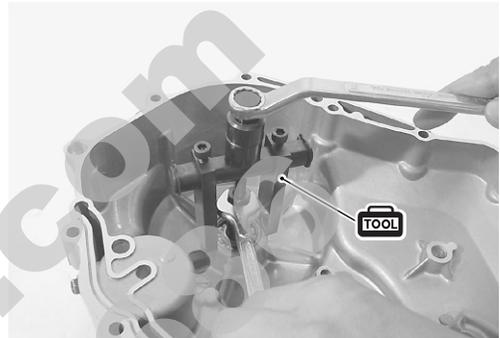


Remove the bearing with the special tool.

**TOOL** 09921-20240: Bearing remover set

#### NOTE:

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



### INSPECTION

Rotate the balls by hand to inspect for an abnormal noise and a smooth rotation. Replace the clutch release ball assembly if there is anything unusual.



### REASSEMBLY

Install the bearing with the special tool.

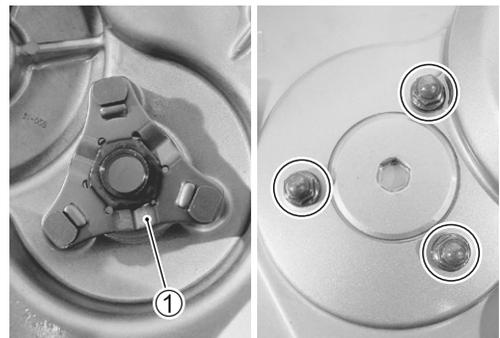
**TOOL** 09913-70210: Bearing installer set

#### NOTE:

*The bearing seal must face the clutch cover.*



Install the clutch release outer guide ①.

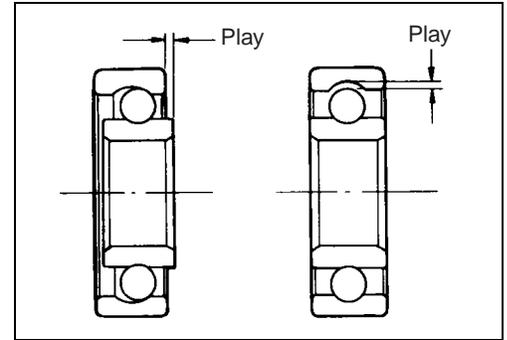


## CRANKCASE

### BEARING INSPECTION

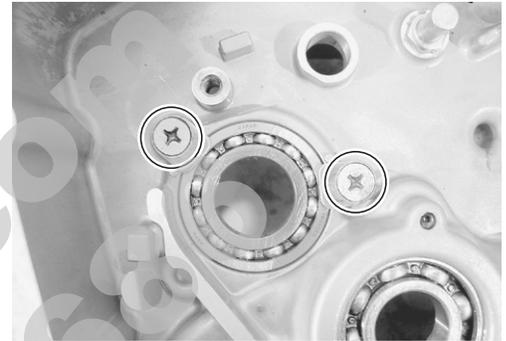
Rotate the bearing inner race by finger to inspect for abnormal play, noise and smooth rotation while the bearings are in the crankcase.

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



### BEARING REMOVAL

Remove the bearing retainers.



Remove the bearings with the special tools.

Use proper bars for the drive bevel gear bearing removal.

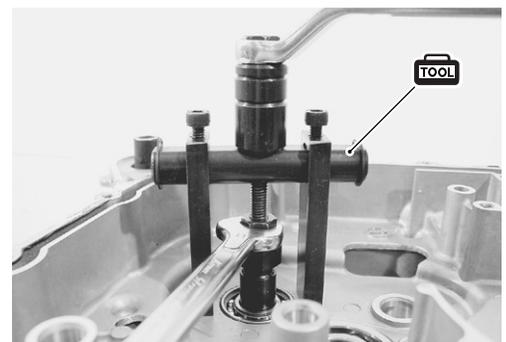
**TOOL** 09921-20240: Bearing remover set

09923-74510: Bearing remover

09930-30104: Sliding shaft

### CAUTION

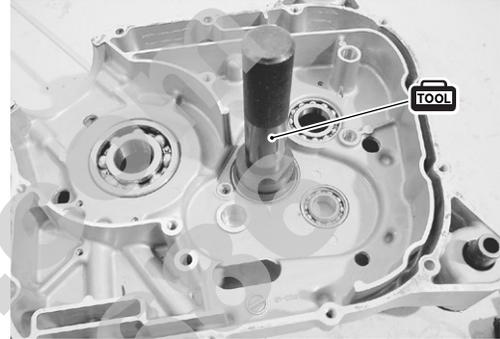
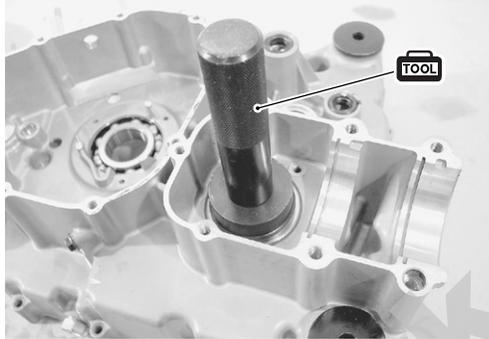
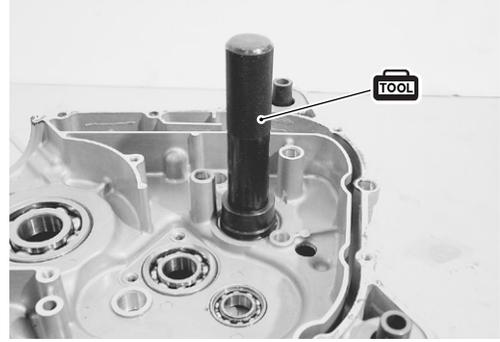
The removed bearings should be replaced with new ones.



### BEARING INSTALLATION

Install the bearings with the special tool.

 09913-70210: Bearing installer set

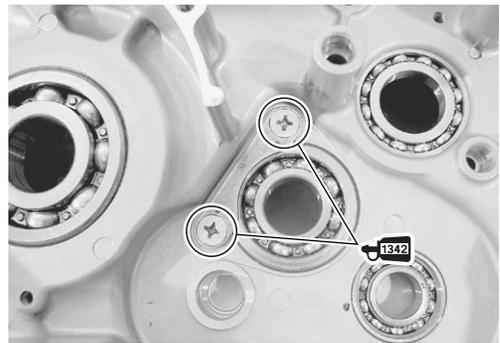
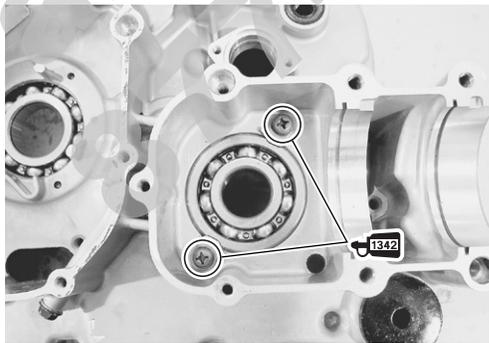
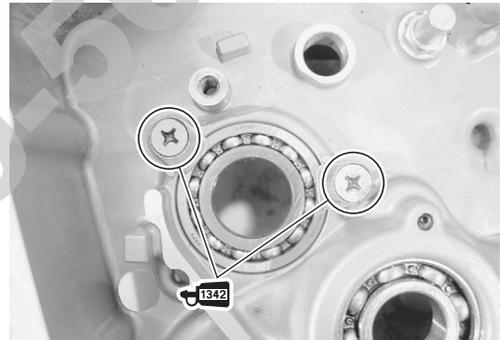


Install the bearing retainers.

**NOTE:**

When installing the bearing retainers, apply a small quantity of **THREAD LOCK** to the screws.

 09900-32050: **THREAD LOCK** 1342



### OIL SEAL REMOVAL AND INSTALLATION

Remove the oil seal.

**CAUTION**

Replace the removed oil seal with a new one.

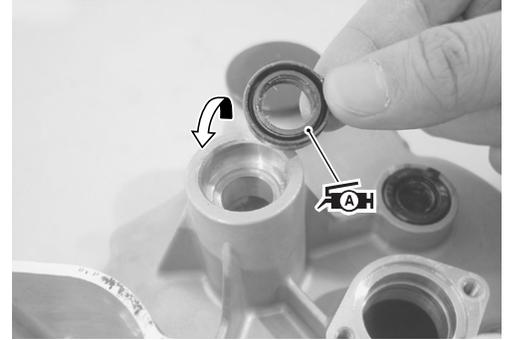


Apply SUZUKI SUPER GREASE to the oil seal.

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

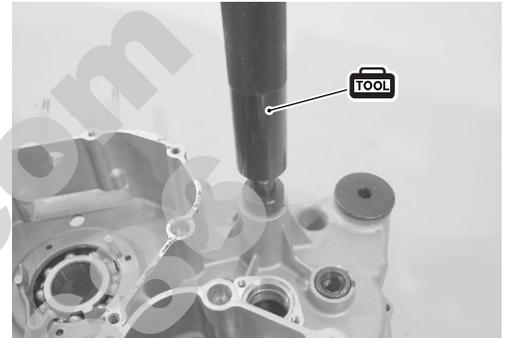
**NOTE:**

When installing the oil seal, the stamped mark on the oil seal must face outside.



Install the oil seal with the special tool.

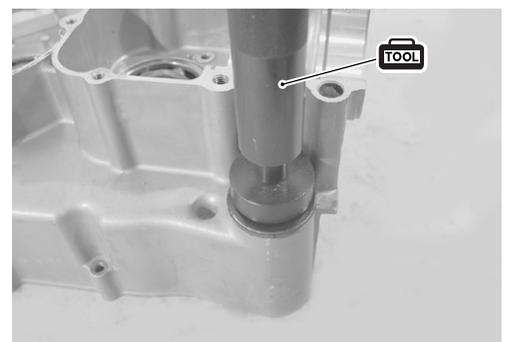
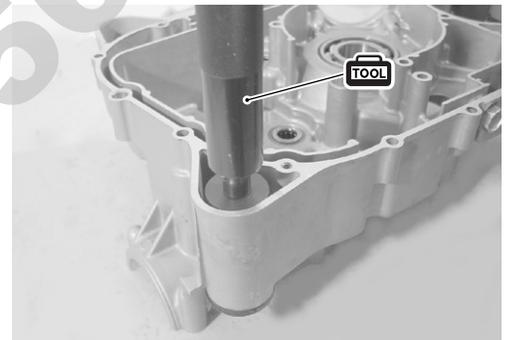
 09913-70210: Bearing installer set



**ENGINE MOUNTING RUBBER AND INSTALLATION**

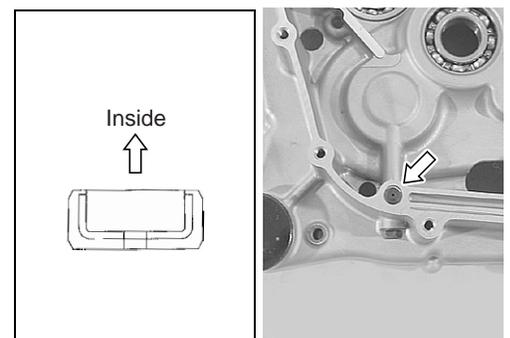
Remove and install the engine mounting rubber with the special tool.

 09913-70210: Bearing installer set

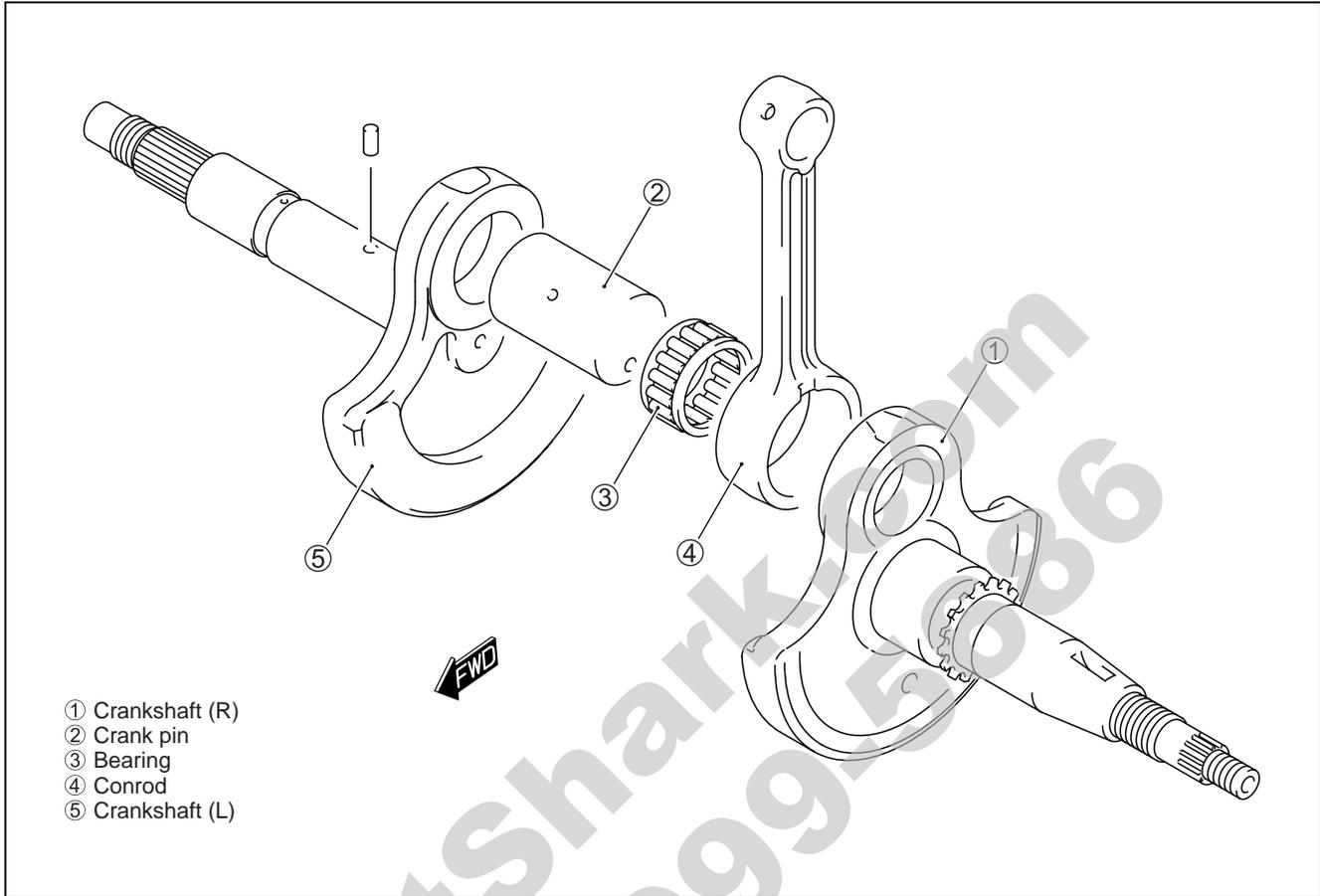


**OIL JET INSTALLATION**

Install the new oil jet in the proper direction.



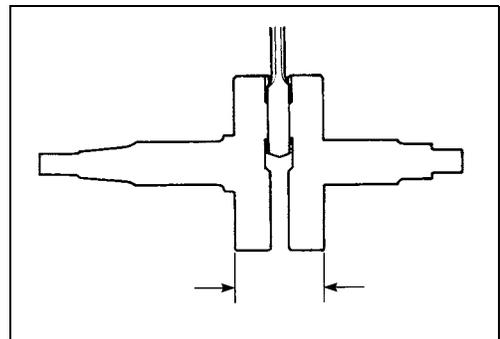
## CRANKSHAFT DISASSEMBLY



### REASSEMBLY

Determine the width between the webs referring to the figure when rebuilding the crankshaft.

**DATA** Crank web to web width  
 Standard: 53.0 – 0.1mm (2.087 – 0.004 in)





**SECONDARY DRIVEN BEVEL GEAR REMOVAL**

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. (☞ 7-11)

Remove the swingarm. (☞ 7-56)

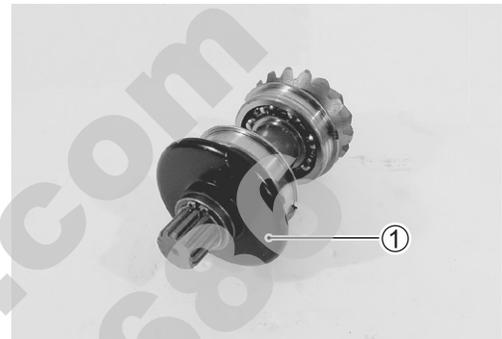
Remove the universal joint.

Remove the secondary driven bevel gear.

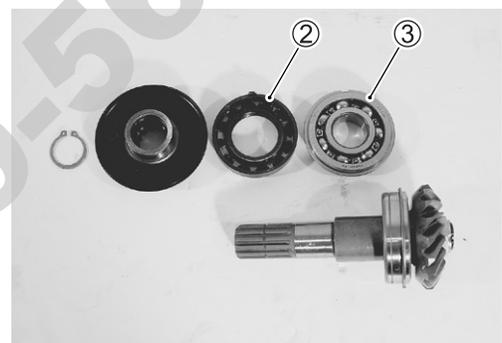
**SECONDARY DRIVEN BEVEL GEAR DISASSEMBLY**

Remove the water proof cover ① by removing the snap ring.

 09900-06107: Snap ring pliers



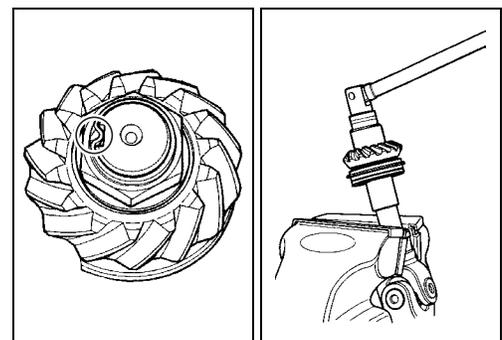
Remove the oil seal ② and bearing ③.



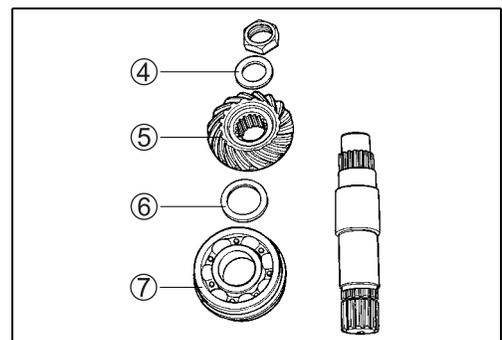
Using a chisel, unlock the nut.

Fit the universal joint onto the driven bevel gear shaft.

Remove the driven bevel gear shaft by holding the universal joint with a vise.



Remove the washer ④, bevel gear ⑤, shim ⑥ and bearing ⑦.



**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

**SECONDARY DRIVEN BEVEL GEAR REASSEMBLY**

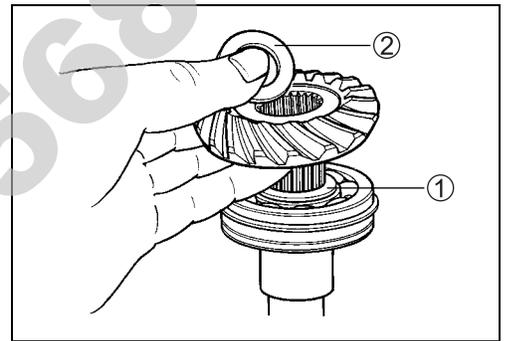
Install the bearing.

**NOTE:**

*Pay attention to the direction of the bearing.*



Install the shim ①, driven gear and washer ②.

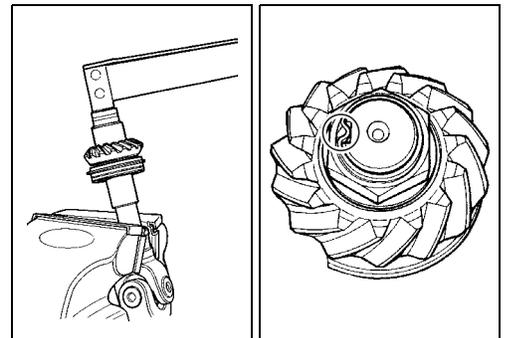


Fit the universal joint onto the driven bevel gear shaft.  
Tighten the driven bevel gear nut to the specified torque.

**Secondary driven bevel gear nut:**

**100 N•m (10.0 kgf-m, 72.5 lb-ft)**

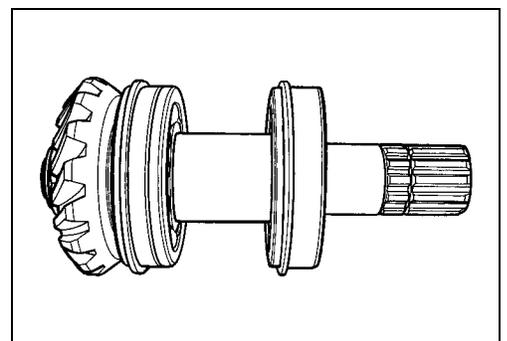
Stake the nut with a center punch.



Install the bearing.

**NOTE:**

*Pay attention to the direction of the bearing.*



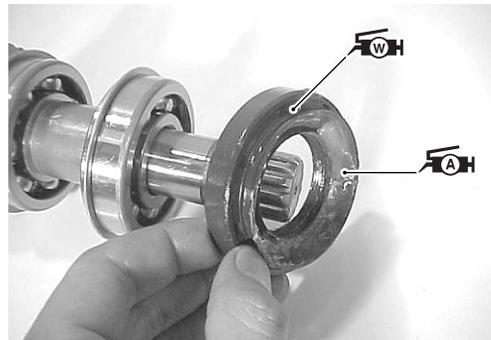
Apply 4 ~ 5 gram of WATER RESISTANCE GREASE to the outside of the seal lip groove.

Apply SUZUKI SUPER GREASE to the seal lip groove and install it.

 99000-25160: WATER RESISTANCE GREASE

 99000-25030: SUZUKI SUPER GREASE A (USA)

99000-25010: SUZUKI SUPER GREASE A (Others)



Apply SUZUKI SUPER GREASE to the O-ring and install the water proof cover.

 99000-25030: SUZUKI SUPER GREASE A (USA)

99000-25010: SUZUKI SUPER GREASE A (Others)



Install the snap ring.

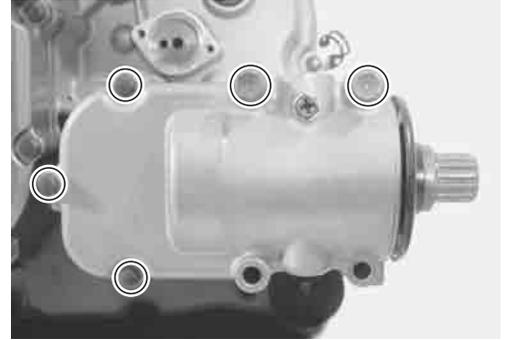
 09900-06107: Snap ring pliers



PartShark.com  
877-999-5688

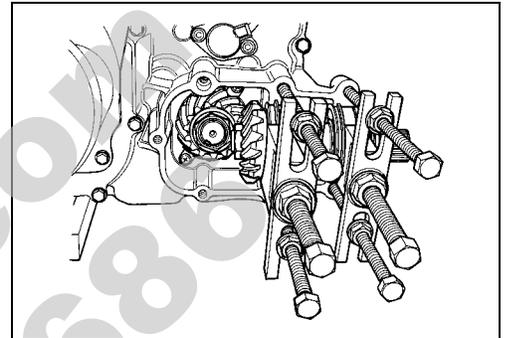
## SECONDARY GEAR SHIMS ADJUSTMENT

Remove the secondary bevel gear cover.

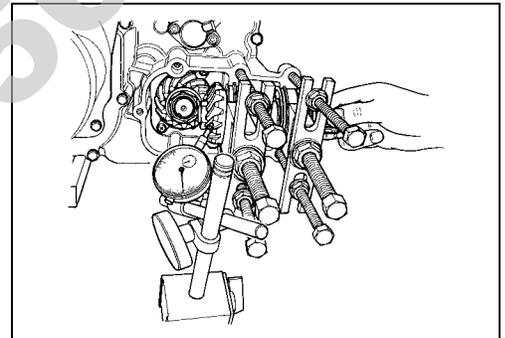


Hold the bearings with the special tool.

**TOOL** 09921-21910: Bearing holder



Set a dial gauge on the driven bevel gear as shown.



Measure the backlash by turning the driven bevel gear shaft in each direction, reading the total backlash on the dial gauge. If the backlash is not within specification, the shim must be changed and the backlash should be re-checked until correct. Refer to the chart at the right for appropriate shim thickness.

### **DATA** Bevel gear backlash

**Standard: 0.03 0.15 mm (0.001 0.006 in)**

#### **NOTE:**

*Adjust the backlash by referring to the chart at the right and using the thickness of the removed shims as a guide.*

Backlash	Shim adjustment
Under 0.03 mm (0.001 in)	Decrease shim thickness
0.03 0.15 mm (0.001 0.006 in)	Correct
Over 0.15 mm (0.006 in)	Increase shim thickness

### For driven bevel gear (☞ 3-58)

Part No.	Shim thickness
09181-25051	0.60 mm (0.0236 in)
09181-25052	0.65 mm (0.0256 in)
09181-25053	0.70 mm (0.0276 in)
09181-25054	0.75 mm (0.0295 in)
09181-25055	0.80 mm (0.0315 in)
09181-25056	0.85 mm (0.0335 in)
09181-25057	0.90 mm (0.0354 in)
09181-25058	0.95 mm (0.0374 in)
09181-25059	1.00 mm (0.0394 in)
09181-25060	1.05 mm (0.0413 in)
09181-25061	1.10 mm (0.0433 in)
09181-25062	1.15 mm (0.0453 in)
09181-25063	1.20 mm (0.0472 in)

## TOOTH CONTACT

After backlash adjustment is carried out, the tooth contact must be checked. Pay attention to the following procedures:

Remove the driven bevel gear.

Clean and degrease several teeth of the drive and driven bevel gears.

Apply a coating of machinist's layout dye or paste to several teeth of the driven bevel gear.

Install the driven bevel gear.

Rotate the driven bevel gear several turns in both directions.

Remove the driven bevel gear and inspect the coated teeth of the drive bevel gear. The tooth contact pattern should be as shown in ①, ② and ③.

If tooth contact is found to be correct (example ②), go to the ENGINE REASSEMBLY section on page 3-59 to complete installation.

① Incorrect (contact at tooth top)

② Correct

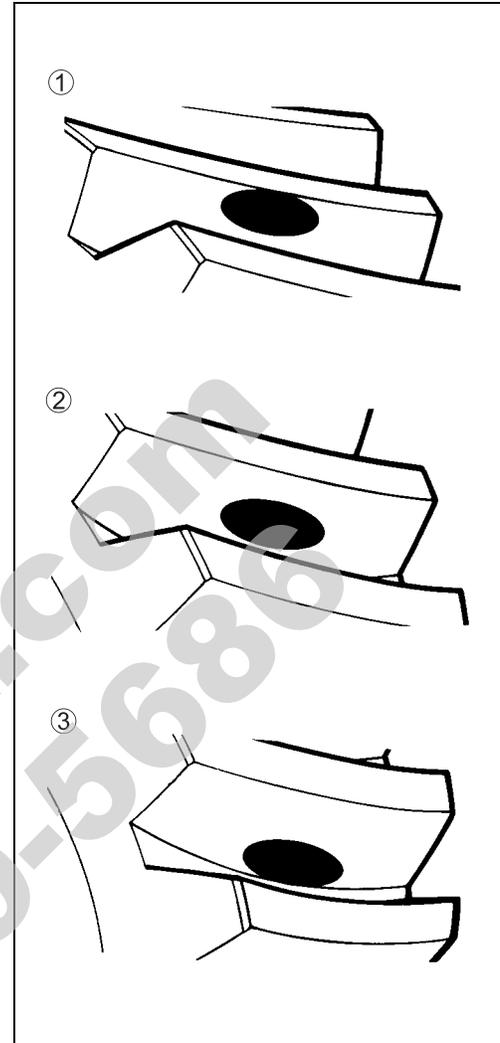
③ Incorrect (contact at tooth root)

If tooth contact is found to be incorrect (examples ① and ③), the shim thickness between the drive bevel gear and driven bevel gear must be changed and the tooth contact rechecked until correct.

### CAUTION

**Make sure to check the backlash after the tooth contact has been adjusted, since it may have changed.**

**Adjust the tooth contact and backlash until they are both within specification. If the correct tooth contact cannot be maintained when adjusting the backlash, replace the drive and driven bevel gears.**



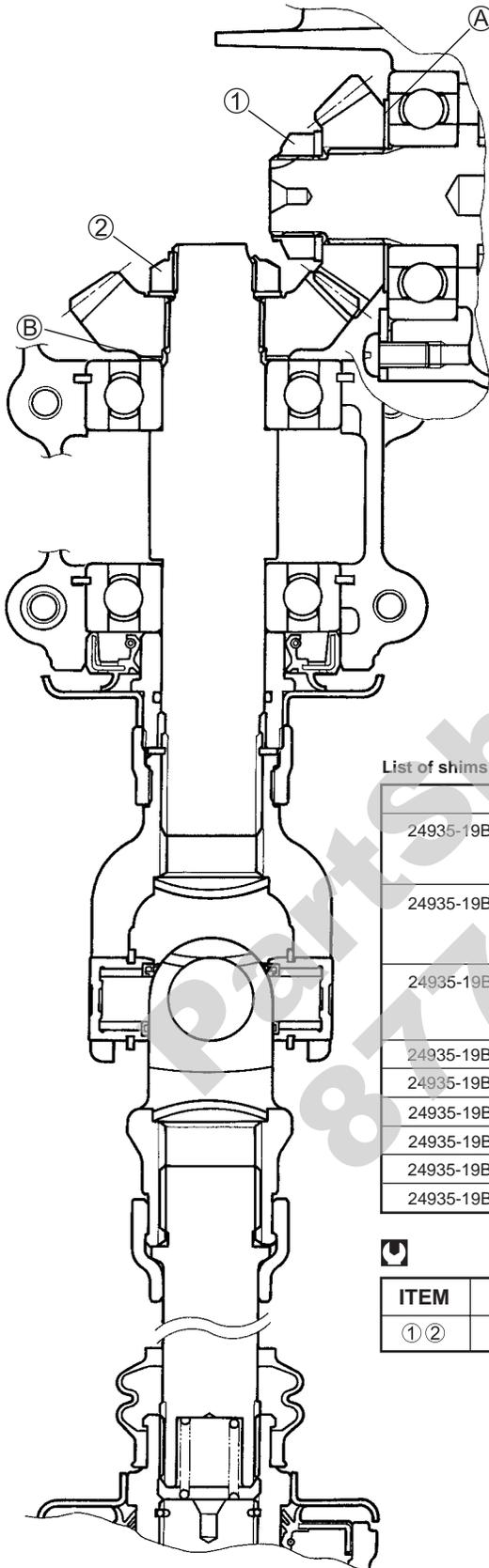
Tooth contact	Drive bevel gear shim adjustment	Driven bevel gear shim adjustment
Contact at tooth top ①	Increase shim thickness	Increase shim thickness
Contact at tooth root ③	Decrease shim thickness	Decrease shim thickness

## For drive bevel gear (☞ 3-58)

Part No.	Shim thickness	
24935-19B00-025: 0.25 mm (0.0098 in)	Combined shim	0.25+0.25=0.50 mm (0.0197 in)
		0.25+0.30=0.55 mm (0.0217 in)
		0.30+0.30=0.60 mm (0.0236 in)
24935-19B00-030: 0.30 mm (0.0118 in)		0.30+0.35=0.65 mm (0.0256 in)
		0.35+0.35=0.70 mm (0.0276 in)
		24935-19B00-035: 0.35 mm (0.0138 in)
0.25+0.25+0.30=0.80 mm (0.0315 in)		
0.25+0.25+0.35=0.85 mm (0.0335 in)		
24935-19B00-090		
24935-19B00-095		0.95 mm (0.0374 in)
24935-19B00-100		1.00 mm (0.0394 in)
24935-19B00-105		1.05 mm (0.0413 in)
24935-19B00-110		1.10 mm (0.0433 in)
24935-19B00-115		1.15 mm (0.0453 in)

PartShark.com  
877-999-5686

## REASSEMBLY INFORMATION



List of shims B available for the driven bevel gear side

Part No.	Shim thickness
09181-25051	0.60 mm (0.0236 in)
09181-25052	0.65 mm (0.0256 in)
09181-25053	0.70 mm (0.0276 in)
09181-25054	0.75 mm (0.0295 in)
09181-25055	0.80 mm (0.0315 in)
09181-25056	0.85 mm (0.0335 in)
09181-25057	0.90 mm (0.0354 in)
09181-25058	0.95 mm (0.0374 in)
09181-25059	1.00 mm (0.0394 in)
09181-25060	1.05 mm (0.0413 in)
09181-25061	1.10 mm (0.0433 in)
09181-25062	1.15 mm (0.0453 in)
09181-25063	1.20 mm (0.0472 in)

List of shims A available for the drive bevel gear side

Part No.	Shim thickness
24935-19B00-025: 0.25 mm (0.0098 in)	0.25+0.25=0.50 mm (0.0197 in)
	0.25+0.30=0.55 mm (0.0217 in)
	0.30+0.30=0.60 mm (0.0236 in)
	0.30+0.35=0.65 mm (0.0256 in)
	0.35+0.35=0.70 mm (0.0276 in)
24935-19B00-030: 0.30 mm (0.0118 in)	0.25+0.25+0.25=0.75 mm (0.0295 in)
	0.25+0.25+0.30=0.80 mm (0.0315 in)
	0.25+0.25+0.35=0.85 mm (0.0335 in)
24935-19B00-035: 0.35 mm (0.0138 in)	
24935-19B00-090	0.90 mm (0.0354 in)
24935-19B00-095	0.95 mm (0.0374 in)
24935-19B00-100	1.00 mm (0.0394 in)
24935-19B00-105	1.05 mm (0.0413 in)
24935-19B00-110	1.10 mm (0.0433 in)
24935-19B00-115	1.15 mm (0.0453 in)



ITEM	N•m	kgf-m	lb-ft
① ②	100	10.0	72.5

## ENGINE REASSEMBLY

Reassemble the engine in the reverse order of disassembly.

Pay special attention to the following points:

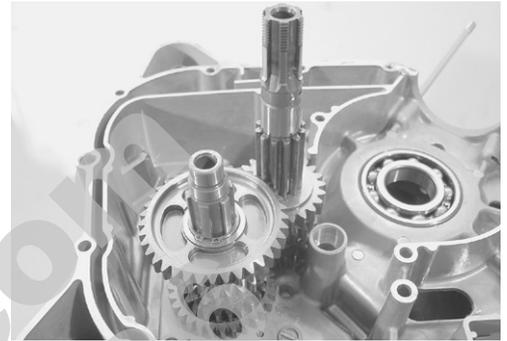
### NOTE:

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

## ENGINE BOTTOM SIDE

### DRIVE TRAIN

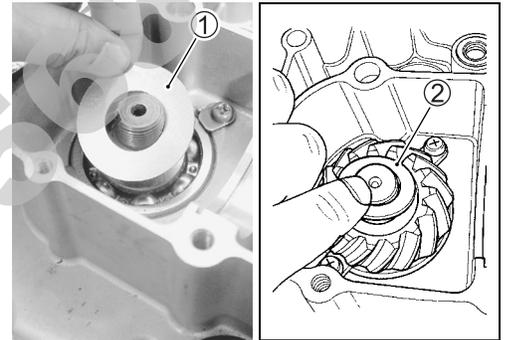
Install the driveshaft and countershaft assembly.



### DRIVE BEVEL GEAR

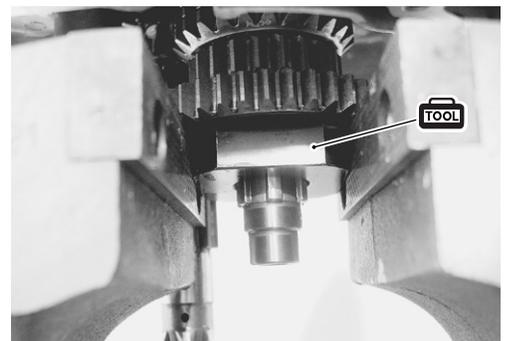
Install the shim ①.

Install the drive bevel gear and washer ②.



Fit the special tool onto the driveshaft.

 **09930-73150: Output shaft holder**

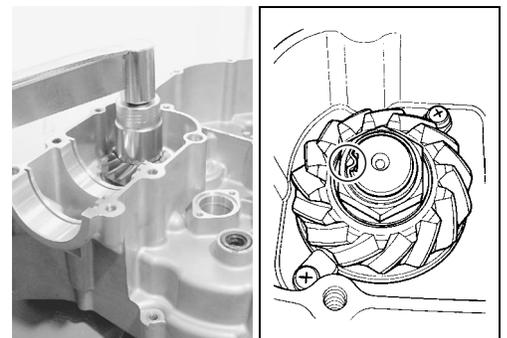


Tighten the secondary drive bevel gear nut to the specified torque by holding the special tool with a vise.

 **Secondary drive bevel gear nut:**

**100 N•m (10.0 kgf-m, 72.5 lb-ft)**

Stake the nut with a center punch.



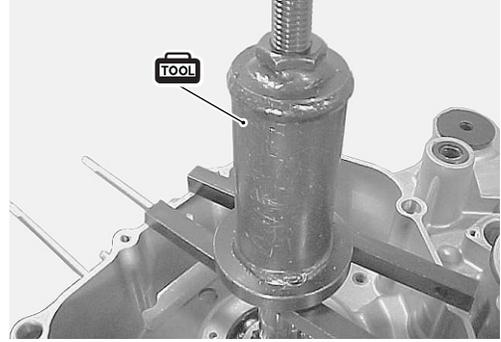
### CRANKSHAFT

When mounting the crankshaft in the crankcase, it is necessary to pull its left end into the crankcase with the special tool.

*NOTE:*

*Use proper bars.*

 **09910-32812: Crankshaft installer**



Install the reverse dog and washer ①.



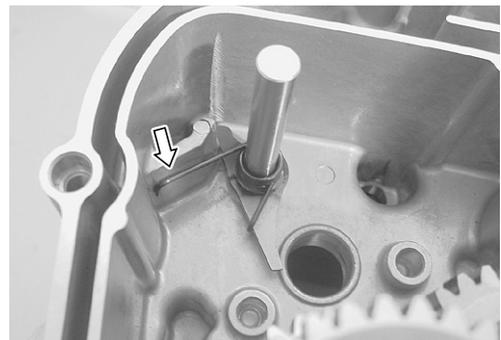
Install the reverse driven gear and washer ②.



Reassemble the shift cam lock shaft.



Install the shift cam lock shaft by fitting the spring end to the stopper properly.



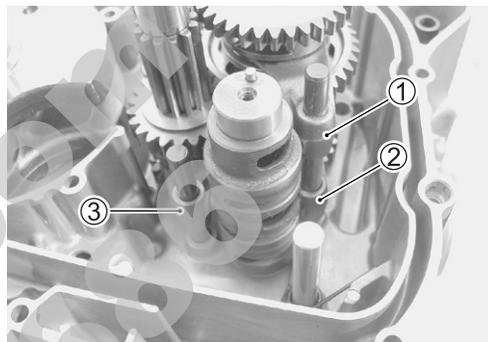
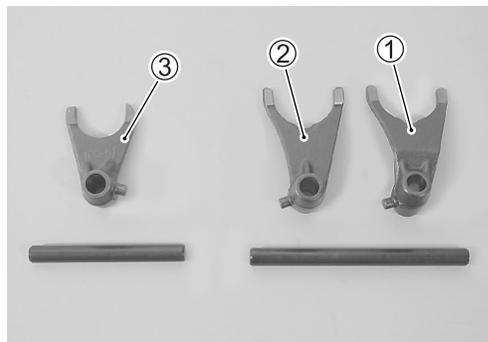
Install the gearshift cam.

Install the gearshift forks and shafts as shown.

**NOTE:**

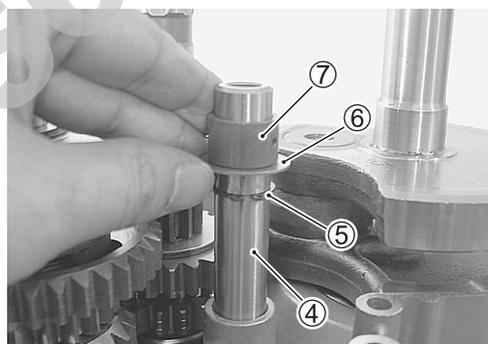
*Each fork differs in shape.*

- ① For reverse/1st gear
- ② For 2nd/3rd gear
- ③ For 4th/5th gear

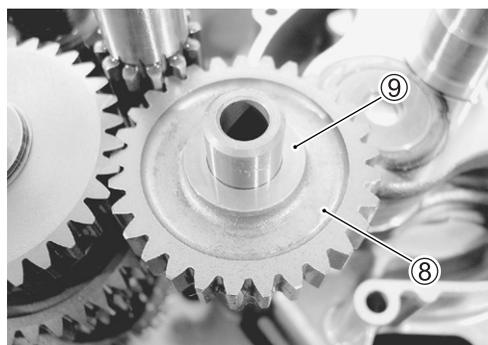


Install the reverse idle gear shaft ④.

Install the snap ring ⑤, washer ⑥ and spacer ⑦.

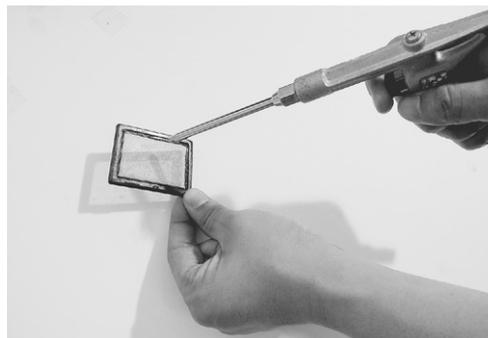


Install the reverse idle gear ⑧ and washer ⑨.

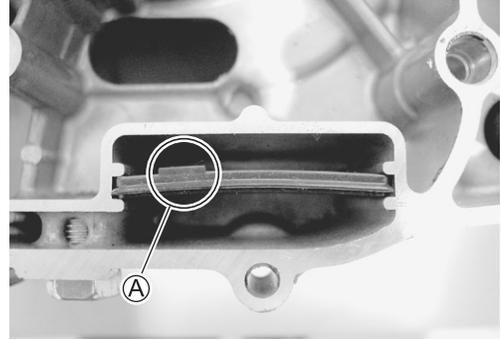


## OIL SUMP FILTER

Clean the oil sump filter by using compressed air.



Install the oil sump filter as its projection ① faces upward.

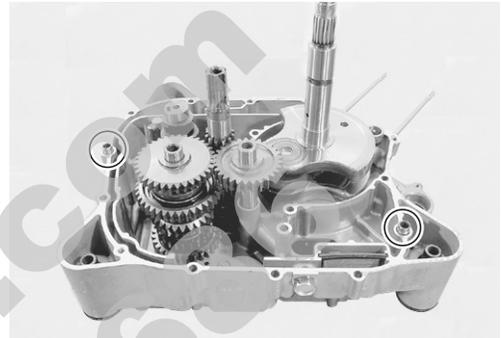


### CRANKCASE

Wipe the crankcase mating surfaces (both surfaces) with a cleaning solvent.

Fit the dowel pins onto the left half on the crankcase.

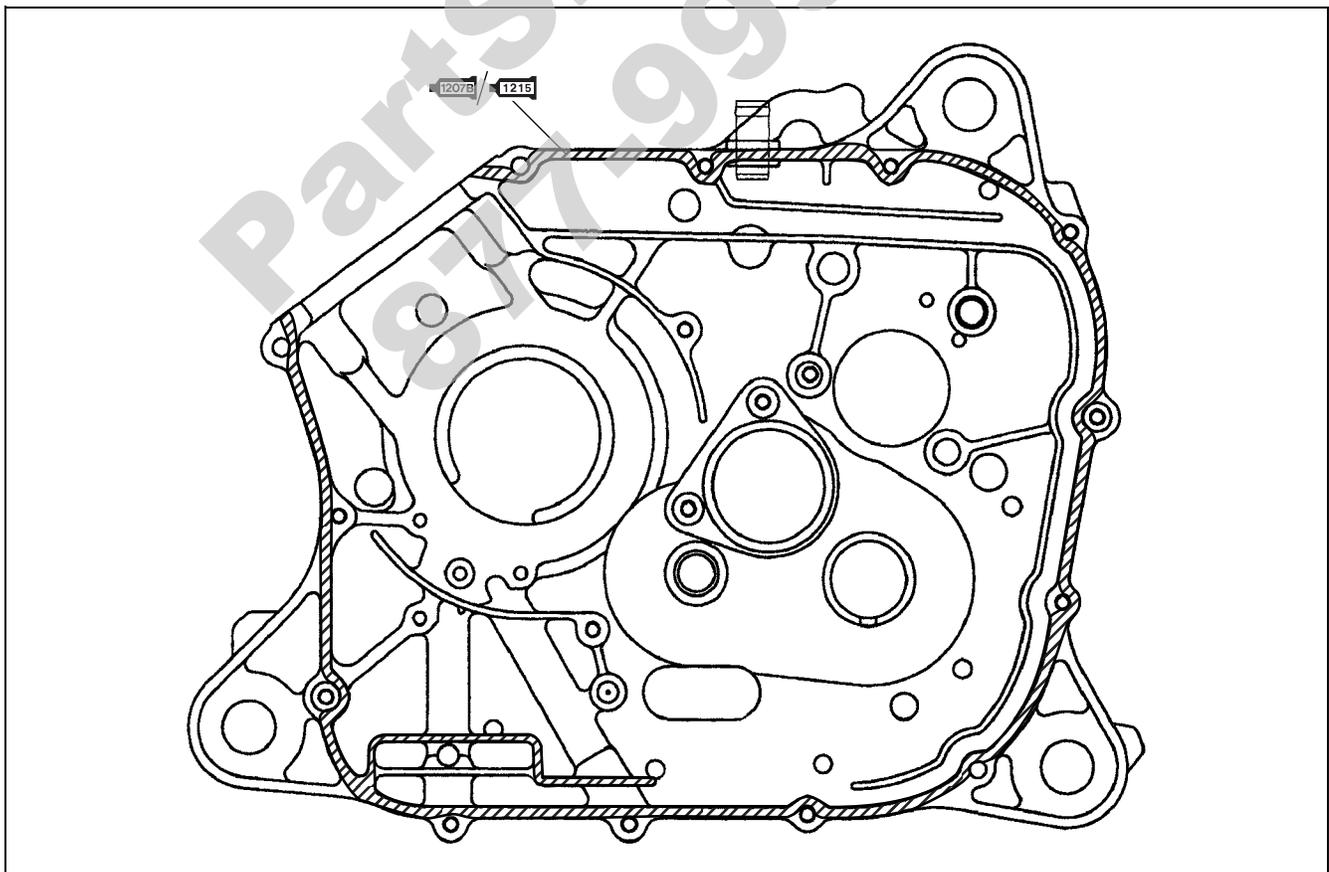
Apply engine oil to the conrod big end and gears.



Apply SUZUKI BOND to the mating surface of the right crankcase.

1207B 99104-31140: SUZUKI BOND 1207B (USA)

1215 99000-31110: SUZUKI BOND 1215 (Others)

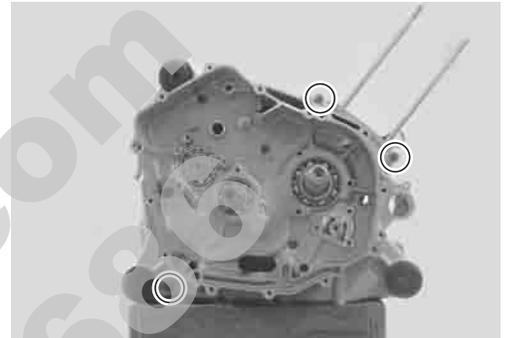
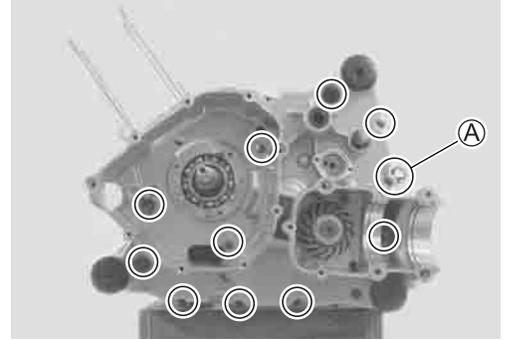


Assemble the crankcase within a few minutes.

**NOTE:**

Fit the clamp to the bolt (A).

 Crankcase bolt: 11 N•m (1.1 kgf-m, 8.0 lb-ft)



**CAM CHAIN**

Install the cam chain.



**GENERATOR**

Install the starter driven gear (1).

Install the key (2).

**NOTE:**

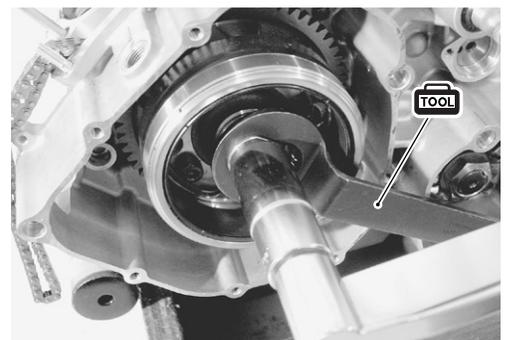
*Degrease the tapered portion of the generator rotor assembly and also the crankshaft. Use nonflammable cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.*



Install the generator rotor and tighten the generator rotor nut to the specified torque with the special tool.

 Generator rotor nut: 160 N•m (16.0 kgf-m, 115.5 lb-ft)

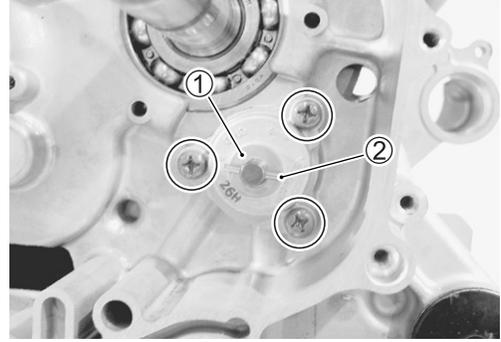
 09930-44520: Rotor holder



**OIL PUMP**

Install the oil pump.

Install the washer ① and pin ②.



Install the oil pump driven gear and E-ring.



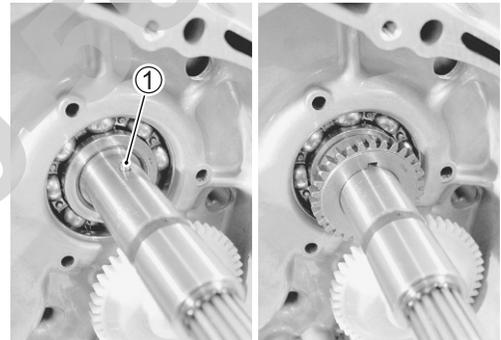
**OIL PUMP DRIVE GEAR**

Install the pin ①.

Install the oil pump drive gear.

**NOTE:**

*Flange side of the gear is positioned inside.*

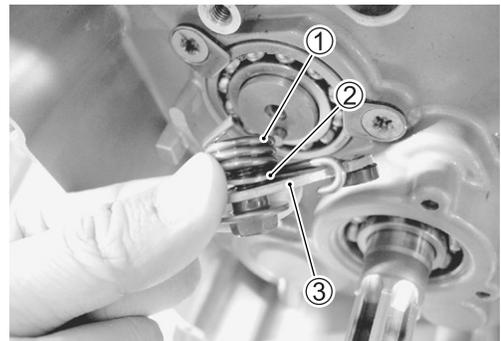


**GEARSHIFT**

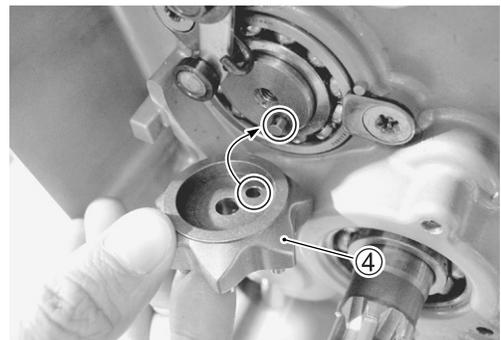
Install the spring ①, washer ② and gearshift cam stopper ③.

**NOTE:**

*Fit the spring end to the stopper properly.*



Install the the gearshift cam plate ④.

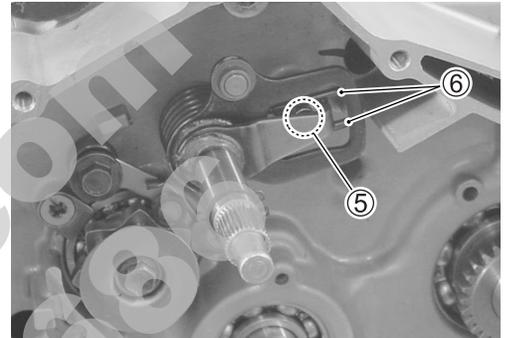


Apply THREAD LOCK to the gearshift cam bolt and install the gearshift cam plate guide.

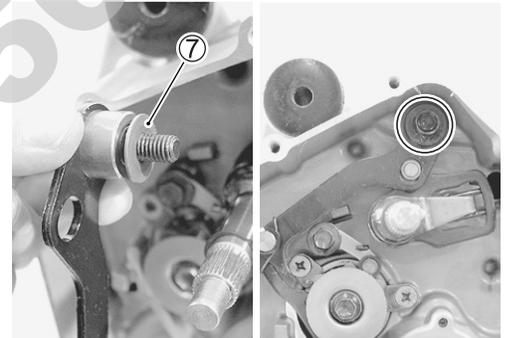
 **1342 99000-32050: THREAD LOCK 1342**



Install the gearshift cam shaft assembly so that the stopper **⑤** comes between the spring ends **⑥**.



Install the washer **⑦** and gearshift arm.



## CLUTCH

Apply engine oil to each of the clutch drive/driven plate. Install the clutch drive/driven plates one by one onto the clutch sleeve hub **①**.

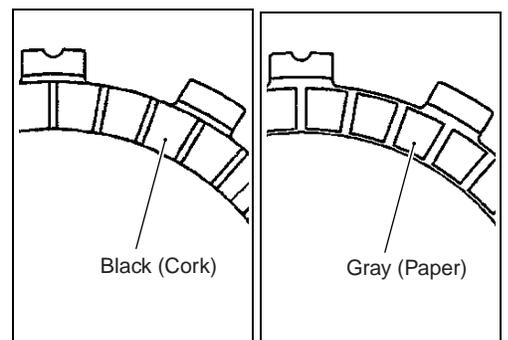
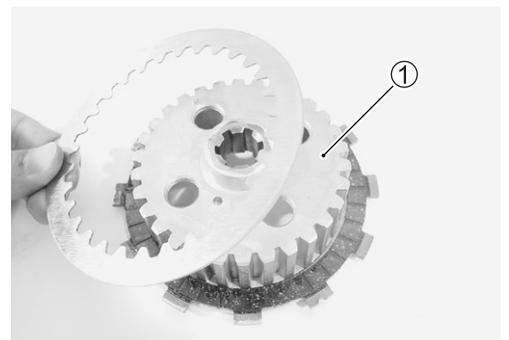
DRIVE PLATE (Black)..... 5 pcs

(Gray)..... 1 pc

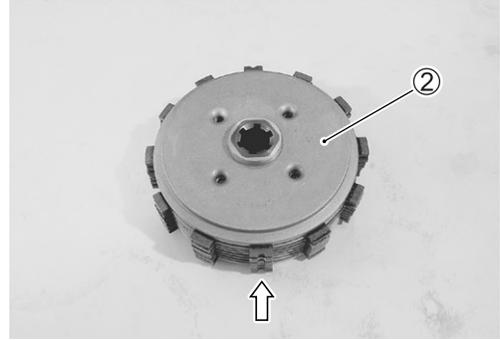
DRIVEN PLATE ..... 5 pcs

### NOTE:

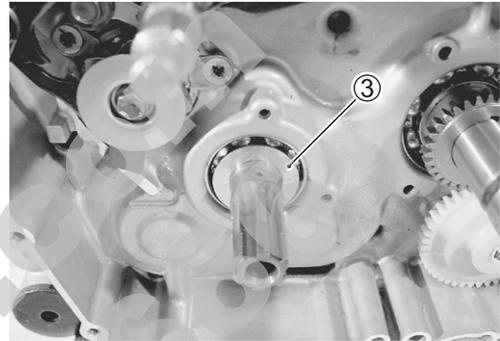
*The gray drive plate should be installed at the last.*



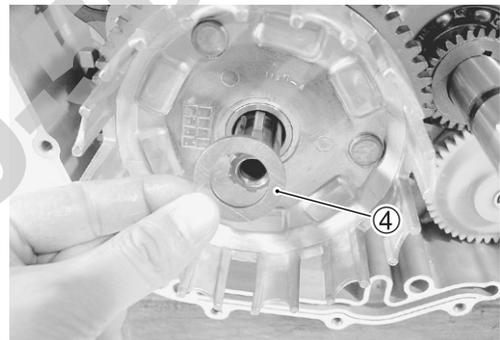
Install the clutch pressure plate ②.  
Align the clutch drive plates in line to facilitate later assembly.



Install the washer ③ onto the countershaft.



Install the primary driven gear assembly.  
Install the washer ④.

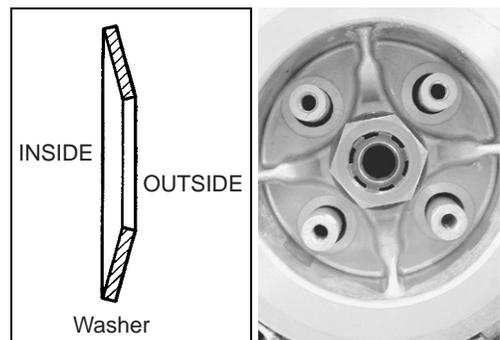


Install the clutch sleeve hub assembly into the primary driven gear assembly.



Install the washer and clutch sleeve hub nut.

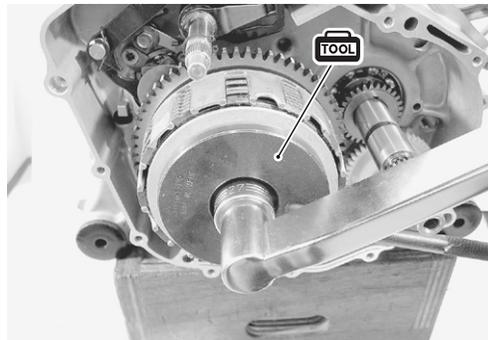
**NOTE:**  
*The convex side of the washer faces outside.*



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

 **Clutch sleeve hub nut: 100 N•m (10.0 kgf-m, 72.5 lb-ft)**

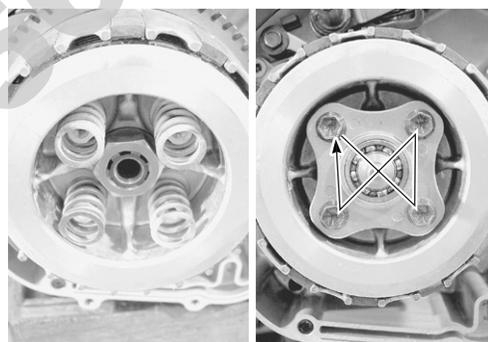
 **09920-53730: Clutch sleeve hub holder**



Stake the clutch sleeve hub nut with a center punch.



Install the clutch springs and clutch release plate.  
Tighten the clutch spring bolts diagonally.



Install the one-way clutch onto the clutch wheel with the → mark facing inside.  
Install the one-way clutch inner race with the groove (A) facing inside.



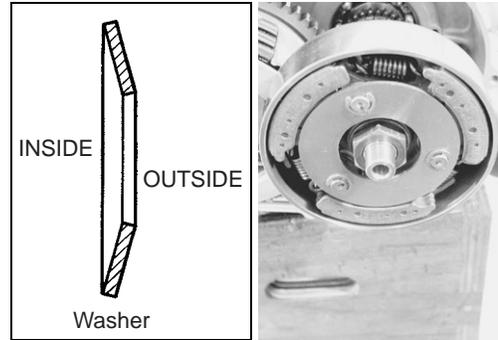
Install the clutch wheel assembly.



Install the clutch shoes.

Install the washer as its convex side faces outside.

Before installing the clutch shoe nut, apply engine oil to the thread and inside surface of the nut.



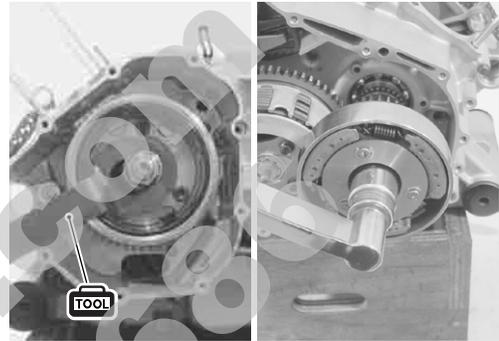
While holding the generator rotor with the special tool, tighten the clutch shoe nut to the specified torque.

**TOOL** 09930-44520: Generator rotor holder

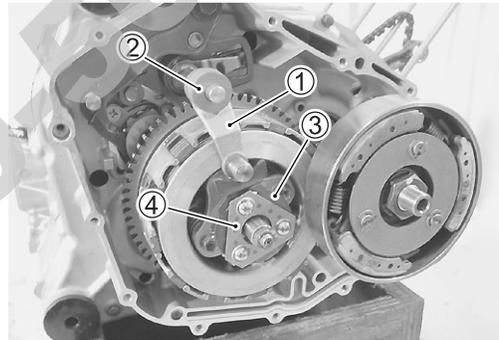
**CAUTION**

The clutch shoe nut has left-hand threads.

**TOOL** Clutch shoe nut: 140 N•m (14.0 kgf-m, 101.5 lb-ft)

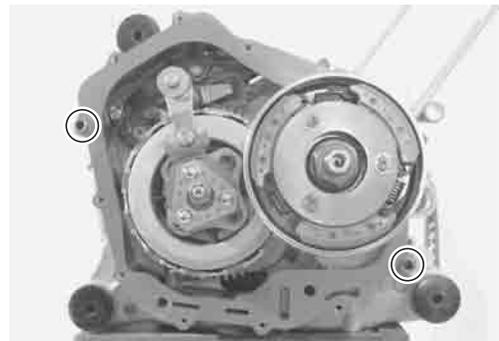


Install the clutch release arm ① and washer ② clutch release ball inner guide ③ and release ball assembly ④.

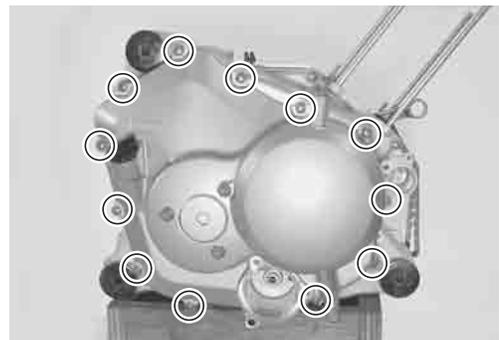


**CLUTCH COVER**

Install the dowel pins and new gasket.



Install the clutch cover.



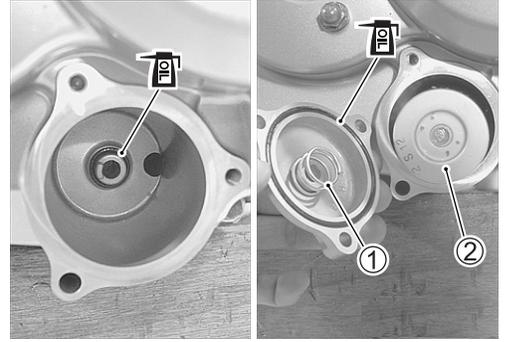
**OIL FILTER**

Before installing the oil filter, fit new O-rings and apply engine oil lightly to them.

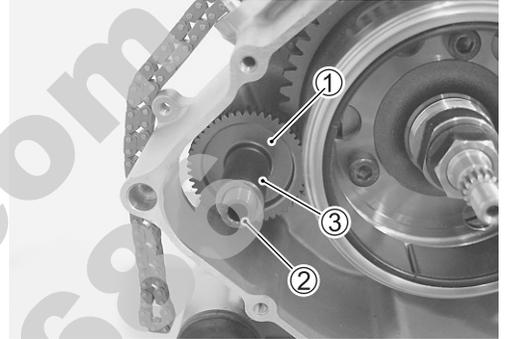
Install the spring ① and oil filter ②.

**CAUTION**

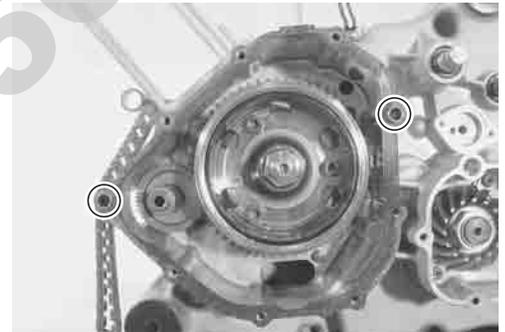
Use new O-rings to prevent oil leakage.

**STARTER IDLE GEAR**

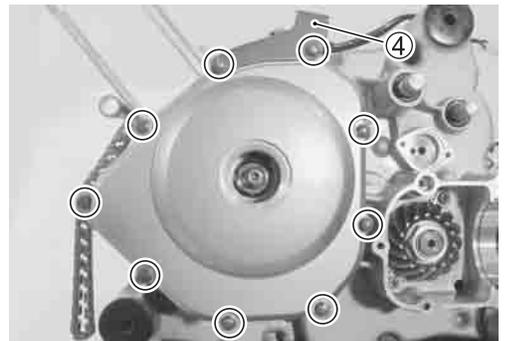
Install the idle driven gear ①, shaft ② and spacer ③.

**GENERATOR COVER**

Install the dowel pins and new gasket.

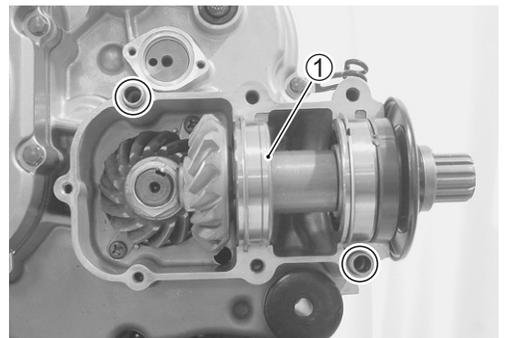


Install the reverse lock release cable holder ④ and tighten the generator cover bolt.

**SECONDARY DRIVEN BEVEL GEAR**

Install the secondary driven bevel gear shaft assembly ①.

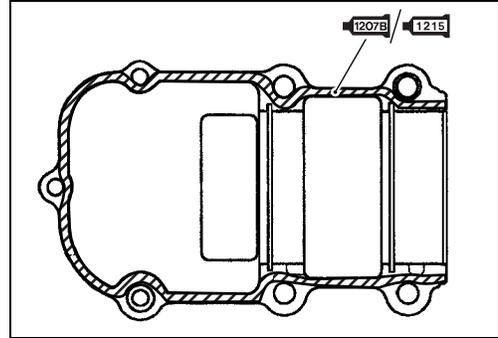
Install the dowel pins.



Apply SUZUKI BOND to the mating surface of the secondary bevel gear cover.

 99104-31140: SUZUKI BOND 1207B (USA)

 99000-31110: SUZUKI BOND 1215 (Others)



Install the secondary bevel gear cover.



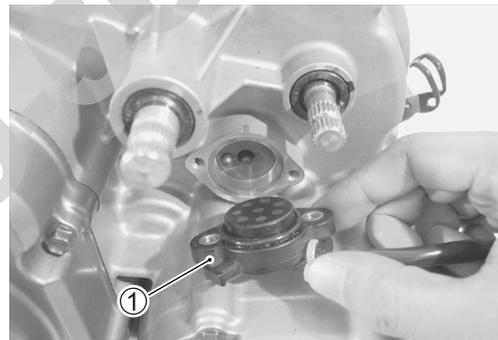
### NEUTRAL SWITCH

Install the springs and switch contacts.

Fit new O-ring and install the neutral switch ①.

Tighten the neutral switch bolts to the specified torque.

 Neutral switch bolt: 7 N•m (0.7 kgf-m, 5.0 lb-ft)



### ENGINE TOP SIDE

#### PISTON

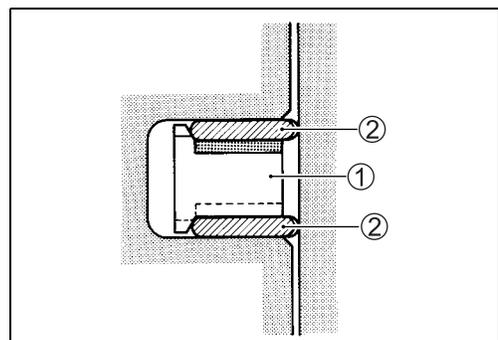
Install the piston rings in the order of oil ring, 2nd ring and 1st ring.

The first member to go into the oil ring groove is a spacer ①.

After placing the spacer, fit the two side rails ②.

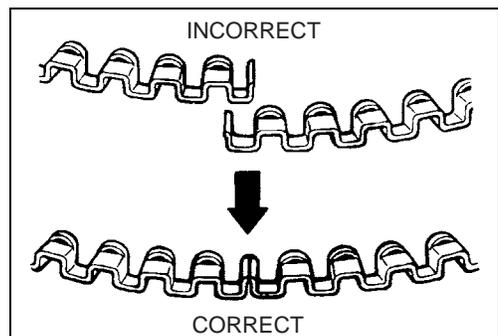
#### NOTE:

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



#### CAUTION

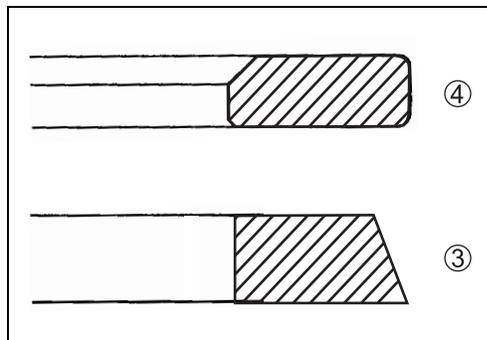
When installing the spacer, be careful not to allow its two ends to overlap in the groove.



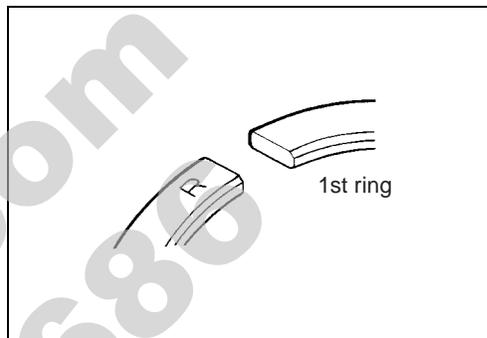
Install the 2nd ring ③ and the 1st ring ④.

**NOTE:**

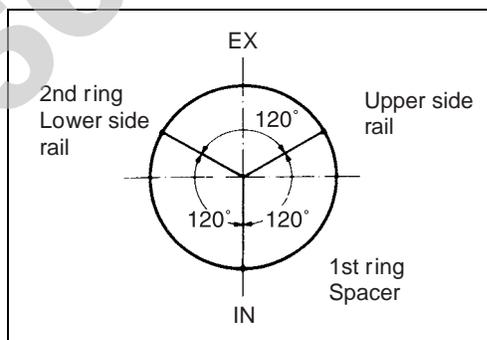
1st ring and 2nd ring differ in shape.



1st ring has letter R marked on the side. Be sure to bring the marked side to the top when fitting it to the piston.



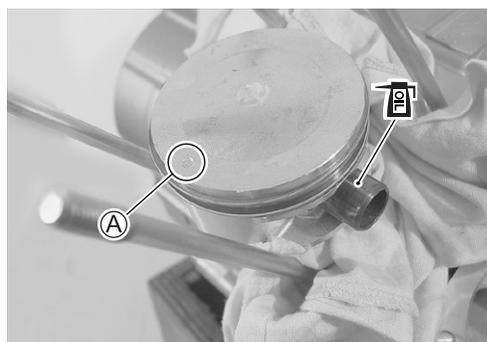
Position the gaps of the three rings as shown. Before inserting the piston into the cylinder, check that the gaps are so located.



Apply engine oil to the piston pin.  
Install the piston and piston pin.

**NOTE:**

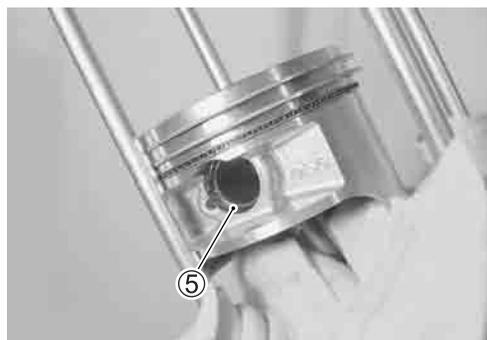
When installing the piston, the punched mark (A) on the piston head is located to the exhaust side.



Place a cloth beneath the piston, install the circlip ⑤.

**CAUTION**

Use new piston pin circlips to prevent circlip failure with bent ones.



**CYLINDER**

Fit the dowel pins and new gasket ①.

**CAUTION**

Use a new gasket to prevent gas leakage.

**NOTE:**

- \* The dowel pins are identified by their length.
- \* Shorter ones ① are for cylinder base.
- \* Apply engine oil to the piston ring grooves and cylinder wall.

Hold each piston ring with proper position, insert the piston into the cylinder.

**CAUTION**

When installing the cylinder and cylinder head, pull the cam chain upward, or the chain will be caught between the crankcase and cam drive sprocket.

Tighten the cylinder base nuts (M6) temporarily.

**NOTE:**

Fit the clamp under the nut ②.

