

SUZUKI

LT-Z90

SERVICE MANUAL



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FOREWORD

This manual contains an introductory description on the SUZUKI LT-Z90 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 to use 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.

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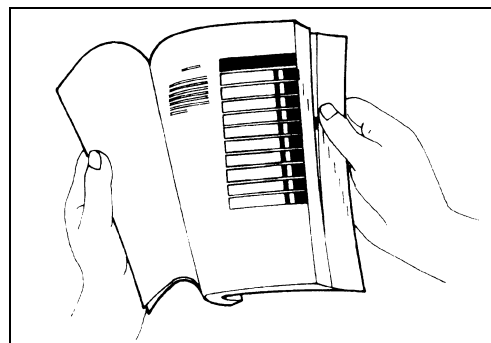
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HOW TO USE THIS MANUAL TO LOCATE WHAT YOU ARE LOOKING FOR:

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

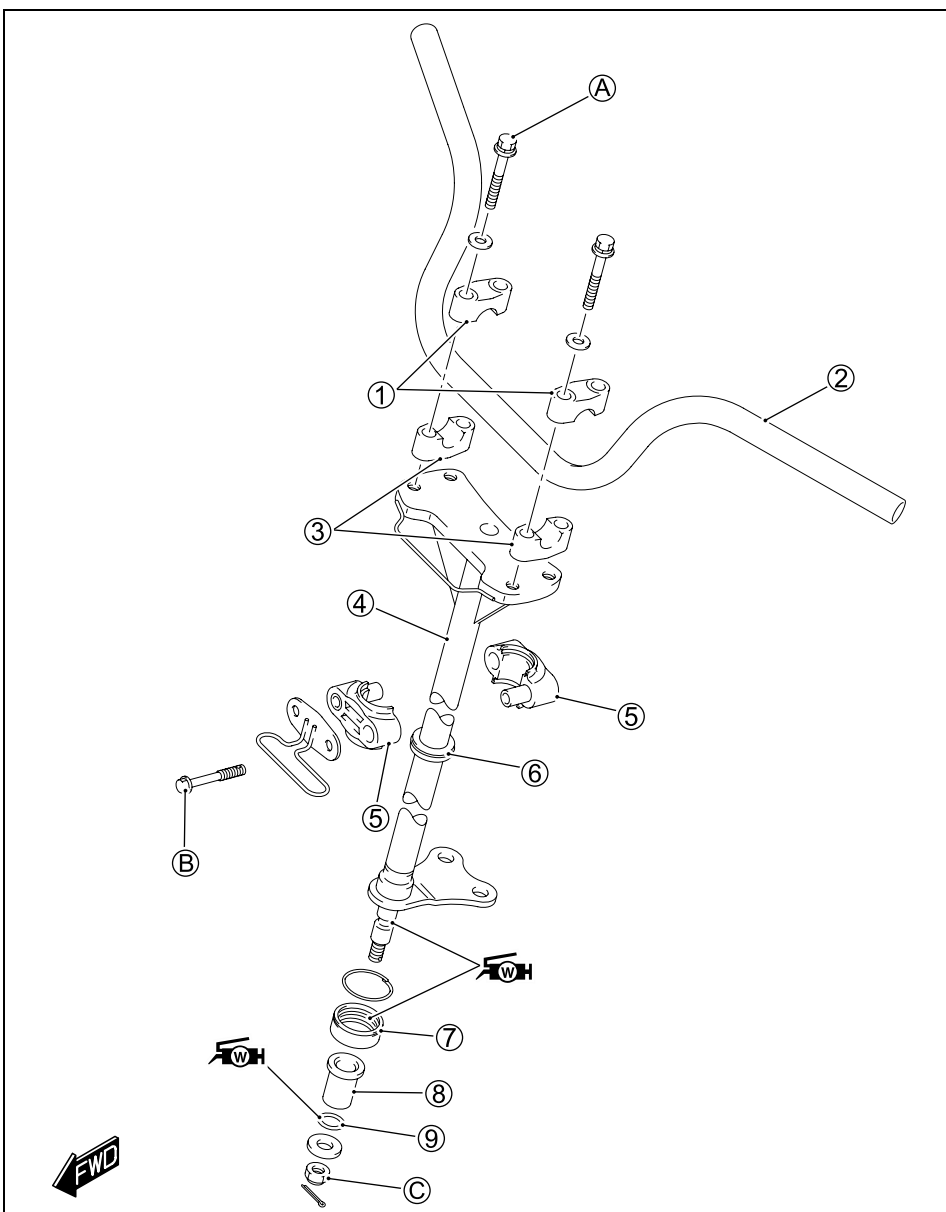
Under the name of each system or unit, is its exploded view. Work instructions and other service information such as the tightening torque, lubricating points and locking agent points, are provided.

Example: Front and rear wheel

①	Handlebar upper holder
②	Handlebars
③	Handlebar lower holder
④	Steering shaft
⑤	Steering shaft holder
⑥	Dust seal
⑦	Steering shaft lower dust seal
⑧	Steering shaft bush
⑨	O-ring
A	Handlebar clamp bolt
B	Steering shaft holder bolt
C	Steering shaft lower nut

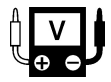
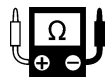
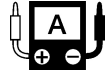


ITEM	N-m	kgf-m	lb-ft
A	25	2.5	18.0
B	23	2.3	17.0
C	35	3.5	25.5



SYMBOL

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

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply THREAD LOCK "1342". 99000-32050
	Apply oil. Use engine oil unless otherwise specified.		Measure in voltage range.
	Apply molybdenum oil solution. (mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1 : 1)		Measure in resistance range.
	Apply SUZUKI SUPER GREASE "A" or equivalent grease. 99000-25010		Measure in current range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in diode test range.
	Apply SUZUKI RESISTANCE GREASE. 99000-25160		Measure in continuity test range.
	Apply SUZUKI BOND "1215" or equivalent bond. 99000-31110		Use special tool.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Indicates service data.
	Apply THREAD LOCK SUPER "1322" or equivalent thread lock. 99000-32110		

GENERAL INFORMATION

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COUNTRY AND AREA CODES

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

MODEL	CODE	COUNTRY or AREA	EFFECTIVE FRAME NO.
LT-Z90K7	P-19	E.U.	LM4AD41A71100001-
	P-28	Canada	
	P-33	California (U.S.A.)	

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

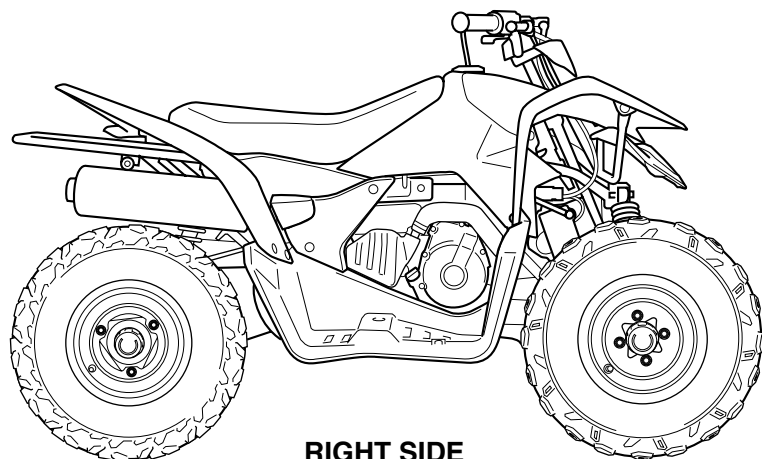
- * **Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the vehicle.**
- * **When 2 or more persons work together, pay attention to the safety of each other.**
- * **When it is necessary to run the engine indoors, make sure that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

CAUTION

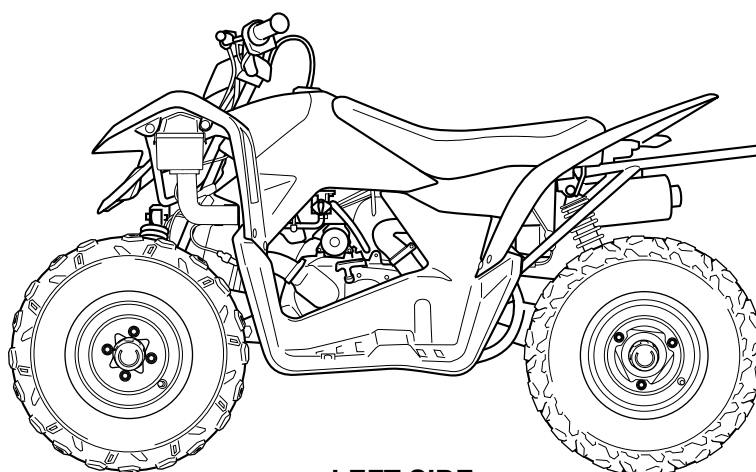
- * If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
- * When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
- * Be sure to use special tools when instructed.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

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

SUZUKI LT-Z90K7 ('07-MODEL)



RIGHT SIDE



LEFT SIDE

- Difference between illustration and actual vehicle may exist depending 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 right side of the generator case. These numbers are required especially for registering the machine and ordering spare parts.



FUEL AND OIL RECOMMENDATION

FUEL (FOR USA AND CANADA)

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.

FUEL (FOR OTHER COUNTRIES)

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

ENGINE OIL AND FINAL REDUCTION GEAR BOX OIL (FOR USA)

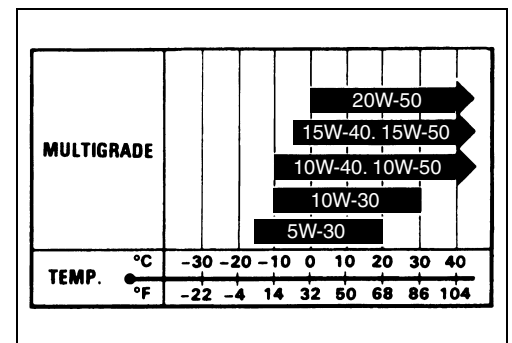
Oil quality is a major contributor to your engine's performance and life. Always select good quality engine oil. Suzuki recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or equivalent engine oil. Use of API SF/SG or SH/SJ with JASO MA.

Suzuki recommends the use of SAE 10W-40 engine oil. If SAE 10W-40 engine oil is not available, select an alternative according to the following chart.

ENGINE OIL AND FINAL REDUCTION GEAR BOX OIL (FOR OTHER COUNTRIES)

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

Suzuki recommends the use of SAE 10W-40 engine oil. If SAE 10W-40 engine oil is not available, select an alternative according to the right chart.



BREAK-IN PROCEDURES

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

- Keep to these break-in throttle position:

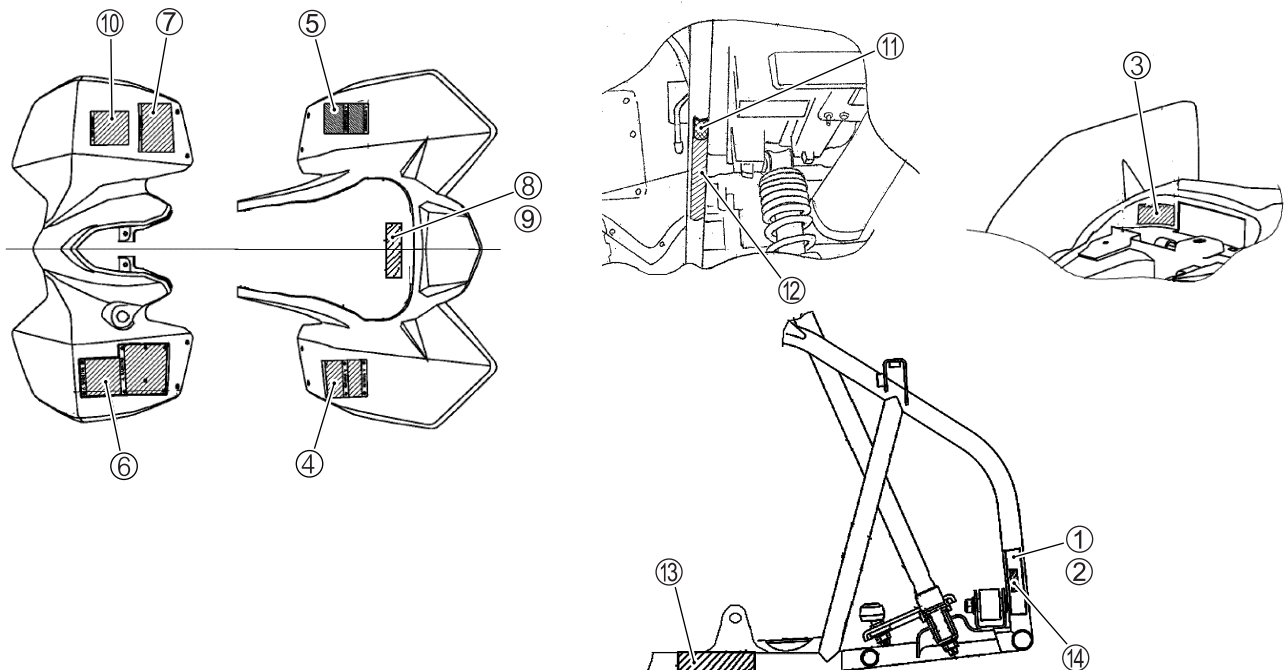
Break-in engine speeds

Up to 10 hours: Less than 1/2 throttle

INFORMATION LABELS

No	LABEL or PLATE NAME	APPLIED SPECIFICATION		
		P19	P28	P33
①	Certification plate	○		○
②	Compliance label		○	
③	Manual notice Label			○
④	Tire information label (Warning no-passenger) ⑤	○	○	○
⑤	Tire information label (Warning no-passenger) ⑥		○	
⑥	General warning and Age, 12 label ⑤	○	○	
⑦	General warning label ⑥		○	
⑧	No-passenger mark ⑤	○		○
⑨	No-passenger mark ⑤ ⑥		○	
⑩	AGE, 12 label ⑥		○	
⑪	EC mark label	○		
⑫	ICES Canada label		○	
⑬	Information label			○
⑭	Approval label	○		

⑤: English ⑥: French



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length.....	1 505 mm (59.2 in)
Overall width	875 mm (34.4 in)
Overall height.....	915 mm (36.0 in)
Wheelbase	1 005 mm (39.6 in)
Ground clearance	150 mm (5.9 in)
Seat height.....	650 mm (25.6 in)
Front track.....	700 mm (27.6 in)
Rear track	700 mm (27.6 in)
Dry mass.....	115 kg (253.5 lbs)
	121 kg (266.8 lbs)

ENGINE

Type	Four stroke, air-cooled, OHC
Number of cylinders	1
Bore	45.5 mm (1.8 in)
Stroke.....	55.2 mm (2.2 in)
Displacement	90 cm ³ (5.5 cu.in)
Compression ratio.....	9.5:1
Carburetor.....	MIKUNI VM16 single
Air cleaner.....	Polyurethane foam element
Starter system.....	Electric and recoil starter
Idle speed	1 900 ± 100 r/min

DRIVE TRAIN

Reduction ratio.....	2.645 – 1.621 (Variable change)
Reduction gear ratio.....	8.294 (45/17 × 47/15)
Final reduction ratio	2.181 (24/11)
Drive chain	RK 530 60 links

CHASSIS

Front suspension.....	Independent, swing axle, coil spring, oil damped
Rear suspension	Swingarm, coil spring, oil damped
Front wheel travel.....	62 mm (2.4 in)
Rear wheel travel	61 mm (2.4 in)
Caster.....	3.0 °
Trail	11 mm (0.4 in)
Toe-in	4.5 ± 3 mm (0.17 ± 0.1 in)
Camber	0.6 °
Steering angle	37.5 °
Turning radius	2.5 m (8.2 ft)
Front brake.....	Drum brake
Rear brake	Drum brake
Front tire size	AT19 × 7-8☆, tubeless AT19 × 7-8☆
Rear tire size	AT19 × 7-8☆, tubeless AT19 × 7-8☆

ELECTRICAL

Ignition type.....	Electronic ignition (CDI)
Ignition timing	10 ° B.T.D.C at 1 800 r/min
Spark plug	NGK CR7HSA or DENSO U20FSR-U
Battery.....	12 V 21.6 kC (6 Ah)/10 HR
Main fuse.....	10 A

CAPACITIES

Fuel tank	6.0 L (1.6/1.3 US/Imp gal)
Engine oil, oil change.....	950 ml (2.00/1.67 US/Imp qt)
with filter change	1 050 ml (2.21/1.84 US/Imp qt)
overhaul	1 100 ml (2.32/1.93 US/Imp qt)
Final reduction gear box oil, oil change.....	90 ml (3.0/3.2 US/Imp oz)
overhaul	100 ml (3.4/3.5 US/Imp oz)

These specifications are subject to change without notice.

PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the vehicle operating at peak performance and economy.

NOTE:

More frequent servicing may be required on vehicles that are used under severe conditions.

PERIODIC MAINTENANCE CHART

Item \ Interval	Initial 1 month	Every 3 months	Every 6 months
Air cleaner element	—	C	C
Exhaust pipe nuts and muffler mounting bolts	T	T	T
Valve clearance	I	—	I
Spark plug	—	—	I
	Replace every 18 months.		
Spark arrester	—	—	C
Fuel line	—	I	I
	Replace every 4 years.		
Engine oil and oil filter	R	—	R
Final reduction gear box oil	—	—	I
	Replace every 2 years.		
Throttle cable play	I	I	I
Idle speed	I	I	I
Drive belt	—	I	R
Drive chain	Clean, lubricate and inspect each time the vehicle is ridden.		
Brakes	I	I	I
Tires	Inspect every month.		
Steering	I	I	I
Suspensions	—	—	I
Chassis nuts and bolts	T	T	T
General lubrications	—	L	L

NOTE:

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

R = Replace

T = Tighten

C = Clean

L = Lubricate

MAINTENANCE AND TUNE-UP PROCEDURES

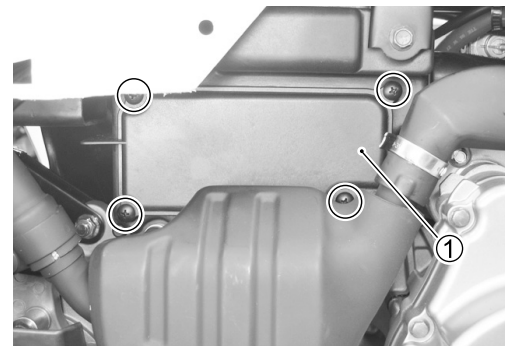
This section describes the servicing procedures for each item of the Periodic Maintenance requirements.

AIR CLEANER

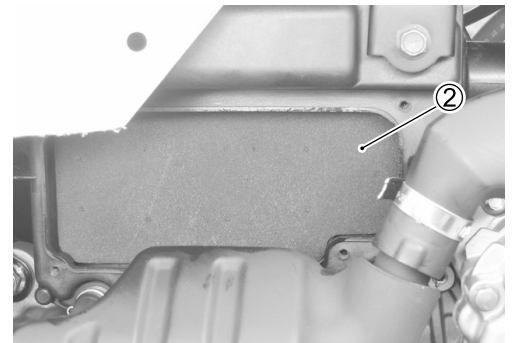
Clean every 3 months.

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 footrest rid. (☞ 5-4)
- Remove the air cleaner box cap ①.



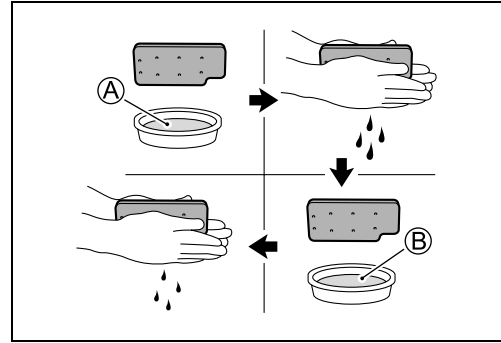
- Remove the air cleaner element ②.



- Fill a wash pan 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 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



CAUTION

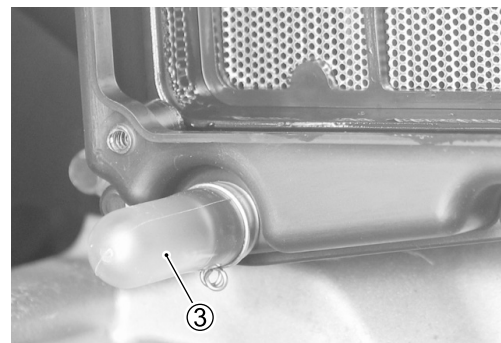
- * **Inspect the air cleaner element for tears. A torn element must be replaced.**
- * **If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to operate the engine without the element or with torn element. Make sure that the air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

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

CAUTION

Be sure to position the element snugly and correctly, so that no incoming air will by-pass it. Remember, the rapid wear of piston rings and the cylinder bore is often caused by a defective or poorly fitted element.

- Remove the drain cap ③ of the air cleaner box to allow any water to drain out.

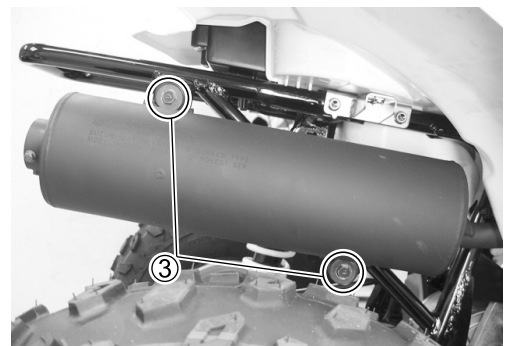
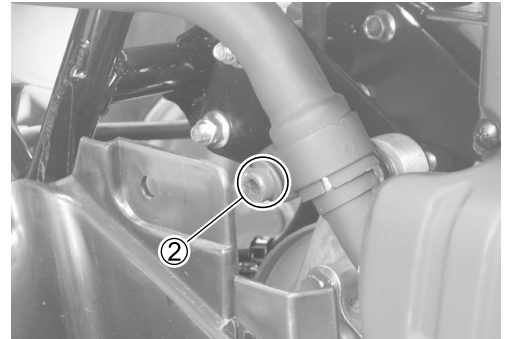
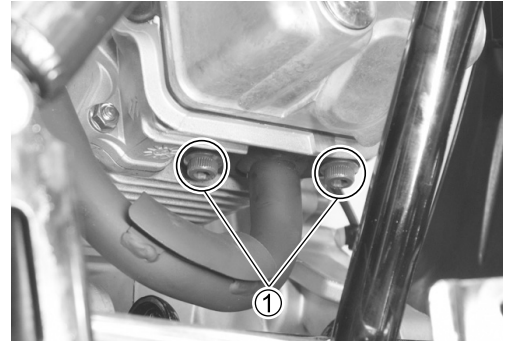


EXHAUST PIPE NUTS AND MUFFLER MOUNTING BOLT

Tighten initially at 1 month and every 3 months thereafter.

- Remove the footrest lid. (☞ 5-4)
- Tighten the exhaust pipe nuts ①, muffler connection bolt ②, and muffler mounting bolts ③ to the specified torque.

🔧 Exhaust pipe nut: 23 N·m (2.3 kgf-m, 16.5 lb-ft)
Muffler connection bolt: 12 N·m (1.2 kgf-m, 9.5 lb-ft)
Muffler mounting bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)



VALVE CLEARANCE

Inspect initially at 1 month and every 6 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 interval indicated above and adjust the valve clearances to specification, if necessary.

- Remove the spark plug cap and spark plug. (➡ 2-8)
- Disconnect the breather hose ①.
- Remove the cylinder head cover ②.

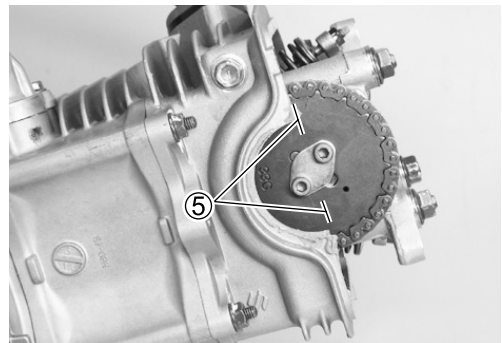
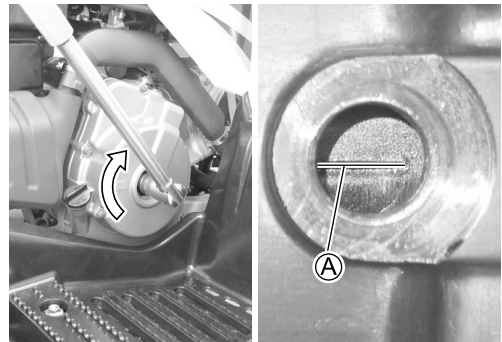
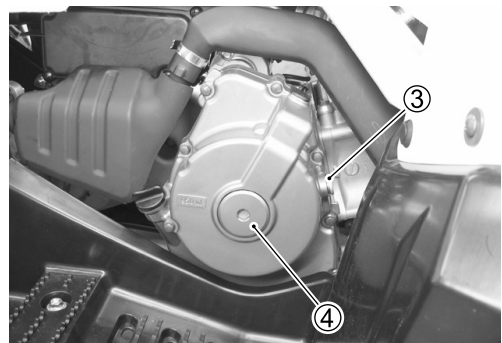
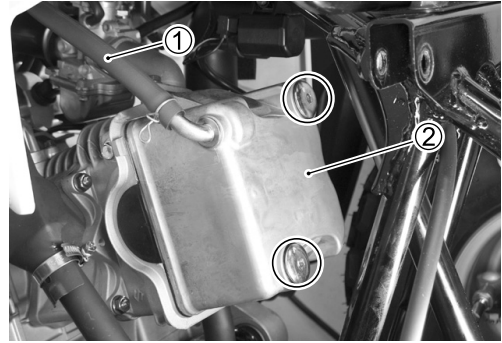
Remove the valve timing inspection plug ③ and generator cover cap ④.

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) of the compression stroke.

- Rotate the crankshaft with a box wrench to set the piston at TDC on the compression stroke. (Rotate the crankshaft until the line ① on the generator rotor is center of the hole in the generator cover.)

- Align the engraved line ⑤ on the camshaft so it is parallel with surface on the cylinder head.



- Insert a thickness gauge between the valve end the adjusting screw on the rocker arm.
- If the clearance is out of specification, adjust it to the specified range.

TOOL 09900-20806: Thickness gauge
09917-14910: Tappet adjust drive

DATA Valve clearance (when cold):
IN: 0.05 – 0.10 mm (0.002 – 0.004 in)
EX: 0.10 – 0.15 mm (0.004 – 0.006 in)

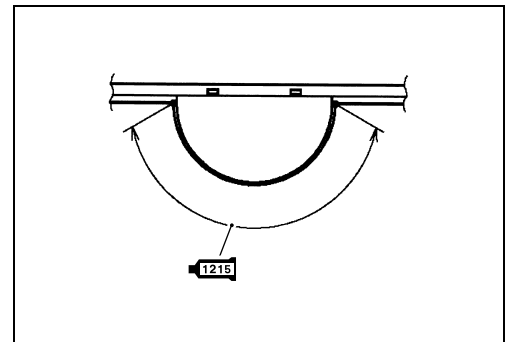
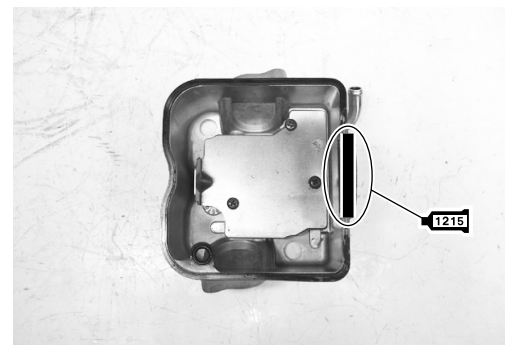
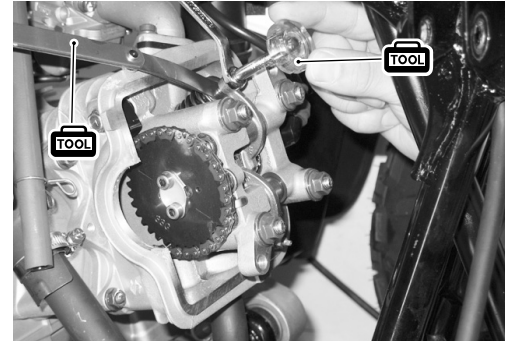
U Valve clearance adjuster locknut:
10 N·m (1.0 kgf-m, 7.0 lb-ft)

- Thoroughly wipe off oil from the fitting surfaces of the cylinder head and cover.
- Apply SUZUKI BOND “1215” to the end caps of the cylinder head cover gasket as shown.

1215 99000-31230: SUZUKI BOND “1215”
(or equivalent bond)

CAUTION

The removed gasket must be replaced with a new one to prevent oil leakage.

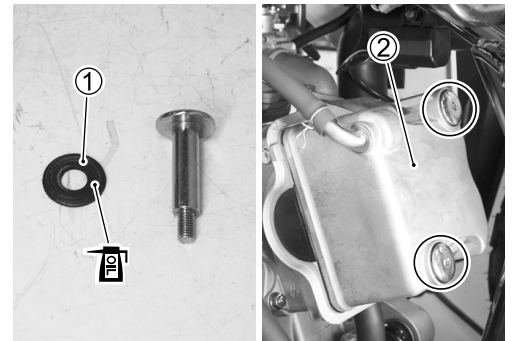


- Apply engine oil to both sides of the washers ⑥.
- Install the cylinder head cover ⑦.
- Lightly tighten the cylinder head cover bolts and then tighten them to the specified torque.

U Cylinder head cover bolt
Initial: 10 N·m (1.0 kgf-m, 7 lb-ft)
Final: 14 N·m (1.4 kgf-m, 10.0 lb-ft)

CAUTION

The removed washers must be replaced with new ones to prevent oil leakage.

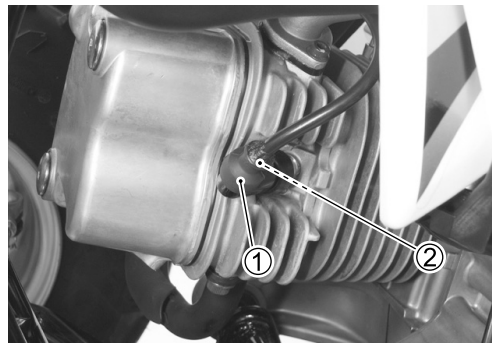


SPARK PLUG

Inspect every 6 months.
Replace every 18 months.

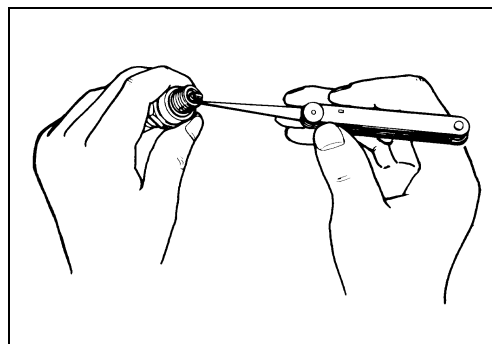
- Disconnect the spark plug cap ① and remove the spark plug ②.

	Standard	Cold type
NGK	CR7HSA	CR8HSA
DENSO	U20FSR-U	U22FSR-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 with a thickness gauge. If the spark plug gap is out of specification, adjust the gap.

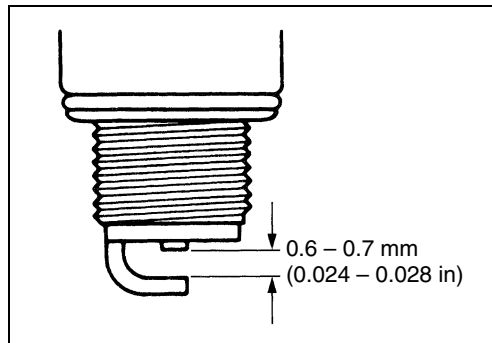
DATA Spark plug gap:
Standard: 0.6 – 0.7 mm (0.024 – 0.028 in)

TOOL 09900-20803: 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 thread, etc.



CAUTION

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

SPARK PLUG INSTALLATION

CAUTION

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

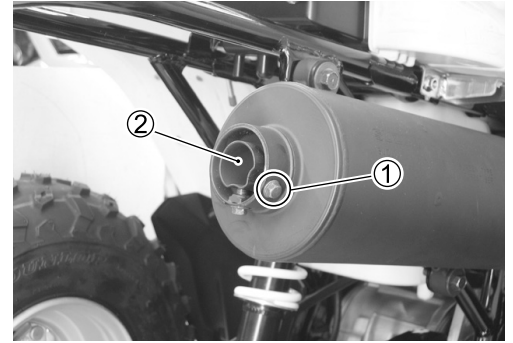
- Insert the spark plug and finger tighten it to the cylinder head and then, tighten the spark plug to the specified torque.

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

SPARK ARRESTER

Clean every 6 months.

- Remove the spark arrester mounting bolt ①.
- Extract the spark arrester pipe ② from the muffler.
- Clean the spark arrester pipe ② by brush.
- Reinstall the spark arrester pipe ②.



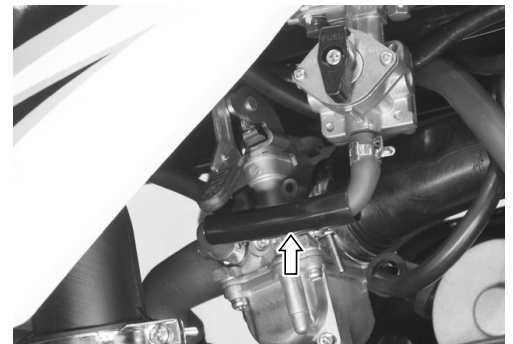
FUEL LINE

Inspect every 3 months.

Replace every 4 years.

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

- When replacing the fuel hose, remove the fuel tank cover.
( 5-4)



ENGINE OIL AND OIL FILTER

Replace initially 1 month and every 6 months thereafter.

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

ENGINE OIL REPLACEMENT

The oil should be changed while the engine is warm.

- Place the vehicle on level ground.
- Place an oil pan below the engine oil drain plug ①.
- The drain out the engine oil by removing the engine oil drain plug ① and engine oil filler cap ②.
- Reinstall the drain plug ① and gasket.
- Tighten the engine oil drain plug ①, to the specified torque, and then pour the fresh oil through the oil filler hole. When performing an oil change (without oil filter replacement). The engine will hold about 950 ml (2.0/1.67 US/Imp qt) of oil. Use API SF/SG or SH/SJ with JASO MA.

 **Engine oil drain plug: 17.5 N·m (1.75 kgf-m, 13.0 lb-ft)**

- Check the engine oil level above.

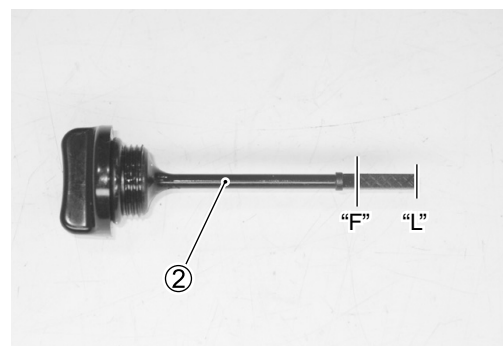
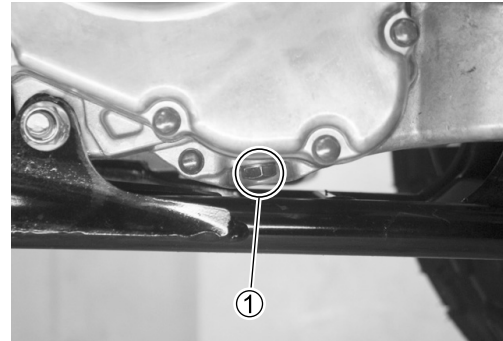
DATA Engine oil capacity:

Oil change: 950 ml (2.00/1.67 US/Imp qt)
With filter change: 1050 ml (2.21/1.84 US/Imp qt)
Overhaul: 1100 ml (2.32/1.93 US/Imp qt)

CAUTION

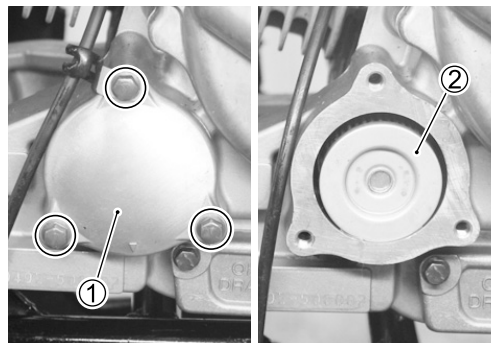
- * Check the engine oil level with the dipstick ① before each time the vehicle is ridden.
- * Be sure the engine oil level is always between the "L" (low) line and the "F" (full) line.

- Install the engine oil filler cap ② securely.



OIL FILTER REPLACEMENT

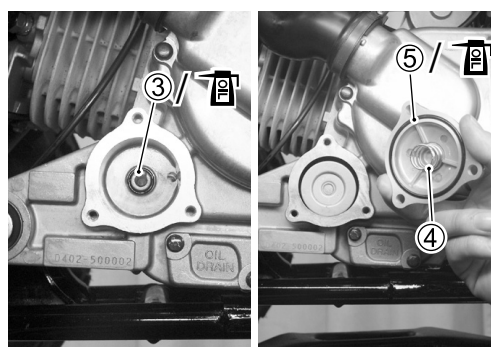
- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil filter cap ① and oil filter ②.
- Replace the oil filter with a new one.



- Install the o-ring ③.
- Install the spring ④ and o-ring ⑤.

CAUTION

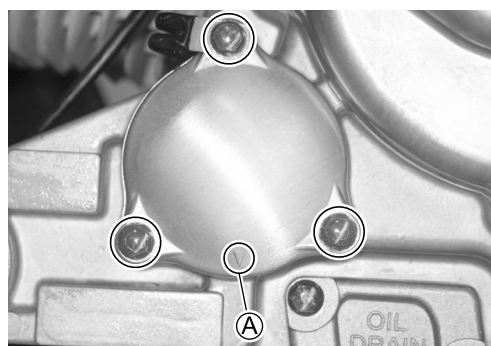
Apply engine oil to the o-rings.



- Install the oil filter cap and tighten the bolt securely.

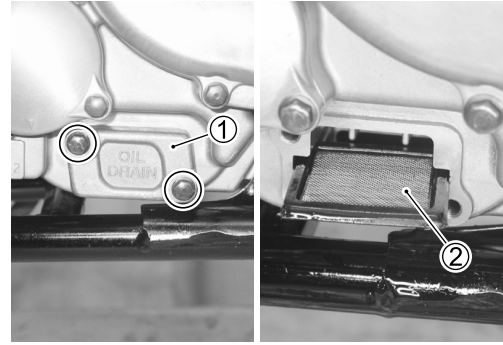
NOTE:

Face the triangle mark (A) on the cap downward.

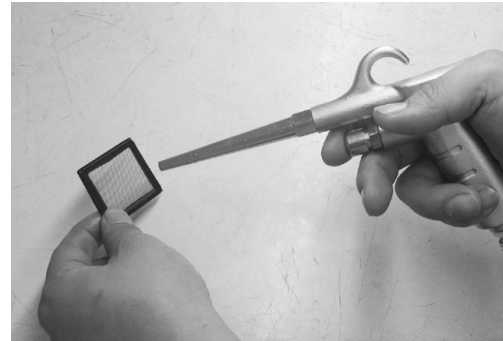


OIL STRAINER INSPECTION AND CLEANING

- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil strainer cap ① and oil strainer ②.



- Clean the oil strainer with compressed air also check the oil strainer for wear and damage. If any defects are found, replace it with a new one.

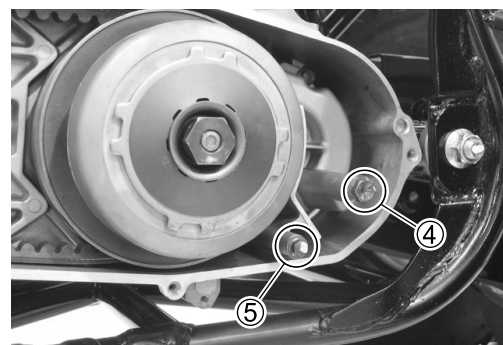
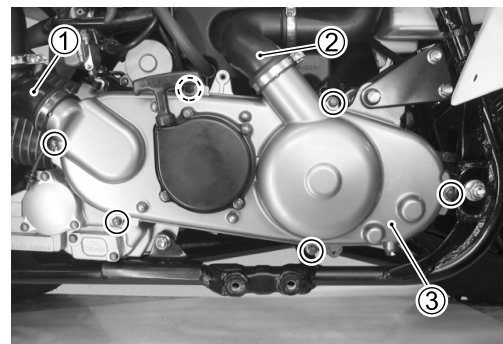
**FINAL REDUCTION GEAR BOX OIL**

Inspect every 6 months.

Replace every 2 years.

FINAL REDUCTION GEAR BOX OIL REPLACEMENT

- Place the vehicle on level ground.
- Remove the left footrest mudguard. (☞ 5-5)
- Remove the front cooling duct connector ① and rear cooling duct connector ②.
- Remove the crankcase cover ③.
- Remove the oil filler cap ④.
- Remove the drain plug ⑤ and drain the oil into an oil pan.
- Reinstall the drain plug ⑤.
- Pour new oil through the oil filler hole until the oil flows from oil filler hole.
- Reinstall the oil filler cap ⑤.



DATA Final reduction gear box oil capacity:
Oil change: 90 ml (3.0/3.2 US/Imp oz)
Overhaul: 100 ml (3.4/3.5 US/Imp oz)

THROTTLE CABLE PLAY

Inspect initially at 1 month and every 3 months thereafter.

Adjust the throttle cable play **A** as follows.

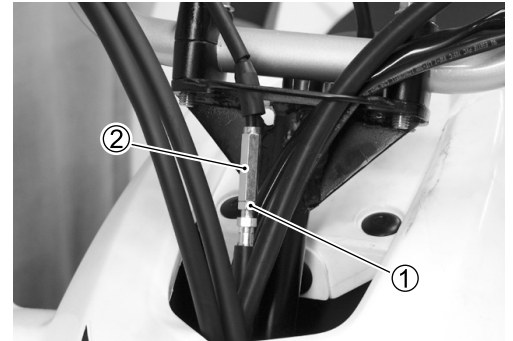
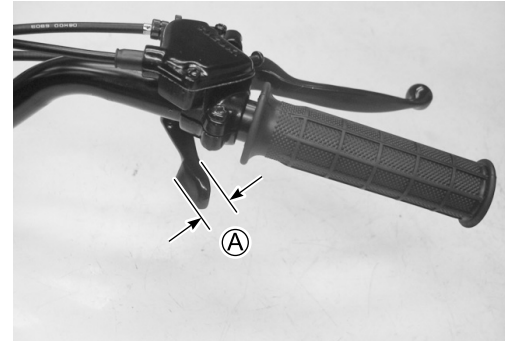
- Loosen the lock-nut **①** of the throttle cable.
- Turn the adjuster **②** in or out to obtain the correct play.

DATA Throttle cable play: 3 – 5 mm (0.1 – 0.2 in)

- After adjusting the throttle cable play, tighten the lock-nut **①**.

⚠ WARNING

After the adjustment is completed, check that handle-bar movement does not raise the engine idle speed and that the throttle lever returns smoothly and automatically.



ENGINE IDLE SPEED

Inspect initially at 1 month and every 3 months thereafter.

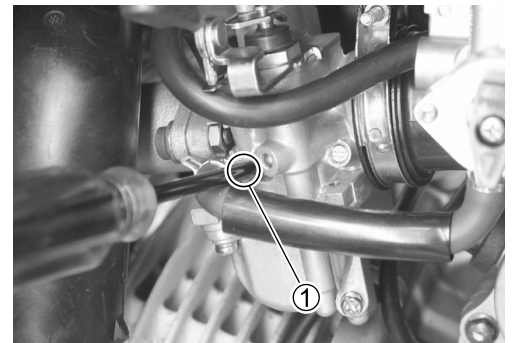
- Adjust the throttle cable play. (☞ above)
- Warm up the engine.

NOTE:

Make this adjustment when the engine is hot.

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

DATA Engine idle speed: 1 900 ± 100 r/min.

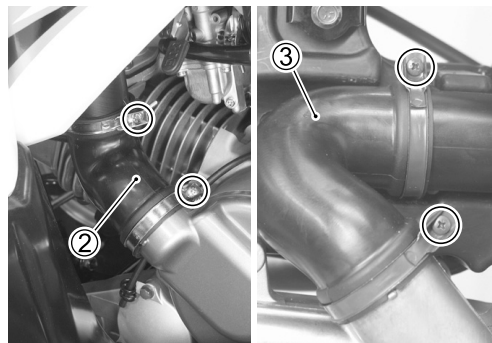
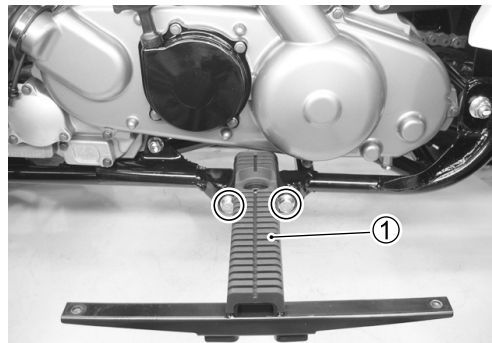


DRIVE BELT

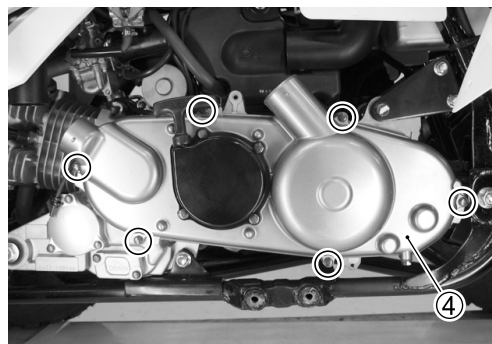
Inspect every 3 months.
Replace every 6 months.

REMOVAL

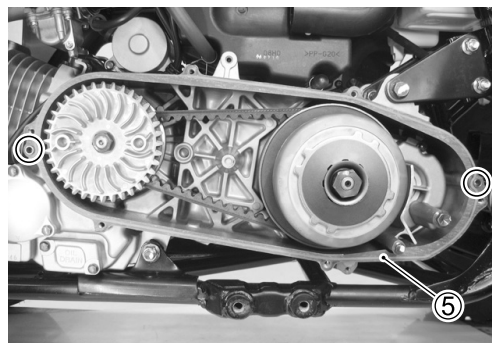
- Remove the left footrest mudguard. (➡ 5-5)
- Remove the left footrest bar ①.
- Remove the front cooling duct connector ② and rear cooling duct connector ③.



- Remove the crankcase cover ④.

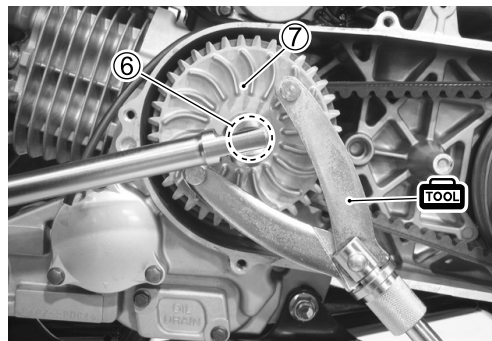


- Remove the crankcase cover gasket ⑤ and dowel pin.

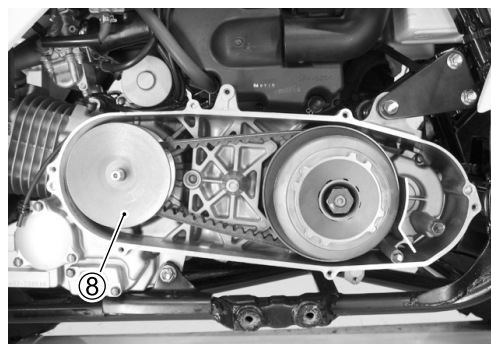


- Remove the fixed drive face nut ⑥ and fixes drive face fan ⑦ with the special tool.

TOOL 09930-40113: Rotor holder

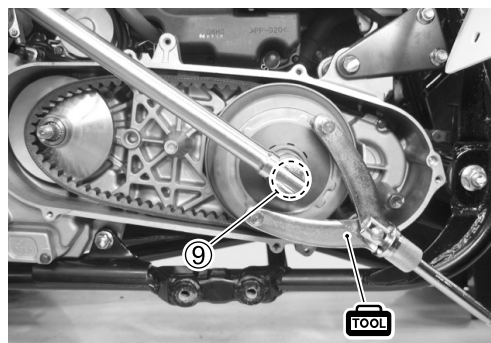


- Remove the fixed drive face ⑧.

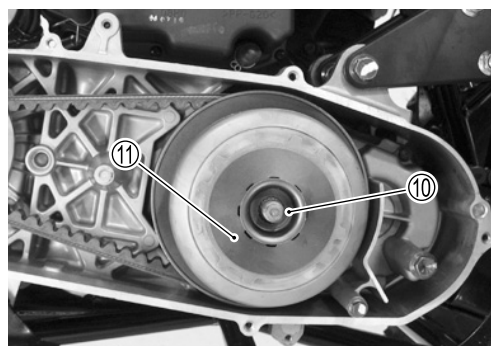


- Remove the limit clutch housing nut ⑨ with the special tool.

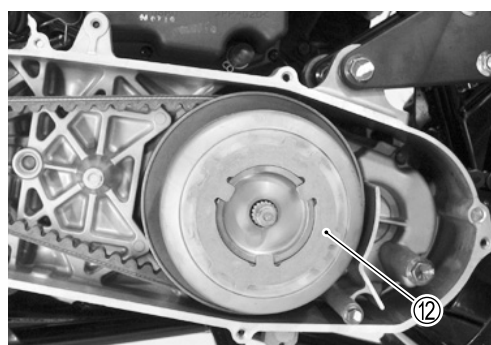
 **09930-40113: Rotor holder**



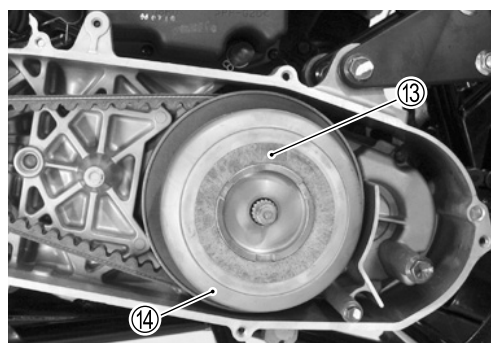
- Remove the limit clutch stopper ⑩ and limit clutch spring ⑪.



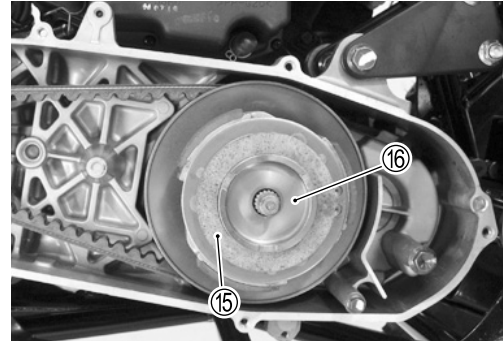
- Remove the limit clutch pressure plate ⑫.



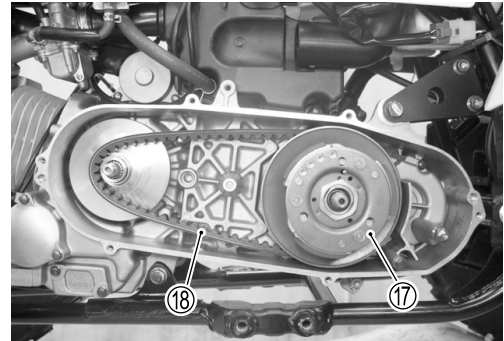
- Remove the limit clutch friction plate ⑬ and clutch housing ⑭.



- Remove the limit clutch friction plate ⑮ and limit clutch ⑯.

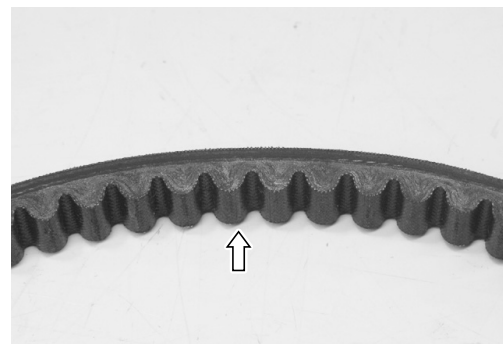


- Remove the movable driven face ⑰ and drive belt ⑱.



INSPECTION

Inspect the drive belt for wear and damage. If any defects are found, replace it with a new one.



INSTALLATION

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

- Insert the drive belt, as low as possible, between the movable driven face to provide the maximum drive belt clearance before installing.
- Install the movable driven face with drive belt.

CAUTION

- * Fit the drive belt to the movable driven face so that the arrows on the drive belt outer surface aim toward normal turning direction.
- * The drive belt contact surface of the driven face should be thoroughly cleaned.



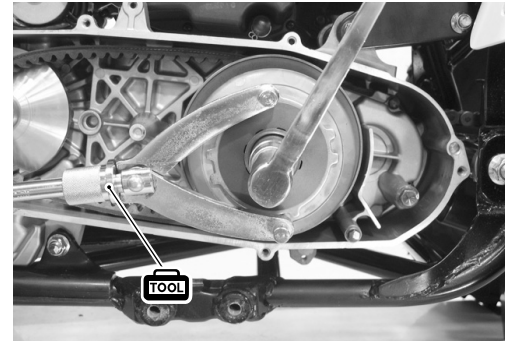
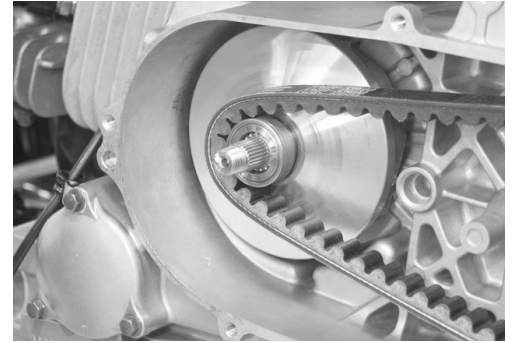
NOTE:

Degrease the movable drive face assembly. Use non-flammable cleaning solvent to wipe off oily or greasy matter and make its surfaces completely dry.

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

 **09930-40113: Rotor holder**

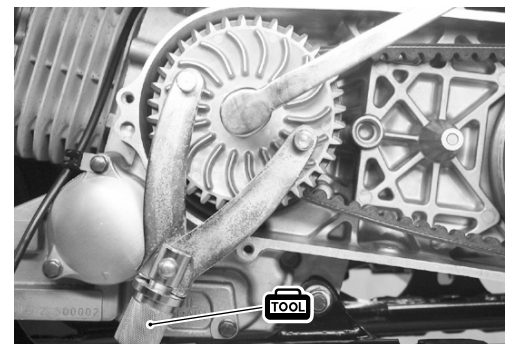
 **Limit clutch nut: 75 N·m (7.5 kgf-m, 54.0 lb-ft)**



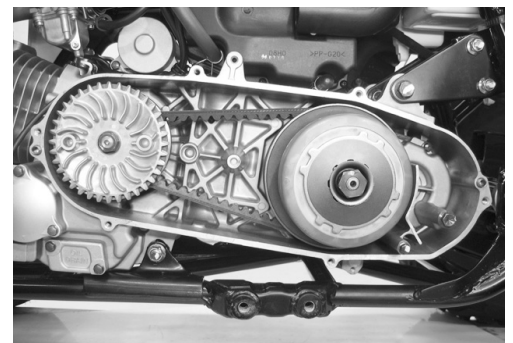
- Tighten the fixed drive face nut to the specified torque with the special tool.

 **09930-40113: Rotor holder**

 **Fixed drive face nut: 50 N·m (5.0 kgf-m, 36.0 lb-ft)**



- Rotate the fixed drive face until the drive belt is properly seated and both the drive and driven face rotate together smoothly and without slipping.



DRIVE CHAIN

Clean, lubricate and inspect each time the vehicle is ridden.

Visually inspect the drive chain for the possible defects listed below. (Support the vehicle by a jack and a wooden block, rotate the rear wheel slowly by hand.)

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

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

CAUTION

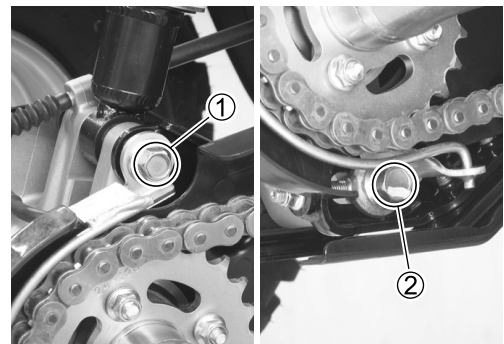
The standard drive chain is RK 530. SUZUKI recommends to use this standard drive chain as a replacement.

NOTE:

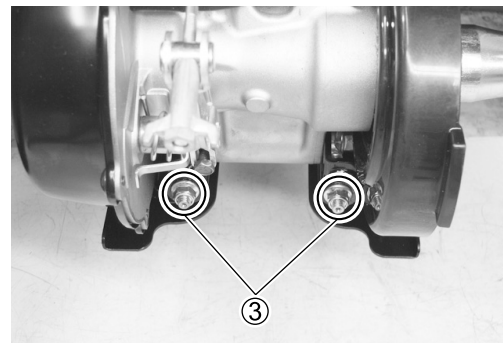
When replacing the drive chain, replace the drive chain and sprockets as a set.

CHECKING

- Remove the chain case cover.
- Loosen the rear shock absorber lower bolts ① and rear axle housing set bolt ②.

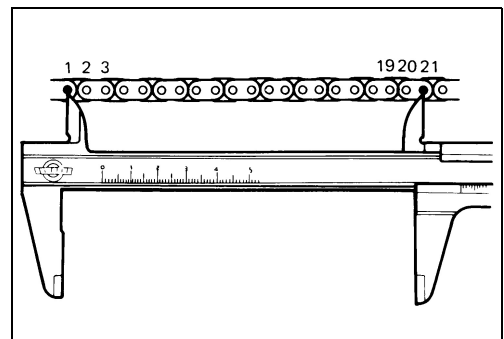


- Tense the drive chain fully by turning both chain adjusters ③.



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

DATA Drive chain 20-pitch length:
Service limit: 319.4 mm (12.6 in)



ADJUSTING

- Place the vehicle on level ground.
- Loosen or tighten both chain adjusters ① equally until the chain has 15 – 25 mm (0.6 – 1.0 in) of slack at the middle of the chain between the engine and rear sprockets as shown.

DATA Drive chain slack:

Standard: 15 – 25 mm (0.6 – 1.0 in)

- After adjusting the drive chain, tighten the rear shock absorber lower bolt ② and rear axle housing set bolt ③ to the specified torque.

ⓘ Rear shock absorber lower bolt: 94 N·m

(9.4 kgf-m, 68.0 lb-ft)

Rear axle housing set bolt: 110 N·m

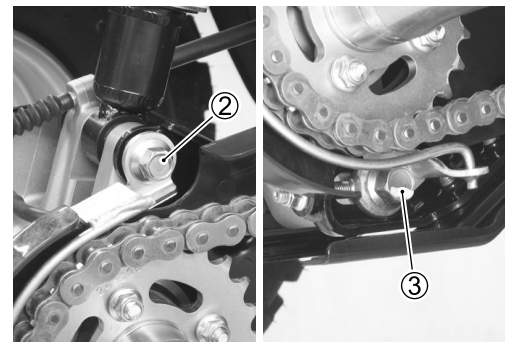
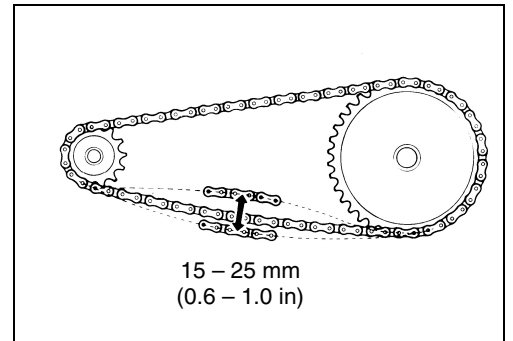
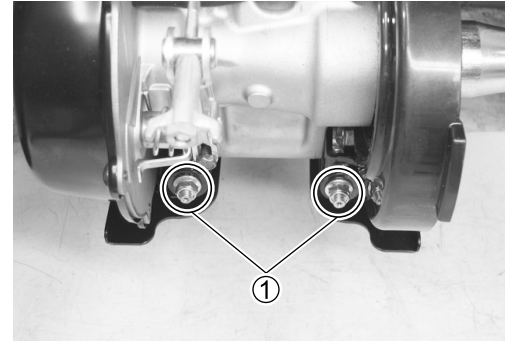
(11.0 kgf-m, 79.0 lb-ft)

- Tighten the adjusting nut ①.
- Recheck the drive chain slack.

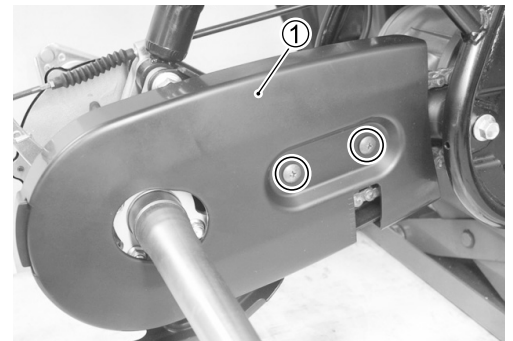
NOTE:

After drive chain adjustment the rear brake.

* *Rear brake adjustment* ➞ 2-20

**CLEANING AND LUBRICATING**

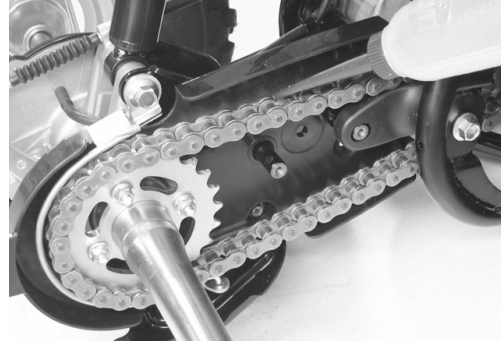
- Remove the chain case cover ①.



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



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



BRAKES

Inspect initially at 1 month and every 3 months thereafter.

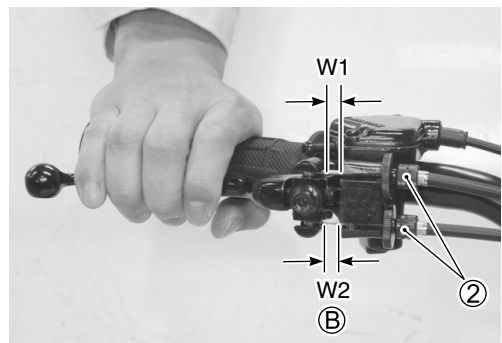
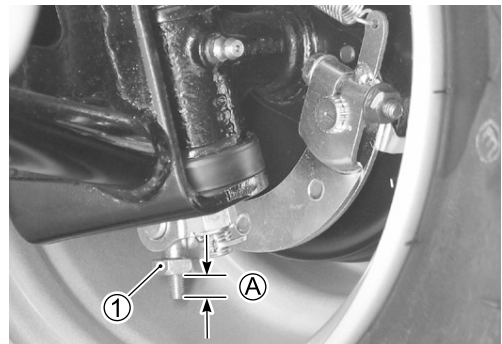
FRONT BRAKE LEVER PLAY

- Adjust the right and left cable end length ① to become equal by adjusting nuts ①.
- Turn the adjusters ② so that the brake lever play ③ is within specification after loosening the locknut.

DATA Front brake lever play ③: 4 – 6 mm (0.16 – 0.24 in)

NOTE:

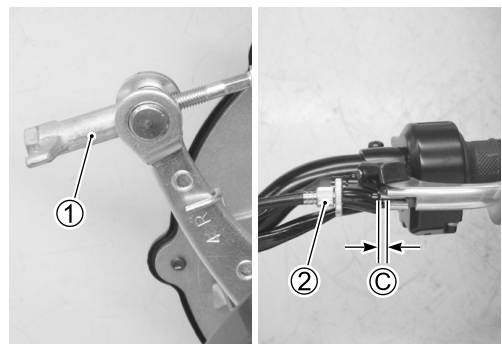
The difference between W1 and W2 should be 1 mm or less.



REAR BRAKE LEVER PLAY

- Loosen the adjuster ① and ②.
- Turn the adjuster ② so that the lever play ③ is within specification after loosening the locknut.

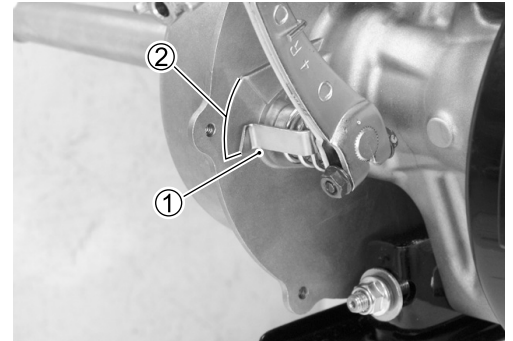
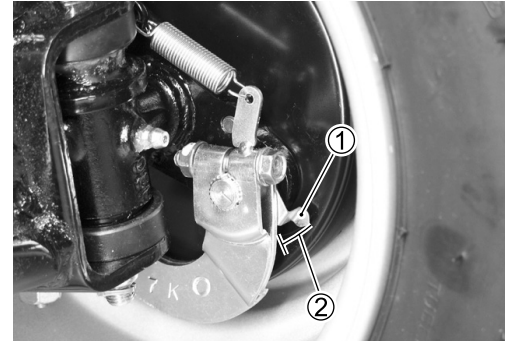
DATA Rear brake lever play ③: 3 – 5 mm (0.12 – 0.20 in)



FRONT AND REAR BRAKE SHOE WEAR

This vehicle is equipped with brake wear limit indicators for the front and rear brake. Check brake lining wear as follows:

- Make sure the brake lever play is properly adjusted.
- While fully applying the brake, check to see that the extension line of the index mark ① is within the range ②.
- If the index mark goes beyond the range, the brake shoe assembly must be replaced with a new set of shoes.



TIRES

Inspect every month.

TIRE TREAD CONDITION

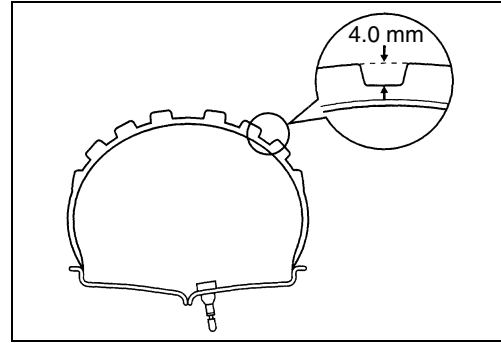
Operating the vehicle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of the tire tread reaches the following specification.

TOOL 09900-20805: Tire depth gauge

DATA Service Limit:

Tire tread depth: Front 4.0 mm (0.16 in)

Rear 4.0 mm (0.16 in)



TIRE PRESSURE

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

DATA Cold inflation tire pressure:

Front: 22.5 kPa (0.225 kgf/cm², 3.3 psi)

Rear : 20 kPa (0.20 kgf/cm², 29 psi)

VEHICLE LOAD CAPACITY LIMIT: 90 kg (198 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/cm², 10 psi).

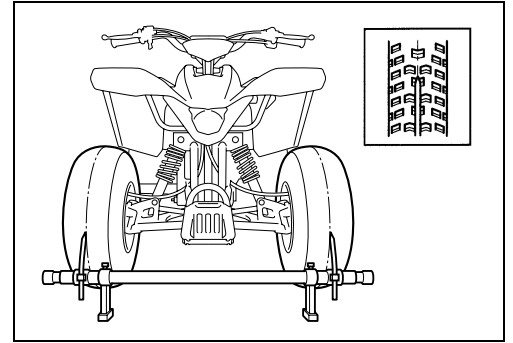
CAUTION

The standard tire fitted on this vehicle is an AT19×7-8☆ for the front and rear. The use of tires other than those specified may cause instability. It is highly recommended to use the specified tires.

STEERING

Inspect initially at 1 month and every 3 months thereafter.

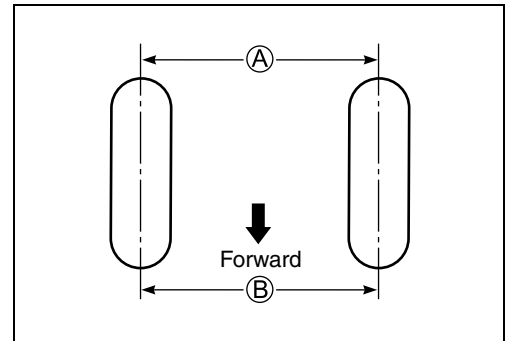
Steering system should be adjusted properly for smooth manipulation of the handlebar and safe running.



TOE-IN

- Place the vehicle on level ground.
- Make sure the tire pressure for both tire is the same and set to the proper specification.
- Set the front wheels in the straight position.
- Place a load of 63 kg (139 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 between **A** and **B**.

$$B - A = \text{Toe-in}$$



DATA Toe-in: $4.5 \pm 3 \text{ mm}$ ($0.17 \pm 0.1 \text{ in}$)

- If the toe-in is out of specification, bring it into the specified range. (🔧 5-32)

SUSPENSIONS

Inspect every 6 months.

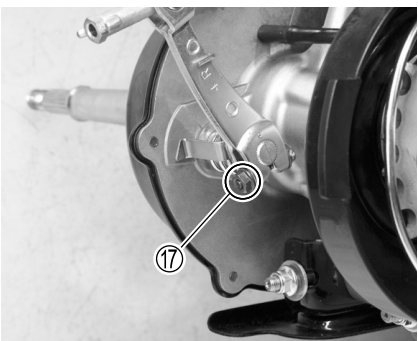
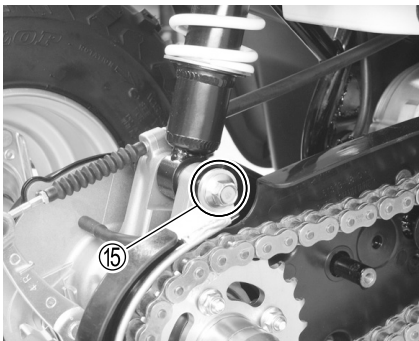
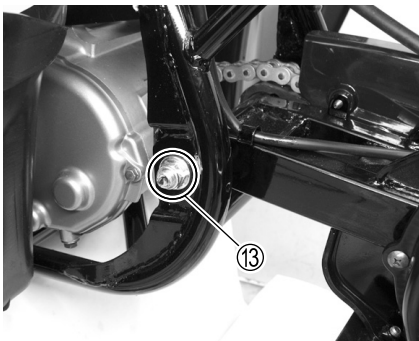
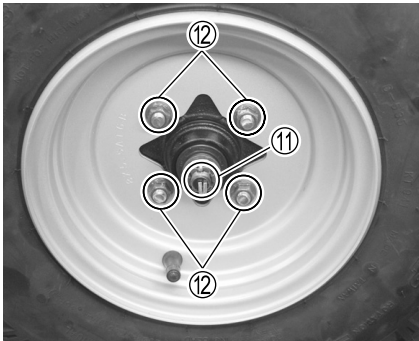
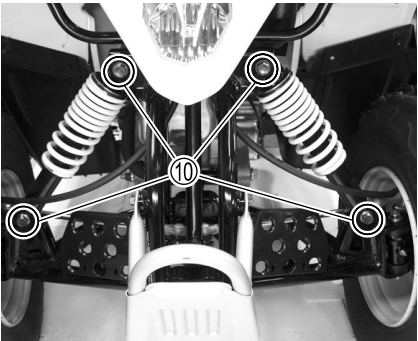
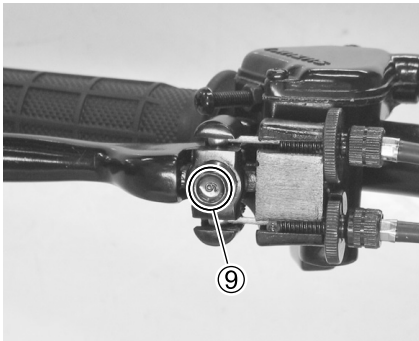
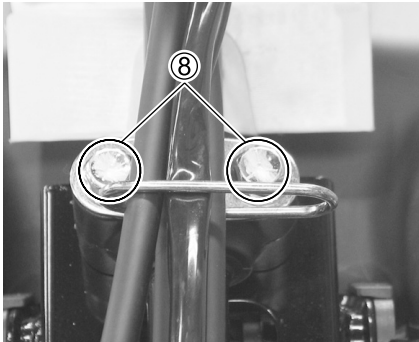
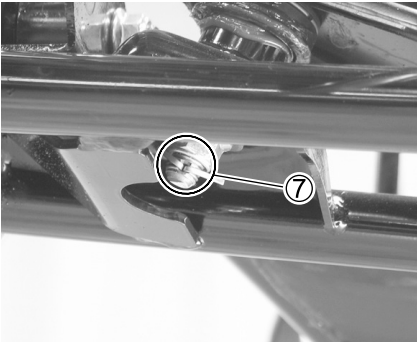
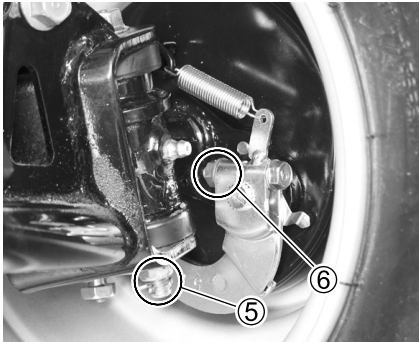
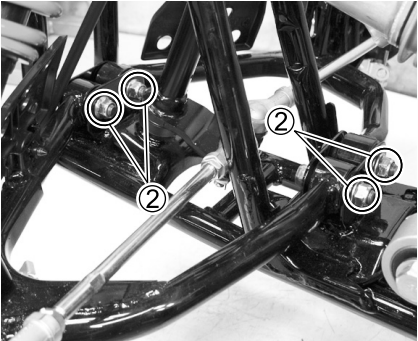
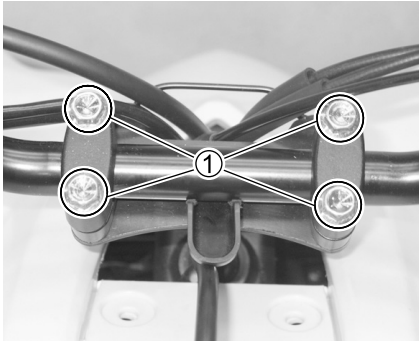
- Support the vehicle with a jack and wooden blocks.
- Remove the front and rear wheels. (🔧 5-8)
- Inspect the suspension arm, swingarm and bush for scratches, wear or defect. If any defects are found, replace them with new ones. (🔧 5-23 and 5-50)
- Inspect the front and rear shock absorbers for oil leakage or defects. If any defects are found, replace them with new ones. (🔧 5-23 and 5-49)

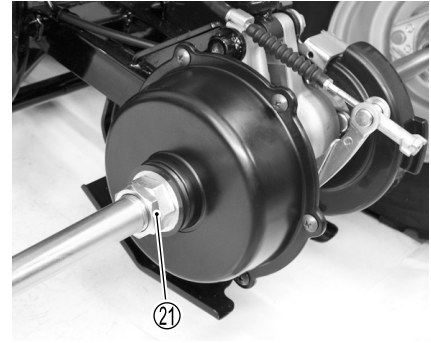
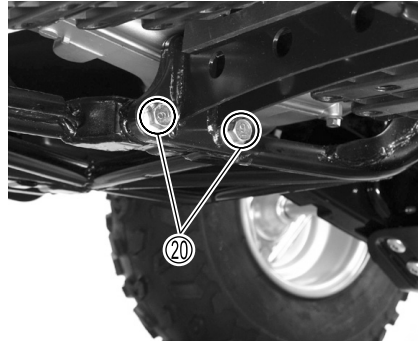
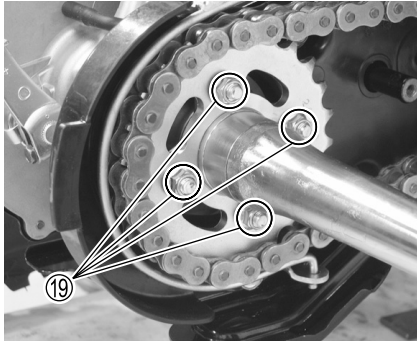
CHASSIS NUTS AND BOLTS

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 2-25 for the locations of the following nuts and bolts.)

