YAMAHA

YP400T

SERVICE MANUAL

LIT-11616-18-38 5RU-28197-10

EAS00001

YP400T
SERVICE MANUAL

Printed in U.S.A.
P/N LIT-11616-18-38

EAS00003

NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

EAS00005

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING Failure to follow WARNING instructions could result in severe injury or death to the scooter operator, a bystander or a person checking or repairing the scooter.

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the scooter.

NOTE: A NOTE provides key information to make procedures easier or clearer.

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HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to “SYMBOLS”.

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 (“PERIODIC CHECKS AND ADJUSTMENTS”), where the sub-section title(s) appears.

③ Sub-section titles appear in smaller print than the section title.

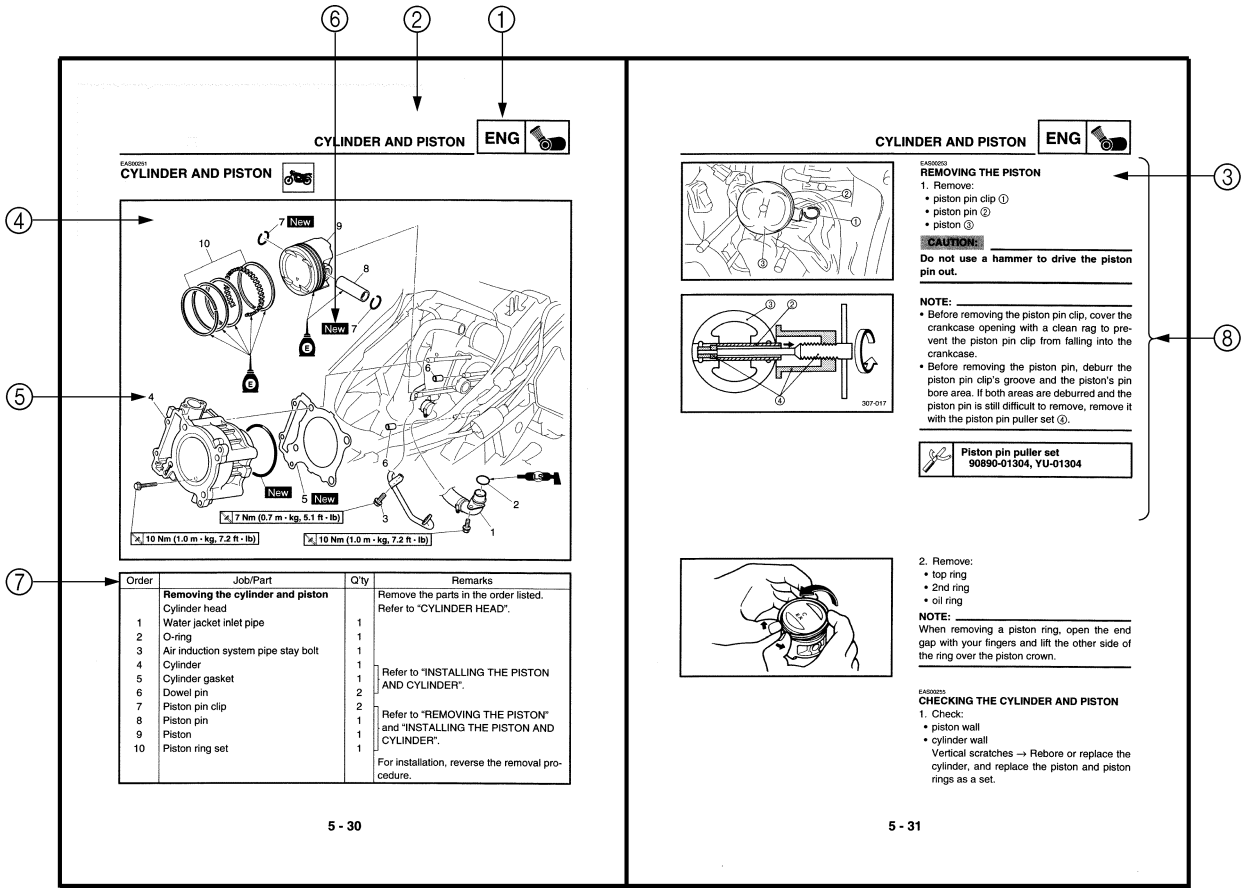
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

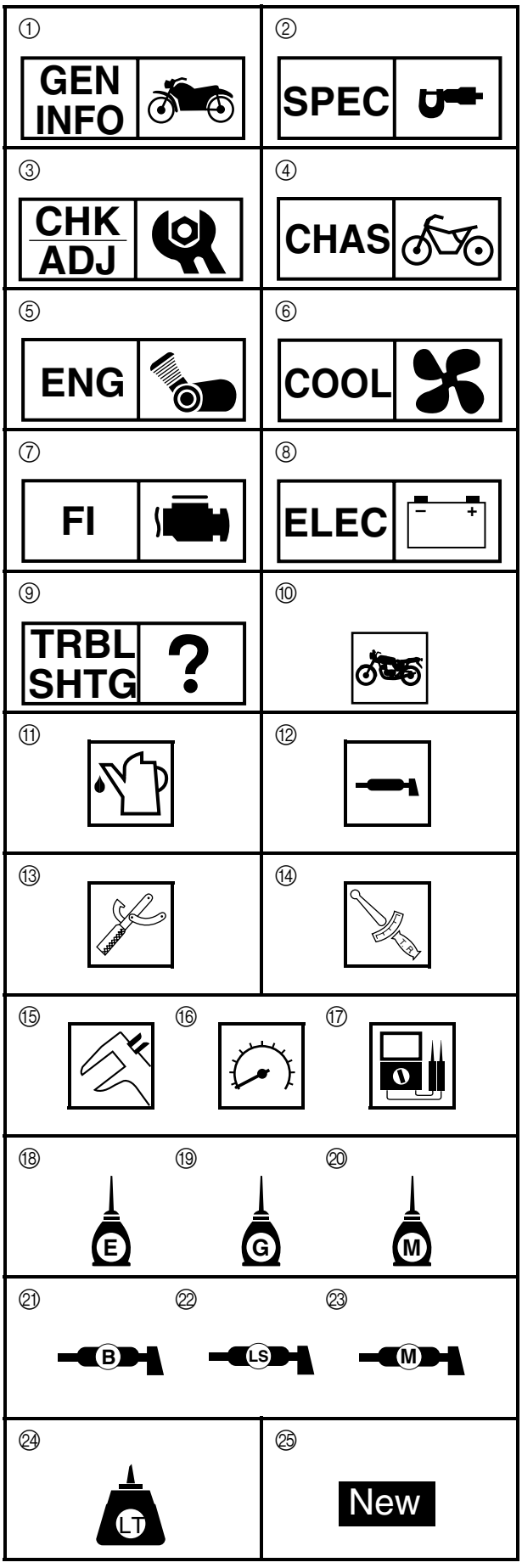
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

⑥ Symbols indicate parts to be lubricated or replaced.
Refer to “SYMBOLS”.

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.





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SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

① General information
② Specifications
③ Periodic checks and adjustments
④ Chassis
⑤ Engine
⑥ Cooling system
⑦ Fuel injection system
⑧ Electrical system
⑨ Troubleshooting

Symbols ⑩ to ⑰ indicate the following.

⑩ Serviceable with engine mounted
⑪ Filling fluid
⑫ Lubricant
⑬ Special tool
⑭ Tightening torque
⑮ Wear limit, clearance
⑯ Engine speed
⑰ Electrical data

Symbols ⑱ to ㉓ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum-disulfide oil
㉑ Wheel-bearing grease
㉒ Lithium-soap-based grease
㉓ Molybdenum-disulfide grease

Symbols ㉔ to ㉕ in the exploded diagrams indicate the following.

㉔ Apply locking agent (LOCTITE®)
㉕ Replace the part

EAS00010

TABLE OF CONTENTS

CONTENTS

CHAPTER 1
GENERAL INFORMATION

CHAPTER 2
SPECIFICATIONS

CHAPTER 3
PERIODIC CHECKS AND ADJUSTMENTS

CHAPTER 4
CHASSIS

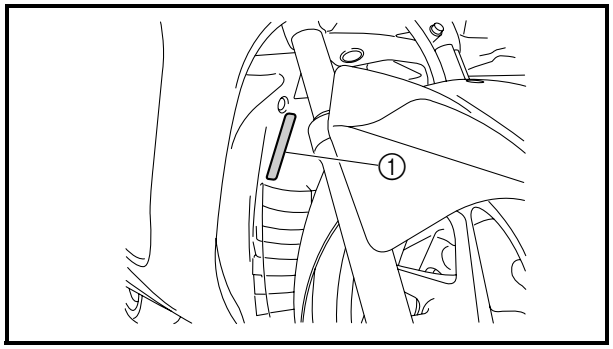
CHAPTER 5
ENGINE

CHAPTER 6
COOLING SYSTEM

CHAPTER 7
FUEL INJECTION SYSTEM

CHAPTER 8
ELECTRICAL SYSTEM

CHAPTER 9
TROUBLESHOOTING



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GENERAL INFORMATION

SCOOTER IDENTIFICATION

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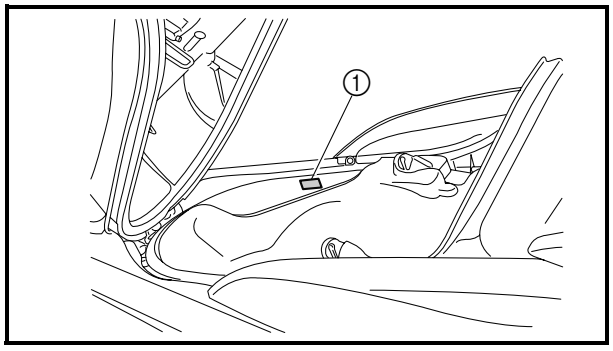
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the frame.



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MODEL LABEL

The model label ① is affixed inside the storage box. Record the information on this label in the space provided. This information will be needed when ordering spare parts.

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FEATURES

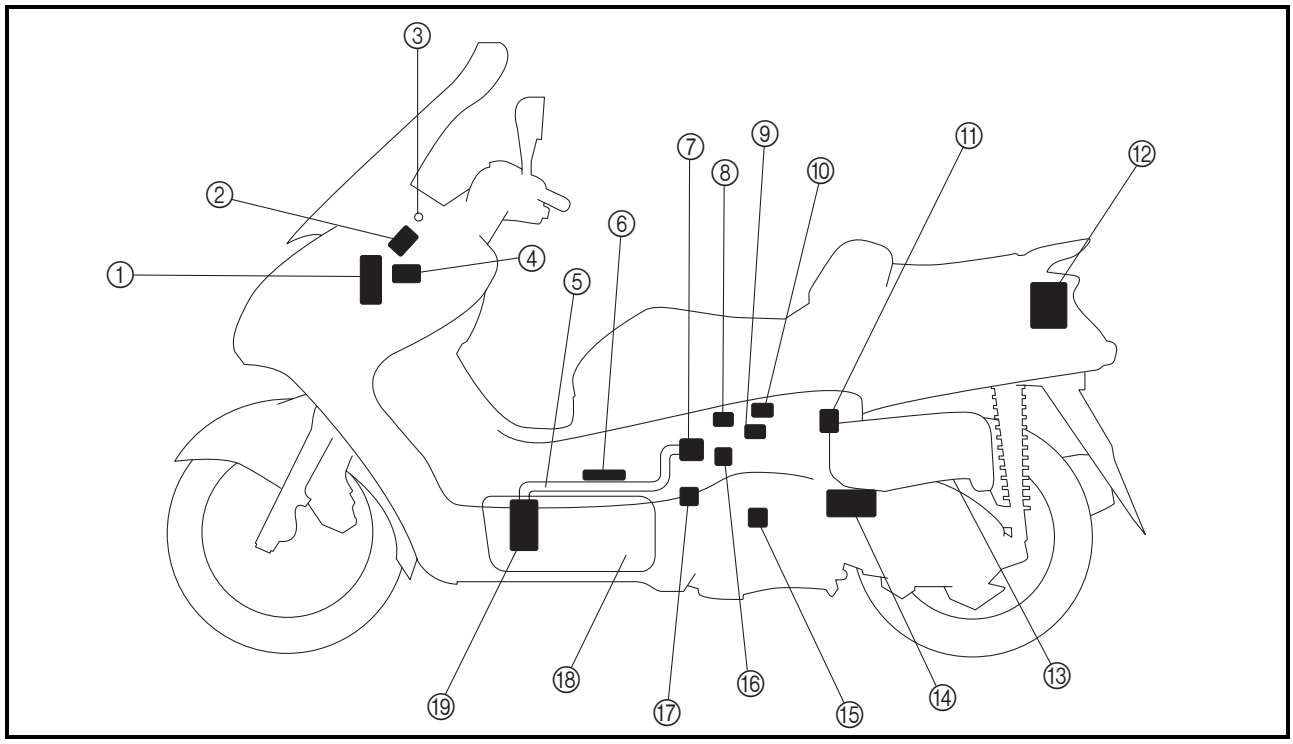
OUTLINE OF THE FI SYSTEM

The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating conditions and the atmospheric temperature. In the conventional carburetor system, the air-fuel ratio of the mixture that is supplied to the combustion chamber is created by the volume of the intake air and the fuel that is metered by the jet used in the respective carburetor.

Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.

As the requirements for the engine to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection (FI) system, in place of the conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors.

The adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions.