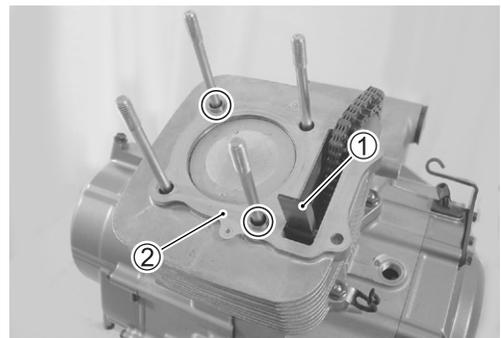
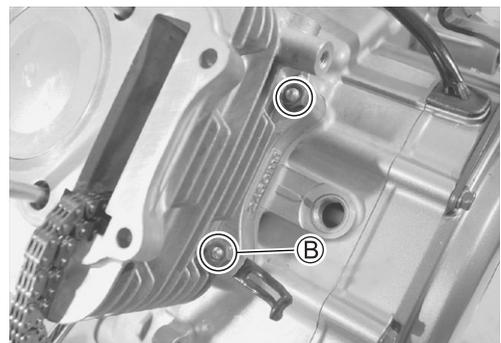
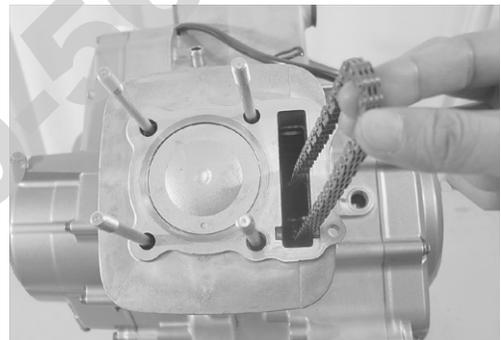
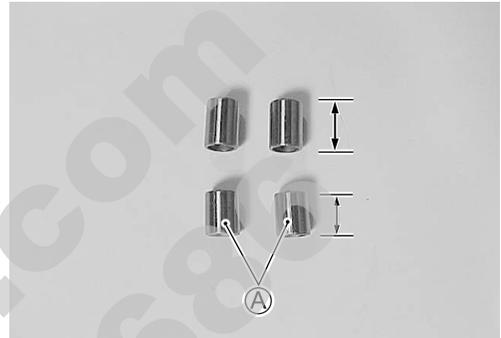
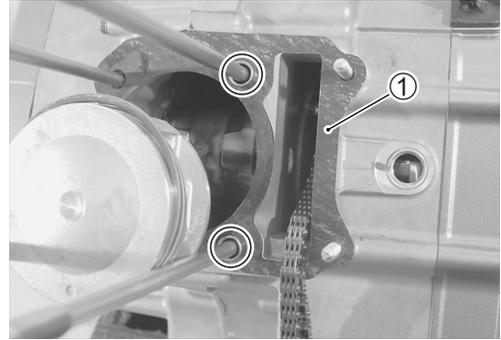
**CYLINDER HEAD**

Install the cam chain guide ①.

Fit the dowel pins and new cylinder head gasket ②.

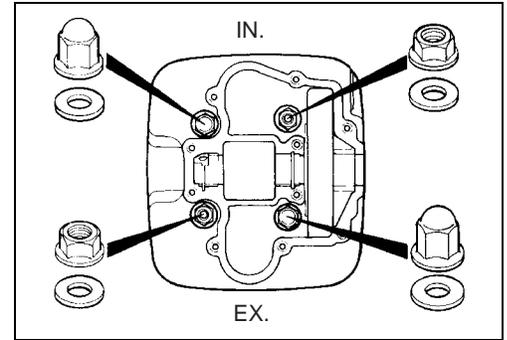
**CAUTION**

Use new gasket to prevent gas leakage.



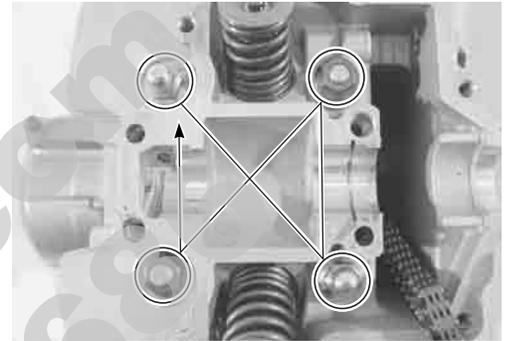
Install the cylinder head.

Install the washers and cylinder head nuts (M8) as shown.



Tighten the cylinder head nuts (M8) diagonally to the specified torque.

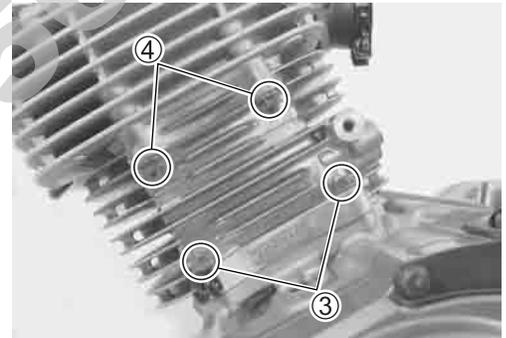
**🔩 Cylinder head nut (M8): 23 N•m (2.3 kgf-m, 16.5 lb-ft)**



Tighten the cylinder base nuts (M6) ③ and head nuts (M6) ④ to the specified torque.

**🔩 Cylinder base nut (M6): 10 N•m (1.0 kgf-m, 7.0 lb-ft)**

**🔩 Cylinder head nut (M6): 10 N•m (1.0 kgf-m, 7.0 lb-ft)**

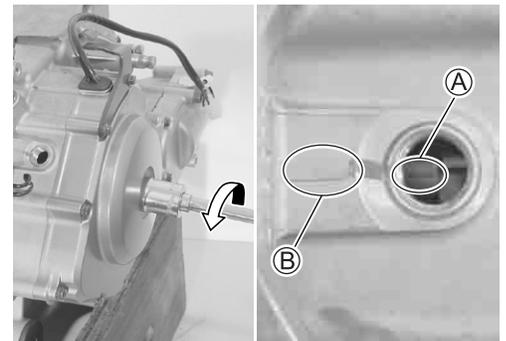


### CAMSHAFT

Turn the crankshaft until the TDC line ① on the generator rotor aligns with the index mark ② on the crankcase.

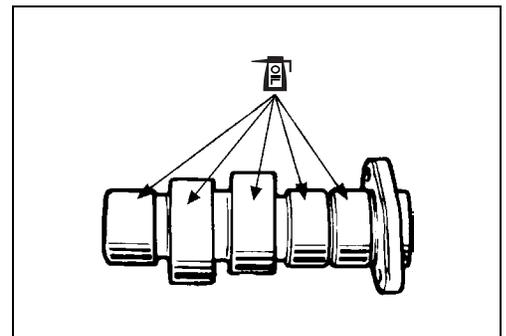
#### CAUTION

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



#### NOTE:

*Before installing the camshaft to the cylinder head, apply engine oil to the camshaft journals and cam faces.*



Install the camshaft and camshaft sprocket.

Engage the hole of the sprocket ③ with the locating pin on the camshaft as shown.

Align the lines ④ on the camshaft so that they are parallel with the surface of the cylinder head.

**NOTE:**

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

\* While aligning the lines ④, remove chain slack by turning the sprocket counterclockwise lightly.

Install the C-ring ①.

Install the lock washer as it covers the locating pin.

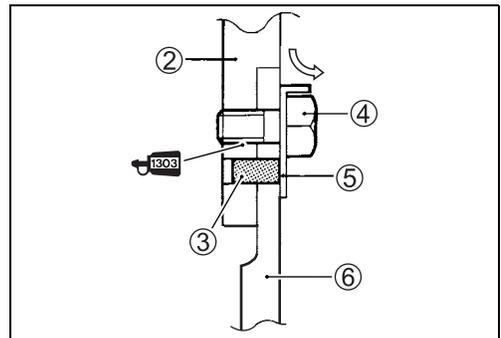
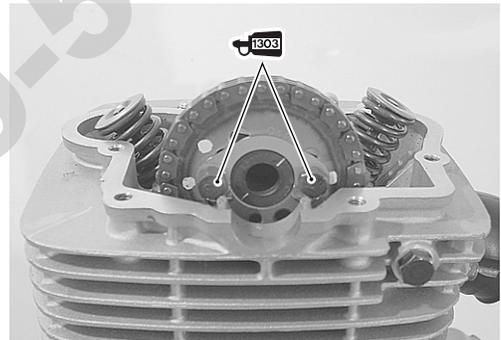
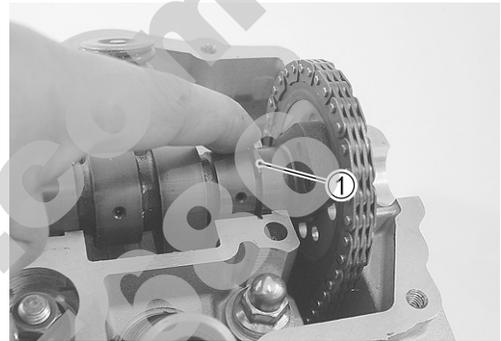
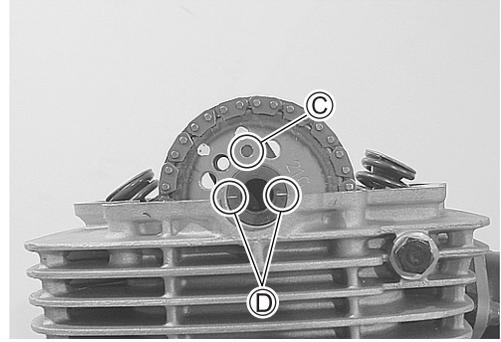
Apply THREAD LOCK SUPER to the bolts and tighten them to the specified torque.

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

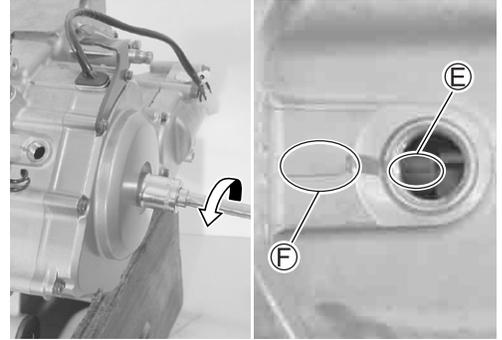
 **Camshaft sprocket bolt: 11 N·m (1.1 kgf-m, 8.0 lb-ft)**

Bend up the washer tongue to lock the bolts.

- ② Camshaft
- ③ Pin
- ④ Bolt
- ⑤ Lock washer
- ⑥ Camshaft sprocket



Turn the crankshaft until the TDC line ⑤ on the generator rotor aligns with the index mark ⑥ on the crankcase.



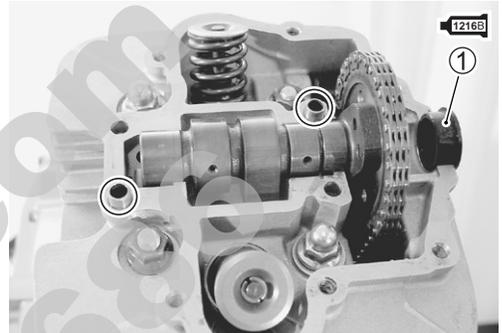
### CYLINDER HEAD COVER

Clean the mating surface of the cylinder head and head cover before matching.

Install the dowel pins to the cylinder head.

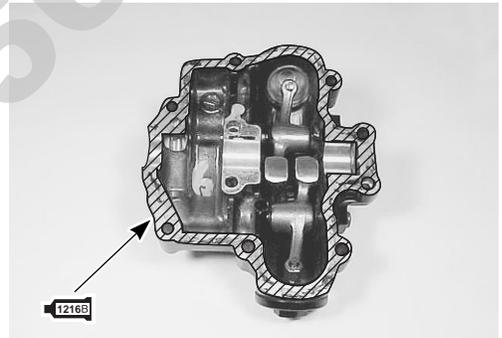
Apply SUZUKI BOND to the periphery of the camshaft end cap ① and fit it

**1216B** 99000-31230: SUZUKI BOND 1216B



Apply SUZUKI BOND to the mating surface of the cylinder head cover.

**1216B** 99000-31230: SUZUKI BOND 1216B

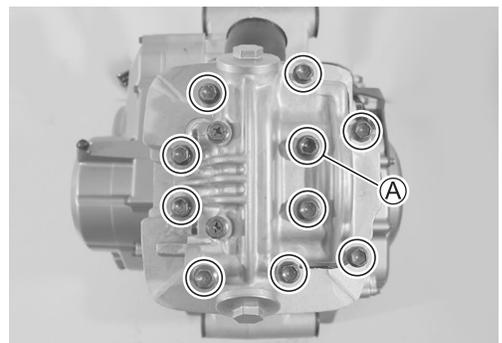


Tighten the cylinder head cover bolts to the specified torque.

**🔧** Cylinder head cover bolt: 10 N•m (1.0 kgf-m, 7.0 lb-ft)

#### CAUTION

Fit the washer to the bolt ①.

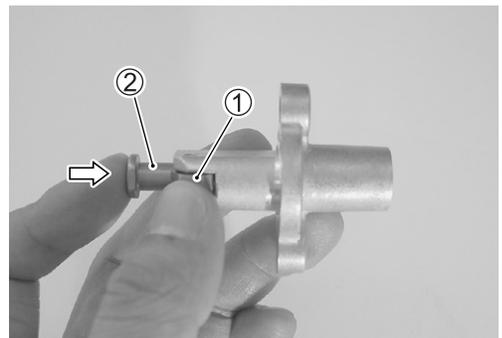


### CAM CHAIN TENSION ADJUSTER

After removing the spring holder bolt and spring, unlock the ratchet mechanism ① and push in the push rod ② all the way.

#### NOTE:

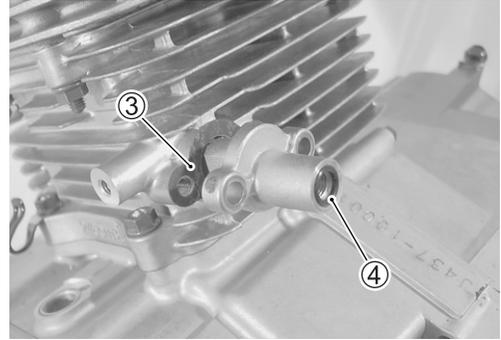
Before installing the cam chain tension adjuster, unlock the ratchet mechanism ① and move the push rod ② in place to see if it slides smoothly.



Install new gasket ③ and cam chain tension adjuster to the cylinder block and tighten its mounting bolts to the specified torque.

**Cam chain tension adjuster bolt:**  
10 N•m (1.0 kgf-m, 7.0 lb-ft)

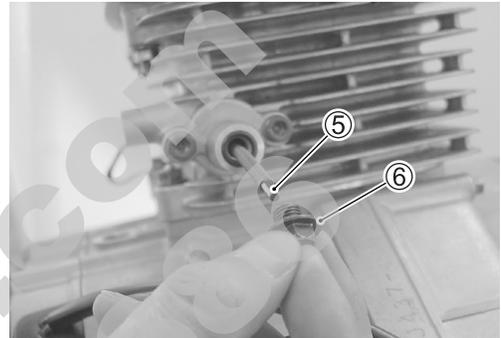
Install new O-ring ④.



Install the spring and pin ⑤.  
Tighten the spring holder bolt ⑥ to the specified torque.

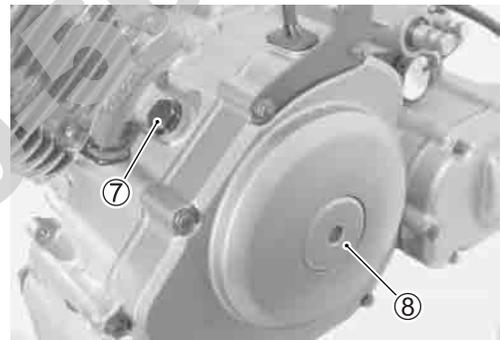
**Cam chain tension adjuster spring holder bolt:**  
8 N•m (0.8 kgf-m, 6.0 lb-ft)

Adjust the valve clearance. (☞ 2-5)



Tighten the valve timing inspection plug ⑦ and generator cover cap ⑧ to the specified torque.

**Valve timing inspection plug:**  
23 N•m (2.3 kgf-m, 16.5 lb-ft)  
**Generator cover cap:** 15 N•m (1.5 kgf-m, 11.0 lb-ft)



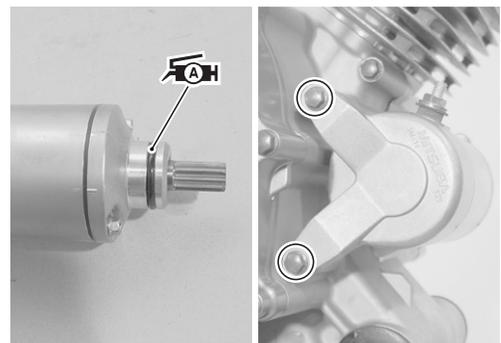
## STARTER MOTOR

Apply SUZUKI SUPER GREASE to new O-ring.

**99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**

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

**Starter motor mounting bolt:** 10 N•m (1.0 kgf-m, 7.0 lb-ft)



## SPARK PLUG

Tighten the spark plug to the specified torque. (☞ 2-8)

**Spark plug:** 18 N•m (1.8 kgf-m, 13.0 lb-ft)

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

Mount the engine. (☞ 3-8)



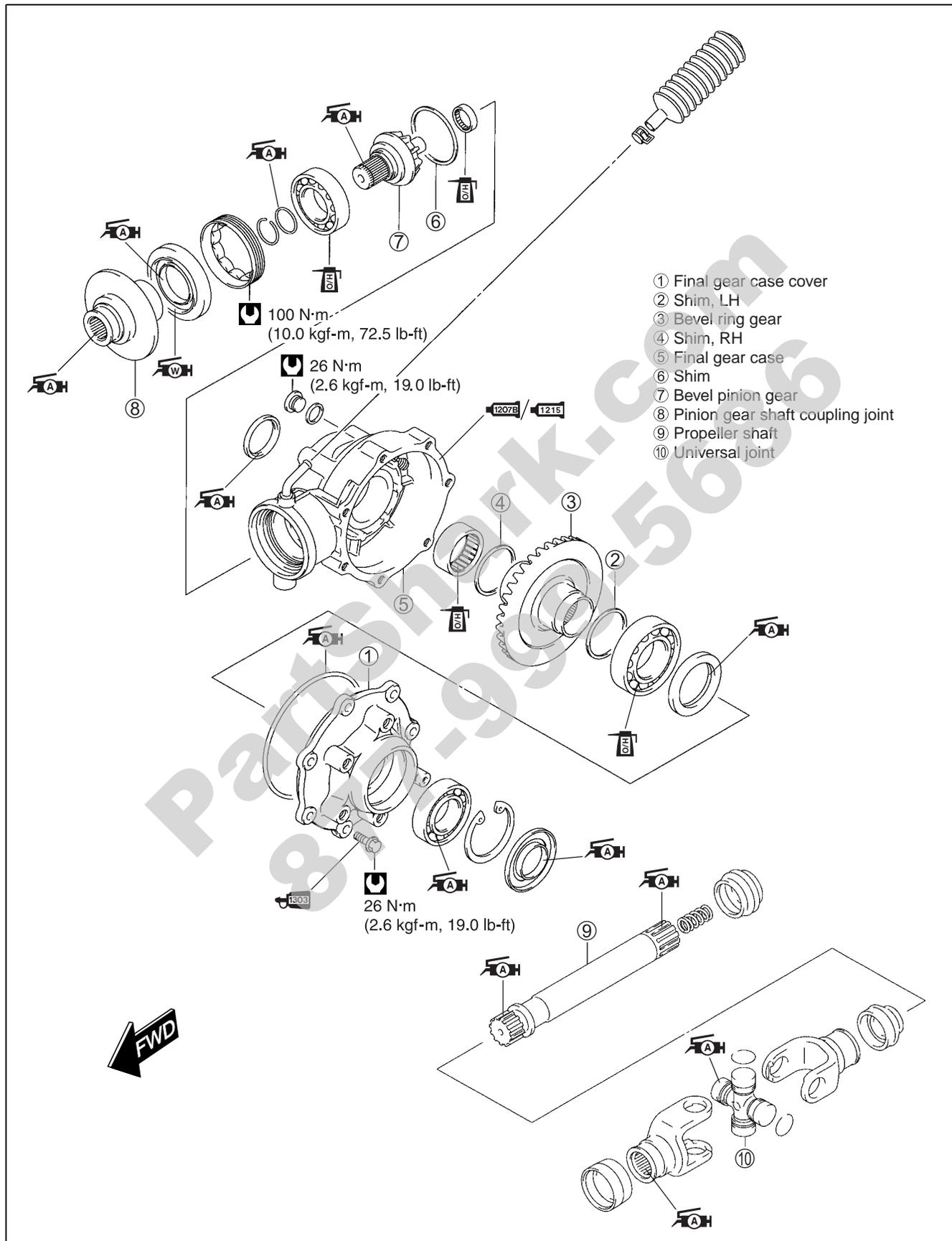
# DRIVE TRAIN

## CONTENTS

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<b>REAR DRIVE REASSEMBLY .....</b>	<b>4-11</b>
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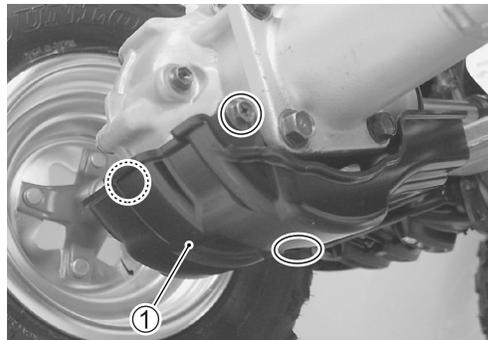
PartShark.com  
877-999-5686

# REAR DRIVING SYSTEM

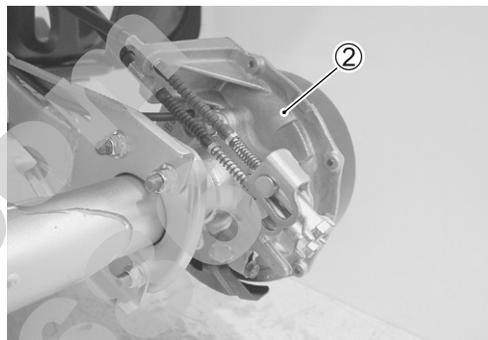


## REAR DRIVE REMOVAL

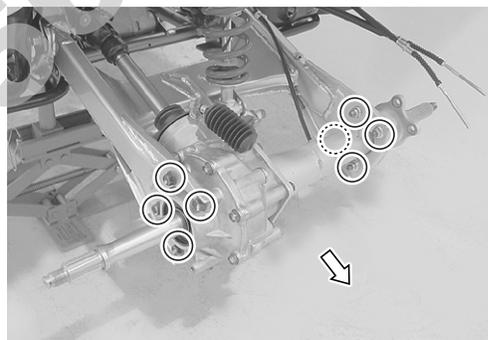
Remove the final gear case under cover ①.  
 Drain gear oil. (☞ 2-11)



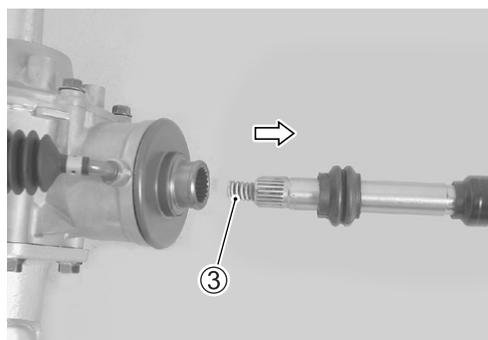
Remove the rear wheels. (☞ 7-11)  
 Remove the rear wheel hubs. (☞ 7-11)  
 Remove the rear brake ②. (☞ 7-46)



Remove the axle housing set bolts/nuts.  
 Remove the final gear case together with the propeller shaft.



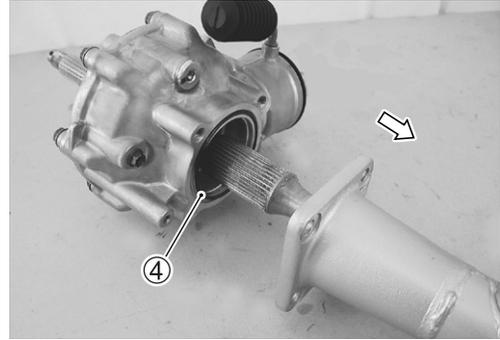
Remove the propeller shaft and spring ③ from the final gear case.



Remove the axle housing/final gear case bolts.



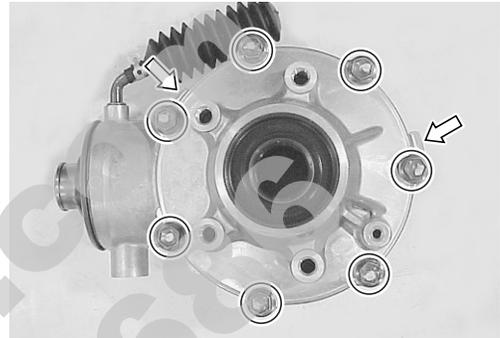
Remove the rear axle together with the axle housing.  
Remove the O-ring ④.



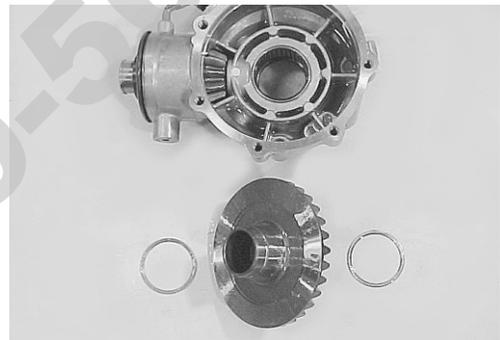
## REAR DRIVE DISASSEMBLY

### FINAL GEAR CASE

Remove the final gear case cover bolts diagonally and evenly.  
Pry the cover at the arrows as shown by tapping with a plastic mallet.



Remove the ring gear and shims.



Remove the dust seal with the special tool.

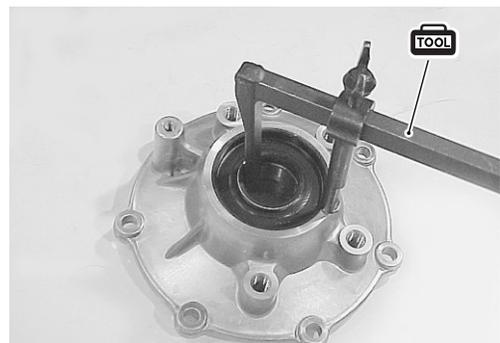
**TOOL** 09913-50121: Oil seal remover

**NOTE:**

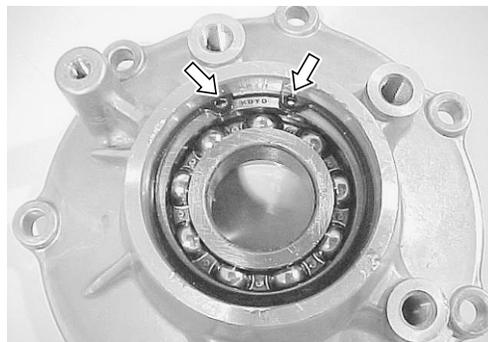
*If there is no abnormal condition, the dust seal removal is not necessary.*

**CAUTION**

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



Remove the snap ring.



Remove the O-ring ①.

Drive out the bearing from the other side with the special tool.

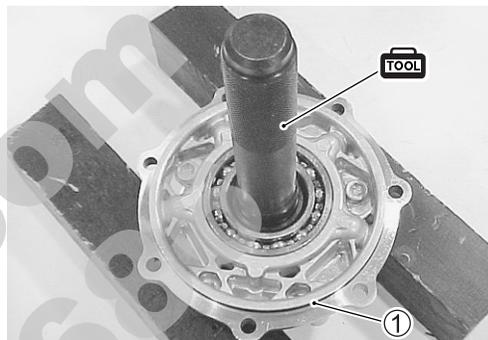
**TOOL** 09913-70210: Bearing installer set

**NOTE:**

*If there is no abnormal condition, the bearing removal is not necessary.*

**CAUTION**

**The removed bearing must be replaced with a new one.**



Remove the bearing and oil seal with a suitable tool.

**NOTE:**

*If there is no abnormal condition, the bearing/oil seal removal is not necessary.*

**CAUTION**

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



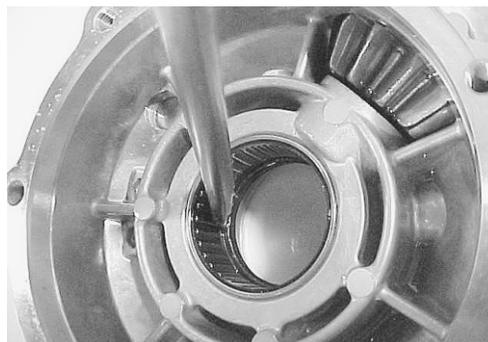
Remove the oil seal with a suitable tool.

**NOTE:**

*If there is no abnormal condition, the oil seal removal is not necessary.*

**CAUTION**

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



Remove the bearing with the special tool.

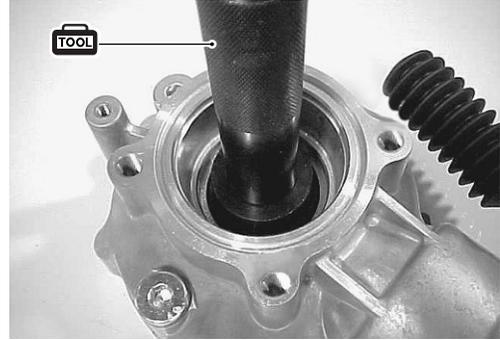
**TOOL** 09913-70210: Bearing installer set

**NOTE:**

*If there is no abnormal condition, the bearing removal is not necessary.*

**CAUTION**

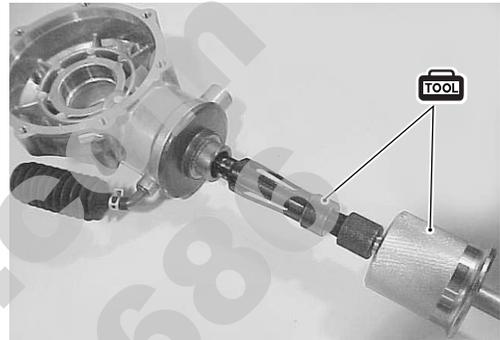
**The removed bearing must be replaced with a new one.**



Remove the pinion gear shaft coupling joint with the special tools.

**TOOL** 09923-74510: Bearing remover

09930-30104: Sliding shaft



Remove the oil seal with a suitable tool.

**NOTE:**

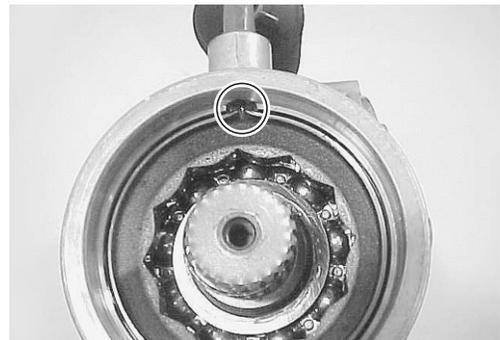
*If there is no abnormal condition, the oil seal removal is not necessary.*

**CAUTION**

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



Unstake the bearing locknut with a small chisel or drill.



Remove the bearing locknut with the special tool.

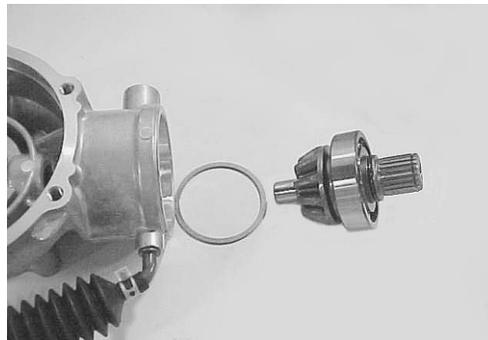
**TOOL** 09921-21820: Bearing locknut wrench

**CAUTION**

**Replace the bearing locknut with a new one.**



Remove the pinion gear assembly and shim.



Remove the stopper ring ① and O-ring ②.



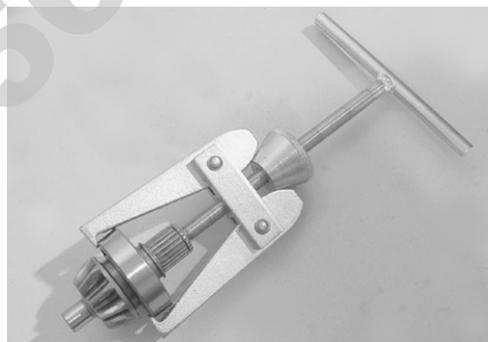
Remove the bearing with a commercially available bearing puller or a hydraulic press.

**NOTE:**

*If there is no abnormal condition, the bearing removal is not necessary.*

**CAUTION**

**The removed O-ring and bearing must be replaced with the new ones.**



Remove the pinion gear pilot bearing with the special tools.

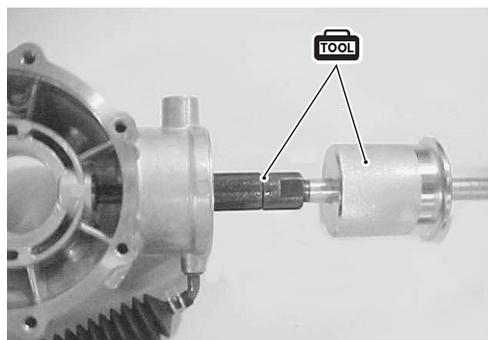
**TOOL** 09921-20210: Bearing remover  
09930-30104: Sliding shaft

**NOTE:**

*If there is no abnormal condition, the bearing removal is not necessary.*

**CAUTION**

**The removed bearing must be replaced with a new one.**

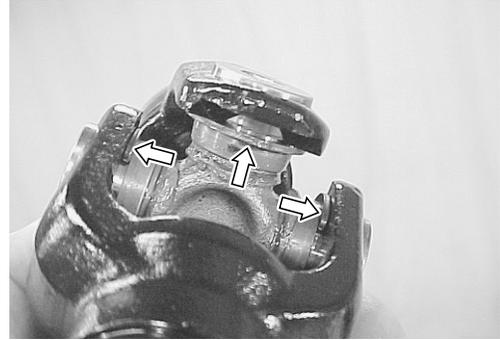


### UNIVERSAL JOINT

Remove the C-rings from the universal joint.

#### CAUTION

Replace the removed C-rings with new ones.



Remove the bearings by tapping with the special tool and a hammer.

**TOOL** 09913-70210: Bearing installer set

Remove the universal joint.



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## REAR DRIVE INSPECTION

### PROPELLER SHAFT

Inspect the splines of the propeller shaft for wear or damage.

Also, inspect the boot for cuts or damage.

If any defects are found, replace the propeller shaft and its boot with new ones.

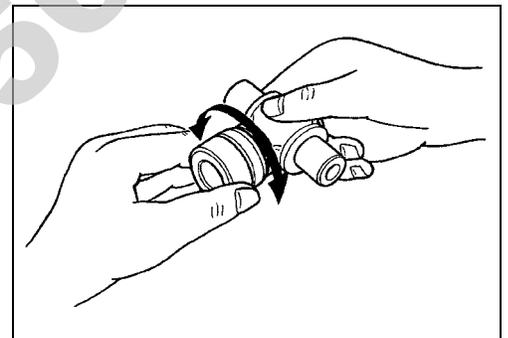


### UNIVERSAL JOINT

Inspect the universal joint and outer surface of the bearing for scuffing, wear and damage. If any defects are found, replace the bearings and universal joint as a set.



Insert the universal joint to the bearing and check the play by turning the universal joint, as shown. If excessive play is noted, replace the bearing with a new one.

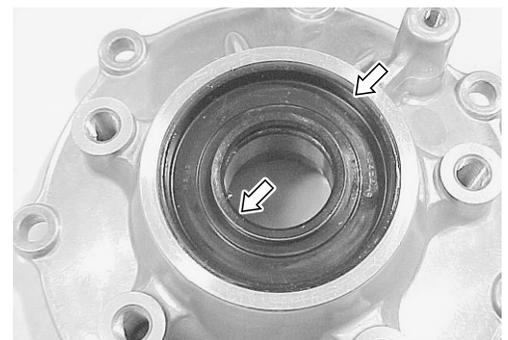
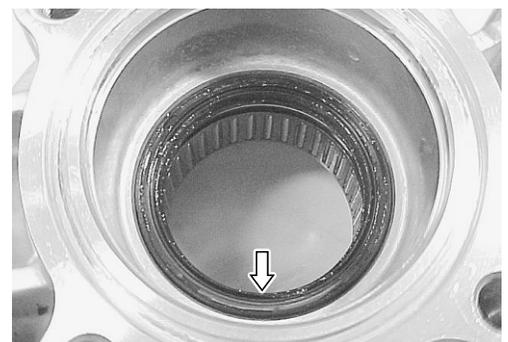


### FINAL GEAR CASE

Inspect the gear case, case cover, oil seals and dust seal for wear or damage.

If any wear or damage is found, replace the oil seal or dust seal with a new one.

**OIL SEAL REMOVAL**  4-4 to -6



Check the outer race play and smooth rotation of the bearing by hand while it is on the pinion gear shaft.

Inspect the pinion gear for wear or damage.

If the pinion gear is damaged, inspect the ring gear also.

If any defects are found, replace the bearing and gear with the new ones.

**BEARING AND GEAR REMOVAL**  4-7



Inspect the ring gear for wear or damage.

If the ring gear is damaged, inspect the pinion gear.

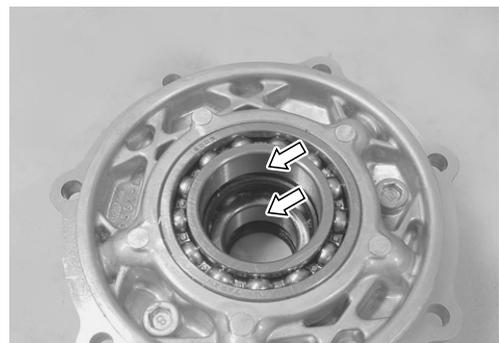
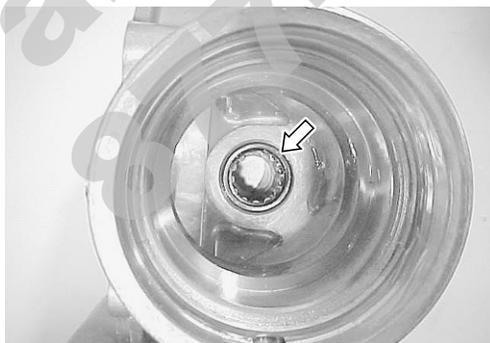
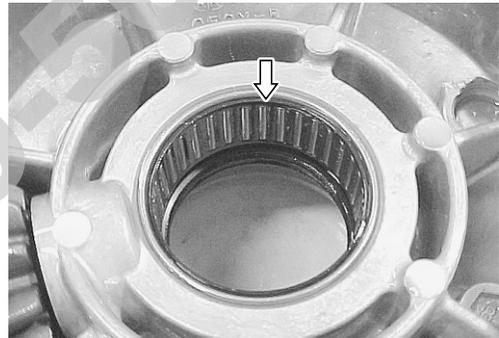
If any defects are found, replace the ring gear with a new one.



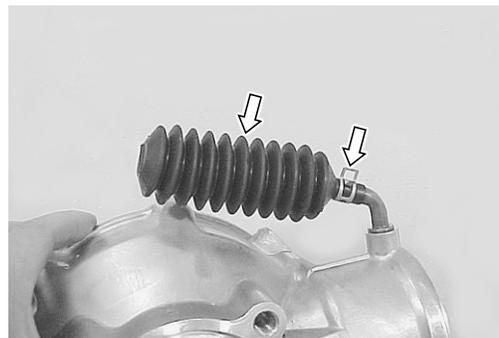
Check the gear case and case cover bearings for wear or damage.

If any wear or damage is found, replace the bearing with a new one.

**BEARING REMOVAL**  4-5 to -7



Check the breather rubber case for wear or damage. Also, check that the joint of the rubber case fits tightly.

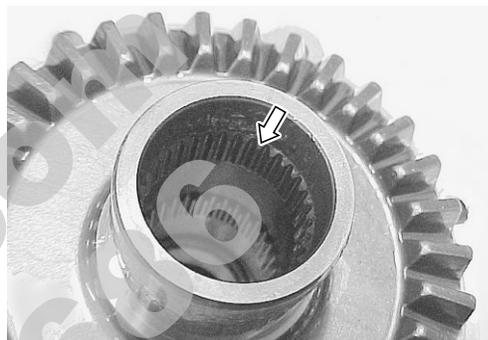
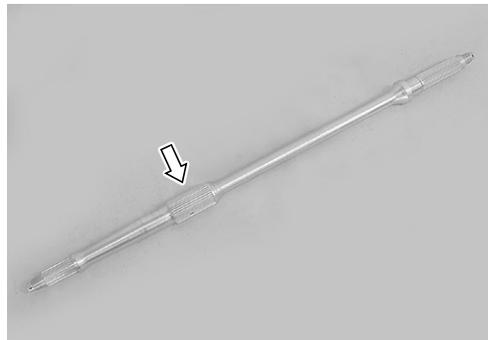


**REAR AXLE**

Inspect the splines of the rear axle and splines of the ring gear for wear or damage.

If any wear or damage is found, replace the rear axle and ring gear with the new ones.

Check the axle shaft runout. (👉 7-61)

**REAR DRIVE REASSEMBLY**

Reassemble the rear drive in the reverse order of disassembly. Pay attention to the following points:

**NOTE:**

*Before reassembly, thoroughly clean all parts in cleaning solvent.*

**FINAL GEAR CASE OIL SEAL**

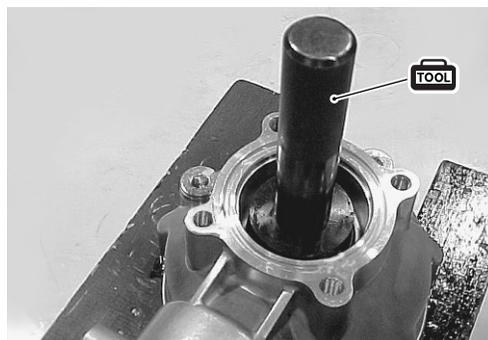
Install new oil seals into the gear case and case cover with the special tool.

Apply SUZUKI SUPER GREASE to the new oil seal lips.

 **09913-70210: Bearing installer set**

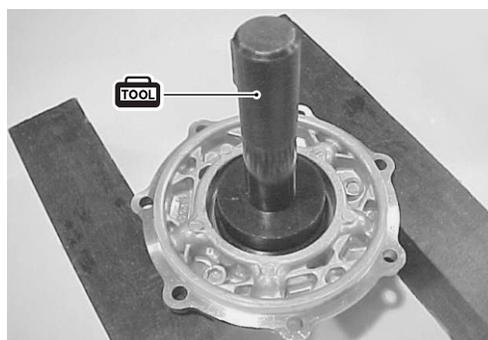
 **99000-25030: SUZUKI SUPER GREASE A (USA)**

**99000-25010: SUZUKI SUPER GREASE A (Others)**

**NOTE:**

*The marked side of the oil seal should be positioned outside.*

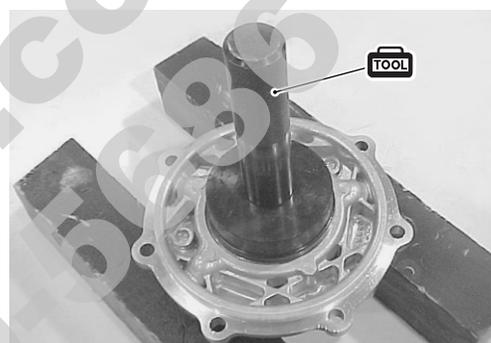
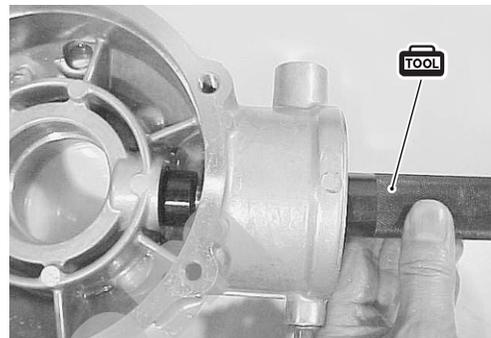
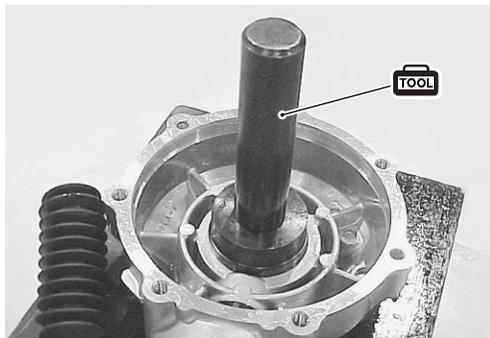
(👉 4-21)



**FINAL GEAR CASE BEARING**

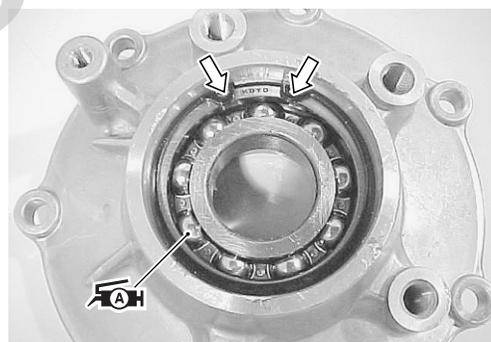
Drive the bearings into the gear case and case cover with the special tool.

 **09913-70210: Bearing installer set**

**DUST SEAL**

Fix the bearing race with the snap ring.  
Apply SUZUKI SUPER GREASE to the bearing.

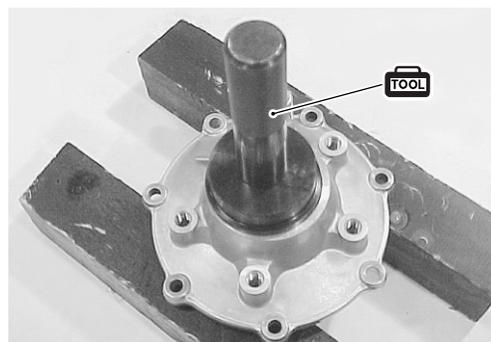
 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**



Install new dust seal with the special tool and then apply SUZUKI SUPER GREASE to the seal lip.

 **09913-70210: Bearing installer set**

 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**



**BEVEL PINION GEAR SHAFT BEARING**

Drive the bearing onto the shaft with the special tool.

 **09913-70210: Bearing installer set**

**BEVEL PINION GEAR/SHIM/LOCKNUT****[FINAL ASSEMBLY]**

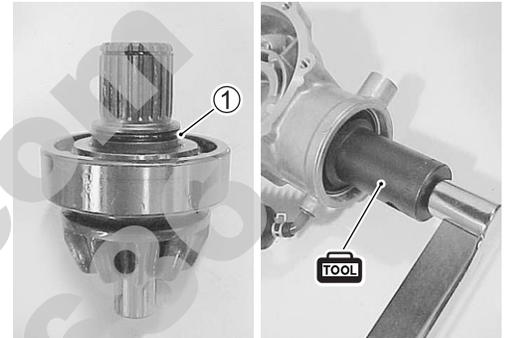
Install new O-ring ① onto the pinion gear shaft.

Install the shim, pinion gear assembly and new bearing locknut.

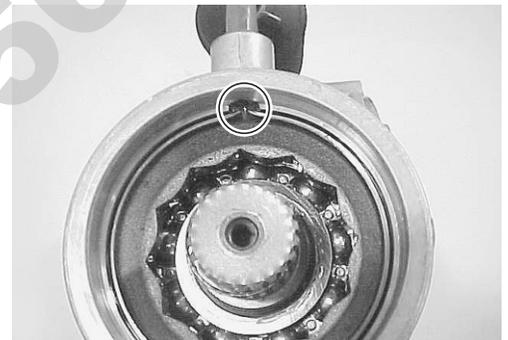
Tighten new bearing locknut to the specified torque.

 **09921-21820: Bearing locknut wrench**

 **Bearing locknut: 100 N•m (10.0 kgf-m, 72.5 lb-ft)**

**NOTE:**

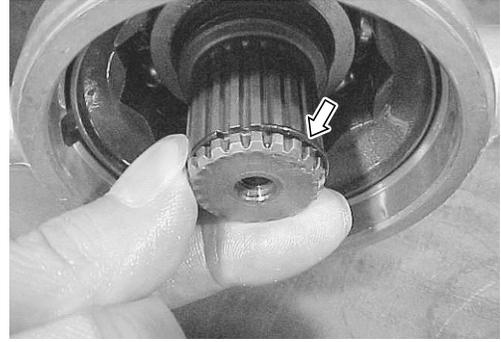
After the backlash and tooth contact have been checked or adjusted (☞ 4-18), stake the nut with a center punch.



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**BEVEL PINION GEAR SHAFT OIL SEAL**

Install new stopper ring to pinion gear shaft securely.



Install new oil seal to the gear case with the special tool.

Apply SUZUKI SUPER GREASE to the new oil seal lip groove.

**TOOL** 09913-85210: Bearing/oil seal installer

**AH** 99000-25030: SUZUKI SUPER GREASE A (USA)

99000-25010: SUZUKI SUPER GREASE A (Others)

**NOTE:**

After the backlash and tooth contact have been checked or adjusted, install the oil seal.

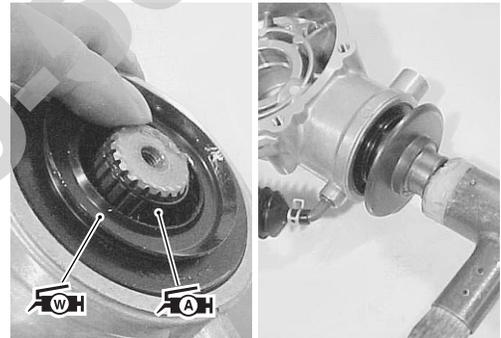
Apply SUZUKI SUPER GREASE to the splines of the pinion gear shaft and install the pinion gear shaft coupling joint by tapping with a plastic mallet.

**AH** 99000-25030: SUZUKI SUPER GREASE A (USA)

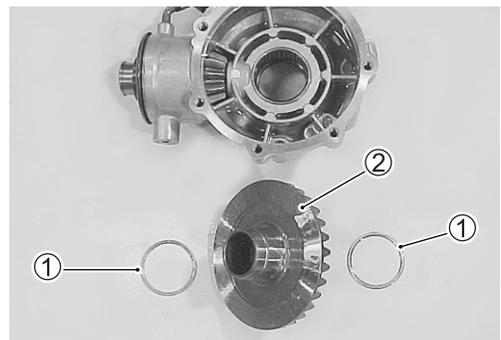
99000-25010: SUZUKI SUPER GREASE A (Others)

Apply 4 ~ 5 gram of WATER RESISTANCE GREASE to the outside of seal lip groove.

**WH** 99000-25160: WATER RESISTANCE GREASE

**BEVEL RING GEAR/SHIM**

Fit the removed shims ① on both sides of the ring gear, then install the ring gear ②.



## FINAL GEAR CASE COVER/GEAR CASE [FINAL ASSEMBLY]

Coat new O-ring with SUZUKI SUPER GREASE and apply SUZUKI BOND to the mating surface of the cover, then install the gear case cover.

-  **99000-25030: SUZUKI SUPER GREASE A (USA)**
- 99000-25010: SUZUKI SUPER GREASE A (Others)**
-  **99104-31140: SUZUKI BOND 1207B (USA)**
-  **99000-31110: SUZUKI BOND 1215 (Others)**

### NOTE:

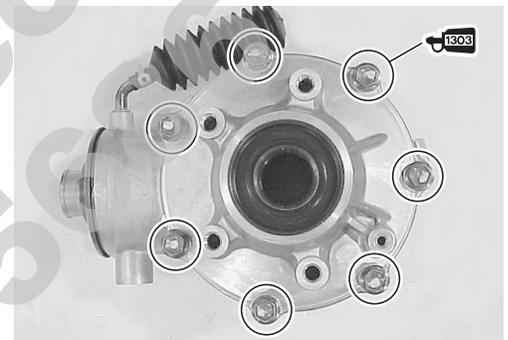
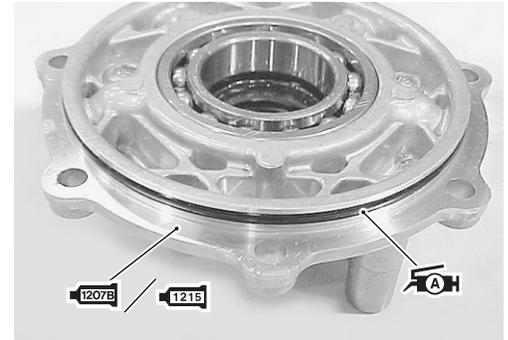
After the backlash and tooth contact have been checked or adjusted (☞ 4-18), install new O-ring and apply SUZUKI BOND.

Apply THREAD LOCK SUPER to the case cover bolts and tighten them to the specified torque in a crisscross pattern.

-  **99000-32030: THREAD LOCK SUPER 1303**
-  **Gear case cover bolt: 26 N•m (2.6 kgf-m, 19.0 lb-ft)**

### NOTE:

After the backlash and tooth contact have been checked or adjusted, apply THREAD LOCK SUPER to the case cover bolts.



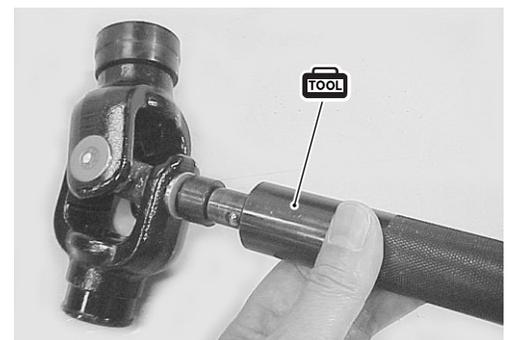
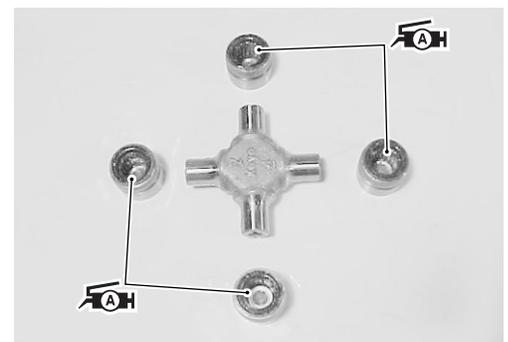
## UNIVERSAL JOINT

Apply SUZUKI SUPER GREASE to the bearing and its dust seal lip.

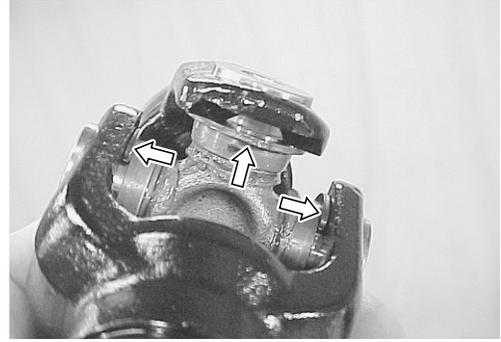
-  **99000-25030: SUZUKI SUPER GREASE A (USA)**
- 99000-25010: SUZUKI SUPER GREASE A (Others)**

Install the universal joint and bearings with the special tool.

-  **09913-70210: Bearing installer set**



Install new C-rings by tapping with a copper hammer.



After reassembling the universal joint, check the joint movement smoothly. If a large resistance is felt to movement, tap the bearing with a plastic mallet lightly.

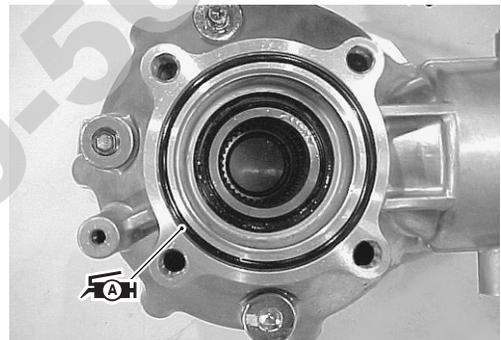


## REAR DRIVE INSTALLATION

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

Coat new O-ring with SUZUKI SUPER GREASE and install it into the groove in the gear case.

 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**



Apply SUZUKI SUPER GREASE to the splines of the axle.

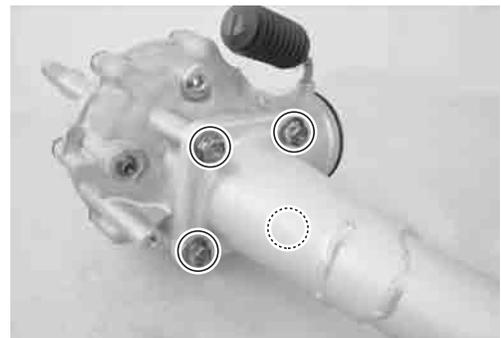
 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**



Apply THREAD LOCK SUPER to the axle housing/final gear case bolts, and tighten them to the specified torque.

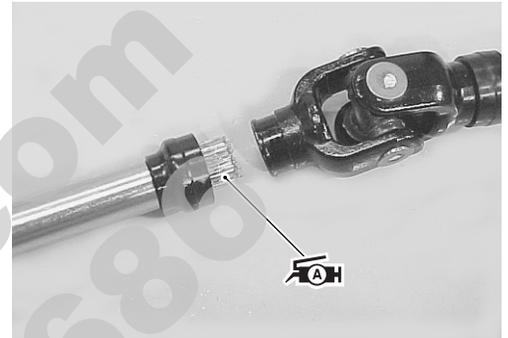
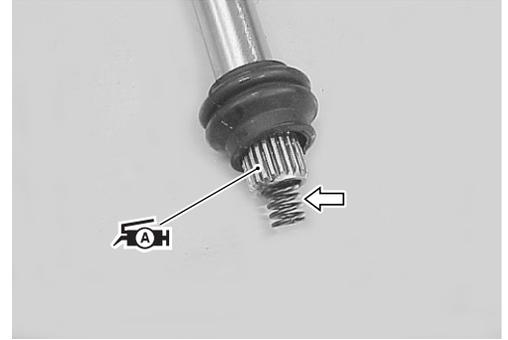
 **99000-32030: THREAD LOCK SUPER 1303**

 **Axle housing/final gear case bolt:**  
**65 N•m (6.5 kgf-m, 47.0 lb-ft)**



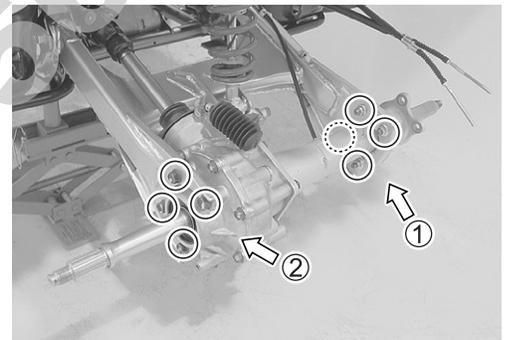
Install the spring into the rear end of the propeller shaft.  
Apply SUZUKI SUPER GREASE to the splines of the propeller shaft.

 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**



Tighten the axle housing set bolts/nuts ① (RH) and ② (LH) to the specified torque of each.

 **Axle housing set bolt/nut ① (RH):**  
**60 N·m (6.0 kgf-m, 43.5 lb-ft)**  
**Axle housing set bolt/nut ② (LH):**  
**65 N·m (6.5 kgf-m, 47.0 lb-ft)**



Pour the specified hypoid gear oil (SAE #90) in through the filler hole. ( 2-12)

Install the rear brake. ( 7-51)

Install the rear wheels. ( 7-15)

## SHIM ADJUSTMENT

### BACKLASH

Install the pinion gear assembly, removed shim and new bearing locknut. (☞ 4-13)

Tighten the bearing locknut to the specified torque.

(☞ 4-13)

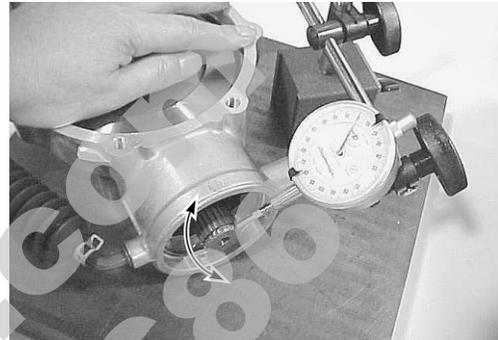
#### NOTE:

At this time, it is not necessary to stake the bearing locknut.

(☞ 4-13)

Install the removed right side shim and ring gear. (☞ 4-14)

Measure the backlash using the dial gauge, as shown. Take backlash readings at several places while turning the pinion gear shaft in each direction and securely holding the ring gear. If the backlash is not within specification, the shim must be changed and the backlash should be re-checked until correct. Refer to the chart at the right for the appropriate shim thickness.



#### DATA Backlash

Standard: 0.05 0.30 mm (0.0020 0.0118 in)

#### NOTE:

Adjust the backlash by referring to the chart at the right and using the thickness of the removed shim as a guide.

Backlash	Shim adjustment
Under 0.05 mm (0.0020 in)	Increase shim thickness
0.05 0.30 mm (0.0020 0.0118 in)	Correct
Over 0.30 mm (0.0118 in)	Decrease shim thickness

#### For right side of ring gear (☞ 4-21)

Part No.	Shim thickness
27407-05820 (Shim set: 10 pcs)	1.26 mm (0.0496 in)
	1.32 mm (0.0520 in)
	1.38 mm (0.0543 in)
	1.44 mm (0.0567 in)
	1.50 mm (0.0591 in)
	1.56 mm (0.0614 in)
	1.62 mm (0.0638 in)
	1.68 mm (0.0661 in)
	1.74 mm (0.0685 in)
	1.80 mm (0.0709 in)

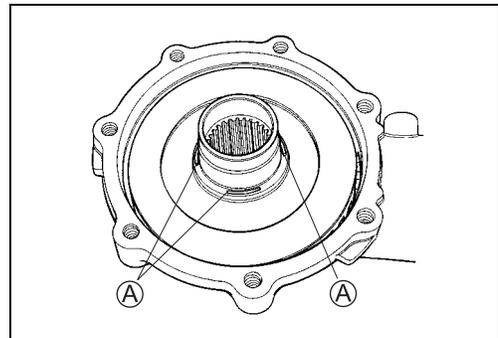
### LEFT SIDE SHIM SELECTION

After the backlash has been checked or adjusted, put a few pieces of solder  $\text{\textcircled{A}}$  (O.D.: 1.4 2.0 mm L: 6 mm) on the ring gear back side, as shown.

#### NOTE:

\* Do not install the left side shim at this time.

\* Apply a small quantity of grease to the solders to prevent them from falling.



Install the final gear case cover and tighten its bolts to the specified torque in a crisscross pattern. (☞ 4-15)

**NOTE:**

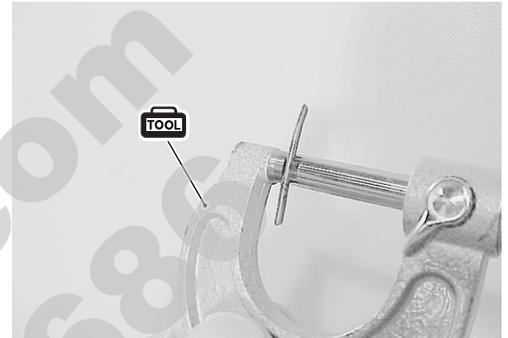
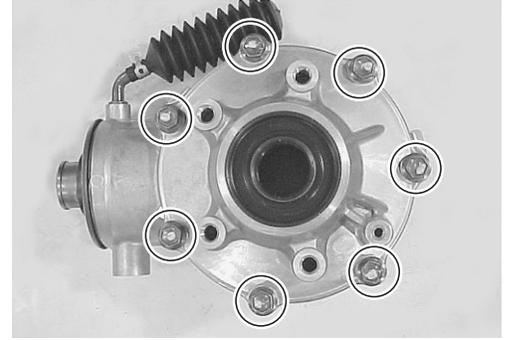
- \* It is not necessary to install the O-ring to the final gear case cover at this time.
- \* Do not apply **THREAD LOCK SUPER** to the final gear case cover bolts at this time.

**🔧 Final gear case cover bolt: 26 N•m (2.6 kgf-m, 19.0 lb-ft)**

Remove the final gear case cover. (☞ 4-4)

Measure the thickness of compressed solder with the micrometer.

**🔧 09900-20205: Micrometer**



Select the proper size of shim from the right chart, according as the compressed solder thickness.

After selecting the proper size of shim, install it on the ring gear back side.

**For left side of ring gear (☞ 4-21)**

Part No.	Shim thickness
27407-05820 (Shim set: 10 pcs)	1.26 mm (0.0496 in)
	1.32 mm (0.0520 in)
	1.38 mm (0.0543 in)
	1.44 mm (0.0567 in)
	1.50 mm (0.0591 in)
	1.56 mm (0.0614 in)
	1.62 mm (0.0638 in)
	1.68 mm (0.0661 in)
	1.74 mm (0.0685 in)
1.80 mm (0.0709 in)	

**TOOTH CONTACT**

After backlash adjustment and left shim selection are carried out, the tooth contact must be checked. Pay attention to the following procedures:

Remove the ring gear.

Clean and degrease several teeth on the ring gear and pinion gear, and then apply a coating of machinist's layout dye or paste to several teeth of the pinion gear.

Install the ring gear with the shims in place.

Install the final gear case cover, and then tighten the bolts to the specified torque in a crisscross pattern. (☞ 4-15)

**Final gear case cover bolt: 26 N•m (2.6 kgf-m, 19.0 lb-ft)**

**NOTE:**

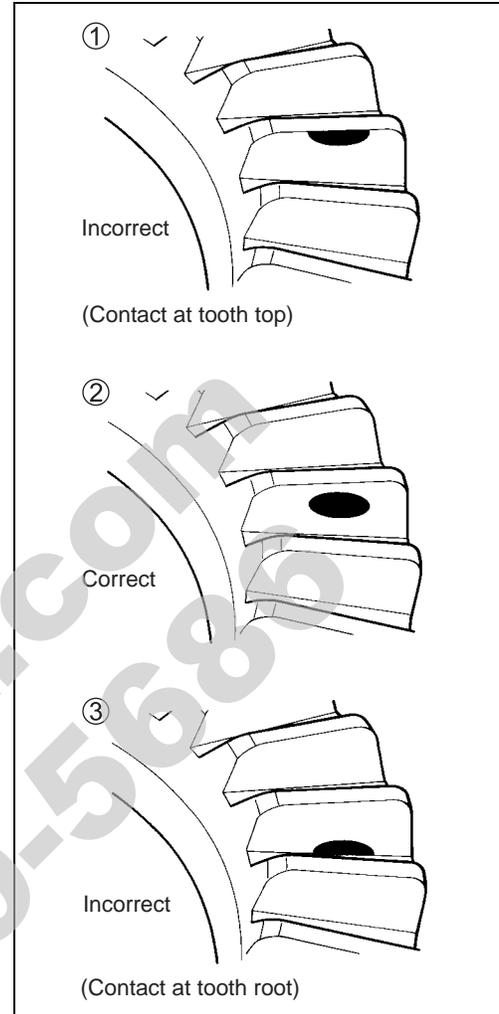
At this time, it is not necessary to install the gear case cover's O-ring.

Rotate the gear several turns in each direction. This will provide a contact pattern on the coated teeth of the gear.

Remove the ring gear and compare the coated teeth to the examples shown in ①, ② and ③.

If tooth contact is found to be correct (example ②), go to the FINAL ASSEMBLY sub-section on page 4-13 to -15 to complete installation.

If tooth contact is found to be incorrect (examples ① and ③), the shim between the pinion gear bearing and gear case must be changed and the tooth contact re-checked until correct.



Tooth contact	Shim adjustment
Contact at tooth top ①	Decrease shim thickness
Contact at tooth root ③	Increase shim thickness

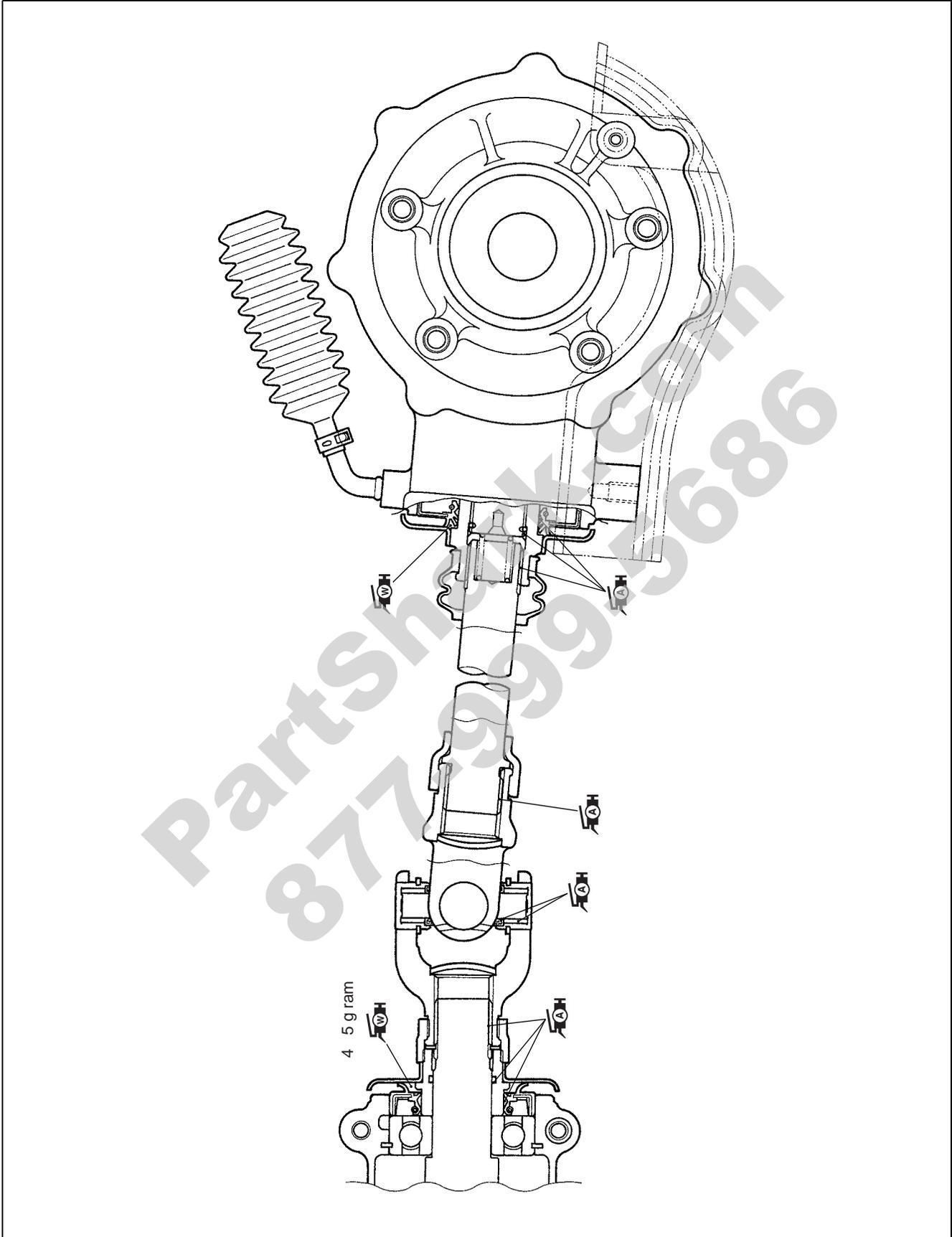
**CAUTION**

**Make sure to check the backlash and shim thickness after the tooth contact has been adjusted, since it may have changed. Adjust the tooth contact and backlash until they are both within specification. If the correct tooth contact cannot be maintained when adjusting the backlash, replace the pinion gear and ring gear as a set.**

**For pinion gear (☞ 4-21)**

Part No.	Shim thickness
27407-05810 (Shim set: 6 pcs)	1.38 mm (0.0543 in)
	1.44 mm (0.0567 in)
	1.50 mm (0.0591 in)
	1.56 mm (0.0614 in)
	1.62 mm (0.0638 in)
	1.68 mm (0.0661 in)





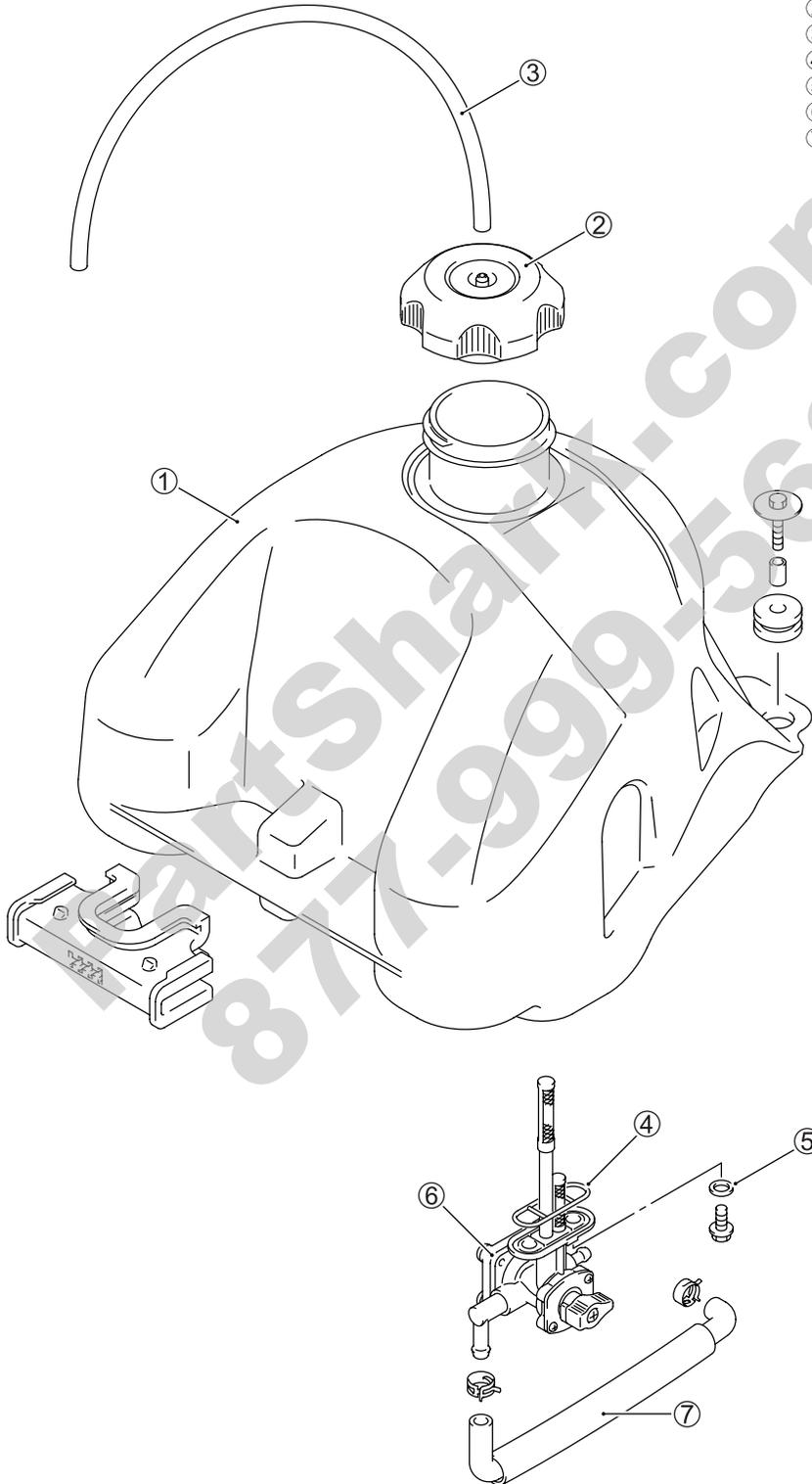
# FUEL SYSTEM

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# FUEL TANK CONSTRUCTION

- ① Fuel tank
- ② Fuel cap
- ③ Breather hose
- ④ Gasket
- ⑤ Seal washer
- ⑥ Fuel valve
- ⑦ Fuel hose



## FUEL LINE INSPECTION

Inspect the fuel lines, fuel tank, fuel tank breather hoses and fuel tank cap for damage, clogging and leakage of fuel. If any damages are found, replace the defective parts with the new ones.