Item	N·m	kgf-m	lb-ft
① Handlebar clamp bolt	25	2.5	18.0
② Front suspension arm pivot nut	65	6.5	47.0
③ Tie-rod end nut	50	5.0	36.0
④ Tie-rod locknut	29	2.9	21.0
⑤ Steering knuckle nut	60	6.0	43.5
⑥ Front brake cam lever nut	8	0.8	6.0
⑦ Steering shaft lower nut	35	3.5	25.5
⑧ Steering shaft holder bolt	23	2.3	17.0
⑨ Front brake cable equalizer bolt	7	0.7	5.0
⑩ Front shock absorber bolt (upper and lower)	50	5.0	36.0
⑪ Front hub nut	65	6.5	47.0
⑫ Wheel set nut (front and rear)	55	5.5	40.0
⑬ Swingarm pivot nut	102	10.2	74.0
⑭ Rear shock absorber bolt (upper)	29	2.9	21.0
⑮ Rear shock absorber bolt (lower)	94	9.4	68.0
⑯ Rear hub nut	75	7.5	54.0
⑰ Rear brake cam lever nut	8	0.8	6.0
⑱ Rear axle housing bolt	110	11.0	79.0
⑲ Rear sprocket bolt	28	2.8	20.0
⑳ Footrest bolt	55	5.5	40.0
㉑ Rear axle nut	180	18.0	130.0

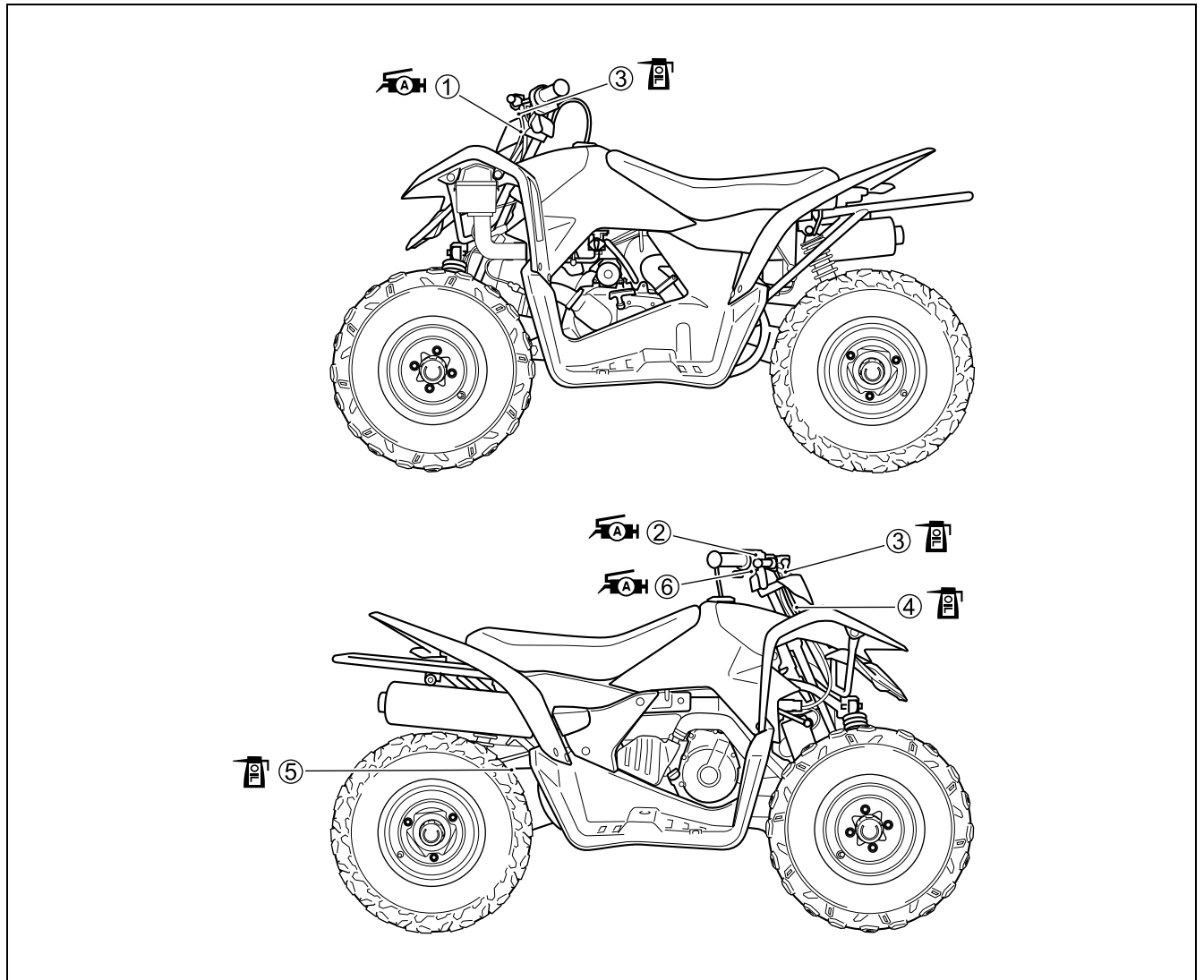




GENERAL LUBRICATIONS

Lubricate every 3 months.

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



- | | | |
|-------------------------|----------------------|------------------|
| ① Steering shaft holder | ② Brake lever holder | ③ Brake cable |
| ④ Throttle cable | ⑤ Drive chain | ⑥ Throttle lever |

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.



Compression pressure:

Standard: 1 500 kPa (15.0 kgf/cm², 213 psi)

Limit: 1 300 kPa (13.0 kgf/cm², 185 psi)

Low compression pressure can indicate any of the following conditions:

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

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 bolts are tightened to the specified torque and the valves are properly adjusted.*
- * *Have the engine warmed up before testing.*
- * *Make sure that the battery is fully-charged.*

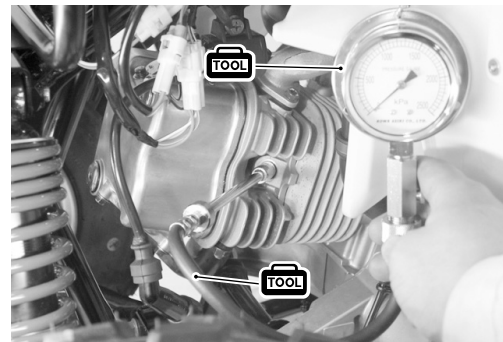
Remove the related parts and test the compression pressure in the following manner.

- Remove the spark plug. (☞ 2-8)
- Install the compression gauge and adaptor in the spark plug hole. Make sure that the connection is tight.
- Keep the throttle 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.



09915-70651: Compression gauge set

09915-63310: Adaptor



INITIAL ENGAGEMENT AND CLUTCH LOCK-UP INSPECTION

The LT-Z90 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:

- Warm up the engine.

INITIAL ENGAGEMENT INSPECTION

- Connect the multi-circuit tester onto the spark plug high-tension cord.
- Start the engine.
- Slowly open the throttle and note the engine speed (r/min) when the vehicle begins to move forward.

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

 **Engagement speed: 2 800 – 3 400 r/min**

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

- * Clutch shoe  3-54
- * Clutch housing.....  3-54
- * Movable drive and driven face  3-51

CLUTCH LOCK-UP INSPECTION

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

- Connect a multi-circuit tester onto the spark plug high-tension code.
- Start the engine.
- 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: 5 400 – 6 000 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 shoe  3-54
- * Clutch housing  3-54
- * Movable drive and driven face  3-51

NOTE:
Release the parking brake lock.

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:

10 – 40 kPa (0.1 – 0.4 kgf/cm², 1.4 – 5.7 psi) at 3 000 r/min, Oil temp. at 60 °C (140 °F)

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

LOW OIL PRESSURE

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

HIGH OIL PRESSURE

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

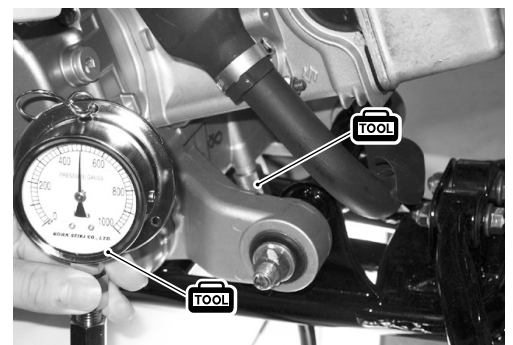
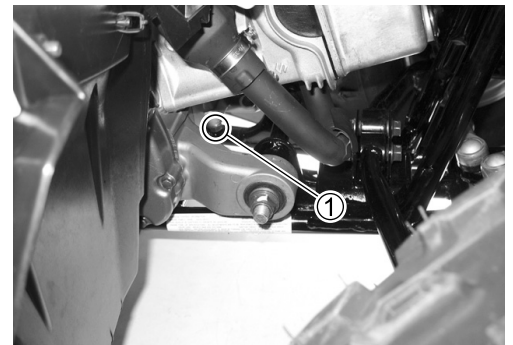
OIL PRESSURE TEST PROCEDURE

- Connect the tachometer onto the spark plug high-tension cord.
- Remove the main oil gallery plug ①.
- Install the oil pressure gauge and adaptor into the main oil gallery.
- Warm up the engine as follows:
Summer: 10 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
09915-74531: Adaptor

- Apply engine oil to both sides of the main oil gallery plug washers.
- Tighten the main oil gallery plug ① to the specified torque.

U Main oil gallery plug: 12 N·m (1.2 kgf-m, 8.5 lb-ft)



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
Oil filter/strainer	3-14	3-71
Movable drive face/driven face	3-15	3-68
Starter motor	3-9	3-77
Recoil starter	3-14	3-71

ENGINE RIGHT SIDE

PARTS	REMOVAL	INSTALLATION
Exhaust pipe/muffler	3-4	3-8
Engine sprocket	3-5	3-7
Generator rotor	3-12	3-67
Oil pump	3-13	3-66

ENGINE CENTER

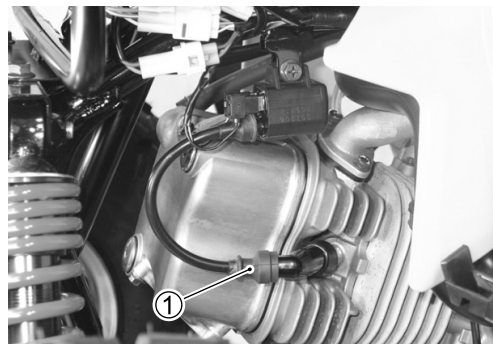
PARTS	REMOVAL	INSTALLATION
Cylinder head cover	3-9	3-76
Cylinder head	3-9	3-74
Cylinder	3-11	3-74
Piston	3-11	3-72
Cam chain tension adjuster	3-10	3-75
Cam chain	3-13	3-66

ENGINE REMOVAL AND REMOUNTING

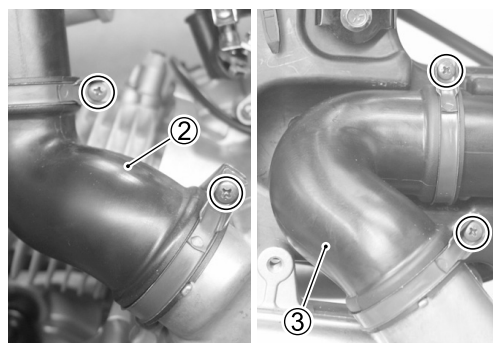
ENGINE REMOVAL

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

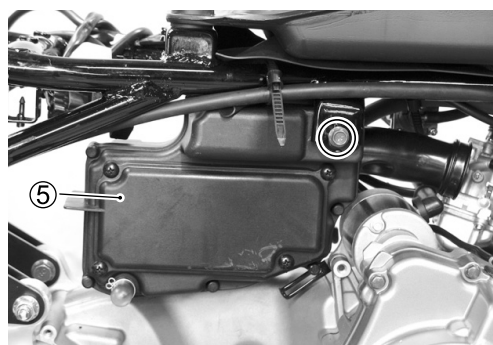
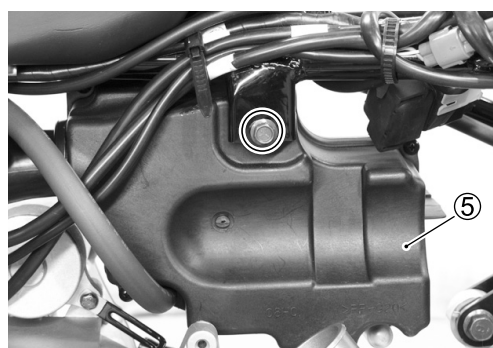
- Drain engine oil. (☞ 2-10)
- Remove the fuel tank cover. (☞ 5-4)
- Remove the footrest mudguard (left and right). (☞ 5-5)
- Remove the left footrestbar. (☞ 5-5)
- Remove the front fender. (☞ 5-5)
- Remove the spark plug cap ①.



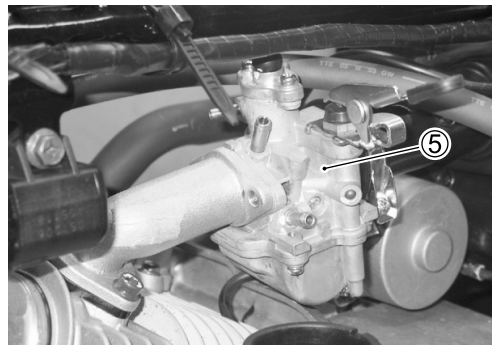
- Remove the connector. (2 and 3).



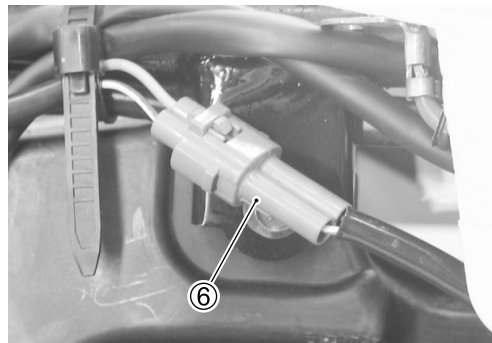
- Remove the air cleaner assembly ⑤.



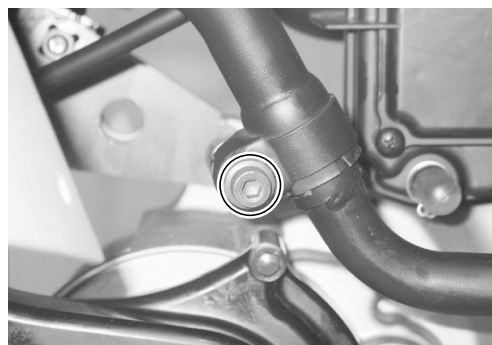
- Remove the carburetor assembly ⑤. (➡ 4-7)



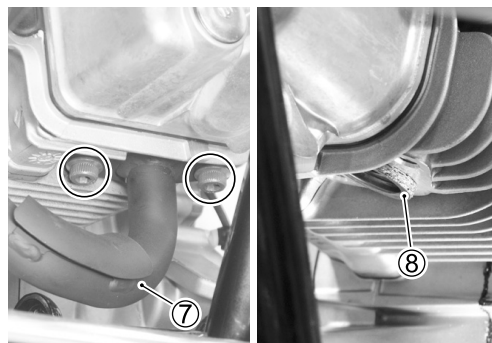
- Disconnect the generator coupler ⑥.



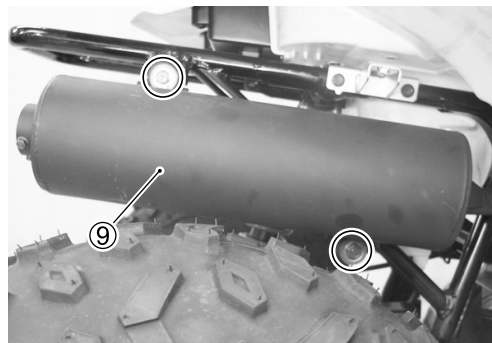
- Loosen the muffler clamp bolt.



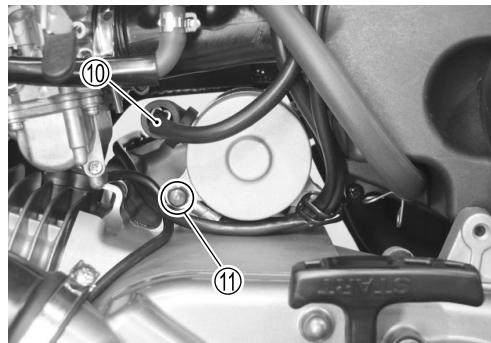
- Remove the exhaust pipe ⑦.
- Remove the gasket ⑧.



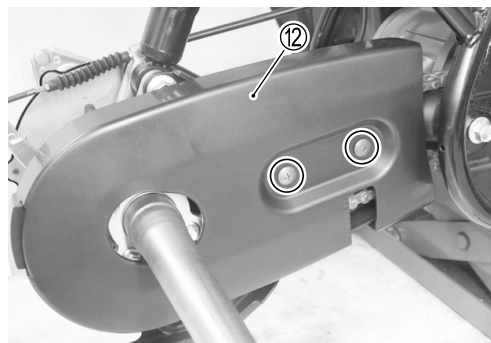
- Remove the muffler ⑨.



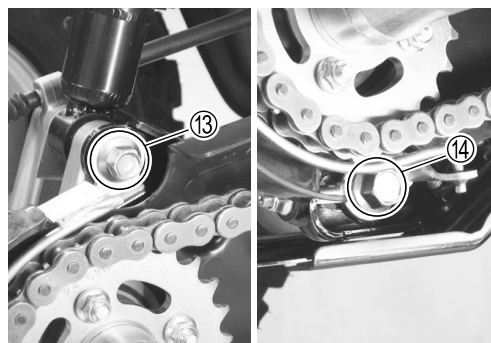
- Remove the starter motor lead wire ⑩ and ground lead wire ⑪.



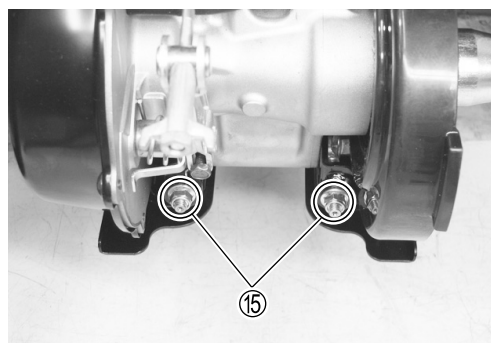
- Remove the chain case cover ⑫.



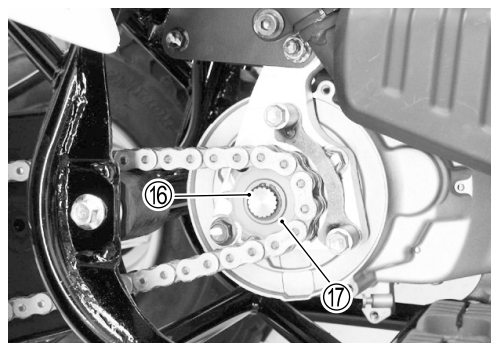
- Loosen the rear shock absorber lower bolt ⑬.
- Loosen the rear axle housing bolt ⑭.



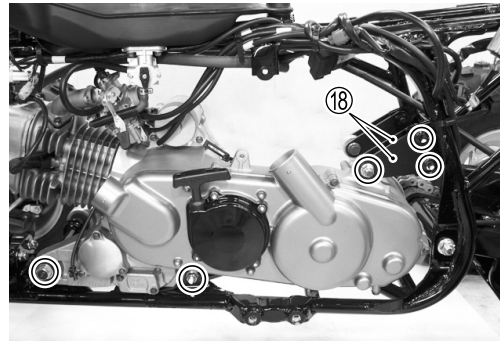
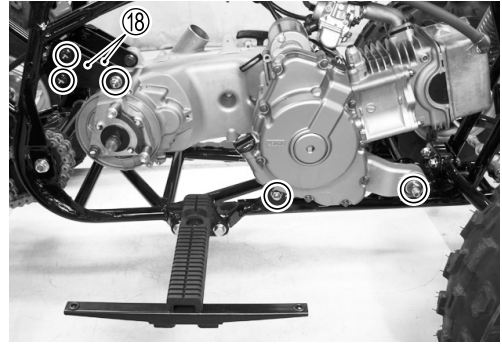
- Loosen the chain adjusters ⑮.



- Remove the snap ring ⑯ and engine sprocket ⑰ with drive chain.



- Remove the engine mounting upper brackets ⑮.
- Remove the engine mounting bolts and nuts.
- Remove the engine from the right side.

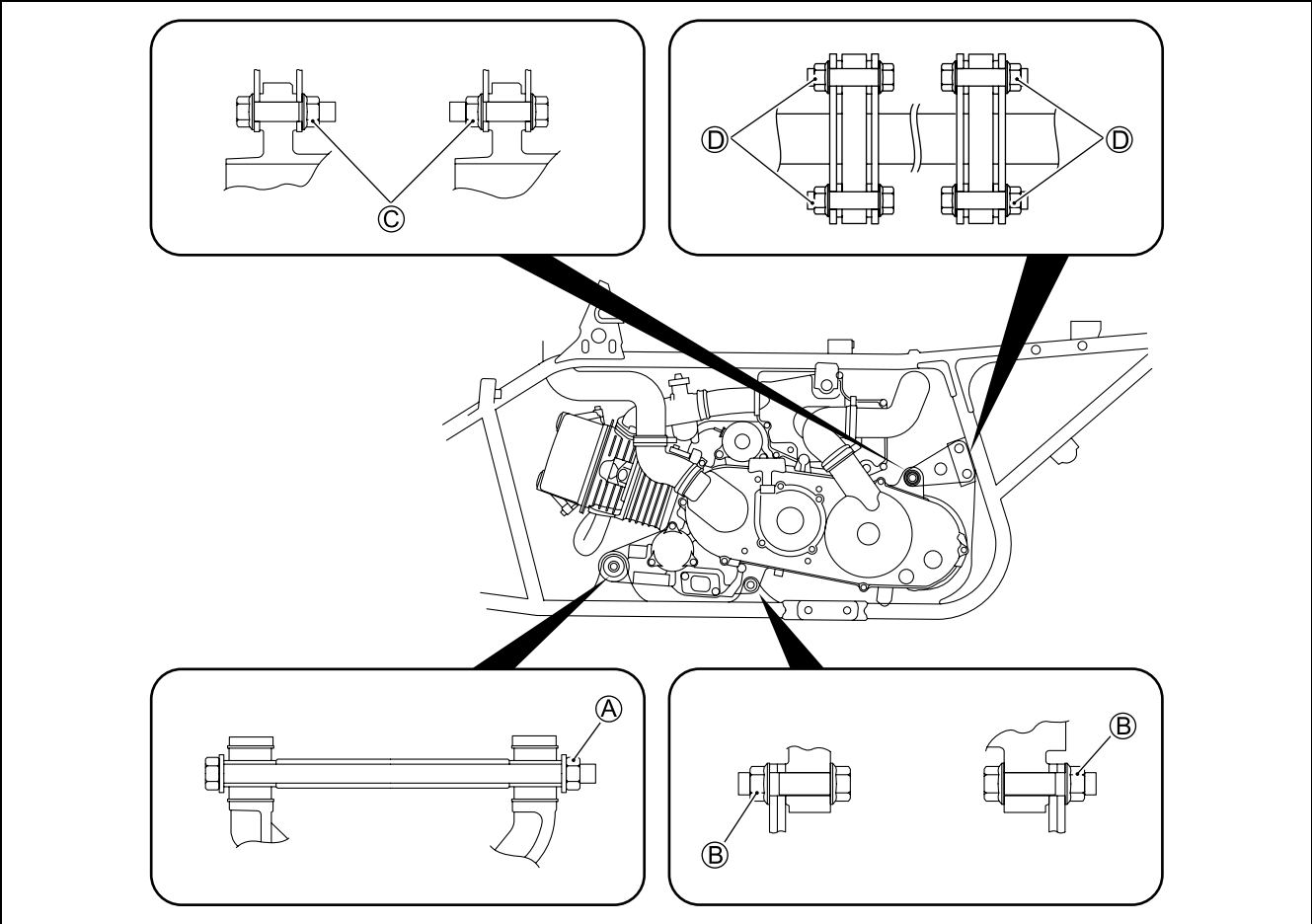


ENGINE REMOUNTING

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

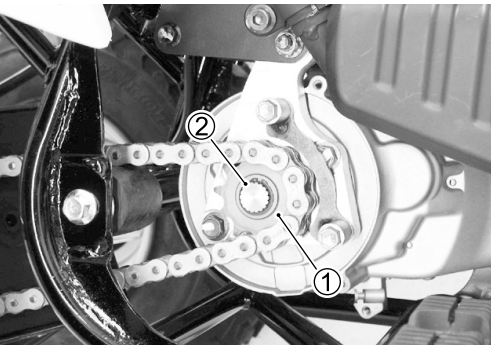
NOTE:

- * 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.



ITEM	N·m	kgf·m	lb·ft
Ⓐ	100	10.0	72.5
Ⓑ	60	6.0	43.5
Ⓒ	60	6.0	43.5
Ⓓ	35	3.5	25.5

- Install the engine sprocket ① with drive chain, and then install the snap ring ②.



- Install the muffler ③ and exhaust pipe ④.
- Tighten the muffler mounting bolt and exhaust pipe bolt to the specified torque.

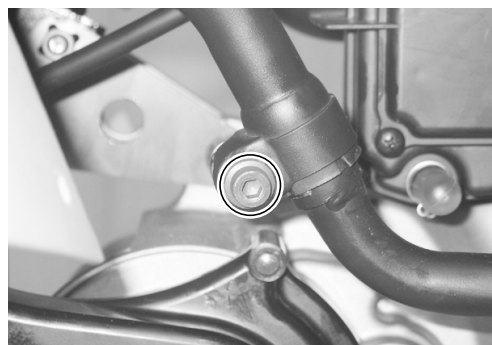
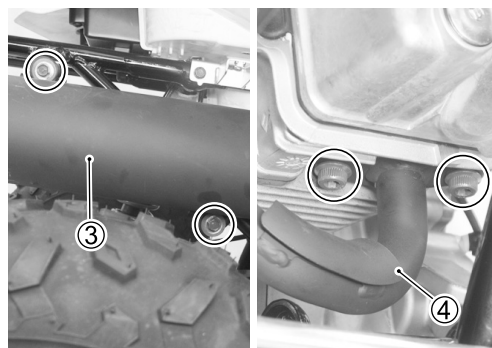
CAUTION

The removed gasket must be replaced with a new one to prevent exhaust gas leakage.

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

- Tighten the muffler clamp bolt to the specified torque.

- 🔧 **Muffler clamp bolt: 12 N·m (1.2 kgf-m, 8.5 lb-ft)**

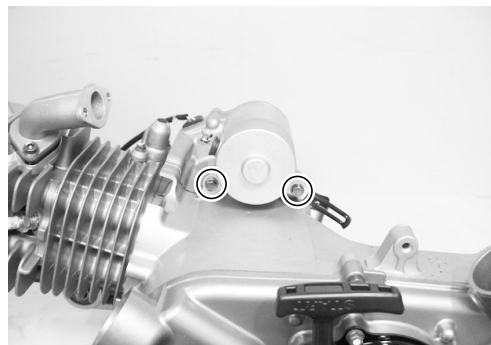


- Install the carburetor assembly. (🔧 4-13)
- After remounting the engine, route the wiring harness, cables and hoses properly. (🔧 7-15)
- Adjust the following items.
 - * Engine oil (🔧 2-10)
 - * Throttle cable play (🔧 2-13)
 - * Engine idle speed (🔧 2-13)
 - * Drive chain slack (🔧 2-18)

ENGINE DISASSEMBLY

STARTER MOTOR

- Remove the starter motor.



SPARK PLUG

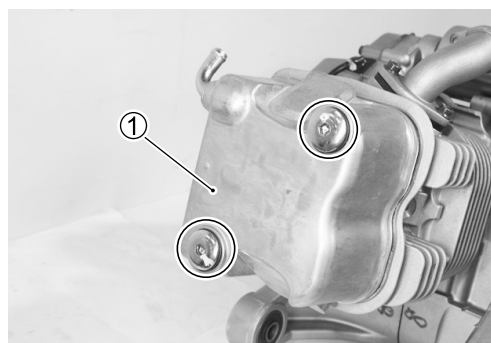
- Remove the spark plug.

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



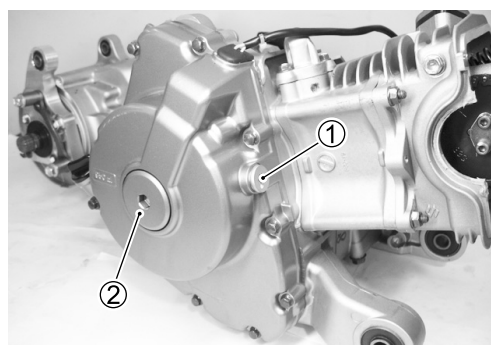
CYLINDER HEAD COVER

- Remove the cylinder head cover bolts, and then remove the cylinder head cover ①.

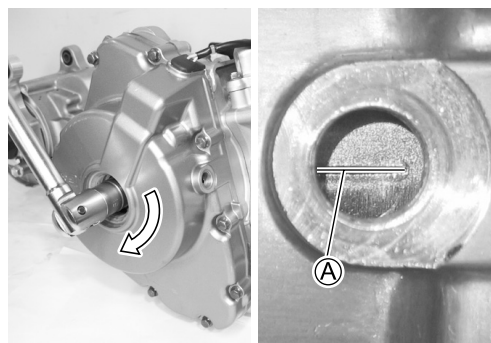


CYLINDER HEAD

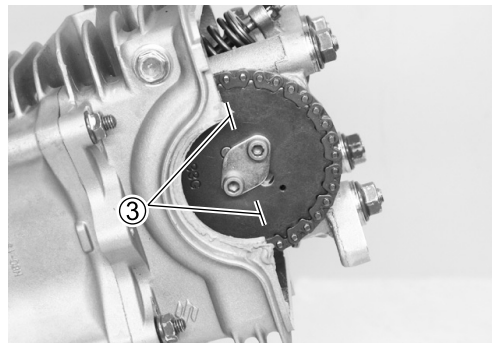
- Remove the valve timing inspection plug ① and generator cover cap ②.



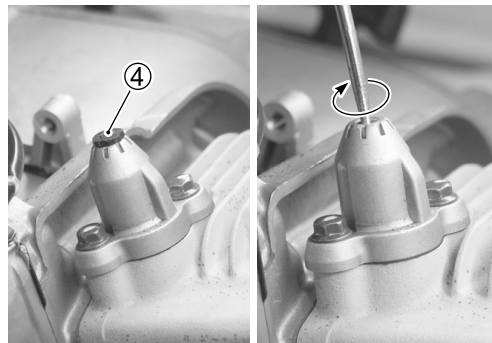
- Turn the crankshaft with a box wrench to set the piston at TDC on the compression stroke. (Rotate the generator rotor until the line A on the generator rotor is center of the hole in the generator cover.)



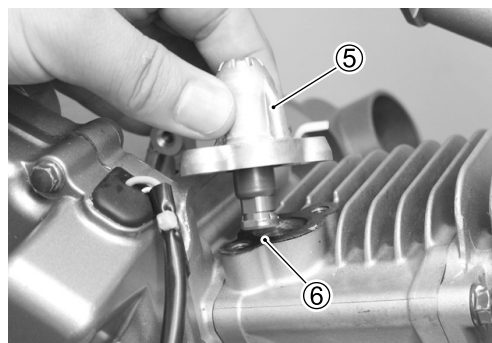
- Align the engraved line ③ on the camshaft so it is parallel with the mating surface of the cylinder head.



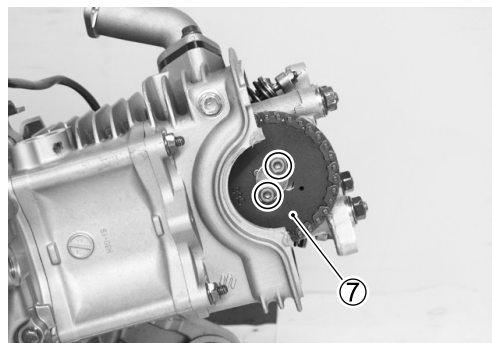
- Remove the cam chain tension adjuster plug cap ④.
- Insert the $\ominus$ screwdriver into the slotted end of cam chain tension adjuster and turn the adjusting screw clockwise with the $\ominus$ screwdriver until the push rod locked.



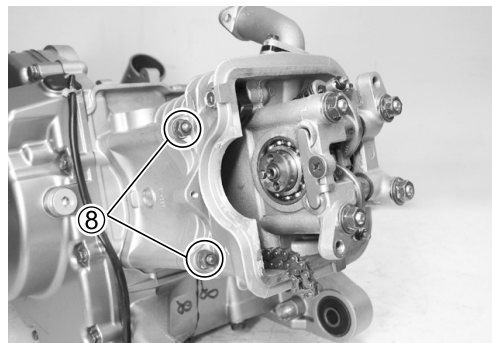
- Remove the cam tension adjuster ⑤ and gasket ⑥.



- Remove the cam sprocket ⑦.



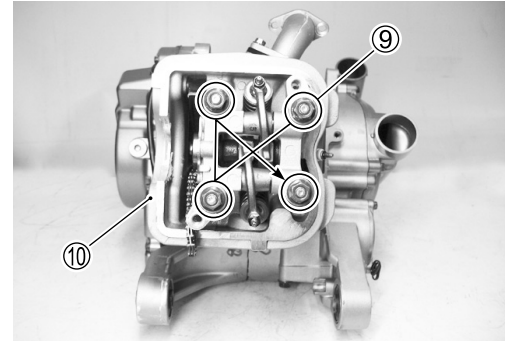
- Remove the cylinder head nut ⑧.



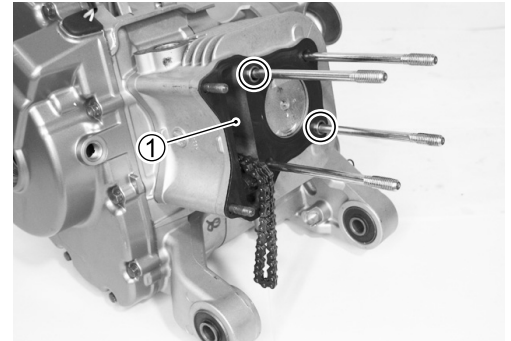
- Remove the cylinder head nut ⑨ in diagonal stages, and then remove the cylinder head ⑩.

NOTE:

If the cylinder head does not come off easily, lightly tap it using a plastic mallet.

**CYLINDER**

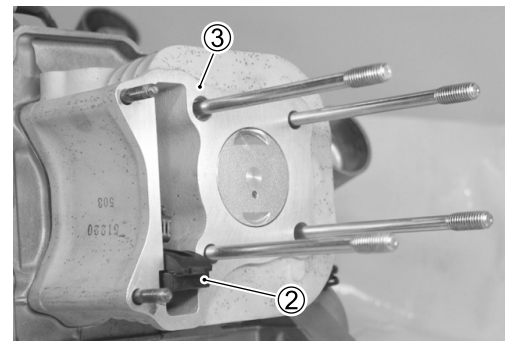
- Remove the cylinder head gasket ① and dowel pins.



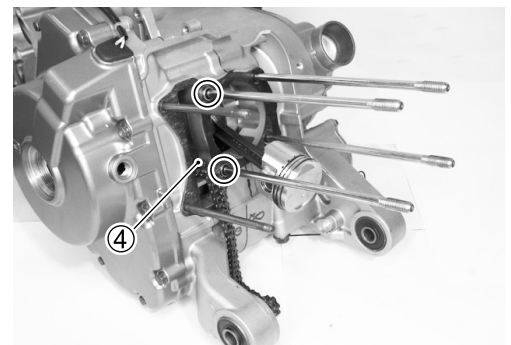
- Remove the cam chain guide ②.
- Remove the cylinder ③.

NOTE:

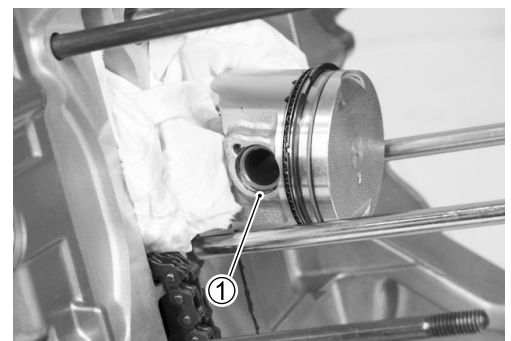
If the cylinder does not come off easily, lightly tap it using a plastic mallet.



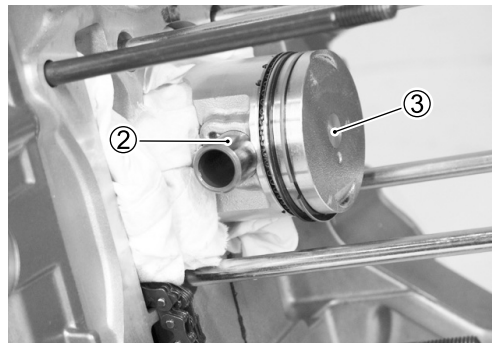
- Remove the cylinder gasket ④ and dowel pins.

**PISTON**

- Place a clean rag over the cylinder base to prevent the piston pin circlip ① from dropping into the crankcase.
- Remove the piston pin circlip ①.

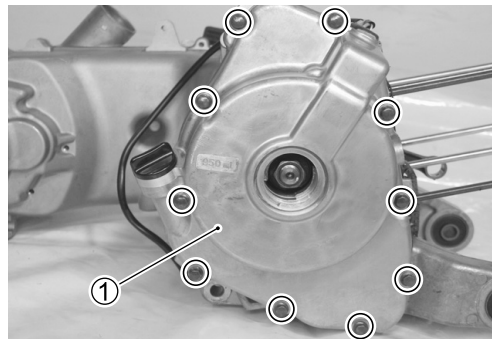


- Draw out the piston pin ② and remove the piston ③.

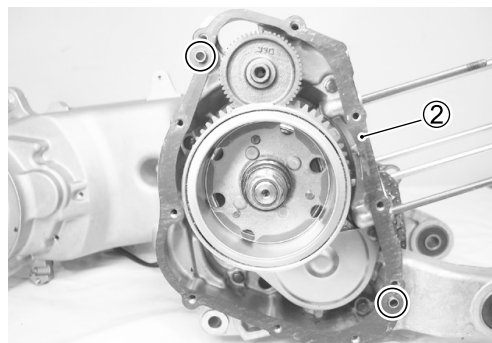


GENERATOR ROTOR COVER

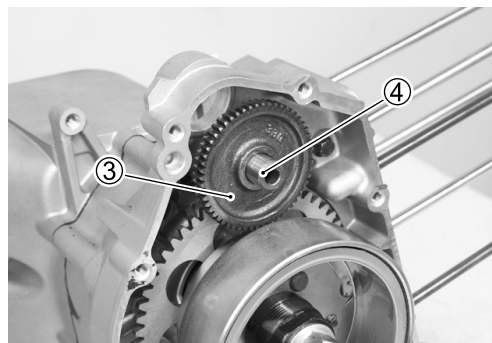
- Remove the generator rotor cover ①.



- Remove the gasket ② and dowel pins.



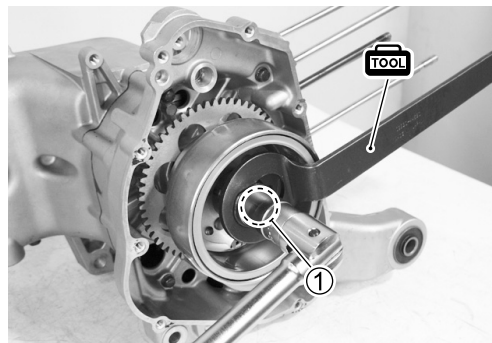
- Remove the starter idle gear ③ and starter idle shaft ④.



GENERATOR ROTOR

- Hold the generator rotor using the special tool, and then remove the generator rotor nut ①.

TOOL 09930-44520: Rotor holder



- Remove the generator rotor ② using the special tool.

TOOL 09930-34980: Rotor remover

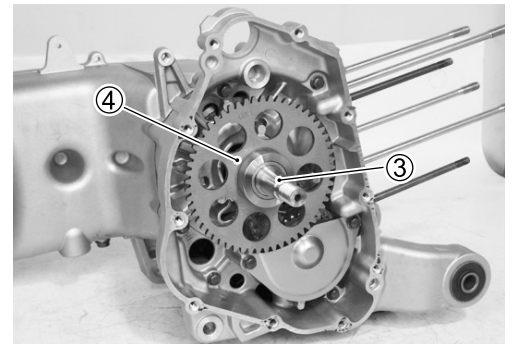
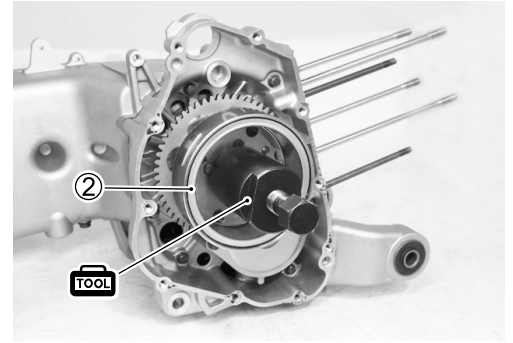
NOTE:

Temporarily install the generator rotor nut to the crankshaft, and then remove the generator rotor using the special tool.

CAUTION

Do not hit the generator rotor with a hammer, otherwise the rotor may be damaged.

- Remove the generator rotor key ③.
- Remove the starter driven gear ④.

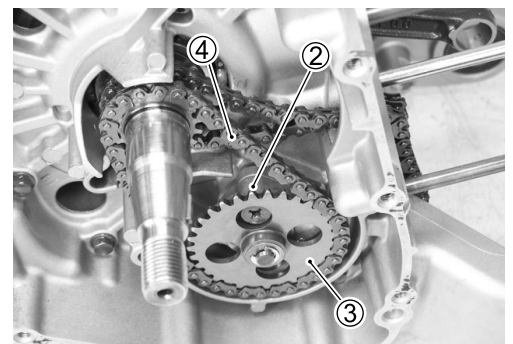


OIL PUMP

- Remove the oil pump cover ①.



- Remove the oil pump assembly ②, oil pump sprocket ③ and oil pump chain ④.



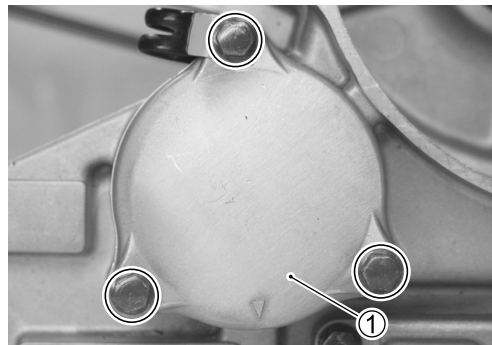
CAM CHAIN

- Remove the cam chain ①.

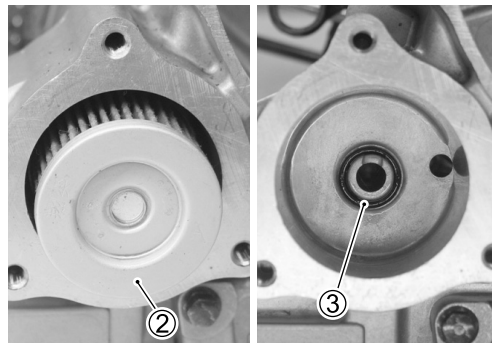


OIL FILTER

- Remove the oil filter cap ①.

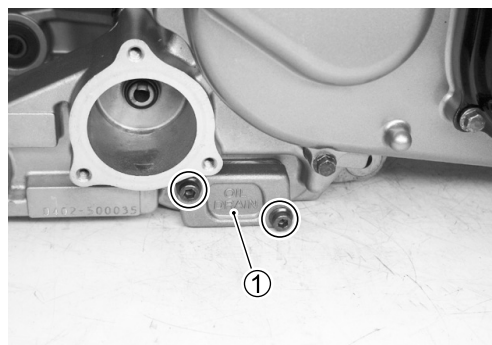


- Remove the oil filter ② and O-ring ③.

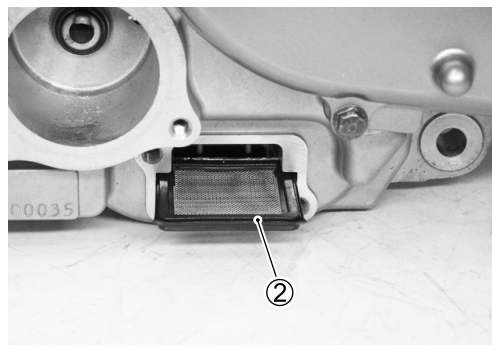


OIL STRAINER

- Remove the oil strainer cap ①.

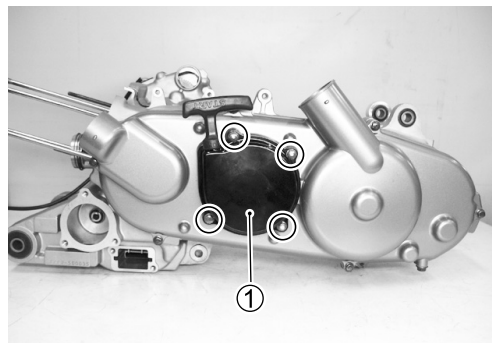


- Remove the oil strainer ②.



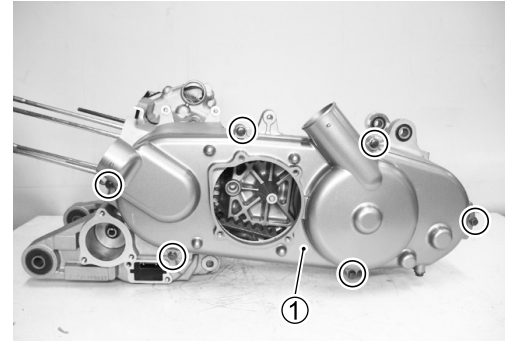
RECOIL STARTER

- Remove the recoil starter ①.

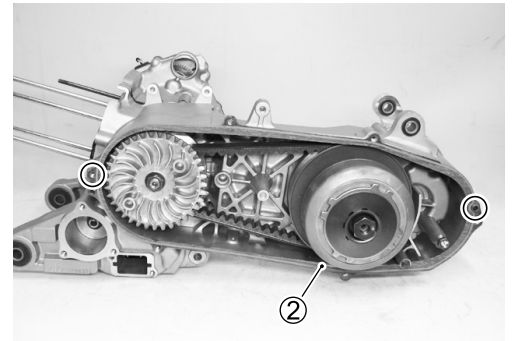


MOVABLE DRIVE FACE

- Remove the crankcase cover ①.



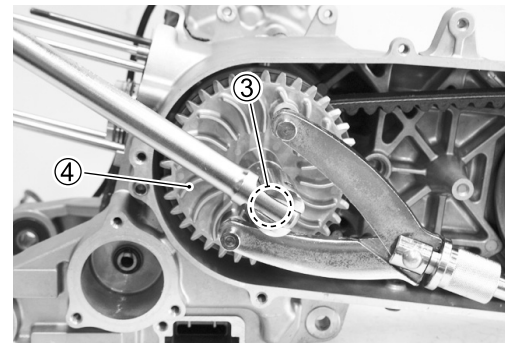
- Remove the gasket ② and dowel pins.



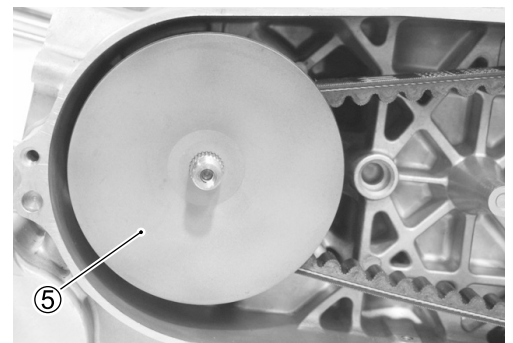
- Remove the fixed drive face nut ③ with the special tool.

TOOL 09930-40113: Rotor holder

- Remove the fixed drive face fan ④.

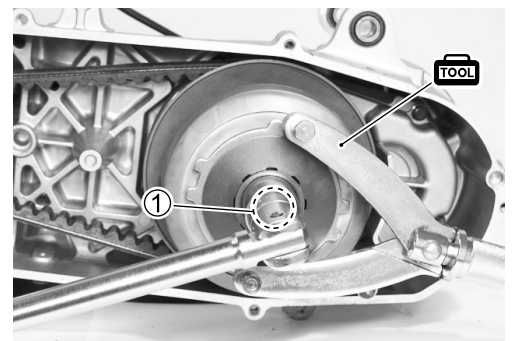


- Remove the fixed drive face ⑤.

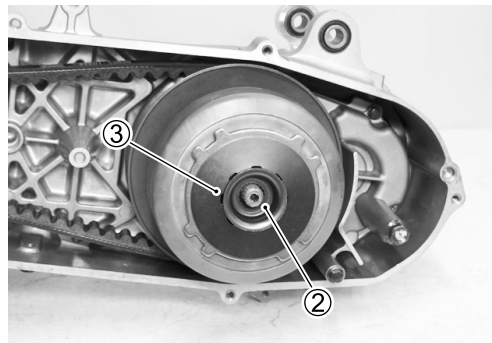
**MOVABLE DRIVEN FACE**

- Remove the limit clutch nut ① with the special tool.

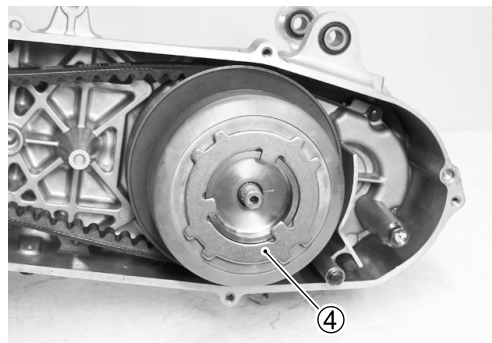
TOOL 09930-40113: Rotor holder



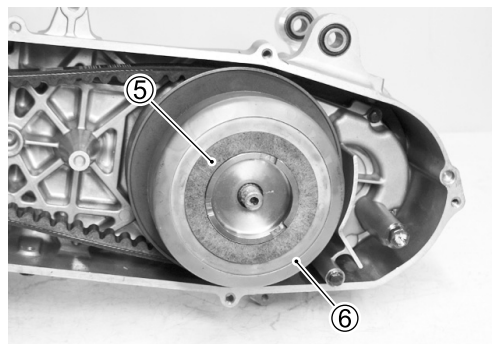
- Remove the limit clutch stopper ② and limit clutch spring ③.



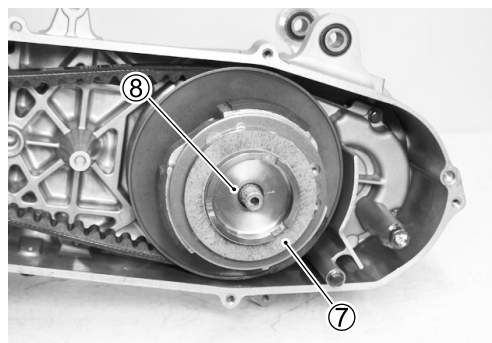
- Remove the limit clutch pressure plate ④.



- Remove the limit clutch friction plate ⑤ and clutch housing ⑥.



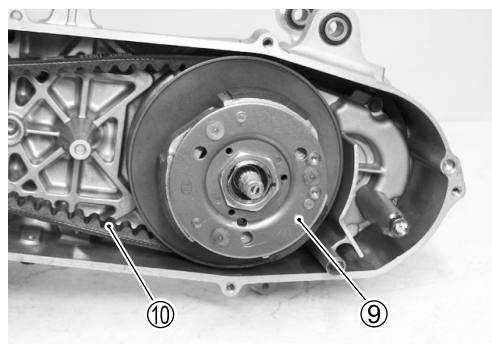
- Remove the limit clutch friction plate ⑦ and limit clutch ⑧.



- Remove the clutch shoe/movable driven face assembly ⑨ with the drive belt ⑩.

NOTE:

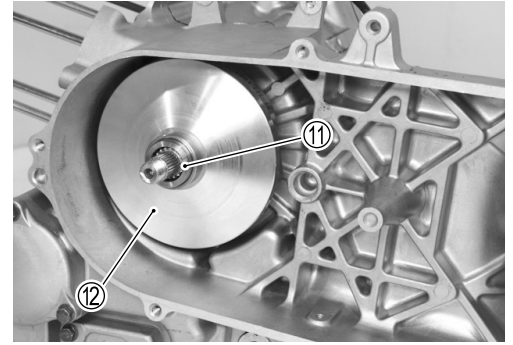
Clutch shoe/movable driven face disassembly. (☞ 3-52)



- Remove the movable drive spacer ⑪ and movable drive face assembly ⑫.

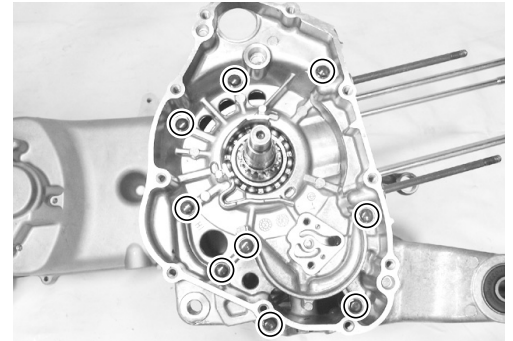
NOTE:

Movable drive face disassembly. (☞ 3-51)



CRANKCASE

- Remove the left crankcase bolts.

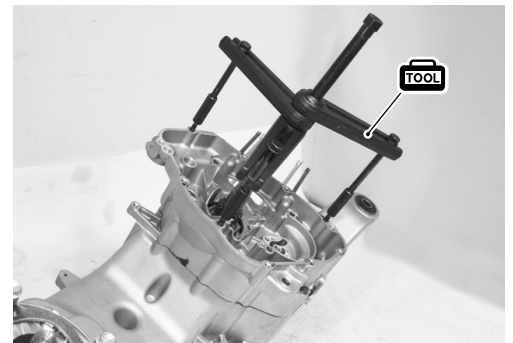


- Separate the crankcase with the special tool.

TOOL 09920-13120: Crankcase separating tool

NOTE:

Fit the crankcase separating tool to the right crankcase, so that the tool plate is paralleled with the end face of the crankcase.



- Remove the crankshaft from the crankcase with the special tool.

TOOL 09920-13120: Crankcase separating tool

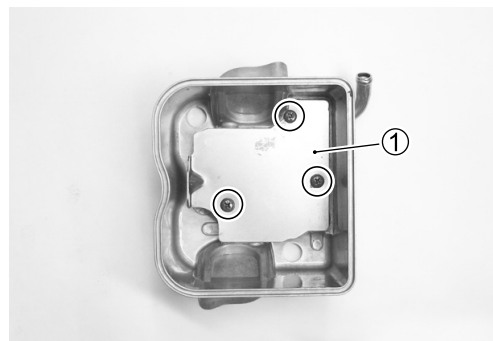


ENGINE COMPONENTS INSPECTION AND SERVICE

CYLINDER HEAD COVER

DISASSEMBLY

- Remove the breather plate ①.



- Remove the gasket ②.



INSPECTION

Inspect the cylinder head cover for carbon deposit. If the clogged are found, clean the cylinder head cover.

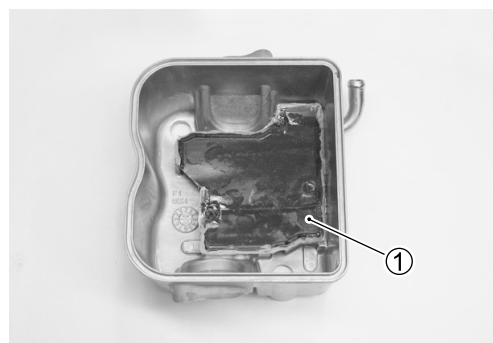


REASSEMBLY

- Install the breather gasket ①.

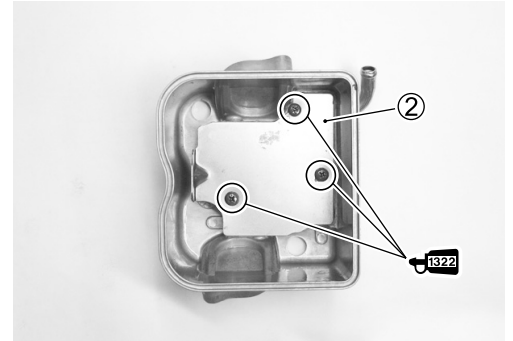
CAUTION

The removed gasket must be replaced with a new one.



- Install the breather plate ②.
- Apply a small quantity of THREAD LOCK SUPER “1322” to the breather plate bolts and tighten then securely.

 99000-32080: THREAD LOCK SUPER “1322”

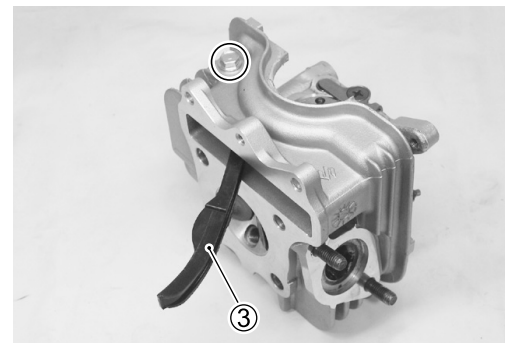
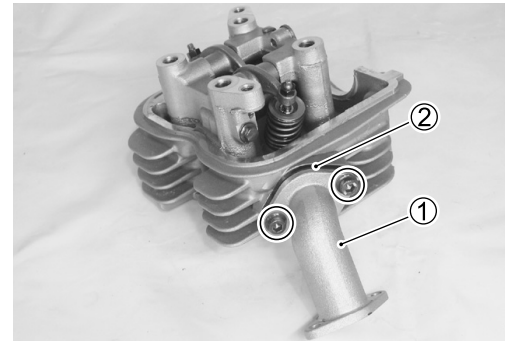


CYLINDER HEAD DISASSEMBLY

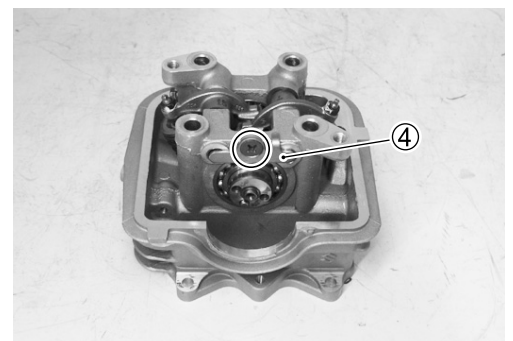
CAUTION

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

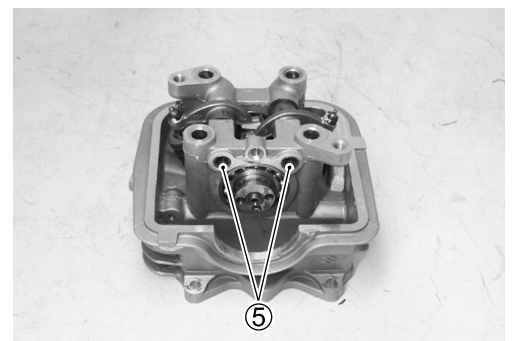
- Remove the intake pipe ① and insulator ②.
- Remove the cam chain guide ③.



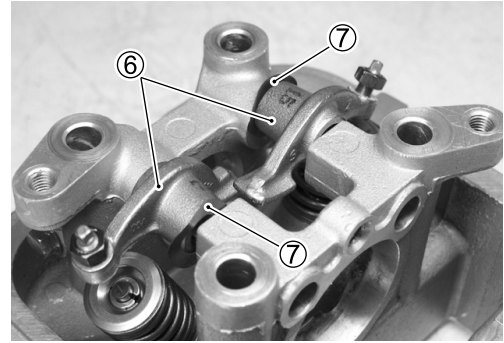
- Remove the camshaft retainer ④.



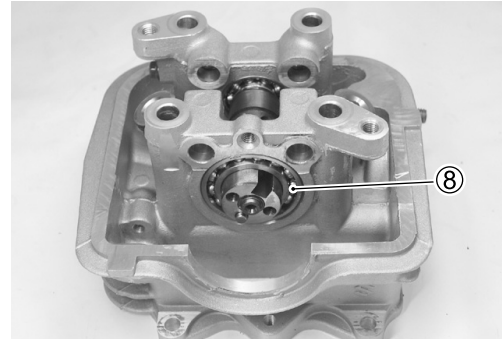
- Remove the rocker arm shafts ⑤.



- Remove the rocker arms ⑥ and wave washer ⑦.



- Remove the cam shaft ⑧.

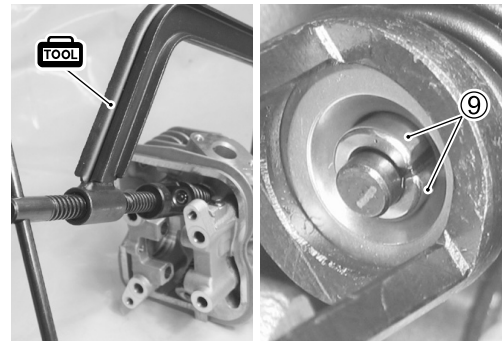


- Using the special tools, compress the valve spring and remove the two cotter halves ⑨ from the valve stem.

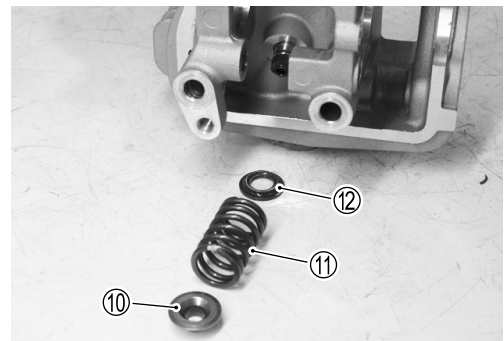
TOOL 09916-14510: Valve lifter
 09916-14521: Valve lifter attachment
 09916-84511: Tweezers

CAUTION

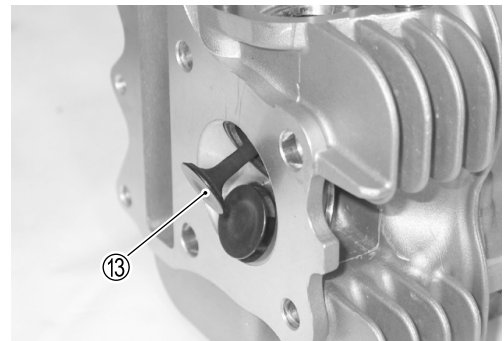
Be careful not to damage the tappet sliding surface with the special tool.



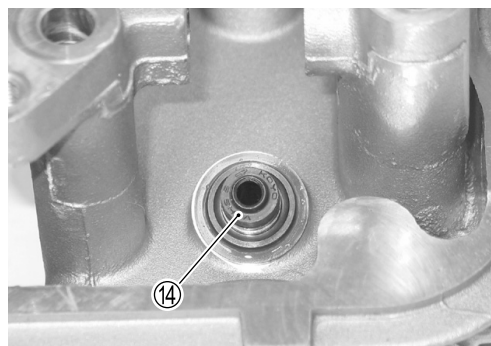
- Remove the valve spring retainer ⑩, valve spring ⑪ and spring seat ⑫.



- Pull out the valve ⑬ from the combustion chamber side.



- Remove the oil seal ⑭.
- Remove the other valves in the same manner as described previously.

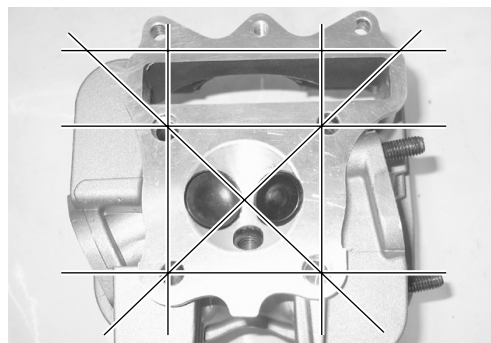


CYLINDER HEAD DISTORTION

Decarbonize the combustion chambers. Check the gasket surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at several places indicated. If the largest reading at any position of the straight-edge exceeds the limit, replace the cylinder head.

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

TOOL 09900-20803: Thickness gauge

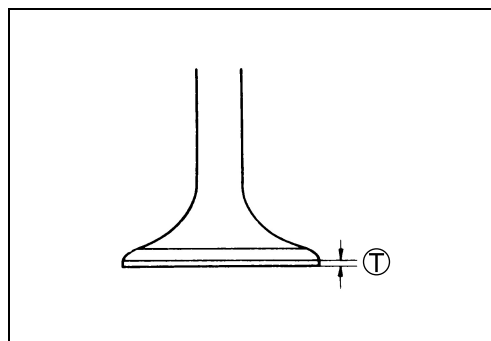


VALVE FACE WEAR

The thickness of the valve face decreases as the face wears. Visually inspect each valve face for wear and replace any valve with an abnormally worn face. Measure the valve face thickness ①, if it is out of specification, replace the valve with a new one.

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

TOOL 09900-20101: Vernier calipers

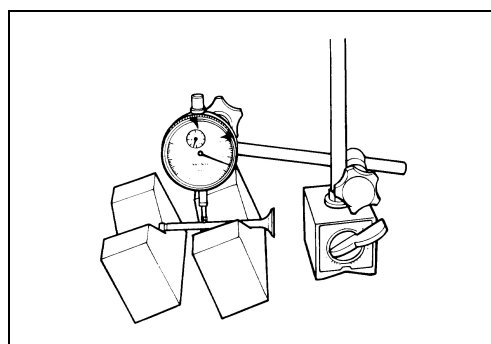


VALVE STEM RUNOUT

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

DATA Valve stem runout:
Service Limit: 0.05 mm (0.002 in)

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



CAUTION

Be careful not to damage the valve and valve stem when handling it.

VALVE HEAD RADIAL RUNOUT

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

DATA Valve head radial runout:

Service Limit: 0.03 mm (0.001 in)

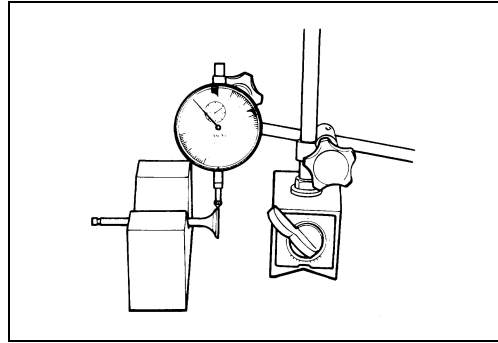
TOOL 09900-20607: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

09900-21304: V-block set (100 mm)

CAUTION

Be careful not to damage the valve and valve stem when handling it.

**VALVE STEM AND VALVE FACE WEAR CONDITION**

- Visually inspect each valve stem and valve face for wear and pitting. If it is worn or damaged, replace the valve with a new one.

**VALVE STEM DEFLECTION**

Lift the valve about 10 mm (0.39 in) from the valve seat.

Measure the valve stem deflection in two directions, perpendicular to each other, by positioning the dial gauge as shown.

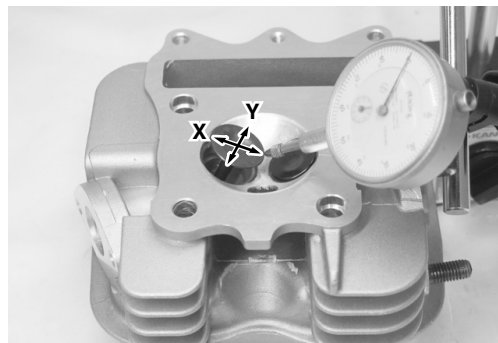
If the deflection measured exceeds the limit, then determine whether the valve or the guide should be replaced with a new one.

DATA Valve stem deflection (IN & EX):

Service Limit: 0.35 mm (0.014 in)

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

09900-20701: Magnetic stand



VALVE STEM WEAR

If the valve stem is worn down to the limit, as measured with a micrometer, replace the valve.

If the stem is within the limit, then replace the guide.

After replacing valve or guide, be sure to recheck the deflection.

DATA Valve stem O.D.:

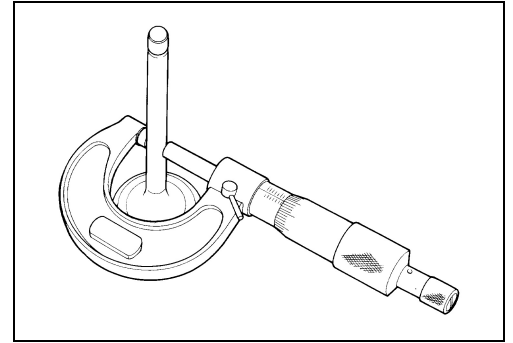
Standard (IN) : 4.975 – 4.990 mm (0.2165 – 0.2170 in)

(EX) : 4.955 – 4.970 mm (0.1950 – 0.1956 in)

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

NOTE:

If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.



VALVE GUIDE SERVICING

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

TOOL 09916-44310: Valve guide remover/installer

NOTE:

* Discard the removed valve guide subassemblies.

* Only oversized valve guides are available as replacement parts. (Part No. 11115-30D70)



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

TOOL 09916-34580: Valve guide reamer (10.8 mm)

09916-34542: Reamer handle



CAUTION

When refinishing or removing the reamer from the valve guide hole, always turn it clockwise.

- Cool down the new valve guides in a freezer for about one hour and heat the cylinder head to 100 – 150 °C (212 – 302 °F) with a hot plate.

CAUTION

Do not use a burner to heat the valve guide hole to prevent cylinder head distortion.

- Apply engine oil to the valve guide hole.
- Drive the valve guide into the hole using the valve guide remover.

 **09916-44310: Valve guide remover (4.95 mm)**

NOTE:

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

CAUTION

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

- After installing the valve guides, re-finish their guiding bores using the reamer.
- Clean and engine oil the guides after reaming.

 **09916-34570: Valve guide reamer (5.0 mm)**
09916-34542: Reamer handle

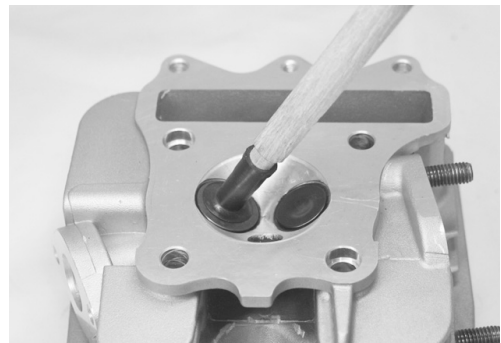
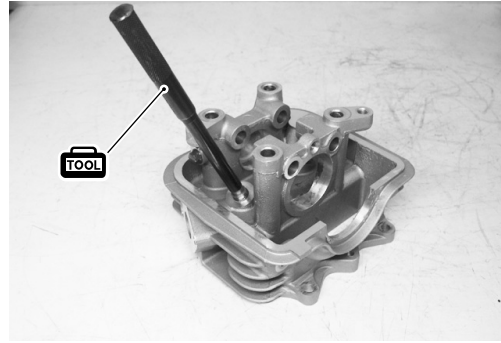
NOTE:

- * *Be sure to cool down the cylinder head to ambient air temperature.*
- * *Insert the reamer from the combustion chamber and always turn the reamer handle clockwise.*

VALVE SEAT WIDTH INSPECTION

- Visually check for valve seat width on each valve face.
- If the valve face has worn abnormally, replace the valve.
- Coat the valve seat with a red lead (Persian Blue) and set the valve in place. Rotate the valve with light pressure.
- Check that the transferred red lead (blue) on the valve face is uniform all around and in center of the valve face.

 **09916-10911: Valve lapper set**

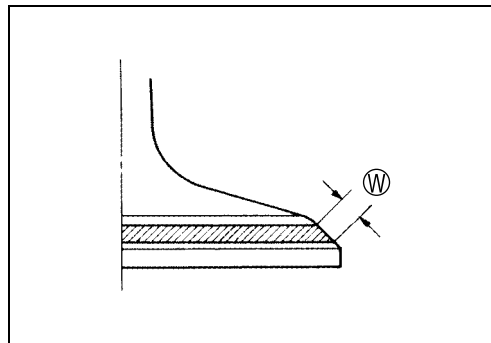


- If the seat width $\textcircled{W}$ measured exceeds the standard value or seat width is not uniform, refuse the seat using the seat cutter.

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

Standard: 0.9 – 1.1 mm (0.09 – 0.11 in)

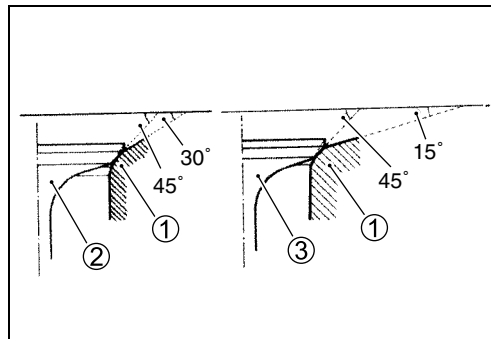
If the valve seat is out of specification, correct the seat by servicing it as follows:



VALVE SEAT SERVICING

- The valve seats ① for both the intake valve ② and exhaust valve ③ are machined to three different angles. The seat contact surface is cut at 45°.

	INTAKE	EXHAUST
seat angle	45°	45°
seat width	0.9 – 1.1 mm (0.09 – 0.11 in)	0.9 – 1.1 mm (0.09 – 0.11 in)
valve diameter	22.5 mm (0.89 in)	19 mm (0.75 in)
valve guide I.D.	5.500 – 5.512 mm (0.2165 – 0.2170 in)	5.500 – 5.512 mm (0.2165 – 0.2170 in)



CAUTION

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

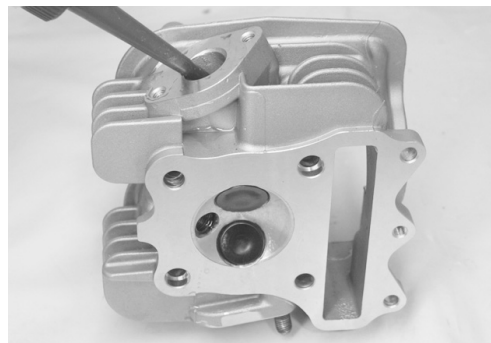
NOTE:

After servicing the valve seats, be sure to check the valve clearance after the cylinder head has been reinstalled. (☞ 2-7)

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

⚠ WARNING

Always use extreme caution when handling gasoline.