① ECU
② Fuel injection system relay
③ Engine trouble warning light
④ Lean angle cut-off switch
⑤ Fuel hose
⑥ Ignition coil
⑦ Fuel injector
⑧ Intake air pressure sensor
⑨ Throttle position sensor
⑩ ISC (idle speed control) valve
⑪ Intake air temperature sensor
⑫ Battery
⑬ Air filter case
⑭ Catalytic converter
⑮ Crankshaft position sensor
⑯ Coolant temperature sensor
⑰ Spark plug
⑱ Fuel tank
⑲ Fuel pump

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FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at only 250 kPa (2.5 kg/cm^2, 35.6 psi). Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, intake temperature sensor and coolant temperature sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

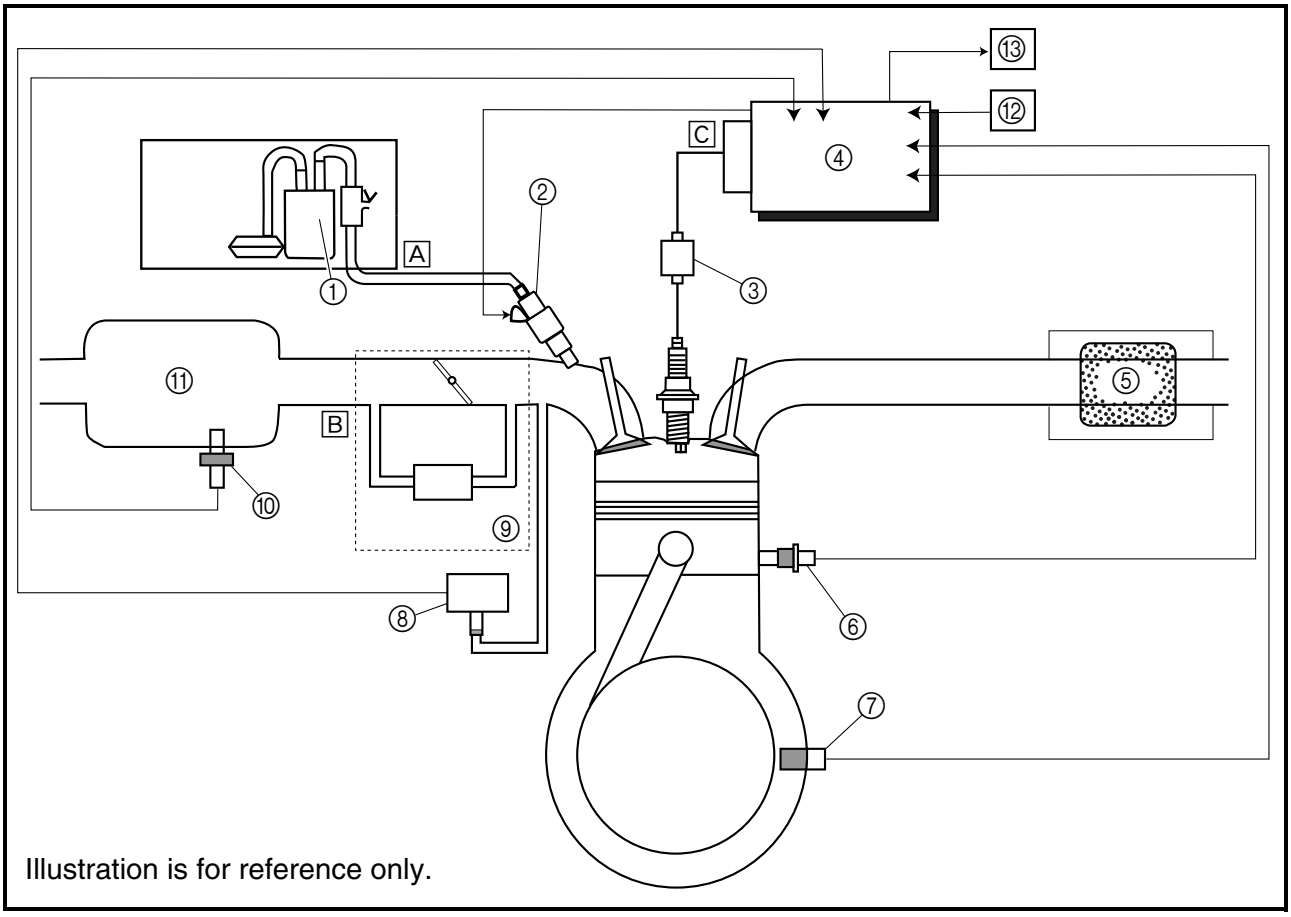
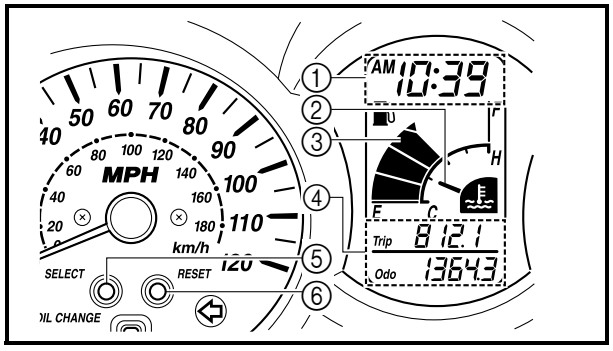
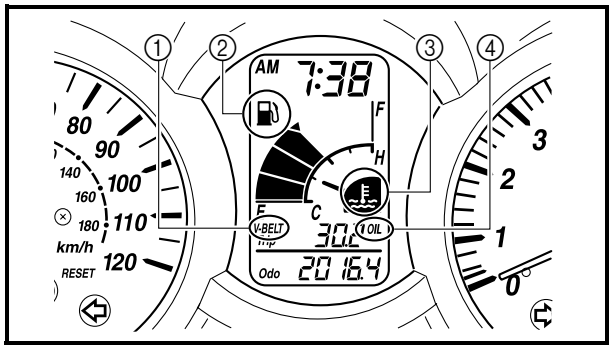
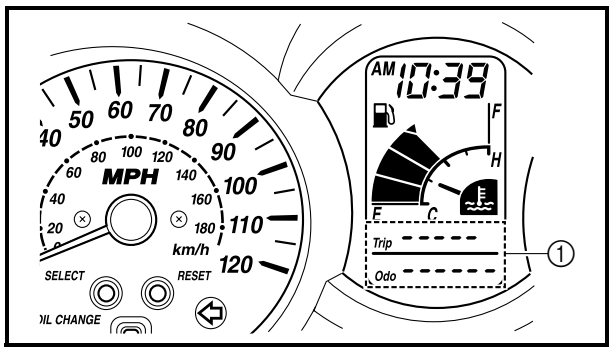


Illustration is for reference only.

① Fuel pump
② Fuel injector
③ Ignition coil
④ ECU
⑤ Catalytic converter
⑥ Coolant temperature sensor
⑦ Crankshaft position sensor
⑧ Intake air pressure sensor
⑨ Throttle body
⑩ Intake air temperature sensor
⑪ Air filter case
⑫ Throttle position sensor
⑬ ISC (idle speed control) valve
A Fuel system
B Air system
C Control system







INSTRUMENT FUNCTIONS

Multifunction display

⚠ WARNING

Be sure to stop the vehicle before making any setting changes to the multifunction display.

① Clock/ambient temperature display
② Coolant temperature meter
③ Fuel meter
④ Odometer/tripmeters
⑤ "SELECT" button
⑥ "RESET" button

① V-belt replacement indicator "V-BELT"
② Fuel level warning symbol " "
③ Coolant temperature symbol " "
④ Oil change indicator "OIL"

The multifunction display is equipped with the following:

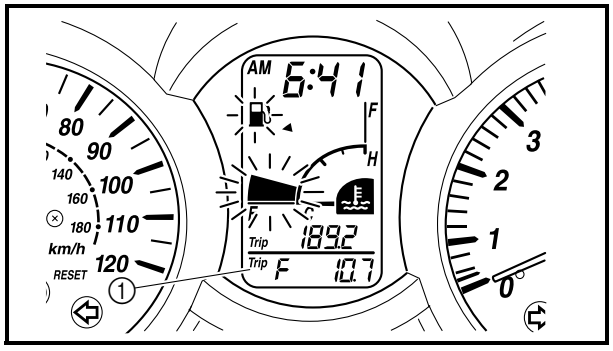
- a fuel meter
- a coolant temperature meter
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the bottom segment of the fuel meter and fuel level warning symbol started flashing)
- a self-diagnosis device
- a clock
- an ambient temperature display
- an oil change indicator
- a V-belt replacement indicator

NOTE:

- Be sure to turn the key to "ON" before using the "SELECT" and "RESET" buttons.
- When the key is turned to "ON", all of the display segments of the multifunction display will appear one after the other and then disappear, in order to test the electrical circuit.

CAUTION:

If bars ① appear where the odometer and tripmeters are normally displayed, the multi-function display is malfunctioning. Replace the entire multi-function display.



Odometer and tripmeter modes

Pushing the "SELECT" button switches the display between the odometer mode "ODO" and the tripmeter modes "TRIP" in the following order:

ODO → TRIP (top) → TRIP (bottom) → ODO

When approximately 2.8 L (0.62 Imp gal, 0.74 US gal) of fuel remains in the fuel tank, the bottom segment of the fuel meter and fuel level warning symbol will start flashing, and the display will automatically change to the fuel reserve tripmeter mode "TRIP F" and start counting the distance traveled from that point. In that case, pushing the "SELECT" button switches the display between the various tripmeter and odometer modes in the following order:

TRIP F → TRIP (top) → TRIP (bottom) → ODO → TRIP F

① Fuel reserve tripmeter

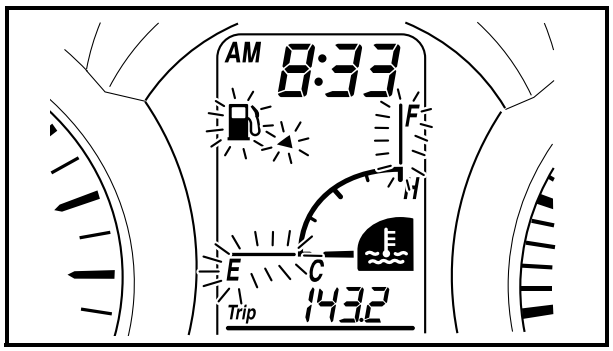
To reset a tripmeter, select it by pushing the "SELECT" button, until "TRIP" or "TRIP F" begins flashing ("TRIP" or "TRIP F" will only flash for five seconds). While "TRIP" or "TRIP F" is flashing, push the "RESET" button for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

NOTE:

The display cannot be changed back to "TRIP F" after pushing the "RESET" button.

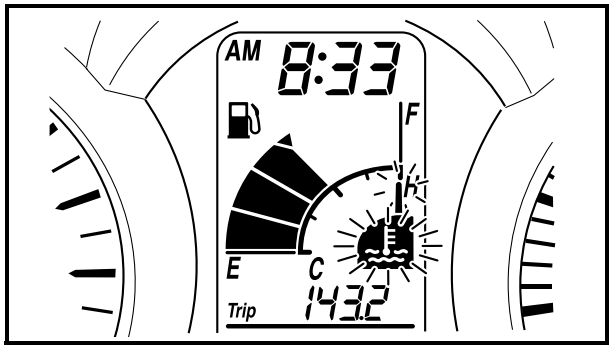
Fuel meter

With the key in the "ON" position, the fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear towards "E" (Empty) as the fuel level decreases. When the fuel level reaches the bottom segment near "E", the fuel level warning symbol and the bottom segment will flash. Refuel as soon as possible.



CAUTION:

If the fuel level is not displayed and the fuel level warning symbol, triangular mark, "E" line, and "F" line flash in the fuel meter, the fuel level monitoring system is malfunctioning. Check the fuel sender and the electrical circuit.



Coolant temperature meter

With the key in the "ON" position, the coolant temperature meter indicates the temperature of the coolant. The coolant temperature varies with changes in the weather and engine load. If the top segment and coolant temperature symbol flash, stop the vehicle and let the engine cool.

CAUTION:

Do not operate the engine if it is overheated.

Oil change indicator "OIL"

This indicator flashes at the initial 1,000 km (600 mi), then at 5,000 km (3,000 mi) and every 5,000 km (3,000 mi) thereafter to indicate that the engine oil should be changed.

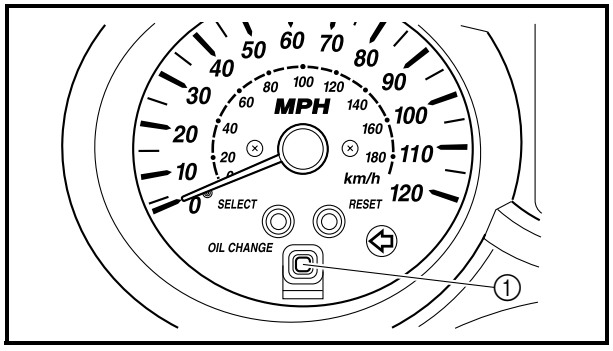
After changing the engine oil, reset the oil change indicator. Refer to "To reset the oil change indicator". If the engine oil is changed before the oil change indicator comes on (i.e. before the periodic oil change interval has been reached), the indicator must be reset after the oil change for the next periodic oil change to be indicated at the correct time.

The electrical circuit of the indicator can be checked according to the following procedure.

1. Set the engine stop switch to "○" and turn the key to "ON".
2. Check that the indicator comes on for a few seconds and then goes off.
3. If the indicator does not come on, check the electrical circuit. Refer to "SIGNALING SYSTEM" in chapter 8.

NOTE:

The oil change indicator may flash when the engine is revved with the scooter on the centerstand, but this does not indicate a malfunction.