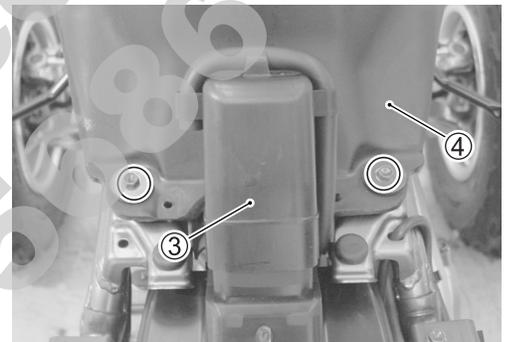
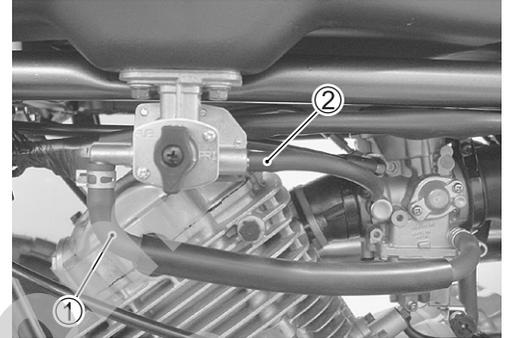
## REMOVAL

- Remove the front fender. (☞ 7-6)
- Turn the fuel valve to the ON position.
- Disconnect the fuel hose ① and vacuum hose ②.

### ⚠ WARNING

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

- Remove the air cleaner duct ③.
- Remove the fuel tank ④.
- Drain fuel completely.



## REMOUNTING

Remount the fuel tank in the reverse order of removal.

## FUEL VALVE

### REMOVAL AND INSPECTION

Remove the fuel tank. (☞ 5-3)

Drain fuel completely.

Remove the fuel valve.

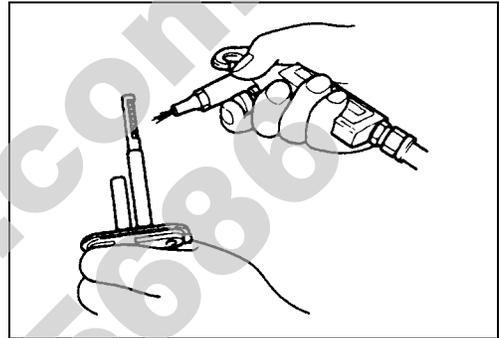
#### ⚠ WARNING

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



### FUEL STRAINER

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

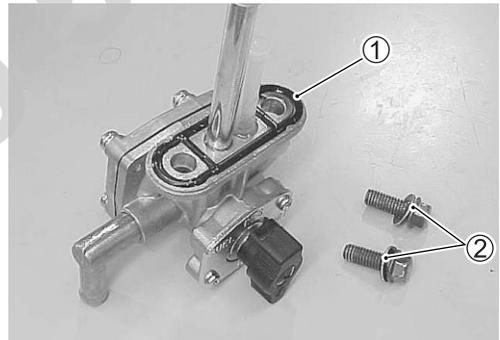


### REMOUNTING

Remount the fuel valve in the reverse order of removal.

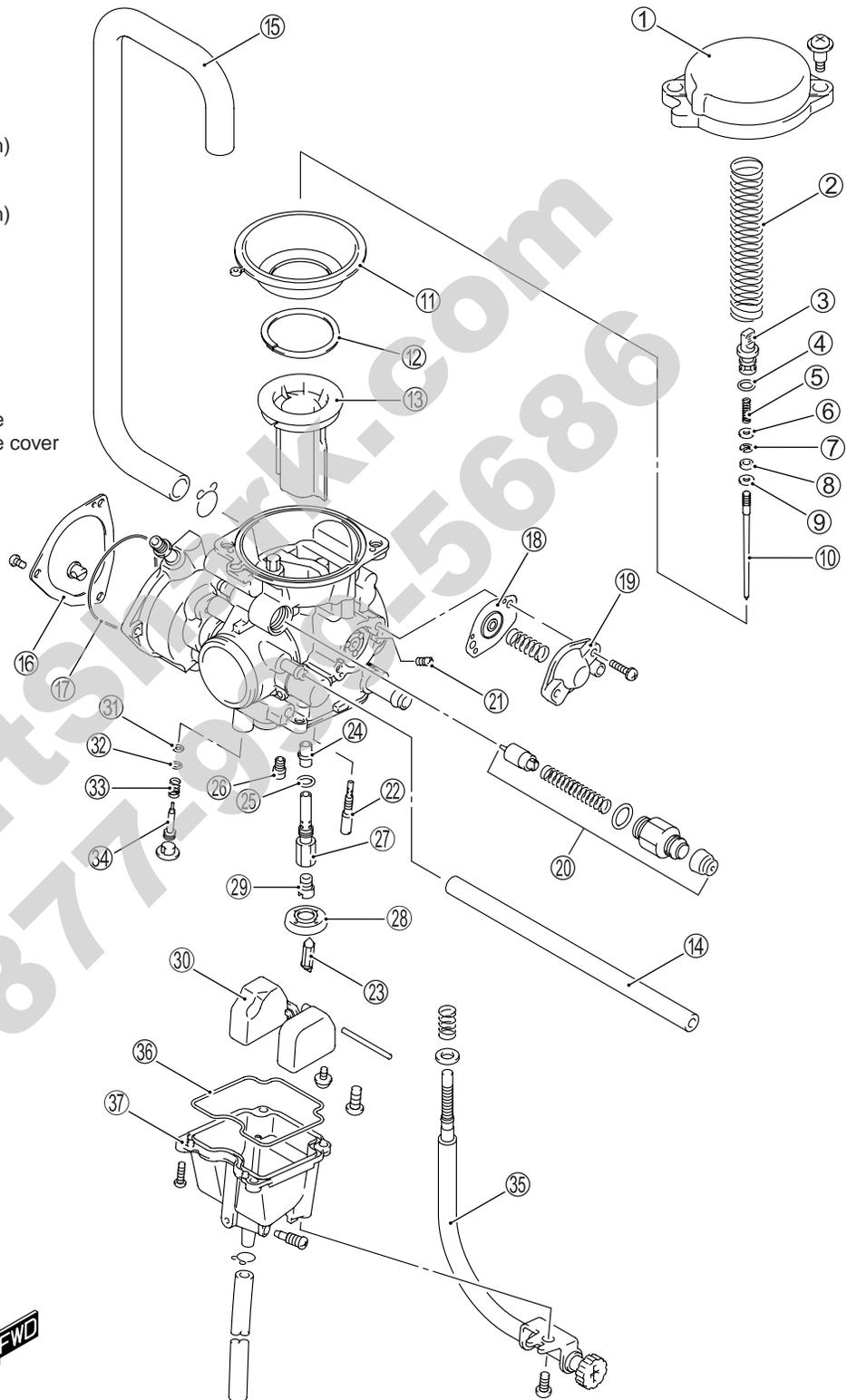
#### ⚠ WARNING

**Replace the removed gasket ① and seal washers ② with the new ones to prevent leakage of fuel.**



# CARBURETOR CONSTRUCTION

- ① Top cap
- ② Spring
- ③ Holder
- ④ O-ring
- ⑤ Spring
- ⑥ Washer (t=0.5 mm, 0.02 in)
- ⑦ E-ring
- ⑧ Spacer
- ⑨ Washer (t=1.0 mm, 0.04 in)
- ⑩ Jet needle
- ⑪ Diaphragm
- ⑫ Ring
- ⑬ Piston valve
- ⑭ Vacuum hose
- ⑮ Air vent hose
- ⑯ Side cover
- ⑰ O-ring
- ⑱ Coasting enrichment valve
- ⑲ Coasting enrichment valve cover
- ⑳ Starter plunger
- ㉑ Pilot air jet
- ㉒ Pilot jet
- ㉓ Needle valve
- ㉔ Needle jet
- ㉕ O-ring
- ㉖ Starter jet
- ㉗ Needle jet holder
- ㉘ Main jet ring
- ㉙ Main jet
- ㉚ Float
- ㉛ O-ring
- ㉜ Washer
- ㉝ Spring
- ㉞ Pilot screw
- ㉟ Throttle stop screw
- ㊱ O-ring
- ㊲ Float chamber



## SPECIFICATIONS

ITEM	SPECIFICATION	
	E-19, 28	E-33
Carburetor type	MIKUNI BSR29	←
Bore size	29.0 mm (1.14 in)	←
I.D. No.	21G0	21G1
Idle r/min	1 500 – 100 r/min	←
Float height	13.0 – 1.0 mm (0.51 – 0.04 in)	←
Main jet (M.J.)	#125	# <i>125</i>
Jet needle (J.N.)	5DH54-2nd	←
Needle jet (N.J.)	P-0M	# <i>P-0M</i>
Pilot jet (P.J.)	#20	# <i>20</i>
Pilot screw (P.S.)	1-1/2 turns back	PRE-SET
Throttle cable play	3 5 mm (0.12 0.20 in)	←
Starter (enricher) plunger cable play	0.5 1.0 mm (0.02 0.04 in)	←

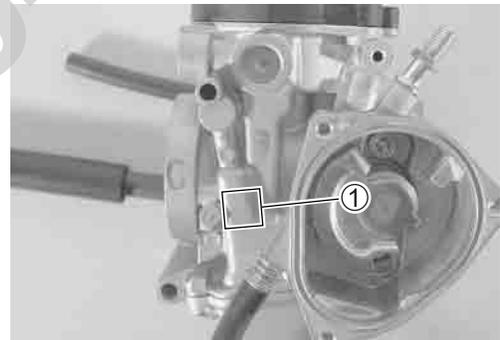
E-19: EU

E-28: Canada

E-33: USA (California)

### I.D. NO. LOCATION

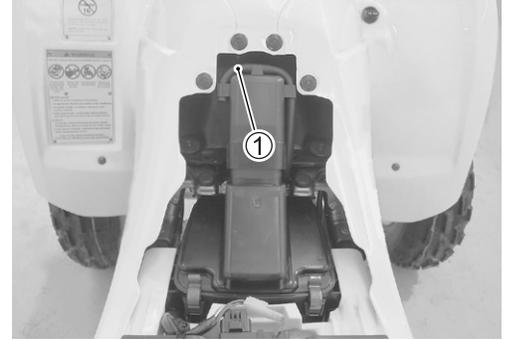
Carburetor has an I.D. number ① printed on its body.



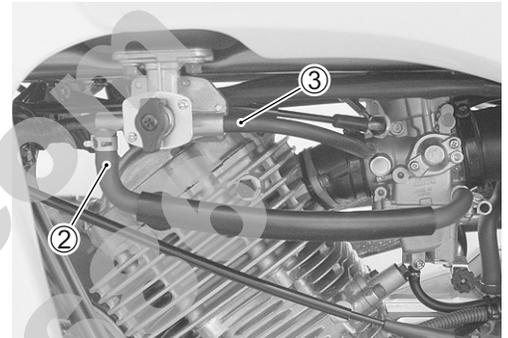
## REMOVAL

Remove the seat. (☞ 7-5)

Disconnect the air vent hose ①.



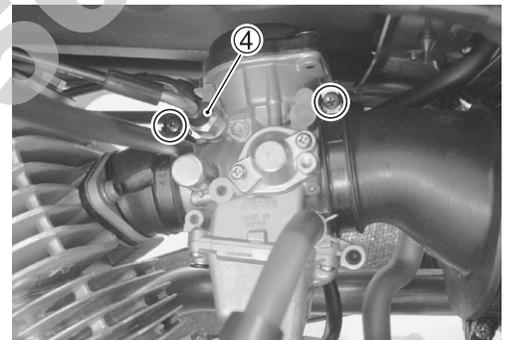
Disconnect the fuel hose ② and vacuum hose ③.



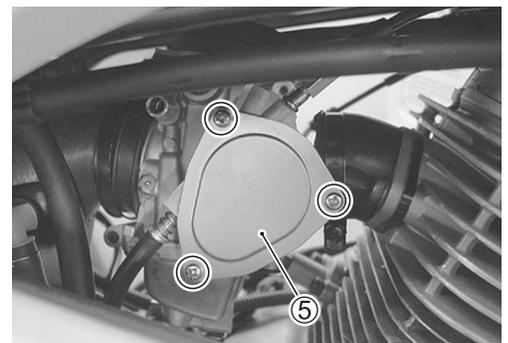
Disconnect the starter cable ④.

Loosen the carburetor clamp screws.

Pull out the carburetor from between the engine and air cleaner.



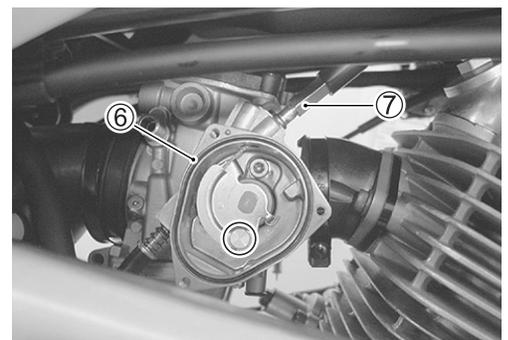
Remove the carburetor side cover ⑤.



Remove the O-ring ⑥.

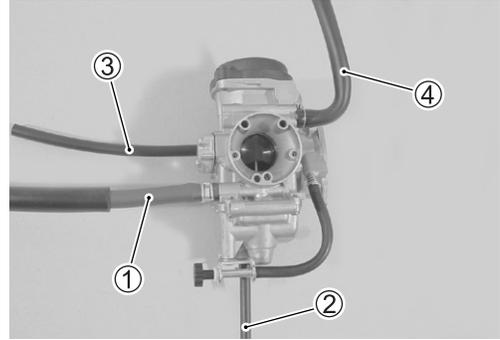
Disconnect the throttle cable ⑦.

Remove the carburetor.

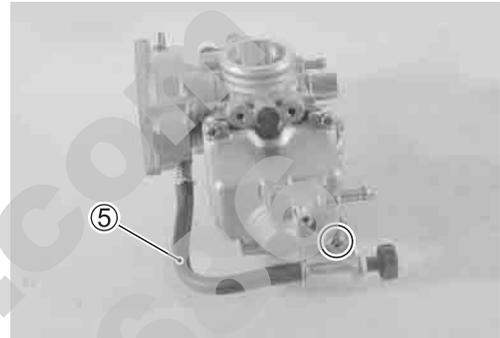


## DISASSEMBLY

Remove the fuel hose ①, overflow hose ②, vacuum hose ③ and air vent hose ④.



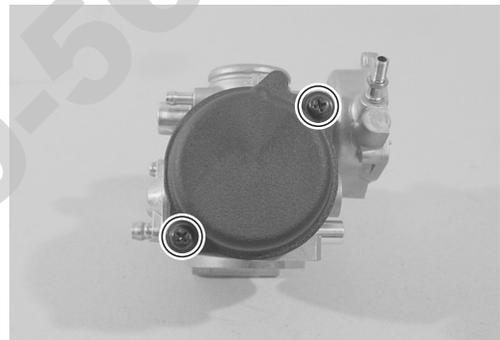
Remove the throttle stop screw ⑤.



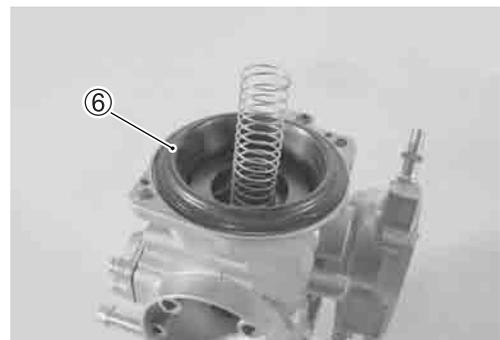
Remove the carburetor top cap.

### CAUTION

**Do not use compressed air on the carburetor body before removing the diaphragm; this may damage the diaphragm.**



Remove the spring and diaphragm assembly ⑥.

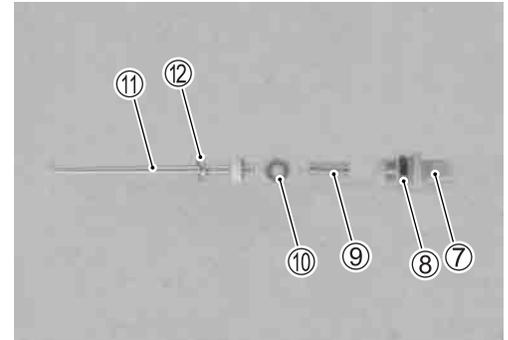


Remove the jet needle holder.



Remove the following parts.

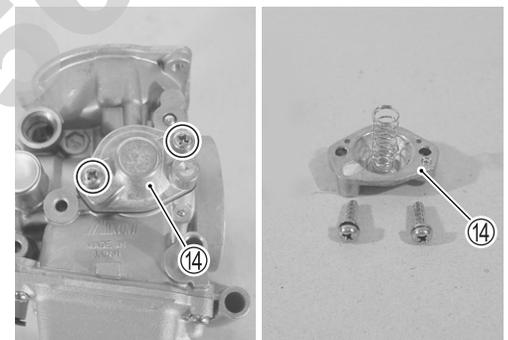
- ⑦ Jet needle holder
- ⑧ O-ring
- ⑨ Spring
- ⑩ Washer (t=0.5 mm, 0.02 in)
- ⑪ Jet needle
- ⑫ Washer (t=1.0 mm, 0.04 in)



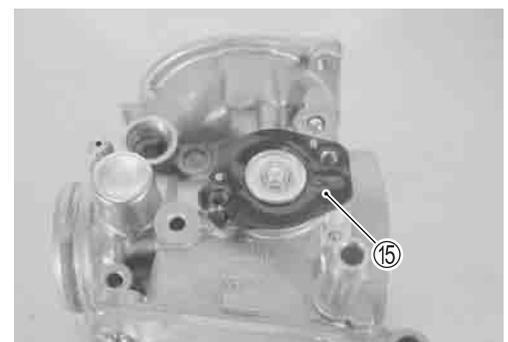
Remove the diaphragm by removing the ring ⑬.



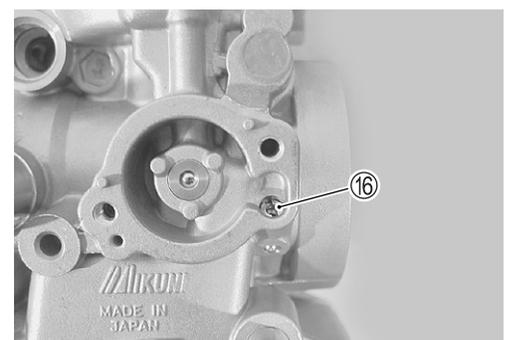
Remove the coasting enrichment valve cover ⑭ and spring.



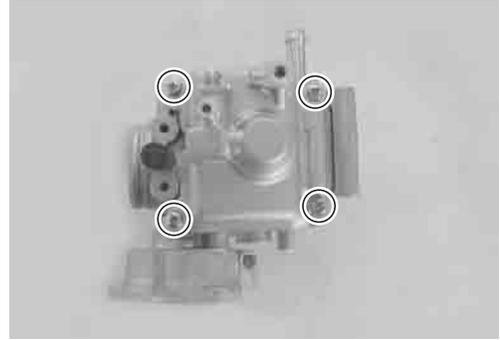
Remove the coasting enrichment valve ⑮.



Remove the pilot air jet ⑯.



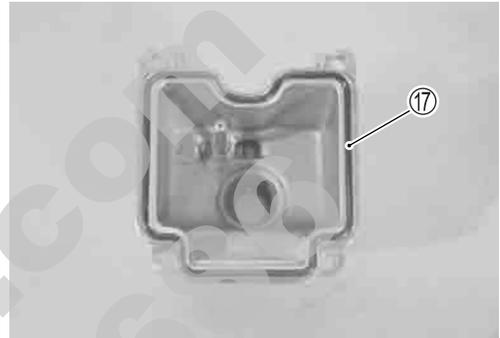
Remove the float chamber.



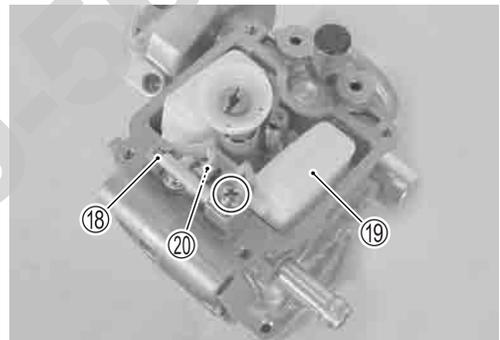
Remove the O-ring ⑰.

**CAUTION**

Replace the removed O-ring with a new one to prevent leakage of fuel.



Remove the float pin ⑱, float ⑲ and needle valve ⑳.



Remove the valve seat ㉑.



Remove the following parts.

- ② Main jet, main jet ring, needle jet holder and needle jet
- ③ Pilot screw
- ④ Starter jet
- ⑤ Pilot jet

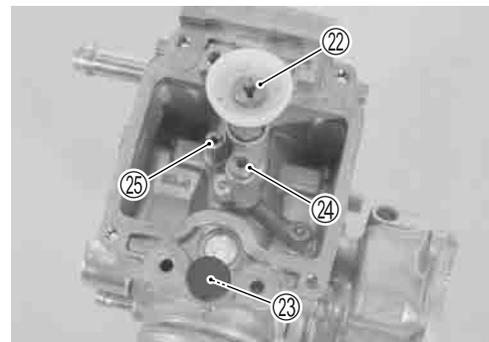
**NOTE:**

Before removing the pilot screw ③, its setting must be determined. Slowly turn the pilot screw clockwise and count the number of turns until it is lightly seated. Make a note of how many turns were made.

When reassembling the pilot screw, you will want to set it to its original position.

**CAUTION**

Do not use wire to clean the passageways, valve seat and jets. Use compressed air only.



**PILOT SCREW REMOVAL (FOR E-33)**

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

Use a 1/8" size drill bit with a drill-stop to remove the pilot screw plug. Set the drill-stop 4 mm (0.16 in) from the end of the bit to prevent drilling into the pilot screw. Carefully drill through the plug.

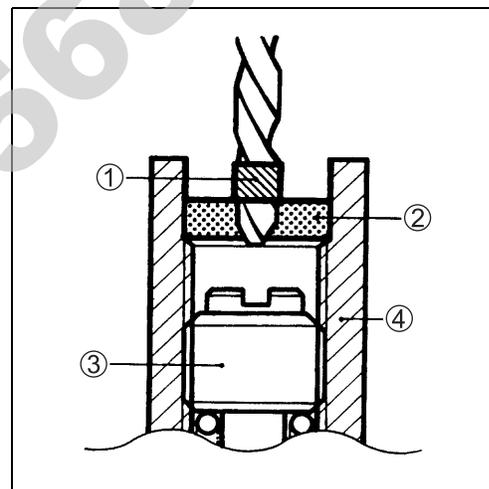
Thread a self-tapping sheet metal screw into the plug. Pull on the screw head with pliers to remove the plug. Carefully clean any metal shavings from the area.

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

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

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

Install a new plug by tapping it into place with a punch.



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

## CLEANING

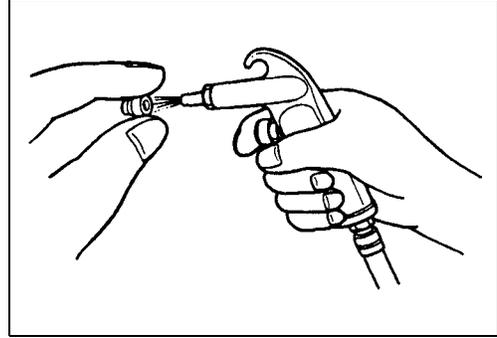
### ⚠ WARNING

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

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

Clean all circuits of the carburetor thoroughly not just the perceived problem area. Clean the circuits in the carburetor body with a spray-type cleaner. If necessary, soak each circuit in a dip-type cleaning solution to loosen dirt and varnish.

Dry the carburetor body using compressed air.



### CAUTION

Do not use a wire to clean the jets or passageways. If wire is used, the jets and passageways may become damaged. If the components cannot be cleaned with a spray-type cleaner it may be necessary to soak the components in a dip-type cleaning solution. Always follow the chemical manufacturer's instructions for proper use and cleaning of the carburetor components.

After cleaning, reassemble the carburetor.

### CAUTION

Replace the removed O-rings with new ones.

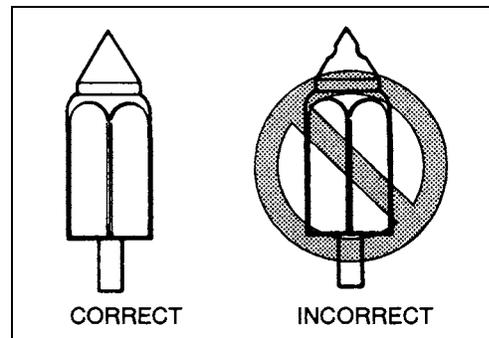
## INSPECTION

Check the following items for any damage or clogging. If any damages are found, replace the damaged parts with new ones.

- |                     |                                  |
|---------------------|----------------------------------|
| * Pilot jet         | * Piston valve                   |
| * Main jet          | * Starter jet                    |
| * Pilot screw       | * O-rings                        |
| * Pilot air jet     | * Throttle valve                 |
| * Needle jet holder | * Diaphragms                     |
| * Float             | * Pilot outlet and by-pass ports |
| * Needle valve      | * Vacuum hose                    |
| * Valve seat        | * Air vent hose                  |
| * Jet needle        | * Overflow hose                  |
| * Needle jet        | * Fuel hose                      |

### 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, replace and the valve seat with a new one. Clean the fuel passage of the mixing chamber using compressed air.



### FLOAT HEIGHT ADJUSTMENT

To check the float height, turn the carburetor upside down. Measure the float height  $\text{\textcircled{A}}$  while the float arm is just contacting the needle valve using vernier calipers. Bend the tongue as necessary to bring the float height  $\text{\textcircled{A}}$  to the specified level.

**DATA** Float height  $\text{\textcircled{A}}$ : 13.0 – 1.0 mm (0.51 – 0.04 in)

**TOOL** 09900-20101: Vernier calipers



### REASSEMBLY

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

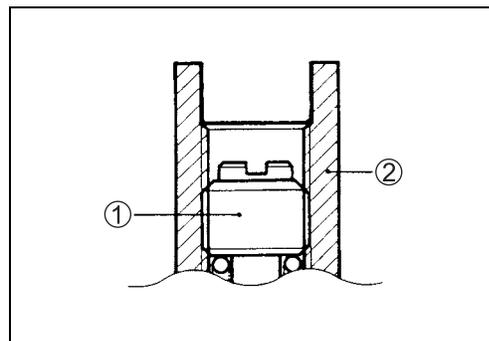
#### PILOT SCREW

After cleaning, install the pilot screw ① 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.

- ① Pilot screw
- ② Carburetor body

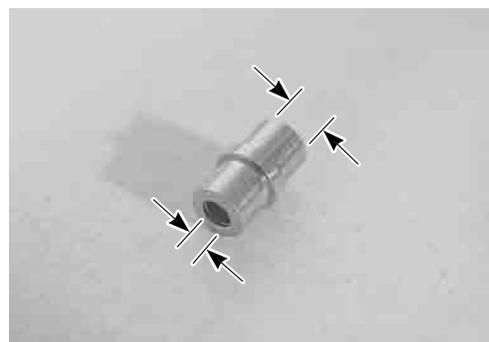
#### CAUTION

Replace the removed O-ring with a new one.



#### NEEDLE JET

Install the needle jet with its smaller internal diameter portion facing to the needle jet holder.

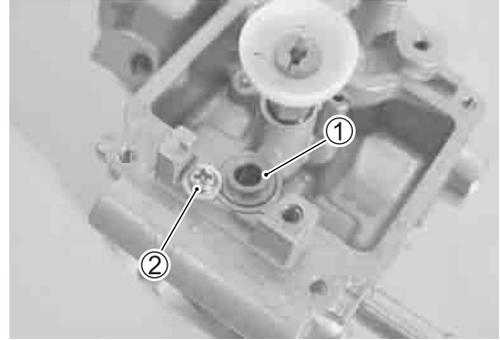


**VALVE SEAT**

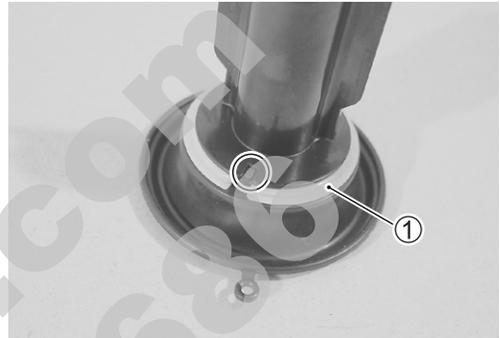
Install the valve seat ① into the carburetor body, and then tighten the screw ②.

**NOTE:**

Make sure that the collar of the screw ② holds the step of the valve seat ① securely.

**DIAPHRAGM**

Install the diaphragm to the piston valve with the lug on the diaphragm aligned with the cutout on the piston valve.  
Install the ring ① to the piston valve.



Install the diaphragm assembly.

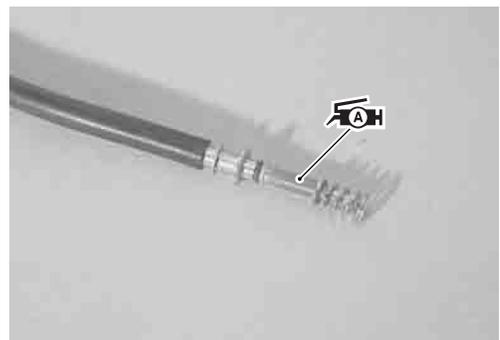
**NOTE:**

When installing the diaphragm, make sure the tab of the diaphragm is aligned with the concave section of the carburetor body's rim.

**THROTTLE STOP SCREW**

Apply SUZUKI SUPER GREASE to thread part of the throttle stop screw, then install the throttle stop screw to the carburetor.

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



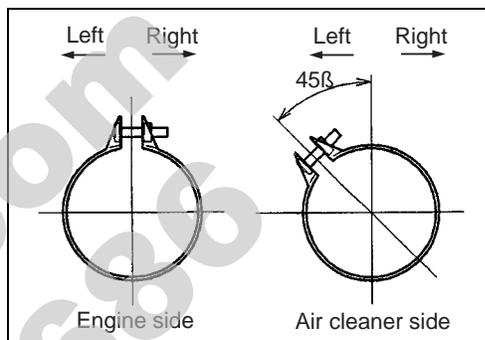
## REMOUNTING

Remount the carburetor assembly in the reverse order of removal. Pay attention to the following points:

Fit the lug on the carburetor with the intake pipe's projection.



Position the carburetor clamps as shown in the illustration. Connect the carburetor hoses properly. (➔9-16)



After the carburetor assembly has been remounted onto the engine, perform the following adjustments:

- \* Throttle cable play ..... ➔ 2-9
- \* Engine idle speed ..... ➔ 2-9

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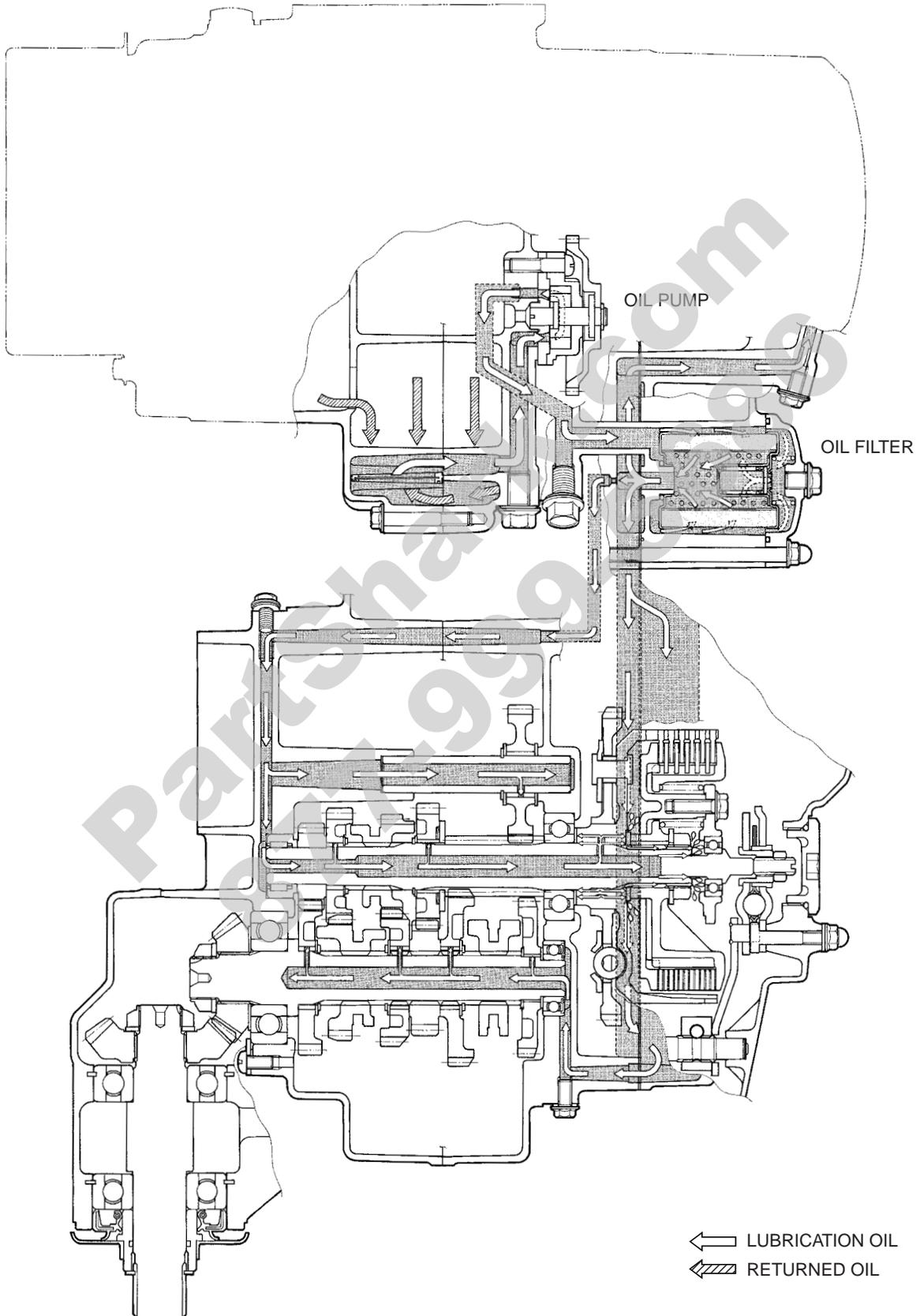
# LUBRICATION SYSTEM

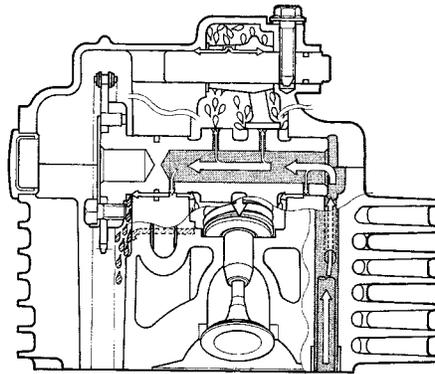
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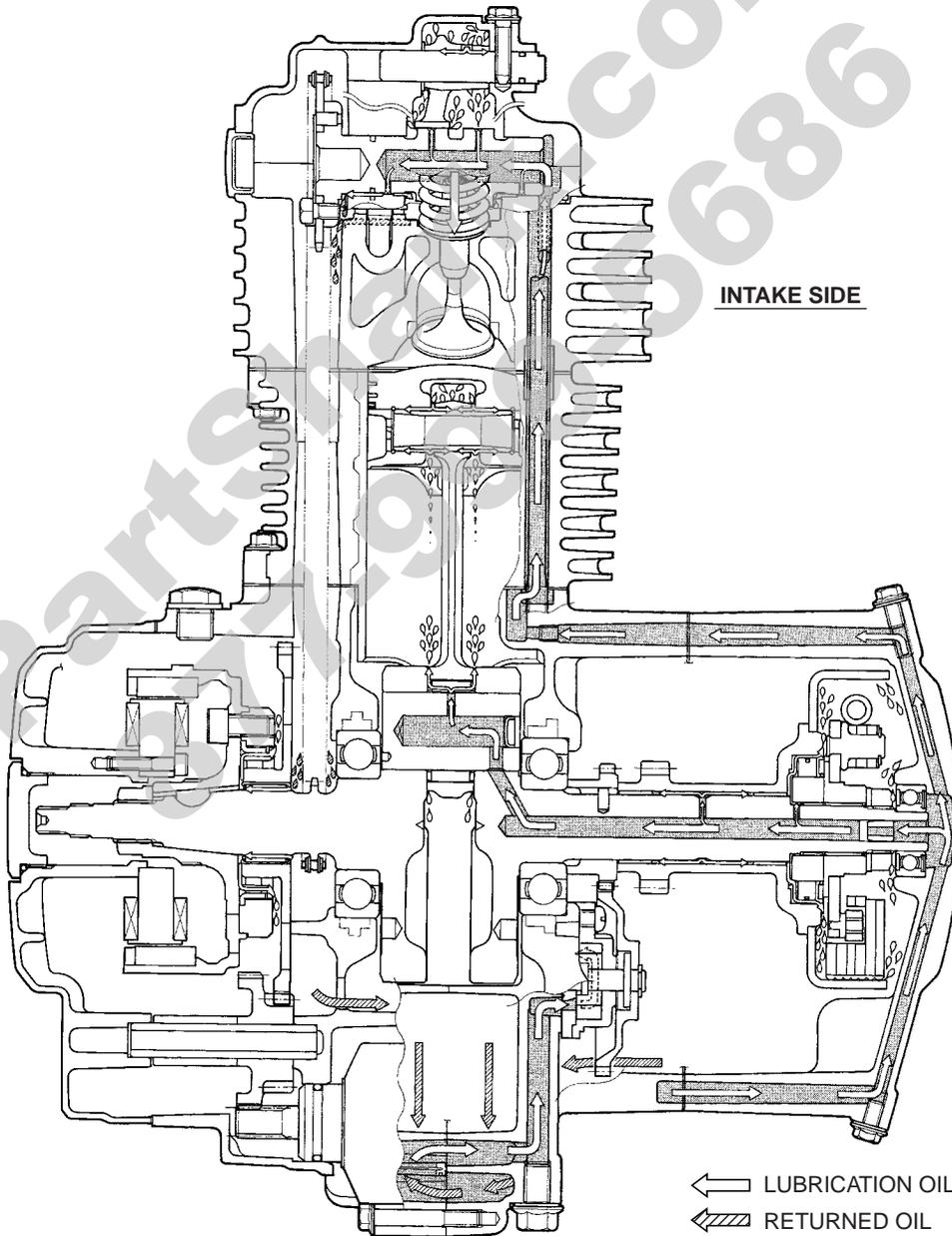
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# LUBRICATION SYSTEM ENGINE LUBRICATION CIRCUIT





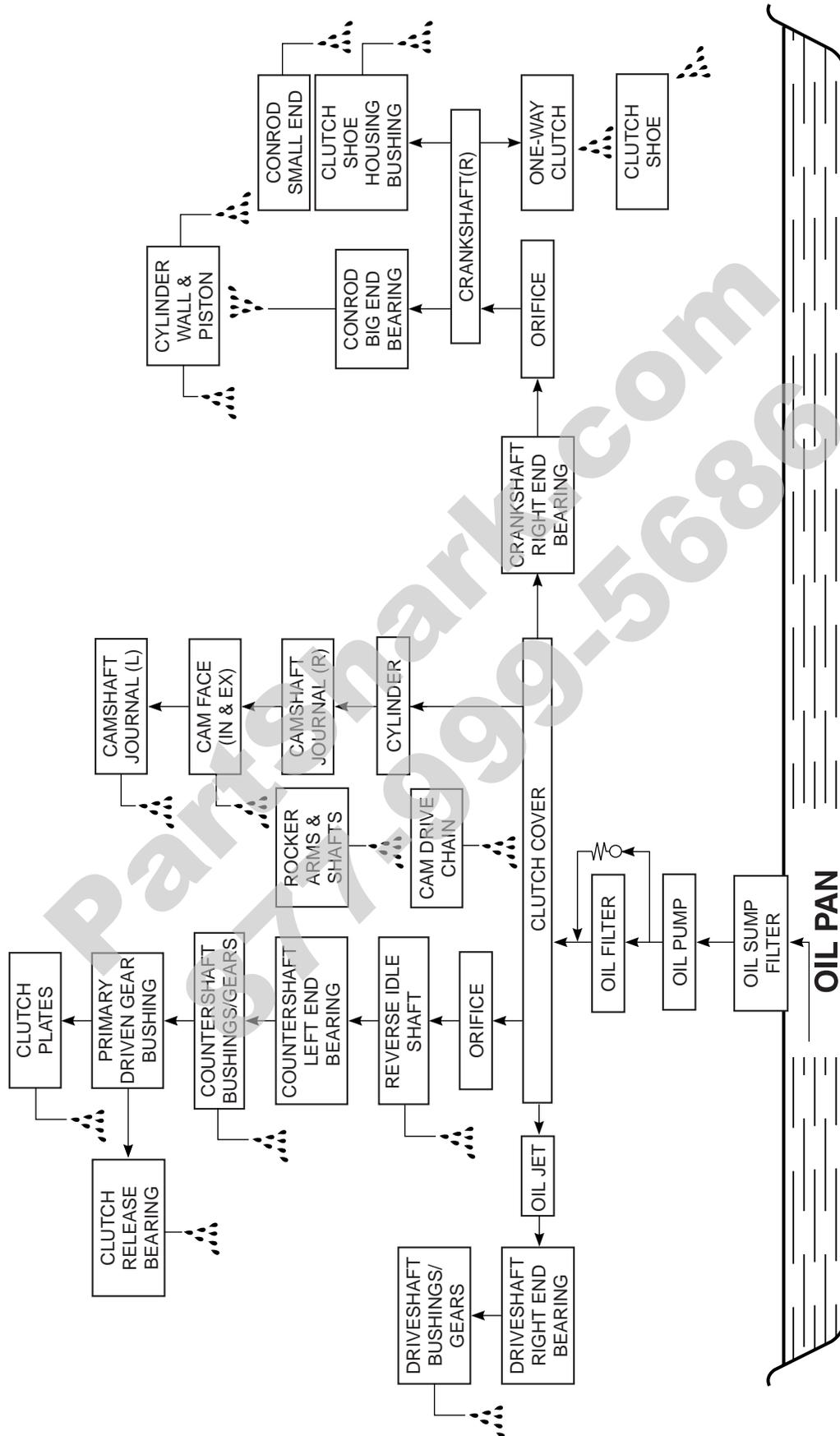
EXHAUST SIDE



INTAKE SIDE

← LUBRICATION OIL  
← RETURNED OIL

# ENGINE LUBRICATION FLOW CHART



## **OIL PRESSURE**

(☞ 2-25)

## **OIL FILTER**

(☞ 2-10)

## **OIL STRAINER**

(☞ 3-20, -61 and -62)

## **OIL PUMP**

(☞ 3-18 and -64)

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# CHASSIS

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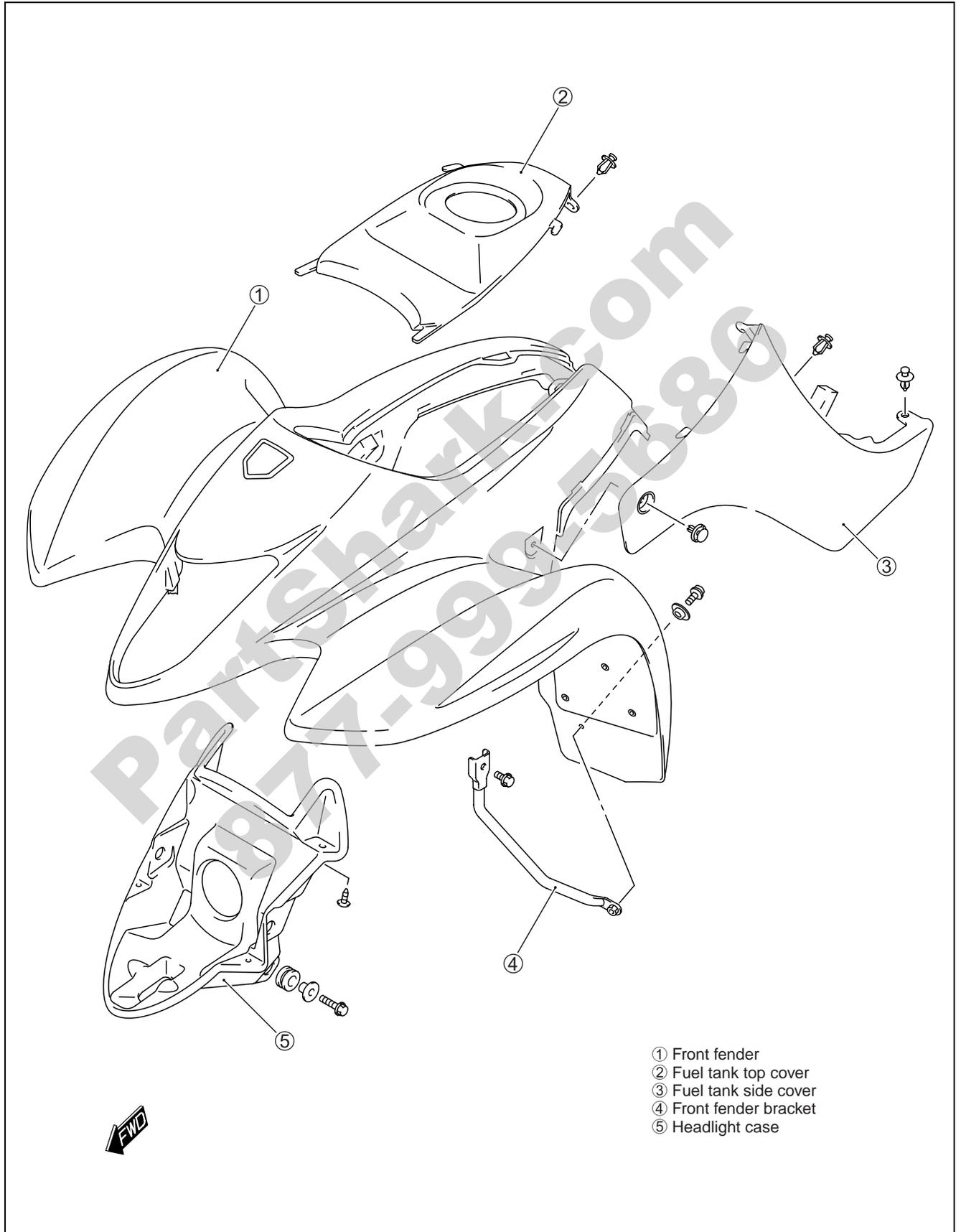
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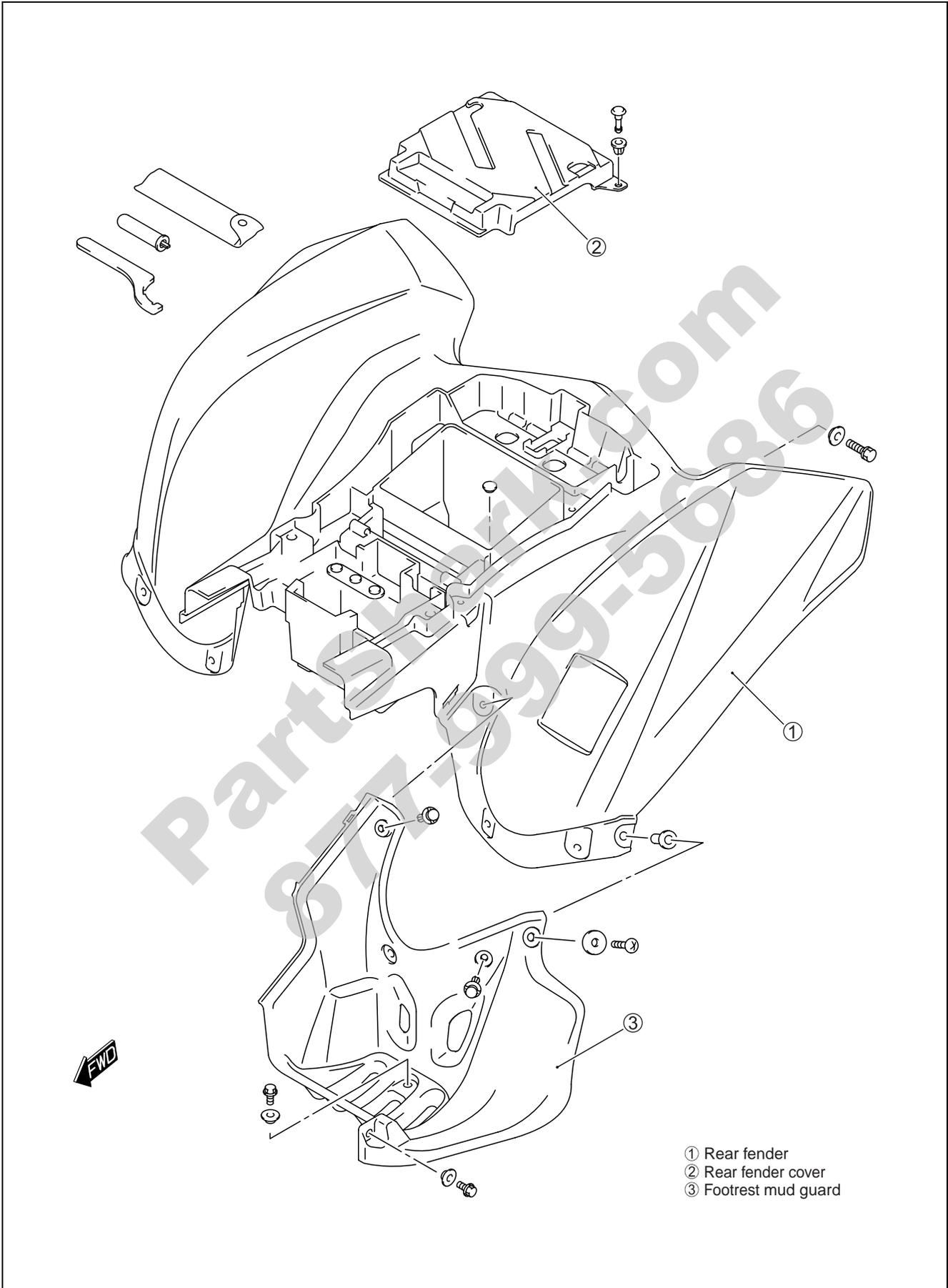
# CHASSIS

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## EXTERIOR PARTS CONSTRUCTION





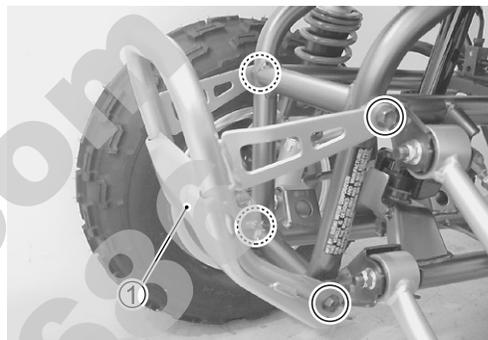
- ① Rear fender
- ② Rear fender cover
- ③ Footrest mud guard

**REMOVAL****SEAT**

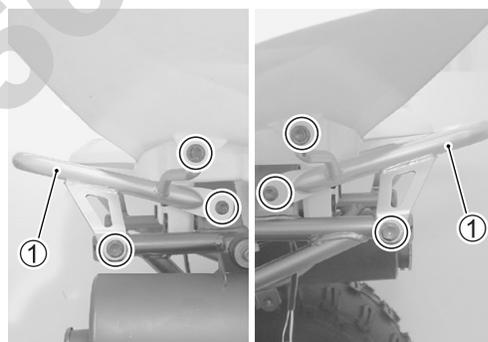
Remove the seat by pulling the lever.

**FRONT GRIP BAR**

Remove the front grip bar ①.

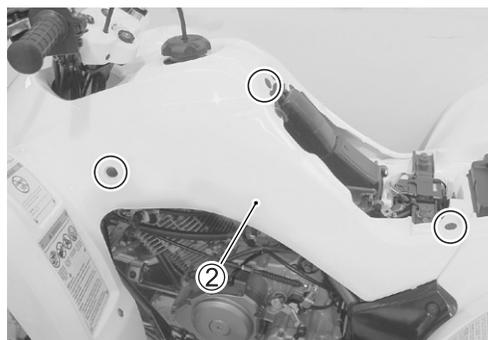
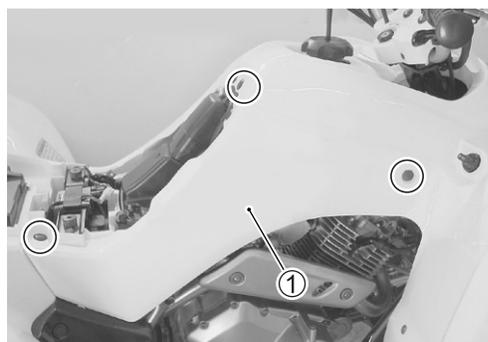
**REAR GRIP BAR**

Remove the rear grip bar ①.

**FUEL TANK SIDE COVER**

Remove the seat. (➡ Above)

Remove the fuel tank side covers ① and ②.

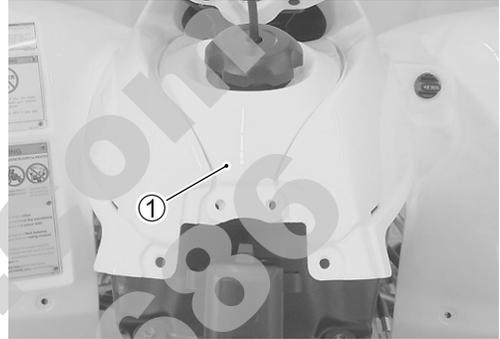


### FRONT FENDER

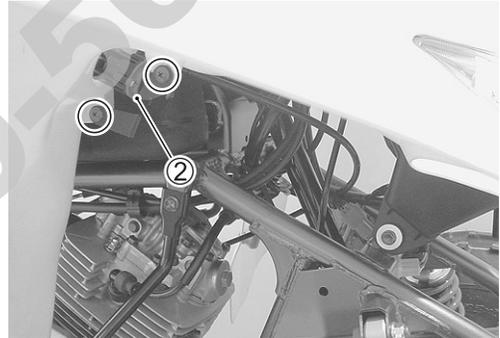
Remove the fuel tank side covers. (☞ 7-5)  
Remove the screws and fasteners.



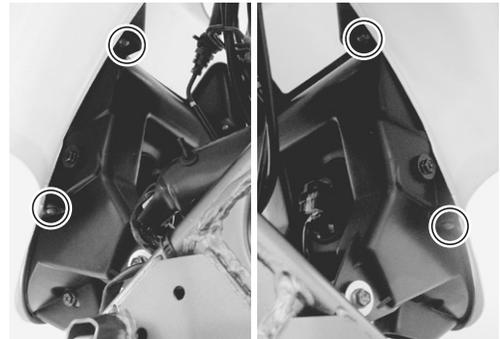
Open the fuel tank cap and remove the fuel tank top cover ①.



Remove the reverse lock release knob ②.



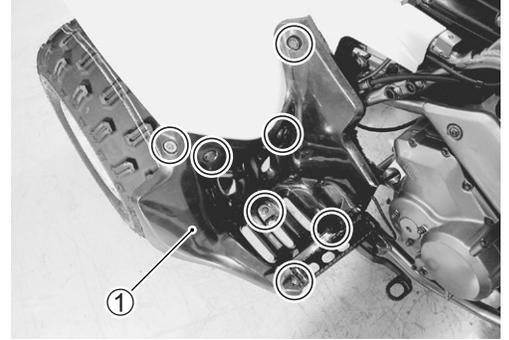
Remove the screws that connect the front fender with the head light.  
Remove the front fender.



**FOOTREST MUD GUARD**

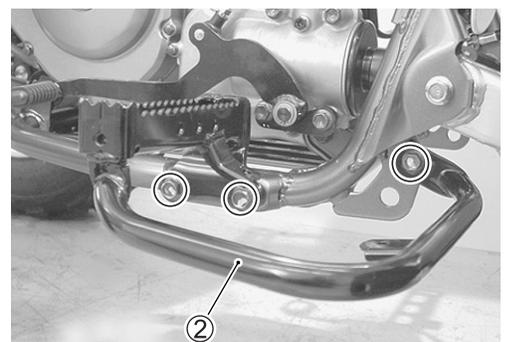
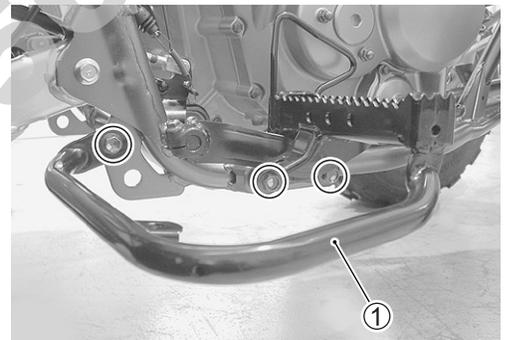
Remove the fuel tank side covers. (☞ 7-5)

Remove the footrest mud guards ① and ②.

**FOOTREST**

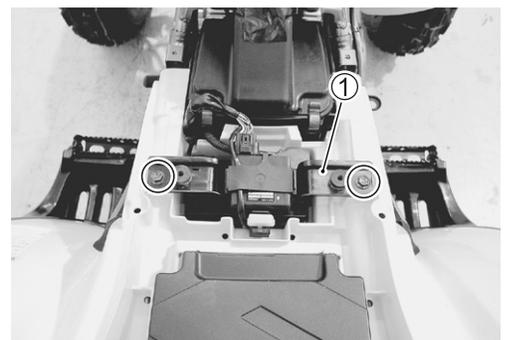
Remove the footrest mud guards. (☞ Above)

Remove the footrest ① and ②.

**REAR FENDER**

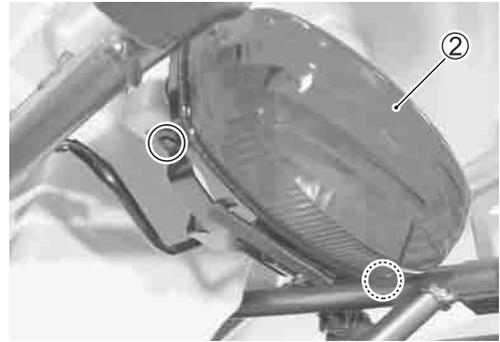
Remove the fuel tank side covers. (☞ 7-5)

Remove the battery holder ① and battery.

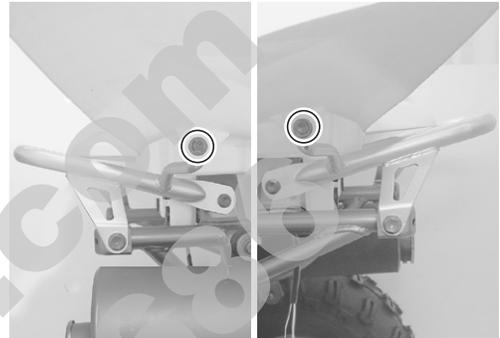


Remove the screws.

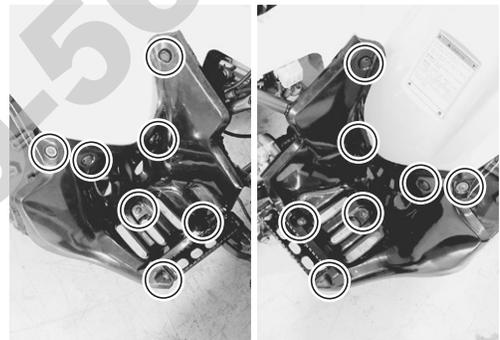
Pull out the taillight assembly ② with the bracket.



Remove the rear fender mounting bolts.



Remove the footrest mud guards.  
Remove the rear fender.



## REMountING

Remount the exterior parts in the reverse order of removal. Pay attention to the following points:

### FRONT GRIP BAR

Tighten the front grip bar mounting bolts to the specified torque.

 **Front grip bar mounting bolt:**

**26 N•m (2.6 kgf-m, 19.0 lb-ft)**



### REAR GRIP BAR

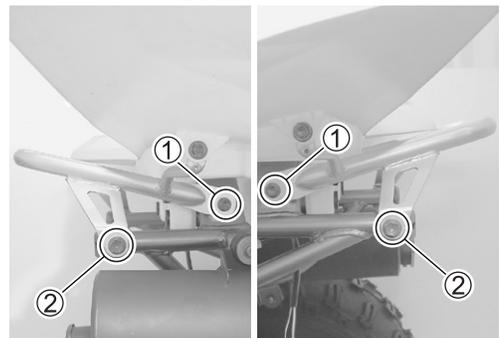
Tighten the rear grip bar mounting bolts to the specified torque of each.

 **Rear grip bar mounting bolt ①:**

**28 N•m (2.8 kgf-m, 20.5 lb-ft)**

**②:**

**55 N•m (5.5 kgf-m, 40.0 lb-ft)**



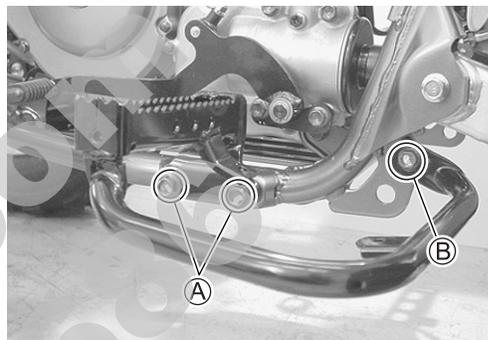
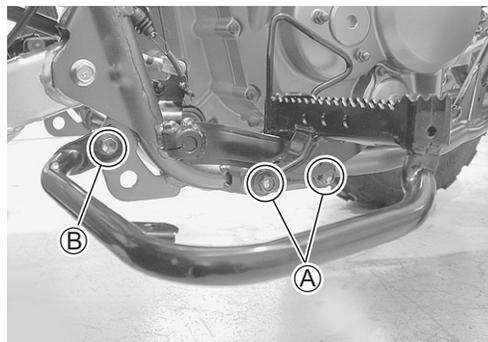
**FOOTREST**

Apply **THREAD LOCK** to the bolts **A** and tighten each bolt to the specified torque.

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

 **Footrest mounting bolt **A**: 55 N•m (5.5 kgf-m, 40.0 lb-ft)**

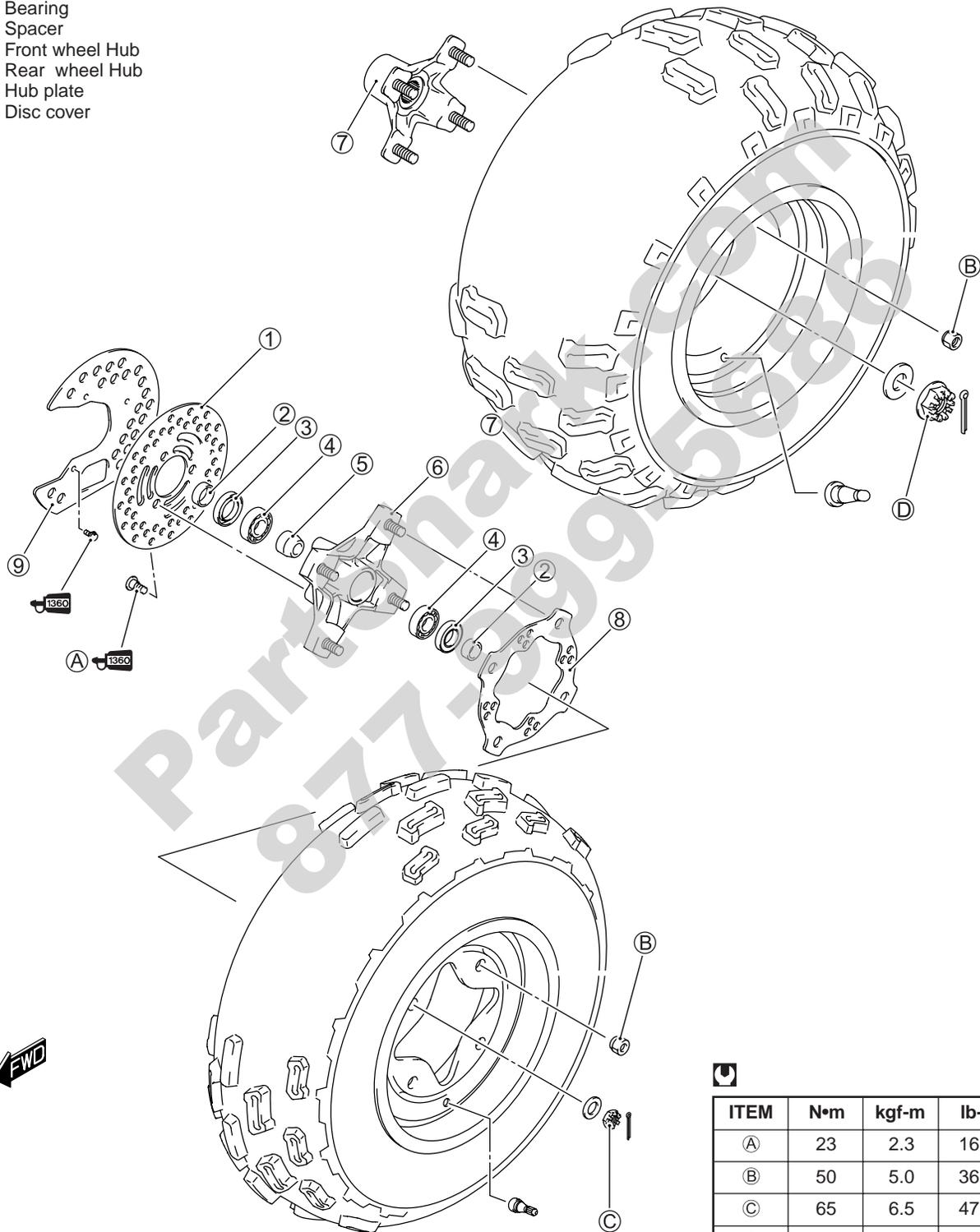
**Footrest mounting bolt **B**: 26 N•m (2.6 kgf-m, 19.0 lb-ft)**



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# FRONT AND REAR WHEELS CONSTRUCTION

- ① Front brake disc
- ② Spacer
- ③ Dust seal
- ④ Bearing
- ⑤ Spacer
- ⑥ Front wheel Hub
- ⑦ Rear wheel Hub
- ⑧ Hub plate
- ⑨ Disc cover



ITEM	N•m	kgf-m	lb-ft
A	23	2.3	16.5
B	50	5.0	36.0
C	65	6.5	47.0
D	138	13.8	99.9

## REMOVAL

### FRONT AND REAR WHEELS

- Place the vehicle on the level ground.
- Support the vehicle with a jack or wooden block.
- Remove the wheel.



### FRONT WHEEL HUB

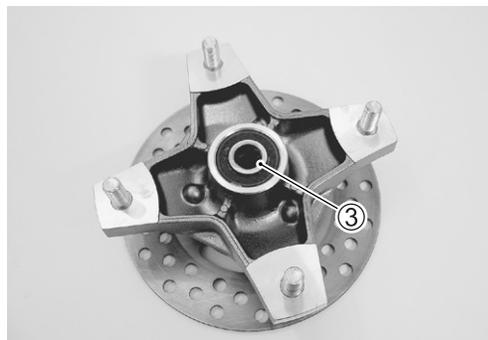
- Remove the front wheel. (☞ Above)
- Remove the front hub plate ①.
- Remove the cotter pin and loosen the wheel hub nut with applying the front brake.
- Remove the wheel hub nut and washer.
- Remove the front brake caliper. (☞ 7-20)
- Remove the front wheel hub ②.



#### CAUTION

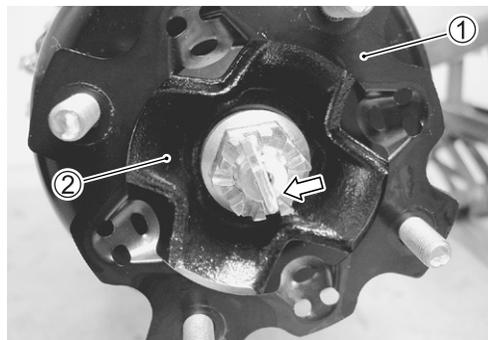
**Do not operate the front brake lever while the caliper is removed.**

- Remove the spacer ③.
- Remove the brake disc. (☞ 7-24)



### REAR WHEEL HUB

- Remove the rear wheel. (☞ 7-11)
- Remove the rear hub plate ①. (RH only)
- Remove the cotter pin and loosen the wheel hub nut with applying the rear brake.
- Remove the wheel hub nut and washer.
- Remove the wheel hub ②.

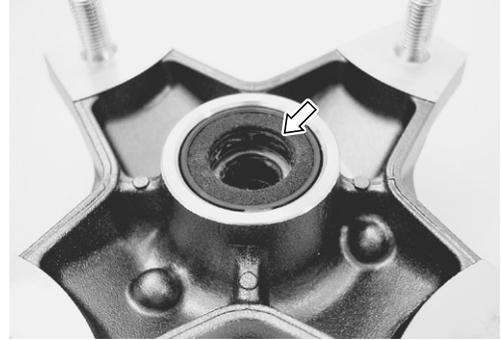


## INSPECTION AND DISASSEMBLY

### DUST SEAL

Inspect the dust seal lips for wear or damage.

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

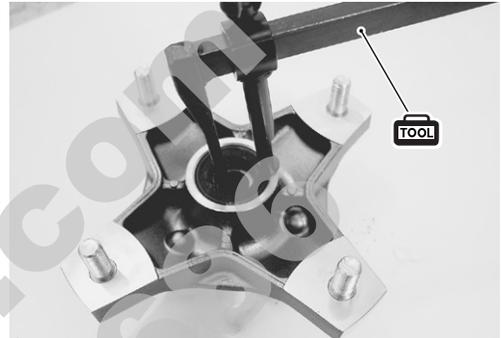


Remove the dust seals with the special tool.

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

#### CAUTION

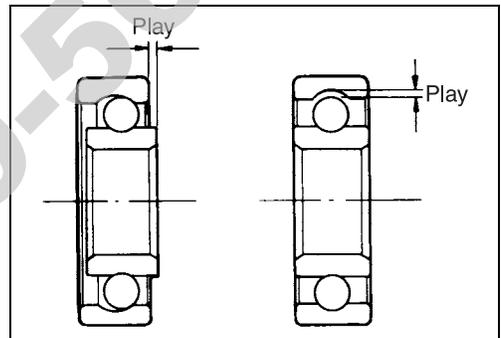
Replace the removed dust seals with new ones.



### HUB BEARINGS

Inspect the inner race play of the hub bearing by hand while it is in the wheel hub.

Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. If there is anything unusual, replace the bearing with a new one.

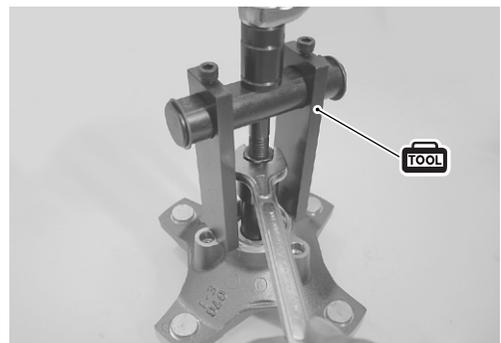


Remove the hub bearings with the special tool.

**TOOL** 09921-20240: Bearing remover set

#### CAUTION

Never reuse the removed bearings.



## REASSEMBLY AND REMOUNTING

### FRONT WHEEL HUB

Apply SUZUKI SUPER GREASE to the hub bearings and the lips of the dust seals before installing them.