VALVE SPRING

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

Check the valve spring for proper strength by measuring its free length and also by the force required to compress it.

If the spring length is less than the service limit, or if the force required to compress the spring does not fall within the range specified, replace the spring.

DATA Valve spring free length:

Service limit: (IN) 32.8 mm (1.29 in)

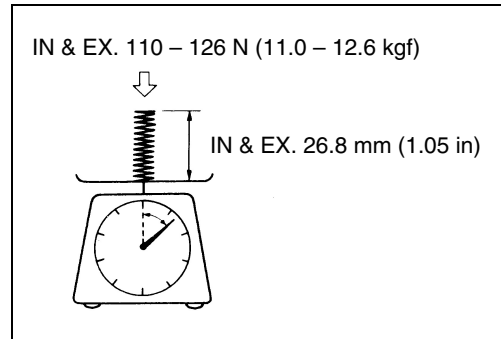
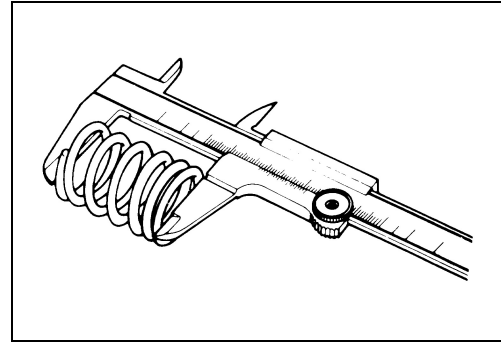
(EX) 32.8 mm (1.29 in)

TOOL 09900-20102: Vernier calipers

DATA Valve spring tension:

Standard:

**(IN & EX) 110 – 126 N, 11.0 – 12.6 kgf/ 26.8 mm
(79.5 – 91.1 lbs/ 1.05 in)**



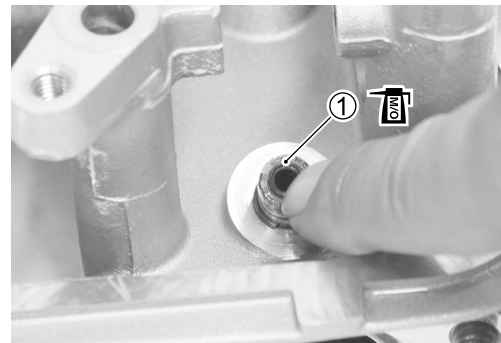
REASSEMBLY

- Install the valve spring seat.
- Apply MOLYBDENUM OIL SOLUTION to the oil seal ①, and press-fit it into position.

INFO MOLYBDENUM OIL SOLUTION

CAUTION

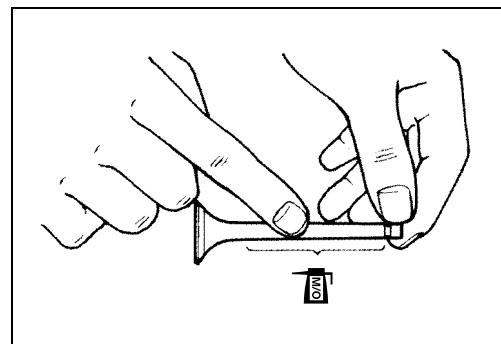
Do not reuse the removed oil seal.



- Insert the valve, with its stem coated with MOLYBDENUM OIL SOLUTION all around and along the full stem length without any break.

CAUTION

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



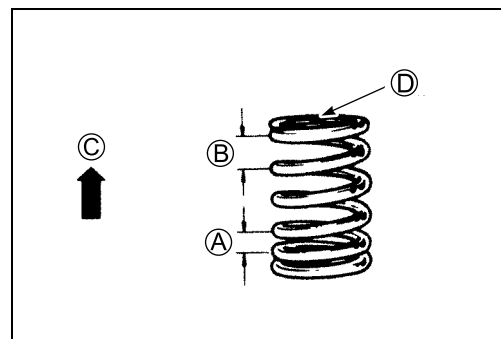
INFO MOLYBDENUM OIL SOLUTION

- Install the valve spring with the small-pitch portion ④ facing cylinder head.

④ Large-pitch portion

③ UPWARD

④ Paint



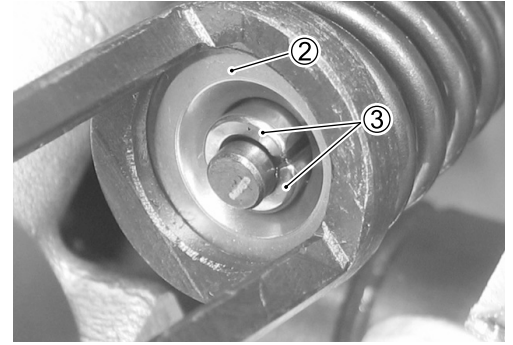
- Put on the valve spring retainer ②, and using the valve lifter, press down the spring, fit the valve cotter halves to the stem end, and release the lifter to allow the valve cotter ③ to wedge in between retainer and stem.



09916-14510: Valve lifter

09916-14521: Valve lifter attachment

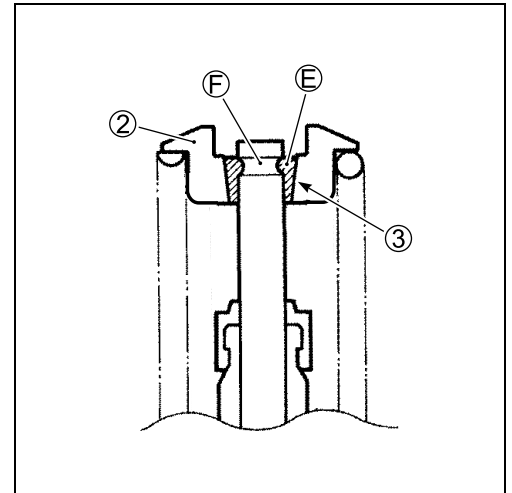
09916-84511: Tweezers



- Be sure that the rounded lip ⑤ of the cotter fits snugly into the groove ⑥ in the stem end.
- Install the other valves and springs in the same manner as described previously.

CAUTION

- * Be sure to restore each spring and valve to their original positions.
- * Be careful not to damage the valve and valve stem when handling it.



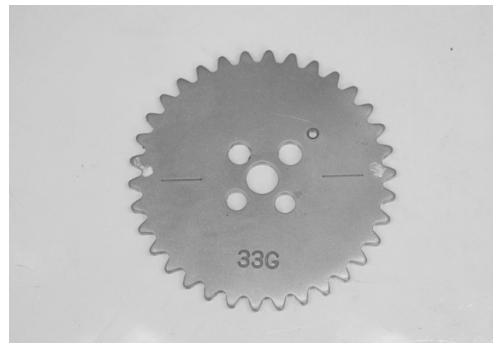
② Valve spring retainer

③ Valve cotter

CAMSHAFT

CAM SPROCKET INSPECTION

Inspect the sprocket teeth for wear. If any worn and defects are found, replace the cam sprocket, crankshaft and cam chain as a set.



CAMSHAFT BEARING INSPECTION

Inspect the bearings for play, discoloration, wear and seizure. Move the outer race by finger and inspect for smooth movement. If there is anything unusual, replace the camshaft assembly.



CAM WEAR

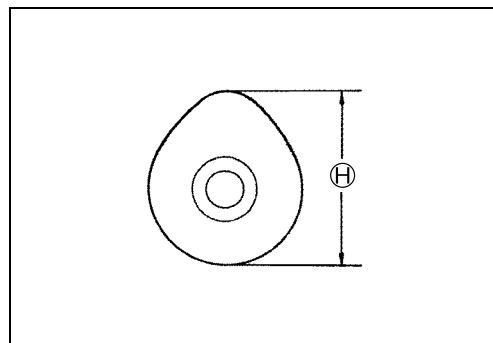
- Inspect the camshaft for wear or damage.
- Measure the cam height H with a micrometer.

DATA Cam height H

Service Limit (IN) 27.62 mm (1.087 in)

(EX) 27.50 mm (1.082 in)

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



ROCKER ARM INSPECTION

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

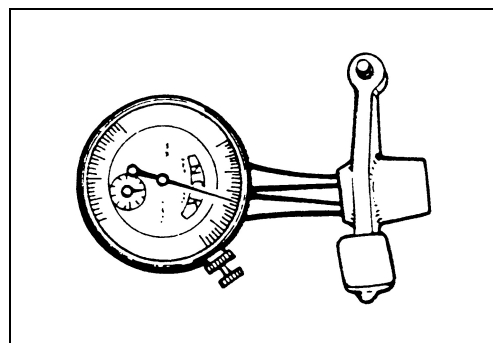


When checking the valve rocker arm, the inside diameter of the valve rocker arm and wear of the camshaft contacting surface should be checked.

DATA Rocker arm I.D.

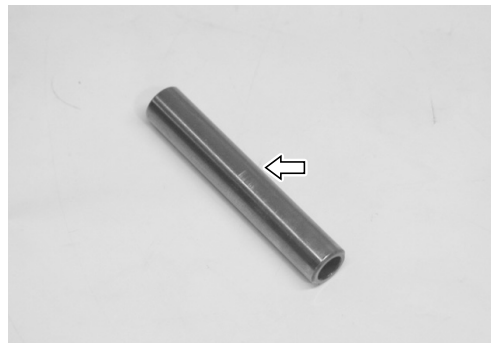
Standard: 10.003 – 10.018 mm (0.393 – 0.394 in)

TOOL 09900-20605: Dial calipers



ROCKER SHAFT INSPECTION

Inspect the rocker arm shaft for abnormal wear or damage.
If any defects are found, replace it with a new one.



Measure the diameter of rocker arm shaft with a micrometer.

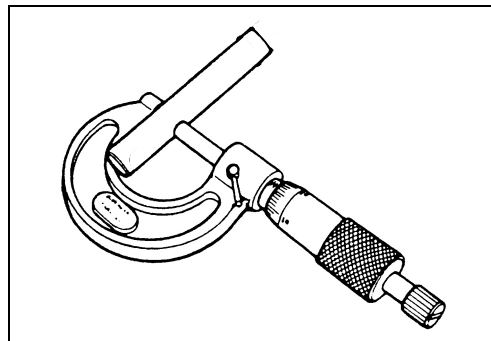


Rocker arm shaft O.D.

Standard: 9.990 – 9.981 mm (0.3933 – 0.3929 in)

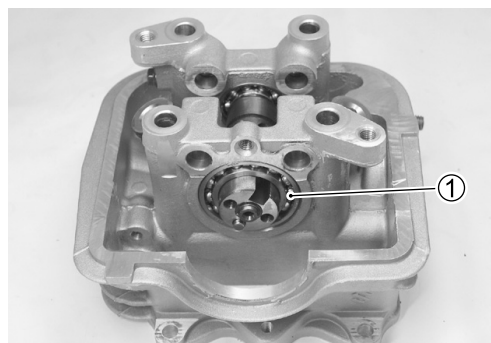


09900-20205: Micrometer (0 - 25 mm)

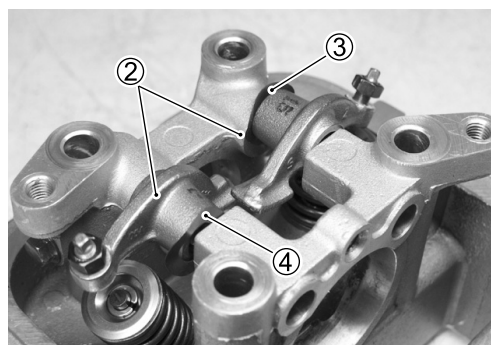


REASSEMBLY

- Install the cam shaft ①.



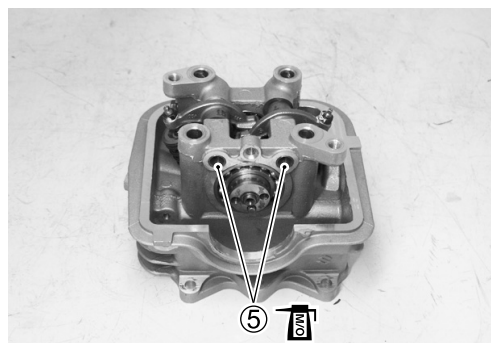
- Install the rocker arms ② and wave washer ③.



- Install the rocker arm shafts ⑤.
- Apply molybdenum oil solution onto the rocker arm shaft.

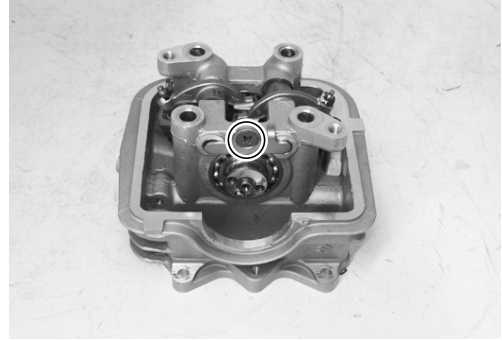


MOLYBDENUM OIL SOLUTION



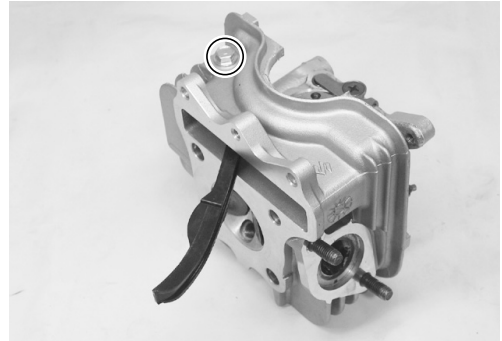
- Install the camshaft retainer screw to the specified torque.

 **Camshaft retainer screw: 5.5 N·m (0.55 kgf-m, 4.0 lb-ft)**



- Install the cam chain guide mounting bolt to the specified torque.

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



CAM CHAIN TENSION ADJUSTER AND TENSIONER/GUIDE

INSPECTION

Check that the push rod slides smoothly when unlocking the spring mechanism.

If push rod does not slide smoothly, replace the cam chain tension adjuster with a new one.



Check the contacting surface of the cam chain tensioner and guide.

If any defects are found, replace it with a new one.



CYLINDER

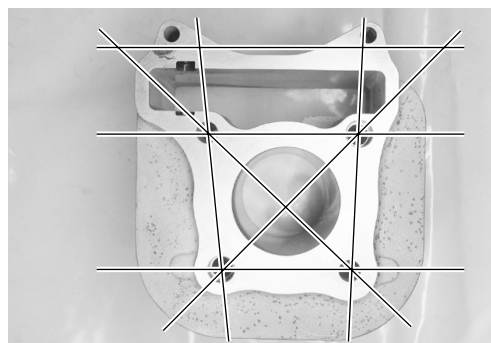
CYLINDER DISTORTION

Check the gasket surface of the cylinder for distortion with a straightedge and thickness gauge, taking a clearance reading at several places indicated.

If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

DATA Cylinder distortion:
Service Limit: 0.05 mm (0.02 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.

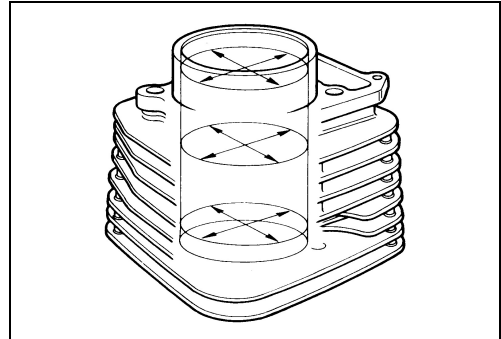
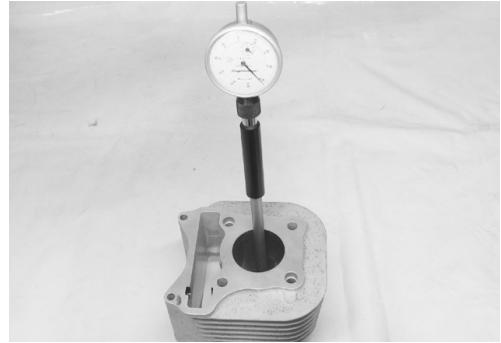
If any one of the measurements exceed the limit, replace the cylinder.

DATA Cylinder bore

Standard: 45.500 – 45.515 mm (1.7913 – 1.7919 in)

TOOL 09900-20530: Cylinder gauge set

09900-20513: Rod (40 mm)



PISTON AND PISTON RING

PISTON DIAMETER

Measure the piston outside diameter at 10 mm (0.4 in) [Ⓐ] from the piston skirt end using a micrometer.

If the measurement is less than the limit, replace the piston.

DATA Piston diameter:

Service Limit: 45.380 mm (1.7860 in)

at 10 mm (0.4 in) from the skirt end

TOOL 09900-20204: Micrometer (25 – 50 mm)



PISTON-TO-CYLINDER CLEARANCE

Subtract the piston diameter from the cylinder bore diameter.
( above)

If the piston-to-cylinder clearance exceeds the service limit, replace the cylinder or the piston, or both.

DATA Piston-to-cylinder clearance:

Service Limit: 0.120 mm (0.0047 in)

PISTON PIN AND PIN BORE

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

DATA Piston pin bore I.D.:

Service Limit: 14.030 mm (0.5523 in)

TOOL 09900-20605: Dial caliper gauge (10 – 34 mm)

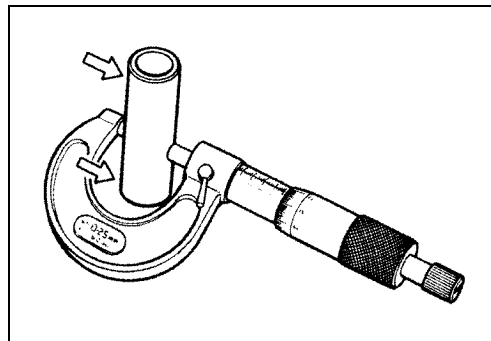


Measure the piston pin outside diameter at three positions using the micrometer. If any of the measurements are out of specification, replace the piston pin.

DATA Piston pin O.D.:

Service Limit: 13.980 mm (0.5503 in)

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



PISTON-RING-TO-GROOVE CLEARANCE

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

TOOL 09900-20803: Thickness gauge

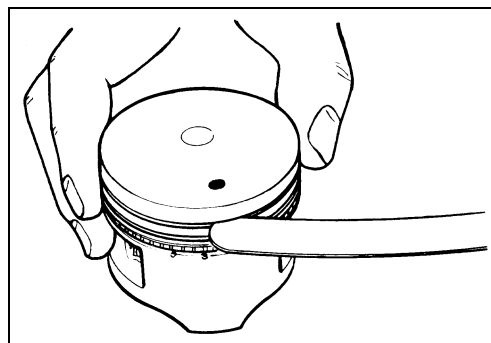
09900-20202: Micrometer (25 – 50 mm)

DATA Piston-ring-to-groove clearance

Service Limit:

1st: 0.180 mm (0.0071 in)

2nd: 0.150 mm (0.0059 in)



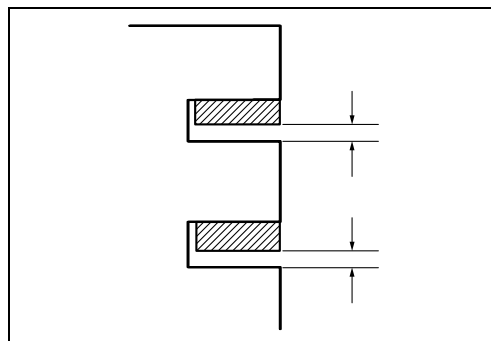
DATA Piston ring groove width

Standard:

1st: 1.01 – 1.03 mm (0.0381 – 0.0389 in)

2nd: 1.01 – 1.03 mm (0.0381 – 0.0389 in)

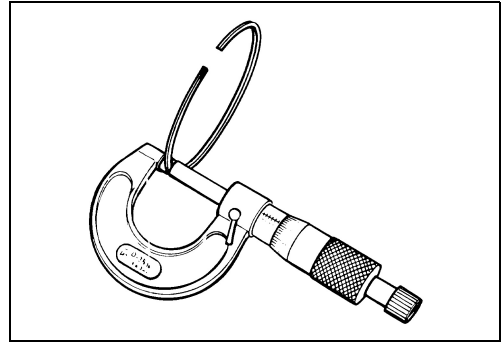
Oil: 2.01 – 2.03 mm (0.0791 – 0.0799 in)



DATA Piston ring thickness**Standard:**

1st: 0.97 – 0.99 mm (0.0382 – 0.0390 in)

2nd: 0.97 – 0.99 mm (0.0382 – 0.0390 in)

**PISTON RING END GAP**

Fit the piston ring squarely into the cylinder and measure the piston ring end gap using the thickness gauge.

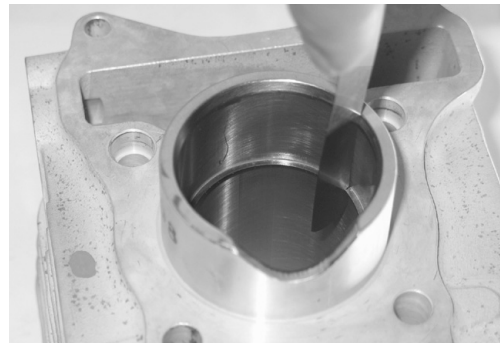
If any of the measurements exceeds the service limit, replace the piston ring with a new one.

DATA Piston ring end gap:**Service Limit:**

1st: 0.80 mm (0.031 in)

2nd: 0.80 mm (0.031 in)

TOOL 09900-20803: Thickness gauge

**CONROD****CONROD SMALL END I.D.**

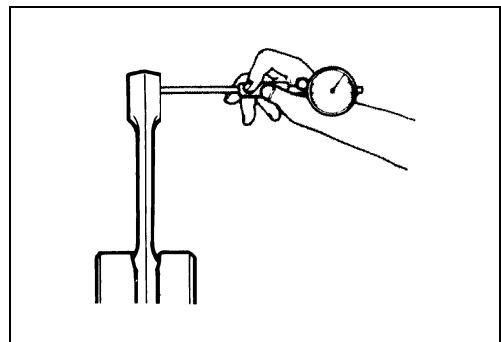
Using a small bore gauge, measure the inside diameter of the conrod small end. If the inside diameter of the conrod small end exceeds the limit, replace the conrod.

DATA Conrod small end I.D.:

Service Limit: 14.040 mm (0.5527 in)

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

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

**CONROD DEFLECTION AND BIG END SIDE CLEARANCE**

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

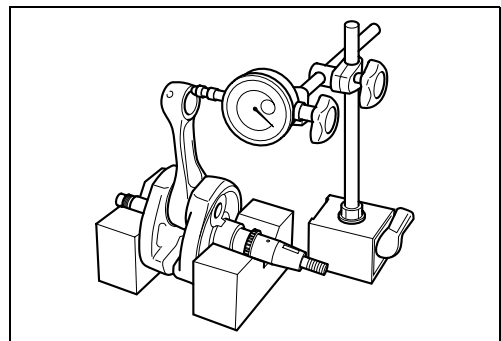
DATA Conrod deflection

Service Limit: 3.0 mm (0.12 in)

TOOL 09900-20701: Magnetic stand

09900-20607: Dial gauge (1/100 mm)

09900-21304: V-block set (100 mm)



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

CRANKSHAFT RUNOUT

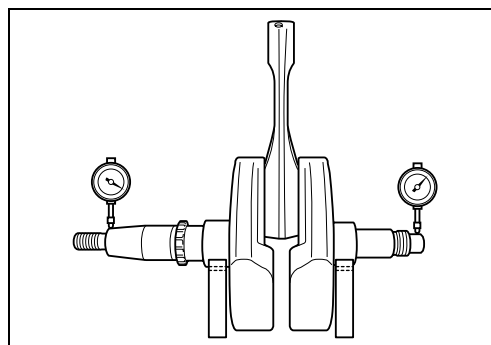
Support the crankshaft using V-blocks and measure the crankshaft runout using the dial gauge, as shown. If the runout exceeds the service limit, replace the crankshaft with a new one.

NOTE:

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

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)



STARTER CLUTCH

INSPECTION

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

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

DISASSEMBLY

- Hold the rotor using the special tool and remove the bolts.

TOOL **09930-44520: Rotor holder**



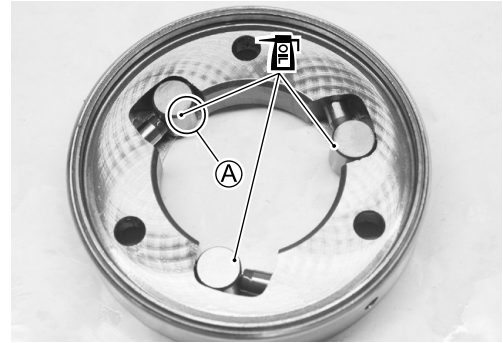
INSPECTION

- Install the starter clutch in the proper direction as shown.

NOTE:

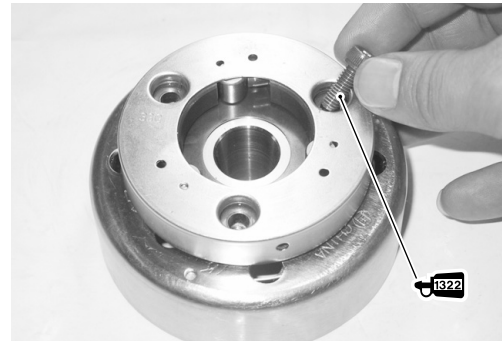
When installing the starter clutch onto the rotor, make sure that the arrow mark **A** in the bearing faces to the rotor.

- Apply engine oil to the starter clutch.



- Apply a small quantity of THREAD LOCK SUPER "1322" to the starter clutch bolt.

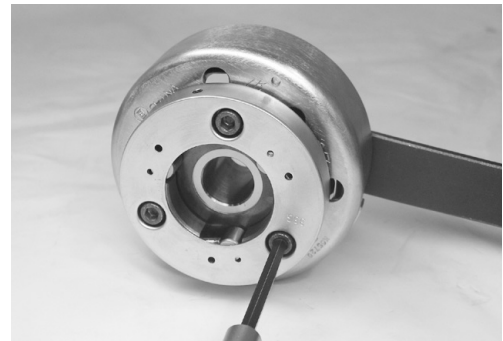
 **99000-32080: THREAD LOCK SUPER "1322"**
(or equivalent thread lock)



- Tighten the bolts while holding the rotor with the special tool.

 **Starter clutch bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

 **09930-44520: Rotor holder**

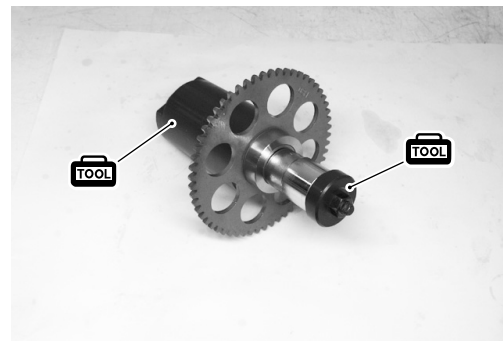
**STARTER DRIVEN GEAR BEARING INSPECTION**

Inspect the starter driven gear bearing for any wear or damage. If any defects are found, replace the stater driven gear bearing with a new one.

**STARTER DRIVEN GEAR BEARING DISASSEMBLY**

- Remove the bearing with the special tool.

 **09930-31920: Roter remover**
09924-84521: Bearing installer



STARTER DRIVEN GEAR BEARING INSTALLATION

- Install the bearing with the special tool.

TOOL 09913-70210: Bearing installer set ($\phi 30$)

CAUTION

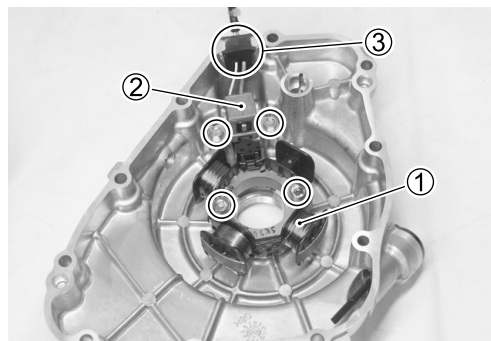
The removed bearing must be replaced with a new one.

NOTE:

The stamped mark on the bearing must face crankcase side.

GENERATOR**INSPECTION** (→ 6-9)**DISASSEMBLY**

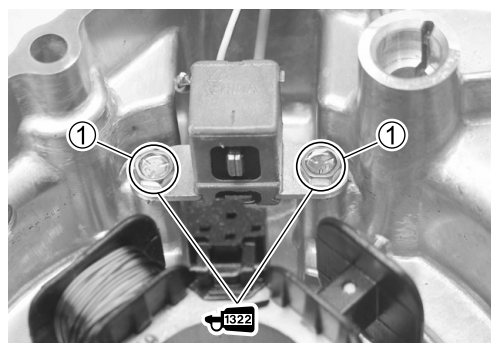
- Remove the generator coil ①, CKP sensor ②, grommet ③.

**REASSEMBLY**

- When replacing the generator coil or CKP sensor, route the wire properly.
- Apply a small quantity of THREAD LOCK SUPER “1322” to the CKP sensor mounting bolts ① and tighten them securely.

1322 99000-32080: THREAD LOCK SUPER “1322”
(or equivalent thread lock)

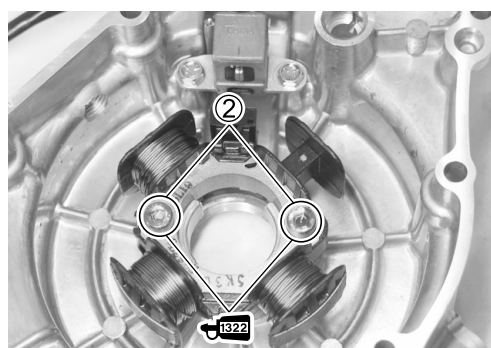
U CKP sensor mounting bolts: 6 N·m (0.6 kgf-m, 4.5 lb-ft)



- Apply a small quantity of THREAD LOCK SUPER “1322” to the generator coil mounting bolts ②, and tighten them securely.

1322 99000-32080: THREAD LOCK SUPER “1322”
(or equivalent thread lock)

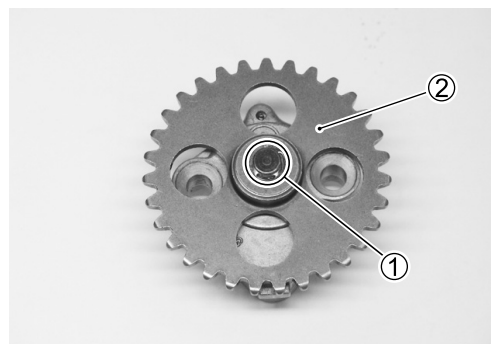
U Generator coil mounting bolts:
10 N·m (1.0 kgf-m, 7.0 lb-ft)



OIL PUMP

DISASSEMBLY

- Remove the circlip ①.
- Remove the oil pump sprocket ②.

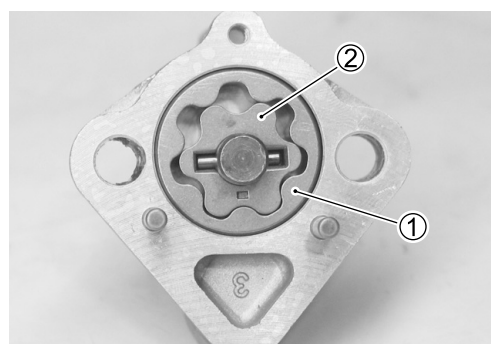


- Remove the oil pump case cover ③.



INSPECTION

Inspect the outer rotor ① and inner rotor ② for any scratches or other damage. If any defects are found, replace them with new ones.



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

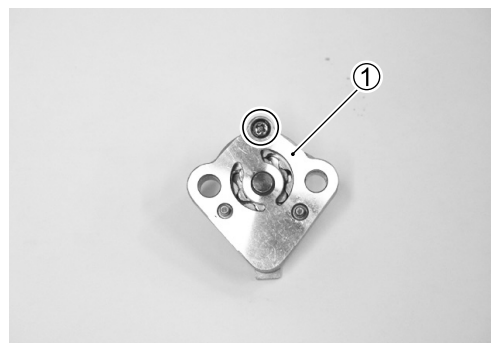
CAUTION

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

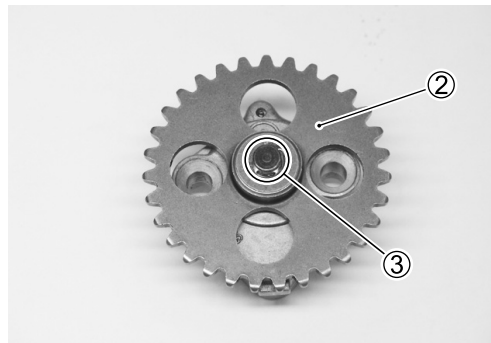


RESASSEMBLY

- Install the pump cover ①.



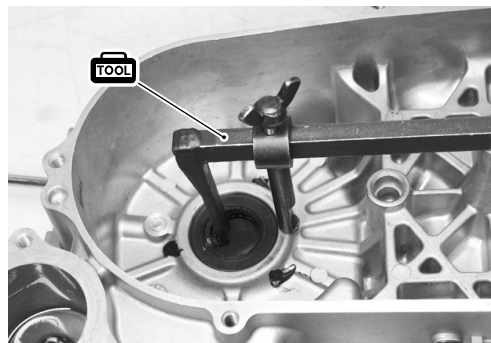
- Install the oil pump sprocket ②.
- Install the circlip ③.



CRANKCASE OIL SEAL INSTALLATION

- Remove the left crankcase oil seal the special tool.

 **09913-50121: Oil seal remover**

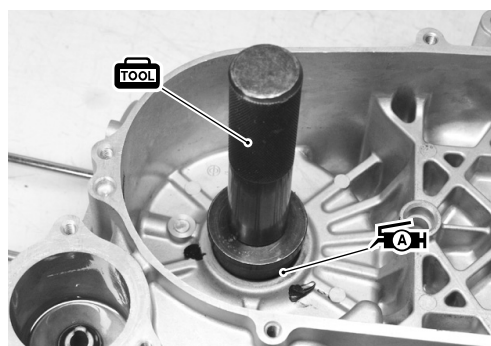


- Install the left crankcase oil seal with the special tool.

CAUTION

The removed oil seals must be replaced with new ones.

 **09913-70210: Bearing installer set**

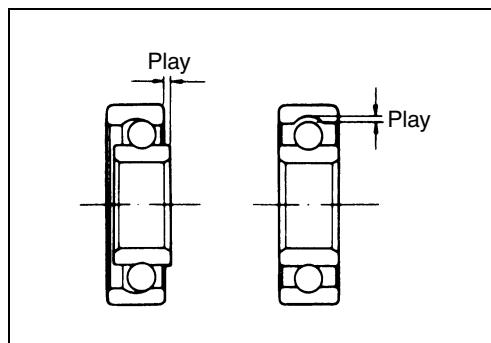


- Apply SUZUKI SUPER GREASE “A” to the lip of the oil seals.

 **99000-25010: SUZUKI SUPER GREASE “A”**
(or equivalent grease)

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.

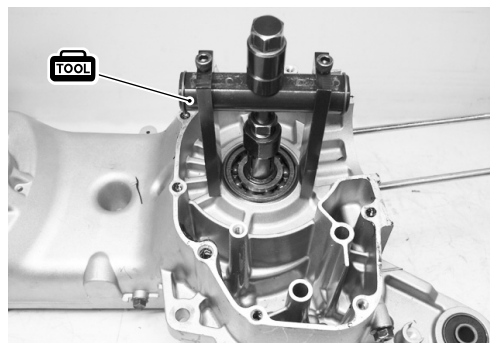
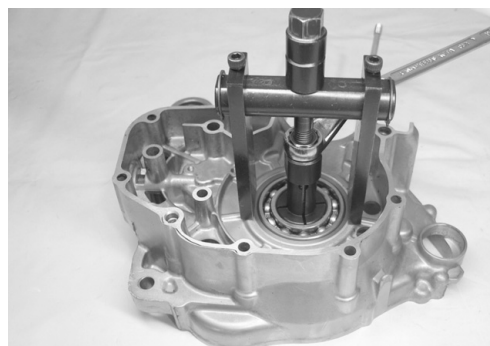


DIASSEMBLY

- Remove the bearings with the special tool.

TOOL 09921-20240: Bearing remover set

Bearing: ϕ 25



REASSEMBLY

- Press the bearings with the special tool.

TOOL 09913-70210: Bearing installer set

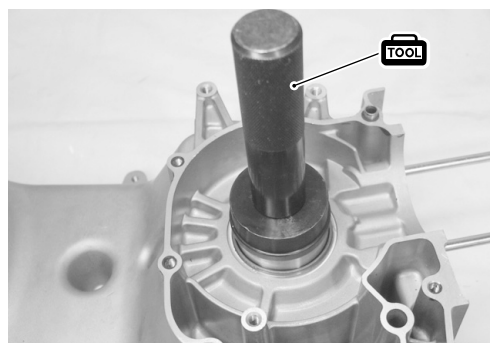
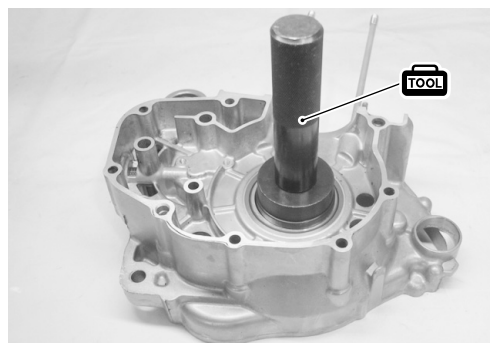
Bearing: ϕ 32

CAUTION

The removed bearings must be replaced with new ones.

NOTE:

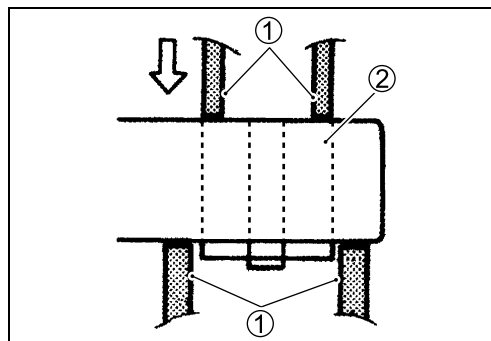
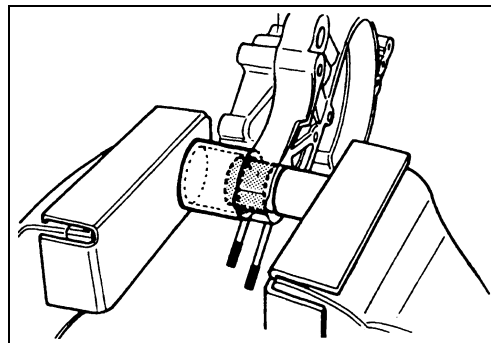
The stamped mark side of the bearing faces inside.



ENGINE MOUNTING BUSH

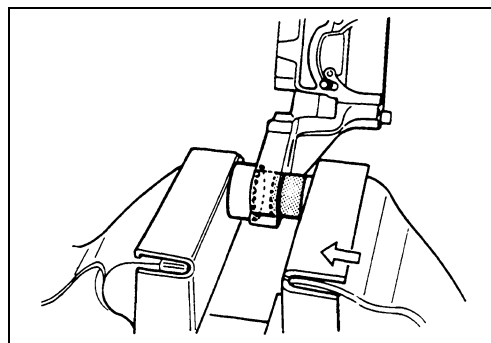
DISASSEMBLY

- Using an appropriate size steel tubes ① and vise, remove the engine mounting bush ②. (LH, RH and rear)



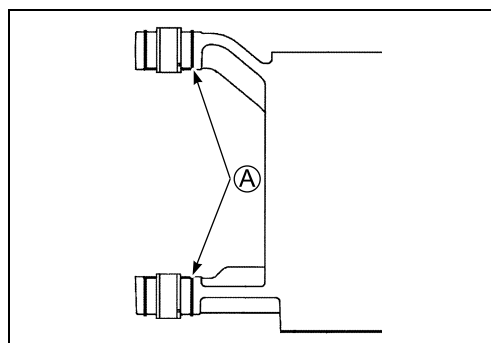
INSTALLATION

Using an appropriate side steel tube and vise, press in the bush into the crankcase. (LH, RH and rear)



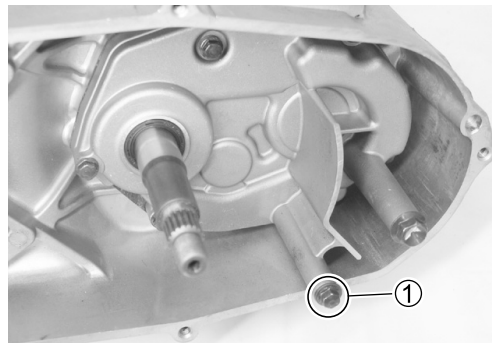
CAUTION

Bush end ① must be flush the crankcase surface.

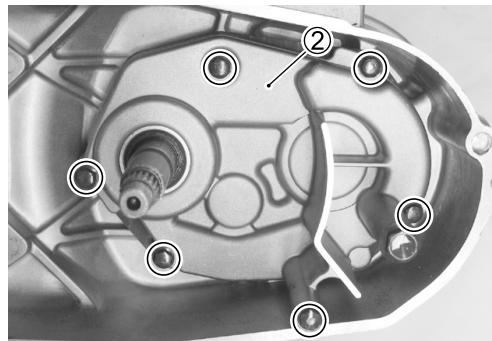


FINAL REDUCTION GEAR BOX DISASSEMBLY

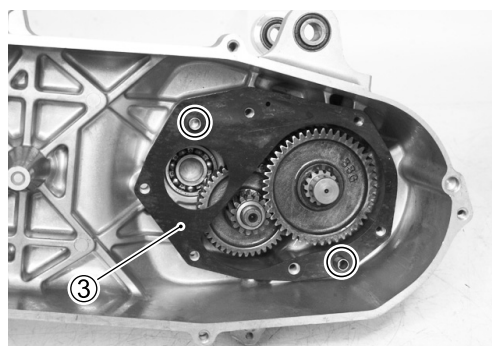
- Remove the drain plug ① and gasket.
- Drain final reduction gear box oil.



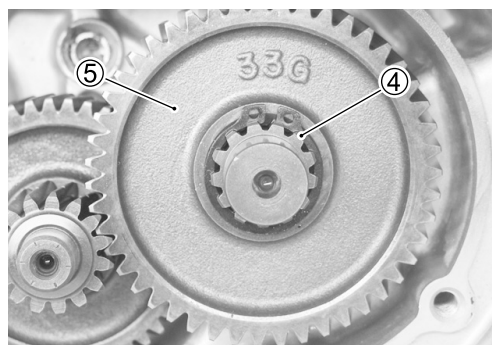
- Remove the final reduction gear box cover bolts and gasket.
- Remove the final reduction gear box cover ②.



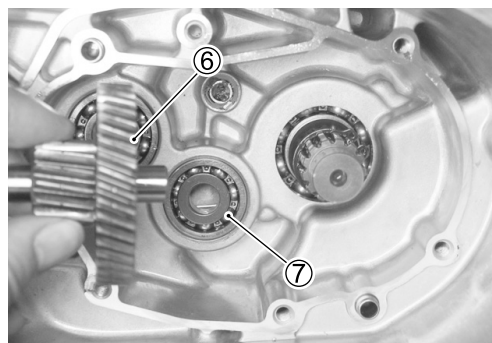
- Remove the gasket ③ and dowel pins.



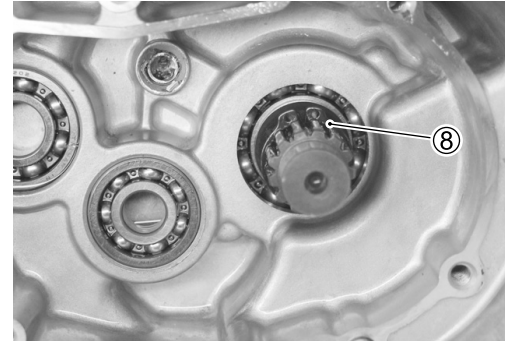
- Remove the snap ring ④ and final driven gear ⑤.



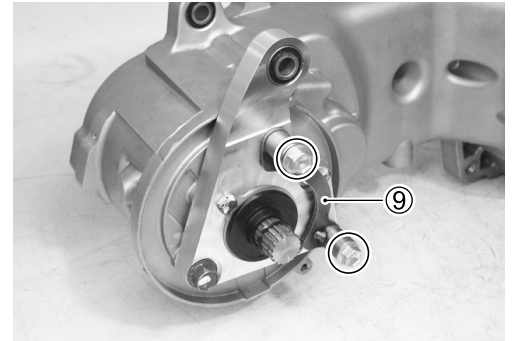
- Remove the idle gear ⑥ and washer ⑦.



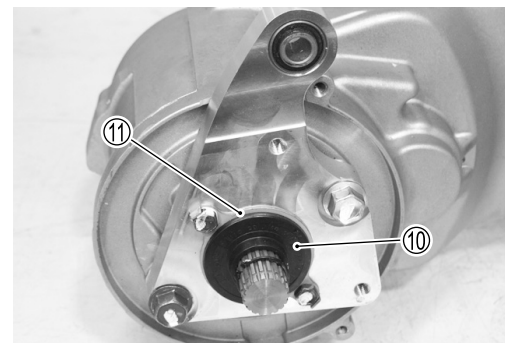
- Remove the snap ring ⑧.



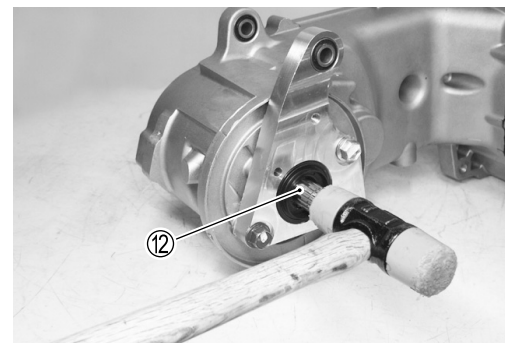
- Remove the chain guide ⑨.



- Remove the dust seal ⑩ and bearing retainer ⑪.



- Remove the counter shaft ⑫ with a plastic mallet.



COUNTER SHAFT INSPECTION

Inspect the counter shaft wear or damage.

If any defects are found, replace it with a new one.



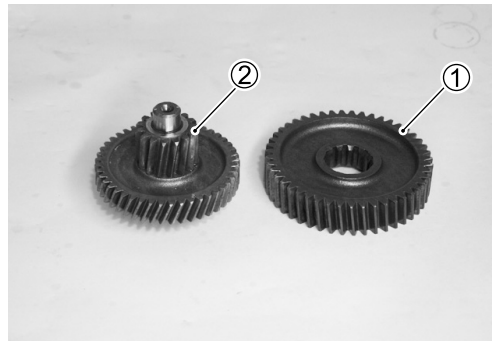
DRIVE SHAFT INSPECTION

Inspect the drive shaft for wear or damage.
If any defects are found, replace it with a new one.



FINAL DRIVEN GEAR AND IDLE GEAR INSPECTION

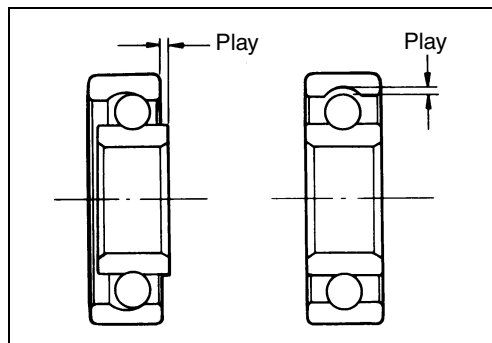
Inspect the final driven gear ① and idle gear ② for wear or damage. If any defects are found, replace the drive shaft gear and idle gear with new ones.



FINAL REDUCTION GEAR BOX INSPECTION AND DISASSEMBLY

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

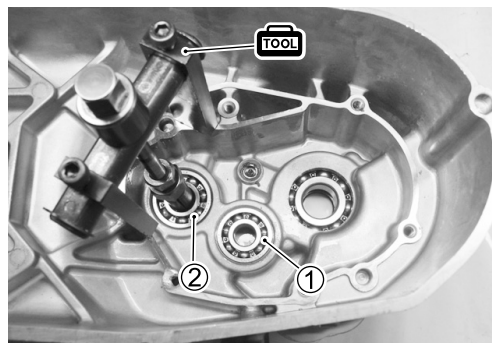
Replace the bearing in the following procedure if there is anything unusual.



- Remove the bearings with the special tool.

TOOL 09921-20240: Bearing remover set

- ①: $\phi 12$
- ②: $\phi 17$

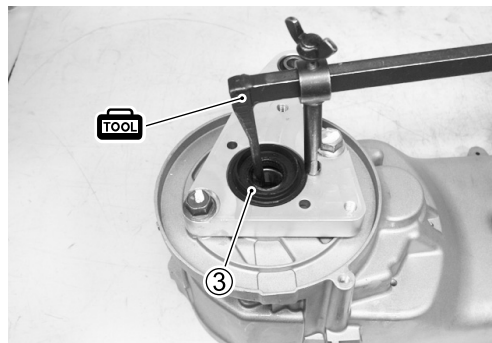


- Remove the oil seal ③ with the special tool.

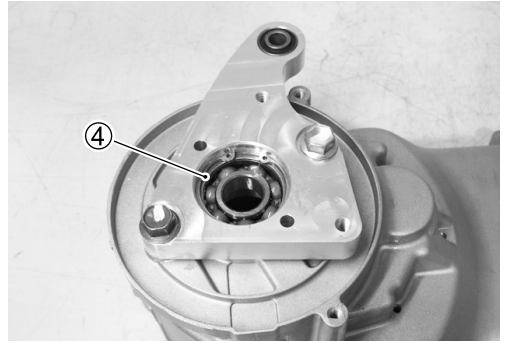
TOOL 09913-50121: Oil seal remover

NOTE:

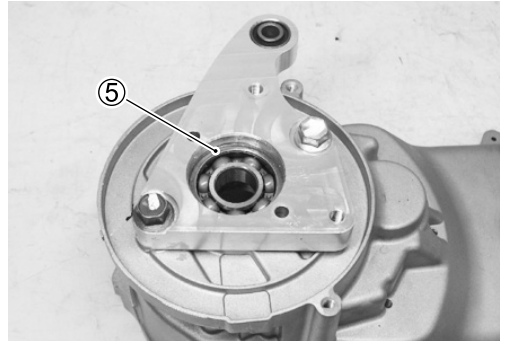
If there is abnormal condition, the oil seal removal is not necessary.



- Remove the snap ring ④.

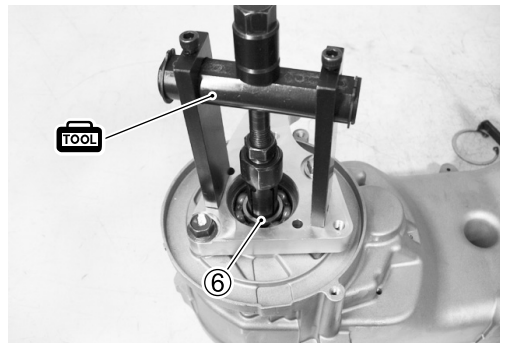


- Remove the rear axle shaft washer ⑤.

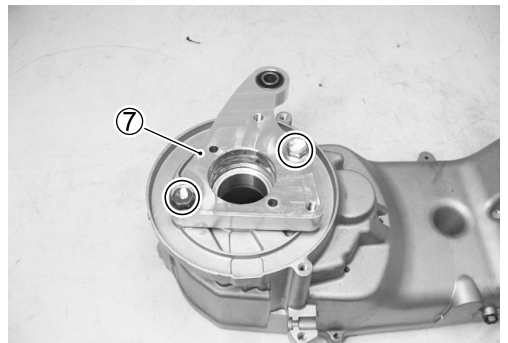


- Remove the bearing ⑥ with the special tool.

TOOL 9913-20240: Bearing remover set ($\phi 20$)

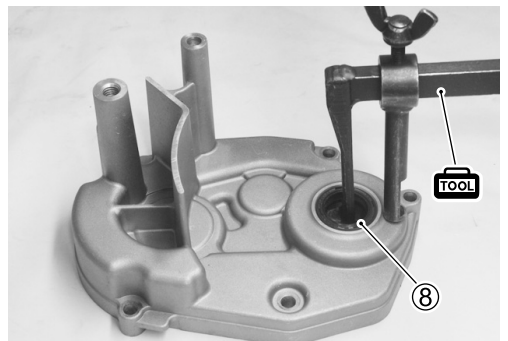


- Remove the rear axle shaft housing ⑦.



- Remove the oil seal ⑧ with the special tool.

TOOL 09913-50121: Oil seal remover



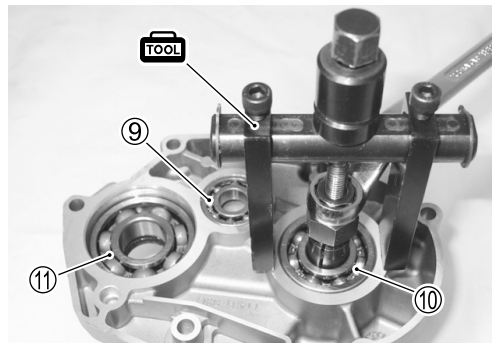
- Remove the bearings with the special tool.

TOOL 09913-20240: Bearing remover set

⑨: $\phi 12$

⑩: $\phi 17$

⑪: $\phi 20$



INSTALLATION

- Apply SUZUKI BOND “1215” to the rear axle housing.

1215 99000-31110: SUZUKI BOND “1215”
(or equivalent bond)



- Tighten the rear axle housing bolts to the specified torque.

Rear axle housing bolt: 60 N·m (6.0 kgf-m, 43.5 lb-ft)



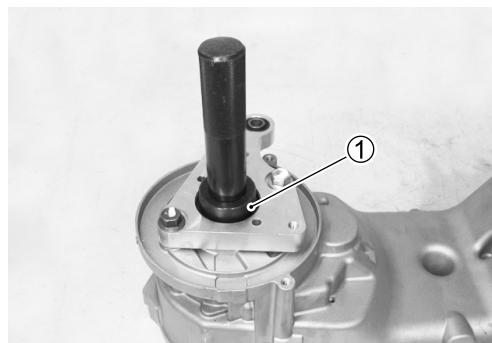
- Install the bearing with the special tool.

TOOL 09913-70210: Bearing installer set

①: $\phi 25$

CAUTION

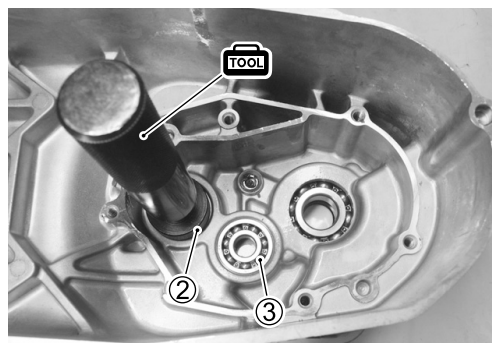
The removed bearings must be replaced with new ones.



TOOL 09913-70210: Bearing installer set

②: $\phi 17$

③: $\phi 20$



TOOL 09913-70210: Bearing installer set

④, ⑤: $\phi 25$

⑥: $\phi 20$

CAUTION

The removed bearings must be replaced with new ones.

- Install the rear axle housing washer ⑦.

- Install the snap ring ⑧.

- Install the oil seals with the special tool.

TOOL 09913-70210: Bearing installer set ($\phi 47$)

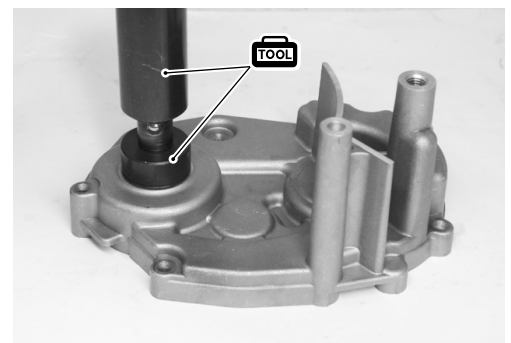
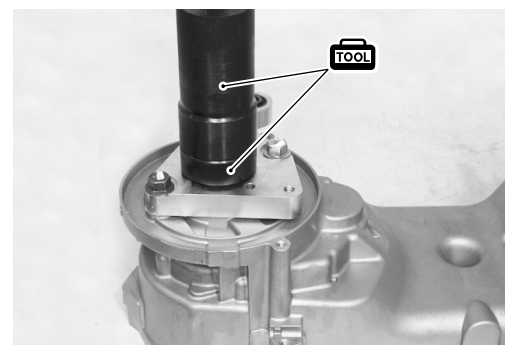
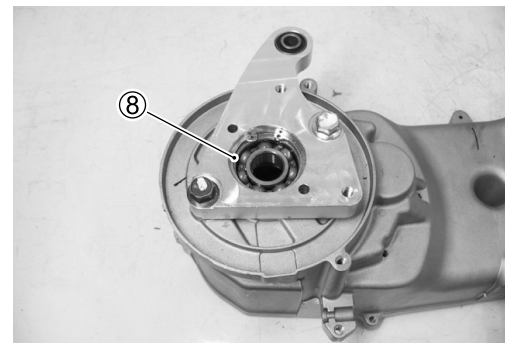
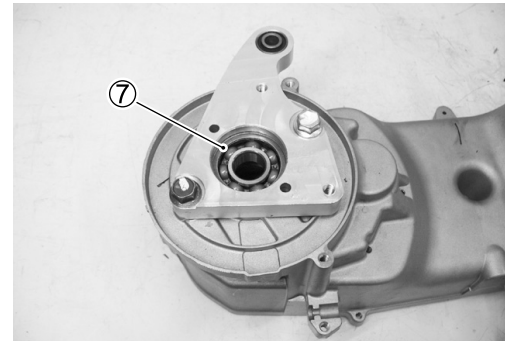
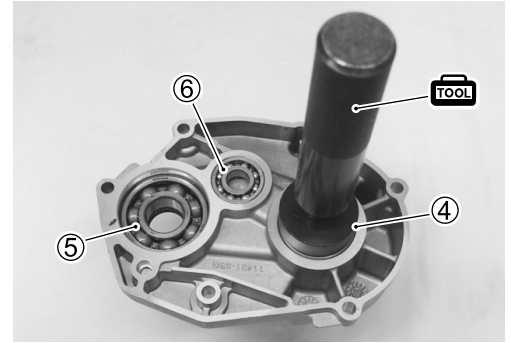
CAUTION

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

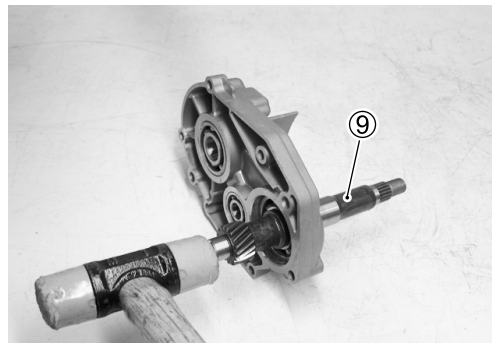
TOOL 09913-70210: Bearing installer set ($\phi 30$)

CAUTION

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



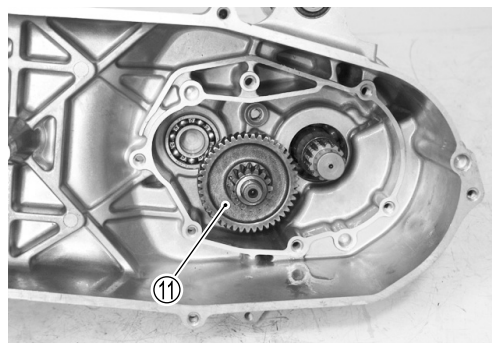
- Install the drive shaft ⑨.



- Install the counter shaft ⑩.



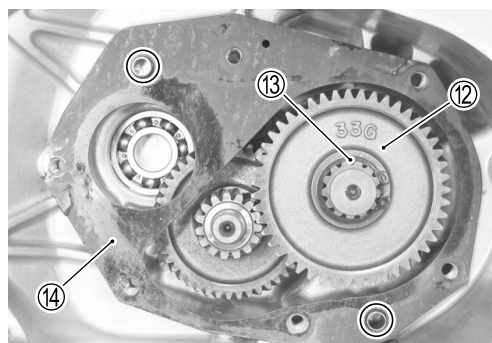
- Install the idle gear ⑪.



- Apply final reduction gear box oil to the gears.
- Install the final driven gear ⑫ to the counter shaft.
- Install the snap ring ⑬.
- Install the gasket ⑭ and dowel pins.

CAUTION

The removed gasket must be replaced with a new one.



- Tighten the final reduction gear box cover bolts and drain plug ⑮ to the specified torque.



Final reduction gear box cover bolts:

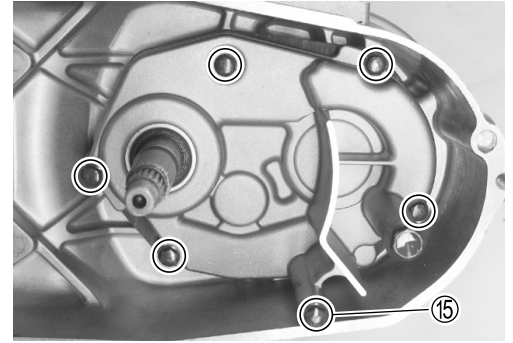
10 N·m (1.0 kgf-m, 7.0 lb-ft)

Final reduction gear box drain plug bolt:

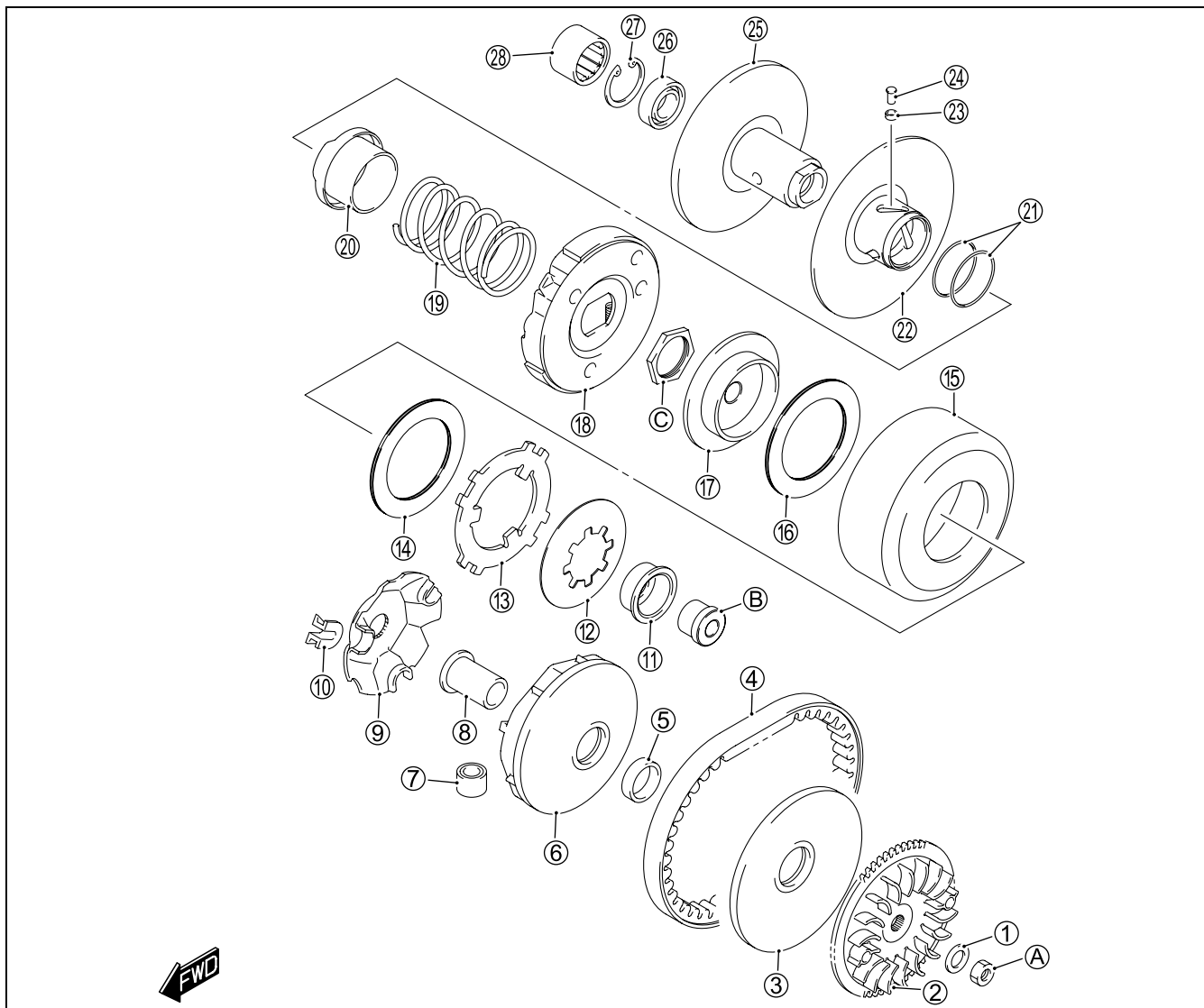
10 N·m (1.0 kgf-m, 7.0 lb-ft)

CAUTION

The removed drain plug bolt gasket and final reduction gear box bolt gaskets must be replaced with a new one.



MOVABLE AND FIXED DRIVE AND DRIVEN FACE



①	Concaved washer	①⑦	Limit clutch
②	Fixed drive face fan	①⑧	Clutch shoe
③	Fixed drive face	①⑨	Movable driven face spring
④	Drive belt	②①	Movable driven face spring seat
⑤	Power reduction spacer	②②	O-ring
⑥	Movable drive face	②③	Movable driven face
⑦	Roller	②④	Roller
⑧	Movable drive spacer	②⑤	Pin
⑨	Movable drive face plate	②⑥	Fixed driven face
⑩	Damper	②⑦	Bearing
⑪	Limit clutch stopper	②⑧	Snap ring
⑫	Limit clutch spring	②⑨	Needle bearing
⑬	Limit clutch pressure plate	③①	Fixed drive face nut
⑭	Limit clutch friction plate	③②	Limit clutch nut
⑮	Clutch housing	③③	Clutch shoe nut
⑯	Limit clutch friction plate		



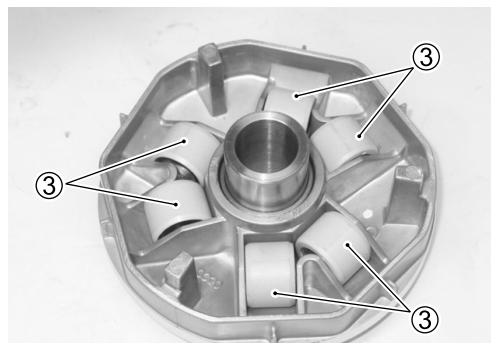
ITEM	N·m	kgf·m	lb·ft
③①	50	5.0	36.0
③②	75	7.5	54.0
③③	60	6.0	43.5

MOVABLE DRIVE FACE DISASSEMBLY

- Remove the movable drive face plate ① and dampers ②.



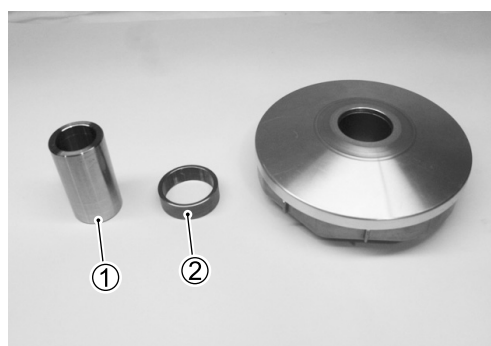
- Remove the rollers ③.



SPACER INSPECTION

Inspect the movable drive spacer ① and power reduction spacer ② for wear or damage.

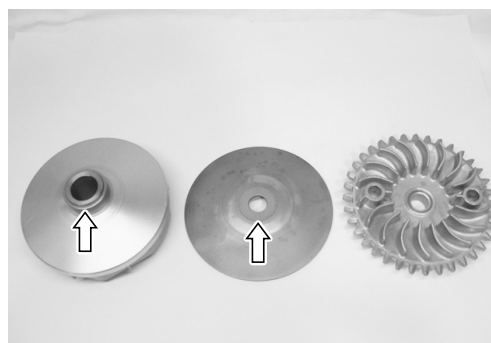
If they are worn or damaged, replace them with new ones.



MOVABLE AND FIXED DRIVE FACE INSPECTION

Inspect the movable drive face for any abnormal condition such as stepped wear or discoloration caused by burning.

If any defects are found, replace them with new ones.

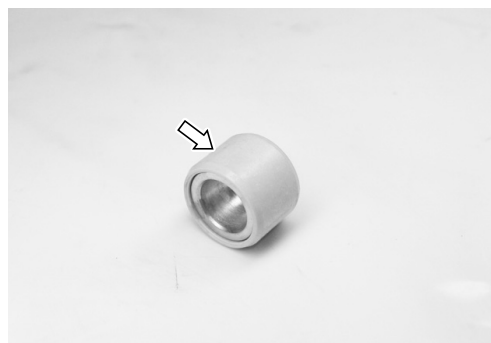


ROLLER INSPECTION

Inspect each roller and their sliding surface for wear or damage. If any defects are found, replace the rollers as a set.

NOTE:

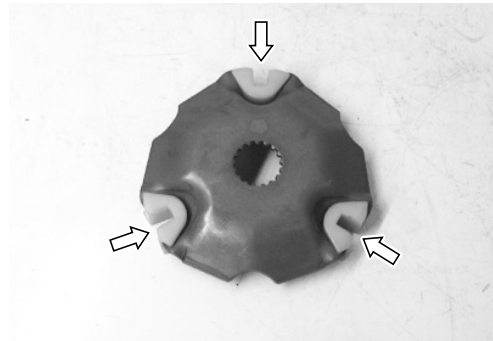
The rollers must always be changed as a set.



DAMPER INSPECTION

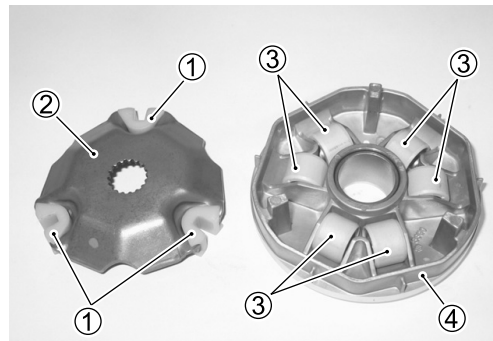
Inspect the dampers for wear or damage.

If any defects are found, replace the dampers with new ones.



MOVABLE DRIVE FACE INSTALLATION

- Mount the dampers ① on the movable drive face plate ②.
- Position the rollers ③ on the movable drive face ④.
- Check that the rollers ① are in normal position in the movable drive face ②.
- Position the movable drive face plate ② on the movable drive face ④.



CLUTCH SHOE/MOVABLE DRIVEN FACE DISASSEMBLY

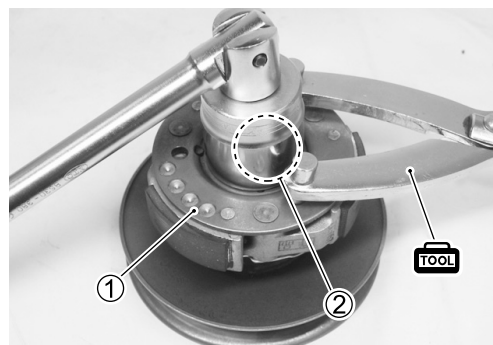
- Hold the clutch shoe assembly ① with the special tool.

TOOL 09930-40113: Rotor holder

- Loosen the clutch shoe nut ②.

⚠ WARNING

Do not remove the clutch shoe nut before attaching the clutch spring compressor.



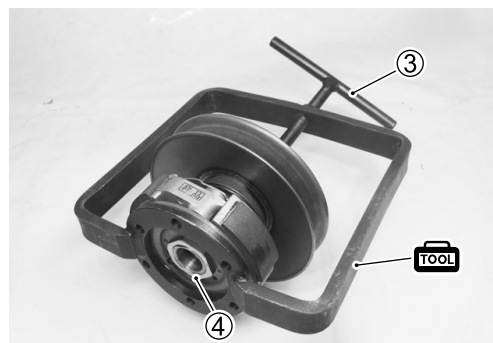
- Attach the special tool to the clutch shoe/movable driven face assembly and compress the clutch shoe assembly by turning in the special tool handle ③.

TOOL 09922-31420: Clutch spring compressor

- Remove the clutch shoe nut ④.

⚠ WARNING

Since a high spring force applies to the clutch shoe assembly, care must be used so as not to cause the clutch shoe assembly and movable driven face to come off abruptly.



- Loosen the special tool handle slowly and remove the clutch shoe assembly ⑤ and spring ⑥.

CAUTION

Do not attempt to disassemble the clutch shoe assembly.



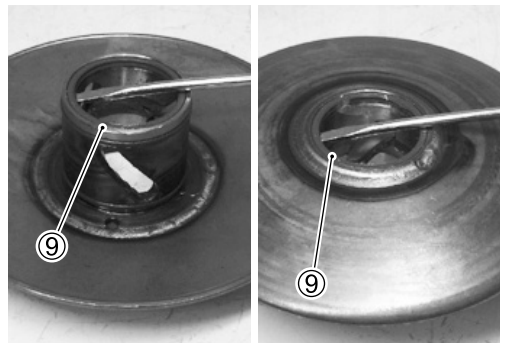
- Remove the movable driven face spring seat ⑦.



- Remove the O-rings ⑧.

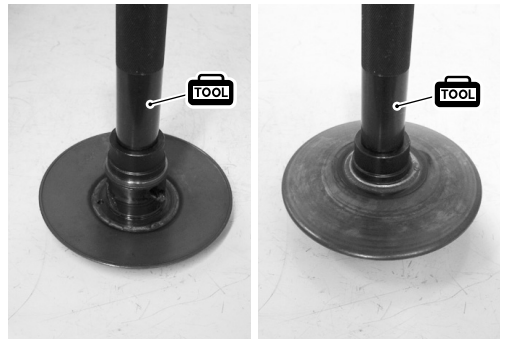


- Remove the oil seals ⑨.



- Install the oil seal with the special tool.

TOOL 09913-70210: Bearing installer set ($\phi 35$)



CLUTCH SHOE INSPECTION

Inspect the boss and centrifugal weight fulcrum sections for looseness, damage and operation.

Inspect the clutch shoe for damage and fouling with oil on the surface.

If any abnormality is found, replace the clutch shoe assembly with a new one.