To reset the oil change indicator

1. Turn the key to "ON".
2. Hold the reset button pushed for two to eight seconds.

① Reset button "OIL CHANGE"

3. Release the reset button, and the oil change indicator will go off.

NOTE:

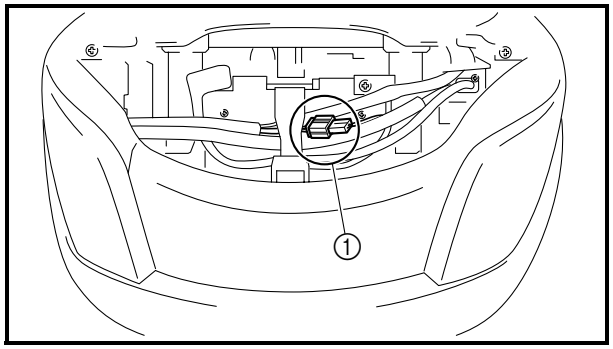
If the engine oil is changed before the oil change indicator comes on (i.e. before the periodic oil change interval has been reached), the indicator must be reset after the oil change for the next periodic oil change to be indicated at the correct time. To reset the oil change indicator before the periodic oil change interval has been reached, follow the above procedure, but note that the indicator will come on for 1.4 seconds after releasing the reset button, otherwise repeat the procedure.

V-belt replacement indicator "V-BELT"

This indicator flashes every 20,000 km (12,500 mi) when the V-belt needs to be replaced.

The electrical circuit of the indicator can be checked according to the following procedure.

1. Turn the key to "ON" and make sure that the engine stop switch is set to "".
2. If the indicator does not come on, check the electrical circuit. Refer to "SIGNALING SYSTEM" in chapter 8.



To reset the V-belt replacement indicator

1. Turn the key to "ON" and make sure that the engine stop switch is set to "ON".
2. Disconnect the V-belt replacement reset coupler ① for two to ten seconds.
3. And then, connect the V-belt replacement reset coupler, the V-belt replacement indicator will come on for 1.4 seconds.
   And the V-belt replacement indicator will go off.

NOTE:

If the V-belt is replaced before the V-belt replacement indicator comes on (i.e. before the V-belt replacement interval has been reached), the indicator must be reset after the V-belt replacement for the next periodic V-belt replacement to be indicated at the correct time.

Self-diagnosis device

This model is equipped with a self-diagnosis device for various electrical circuits.

If any of those circuits are defective, the multi-function display will indicate a two-digit error code (e.g., 12, 13, 14).

If the multifunction display indicates an error code, note the code number, and then check the vehicle. Refer to “FUEL INJECTION SYSTEM” in chapter 7.

CAUTION:

If the multifunction display indicates an error code, the vehicle should be checked as soon as possible in order to avoid engine damage.

Clock mode

To set the clock:

1. Push the “SELECT” button and “RESET” button together for at least two seconds.
2. When the hour digits start flashing, push the “RESET” button to set the hours.
3. Push the “SELECT” button, and the minute digits will start flashing.
4. Push the “RESET” button to set the minutes.
5. Push the “SELECT” button and then release it to start the clock. Pushing the “RESET” button for at least two seconds switches the clock display to the ambient temperature display.

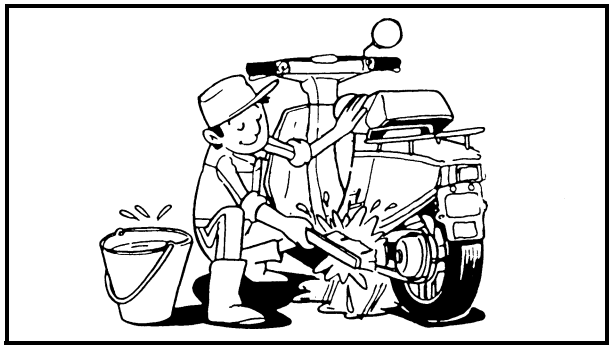
Ambient temperature display

This display shows the ambient temperature from –10 °C to 50 °C in 1 °C increments. The temperature displayed may vary from the ambient temperature. Pushing the “RESET” button for at least two seconds switches the ambient temperature display to the clock display.

- When the ambient temperature falls below –10.0 °C, “–10.0 °C” is displayed.
- When the ambient temperature climbs above 50.0 °C, “50.0” is displayed.

NOTE:

- If “– – °C” is displayed or “50.0” flashes while the ambient temperature is between –10.0 °C and 50.0 °C, there is a problem with the electrical circuit. Check or repair the electric circuit or replace the thermistor.
- The accuracy of the temperature reading may be affected when riding slowly (approximately under 20 km/h) or when stopped at traffic signals, railroad crossings, etc.

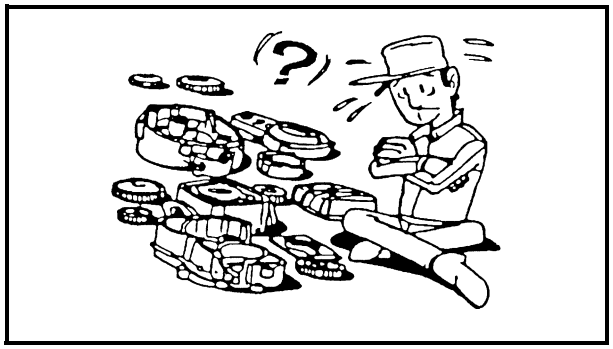


EAS00020

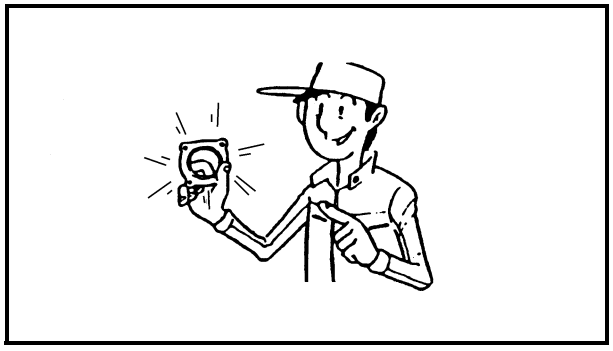
IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



2. Use only the proper tools and cleaning equipment.
   Refer to “SPECIAL TOOLS”.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.



EAS00021

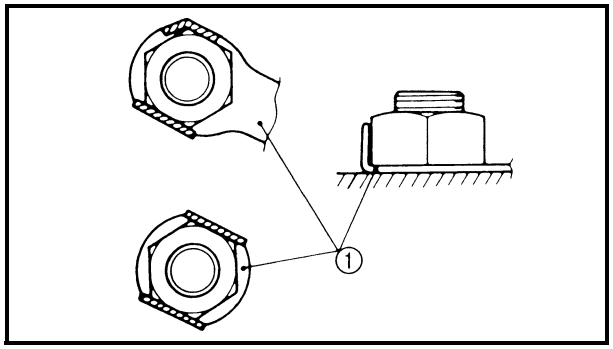
REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

EAS00022

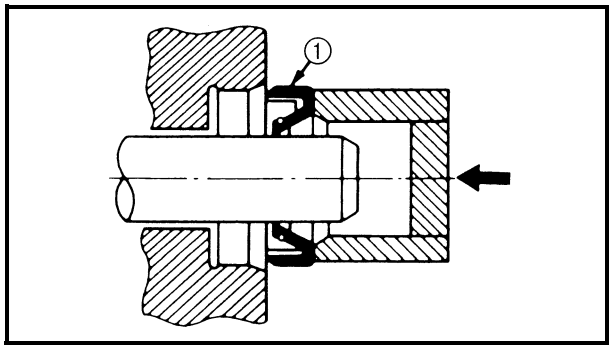
GASKETS, OIL SEALS AND O-RINGS

1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



EAS00023
LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates ① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



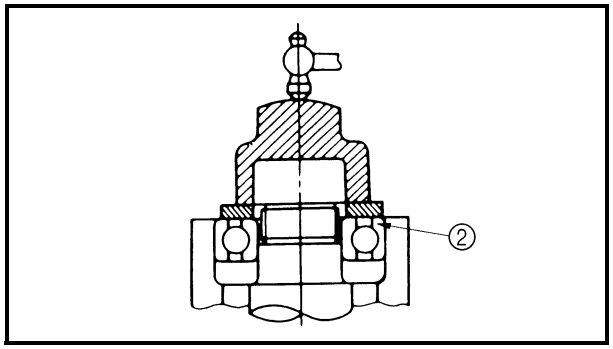
EAS00024
BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

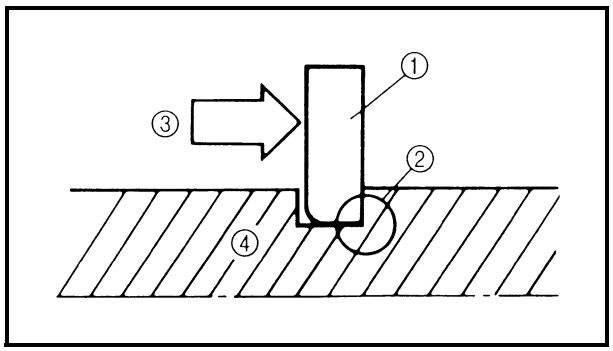
① Oil seal

CAUTION:

Do not spin the bearing with compressed air because this will damage the bearing surfaces.



② Bearing



EAS00025
CIRCLIPS

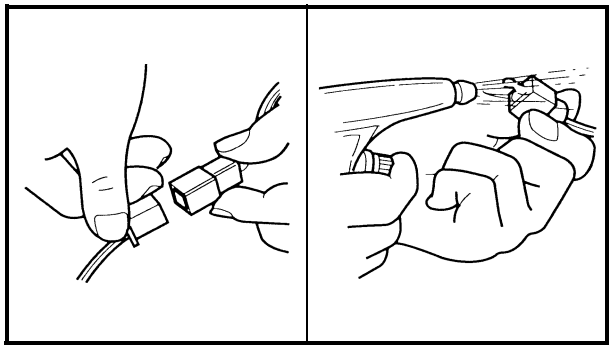
Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

EAS00026
CHECKING THE CONNECTIONS

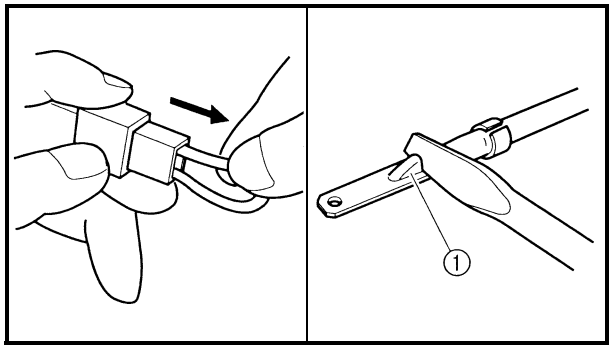
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - lead
   - coupler
   - connector



2. Check:
   - lead
   - coupler
   - connector

   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.



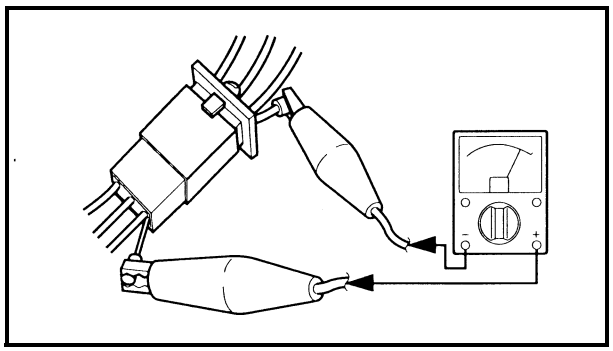
3. Check:
   - all connections

   Loose connection → Connect properly.

NOTE:
If the pin ① on the terminal is flattened, bend it up.

4. Connect:
   - lead
   - coupler
   - connector

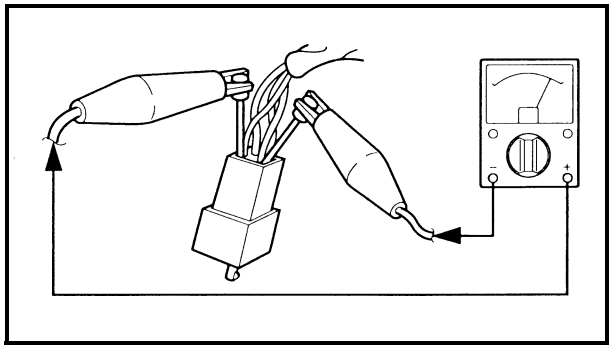
NOTE:
Make sure all connections are tight.