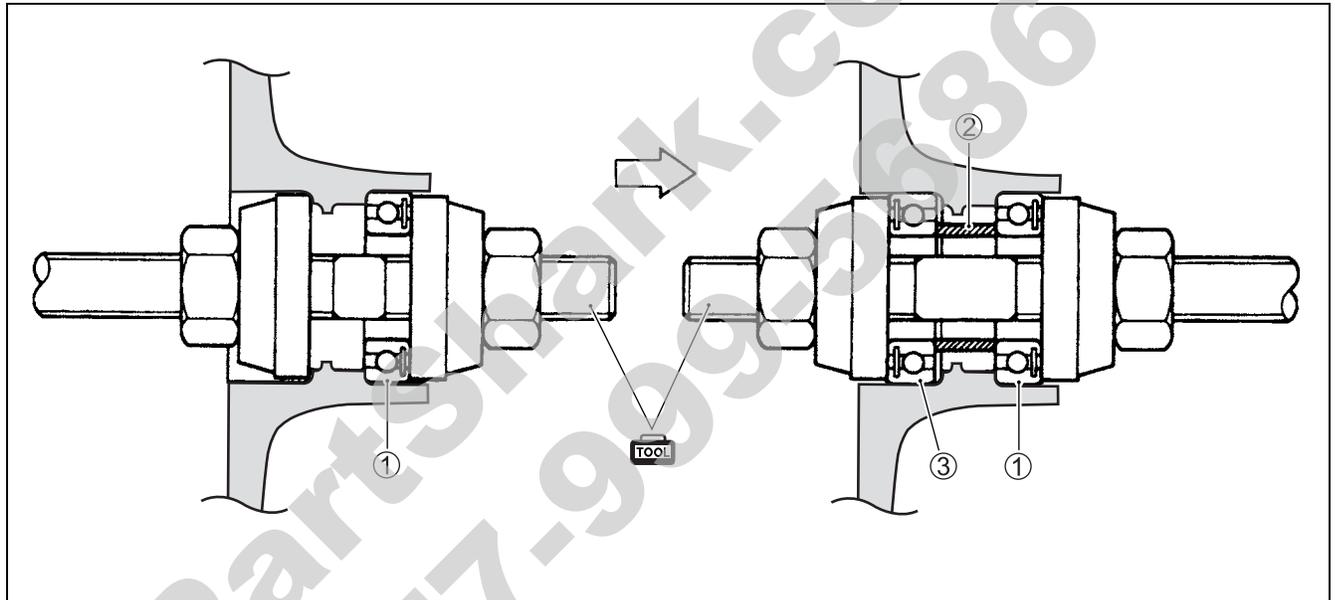
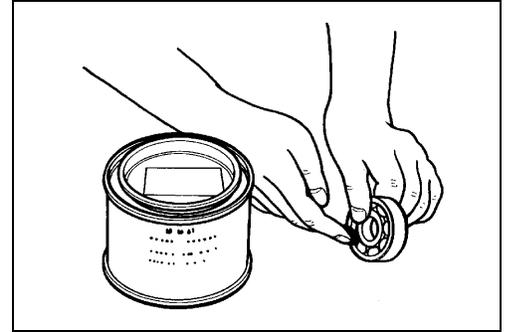
-  **99000-25030: SUZUKI SUPER GREASE A (USA)**
- 99000-25010: SUZUKI SUPER GREASE A (Others)**

Install the hub bearings and spacer into the front wheel hub.

-  **09913-70210: Bearing installer set**
- 09924-84510: Bearing installer set**

#### NOTE:

Install the inner bearing ① and the spacer ② first, and then install the outer bearing ③. Make sure the sealed side of the bearing faces the bearing installer.



Install the dust seals into the front wheel hub with stamped mark facing outside with the special tool.

-  **09913-70210: Bearing installer set**

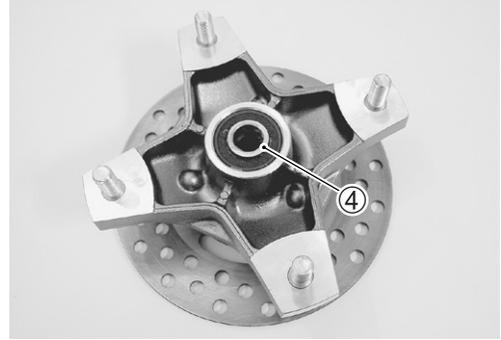
Apply SUZUKI SUPER GREASE to the dust seal lips.

-  **99000-25030: SUZUKI SUPER GREASE A (USA)**
- 99000-25010: SUZUKI SUPER GREASE A (Others)**

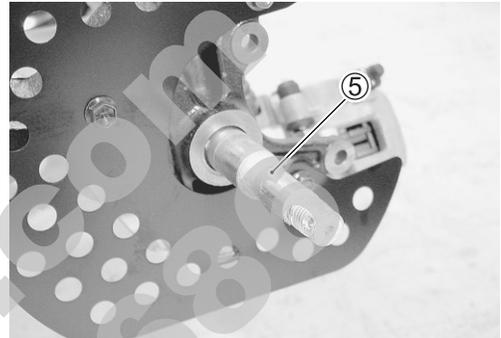
Install the brake disc. (☞ 7-25)



Install the spacer ④ to the front wheel hub.



Install the front wheel hub to the front axle ⑤.  
Install the front brake caliper. (☞ 7-24)



Tighten the front wheel hub nut to the specified torque.

**Front wheel hub nut: 65 N•m (6.5 kgf-m, 47.0 lb-ft)**

Install the cotter pin into the front axle as shown.

Install the front hub plate.

Install the front wheel. (☞ 7-15)



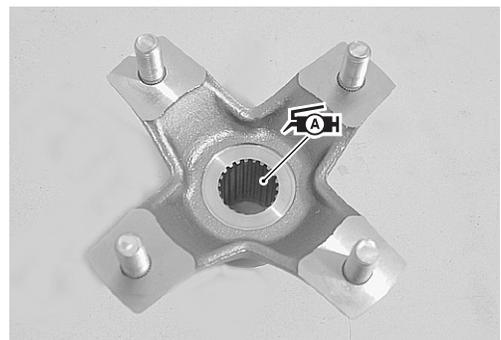
**CAUTION**

Replace the removed cotter pin with a new one.

**REAR WHEEL HUB**

Apply small amount of SUZUKI SUPER GREASE to the left rear wheel hub's spline.

**99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**



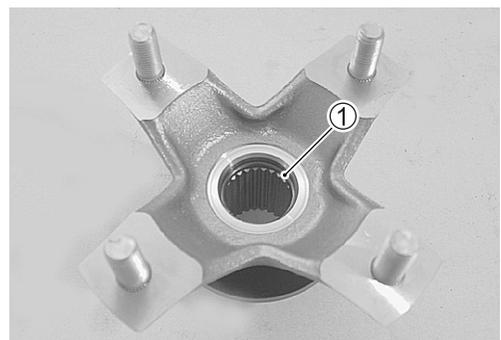
Apply detergent to the O-ring ① and install it to the right rear wheel hub.

**NOTE:**

Check the O-ring before installing. If abnormal, change the O-ring with a new one.

**CAUTION**

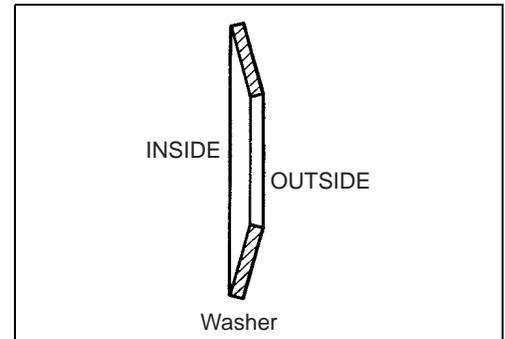
Do not apply grease to the right rear wheel hub's spline.



Install the rear wheel hub and washer.

**NOTE:**

*The convex side of the washer faces outside.*



Tighten the rear wheel hub nut to the specified torque.

**🔧 Rear wheel hub nut: 138 N•m (13.8 kgf-m, 99.9 lb-ft)**

Install the cotter pin into the rear axle as shown.

Install the rear hub plate. (RH only)

Install the rear wheel. (👉 Below)

**CAUTION**

**Replace the removed cotter pin with a new one.**



**FRONT WHEEL**

Tighten the front wheel set nuts to the specified torque.

**🔧 Front wheel set nut: 50 N•m (5.0 kgf-m, 36.0 lb-ft)**

**NOTE:**

*When installing the front wheel, make sure that the arrow **A** on the tire points in the direction of rotation.*



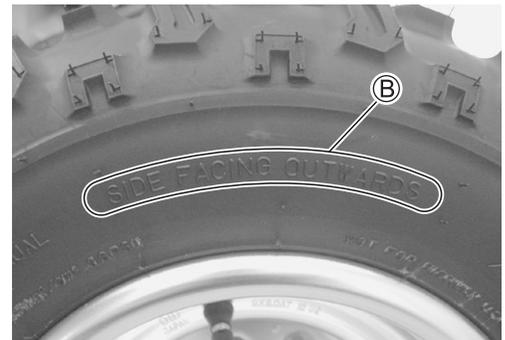
**REAR WHEEL**

Tighten the rear wheel set nuts to the specified torque.

**🔧 Rear wheel set nut: 50 N•m (5.0 kgf-m, 36.0 lb-ft)**

**NOTE:**

*When installing the rear wheel, make sure that the instruction **SIDE FACING OUTWARDS** **B** on the rear tire faces outwards.*



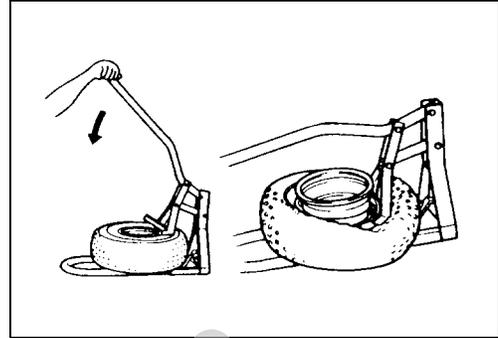
## TIRES

### TIRE REPLACEMENT

Remove the front and rear wheels. (☞ 7-11)

After removing the air valve cap, release the tire pressure by depressing the valve.

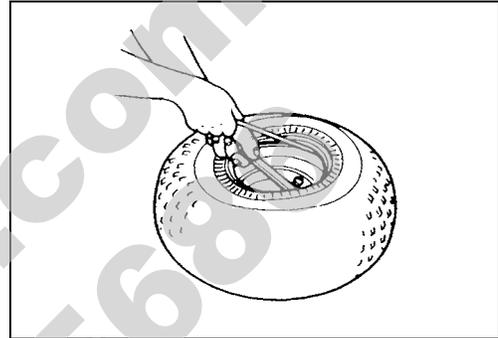
Dismount the bead from the rim completely as shown.



Separate the tire from the rim by using a set of tire levers and rim protectors.

#### CAUTION

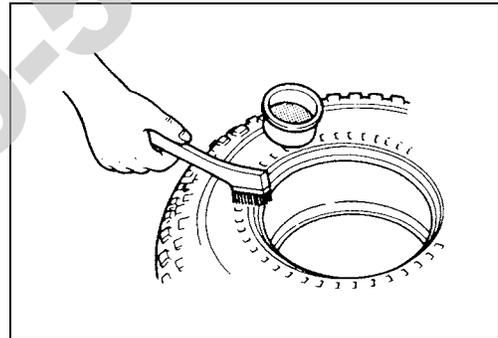
When using the tire lever, do not scratch or hit the sealing portion (hump) of the wheel or it may cause air-leakage.



Apply tire lubricant to the tire bead and the flange of the rim.

#### CAUTION

Never apply grease, oil or gasoline to the tire bead because they will deteriorate the tire.

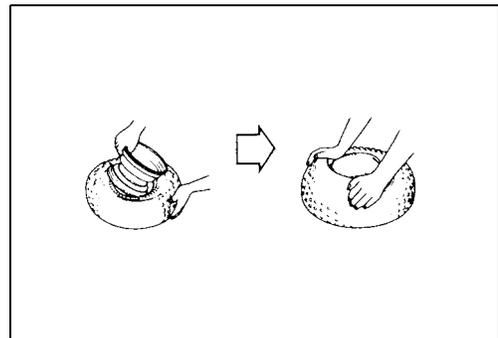


#### CAUTION

The standard tire fitted on this vehicle is AT22 × 7-10 ☆☆ for the front and AT20 × 10-9 ☆ for the rear.

The use of tires other than the standard may cause instability. It is highly recommended to use the specified tire.

Mount the tire on the rim.



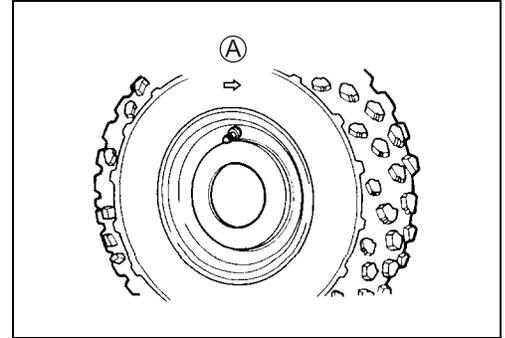
#### NOTE:

Inspect the sealing portion of the rim for contamination and distortion before installing the tire on the rim.

When installing each tire, make sure the arrow **(A)** on the tire points in the direction of rotation. Also, make sure the outer side of the wheel rim is facing outward.

**NOTE:**

For inspecting the tire refer to page 2-17.  
Inspect the valve core, before installation.

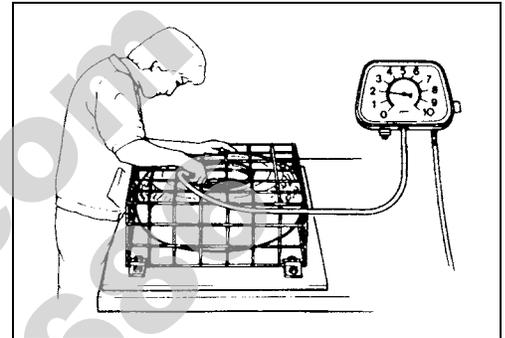


Inflate the tire to seat the tire bead.

**DATA** Maximum tire bead seat pressure  
Front and rear: 250 kPa (2.5 kgf/cm<sup>2</sup>, 36 psi)

**CAUTION**

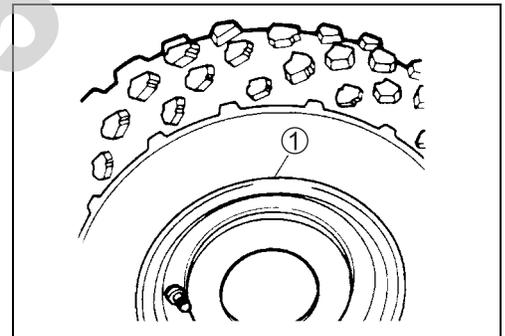
Place the tire under a protective tire cage or similar protective covering device before inflating the tire. To minimize the possibility of tire damage when seating the tire bead, never exceed the **MAXIMUM TIRE BEAD SEAT PRESSURE** rating shown on the tire.



**NOTE:**

Check the rim line **(1)** cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and the wheel rim varies this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the tire bead on both sides. Then, coat the bead with clean water, and re-seat the tire.

Adjust the tire pressure to specification. (☞ 2-18)



**CAUTION**

Before inflating the tire, check the **MAXIMUM OPERATING PRESSURE** rating of the tire. This is indicated by a ☆ following the tire size shown on the sidewall. The number of ☆ on the tire indicates the maximum operating pressure.

**DATA** Maximum operating pressure

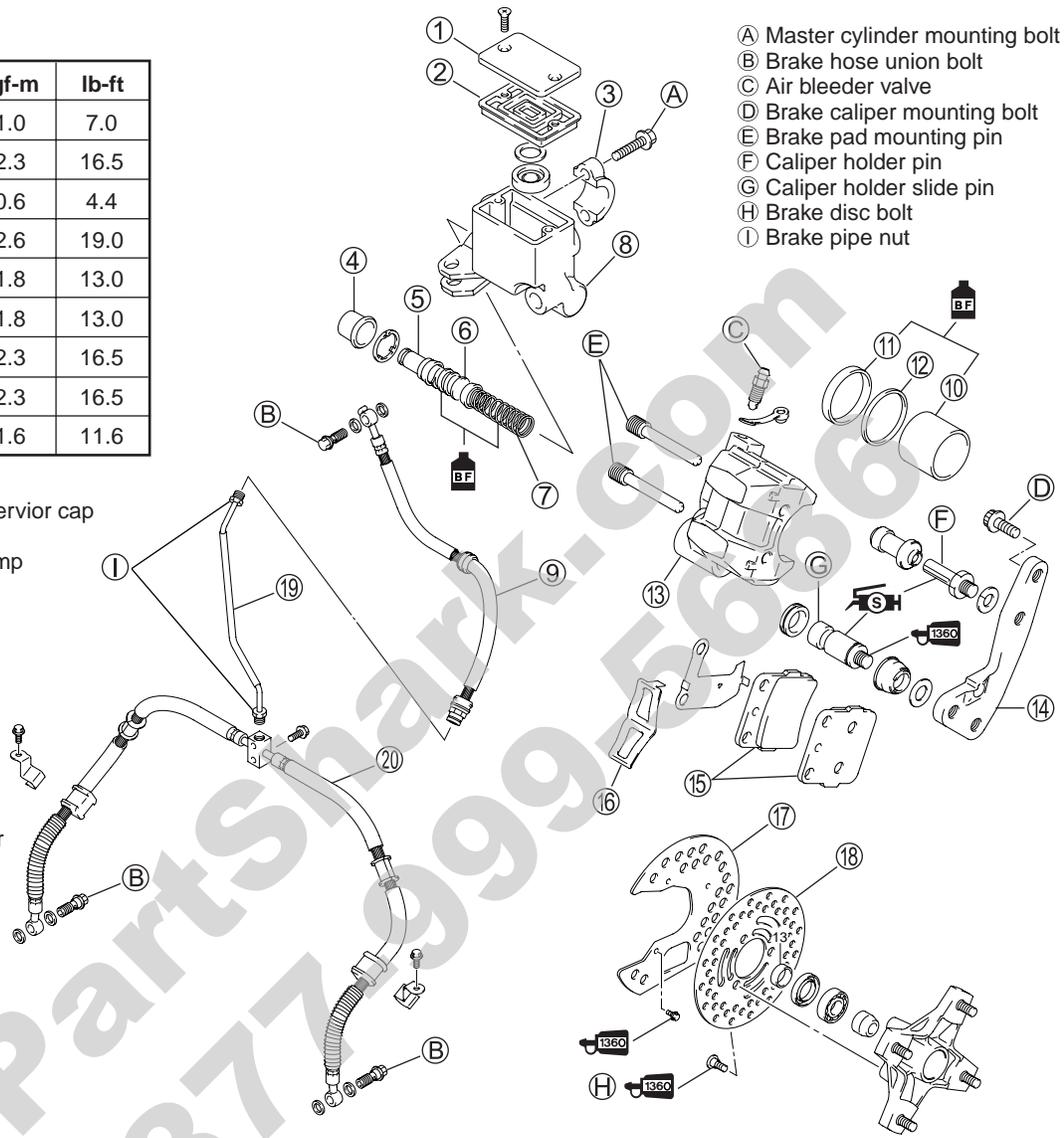
- ☆: 25 kPa (0.25 kgf/cm<sup>2</sup>, 3.6 psi)
- ☆☆: 35 kPa (0.35 kgf/cm<sup>2</sup>, 5.1 psi)
- ☆☆☆: 45 kPa (0.45 kgf/cm<sup>2</sup>, 6.5 psi)

# FRONT BRAKE CONSTRUCTION



ITEM	N•m	kgf-m	lb-ft
(A)	10	1.0	7.0
(B)	23	2.3	16.5
(C)	6	0.6	4.4
(D)	26	2.6	19.0
(E)	18	1.8	13.0
(F)	18	1.8	13.0
(G)	23	2.3	16.5
(H)	23	2.3	16.5
(I)	16	1.6	11.6

- ① Master cylinder reservoir cap
- ② Diaphragm
- ③ Master cylinder clamp
- ④ Boot
- ⑤ Piston/cup set
- ⑥ Cup
- ⑦ Spring
- ⑧ Master cylinder
- ⑨ Brake hose No. 1
- ⑩ Piston
- ⑪ Piston seal
- ⑫ Dust seal
- ⑬ Brake caliper
- ⑭ Brake caliper holder
- ⑮ Brake pad
- ⑯ Pad spring
- ⑰ Disc cover
- ⑱ Front brake disc
- ⑲ Brake pipe
- ⑳ Brake hose No. 2



- (A) Master cylinder mounting bolt
- (B) Brake hose union bolt
- (C) Air bleeder valve
- (D) Brake caliper mounting bolt
- (E) Brake pad mounting pin
- (F) Caliper holder pin
- (G) Caliper holder slide pin
- (H) Brake disc bolt
- (I) Brake pipe nut

## ⚠ WARNING

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

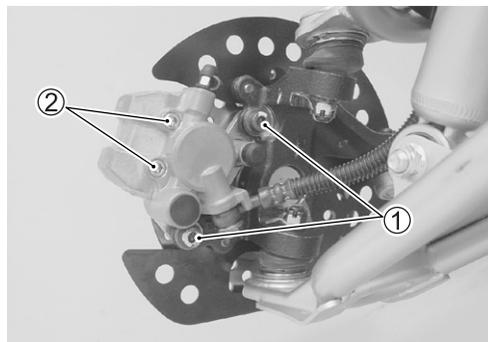
## CAUTION

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

## BRAKE PAD REPLACEMENT

Remove the front wheel. (☞ 7-11)

Remove the brake caliper mounting bolts ① and brake pad mounting pins ②.



Remove the brake pads.

### 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.

### NOTE:

The shim must be installed to the caliper piston side pad.

Tighten the brake pad mounting pins ③ and brake caliper mounting bolts ④ to the specified torque.

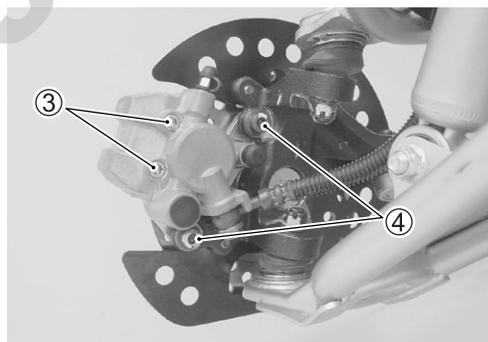
 **Brake pad mounting pin: 18 N•m (1.8 kgf-m, 13.0 lb-ft)**

**Brake caliper mounting bolt:**

**26 N•m (2.6 kgf-m, 19.0 lb-ft)**

### 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 vehicle on a level surface and keep the handlebar straight.

Remove the master cylinder reservoir cap and diaphragm.

Suck up the old brake fluid as much as possible.

Fill the reservoir with new brake fluid.

 **Specification and classification: DOT 4**



Connect a clear hose 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.

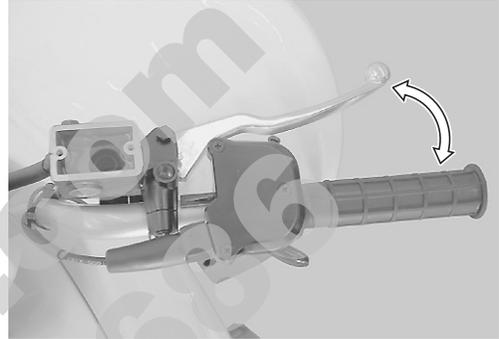
Close the air bleeder valve and disconnect the clear hose. Fill the reservoir with new brake fluid to the upper end of the inspection window.

 **Brake air bleeder valve: 6.0 N•m (0.6 kgf-m, 4.4 lb-ft)**



### CAUTION

- \* Never reuse the brake fluid left over from previous servicing and which has been stored for long periods of time.
- \* Bleed air from the brake system.  
( 2-16)



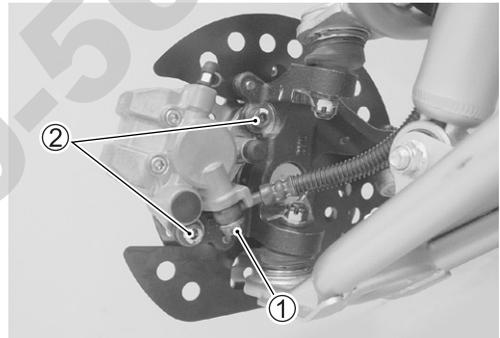
## BRAKE CALIPER REMOVAL AND DISASSEMBLY

Remove the front wheel. ( 7-11)

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.

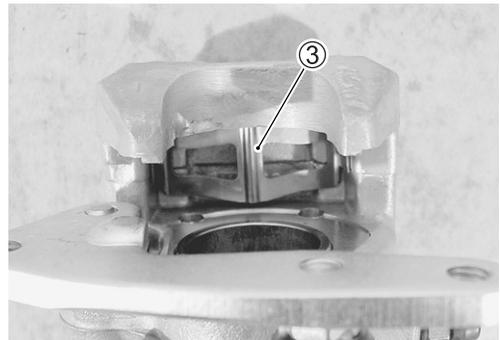
Remove the brake pads. ( 7-19)



### ⚠ WARNING

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

Remove the spring ③.



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

**CAUTION**

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



Remove the dust seal and piston seal.

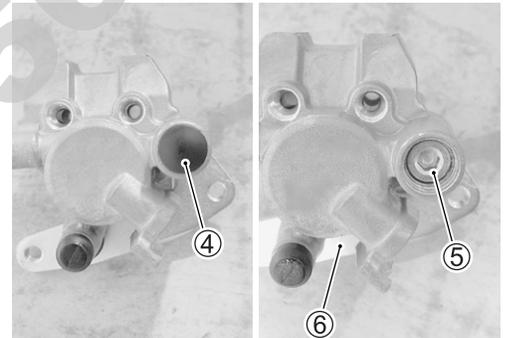
**CAUTION**

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

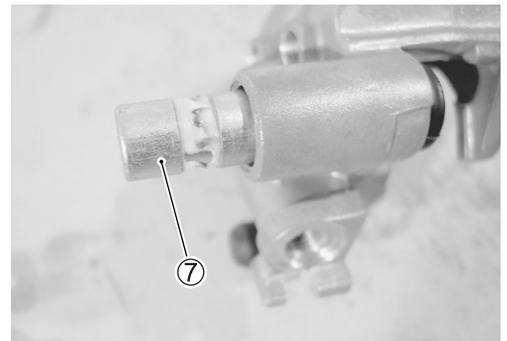


Remove the cap ④ and loosen the brake caliper holder slide pin ⑤.

Remove the brake caliper holder ⑥.



Remove the brake caliper holder slide pin ⑦.

**BRAKE CALIPER INSPECTION****BRAKE CALIPER**

Inspect the 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 PISTON**

Inspect the brake caliper piston for any scratches or other damage. If any damages are found, replace the piston with a new one.



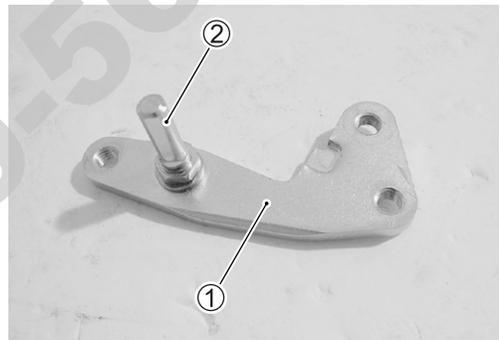
**RUBBER PARTS**

Inspect the rubber parts for damage. If any damages are found, replace them with new ones.



**CALIPER HOLDER**

Inspect the caliper holder ① and pin ② for damage. If any damages are found, replace them with new ones.



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## BRAKE CALIPER REASSEMBLY AND REMOUNTING

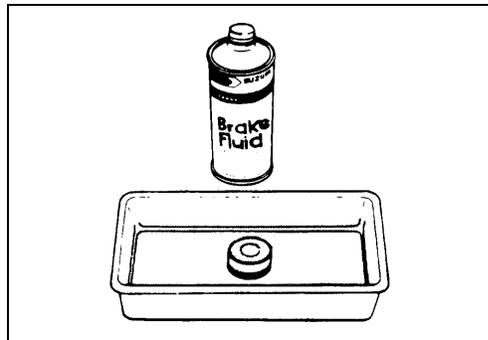
Reassemble and remount the brake caliper in the reverse order of removal and disassembly. Pay attention to the following points:

Wash the caliper bore and piston with the specified brake fluid. Thoroughly wash the dust seal grooves and piston seal grooves.

 **Specification and classification: DOT 4**

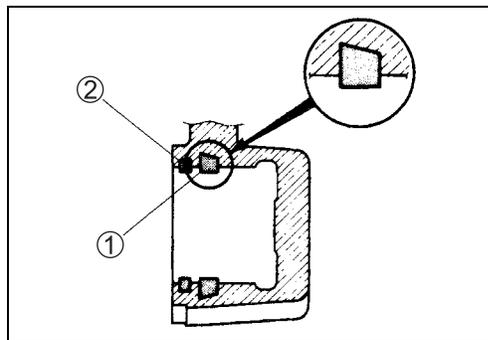
### CAUTION

- \* Wash the brake caliper components with new brake fluid before reassembly.
- \* Do not wipe the brake fluid off with a rag 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, kerosene, 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 SEAL

Install the piston seal ① and dust seal ② as shown.



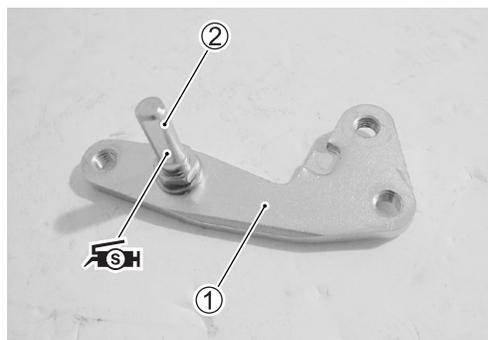
### BRAKE CALIPER HOLDER

Tighten the pin ② to the caliper holder ① to the specified torque.

 **Caliper holder pin: 18 N·m (1.8 kgf-m, 13.0 lb-ft)**

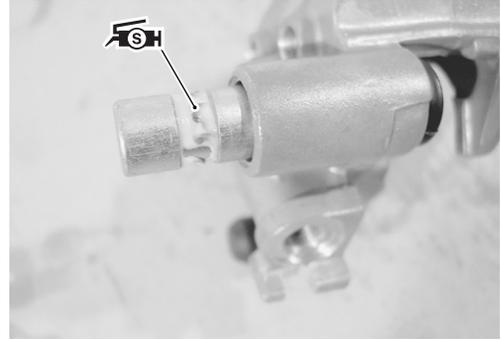
Apply SUZUKI SILICONE GREASE to the brake caliper holder pin ②.

 **99000-25100: SUZUKI SILICONE GREASE**



Apply SUZUKI SILICONE GREASE to the brake caliper holder slide pin.

 99000-25100: SUZUKI SILICONE GREASE



Install the pin ①, washer ② and caliper holder ③ to the caliper.

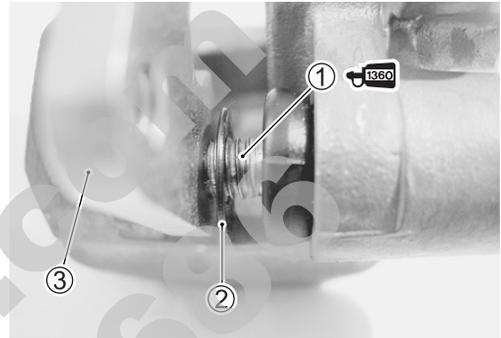
Apply THREAD LOCK SUPER to the pin ①.

 99000-32130: THREAD LOCK SUPER 1360

Tighten the pin ① to the specified torque.

 Caliper holder slide pin: 23 N•m (2.3 kgf-m, 16.5 lb-ft)

Install the pads and spring to the caliper.



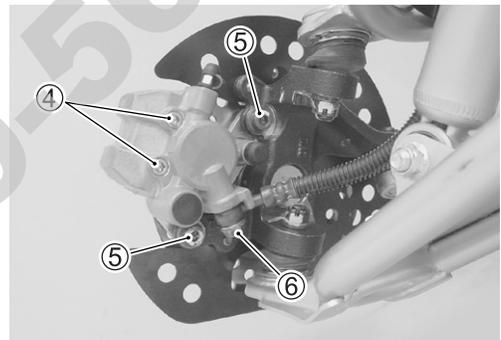
Tighten the brake pad mounting pins ④, brake caliper mounting bolts ⑤ and brake hose union bolt ⑥ to the specified torque.

 Brake pad mounting pin: 18 N•m (1.8 kgf-m, 13.0 lb-ft)

Brake caliper mounting bolt:

26 N•m (2.6 kgf-m, 19.0 lb-ft)

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



#### 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. (☞ 2-16)

## BRAKE DISC REMOVAL AND DISASSEMBLY

Remove the front wheel hub. (☞ 7-11)

Remove the brake disc.



## BRAKE DISC INSPECTION

Remove the front wheel. (☞ 7-10)

Remove the caliper. (☞ 7-19)

Inspect 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.

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

**DATA** Brake disc thickness

**Service Limit: 2.5 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.

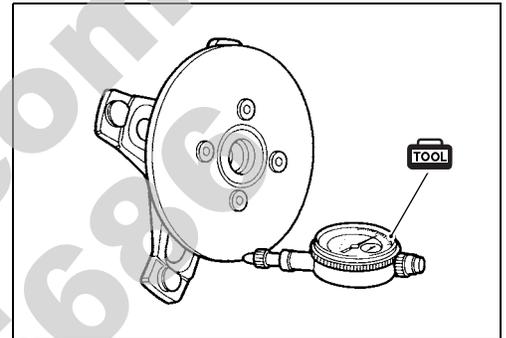
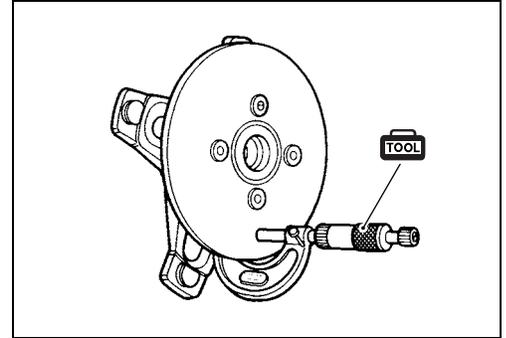
**TOOL** 09900-20607: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

**DATA** 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.



## BRAKE DISC REASSEMBLY AND REMOUNTING

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

Install the disc to the wheel hub with the punching letters **A** on the disc showed up.

**NOTE:**

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

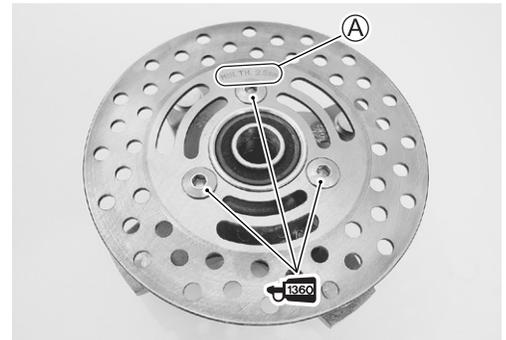
Apply **THREAD LOCK SUPER** to the brake disc bolts and tighten them to the specified torque.

**1360** 99000-32130: **THREAD LOCK SUPER** 1360

**U** Brake disc bolt: 23 N•m (2.3 kgf-m, 16.5 lb-ft)

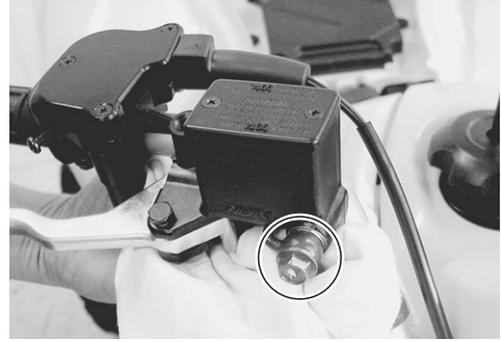
Install the front wheel hub. (☞ 7-14)

Install the front wheel. (☞ 7-15)



## MASTER CYLINDER REMOVAL AND DISASSEMBLY

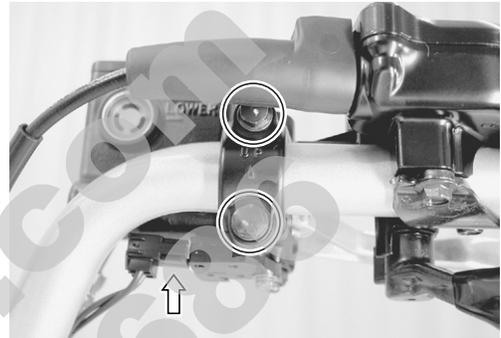
Place a rag underneath the brake hose union bolt on the master cylinder to catch any split brake fluid. Remove the brake hose union bolt and disconnect the brake hose.



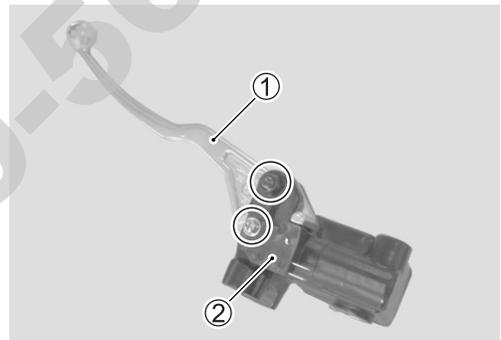
### CAUTION

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

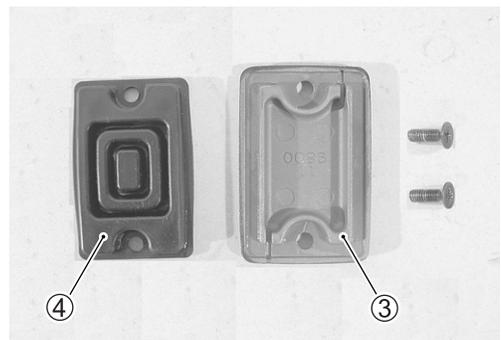
Remove the master cylinder assembly.  
Disconnect the brake switch coupler.



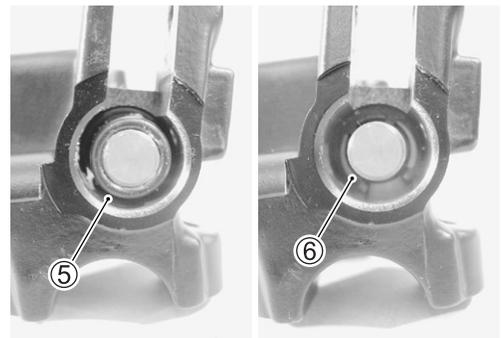
Remove the brake lever ① and brake switch ②.



Remove the reservoir cap ③ and diaphragm ④ from the master cylinder.  
Drain the brake fluid.

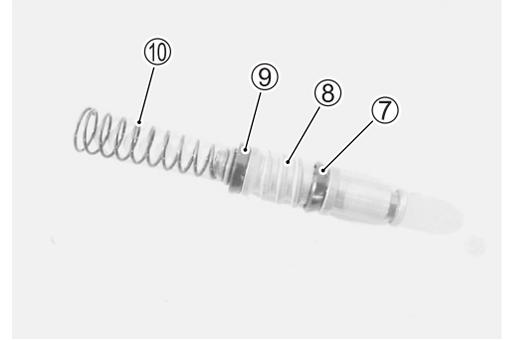


Pull the dust boot ⑤ out and remove the snap ring ⑥.



Remove the piston/secondary cup, primary cup and spring.

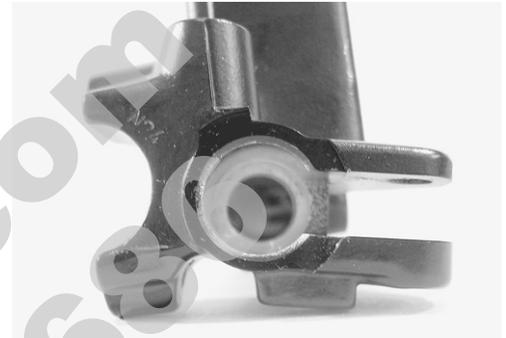
- ⑦ Secondary cup
- ⑧ Piston
- ⑨ Primary cup
- ⑩ Spring



## 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 cup, secondary cup and dust boot for any scratches, wear or damage. If any damages are found, replace them with a new one.

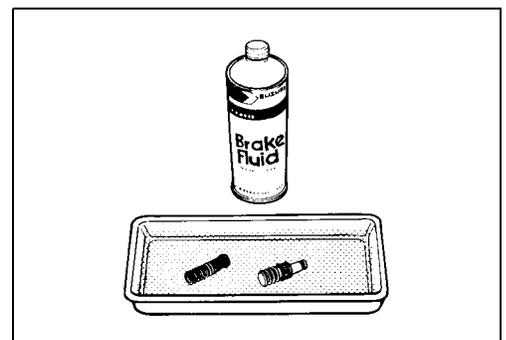


## MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

### CAUTION

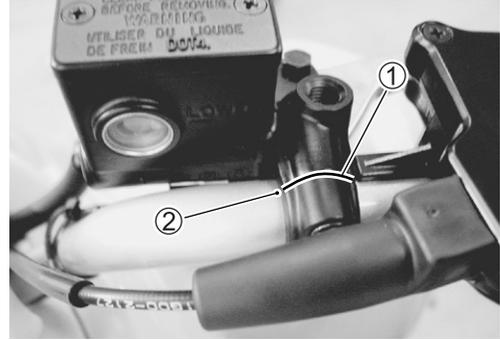
- \* Wash the master cylinder components with new brake fluid before reassembly.
- \* Do not wipe the brake fluid off with a rag after washing the components.
- \* When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine,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



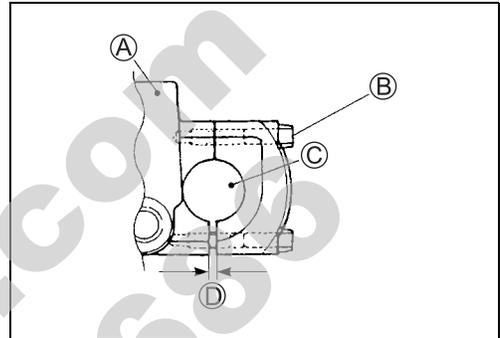
Specification and classification: DOT 4

Align the master cylinder holder's mating surface ① with the punched mark ② on the handlebars and tighten the upper clamp bolt first.

**Master cylinder clamp bolt: 10 N•m (1.0 kgf-m, 7.0 lb-ft)**



- Ⓐ Master cylinder
- Ⓑ Master cylinder upper clamp bolt
- Ⓒ Handlebar
- Ⓓ Clearance



Tighten the brake hose union bolt ③ to the specified torque.

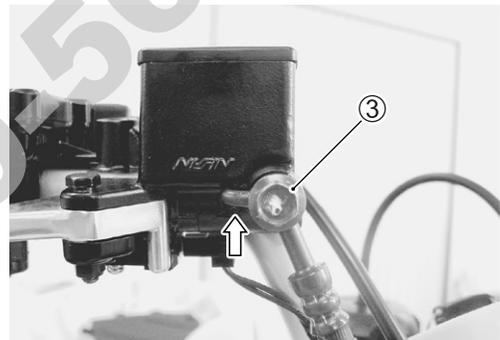
**Brake hose union bolt: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**

**NOTE:**

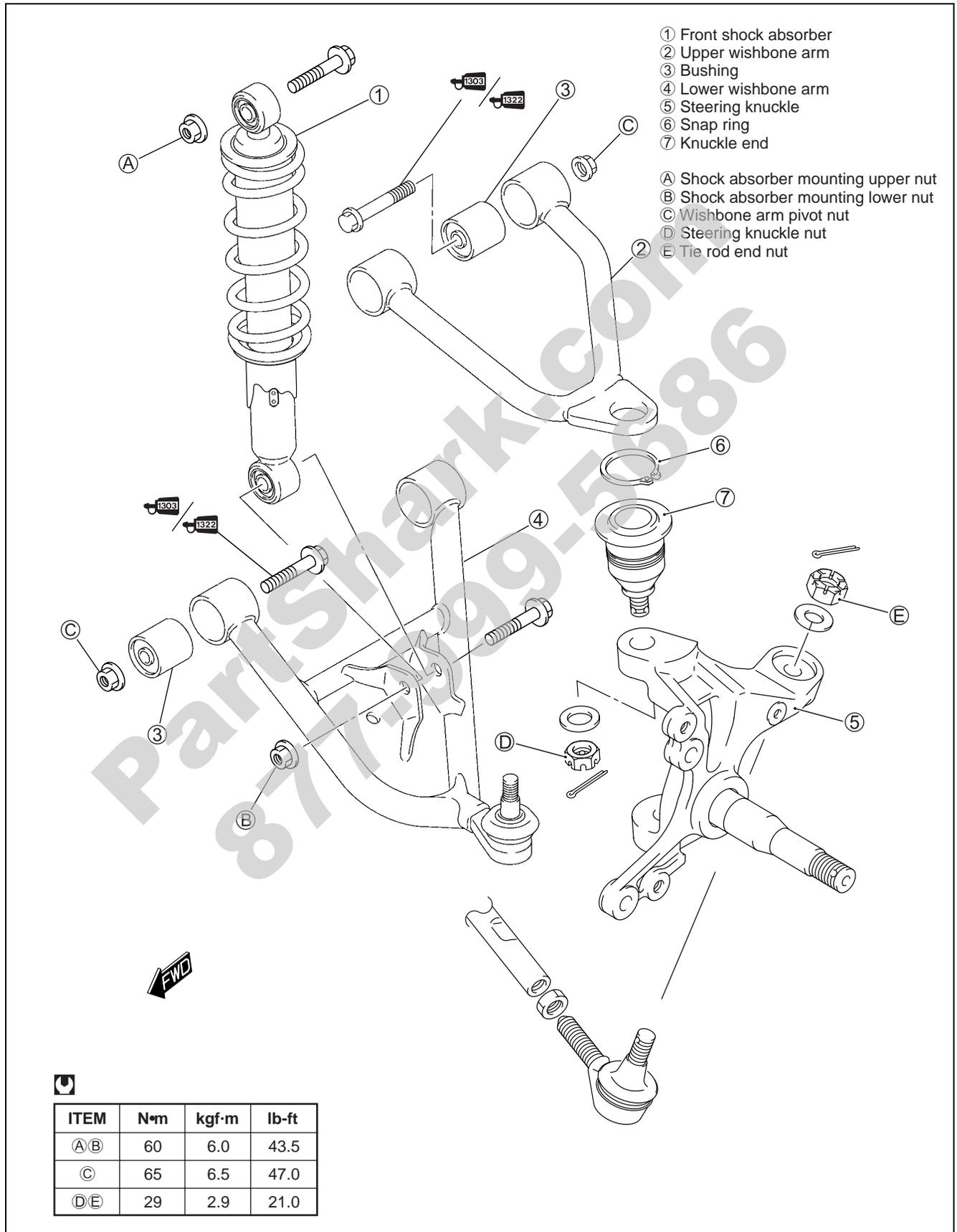
After the brake hose union touching to the stopper, tighten the union bolt.

**CAUTION**

**Bleed air from the brake system after reassembling the master cylinder. (2-16)**



# FRONT SUSPENSION CONSTRUCTION

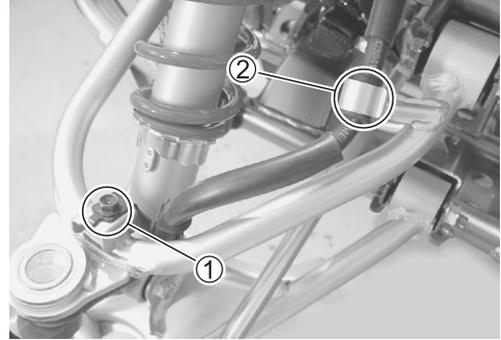


## REMOVAL AND DISASSEMBLY

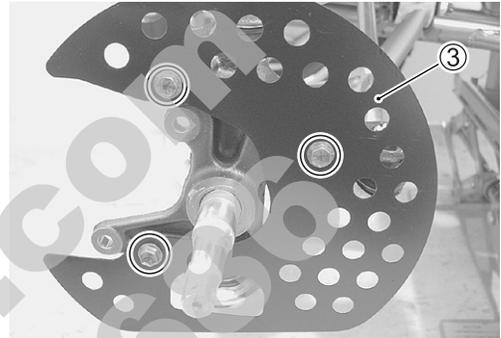
Remove the wheel hub. (☞ 7-11)

Remove the brake hose clamp ①.

Disconnect the brake hose from the brake hose clamp ②.



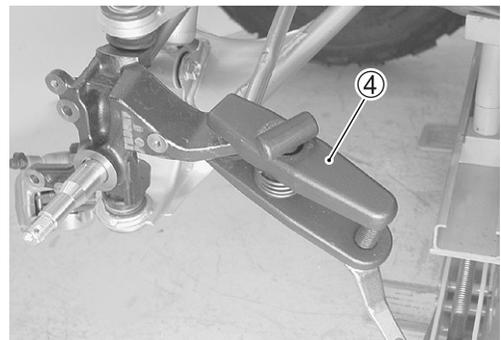
Remove the front disc cover ③.



Remove the cotter pin, tie rod end nut and washer.

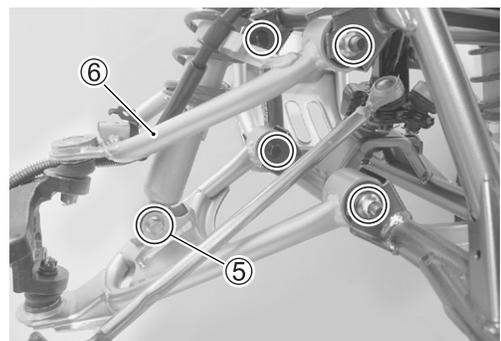


Disconnect the tie rod end with a commercially available ball bearing joint remover ④.



Remove the shock absorber lower mounting bolt ⑤.

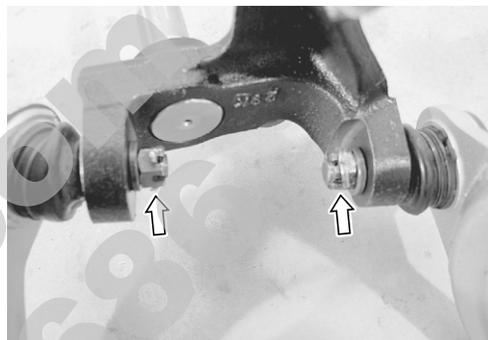
Remove the wishbone arm assembly ⑥.



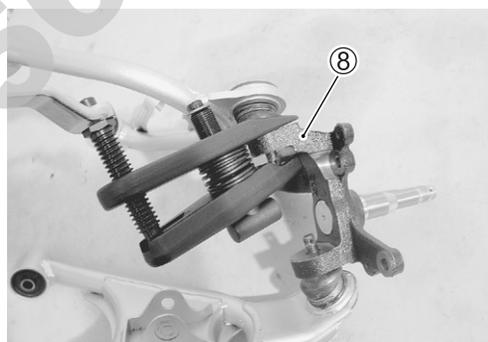
Remove the front shock absorber ⑦.



Remove the cotter pins, knuckle nuts and washers.



Disconnect the steering knuckle ⑧ with a commercially available ball bearing joint remover.



## INSPECTION

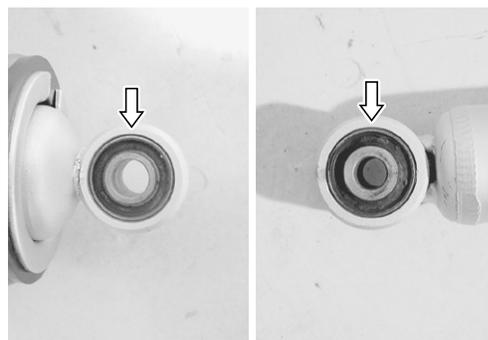
### FRONT SHOCK ABSORBER

Inspect the shock absorber for oil leakage or damage. If any damages are found, replace the front shock absorber with a new one.



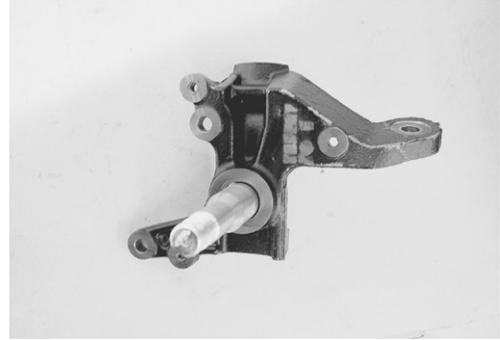
Inspect the rubber bushing for wear or damage.

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



**KNUCKLE**

Inspect the knuckle for damage. If any damages are found, replace the knuckle with a new one.



**KNUCKLE END**

Inspect the knuckle end boots for wear or damage. If any damages are found, replace the wishbone arm with a new one.

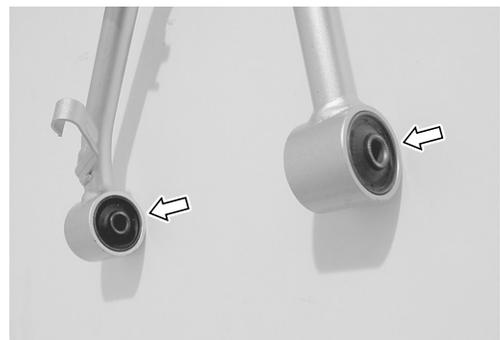


**WISHBONE ARM**

Inspect the wishbone arms for wear or damage. If any damages are found, replace the wishbone arm with a new one.

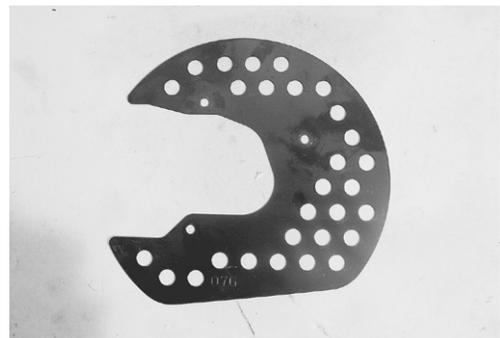


Inspect the rubber bushing for wear or damage. If any damages are found, replace the bushing with a new one.



**BRAKE DISC COVER**

Inspect the brake disc cover for damage. If any damages are found, replace the brake disc cover with a new one.



## REASSEMBLY AND REMOUNTING

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

Degrease the tapered portions of the knuckle, knuckle end and tie rod end with nonflammable cleaning solvent.



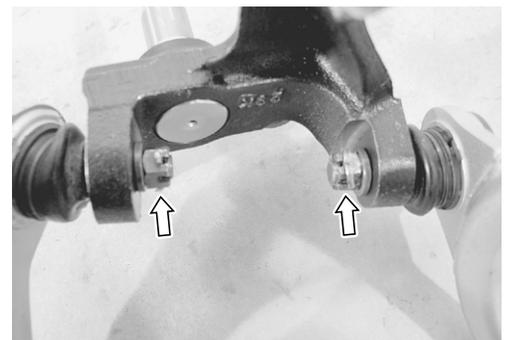
Install the wishbone arms to the knuckle.  
Install the washers and tighten the knuckle nuts to the specified torque.

 **Knuckle nut: 29 N·m (2.9 kgf-m, 21.0 lb-ft)**

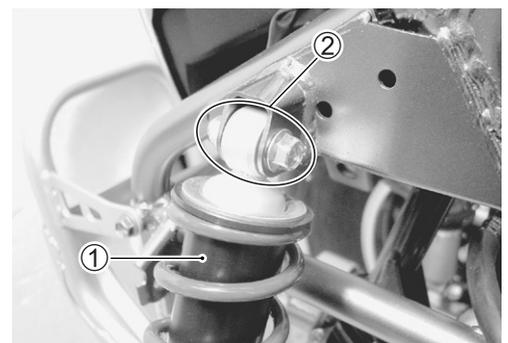
Install new cotter pins.

### CAUTION

**Replace the removed cotter pins with new ones.**



Install the front shock absorber ①.



Apply THREAD LOCK SUPER to the wishbone arm pivot bolts ③.

Tighten the upper and lower front shock absorber mounting nuts ② and the wishbone arm pivot nuts ③ to the specified torque.

 **1303** 99000-32030: THREAD LOCK SUPER 1303 (USA)

 **1322** 99000-32110: THREAD LOCK SUPER 1322 (Others)

 **Wishbone arm pivot nut: 65 N•m (6.5 kgf-m, 47.0 lb-ft)**

**Shock absorber upper mounting nut:**

**60 N•m (6.0 kgf-m, 43.5 lb-ft)**

Install the washer and tighten the tie rod end nut to the specified torque.

 **Tie rod end nut: 29 N•m (2.9 kgf-m, 21 lb-ft)**

Install new cotter pin.

#### CAUTION

Replace the removed cotter pin with a new one.

Apply THREAD LOCK SUPER to the disc cover mounting bolts, and then tighten the bolts.

 **1360** 99000-32130: THREAD LOCK SUPER 1360

## SUSPENSION SETTING

### SPRING PRE-LOAD ADJUSTMENT

After installing the rear suspension, adjust the spring pre-load.

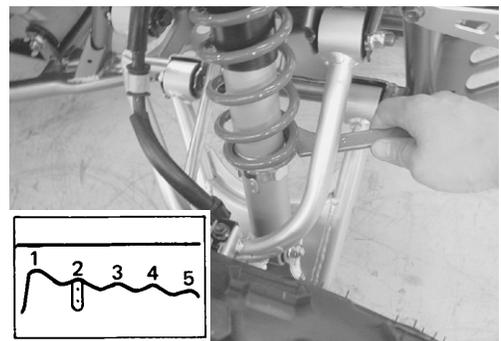
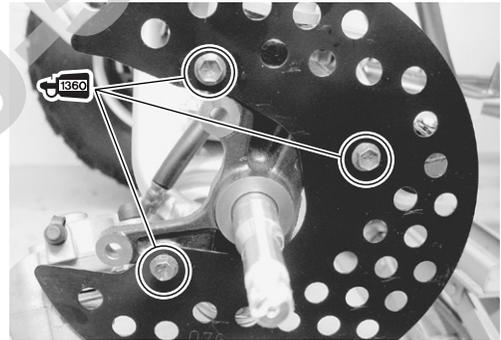
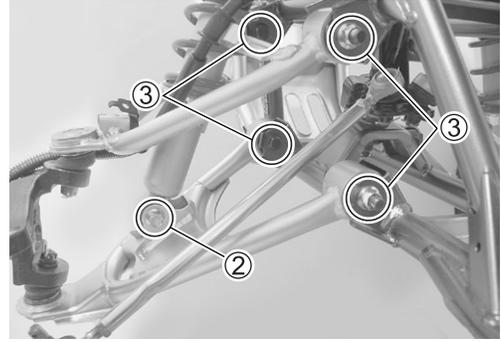
Position 1 provides the softest spring pre-load.

Position 5 provides the stiffest spring pre-load.

**STD POSITION: 2**

#### WARNING

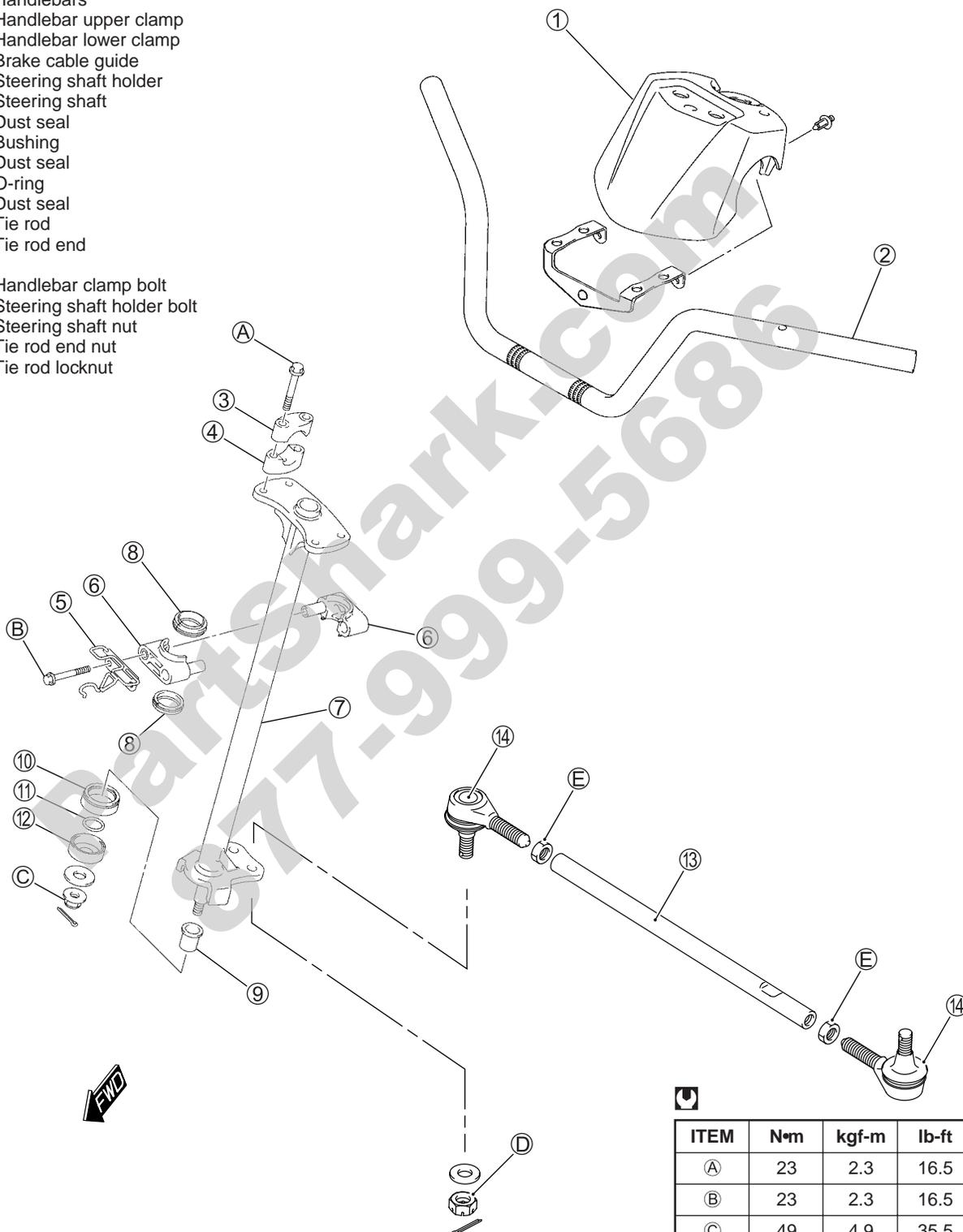
Be sure to adjust the spring pre-load on the both suspensions equally.



# STEERING CONSTRUCTION

- ① Steering head cover
- ② Handlebars
- ③ Handlebar upper clamp
- ④ Handlebar lower clamp
- ⑤ Brake cable guide
- ⑥ Steering shaft holder
- ⑦ Steering shaft
- ⑧ Dust seal
- ⑨ Bushing
- ⑩ Dust seal
- ⑪ O-ring
- ⑫ Dust seal
- ⑬ Tie rod
- ⑭ Tie rod end

- Ⓐ Handlebar clamp bolt
- Ⓑ Steering shaft holder bolt
- Ⓒ Steering shaft nut
- Ⓓ Tie rod end nut
- Ⓔ Tie rod locknut



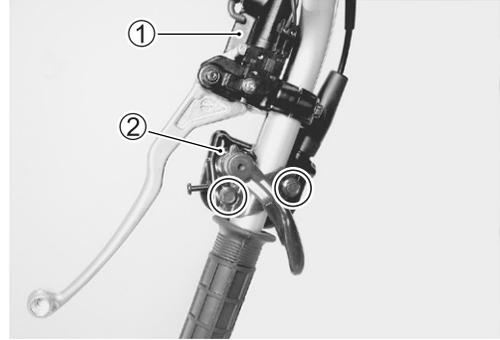
ITEM	N·m	kgf-m	lb-ft
Ⓐ	23	2.3	16.5
Ⓑ	23	2.3	16.5
Ⓒ	49	4.9	35.5
Ⓓ	29	2.9	21.0
Ⓔ	29	2.9	21.0

## REMOVAL

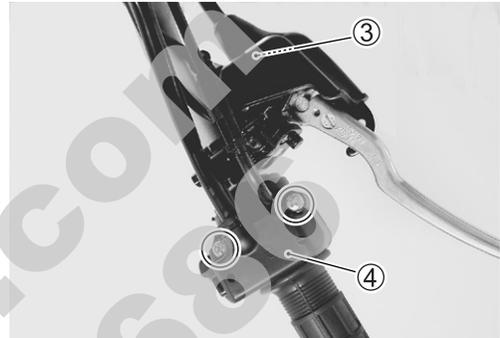
Remove the front fender. (➡ 7-6)

Remove the master cylinder assembly ① from the handlebars. (➡ 7-26)

Remove the throttle lever case ②.



Disconnect the rear brake cable ③ and remove the handlebar switch ④.



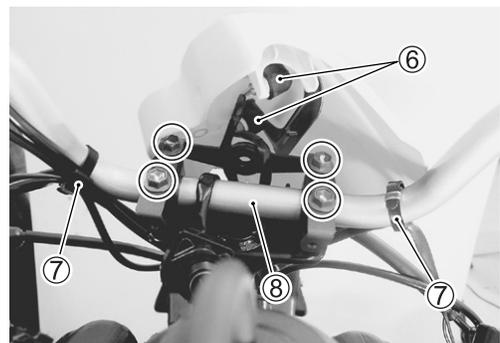
Disconnect the fuel vent hose and remove the steering head cover ⑤.



Disconnect the indicator lights ⑥ from the steering head cover.

Remove the clamps ⑦.

Remove the handlebars ⑧.



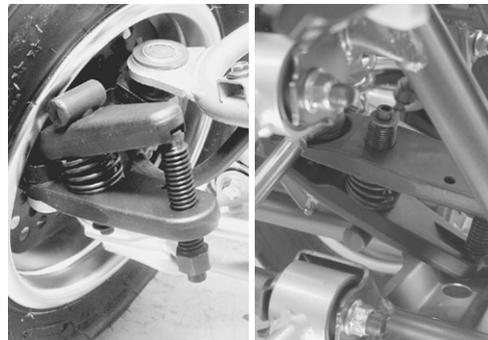
Remove the cotter pins, tie rod end nuts and washers.

### CAUTION

Replace the removed cotter pins with new ones.



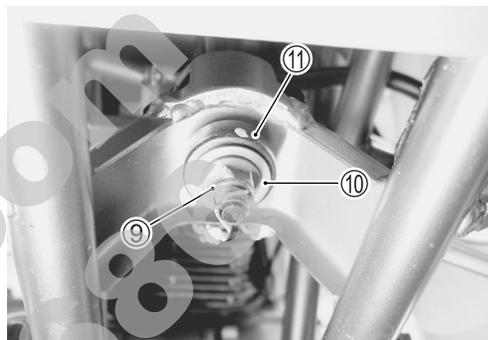
Remove the tie rod ends with a commercially available ball bearing joint remover.



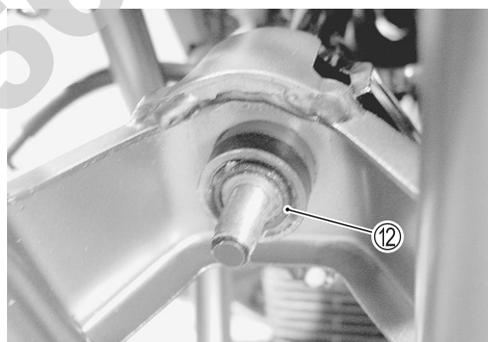
Remove the cotter pin and steering shaft nut ⑨, washer ⑩ and dust seal ⑪.

**CAUTION**

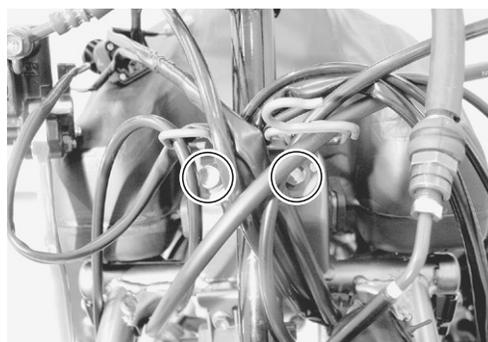
Replace the removed cotter pins with new ones.



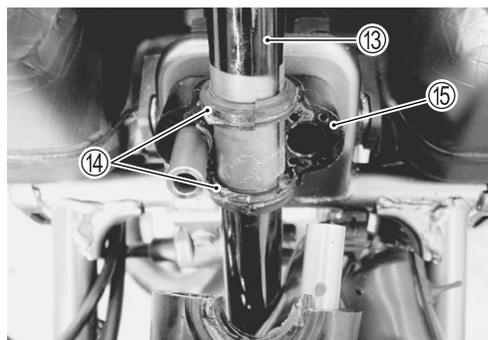
Remove the O-ring ⑫.



Remove the steering shaft holder bolts.  
Remove the steering shaft holder half.



Remove the steering shaft ⑬.  
Remove the dust seals ⑭ from the steering shaft.  
Remove the steering shaft holder half ⑮.



Remove the steering shaft.  
Remove the dust seal ⑯ from the steering shaft.



## INSPECTION AND DISASSEMBLY

Inspect the removed parts for the following abnormalities.

- \* Handlebar distortion
- \* Handlebar clamp wear

### DUST SEALS AND O-RING

Inspect the dust seals and O-ring for wear or damage. If any damages are found, replace the dust seals with new ones.



### TIE ROD

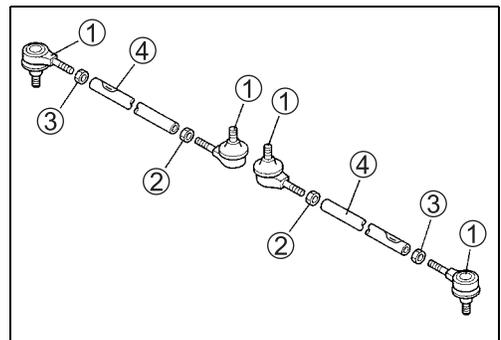
Inspect the tie rod for distortion or damage. If any damages are found, replace the tie rod with a new one.



- ① Tie rod end
- ② Locknut
- ③ Locknut
- ④ Tie rod

### CAUTION

The locknuts ② with a yellow finished surface have left-hand threads.



### TIE ROD END

Inspect the tie rod ends for smooth movement. If there are any abnormalities, replace the tie rod end with a new one.

Inspect the tie rod end boot for wear or damage.

If any damages are found, replace the tie rod end with a new one.



**STEERING SHAFT**

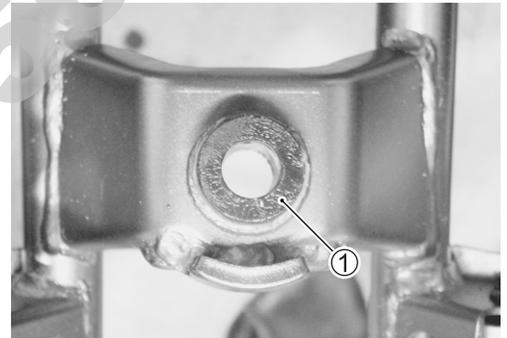
Inspect the steering shaft for distortion or bends. If any damages are found, replace the steering shaft with a new one.

**STEERING SHAFT HOLDER**

Inspect the two steering shaft holders for wear or damage. If any damages are found, replace the steering shaft holders with new ones.

**STEERING SHAFT BUSHING**

Inspect the steering shaft bushing ① for wear and damage. If any damages are found, replace it with a new one.



Remove the steering shaft bushing with the special tools.

 **09924-84510: Bearing installer set**  
**09930-30721: Rotor remover**



Install the steering shaft bushing with the special tool.

 **09924-84510: Bearing installer set**



## REASSEMBLY AND REMOUNTING

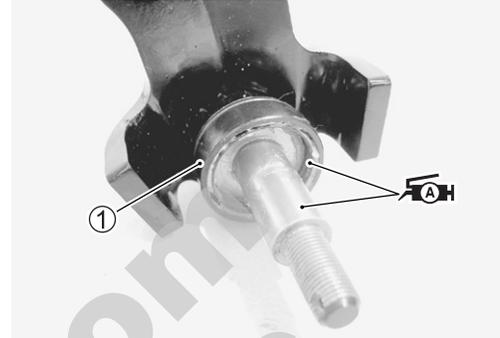
Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:

### STEERING SHAFT

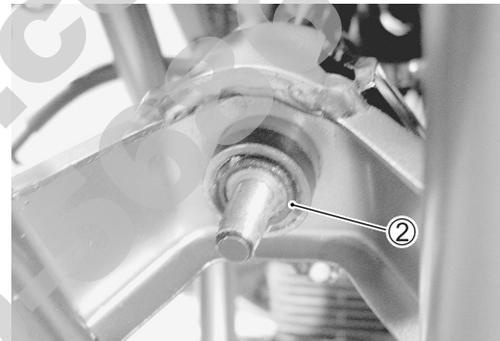
Apply SUZUKI SUPER GREASE to the O-ring, dust seals and steering shaft before remounting the steering shaft.

 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**

Install the dust seal ① to the steering shaft.



Install the new O-ring ② and dust seal to the steering shaft.



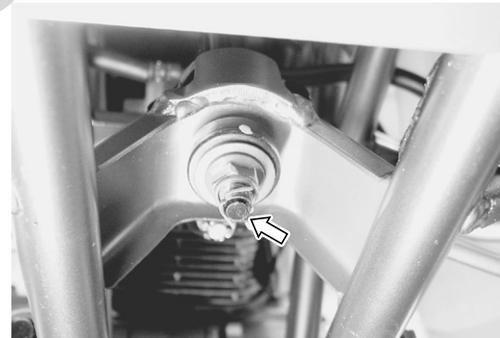
Tighten the steering shaft nut to the specified torque.