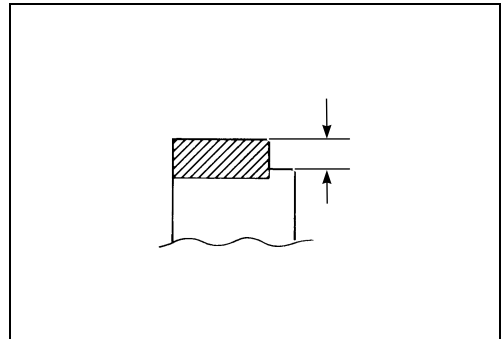
Measure the thickness of clutch shoe at the center position.

If the thickness is less than the service limit, replace the clutch shoe assembly with a new one.

DATA Clutch shoe thickness:

Service Limit: 2.5 mm (0.098 in)

TOOL 09900-20102: Vernier calipers

**CLUTCH HOUSING INSPECTION**

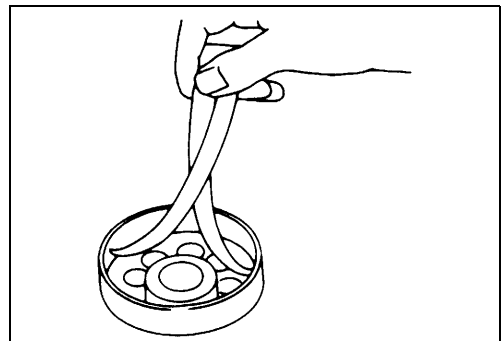
Inspect the clutch housing for any abnormal surface damage.

Measure the inside diameter of the clutch housing.

If the measurement exceeds the service limit, replace the clutch housing with a new one.

DATA Clutch housing I.D.:

Service Limit: 110.5 mm (4.350 in)

**MOVABLE DRIVEN FACE SPRING INSPECTION**

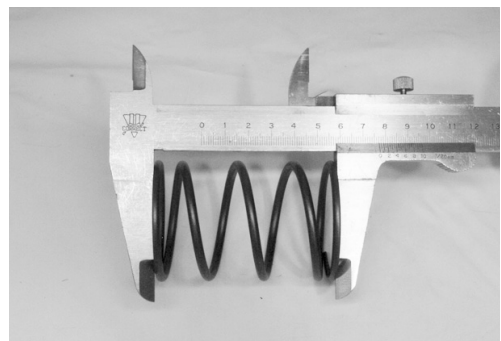
Measure the movable driven face spring free length with a vernier calipers.

If the length is less than the service limit, replace the spring with a new one.

DATA Movable driven face spring free length:

Service Limit: 99.8 mm (3.929 in)

TOOL 09900-20102: Vernier calipers



DRIVE BELT INSPECTION

Inspect that the drive belt is free from any greasy substance. Inspect the contact surface of the drive belt for cracks or damage and measure the width of the drive belt with a vernier calipers.

If any defects are found or the measurement exceeds the service limit, replace the drive belt with a new one.

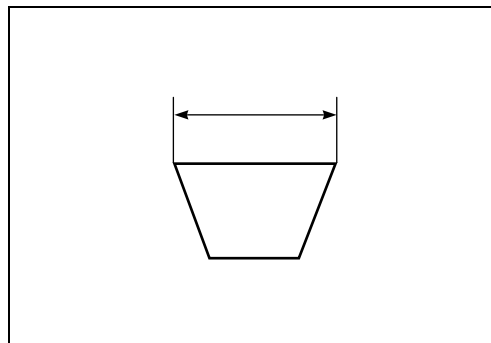
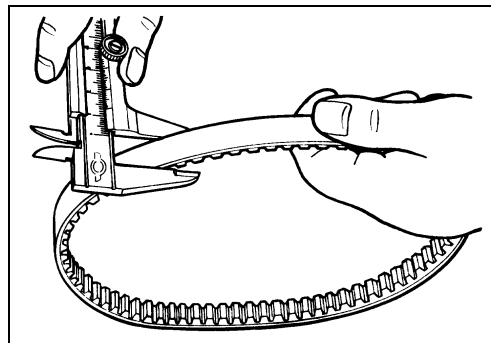
CAUTION

If grease or oil is present on the surface of the drive belt, degrease the belt thoroughly.



Drive belt width:

Service Limit: 18.9 mm (0.74 in)



MOVABLE AND FIXED DRIVEN FACE INSPECTION

Inspect the driven face for any abnormal condition such as stepped wear or discoloration caused by burning.

If any damages are found, replace the then with new ones.



CLUTCH SHOE/MOVABLE DRIVEN FACE DIASSEMBLY INSTALLATION

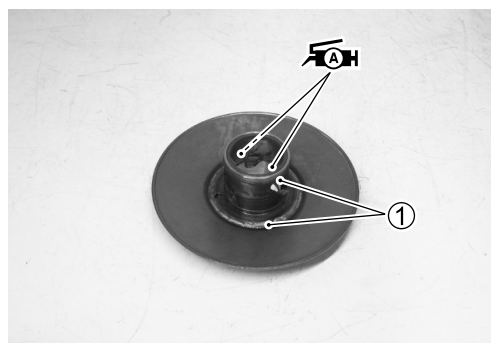
- Install the new O-rings ①.
- Apply SUZUKI SUPER GREASE "A" to the oil seal lips and movable driven face inside grease groove.



99000-25030: SUZUKI SUPER GREASE "A"
(or equivalent)

CAUTION

The removed O-rings must be replaced with a new one.



- Apply SUZUKI SUPER GREASE "A" to the O-rings and pin grooves.

 **99000-25030: SUZUKI SUPER GREASE "A"**
(or equivalent)

- Install the rollers and pins ②.

CAUTION

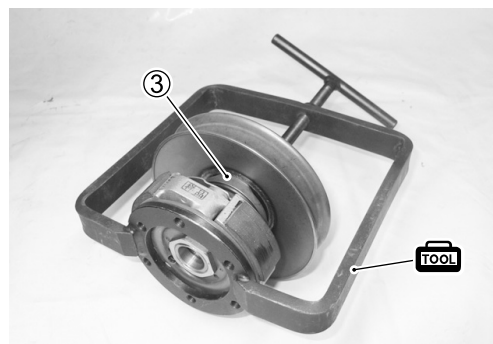
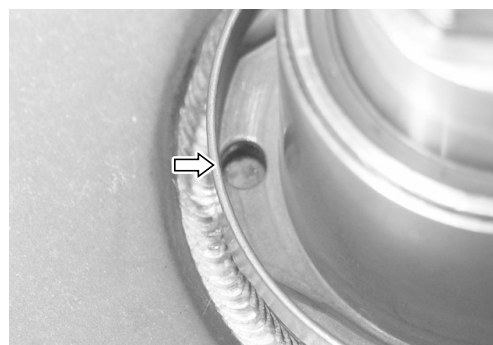
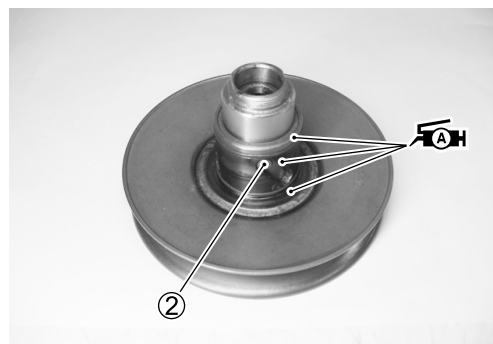
To prevent damaging the oil seal lip from during installation, slide the lip using a 0.1-mm steel sheet as a guide.

- Install the spring seat by aligning the hole.

- Install the spring and spring plate by aligning the spring ends with the holes.

- Compress the spring ③ with the special tool.

 **09922-31420: Clutch spring compressor**



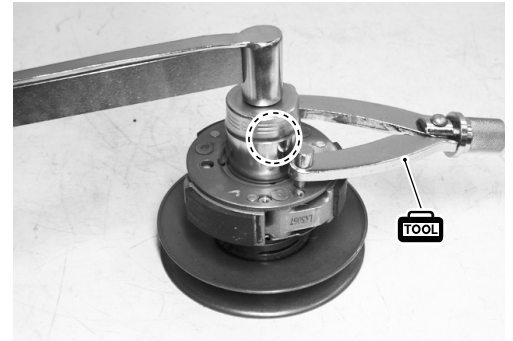
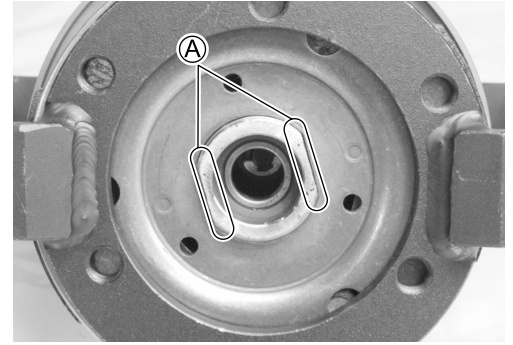
CAUTION

Align the flats [Ⓐ] of the fixed driven face end and clutch shoe plate.

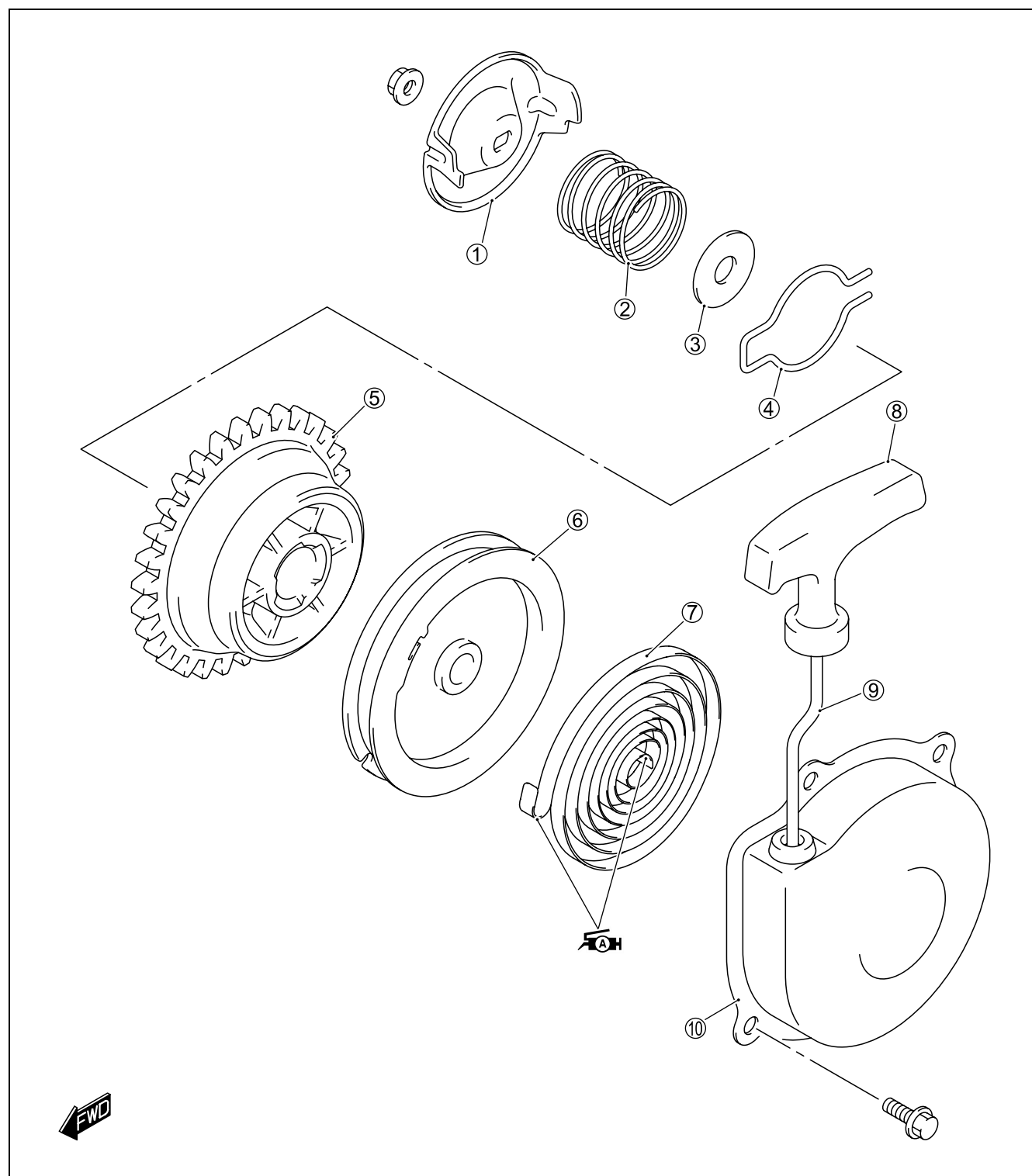
- Tighten the clutch shoe nut temporarily.
- Remove the special tool from the clutch shoe assembly.
- Tighten the clutch shoe nut to the specified torque with the special tool.

 **09930-40113: Rotor holder**

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



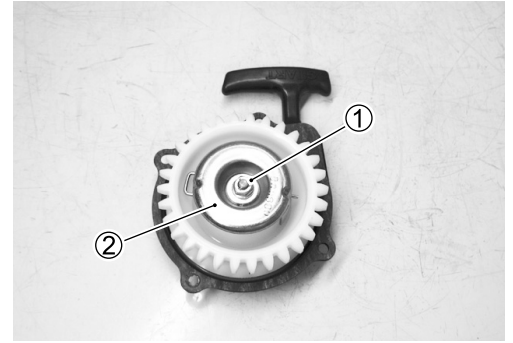
RECOIL STARTER



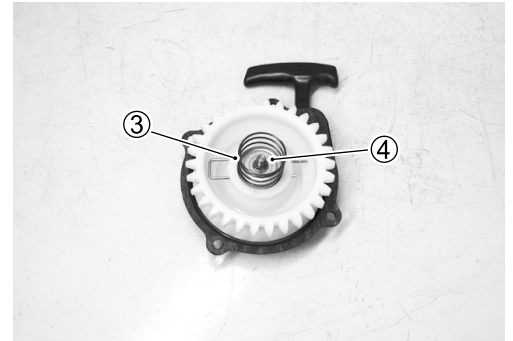
①	Friction plate	⑥	Reel
②	Spring	⑦	Spiral spring
③	Friction plate	⑧	Knob
④	Friction spring	⑨	Rope
⑤	Starter cap	⑩	Starter case

DISASSEMBLY

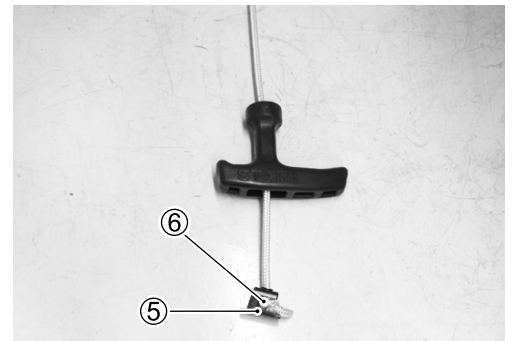
- Remove the nut ① and friction plate ②.



- Remove the spring ③ and washer ④.



- Remove the cap ⑤ from the knob ⑥.
- Untie a knot at the rope.



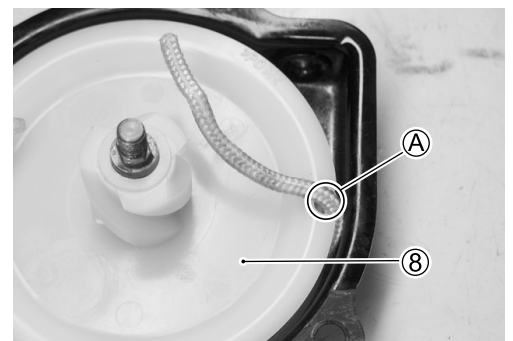
- Remove the starter cup ⑦.



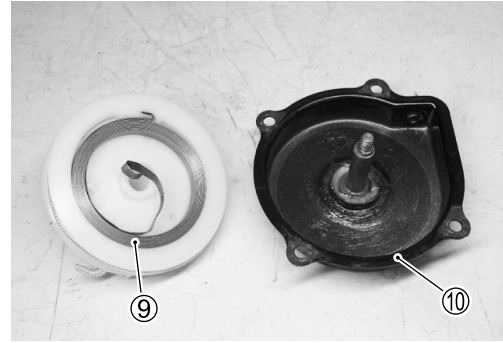
- Hook the rope to the groove A of the reel ⑧.
- Remove the reel ⑧.

⚠ WARNING

Wear hand and eye protection when removing the reel, since the spiral spring may quickly unwind and cause an injury.



- Remove the spiral spring ⑨ from the recoil starter case ⑩.



REASSEMBLY

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

- When installing the spiral spring, hook the spiral spring end ① with the recoil starter case.

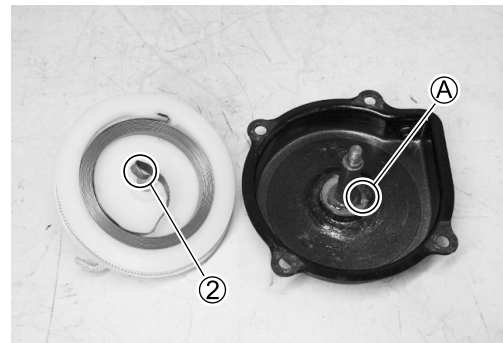
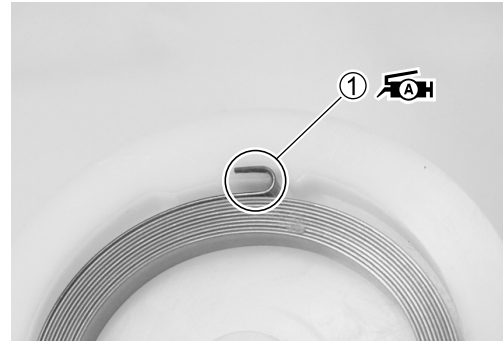
⚠ WARNING

Wear hand and eye protection when installing the reel, since the spiral spring may quickly unwind and cause an injury.

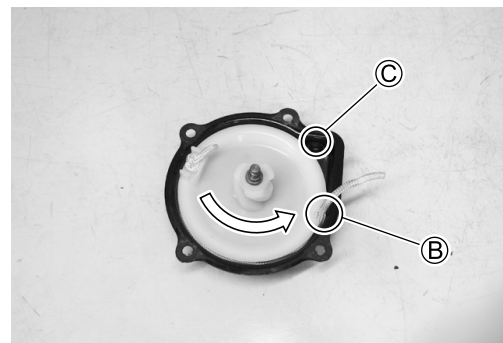
- Apply SUZUKI SUPER GREASE "A" to the spiral spring.

 99000-25010: SUZUKI SUPER GREASE "A" (or equivalent)

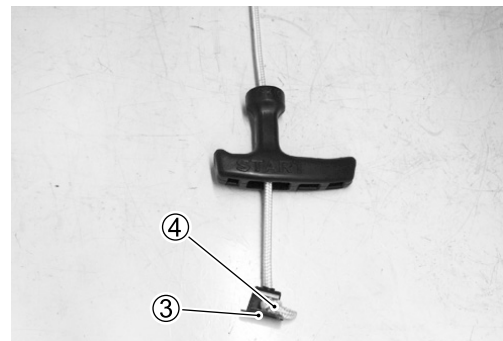
- Turn the rope on the reel properly.
- After installing the spiral spring, engage the part ① of the reel with the spiral spring end ②.



- Hook the rope onto the hook part ③ of the reel.
- Turn the reel counterclockwise three or four times with the rope.
- Lace the end of the rope through the recoil starter case hole ④.



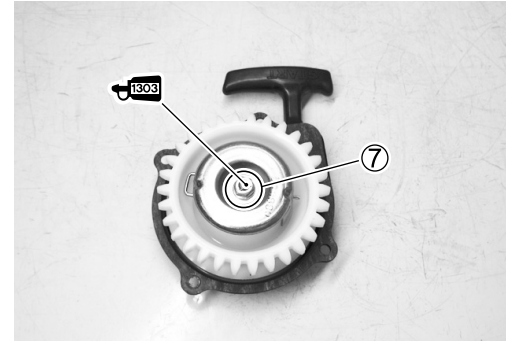
- Tie a knot at the end of the rope.
- Install the cap ③ to the knob ④.



- Apply THREAD LOCK “1303” to the bolt ⑦.
- Tighten the bolt ⑦ to the specified torque.

 **99000-32050: THREAD LOCK “1303” (or equivalent)**

 **Recoil starter friction plate bolt:**
5.0 N·m (0.5 kgf-m, 3.5 lb-ft)



- Pull the rope and check that the ratchet is pushed out.

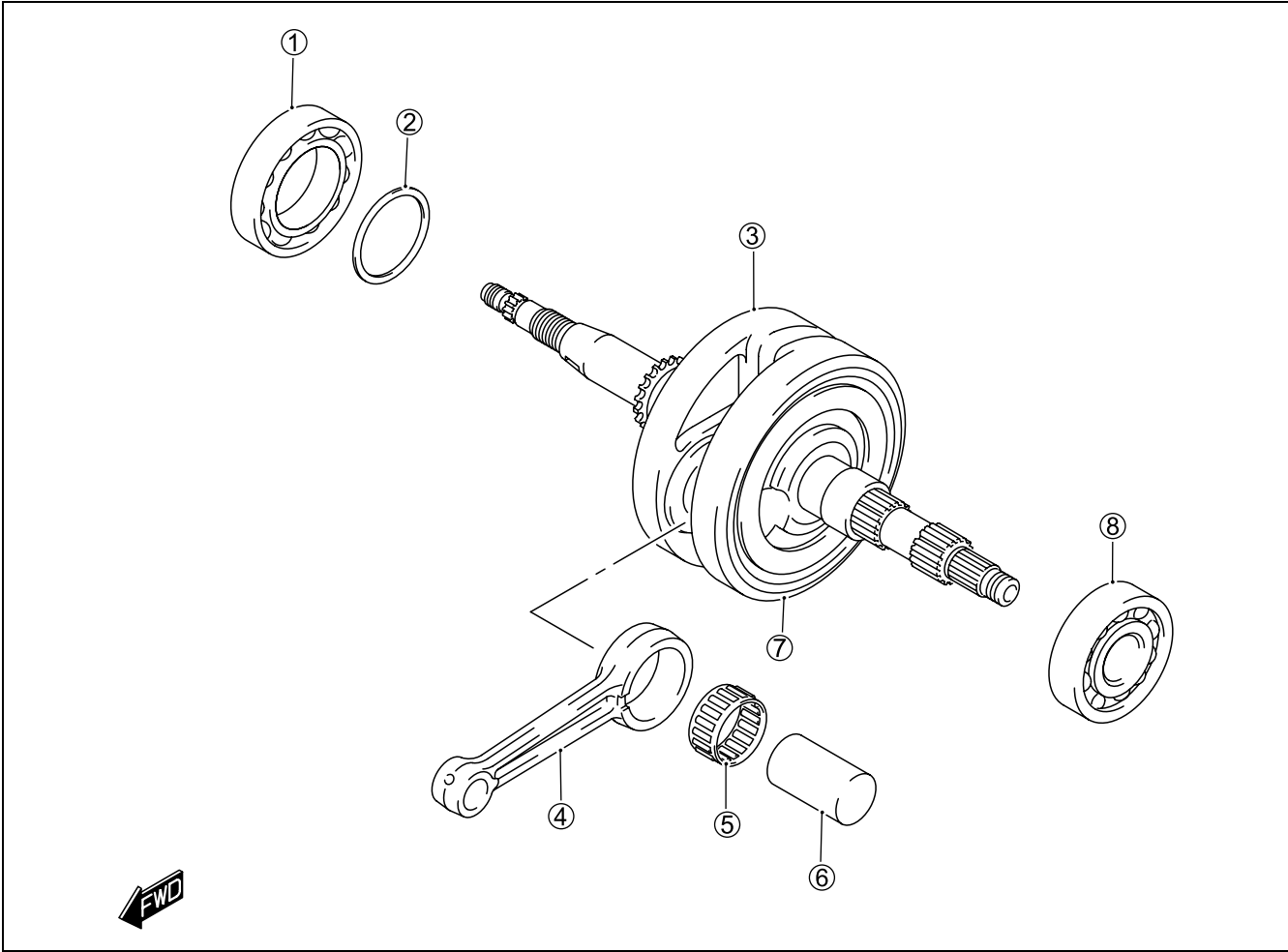
ENGINE REASSEMBLY

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

NOTE:

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

CRANKSHAFT



①	Bearing	④	Conrod	⑦	Crankshaft (L)
②	Sim	⑤	Bearing	⑧	Bearing
③	Crankshaft (R)	⑥	Crank pin		

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



Crank-web-to-web-width

Standard: 49 ± 0.1 mm (1.929 ± 0.003 in)

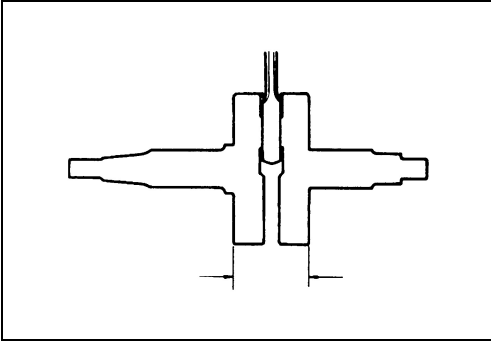
- When mounting the crankshaft in the crankcase, it is necessary to pull its left end into the crankcase with the special tools.



09910-32812: Crankshaft installer

09911-11310: Attachment

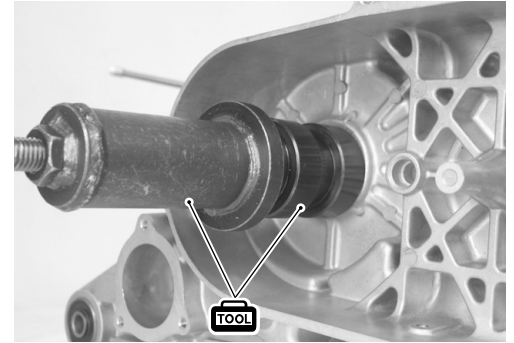
09913-70210: Bearing installer set (φ 35)



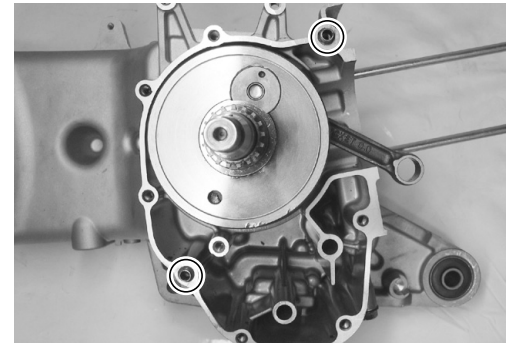
CAUTION

Never fit the crankshaft into the crankcase by striking it with a plastic hammer.

Always use the special tool, otherwise the accuracy of the crankshaft alignment will be affected.

**CRANKCASE**

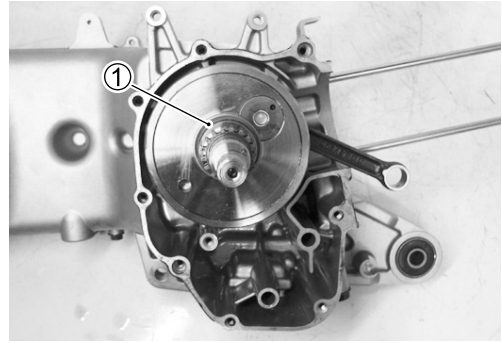
- Thoroughly remove the sealant material and oil stains on the mating surface of the right and left crankcases.
- Install the dowel pins to the left crankcase.
- Apply engine oil to the conrod big end.



CRANKSHAFT SHIM SELECTION

- Degrease the right crankshaft web, shim and inner race of the right crankshaft bearing.
- Place the removed shim ① on the right crankshaft.
- Put the plasti-gauge (special tool) cut out about 10 mm on the shim as shown.

 **09900-22302: Plasti-gauge**



- Install the right crankcase and tighten the crankcase bolts.

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

- Remove the crankcase bolts.
- Separate the crankcase into 2 parts, left and right, with the special tool. (☞ 3-17)

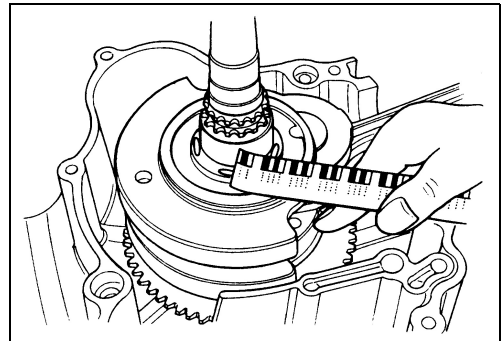
 **09920-13120: Crankcase separator**



- Measure the width of compressed plasti-gauge with the envelope scale.

 **Crankshaft thrust clearance**
Standard: 0.02 – 0.07 mm

- If the thrust clearance is not within specification, select the proper size of shim.
- After selecting the proper size of shim, place it on the right crankshaft.

**LIST OF SHIMS**

Part number	Shim thickness	Part number	Shim thickness
09181-35101	0.50 ± 0.002 mm	09181-35109	0.95 ± 0.002 mm
09181-35025	0.55 ± 0.002 mm	09181-35110	1.00 ± 0.002 mm
09181-35103	0.60 ± 0.002 mm	09181-35113	1.05 ± 0.002 mm
09181-35026	0.65 ± 0.002 mm	09181-35116	1.10 ± 0.002 mm
09181-35104	0.70 ± 0.002 mm	09181-35118	1.15 ± 0.002 mm
09181-35105	0.75 ± 0.002 mm	09181-35120	1.20 ± 0.002 mm
09181-35106	0.80 ± 0.002 mm	09181-35123	1.25 ± 0.002 mm
09181-35107	0.85 ± 0.002 mm	09181-35125	1.30 ± 0.002 mm
09181-35108	0.90 ± 0.002 mm		

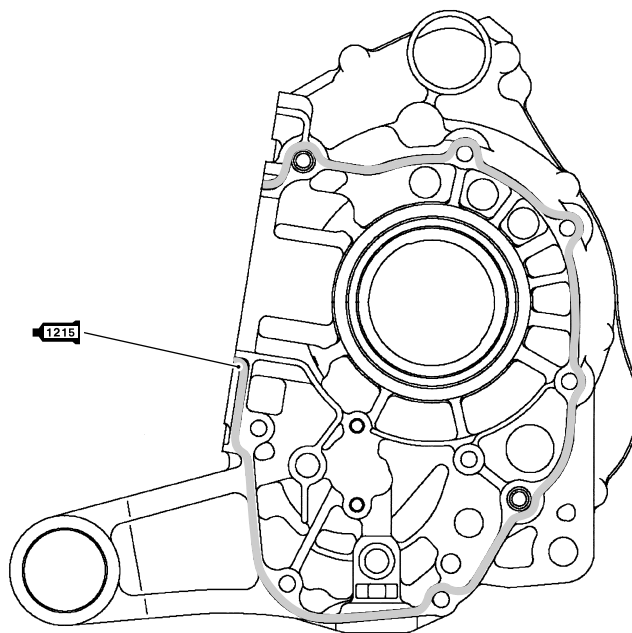
- Apply SUZUKI BOND “1215” to the mating surface of the right crankcase as shown.

1215 99000-31080: SUZUKI BOND “1215”
(or equivalent bond)

NOTE:

Use of SUZUKI BOND “1215” is as follows:

- * *Make surfaces free from moisture, oil, dust and other foreign materials.*
- * *Spread on surfaces thinly to form an even layer, and assemble the crankcases within few minutes.*
- * *Take extreme care not to apply any BOND “1215” to the oil hole, oil groove and bearing.*
- * *Apply to distorted surfaces as it forms a comparatively thick film.*

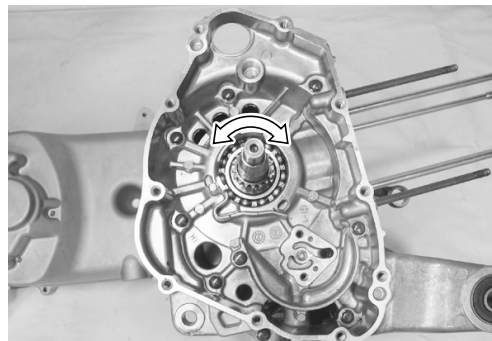


- Tighten the crankcase bolts to the specified torque.

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



- After the crankcase bolts have been tightened, check if the crankshaft, rotate smoothly.



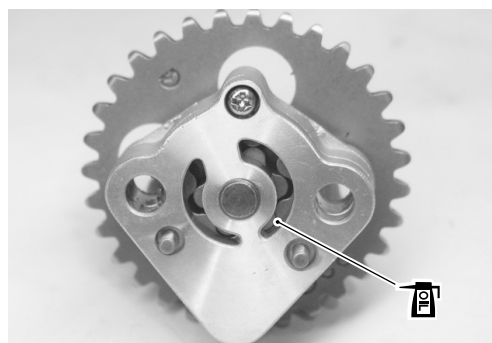
CAM CHAIN

- Install the cam chain ① onto the sprocket.

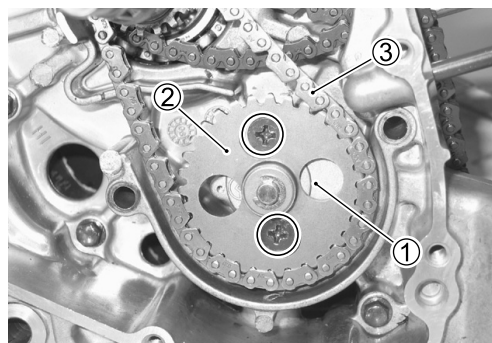


OIL PUMP

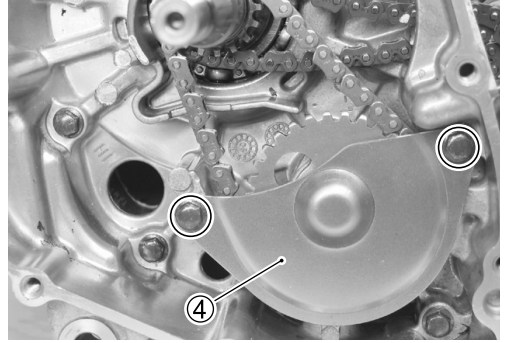
- Apply engine oil to the oil pump assembly.



- Install the oil pump assembly ①, sprocket ② and oil pump chain ③.

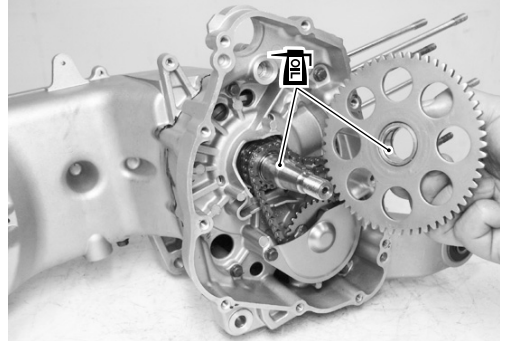


- Install the oil pump cover ④.

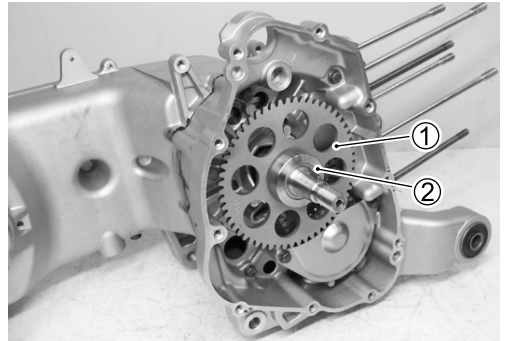


STARTER CLUTCH AND GENERATOR ROTOR

- Apply engine oil to the starter driven gear bearing and crankshaft.



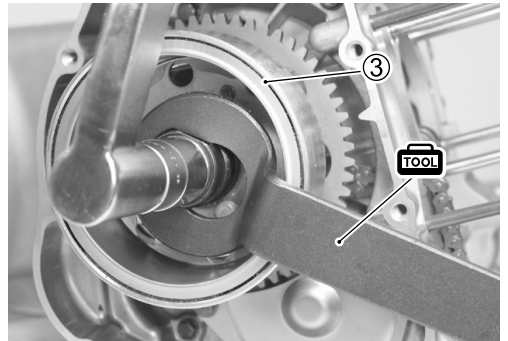
- Install the starter driven gear ①.
- Degrease the tapered portion of generator rotor and also the crankshaft. Use nonflammable cleaning solvent to wipe off oily or greasy matter and make these surfaces completely dry.
- Install the key ②.



- Install the generator rotor ③.
- Tighten the generator rotor nut to the specified torque with the special tool.

 **Generator rotor nut: 80 N·m (8.0 kgf-m, 58 lb-ft)**

 **09930-44520: Rotor holder**



GENERATOR ROTOR COVER

- Before installing the starter idle gear, apply molybdenum oil solution to the hole of starter idle gear shaft.

MOLYBDENUM OIL SOLUTION

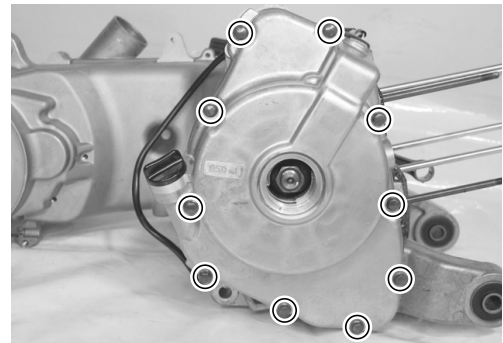
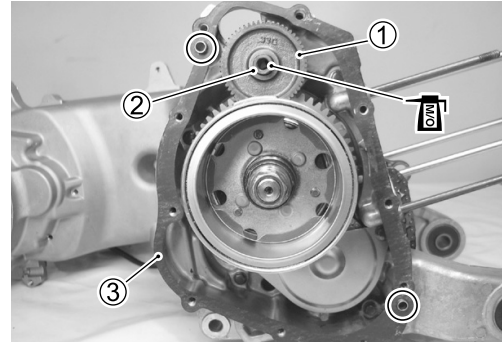
- Install the starter idle gear ①, shaft ②, dowel pins and gasket ③.

CAUTION

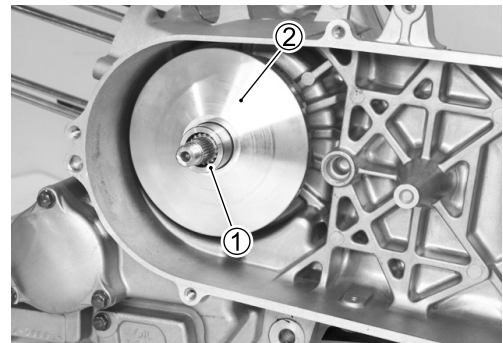
The removed gasket must be replaced with a new one to prevent oil leakage.

- Tighten the generator rotor cover bolts to the specified torque.

Generator rotor cover bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

**MOVABLE DRIVEN**

- Install the movable drive spacer ① and movable drive face assembly ②.



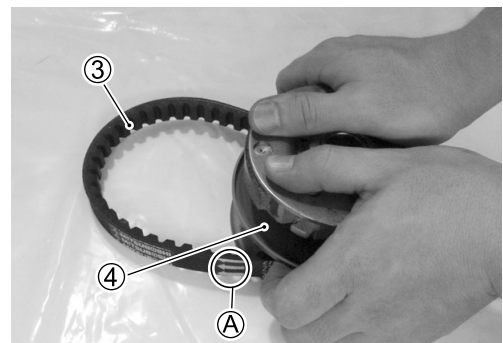
- Install the drive belt ③ to the movable driven face ④.

NOTE:

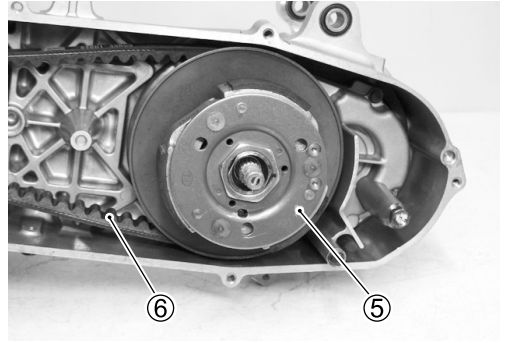
With the clutch shoe spring compressed by hands, install the drive belt ③ between the movable driven face ④ and fixed driven face.

CAUTION

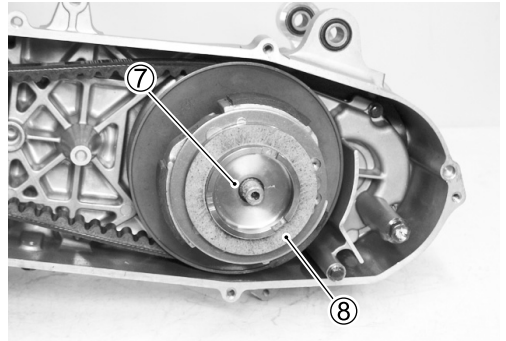
- * Degrease the drive belt contact surface (pulley face).
- * Position the drive belt so that the arrow A points the engine rotating direction.



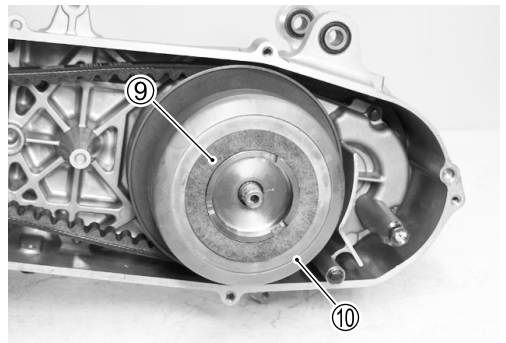
- Install the clutch shoe/movable driven face assembly ⑤ with the drive belt ⑥.



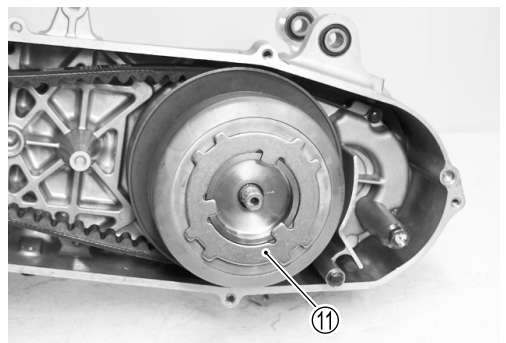
- Install the limit clutch friction plate ⑦ and limit clutch ⑧.



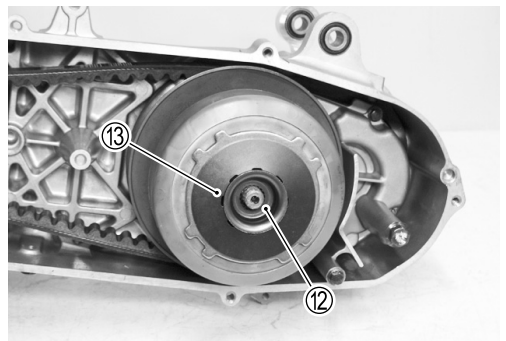
- Install the limit clutch friction plate ⑨ and clutch housing ⑩.



- Install the limit clutch pressure plate ⑪.



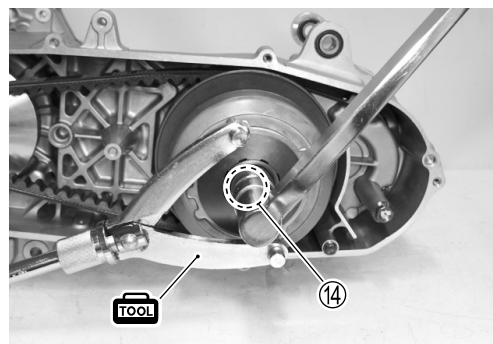
- Install the limit clutch stopper ⑫ and limit clutch spring ⑬.



- Install the limit clutch nut ⑭ with the special tool.

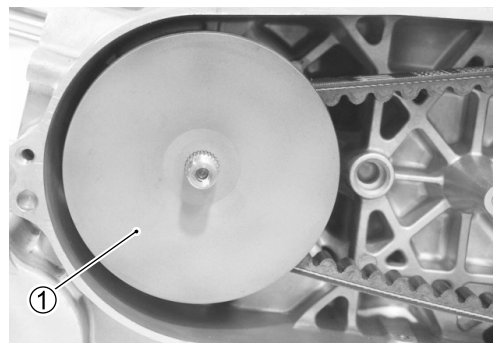
 09930-40113: Rotor holder

 Limit clutch nut: 75 N·m (7.5 kgf-m, 54.0 lb-ft)



MOVABLE DRIVE

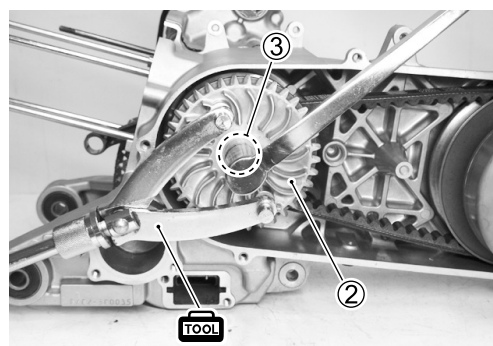
- Install the fixed drive face ①.



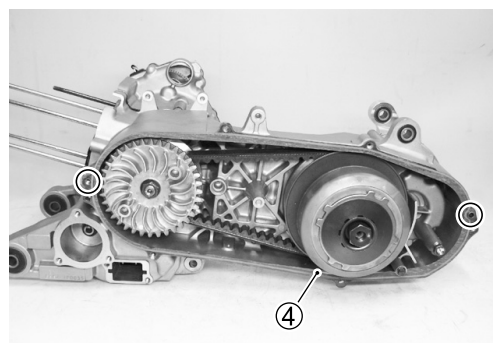
- Install the fixed drive face fan ②.
- Install the fixed drive face nut ③ with the special tool.

 09930-40113: Rotor holder

 Fixed drive face nut: 50 N·m (5.0 kgf-m, 36.0 lb-ft)

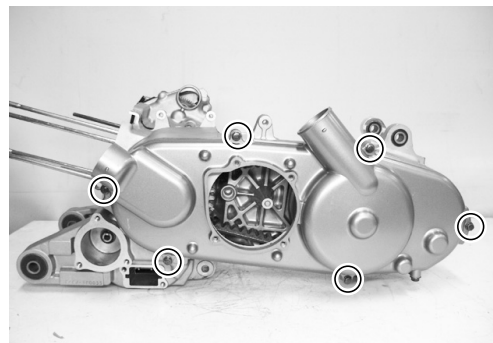


- Install the gasket ④ and dowel pins.



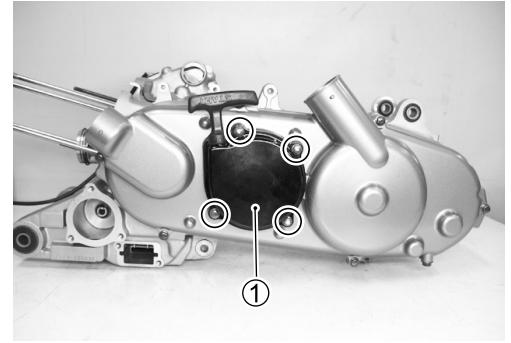
- Install the crankcase cover bolts to the specified torque.

 Crankcase cover bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)



RECOIL STARTER

- Install the recoil starter ①.

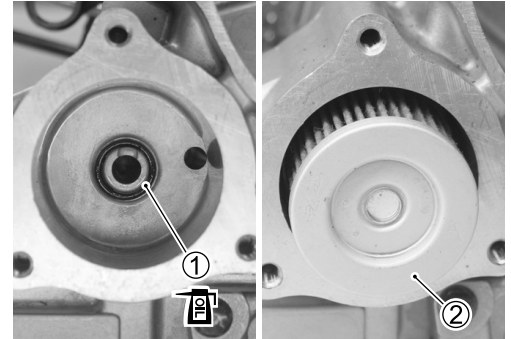


OIL FILTER

- Apply engine oil to the O-ring ①.
- Install the O-ring ① and oil filter ②.

CAUTION

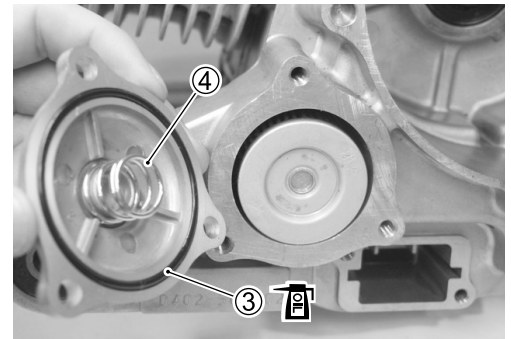
The removed O-ring must be replaced with a new one to prevent oil leakage.



- Apply engine oil to the O-ring ③.
- Install the O-ring ③ and spring ④.

CAUTION

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

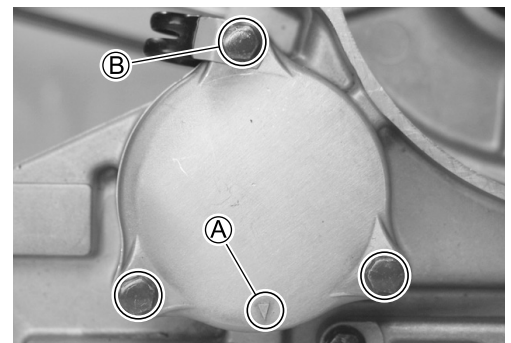


- Install the oil filter cap and tighten the bolts securely.

NOTE:

Face the triangle mark (A) on the cap downward.

(B): Bolt with clamp.

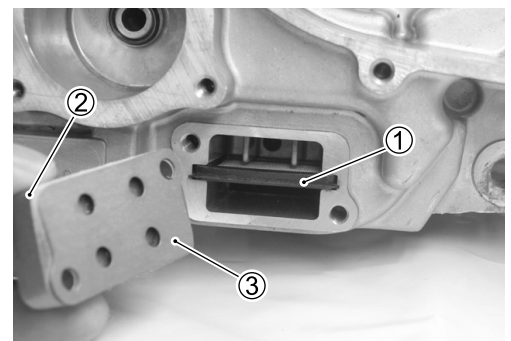


OIL STRAINER

- Install the oil strainer ①.
- Install the oil strainer cap ② and gasket ③.

CAUTION

The removed gasket ③ must be replaced with a new one.



PISTON RING

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

NOTE:

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

CAUTION

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

- Ⓐ INCORRECT
Ⓑ CORRECT

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

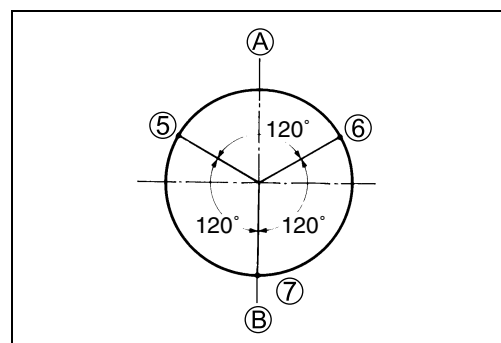
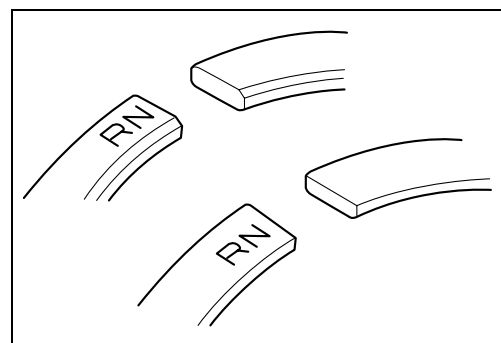
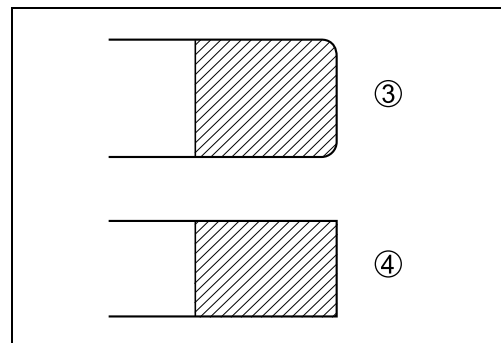
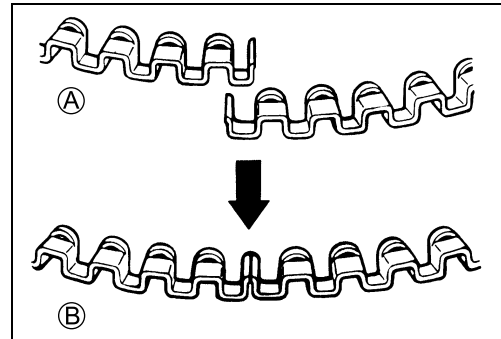
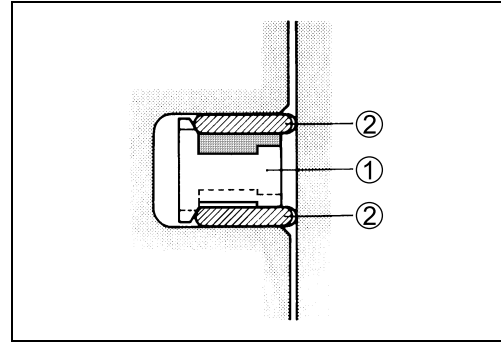
NOTE:

1st ring and 2nd ring differ in shape.

- Be sure to bring the concave side of 1st ring to the top when fitting it to the piston.
- 2nd ring has letter "RN" marked on the side. Be sure to bring the marked side ring to the top when fitting it to the piston.

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

- Ⓐ Exhaust side
Ⓑ Intake side
⑤ 2nd ring and lower side rail
⑥ Upper side rail
⑦ 1st ring and spacer



PISTON AND CYLINDER

- Apply molybdenum oil solution onto the piston pin and small end of the conrod.

NOTE:

Install the piston with the punch mark ① on the piston head facing toward the exhaust side.

MOLYBDENUM OIL SOLUTION

- Place a clean rag over the cylinder base to prevent the piston pin circlip from dropping into the crankcase, and then fit the piston pin circlip with long-nose pliers.

CAUTION

The removed piston pin circlip must be replaced with a new one to prevent circlip failure.

NOTE:

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

- Thoroughly wipe off oil from the fitting surface of the crankcase.
- Apply SUZUKI BOND “1215” to the crankcase ② as shown.

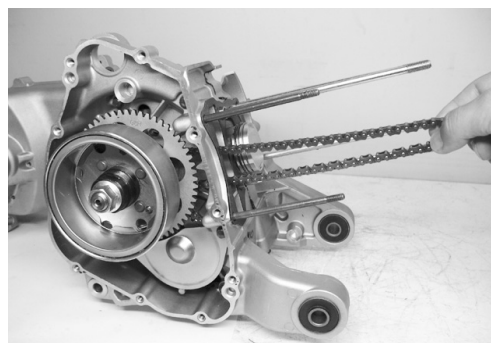
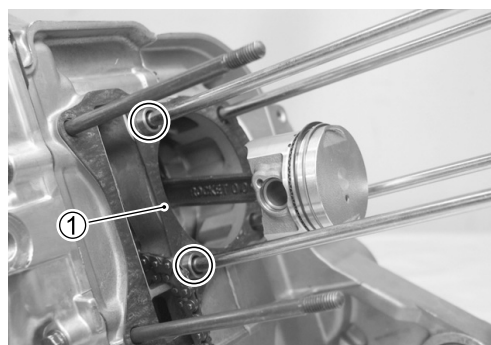
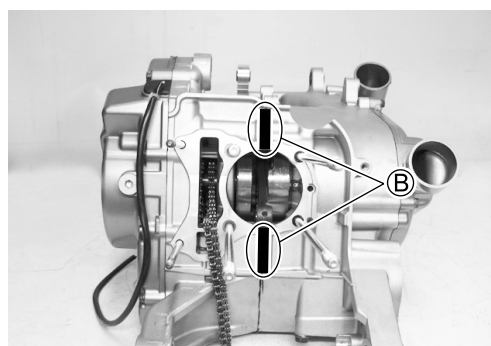
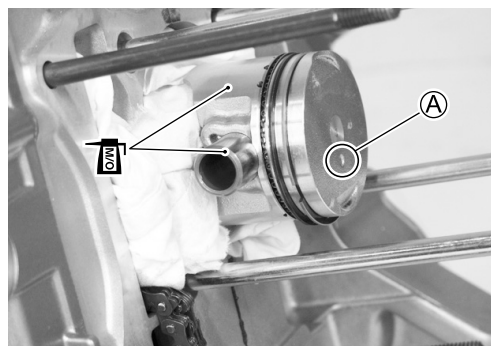
 99000-31080: SUZUKI BOND “1215”
(or equivalent bond)

- Install the dowel pins and gasket ① onto the crankcase.

- Hold each piston ring with the piston ring sections positioned correctly and put it into the cylinder. Make sure that the piston rings are caught by the cylinder skirt.

NOTE:

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



- Install the cam chain guide ②.

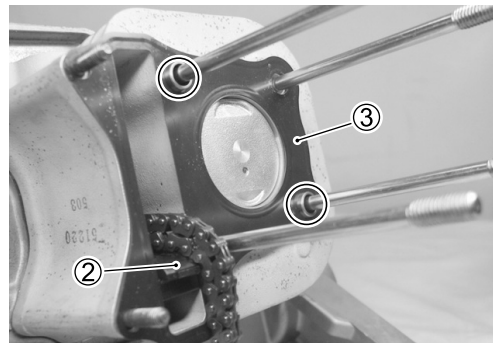
NOTE:

Make sure that the guide ② is inserted properly or binding of the cam chain and guide may result.

- Install the dowel pins and gasket ③.

CAUTION

The removed gasket must be replaced with a new one to prevent oil leakage.

**CYLINDER HEAD****NOTE:**

Apply engine oil to the threaded parts of the cylinder head nuts ① and both sides of the its washers.

- With the head snugly seated on the cylinder, secure it by tightening the nuts in diagonal stages. Tighten the cylinder head nuts diagonally to the specified torque.

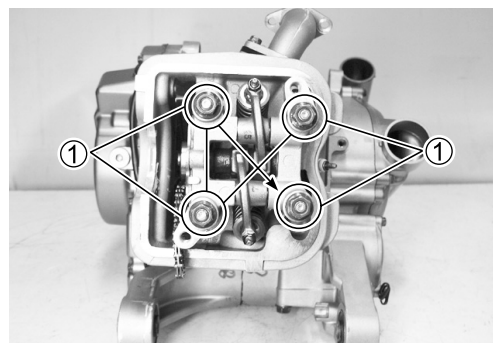
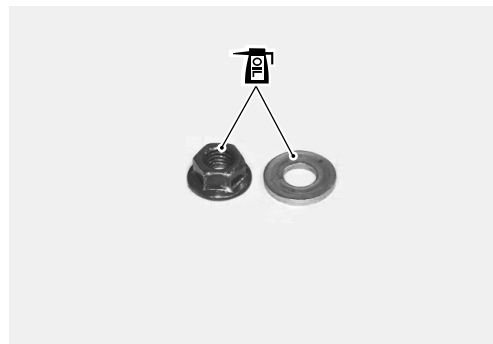
 **Cylinder head nut ①: 25 N·m (2.5 kgf-m, 18.0 lb-ft)**

NOTE:

Be sure to install the washer with rounded side facing up.

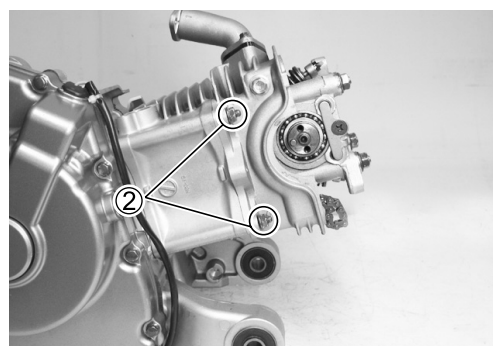
CAUTION

The removed copper washers must be replaced with a new ones to prevent oil leakage.



- After tightening the cylinder head nut ① to specified torque, tighten the cylinder nuts ② to the specified torque.

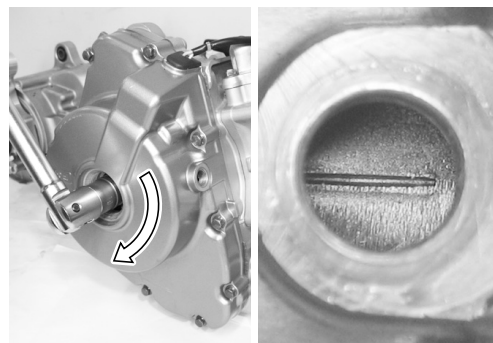
 **Cylinder head nut ②: 10 N·m (1.0 kgf-m, 7.0 lb-ft)**

**CAMSHAFT/ASSEMBLY**

- Turn the generator rotor until the line on the generator rotor is aligned with the center of the hole in the generator cover.

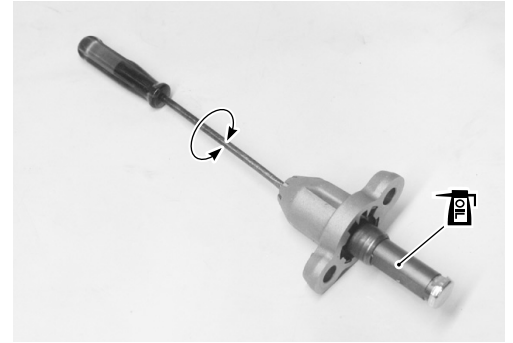
CAUTION

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



CAM CHAIN TENSION ADJUSTER

- Apply engine oil to the push rod.
- Turn the adjusting screw clockwise with a $\ominus$ screwdriver until the rod locked.

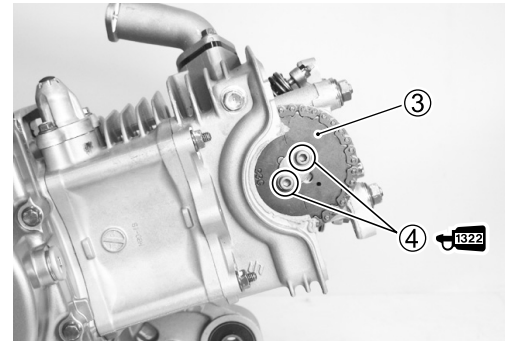


- Install the cam sprocket ③.
- Apply a small quantity of THREAD LOCK SUPER "1322" to the cam sprocket bolt ④.

 **99000-3208: THREAD LOCK SUPER "1322"**

- Tighten the cam sprocket bolt to the specified torque.

 **Cam sprocket bolt: 11 N·m (1.1 kgf-m, 8 lb-ft)**



- Install the gasket ① and cam chain tension adjuster ② to the cylinder.

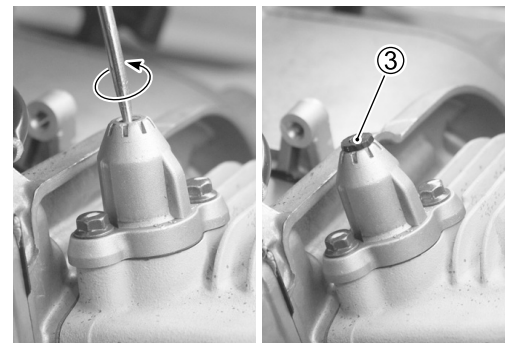
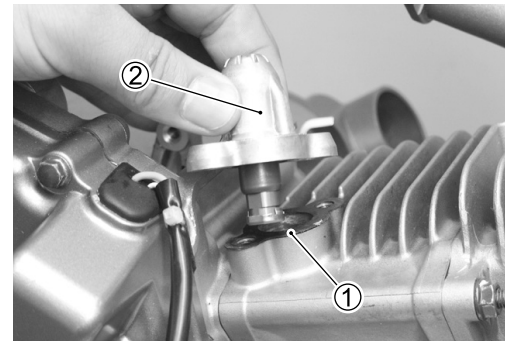
CAUTION

The removed gasket must be replaced with a new one to prevent oil leakage.

- Tighten the cam chain tension adjuster mounting bolts to the specified torque.

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

- Turn the adjusting screw counter clockwise with a $\ominus$ screwdriver until the push rod unlocked.
- Install the cam chain tension adjuster plug cap ③.



NOTE:

Make sure that the "up mark" (A) comes to the upper side.

CAUTION

After installing the cam chain tension adjuster, check to be sure that the adjuster works properly by checking the slack of cam chain.

- After installing the cam chain tension adjuster, rotate the crankshaft, and recheck the positions of the camshafts. (3-9)
- Apply SUZUKI SUPER GREASE "A" to the O-ring (4).
- Tighten the generator cover cap (5) and valve timing inspection plug (6).

CAUTION

The removed O-ring must be replaced with a new one.

 99000-25030: SUZUKI SUPER GREASE "A"
(or equivalent)

 Generator cover cap: 15 N·m (1.5 kgf-m, 11 lb-ft)
Valve timing inspection plug:
17.5 N·m (1.75 kgf-m, 12.5 lb-ft)

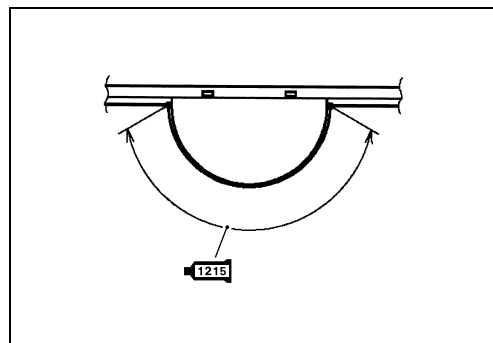
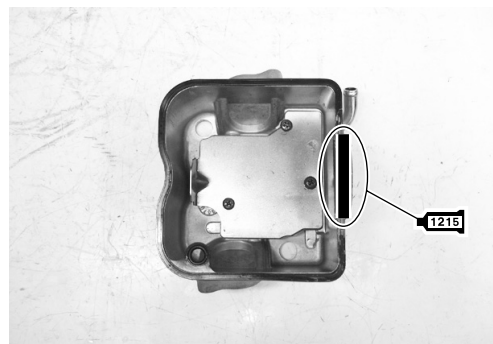
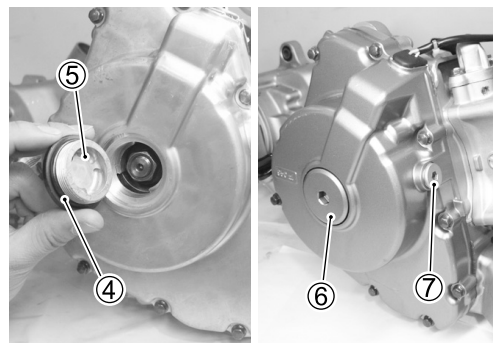
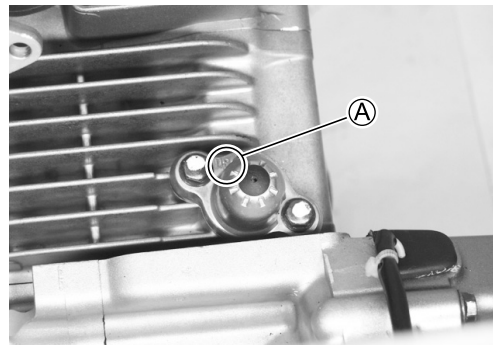
CYLINDER HEAD COVER

- Thoroughly wipe off oil from the fitting surfaces of the cylinder head and cover.
- Apply SUZUKI BOND "1215" to the end caps of the cylinder head cover gasket as shown.

 99000-31230: SUZUKI BOND "1215"
(or equivalent bond)

CAUTION

The removed gasket must be replaced with a new one to prevent oil leakage.



- Apply engine oil to both sides of the washers ①.
- Install the cylinder head cover ②.
- Lightly tighten the cylinder head cover bolts and then tighten them to the specified torque.

Cylinder head cover bolt

Initial: 10 N·m (1.0 kgf-m, 7 lb-ft)

Final: 14 N·m (1.4 kgf-m, 10.0 lb-ft)

CAUTION

The removed washers must be replaced with new ones to prevent oil leakage.

- Install the spark plug. (🔧 2-8)

STARTER MOTOR

- Apply SUZUKI SUPER GREASE “A” to the O-ring.
- Install the starter motor ①.

 99000-25010: SUZUKI SUPER GREASE “A”
(or equivalent grease)

The removed O-ring must be replaced with new ones to prevent oil leakage.

INTAKE PIPE

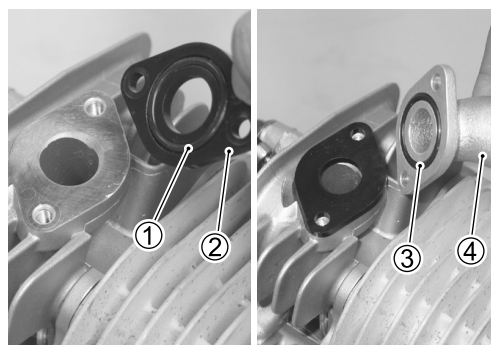
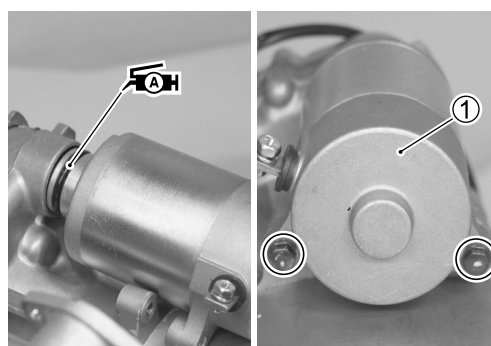
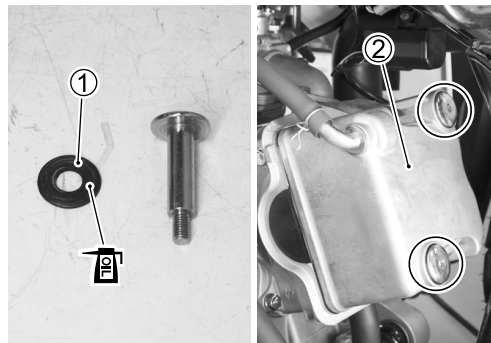
- Install the O-ring ① to insulator ②.
- Install the O-ring ③ to intake pipe ④.

CAUTION

The removed o-rings must be replaced with new ones to prevent air from sucking the joint.

- Tighten the intake pipe bolts to the specified torque.

 Intake pipe bolt: 6 N·m (0.6 kgf-m, 4 lb-ft)



FUEL SYSTEM

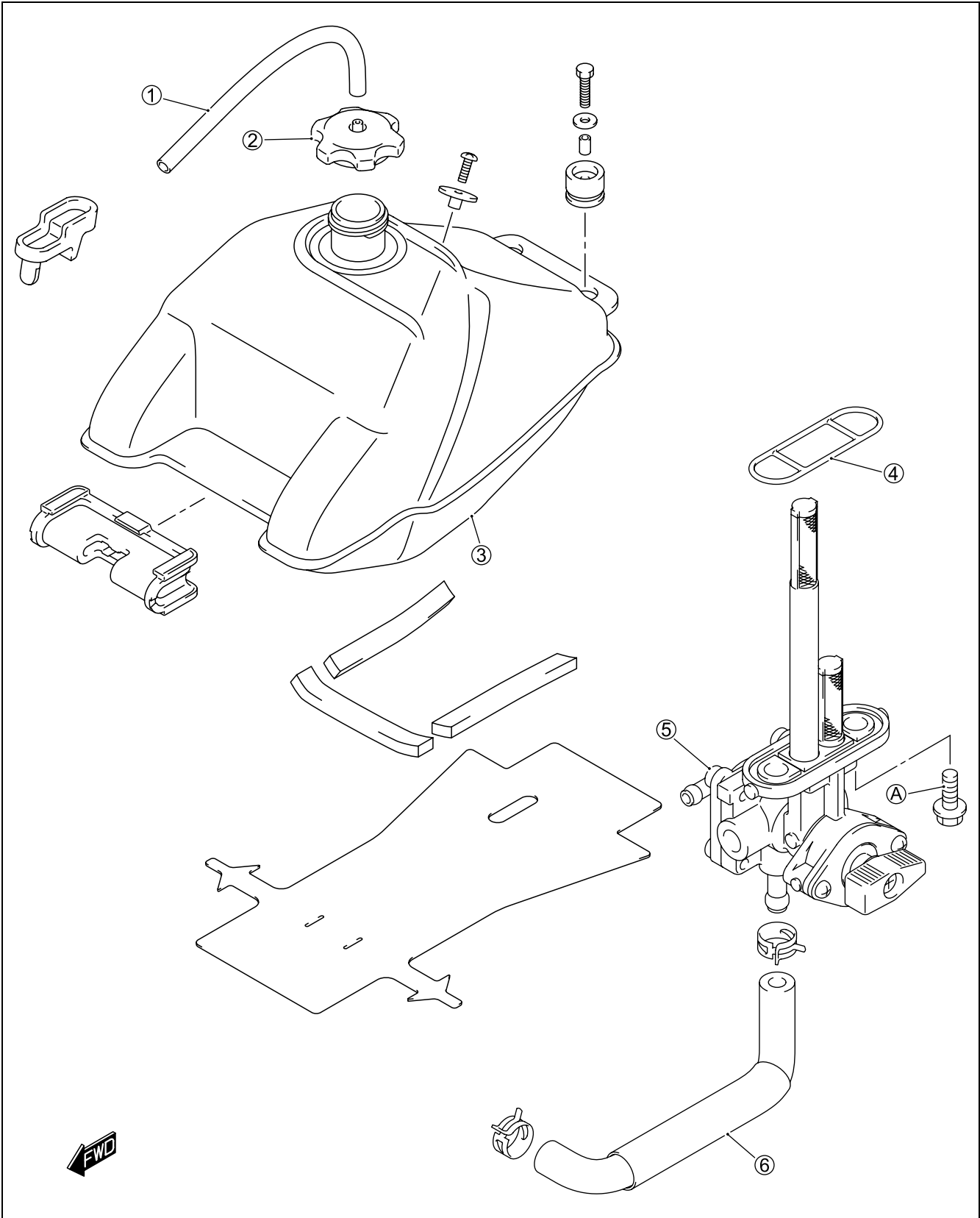
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⚠ WARNING

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

FUEL TANK AND FUEL VALVE



①	Fuel tank breather hose	⑤	Fuel valve
②	Fuel tank cap	⑥	Fuel hose
③	Fuel tank	Ⓐ	Fuel valve bolt
④	O-ring		



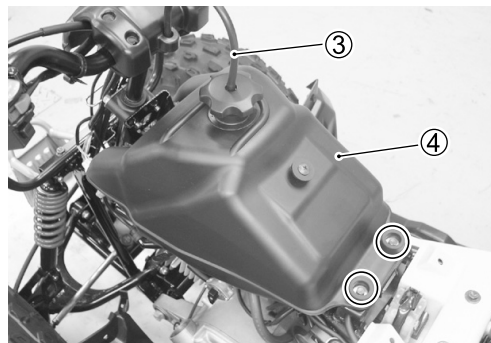
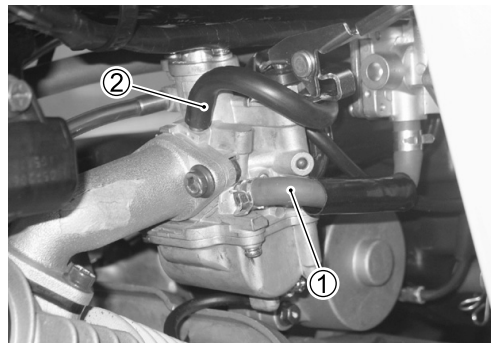
ITEM	N·m	kgf·m	lb·ft
Ⓐ	4.6	0.46	3.5

REMOVAL

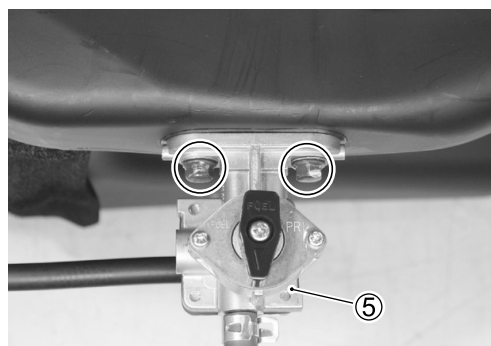
⚠ WARNING

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

- Remove the fuel tank cover. (👉 5-4)
- Turn the fuel valve to “ON” position.
- Disconnect the fuel hose ①.
- Disconnect the vacuum hose ②.
- Remove the breather hose ③.
- Remove the fuel tank ④.