5. Check:
   - continuity

   (with the pocket tester)

	Pocket tester **90890-03112, YU-03112-C**

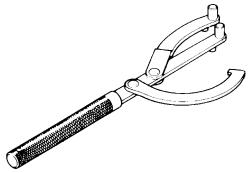
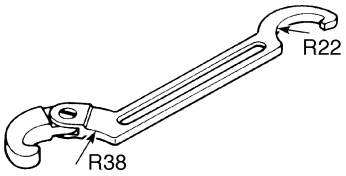
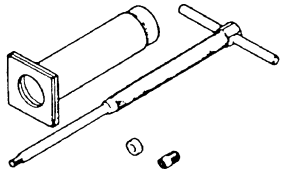
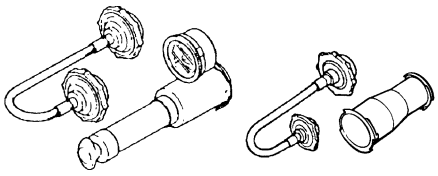
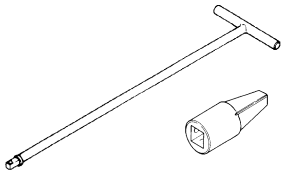
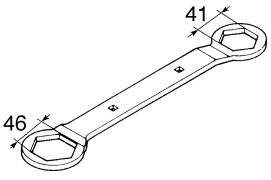


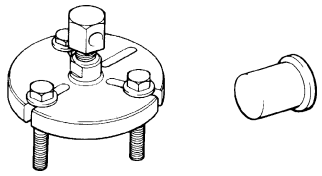
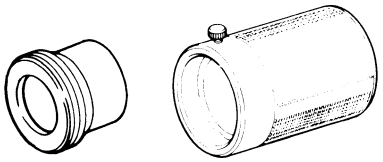
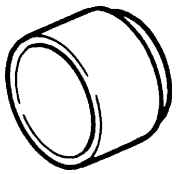
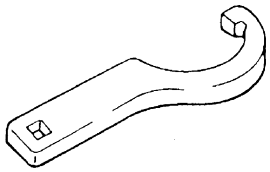
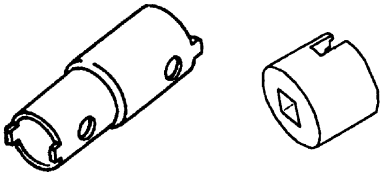
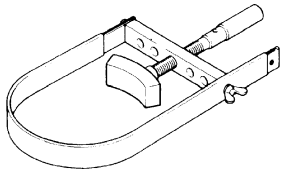
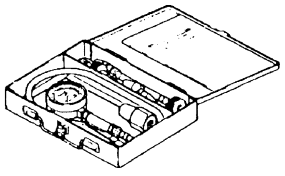
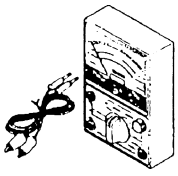
NOTE:
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.

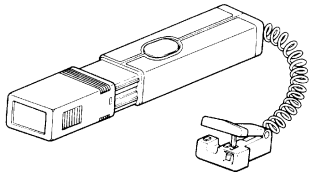
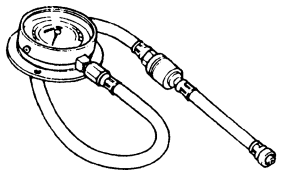
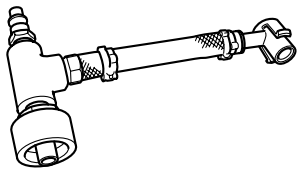
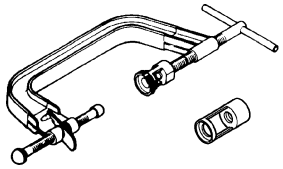
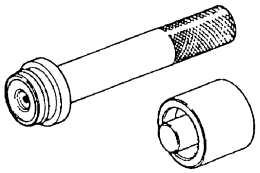
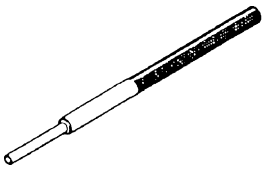
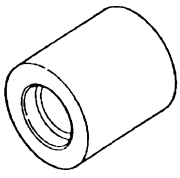
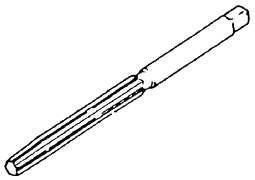
EAS00027
SPECIAL TOOLS

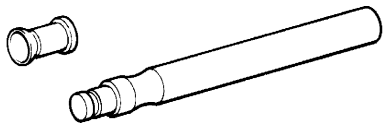
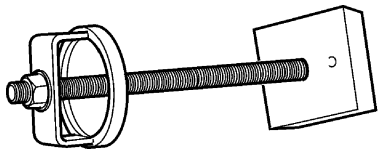
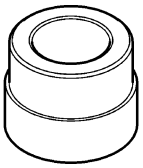
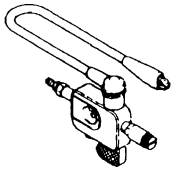
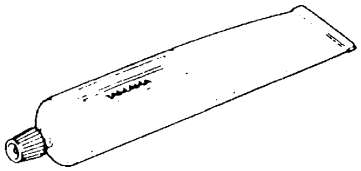
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.
When placing an order, refer to the list provided below to avoid any mistakes.

NOTE:
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool No.	Tool name/Function	Illustration
90890-01235 YU-01235	Rotor holding tool This tool is used to hold the primary fixed sheave and clutch shoe assembly.	
90890-01268 YU-01268	Ring nut wrench This tool is used to loosen or tighten the steering ring nuts.	
90890-01304 YU-01304	Piston pin puller set This tool is used to remove the piston pins.	
Radiator cap tester 90890-01325 YU-24460-01 Radiator cap tester adapter 90890-01352 YU-33984	Radiator cap tester Radiator cap tester adapter These tools are used to check the cooling system.	
T-handle 90890-01326 Damper rod holder 90890-01460	T-handle Damper rod holder These tools are used to hold the damper rod when removing or installing the damper rod.	
90890-01348 YM-01348	Locknut wrench This tool is used to remove or install the clutch shoe assembly nut.	

Tool No.	Tool name/Function	Illustration
Flywheel puller 90890-01362 Flywheel puller attachment 90890-04089 YM-33282	Flywheel puller Flywheel puller attachment This tool is used to remove the generator rotor.	
Fork seal driver weight 90890-01367 YM-A9409-7 Fork seal driver attachment 90890-01381 YM-A5142-2	Fork seal driver weight Fork seal driver attachment (41 mm) These tools are used to install the oil seal, dust seal, and the outer tube bushing of a front fork leg.	
90890-01396	Oil seal guide This tool is used for protecting the oil seal lip when installing the secondary sliding sheave.	
90890-01403 YU-A9472	Steering nut wrench This tool is used to loosen or tighten the steering ring nuts.	
Pivot shaft wrench 90890-01471 YM-01471 Pivot shaft wrench adapter 90890-01476	Pivot shaft wrench Pivot shaft wrench adapter These tools are used to tighten the subframe adjusting bolt.	
90890-01701 YS-01880-A	Sheave holder This tool is used to hold the generator rotor and clutch housing.	
Compression gauge 90890-03081 YU-33223 Adapter (compression gauge) 90890-04082	Compression gauge Adapter (compression gauge) These tools are used to measure engine compression.	
90890-03112 YU-03112-C	Pocket tester This tool is used to check the electrical system.	

Tool No.	Tool name/Function	Illustration
90890-03141 YU-03141	Timing light This tool is used to check the ignition timing.	
90890-03153 YU-03153	Pressure gauge This tool is used to measure fuel pressure.	
90890-03181 YM-03181	Adapter This tool is used to measure fuel pressure.	
Valve spring compressor 90890-04019 YM-04019 Valve spring compressor attachment 90890-01243 YM-01253-1	Valve spring compressor Valve spring compressor attachment These tools are used to remove or install the valve assemblies.	
Middle driven shaft bearing driver 90890-04058 YM-04058 Mechanical seal installer 90890-04145 YM-04145	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
90890-04097 YM-04097	Valve guide remover (5 mm) This tool is used to remove or install the valve guides.	
90890-04098 YM-04098	Valve guide installer (5 mm) This tool is used to install the valve guides.	
90890-04099 YM-04099	Valve guide reamer (5 mm) This tool is used to rebore the new valve guides.	

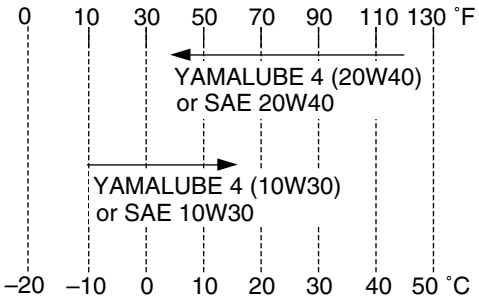
Tool No.	Tool name/Function	Illustration
90890-04101	Valve lapper This tool is needed to remove and install the valve lifters.	
Sheave spring compressor 90890-04134 YM-04134 Sheave fixed block 90890-04135 YM-04135	Sheave spring compressor Sheave fixed block This tool is used to hold the compression spring when removing or installing the clutch shoe assembly nut.	
90890-04146 YM-04146	Plane bearing installer/remover This tool is used to install or remove the crankshaft journal bearings.	
90890-06754 YM-34487	Ignition checker This tool is used to check the ignition system components.	
Bond 90890-85505 Sealant ACC-11001-05-01	Yamaha bond No. 1215 Sealant (Quick Gasket®) This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	

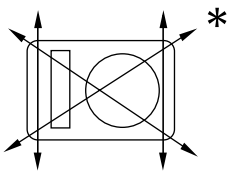
SPECIFICATIONS

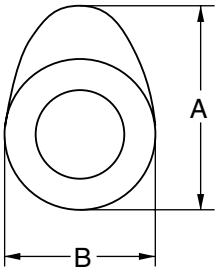
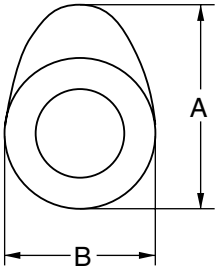
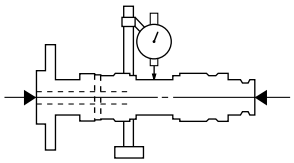
GENERAL SPECIFICATIONS

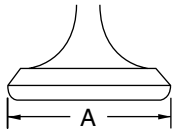
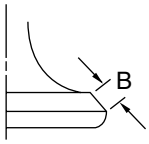
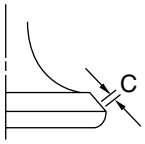
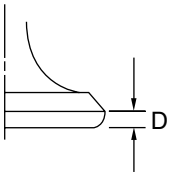
Item	Standard	Limit
Model code	5RU4 (USA) 5RUC (CDN)	---- ----
Dimensions		
Overall length	2,230 mm (87.8 in)	----
Overall width	780 mm (30.7 in)	----
Overall height	1,380 mm (54.3 in)	----
Seat height	750 mm (29.5 in)	----
Wheelbase	1,565 mm (61.6 in)	----
Minimum ground clearance	120 mm (4.72 in)	----
Minimum turning radius	2,600 mm (102.4 in)	----
Weight		
Wet (with oil and a full fuel tank)	212 kg (467 lb)	----
Maximum load (total of cargo, rider, passenger, and accessories)	196 kg (432 lb)	----

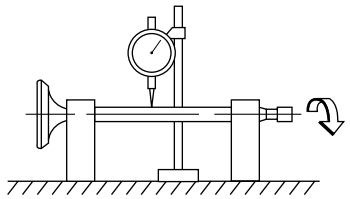
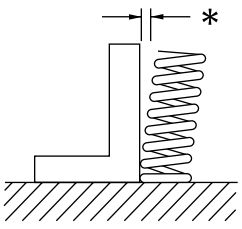
ENGINE SPECIFICATIONS

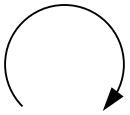
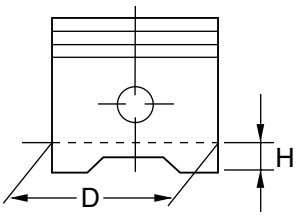
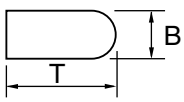
Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 4-stroke, DOHC	----
Displacement	394.9 cm^3 (24.10 cu.in)	----
Cylinder arrangement	Forward-inclined single cylinder	----
Bore × stroke	83.0 × 73.0 mm (3.27 × 2.87 in)	----
Compression ratio	10.6 : 1	----
Engine idling speed	1,300 ~ 1,500 r/min	----
Vacuum pressure at engine idling speed	35.0 ~ 41.0 kPa (263 ~ 308 mmHg, 10.4 ~ 12.1 inHg)	----
Compression pressure (at sea level)		----
Standard	1,000 kPa (10.0 kg/cm^2, 142.2 psi) at 410 r/min	----
Minimum	870 kPa (8.7 kg/cm^2, 123.7 psi)	----
Maximum	1,120 kPa (11.2 kg/cm^2, 159.3 psi)	----
Fuel		
Recommended fuel	Unleaded gasoline only (USA) Regular unleaded gasoline only (CDN)	---- ----
Fuel tank capacity		
Total	14.0 L (3.08 Imp gal, 3.70 US gal)	----
Engine oil		
Lubrication system	Wet sump	----
Recommended oil		----
Recommended engine oil grade	API service SE, SF, SG type or higher	----
Quantity		
Total amount	1.70 L (1.50 Imp qt, 1.80 US qt)	----
Without oil filter element replacement	1.50 L (1.32 Imp qt, 1.59 US qt)	----
With oil filter element replacement	1.70 L (1.50 Imp qt, 1.80 US qt)	----
Engine oil temperature	70 ~ 80 °C (158 ~ 176 °F)	----
Final transmission oil		
Type	SAE10W-30 type SE motor oil	----
Quantity	0.25 L (0.22 Imp qt, 0.26 US qt)	----