 **Steering shaft nut: 49 N•m (4.9 kgf-m, 35.5 lb-ft)**

Install new cotter pin.

### CAUTION

Replace the removed cotter pin with a new one.

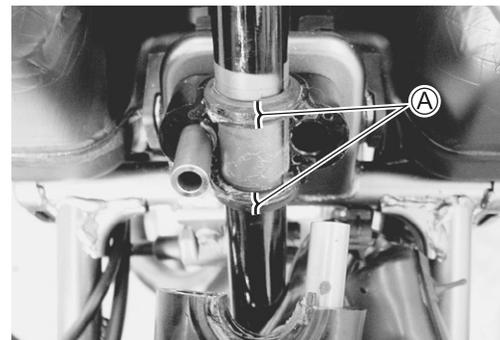


Apply SUZUKI SUPER GREASE to the steering shaft holders and dust seals before remounting the steering shaft holders.

 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**

### CAUTION

To prevent the entry of dirt, the dust seal end Ⓐ must face forward when installed to the steering shaft.

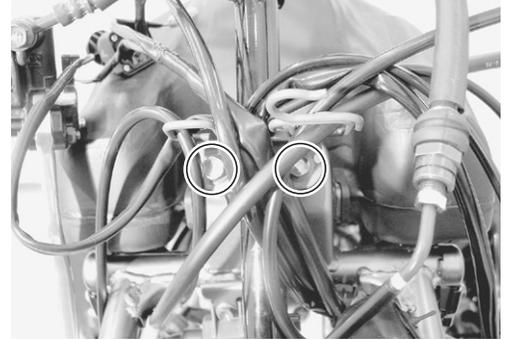


Tighten the steering shaft holder bolts to the specified torque.

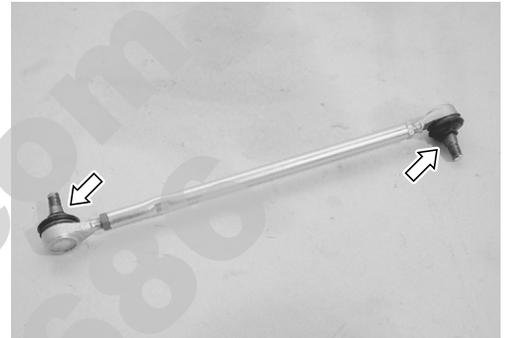
**🔧 Steering shaft holder bolt: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**

*NOTE:*

*Make sure that the wiring harness, cables and brake hose routing are properly. (👉 9-12 to -14)*



Degrease the tapered portions of the tie rod ends with non-flammable cleaning solvent.



### TIE ROD

Install the washers and tighten the tie rod end nuts to the specified torque.

**🔧 Tie rod end nut: 29 N•m (2.9 kgf-m, 21.0 lb-ft)**

Install new cotter pins.

#### CAUTION

**Replace the removed cotter pins with new ones.**

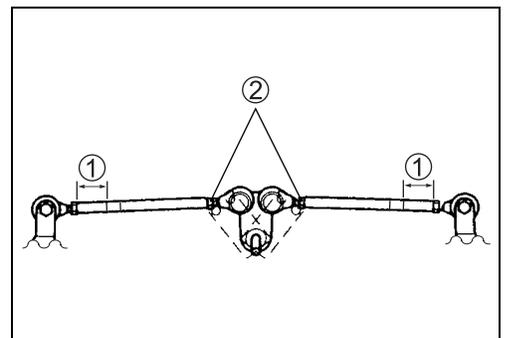


*NOTE:*

*When installing the tie rod, make sure the narrow end ① of the tie rod comes out.*

#### CAUTION

**The locknuts ② with a yellow finished surface have left-hand threads.**



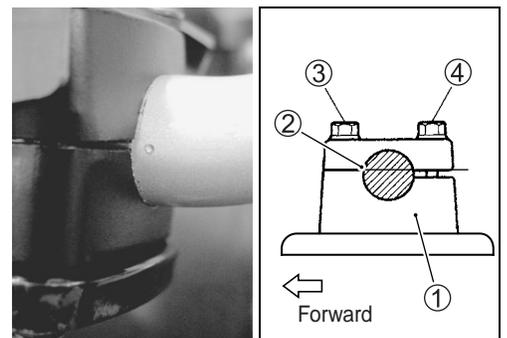
### HANDLEBARS

When installing the lower handlebar holder ① to the steering shaft, the higher mating portion must face to forward.

Set the handlebars to match its punched mark ② to the mating face of the handlebar clamps.

First tighten the bolts ③ to the specified torque and then tighten the bolts ④ to the specified torque.

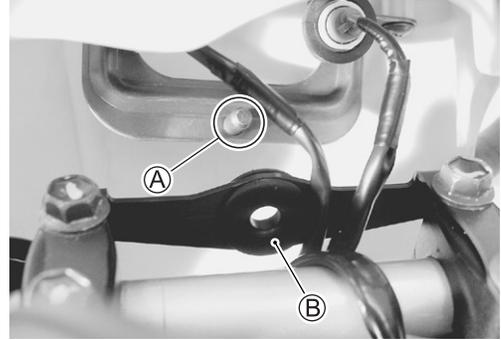
**🔧 Handlebar clamp bolt: 23 N•m (2.3 kgf-m, 16.5 lb-ft)**



Install the steering head cover with the projection **(A)** inserting into the cushion **(B)** on the steering head cover bracket.

**NOTE:**

*The indicator light position on the steering head cover is shown on page 8-24.*

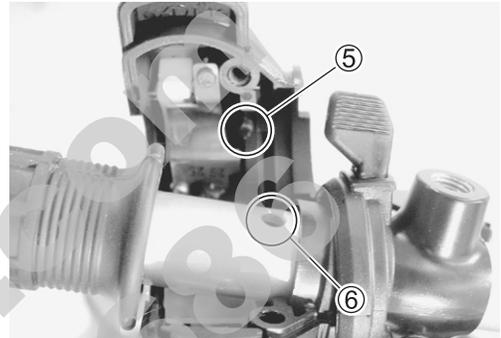


Install the handle switch with the lug **(5)** on the switch half inserted into the hole **(6)** on the handlebars.

**NOTE:**

*After installing the handlebars, make sure that the cable, wiring harness and brake hose routing are properly. (☞ 9-12 to -14)*

Install the steering head cover.



PartShark.com  
877-999-5683

## TOE-IN ADJUSTMENT

Adjust the toe-in as follows:

Place the vehicle on level ground and set the handlebars straight.

Make sure all the tires are inflated to the standard pressure. (☞ 2-18)

Place 75 kg (165 lbs) of weight on the seat.

Loosen the locknuts (①, ②) on each tie rod.

### CAUTION

The locknuts ② have left-hand threads.

Measure the distances (A) and (B) between the front wheels. Subtract the measurements of (A) from the measurements of (B) to find the toe-in. If the toe-in is not within specification, adjust the tie rod to the right or left until the toe-in is within the specified range.

(A) (B) = Toe-in



### Toe-in

Standard: 5 – 4 mm (0.20 – 0.16 in)

Temporarily tighten the four locknuts.

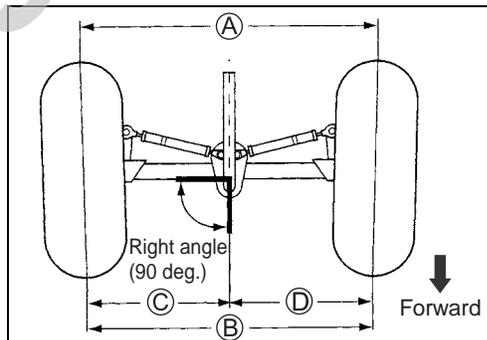
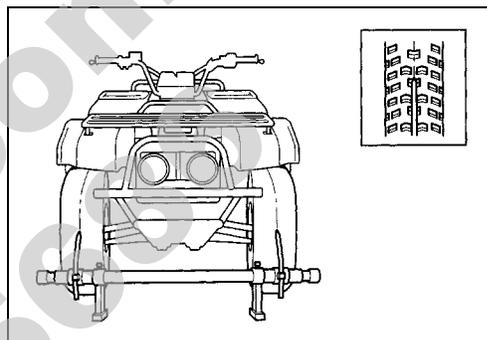
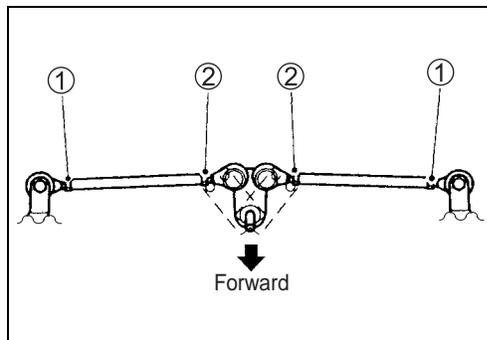
Check that the distances (C) and (D) are equal, as shown. If the distances are not equal, adjust the tie rod to the right or left until the toe-in is within specification. Check the toe-in again by measuring distances (A) and (B).

If the toe-in is not within specification, repeat the adjustment as above until the proper toe-in is obtained and distances (C) and (D) become equal.

After adjustment has been made, tighten the four locknuts (①) to the specified torque.

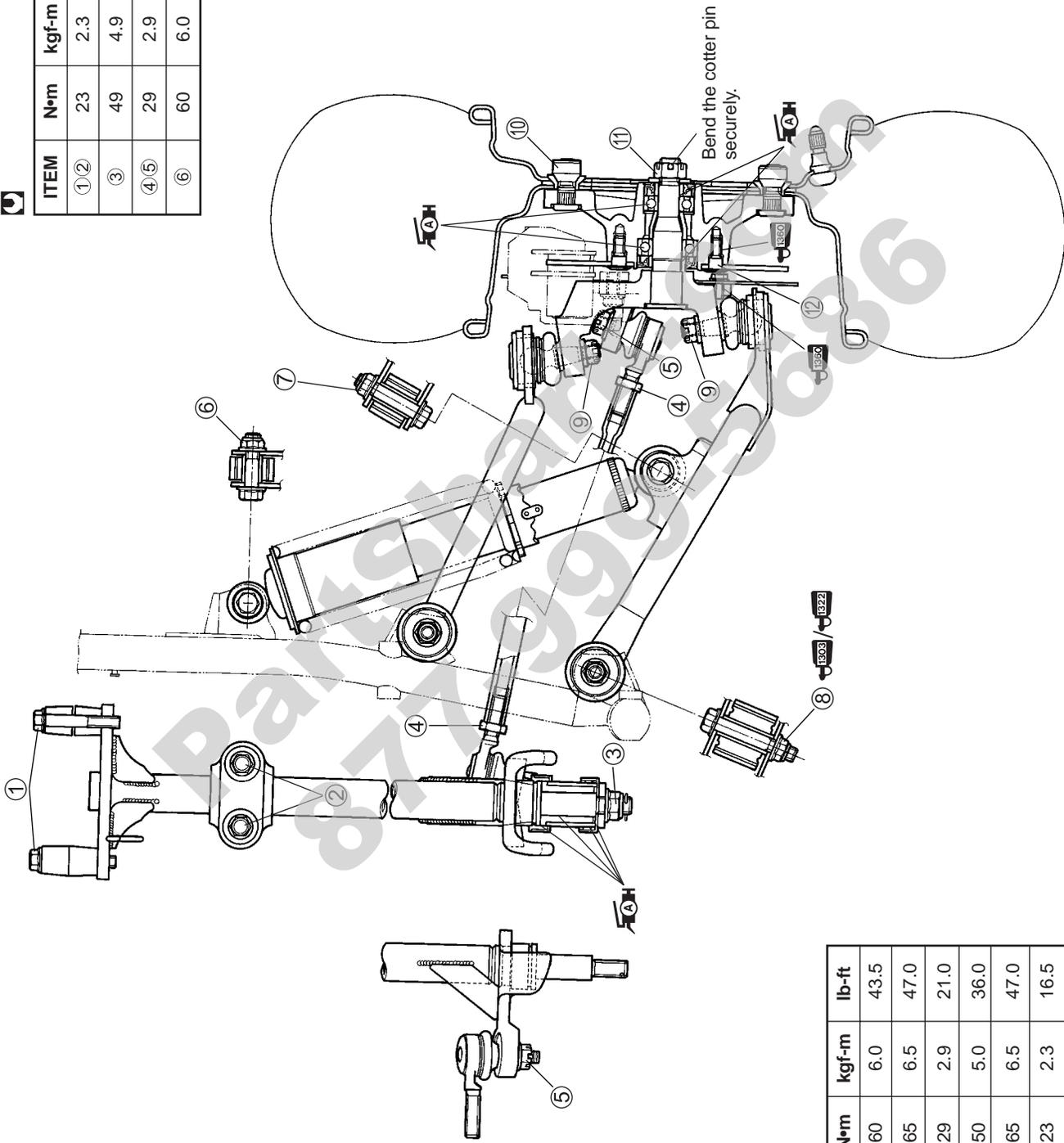


Tie rod locknut: 29 N•m (2.9 kgf-m, 21.0 lb-ft)



# FRONT WHEEL, FRONT BRAKE, FRONT SUSPENSION AND STEERING REASSEMBLING INFORMATION

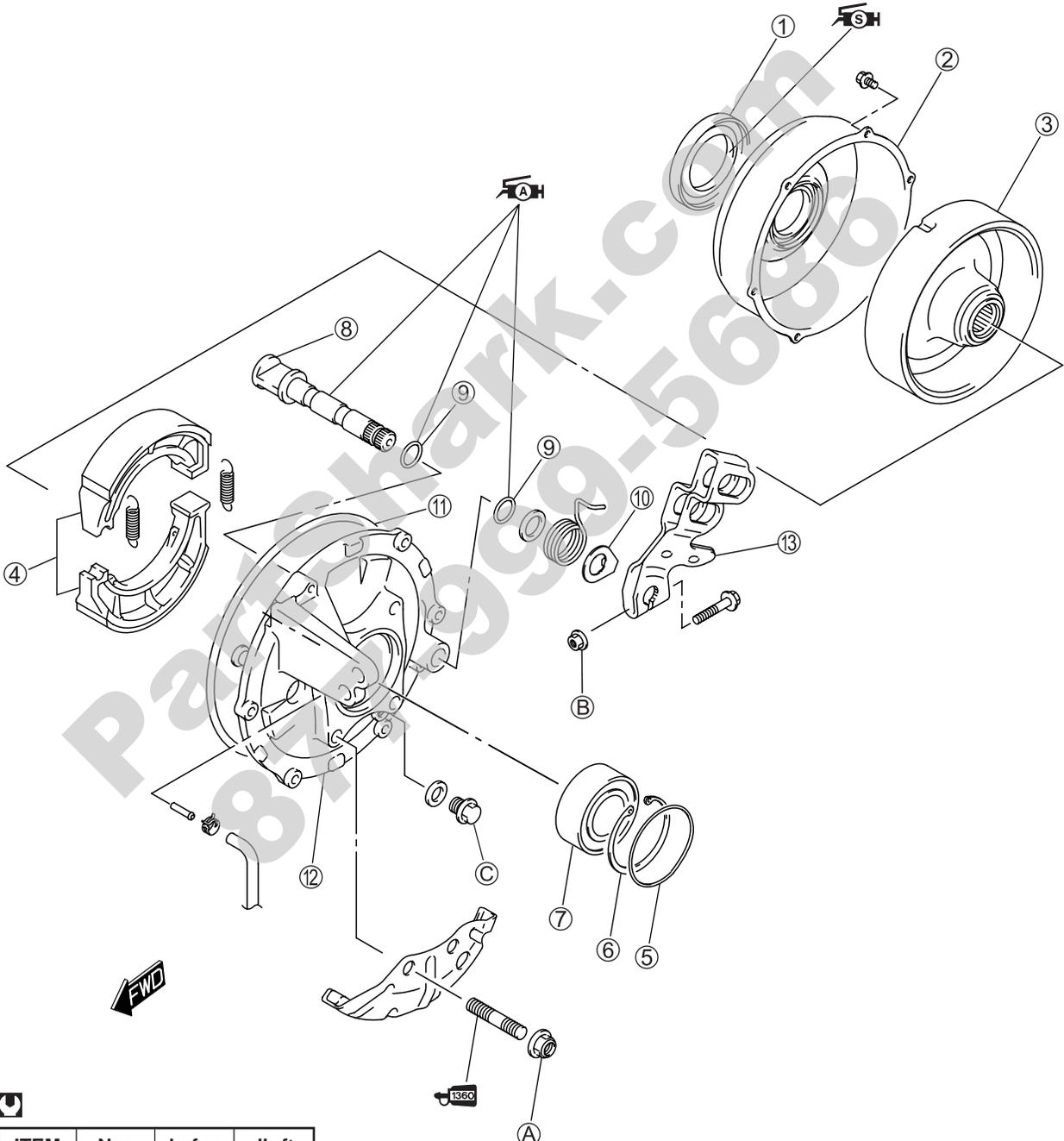
ITEM	N•m	kgf-m	lb-ft
①②	23	2.3	16.5
③	49	4.9	35.5
④⑤	29	2.9	21.0
⑥	60	6.0	43.5



ITEM	N•m	kgf-m	lb-ft
⑦	60	6.0	43.5
⑧	65	6.5	47.0
⑨	29	2.9	21.0
⑩	50	5.0	36.0
⑪	65	6.5	47.0
⑫	23	2.3	16.5

# REAR BRAKE CONSTRUCTION

- ① Dust seal
- ② Drum cover
- ③ Brake drum
- ④ Brake shoe
- ⑤ O-ring
- ⑥ Snap ring
- ⑦ Bearing
- ⑧ Brake camshaft
- ⑨ O-ring
- ⑩ Brake lining indicator plate
- ⑪ O-ring
- ⑫ Brake panel
- ⑬ Brake cam lever
- Ⓐ Brake panel nut
- Ⓑ Brake cam lever nut



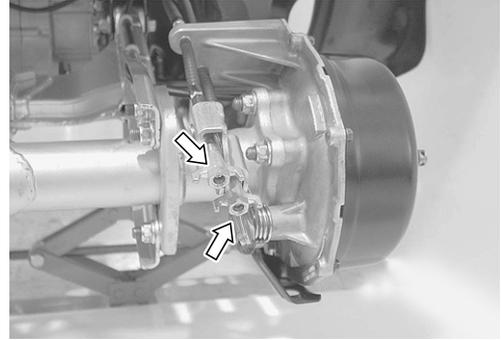
ITEM	N•m	kgf-m	lb-ft
Ⓐ	60	6.0	43.5
Ⓑ	11	1.1	8.0
Ⓒ	11	1.1	8.0

## REMOVAL AND DISASSEMBLY

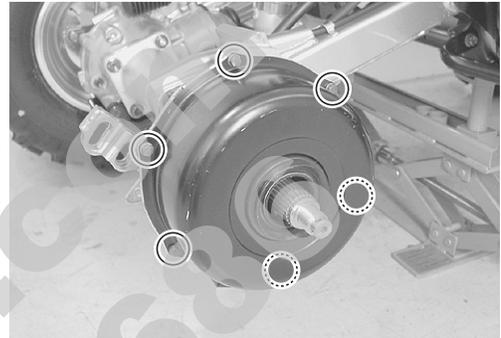
Raise the rear wheel off the ground and support the vehicle with a jack or wooden block.

Remove the right rear wheel hub. (☞ 7-11)

Disconnect the brake cables.



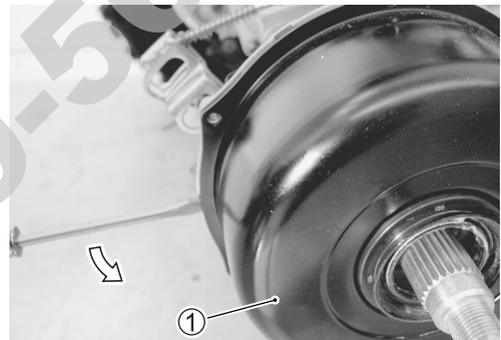
Remove the drum cover bolts.



Remove the drum cover ① with a flat head screwdriver.

### CAUTION

- \* Be careful not to distort the drum cover.
- \* Distortion of drum cover would cause a malfunction of sealing.



Remove the brake drum ②.

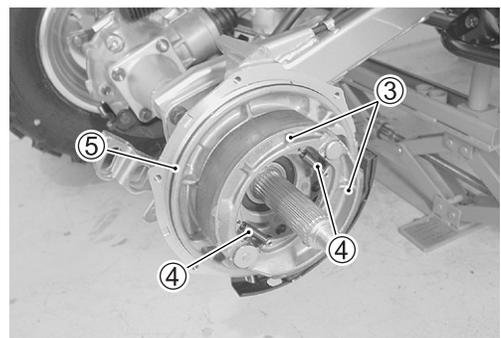


Remove the brake shoes ③ and springs ④.

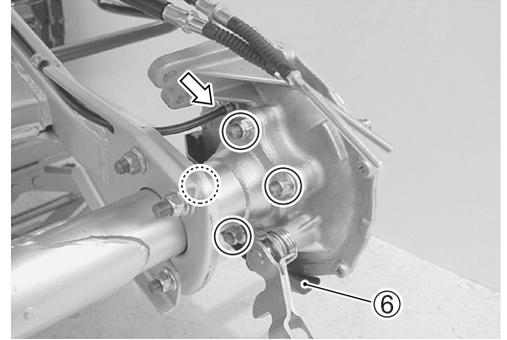
Remove the O-ring ⑤.

### NOTE:

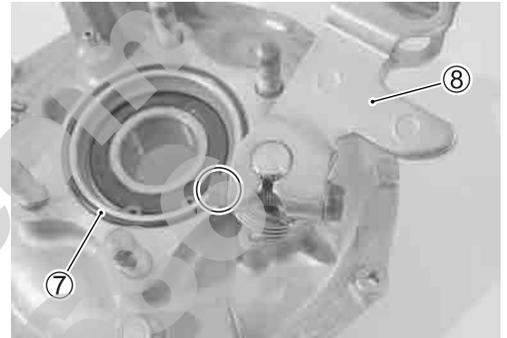
If reinstalling the removed brake shoes, mark the brake shoes with direction (leading and trailing) of installation before removing the brake shoes.



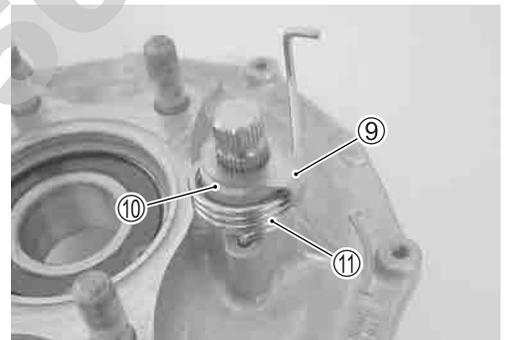
Disconnect the brake breather hose.  
Remove the brake panel and panel cover ⑥.



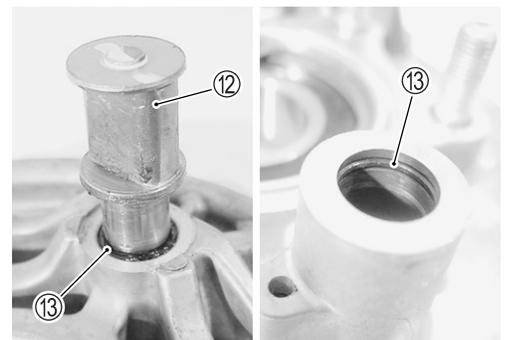
Remove the O-ring ⑦.  
Remove the brake cam lever ⑧.



Remove the brake lining indicator plate ⑨, washer ⑩ and spring ⑪.



Remove the brake camshaft ⑫ and O-rings ⑬ from the brake panel.



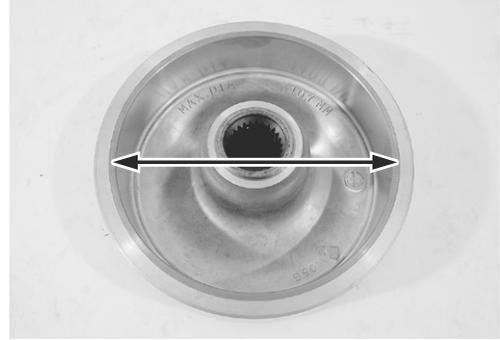
## INSPECTION

### BRAKE DRUM

Measure the brake drum's I.D. to determine the extent of wear. If the measurement value exceeds the service limit, replace the brake drum with a new one.

**DATA** Brake drum I.D.

**Service Limit: 140.7 mm (5.54 in)**



### BRAKE SHOE

Inspect the brake shoes for wear or damage. If any wear or damages are found, replace the brake shoes with new ones.

#### CAUTION

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



### DUST SEAL

Inspect the dust seal on the drum cover for wear or damage. If any damages are found, replace the dust seal with a new one.

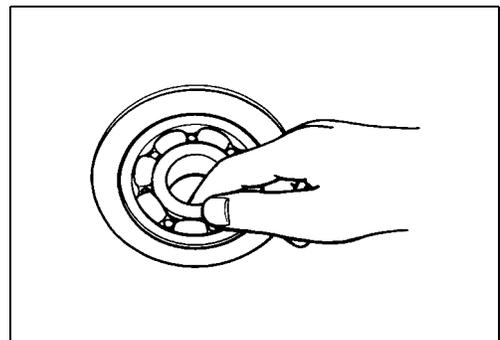
#### CAUTION

Replace the removed dust seal with a new one.



### BRAKE PANEL BEARING

Inspect the play of the brake panel bearing by hand while it is in the brake panel. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.



Remove the snap ring.

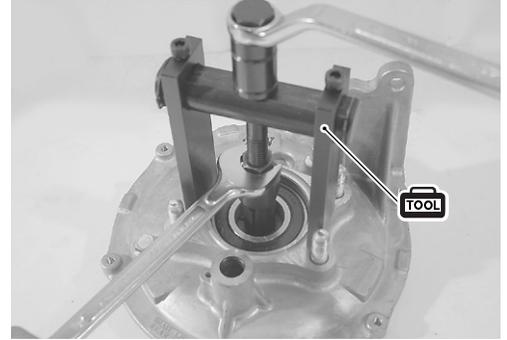


Remove the bearing with the special tool.

 **09921-20240: Bearing remover set**

**CAUTION**

The removed bearing must be replaced with a new one.



## REASSEMBLY AND REMOUNTING

Install new bearing with the special tool.

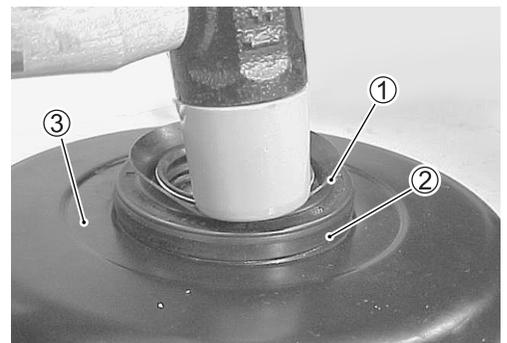
 **09913-70210: Bearing installer set**



Install the snap ring.

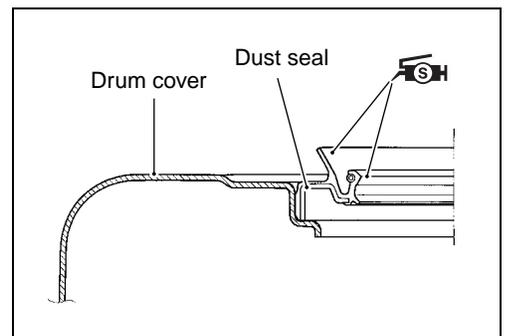


Install new dust seal ② to the drum cover ③ by using the removed dust seal ①.



Apply SUZUKI SILICONE GREASE to the dust seal lips.

 **99000-25100: SUZUKI SILICONE GREASE**



Apply SUZUKI SUPER GREASE to new O-rings and brake camshaft.

Install the O-rings and brake camshaft to the anchor panel.

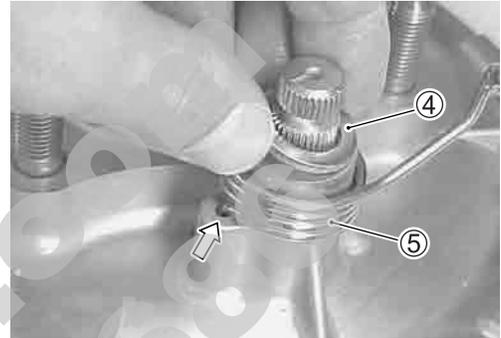
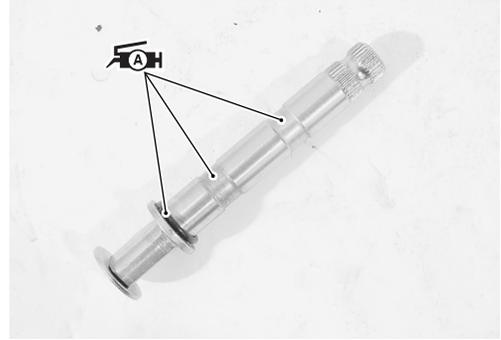
 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**

**CAUTION**

**O-rings should be replaced with new ones.**

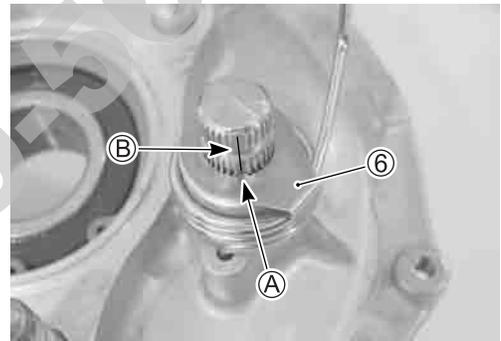
Install the washer **④**.

Install the spring **⑤** with the spring end hooked to the hole on the brake panel.



Align the protrusion **Ⓐ** of the brake lining indicator plate **⑥** with the groove **Ⓑ** of the brake camshaft.

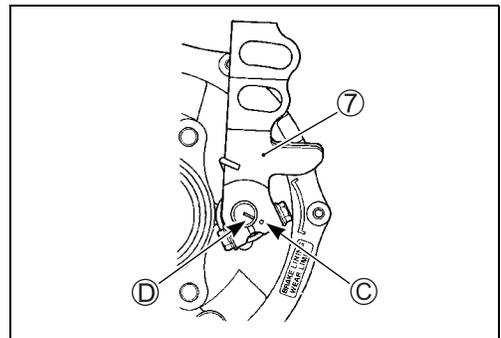
Install the brake lining indicator plate **⑥**.



Install the brake cam lever **⑦** as its punched mark **Ⓒ** aligns with the slit **Ⓓ** on the brake camshaft.

Tighten the cam lever nut to the specified torque.

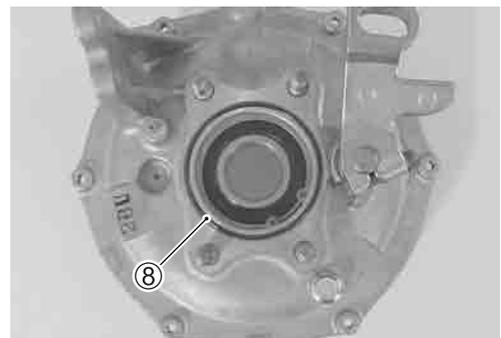
 **Cam lever nut: 11 N•m (1.1 kgf-m, 8.0 lb-ft)**



Install new O-ring **⑧** onto the rear brake panel.

**CAUTION**

**O-ring must be replaced with a new one.**



Install the brake panel to the rear axle housing.

Install the panel cover ⑨.

Tighten the brake panel mounting nuts to the specified torque.

**🔧 Brake panel mounting nut: 60 N•m (6.0 kgf-m, 43.5 lb-ft)**

Connect the brake breather hose.

**NOTE:**

*Make sure that the O-ring ⑧ must be fitted into the groove on the brake panel securely.*

Install new O-ring to the brake panel.

**CAUTION**

**Replace the removed O-ring with a new one.**

Apply SUZUKI SUPER GREASE to the anchor pin and brake camshaft sliding surface lightly.

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

**⚠ WARNING**

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

Install the brake shoes and springs to the brake panel.

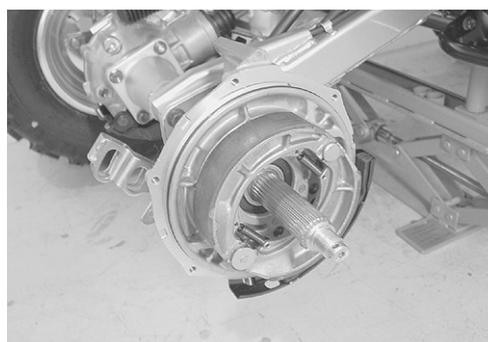
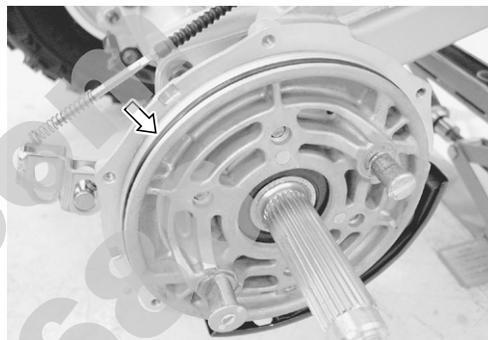
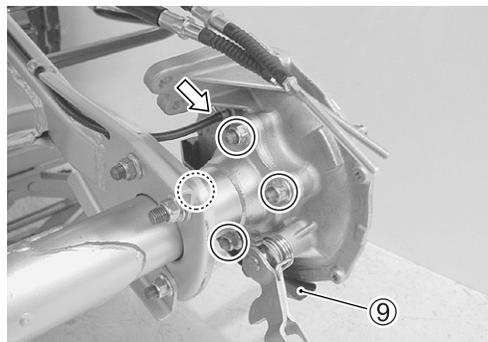
**CAUTION**

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

**NOTE:**

*\* When reinstalling the removed brake shoes, install them in their original position, leading and trailing.*

*\* Make sure that the brake shoe spring's end faces the brake panel as shown.*



Install the brake drum.

**CAUTION**

**Do not apply grease to the spline portion of brake drum.**

**NOTE:**

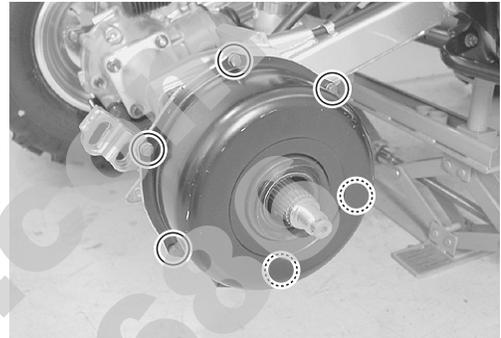
Before installing the brake drum, make sure that the brake drum is clean and free of any greasy matter.



Install the drum cover and tighten the bolts.

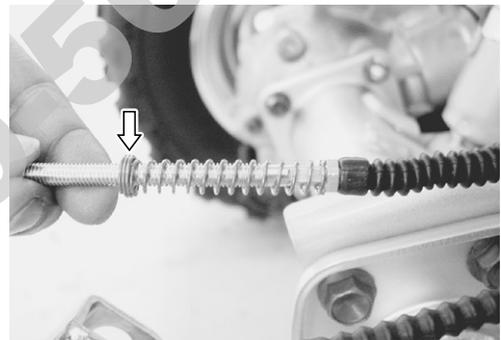
**NOTE:**

When installing the drum cover, make sure that the O-ring must be fitted into the groove on the brake panel securely.

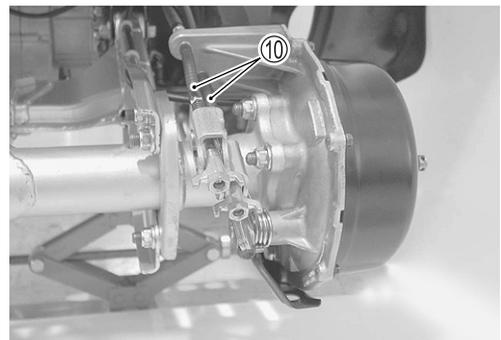


**NOTE:**

Before connecting the brake cables, make sure that the small-pitch portion of the cable spring faces to the cable adjuster nut.



Connect the brake cables ⑩.



Install the right rear wheel hub. (☞7-14)

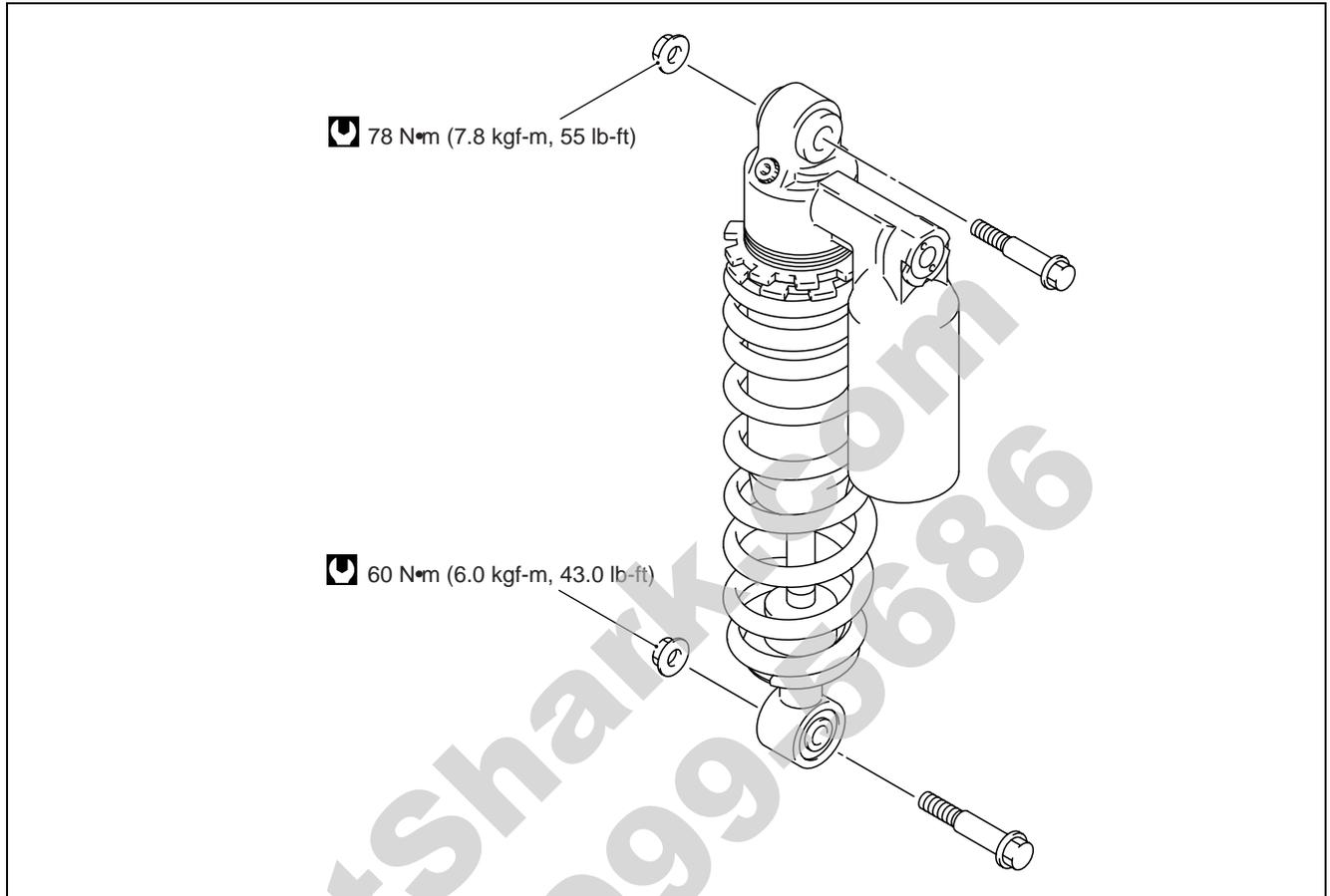
Install the right rear wheel. (☞7-15)

After installing the rear brake, adjust the following items.

\* Brake pedal play ..... ☞2-14

\* Brake lever play ..... ☞2-15

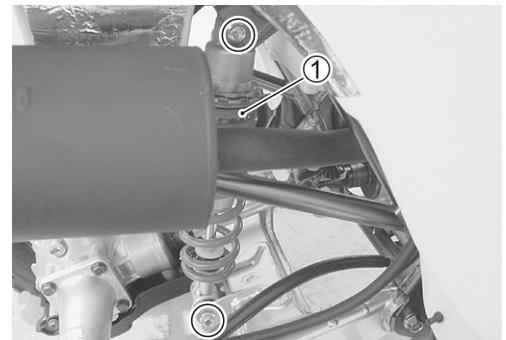
## REAR SHOCK ABSORBER CONSTRUCTION



### REMOVAL

Raise the rear wheel off the ground and support the vehicle with a jack or wooden block.

Remove the rear shock absorber ①.



### INSPECTION

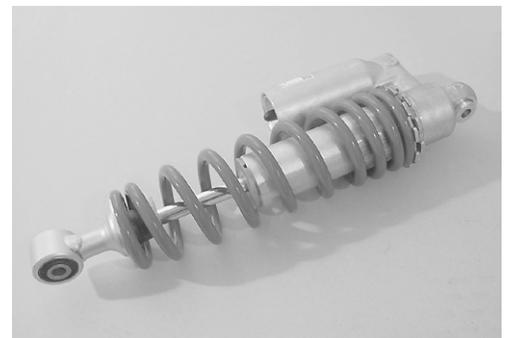
#### REAR SHOCK ABSORBER

Inspect the rear shock absorber body and rubber bushing for damage and leakage of oil.

If any defects are found, replace the rear shock absorber with a new one.

#### CAUTION

**Do not attempt to disassemble the rear shock absorber and to bleed out the nitrogen gas. It is unserviceable.**



**REAR SHOCK ABSORBER SPACER AND BEARING**

Remove the spacers and dust seals.

**CAUTION**

The removed dust seals must be replaced with new ones.

Inspect the spacers for any flaws or other damage. If any damages are found, replace the spacers with new ones.

Insert the spacer into the rear shock absorber bearing and then check the play by moving the spacer up and down.

If excessive play is noted, replace the bearing with a new one.

Remove the rear shock absorber bearing with the special tools.

 **09923-73210: Bearing remover**  
**09930-30104: Sliding shaft**

**CAUTION**

The removed bearing must be replaced with a new one.

**REASSEMBLY****REAR SHOCK ABSORBER**

Press the bearing into the rear shock absorber to the depth of 4 mm (0.157 in) with the special tool and suitable socket wrench.

**NOTE:**

When installing the rear shock absorber bearing, make sure that the stamped mark faces right side.

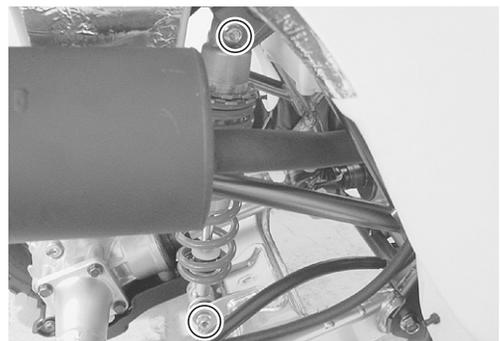
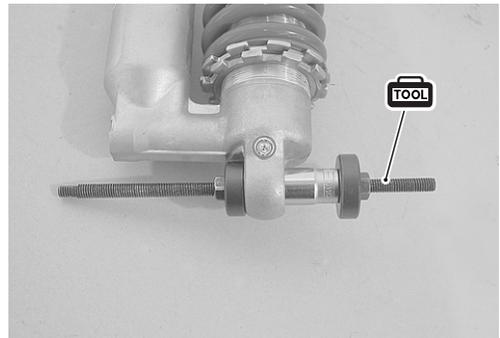
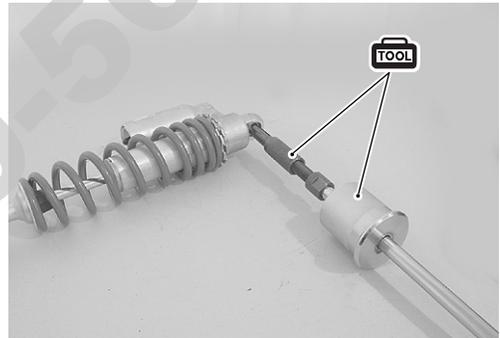
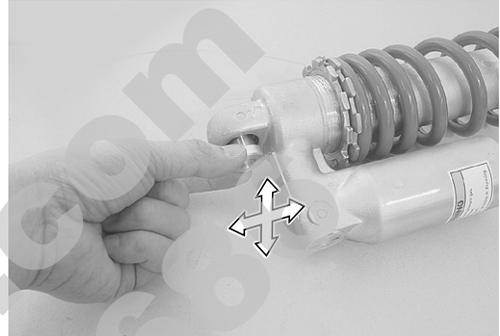
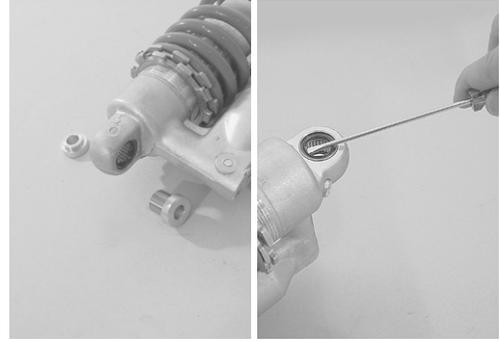
 **09924-84521: Bearing installer set**

**REMOUNTING**

Tighten the upper and lower shock absorber mounting nuts to the specified torque of each.

 **Rear shock absorber mounting nut (Upper):**  
**78 N•m (7.8 kgf-m, 55 lb-ft)**

**Rear shock absorber mounting nut (Lower):**  
**60 N•m (6.0 kgf-m, 43.0 lb-ft)**



## SUSPENSION SETTING

### SPRING PRE-LOAD ADJUSTMENT

The rear suspension spring pre-load is adjustable. This adjustment is performed by changing spring set length.

Loosen the locknut ①.

Adjust the spring set length by turning the adjuster ②.

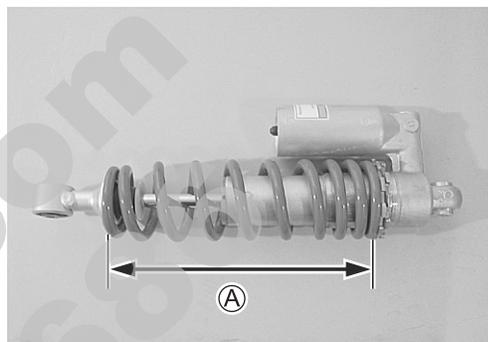
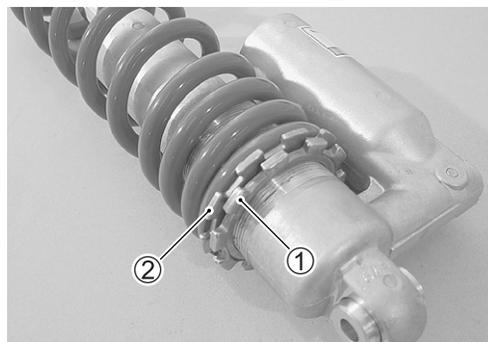
### SPRING SET LENGTH <sup>Ⓐ</sup>

STANDARD	MAXIMUM (SOFTTEST)	MINIMUM (STIFFEST)
232.5 mm (9.15 in)	235 mm (9.25 in)	227 mm (8.94 in)

### CAUTION

Do not set the spring length out of the specified range.

Tighten the locknut ①.



## REAR SHOCK ABSORBER DISPOSAL

### ⚠ WARNING

- \* The rear shock absorber unit contains high-pressure nitrogen gas.
- \* Mishandling can cause explosion.
- \* Keep away from fire and heat. High gas pressure caused by heat can cause an explosion.
- \* Release gas pressure before disposing.

### GAS PRESSURE RELEASE

Remove the valve cap.

Press the valve with a screwdriver to bleed out the nitrogen gas.

### ⚠ WARNING

- \* Releasing high pressure gas from the rear shock absorber unit can be hazardous. Never perform any servicing until the nitrogen gas pressure has been released from the rear shock absorber unit.
- \* When releasing the gas pressure, place a rag over the gas valve and use the tip of a screwdriver to press the valve. Do not use your finger to depress the gas valve, and be sure to direct the valve away from your face and body.
- \* Be sure to always wear eye protection when performing this procedure.



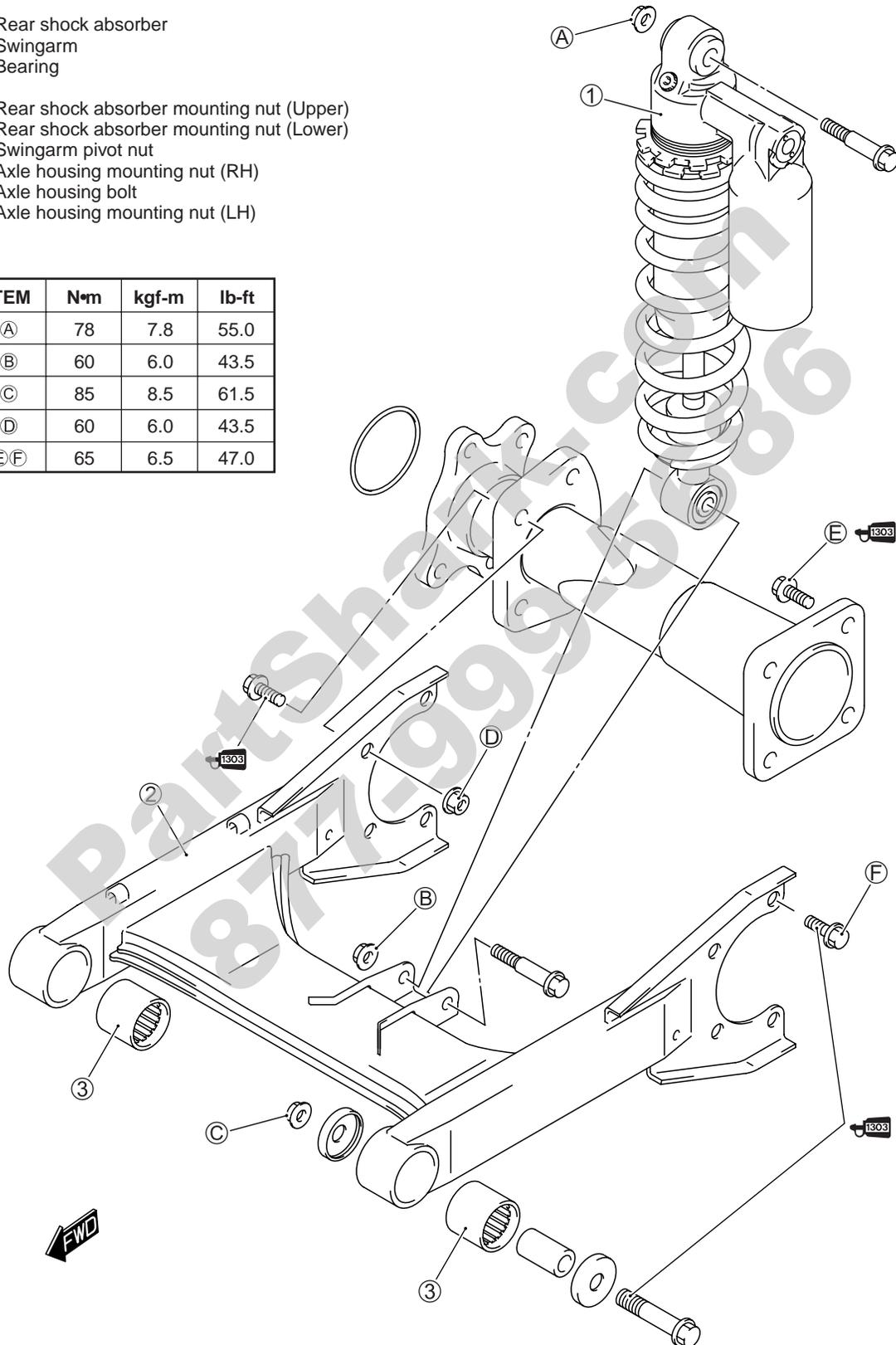
# REAR SUSPENSION CONSTRUCTION

- ① Rear shock absorber
- ② Swingarm
- ③ Bearing

- A Rear shock absorber mounting nut (Upper)
- B Rear shock absorber mounting nut (Lower)
- C Swingarm pivot nut
- D Axle housing mounting nut (RH)
- E Axle housing bolt
- F Axle housing mounting nut (LH)



ITEM	N•m	kgf-m	lb-ft
A	78	7.8	55.0
B	60	6.0	43.5
C	85	8.5	61.5
D	60	6.0	43.5
E/F	65	6.5	47.0



## REMOVAL

Remove the footrest mud guards. (☞ 7-7)

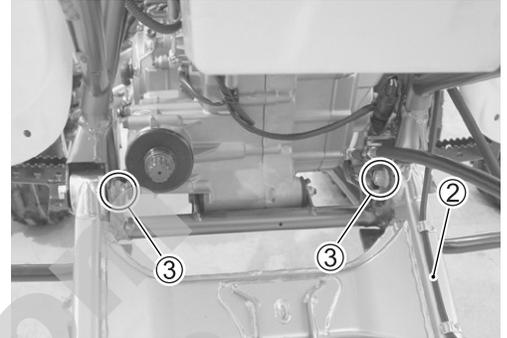
Remove the rear drive gear case assembly. (☞ 4-3)

Remove the rear shock absorber. (☞ 7-53)

Disconnect the brake breather hose ② from the swingarm.

Loosen the swingarm pivot bolts/nuts ③.

Remove the swingarm.



## INSPECTION AND DISASSEMBLY

### REAR SHOCK ABSORBER

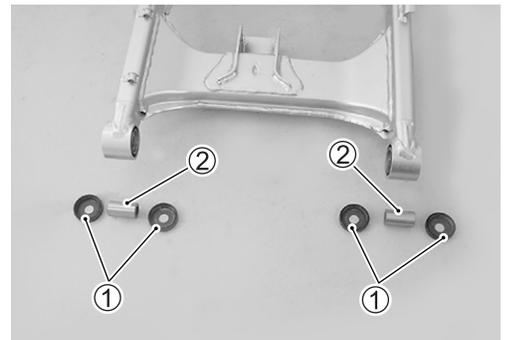
Inspect the rear shock absorber. (☞ 7-53)



### SPACER

Remove the dust covers ① and spacers ② from the swingarm.

Inspect the spacers ② for any flaws or other damage. If any defects are found, replace the spacer with a new one.



### SWINGARM

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



**SWINGARM PIVOT BEARING**

Insert the spacer into the swingarm pivot bearings and then check the play by moving the spacer up and down.

If excessive play is noted, replace the bearing with a new one.

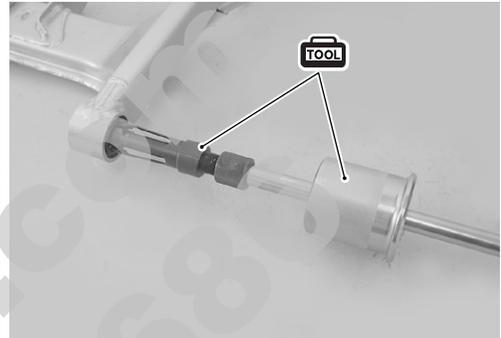


Remove the swingarm pivot bearing with the special tools.

**TOOL** 09923-74510: Bearing remover  
09930-30104: Sliding shaft

**CAUTION**

The removed bearing must be replaced with a new one.

**REASSEMBLY****SWINGARM PIVOT BEARING AND DUST SEAL**

Press the bearing into the swingarm pivot to the depth of 5.0 mm (0.197 in) from the outside with the special tool and suitable socket wrench.

**NOTE:**

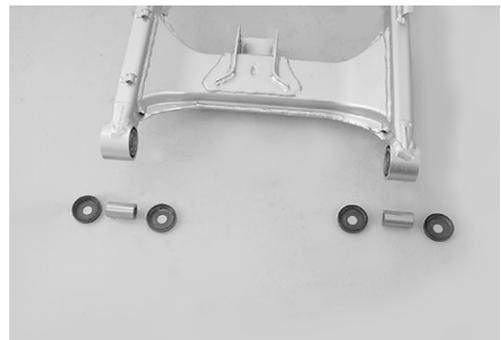
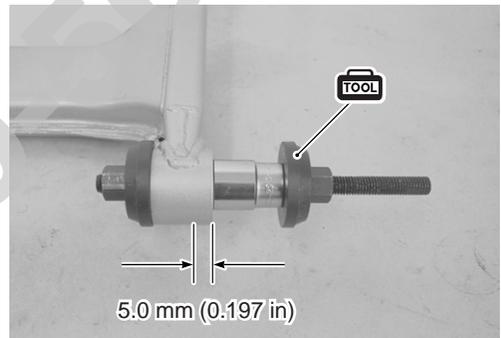
When installing the swingarm pivot bearing, make sure that the stamped mark faces outside.

**TOOL** 09924-84510: Bearing installer set

Apply SUZUKI SUPER GREASE to the bearings, spacers and lips of the dust covers.

**FAH** 99000-25030: SUZUKI SUPER GREASE A (USA)  
99000-25010: SUZUKI SUPER GREASE A (Others)

Install the spacers and dust covers to the swingarm.



## REMOUNTING

Remount the rear swingarm and suspension in the reverse order of removal. Pay attention to the following points:

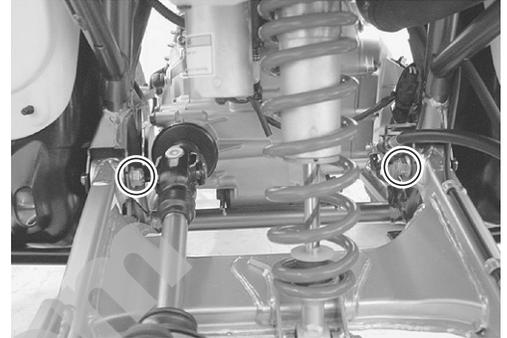
Apply **THREAD LOCK SUPER** to the swingarm pivot bolts. Install the swingarm pivot bolts and upper and lower shock absorber mounting bolts temporarily.

Tighten the swingarm pivot nut to the specified torque.

 **1303** 99000-32030: **THREAD LOCK SUPER 1303 (USA)**

 **1322** 99000-32110: **THREAD LOCK SUPER 1322 (Others)**

 **Swingarm pivot nut: 85 N•m (8.5 kgf-m, 61.5 lb-ft)**



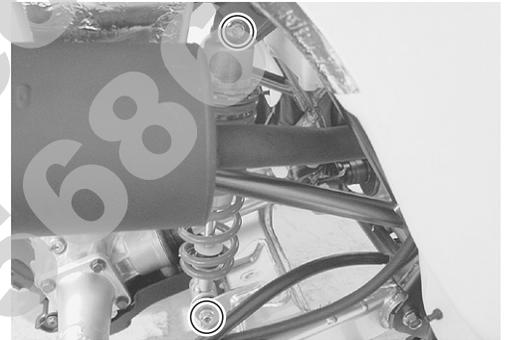
Tighten the upper and lower shock absorber mounting nuts to the specified torque of each.

 **Rear shock absorber mounting nut (Upper):**

**78 N•m (7.8 kgf-m, 55 lb-ft)**

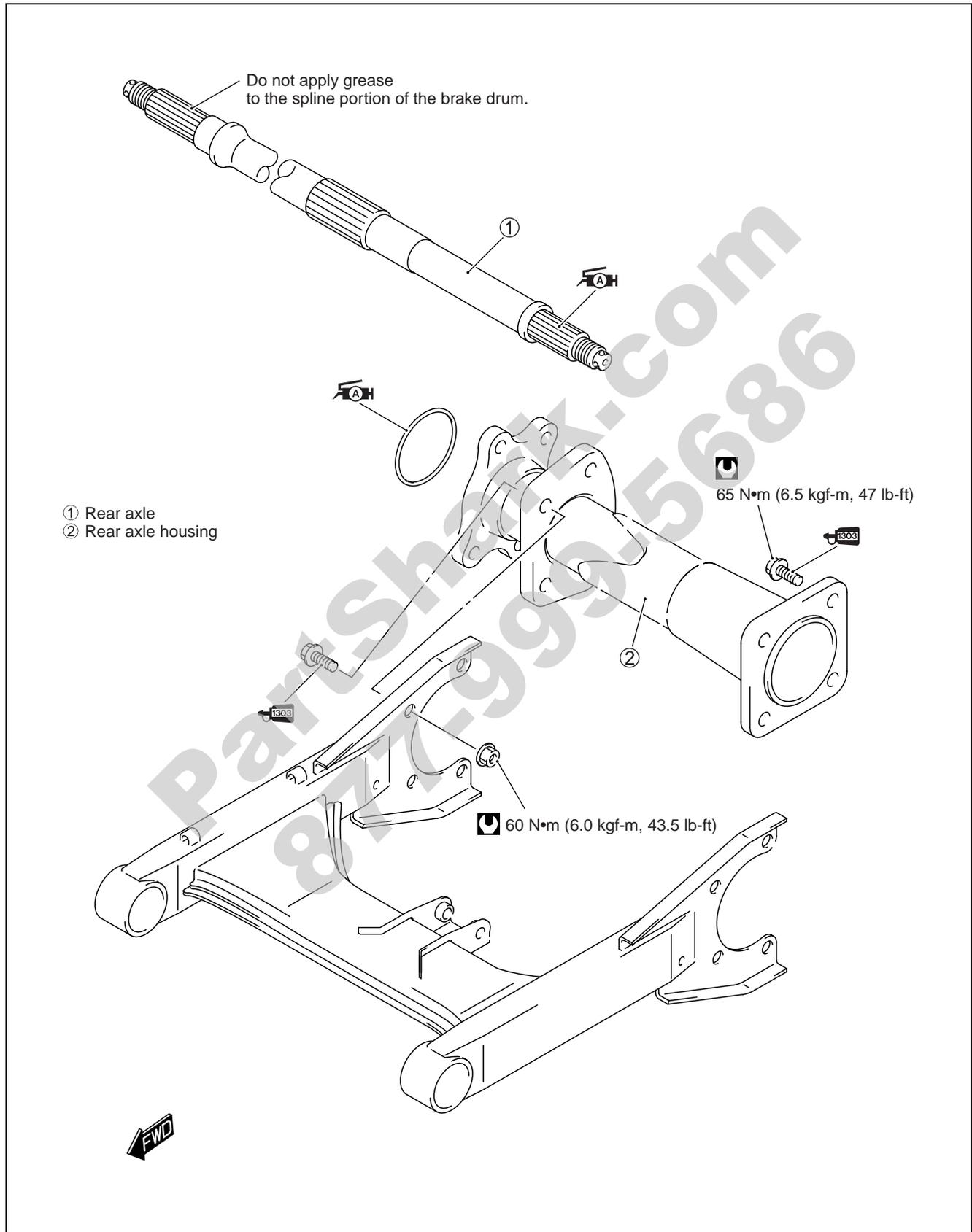
**Rear shock absorber mounting nut (Lower):**

**60 N•m (6.0 kgf-m, 43.0 lb-ft)**



PartShark.com  
877-999-4681

# REAR AXLE CONSTRUCTION



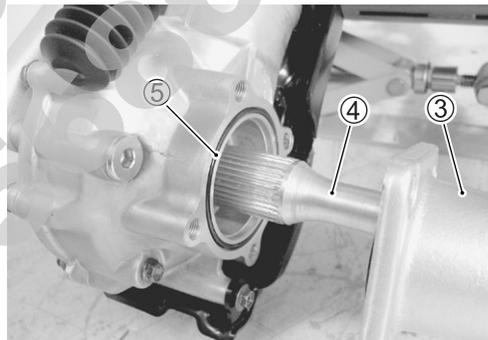
## REMOVAL

- Remove the rear wheels. (☞ 7-11)
- Remove the rear wheel hubs. (☞ 7-11)
- Remove the rear brake. (☞ 7-46)

Remove the rear axle housing/final gear case bolts ① and rear axle housing set bolts/nuts ②.



Remove the rear axle housing ③ and rear axle ④.  
Remove the O-ring ⑤.



## INSPECTION

### REAR AXLE SHAFT

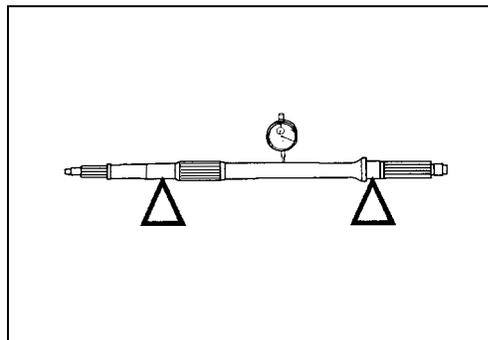
Inspect the rear axle shaft visually for distortion or damages. If any damages are found, replace the rear axle shaft with a new one.



Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

- TOOL** 09900-20607: Dial gauge (1/100 mm)
- 09900-20701: Magnetic stand
- 09900-21304: V-block set (100 mm)

- DATA** Axle shaft runout
- Service Limit: 3.0 mm (0.12 in)



## REAR AXLE HOUSING

Inspect the rear axle housing for distortion or damages. If any damages are found, replace the rear axle housing with a new one.



## REASSEMBLY AND REMOUNTING

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

Apply SUZUKI SUPER GREASE to the rear drive case spline.

-  **99000-25030: SUZUKI SUPER GREASE A (USA)**
- 99000-25010: SUZUKI SUPER GREASE A (Others)**

Install new O-ring to the rear drive gear case.

### NOTE:

*Before installing the O-ring, apply grease to it.*

Install the rear axle shaft and rear axle housing to the rear drive gear case.

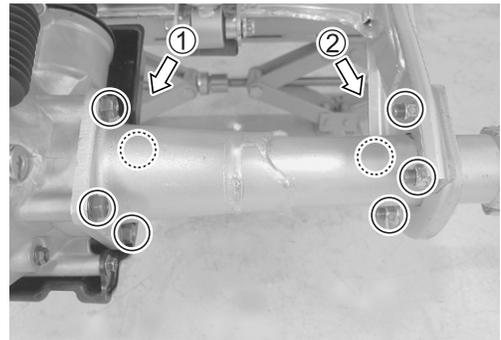
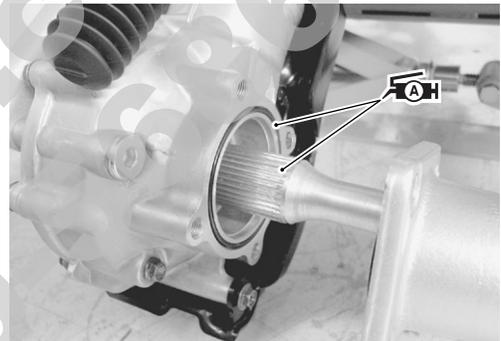
Apply THREAD LOCK SUPER to the rear axle housing/final gear case bolts ① and rear axle housing set bolts ②.

Tighten the rear axle housing/final gear case bolts ① and rear axle housing set nuts ② to the specified torque of each.

-  **1303 99000-32030: THREAD LOCK SUPER 1303 (USA)**
-  **1322 99000-32110: THREAD LOCK SUPER 1322 (Others)**

 **Rear axle housing/final gear case bolt:**  
65 N•m (6.5 kgf-m, 47.0 lb-ft)

**Rear axle housing set nut:**  
60 N•m (6.0 kgf-m, 43.5 lb-ft)



# REAR WHEEL, REAR BRAKE, REAR SUSPENSION, REAR SWINGARM AND REAR AXLE SHAFT REASSEMBLING INFORMATION

ITEM	N·m	kgf·m	lb·ft
①	85	8.5	61.5
②	78	7.8	56.0
③	60	6.0	43.5
④	60	6.0	43.5
⑤	50	5.0	36.0
⑥	138	13.8	96.6
⑦	11	1.1	8.0
⑧	60	6.0	43.5
⑨	65	6.5	47.0

4 mm (0.16 in)

5 mm (0.20 in)

12 mm (0.47 in)

25 mm (0.98 in)

5 mm (0.20 in)

Do not apply grease.

Bend the cotter pin securely.

Apply grease to the sliding part.

11 N·m (1.1 kgf·m, 8.0 lb·ft)

Washer installing direction

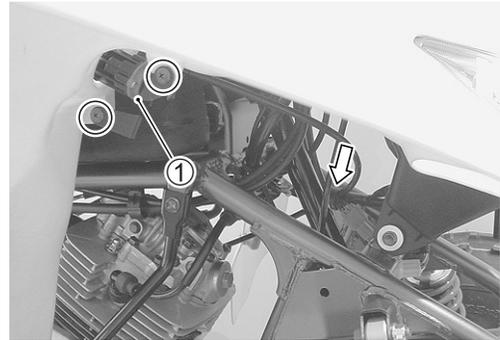
$\alpha = \beta$

## REVERSE LOCK RELEASE CABLE

### REMOVAL

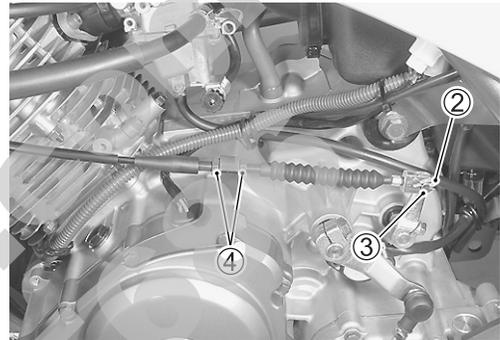
Remove the reverse lock release knob ① from the front fender.

Open the fixed clamp.

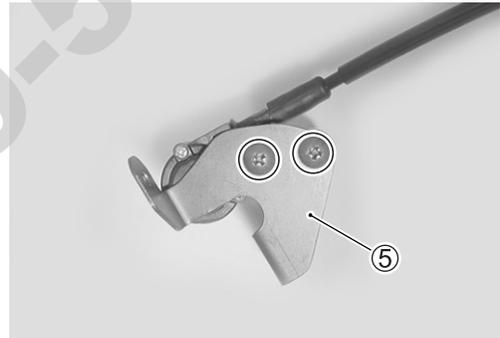


Remove the clip ② and pin ③.

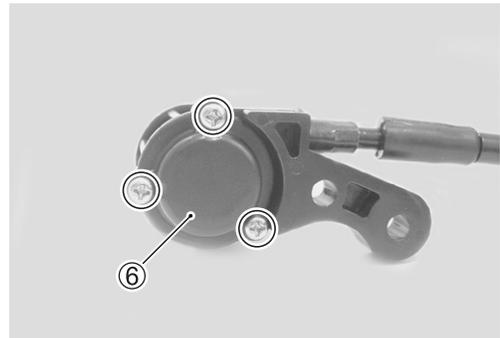
Loosen the locknuts ④ and remove the reverse lock release cable.



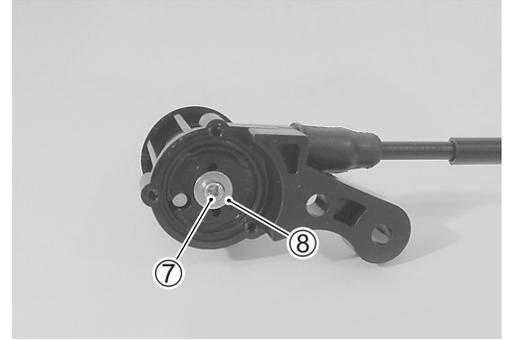
Remove the bracket ⑤.



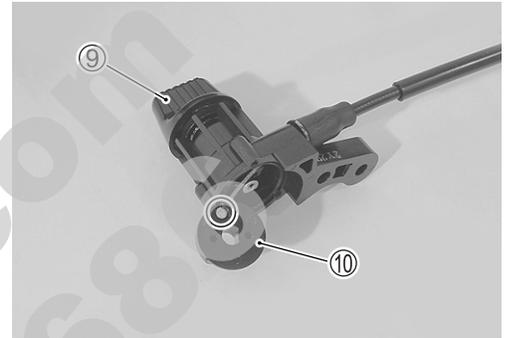
Remove the cap ⑥.



Remove the screw ⑦ and washers ⑧.



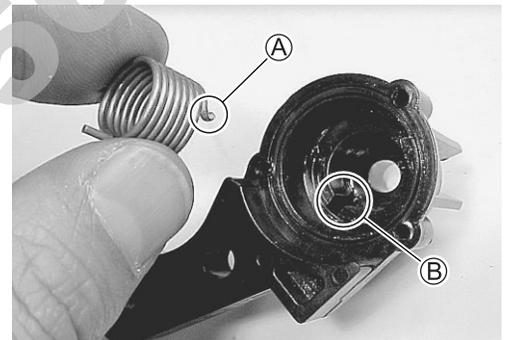
Remove the knob ⑨.  
Disconnect the cable by removing the rotor ⑩.



## REMountING

Remount the reverse lock release cable in the reverse order of removal. Pay attention to the following points:

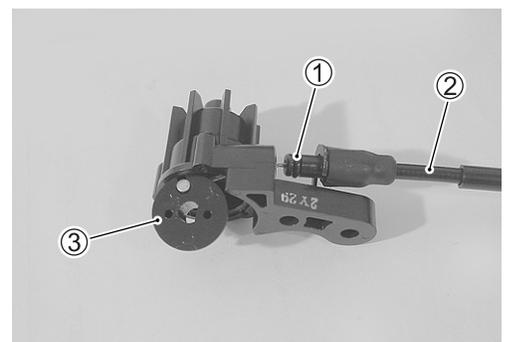
Install the spring so that the spring end ① matches the groove ② on the housing.



Apply SUZUKI SUPER GREASE to the O-ring ①.

**99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**

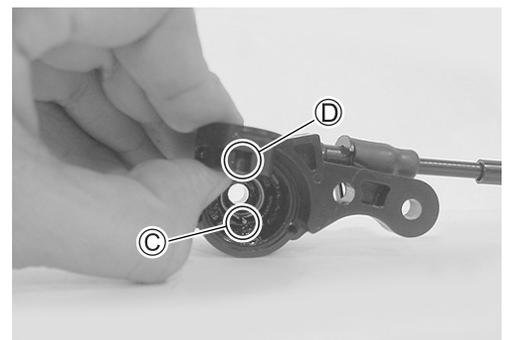
Install the O-ring ① to the reverse lock release cable ②.  
Connect the cable to the rotor ③ through the hole of the housing.