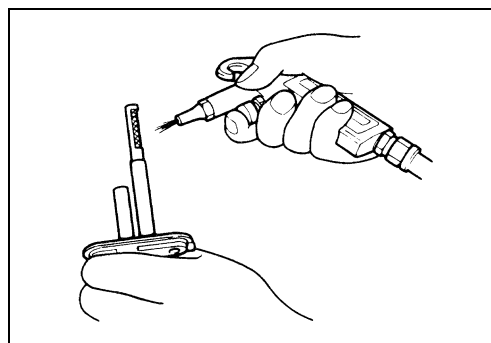
- Remove the fuel valve assembly ⑤.



FUEL FILTER INSPECTION AND CLEANING

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

Clean the fuel filter with compressed air also check the fuel filter for cracks.



INSTALLATION

Install the fuel tank and fuel valve in the reverse order of removal. Pay attention to the following points:

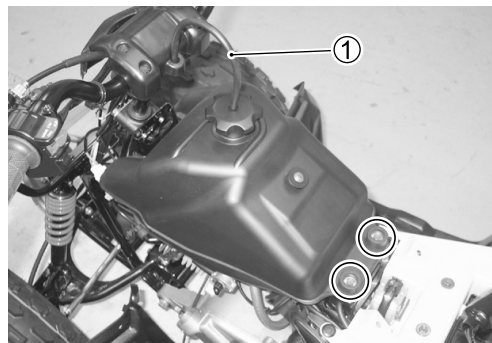
- Tighten the fuel valve bolts to the specified torque.

 **Fuel valve bolt: 4.5 N·m (0.45 kgf-m, 3.0 lb-ft)**

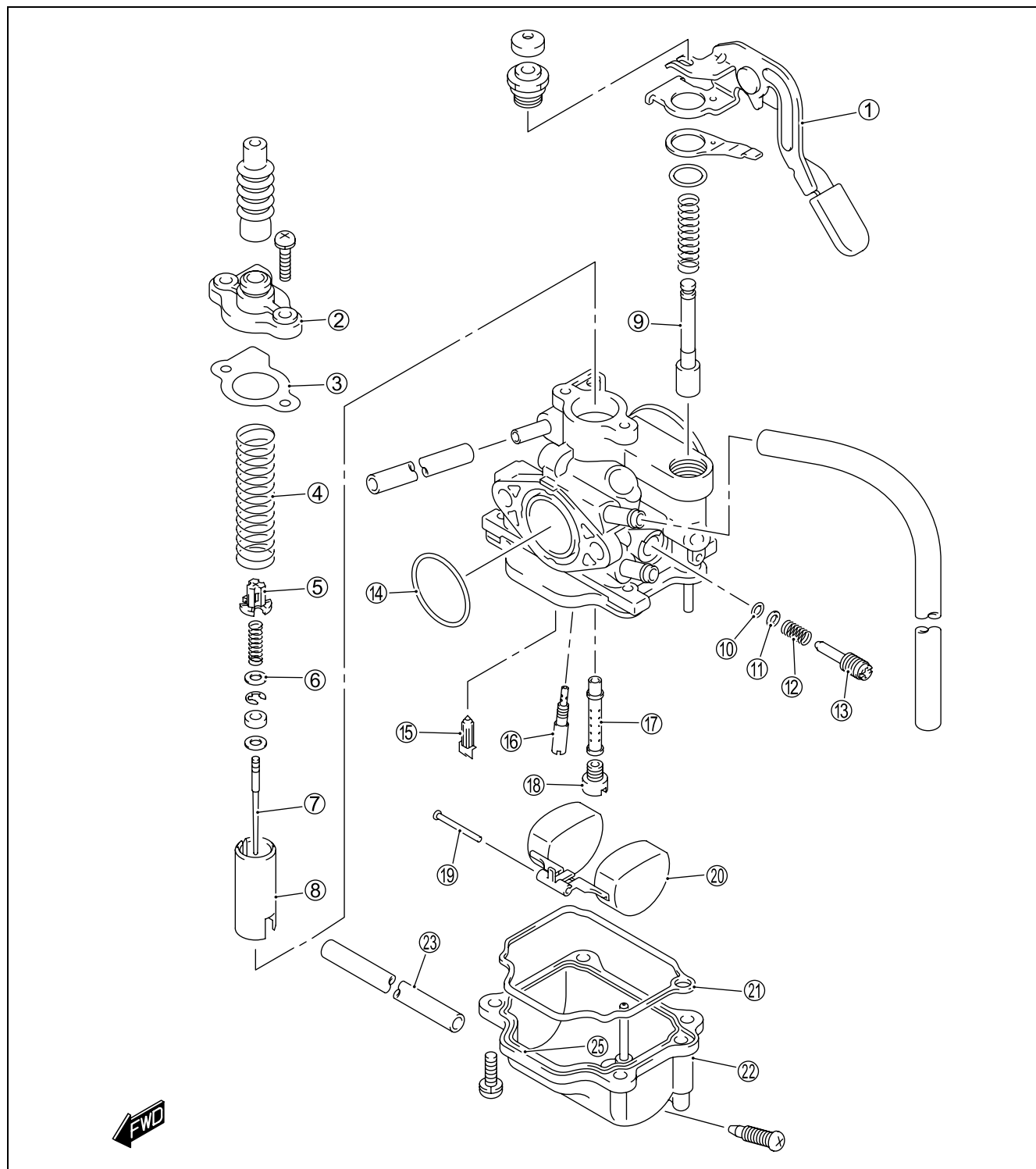
WARNING

The removed gaskets and O-ring must be replaced with new ones to prevent fuel leakage.

- Install the fuel tank and tighten the bolts securely.
- Rout the fuel tank breather hose ①. ( 7-18)



CARBURETOR



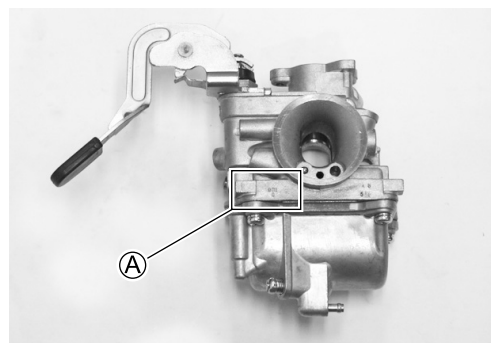
①	Choke lever	⑨	Starter plunger	⑰	Needle jet
②	Carburetor top cap	⑩	Washer	⑱	Main jet
③	Gasket	⑪	O-ring	⑲	Float pin
④	Spring	⑫	Spring	⑳	Float
⑤	Spring seat	⑬	Throttle stop screw	㉑	Gasket
⑥	O-ring	⑭	O-ring	㉒	Float chamber
⑦	Jet needle	⑮	Needle valve	㉓	Drain hose
⑧	Piston valve	⑯	Pilot jet		

SPECIFICATIONS

ITEM	SPECIFICATION
Carburetor type	MIKUNI VM16SH
Bore size	$\phi 16$
I.D.N.	08H0
Idle r/min	$1\,900 \pm 100$ r/min
Float height	16 mm
Main jet (M.J)	#80
Jet needle (J.N)	4LA43-1
Needle jet (N.J)	E-1M
Pilot jet (P.J)	#17.5
Air screw (A.S)	PRE-SET (1, $\frac{3}{4}$)
Throttle cable play	3 – 5 mm (0.12 – 0.20)

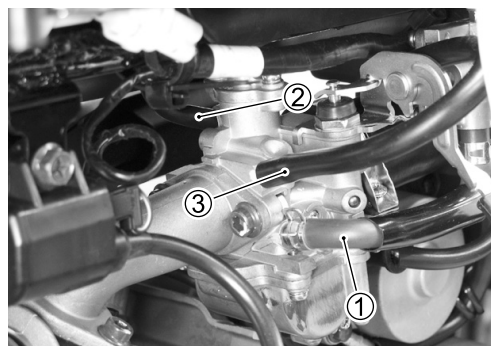
I.D. NO. LOCATION

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

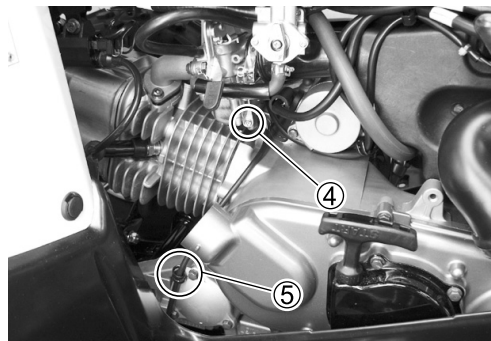


REMOVAL

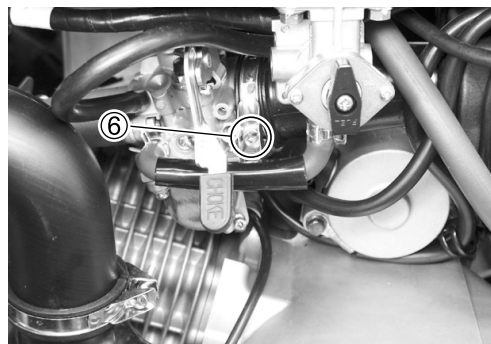
- Remove the fuel tank cover. (☞ 5-4)
- Remove the front cooling duct. (☞ 3-3)
- Remove the fuel hose ①.
- Remove the air vent hose ②.
- Remove the vacuum hose ③.



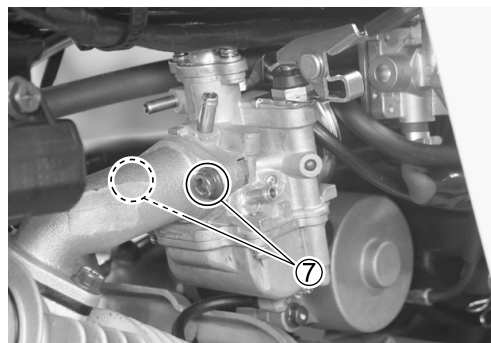
- Loosen the drain plug ④.
- Drain the fuel from the carburetor.
- Remove the drain hose from the clamp ⑤.



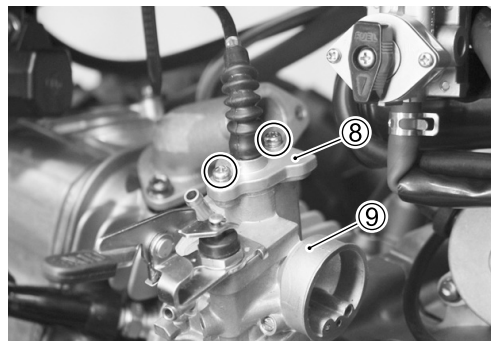
- Loosen the clamp bolt ⑥.



- Remove the carburetor mounting bolts/nuts ⑦.

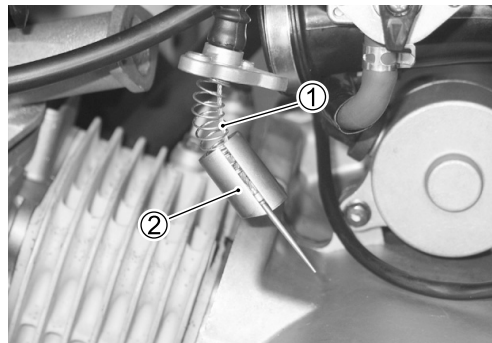


- Remove the carburetor top cap ⑧.
- Remove the carburetor assembly ⑨.

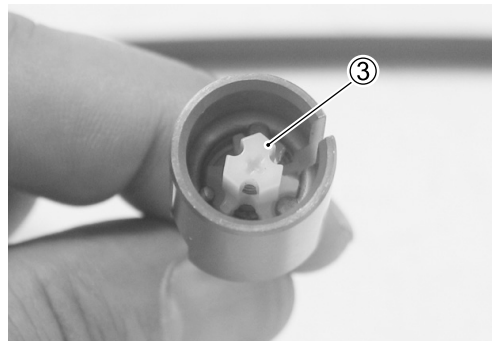


DISASSEMBLY

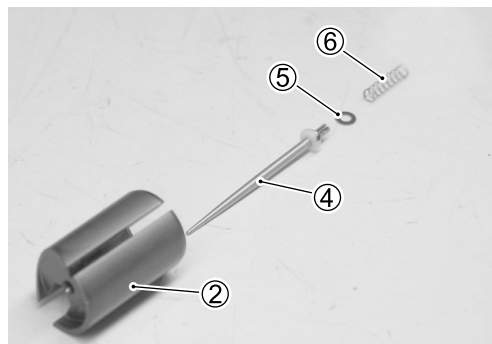
- Remove the spring ① and piston valve ② from the throttle cable.



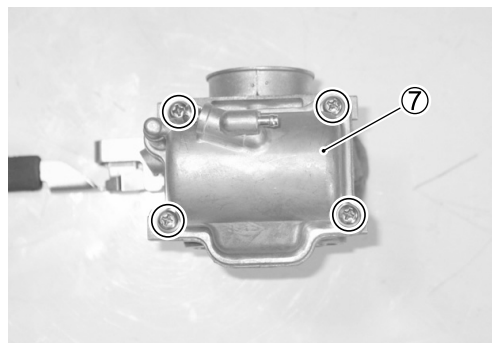
- Remove the spring seat ③.



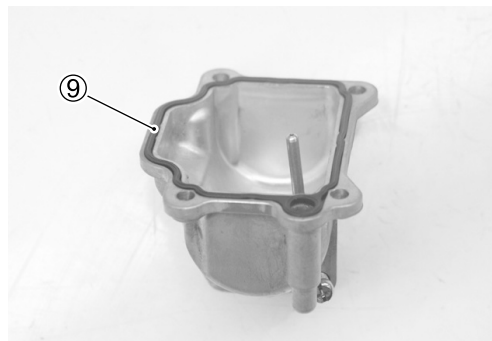
- Remove the jet needle ④, washer ⑤ and spring ⑥ from the piston valve ②.



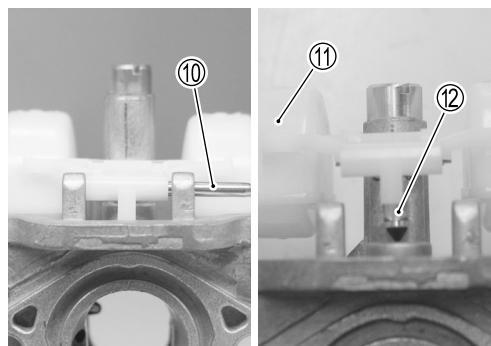
- Remove the float chamber ⑦.



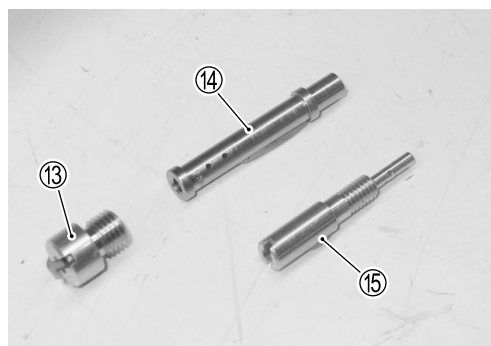
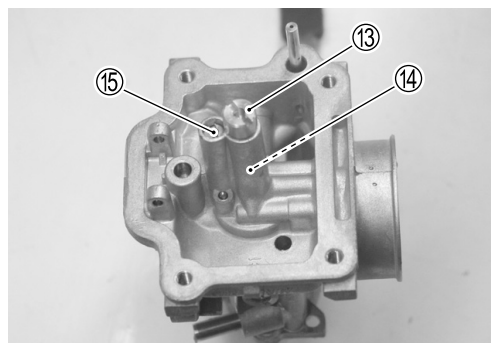
- Remove the gasket ⑨.



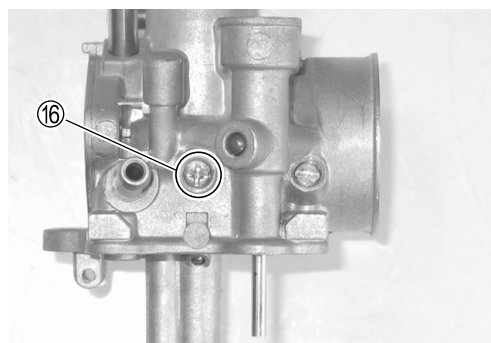
- Remove the float pin ⑩.
- Remove the float ⑪.
- Remove the needle valve ⑫.



- Remove the main jet ⑬ and needle jet ⑭.
- Remove the pilot jet ⑮.



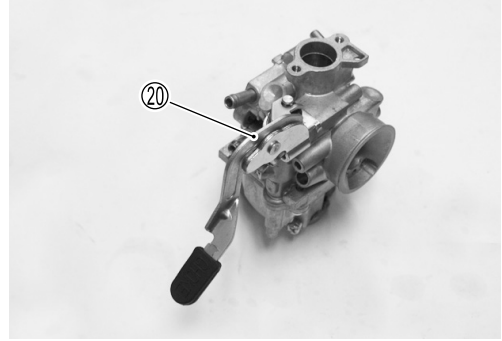
- Remove the throttle stop screw ⑯.



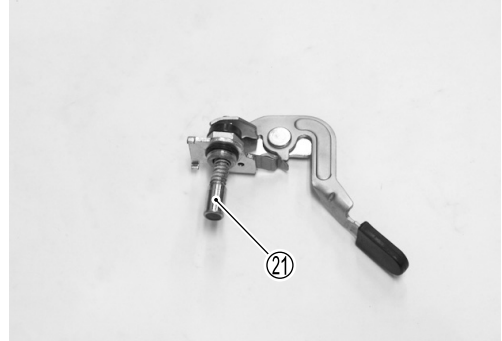
- Remove the spring ⑰, washer ⑱ and O-ring ⑲ from the throttle stop screw ⑯.



- Remove the choke lever ②①.



- Remove the starter plunger ②①.



CLEANING

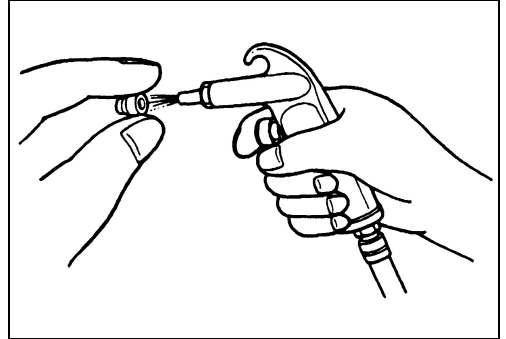
⚠ WARNING

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 with compressed air.
- Clean all circuits of the carburetor thoroughly - not just the perceived problem area. Clean the circuits in the carburetor body with a spray-type cleaner and allow each circuit to soak, if necessary, to loosen dirt and varnish. Blow the body with compressed air.

CAUTION

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



INSPECTION AND ADJUSTMENT

CARBURETOR PARTS

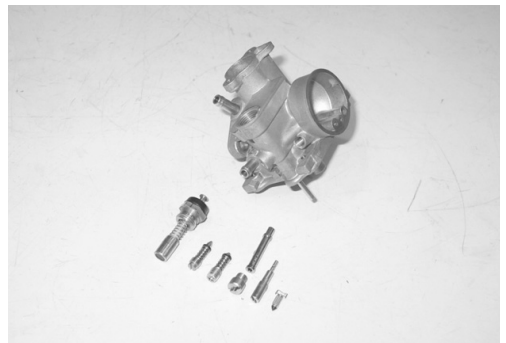
Check the following items for any damage or clogging.

If they are clogged, clean the fuel passage.

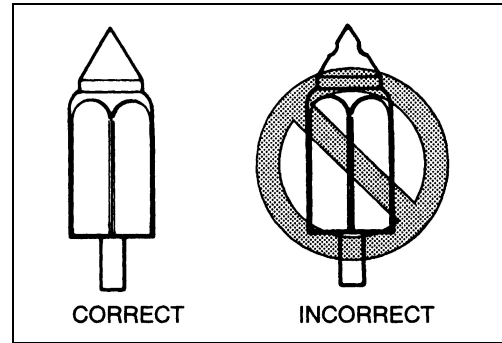
- | | |
|-------------------|-----------------------|
| * Pilot jet | * Pilot passageway |
| * Main jet | * Starter passageway |
| * Starter plunger | * Needle jet |
| * Float | * Throttle stop screw |
| * Piston valve | * Needle valve |

NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle valve, the gasoline will continue flowing and overflow. If the needle valve is worn beyond the permissible limit, similar trouble will occur. Conversely, if the needle valve sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline.



If the needle valve is worn, as shown in the illustration, replace the needle valve assembly with a new one. Clean the fuel passage of the mixing chamber with compressed air.



FLOAT HEIGHT ADJUSTMENT

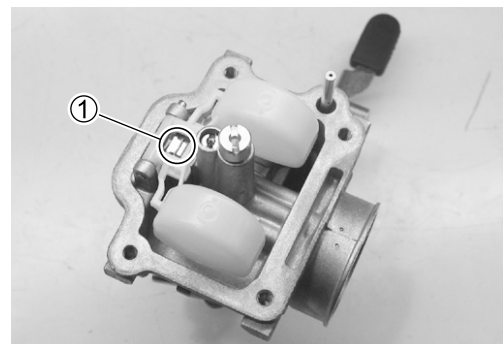
To check the float height, turn the carburetor upside down. Measure the float height $\textcircled{A}$ while the float arm is just contacting the needle valve with vernier calipers.

DATA Float height $\textcircled{A}$: $16 \pm 1 \text{ mm}$ ($0.6 \pm 0.03 \text{ in}$)

TOOL 09900-20102: Vernier calipers



- If the float height $\textcircled{A}$ is out of specification, bend the float arm $\textcircled{1}$ to bring the float height $\textcircled{A}$ to the standard range.
- After adjusting, check the float height $\textcircled{A}$.



REASSEMBLY AND INSTALLATION

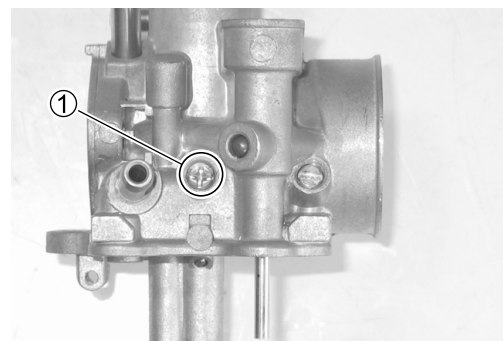
Reassemble and install the carburetor in the reverse order of removal and disassembly. Pay attention to the following points:

⚠ WARNING

The removed gasket and O-rings must be replaced with new ones.

THROTTLE STOP SCREW

- Install the throttle stop screw $\textcircled{1}$.

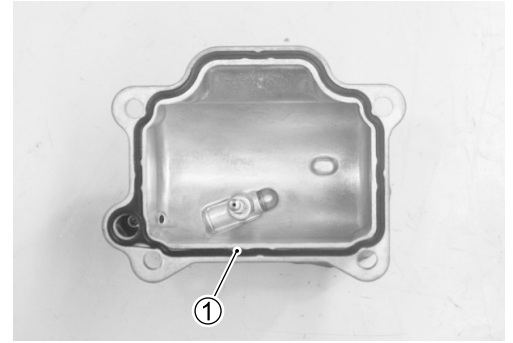


GASKET

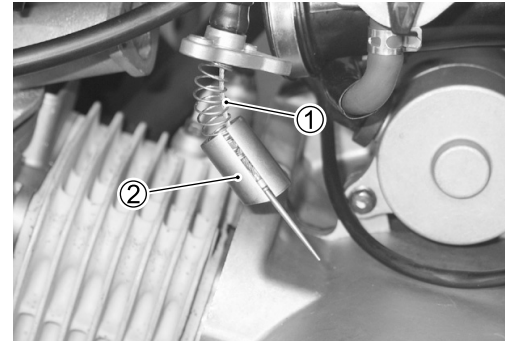
- Install the gasket ①.

⚠ WARNING

The removed gasket must be replaced with a new one to prevent fuel leakage.

**PISTON VALVE AND SPRING**

- Install the piston valve ① and spring ② to the throttle cable.

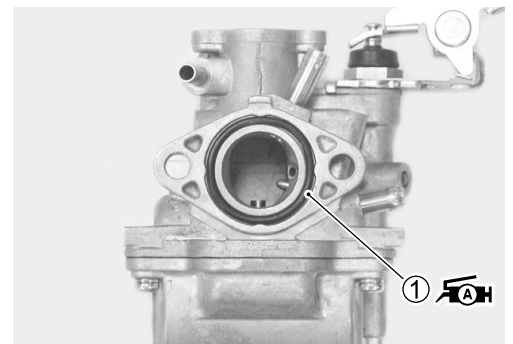


- Apply SUZUKI SUPER GREASE "A" to the O-ring ①.

 99000-25010: SUZUKI SUPER GREASE "A"
(or equivalent)

CAUTION

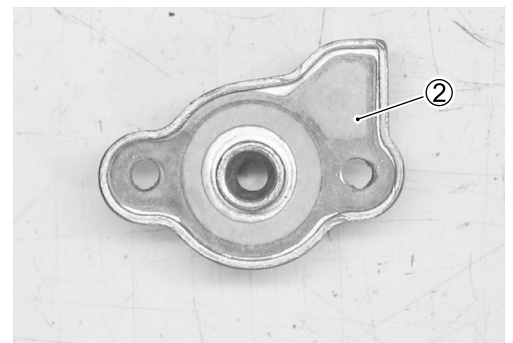
The removed O-ring must be replaced with a new one.



- Install the gasket ②.

CAUTION

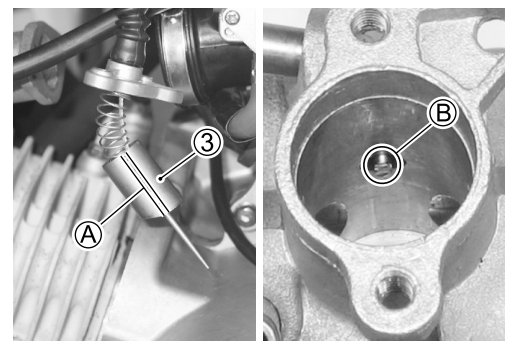
The removed gasket must be replaced with a new one.



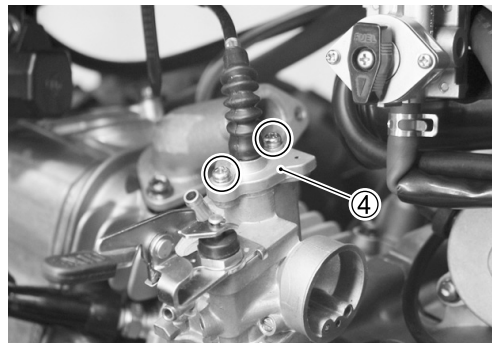
- Install the piston valve ③ to the carburetor.

CAUTION

Align the slit (A) of the piston valve ③ with the projection (B) on the carburetor body.



- Install the carburetor top cap ④.



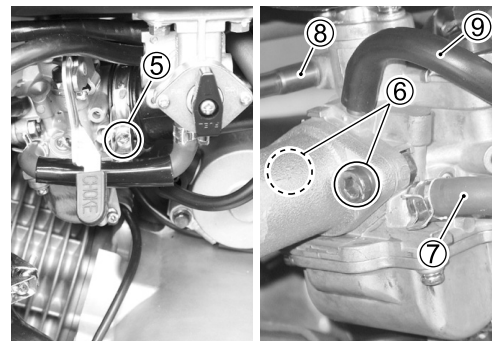
- Install the intake pipe clamp ⑤.
- Tighten the carburetor mounting bolts ⑥ to the specified torque.

🔧 Carburetor mounting bolt: 6 N·m (0.6 kgf-m, 4.5 lb-ft)

- Install the fuel hose ⑦.
- Install the air vent hose ⑧.
- Install the vacuum hose ⑨.

NOTE:

Do not squall each hose.



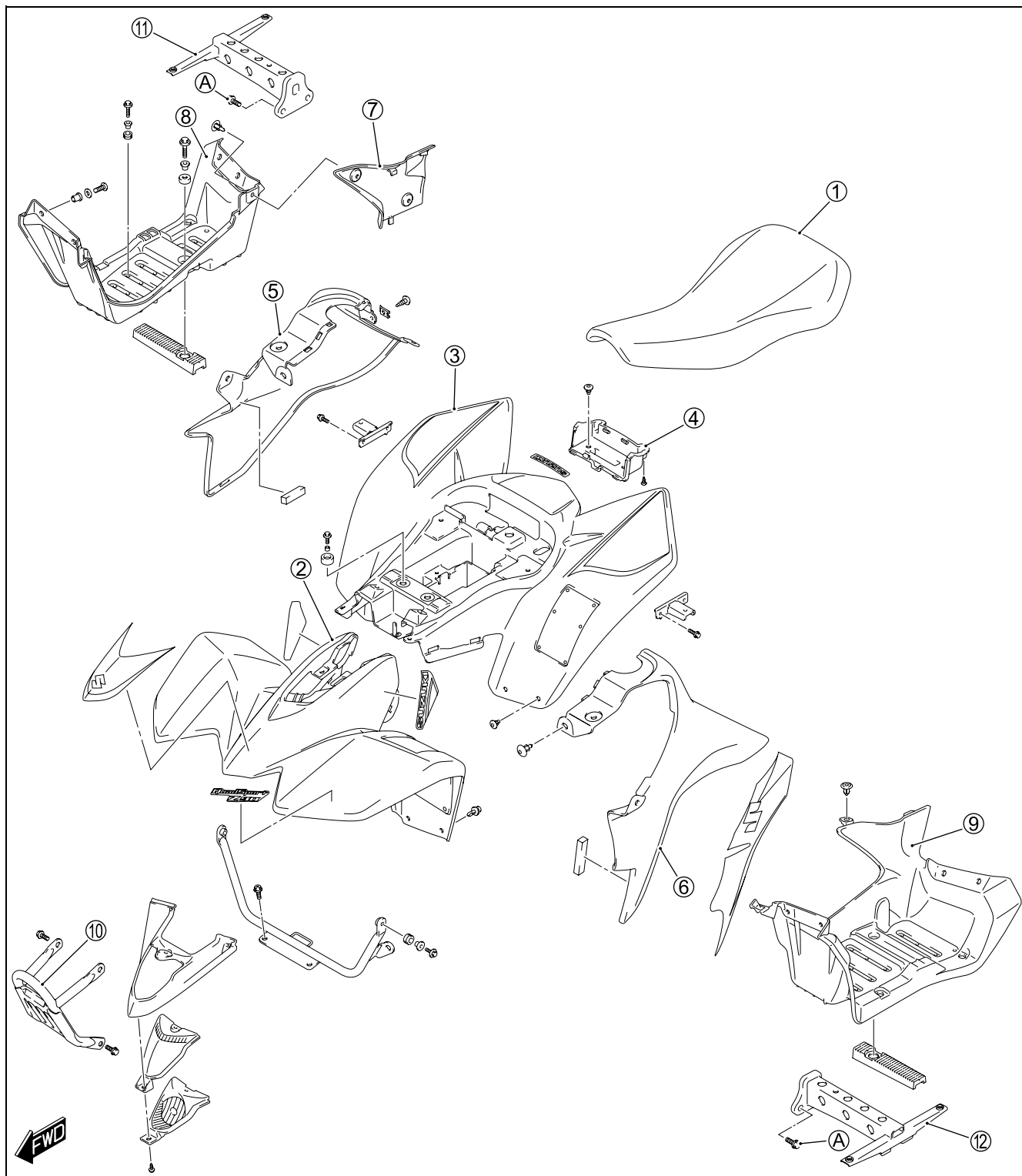
- After installing the carburetor, perform the following:
 - * Inspect fuel leakage.
 - * Engine idle r/min adjustment..... 🗝 2-13
 - * Throttle cable play adjustment..... 🗝 2-13

CHASSIS

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EXTERIOR PARTS CONSTRUCTION



① Seat	⑦ Footrest lid
② Front fender	⑧ Right footrest mudguard
③ Rear fender	⑨ Left footrest mudguard
④ Rear lower fender	⑩ Front grip
⑤ Right fuel tank cover	⑪ Right footrest bar
⑥ Left fuel tank cover	⑫ Left footrest bar



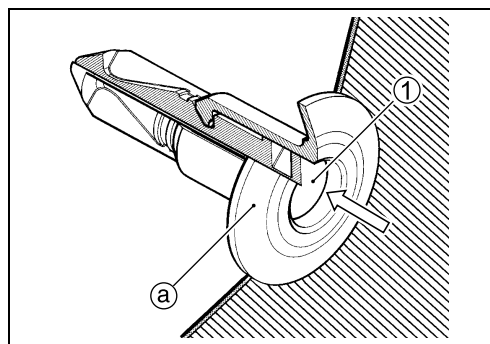
ITEM	N·m	kgf-m	lb-ft
①	55	5.5	40.0

FASTENER REMOVAL AND INSTALLATION

FASTENER

Removal

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

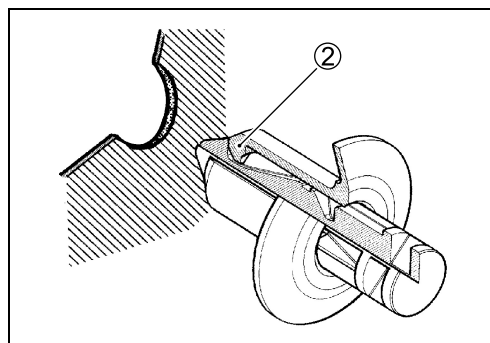


Installation

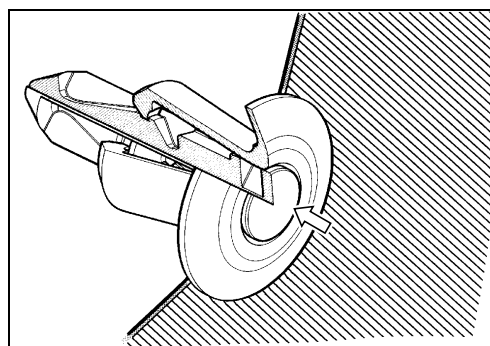
- Let the center piece stick out toward the head so that the pawls ② close.
- Insert the fastener into the installation hole.

NOTE:

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



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



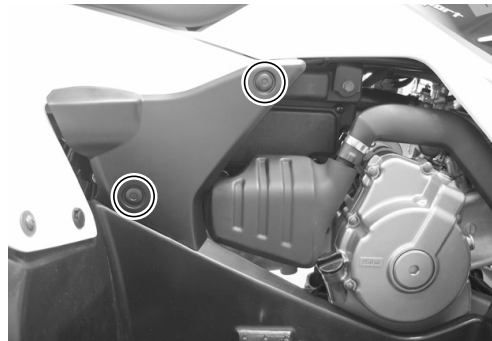
REMOVAL SEAT

- Remove the seat.



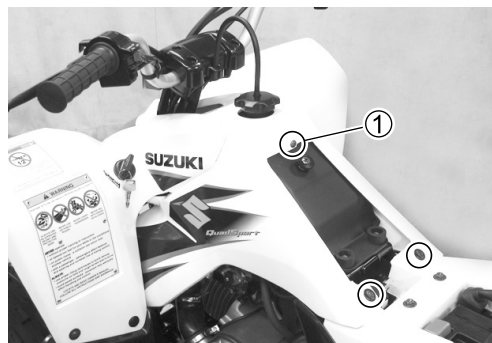
FOOTREST LID

- Remove the footrest lid.



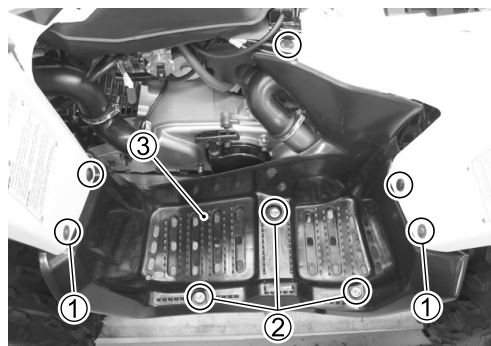
FUEL TANK COVER

- Remove the seat. (☞ above)
- Remove the footrest lid. (☞ above)
- Remove the screw ① and fastener.

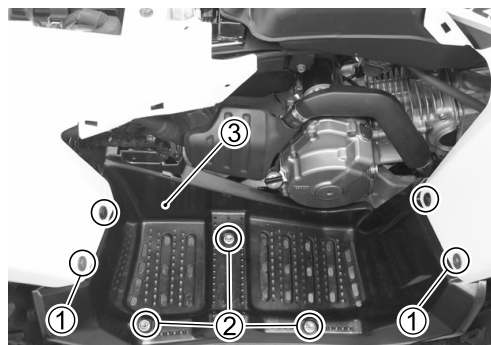


LEFT FOOTREST MUDGUARD

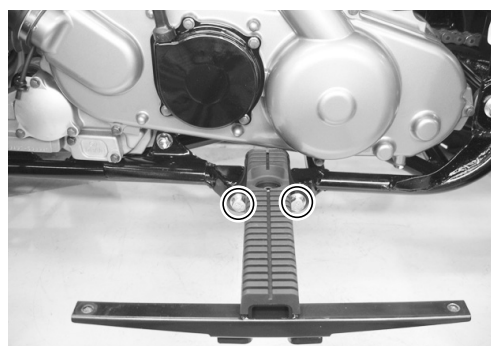
- Remove the fuel tank cover. (☞ 5-4)
- Remove the screws ① and fasteners.
- Remove the bolts ②.
- Remove the left footrest mudguard ③.

**RIGHT FOOTREST MUDGUARD**

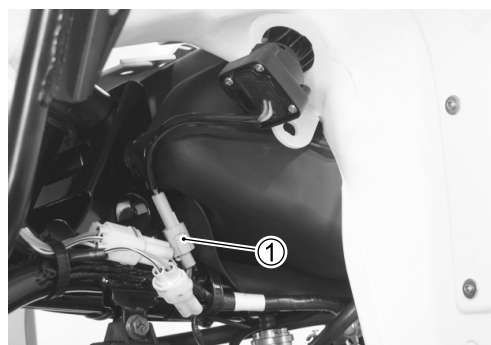
- Remove the fuel tank cover. (☞ 5-4)
- Remove the footrest lid. (☞ 5-4)
- Remove the screws ① and fasteners.
- Remove the bolts ②.
- Remove the right footrest mudguard ③.

**FOOTREST BAR**

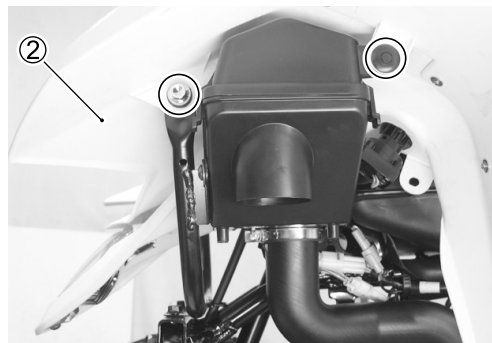
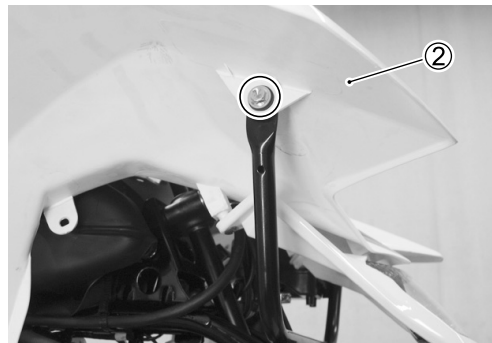
- Remove the fuel tank cover. (☞ 5-4)
- Remove the footrest lid. (☞ 5-4)
- Remove the footrest mudguard, left and right. (☞ above)
- Remove the footrest bar, left and right.

**FRONT FENDER**

- Remove the seat. (☞ 5-4)
- Remove the footrest lid. (☞ 5-4)
- Remove the footrest mudguard, left and right (☞ above)
- Remove the ignition switch coupler ①.

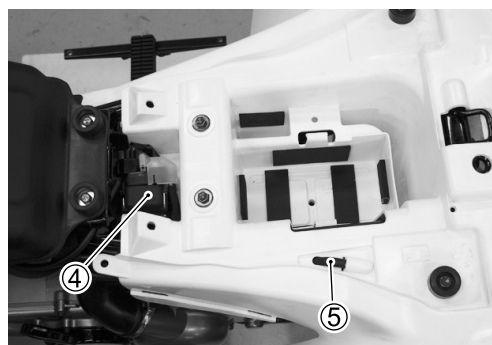
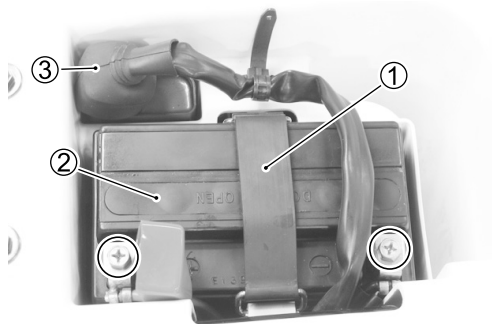


- Remove the front fender ②.

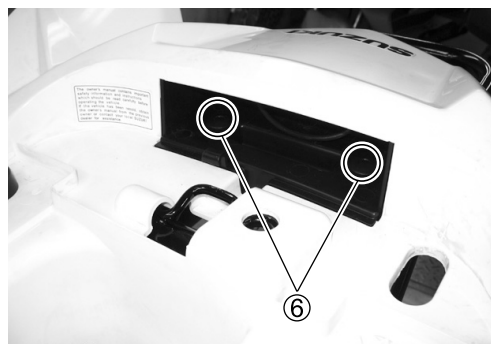


REAR FENDER

- Remove the seat. (5-4)
- Remove the footrest lid. (5-4)
- Remove the fuel tank cover. (5-4)
- Remove the footrest mudguard, left and right (5-5)
- Disconnect the $\ominus$ battery cable first, and then $\oplus$ battery cable.
- Remove the battery band ①.
- Remove the battery ② and CDI unit ③.
- Remove the starter relay ④.
- Remove the breather hose ⑤.

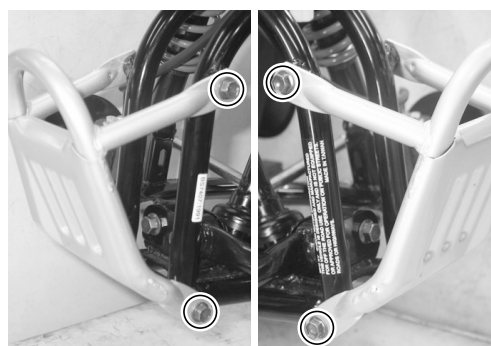


- Remove the rear lower fender fastener ⑥.
- Remove the rear fender ⑦.



FRONT GRIP

- Remove the front grip.



INSTALLATION

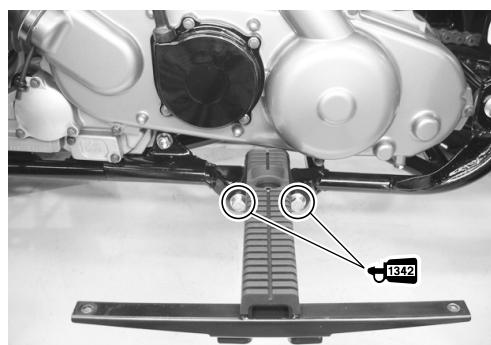
Install the exterior parts in the reverse order of removal. Pay attention to the following points:

FOOTREST BAR

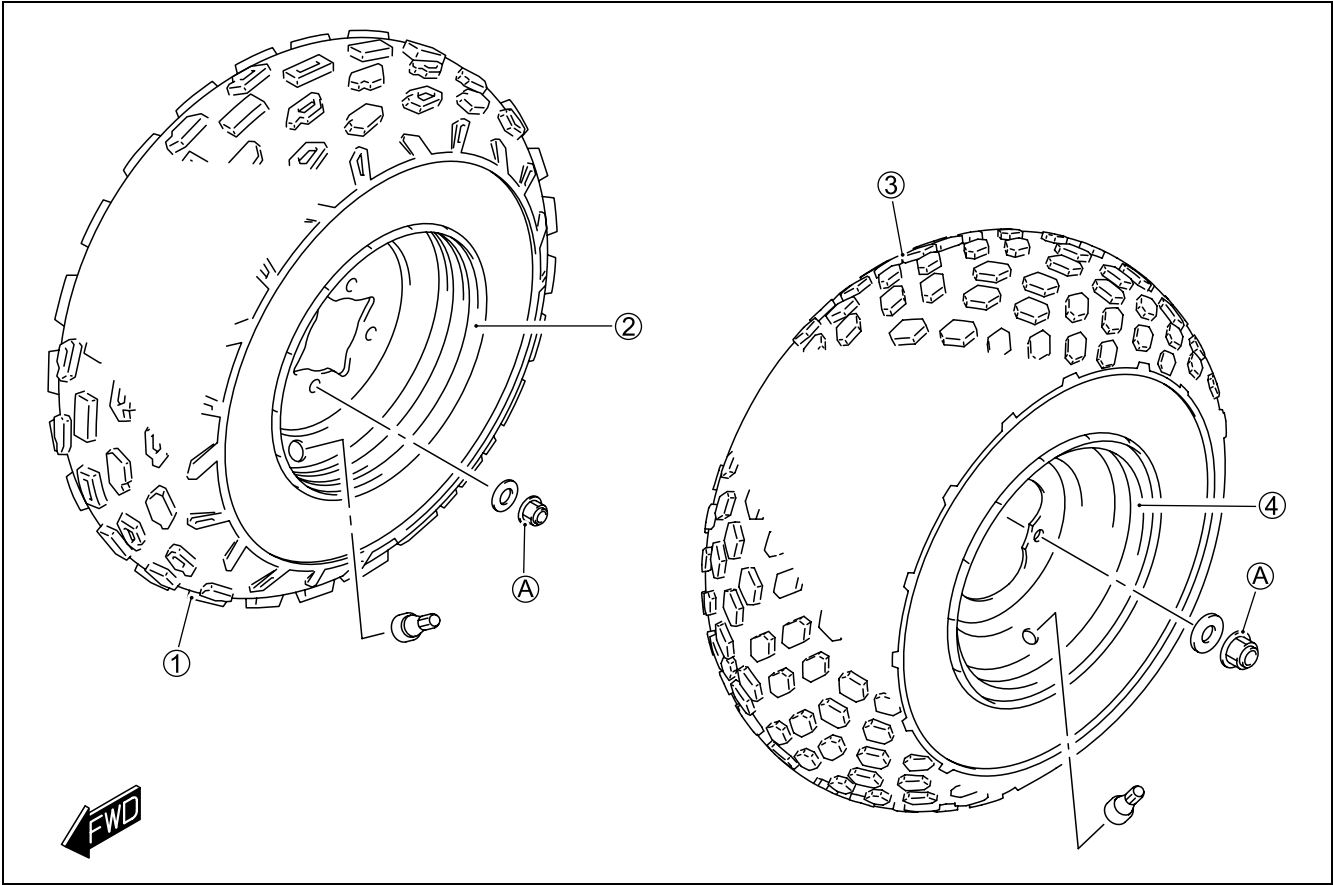
- Apply THREAD LOCK “1342” to the footrest mounting bolts and tighten footrest mounting bolts the specified torque.

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

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



FRONT AND REAR WHEELS CONSTRUCTION



①	Front tire	④	Rear wheel
②	Front wheel	Ⓐ	Wheel set nut (front & rear)
③	Rear tire		

ITEM	N·m	kgf·m	lb·ft
Ⓐ	55	5.5	40.0

REMOVAL

- Place the vehicle on level ground.
- Support the vehicle with a jack or block and remove the front and rear wheel set nuts.
- Remove the front and rear wheels.



INSTALLATION

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

- Installing each wheel, make sure the arrow Ⓐ on the tire points in the direction of rotation.
- Tighten the wheel set nuts to the specified torque.

 **Front and rear wheel set nut:**

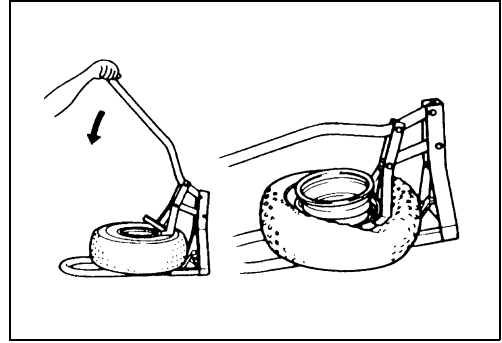
55 N·m (5.5 kgf-m, 40.0 lb-ft)



TIRES

TIRE REPLACEMENT

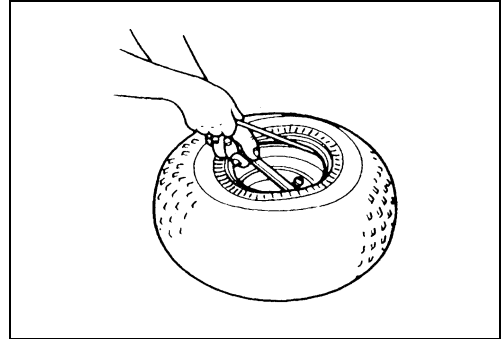
- Remove the front and rear wheels. (☞ 5-8)
- After removing the air valve caps, release the tire pressure by depressing the valves.
- Dismount the bead from the rim completely as shown.



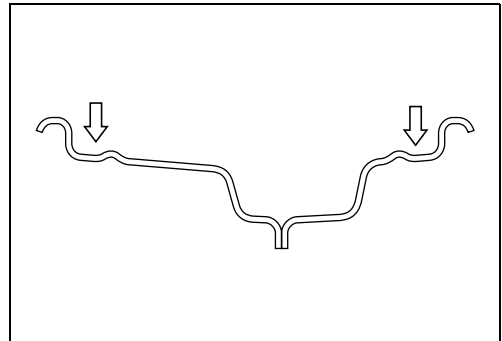
- Separate the tire from the rim using a set of tire levers and rim protectors.

CAUTION

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



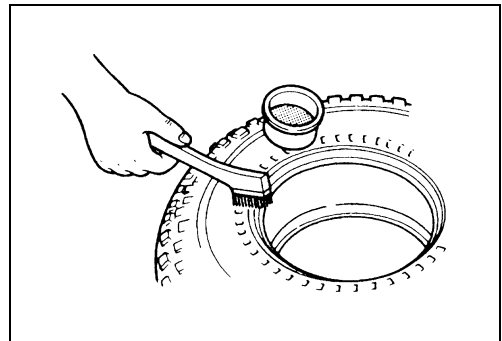
- Inspect the sealing portion of the rim for contamination and distortion. If any defects are found, replace the rim with a new one.
- Clear up the sealing portion of the rim.



- 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.

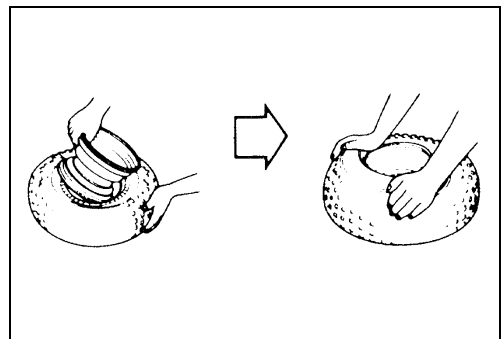


CAUTION

The standard tire fitted on this vehicle is AT19 × 7-8☆ for the front and rear.

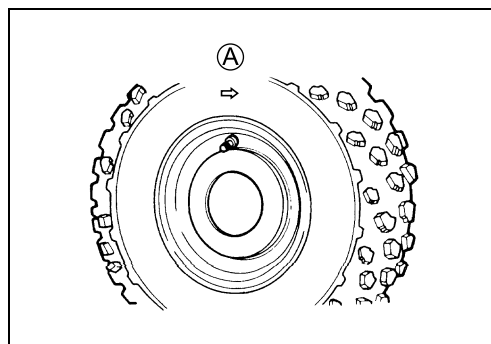
The use of tires other than the standard may cause instability. It is highly recommended to use the specified tire.

- Mount the tire on the rim by hand as shown.



NOTE:

- * For inspecting the tires, refer to page 2-22.
- * Inspect the valve cores, before installation.
- * When installing each tire, make sure that the arrow **A** on the side wall of the tire points in the direction of rotation. Also, make sure the outer side of the wheel rim is facing outward.

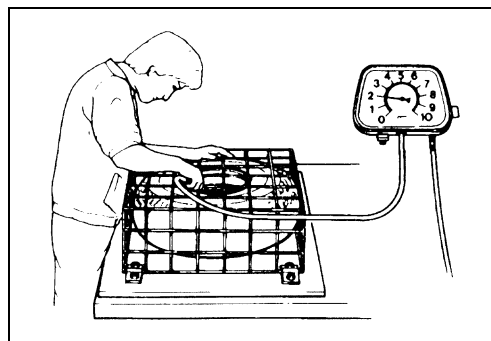


- Inflate the tire to seat the tire bead.

DATA Maximum tire bead seat pressure
 Front : 250 kPa (2.5 kgf/cm², 36 psi)
 Rear : 250 kPa (2.5 kgf/cm², 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.

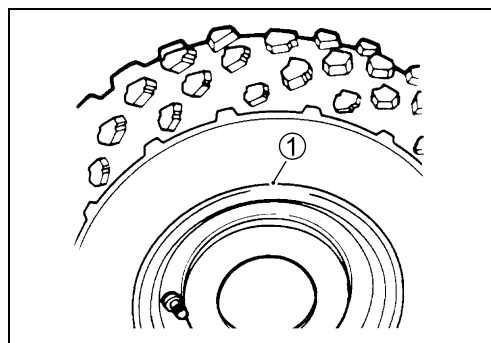
- Adjust the tire pressure to the specified pressure.

DATA Cold inflation tire pressure
 Front : 22.5 kPa (0.225 kgf/cm², 3.3 psi)
 Rear : 20 kPa (0.20 kgf/cm², 2.9 psi)

DATA Vehicle load capacity: 90 kg (198.0 lbs)

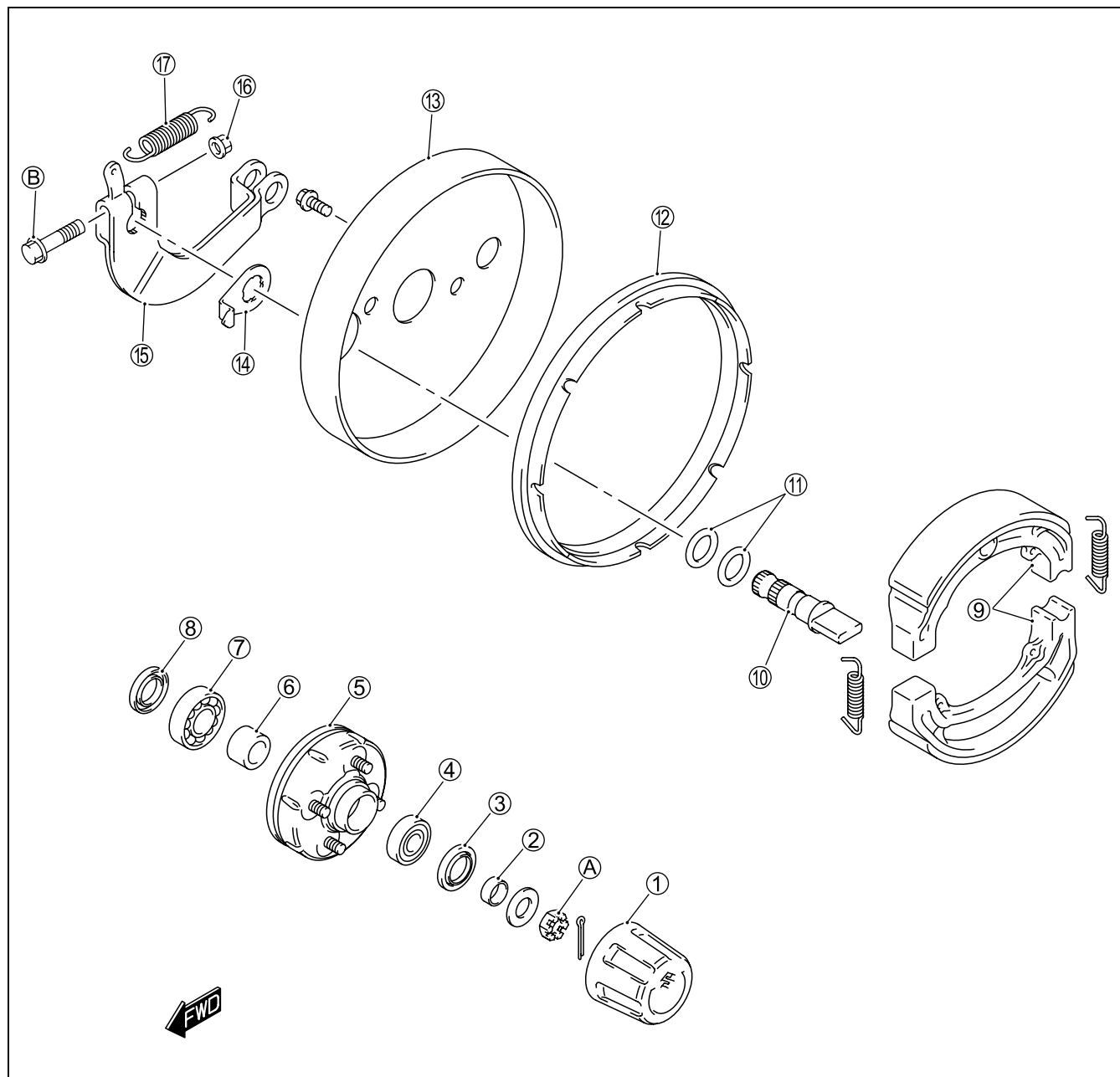
CAUTION

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/cm², 3.6 psi)

FRONT BRAKE CONSTRUCTION



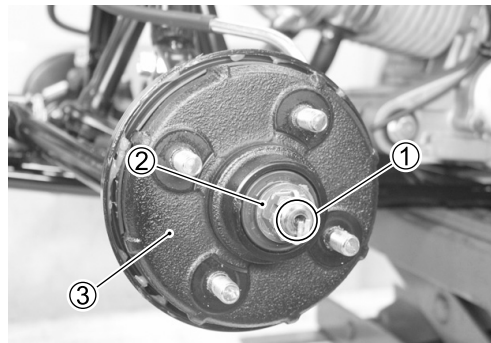
①	Wheel center cap	⑪	O-ring
②	Axle spacer	⑫	Front brake dust seal
③	Outer dust seal	⑬	Brake plate
④	Wheel hub outer bearing	⑭	Limit indicator
⑤	Front wheel hub	⑮	Brake cam lever
⑥	Spacer	⑯	Front brake cam lever bolt
⑦	Wheel hub inner bearing	⑰	Spring
⑧	Inner dust seal	A	Front hub nut
⑨	Front brake shoe	B	Front brake cam lever nut
⑩	Front brake camshaft		



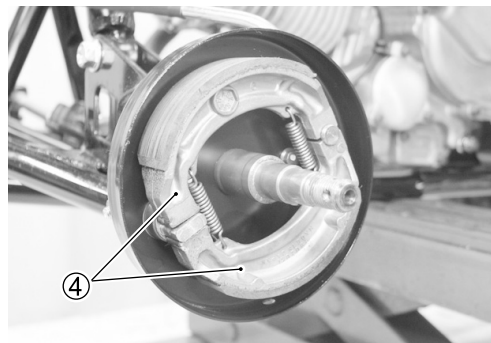
ITEM	N·m	kgf·m	lb·ft
A	65	6.5	47.0
B	8	0.8	6.0

REMOVAL

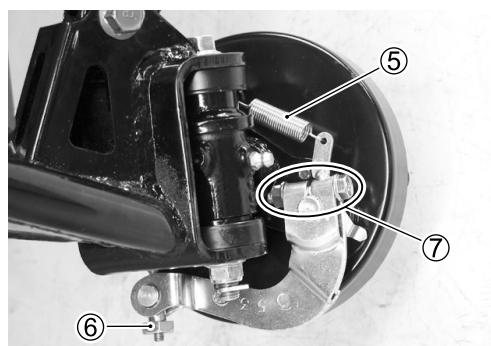
- Remove the front wheel. (→ 5-8)
- Remove the wheel center cap.
- Remove the cotter pin and front hub nut ①.
- Remove the front washer ② and wheel hub ③.



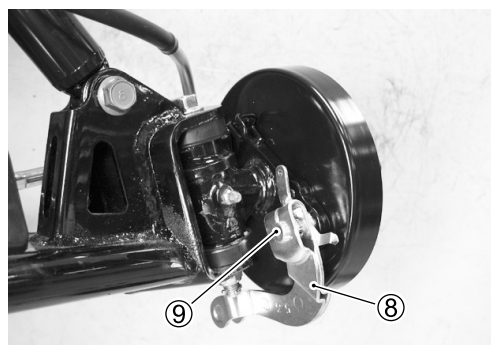
- Remove the front brake shoe assembly ④.



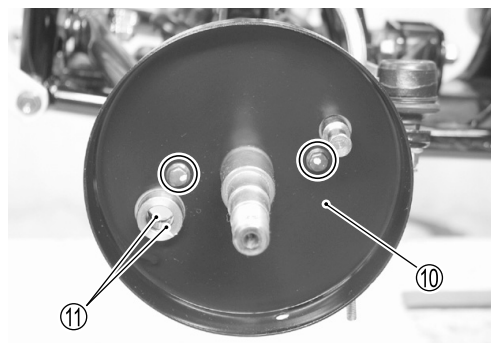
- Remove the spring ⑤.
- Remove the front brake adjusting nut ⑥.
- Remove the front brake cam lever nut/bolt ⑦.



- Remove the brake cam lever ⑧ and front brake camshaft ⑨.



- Remove the brake plate ⑩.
- Remove the O-rings ⑪.

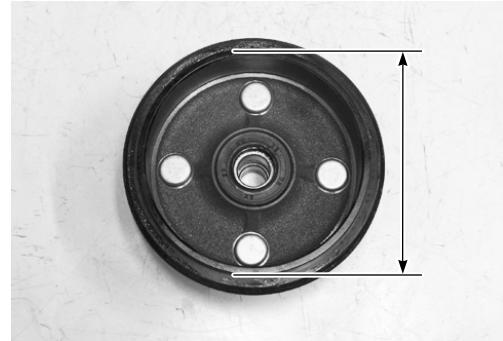


INSPECTION AND DISASSEMBLY BRAKE DRUM/WHEEL HUB

Inspect the brake drum and measure the brake drum I.D. to determine the extent of wear. Replace the brake drum if the measurement exceeds the service limit.

TOOL 09900-20101: Vernier calipers

DATA Brake drum I.D.:
Service Limit: 110.7 mm (4.35 in)



BRAKE SHOE

Inspect the brake shoes for wear or damage. If any defects are found, replace it with new ones.

CAUTION

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



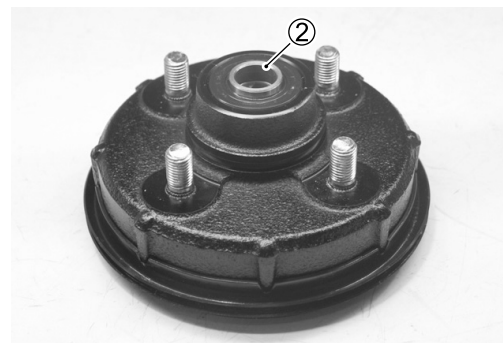
FRONT BRAKE DUST SEAL

Inspect the front brake drum dust seal ① for wear or damage. If any defects are found, replace it with a new one.



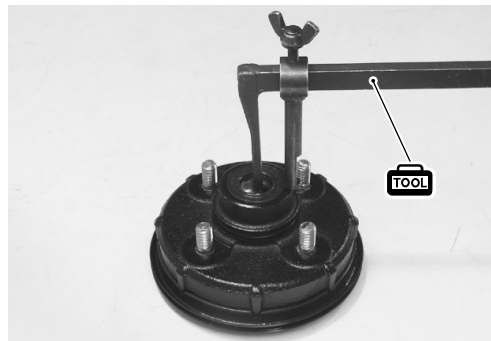
DUST SEAL

- Remove the axle spacer ②.



- Remove the dust seals with the special tool.

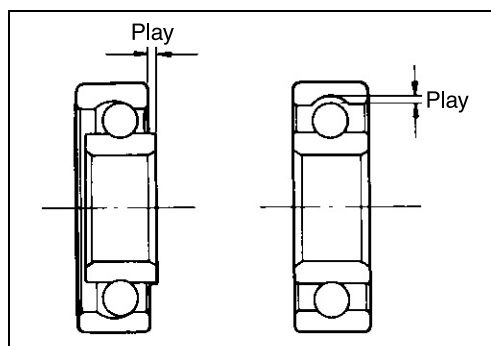
 **09913-50121: Oil seal remover**



WHEEL HUB BEARING

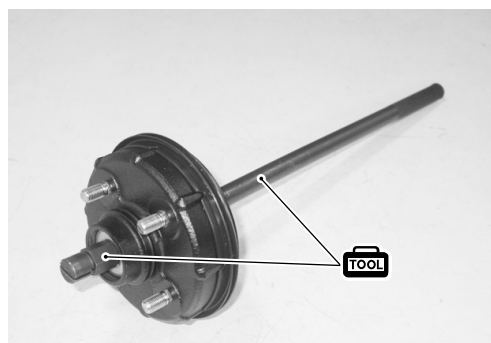
Inspect the inner race play of the wheel hub bearing by hand while it is in the wheel hub.

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.

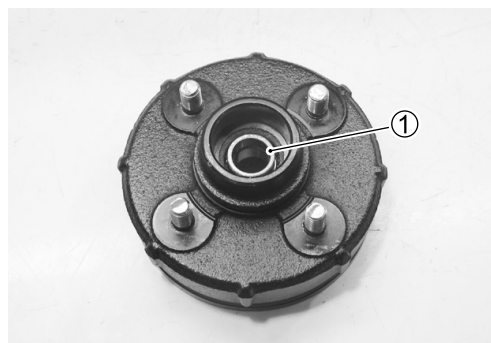


- Remove the wheel hub outer bearing with the special tool.

 **09941-50111: Bearing remover**

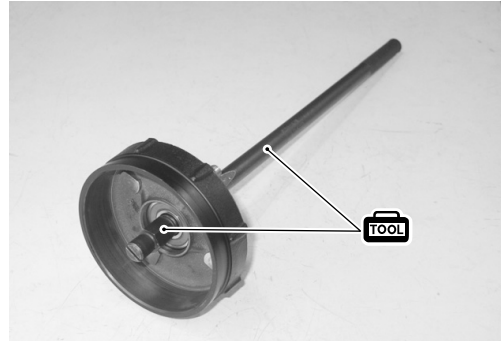


- Remove the spacer ①.



- Remove the wheel hub inner bearing with the special tool.

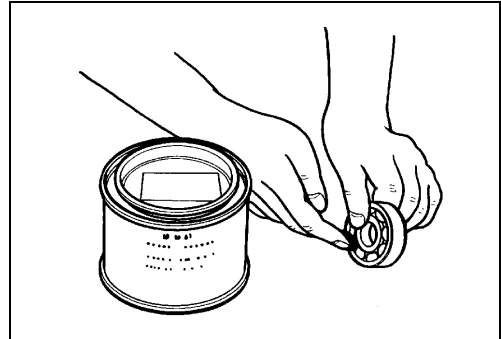
 **09941-50111: Bearing remover**



REASSEMBLY AND INSTALLATION BEARING

- Apply SUZUKI SUPER GREASE "A" to the wheel hub bearings.

 **99000-25010: SUZUKI SUPER GREASE "A" or equivalent**

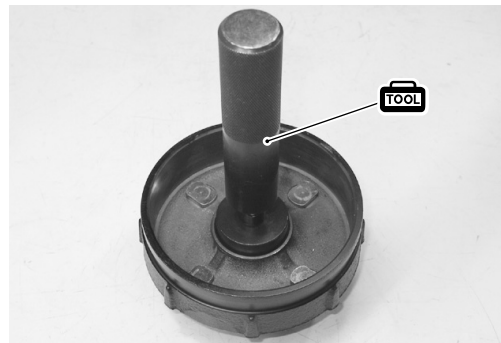


- Install the wheel hub inner bearing with the special tool.

 **09913-70210: Bearing installer set**

CAUTION

- * First install the wheel hub inner bearing, then install the spacer and outer bearing.
- * The sealed cover of the bearing must face outside.
- * The removed bearing must be replaced with a new one

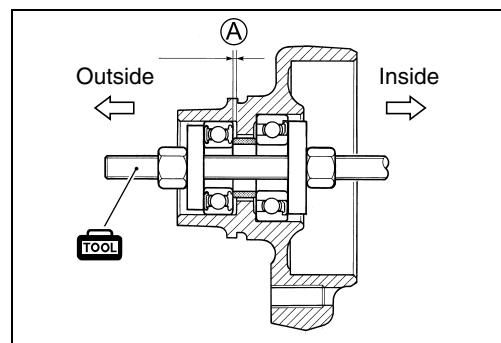


- Install the wheel hub outer bearing with the special tool and suitable size socket wrench.

 **09924-84510: Bearing installer set**

CAUTION

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



Ⓐ: Clearance

- Install the dust seals with the special tool.

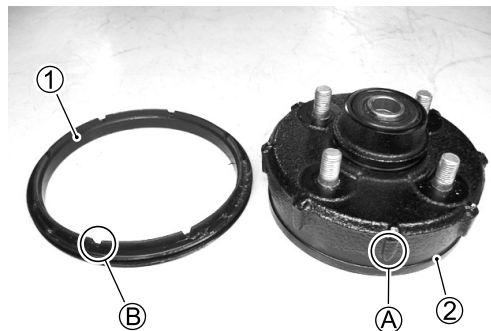
TOOL 09913-70210: Bearing installer set

CAUTION

The removed dust seals must be replaced with new ones.



- Install the front brake drum dust seal ① to the groove of the front brake drum ②.
- Align the front brake drum ① with the groove of front brake drum dust seal ②.



- Apply WATER RESISTANCE GREASE to the each dust seal lip.

W 99000-25160: RESISTANCE GREASE

(or equivalent)

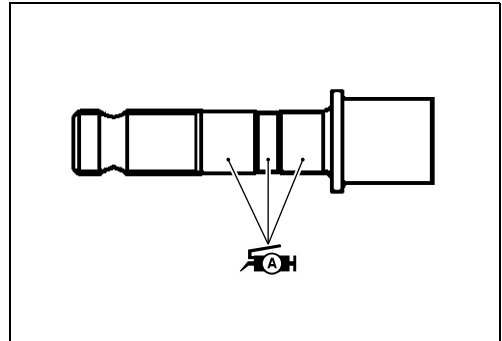
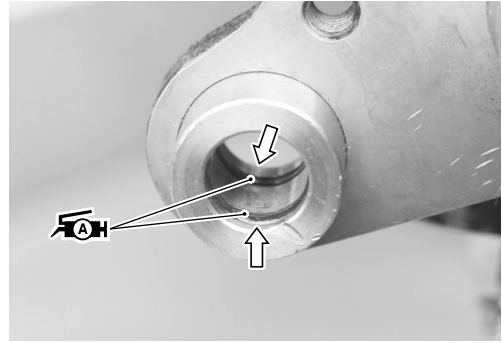


- Install the O-rings.
- Apply SUZUKI SUPER GREASE "A" to the O-rings and camshaft.

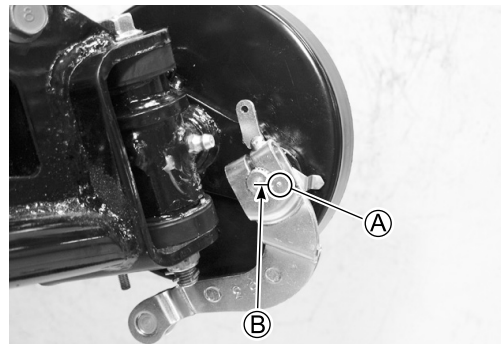
 99000-25010: SUZUKI SUPER GREASE "A"
(or equivalent)

CAUTION

The removed O-rings must be replaced with new ones.



- Align the punched mark  of the brake cam lever with the slit  of the front brake camshaft.

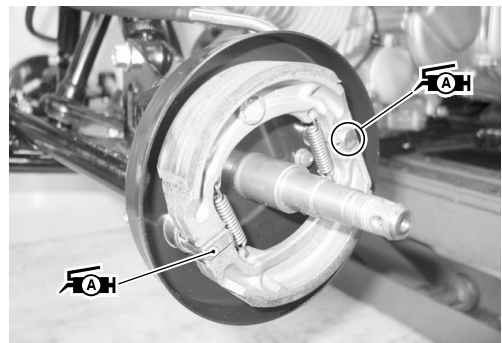


- Apply SUZUKI SUPER GREASE "A" to the front brake camshaft and pin, and then install the brake shoes.

 99000-25010: SUZUKI SUPER GREASE "A" or equivalent

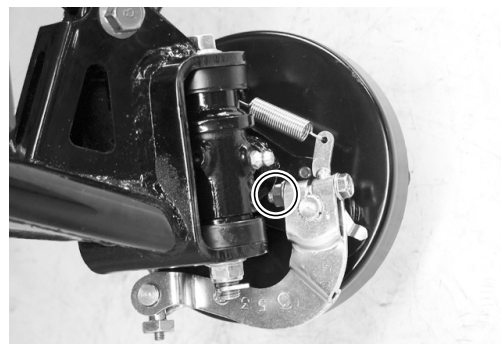
⚠ WARNING

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



- Install the front wheel hub and spring.
- Tighten front brake cam lever nut to the specified torque.

 Front brake cam lever nut: 8 N·m (0.8 kgf·m, 6.0 lb-ft)



- Tighten the front hub nut to the specified torque.

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

- Install the cotter pin.