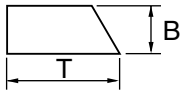
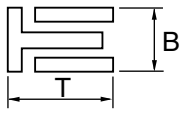
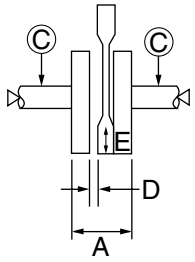
Item	Standard	Limit
Oil pump		
Oil pump type	Trochoid	----
Inner-rotor-to-outer-rotor-tip clearance	0.07 mm (0.0028 in)	0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance	0.013 ~ 0.036 mm (0.0005 ~ 0.0014 in)	0.106 mm (0.0042 in)
Oil-pump-housing-to-inner-and-outer rotor clearance	0.040 ~ 0.096 mm (0.0016 ~ 0.0038 in)	0.166 mm (0.0065 in)
Cooling system		
Radiator capacity	1.57 L (1.38 Imp qt, 1.66 US qt)	----
Radiator cap opening pressure	110.0 ~ 140.0 kPa (1.10 ~ 1.40 kg/cm^2, 15.6 ~ 19.9 psi)	----
Radiator core		
Width	260 mm (10.24 in)	----
Height	148 mm (5.83 in)	----
Depth	24 mm (0.94 in)	----
Coolant reservoir		
Capacity	0.32 L (0.28 Imp qt, 0.34 US qt)	----
Water pump		
Water pump type	Single-suction centrifugal pump	----
Reduction ratio	37/22 × 25/37 (1.136)	----
Coolant temperature	80 ~ 90 °C (176 ~ 194 °F)	----
Starting system type	Electric starter	----
Electric fuel injection		
Type	1100-87C00-A	----
Manufacturer	AISAN	----
Spark plug		
Model (manufacturer) × quantity	CR7E (NGK) × 1	----
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)	----
Cylinder head		
Volume	30.3 ~ 31.1 cm^3 (1.85 ~ 1.90 cu.in)	----
Maximum warpage *	----	0.05 mm (0.002 in)
		

Item	Standard	Limit
Camshafts		
Drive system	Chain drive (right)	----
Camshaft cap inside diameter	24.500 ~ 24.521 mm (0.9646 ~ 0.9654 in)	----
Camshaft journal diameter	24.459 ~ 24.472 mm (0.9630 ~ 0.9635 in)	----
Camshaft-journal-to-camshaft-cap clearance	0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	0.08 mm (0.0031 in)
Intake camshaft lobe dimensions 		
Measurement A	34.350 ~ 34.450 mm (1.352 ~ 1.356 in)	34.250 mm (1.3484 in)
Measurement B	24.950 ~ 25.050 mm (0.982 ~ 0.986 in)	24.850 mm (0.9783 in)
Exhaust camshaft lobe dimensions 		
Measurement A	33.450 ~ 33.550 mm (1.317 ~ 1.321 in)	33.350 mm (1.3130 in)
Measurement B	24.956 ~ 25.056 mm (0.983 ~ 0.986 in)	24.856 mm (0.9786 in)
Maximum camshaft runout 	----	0.03 mm (0.0012 in)

Item	Standard	Limit
Timing chain		
Model/number of links	DID SCR-0409 SV/136LE	----
Tensioning system	Automatic	----
Valves, valve seats, valve guides		
Valve clearance (cold)		
Intake	0.15 ~ 0.20 mm (0.0059 ~ 0.0079 in)	----
Exhaust	0.25 ~ 0.30 mm (0.0098 ~ 0.0118 in)	----
Valve dimensions		
 Head Diameter	 Face Width	 Seat Width	 Margin Thickness
Valve head diameter A		
Intake	30.9 ~ 31.1 mm (1.2165 ~ 1.2244 in)	----
Exhaust	27.9 ~ 28.1 mm (1.0984 ~ 1.1063 in)	----
Valve face width B		
Intake	1.838 ~ 2.687 mm (0.0724 ~ 0.1058 in)	----
Exhaust	1.697 ~ 2.828 mm (0.0668 ~ 0.1113 in)	----
Valve seat width C		
Intake	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Exhaust	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Valve margin thickness D		
Intake	0.85 ~ 1.15 mm (0.0335 ~ 0.0453 in)	----
Exhaust	0.85 ~ 1.15 mm (0.0335 ~ 0.0453 in)	----
Valve stem diameter		
Intake	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)	4.945 mm (0.1947 in)
Exhaust	4.960 ~ 4.975 mm (0.1953 ~ 0.1959 in)	4.930 mm (0.1941 in)
Valve guide inside diameter		
Intake	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.050 mm (0.1988 in)
Exhaust	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.050 mm (0.1988 in)
Valve-stem-to-valve-guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.080 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.100 mm (0.0039 in)

Item	Standard	Limit
Valve stem runout 	----	0.01 mm (0.0004 in)
Valve seat width		
Intake	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Exhaust	1.0 ~ 1.2 mm (0.0394 ~ 0.0472 in)	1.6 mm (0.06 in)
Valve springs		
Free length		
Intake	46.45 mm (1.83 in)	44.13 mm (1.74 in)
Exhaust	46.45 mm (1.83 in)	44.13 mm (1.74 in)
Installed length (valve closed)		
Intake	35.10 mm (1.38 in)	----
Exhaust	35.10 mm (1.38 in)	----
Spring rate (K1)		
Intake	15.21 N/mm (1.55 kg/mm, 86.77 lb/in)	----
Exhaust	15.21 N/mm (1.55 kg/mm, 86.77 lb/in)	----
Spring rate (K2)		
Intake	19.84 N/mm (2.02 kg/mm, 113.28 lb/in)	----
Exhaust	19.84 N/mm (2.02 kg/mm, 113.28 lb/in)	----
Compressed spring force (installed)		
Intake	160.5 ~ 184.7 N at 35.10 mm (16.37 ~ 18.83 kg at 35.10 mm, 36.08 ~ 41.52 lb at 1.38 in)	----
Exhaust	160.5 ~ 184.7 N at 35.10 mm (16.37 ~ 18.83 kg at 35.10 mm, 36.08 ~ 41.52 lb at 1.38 in)	----
Spring tilt * 		
Intake	----	2.0 mm (0.08 in)
Exhaust	----	2.0 mm (0.08 in)

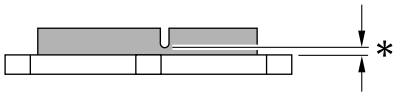
Item	Standard	Limit
Winding direction (top view)		
Intake	Clockwise	----
Exhaust	Clockwise	----
		
Cylinder		
Cylinder arrangement	Forward-inclined single cylinder	----
Bore × stroke	83.0 × 73.0 mm (3.27 × 2.87 in)	----
Compression ratio	10.6 : 1	----
Bore	83.000 ~ 83.010 mm (3.2677 ~ 3.2681 in)	----
Maximum taper	----	0.05 mm (0.002 in)
Piston		
Piston-to-cylinder clearance	0.060 ~ 0.075 mm (0.0024 ~ 0.0030 in)	0.15 mm (0.0059 in)
Diameter D	82.930 ~ 82.945 mm (3.2650 ~ 3.2656 in)	----
		
Height H	5.0 mm (0.20 in)	----
Piston pin bore (in the piston)		
Diameter	20.004 ~ 20.015 mm (0.7876 ~ 0.7880 in)	20.045 mm (0.7892 in)
Offset	1.0 mm (0.0394 in)	----
Offset direction	Intake side	----
Piston pin		
Outside diameter	19.991 ~ 20.000 mm (0.7870 ~ 0.7874 in)	19.971 mm (0.7863 in)
Piston-pin-to-piston-pin-bore clearance	0.004 ~ 0.024 mm (0.0002 ~ 0.0009 in)	0.074 mm (0.0029 in)
Piston rings		
Top ring		
		
Ring type	Barrel	----
Dimensions (B × T)	1.00 × 2.70 mm (0.04 × 0.11 in)	----
End gap (installed)	0.20 ~ 0.35 mm (0.0079 ~ 0.0138 in)	0.50 mm (0.0197 in)
Ring side clearance	0.030 ~ 0.070 mm (0.0012 ~ 0.0028 in)	0.100 mm (0.0039 in)

Item	Standard	Limit
2nd ring  		
Ring type	Taper	----
Dimensions (B × T)	1.00 × 3.10 mm (0.04 × 0.12 in)	----
End gap (installed)	0.40 ~ 0.55 mm (0.0157 ~ 0.0217 in)	0.80 mm (0.0315 in)
Ring side clearance	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)	0.100 mm (0.0039 in)
Oil ring  		
Dimensions (B × T)	2.00 × 2.25 mm (0.08 × 0.09 in)	----
End gap (installed)	0.10 ~ 0.40 mm (0.0039 ~ 0.0157 in)	----
Ring side clearance	0.040 ~ 0.140 mm (0.0016 ~ 0.0055 in)	----
Crankshaft  		
Width A	63.95 ~ 64.00 mm (2.518 ~ 2.520 in)	----
Maximum runout C	----	0.030 mm (0.0012 in)
Big end side clearance D	0.350 ~ 0.850 mm (0.0138 ~ 0.0335 in)	----
Big end radial clearance E	0.010 ~ 0.024 mm (0.0004 ~ 0.0009 in)	----
Crankshaft-journal-to-crankshaft-journal-bearing clearance	0.030 ~ 0.077 mm (0.0012 ~ 0.0030 in)	0.09 mm (0.0035 in)
Bearing color code	0 = White 1 = Blue 2 = Black 3 = Brown 4 = Green	----

Item	Standard	Limit
Automatic centrifugal clutch		
Clutch shoe thickness	4.0 mm (0.16 in)	2.5 mm (0.10 in)
Clutch shoe spring free length	34.7 mm (1.37 in)	----
Clutch housing inside diameter	160 mm (6.30 in)	160.5 mm (6.32 in)
Compression spring free length	103.5 mm (4.075 in)	91 mm (3.58 in)
Weight outside diameter	25 mm (0.98 in)	24.5 mm (0.96 in)
Clutch-in revolution	1,700 ~ 2,300 r/min	----
Clutch-stall revolution	4,000 ~ 5,000 r/min	----
V-belt		
V-belt width	30 mm (1.18 in)	27 mm (1.06 in)
Transmission		
Primary reduction system	Helical gear	----
Primary reduction ratio	31/14 (2.214)	----
Secondary reduction system	Helical gear	----
Secondary reduction ratio	42/16 (2.625)	----
Clutch type	Dry, centrifugal automatic	----
Transmission type	V-belt automatic	----
Operation	Centrifugal automatic type	----
Single speed automatic	2.380 ~ 0.892:1	----
Air filter		
Air filter element	Oil-coated paper element	----
Air filter oil grade	Foam air-filter oil or SAE10W30SE	----
Fuel pump		
Pump type	Electrical	----
Model (manufacturer)	5RU (AISAN)	----
Output pressure	250 kPa (2.5 kg/cm^2, 35.6 psi)	----
Throttle body		
Manufacturer	AISAN	----
ID mark	5RU4 10	----
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm (0.12 ~ 0.20 in)	----

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Aluminum die-cast and steel tube back-bone	----
Caster angle	27°	----
Trail	100.0 mm (3.94 in)	----
Front wheel		
Wheel type	Cast wheel	----
Rim		
Size	14 M/C × MT3.00	----
Material	Aluminum	----
Wheel travel	107 mm (4.21 in)	----
Wheel runout		
Maximum radial wheel runout	----	1.0 mm (0.04 in)
Maximum lateral wheel runout	----	0.5 mm (0.02 in)
Wheel axle bending limit	----	0.25 mm (0.01 in)
Rear wheel		
Wheel type	Cast wheel	----
Rim		
Size	13 M/C × MT4.00	----
Material	Aluminum	----
Wheel travel	104 mm (4.09 in)	----
Wheel runout		
Maximum radial wheel runout	----	1.0 mm (0.04 in)
Maximum lateral wheel runout	----	0.5 mm (0.02 in)
Front tire		
Tire type	Tubeless	----
Size	120/80-14M/C 58S	----
Model (manufacturer)	MB 67 (IRC)	----
	D305FL (DUNLOP)	----
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	200 kPa (2.00 kgf/cm^2, 29 psi)	----
90 ~ 196 kg (198 ~ 432 lb)	200 kPa (2.00 kgf/cm^2, 29 psi)	----
High-speed riding	200 kPa (2.00 kgf/cm^2, 29 psi)	----
Minimum tire tread depth	----	1.0 mm (0.04 in)

Item	Standard	Limit
Rear tire		
Tire type	Tubeless	----
Size	150/70-13M/C 64S	----
Model (manufacturer)	MB 67 (IRC)	----
	D305L (DUNLOP)	----
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	250 kPa (2.50 kgf/cm^2, 36 psi)	----
90 ~ 196 kg (198 ~ 432 lb)	250 kPa (2.50 kgf/cm^2, 36 psi)	----
High-speed riding	250 kPa (2.50 kgf/cm^2, 36 psi)	----
Minimum tire tread depth	----	1.0 mm (0.04 in)
Front brake		
Brake type	Single-disc brake	----
Operation	Right-hand operation	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	267 × 5 mm (10.51 × 0.20 in)	----
Minimum thickness	----	4.5 mm (0.18 in)
Maximum deflection	----	0.15 mm (0.006 in)
Brake pad lining thickness * 	6.0 mm (0.24 in)	0.8 mm (0.03 in)
Master cylinder inside diameter	14.0 mm (0.55 in)	----
Caliper cylinder inside diameter	30.16 mm and 33.34 mm (1.19 in and 1.31 in)	----

Item	Standard	Limit
Rear brake		
Brake type	Single-disc brake	----
Operation	Left-hand operation	----
Recommended fluid	DOT 4	----
Brake discs		
Diameter × thickness	267 × 5 mm (10.51 × 0.20 in)	----
Minimum thickness	----	4.5 mm (0.18 in)
Maximum deflection	----	0.15 mm (0.006 in)
Brake pad lining thickness *	8.3 mm (0.33 in)	0.8 mm (0.03 in)
		