### NOTE:

\* When installing the rotor, hook the spring end ③ on the concave portion ④ of the rotor.

\* Make sure that the reverse lock release cable is routed correctly.



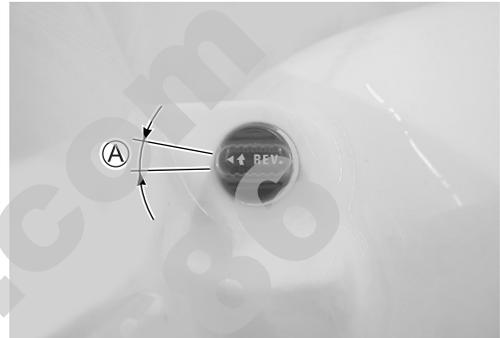
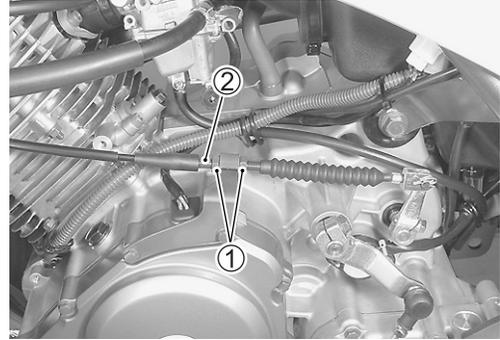
### CABLE PLAY ADJUSTMENT

After installing the reverse lock release cable, adjust the cable play.

Loosen the locknuts ①.

Slide the adjuster ② until the cable play at the reverse lock release knob ③ reaches 1 – 2 mm (0.04 – 0.08 in).

Tighten the locknuts ① securely.



After adjustment, be sure to check for reverse lock function.

PartShark.com  
877-999-5680

# ELECTRICAL SYSTEM

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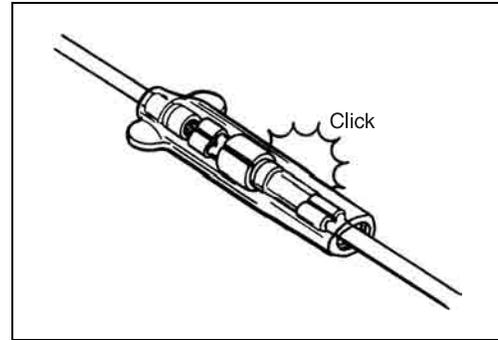
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<b>CONNECTORS .....</b>	<b>8- 2</b>
<b>COUPLERS .....</b>	<b>8- 2</b>
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## CAUTIONS IN SERVICING CONNECTORS

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.

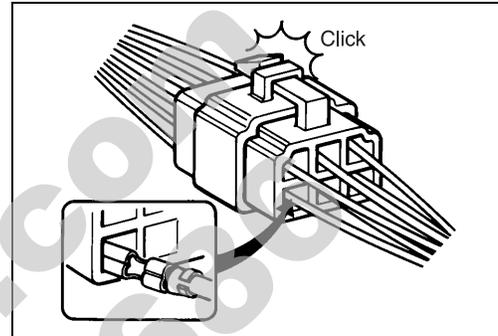


## COUPLERS

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.



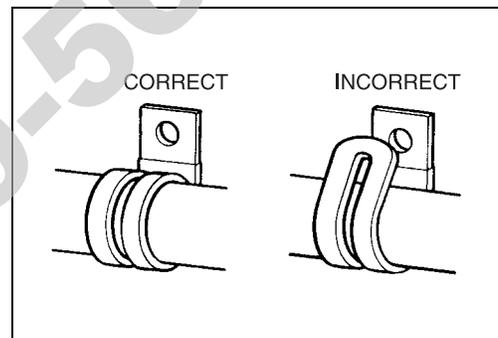
## CLAMPS

Refer to the WIRING HARNESS ROUTING section for proper clamping procedures. (9-11 to -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.

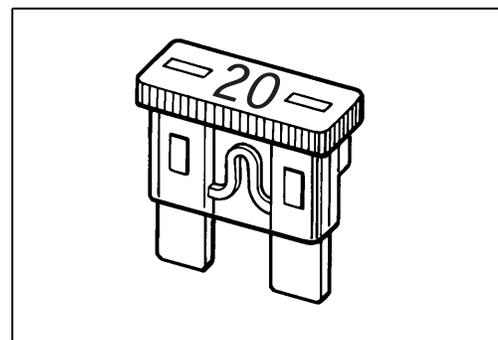


## FUSES

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.

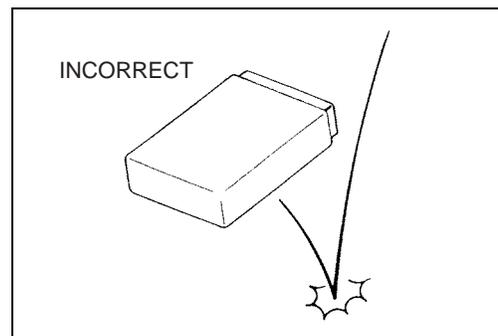
Do not use any substitutes for the fuse (e.g., wire).



## SEMI-CONDUCTOR EQUIPPED PARTS

Do not drop any part that contains a semi-conductor (e.g., CDI unit, regulator/rectifier).

When inspecting the part, follow the inspection instructions carefully. Neglecting proper procedures may cause this part to be damaged.



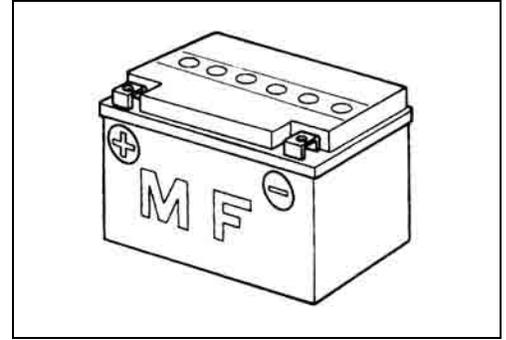
## BATTERY

The MF battery used in this vehicle 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

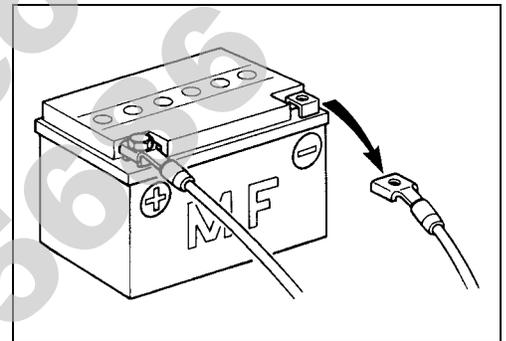
When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the  $\ominus$  battery lead wire, first.

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.

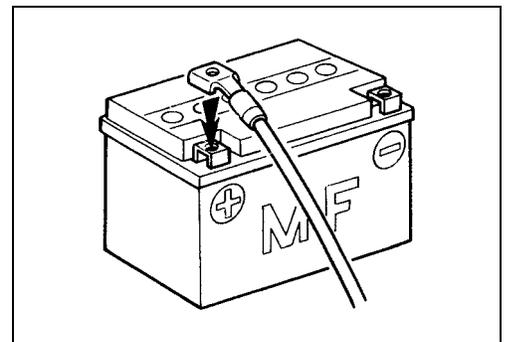
After connecting the battery, apply a light coat of grease to the battery terminals.

Install the cover over the  $\oplus$  battery terminal.



## WIRING PROCEDURE

Properly route the wire harness according to the WIRING HARNESS ROUTING section. (9-11 to -14)



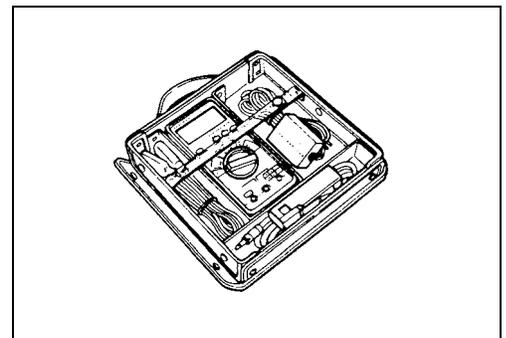
## USING THE MULTI CIRCUIT TESTER

Properly use the multi circuit tester  $\oplus$  and  $\ominus$  probes. Improper use can cause damage to the vehicle and tester.

If the voltage and current values are not known, begin measuring in the highest range.

When measuring the resistance, make sure no voltage is applied. If voltage is applied, the tester will be damaged.

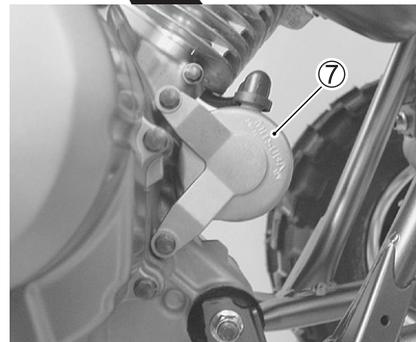
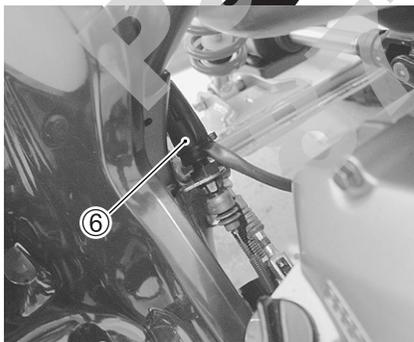
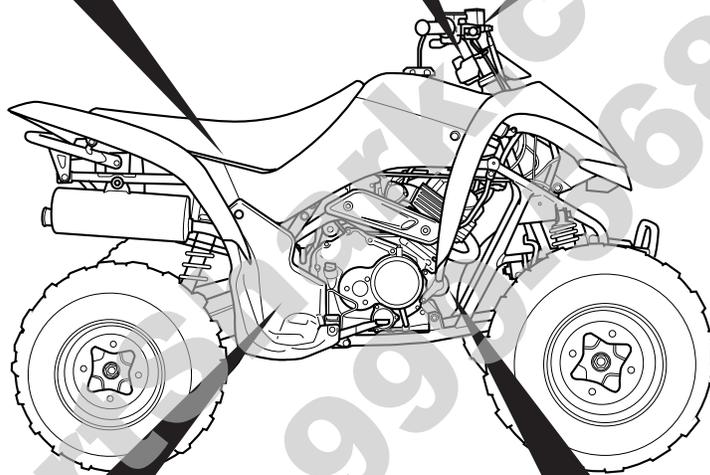
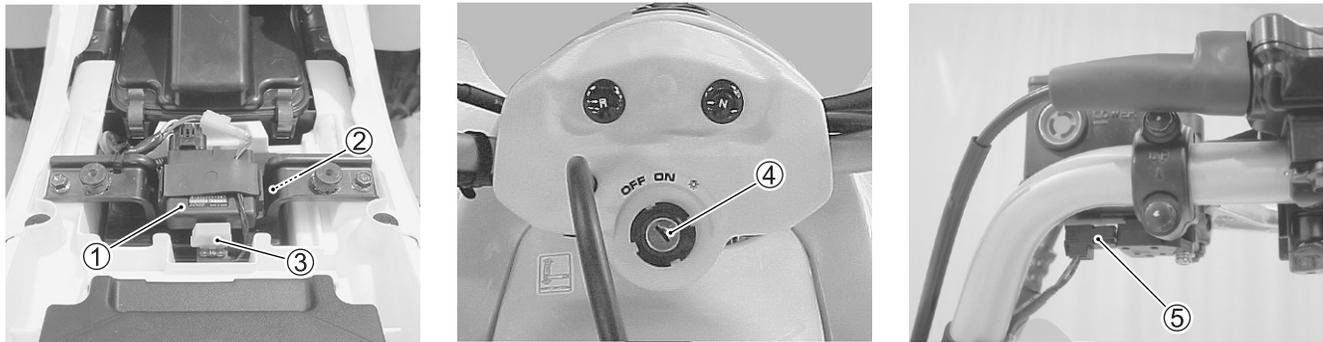
After using the tester, be sure to turn the switch to the OFF position.



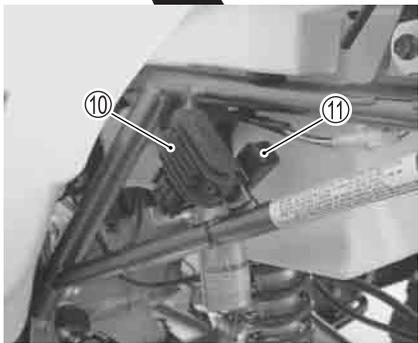
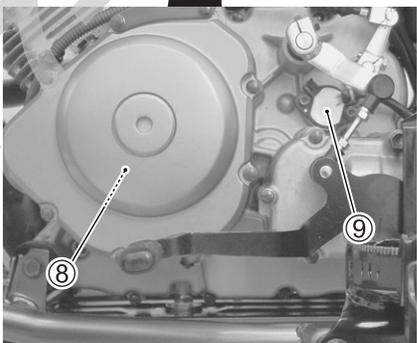
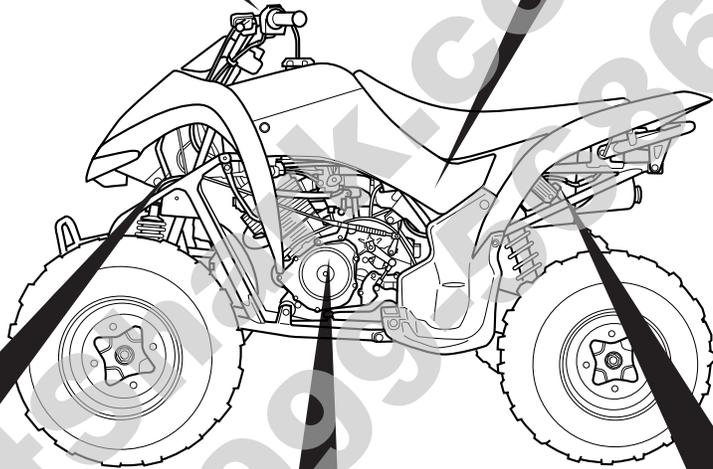
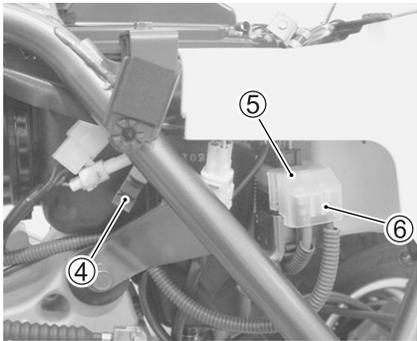
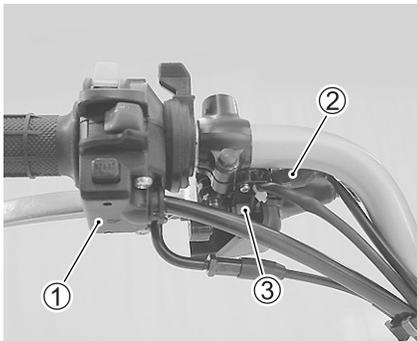
### CAUTION

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

## LOCATION OF ELECTRICAL COMPONENTS



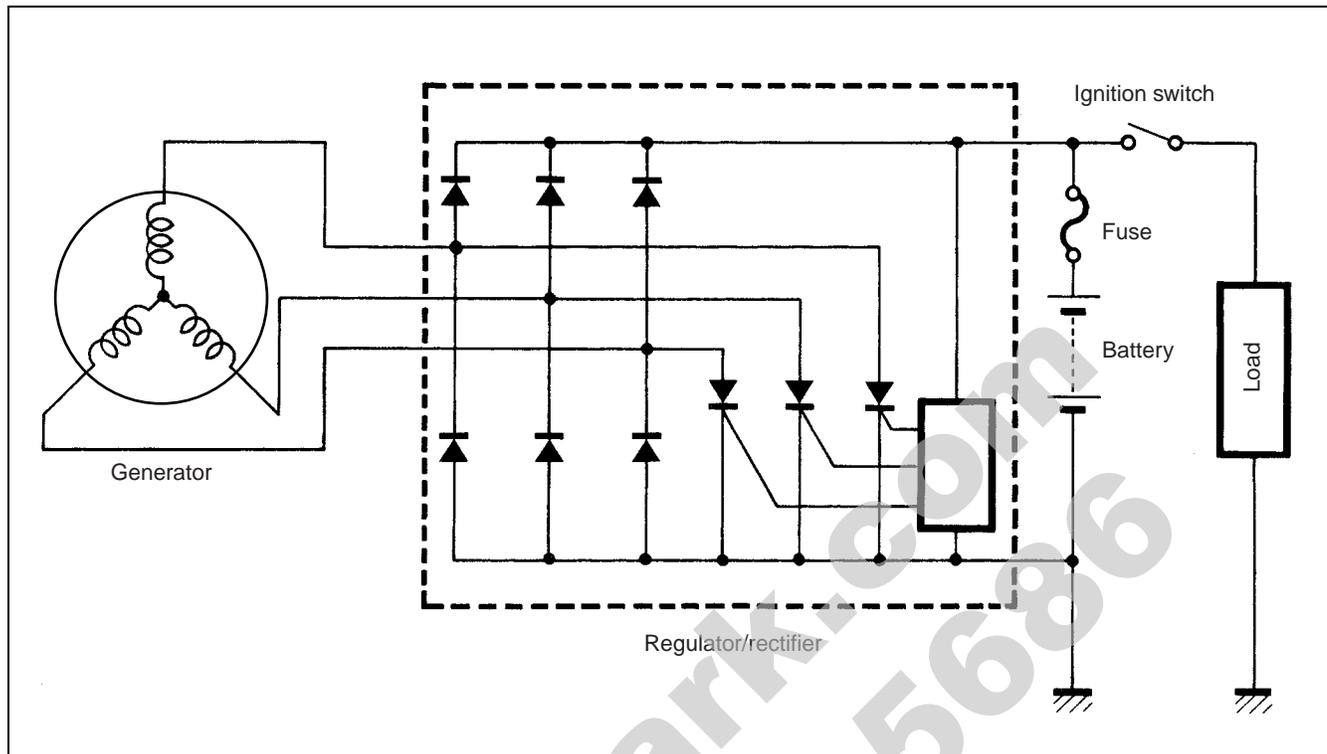
- ① CDI unit
- ② Battery
- ③ Fuse
- ④ Ignition switch
- ⑤ Front brake light switch
- ⑥ Rear brake light pedal switch
- ⑦ Starter motor



- ① Handlebar switch (L)
- ② Rear brake light switch
- ③ Parking brake switch
- ④ Neutral switch diode
- ⑤ Fuse
- ⑥ Starter relay

- ⑦ Ignition coil
- ⑧ Generator
- ⑨ Neutral switch
- ⑩ Regulator/rectifier
- ⑪ Neutral relay

## CHARGING SYSTEM



## TROUBLE SHOOTING

**Battery runs down quickly.**

### Step 1

1) Check accessories which use excessive amounts of electricity.

Are accessories being installed ?

YES	Remove accessories
NO	Go to Step 2.

### Step 2

1) Check the battery for current leaks. (☞ 8-8)

Is the battery for current leaks OK ?

YES	Go to Step 3.
NO	Short circuit of wire harness Faulty electrical equipment

### Step 3

1) Measure the regulated voltage between the battery terminals. (☞ 8-8)

Is the battery charging of voltage OK ?

YES	Faulty battery Abnormal driving condition
NO	Go to Step 4.

<Continued on next page>

**Step 4**

1) Measure the resistance of the generator coil. (☞ 8-9)

Is the resistance of generator coil OK ?

YES	Go to Step 5.
NO	Faulty generator coil or disconnected lead wires

**Step 5**

1) Measure the generator no-load voltage. (☞ 8-9)

Is the generator no-load voltage OK ?

YES	Go to Step 6.
NO	Faulty generator

**Step 6**

1) Inspect the regulator/rectifier. (☞ 8-10)

Is the regulator/rectifier OK ?

YES	Go to Step 7.
NO	Faulty regulator/rectifier

**Step 7**

1) Inspect the wirings.

Are the wirings OK ?

YES	Faulty battery
NO	Short circuit of wire harness Poor contact of couplers

**Battery overcharge**

Faulty regulator/rectifier

Faulty battery

Poor contact of generator lead wire coupler

## INSPECTION

### BATTERY CURRENT LEAKAGE

Remove the seat. (☞ 7-5)

Turn the ignition switch to the OFF position.

Disconnect the  $\ominus$  battery lead wire ①.

Measure the current between the  $\ominus$  battery terminal and the  $\ominus$  battery lead wire using the multi circuit tester. If the reading exceeds the specified value, leakage is evident.

**DATA** Battery current (leak): Under 1.0 mA

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

**TESTER** Tester knob indication: Current (---, 20 mA)

#### CAUTION

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

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

### REGULATED VOLTAGE

Remove the seat. (☞ 7-5)

Remove the battery holder ①.

Shift the transmission to the neutral position.

Start the engine, turn the ignition switch to LIGHT (⊙) and the dimmer switch to HI and run the engine at 5 000 r/min.

Measure the DC voltage between the  $\oplus$  and  $\ominus$  battery terminals using the multi circuit tester. If the voltage is not within the specified value, inspect the generator and regulator/rectifier. (☞ 8-9 to -10)

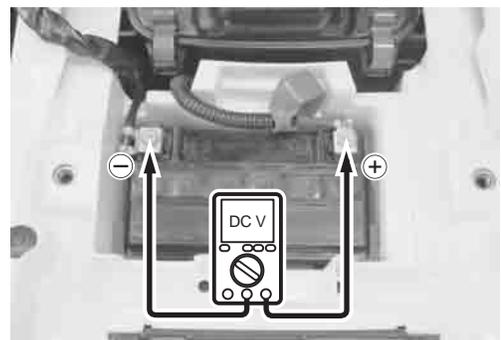
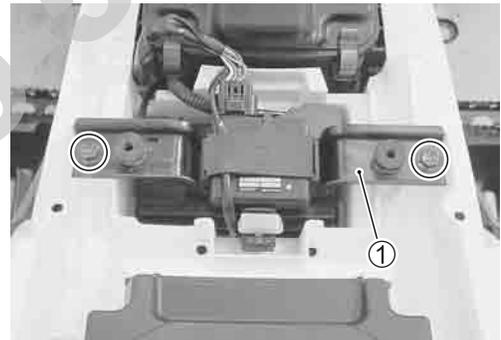
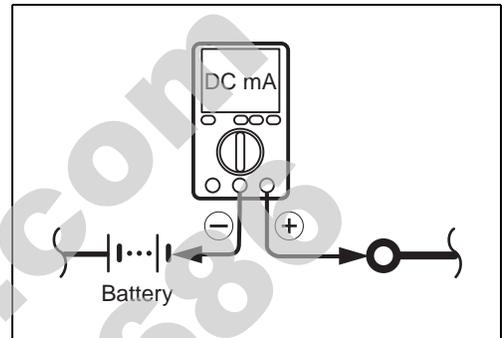
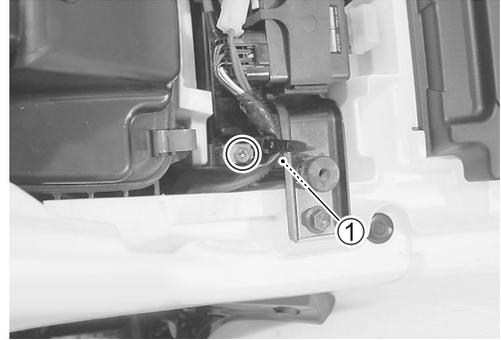
#### NOTE:

When making this test, be sure that the battery is in fully-charged condition.

**DATA** Regulated voltage: 14.0 15.5 V at 5 000 r/min

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

**TESTER** Tester knob indication: Voltage (---)



**GENERATOR COIL RESISTANCE**

Remove the left fuel tank side cover. (☞ 7-5)

Disconnect the generator lead wire coupler.

Measure the resistance among the three lead wires.

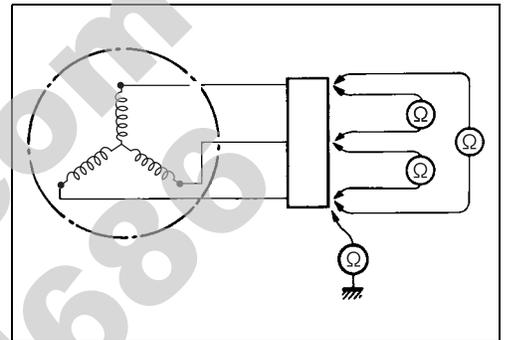
If the resistance is not specified value, replace the stator coil with a new one.

Also, check that the generator core is insulated.

**DATA** Generator coil resistance: 0.5 1.2  $\Omega$   
(Yellow Yellow)  
 $\infty \Omega$  (Yellow Ground)

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

**Tester knob indication: Resistance ( $\Omega$ )**

**GENERATOR NO-LOAD PERFORMANCE**

Remove the left fuel tank side cover. (☞ 7-5)

Disconnect the generator lead wire coupler.

Shift the transmission to the neutral position.

Start the engine and run it at 5 000 r/min.

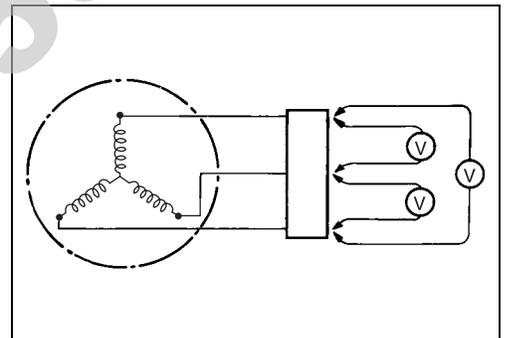
Measure the AC voltage among the lead wires using the multi circuit tester.

If the voltage is under the specified value, replace the AC generator with a new one.

**DATA** Generator no-load performance (when engine is cold):  
65 V and more (AC) at 5 000 r/min

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

**Tester knob indication: Voltage (~)**



**REGULATOR/RECTIFIER**

Remove the regulator/rectifier.

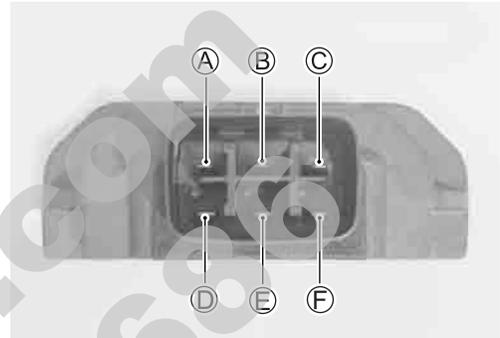


Measure the voltage between the terminals using the multi circuit tester, as indicated in the table below.

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

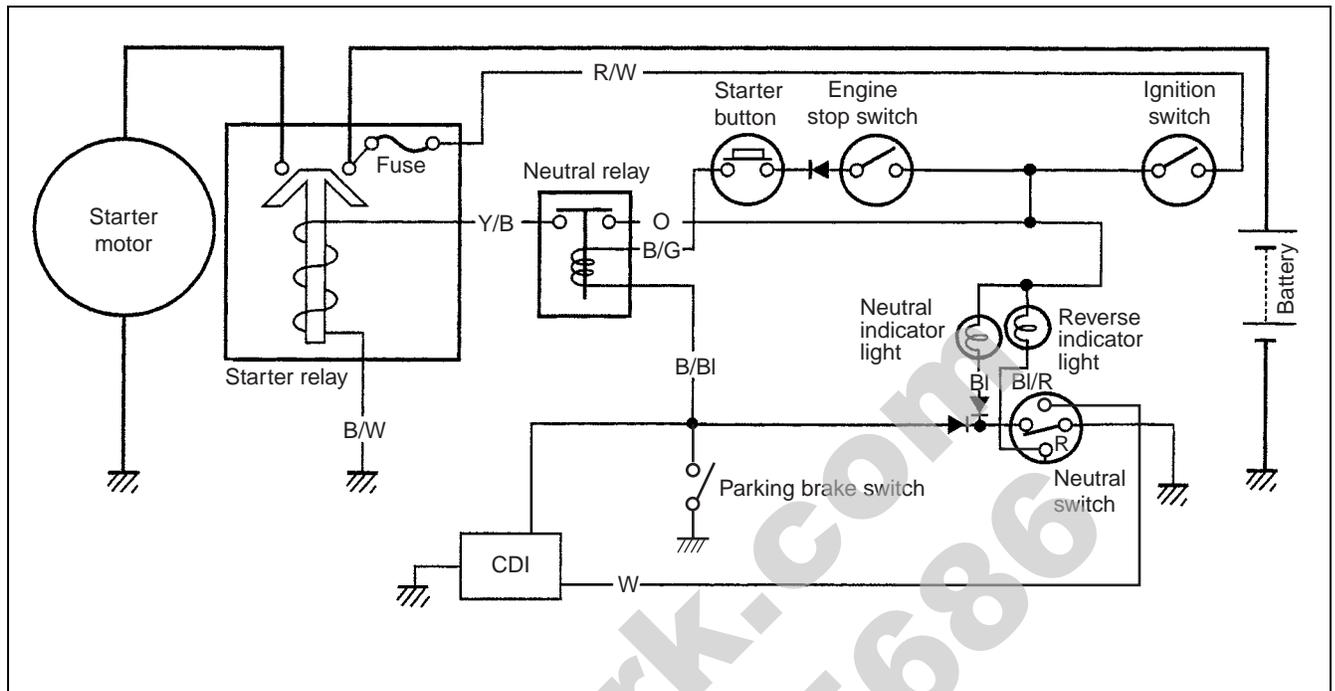
		⊕ Tester probe									
		(A)	(B)	(C)		(D)	(E)		(F)		
⊖ Tester probe	(A)		*	0.5	1.2	0.4	0.7	0.4	0.7	0.4	0.7
	(B)	*		*		*		*		*	
	(C)	*	*			*		*		*	
	(D)	*	*	0.4	0.7			*		*	
	(E)	*	*	0.4	0.7	*				*	
	(F)	*	*	0.4	0.7	*		*			

\* 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.

## STARTER SYSTEM



## TROUBLE SHOOTING

**Starter motor will not run.**

### Step 1

- 1) The transmission is in neutral. Turn on the ignition switch with the engine stop switch in the RUN position.
- 2) Listen for a click from the starter relay when the starter button is pushed.  
Is a click sound heard?

YES	Go to Step 2.
NO	Go to Step 3.

### Step 2

- 1) Check if the starter motor runs when its terminal is connected to the ⊕ battery terminal. (Do not use thin wire because a large amount of current flows.)  
Does the starter motor run?

YES	Faulty starter relay Loose or disconnected starter motor lead wire
NO	Faulty starter motor

<Continued on next page>

**Step 3**

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

Is the voltage OK ?

YES	Go to Step 4.
NO	Faulty ignition switch Faulty engine stop switch Faulty neutral relay Faulty neutral switch Faulty starter button Poor contact of connector Open circuit in wire harness

**Step 4**

1) Check the starter relay. (☞ 8-15)

Is the starter relay OK ?

YES	Poor contact of the starter relay
NO	Faulty starter relay

**NOTE:**

*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 parking lever grasp firmly.*

2) Check the parking brake switch. (☞ 8-26)

Is the parking brake switch OK ?

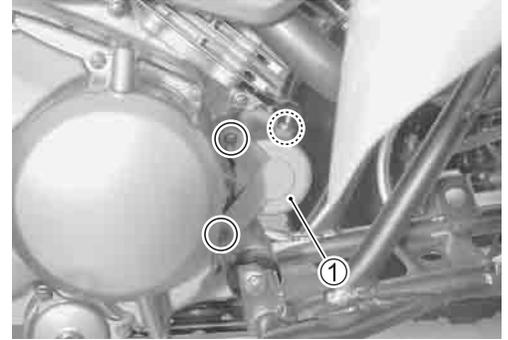
YES	Open circuit in wire harness Poor contact of connector
NO	Faulty parking brake switch

**Engine does not turn though the starter motor runs.**

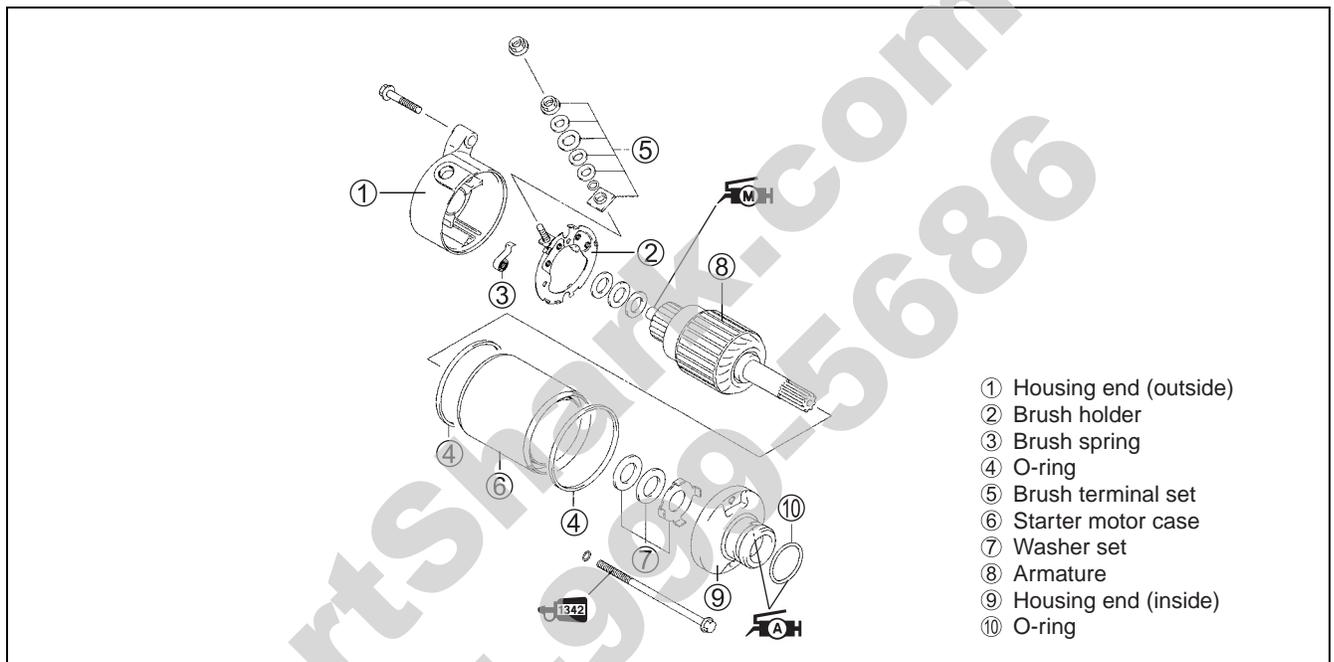
Faulty starter clutch. (☞ 3-40)

## STARTER MOTOR REMOVAL AND DISASSEMBLY

Remove the starter motor ①.



Disassembly the starter motor, as shown.

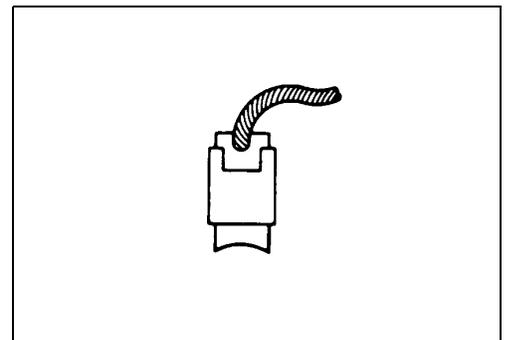


## STARTER MOTOR INSPECTION

### CARBON BRUSHES

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

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



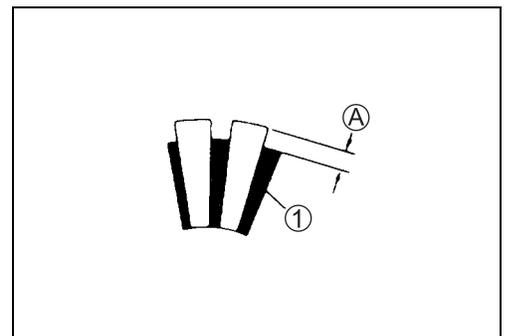
### COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut ①.

If abnormal wear is found, replace the armature with a new one.

If the commutator surface is discolored, polish it with #400 sandpaper and wipe it using a clean, dry cloth.

If there is no undercut, scrape out the insulator ① with a saw blade.



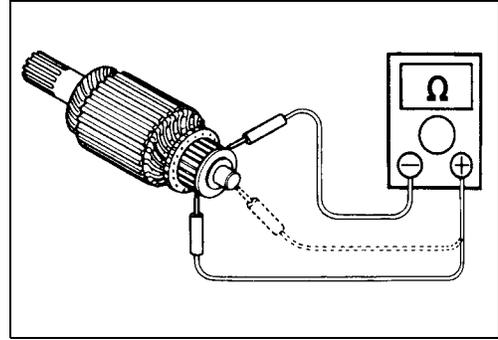
**ARMATURE COIL INSPECTION**

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.

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

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

**OIL SEAL**

Check the seal lip for damage or leakage. If any damages are found, replace the starter motor with a new one.

**STARTER MOTOR REASSEMBLY AND REMOUNTING**

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

**CAUTION**

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

Apply SUZUKI SUPER GREASE to the lip of the oil seal.

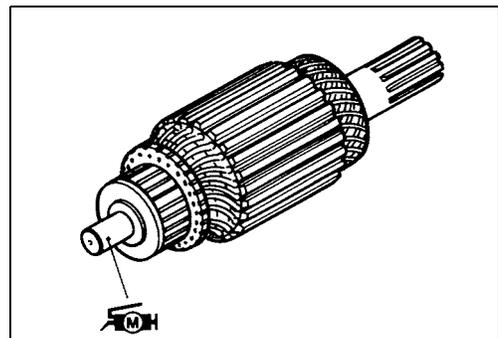
**HAH** 99000-25030: SUZUKI SUPER GREASE A (USA)

99000-25010: SUZUKI SUPER GREASE A (Others)



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

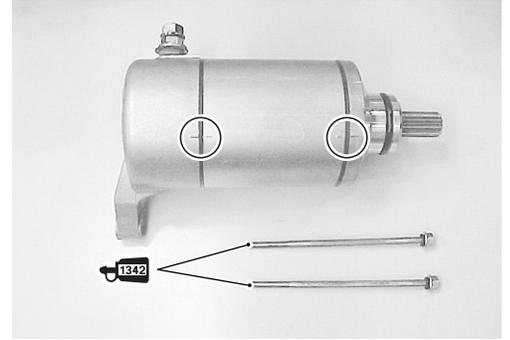
**MH** 99000-25140: SUZUKI MOLY PASTE



Align the match marks on the starter motor case with the match mark on the housing end.

Apply a small quantity of THREAD LOCK to the starter motor housing bolts and tighten it securely.

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



Apply SUZUKI SUPER GREASE to the O-ring.

 **99000-25030: SUZUKI SUPER GREASE A (USA)**  
**99000-25010: SUZUKI SUPER GREASE A (Others)**

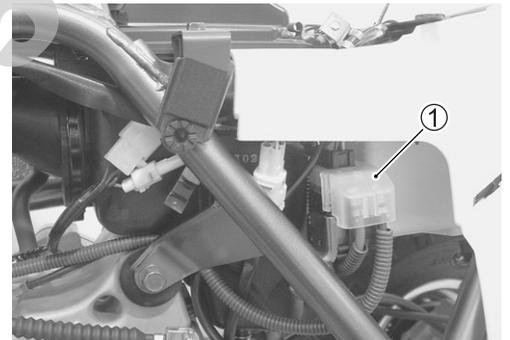


## STARTER RELAY INSPECTION

Remove the left fuel tank side cover. (☞ 7-5)

Disconnect the  $\ominus$  battery lead wire from the battery terminal. (☞ 8-8)

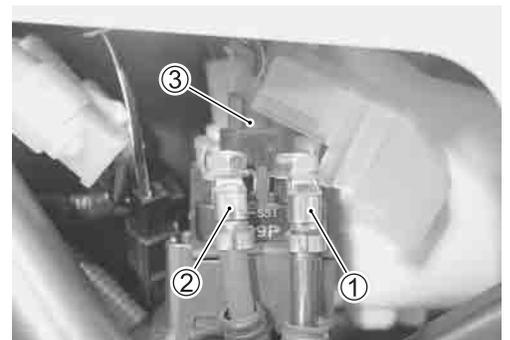
Open the starter relay cover ①.



Disconnect the starter motor lead wire ① and battery lead wire ② from the starter relay.

Remove the starter relay from the frame.

Disconnect the starter relay coupler ③.



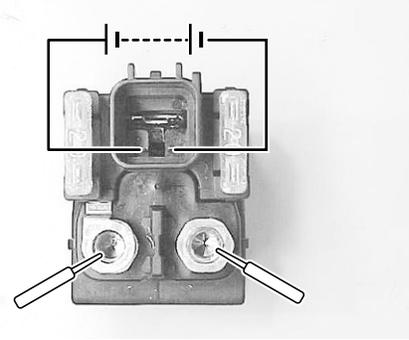
Apply 12 V to the terminals and check for continuity between the positive and negative terminals using the multi circuit tester. If the starter relay clicks and continuity is found, the relay is OK.

**TOOL** 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.  
This may overheat and damage the relay coil.**



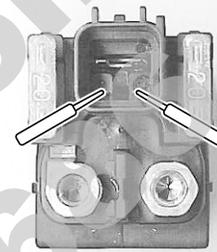
Measure the relay coil resistance between the terminals using the multi circuit tester. If the resistance is not within the specified value, replace the starter relay with a new one.

**DATA** Starter relay resistance

Standard: 3 6  $\Omega$

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

**Tester knob indication: Resistance ( $\Omega$ )**



## NEUTRAL RELAY INSPECTION

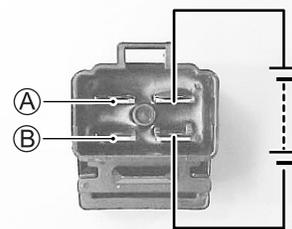
Remove the neutral relay.



First check the insulation between Ⓐ and Ⓑ terminals with the tester. Then apply 12 V to terminals as shown and check the continuity between Ⓐ and Ⓑ. If there is no continuity, replace the neutral relay with a new one.

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

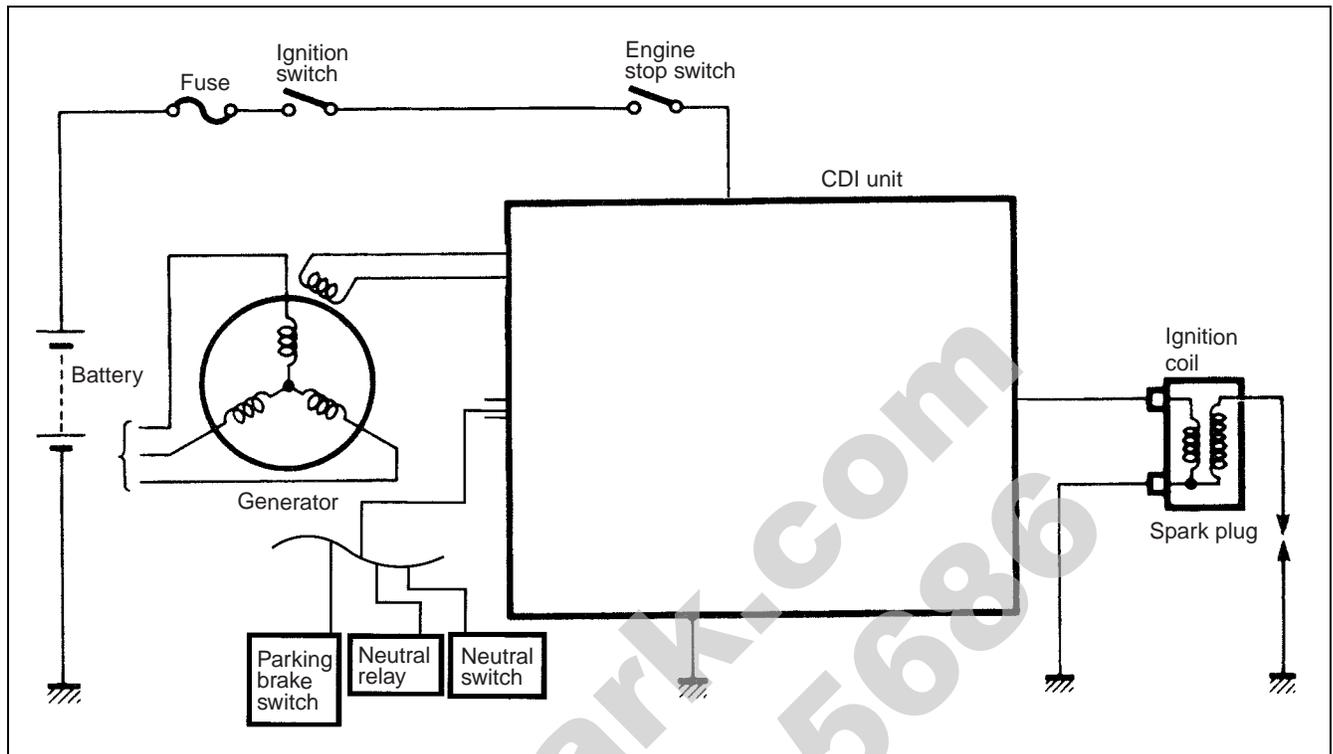
**Tester knob indication: Continuity set (•••)**



## PARKING BRAKE SWITCH

( 8-26)

## IGNITION SYSTEM



## TROUBLESHOOTING

### NOTE:

\* Check that the transmission is in neutral and the engine stop switch is in the RUN position. Check that the fuse is not blown and the battery is fully-charged before diagnosing.

### No spark or poor spark

#### Step 1

1) Check the ignition system couplers for poor connections.

Is there connection in the ignition switch couplers ?

YES	Go to Step 2.
NO	Poor connection of couplers

#### Step 2

1) Measure the battery voltage between input lead wires (O/W and B/W) at the CDI with the ignition switch in the ON position.

Is the voltage OK ?

YES	Go to Step 3.
NO	Faulty ignition switch Faulty engine stop switch Broken wire harness or poor connection of related circuit couplers

<Continued on next page>

**Step 3**

1) Measure the ignition coil primary peak voltage. (☞ 8-19)

**NOTE:**

*This inspection method is applicable only with the multi circuit tester and the peak volt adaptor.*

Is the peak voltage OK ?

YES	Go to Step 4.
NO	Go to Step 5.

**Step 4**

1) Inspect the spark plug. (☞ 2-7)

Are the spark plug OK ?

YES	Poor connection of the spark plug cap Go to Step 5.
NO	Faulty spark plug

**Step 5**

1) Inspect the ignition coil. (☞ 8-20)

Are the ignition coil OK ?

YES	Go to Step 6.
NO	Faulty ignition coil

**Step 6**

1) Measure the pickup coil peak voltage and its resistance. (☞ 8-20 to -21)

**NOTE:**

*The pickup coil peak voltage inspection is applicable only with the multi circuit tester and peak volt adaptor.*

Are the peak voltage and its resistance OK ?

YES	Faulty CDI Open circuit in wiring harness. Poor connection of ignition couplers
NO	Faulty pickup coil

## INSPECTION

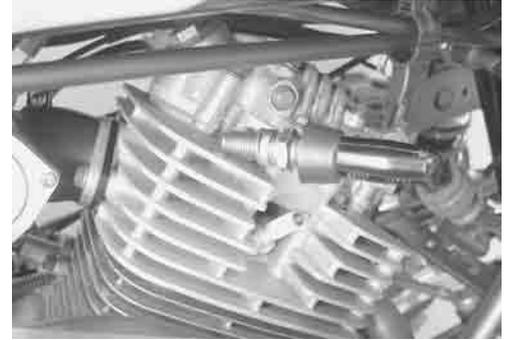
### IGNITION COIL PRIMARY PEAK VOLTAGE

Disconnect the spark plug cap.

Connect a new spark plug to the spark plug cap and ground it to the cylinder head.

#### NOTE:

Make sure that the spark plug cap and spark plug are connected properly and the battery is fully-charged.



Measure the ignition coil primary peak volt using the multi circuit tester in the following procedure:

Connect the multi circuit tester with the peak voltage adaptor as follows.

- ⊕ Probe: Black/White lead wire
- ⊖ Probe: White/Blue lead wire

#### NOTE:

Do not disconnect the ignition coil primary wire.



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

#### CAUTION

**When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.**

Shift the transmission to the neutral position and turn the ignition switch to the ON position.

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.

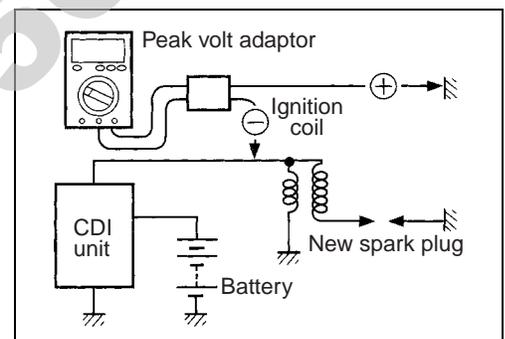
**DATA** Ignition coil primary peak voltage: 120 V and more

**Tester knob indication:** Voltage (---)

#### WARNING

**While testing, do not touch the tester probes and spark plug to prevent receiving an electric shock.**

If the voltage is lower than the standard values, inspect the ignition coil. (↗ 8-20)



## IGNITION COIL RESISTANCE

Disconnect the ignition coil lead wires and spark plug cap.

Measure the ignition coil resistance in both the primary and secondary windings using the multi circuit tester. If the resistance in both the primary and secondary windings is close to the specified values, the windings are in sound condition.



### **DATA** Ignition coil resistance

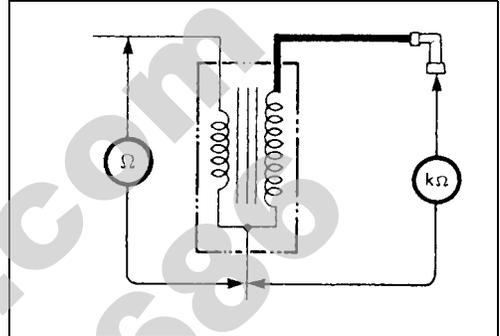
Primary : 0.05 1.0  $\Omega$  (+ Terminal - Terminal)

Secondary : 10.5 19.0 k $\Omega$

(Spark plug cap + Terminal)

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

**TESTER** Tester knob indication: Resistance ( $\Omega$ )



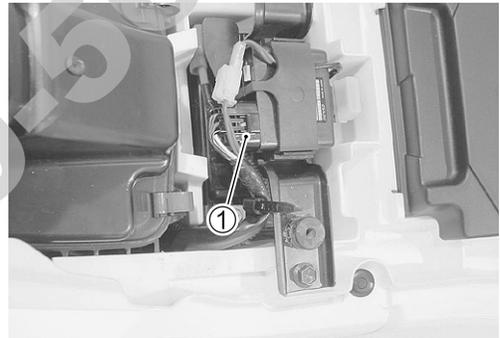
## PICKUP COIL PEAK VOLTAGE

**NOTE:**

Make sure all of the couplers are connected properly.

Remove the seat. (➔ 7-5)

Disconnect the CDI unit coupler ①.



Measure the pickup coil peak voltage in the following procedure:

Connect the multi circuit tester with the peak volt adaptor as follows.

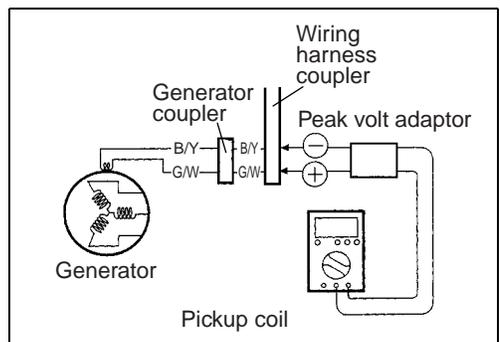
Pickup coil: + Probe...Green/White lead wire

- Probe...Black/Yellow lead wire

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

### **CAUTION**

When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.



Shift the transmission to the neutral position, turn the ignition switch to the ON position.

Press the starter button and allow the engine to turn for a few seconds, and then measure the pickup coil peak voltage.

Repeat the above procedure a few times and measure the highest pickup coil peak voltage.

**DATA** Pickup coil peak voltage: 4.0 V and more

**Tester knob indication: Voltage (---)**

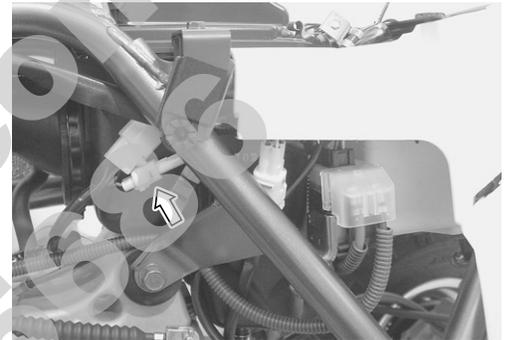
If the peak voltage measured on the CDI unit coupler is lower than the standard value, measure the peak voltage on the generator coupler as follows:

Remove the left fuel tank side cover. (☞7-5)

Disconnect the generator coupler and connect the multi circuit tester with the peak volt adaptor as follows.

Pickup coil: ⊕ Probe...Green/White lead wire

⊖ Probe...Blue/Yellow lead wire

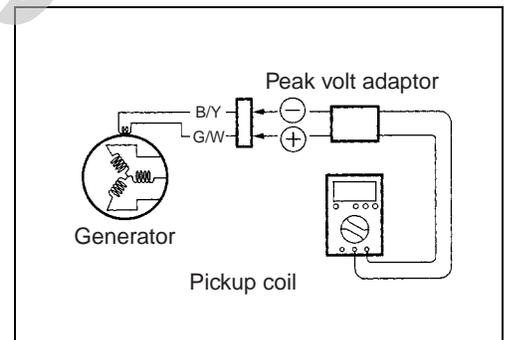


Measure the pickup coil peak voltage in the same manner as on the CDI unit coupler.

**DATA** Pickup coil peak voltage: 4.0 V and more

**Tester knob indication: Voltage (---)**

If the peak voltage on the generator coupler is within the specification, but on the CDI unit coupler is not within specification, replace the wire harness with a new one. If both peak voltages are out of specification, replace the generator with a new one.



### PICKUP COIL RESISTANCE

Remove the left fuel tank side cover. (☞7-5)

Disconnect the generator coupler.

Measure the resistance between the lead wires using the multi circuit tester. If the resistance is not within the specified value, stator coil must be replaced.

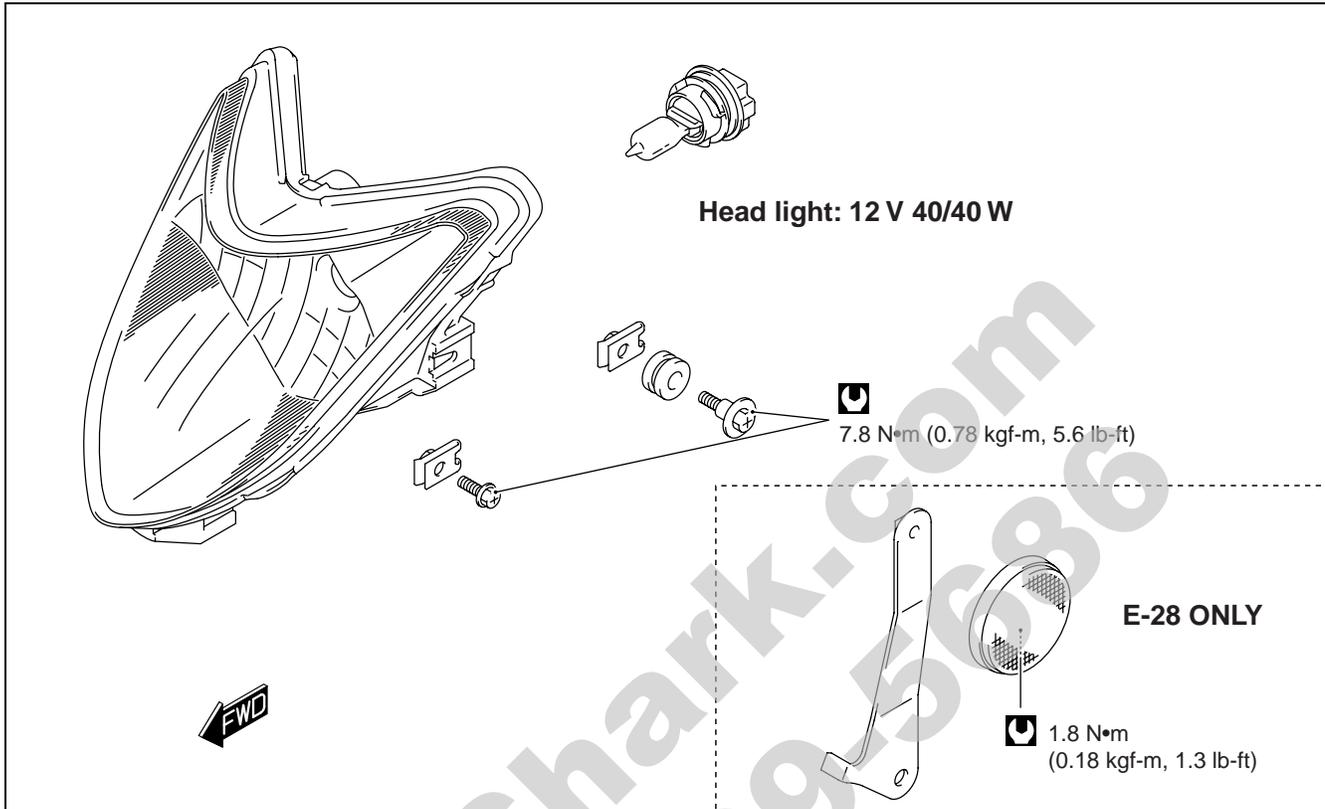
**DATA** Pickup coil resistance: 80 155 Ω (B/Y G/W)

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

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



## LAMPS HEADLIGHT



### 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.

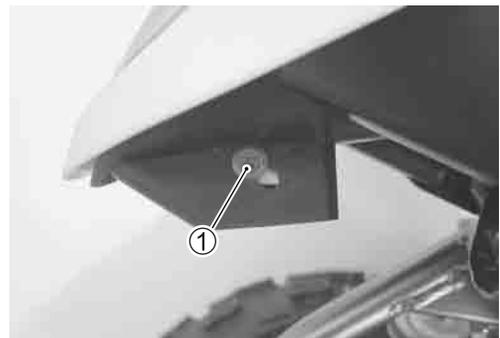
### HEADLIGHT BULB REPLACEMENT

- Disconnect the coupler.
- Remove the bulb.
- Install new bulb in the reverse order of removal.

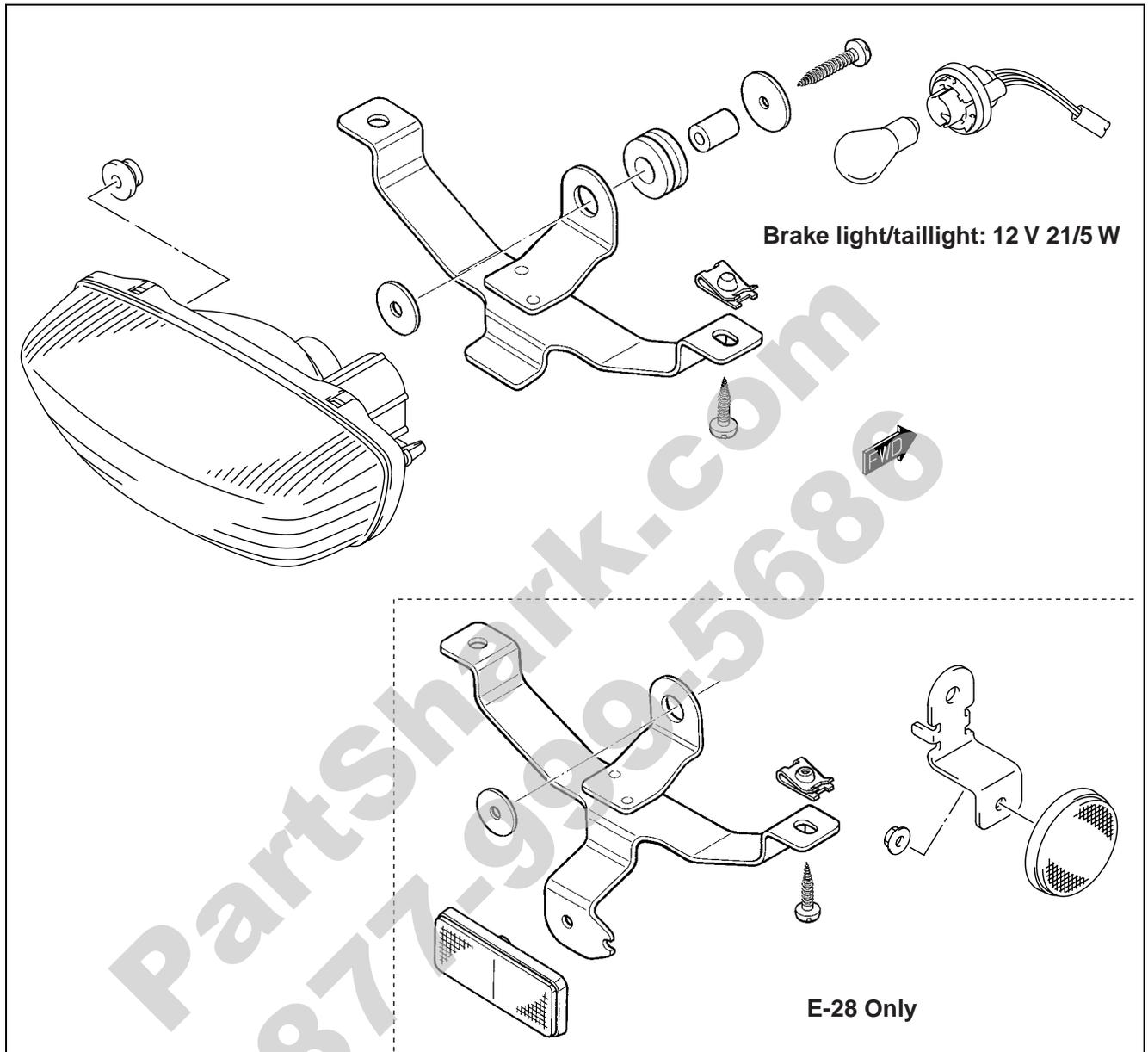


### HEADLIGHT BEAM ADJUSTMENT

- Adjust the headlight vertical beam by loosening the screw ①.



## BRAKE LIGHT/TAILLIGHT



### 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.

### BULB REPLACEMENT

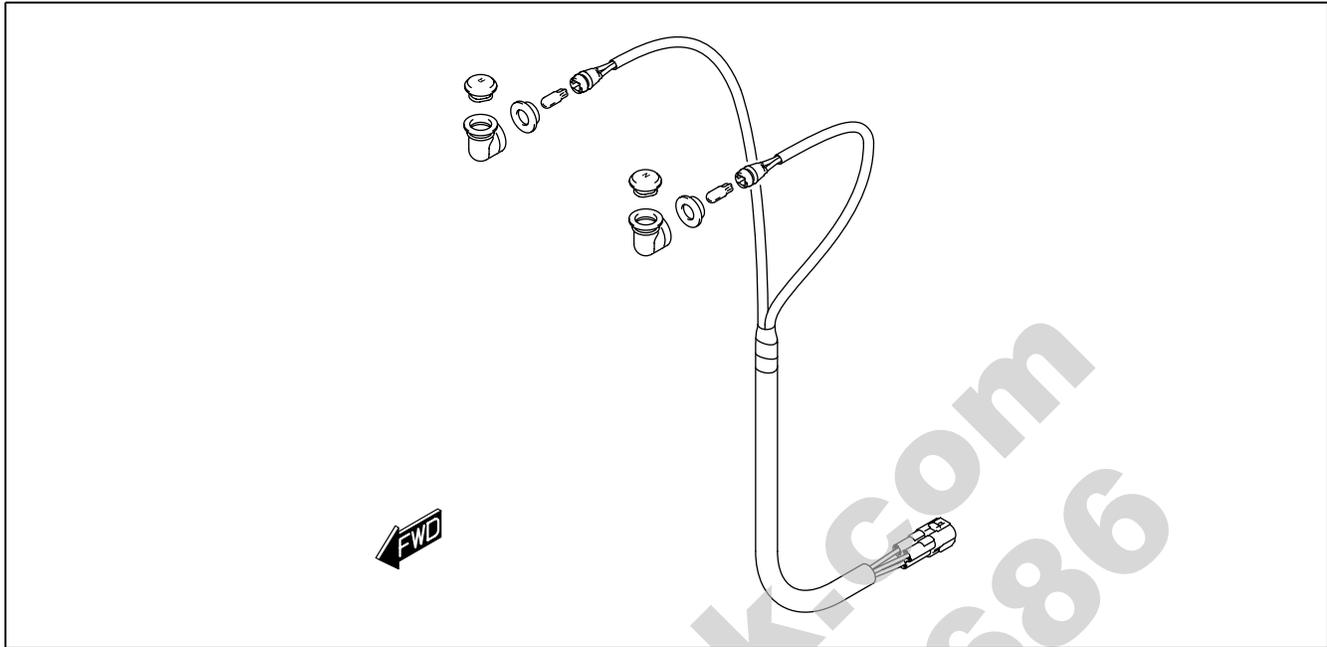
Disconnect the socket.

Remove the bulb.

Install new bulb in the reverse order of removal.



# INDICATOR LIGHT



## INSPECTION

Steering stem head cover

ITEM	+	-
RE: Reverse indicator light	O/B	BI/R
NU: Neutral indicator light	O/B	BI/B

**WIRE COLOR**  
 BI/B : Blue with Black tracer  
 BI/R : Blue with Red tracer  
 O/B : Orange with Blue tracer

## INDICATOR LIGHT POSITION

Steering stem head cover

Neutral indicator light (BI/B & O/B)

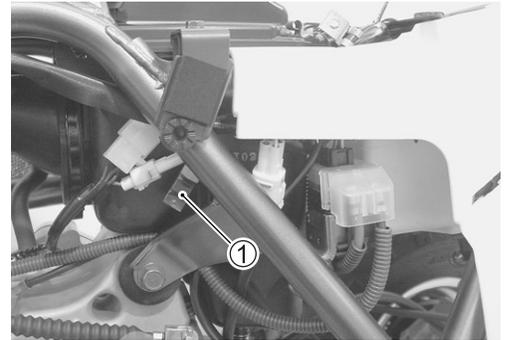
Reverse indicator light (BI/R & O/B)

**WIRE COLOR**  
 BI/B : Blue with Black tracer  
 BI/R : Blue with Red tracer  
 O/B : Orange with Blue tracer

## DIODE

Remove the fuel tank left side cover. (☞ 7-5)

Remove the neutral switch diode ①.



Measure the voltage between the terminals using the multi circuit tester as indicated in the table below.

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

 **Tester knob indication: Diode test (↔)**

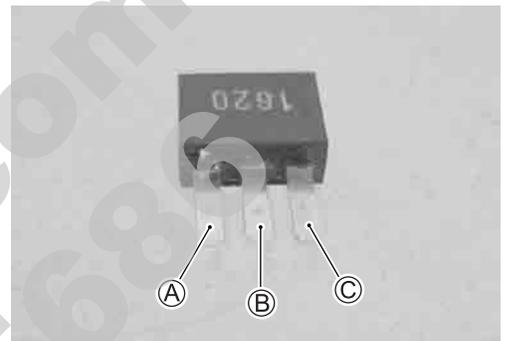
Unit: V

		⊕ Tester probe		
		Ⓐ	Ⓑ	Ⓒ
⊖ Tester probe	Ⓐ		*	*
	Ⓑ	0.4 0.6		0.4 0.6
	Ⓒ	*	*	

\* 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.



# SWITCHES

Measure each switch for continuity using the multi circuit tester. If any abnormality is found, replace the respective switch assemblies with a new one.

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

## IGNITION SWITCH

Position \ Color	R	O	Gr
LIGHT (☀)	○	○	○
ON	○	○	
OFF			

## NEUTRAL SWITCH

Position \ Color	Bl	R	B/W
Neutral	○		○
Reverse		○	○
Others			

## STARTER BUTTON

Position \ Color	O/W	Y/G
•		
PUSH	○	○

## PARKING BRAKE SWITCH

Position \ Color	B/W	B/Bl
ON	○	○
OFF		

## BRAKE LIGHT LEVER SWITCH (R)

Position \ Color	Terminal	Terminal
ON	○	○
OFF		

## DIMMER SWITCH

Position \ Color	Y	W	Gr
HI	○		○
LO		○	○

## BRAKE LIGHT LEVER SWITCH (L)

Position \ Color	B	B
ON	○	○
OFF		

## ENGINE STOP SWITCH

Position \ Color	O	O/W
RUN	○	○
OFF		

## BRAKE LIGHT PEDAL SWITCH

Position \ Color	O	W/B
ON	○	○
OFF		

## WIRE COLOR

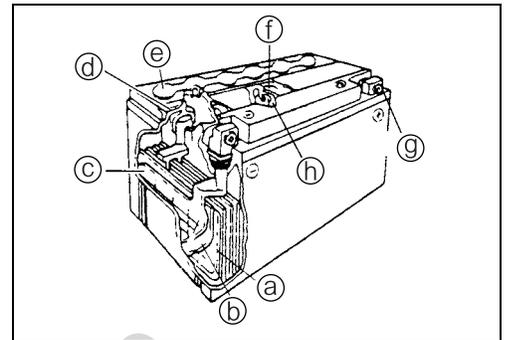
- B : Black
- Bl : Blue
- G : Green
- Gr : Gray
- O : Orange
- R : Red
- Y : Yellow
- B/Bl : Black with Blue tracer
- B/W : Black with White tracer
- O/W : Orange with White tracer
- O/G : Orange with Green tracer
- W/B : White with Black tracer
- Y/G : Yellow with Green tracer

## BATTERY

### SPECIFICATIONS

Type designation	YTX9-BS
Capacity	12 V, 28.8 kC (8 Ah)/10 HR

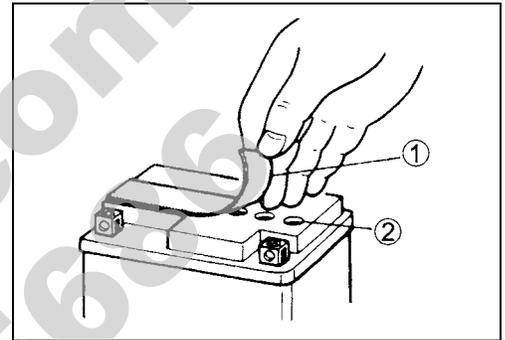
- |                                |                |
|--------------------------------|----------------|
| Ⓐ Anode plates                 | Ⓔ Stopper      |
| Ⓑ Separator (fiberglass plate) | Ⓕ Filter       |
| Ⓒ Cathode plates               | Ⓖ Terminal     |
| Ⓓ Upper cover breather         | Ⓗ Safety valve |



### INITIAL CHARGING

#### FILLING ELECTROLYTE

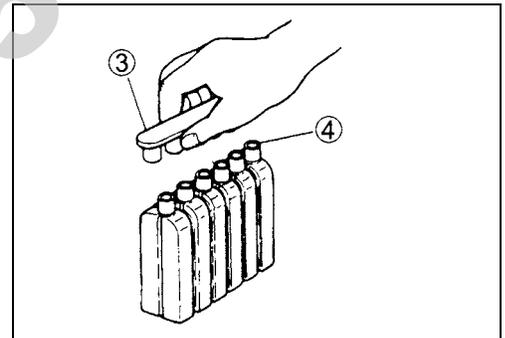
Remove the aluminum tape ① sealing the battery electrolyte filler holes ②.



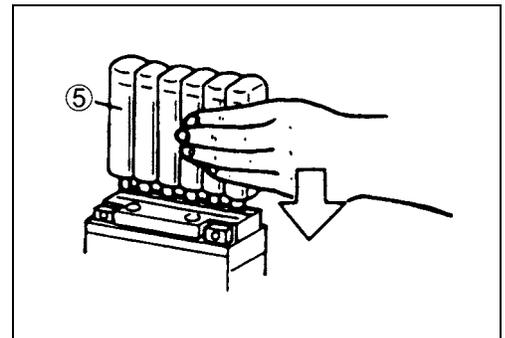
Remove the caps ③.

#### NOTE:

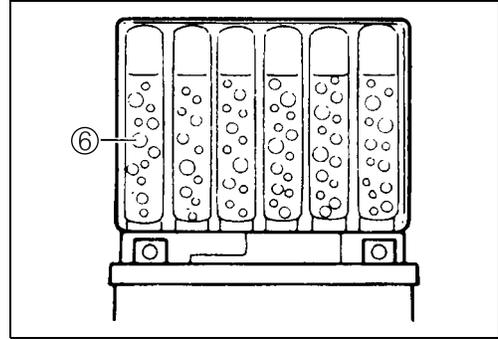
- \* After filling the electrolyte completely, use the removed caps ③ as the sealing caps of the battery electrolyte filler holes.
- \* Do not remove or pierce the sealed portions ④ of the electrolyte container.



Insert the nozzles of the electrolyte container ⑤ into the battery electrolyte filler holes, holding the container firmly so that it does not fall. Take a precaution not to allow any of the fluid to spill.



Make sure that air bubbles ⑥ are coming up into each electrolyte container, and leave it in this position for more than 20 minutes.

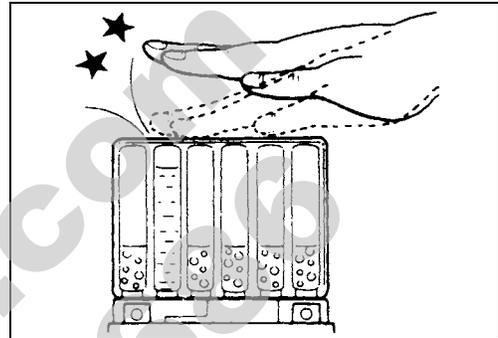


**NOTE:**

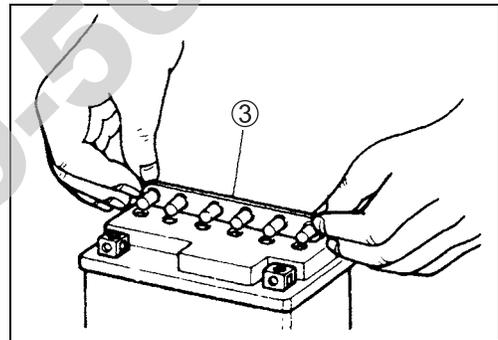
If no air bubbles are coming up from a filler port, tap the bottom of the electrolyte container two or three times.