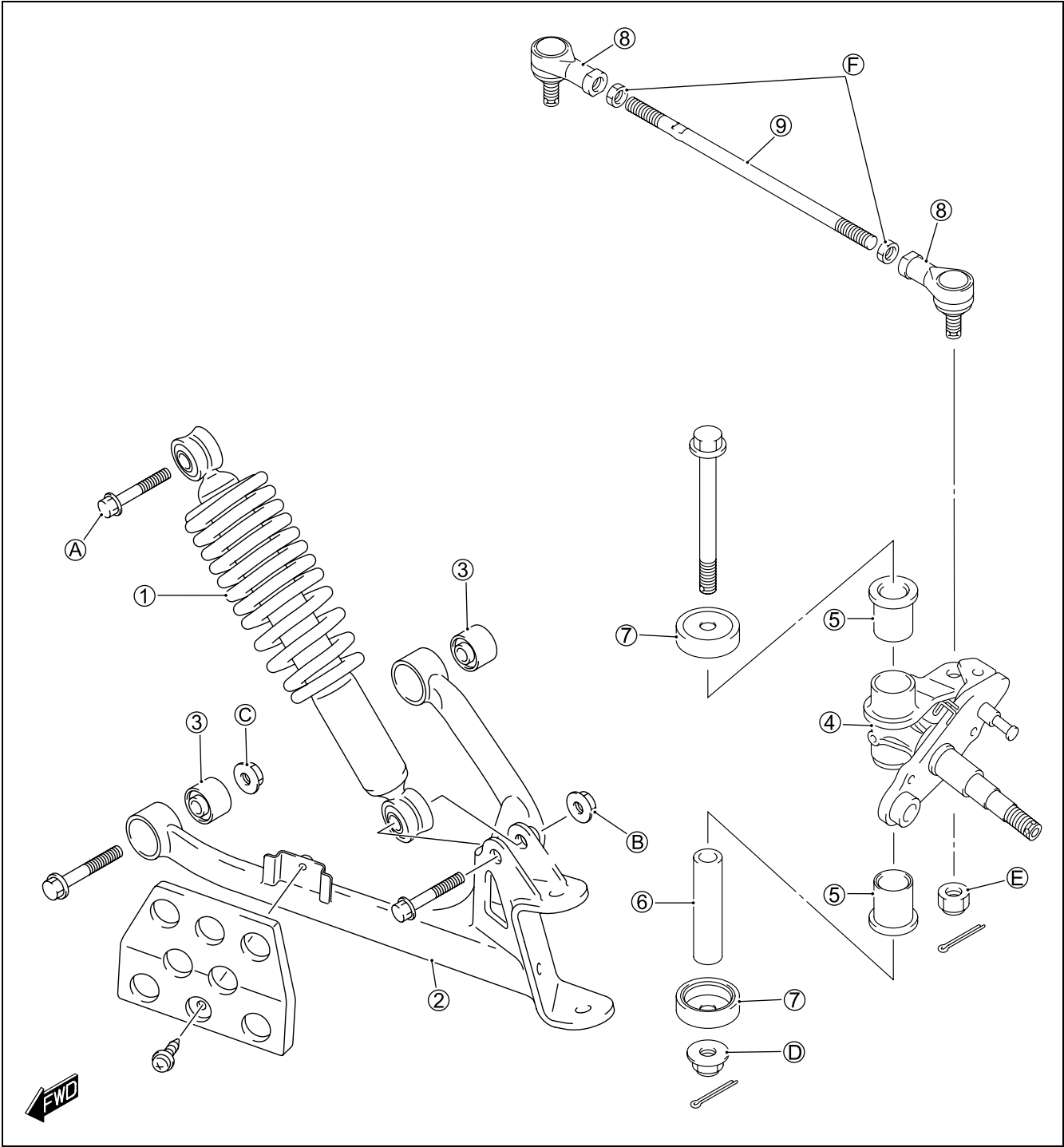
CAUTION

The removed cotter pin must be replaced with a new one.

- Install the front wheel. ( 5-8)
- After installing the front brake, adjust the front brake lever play. ( 2-20)

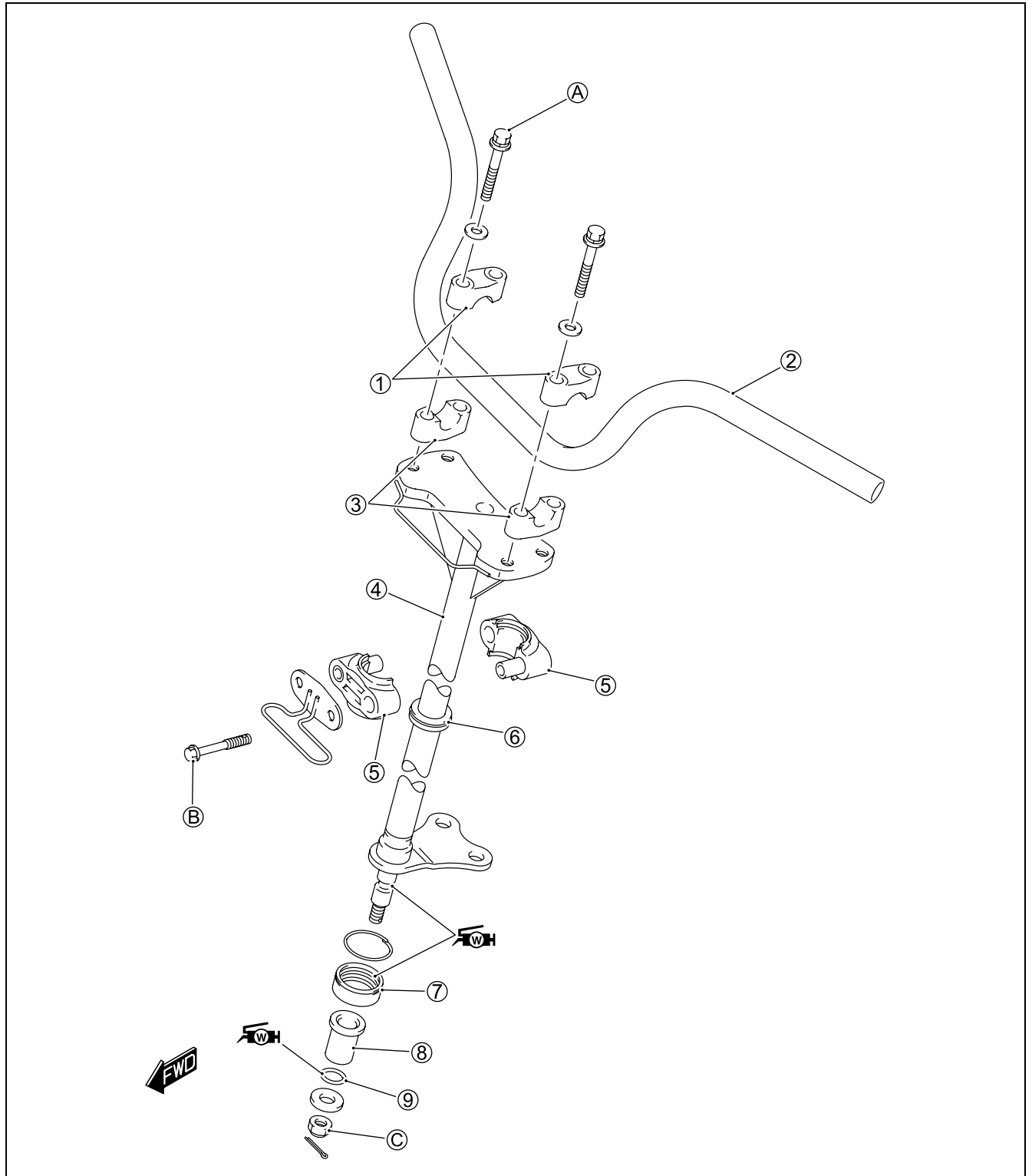


STEERING AND FRONT SUSPENSION CONSTRUCTION



①	Front shock absorber	⑨	Tie-lod
②	Front suspension arm	A	Front shock absorber upper nut
③	Bush	B	Front shock absorber lower nut
④	Steering knuckle arm	C	Front suspension arm bolt
⑤	Knuckle arm bush	D	Steering knuckle arm nut
⑥	Spacer	E	Tie-rod end nut
⑦	Dust seal	F	Tie-rod locknut
⑧	Tie-lod end		

ITEM	N·m	kgf·m	lb·ft
A	50	5.0	36.0
B	50	5.0	36.0
C	65	6.5	47.0
D	60	6.0	43.5
E	50	5.0	36.0
F	29	2.9	21.0



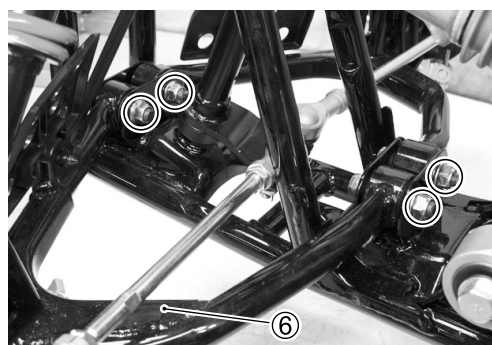
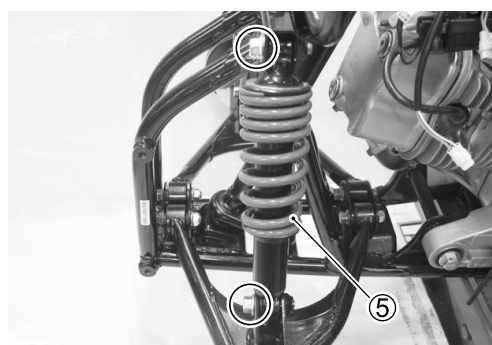
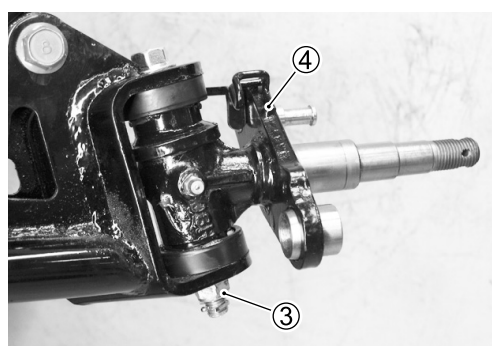
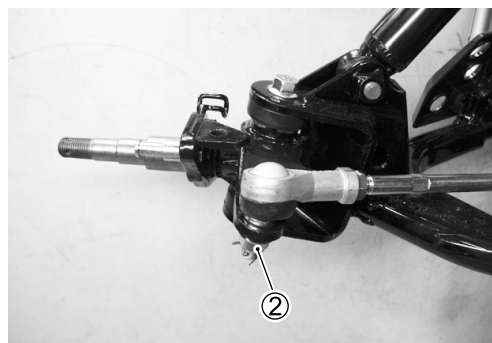
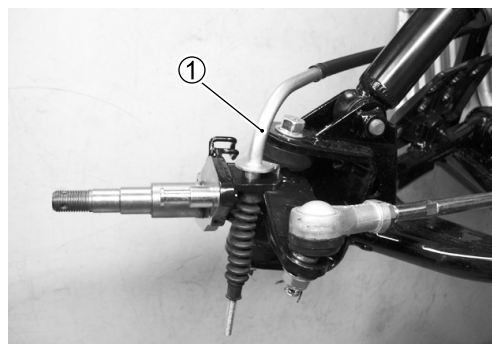
①	Handlebar upper holder	⑦	Steering shaft lower dust seal
②	Handlebars	⑧	Steering shaft bush
③	Handlebar lower holder	⑨	O-ring
④	Steering shaft	A	Handlebar clamp bolt
⑤	Steering shaft holder	B	Steering shaft holder bolt
⑥	Dust seal	C	Steering shaft lower nut



ITEM	N·m	kgf-m	lb-ft
A	25	2.5	18.0
B	23	2.3	17.0
C	35	3.5	25.5

REMOVAL AND DISASSEMBLY FRONT SUSPENSION

- Remove the front wheel. (☞ 5-8)
 - Remove the front grip. (☞ 5-7)
 - Remove the front brake. (☞ 5-13)
 - Remove the front brake cable ①.
-
- Remove the cotter pin and tie-rod end nut ②.
-
- Remove the cotter pin and knuckle arm nut ③.
 - Remove the knuckle arm ④.
-
- Remove the front shock absorber ⑤.
-
- Remove the front suspension arm ⑥.



INSPECTION

KNUCKLE ARM BUSH

Insert the spacer into the bush and inspect for abnormal noise and smooth rotation while rotating the spacer.

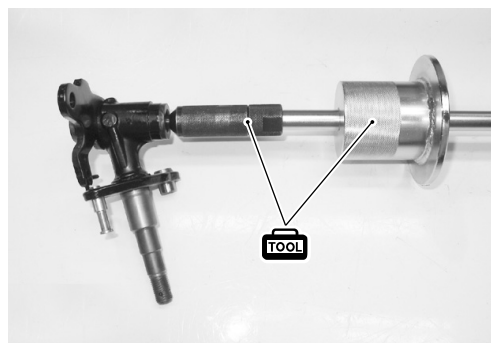
If any defects are found, replace it with a new one.

- Remove the knuckle arm bushes with the special tools.



09923-73210: Bearing remover

09930-30104: Sliding shaft



SUSPENSION ARM

Inspect the suspension arm and suspension arm bush for wear or damage. If any defects are found, replace it with a new one.



FRONT SHOCK ABSORBER

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

CAUTION

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



REASSEMBLY AND INSTALLATION STEERING KNUCKLE ARM

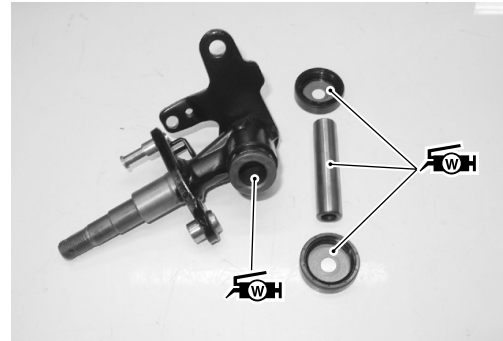
- Install the knuckle arm bush with the special tool.

 **09924-84510: Bearing installer set**



- Apply SUZUKI RESISTANCE GREASE to the knuckle arm bushes, dust seals and spacer.
- Install the spacer and dust seals.

 **99000-25160: SUZUKI RESISTANCE GREASE**
(or equivalent)



FRONT SUSPENSION

- Tighten the front suspension arm bolts to the specified torque.

 **Front suspension arm pivot nut:**
65 N·m (6.5 kgf·m, 47.0 lb-ft)



- Tighten the front shock absorber bolts to the specified torque.

 **Front shock absorber upper bolt: 50 N·m**
(5.0 kgf·m, 36.0 lb-ft)

Front shock absorber lower bolt: 50 N·m
(5.0 kgf·m, 36.0 lb-ft)

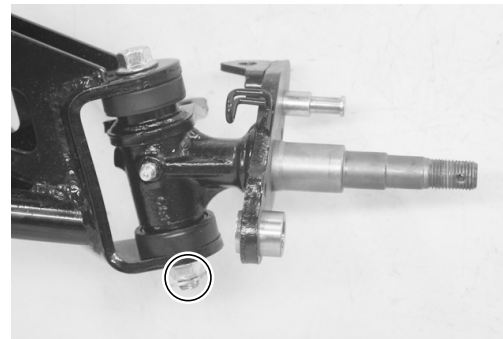


- Tighten the knuckle arm nut to the specified torque and install the cotter pin.

 **Steering knuckle arm nut: 60 N·m (6.0 kgf·m, 43.5 lb-ft)**

CAUTION

The removed cotter pin must be replaced with a new one.



- Tighten the tie rod end nut to the specified torque and install the cotter pin.

🔧 Tie rod end nut: 50 N·m (5.0 kgf·m, 36.0 lb-ft)

NOTE:

Make sure that the steering turns smoothly in both directions.

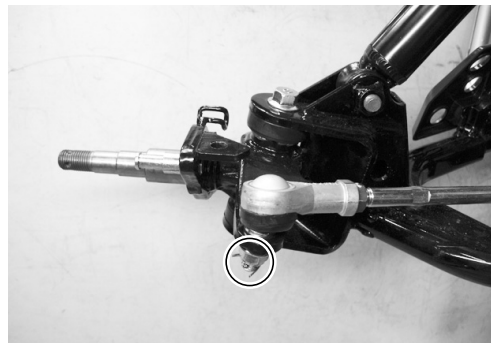
CAUTION

The removed cotter pin must be replaced with a new one.

- Install the front brake. (🔧 5-16)
- Install the front grip. (🔧 5-7)
- Install the front wheel. (🔧 5-9)

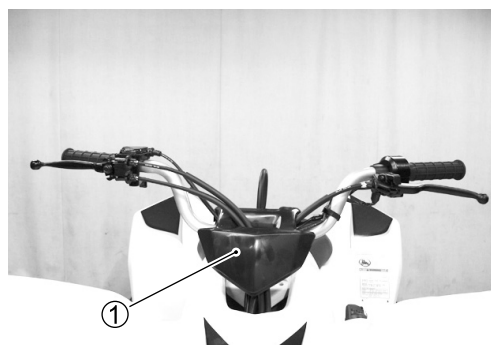
After installing the front brake and front suspension, adjust the following items.

- * Front brake lever play. (🔧 2-20)

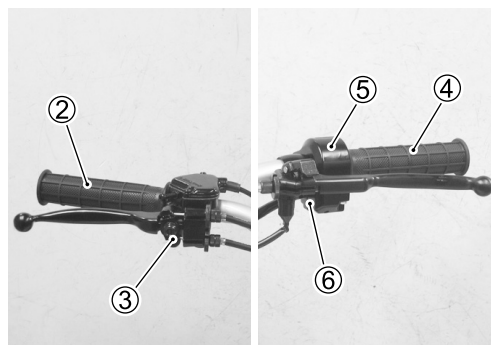


STEERING

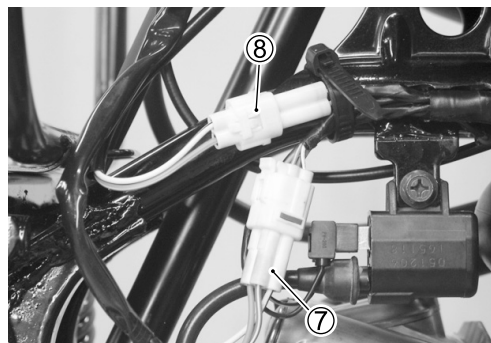
- Remove the front fender. (🔧 5-5)
- Remove the front suspension. (🔧 5-22)
- Remove the steering head cover ①.



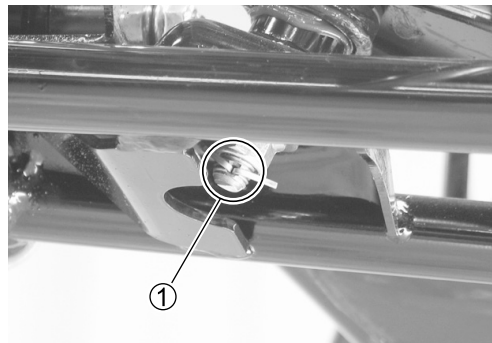
- Remove the right grip ②, front brake lever ③.
- Remove the left grip ④, left handle switch ⑤ and rear brake lever ⑥.



- Disconnect the left handle switch coupler ⑦ and parking brake switch coupler ⑧.



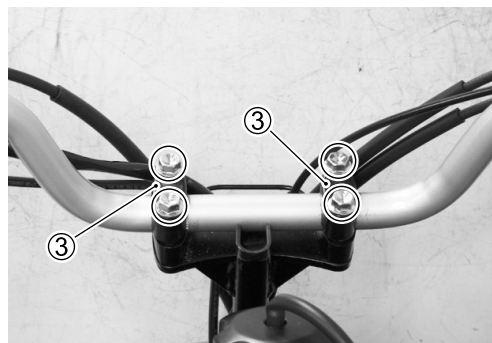
- Remove the cotter pin and steering shaft lower nut ① and O-ring.



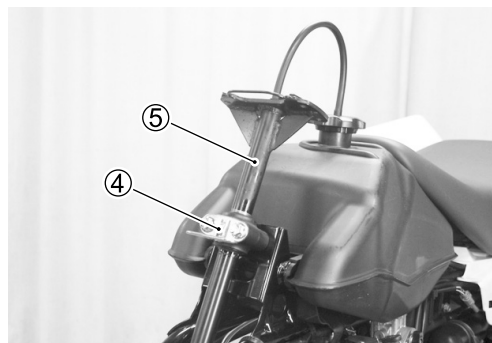
- Remove the cotter pins and tie-rod end nuts ②.
- Remove the tie rods.



- Remove the handlebar clamp ③.

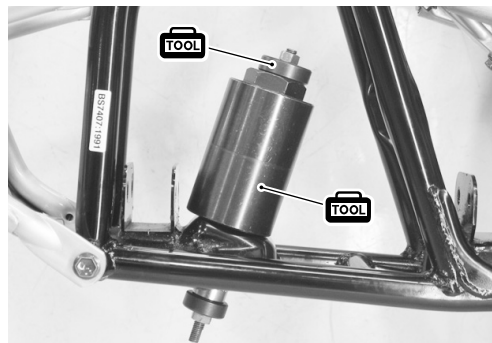


- Remove the steering shaft holder ④ and steering shaft ⑤.

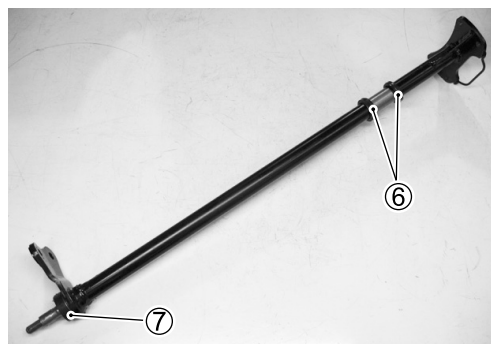


- Remove the steering shaft bush with the special tools and suitable size wrench.

TOOL 09924-84521: Bearing installer set
09930-30721: Rotor remover



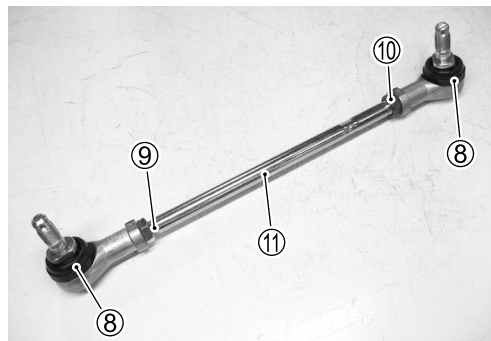
- Remove the dust seals ⑥ and steering shaft lower dust seal ⑦.



- Separate the tie-rod ends ⑧, lock-nuts (⑨, ⑩) and tie rods ⑪.

CAUTION

The locknuts ⑥ have left-hand threads.



TIE ROD/TIE ROD END

Inspect the tie-rod for distortion and the boot for wear and tie rod end for smooth movement. If any defects are found, replace it with a new one.

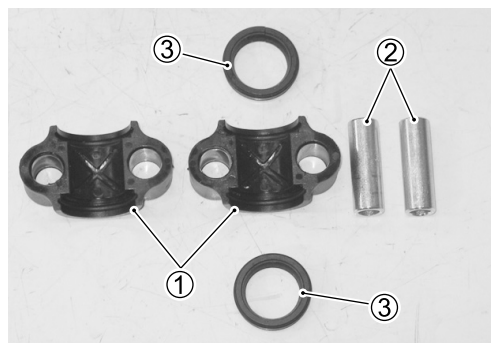


STEERING SHAFT AND HOLDER

Inspect the steering shaft for distortion or bend. If any defects are found, replace it with a new one.



Inspect the steering shaft holders ①, holder shafts ② and dust seals ③ for wear or damage. If any defects are found, replace them with new ones.



REASSEMBLY AND INSTALLATION

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

- Install the steering shaft bush with the special tool and suitable size socket wrench.

 **09924-84521: Bearing installer set**

CAUTION

The removed steering shaft bush must be replaced with a new one.

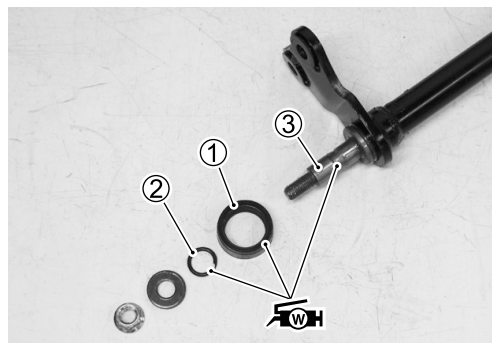


STEERING SHAFT

- Apply RESISTANCE GREASE to the steering shaft lower dust seal ① O-ring ② and steering shaft ③.

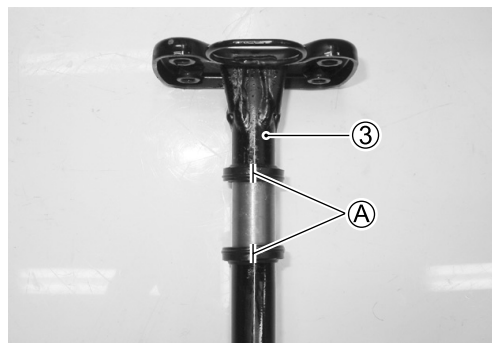
 **99000-25160: SUZUKI RESISTANCE GREASE**
(or equivalent)

- Install the steering shaft lower dust seal ① and O-ring ② to the steering shaft ③.



CAUTION

To prevent the entry of dirt, the dust seal end ① must face forward when installed on the steering shaft ③.



- Tighten the steering shaft lower nut to the specified torque and install the cotter pin.

 **Steering shaft lower nut: 35 N·m (3.5 kgf·m, 25.5 lb·ft)**

CAUTION

The removed cotter pin must be replaced with a new one.



- Tighten the steering shaft holder bolts to the specified torque.

 **Steering shaft holder bolt: 23 N·m (2.3 kgf·m, 17.0 lb-ft)**



TIE ROD

- Tighten the tie-rod end nuts to the specified torque and install the cotter pins.

 **Tie rod end nut: 50 N·m (5.0 kgf·m, 36.0 lb-ft)**

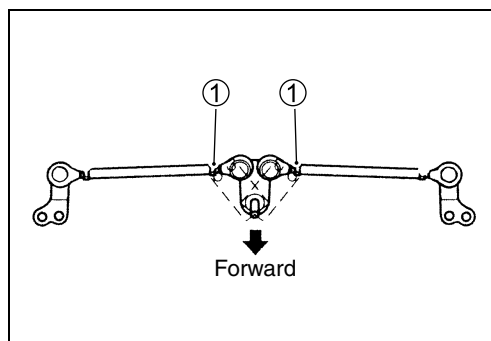
CAUTION

The removed cotter pins must be replaced with new ones.



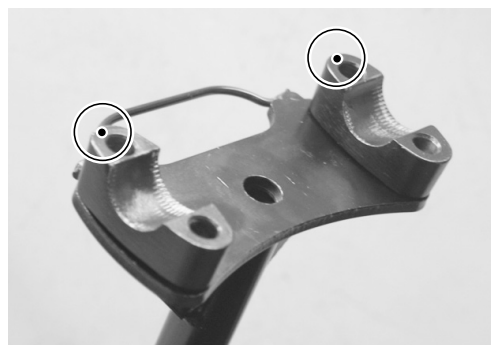
NOTE:

The lock-nuts ① have left-hand threads.



HANDLEBARS

- Set the yellow mark on the handlebar lower holder to the forward.

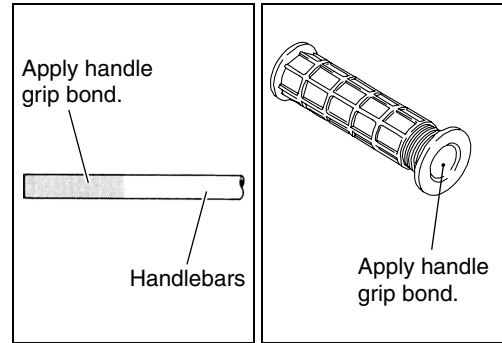


INSTALLATION

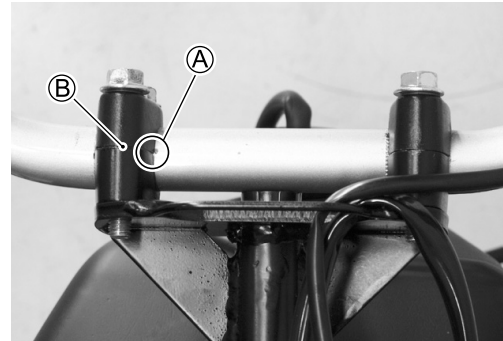
Install the handlebars in the reverse order of removal. Pay attention to the following points:

- Apply adhesive agent to the handlebar right and left end and right and left grip inner wall.

HANDLE GRIP BOND (commercial available)



- Align the punched mark (A) on the handlebars with the mating surface (B) of handlebar holder.

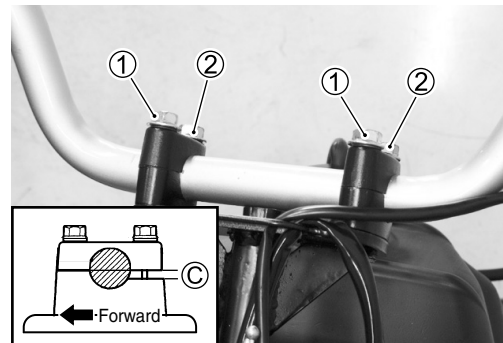


- First tighten the bolts (1) to the specified torque, and then tighten the bolts (2) to the specified torque.

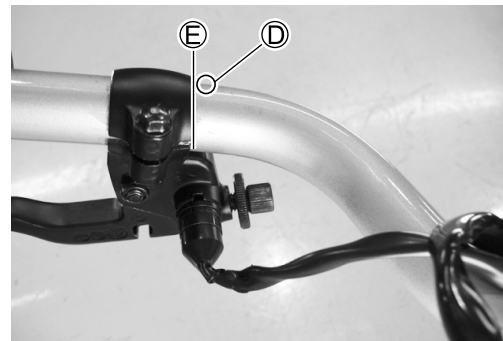
Handlebar clamp bolt: 25 N·m (2.5 kgf-m, 18.0 lb-ft)

NOTE:

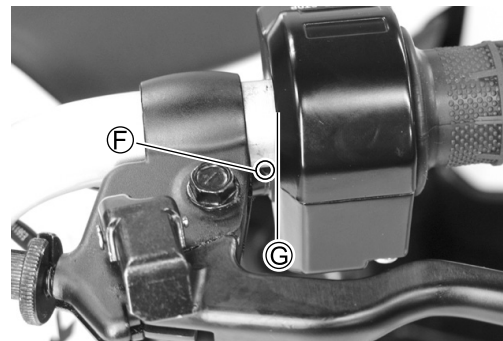
The higher portion of handlebar holder must face forward, so that the clearance (C) of holder is in back of the handlebars.



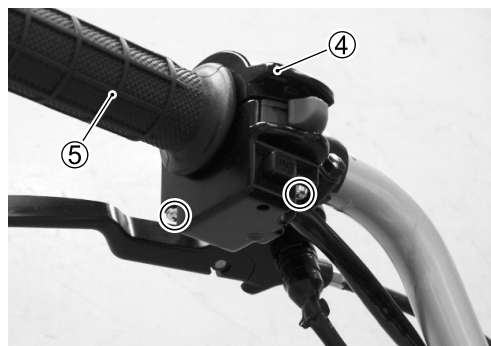
- Align the punched mark (D) on the handlebars with the mating surface (E) of left brake lever holder (3).



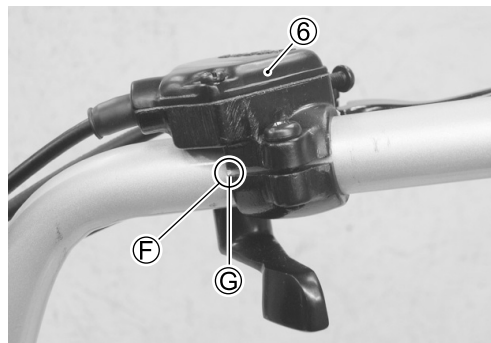
- Align the punched mark (F) on the handlebars with the mating surface (G) of left handle switch (4).



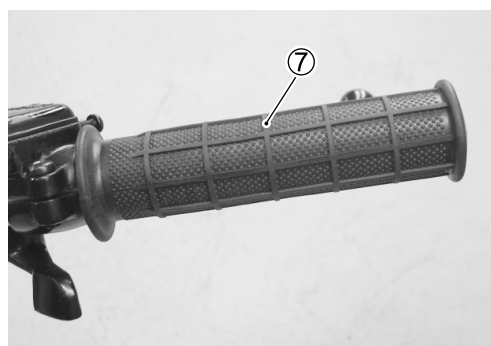
- Install the left handle switch ④ and left grip ⑤.



- Align the punched mark (F) on the handlebars with the mating surface (G) of throttle lever (6).



- Install the right grip (7).



TOE-IN ADJUSTMENT

Adjust the toe-in as follows:

- Place the vehicle on level ground and set the handlebar straight.
- Make sure all the tires are inflated to the standard pressure. (☞ 2-22)
- Place 63 kg (139 lbs) weight on the seat.
- Loosen the locknuts (①, ②) on each tie-rod.

CAUTION

The locknuts ② have left-hand threads.

- Measure the distances (Ⓐ and Ⓑ) between the front wheels. Subtract the measurements of Ⓐ from the measurements of Ⓑ 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.

$$\text{Ⓑ} - \text{Ⓐ} = \text{Toe-in}$$



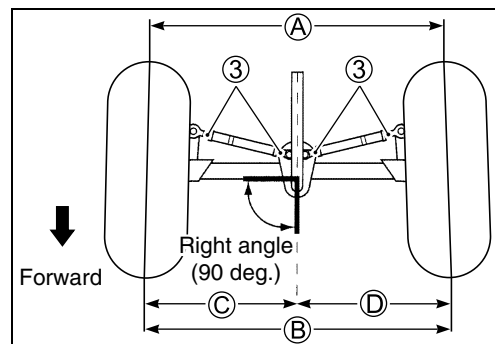
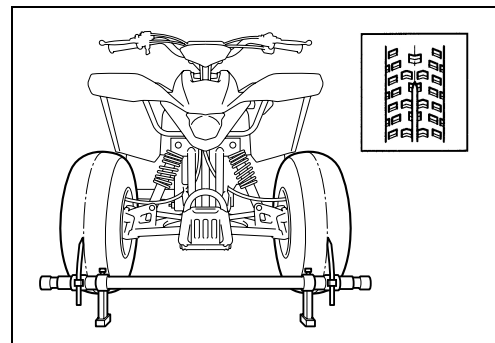
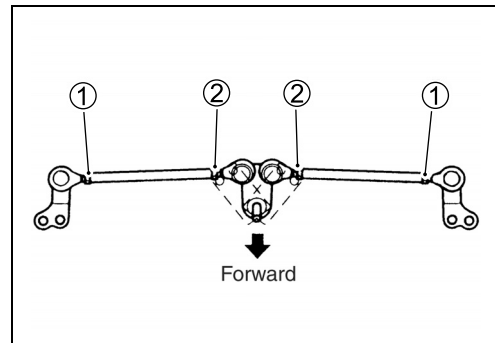
Toe-in

Standard: $4.5 \pm 3 \text{ mm}$ ($0.17 \pm 0.1 \text{ in}$)

- Temporarily tighten the four locknuts ③.
- Check that the distance Ⓒ and Ⓓ 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 distance Ⓐ and Ⓑ.
- If the toe-in is not within specification, repeat the adjustment as above until the proper toe-in is obtained and distance Ⓒ and Ⓓ become equal.
- After adjustment has been made, tighten the four locknuts ③ to the specified torque.



Tie-rod locknut: 29 N·m (2.9 kgf-m, 21.0 lb-ft)

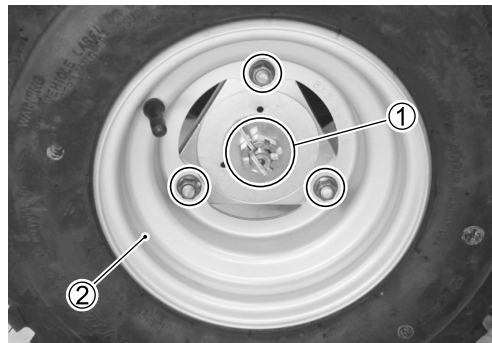




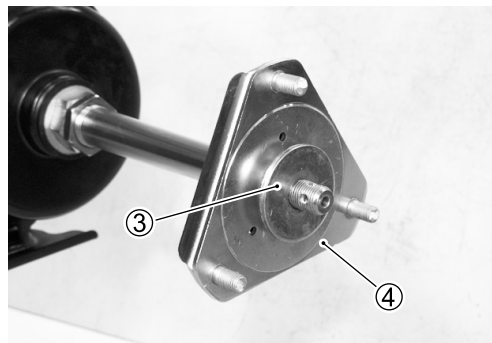
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REMOVAL REAR BRAKE

- Remove the cotter pin and rear axle nut ①.
- Remove the rear wheel ②.

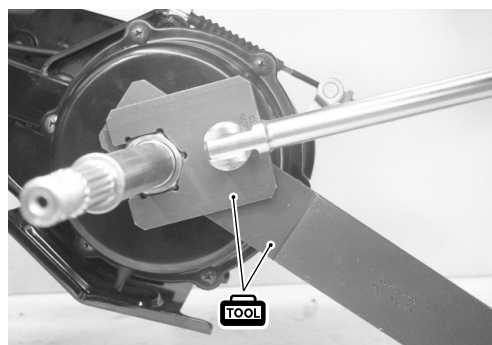
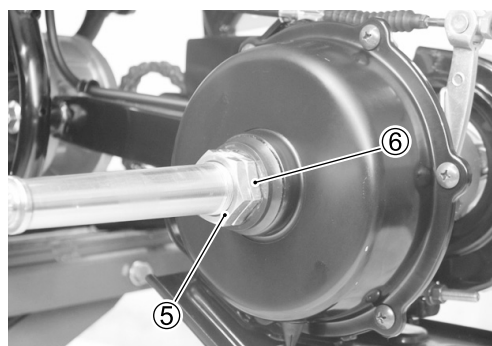


- Remove the rear axle washer ③ and rear wheel hub ④.

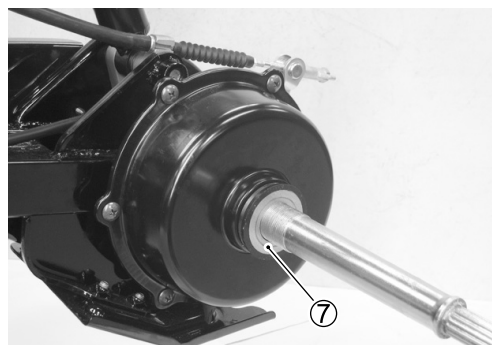


- Remove the rear axle lock-nut ⑤ and axle nut ⑥ with the special tool.

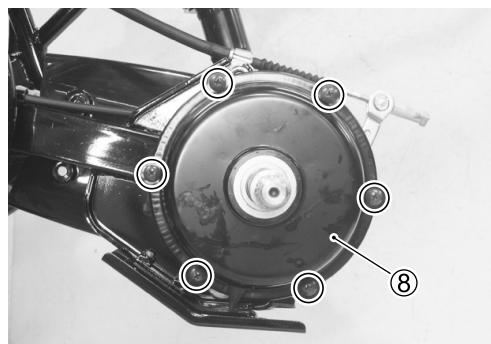
 **09940-92430: Rear axle nut wrench set**



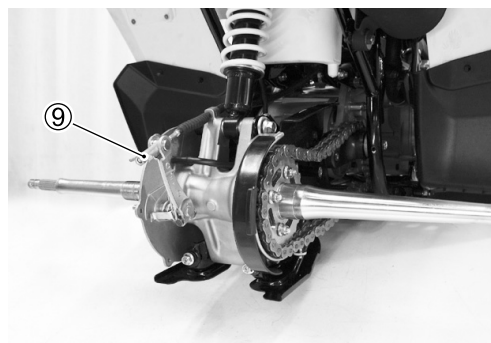
- Remove the rear brake drum outer seal ⑦.



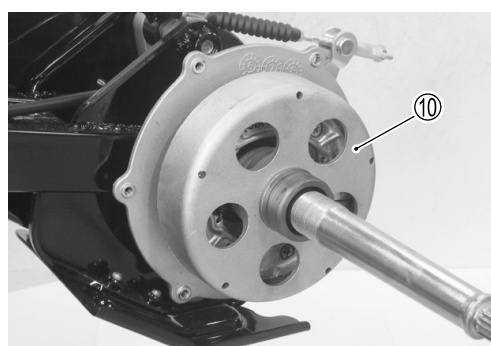
- Remove the rear brake drum cover ⑧.



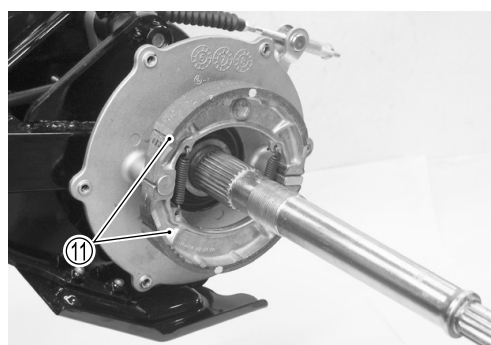
- Loosen the rear brake cable ⑨.



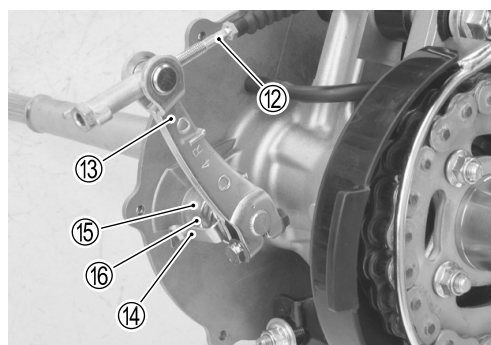
- Remove the rear brake drum ⑩.



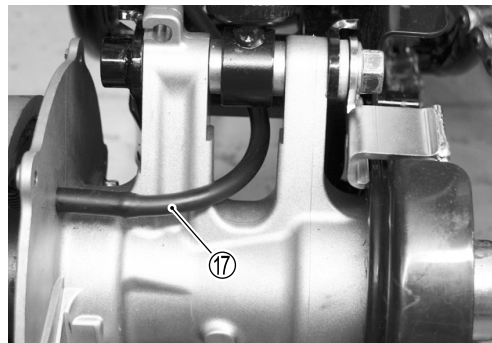
- Remove the rear brake shoes ⑪.



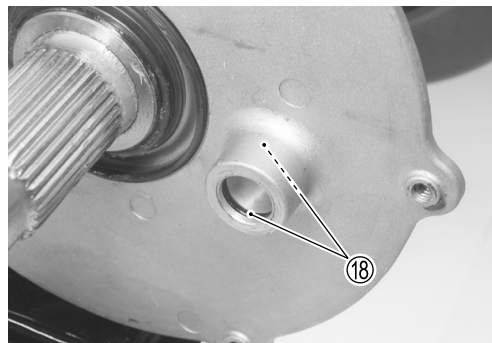
- Remove the rear brake cable ⑫, rear brake cam lever ⑬, limit indicator ⑭ spring ⑮ and spacer ⑯.



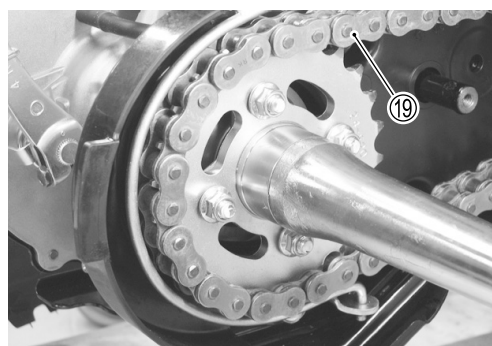
- Remove the breather hose ⑰.



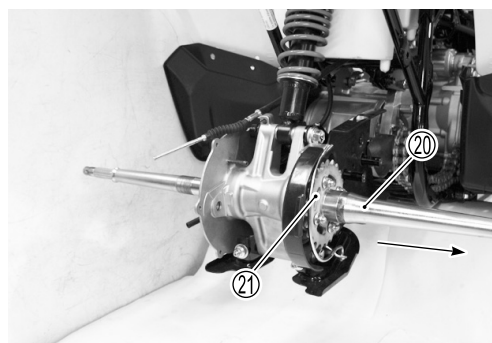
- Remove the O-rings ⑱.



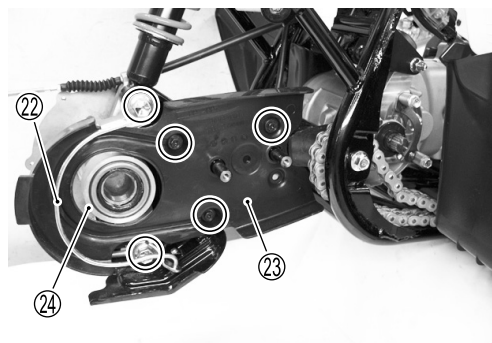
- Disengage the drive chain ⑲ from the rear sprocket.



- Remove the rear axle shaft ⑳ and sprocket ㉑.
- Draw out the rear axle shaft ⑳ to the right side.



- Remove the chain guide ㉒, chain case ㉓ and rear axle ㉔.



INSPECTION AND DISASSEMBLY

BRAKE DRUM

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

TOOL 09900-20101: Vernier calipers

DATA Brake drum I.D.:

Service Limit: 130.7 mm (5.14 in)

BRAKE SHOE

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

CAUTION

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



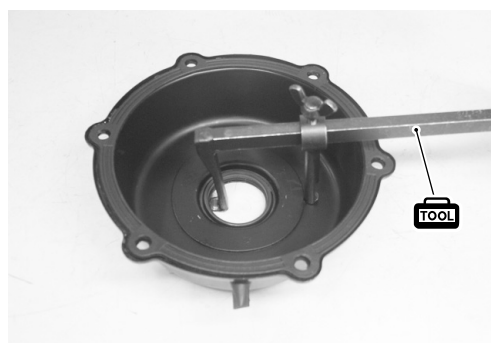
REAR BRAKE DRUM OUTER SEAL

Inspect the rear drum outer seal and inner seal for wear or damage. If any defects are found, replace them with new ones.



- Remove the rear brake inner seal with the special tool.

TOOL 09913-50121: Oil seal remover



REAR BRAKE DRUM COVER

Inspect the rear brake drum cover for wear or damage. If any defects are found, rear drum cover with a new one.



REAR AXLE

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

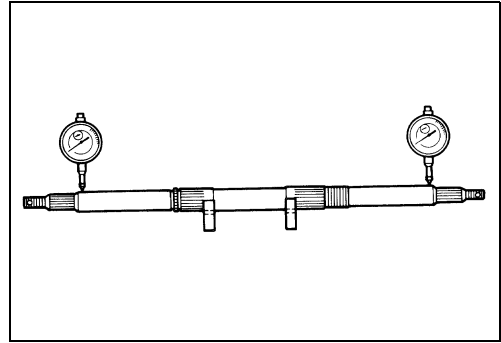
DATA Rear axle runout:

Service Limit: 6 mm (0.23 in)

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

09900-20701: Magnetic stand

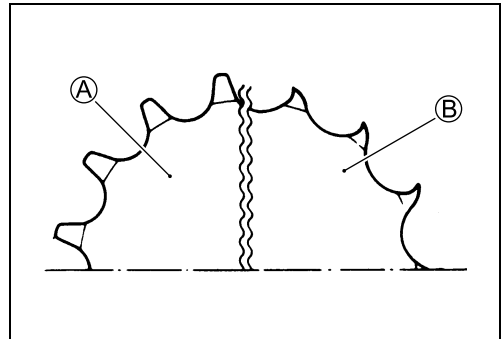
09900-21304: V-block set (100 mm)

**REAR SPROCKET**

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

Ⓐ: Normal wear

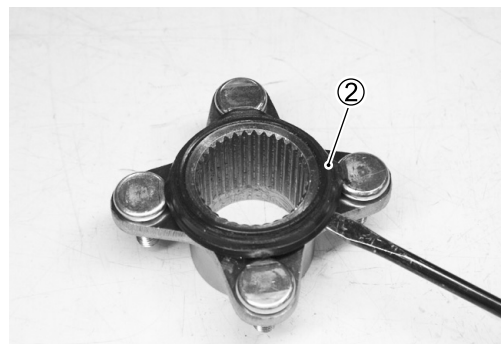
Ⓑ: Excessive wear



- Remove the rear sprocket ①.



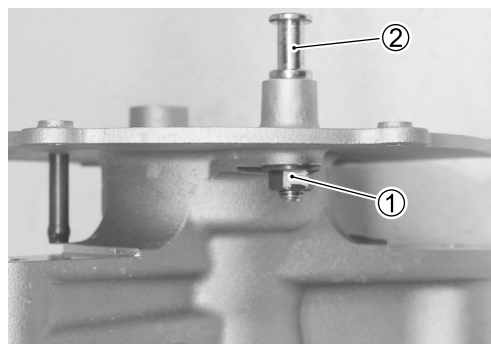
- Remove the dust seal ②.

**REAR AXLE HOUSING**

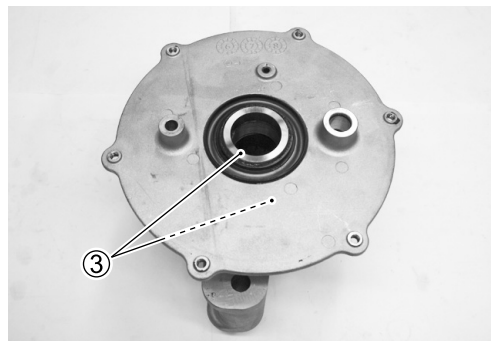
Inspect the rear axle housing for damage. If any defects are found, replace the rear axle housing with a new one.



- Remove the rear brake anchor nut ①.
- Extract the anchor pin ②.

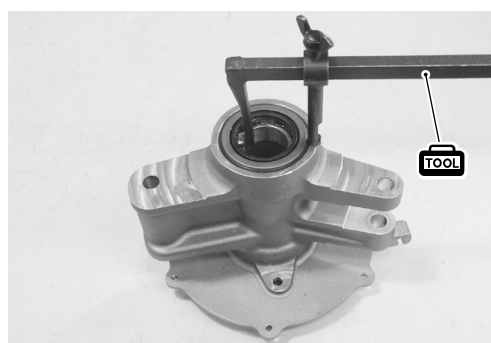
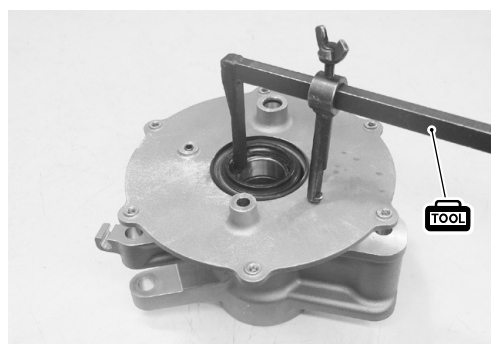


- Remove the rear axle spacers ③.



- Remove the dust seals with the special tool.

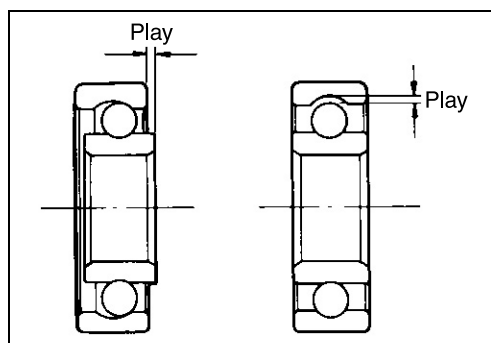
TOOL 09913-50121: Oil seal remover



REAR AXLE HOUSING BEARING

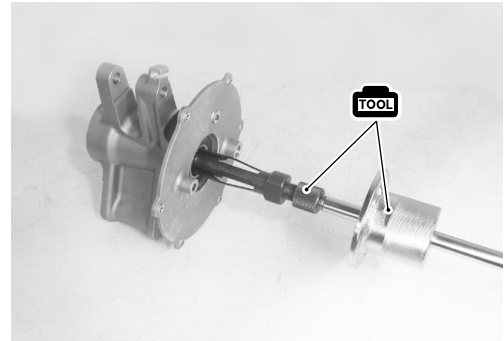
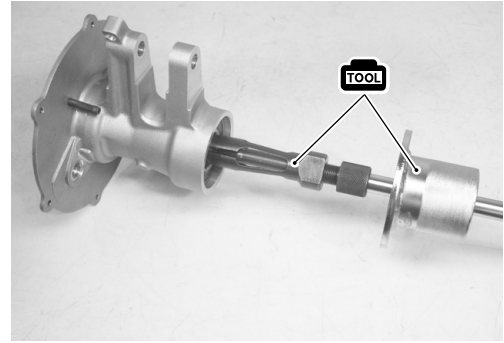
Inspect the inner race play of the rear axle housing bearing by hand while it is in the rear axle housing.

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.

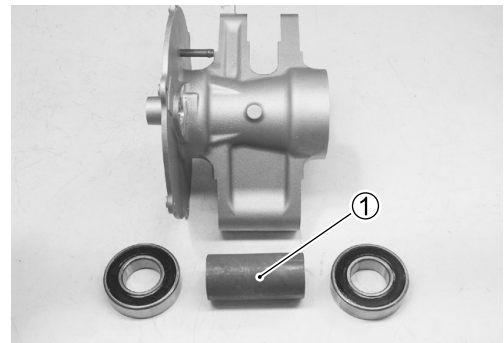


- Remove the rear axle housing bearings with the special tool.

TOOL 09930-30104: Sliding shaft
 09923-74511: Bearing remover ($\phi 20$)
 09923-73210: Bearing remover ($\phi 17$)



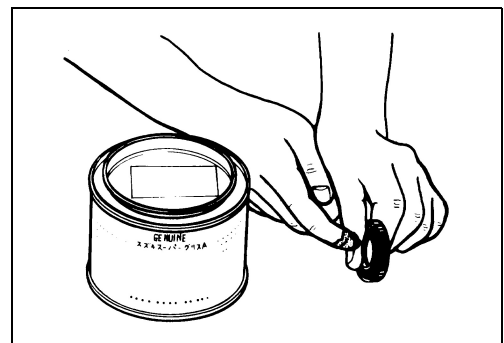
- Remove the spacer ①.



REASSEMBLY AND INSTALLATION

Reassemble and install the rear brake and rear axle housing in the reverse order of removal and disassembly.

Pay attention to the following points:



REAR SPROCKET AND REAR AXLE

- Install the dust seal with the special tool.

TOOL 09913-70210: Bearing installer

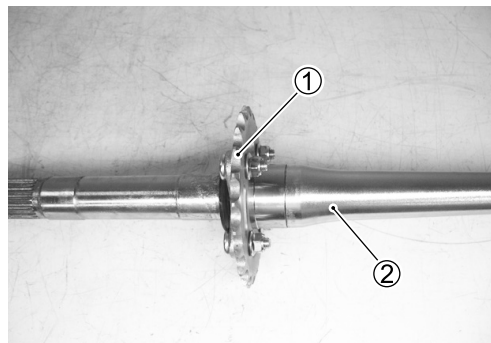


- The stamped mark ① on the rear sprocket should face outside.
- Tighten the rear sprocket nut to the specified torque.

 **Rear sprocket nut: 28 N·m (2.8 kgf·m, 20.0 lb-ft)**



- Install the rear sprocket flange ① to the rear axle shaft ②.



BEARING AND REAR AXLE HOUSING

- Apply SUZUKI SUPER GREASE “A” to the rear axle housing bearings and lip of the dust seals, before installing them.

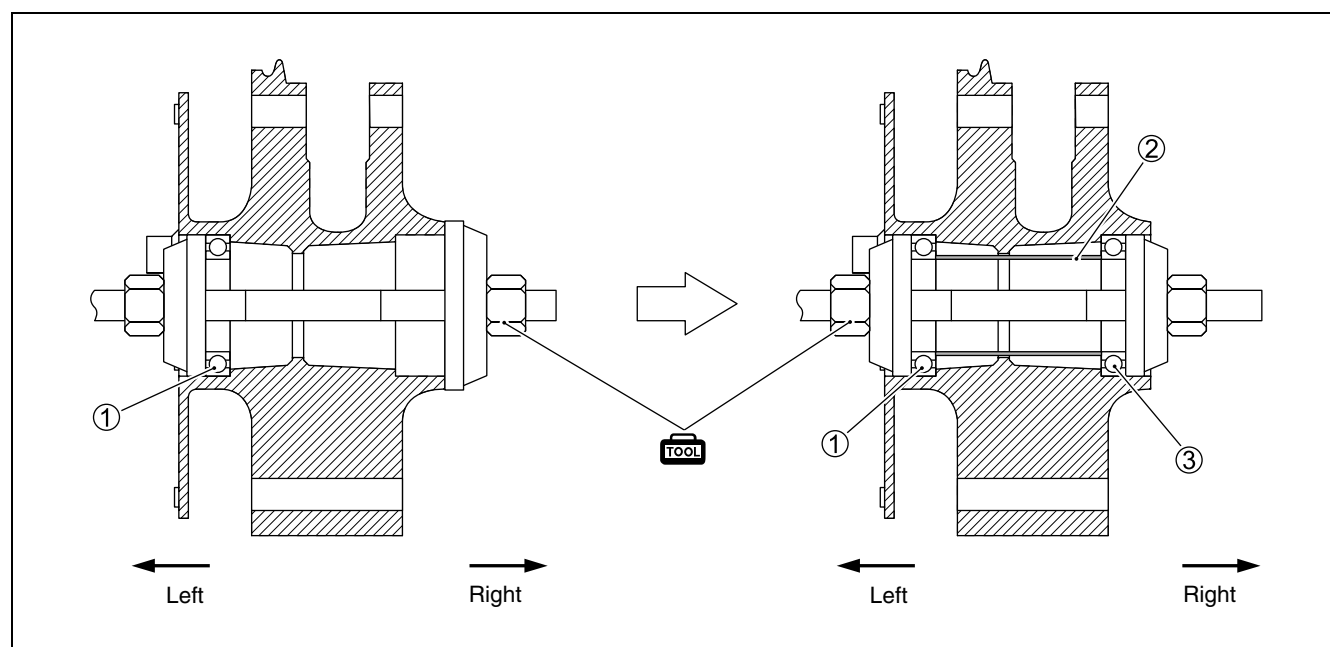
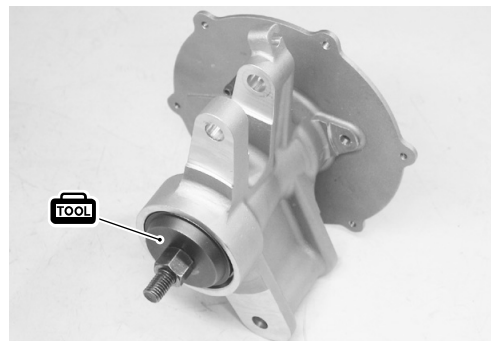
 **99000-25010: SUZUKI SUPER GRESE “A”**
(or equivalent)

- Install the rear axle housing bearing with the special tool.
- Install the dust seals with the special tool.

 **09924-84510: Bearing installer set**

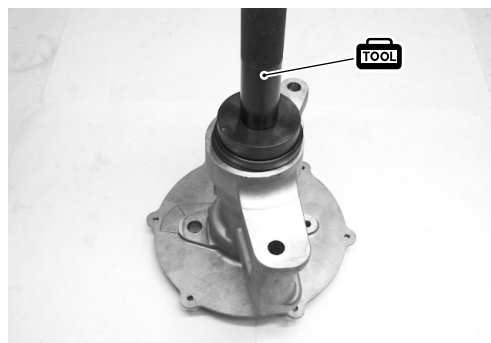
CAUTION

- * First install the left bearing ①, then install the spacer ② and right bearing ③.
- * The sealed cover of the bearing must face outside.



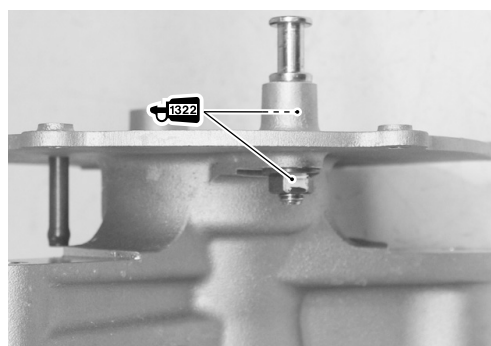
- Install the rear axle housing seals with the special tool.

 **09913-70210: Bearing installer**



- When installing the rear brake anchor pin, apply THREAD LOCK “1322” to the mating surface of the pin and the axle housing.
- Apply a small quantity of THREAD LOCK SUPER “1322” to the anchor pin nut.

 **99000-32110: THREAD LOCK SUPER “1322”**



REAR BRAKE

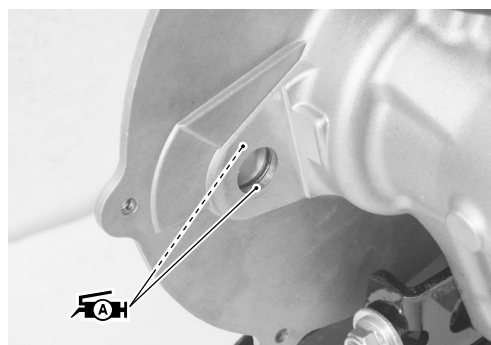
- Apply SUZUKI SUPER GREASE “A” to the rear brake camshaft and O-rings.

 **99000-25010: SUZUKI SUPER GREASE “A” or equivalent**

CAUTION

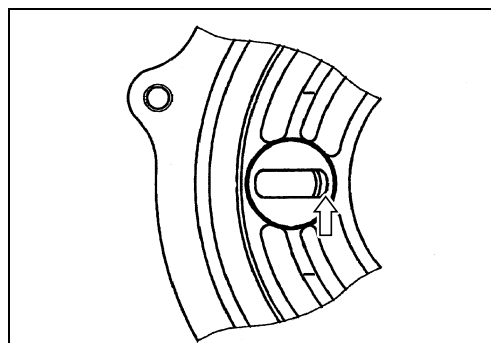
The removed O-rings must be replaced with new ones.

- Install the O-rings into the brake camshaft hole.



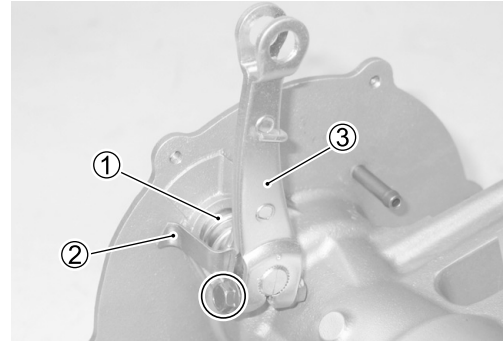
NOTE:

Face the groove on the camshaft to the inside.



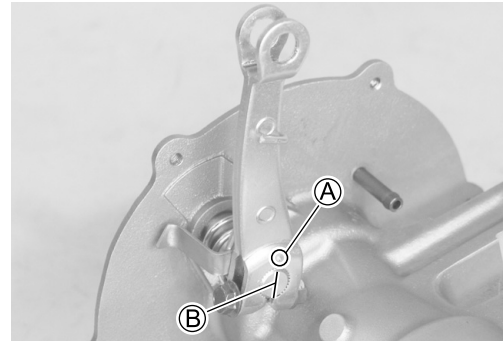
- Install the spring ①, limit indicator ② and rear brake cam lever ③.
- Tighten the rear brake cam lever nut to the specified torque.

 **Rear brake cam lever nut: 8 N·m (0.8 kgf·m, 6.0 lb-ft)**



NOTE:

Align the punched mark (A) on the cam lever with the slit (B) on the camshaft.



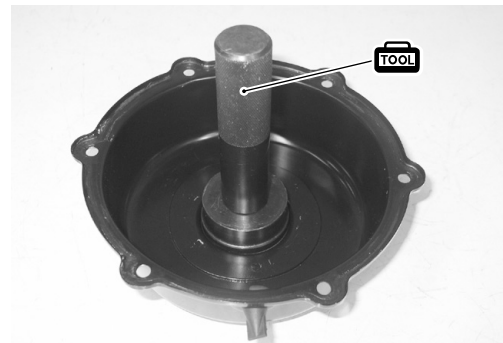
REAR BRAKE DRUM COVER

- Install the rear brake inner seal with the special tool.

 **09913-70210: Bearing installer**

CAUTION

The removed rear brake inner seal must be replaced with a new one.

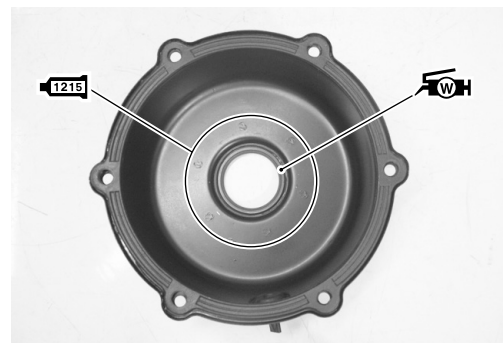


- Apply SUZUKI RESISTANCE GREASE to the rear brake inner seal.

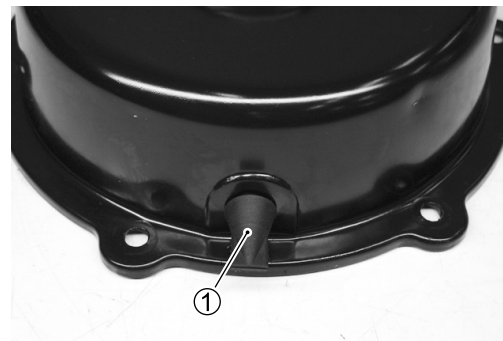
 **99000-25160: SUZUKI RESISTANCE GREASE**
(or equivalent grease)

- Apply SUZUKI BOND “1215” to the rear brake cover.

 **99000-31110: SUZUKI BOND “1215”**
(or equivalent bond)



- Install the rear brake drum cover so that the water drain tube ① downward.



- Apply SUZUKI SUPER GREASE “A” to the brake camshaft and pin.

 **99000-25010: SUZUKI SUPER GREASE “A”**
(or equivalent grease)

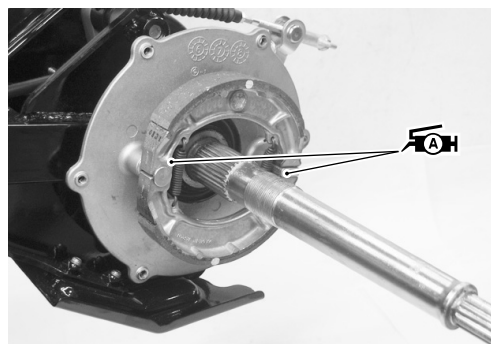
- Install the brake shoes.

⚠ WARNING

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

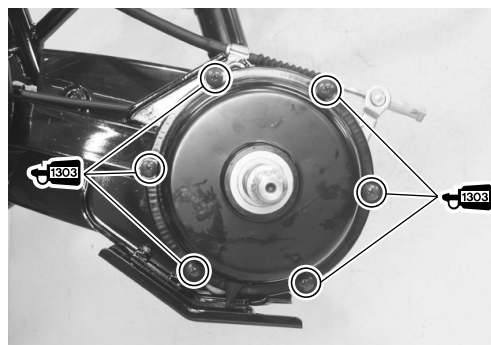
- Apply SUZUKI SUPER GREASE “A” to the rear brake drum.

 **99000-25010: SUZUKI SUPER GREASE “A”**
(or equivalent grease)



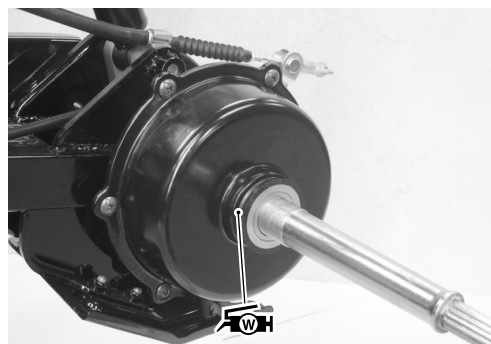
- Apply a small quantity of THREAD LOCK SUPER “1322” to the rear brake drum cover mounting screws.

 **99000-32110: THREAD LOCK SUPER “1322”**
(or equivalent thread lock)



- SUZUKI RESISTANCE GREASE to the around the rear brake drum outer seal.

 **99000-25160: SUZUKI RESISTANCE GREASE**

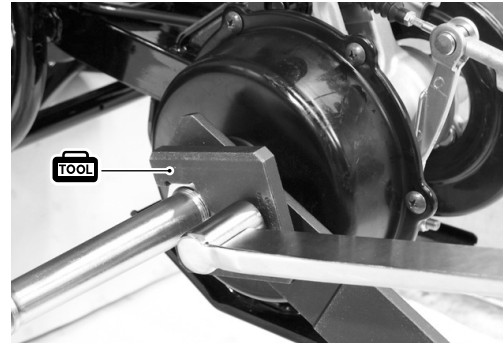
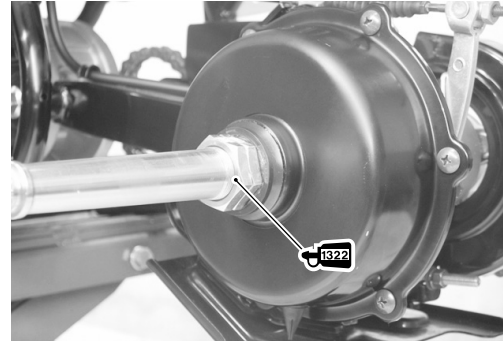


- Apply a small quantity of THREAD LOCK SUPER “1303” to the thread portion of the axle nut.
- Tighten the axle nut to the specified torque with the special tool.

 **Rear axle nut: 180 N·m (18.0 kgf·m, 130.0 lb-ft)**

 **99000-32110: THRAD LOCK SUPER “1322”**
(or equivalent thread lock)

 **09940-92460: Rear axle nut wrench set**



- Tighten the rear hub nut to the specified torque.

 **Rear hub nut: 75 N·m (7.5 kgf·m, 54.0 lb-ft)**

- Install the cotter pin.

CAUTION

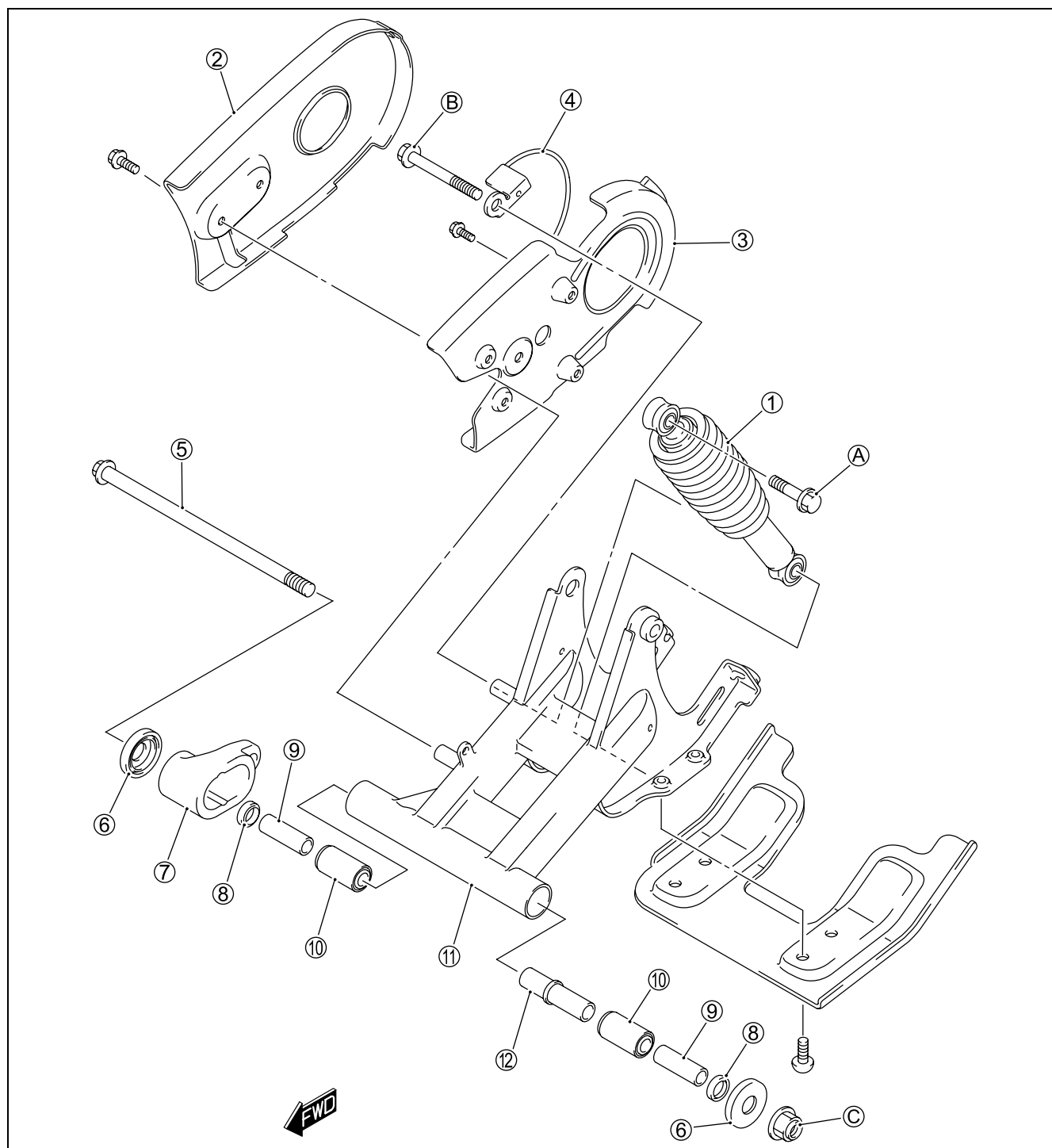
The removed cotter pin must be replaced with a new one.



- After installing the rear brake and rear axle housing, adjust the following items.

- * Rear brake lever play  2-20
- * Drive chain slack  2-18

REAR SUSPENSION CONSTRUCTION



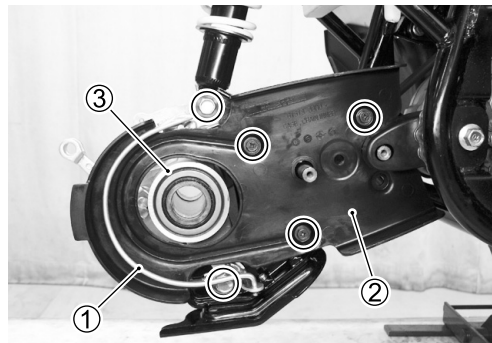
①	Rear shock absorber	⑨	Out spacer
②	Chain case cover	⑩	Swingarm pivot bush
③	Chain case	⑪	Swingarm
④	Chain guide	⑫	Spacer
⑤	Swingarm pivot shaft	A	Rear shock absorber upper bolt
⑥	Dust seal	B	Rear shock absorber lower bolt
⑦	Chain buffer	C	Swingarm pivot nut
⑧	Oil seal		



ITEM	N·m	kgf·m	lb·ft
A	29	2.9	21.0
B	94	9.4	18.0
C	102	10.2	74.0

REMOVAL

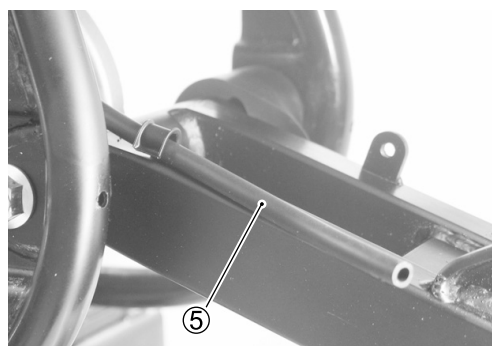
- Remove the rear wheel. (➡ 5-8)
- Remove the rear brake and rear axle housing. (➡ 5-34)
- Remove the chain guide ①, chain case ② and rear axle housing ③.