Master cylinder inside diameter	14.0 mm (0.55 in)	----
Caliper cylinder inside diameter	38.1 mm (1.50 in)	----
Front suspension		
Suspension type	Telescopic fork	----
Front fork type	Coil spring/oil damper	----
Front fork travel	120 mm (4.72 in)	----
Spring		
Free length	316.7 mm (12.47 in)	310.4 mm (12.22 in)
Installed length	296.7 mm (11.68 in)	----
Spring rate (K1)	14.09 N/mm (1.44 kg/mm, 80.45 lb/in)	----
Spring rate (K2)	26.67 N/mm (2.72 kg/mm, 152.28 lb/in)	----
Spring stroke (K1)	0 ~ 90 mm (0 ~ 3.54 in)	----
Spring stroke (K2)	90 ~ 120 mm (3.54 ~ 4.72 in)	----
Inner tube outer diameter	41 mm (1.61 in)	----
Inner tube bending limit	----	0.2 mm (0.01 in)
Optional spring available	No	----
Fork oil		
Recommended oil	Yamaha fork oil 10 WT	----
Quantity (each front fork leg)	0.298 L (0.262 Imp qt, 0.315 US qt)	----
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	88 mm (3.46 in)	----

Item	Standard	Limit
Steering		
Steering bearing type	Angular and taper roller bearings	----
Lock-to-lock angle (left)	40°	----
Lock-to-lock angle (right)	40°	----
Rear suspension		
Suspension type	Unit swing	----
Rear shock absorber assembly type	Coil spring/oil damper	----
Rear shock absorber assembly travel	130 mm (5.12 in)	----
Spring		
Free length	306.6 mm (12.07 in)	300.0 mm (11.81 in)
Installed length	290.6 mm (11.44 in)	----
Spring rate (K1)	6.22 N/mm (0.63 kg/mm, 35.52 lb/in)	----
Spring rate (K2)	11.80 N/mm (1.20 kg/mm, 67.38 lb/in)	----
Spring rate (K3)	22.50 N/mm (2.29 kg/mm, 128.47 lb/in)	----
Spring stroke (K1)	0 ~ 29 mm (0 ~ 1.14 in)	----
Spring stroke (K2)	29 ~ 90 mm (1.14 ~ 3.54 in)	----
Spring stroke (K3)	90 ~ 130 mm (3.54 ~ 5.12 in)	----
Optional spring available	No	----
Swingarm		
Free play (at the end of the swingarm)		
Radial	----	1.0 mm (0.04 in)
Axial	----	1.0 mm (0.04 in)

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	----
Ignition system		
Ignition system type	Transistorized coil ignition (digital)	----
Ignition timing	5° BTDC at 1,400 r/min	----
Advancer type	Digital	----
Crankshaft position sensor resistance/color	248 ~ 372 Ω at 20 °C (68 °F)/red–white	----
ECU		
Model (manufacturer)	5RU30/MORIC	----
Ignition coil		
Model (manufacturer)	2JN (MORIC)	----
Minimum ignition spark gap	6 mm (0.24 in)	----
Primary coil resistance	2.16 ~ 2.64 Ω at 20 °C (68 °F)	----
Secondary coil resistance	8.64 ~ 12.96 kΩ at 20 °C (68 °F)	----
Spark plug cap		
Material	Resin	----
Resistance	10.0 kΩ at 20 °C (68 °F)	----
Charging system		
System type	A.C. magneto	----
Model (manufacturer)	F5RU (MORIC)	----
Nominal output	14 V/27.5 A at 5,000 r/min	----
Stator coil resistance/color	0.184 ~ 0.276 Ω at 20 °C (68 °F)/ white–white	----
Rectifier/regulator		
Regulator type	Semiconductor, short-circuit type	----
Model (manufacturer)	SH678-11 (SHINDENGEN)	----
No-load regulated voltage	14.1 ~ 14.9 V	----
Rectifier capacity	22 A	----
Withstand voltage	200 V	----
Battery		
Battery type	GT9B-4	----
Battery voltage/capacity	12 V/8 Ah	----
Specific gravity	1.320	----
Manufacturer	GS	----
Ten hour rate amperage	0.8 A	----
Minimum open-circuit voltage	12.8 V or more at 20 °C (68 °F)	----
Headlight		
Headlight type	Halogen bulb	----

Item	Standard	Limit
Bulbs (voltage/wattage × quantity)		
Headlight	12 V 60/55 W × 2	----
Tail/brake light	LED × 1	----
Front turn signal/position light	12 V 21 W/5 W × 2	----
Rear turn signal light	12 V 21 W × 2	----
Licence plate light	12 V 5 W × 1	----
Meter light	12 V 2.0 W × 3	----
Indicator light (voltage/wattage × quantity)		
High beam indicator light	12 V 1.4 W × 1	----
Turn signal indicator light	12 V 1.4 W × 2	----
Engine trouble warning light	12 V 1.4 W × 1	----
Electric starting system		
System type	Constant mesh	----
Starter motor		
Model (manufacturer)	SM-13 (MITSUBA)	----
Power output	0.65 kW	----
Brushes		
Overall length	12 mm (0.47 in)	4.0 mm (0.16 in)
Spring force	7.65 ~ 10.01 N (780 ~ 1,021 gf, 27.54 ~ 36.03 oz)	----
Armature coil resistance	0.0012 ~ 0.0022 Ω at 20 °C (68 °F)	----
Insulation resistance	Above 1 MΩ at 20 °C (68 °F)	----
Commutator diameter	28 mm (1.1 in)	27 mm (1.06 in)
Mica undercut	0.7 mm (0.028 in)	----
Starter relay		
Model (manufacturer)	2768098-A (JIDECO)	----
Amperage	180 A	----
Horn		
Horn type	Plane	----
Model (manufacturer) × quantity	HF-12 (NIKKO) × 1	----
Maximum amperage	3 A	----
Performance	105 ~ 118 dB/2 m	----
Coil resistance	1.01 ~ 1.11 Ω at 20 °C (68 °F)	----
Turn signal relay		
Relay type	Full transistor	----
Model (manufacturer)	FE246BH (DENSO)	----
Self-cancelling device built-in	No	----
Turn signal blinking frequency	75 ~ 95 cycles/minute	----
Wattage	21 W × 2 + 3.4 W	----

Item	Standard	Limit
Fuses (amperage × quantity)		
Main fuse	40 A × 1	----
Fuel injection system fuse	10 A × 1	----
Headlight fuse	20 A × 1	----
Signaling system fuse	10 A × 1	----
Ignition fuse	10 A × 1	----
Radiator fan motor fuse	10 A × 1	----
Backup fuse (storage box light and meter assembly)	10 A × 1	----
Turn signal/position light fuse	10 A × 1	----
Spare fuse	40 A × 1, 20 A × 1, 10 A × 2	----
Fuel gauge		
Model (manufacturer)	5RU (AISAN)	----
Sender unit resistance-full	19 ~ 21 Ω	----
Sender unit resistance-empty	137 ~ 143 Ω	----
Starting circuit cut-off relay		
Model (manufacturer)	ACA12115-4 (MATSUSHITA)	----
Coil resistance	72 ~ 88 Ω	----
Diode	Yes	----
Radiator fan motor		
Model (manufacturer)	5RU (MITSUBA)	----
Running rpm	4,500 r/min	----
Coolant temperature sensor		
Model (manufacturer)	5PS (DENSO)	----
Resistance at 20 °C (68 °F)	2.32 ~ 2.59 kΩ	----
Resistance at 80 °C (176 °F)	0.310 ~ 0.326 kΩ	----
Resistance at 110 °C (230 °F)	0.140 ~ 0.144 kΩ	----
Intake air pressure sensor		
Output voltage	3.4 ~ 3.8 V	----
Intake air temperature sensor		
Resistance	2.3 ~ 2.6 kΩ at 20 °C (68 °F)	----
Speed sensor		
Output voltage		
When sensor is on	DC 4.8 V or more	----
When sensor is off	DC 0.6 V or less	----
Throttle position sensor		
Voltage/color	5 V/blue–black/blue	----
Voltage (closed position)/color	0.4 ~ 0.9 V/yellow/blue–black/blue	----
ISC (idle speed control) valve		
Resistance/color	27 ~ 33 Ω at 20 °C (68 °F)/ pink–light green or gray–sky blue	----
Lean angle cut-off switch		
Voltage		
Less than 45°	Approximately 1 V	----
More than 45°	Approximately 4 V	----

EAS00028
CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.
Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

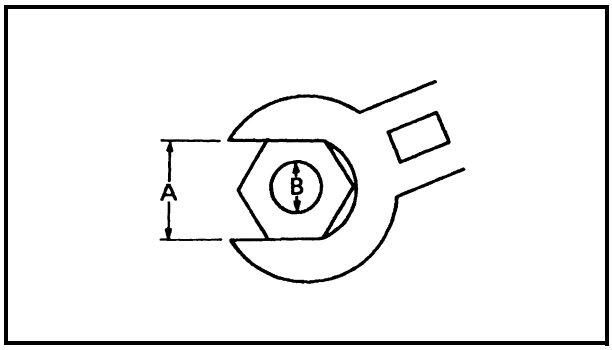
METRIC		MULTIPLIER		IMPERIAL
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Tightening torque	m·kg	7.233	ft·lb
	m·kg	86.794	in·lb
	cm·kg	0.0723	ft·lb
	cm·kg	0.8679	in·lb
Weight	kg	2.205	lb
	g	0.03527	oz
Speed	km/hr	0.6214	mph
Distance	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume/ Capacity	cc (cm^3)	0.03527	oz (IMP lip.)
	cc (cm^3)	0.06102	cu.in
	lt (liter)	0.8799	qt (IMP liq.)
	lt (liter)	0.2199	gal (IMP liq.)
Misc.	kg/mm	55.997	lb/in
	kg/cm^2	14.2234	psi (lb/in^2)
	Centigrade (°C)	9/5+32	Fahrenheit (°F)

EAS00030
GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A: Distance between flats
B: Outside thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

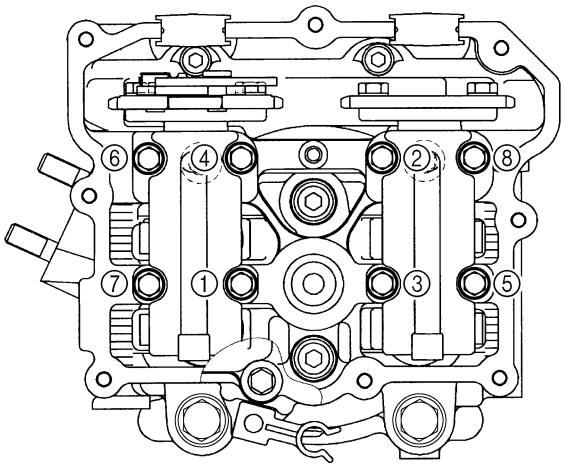
TIGHTENING TORQUES

ENGINE TIGHTENING TORQUES

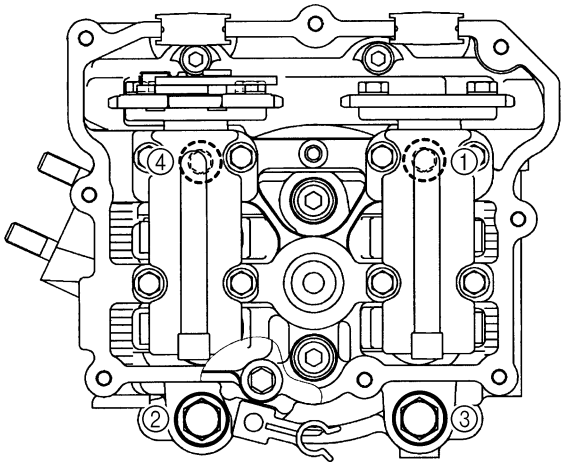
Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m · kg	ft · lb	
Camshaft cap	Bolt	M6	8	10	1.0	7.2	
Exhaust pipe stud bolt	—	M8	2	13	1.3	9.4	
Spark plug	—	M10	1	13	1.3	9.4	
Cylinder head and cylinder	Bolt	M6	2	10	1.0	7.2	
Cylinder head and cylinder	Nut	M10	2	40	4.0	29	
Cylinder head and cylinder	Cap nut	M10	2	52	5.2	37	
Cylinder head cover and cylinder head	Bolt	M6	9	10	1.0	7.2	
Cylinder head cover and camshaft cap	Bolt	M6	1	10	1.0	7.2	
Oil gallery bolt	—	M6	1	10	1.0	7.2	
Cylinder and crankcase	Bolt	M6	1	10	1.0	7.2	
Generator rotor	Nut	M18	1	130	13.0	94	
Camshaft sprocket (intake and exhaust)	Bolt	M7	4	20	2.0	14	
Timing chain guide (intake side)	Bolt	M6	2	10	1.0	7.2	
Timing chain tensioner assembly	Bolt	M6	2	10	1.0	7.2	
Timing chain tensioner cap bolt	—	M6	1	7	0.7	5.1	
Water pump cover	Bolt	M6	3	10	1.0	7.2	
Oil cooler outlet hose joint	Bolt	M6	1	10	1.0	7.2	
Thermostat cover	Bolt	M6	2	10	1.0	7.2	
Radiator filler hose and bracket	Bolt	M5	1	9	0.9	6.5	
Radiator pipe assembly	Bolt	M6	3	7	0.7	5.1	
Oil cooler pipe	Bolt	M6	2	10	1.0	7.2	
Oil cooler cover	Bolt	M6	3	10	1.0	7.2	
Coolant drain bolt	—	M6	1	10	1.0	7.2	
Air bleed bolt (coolant)	—	M5	1	6	0.6	4.3	
Oil pump assembly	Bolt	M6	2	7	0.7	5.1	
Oil strainer cover	—	M35	1	32	3.2	23	
Oil filter element cover	Bolt	M6	3	10	1.0	7.2	
Cylinder head and intake manifold	Bolt	M6	2	10	1.0	7.2	
Intake manifold and throttle body joint	Bolt	M6	2	10	1.0	7.2	
Fuel injector assembly	Bolt	M6	1	12	1.2	8.7	
Fuel hose stay	Bolt	M5	1	7	0.7	5.1	
Intake air pressure sensor and stay	Bolt	M6	3	10	1.0	7.2	
Air filter case (left and right)	Bolt	M6	4	7	0.7	5.1	
Muffler joint	Bolt	M8	1	14	1.4	10	
Muffler protector	Bolt	M6	2	10	1.0	7.2	
Muffler end cover	Bolt	M6	5	10	1.0	7.2	
Muffler end cover stay	Bolt	M6	3	10	1.0	7.2	
Exhaust pipe protector	Bolt	M6	2	10	1.0	7.2	