Never remove the container from the battery.

After confirming that the electrolyte has entered the battery completely, remove the electrolyte container from the battery. Wait for more than 20 minutes.

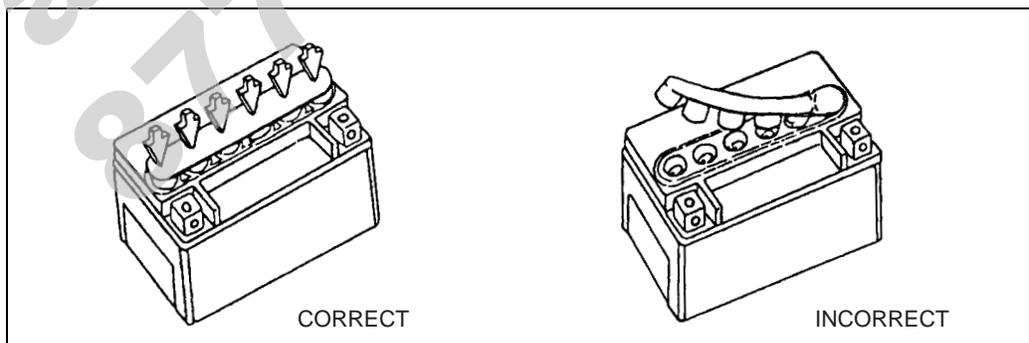


Insert the caps ③ into the filler holes, pressing in firmly so that the caps do not protrude above the upper surface of the battery top cover.



**CAUTION**

- \* Never use anything except the specified battery.
- \* Once install the caps to the battery; do not remove the caps.
- \* Do not tap the caps with a hammer when installing them.



For initial charging, use a charger specially designed for MF batteries.

**CAUTION**

- \* For charging the battery, make sure to use a charger specially designed for MF batteries. Otherwise, the battery may be overcharged resulting in shortened service life.
- \* Do not remove the caps while charging.
- \* Position the battery with the cap facing upward while charging.

**SERVICING**

Visually inspect the surface of the battery. If any signs of cracking or electrolyte leakage 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 with the multi circuit tester. If the voltage reading is less than 12 V (DC), recharge the battery with a battery charger.

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

**CAUTION**

- \* When recharging the battery, remove the battery from the vehicle.
- \* Do not remove the caps while recharging.

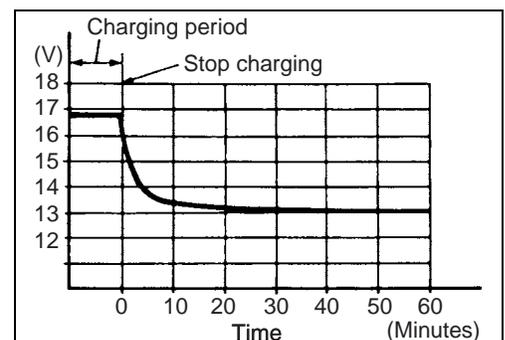
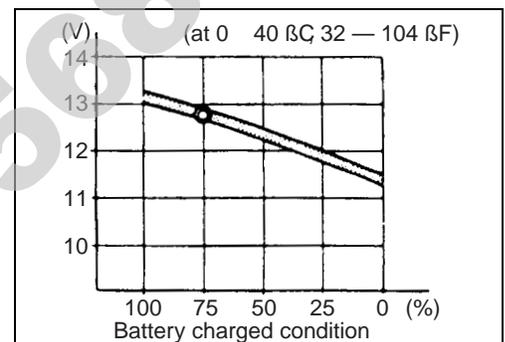
Recharging time: 0.9 A for 5 to 10 hours or 4 A for 1 hour.

**CAUTION**

Be careful not to permit the charging current to exceed 4 A at any time.

After recharging, wait at least 30 minutes and then measure the battery voltage with the multi circuit tester. If the battery voltage is less than 12.5 V, recharge the battery again. If the battery voltage is still less than 12.5 V after recharging twice, 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 vehicle is not used for more than one month (especially during the winter season), measure the battery voltage at least once a month.



**PartShark.com**  
**877-999-5686**

# SERVICING INFORMATION

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## TROUBLESHOOTING ENGINE

Complaint	Symptom and possible causes	Remedy
<b>Engine will not start or is hard to start.</b>	<p><b>Compression too low</b></p> <ol style="list-style-type: none"> <li>1. Worn cylinder.</li> <li>2. Worn piston ring.</li> <li>3. Worn valve guide or improper valve seating.</li> <li>4. Loose spark plug.</li> <li>5. Slow cranking starter motor.</li> <li>6. Mistimed valves.</li> <li>7. Valve clearance out of adjustment.</li> </ol> <p><b>Spark plug not sparking</b></p> <ol style="list-style-type: none"> <li>1. Fouled spark plug.</li> <li>2. Wet spark plug.</li> <li>3. Defective ignition coil.</li> <li>4. Open or short in high-tension cord.</li> <li>5. Defective generator.</li> <li>6. Defective CDI unit.</li> </ol> <p><b>No fuel reaching the carburetor</b></p> <ol style="list-style-type: none"> <li>1. Clogged fuel tank vent hose.</li> <li>2. Clogged or defective fuel valve.</li> <li>3. Defective carburetor needle valve.</li> <li>4. Clogged fuel hose.</li> <li>5. Clogged fuel filter.</li> </ol>	<p>Replace. Replace. Repair or replace. Tighten. See electrical section. Adjust. Adjust.</p> <p>Clean or replace. Clean and dry or replace. Replace. Replace. Replace. Replace.</p> <p>Clean or replace. Clean or replace. Replace. Clean or replace. Clean or replace.</p>
<b>Engine stalls easily.</b>	<ol style="list-style-type: none"> <li>1. Fouled spark plug.</li> <li>2. Defective generator.</li> <li>3. Defective CDI unit.</li> <li>4. Clogged or defective fuel valve.</li> <li>5. Clogged carburetor jet.</li> <li>6. Valve clearance out of adjustment.</li> </ol>	<p>Clean or replace. Replace. Replace. Clean or replace. Clean. Adjust.</p>
<b>Engine is noisy.</b>	<p><b>Excessive valve chatter</b></p> <ol style="list-style-type: none"> <li>1. Excessive valve clearance.</li> <li>2. Weak or broken valve spring.</li> <li>3. Worn rocker arm and rocker arm shaft.</li> </ol> <p><b>Noise seems to come from the piston</b></p> <ol style="list-style-type: none"> <li>1. Worn piston.</li> <li>2. Worn cylinder.</li> <li>3. Carbon build-up in combustion chamber.</li> <li>4. Worn piston pin or piston pin bore.</li> <li>5. Worn piston ring or ring groove.</li> </ol> <p><b>Noise seems to come from the cam chain</b></p> <ol style="list-style-type: none"> <li>1. Stretched cam chain.</li> <li>2. Worn cam chain sprocket.</li> <li>3. Improperly working cam chain tension adjuster.</li> </ol> <p><b>Noise seems to come from the clutch</b></p> <ol style="list-style-type: none"> <li>1. Worn splines of crankshaft or inner race.</li> <li>2. Worn splines of countershaft or hub.</li> <li>3. Worn teeth of clutch plates.</li> <li>4. Distorted clutch plates, driven and drive.</li> <li>5. Clutch dampers weakened.</li> </ol>	<p>Adjust. 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. Replace. Replace. Replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
<b>Engine is noisy.</b>	<p><b>Noise seems to come from the crankshaft</b></p> <ol style="list-style-type: none"> <li>1. Worn or burnt bearing.</li> <li>2. Big-end bearing worn or burnt.</li> <li>3. Excessive thrust clearance.</li> </ol> <p><b>Noise seems to come from transmission</b></p> <ol style="list-style-type: none"> <li>1. Gears worn or rubbing.</li> <li>2. Badly worn splines.</li> <li>3. Primary gears worn or rubbing.</li> <li>4. Badly worn bearings.</li> <li>5. Worn bushing.</li> </ol> <p><b>Noise seems to come from transfer</b></p> <ol style="list-style-type: none"> <li>1. Worn down gears or shafts.</li> <li>2. Damage to bearings/bushing.</li> </ol> <p><b>Noise seems to come from secondary bevel gear and rear drive bevel gear</b></p> <ol style="list-style-type: none"> <li>1. Drive and driven bevel gears damaged or worn.</li> <li>2. Excessive backlash.</li> <li>3. Improper tooth contact.</li> <li>4. Damage to bearing.</li> <li>5. Gears worn or rubbing.</li> <li>6. Badly worn splines.</li> <li>7. Secondary bevel gear thrust clearance too large.</li> <li>8. Rear drive bevel gear thrust clearance too large.</li> </ol>	<p>Replace. Replace. Replace.</p> <p>Replace. Replace. Replace. Replace. Replace.</p> <p>Replace. Replace.</p> <p>Replace. Adjust. Adjust. Replace. Replace. Replace. Adjust or replace. Adjust or replace.</p>
<b>Slipping clutch.</b>	<ol style="list-style-type: none"> <li>1. Clutch control out of adjustment or loss of play.</li> <li>2. Weakened clutch springs.</li> <li>3. Worn clutch shoes.</li> <li>4. Worn or distorted pressure plate.</li> <li>5. Distorted clutch plates, driven and drive.</li> </ol>	<p>Adjust. Replace. Replace. Replace. Replace.</p>
<b>Dragging clutch.</b>	<ol style="list-style-type: none"> <li>1. Clutch control out of adjustment or too much play.</li> <li>2. Some clutch springs weakened while others are not.</li> <li>3. Distorted pressure plate or clutch plates.</li> <li>4. Worn or damage clutch release mechanism.</li> </ol>	<p>Adjust. Replace. Replace. Adjust or replace.</p>
<b>Transmission will not shift.</b>	<ol style="list-style-type: none"> <li>1. Broken gearshift cam.</li> <li>2. Distorted gearshift forks.</li> <li>3. Worn gearshift shaft.</li> <li>4. Worn or damage clutch release mechanism.</li> <li>5. Improperly adjusted reverse cable.</li> </ol>	<p>Replace. Replace. Replace. Adjust or replace. Adjust.</p>
<b>Transmission will not shift back.</b>	<ol style="list-style-type: none"> <li>1. Broken reverse shift cam.</li> <li>2. Shift shafts are rubbing or sticky.</li> <li>3. Distorted or worn gearshift forks.</li> <li>4. Broken or damaged gearshift lever return spring.</li> </ol>	<p>Replace. Repair Replace. Replace.</p>
<b>Transmission jumps out of gear.</b>	<ol style="list-style-type: none"> <li>1. Worn shifting gears on driveshaft or countershaft.</li> <li>2. Distorted or worn gearshift forks.</li> <li>3. Weakened cam stopper spring on gearshift cam.</li> <li>4. Worn gearshift lever stopper pin.</li> </ol>	<p>Replace. Replace. Replace. Replace.</p>
<b>Transfer will not shift or shift back.</b>	<ol style="list-style-type: none"> <li>1. Broken or worn sliding dog.</li> <li>2. Broken or worn gearshift fork.</li> <li>3. Worn gearshift cam.</li> <li>4. Weakened cam stopper spring.</li> <li>5. Worn gearshift fork shaft.</li> </ol>	<p>Replace. Replace. Replace. Replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
<b>Engine idles poorly.</b>	<ol style="list-style-type: none"> <li>1. Valve clearance out of adjustment.</li> <li>2. Poor seating of valves.</li> <li>3. Defective valve guides.</li> <li>4. Worn rocker arm or arm shaft.</li> <li>5. Defective generator.</li> <li>6. Defective CDI unit.</li> <li>7. Spark plug gap too wide.</li> <li>8. Defective ignition coil resulting in weak sparking.</li> <li>9. Float-chamber fuel level out of adjustment in carburetor.</li> <li>10. Clogged jets.</li> <li>11. Defective fuel valve.</li> <li>12. Improperly set pilot screw.</li> </ol>	<p>Adjust.            Replace.            Replace.            Replace.            Replace.            Replace.            Adjust or replace.            Replace.            Adjust.            Clean.            Replace.            Adjust.</p>
<b>Engine runs poorly in high speed range.</b>	<ol style="list-style-type: none"> <li>1. Valve springs weakened.</li> <li>2. Valve timing out of adjustment.</li> <li>3. Worn cams or rocker arms.</li> <li>4. Spark plug gap too narrow.</li> <li>5. Defective ignition coil.</li> <li>6. Float-chamber fuel level too low.</li> <li>7. Clogged air cleaner element.</li> <li>8. Clogged fuel pipe, resulting in inadequate fuel supply to carburetor.</li> <li>9. Defective fuel valve.</li> </ol>	<p>Replace.            Adjust.            Replace.            Adjust.            Replace.            Adjust.            Clean.            Clean and prime.            Replace.</p>
<b>Dirty or heavy exhaust smoke.</b>	<ol style="list-style-type: none"> <li>1. Too much engine oil in the engine.</li> <li>2. Worn piston rings or cylinder.</li> <li>3. Worn valve guides.</li> <li>4. Cylinder wall scored or scuffed.</li> <li>5. Worn valve stems.</li> <li>6. Defective stem seals.</li> </ol>	<p>Check with inspection window, drain out excess oil.            Replace.            Replace.            Replace.            Replace.            Replace.</p>
<b>Engine lacks power.</b>	<ol style="list-style-type: none"> <li>1. Loss of valve clearance.</li> <li>2. Weakened valve springs.</li> <li>3. Valve timing out of adjustment.</li> <li>4. Worn piston ring or cylinder.</li> <li>5. Poor seating of valves.</li> <li>6. Fouled spark plug.</li> <li>7. Worn rocker arms or shafts.</li> <li>8. Spark plug gap incorrect.</li> <li>9. Clogged jets in carburetor.</li> <li>10. Float-chamber fuel level out of adjustment.</li> <li>11. Clogged air cleaner element.</li> <li>12. Too much engine oil.</li> <li>13. Sucking air around intake pipe.</li> </ol>	<p>Adjust.            Replace.            Adjust.            Replace.            Repair.            Clean or replace.            Replace.            Adjust or replace.            Clean.            Adjust.            Clean.            Drain out excess oil.            Retighten or replace.</p>
<b>Engine overheats.</b>	<ol style="list-style-type: none"> <li>1. Heavy carbon deposit on piston crown.</li> <li>2. Not enough oil in the engine.</li> <li>3. Defective oil pump or clogged oil circuit.</li> <li>4. Fuel level too low in float chamber.</li> <li>5. Air leak from intake pipe.</li> <li>6. Use of incorrect engine oil.</li> </ol>	<p>Clean.            Add oil.            Replace or clean.            Adjust.            Retighten or replace.            Change.</p>

## DRIVE TRAIN

Complaint	Symptom and possible causes	Remedy
<b>Power will not transmit from the engine to the rear wheel.</b>	<ol style="list-style-type: none"> <li>1. Broken drive and driven bevel gear teeth.</li> <li>2. Broken propeller shaft serration.</li> <li>3. Worn or broken rear axle serration.</li> <li>4. Worn or damaged coupling joint serration.</li> <li>5. Broken or damaged rear drive and driven bevel gears.</li> <li>6. Worn or damaged universal joint.</li> </ol>	Replace. Replace. Replace. Replace. Replace. Replace.

## CARBURETOR

Complaint	Symptom and possible causes	Remedy
<b>Starting difficulty.</b>	<ol style="list-style-type: none"> <li>1. Clogged starter jet.</li> <li>2. Clogged starter jet passage.</li> <li>3. Air leaking from joint between starter body and carburetor.</li> <li>4. Improperly working starter (enricher) plunger.</li> </ol>	Clean. Clean. Tighten, adjust or replace gasket. Adjust.
<b>Idling or low-speed trouble.</b>	<ol style="list-style-type: none"> <li>1. Clogged or loose pilot jet.</li> <li>2. Clogged pilot jet passage.</li> <li>3. Clogged pilot outlet port.</li> <li>4. Clogged bypass port.</li> <li>5. Starter (enricher) plunger not fully closed.</li> <li>6. Improperly set pilot screw.</li> <li>7. Incorrect float height.</li> </ol>	Clean or tighten. Clean. Clean. Clean. Adjust. Adjust. Adjust.
<b>Medium-or high speed trouble.</b>	<ol style="list-style-type: none"> <li>1. Clogged main jet.</li> <li>2. Clogged main air jet.</li> <li>3. Clogged needle jet.</li> <li>4. Improperly working throttle valve.</li> <li>5. Clogged fuel filter.</li> <li>6. Incorrect float height.</li> <li>7. Starter (enricher) plunger not fully closed.</li> </ol>	Clean. Clean. Clean. Adjust. Clean or replace. Adjust. Adjust.
<b>Overflow and fuel level fluctuations.</b>	<ol style="list-style-type: none"> <li>1. Worn or damaged needle valve.</li> <li>2. Broken needle valve spring.</li> <li>3. Improperly working float.</li> <li>4. Foreign matter on the needle valve.</li> <li>5. Incorrect float chamber fuel level.</li> </ol>	Replace. Replace. Adjust or replace. Clean or replace with needle valve seat. Adjust float height.

## CHASSIS

Complaint	Symptom and possible causes	Remedy
<b>Handling is too heavy or stiff.</b>	<ol style="list-style-type: none"> <li>1. Improper front wheel alignment.</li> <li>2. Insufficiently lubricated.</li> <li>3. Low air pressure in front tires.</li> <li>4. Tie rod ends tending to seize.</li> <li>5. Linkage connections tending to seize.</li> </ol>	Adjust. Lubricate. Adjust. Replace. Repair or replace.
<b>Steering wobbles.</b>	<ol style="list-style-type: none"> <li>1. Unequally inflated tires.</li> <li>2. Loose front wheel hub nuts.</li> <li>3. Damaged or worn front wheel hub bearings.</li> <li>4. Worn or loose tie rod ends.</li> <li>5. Defective or incorrect front tires.</li> <li>6. Damaged or worn wishbone arms and related bushings.</li> <li>7. Distorted front wheels.</li> <li>8. Loose chassis nuts and bolts.</li> </ol>	Regulate. Tighten. Replace. Replace or tighten. Replace. Replace. Replace. Tighten.
<b>Steering pulls to one side.</b>	<ol style="list-style-type: none"> <li>1. Unequally inflated tires.</li> <li>2. Improper front wheel alignment.</li> <li>3. Worn front wheel hub bearings.</li> <li>4. Distorted frame or wishbone.</li> <li>5. Defective shock absorber.</li> </ol>	Regulate. Adjust. Replace. Repair or replace. Replace.
<b>Shocks felt in the steering.</b>	<ol style="list-style-type: none"> <li>1. High tire pressure.</li> <li>2. Worn steering linkage connections.</li> <li>3. Loose suspension system bolts.</li> </ol>	Regulate. Replace. Tighten.
<b>Tires rapidly or unevenly wear.</b>	<ol style="list-style-type: none"> <li>1. Worn or loose front wheel hub bearings.</li> <li>2. Improper front wheel alignment.</li> </ol>	Replace. Adjust.
<b>Steering too noisy.</b>	<ol style="list-style-type: none"> <li>1. Loose nuts and bolts.</li> <li>2. Damaged or worn front wheel hub bearings.</li> <li>3. Insufficiently lubricated.</li> </ol>	Tighten. Replace. Lubricate.
<b>Suspension too soft.</b>	<ol style="list-style-type: none"> <li>1. Weakened spring.</li> <li>2. Shock absorber leaks oil.</li> </ol>	Replace. Replace.
<b>Suspension too stiff.</b>	<ol style="list-style-type: none"> <li>1. Worn upper or lower wishbone arms and related bushings.</li> <li>2. Bent shock absorber rod.</li> </ol>	Tighten. Replace.
<b>Suspension too noisy.</b>	<ol style="list-style-type: none"> <li>1. Loose suspension system bolts.</li> <li>2. Worn wishbone arms and related bushings.</li> <li>3. Worn swingarm bushings.</li> </ol>	Tighten. Replace. Replace.
<b>Rear wheels wobble.</b>	<ol style="list-style-type: none"> <li>1. Distorted rear wheel rims.</li> <li>2. Damage or worn rear brake panel bearings.</li> <li>3. Defective or incorrect rear tires.</li> <li>4. Loose rear wheel hub nuts.</li> <li>5. Distorted rear axle.</li> <li>6. Loosen rear axle housing mounting bolts.</li> <li>7. Improper rear brake adjustment.</li> <li>8. Damaged or worn rear swingarm and related bushings.</li> <li>9. Rear shock absorber leaks oil.</li> <li>10. Loose rear swingarm nut.</li> </ol>	Replace. Replace. Replace. Tighten. Replace. Tighten. Adjust. Replace. Replace. Tighten.

## BRAKES

Complaint	Symptom and possible causes	Remedy
<b>Poor braking. (FRONT)</b>	<ol style="list-style-type: none"> <li>1. Insufficient brake fluid.</li> <li>2. Air in brake fluid circuit.</li> <li>3. Worn pads.</li> <li>4. Worn disc.</li> </ol>	Refill to level mark. Bleed air out. Replace. Replace.
<b>Poor braking. (REAR)</b>	<ol style="list-style-type: none"> <li>1. Worn shoe linings.</li> <li>2. Too much play on brake pedal or brake lever.</li> </ol>	Replace. Adjust.
<b>Insufficient brake power.</b>	<ol style="list-style-type: none"> <li>1. Leakage of brake fluid from hydraulic system.</li> <li>2. Worn pads, worn lining.</li> <li>3. Oil adhesion on engaging surface of pads.</li> <li>4. Worn disc or bake drum.</li> <li>5. Air in hydraulic system.</li> </ol>	Repair or replace. Replace. Clean disc and pads. Replace. Bleed.
<b>Brake squeaks.</b>	<ol style="list-style-type: none"> <li>1. Carbon adhesion on pad surface. Carbon adhesion on lining surface.</li> <li>2. Titled pad.</li> <li>3. Loose front wheel axle or rear wheel axle.</li> <li>4. Worn brake pads and linings.</li> <li>5. Foreign material in brake fluid.</li> <li>6. Clogged return port of master cylinder.</li> <li>7. Wrongly fixed spring.</li> <li>8. Caliper binding on caliper axles.</li> </ol>	Repair surface with emery paper. Modify pad fitting or replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder. Set correctly. Clean and lubricate.
<b>Excessive brake lever stroke.</b>	<ol style="list-style-type: none"> <li>1. Air in hydraulic system.</li> <li>2. Insufficient brake fluid.</li> <li>3. Improper quality of brake fluid.</li> </ol>	Bleed. Replenish fluid to specified level and bleed air. Replace with correct fluid.
<b>Brake fluid leakage.</b>	<ol style="list-style-type: none"> <li>1. Insufficient tightening of connection joints.</li> <li>2. Cracked hose.</li> <li>3. Worn piston and/or cup.</li> </ol>	Tighten to specified torque and add brake fluid. Replace. Replace piston and/or cup.

## ELECTRICAL

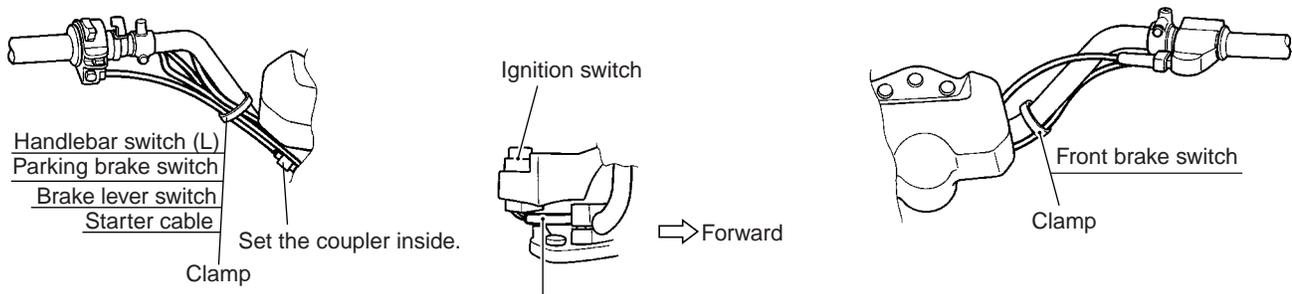
Complaint	Symptom and possible causes	Remedy
<b>No sparking or poor sparking.</b>	<ol style="list-style-type: none"> <li>1. Defective ignition coil.</li> <li>2. Defective spark plug.</li> <li>3. Defective generator.</li> <li>4. Defective CDI unit.</li> <li>5. Defective pickup coil.</li> </ol>	Replace. Replace. Replace. Replace. Replace.
<b>Spark plug is wet or quickly becomes fouled with carbon.</b>	<ol style="list-style-type: none"> <li>1. Excessively rich air/fuel mixture.</li> <li>2. Excessively high idling speed.</li> <li>3. Incorrect gasoline.</li> <li>4. Dirty air cleaner element.</li> <li>5. Incorrect spark plug (cold type).</li> </ol>	Adjust carburetor. Adjust carburetor. Change. Clean or replace. Change to standard spark plug.
<b>Spark plug quickly becomes fouled with oil or carbon.</b>	<ol style="list-style-type: none"> <li>1. Worn piston ring.</li> <li>2. Worn piston.</li> <li>3. Worn cylinder.</li> <li>4. Excessive valve-stem-to-valve-guide clearance.</li> <li>5. Worn valve stem oil seal.</li> </ol>	Replace. Replace. Replace. Replace. Replace.
<b>Spark plug electrodes overheat or burn.</b>	<ol style="list-style-type: none"> <li>1. Incorrect spark plug.</li> <li>2. Overheated engine.</li> <li>3. Loose spark plug.</li> <li>4. Excessively lean air/fuel mixture.</li> </ol>	Change to cold type spark plug. Turn-up. Tighten. Adjust carburetor.
<b>Generator does not charge.</b>	<ol style="list-style-type: none"> <li>1. Open or short in lead wires, or loose lead connections.</li> <li>2. Shorted, grounded or open generator coil.</li> <li>3. Shorted or punctured regulator/rectifier.</li> </ol>	Repair, replace or connect properly. Replace. Replace.
<b>Generator charges but charging rate is below specification.</b>	<ol style="list-style-type: none"> <li>1. Lead wires tend to get shorted, open-circuited, or loosely connected at terminal.</li> <li>2. Grounded or open-circuited stator coils or generator.</li> <li>3. Defective regulator/rectifier.</li> </ol>	Repair or tighten. Replace. Replace.
<b>Generator over-charges.</b>	<ol style="list-style-type: none"> <li>1. Internal short-circuit in the battery.</li> <li>2. Damaged or defective regulator/rectifier.</li> </ol>	Replace battery. Replace.
<b>Unstable charging.</b>	<ol style="list-style-type: none"> <li>1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting.</li> <li>2. Internally shorted generator.</li> <li>3. Defective regulator/rectifier.</li> </ol>	Repair or replace. Replace. Replace.
<b>Starter button does not work.</b>	<ol style="list-style-type: none"> <li>1. Run down battery.</li> <li>2. Defective switch contact.</li> <li>3. Brushes do not seat properly on the commutator in the starter motor.</li> <li>4. Defective starter relay.</li> <li>5. Defective neutral relay.</li> <li>6. Defective emergency switch. (E-17)</li> <li>7. Defective engine stop switch.</li> <li>8. Defective neutral switch.</li> <li>9. Defective parking brake switch.</li> <li>10. Wiring connections loose or disconnected.</li> </ol>	Recharge or replace. Replace. Repair or replace. Replace. Replace. Replace. Replace. Replace. Replace. Connect, tighten or repair.

## BATTERY

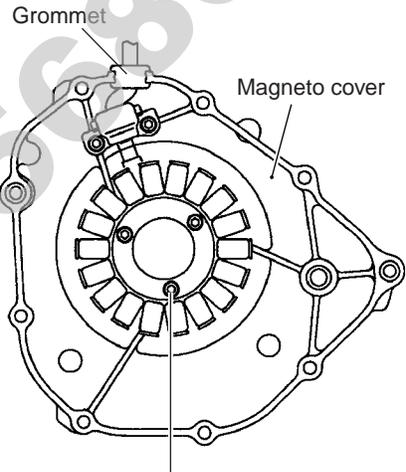
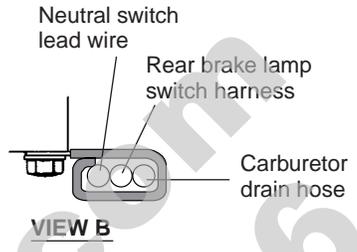
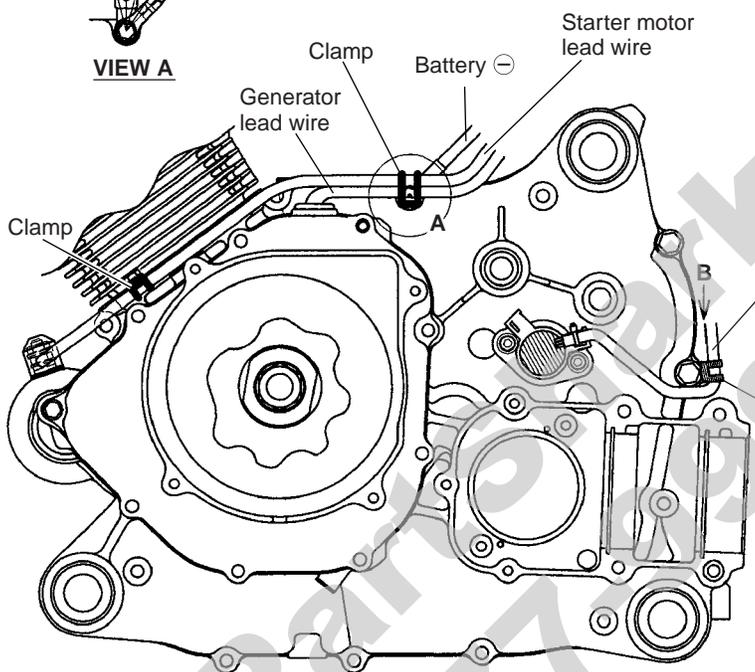
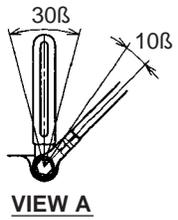
Complaint	Symptom and possible causes	Remedy
<b>Sulfation or spots on surfaces of cell plates.</b>	<ol style="list-style-type: none"> <li>1. Cracked battery case.</li> <li>2. Battery has been left in a run-down condition for a long time.</li> </ol>	<p>Replace.</p> <p>Replace.</p>
<b>Battery runs down quickly.</b>	<ol style="list-style-type: none"> <li>1. Incorrect charging method.</li> <li>2. Battery cell plates have lost much of their active material as a result of overcharging.</li> <li>3. Internally shorted battery.</li> <li>4. Old battery.</li> </ol>	<p>Check the generator, and regulator/rectifier circuit connections, and make necessary adjustments to obtain specified charging operation.</p> <p>Replace the battery and correct the charging system.</p> <p>Replace.</p> <p>Replace.</p>
<b>Reversed battery polarity.</b>	<ol style="list-style-type: none"> <li>1. Improperly connected battery leads. (i.e., <math>\ominus</math> to <math>\oplus</math> and <math>\oplus</math> to <math>\ominus</math>)</li> </ol>	<p>Replace the battery and be sure to connect it properly.</p>
<b>Battery discharged too rapidly.</b>	<ol style="list-style-type: none"> <li>1. Dirty container top and sides.</li> <li>2. Old battery.</li> </ol>	<p>Clean.</p> <p>Replace.</p>
<b>Battery sulfation.</b>	<ol style="list-style-type: none"> <li>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.)</li> <li>2. The battery was left unused in a cold climate for too long.</li> </ol>	<p>Replace.</p> <p>Replace the battery if badly sulfated.</p>



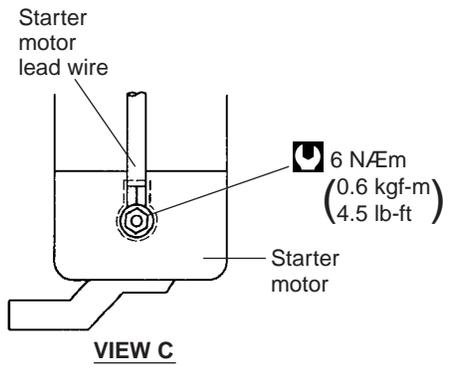
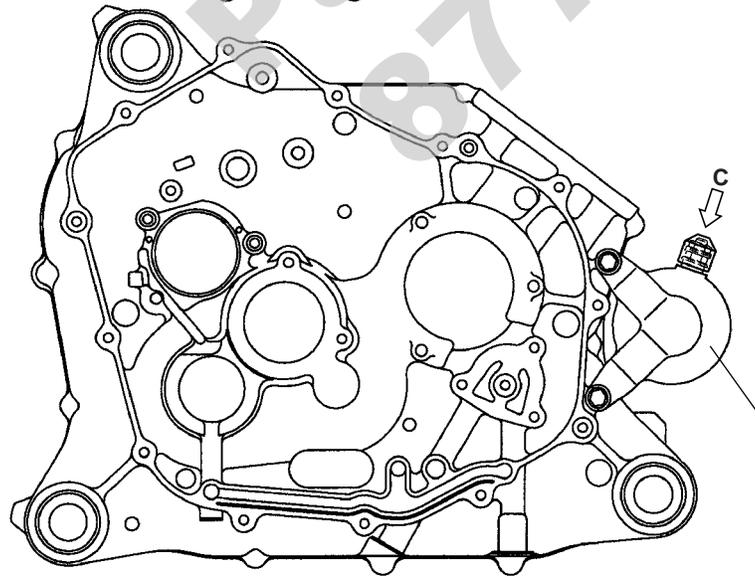




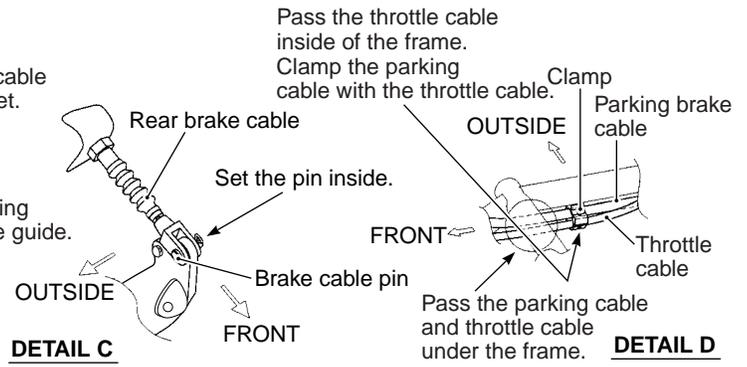
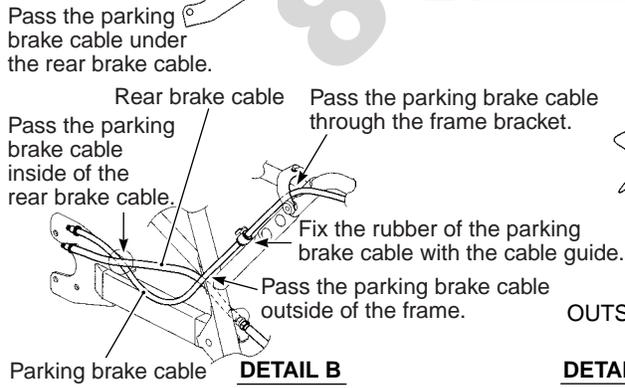
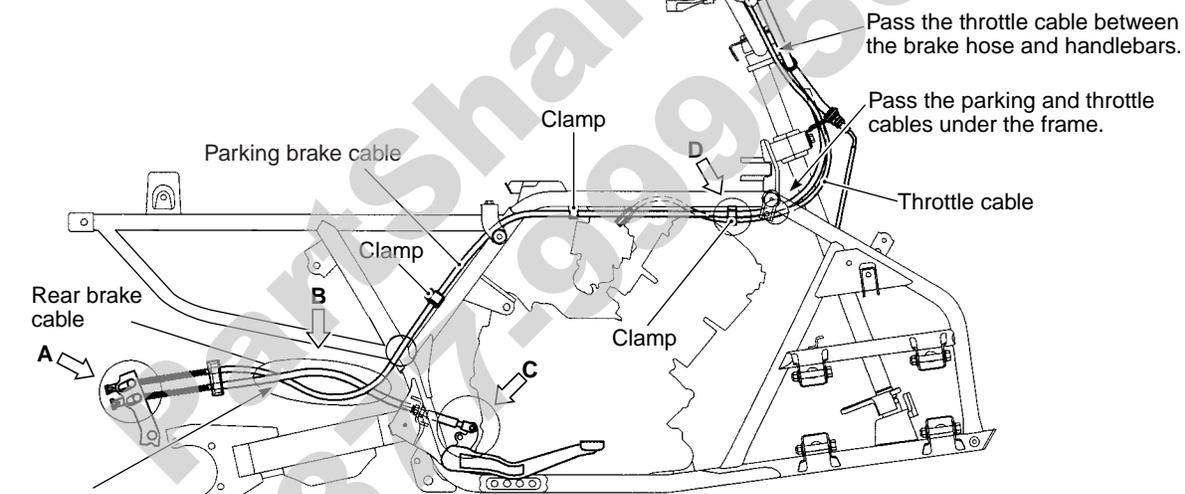
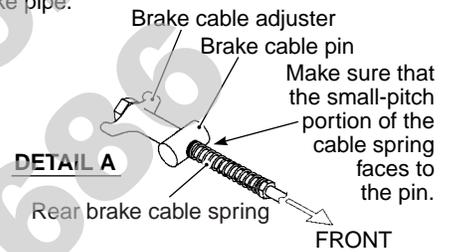
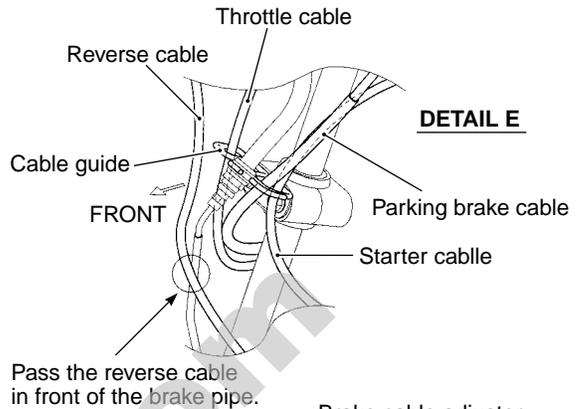
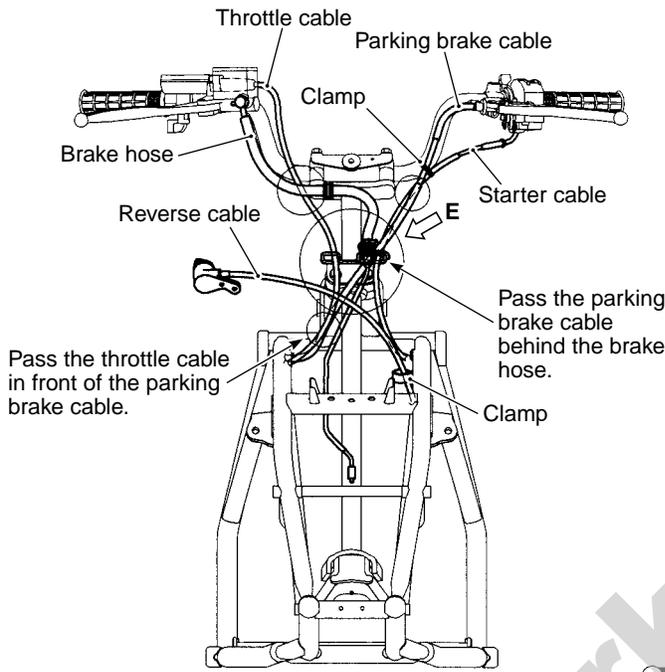
Pass the lead wire on the upper bracket.

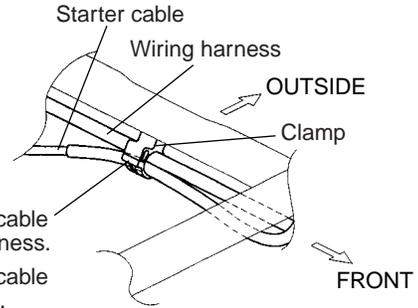


7 NÆm (0.7 kgf-m, 5.0 lb-ft)



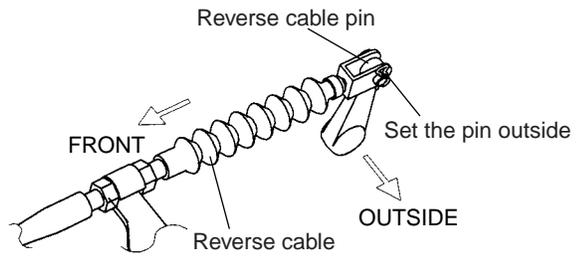
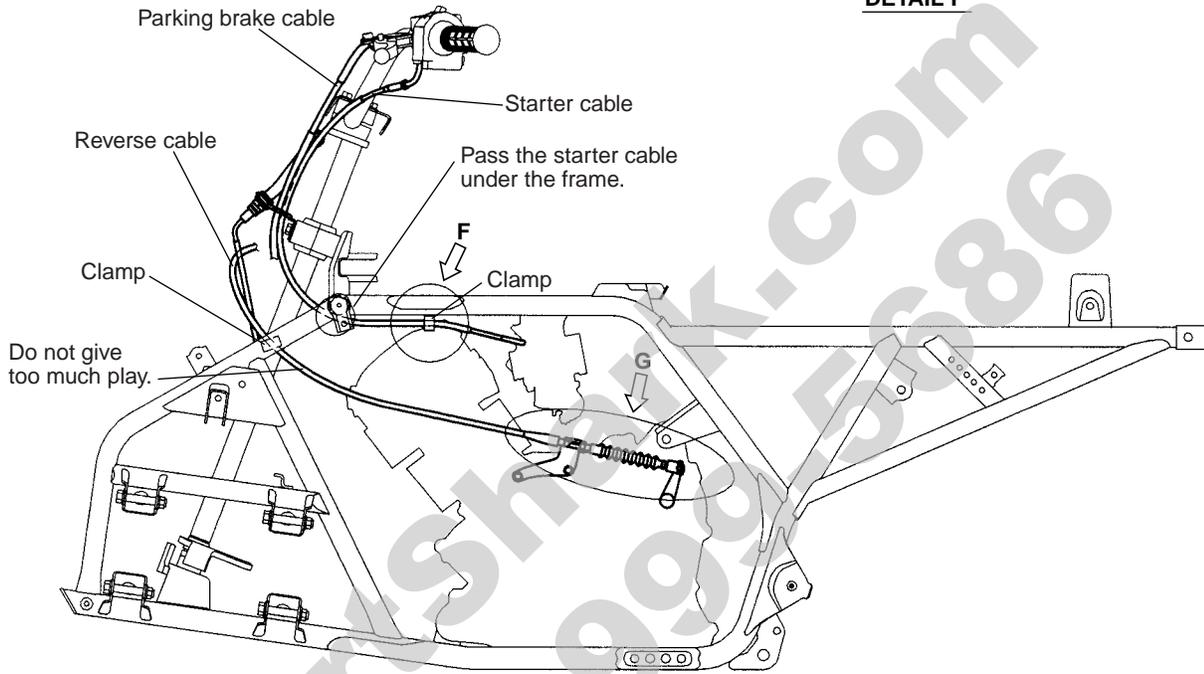
# CABLE ROUTING





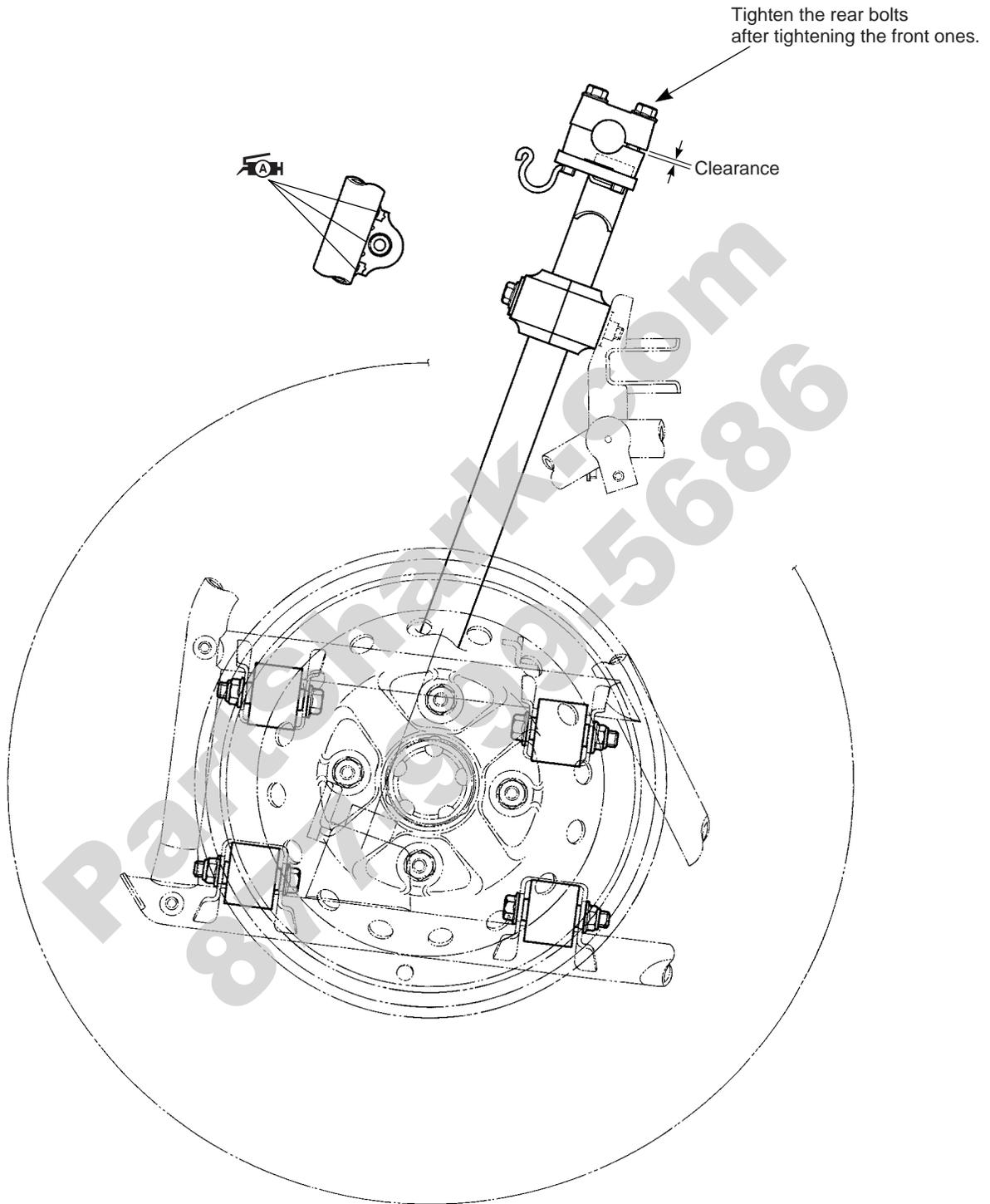
Clamp the starter cable with the wiring harness.  
Clamp the starter cable inside of the frame.

**DETAIL F**

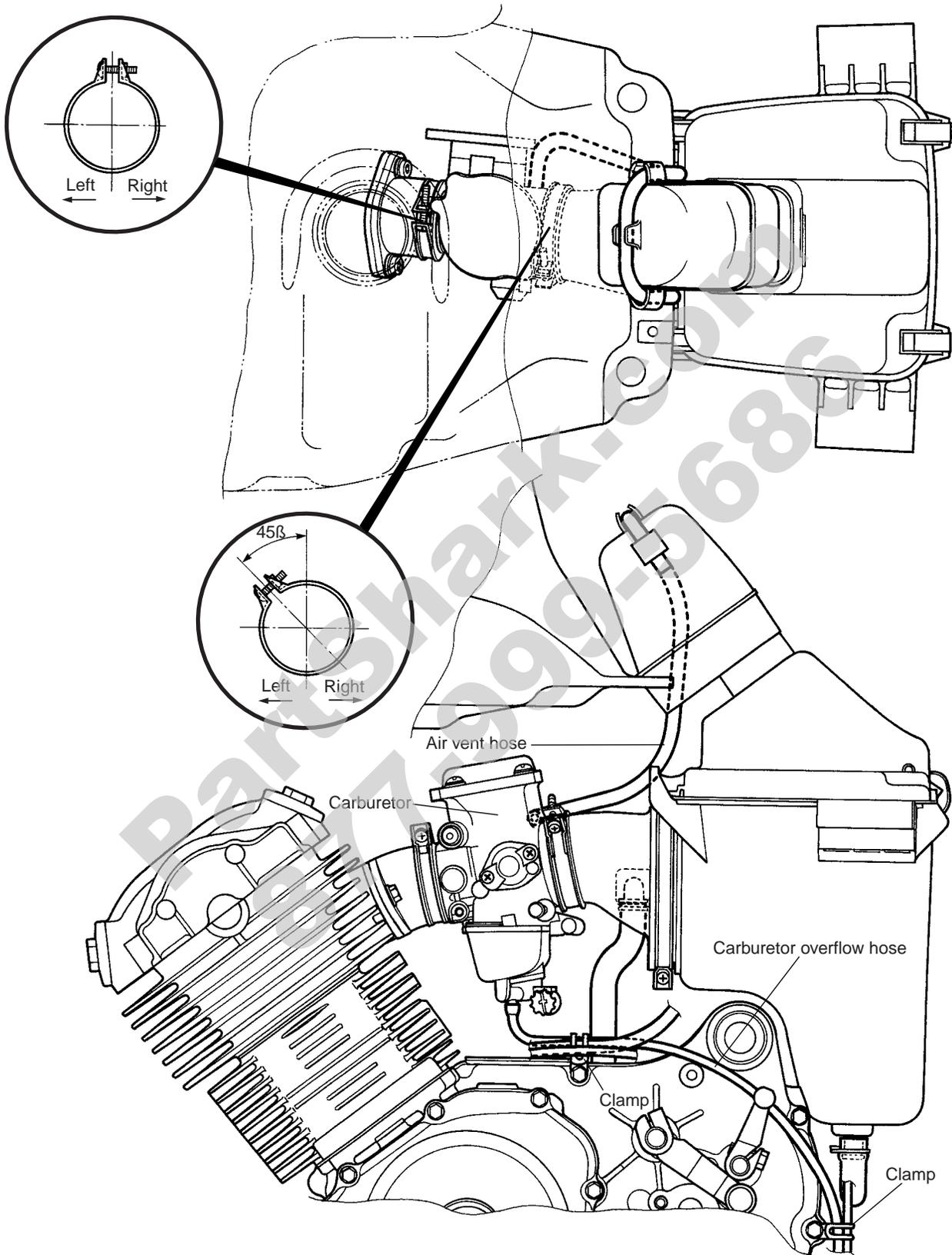


**DETAIL G**

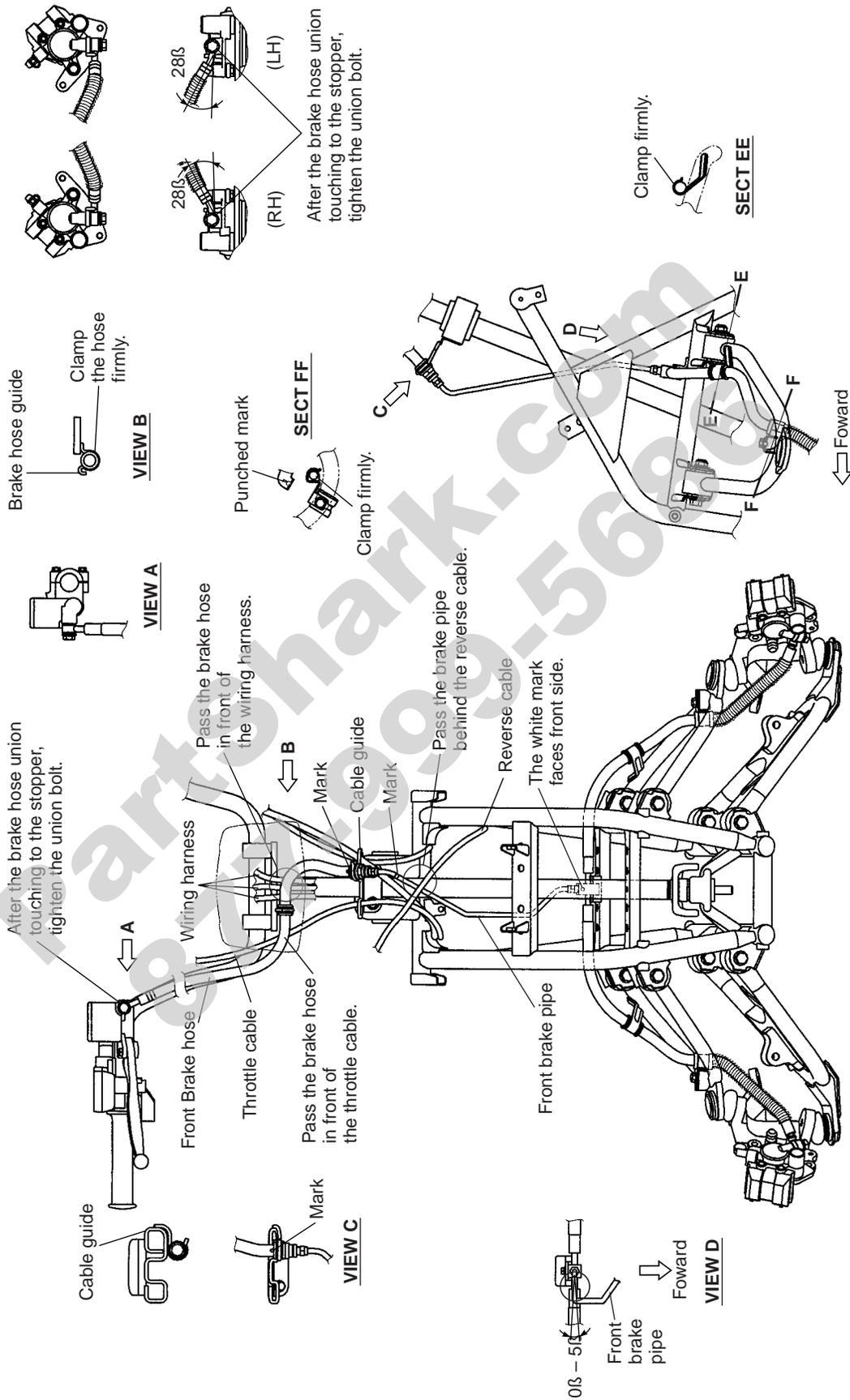
## STEERING SHAFT SET-UP



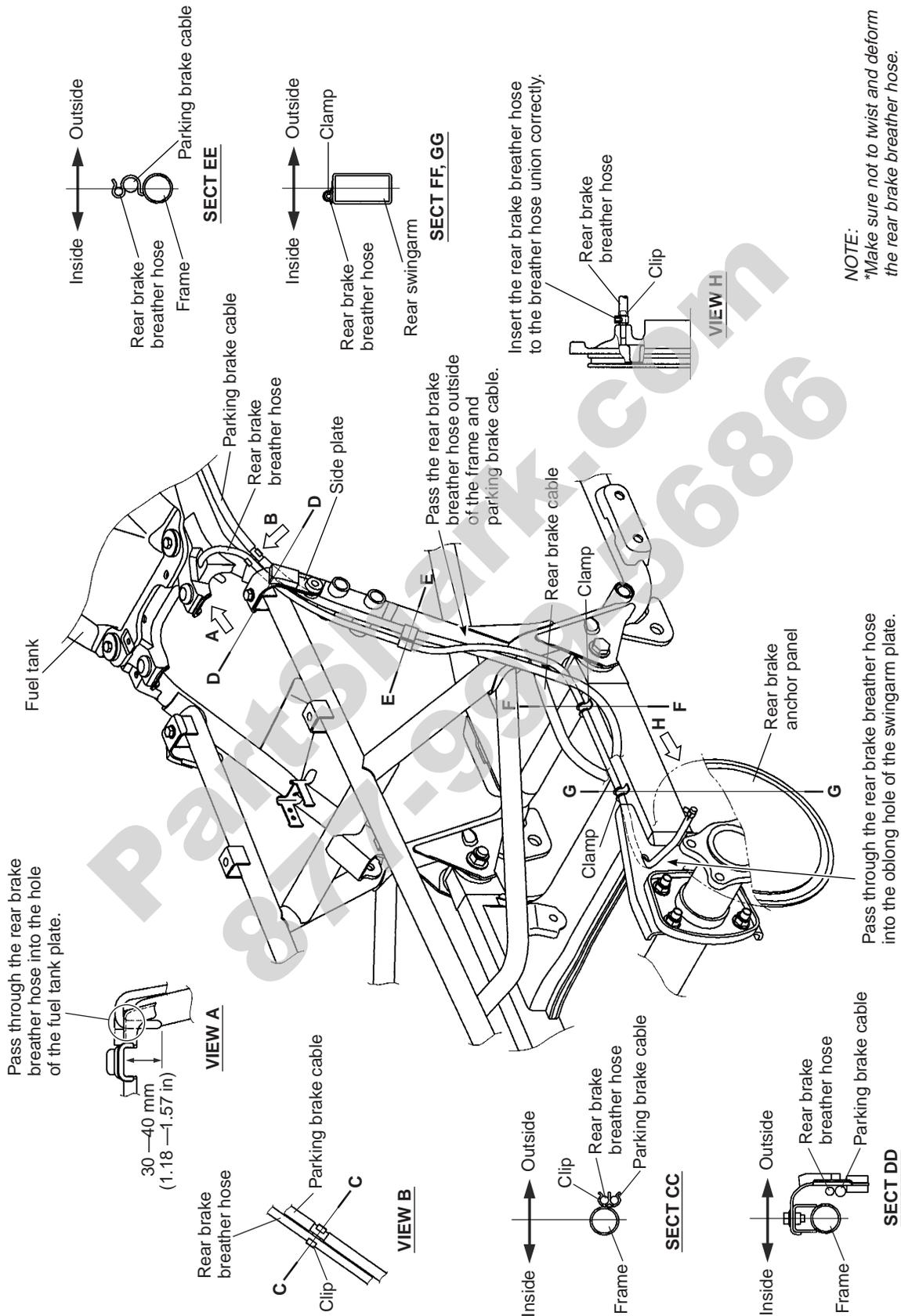
## CARBURETOR HOSE ROUTING



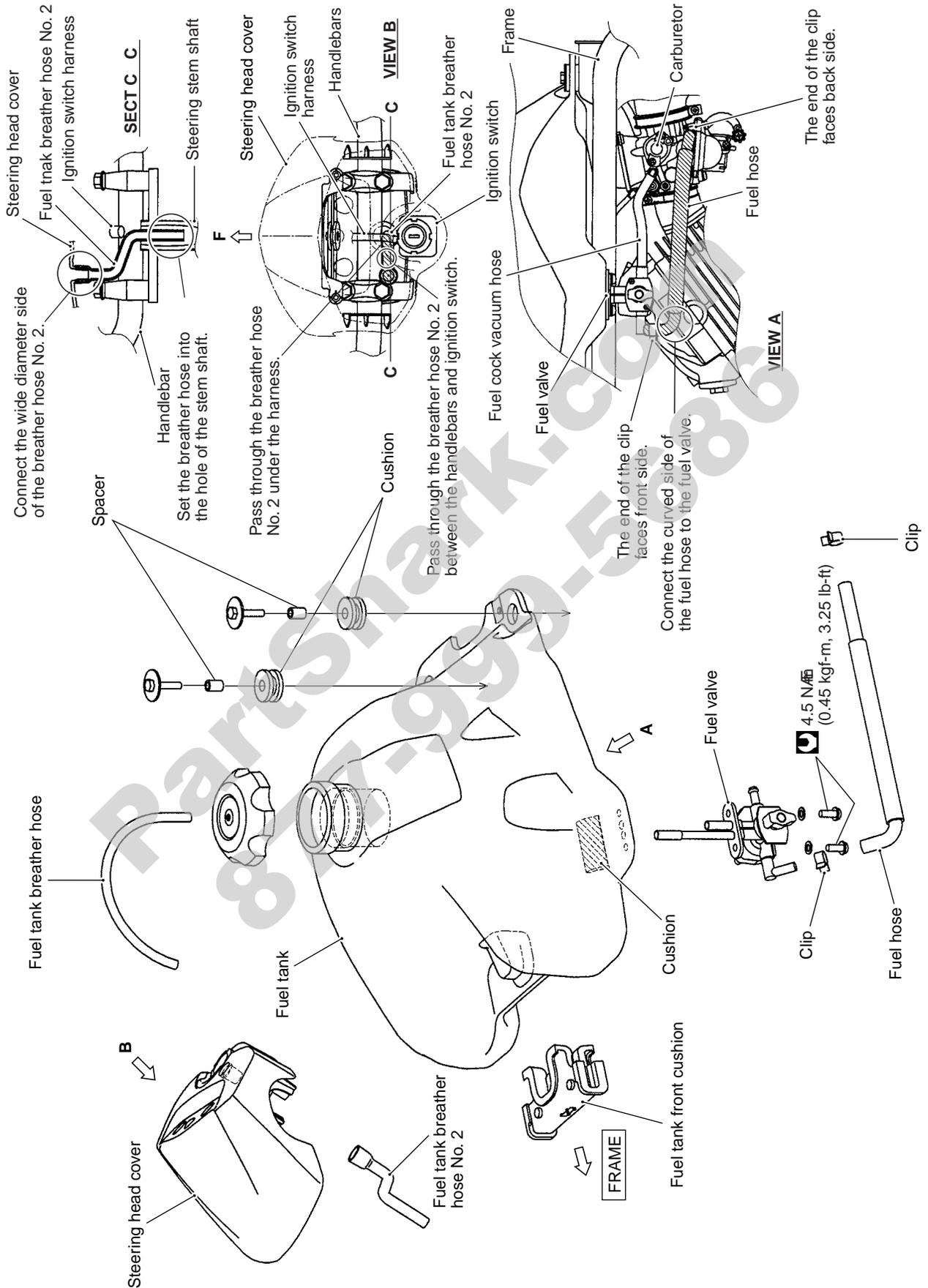
# FRONT BRAKE HOSE ROUTING



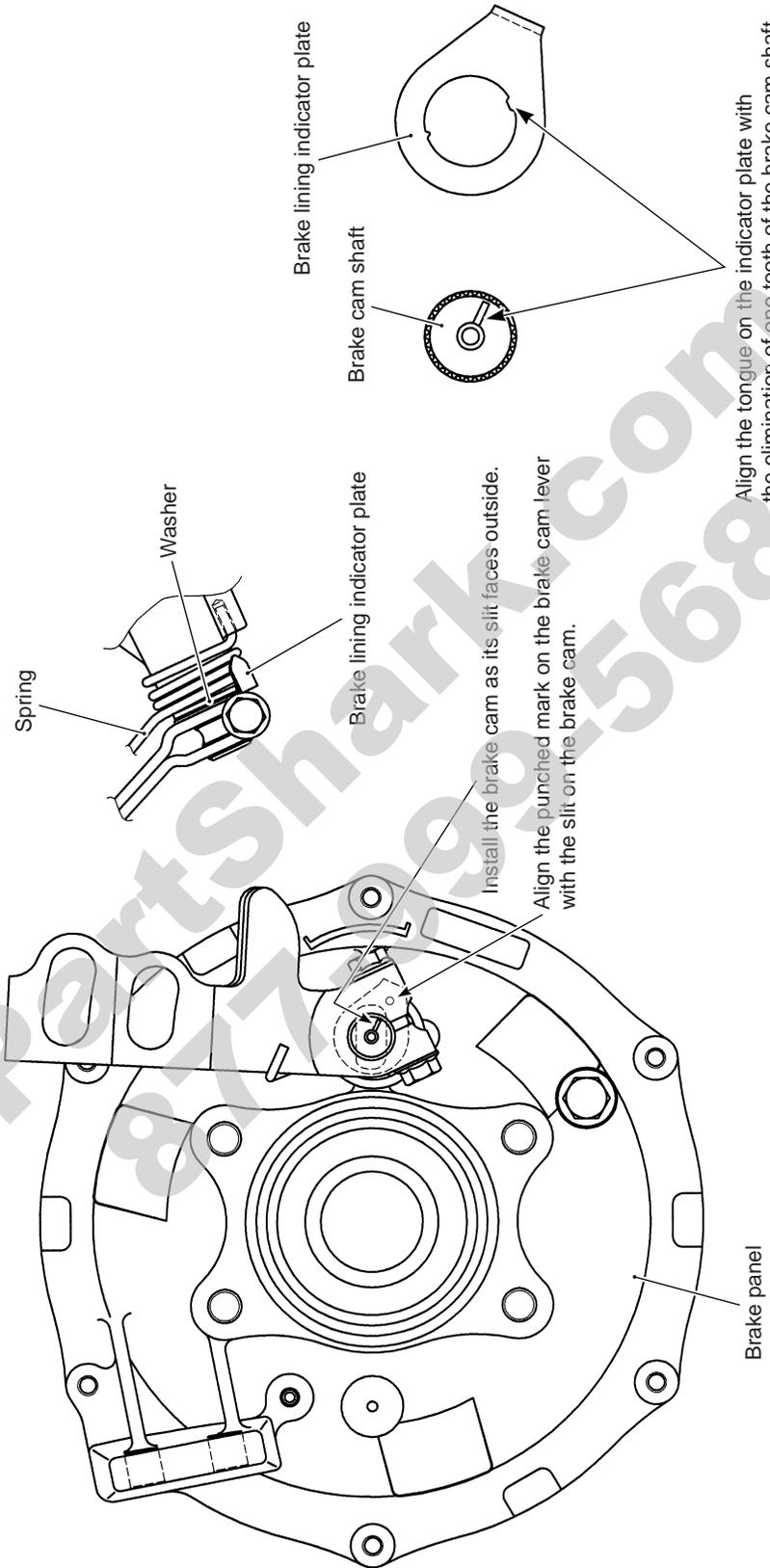
# REAR BRAKE BREATHER HOSE ROUTING



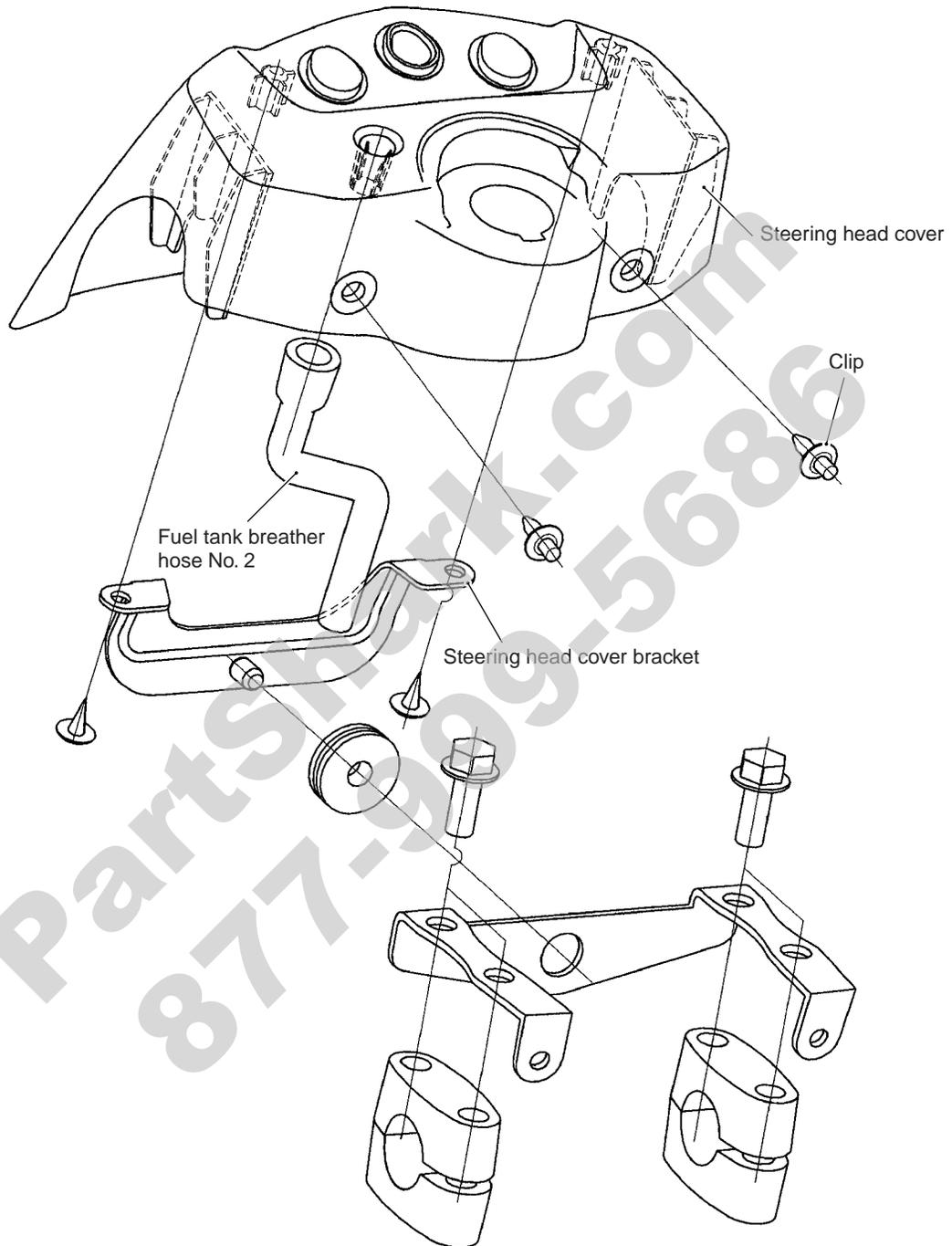
# FUEL HOSE ROUTING



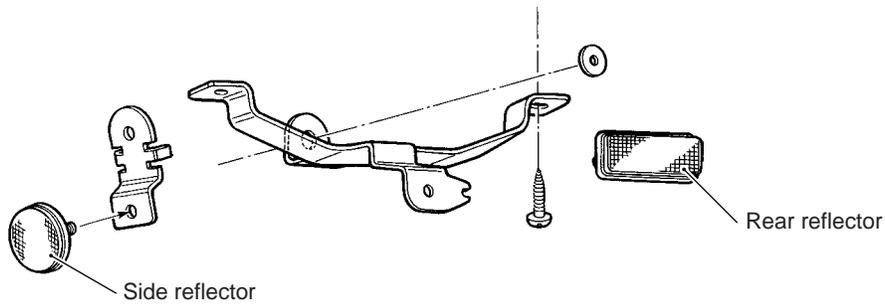
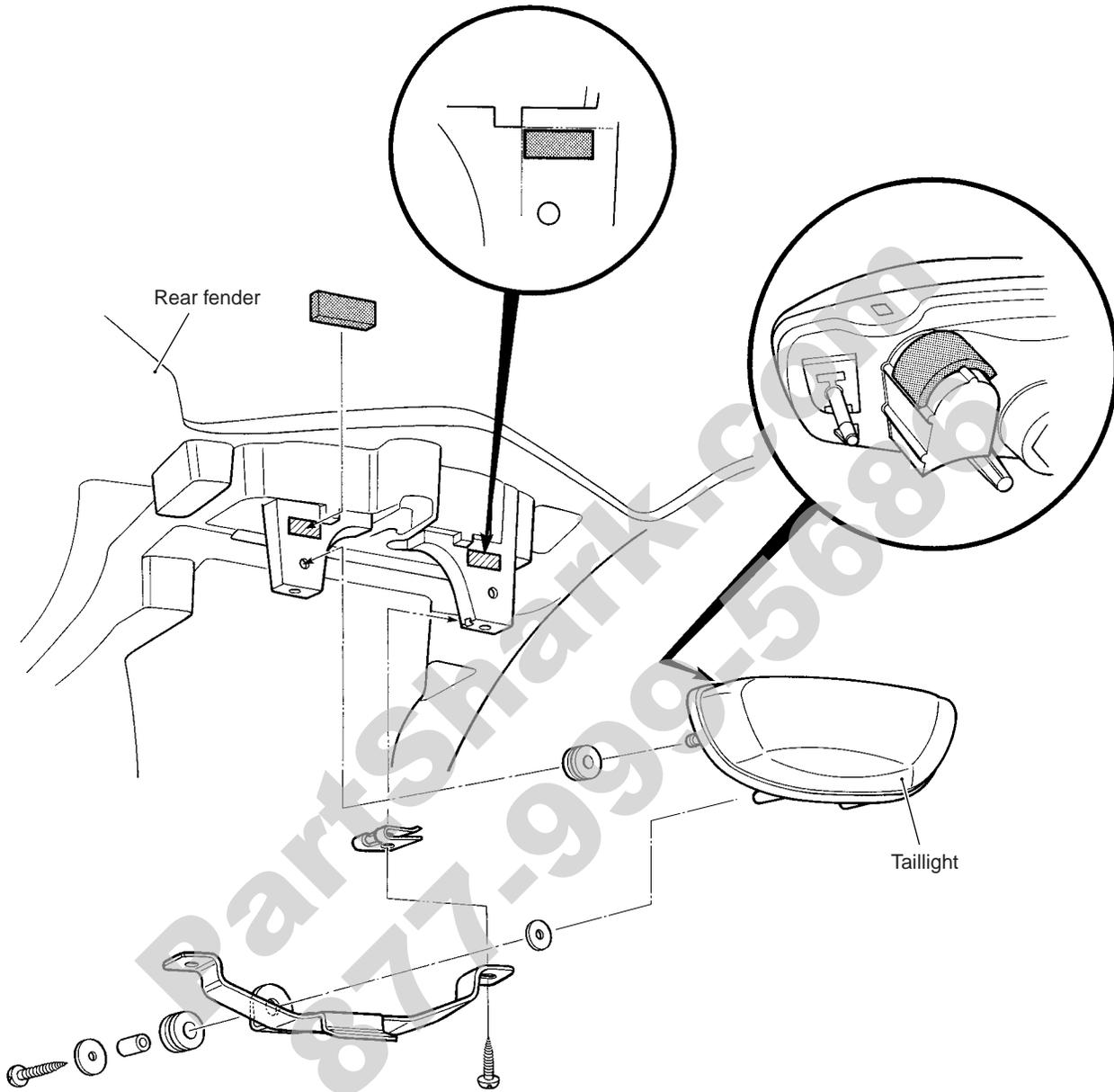
# REAR BRAKE CAM LEVER SET-UP