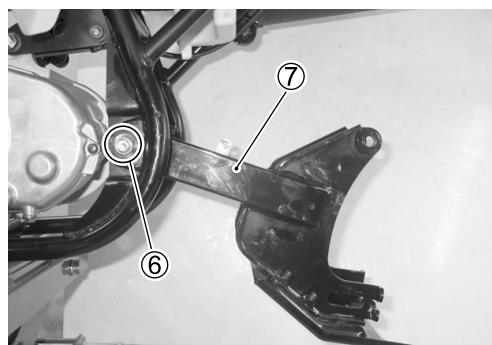
- Remove the rear shock absorber ④.



- Remove the breather hose ⑤.



- Remove the swingarm pivot nut ⑥ and shaft.
- Remove the swingarm ⑦.



INSPECTION AND DISASSEMBLY REAR SHOCK ABSORBER

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

CAUTION

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

REAR SHOCK ABSORBER DUST SEAL

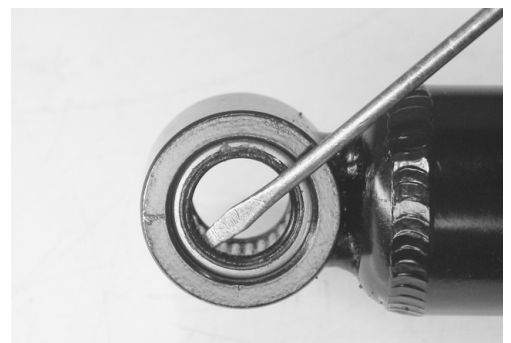
- Remove the collars.

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

- Remove the dust seals.

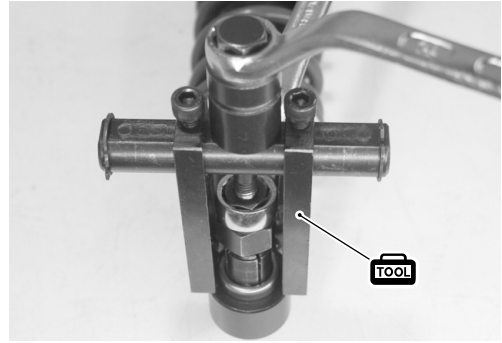
REAR SHOCK ABSORBER BEARING

Inspect the bearings for abnormal noise and smooth movement.



- Remove the bearing with the special tool.

 **09921-20240: Bearing remover set**



SWINGARM PIVOT SHAFT

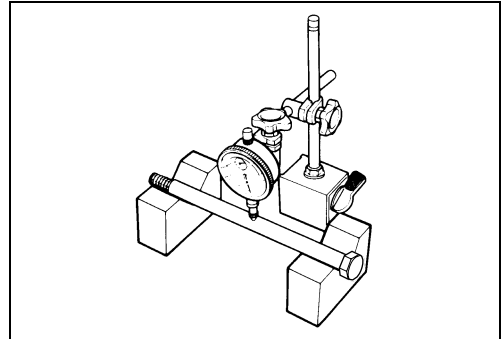
Check the pivot shaft for runout with a dial gauge and replace it if the runout exceeds the limit.

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

09900-20701: Magnetic stand

09900-21304: V-block set (100 mm)

 **Swingarm pivot shaft runout:**
Service Limit: 0.6 mm (0.02 in)

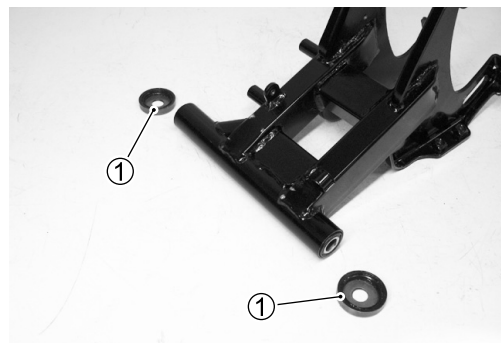


SWINGARM

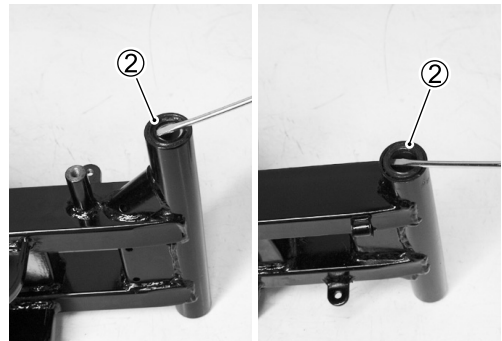
Inspect the swingarm for distortion or damage. If any defects are found, replace the swingarm with a new one.



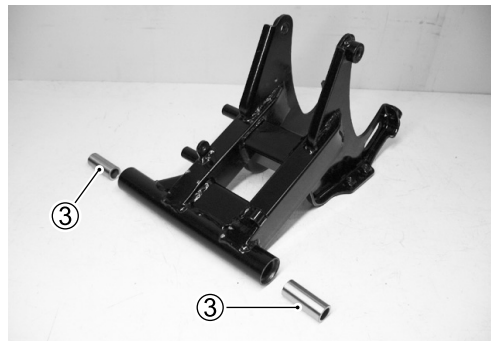
- Remove the dust cover ①.



- Remove the oil seal ②.

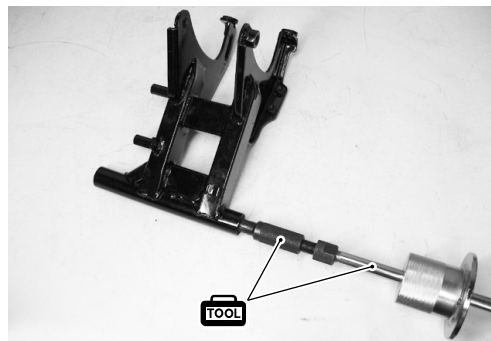


- Remove the outer spacers ③.

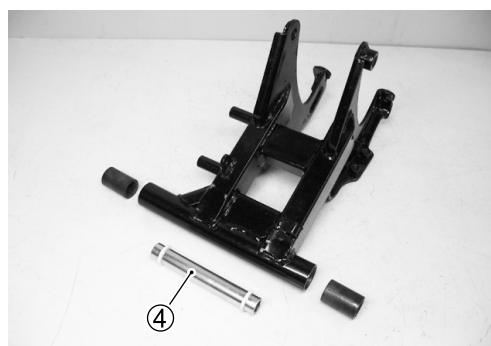


- Remove the swingarm pivot bushes with the special tool.

TOOL 09923-73210: Bearing remover
09930-30104: Sliding shaft



- Remove the swingarm spacer ④.



SWINGARM BUSH

Inspect the swingarm bush for wear or damage. If any defects are found, replace swingarm bushes with new ones.



SWINGARM SPACER

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



CHAIN BUFFER

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

**REASSEMBLY AND INSTALLATION**

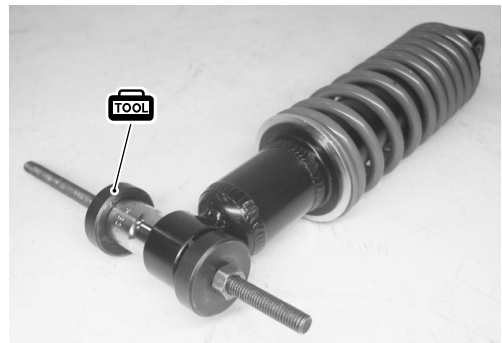
Reassemble and install the rear suspension in the reverse order of removal and disassembly. Pay attention to the following points:

- 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.

 **09924-84521: Bearing installer set**

CAUTION

The removed bearing must be replaced with a new one.



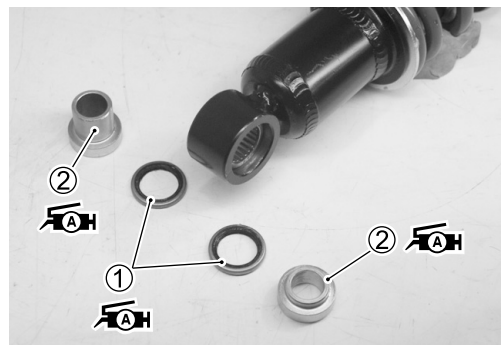
- Apply SUZUKI SUPER GREASE "A" to lip of the dust seals and collars.

 **99000-25010: SUZUKI SUPER GREASE "A"**
(or equivalent grease)

- Install the dust seals ① and collars ② into the rear shock absorber.

CAUTION

The removed dust seals must be replaced with new ones.

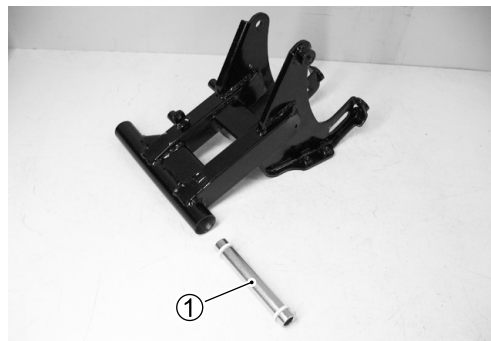


- Press the swingarm pivot bush into the swingarm to the depth of 4 mm (0.157 in) with the special tool and suitable socket wrench.

 **09941-94513: Steering race installer**

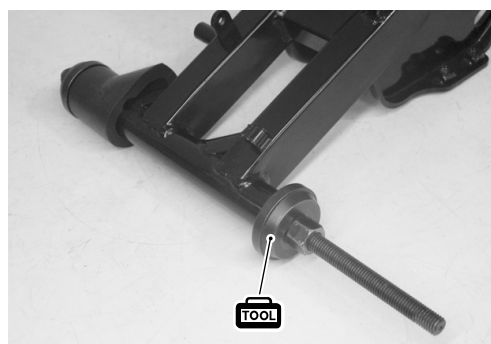


- Install the swingarm spacer ①.



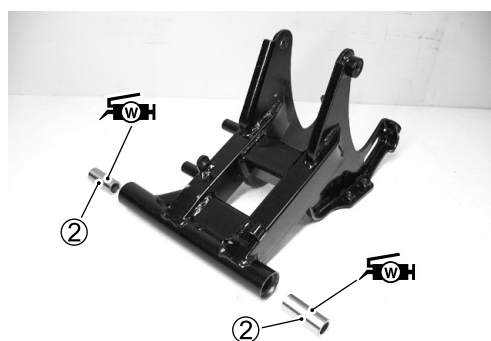
- Install the swingarm pivot bushes with the special tool.

 **09941-34513: Steering race installer**

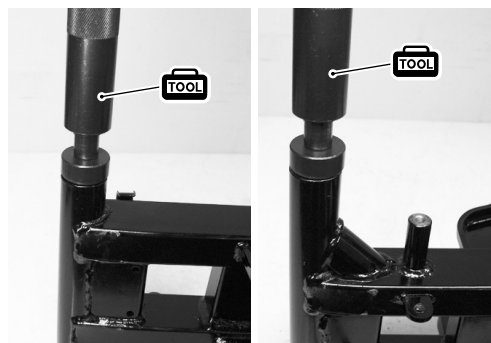


- Install the outer spacer ②.
- Apply SUZUKI RESISTANCE GREASE to the outer spacers.

 **99000-25160: SUZUKI RESISTANCE GREASE**

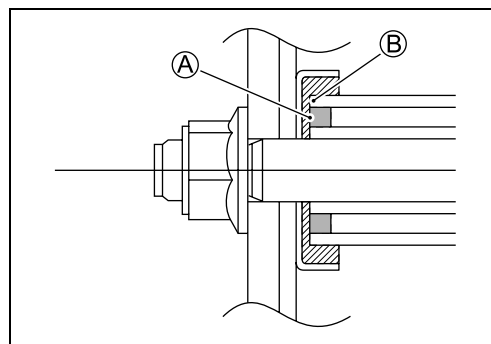


- Install the oil seals.



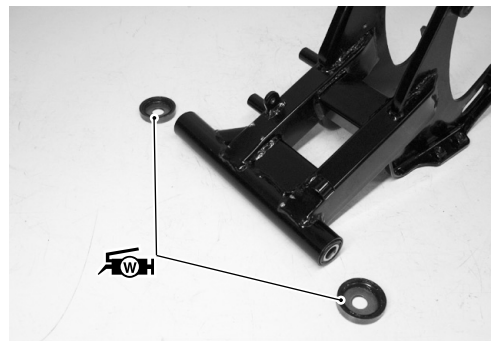
NOTE:

Align the oil seal surface (A) with the swingarm end (B).

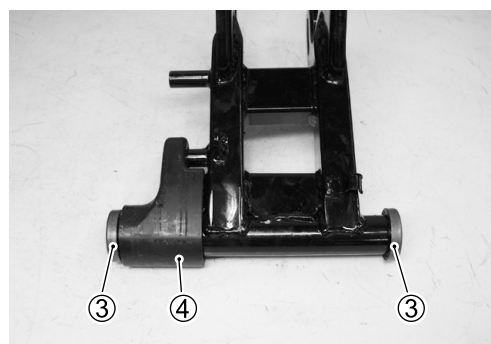


- Apply SUZUKI RESISTANCE GREASE to the dust seals.

 99000-25160: SUZUKI RESISTANCE GREASE



- Install the dust seals (3) and chain buffer (4).



- Tighten the swingarm pivot nut to the specified torque.

 **Swingarm pivot nut: 102 N·m (10.2 kgf·m, 74.0 lb-ft)**

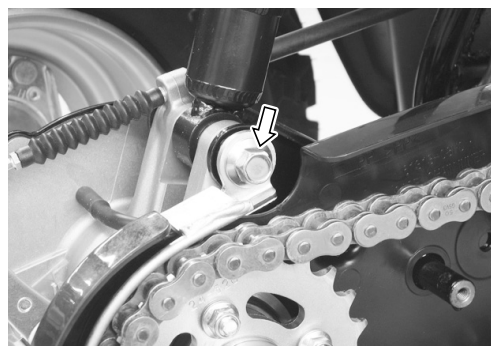


- Tighten the rear shock absorber upper bolt to the specified torque.

 **Rear shock absorber upper bolt:**
29 N·m (2.9 kgf·m, 21.0 lb-ft)



- Tighten the rear shock absorber lower/bolt to the specified torque.

**Rear shock absorber lower bolt:****94 N·m (9.4 kgf·m, 68.0 lb-ft)**

- Install the rear axle housing and rear brake. (👉 5-40)
- Install the rear wheel. (👉 5-9)
- After installing the rear suspension, adjust the following items.
 - * Rear brake lever play 📄 2-20
 - * Drive chain slack 📄 2-18

ELECTRICAL SYSTEM

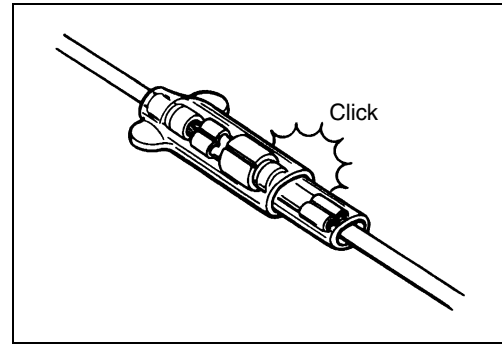
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CAUTIONS IN SERVICING

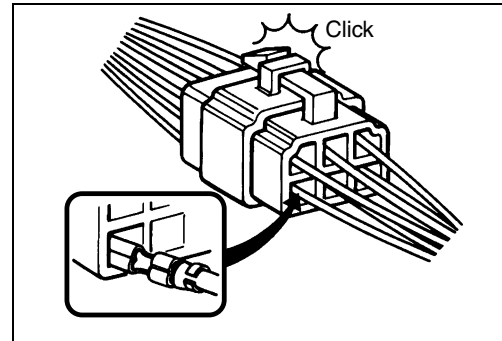
CONNECTOR

- When disconnecting a connector, be sure to hold the terminals and do not pull the lead wires.
- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.



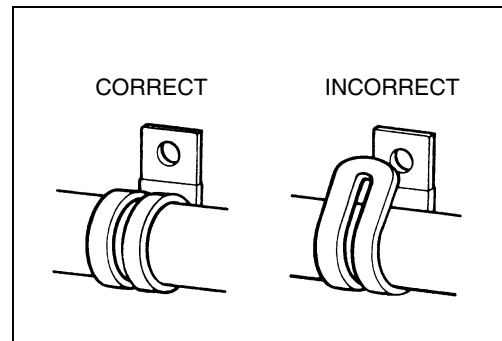
COUPLER

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



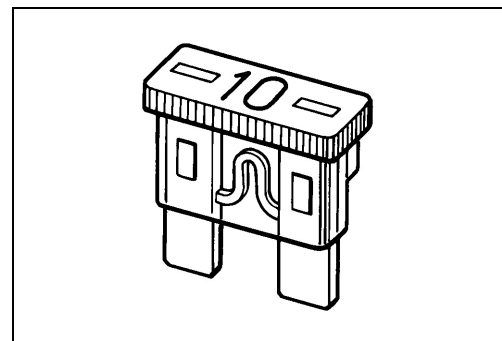
CLAMP

- Clamp the wiring harness at such positions as indicated in "WIRING HARNESS ROUTING". (➡ 7-14)
- Bend the clamp properly so that the wiring harness is clamped securely.
- In clamping the wiring harness, use care not to allow it to hang down.
- Do not use wire or any other substitute for the band type clamp.



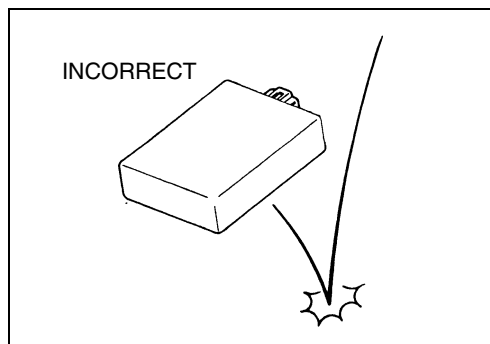
FUSE

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



SEMI-CONDUCTOR EQUIPPED PART

- Be careful not to drop the part with a semi-conductor built in such as a CDI unit and regulator/rectifier.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.

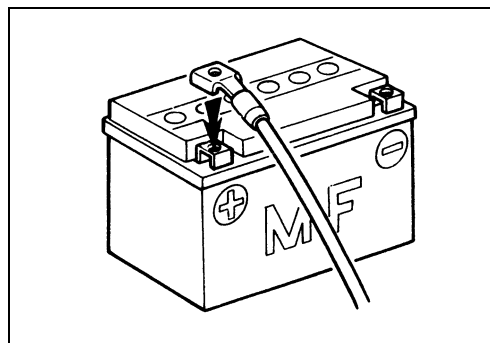
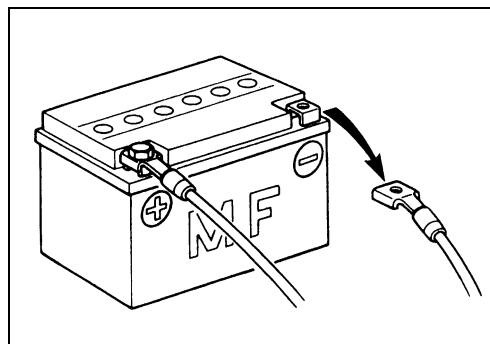


BATTERY

- The MF battery used in this vehicle does not require maintenance (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 wiring harness according to the "WIRING HARNESS ROUTING" section. (7-14)

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 that no voltage is applied. If voltage is applied, the tester will be damaged.
- After using the tester, be sure to turn the switch to the OFF position.

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

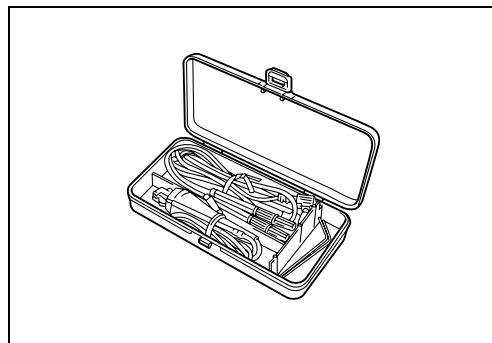
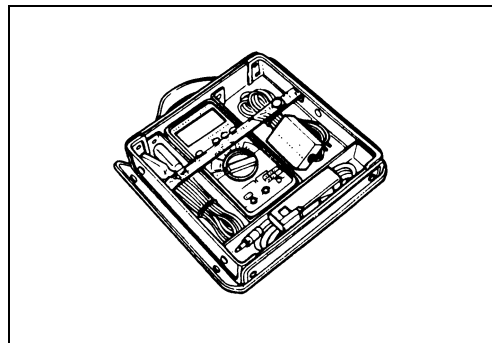
CAUTION

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

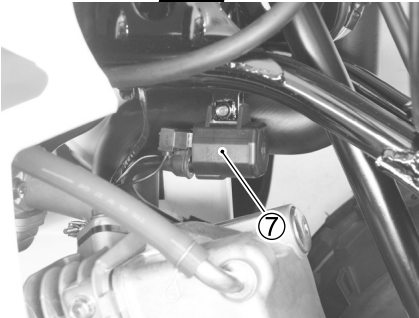
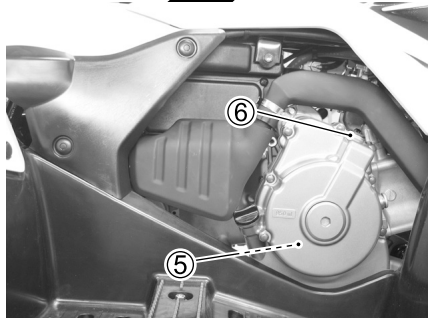
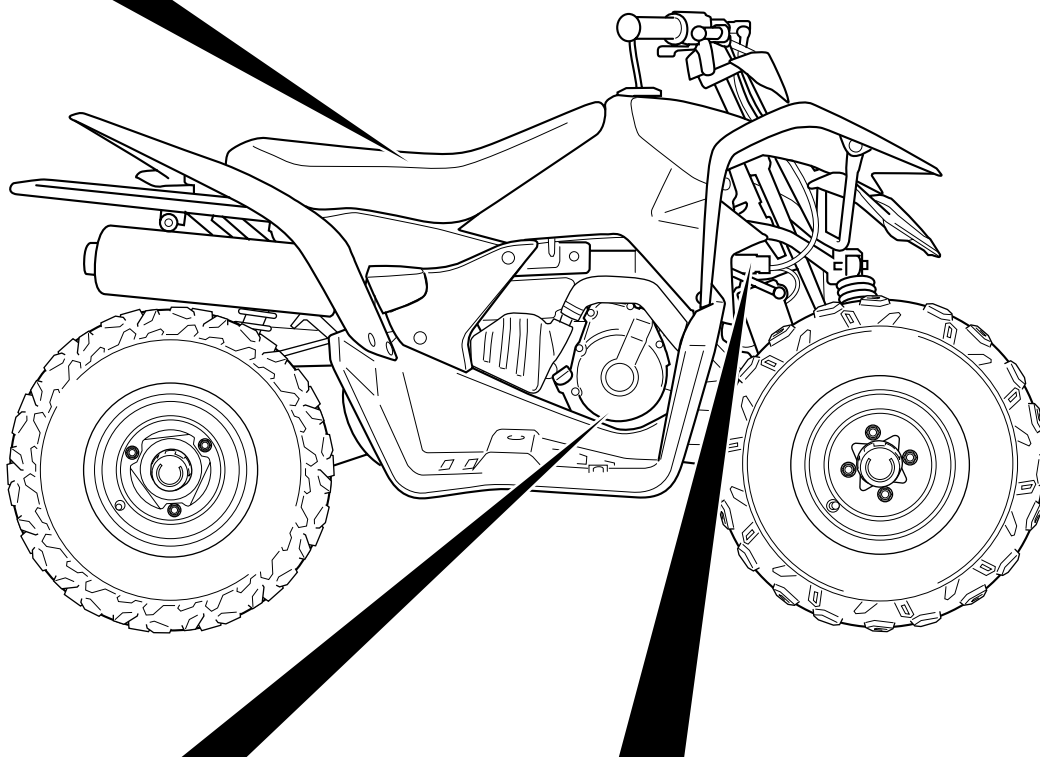
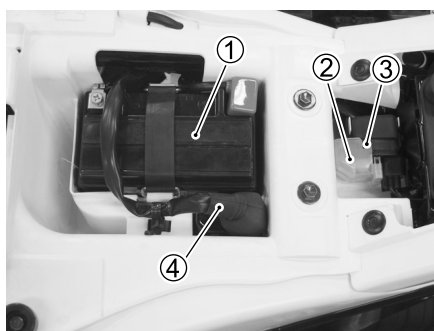
NOTE:

- * When connecting the multi-circuit tester, use the needle pointed probe to the back side of the lead wire coupler and connect the probes of tester to them.
- * Use the needle pointed probe to prevent the rubber of the water proof coupler from damage.

 **09900-25009: Needle pointed probe set**

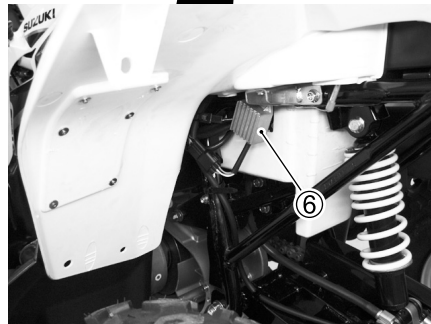
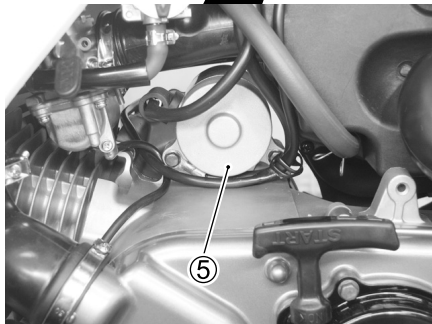
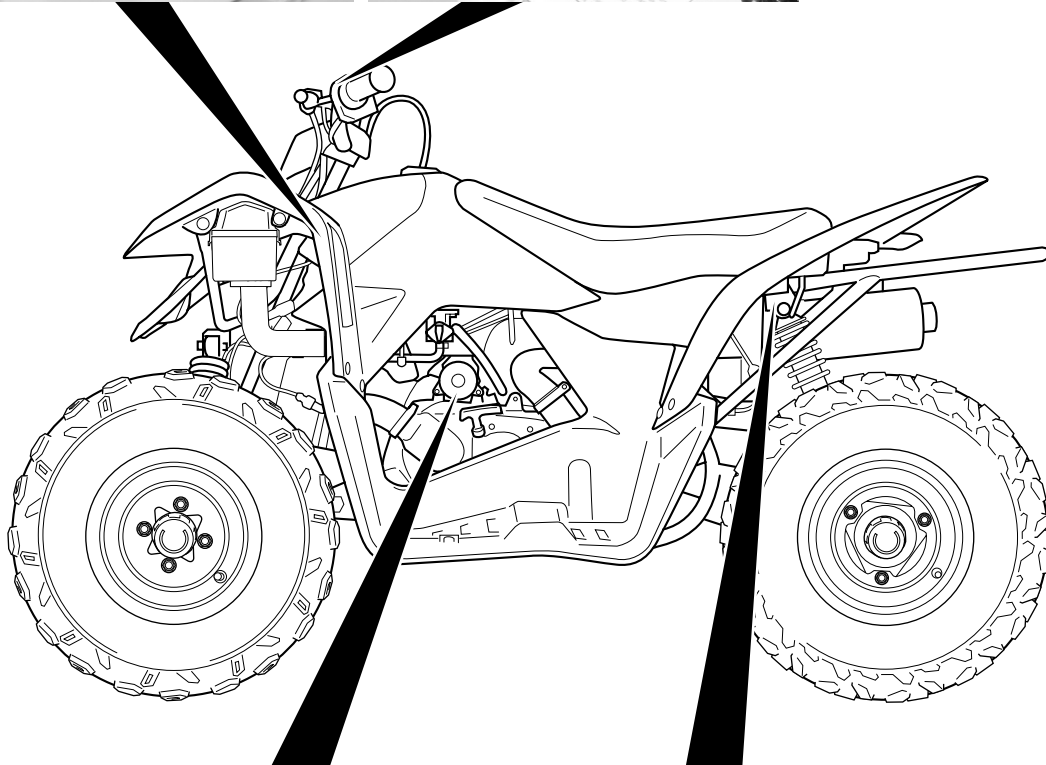
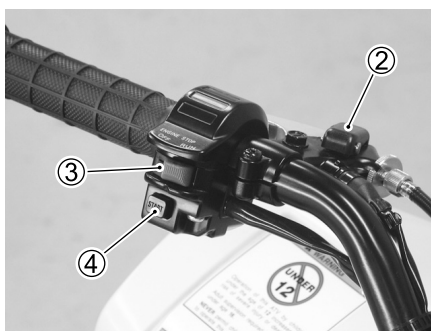


LOCATION OF ELECTRICAL COMPONENTS



- ① Battery
- ② Starter relay
- ③ Fuse (10 A)
- ④ CDI unit

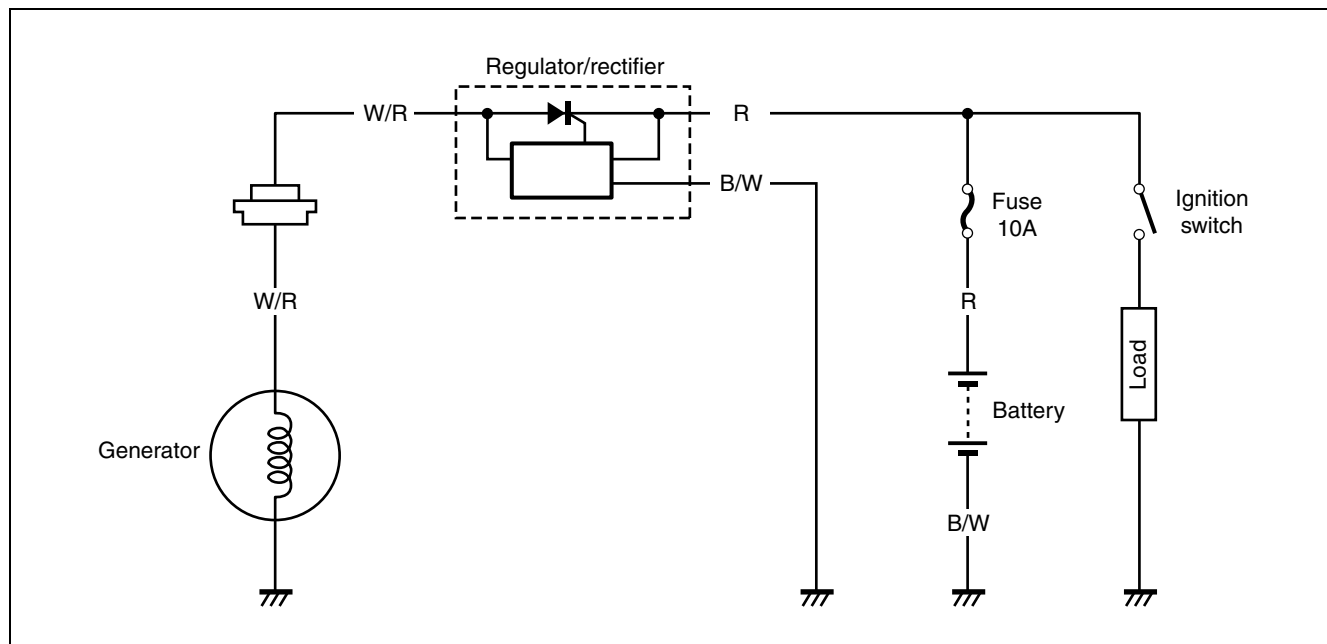
- ⑤ Generator
- ⑥ CKP sensor
- ⑦ Ignition coil



- ① Ignition switch
- ② Parking brake switch
- ③ Engine stop switch

- ④ Starter button
- ⑤ Starter motor
- ⑥ Regulator/rectifier

CHARGING SYSTEM



TROUBLESHOOTING

Battery runs down quickly

Step 1

- 1) Check accessories which use excessive amounts of electricity.

Are accessories being installed?

YES	Remove accessories.
NO	Go to Step 2.

Step 2

- 1) Check the battery for current leaks. (🔧 6-8)

Is the battery current leaks OK?

YES	Go to Step 3.
NO	- Short circuit of wiring harness. - Faulty electrical equipment.

Step 3

- 1) Measure the regulated voltage between the battery terminals. (🔧 6-9)

Is the regulated voltage OK?

YES	- Faulty battery. - Abnormal driving condition.
NO	Go to Step 4.

Step 4

- 1) Measure the resistance of the generator coil. (🔧 6-9)

Is the resistance of generator coil OK?

YES	Go to Step 5.
NO	- Faulty generator coil. - Disconnected lead wires.

Step 5

1) Measure the generator no-load performance. (🔧 6-10)

Is the generator no-load performance OK?

YES	Go to Step 6.
NO	Faulty generator.

Step 6

1) Inspect the regulator/rectifier. (🔧 6-10)

Is the regulator/rectifier OK?

YES	Go to Step 7.
NO	Faulty regulator/rectifier.

Step 7

1) Inspect wiring harness.

Is the wiring harness OK?

YES	Faulty battery.
NO	• Short circuit of wiring harness. • Poor contact of couplers.

Battery overcharges

- Faulty regulator/rectifier.
- Faulty battery.
- Poor contact of regulator/rectifier lead wire coupler.

INSPECTION**BATTERY CURRENT LEAKAGE**

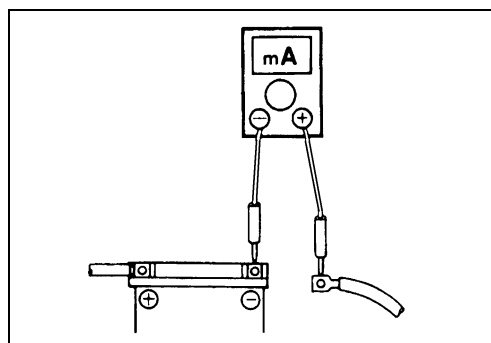
- Remove the seat. (🔧 5-4)
- Turn the ignition switch to the OFF position.
- Disconnect the battery $\ominus$ lead wire.
- Measure the current between $\ominus$ battery terminal and the $\ominus$ battery lead wire using the multi-circuit tester. If the reading exceeds the specified value, leakage is evident.

TOOL 09900-25008: Multi-circuit tester set**TESTER** Tester knob indication: Current ($\overline{\text{---}}$, 20 mA)**DATA** Battery current (leak): Under 1 mA**CAUTION**

- * In case of a large current leak, turn the tester to high range first to avoid tester damage.
- * Do not turn the ignition switch to the "ON" position when measuring current.

NOTE:

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



REGULATED VOLTAGE

- Remove the seat. (☞ 5-4)
- Start the engine to keep it running at 2 800 r/min.

Measure the DC voltage between the $\oplus$ and $\ominus$ battery terminals with the multi-circuit tester. If the voltage is not within the standard range, inspect the generator and regulator/rectifier. (☞ 6-10)

NOTE:

When making this test, be sure that the battery is in fully-charged condition.

TOOL 09900-25008: Multi-circuit tester set

TESTER Tester knob indication: Voltage (---)

DATA Regulated voltage (Charging output):
13.5 – 15.2 V at 2 800 r/min.

**GENERATOR COIL RESISTANCE**

- Remove the left footrest mudguard. (☞ 5-5)
- Disconnect the generator coupler ①.
- Measure the resistance between the W/R wire and ground with the multi-circuit tester.

If the resistance is out of specified value, replace the generator coil with a new one.

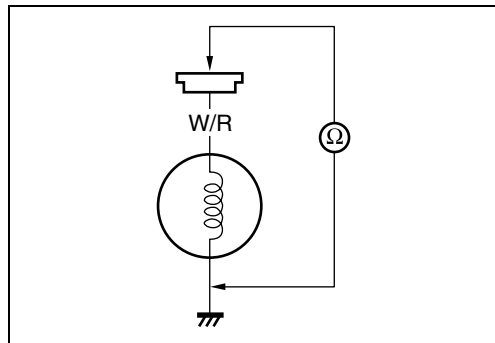
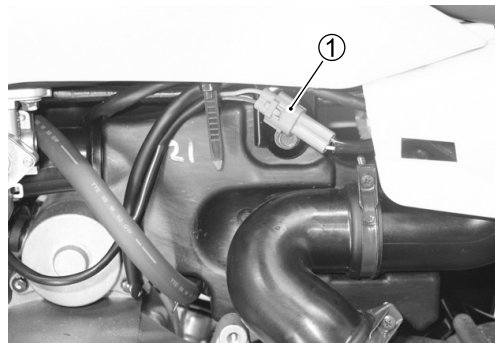
TOOL 09900-25008: Multi-circuit tester set

TESTER Tester knob indication: Resistance (Ω)

DATA Generator coil resistance: 0.5 – 2.0 Ω (W/R – Ground)

NOTE:

When making above test, it is not necessary to remove the generator.



GENERATOR NO-LOAD PERFORMANCE

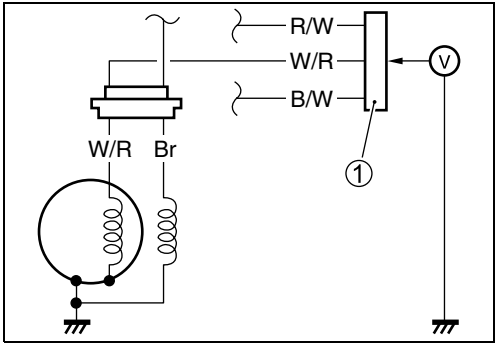
- Remove the left footrest mudguard. (☞ 5-5)
- Disconnect the regulator/rectifier coupler ①.
- Start the engine and keep it running at 2 800 r/min.
- Using the multi-circuit the voltage between W/R wire and ground.

If the tester reads under the specified value, replace the generator coil with a new one.

 09900-25008: Multi-circuit tester set

 Tester knob indication: Voltage (~)

 **Generator no-load performance:**
20 V and more at 2 800 r/min (When engine is cold)



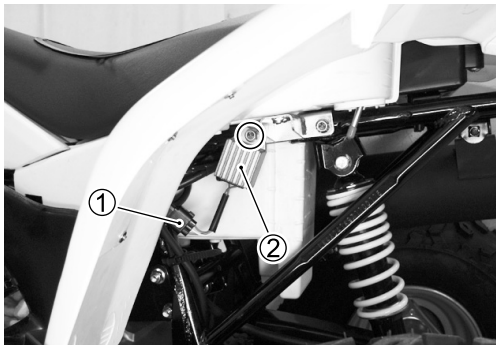
REGULATOR/RECTIFIER

- Disconnect the regulator/rectifier coupler ①.
- Remove the regulator/rectifier ②.

Measure the voltage between the lead wire with 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 (→←)



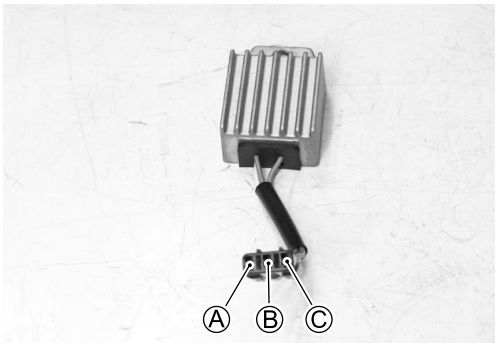
Unit: V

		⊕ Probe of tester to:		
① Probe of tester to:		Ⓐ	Ⓑ	Ⓒ
	Ⓐ		*	*
	Ⓑ	*		*
	Ⓒ	*	*	

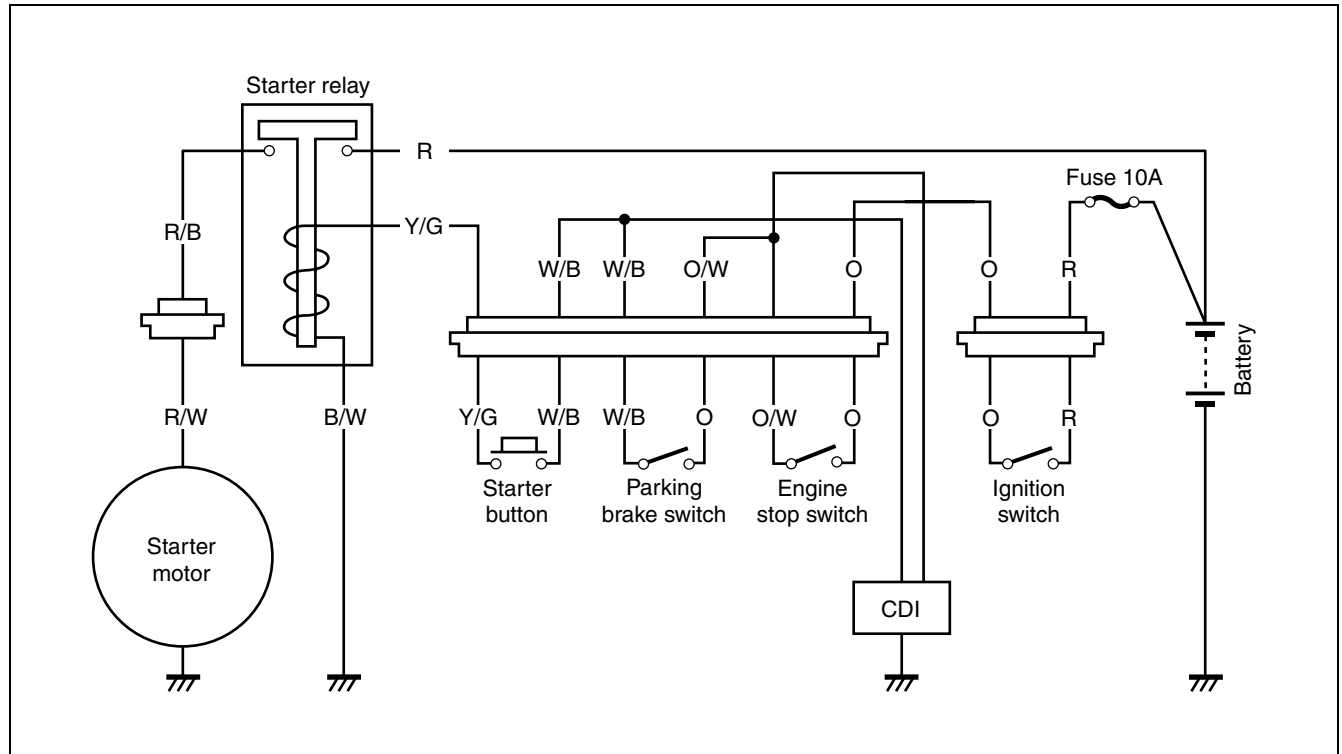
*1.4 V and more (tester's battery voltage)

NOTE:

If the tester reads 1.4 V and below when the tester probes are not connected, replace its battery.



STARTER SYSTEM



TROUBLESHOOTING

Make sure that the fuse is not blown and the battery is fully-charged before diagnosing.

Starter motor will not run

Step 1

- 1) Turn on the ignition switch with the engine stop switch, parking brake switch in the "RUN", "ON" and "SET" positions and listen for a click from the starter relay when the starter button is pushed.

Is a click sound heard?

YES	Go to Step 2.
NO	Go to Step 3.

Step 2

- 1) Check if the starter motor runs when its terminal is connected to the battery (+) 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 - Loose or disconnected between starter relay and battery (+) terminal
NO	Faulty starter motor

Step 3

- 1) Measure the starter relay voltage at the starter relay connectors (between Y/G ⊕ and B/W ⊖) when the starter button is pushed.
- Is a voltage OK?

YES	Go to Step 4.
NO	- Faulty engine stop switch - Faulty starter button - Faulty parking brake switch - Faulty ignition switch - Poor contact of connector - Open circuit in wiring harness

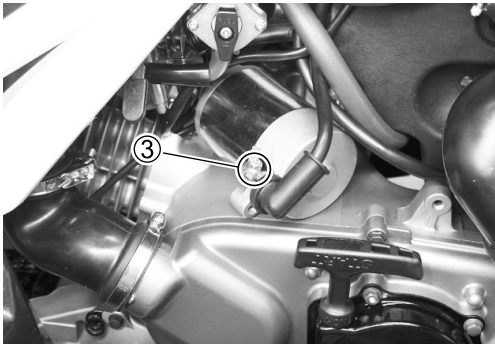
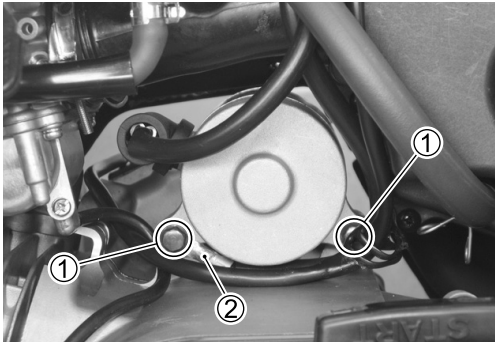
Step 4

- 1) Check the starter relay. (ⓘ 6-16)
- Is the starter relay OK?

YES	Poor contact of the starter relay
NO	Faulty starter relay

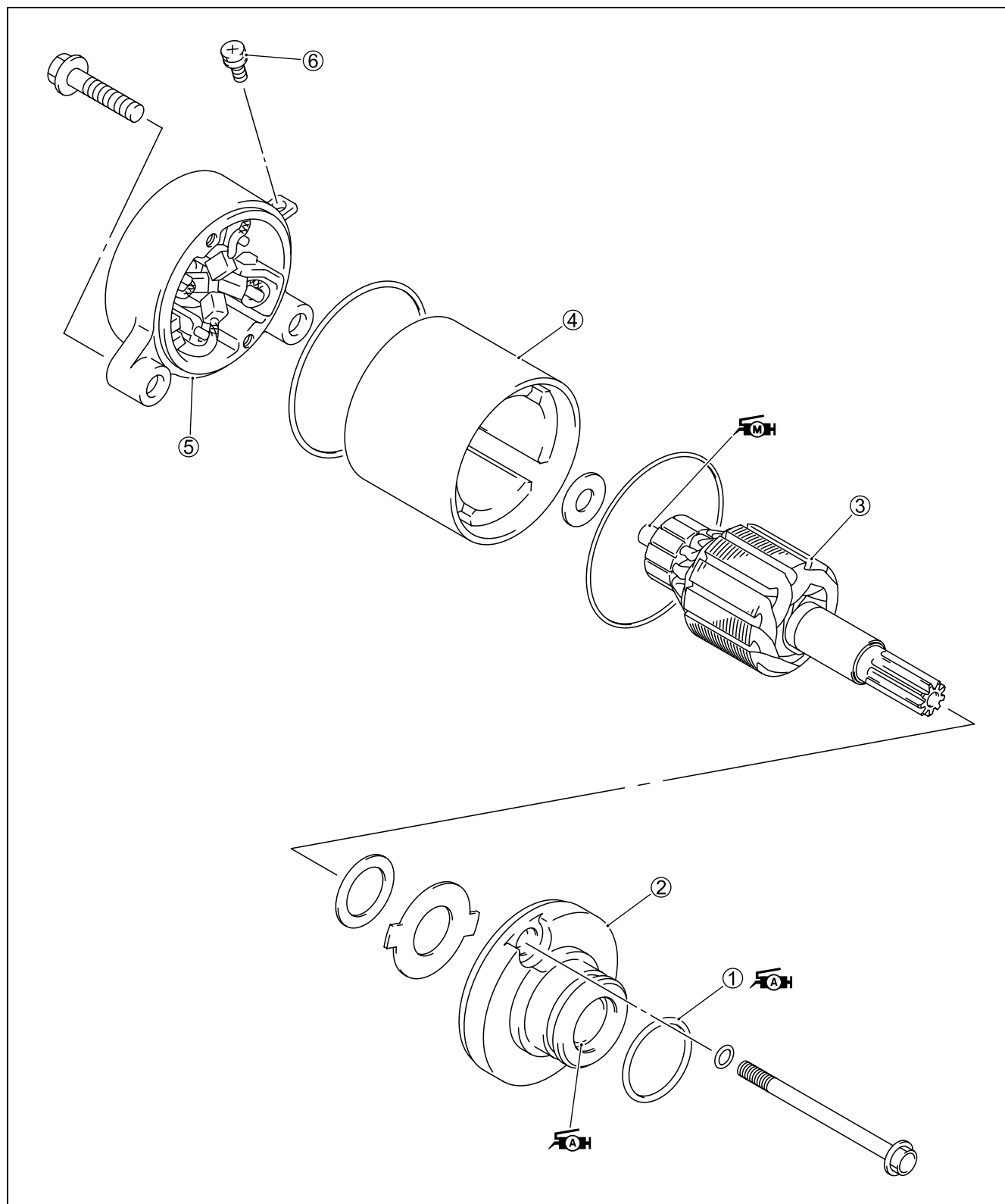
STARTER MOTOR REMOVAL

- Disconnect the battery ⊖ lead wire.
- Remove the left footrest mudguard. (ⓘ 5-5)
- Remove the starter motor mounting bolts ① and engine grand lead wire ②.
- Disconnect the starter motor lead wire ③.



STARTER MOTOR DISASSEMBLY

- Disassemble the starter motor as shown in the illustration.



①	O-ring	④	Starter motor case
②	Housing end (inside)	⑤	Housing end (outside)
③	Armature	⑥	Starter motor lead wire mounting bolt

STARTER MOTOR INSPECTION

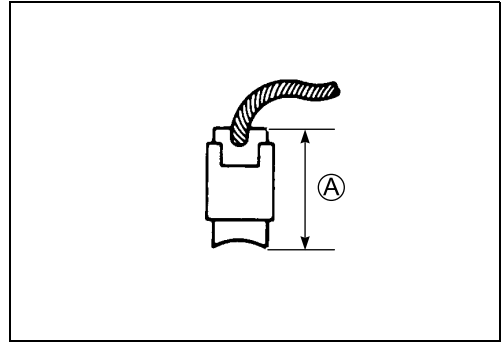
CARBON BRUSH

- Inspect the brushes for abnormal wear, cracks, or smoothness in the brush holder.
If any defects are found, replace the housing end assembly with a new one.
- Measure the brush length $\textcircled{A}$ of the brushes using a vernier calipers. If measurement is less than the service limit, replace the housing end assembly with a new one.

 **09900-20101: Vernier calipers**

 **Brush length**

Service Limit: 5.0 mm (0.196 in)



COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut $\textcircled{A}$.

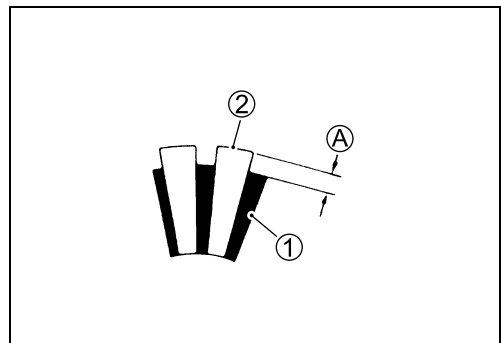
If abnormal wear is found, replace the armature with a new one.

If the commutator surface is discolored, polish it with #400 sand paper and wipe it using a clean dry cloth.

If there is no undercut, scrape out the insulator with a saw blade.

① Insulator

② Segment



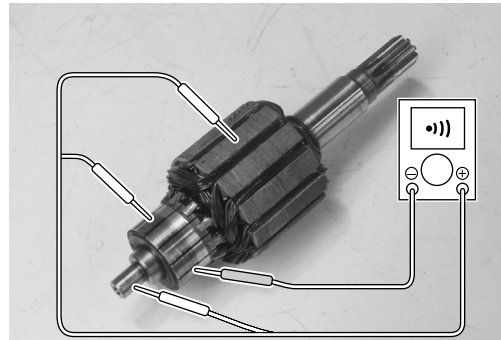
ARMATURE COIL INSPECTION

Check for continuity between each segment and between each segment and the armature shaft with the multi-circuit tester.

If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.

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

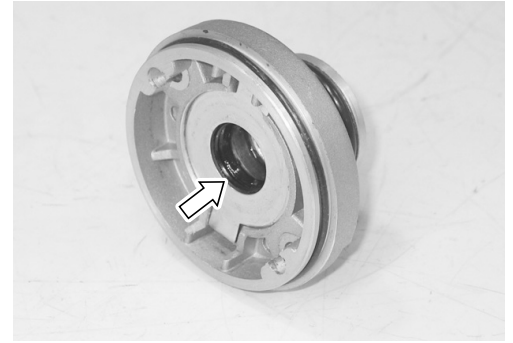
 **Tester knob indication: Continuity test (•••••)**



OIL SEAL INSPECTION

Check the oil seal lip for damage or leakage.

If any defects are found, replace the housing end assembly.



STARTER MOTOR REASSEMBLY

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

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

 **99000-25010: SUZUKI SUPER GREASE "A"**
(or equivalent grease)



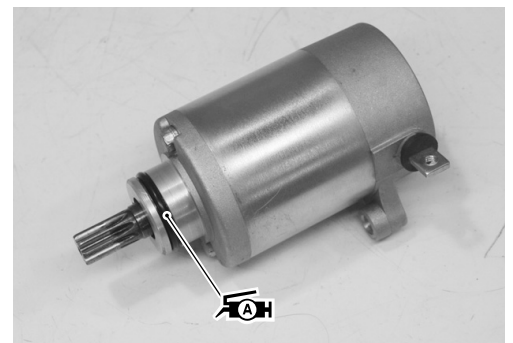
- Apply SUZUKI MOLY PASTE to the armature shaft.

 **99000-25140: SUZUKI MOLY PASTE**



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

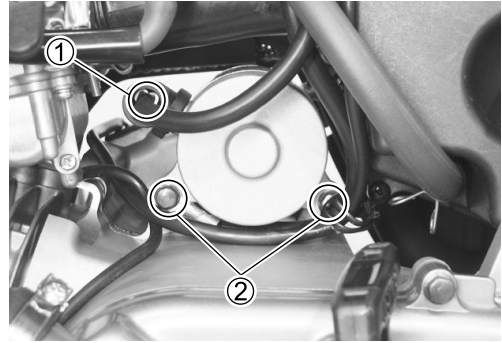
 **99000-25010: SUZUKI SUPER GREASE "A"**
(or equivalent grease)



STARTER MOTOR INSTALLATION

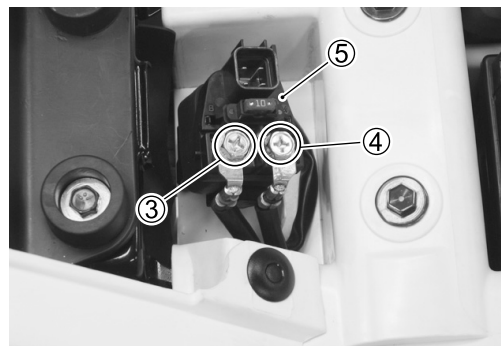
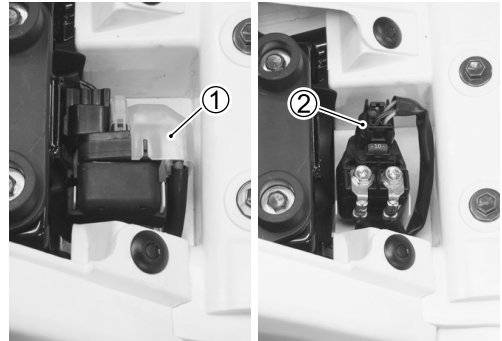
- Tighten the starter motor lead wire mounting bolt ① and starter motor mounting bolts ②.
- Tighten the starter motor lead wire mounting bolt to the specified torque.

 **Starter motor lead wire mounting bolt:**
4 N·m (0.4 kgf-m, 3.0 lb-ft)



STARTER RELAY INSPECTION

- Remove the seat. (→ 5-4)
- Disconnect the battery $\ominus$ lead wire from the battery.
- Remove the starter relay cover ①.
- Disconnect the starter relay coupler ②.
- Disconnect the battery $\oplus$ lead wire ③ starter motor lead wire ④.
- Remove the starter relay ⑤.



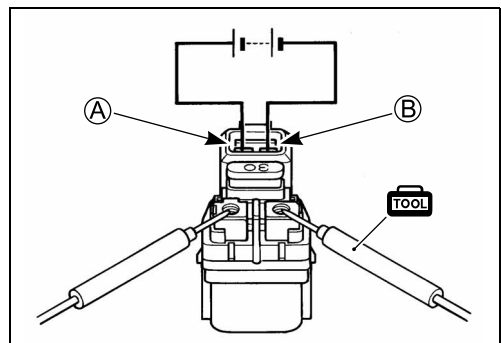
- Apply 12 V to (A) and (B) terminals and check for continuity between the positive and negative terminals using the multi-circuit tester. If the starter relay clicks and continuity is found, the relay is ok.

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

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

CAUTION

Do not apply battery voltage to the starter relay for more than five seconds, since the relay coil may over-heat and get damaged.



Measure the relay coil resistance between the terminals with the multi-circuit tester. If the resistance is not within the standard range, replace the starter relay with a new one.

TOOL 09900-25008: Multi-circuit tester set

Tester knob indication: Resistance (Ω)

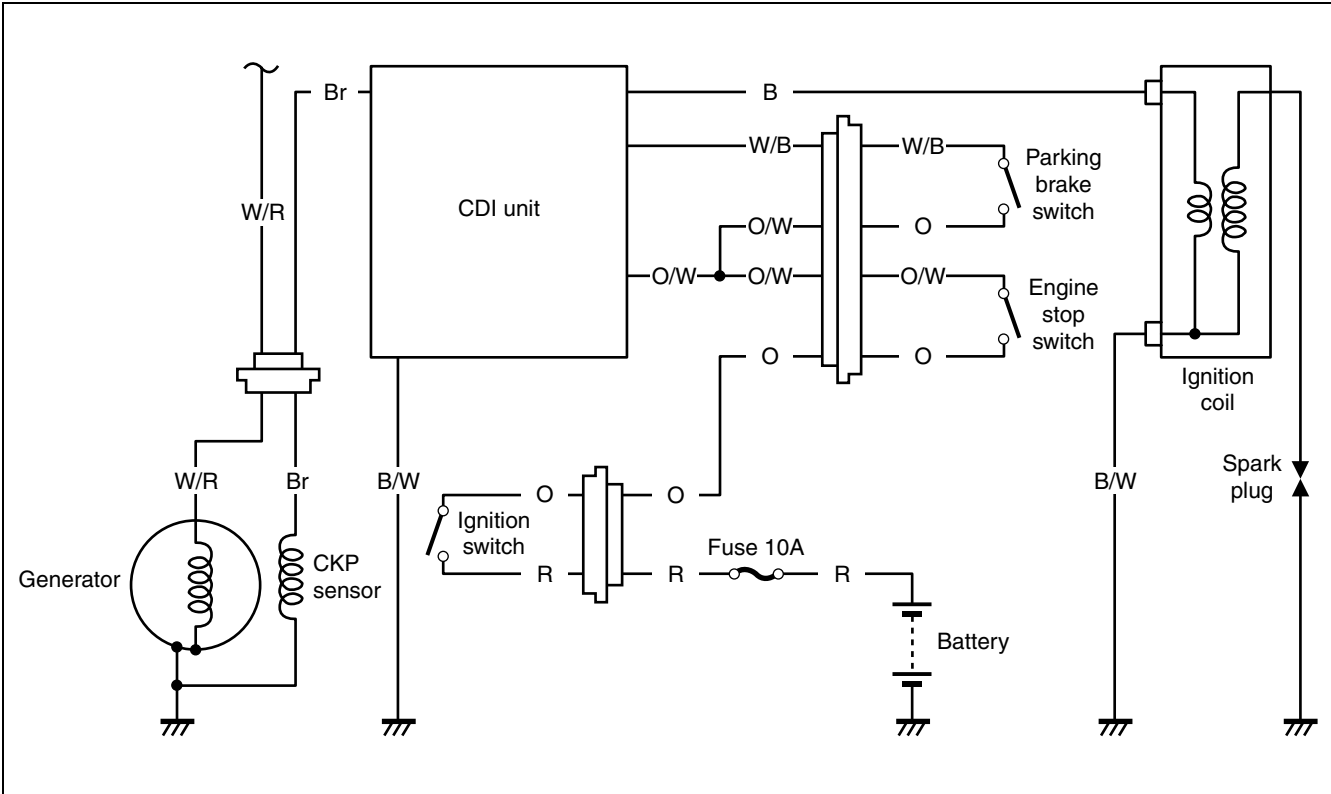
DATA Starter relay resistance: 3 – 6 Ω

- Tighten the starter relay lead wire mounting bolt to the specified torque.

W Starter relay lead wire mounting bolts:
4.5 N·m (0.45 kgf-m, 3.0 lb-ft)



IGNITION SYSTEM



TROUBLESHOOTING

No spark or poor spark

NOTE:

Check that the engine stop switch, parking brake switch is in the “RUN”, “ON” and “SET” positions. Check that the fuse is not blown and the battery is fully-charged before diagnosing.

Step 1

1) Check the ignition system couplers for poor connections.

Is there connection in the ignition system couplers?

YES	Go to Step 2.
NO	Poor connection of couplers.

Step 2

- 1) Measure the battery voltage between input lead wires (O/W and B/W) at the CDI unit with the ignition switch in the "ON" position.

Is the voltage OK?

YES	Go to Step 3.
NO	- Faulty ignition switch - Faulty engine stop switch - Broken wiring harness or poor connection of related circuit couplers

Step 3

- 1) Measure the ignition coil primary peak voltage. (🔧 6-20)

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. (🔧 2-8)

Is the spark plug OK?

YES	Go to Step 6.
NO	Faulty spark plug.

Step 5

- 1) Inspect the parking brake switch. (🔧 6-23)

Is the parking brake switch OK?

YES	Go to Step 6.
NO	Faulty parking brake switch.

Step 6

- 1) Inspect the ignition coil. (🔧 6-21)

Is the ignition coil OK?

YES	Go to Step 7.
NO	- Poor connection of the ignition coil. - Faulty ignition coil.

Step 7

- 1) Measure the CKP sensor peak voltage and resistance. (🔧 6-21)

NOTE:

The CKP sensor peak voltage inspection is applicable only with the multi-circuit tester and peak volt adaptor.

Is the peak voltage and resistance OK?

YES	- Faulty CDI unit. - Poor connection of generator coupler. - Open or short circuit in wire harness.
NO	Faulty CKP sensor.

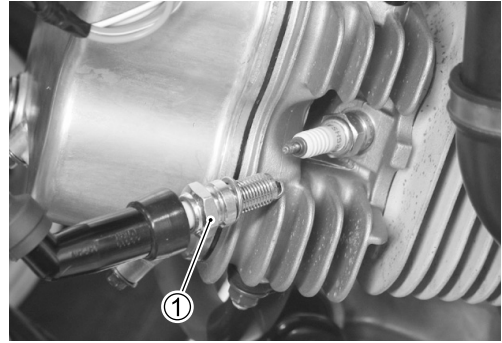
INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Disconnect the spark plug cap.
- Connect a new spark plug ① to 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 ignition coil primary peak voltage using the multi-circuit tester in the following procedure.

- Connect the multi-circuit tester with the peak voltage adaptor as follows.

⊕ Probe: Black/White lead wire or ground

⊖ Probe: Black lead wire

NOTE:

Do not disconnect the ignition coil primary wires.

TOOL 09900-25008: Multi-circuit tester set

CAUTION

When using the multi-circuit tester and peak volt adaptor, refer to the appropriate instruction manual.

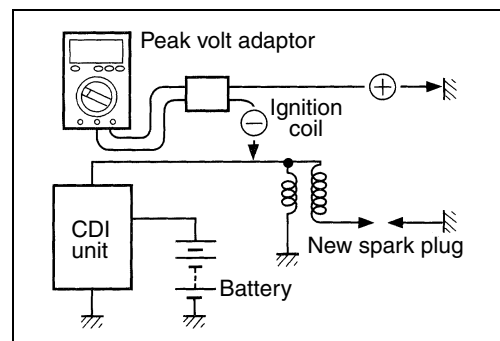
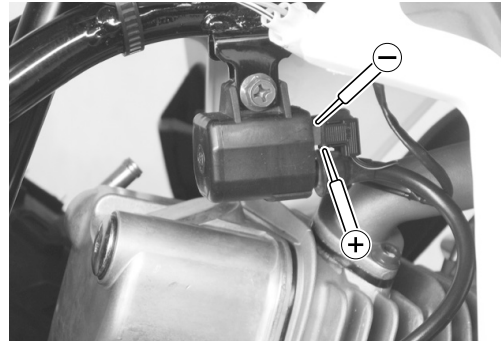
- Turn the ignition switch to the "ON" position.
- Push the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage. If the voltage is lower than the standard values, inspect the ignition coil.

TESTER Tester knob indication: Voltage (V)

DATA Ignition coil primary peak voltage: 150 V and more

WARNING

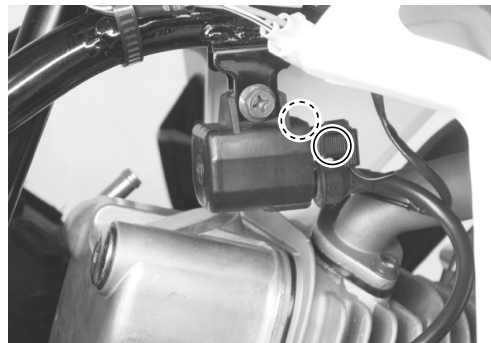
While testing, do not touch the tester probes and spark plug to prevent receiving an electric shock.



IGNITION COIL RESISTANCE

- Disconnect the ignition coil lead wires and spark plug cap, and remove the ignition coil.

Measure the ignition coil resistance in both the primary and secondary windings with the multi-circuit tester. If the resistance is not within the standard range, replace the ignition coil.



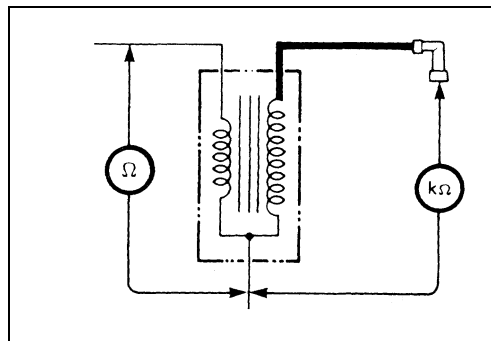
TOOL 09900-25008: Multi-circuit tester set

TESTER Tester knob indication: Resistance (Ω)

DATA Ignition coil resistance

Primary : 0.1 – 0.7 Ω (Terminal – Terminal)

Secondary : 14 – 20 k Ω (Spark plug cap – Terminal)



CKP SENSOR PEAK VOLTAGE

- Remove the seat. (☞ 5-4)

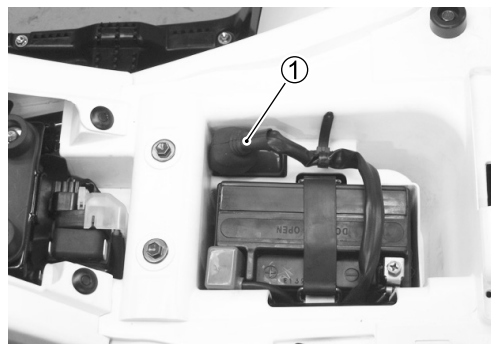
NOTE:

Make sure all of the couplers are connected properly.

- Disconnect the CDI unit coupler ①.

Measure the CKP sensor peak voltage in the following procedure.

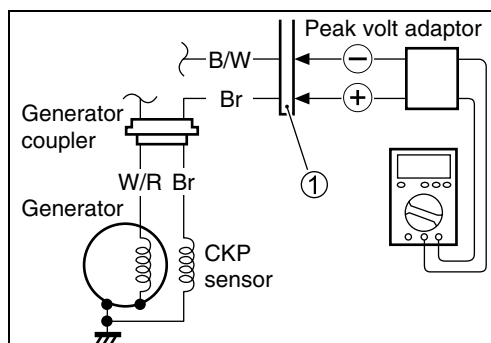
- Connect the multi-circuit tester with the peak volt adaptor as follows.



CKP sensor: ⊕ Probe...Brown lead wire

⊖ Probe...Black/White lead wire or ground

TOOL 09900-25008: Multi-circuit tester set



CAUTION

When using the multi-circuit tester and peak volt adaptor, refer to the appropriate instruction manual.

- 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 CKP sensor peak voltage.

- Repeat the above procedure a few times and measure the highest CKP sensor peak voltage.

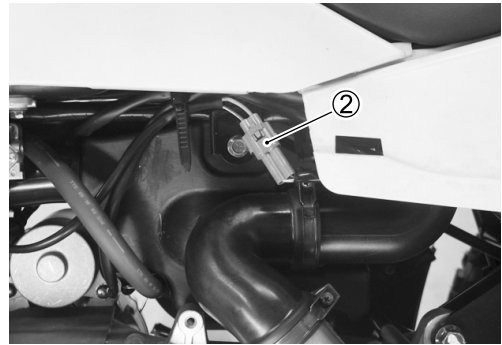
 **Tester knob indication: Voltage (---)**

DATA CKP sensor peak voltage: 1.5 V and more

If the peak voltage measured on the CDI unit coupler is lower than the standard value, measure the peak voltage on the generator coupler as follows.

- Remove the left footrest mudguard. (📄 5-5)
- Disconnect the generator coupler ② and connect the multi-circuit tester with the peak volt adaptor as follows.

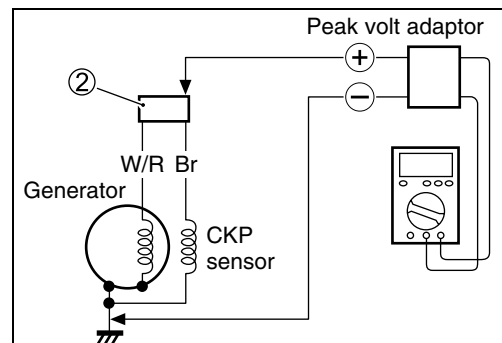
CKP sensor: ⊕ Probe...Brown lead wire
⊖ Probe...Ground



Measure the CKP sensor peak voltage in the same manner as on the CDI unit coupler.

 **Tester knob indication: Voltage (---)**

DATA CKP sensor peak voltage: 1.5 V and more



If the peak voltage on the generator coupler is within the specification, but on the CDI unit coupler is not within specification, replace the wiring harness with a new one. If both peak voltages are not within specification, replace the generator coil with a new one.

CKP SENSOR RESISTANCE

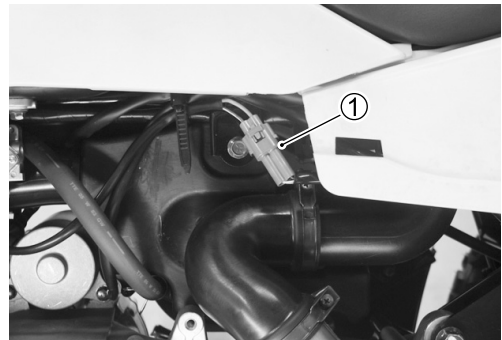
- Remove the left footrest mudguard. (📄 5-5)
- Disconnect the generator coupler ①.

Measure the resistance with the multi-circuit tester. If the resistance is not within the standard range, replace the generator coil.

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

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

DATA CKP sensor resistance: 150 – 230 Ω (Brown – Ground)



SWITCHES

Measure each switch for continuity using a multi-circuit tester. If any abnormality is found, replace the respective switch assemblies with new ones.

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

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

IGNITION SWITCH

Position \ Color	B/Y	B/W	R	O
OFF	○	○		
ON			○	○

WIRE COLOR

O : Orange
R : Red

B/W : Black with White tracer
B/Y : Black with Yellow tracer
O/G : Orange with Green tracer
O/W : Orange with White tracer
W/B : White with Black tracer
Y/G : Yellow with Green tracer

ENGINE STOP SWITCH

Position \ Color	O/G	O/W
OFF		
RUN	○	○

STARTER BUTTON

Position \ Color	B/W	Y/G
•		
PUSH	○	○

PARKING BRAKE SWITCH

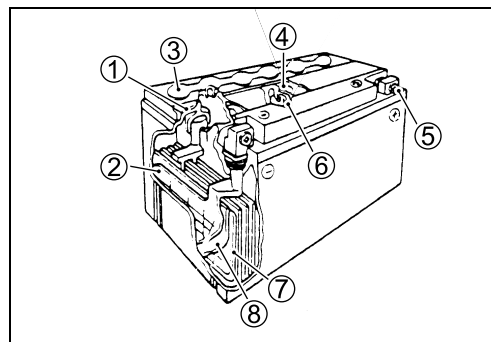
Position \ Color	O	W/B
OFF		
ON	○	○

BATTERY

SPECIFICATIONS

Type designation	YTX7A-BS
Capacity	12 V, 14.4 kC (6 Ah)/10 HR

- | | |
|------------------------|--------------------------------|
| ① Upper cover breather | ⑤ Terminal |
| ② Cathode plates | ⑥ Safety valve |
| ③ Stopper | ⑦ Anode plates |
| ④ Filter | ⑧ Separator (Fiberglass plate) |



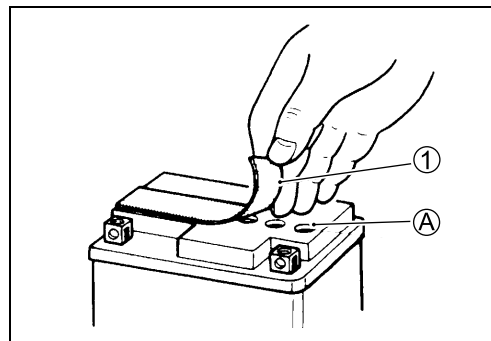
INITIAL CHARGING

Filling electrolyte

- Remove the aluminum tape ① sealing the battery electrolyte filler holes ④.

NOTE:

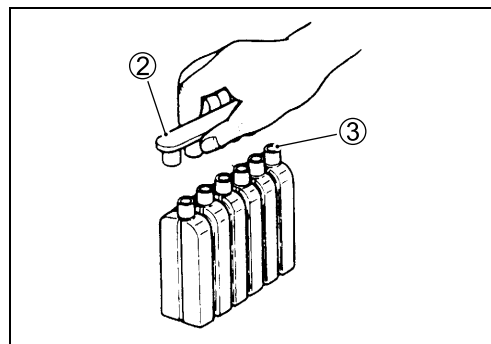
When filling electrolyte, the battery must be removed from the vehicle and must be put on the level ground.



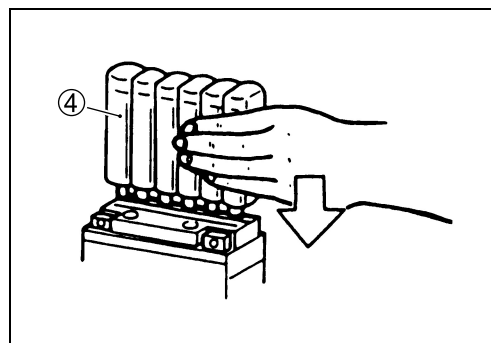
- Remove the caps ②.