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m · kg	ft · lb	
Exhaust pipe	Nut	M8	2	20	2.0	14	
Air induction system pipe	Bolt	M6	2	12	1.2	8.7	
Air induction system pipe stay	Bolt	M6	1	7	0.7	5.1	
Air cut-off valve	Bolt	M6	2	10	1.0	7.2	
Muffler mount	Bolt	M10	3	53	5.3	38	
V-belt case air duct 1 and 2	Bolt	M6	4	7	0.7	5.1	
Crankcase	Bolt	M6	7	10	1.0	7.2	
Crankcase	Bolt	M8	5	16	1.6	11	
Crankcase	Bolt	M8	1	30	3.0	22	
Cylinder head stud bolt	—	M10	4	13	1.3	9.4	
Transmission oil drain bolt	—	M8	1	20	2.0	14	
Bearing retainer	Screw	M6	1	10	1.0	7.2	
Transmission case cover	Bolt	M8	7	16	1.6	11	
V-belt case	Bolt	M8	1	22	2.2	16	
V-belt case	Bolt	M6	9	10	1.0	7.2	
V-belt case cover	Bolt	M6	6	7	0.7	5.1	
Generator rotor cover inner bracket	Bolt	M6	2	7	0.7	5.1	
Generator rotor cover	Bolt	M6	11	10	1.0	7.2	
Primary sheave	Nut	M18	1	83	8.3	60	
Timing plug	—	M16	1	8	0.8	5.8	
Engine oil drain bolt	—	M12	1	20	2.0	14	
Secondary sheave	Nut	M14	1	60	6.0	43	
Starter clutch	Bolt	M8	6	30	3.0	22	
Clutch shoe assembly	Nut	M36	1	90	9.0	65	
Stator coil	Bolt	M6	3	10	1.0	7.2	
Crankshaft position sensor	Bolt	M6	2	10	1.0	7.2	
Starter motor	Bolt	M6	2	12	1.2	8.7	
Coolant temperature sensor	—	M12	1	18	1.8	13	

Camshaft cap tightening sequence:



Cylinder head tightening sequence:



CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening torque			Remarks
		Nm	m · kg	ft · lb	
Bottom cover and sub-frame	M6	7	0.7	5.1	
Radiator cover and frame	M6	7	0.7	5.1	
Front cowling and front cowling stay	M6	7	0.7	5.1	
Footrest board and footrest board stay	M6	7	0.7	5.1	
Footrest board and sub-frame	M6	7	0.7	5.1	
Rear reflector and reflector bracket	M5	4	0.4	2.9	
Rear fender and licence plate bracket	M6	4	0.4	2.9	
Front reflector and reflector bracket	M6	7	0.7	5.1	
Storage compartment and frame	M6	7	0.7	5.1	
Rear fender and frame	M6	10	1.0	7.2	
Sub-frame adjusting bolt	M18	4	0.4	2.9	
Sub-frame front upper mounting nut	M10	54	5.4	39	
Sub-frame front lower mounting bolt	M10	54	5.4	39	
Sub-frame rear mounting bolt	M10	54	5.4	39	
Radiator and sub-frame	M6	7	0.7	5.1	
Coolant reservoir and sub-frame	M6	7	0.7	5.1	
Footrest board plate and sub-frame	M6	7	0.7	5.1	
Fuel tank and sub-frame (bolt)	M6	10	1.0	7.2	
Fuel tank and sub-frame (nut)	M6	7	0.7	5.1	
Fuel hose holder and sub-frame	M6	7	0.7	5.1	
Ignition coil and ignition coil bracket	M6	7	0.7	5.1	
Ignition coil bracket and sub-frame	M8	16	1.6	11	
Engine bracket upper mounting nut	M12	59	5.9	43	
Engine bracket lower mounting bolt	M10	45	4.5	32	
Engine mounting nut	M12	65	6.5	47	
Engine bracket bolt	M10	56	5.6	40	
Front cowling stay and frame	M10	32	3.2	23	
Steering stem nut	M20	140	14.0	100	
Upper steering ring nut	M30	90	9.0	65	See “NOTE”.
Lower steering ring nut	M30	24	2.4	17	See “NOTE”.
Rear axle nut	M14	135	13.5	98	
Rear shock absorber assembly upper nut	M10	34	3.4	24	
Rear shock absorber assembly lower bolt	M8	29	2.9	21	
Rear brake caliper bracket and swingarm	M10	40	4.0	29	
Rear brake hose holder and swingarm	M6	10	1.0	7.2	
Swingarm and engine	M10	46	4.6	33	
Brake hose union bolt (front and rear brake hose)	M10	30	3.0	22	
Rear brake caliper and rear brake caliper bracket	M10	27	2.7	19	
Bleed screw (front and rear brake caliper)	M7	6	0.6	4.3	
Upper handlebar holder and lower handlebar holder	M8	23	2.3	17	
Front brake master cylinder and front brake master cylinder holder	M6	10	1.0	7.2	

Item	Thread size	Tightening torque			Remarks
		Nm	m · kg	ft · lb	
Rear brake master cylinder and rear brake master cylinder holder	M6	10	1.0	7.2	
Grip end	M16	26	2.6	19	
Right handlebar switch	M5	4	0.4	2.9	
Rear brake lock lever and left handlebar switch	M5	6	0.6	4.3	
Storage box and frame	M6	11	1.1	8.0	
Rider seat and bottom plate	M6	7	0.7	5.1	
Seat lock assembly and frame	M6	10	1.0	7.2	
Grab bar bracket and frame	M8	30	3.0	22	
Grab bar and grab bar bracket	M8	23	2.3	17	
Grab bar and frame	M8	23	2.3	17	
Passenger seat and grab bar	M6	7	0.7	5.1	
Seat bracket and frame	M8	30	3.0	22	
Gas spring assembly bracket and frame	M8	30	3.0	22	
Front brake hose holder and lower bracket	M6	7	0.7	5.1	
Front brake hose holder and outer tube	M6	7	0.7	5.1	
Sidestand and sub-frame	M10	39	3.9	28	
ECU bracket and front cowling stay	M6	7	0.7	5.1	
ECU and ECU bracket	M6	7	0.7	5.1	
Front cowling stay and horn	M6	10	1.0	7.2	
Front wheel axle pinch bolt	M8	20	2.0	14	
Damper rod bolt	M10	30	3.0	22	
Lower bracket pinch bolt	M10	30	3.0	22	
Cap bolt	M38	70	7.0	50	
Front wheel axle	M14	55	5.5	40	
Front wheel and brake disc	M8	23	2.3	17	
Front brake caliper bracket and outer tube	M10	40	4.0	29	
Front brake caliper and front brake caliper bracket	M10	27	2.7	19	
Rear wheel and brake disc	M8	23	2.3	17	
Rectifier/regulator	M6	7	0.7	5.1	
Canister and sub-frame	M6	7	0.7	5.1	
Rollover valve holder	M5	4	0.4	2.9	

NOTE:

1. Tighten the lower steering ring nut 36 Nm (3.6 m · kg, 25 ft · lb) with a torque wrench and the steering nut wrench, and then loosen the nut 1/4 turn.
2. Tighten the lower steering ring nut 24 Nm (2.4 m · kg, 17 ft · lb) with a torque wrench and the steering nut wrench.
3. Install the rubber washer and the center steering ring nut.
4. Finger tighten the center steering ring nut, align the slots of both steering ring nuts, and then install the lock washer.
5. Hold the lower and center steering ring nuts, and then tighten the upper steering ring nut 90 Nm (9.0 m · kg, 65 ft · lb) with a torque wrench and the steering nut wrench.

EAS00031

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Oil seal lips	LS
Bearings	E
O-rings	LS
Cylinder head nut	E
Camshaft cap and camshaft cap bolts	E
Crankshaft pin	E
Connecting rod big end thrust surface	E
Balancer drive gear inner surface	E
Crankshaft thrust surface	E
Crankshaft journals	E
Crankshaft end (generator rotor side)	E
Generator rotor nut and washer	E
Piston and piston rings	E
Piston pin and connecting rod small end	E
Balancer driven gear assembly	E
Impeller shaft end	E
Camshaft lobes	M
Camshaft journals	M
Valve stems (intake and exhaust)	M
Valve stem ends (intake and exhaust)	E
Decompressor (lever, pin and spring)	E
Oil pump shafts	E
O-ring (fuel injector assembly)	Silicone oil
Primary sheave collar and O-ring	Shell BT grease 3®
Secondary sheave collar and O-ring	Shell BT grease 3®
Engine mounting bolt collars	LS
Crankshaft journal bearings	E
Starter clutch idle gear and shaft	E
Starter clutch gear	E
Main axle thrust surface	E
Main and drive axle serration	E
Drive axle spline	LS
Drive axle bearing	LS
Primary sheave	BEL-RAY assembly lube®
Secondary sheave	BEL-RAY assembly lube®

LUBRICATION POINTS AND LUBRICANT TYPES

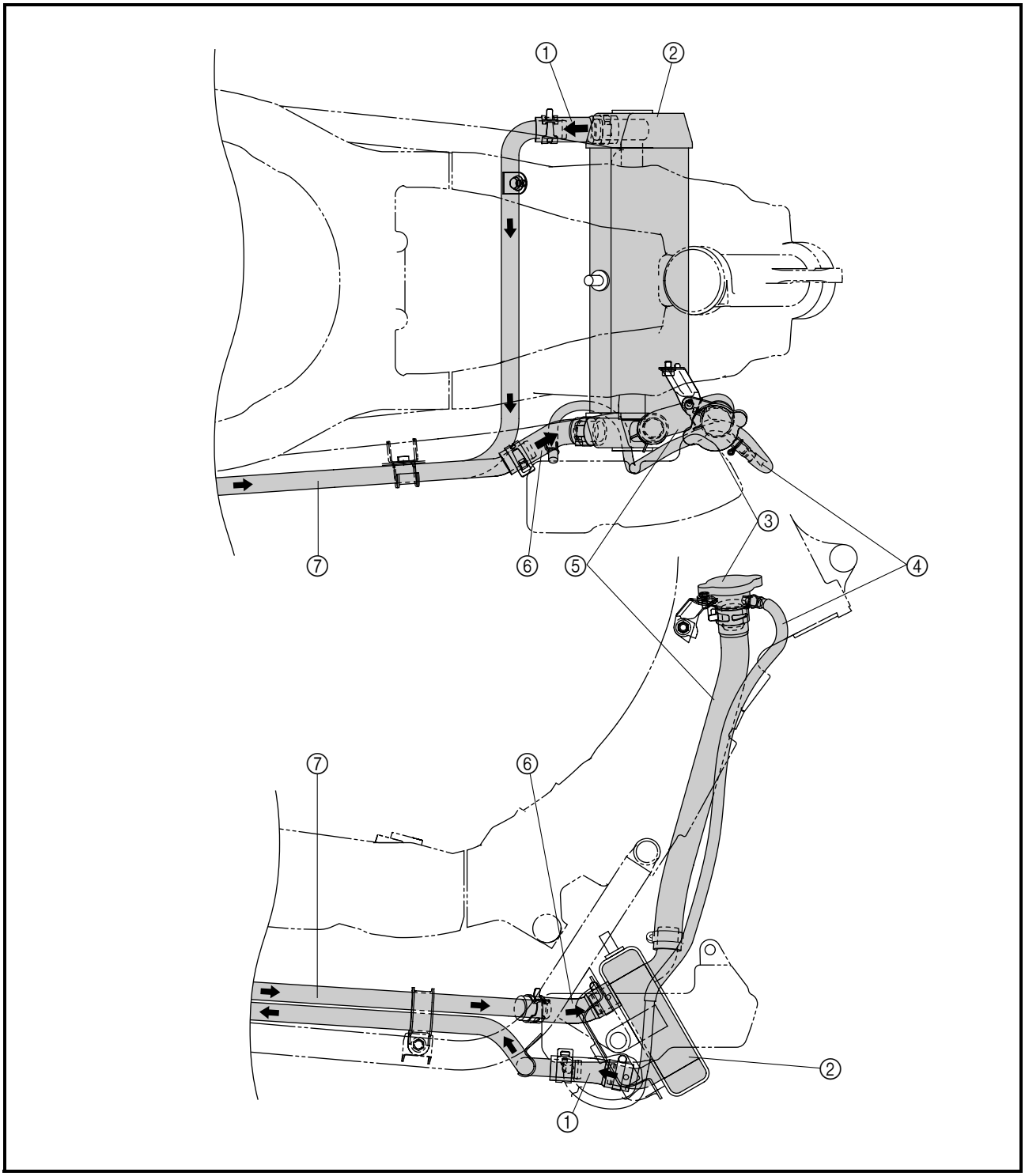
Lubrication point	Lubricant
Water pump seal lip	LS
Crankcase breather pipe	
Transmission case breather pipe	
Cylinder head cover (guide stopper mating surface)	Yamaha bond No. 1215
Crankcase mating surface	Yamaha bond No. 1215
Generator rotor cover (grommet mating surface)	Yamaha bond No. 1215