# STEERING HEAD COVER SET-UP

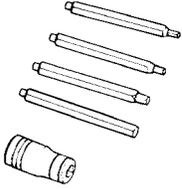
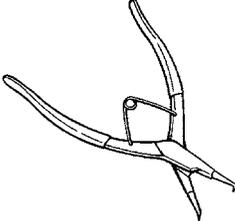
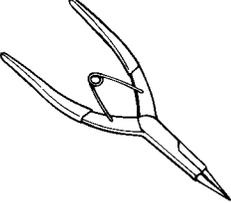
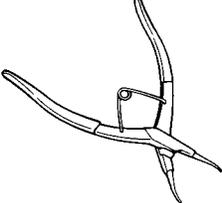
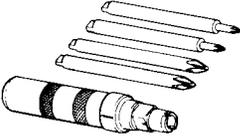
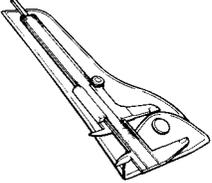
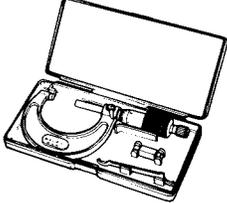
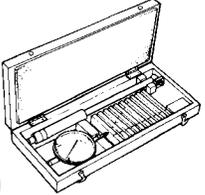
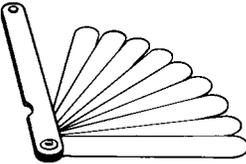
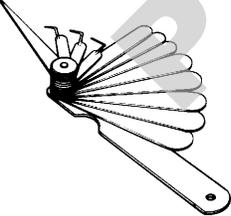
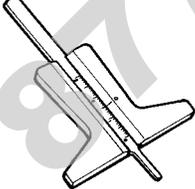
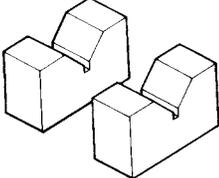
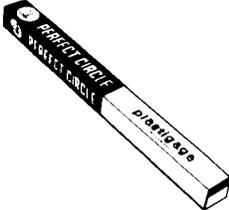
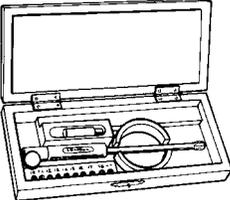
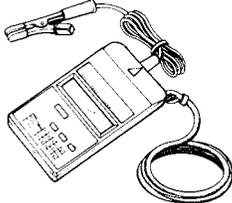
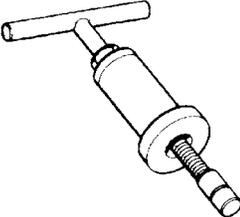
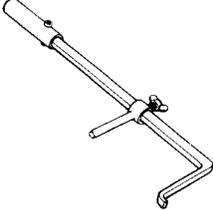
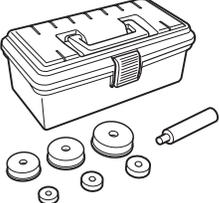


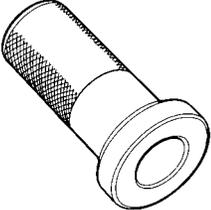
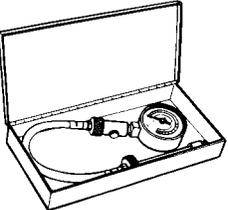
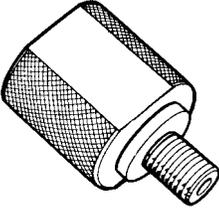
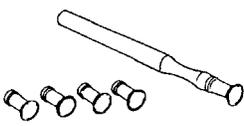
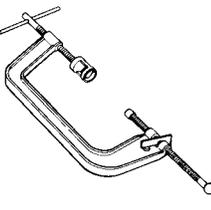
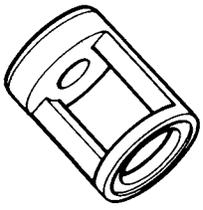
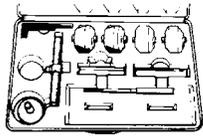
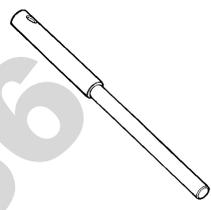
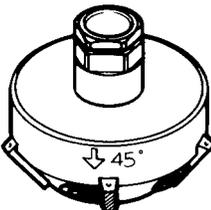
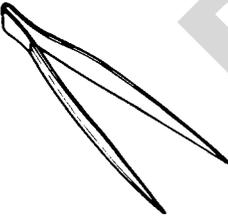
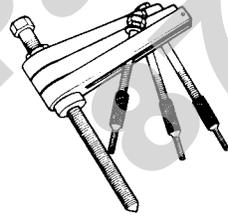
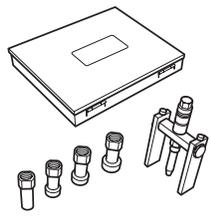
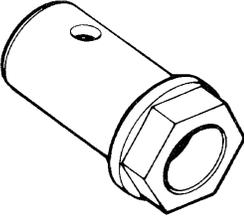
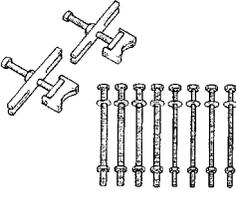
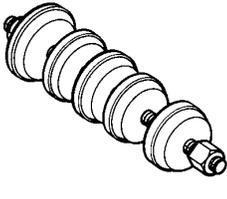
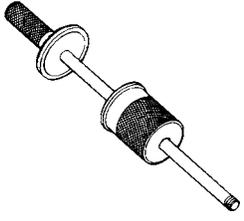
# TAILLIGHT SET-UP

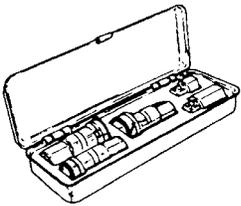
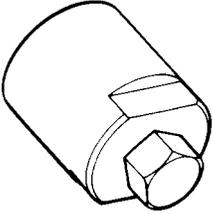
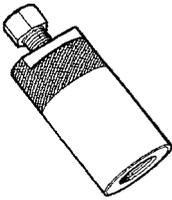
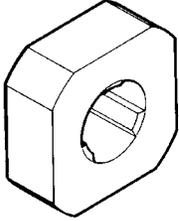
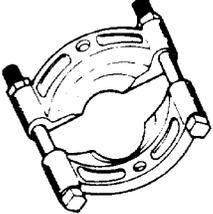


**E-28 ONLY**

## SPECIAL TOOLS

 <p><b>09900-00410</b> Hexagon wrench set</p>	 <p><b>09900-06106</b> Snap ring pliers</p>	 <p><b>09900-06107</b> Snap ring pliers</p>	 <p><b>09900-06108</b> Snap ring pliers</p>	 <p><b>09900-09004</b> Impact driver set</p>
 <p><b>09900-20101</b> Vernier calipers</p>	 <p><b>09900-20202</b> Micrometer (1/100 mm, 25 50 mm)</p>	 <p><b>09900-20203</b> Micrometer (1/100 mm, 50 75 mm)</p>	 <p><b>09900-20205</b> Micrometer (1/1000 mm, 0 25 mm)</p>	 <p><b>09900-20508</b> Cylinder gauge set (1/100 mm, 40 80 mm)</p>
 <p><b>09900-20602</b> Dial gauge (1/1000 mm)</p>	 <p><b>09900-20605</b> Dial calipers (1/100 mm, 10 34 mm)</p>	 <p><b>09900-20607</b> Dial gauge (1/100 mm)</p>	 <p><b>09900-20701</b> Magnetic stand</p>	 <p><b>09900-20803</b> Thickness gauge</p>
 <p><b>09900-20804</b> Thickness gauge</p>	 <p><b>09900-20805</b> Tire depth gauge</p>	 <p><b>09900-21304</b> V-block set (100 mm)</p>	 <p><b>09900-22302</b> Plastigauge</p>	 <p><b>09900-22401</b> Small bore gauge (10 18 mm)</p>
 <p><b>09900-25008</b> Multi circuit tester set</p>	 <p><b>09900-26006</b> Tachometer</p>	 <p><b>09910-32812</b> Crankshaft installer</p>	 <p><b>09913-50121</b> Oil seal remover</p>	 <p><b>09913-70210</b> Bearing installer set</p>

 <p><b>09913-85210</b> Bearing/oil seal installer</p>	 <p><b>09915-64510</b> Compression gauge set <b>09918-02410</b> or <b>09918-03810</b> (Adaptor)</p>	 <p><b>09915-74511</b> Oil pressure gauge</p>	 <p><b>09915-74512</b> Oil pressure gauge adaptor</p>	 <p><b>09916-10911</b> Valve lapper set</p>
 <p><b>09916-14510</b> Valve spring compressor</p>	 <p><b>09916-14910</b> Valve spring compressor attachment</p>	 <p><b>09916-21111</b> <b>09916-24900</b> Valve seat cutter set</p>	 <p><b>09916-24450</b> Solid pilot (N-100-5.52)</p>	 <p><b>09916-22480</b> Solid pilot (N-140-5.5)</p>
 <p><b>09916-24935</b> Valve seat cutter (N-608)</p>	 <p><b>09916-34542</b> Reamer handle</p>	 <p><b>09916-34550</b> Valve guide reamer (5.5 mm)</p>	 <p><b>09916-34561</b> Valve guide reamer (11.3 mm)</p>	 <p><b>09916-44910</b> Valve guide remover/installer</p>
 <p><b>09916-84511</b> Tweezers</p>	 <p><b>09920-13120</b> Crankcase separator</p>	 <p><b>09920-53730</b> Clutch sleeve hub holder</p>	 <p><b>09921-20210</b> Bearing puller</p>	 <p><b>09921-20240</b> Bearing remover set</p>
 <p><b>09921-21820</b> Bearing locknut wrench</p>	 <p><b>09921-21910</b> Bearing holder</p>	 <p><b>09923-74510</b> Bearing remover</p>	 <p><b>09924-84510</b> Bearing installer set</p>	 <p><b>09930-30104</b> Sliding shaft</p>

 <p><b>09930-10121</b> Spark plug wrench set</p>	 <p><b>09930-30721</b> Rotor remover</p>	 <p><b>09930-35010</b> Rotor remover</p>	 <p><b>09930-31921</b> Rotor remover</p>	 <p><b>09930-44520</b> Rotor holder</p>
 <p><b>09930-73150</b> Output shaft holder</p>	 <p><b>09950-81910</b> Remover</p>	<p><i>PartShark.com</i> <i>877-999-5686</i></p>		

**NOTE:**

*When ordering a special tool, please confirm whether it is available or not.*

## TIGHTENING TORQUE ENGINE

ITEM	N•m	kgf-m	lb-ft
Cylinder head cover bolt	10	1.0	7.0
Camshaft sprocket bolt	11	1.1	8.0
Cylinder head nut (M8)	23	2.3	16.5
Cylinder head nut (M6)	10	1.0	7.0
Cylinder base nut (M6)	10	1.0	7.0
Cam chain tensioner mounting bolt	10	1.0	7.0
Cam chain tension adjuster spring holder bolt	8	0.8	6.0
Neutral switch bolt	7	0.7	5.0
Spark plug	18	1.8	13.0
Rocker arm shaft bolt	9	0.9	6.5
Valve clearance adjuster locknut	14	1.4	10.0
Crankcase bolt	11	1.1	8.0
Valve timing inspection plug	23	2.3	16.5
Clutch shoe nut	140	14.0	101.5
Clutch sleeve hub nut	100	1.0	72.5
Clutch adjuster lock nut	23	2.3	16.5
Clutch adjuster cap	15	1.5	11.0
Generator rotor nut	160	16.0	115.5
Generator cover cap	15	1.5	11.0
Starter clutch bolt	26	2.6	19.0
Exhaust pipe nut	23	2.3	16.5
Muffler mounting bolt/nut	23	2.3	16.5
Muffler connecting bolt	23	2.3	16.5
Spark arrester bolt	11	1.1	8.0
Engine oil drain plug	21	2.1	15.0
Secondary drive bevel gear nut	100	10.0	72.5
Secondary driven bevel gear nut	100	10.0	72.5
Engine mounting bolt/nut	66	6.6	48.0
Engine mounting bracket bolt	23	2.3	16.5
Starter motor lead wire nut	6	0.6	4.5
Starter motor mounting bolt	10	1.0	7.0

**DRIVE TRAIN**

ITEM	N•m	kgf-m	lb-ft
Final gear case cover bolt	26	2.6	19.0
Pinion gear bearing locknut	100	10.0	72.5
Rear drive gear oil filler plug	26	2.6	19.0
Rear drive gear oil drain plug	26	2.6	19.0
Rear axle housing set bolt/nut (RH)	60	6.0	43.5
Rear axle housing set bolt/nut (LH)	65	6.5	47.0
Rear axle housing/final gear case bolt	65	6.5	47.0

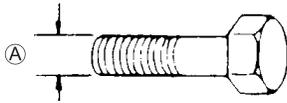
**CHASSIS**

ITEM	N•m	kgf-m	lb-ft
Handlebar clamp bolt	23	2.3	16.5
Steering shaft holder bolt	23	2.3	16.5
Steering shaft nut	49	4.9	35.5
Wishbone arm pivot bolt/nut (upper and lower)	65	6.5	47.0
Wheel hub nut (front)	65	6.5	47.0
Wheel hub nut (rear)	138	13.8	99.9
Wheel set nut (front and rear)	50	5.0	36.0
Steering knuckle nut (upper and lower)	29	2.9	21.0
Front shock absorber mounting bolt/nut (upper and lower)	60	6.0	43.5
Tie rod end nut	29	2.9	21.0
Tie rod lock nut	29	2.9	21.0
Front brake air bleeder valve	6.0	0.6	4.4
Front brake caliper mounting bolt	26	2.6	19.0
Front brake pipe nut (Upper and lower)	16	1.6	11.6
Front brake pad mounting pin	18	1.8	13.0
Front brake caliper holder pin	18	1.8	13.0
Front brake caliper holder slide pin	23	2.3	16.5
Front brake master cylinder mounting bolt	10	1.0	7.0
Front brake hose union bolt	23	2.3	16.5
Front brake disc bolt	23	2.3	16.5
Front brake disc plate mounting bolt	23	2.3	16.5
Footrest bolt (M8)	26	2.6	19.0
Footrest bolt (M10)	55	5.5	40.0
Rear shock absorber mounting bolt/nut (Upper)	78	7.8	55.0
Rear shock absorber mounting bolt/nut (Lower)	60	6.0	43.5
Swingarm pivot bolt/nut	85	8.5	61.5
Rear brake cam lever bolt/nut	11	1.1	8.0
Rear brake pedal mounting bolt	11	1.0	8.0
Rear brake panel mounting nut	60	6.0	43.5

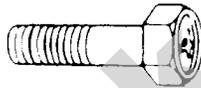
## TIGHTENING TORQUE CHART

For other nuts and bolts not listed in the preceding page, refer to this chart:

Bolt Diameter Ⓐ (mm)	Conventional or 4 marked bolt			7 marked bolt		
	N•m	kgf-m	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

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## SERVICE DATA

### VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	32 (1.3)	
	EX.	28 (1.1)	
Tappet clearance (when cold)	IN.	0.03 0.08 (0.001 0.003)	
	EX.	0.08 0.13 (0.003 0.005)	
Valve guide to valve stem clearance	IN.	0.010 0.037 (0.0004 0.0015)	
	EX.	0.030 0.057 (0.0012 0.0024)	
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.		2.5 (0.10)
Valve seat width	IN. & EX.	0.88 1.08 (0.035 0.043)	
Valve head radial runout	IN. & EX.		0.03 (0.001)
Valve spring free length	IN. & EX.		43.0 (1.69)
Valve spring tension	IN. & EX.	256 294 N (26.1 30.0 kgf, 57.5 66.1 lbs) at length 36.6 mm (1.44 in)	

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.780 33.820 (1.3299 1.3315)	33.480 (1.3181)
	EX.	32.990 33.030 (1.2988 1.3004)	32.690 (1.2870)
Camshaft journal oil clearance		0.036 0.066 (0.0014 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.		22.012 22.025 (0.8666 0.8671)	
Camshaft journal O.D.		21.959 21.976 (0.8645 0.8652)	
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.	11.977 11.995 (0.4715 0.4722)	
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		1 400 kPa (14.0 kgf/cm <sup>2</sup> , 199 psi)	1 200 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi)	
Piston to cylinder clearance		0.040 0.050 (0.0016 0.0020)	0.120 (0.0047)	
Cylinder bore		66.000 66.015 (2.5984 2.5990)	66.090 (2.6020)	
Piston diam.		65.955 65.970 (2.5966 2.5972) Measure at 18 mm (0.71 in) from the skirt end.	65.880 (2.5937)	
Cylinder distortion			0.05 (0.002)	
Piston ring free end gap	1st	R	Approx. 8.7 (0.34)	7.0 (0.28)
	2nd	R	Approx. 9.0 (0.35)	7.2 (0.28)
Piston ring end gap	1st		0.10 0.25 (0.004 0.010)	0.50 (0.020)
	2nd		0.10 0.25 (0.004 0.010)	0.5 (0.020)
Piston ring to 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		2.01 2.03 (0.0791 0.0799)	

ITEM	STANDARD		LIMIT
Piston ring thickness	1st	0.97 0.99 (0.038 0.039)	
	2nd	1.17 1.19 (0.046 0.047)	
Piston pin bore		16.002 16.008 (0.6300 0.6302)	16.030 (0.6311)
Piston pin O.D.		15.992 16.000 (0.6296 0.6299)	15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.		16.006 16.014 (0.6302 0.6305)	16.040 (0.6315)
Conrod deflection			3.0 (0.12)
Conrod big end side clearance		0.10 0.45 (0.004 0.018)	1.0 (0.04)
Conrod big end width		17.95 18.00 (0.707 0.709)	
Crank web to web width		53.0 – 0.1 (2.087 – 0.004)	
Crankshaft runout			0.08 (0.003)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 30 kPa (0.3 kgf/cm <sup>2</sup> , 4.3 psi) Below 70 kPa (0.7 kgf/cm <sup>2</sup> , 9.9 psi) at 3 000 r/min.	

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch release screw	1/16 1/8 turn back	
Drive plate thickness	2.7 2.9 (0.106 0.114)	2.4 (0.094)
Drive plate claw width	11.9 12.0 (0.469 0.472)	11.0 (0.433)
Driven plate distortion		0.10 (0.004)
Clutch spring free length	28.9 (1.14)	27.5 (1.08)
Clutch wheel I.D.	116.00 116.15 (4.567 4.573)	116.5 (4.59)
Clutch shoe		No groove at any part
Clutch engagement r/min.	1 700 2 100 r/min	
Clutch lock-up r/min.	3 100 3 700 r/min	

**DRIVE TRAIN**

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.047 (64/21)	
Secondary reduction ratio		1.133 (17/15)	
Final reduction ratio		3.200 (32/10)	
Gear ratios	1st	3.083 (37/12)	
	2nd	1.933 (29/15)	
	3rd	1.388 (25/18)	
	4th	1.095 (23/21)	
	5th	0.913 (21/23)	
	Reverse	2.833 (34/12)	
Shift fork to groove clearance		0.10 0.30 (0.004 0.012)	0.5 (0.020)
Shift fork groove width		4.50 4.6 0 (0.169 0.173)	
Shift fork thickness		4.30 4.40 (0.169 0.173)	
Gearshift lever height		0 10 (0 0.393)	
Secondary bevel gear backlash		0.03 0.15 (0.001 0.006)	
Rear drive (final) bevel gear backlash		0.05 0.30 (0.002 0.012)	

**CARBRETOR**

ITEM	SPECIFICATION	
	E-19, 28	E-33
Carburetor type	MIKUNI BSR29	←
Bore size	29 mm (1.14 in)	←
I.D. No.	21G0	21G1
Idle r/min	1 500 – 100 r/min	←
Float height	13.0 – 1.0 mm (0.51 – 0.04 in)	←
Main jet (M.J.)	#125	# <i>125</i>
Jet needle (J.N.)	5DH54-2nd	←
Needle jet (N.J.)	P-0M	# <i>P-0M</i>
Pilot jet (P.J.)	#20	# <i>20</i>
Pilot screw (P.S.)	1-1/2 turns back	PRE-SET
Throttle cable play	3 5 mm (0.12 0.2 0 in)	←
Starter (enricher) plunger cable play	0.5 1.0 mm (0.02 0.0 4 in)	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Spark plug	Type	NGK: DR7EA DENSO: X22ESR-U		
	Gap	0.6 0.7 (0.024 0.028)		
Spark performance		Over 8 (0.3) at 1 atm.		
Ignition coil resistance	Primary	0.05 1.0 $\Omega$		Terminal Terminal
	Secondary	10.5 19.0 k $\Omega$		Plug cap Terminal
Ignition coil primary peak voltage		120 V and more		⊕: B/W ⊖: W/BI
Generator coil resistance	Pick-up	80 155 $\Omega$		BI/Y G/W
	Charging	0.5 1.2 $\Omega$		Y Y
Pick-up coil peak voltage		4.0 V and more		⊕: G/W ⊖: BI/Y
Generator no-load voltage (When engine is cold)		65 V (AC) and more at 5 000 r/min		
Generator Max. output		Approx. 150 W at 5 000 r/min		
Regulated voltage		14.0 15.5 V at 5 000 r/min		
Starter relay resistance		3 6 $\Omega$		
Battery	Type designation	YTX9-BS		
	Capacity	12V 28.8 kC (8 Ah)/10HR		
Fuse size		20 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION
Headlight	HI	40
	LO	40
Brake light/Taillight		21/5
Reverse indicator light		3
Neutral indicator light		3

**BRAKE + WHEEL**

Unit: mm (in)

ITEM	STANDARD/SPECIFICATION		LIMIT
Rear brake lever play	3 5 (0.12 0.20)		
Rear brake pedal free travel	20 30 (0.79 1.18)		
Brake disc thickness	Front	2.8 3.2 (0.110 0.126)	2.5 (0.098)
Brake disc runout	Front		0.30 (0.012)
Brake drum I.D.	Rear		140.7 (5.54)
Master cylinder bore	Front	12.700 12.743 (0.5000 0.5017)	
Master cylinder piston diam.	Front	12.657 12.684 (0.4983 0.4994)	
Brake caliper cylinder bore	Front	32.030 32.080 (1.2610 1.2630)	
Brake caliper piston diam.	Front	31.948 31.998 (1.2578 1.2598)	
Brake fluid type	DOT 4		
Turning radius	2.7 m (8.9 ft)		
Toe-in (with 75 kg, 165 lbs)	5 - 4 (0.20 - 0.16)		
Camber	0		
Caster	7 40		
Wheel rim size	Front	10 5.5 A T	
	Rear	9 8.0 AT	
Tire size	Front	AT22 7-10 ☆☆	
	Rear	AT20 10-9 ☆	
Tire tread depth	Front		4.0 (0.16)
	Rear		4.0 (0.16)
Wheel axle runout	Rear		3.0 (0.12)

**TIRE PRESSURE**

COLD INFLATION TIRE PRESSURE	kPa	kgf/cm <sup>2</sup>	psi
FRONT	30	0.30	4.4
REAR	25	0.25	3.6

VEHICLE LOAD CAPACITY LIMIT: 110 kg (243 lbs)

**FUEL + OIL**

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octane or higher rated by the Research Method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10 % ethanol, or less than 5 % methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		The others
Fuel tank including reserve	10.6 L (2.8/2.3 US/Imp gal)		
Reserve	2.6 L (0.7/0.6 US/Imp gal)		
Engine oil type	SAE 10W-40, API SF or SG		
Engine oil capacity	Change	2 200 ml (2.3/1.9 US/Imp qt)	
	Filter change	2 300 ml (2.4/2.0 US/Imp qt)	
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)	
Final gear oil type	Hypoid gear oil SAE #90, API grade GL-5		
Final gear oil capacity	190 ml (6.4/6.7 US/Imp oz)		

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# LT-Z250K5 (05-MODEL)

*This chapter describes specifications, service data and servicing procedures which differ from those of the LT-Z250K4 (04-MODEL).*

**NOTE:**

*\* Any differences between the LT-Z250K4 (04-MODEL) and LT-Z250K5 (05-MODEL) in specifications and service data are indicated with an asterisk mark (\*).*

*\* Please refer to the chapter 1 through 9 for details which are not given in this chapter.*

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

Overall length.....	1 720 mm (67.7 in)
Overall width.....	1 070 mm (42.1 in)
Overall height.....	1 090 mm (42.9 in)
Wheelbase.....	1 135 mm (44.7 in)
Front track.....	830 mm (32.7 in)
Rear track.....	810 mm (31.9 in)
Ground clearance.....	230 mm (9.1 in)
Seat height.....	810 mm (31.9 in)
Dry mass.....	166 kg (365 lbs)

## ENGINE

Type.....	Four-stroke, air-cooled, OHC
Number of cylinders.....	1
Bore.....	66.0 mm (2.598 in)
Stroke.....	72.0 mm (2.835 in)
Displacement.....	246 cm <sup>3</sup> (15.0 cu. in)
Compression ratio.....	9.2: 1
Carburetor.....	MIKUNI BSR29, single
Air cleaner.....	Polyurethane foam element
Starter system.....	Electric
Lubrication system.....	Wet sump
Idle speed.....	1 500 – 100 r/min

## DRIVE TRAIN

Clutch.....	Wet multi-plate, automatic, centrifugal type
Transmission.....	5-forward and 1-reverse
Gearshift pattern, forward.....	All up, foot lever operated
reverse.....	Foot/hand operated
Primary reduction ratio.....	3.047 (64/21)
Secondary reduction ratio.....	1.133 (17/15)
Gear ratios, Low.....	3.083 (37/12)
2nd.....	1.933 (29/15)
3rd.....	1.388 (25/18)
4th.....	1.095 (23/21)
Top.....	0.913 (21/23)
Reverse.....	2.833 (34/12)
Final reduction ratio.....	3.200 (32/10)

## CHASSIS

Front suspension.....	Independent, double wishbone, coil spring, oil damped
Rear suspension.....	Swingarm type, coil spring, oil damped
Front wheel travel.....	160 mm (6.3 in)
Rear wheel travel.....	170 mm (6.7 in)
Caster.....	7 40..... 1G
Trail.....	33 mm (1.30 in)..... 1G
Toe-in.....	5 mm (0.20 in)..... 1G
Steering angle.....	45
Turning radius.....	2.7 m (8.9 ft)
Front brake.....	Disc brake, twin
Rear brake.....	Drum brake
Front tire size.....	AT22 7-10 ☆☆☆, tubeless
Rear tire size.....	AT20 10-9 ☆, tubeless

## ELECTRICAL

Ignition type.....	Electronic ignition (CDI)
Ignition timing.....	5 B.T.D.C. at 1 500 rpm
Spark plug.....	NGK DR7EA or DENSO X22ESR-U
Battery.....	12 V 28.8 kC (8 Ah)/10 HR
Generator.....	Three-phase A.C. generator
Main fuse.....	20/15 A
Headlight.....	12 V 40/40 W
Brake light/Taillight.....	12 V 21/5 W
Neutral indicator light.....	12 V 3 W
Reverse indicator light.....	12 V 3 W

## CAPACITIES

Fuel tank, including reserve.....	10.6 L (2.8/2.3 US/Imp gal)
reserve.....	2.6 L (0.7/0.6 US/Imp gal)
Engine oil, oil change.....	2 200 ml (2.3/1.9 US/Imp qt)
filter change.....	2 300 ml (2.4/2.0 US/Imp qt)
overhaul.....	2 500 ml (2.6/2.2 US/Imp qt)
Final gear oil change.....	190 ml (6.4/6.7 US/Imp oz)

**SERVICE DATA****VALVE + GUIDE**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	32 (1.3)	
	EX.	28 (1.1)	
Tappet clearance (when cold)	IN.	0.03 0.08 (0.001 0.003)	
	EX.	0.08 0.13 (0.003 0.005)	
Valve guide to valve stem clearance	IN.	0.010 0.037 (0.0004 0.0015)	
	EX.	0.030 0.057 (0.0012 0.0024)	
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.		2.5 (0.10)
Valve seat width	IN. & EX.	0.88 1.08 (0.035 0.043)	
Valve head radial runout	IN. & EX.		0.03 (0.001)
Valve spring free length	IN. & EX.		43.0 (1.69)
Valve spring tension	IN. & EX.	256 294 N (26.1 30.0 kgf, 57.5 66.1 lbs) at length 36.6 mm (1.44 in)	

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.780 33.820 (1.3299 1.3315)	33.480 (1.3181)
	EX.	32.990 33.030 (1.2988 1.3004)	32.690 (1.2870)
Camshaft journal oil clearance	0.036 0.066 (0.0014 0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	22.012 22.025 (0.8666 0.8671)		
Camshaft journal O.D.	21.959 21.976 (0.8645 0.8652)		
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.	11.977 11.995 (0.4715 0.4722)	
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	1 400 kPa (14.0 kgf/cm <sup>2</sup> , 199 psi)		1 200 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi)
Piston to cylinder clearance	0.040 0.050 (0.0016 0.0020)		0.120 (0.0047)
Cylinder bore	66.000 66.015 (2.5984 2.5990)		66.090 (2.6020)
Piston diam.	65.955 65.970 (2.5966 2.5972) Measure at 18 mm (0.71 in) from the skirt end.		65.880 (2.5937)
Cylinder distortion			0.05 (0.002)
Piston ring free end gap	1st	R	Approx. 8.7 (0.34)
	2nd	R	Approx. 9.0 (0.35)
Piston ring end gap	1st	0.10 0.25 (0.004 0.010)	
	2nd	0.10 0.25 (0.004 0.010)	
Piston ring to groove clearance	1st	0.180 (0.007)	
	2nd	0.150 (0.006)	

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006 16.014 (0.6302 0.6305)	16.040 (0.6315)
Conrod deflection		3.0 (0.12)
Conrod big end side clearance	0.10 0.45 (0.004 0.018)	1.0 (0.04)
Conrod big end width	17.95 18.00 (0.707 0.709)	
Crank web to web width	53.0 – 0.1 (2.087 – 0.004)	
Crankshaft runout		0.08 (0.003)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pressure (at 60 C, 140 F)	Above 30 kPa (0.3 kgf/cm <sup>2</sup> , 4.3 psi) Below 70 kPa (0.7 kgf/cm <sup>2</sup> , 9.9 psi) at 3 000 r/min	

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch release screw	1/16 1/8 turn back	
Drive plate thickness	2.7 2.9 (0.106 0.114)	2.4 (0.094)
Drive plate claw width	11.9 12.0 (0.469 0.472)	11.0 (0.433)
Driven plate distortion		0.10 (0.004)
Clutch spring free length	28.9 (1.14)	27.5 (1.08)
Clutch wheel I.D.	116.00 116.15 (4.567 4.573)	116.5 (4.59)
Clutch shoe		No groove at any part
Clutch engagement r/min	1 700 2 100 r/min	
Clutch lock-up r/min	3 100 3 700 r/min	

**DRIVE TRAIN**

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.047 (64/21)	
Secondary reduction ratio		1.133 (17/15)	
Final reduction ratio		3.200 (32/10)	
Gear ratios	1st	3.083 (37/12)	
	2nd	1.933 (29/15)	
	3rd	1.388 (25/18)	
	4th	1.095 (23/21)	
	5th	0.913 (21/23)	
	Reverse	2.833 (34/12)	
Shift fork to groove clearance		0.10 0.30 (0.004 0.012)	0.5 (0.020)
Shift fork groove width		4.50 4.60 (0.169 0.173)	
Shift fork thickness		4.30 4.40 (0.169 0.173)	
Gearshift lever height		0 10 (0 0.393)	
Secondary bevel gear backlash		0.03 0.15 (0.001 0.006)	
Rear drive (final) bevel gear backlash		0.05 0.30 (0.002 0.012)	

**CARBRETOR**

ITEM	SPECIFICATION	
	E-19, 28	E-33
Carburetor type	MIKUNI BSR29	←
Bore size	29 mm (1.14 in)	←
I.D. No.	21G0	21G1
Idle r/min	1 500 – 100 r/min	←
Float height	13.0 – 1.0 mm (0.51 – 0.04 in)	←
Main jet (M.J.)	#125	# 125
Jet needle (J.N.)	5DH54-2nd	←
Needle jet (N.J.)	P-0M	# P-0M
Pilot jet (P.J.)	#20	# 20
Pilot screw (P.S.)	1 and 1/2 turns back	PRE-SET
Throttle cable play	3 5 mm (0.12 0.20 in)	←
Starter (enricher) plunger cable play	0.5 1.0 mm (0.02 0.04 in)	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION	NOTE
Spark plug	Type	NGK: DR7EA DENSO: X22ESR-U	
	Gap	0.6 0.7 (0.024 0.028)	
Spark performance		Over 8 (0.3) at 1 atm.	
Ignition coil resistance	Primary	0.05 1.0 $\Omega$	Terminal Terminal
	Secondary	10.5 19.0 k $\Omega$	Plug cap Terminal
Ignition coil primary peak voltage		120 V and more	⊕: B/W ⊖: W/BI
Generator coil resistance	Pick-up	80 155 $\Omega$	BI/Y G/W
	Charging	0.5 1.2 $\Omega$	Y Y
Pick-up coil peak voltage		4.0 V and more	⊕: G/W ⊖: BI/Y
Generator no-load voltage (When engine is cold)		65 V (AC) and more at 5 000 r/min	
Generator Max. output		Approx. 150 W at 5 000 r/min	
Regulated voltage		14.0 15.5 V at 5 000 r/min	
Starter relay resistance		3 6 $\Omega$	
Battery	Type designation	YTX9-BS	
	Capacity	12V 28.8 kC (8 Ah)/10HR	
Fuse size		20 A	

**WATTAGE**

Unit: W

ITEM		SPECIFICATION
Headlight	HI	40
	LO	40
Brake light/Taillight		21/5
Reverse indicator light		3
Neutral indicator light		3

**BRAKE + WHEEL**

Unit: mm (in)

ITEM	STANDARD/SPECIFICATION		LIMIT
Rear brake lever play	3 5 (0.12 0.20)		
Rear brake pedal free travel	20 30 (0.79 1.18)		
Brake disc thickness	Front	2.8 3.2 (0.110 0.126)	2.5 (0.098)
Brake disc runout	Front		0.30 (0.012)
Brake drum I.D.	Rear		140.7 (5.54)
Master cylinder bore	Front	12.700 12.743 (0.5000 0.5017)	
Master cylinder piston diam.	Front	12.657 12.684 (0.4983 0.4994)	
Brake caliper cylinder bore	Front	32.030 32.080 (1.2610 1.2630)	
Brake caliper piston diam.	Front	31.948 31.998 (1.2578 1.2598)	
Brake fluid type	DOT 4		
Turning radius	2.7 m (8.9 ft)		
Toe-in (with 75 kg, 165 lbs)	5 - 4 (0.20 - 0.16)		
Camber	0		
Caster	7 40		
Wheel rim size	Front	10 5.5 AT	
	Rear	9 8.0 AT	
Tire size	Front	AT22 7-10 ☆☆	
	Rear	AT20 10-9 ☆	
Tire tread depth	Front		4.0 (0.16)
	Rear		4.0 (0.16)
Wheel axle runout	Rear		3.0 (0.12)

**TIRE PRESSURE**

COLD INFLATION TIRE PRESSURE	kPa	kgf/cm <sup>2</sup>	psi
FRONT	30	0.30	4.4
REAR	25	0.25	3.6

VEHICLE LOAD CAPACITY LIMIT: 110 kg (243 lbs)

**FUEL + OIL**

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octane or higher rated by the Research Method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		The others
Fuel tank capacity including reserve	10.6 L (2.8/2.3 US/Imp gal)		
Reserve	2.6 L (0.7/0.6 US/Imp gal)		
Engine oil type	SAE 10W-40, API SF or SG		
Engine oil capacity	Change	2 200 ml (2.3/1.9 US/Imp qt)	
	Filter change	2 300 ml (2.4/2.0 US/Imp qt)	
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)	
Final gear oil type	Hypoid gear oil SAE #90, API grade GL-5		
Final gear oil capacity	190 ml (6.4/6.7 US/Imp oz)		

## TIGHTENING TORQUE

### CHASSIS

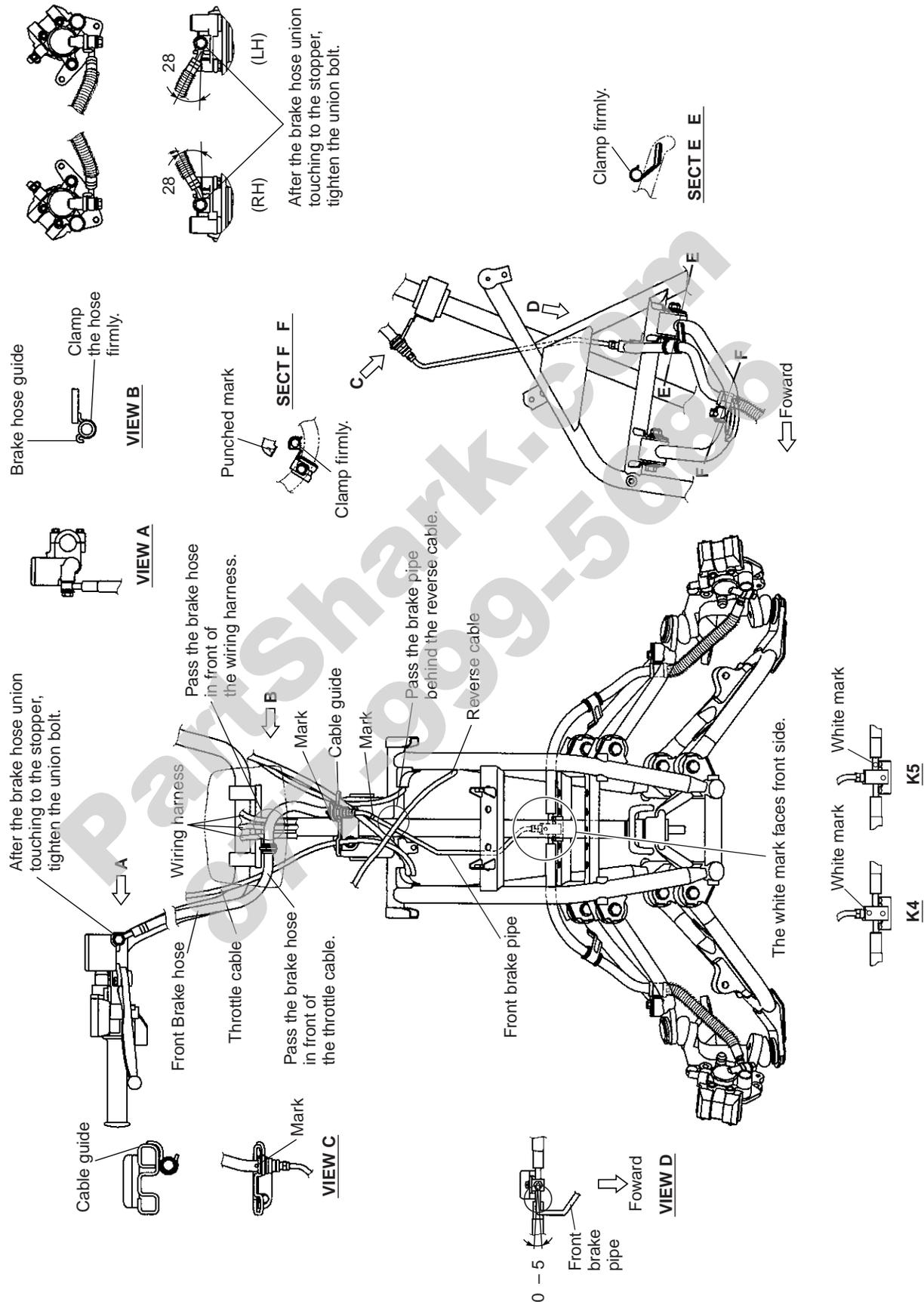
ITEM	N•m	kgf-m	lb-ft
Handlebar clamp bolt	23	2.3	16.5
Steering shaft holder bolt	23	2.3	16.5
Steering shaft nut	49	4.9	35.5
Wishbone arm pivot bolt/nut (upper and lower)	65	6.5	47.0
Wheel hub nut (front)	65	6.5	47.0
Wheel hub nut (rear)	138	13.8	99.9
Wheel set nut (front and rear)	* 60	* 6.0	* 43.5
Steering knuckle nut (upper and lower)	29	2.9	21.0
Front shock absorber mounting bolt/nut (upper and lower)	60	6.0	43.5
Tie rod end nut	29	2.9	21.0
Tie rod lock nut	29	2.9	21.0
Front brake air bleeder valve	6.0	0.6	4.4
Front brake caliper mounting bolt	26	2.6	19.0
Front brake pipe nut (Upper and lower)	16	1.6	11.6
Front brake pad mounting pin	18	1.8	13.0
Front brake caliper holder pin	18	1.8	13.0
Front brake caliper holder slide pin	23	2.3	16.5
Front brake master cylinder mounting bolt	10	1.0	7.0
Front brake hose union bolt	23	2.3	16.5
Front brake disc bolt	23	2.3	16.5
Front brake disc plate mounting bolt	23	2.3	16.5
Footrest bolt (M8)	26	2.6	19.0
Footrest bolt (M10)	55	5.5	40.0
Rear shock absorber mounting bolt/nut (Upper)	78	7.8	55.0
Rear shock absorber mounting bolt/nut (Lower)	60	6.0	43.5
Swingarm pivot bolt/nut	85	8.5	61.5
Rear brake cam lever bolt/nut	11	1.1	8.0
Rear brake pedal mounting bolt	11	1.0	8.0
Rear brake panel mounting nut	60	6.0	43.5

## FRONT BRAKE CALIPER MOUNTING BOLT

Apply THREAD LOCK SUPER 1360 to the caliper mounting bolts before tightening them.

 99000-32130: THREAD LOCK SUPER 1360

# FRONT BRAKE HOSE ROUTING



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# LT-Z250K6 (06-MODEL)

*This chapter describes specifications, service data and servicing procedures which differ from those of the LT-Z250K5 (05-MODEL).*

**NOTE:**

*\* Any differences between the LT-Z250K5 (05-MODEL) and LT-Z250K6 (06-MODEL) in specifications and service data are indicated with an asterisk mark (\*).*

*\* Please refer to the chapter 1 through 10 for details which are not given in this chapter.*

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

Overall length .....	1 720 mm (67.7 in)
Overall width .....	1 070 mm (42.1 in)
Overall height .....	1 090 mm (42.9 in)
Wheelbase .....	1 135 mm (44.7 in)
Front track .....	830 mm (32.7 in)
Rear track .....	810 mm (31.9 in)
Ground clearance .....	230 mm (9.1 in)
Seat height .....	810 mm (31.9 in)
Dry mass .....	166 kg (365 lbs)

## ENGINE

Type .....	Four-stroke, air-cooled, OHC
Number of cylinders .....	1
Bore .....	66.0 mm (2.598 in)
Stroke .....	72.0 mm (2.835 in)
Displacement .....	246 cm <sup>3</sup> (15.0 cu. in)
Compression ratio .....	9.2 : 1
Carburetor .....	MIKUNI BSR29, single
Air cleaner .....	Polyurethane foam element
Starter system .....	Electric
Lubrication system .....	Wet sump
Idle speed .....	1 500 – 100 r/min

## DRIVE TRAIN

Clutch .....	Wet multi-plate, automatic, centrifugal type
Transmission .....	5-forward and 1-reverse
Gearshift pattern, forward .....	All up, foot lever operated
reverse .....	Foot/hand operated
Primary reduction ratio .....	3.047 (64/21)
Secondary reduction ratio .....	1.133 (17/15)
Gear ratios, Low .....	3.083 (37/12)
2nd .....	1.933 (29/15)
3rd .....	1.388 (25/18)
4th .....	1.095 (23/21)
Top .....	0.913 (21/23)
Reverse .....	2.833 (34/12)
Final reduction ratio .....	3.200 (32/10)

## CHASSIS

Front suspension .....	Independent, double wishbone, coil spring, oil damped
Rear suspension .....	Swingarm type, coil spring, oil damped
Front wheel travel .....	160 mm (6.3 in)
Rear wheel travel .....	170 mm (6.7 in)
Caster .....	7° 40' ..... 1G
Trail .....	33 mm (1.30 in) ..... 1G
Toe-in .....	5 mm (0.20 in) ..... 1G
Steering angle .....	45°
Turning radius .....	2.7 m (8.9 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Drum brake
Front tire size .....	AT22 7-10☆☆, tubeless
Rear tire size .....	AT20 10-9 ☆, tubeless

## ELECTRICAL

Ignition type .....	Electronic ignition (CDI)
Ignition timing .....	5° B.T.D.C. at 1 500 rpm
Spark plug .....	NGK DR7EA or DENSO X22ESR-U
Battery .....	12 V 28.8 kC (8 Ah)/10 HR
Generator .....	Three-phase A.C. generator
Main fuse .....	20/15 A
Headlight .....	12 V 40/40 W
Brake light/Taillight .....	12 V 21/5 W
Neutral indicator light .....	12 V 3 W
Reverse indicator light .....	12 V 3 W

## CAPACITIES

Fuel tank, including reserve .....	10.6 L (2.8/2.3 US/Imp gal)
reserve .....	2.6 L (0.7/0.6 US/Imp gal)
Engine oil, oil change .....	2 200 ml (2.3/1.9 US/Imp qt)
filter change .....	2 300 ml (2.4/2.0 US/Imp qt)
overhaul .....	2 500 ml (2.6/2.2 US/Imp qt)
Final gear oil change .....	190 ml (6.4/6.7 US/Imp oz)

## SERVICE DATA

### VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	32 (1.3)	
	EX.	28 (1.1)	
Tappet clearance (when cold)	IN.	0.03 0.08 (0.001 0.003)	
	EX.	0.08 0.13 (0.003 0.005)	
Valve guide to valve stem clearance	IN.	0.010 0.037 (0.0004 0.0015)	
	EX.	0.030 0.057 (0.0012 0.0024)	
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.		2.5 (0.10)
Valve seat width	IN. & EX.	0.88 1.08 (0.035 0.043)	
Valve head radial runout	IN. & EX.		0.03 (0.001)
Valve spring free length	IN. & EX.		43.0 (1.69)
Valve spring tension	IN. & EX.	256 294 N (26.1 30.0 kgf, 57.5 66.1 lbs) at length 36.6 mm (1.44 in)	

**CAMSHAFT + CYLINDER HEAD**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.780 33.820 (1.3299 1.3315)	33.480 (1.3181)
	EX.	32.990 33.030 (1.2988 1.3004)	32.690 (1.2870)
Camshaft journal oil clearance	0.036 0.066 (0.0014 0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	22.012 22.025 (0.8666 0.8671)		
Camshaft journal O.D.	21.959 21.976 (0.8645 0.8652)		
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.	11.977 11.995 (0.4715 0.4722)	
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	1 400 kPa (14.0 kgf/cm <sup>2</sup> , 199 psi)		1 200 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi)	
Piston to cylinder clearance	0.040 0.050 (0.0016 0.0020)		0.120 (0.0047)	
Cylinder bore	66.000 66.015 (2.5984 2.5990)		66.090 (2.6020)	
Piston diam.	65.955 65.970 (2.5966 2.5972) Measure at 18 mm (0.71 in) from the skirt end.		65.880 (2.5937)	
Cylinder distortion			0.05 (0.002)	
Piston ring free end gap	1st	R	Approx. 8.7 (0.34)	7.0 (0.28)
	2nd	R	Approx. 9.0 (0.35)	7.2 (0.28)
Piston ring end gap	1st	0.10 0.25 (0.004 0.010)		0.50 (0.020)
	2nd	0.10 0.25 (0.004 0.010)		0.50 (0.020)
Piston ring to 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	2.01 2.03 (0.0791 0.0799)		

ITEM	STANDARD		LIMIT
Piston ring thickness	1st	0.97 0.99 (0.038 0.039)	
	2nd	1.17 1.19 (0.046 0.047)	
Piston pin bore	16.002 16.008 (0.6300 0.6302)		16.030 (0.6311)
Piston pin O.D.	15.992 16.000 (0.6296 0.6299)		15.980 (0.6291)

**CONROD + CRANKSHAFT**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	16.006 16.014 (0.6302 0.6305)		16.040 (0.6315)
Conrod deflection			3.0 (0.12)
Conrod big end side clearance	0.10 0.45 (0.004 0.018)		1.0 (0.04)
Conrod big end width	17.95 18.00 (0.707 0.709)		
Crank web to web width	53.0 – 0.1 (2.087 – 0.004)		
Crankshaft runout			0.08 (0.003)

**OIL PUMP**

ITEM	STANDARD	LIMIT
Oil pressure (at 60 C, 140 F)	Above 30 kPa (0.3 kgf/cm <sup>2</sup> , 4.3 psi) Below 70 kPa (0.7 kgf/cm <sup>2</sup> , 9.9 psi) at 3 000 r/min	

**CLUTCH**

Unit: mm (in)

ITEM	STANDARD		LIMIT
Clutch release screw	1/16 1/8 turn back		
Drive plate thickness	2.7 2.9 (0.106 0.114)		2.4 (0.094)
Drive plate claw width	11.9 12.0 (0.469 0.472)		11.0 (0.433)
Driven plate distortion			0.10 (0.004)
Clutch spring free length	28.9 (1.14)		27.5 (1.08)
Clutch wheel I.D.	116.00 116.15 (4.567 4.573)		116.5 (4.59)
Clutch shoe			No groove at any part
Clutch engagement r/min	1 700 2 100 r/min		
Clutch lock-up r/min	3 100 3 700 r/min		

**DRIVE TRAIN**

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.047 (64/21)	
Secondary reduction ratio		1.133 (17/15)	
Final reduction ratio		3.200 (32/10)	
Gear ratios	1st	3.083 (37/12)	
	2nd	1.933 (29/15)	
	3rd	1.388 (25/18)	
	4th	1.095 (23/21)	
	5th	0.913 (21/23)	
	Reverse	2.833 (34/12)	
Shift fork to groove clearance		0.10 0.30 (0.004 0.012)	0.5 (0.020)
Shift fork groove width		4.50 4.60 (0.169 0.173)	
Shift fork thickness		4.30 4.40 (0.169 0.173)	
Gearshift lever height		0 10 (0 0.393)	
Secondary bevel gear backlash		0.03 0.15 (0.001 0.006)	
Rear drive (final) bevel gear backlash		0.05 0.30 (0.002 0.012)	

**CARBRETOR**

ITEM	SPECIFICATION	
	E-19, 28	E-33
Carburetor type	MIKUNI BSR29	←
Bore size	29 mm (1.14 in)	←
I.D. No.	21G0	21G1
Idle r/min	1 500 – 100 r/min	←
Float height	13.0 – 1.0 mm (0.51 – 0.04 in)	←
Main jet (M.J.)	#125	# <del>125</del>
Jet needle (J.N.)	5DH54-2nd	←
Needle jet (N.J.)	P-0M	# <del>P-0M</del>
Pilot jet (P.J.)	#20	# <del>20</del>
Pilot screw (P.S.)	1 and 1/2 turns back	PRE-SET
Throttle cable play	3 5 mm (0.12 0.20 in)	←
Starter (enricher) plunger cable play	0.5 1.0 mm (0.02 0.04 in)	←

**ELECTRICAL**

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Spark plug		Type	NGK: DR7EA DENSO: X22ESR-U	
		Gap	0.6 0.7 (0.024 0.028)	
Spark performance		Over 8 (0.3) at 1 atm.		
Ignition coil resistance		Primary	0.05 1.0 $\Omega$	Terminal Terminal
		Secondary	10.5 19.0 k $\Omega$	Plug cap Terminal
Ignition coil primary peak voltage		120 V and more		⊕: B/W ⊖: W/BI
Generator coil resistance		Pick-up	80 155 $\Omega$	BI/Y G/W
		Charging	0.5 1.2 $\Omega$	Y Y
Pick-up coil peak voltage		4.0 V and more		⊕: G/W ⊖: BI/Y
Generator no-load voltage (When engine is cold)		65 V (AC) and more at 5 000 r/min		
Generator Max. output		Approx. 150 W at 5 000 r/min		
Regulated voltage		14.0 15.5 V at 5 000 r/min		
Starter relay resistance		3 6 $\Omega$		
Battery	Type designation	YTX9-BS		
	Capacity	12V 28.8 kC (8 Ah)/10HR		
Fuse size		20 A		

**WATTAGE**

Unit: W

ITEM		SPECIFICATION
Headlight	HI	40
	LO	40
Brake light/Taillight		21/5
Reverse indicator light		3
Neutral indicator light		3

**BRAKE + WHEEL**

Unit: mm (in)

ITEM	STANDARD/SPECIFICATION		LIMIT
Rear brake lever play	3 5 (0.12 0.20)		
Rear brake pedal free travel	20 30 (0.79 1.18)		
Brake disc thickness	Front	2.8 3.2 (0.110 0.126)	2.5 (0.098)
Brake disc runout	Front		0.30 (0.012)
Brake drum I.D.	Rear		140.7 (5.54)
Master cylinder bore	Front	12.700 12.743 (0.5000 0.5017)	
Master cylinder piston diam.	Front	12.657 12.684 (0.4983 0.4994)	
Brake caliper cylinder bore	Front	32.030 32.080 (1.2610 1.2630)	
Brake caliper piston diam.	Front	31.948 31.998 (1.2578 1.2598)	
Brake fluid type	DOT 4		
Turning radius	2.7 m (8.9 ft)		
Toe-in (with 75 kg, 165 lbs)	5 - 4 (0.20 - 0.16)		
Camber	0		
Caster	7 40		
Wheel rim size	Front	10 5.5 AT	
	Rear	9 8.0 AT	
Tire size	Front	AT22 7-10 ☆☆	
	Rear	AT20 10-9 ☆	
Tire tread depth	Front		4.0 (0.16)
	Rear		4.0 (0.16)
Wheel axle runout	Rear		3.0 (0.12)

**TIRE PRESSURE**

COLD INFLATION TIRE PRESSURE	kPa	kgf/cm <sup>2</sup>	psi
FRONT	30	0.30	4.4
REAR	25	0.25	3.6

VEHICLE LOAD CAPACITY LIMIT: 110 kg (243 lbs)

**FUEL + OIL**

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octane or higher rated by the Research Method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		The others
Fuel tank capacity including reserve	10.6 L (2.8/2.3 US/Imp gal)		
Reserve	2.6 L (0.7/0.6 US/Imp gal)		
Engine oil type	* SAE 10W-40, API SF/SG or SH/SJ with JASO MA		
Engine oil capacity	Change	2 200 ml (2.3/1.9 US/Imp qt)	
	Filter change	2 300 ml (2.4/2.0 US/Imp qt)	
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)	
Final gear oil type	Hypoid gear oil SAE #90, API grade GL-5		
Final gear oil capacity	190 ml (6.4/6.7 US/Imp oz)		

# LT-Z250K7 ( 07-MODEL)

**NOTE:**

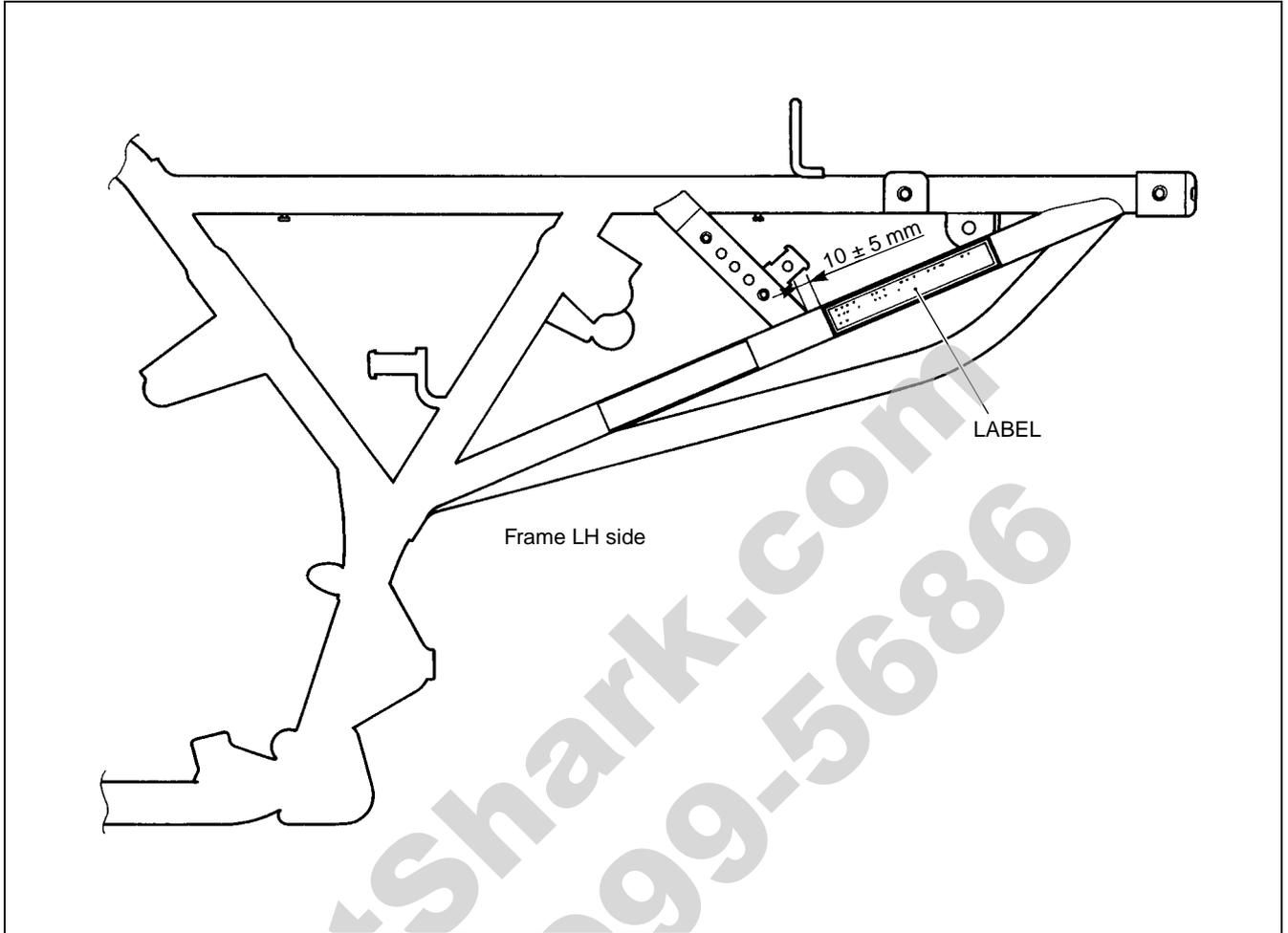
\* The specification and service data are the same as the K6-MODEL

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## INFORMATION LABEL INSTALLATION (For E-33)



# LT-Z250K8 ( 08-MODEL)

NOTE:

\* The specification and service data are the same as the K7-MODEL

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# INFORMATION LABELS

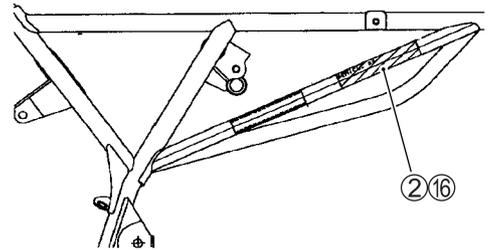
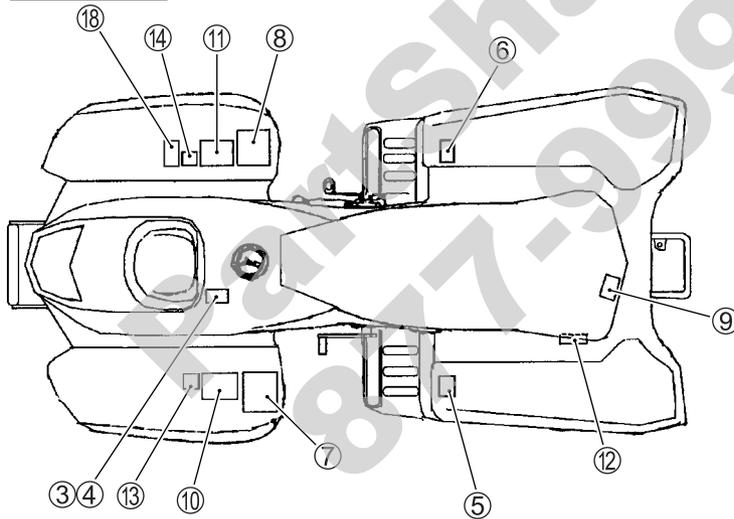
No.	LABEL or PLATE NAME	APPLIED SPECIFICATION		
		E-19	E-28	E-33
①	Certification plate (E)	A		A
②	Information label (E)			A
③	Gearshift pattern label (E)			A
④	Gearshift pattern label (E/F)		A	
⑤	Tire air pressure label (E)	A	A	A
⑥	Tire air pressure label and warning no-passenger label (F)		A	
⑦	General warning label (E)	A	A	A
⑧	General warning label (F)		A	
⑨	Warning no-passenger label (E)	A	A	A
⑩	Age, 16 label (E)	A	A	A
⑪	Age, 16 label (F)		A	
⑫	Manual notice label (E)			A
⑬	Gearshift label (E)	A	A	A
⑭	Gearshift label (F)		A	
⑮	ICES Canada label (E/F)			
⑯	Compliance label (E)		A	
⑰	EC approval mark	A	A	
⑱	<b>Compliance label</b>	<b>A</b>		

\* E-28: Fuel caution label enclosed.

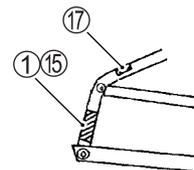
(E): English (F): French

A: Attached

### Additional



Left side frame



Front of left side frame

# LT-Z250K9 ('09 MODEL)

*This chapter describes service specifications, service data and servicing procedures which differ from those of the LT-Z250K8 ('08-MODEL).*

**NOTE:**

*\* Any differences between the LT-Z250K8 ('08-MODEL) and LT-Z250K9 ('09-MODEL) in specifications are clearly indicated with an asterisk (\*) mark.*

*\* Please refer to the chapters 1 through 13 for details which are not given in this chapter.*

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# SPECIFICATIONS

## DIMENSIONS AND CURB MASS

Overall length .....	1 720 mm (67.7 in)
Overall width .....	1 070 mm (42.1 in)
Overall height .....	1 090 mm (42.9 in)
Wheelbase .....	1 135 mm (44.7 in)
Front track .....	830 mm (32.7 in)
Rear track .....	810 mm (31.9 in)
Ground clearance .....	230 mm (9.1 in)
Seat height .....	810 mm (31.9 in)
* Curb mass .....	177 kg (390 lbs)

## ENGINE

Type .....	4-stroke, air-cooled, OHC
Number of cylinders .....	1
Bore .....	66.0 mm (2.598 in)
Stroke .....	72.0 mm (2.835 in)
Displacement .....	246 cm <sup>3</sup> (15.0 cu. in)
Compression ratio .....	9.2 : 1
Carburetor .....	MIKUNI BSR29, single
Air cleaner .....	Polyurethane foam element
Starter system .....	Electric
Lubrication system .....	Wet sump
Idle speed .....	1 500 ± 100 r/min

## DRIVE TRAIN

Clutch .....	Wet multi-plate, automatic, centrifugal type
Transmission .....	5-speed forward with reverse
Gearshift pattern, forward .....	All up, foot operated
reverse .....	Foot/hand operated
Primary reduction ratio .....	3.047 (64/21)
Gear ratios, Low .....	3.083 (37/12)
2nd .....	1.933 (29/15)
3rd .....	1.388 (25/18)
4th .....	1.095 (23/21)
Top .....	0.913 (21/23)
Reverse .....	2.833 (34/12)
Secondary reduction ratio .....	1.133 (17/15)
Final reduction ratio .....	3.200 (32/10)

## CHASSIS

Front suspension .....	Independent, double wishbone, coil spring, oil damped
Rear suspension .....	Swingarm type, coil spring, oil damped
Front wheel travel .....	160 mm (6.3 in)
Rear wheel travel .....	170 mm (6.7 in)
Caster .....	7° 40'
Trail .....	33 mm (1.30 in)
Toe-in .....	5 mm (0.20 in)
Steering angle .....	45° (right & left)
Turning radius .....	2.7 m (8.9 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Drum brake
Front tire .....	AT22 × 7-10 ☆☆☆, tubeless
Rear tire .....	AT20 × 10- 9 ☆☆, tubeless

## ELECTRICAL

Ignition type .....	Electronic ignition (CDI)
Ignition timing .....	5° B.T.D.C. at 1 500 r/min
Spark plug .....	NGK DR7EA or DENSO X22ESR-U
Battery .....	12 V 28.8 kC (8 Ah)/10 HR
Generator .....	Three-phase A.C. generator
Main fuse .....	20 A
Fuse .....	15 A
Headlight .....	12 V 40/40 W
Brake/Tail light .....	12 V 21/5 W
Neutral indicator light .....	12 V 3 W
Reverse indicator light .....	12 V 3 W

## CAPACITIES

Fuel tank, including reserve .....	* 9.7 L (2.6/2.1 US/Imp gal)
reserve .....	* 2.1 L (0.6/0.5 US/Imp gal)
Engine oil, oil change .....	2 200 ml (2.3/1.9 US/Imp qt)
with filter change .....	2 300 ml (2.4/2.0 US/Imp qt)
overhaul .....	2 500 ml (2.6/2.2 US/Imp qt)
Final gear oil .....	190 ml (6.4/6.7 US/Imp oz)

## SERVICE DATA

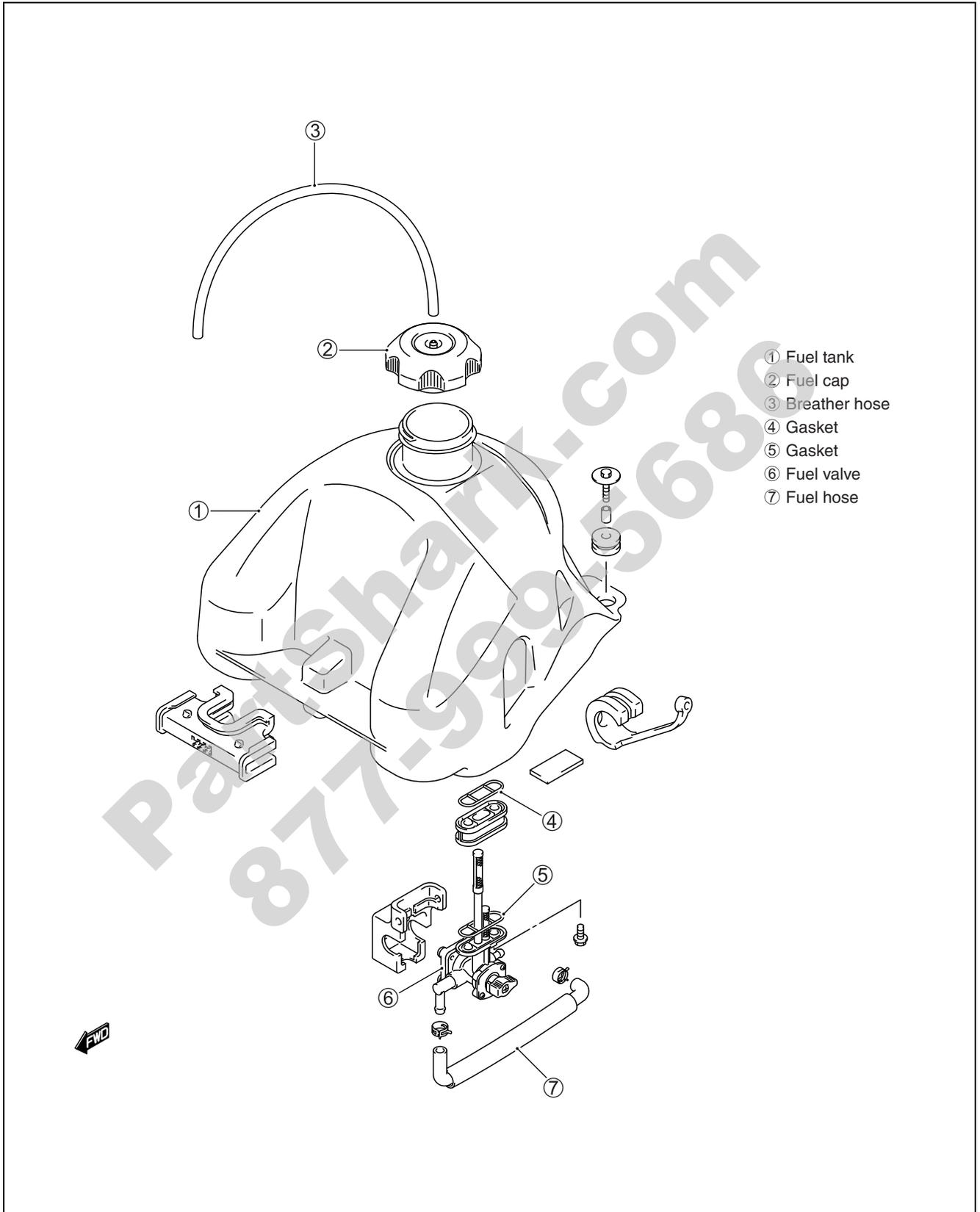
### CARBURETOR

ITEM	SPECIFICATION	
	* E-19	* E-28, 33
Carburetor type	MIKUNI BSR29	←
Bore size	29 mm (1.14 in)	←
I.D. No.	21G0	21G1
Idle r/min	1 500 ± 100 r/min	←
Float height	13.0 ± 1.0 mm (0.51 ± 0.04 in)	←
Main jet (M.J.)	#125	# <del>125</del>
Jet needle (J.N.)	5DH54-2nd	←
Needle jet (N.J.)	P-0M	# <del>P-0M</del>
Pilot jet (P.J.)	#20	# <del>20</del>
Pilot screw (P.S.)	1 and 1/2 turns back	PRE-SET
Throttle cable play	3 – 5 mm (0.12 – 0.20 in)	←
Starter (enricher) plunger cable play	0.5 – 1.0 mm (0.02 – 0.04 in)	←

### FUEL + OIL

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octane or higher rated by the Research Method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.	E-19
Fuel tank capacity including reserve	* 9.7 L (2.6/2.1 US/Imp gal)	
Reserve	* 2.1 L (0.6/0.5 US/Imp gal)	
Engine oil type	SAE 10W-40, API SF/SG or SH/SJ with JASO MA	
Engine oil capacity	Change	2 200 ml (2.3/1.9 US/Imp qt)
	Filter change	2 300 ml (2.4/2.0 US/Imp qt)
	Overhaul	2 500 ml (2.6/2.2 US/Imp qt)
Final gear oil type	Hypoid gear oil SAE #90, API grade GL-5	
Final gear oil capacity	190 ml (6.4/6.7 US/Imp oz)	

# FUEL TANK CONSTRUCTION



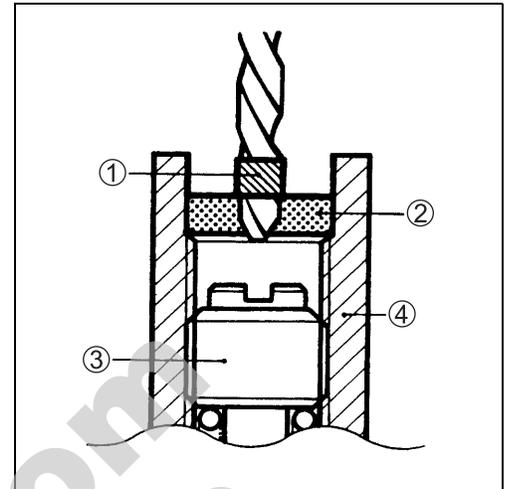
## CARBURETOR

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

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

- Use a 1/8" size drill bit with a drill-stop to remove the pilot screw plug. Set the drill-stop 4 mm (0.16 in) from the end of the bit to prevent drilling into the pilot screw. Carefully drill through the plug.
- Thread a self-tapping sheet metal screw into the plug. Pull on the screw head with pliers to remove the plug. Carefully clean any metal shavings from the area.
- Slowly turn the pilot screw clockwise and count the number of turns until the screw is lightly seated. Make a note of how many turns were made so the screw can be reset correctly after cleaning.
- Remove the pilot screw along with the spring, washer and O-ring.

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



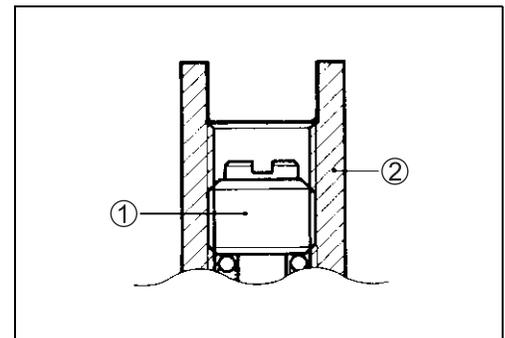
### PILOT SCREW REASSEMBLY (For E-28, 33)

- After cleaning, install the pilot screw ① to the original setting by turning the screw in until it lightly seats, and then backing it out the same number of turns counted during disassembly.
- Install a new plug by tapping it into place with a punch.

- ① Pilot screw
- ② Carburetor body

#### CAUTION

Replace the removed O-ring with a new one.



## INFORMATION LABELS