NOTE:

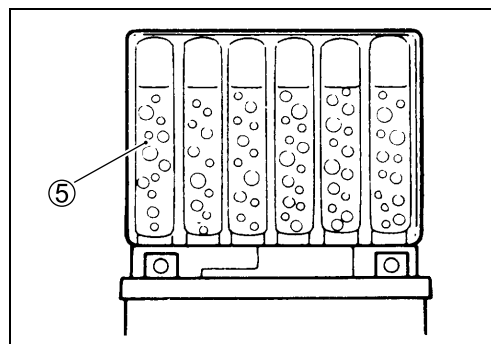
- * After filling the electrolyte completely, use the removed cap ② as sealing caps of battery-filler holes.
- * Do not remove or pierce the sealed areas ③ of the electrolyte container.



- Insert the nozzles of the electrolyte container ④ into the battery's electrolyte filler holes, holding the container firmly so that it does not fall. Take precaution not to allow any of the fluid to spill.



- Make sure air bubbles ⑤ are coming up in each electrolyte container, and leave in this position for about more than 20 minutes.

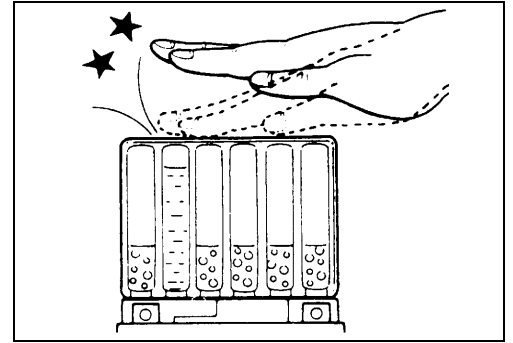


NOTE:

If no air bubbles are coming up from a filler port, tap the bottom of the electrolyte container two or three times.

Never remove the container from the battery.

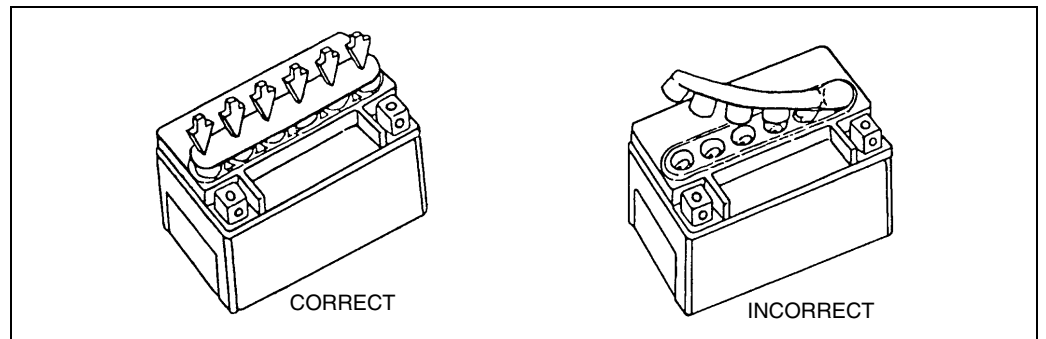
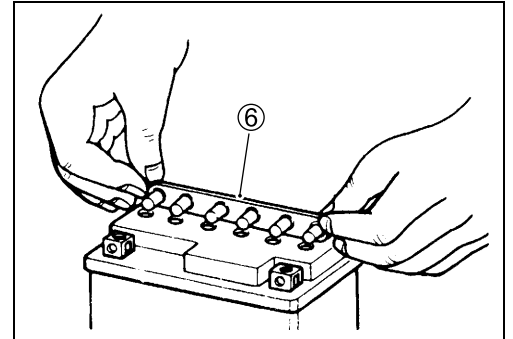
- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for about 20 minutes.



- Insert the caps ⑥ into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.

CAUTION

- * **Never use anything except the specified battery.**
- * **Once the caps have been installed to the battery, do not remove the caps.**
- * **Do not tap the caps with a tool such as hammer when installing them.**



For initial charging, use the charger specially designed for MF battery.

CAUTION

- * **For charging the battery, make sure to use the charger specially designed for MF battery. Otherwise, the battery may be overcharged resulting in shortened service life.**
- * **Do not remove the cap during charging.**
- * **Position the battery with the cap facing upward during charging.**

SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, clean the battery terminals with sandpaper.

RECHARGING OPERATION

- Using the multi-circuit tester, check the battery voltage. If the voltage reading is 12.0 V (DC) and less, recharge the battery with a battery charger.

Ⓐ Charging period

Ⓑ Stop charging

CAUTION

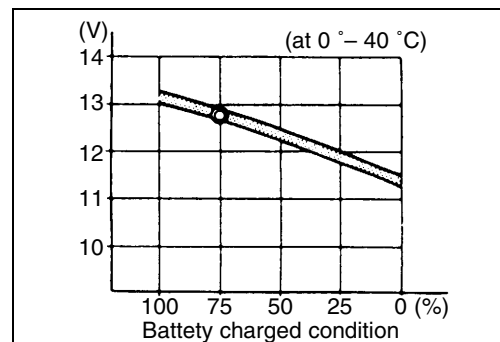
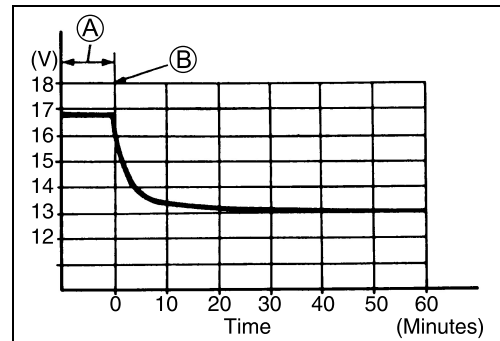
- * When recharging the battery, remove the battery from the vehicle.**
- * Do not remove the caps on the battery top while recharging.**

Recharging time: 0.5 A for 5 to 10 hours or 5 A for 30 minutes

CAUTION

Be careful not to permit the charging current to exceed 5 A at any time.

- After recharging, wait for 30 minutes and more and check the battery voltage with a multi-circuit tester.
- If the battery voltage is the 12.5 V and less, recharge the battery again.
- If battery voltage is still 12.5 V and less, after recharging, replace the battery with a new one.
- When the vehicle is not used for a long period, check the battery every 1 month to prevent the battery discharge.



SERVICING INFORMATION

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TROUBLESHOOTING

ENGINE

ENGINE WILL NOT START OR IS HARD TO START

Symptom, possible causes and remedy

1) Compression too low

- | | |
|--|-------------------------|
| • Valve clearance out of adjustment. | Adjust. |
| • Worn valve guides or poor seating of valves. | Repair or replace. |
| • Mistimed valves. | Adjust. |
| • Excessively worn piston rings. | Replace. |
| • Worn-down cylinder bore. | Replace. |
| • Starter motor cranks too slowly. | See electrical section. |
| • Poor seating of spark plug. | Retighten. |
| • Gas leaks from the joint in cylinder or cylinder head. | Repair or replace. |
| • Loose spark plug. | Tighten. |
| • Broken, cracked or damaged piston. | Replace. |

2) Plug not sparking

- | | |
|--------------------------------------|--------------------|
| • Fouled spark plug. | Clean or replace. |
| • Wet spark plug. | Clean and dry. |
| • Defective CKP sensor | Replace. |
| • Defective CDI unit. | Replace. |
| • Defective ignition coil. | Replace. |
| • Open-circuited wiring connections. | Repair or replace. |
| • Defective generator coil. | Replace. |

3) No fuel reaching the carburetor

- | | |
|--------------------------------------|-------------------|
| • Clogged fuel hose. | Clean or replace. |
| • Clogged or defective fuel valve. | Clean or replace. |
| • Defective carburetor needle valve. | Replace. |
| • Clogged fuel filter. | Clean or replace. |

ENGINE STALLS OFTEN

Symptom, possible causes and remedy

- | | |
|--------------------------------------|----------|
| • Fouled spark plug. | Clean. |
| • Defective CDI unit. | Replace. |
| • Defective ignition coil. | Replace. |
| • Clogged fuel hose. | Clean. |
| • Clogged carburetor jets. | Clean. |
| • Clogged exhaust pipe. | Clean. |
| • Damaged cylinder head gasket. | Replace. |
| • Valve clearance out of adjustment. | Adjust. |

NOISY ENGINE**Symptom, possible causes and remedy**

- | | |
|---|---------------------------|
| 1) Excessive valve chatter | |
| • Too large valve clearance. | Adjust. |
| • Weakened or broken valve springs. | Replace. |
| • Worn rocker arm or cam surface. | Replace. |
| 2) Noise seems to come from piston | |
| • Worn down piston or cylinder. | Replace. |
| • Combustion chamber fouled with carbon. | Clean. |
| • Worn piston pin or piston pin bore. | Replace. |
| • Worn piston rings or ring grooves. | Replace. |
| 3) Noise seems to come from clutch | |
| • Weak clutch shoe spring. | Replace. |
| 4) Noise seems to come from crankshaft | |
| • Rattling bearings due to wear. | Replace. |
| • Worn and burnt journal bearings. | Replace. |
| • Too large thrust clearance. | Replace bearing retainer. |
| 5) Noise seems to come from the movable drive and driven face | |
| • Worn or slipping drive belt. | Replace. |
| • Worn rollers in movable drive face. | Replace. |

CLUTCH SLIPS**Symptom, possible causes and remedy**

- | | |
|--------------------------------|----------|
| • Worn or damaged clutch shoe. | Replace. |
| • Worn clutch housing. | Replace. |

ENGINE IDLES POORLY**Symptom, possible causes and remedy**

- | | |
|---------------------------------------|----------------------|
| • Valve clearance out of adjustment. | Adjust. |
| • Poor seating of valves. | Replace or repair. |
| • Defective valve guides. | Replace. |
| • Worn down camshaft. | Replace. |
| • Worn cylinder. | Replace. |
| • Worn piston rings. | Replace. |
| • Stiff piston rings. | Replace. |
| • Excessive spark plug gap. | Adjust or replace. |
| • Defective CDI unit. | Replace. |
| • Defective ignition coil. | Replace. |
| • Defective generator coil. | Replace. |
| • Incorrect float chamber fuel level. | Adjust float height. |
| • Clogged carburetor jet. | Clean. |

ENGINE RUNS POORLY IN HIGH SPEED RANGE**Symptom, possible causes and remedy**

• Weakened valve springs.	Replace.
• Worn camshaft.	Replace.
• Valve timing out of adjustment.	Adjust.
• Too narrow spark plug gap.	Adjust.
• Ignition not advanced sufficiently due to poorly working timing advance circuit.	Replace.
• Defective CDI unit.	Replace.
• Defective ignition coil.	Replace.
• Defective generator coil.	Replace.
• Low float chamber fuel level.	Adjust float height.
• Clogged fuel hose, resulting in inadequate fuel supply to the carburetor.	Clean and prime.
• Clogged fuel valve.	Clean.
• Clogged air cleaner element.	Clean or replace.
• Sucking air from carburetor joint.	Repair or replace.

ENGINE LACKS POWER**Symptom, possible causes and remedy**

- | | |
|---|-----------------------|
| • Loss of valve clearance. | Adjust. |
| • Weakened valve springs. | Replace. |
| • Valve timing out of adjustment. | Adjust. |
| • Worn piston rings or cylinder. | Replace. |
| • Poor seating of valves. | Repair. |
| • Fouled spark plug. | Clean or replace. |
| • Incorrect spark plug. | Adjust or replace. |
| • Clogged carburetor jet. | Clean. |
| • Insufficient spark plug gap. | Regap or replace. |
| • Air leakage from intake pipe. | Tighten or replace. |
| • Incorrect float chamber fuel level. | Adjust float height. |
| • Clogged air cleaner element. | Replace. |
| • Sucking air from carburetor or vacuum hose. | Retighten or replace. |
| • Too much engine oil. | Drain out excess oil. |

ENGINE OVERHEATS**Symptom, possible causes and remedy**

- | | |
|---|----------------------|
| • Heavy carbon deposit on piston head. | Clean. |
| • Not enough oil in the engine. | Add oil. |
| • Use of incorrect engine oil. | Change. |
| • Low float chamber fuel level. | Adjust float height. |
| • Air leakage from intake pipe. | Tighten or replace. |
| • Incorrect spark plug. | Change. |
| • Clogged exhaust pipe/muffler. | Clean or replace. |
| • Ignition timing too advanced due to defective timing. | Replace. |

DIRTY OR HEAVY EXHAUST SMOKE**Symptom, possible causes and remedy**

- | | |
|--------------------------------------|-------------------|
| • Too much engine oil in the engine. | Drain excess oil. |
| • Worn piston rings or cylinder. | Replace. |
| • Worn valve guides. | Replace. |
| • Scored or scuffed cylinder wall. | Replace. |
| • Worn valves stems. | Replace. |
| • Defective stem seal. | Replace. |
| • Worn oil ring side rail. | Replace. |

CARBURETOR

STARTING DIFFICULTY

Symptom, possible causes and remedy

- | | |
|--|-------------------------------------|
| • Clogged fuel pipe. | Clean. |
| • Air leaking from joint between intake port and carburetor. | Tighten or replace gasket. |
| • Air leaking from carburetor joint. | Tighten or replace defective parts. |
| • Improperly working starter plunger. | Adjust. |

IDLING OR LOW-SPEED TROUBLE

Symptom, possible causes and remedy

- | | |
|--------------------------------------|-------------------------------------|
| • Clogged or loose pilot jet. | Clean or tighten. |
| • Air leaking from carburetor joint. | Tighten, or replace defective part. |
| • Clogged pilot outlet port. | Clean. |
| • Clogged bypass port. | Clean. |
| • Starter plunger not fully closed. | Adjust. |

MEDIUM OR HIGH-SPEED TROUBLE

Symptom, possible causes and remedy

- | | |
|------------------------------------|-------------------|
| • Clogged main jet. | Clean. |
| • Clogged needle jet. | Clean. |
| • Improperly working piston valve. | Adjust. |
| • Clogged fuel filter. | Clean or replace. |

OVERFLOW AND FUEL LEVEL FLUCTUATIONS

Symptom, possible causes and remedy

- | | |
|---------------------------------------|--|
| • Worn or damaged needle valve. | Replace. |
| • Improperly working float. | Adjust or replace. |
| • Foreign matter on the needle valve. | Clean or replace with needle valve seat. |
| • Incorrect float chamber fuel level. | Adjust float height. |

CHASSIS

HEAVY STEERING

Symptom, possible causes and remedy

- | | |
|---|--------------------|
| • Distorted steering shaft. | Replace. |
| • Not enough pressure in tires. | Adjust. |
| • Improper front wheel alignment. | Adjust. |
| • Insufficiently lubricated. | Lubricate. |
| • Linkage connections tending to seize. | Repair or replace. |
| • Tie-rod ends tending to seize. | Replace. |

WOBBLY HANDLEBAR

Symptom, possible causes and remedy

- | | |
|---|---------------------|
| • Unequally inflated tires. | Regulate. |
| • Loose front wheel hub nuts. | Tighten. |
| • Damaged or worn front wheel hub bearings. | Replace. |
| • Worn or loose tie-rod ends. | Replace or tighten. |
| • Defective or incorrect front tires. | Replace. |
| • Damaged or worn suspension arms and related bushings. | Replace. |
| • Distorted front wheels. | Replace. |
| • Loose chassis nuts and bolts. | Tighten. |

STEERING PULLS TO ONE SIDE

Symptom, possible causes and remedy

- | | |
|-----------------------------------|--------------------|
| • Unequally inflated tires. | Regulate. |
| • Improper front wheel alignment. | Adjust. |
| • Worn front wheel hub bearings. | Replace. |
| • Distorted frame. | Repair or replace. |
| • Defective shock absorber. | Replace. |

SHOCKS FELT IN THE STEERING

Symptom, possible causes and remedy

- | | |
|-------------------------------------|-----------|
| • High tire pressure. | Regulate. |
| • Worn steering linkage connection. | Replace. |
| • Loose suspension system bolts. | Tighten. |

TIRES RAPIDLY OR UNEVENLY WEAR

Symptom, possible causes and remedy

- | | |
|---|----------|
| • Worn or loose front wheel hub bearings. | Replace. |
| • Improper front wheel alignment. | Adjust. |

STEERING TOO NOISY

Symptom, possible causes and remedy

- | | |
|---|------------|
| • Loose nuts and bolts. | Tighten. |
| • Damaged or worn front wheel hub bearings. | Replace. |
| • Insufficiently lubricated. | Lubricate. |

FRONT SUSPENSION TOO SOFT**Symptom, possible causes and remedy**

- | | |
|--------------------------------------|----------|
| • Weakened spring of shock absorber. | Replace. |
| • Shock absorber leaks oil. | Replace. |

FRONT SUSPENSION TOO STIFF**Symptom, possible causes and remedy**

- | | |
|---|----------|
| • Bent shock absorber shaft. | Replace. |
| • Worn suspension arms and related bushing. | Replace. |

NOISY FRONT SUSPENSION**Symptom, possible causes and remedy**

- | | |
|--|------------|
| • Loose nuts or bolts on suspension. | Retighten. |
| • Worn suspension arms and related bushings. | Replace. |

WOBBLY REAR WHEEL**Symptom, possible causes and remedy**

- | | |
|---|------------|
| • Distorted wheel rims. | Replace. |
| • Damaged or worn rear axle housing bearings. | Replace. |
| • Defective or incorrect tires. | Replace. |
| • Defective rear axle. | Replace. |
| • Loose nuts or bolts on rear suspension. | Retighten. |
| • Loose rear wheel hub nuts. | Tighten. |
| • Loosen rear axle housing mounting bolts. | Tighten. |
| • Improper rear brake adjustment. | Adjust. |
| • Rear shock absorber leaks oil. | Replace. |
| • Damaged or worn rear swingarm and related bushings. | Replace. |

REAR SUSPENSION TOO SOFT**Symptom, possible causes and remedy**

- | | |
|---------------------------------------|----------|
| • Weakened spring of shock absorber. | Replace. |
| • Leakage of oil from shock absorber. | Replace. |

REAR SUSPENSION TOO STIFF**Symptom, possible causes and remedy**

- | | |
|---------------------------------------|----------|
| • Bent shock absorber shaft. | Replace. |
| • Worn swingarm and related bushings. | Replace. |

NOISY REAR SUSPENSION**Symptom, possible causes and remedy**

- | | |
|---|------------|
| • Loose nuts or bolts on rear suspension. | Retighten. |
| • Worn swingarm. | Replace. |

BRAKES

INSUFFICIENT BRAKE POWER

Symptom, possible causes and remedy

- | | |
|--|-----------------------|
| • Worn brake drum. | Replace. |
| • Oil adhesion on friction surface of shoes. | Clean drum and shoes. |
| • Worn shoe linings. | Replace. |
| • Too much play on brake lever. | Adjust. |

BRAKE SQUEAKING

Symptom, possible causes and remedy

- | | |
|--|--------------------------------|
| • Carbon adhesion on lining surface. | Repair surface with sandpaper. |
| • Loose front wheel hub nut or rear wheel hub nut. | Tighten to specified torque. |
| • Damaged wheel hub bearings. | Replace. |
| • Worn linings. | Replace. |
| • Wrongly fixed spring. | Set correctly. |

EXCESSIVE BRAKE LEVER STROKE

Symptom, possible causes and remedy

- | | |
|-------------------------|--------------------|
| • Worn brake lever cam. | Replace brake cam. |
|-------------------------|--------------------|

BRAKE DRAGS

Symptom, possible causes and remedy

- | | |
|---|----------------------|
| • Rusty part. | Clean and lubricate. |
| • Insufficient brake lever lubrication. | Lubricate. |

ELECTRICAL

NO SPARKING OR POOR SPARKING

Symptom, possible causes and remedy

- | | |
|--------------------------------------|---------------------|
| • Defective CDI unit. | Replace. |
| • Defective ignition coil. | Replace. |
| • Defective spark plug. | Replace. |
| • Defective generator coil. | Replace. |
| • Loose connection of lead wire. | Connect or tighten. |
| • Open-circuited wiring connections. | Check and repair. |

SPARK PLUG SOON BECOMES FOULED WITH CARBON

Symptom, possible causes and remedy

- | | |
|------------------------------|--------------------|
| • Mixture too rich. | Adjust carburetor. |
| • Incorrect gasoline. | Change. |
| • Dirty air cleaner element. | Replace. |
| • Incorrect spark plug. | Replace. |

SPARK PLUG BECOMES FOULED TOO SOON

Symptom, possible causes and remedy

- | | |
|---|----------|
| • Worn piston rings. | Replace. |
| • Worn piston or cylinder. | Replace. |
| • Excessive clearance of valve stems in valve guides. | Replace. |
| • Worn stem oil seal. | Replace. |

SPARK PLUG ELECTRODES OVERHEAT OR BURN

Symptom, possible causes and remedy

- | | |
|--------------------------|------------------------------|
| • Too hot spark plug. | Replace with cold type plug. |
| • Overheated the engine. | Tune up. |
| • Loose spark plug. | Retighten. |
| • Too lean mixture. | Adjust carburetor. |

GENERATOR DOES NOT CHARGE

Symptom, possible causes and remedy

- | | |
|---|---------------------------------|
| • Open- or short-circuited lead wires, or loose lead connections. | Repair or replace or retighten. |
| • Short-circuited, grounded or open generator coil. | Replace. |
| • Short-circuited or punctured regulator/rectifier. | Replace. |

GENERATOR DOES CHARGE, BUT CHARGING RATE IS BELOW THE SPECIFICATION

Symptom, possible causes and remedy

- | | |
|--|----------------------|
| • Lead wires tend to get short- or open-circuited or loosely connected at terminals. | Repair or retighten. |
| • Grounded or open-circuited generator coil. | Replace. |
| • Defective regulator/rectifier. | Replace. |
| • Defective cell plates in the battery. | Replace the battery. |

GENERATOR OVERCHARGES

Symptom, possible causes and remedy

- | | |
|---|--------------------------------------|
| • Internal short-circuit in the battery. | Replace the battery. |
| • Damaged or defective regulator/rectifier. | Replace. |
| • Poorly grounded regulator/rectifier. | Clean and tighten ground connection. |

UNSTABLE CHARGING**Symptom, possible causes and remedy**

- | | |
|---|--------------------|
| • Lead wire insulation frayed due to vibration, resulting in intermittent short-circuiting. | Repair or replace. |
| • Internally short-circuited generator. | Replace. |
| • Defective regulator/rectifier. | Replace. |

START BUTTON IS NOT EFFECTIVE**Symptom, possible causes and remedy**

- | | |
|---|--------------------|
| • Run down battery. | Repair or replace. |
| • Defective switch contacts. | Replace. |
| • Brushes not seating properly on starter motor commutator. | Repair or replace. |
| • Defective starter relay. | Replace. |
| • Defective main fuse. | Replace. |

BATTERY

“SULFATION”, ACIDIC WHITE POWDERY SUBSTANCE OR SPOTS ON SURFACE OF CELL PLATES

Symptom, possible causes and remedy

- | | |
|--|----------------------|
| • Cracked battery case. | Replace the battery. |
| • Battery has been left in a run-down condition for a long time. | Replace the battery. |

BATTERY RUNS DOWN QUICKLY

Symptom, possible causes and remedy

- | | |
|--|---|
| • Trouble in charging system. | Check the generator, regulator/rectifier and circuit connections and make necessary adjustments to obtain specified charging operation. |
| • Cell plates have lost much of their active material as a result of overcharging. | Replace the battery and correct the charging system. |
| • Internal short-circuit in the battery. | Replace the battery. |
| • Too low battery voltage. | Recharge the battery fully. |
| • Too old battery. | Replace the battery. |

BATTERY “SULFATION”

Symptom, possible causes and remedy

- | | |
|--|--|
| • Incorrect charging rate.
(When not in use, battery should be checked at least once a month to avoid sulfation.) | Replace the battery. |
| • The battery was left unused in a cold climate for too long. | Replace the battery if badly sulfated. |

LUBRICATION SYSTEM

OIL PRESSURE

 2-31

OIL FILTER

 2-11

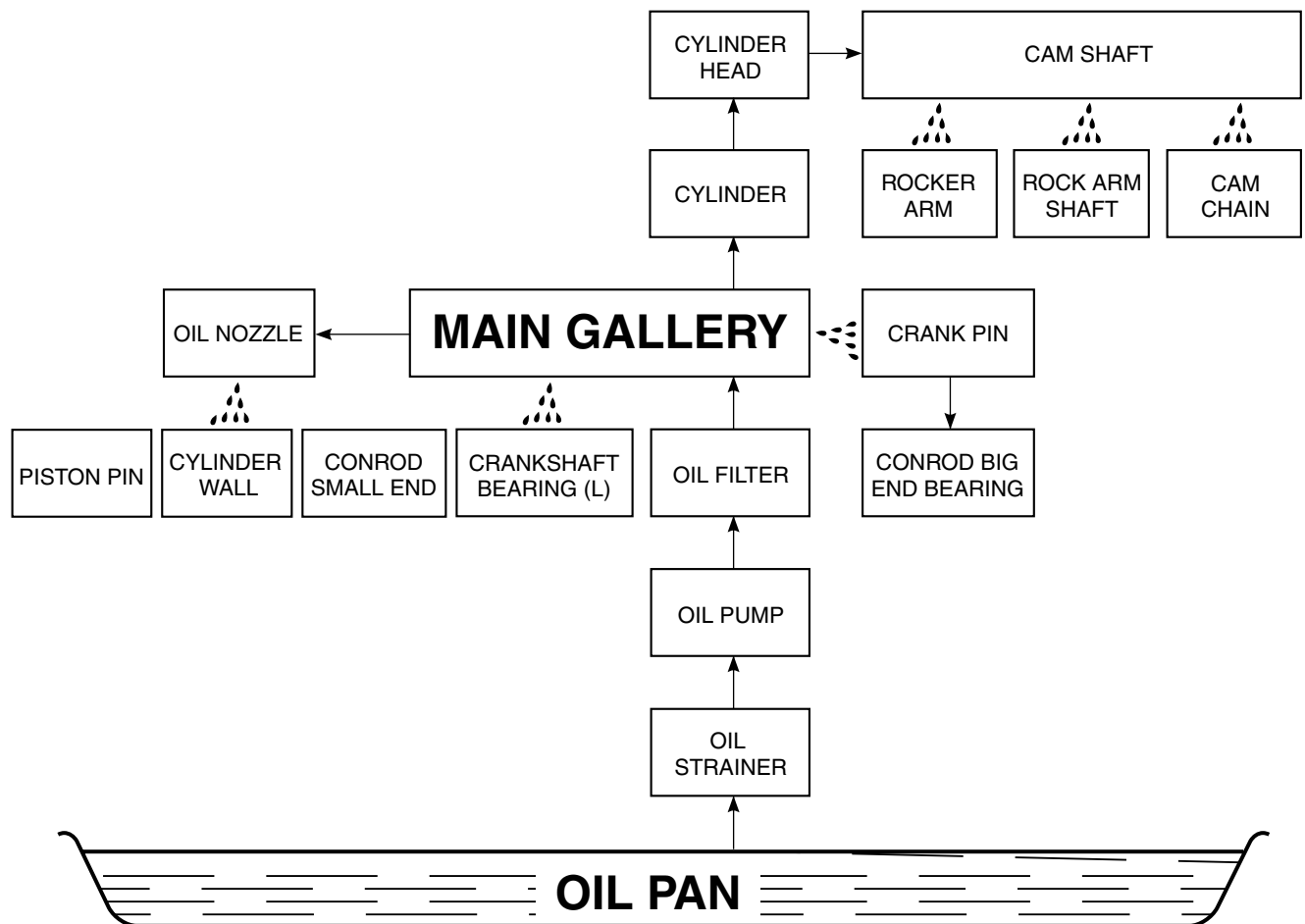
OIL STRAINER

 2-12

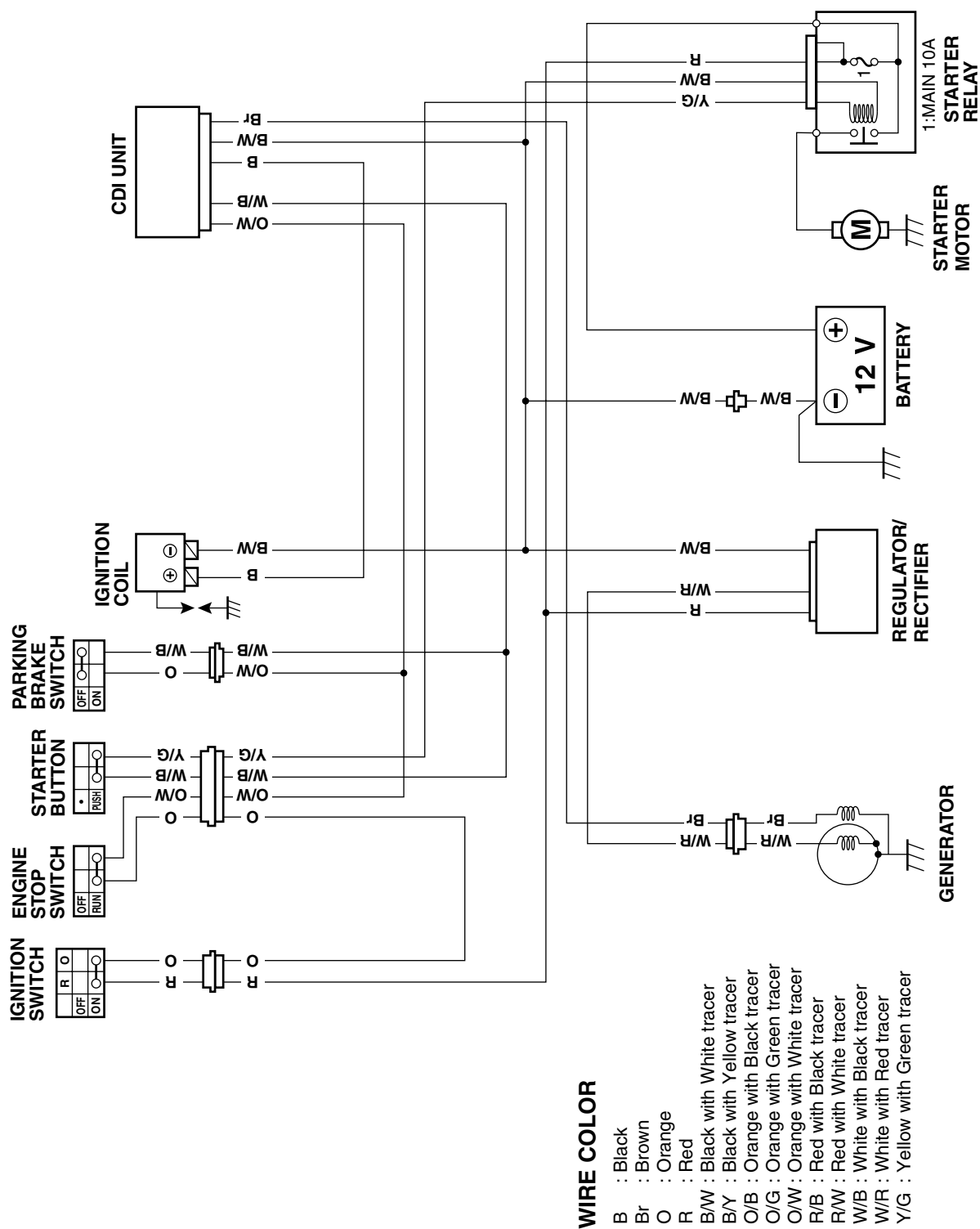
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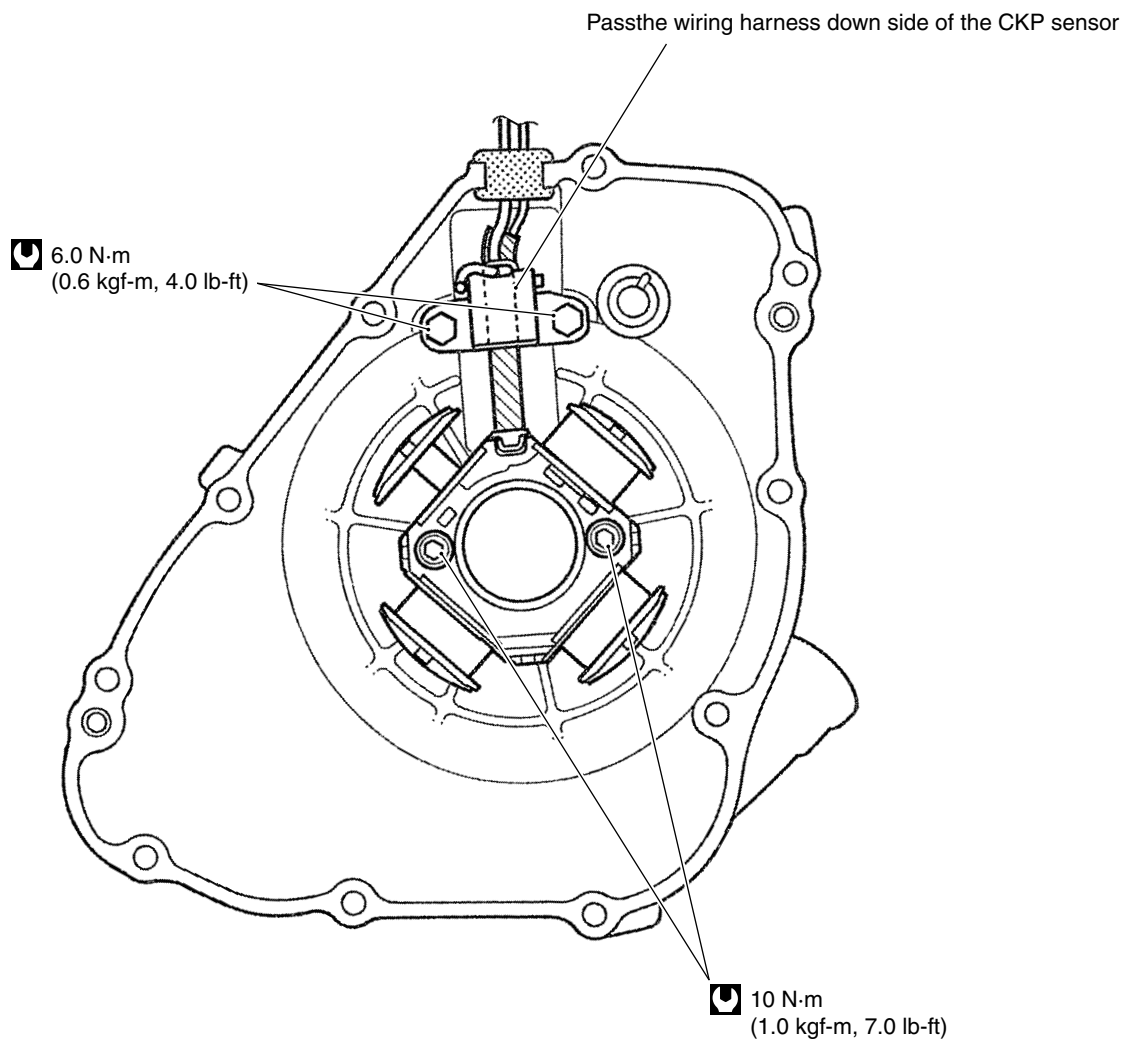
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ENGINE LUBRICATION SYSTEM CHART

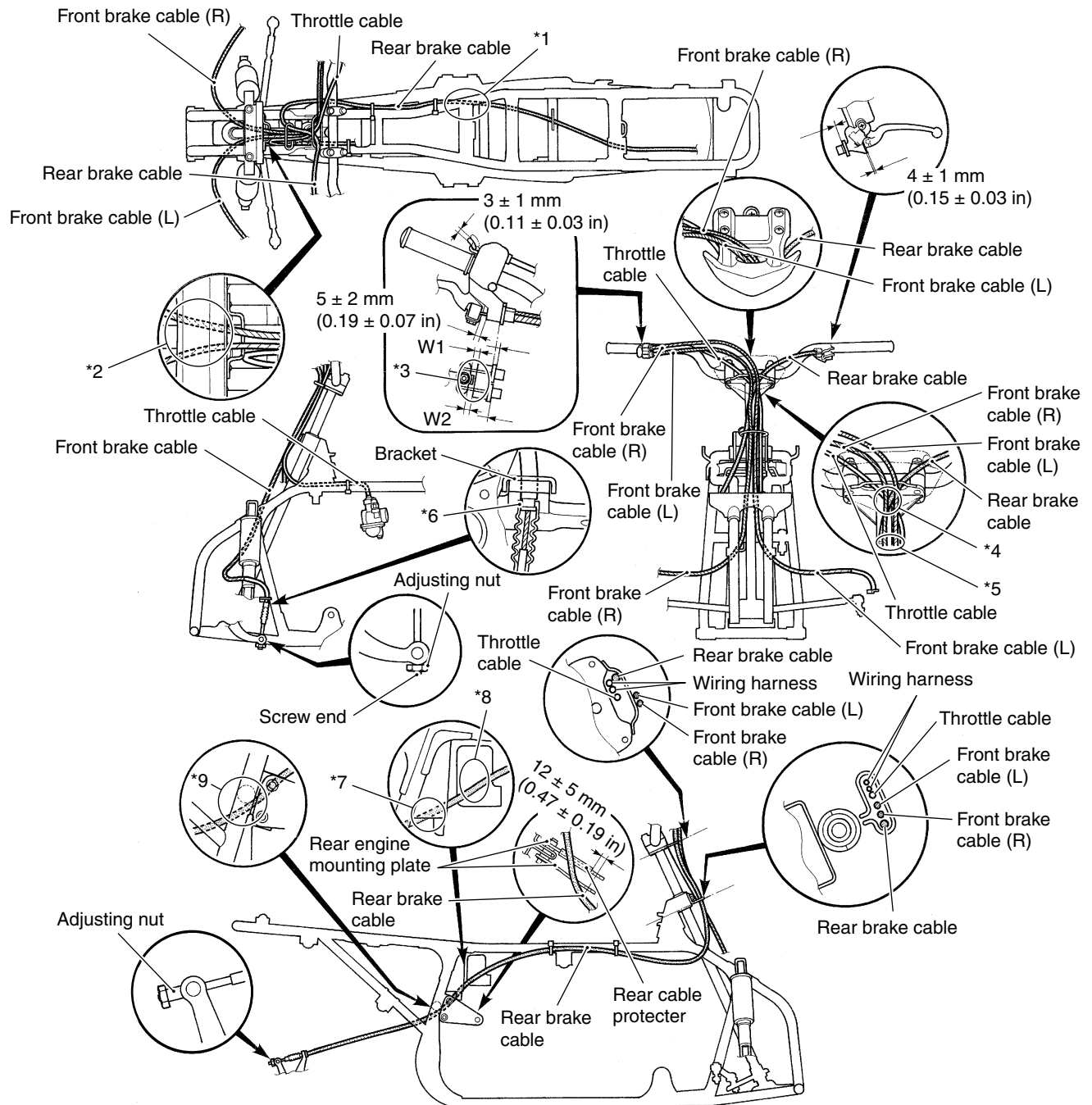


WIRING DIAGRAM



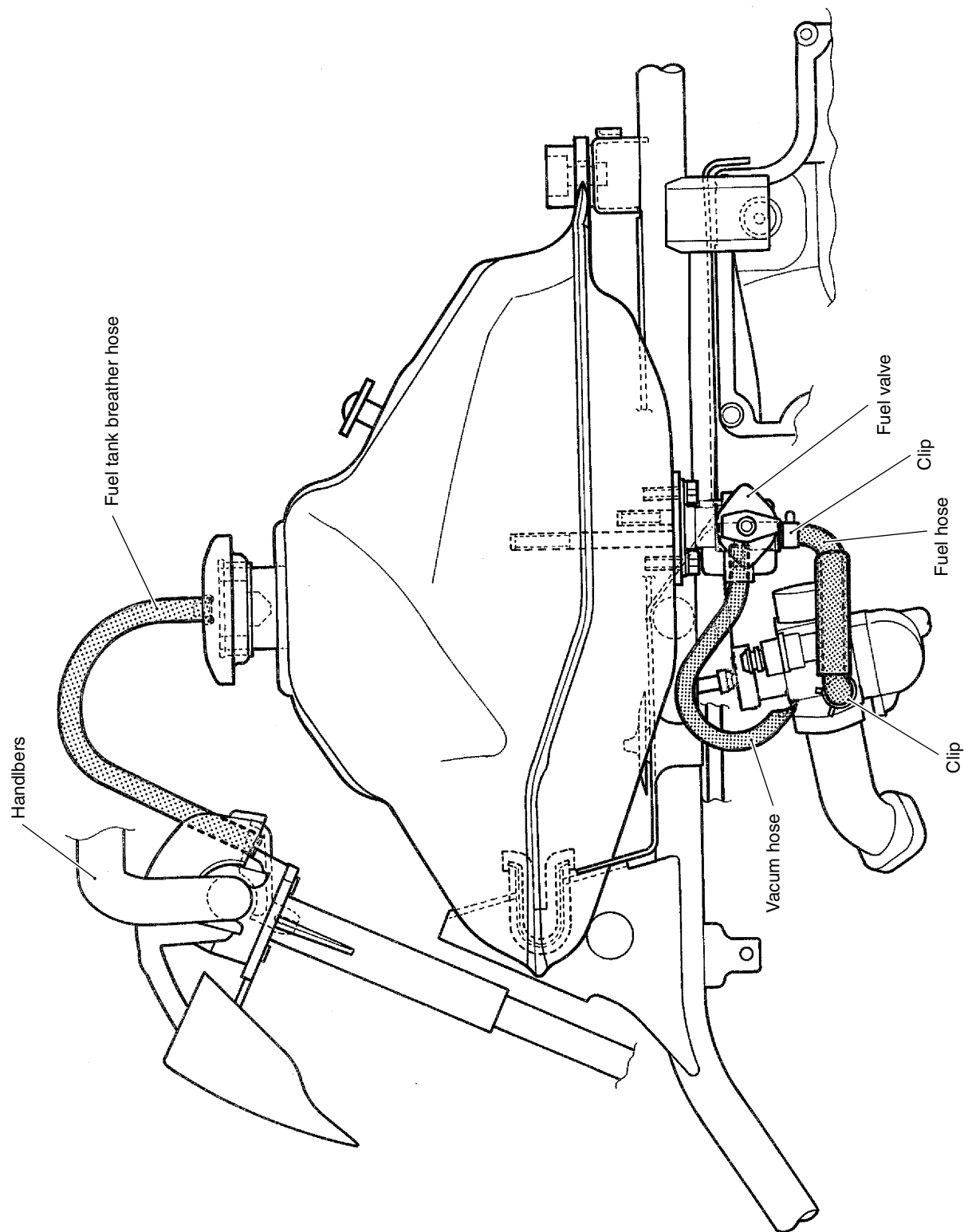


CABLE ROUTING

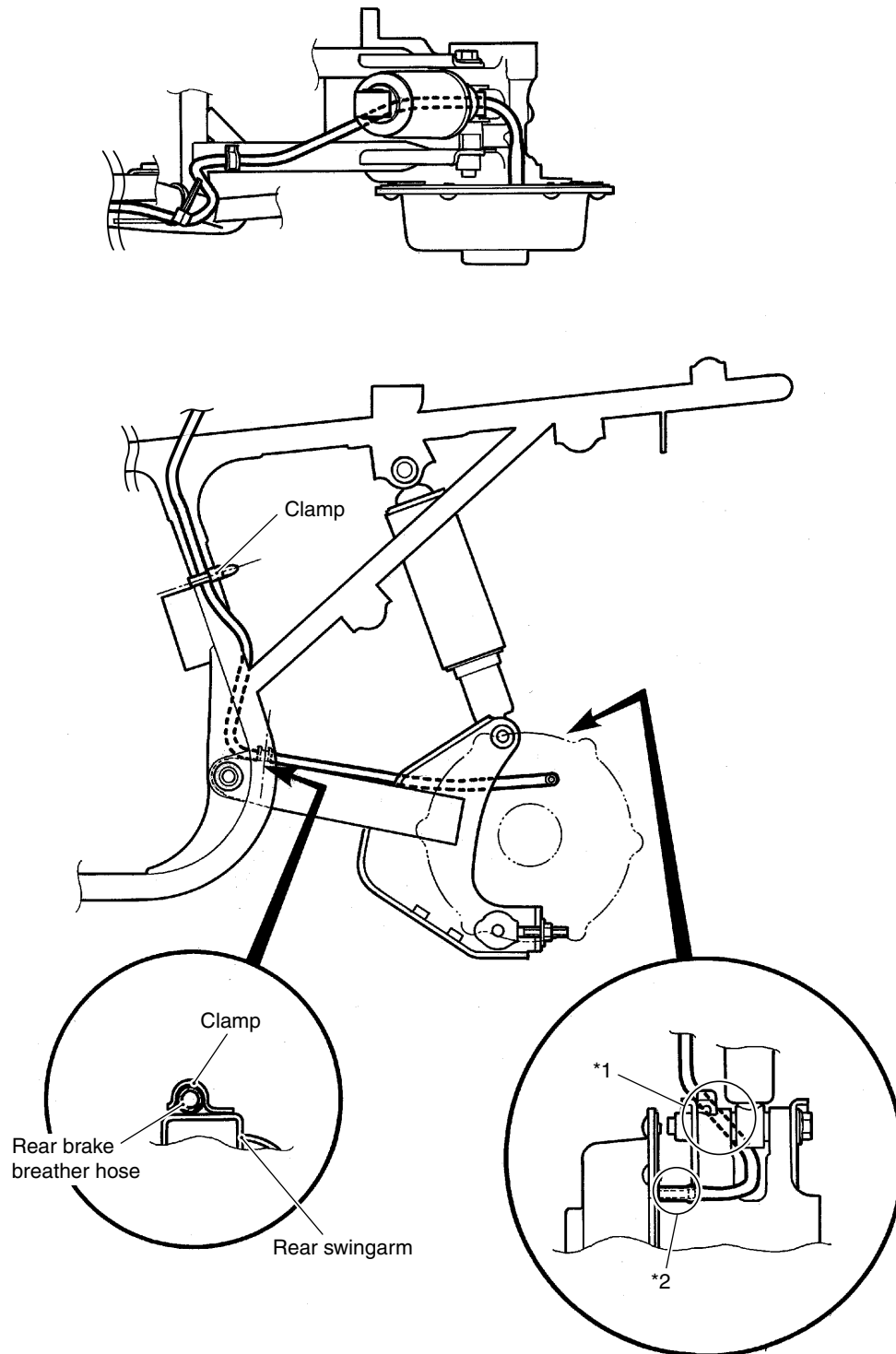


*1	Pass the rear brake cable through downside of the frame.	*6	Fix the boot of the front brake cable.
*2	Pass the brake cables through downside of the frame.	*7	Pass the rear brake cable through inside of the rear fender.
*3	Align the clearance less than 1 mm difference between W1 and W2.	*8	Pass the rear brake cable through outside of the rear belt cooling duct.
*4	Pass the throttle cable through in side of the rear brake cable.	*9	Pass the rear brake cable through under side of the frame.
*5	Pass the front brake cable through out side of the rear brake cable.		

FUEL HOSE PIPING

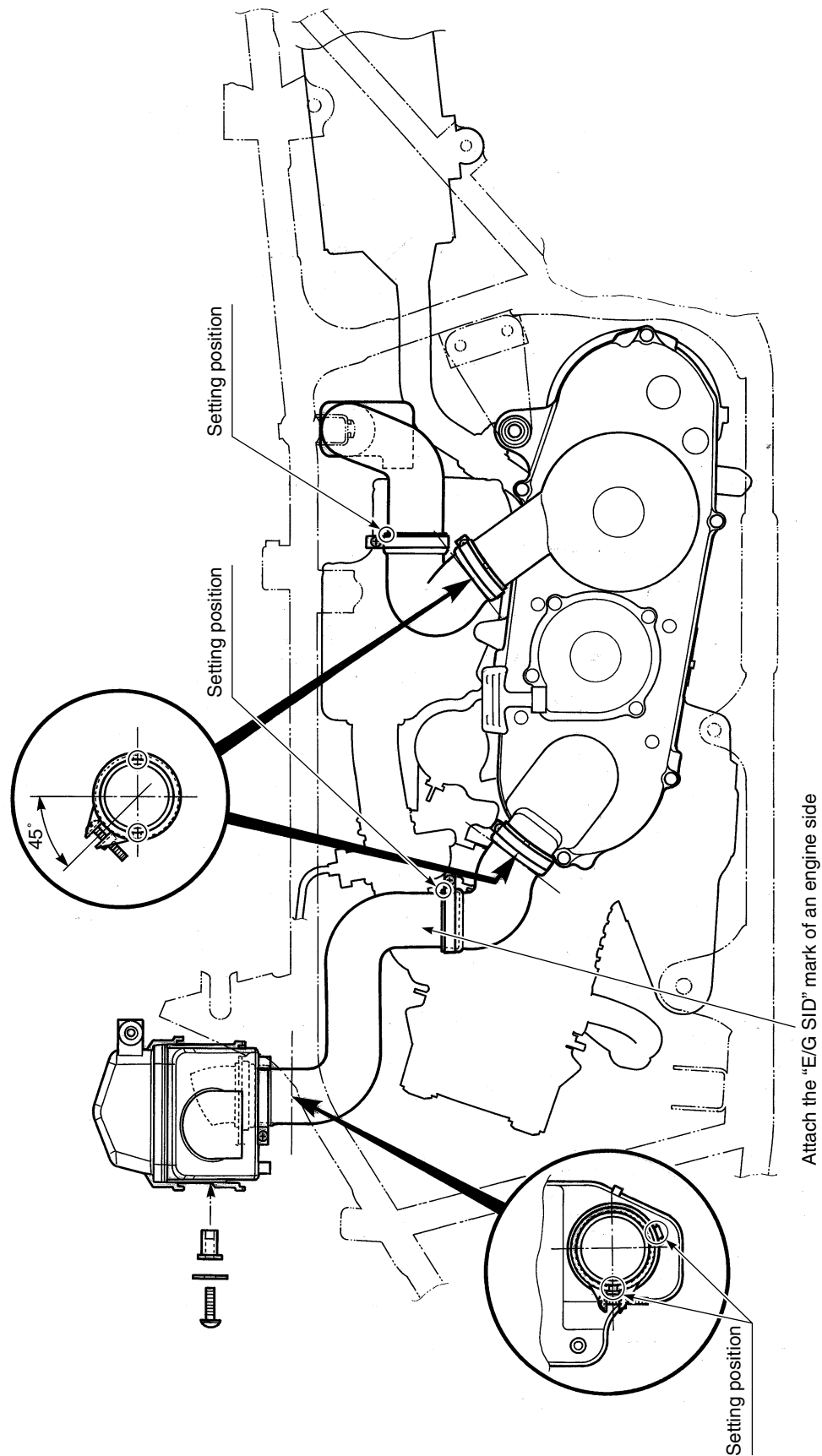


REAR BRAKE BREATHER HOSE ROUTING

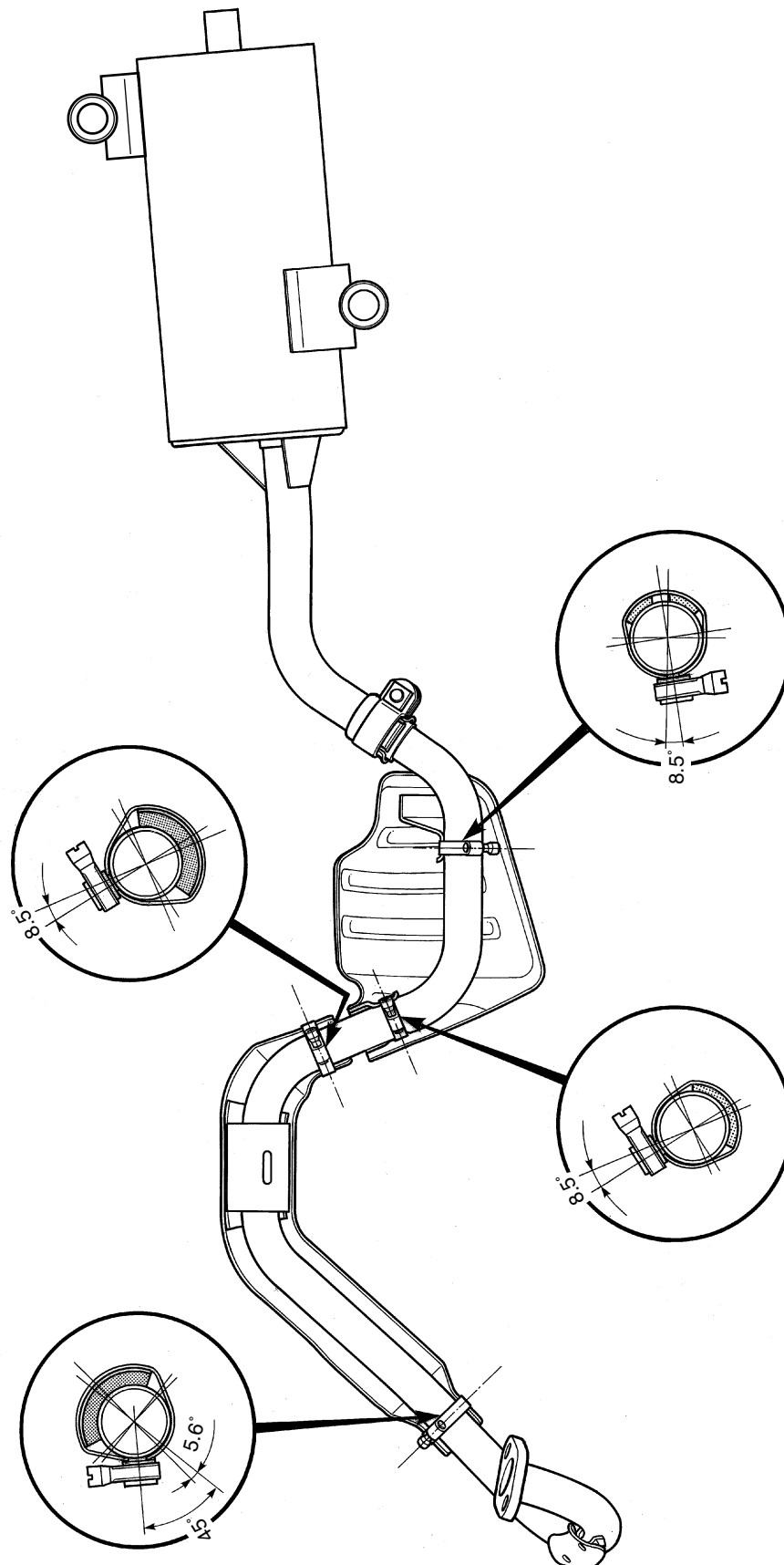


*1	Pass the rear brake breather hose through downside of the rear shock absorber.	*2	Insert the rear brake breather hose into the joint to the root.
----	--	----	---

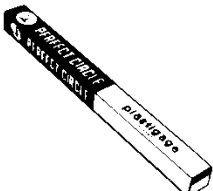
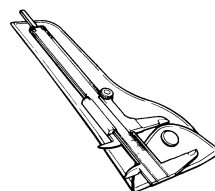
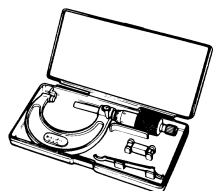
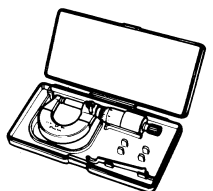
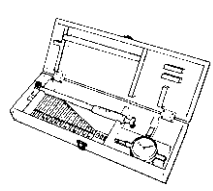
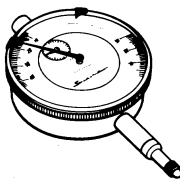
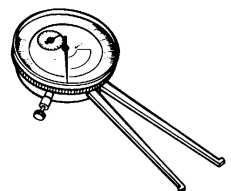
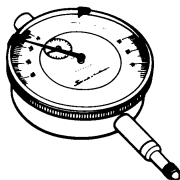
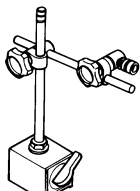
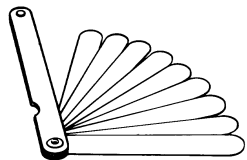
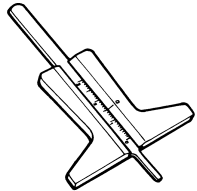
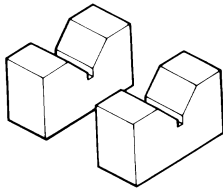
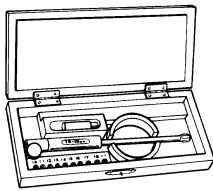
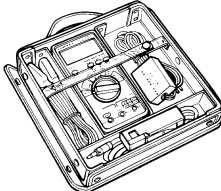
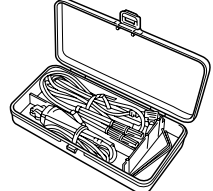
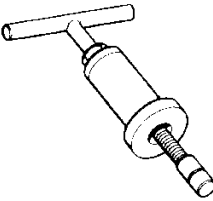
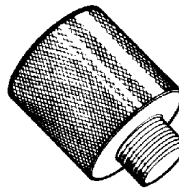
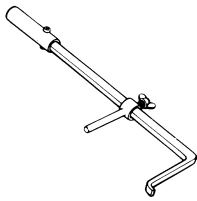
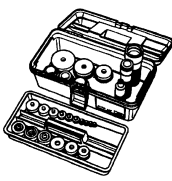
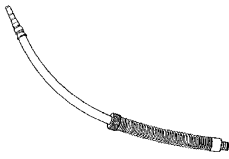
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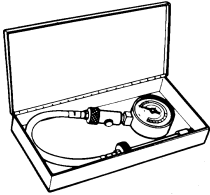
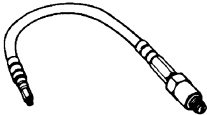
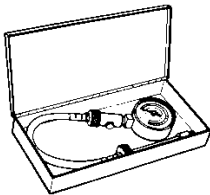
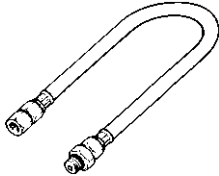
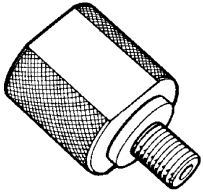
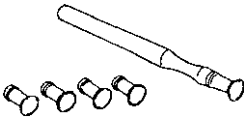
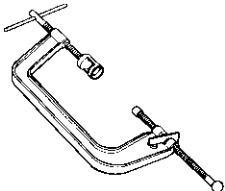
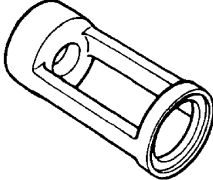
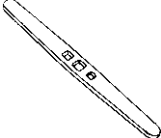
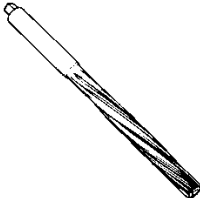
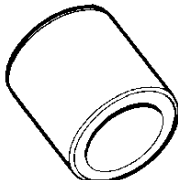
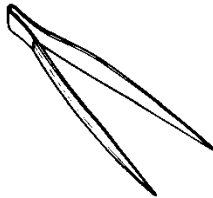
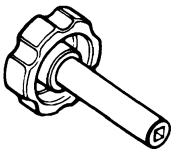
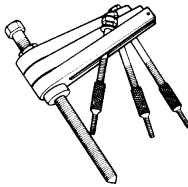
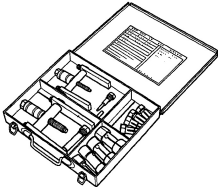
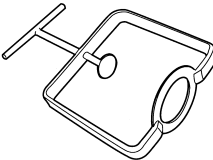
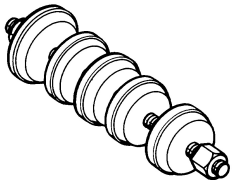


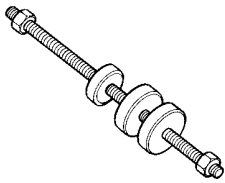
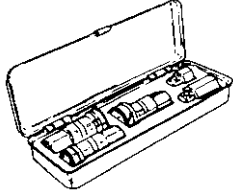
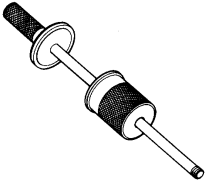
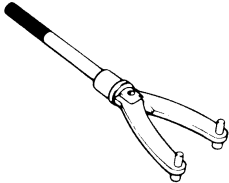
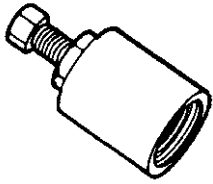
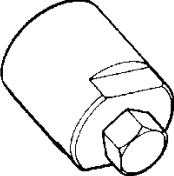
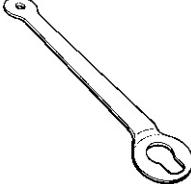
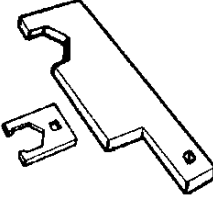
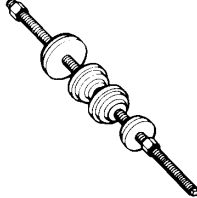
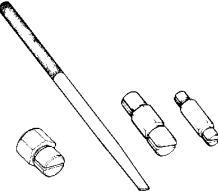
EXHAUST PIPE COVER



SPECIAL TOOLS

				
09900-22301 09900-22302 Plastigauge	09900-20101 09900-20102 Vernier calipers	09900-20202 Micrometer (25 – 50 mm)	09900-20205 Micrometer (0 – 25 mm)	09900-20530 Cylinder gauge set
				
09900-20602 Dial gauge (1/1000 mm, 1 mm)	09900-20605 Dial calipers (1/100 mm, 10 – 34 mm)	09900-20607 Dial gauge (1/100 mm, 10 mm)	09900-20701 Magnetic stand	09900-20803 09900-20806 Thickness gauge
				
09900-20805 Tire depth gauge	09900-21304 V-block set (100 mm)	09900-22401 (10 – 18 mm) Small bore gauge	09900-25008 Multi-circuit tester set	09900-25009 Needle pointed probe set
				
09910-32812 Crankshaft installer	09911-11310 Attach ment	09913-50121 Oil seal remover	09913-70210 Bearing installer set	09915-63310 Adaptor

 09915-70651 Compression gauge set	 09915-63311 Compression gauge nose	 09915-74511 Oil pressure gauge set	 09915-74521 Oil pressure gauge hose	 09915-74531 Attachment
 09916-10911 Valve lapper set	 09916-14510 Valve lifter	 09916-14521 Attachment	 09916-34542 Reamer handle	 09916-34570 Valve guide reamer (5.0 mm)
 09916-34580 Valve guide reamer (10.8 mm)	 09916-44310 Valve guide remover/installer	 09916-53360 Valve guide installer attachment	 09916-84511 Tweezers	 09917-14910 Valve clearance adjusting driver
 09920-13120 Crankshaft separator	 09921-20240 Bearing remover set	 09922-31420 Clutch spring compressor	 09923-73210 Bearing remover	 09924-84510 Bearing installer set

	 09930-10121 Spark plug wrench set			 09930-30721 Rotor remover
09924-84521 Bearing installer set		09930-30104 Sliding shaft	09930-40113 Rotor holder	
	 09930-44520 Rotor holder	 09940-92460 Rear axle nut wrench set	 09941-34513 Steering race installer	 09941-50111 Bearing remover
09930-31920 09930-34980 Rotor remover				

NOTE:

When order the special tool, please confirm whether it is available or not.

TIGHTENING TORQUE

ENGINE

ITEM		N·m	kgf-m	lb-ft
Cylinder head cover bolt	Initial	10	1.0	7.0
	Final	14	1.4	10.0
Cylinder head nut	M12	25	2.5	18.0
	M10	10	1.0	7.0
Valve clearance adjuster locknut		10	1.0	7.0
Cam sprocket bolt		11	1.1	8
Cam chain guide mounting bolt		10	1.0	7.0
Cam shaft retainer screw		5.5	0.55	4.0
Cam chain tension adjuster mounting bolt		10	1.0	7.0
Generator rotor nut		80	8.0	58.0
Limit clutch nut		75	7.5	54
Clutch shoe nut		60	6.0	43.5
Fixed drive face nut		50	5.0	36.0
Starter clutch bolt		10	1.0	7.0
Generator coil mounting bolt		10	1.0	7.0
CKP sensor mounting bolt		6	0.6	4.5
Crankcase bolt		10	1.0	7.0
Generator rotor cover bolt		10	1.0	7.0
Generator cover cap		15	1.5	11.0
Valve timing inspection plug		17.5	1.75	12.5
Crank case cover bolt		10	1.0	7.0
Engine oil drain plug		17.5	1.75	12.5
Final reduction gear box cover bolt		10	1.0	7.0
Final reduction gear box drain		10	1.0	7.0
Engine mounting nut	(Front)	100	10	72.5
	(under and rear)	60	6.0	43.5
Engine mounting upper bracket		35	3.5	25.5
Muffler mounting bolt		23	2.3	16.5
Muffler clamp bolt		12	1.2	8.5
Exhaust pipe nut		23	2.3	16.5
Recoil starter friction plate bolt		5	0.5	3.5
Spark plug		11	1.1	8.0
Carburetor mounting bolt		6	0.6	4.5
Intake pipe bolt		6	0.6	4.5
Main oil gallery plug		12	1.2	8.5
Starter motor lead wire mounting bolt		4	0.4	3.0
Starter relay lead wire mounting bolts		4.5	0.45	3.0
Rear axle housing bolt		60	6.0	43.5

FUEL

ITEM	N·m	kgf-m	lb-ft
Fuel valve bolt	4.5	0.45	3.0

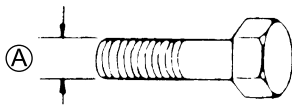
CHASSIS

ITEM	N·m	kgf-m	lb-ft
Front suspension arm pivot nut	65	6.5	47.0
Steering knuckle arm nut	60	6.0	43.5
Tie-rod end nut	50	5.0	36.0
Tie-rod locknut	29	2.9	21.0
Steering shaft lower nut	35	3.5	25.5
Steering shaft holder bolt	23	2.3	17.0
Handlebar clamp bolt	25	2.5	18.0
Front shock absorber bolt (upper and lower)	50	5.0	36.0
Front hub nut	65	6.5	47.0
Wheel set nut (front and rear)	55	5.5	40.0
Front brake cable equalizer bolt	8	0.8	6.0
Front brake cam lever nut	8	0.8	5.8
Swingarm pivot nut	102	10.2	74.0
Rear shock absorber bolt (upper)	29	2.9	21.0
(lower)	94	9.4	68.0
Rear hub nut	75	7.5	54.0
Rear brake cam lever nut	8	0.8	6.0
Rear axle housing set bolt	110	11.0	79.0
Rear sprocket nut	28	2.8	20.0
Footrest mounting bolt	55	5.5	40.0
Rear axle nut	180	18.0	130.0

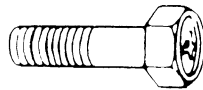
TIGHTENING TORQUE CHART

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

SERVICE DATA

VALVE + VALVE GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	22.5 (0.89)	—
	EX.	19 (0.75)	—
Valve clearance (when cold)	IN.	0.05 – 0.10 (0.002 – 0.004)	—
	EX.	0.10 – 0.15 (0.004 – 0.006)	—
Valve guide to valve stem clearance	IN.	0.010 – 0.037 (0.0004 – 0.0015)	—
	EX.	0.030 – 0.057 (0.0018 – 0.0022)	—
Valve guide I.D.	IN. & EX.	5.500 – 5.512 (0.2165 – 0.2170)	—
Valve stem O.D.	IN.	4.975 – 4.990 (0.1958 – 0.1964)	—
	EX.	4.955 – 4.970 (0.1950 – 0.1956)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve stem end length	IN. & EX.	—	3.0 (0.12)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	—	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length	IN. & EX.	—	32.8 (1.29)
Valve spring tension	IN. & EX.	110 – 126 N (11.0 – 12.6 kgf, 79.5 – 91.1 lbs) at length 26.8 mm (1.05 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	27.92 – 27.97 (1.099 – 1.101)	27.62 (1.087)
	EX.	27.80 – 27.85 (1.094 – 1.096)	27.50 (1.082)
Rocker arm I.D.	IN. & EX.	10.003 – 10.018 (0.393 – 0.394)	—
Rocker arm shaft O.D.	IN. & EX.	9.981 – 9.990 (0.3929 – 0.3933)	—
Cylinder head distortion	—		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT
Compression pressure	1 500 kPa (15 kgf/cm ² , 213 psi)		1 300 kPa (13 kgf/cm ² , 185 psi)
Piston-to-cylinder clearance	0.020 – 0.030 (0.0008 – 0.0012)		0.120 (0.0047)
Cylinder bore	45.500 – 45.515 (1.7913 – 1.7919)		Nicks or Scratches
Piston diam.	45.490 – 45.475 (1.7909 – 1.7903) Measure at 10 mm (0.4 in) from the skirt end.		45.380 (1.7860)
Cylinder distortion	—		0.05 (0.002)
Piston ring free end gap	1st	Approx. 5.5 (0.22)	—
	2nd	Approx. 5.3 (0.21)	—
Piston ring end gap	1st	0.10 – 0.25 (0.003 – 0.009)	0.80 (0.031)
	2nd	0.10 – 0.25 (0.003 – 0.009)	0.80 (0.031)
Piston ring to groove clearance	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.01 – 1.03 (0.0397 – 0.0405)	—
	2nd	1.04 – 1.03 (0.0397 – 0.0405)	—
	Oil	2.01 – 2.03 (0.0791 – 0.0799)	—
Piston ring thickness	1st	0.97 – 0.99 (0.0382 – 0.0390)	—
	2nd	0.97 – 0.99 (0.0382 – 0.0390)	—
Piston pin bore I.D.	14.002 – 14.008 (0.5512 – 0.5514)		14.030 (0.5523)
Piston pin O.D.	13.986 – 14.000 (0.5506 – 0.5511)		13.980 (0.5503)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	14.006 – 14.024 (0.5514 – 0.5521)	14.040 (0.5527)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.45 (0.006 – 0.019)	1.0 (0.04)
Conrod big end width	16.95 – 17.00 (0.67 – 0.669)	—
Crank web to web width	49.0 ± 1 (1.9291 ± 0.004)	—
Crankshaft runout	—	0.08 (0.003)

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch housing I.D.	110.00 – 110.15 (4.331 – 4.337)	110.50 (4.350)
Clutch shoe thickness	4.0 (0.16)	2.5
Clutch engagement	2 800 – 3 400 r/min.	—
Clutch lock-up	5 400 – 6 000 r/min.	—

REDUCTION GEAR + DRIVE BELT + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Reduction ratio	Variable change (2.645 – 1.621)		—
Reduction gear ratio	8.294 (47/17 × 47/15)		—
Final reduction ratio	2.181 (24/11)		—
Drive belt width	19.9 (0.78)		18.9 (0.74)
Movable driven face spring free length	105.0 (4.13)		99.8 (3.92)
Drive chain	Type	RK 530	—
	Links	60	—
	20-pitch length	—	319.4 (12.57)
Drive chain slack	15 – 25 (0.6 – 1.0)		—

CARBURETOR

ITEM	SPECIFICATION
Carburetor type	MIKUNI VM16H
Bore size	16 mm
I.D.No.	08H0
Idle r/min	1 900 ± 100 r/min.
Float height	16 ± 1.0 mm (0.6 ± 0.04 in)
Main jet (M.J.)	#80
Jet needle (J.N.)	4LA43-1
Needle jet (N.J.)	E-1M
Pilot jet (P.J.)	#17.5
Air screw (A.S.)	PRE-SET (1, ¼)
Throttle cable play	3 – 5 mm (0.12 – 0.20 in)

ELECTRICAL

Unit: mm (in)

ITEM		STANDARD/SPECIFICATION	LIMIT	NOTE
Spark plug	Type	NGK: CR7HSA DENSO: U20FSR-U	—	
	Gap	0.7 – 0.8 (0.028 – 0.031)	—	
Spark performance	Over 8 (0.3) at 1 atm.		—	
Ignition coil resistance	Primary	0.1 – 0.7 Ω	—	Terminal – Terminal
	Secondary	14 – 20 k Ω	—	Plug cap – Terminal
Ignition coil primary peak voltage	150 V and more		—	⊕: Ground ⊖: B
CKP sensor peak voltage	1.5 V and more		—	⊕: Br ⊖: Ground
Generator coil resistance	Charging	0.5 – 2.0 Ω	—	W/R – Ground
	CKP sensor	150 – 230 Ω	—	Br – Ground
Generator no-load voltage (when engine is cold)	20 V (AC) and more at 2 800 r/min.		—	
Generator output	70 W at 5 000 r/min.		—	
Regulated voltage	13.5 – 15.2 V		—	
Starter relay resistance	3 – 6 Ω		—	
Battery	Type designation	YTX7A-BS	—	
	Capacity	12 V 14.4 kC (6 Ah)/10 HR	—	
Fuse size	Main	10 A	—	
Starter motor brush length	7.0 (0.27)		5.0 (0.19)	

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Front brake lever play	4 – 6 (0.16 – 0.24)		—
Rear brake lever play	3 – 5 (0.12 – 0.26)		—
Brake drum I.D.	Front	—	110.7 (4.35)
	Rear	—	130.7 (5.14)
Rear axle runout	Rear	—	6.0 (0.23)
Wheel rim size	Front & Rear	AT19 × 7 – 8 ☆	—
Toe-in (with 63 kg)	4.5 ± 3 (0.17 ± 0.1)		—
Turning radius	2.5 m (8.2 ft)		—
Camber	+0.6		—
Caster	3°		—
Trail	11 (0.4)		—
Steering angle	37.5° (Right & Left)		—

TIRE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cold inflation tire pressure (Solo riding)	Front	22.5 kPa (0.225 kgf/cm ² , 3.3 psi)	—
	Rear	20 kPa (0.20 kgf/cm ² , 2.9 psi)	—
Tire size	Front	AT 19 × 7-8 ☆, tubeless	—
	Rear	AT 19 × 7-8 ☆, tubeless	—
Tire tread depth	Front	—	4.0 (0.16)
	Rear	—	4.0 (0.16)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front wheel travel	62 (2.4)	—
Rear wheel travel	61 (2.4)	—
Swingarm pivot shaft runout	—	0.6 (0.02)

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.		P-28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		Others
Fuel tank capacity	6.0 L (0.7/0.6 US/lmp gal)		
Engine oil type	SAE 10W-40, API SF/SG or SH/SJ with JASO MA		
Engine oil capacity	Change	950 ml (1.6/1.3 US/lmp qt)	
	Filter charge	1 050 ml (2.21/1.84 US/lmp qt)	
	Overhaul	1 100 ml (1.2/1.0 US/lmp qt)	
Final reduction gear box oil type	SAE 10W-40, API SF/SG or SH/SJ with JASO MA		
Final reduction gear box oil capacity	Change	90 ml (3.0/3.2 US/lmp oz)	
	Overhaul	100 ml (3.4/3.5 US/lmp oz)	

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