EAS00032
CHASSIS LUBRICATION POINTS AND LUBRICANT TYPES

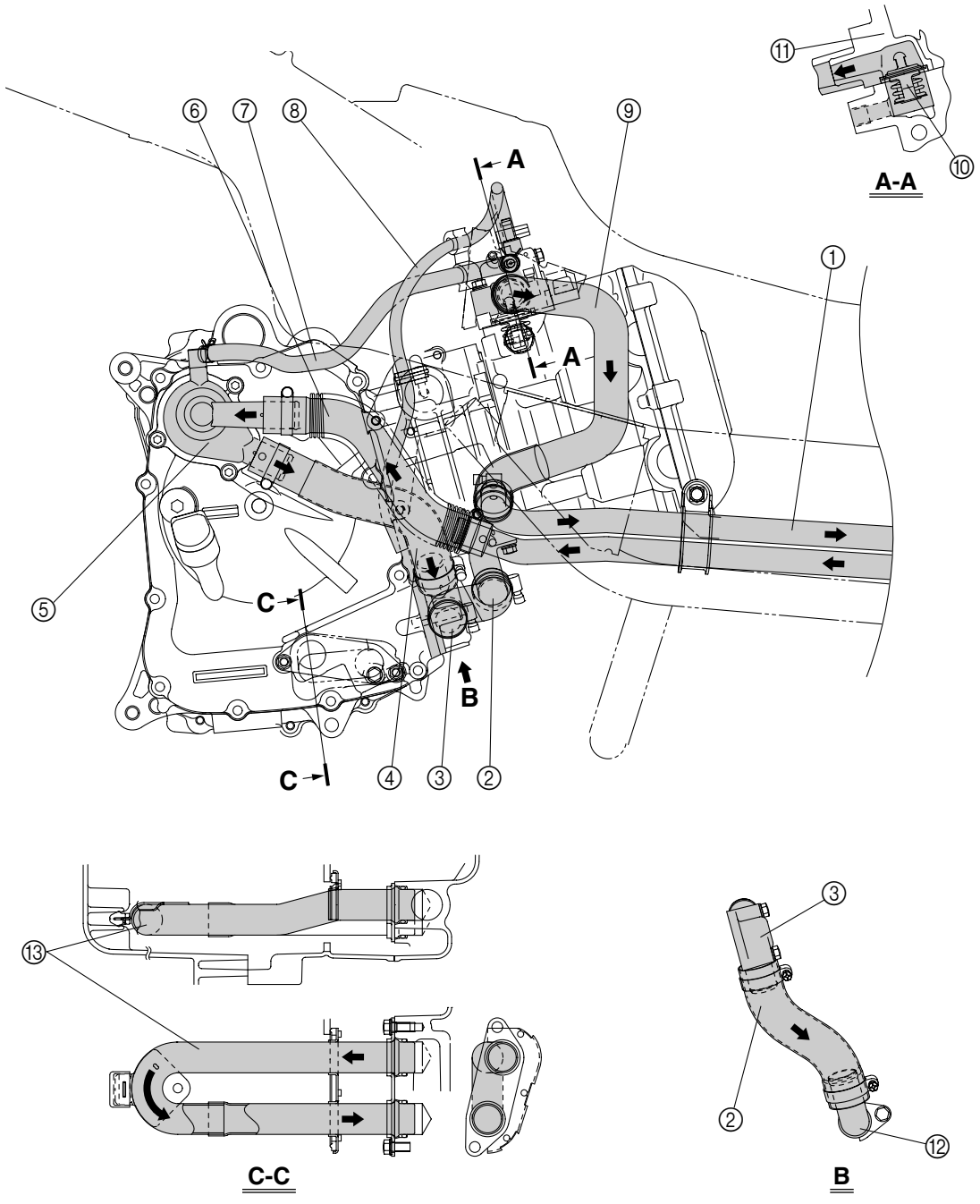
Lubrication Point	Symbol
Engine mounting bolt	LS
Swingarm, oil seal	LS
Steering bearings and oil seal	LS
Throttle grip inner surface and throttle cables	LS
Brake lever pivoting point and metal-to-metal moving parts (left and right)	LS
Rear brake lock lever cable and rear brake lock lever (cable connection area)	LS
Front wheel oil seal	LS
Speed sensor oil seal	LS
Rear axle	LS
Sidestand pivoting point, metal-to-metal moving parts and collar outer surface	LS
Centerstand shaft pivoting point and metal-to-metal moving parts	LS
Centerstand stopper pivoting point	LS
Centerstand and sidestand spring hook metal-to-metal moving parts	LS
Sidestand switch contact point	LS
Fuel tank lid hinge and stopper	LS

EAS00033
COOLING SYSTEM DIAGRAMS

① Radiator outlet hose
② Radiator
③ Radiator cap
④ Coolant reservoir hose
⑤ Radiator filler hose
⑥ Radiator inlet hose
⑦ Radiator pipe assembly



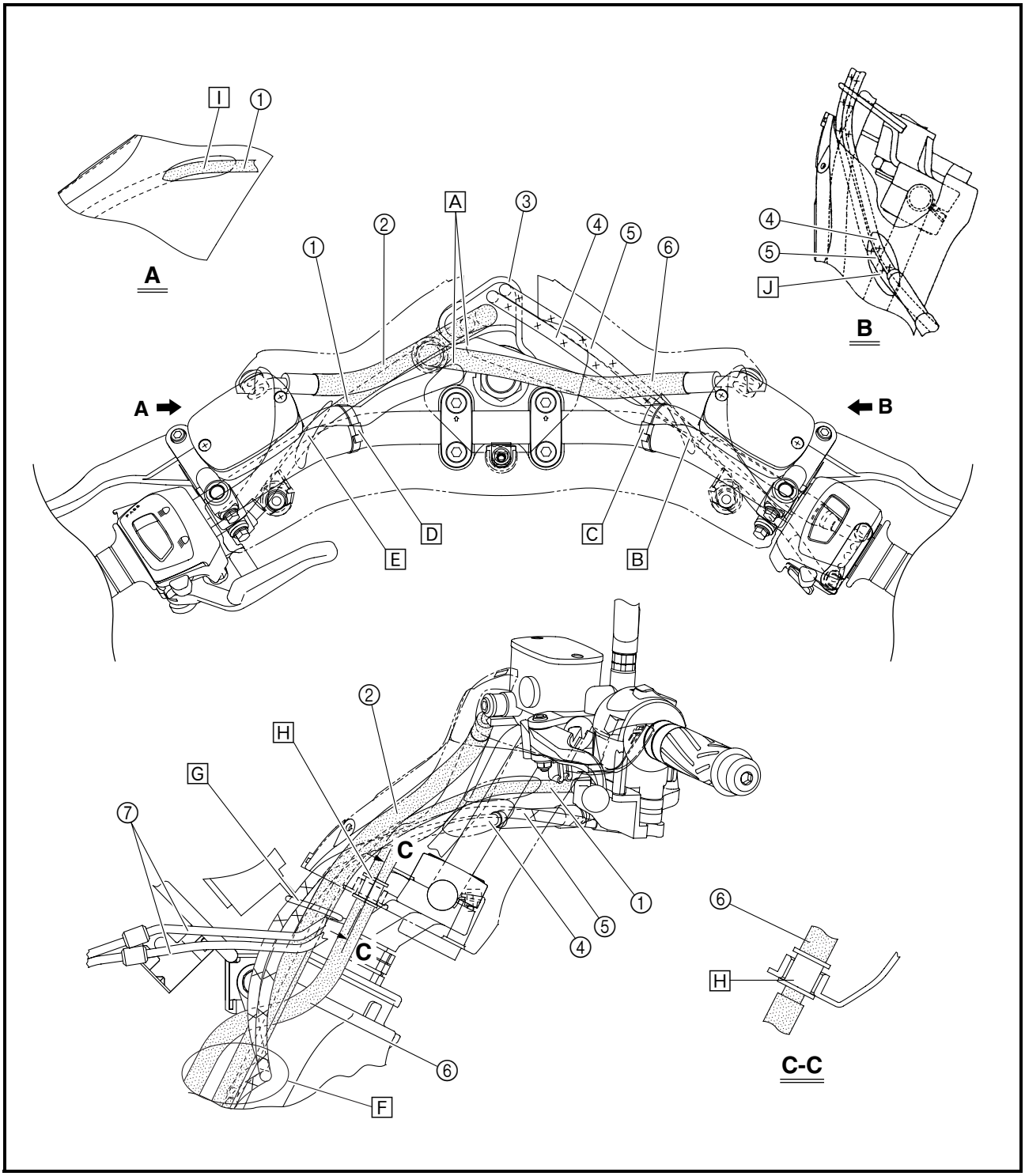
① Radiator pipe assembly
② Oil cooler outlet hose
③ Oil cooler cover
④ Water pump outlet hose
⑤ Water pump cover
⑥ Water pump inlet hose
⑦ Thermostat inlet hose
⑧ Cooling system air bleed hose
⑨ Thermostat outlet hose
⑩ Thermostat
⑪ Thermostat cover
⑫ Water jacket inlet pipe
⑬ Oil cooler pipe



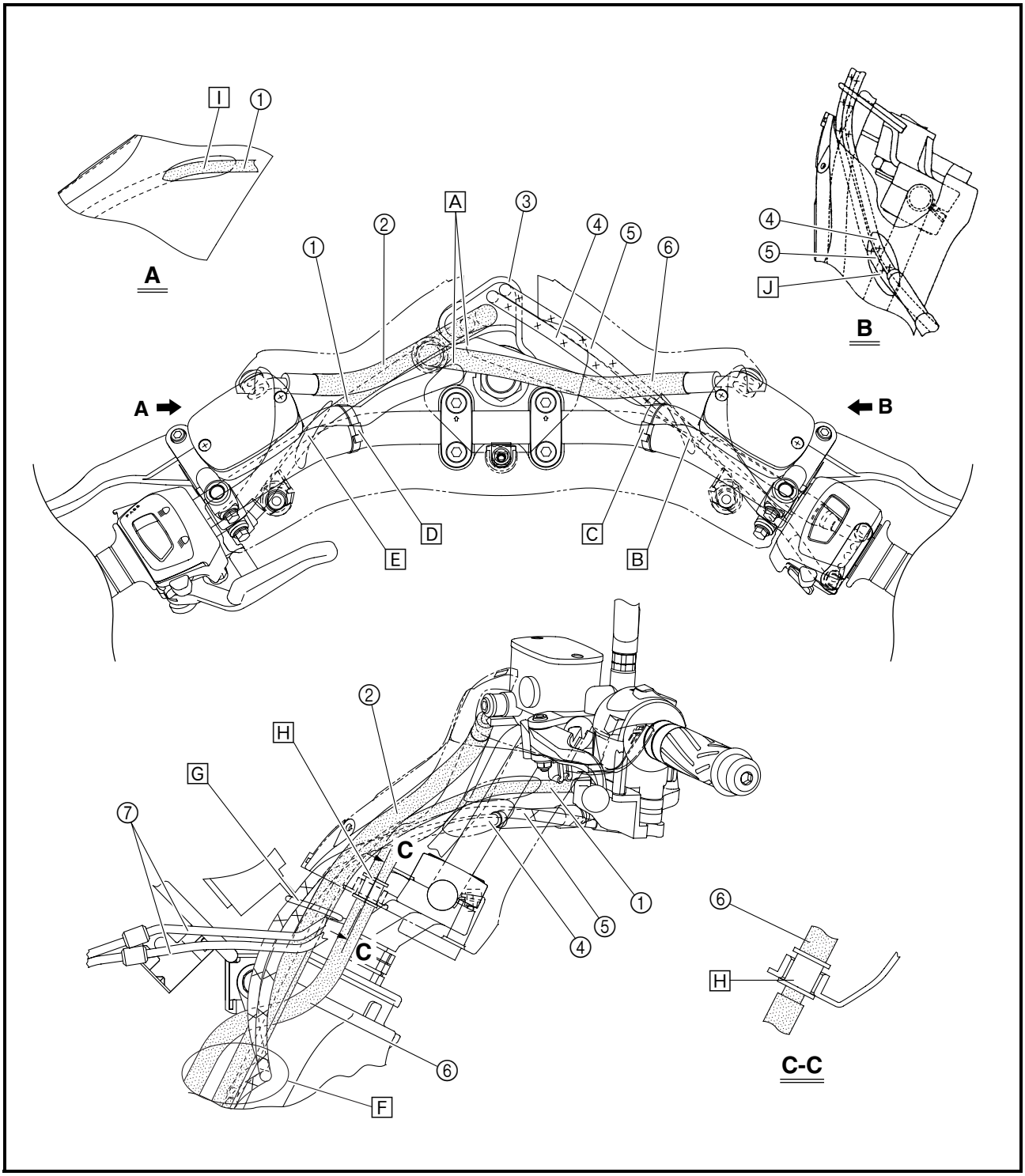
EAS00035
CABLE ROUTING

① Rear brake lock lever cable
② Rear brake hose
③ Cable guide (lower handlebar holder)
④ Throttle cable (accelerator cable)
⑤ Throttle cable (decelerator cable)
⑥ Front brake hose
⑦ Handlebar switch leads

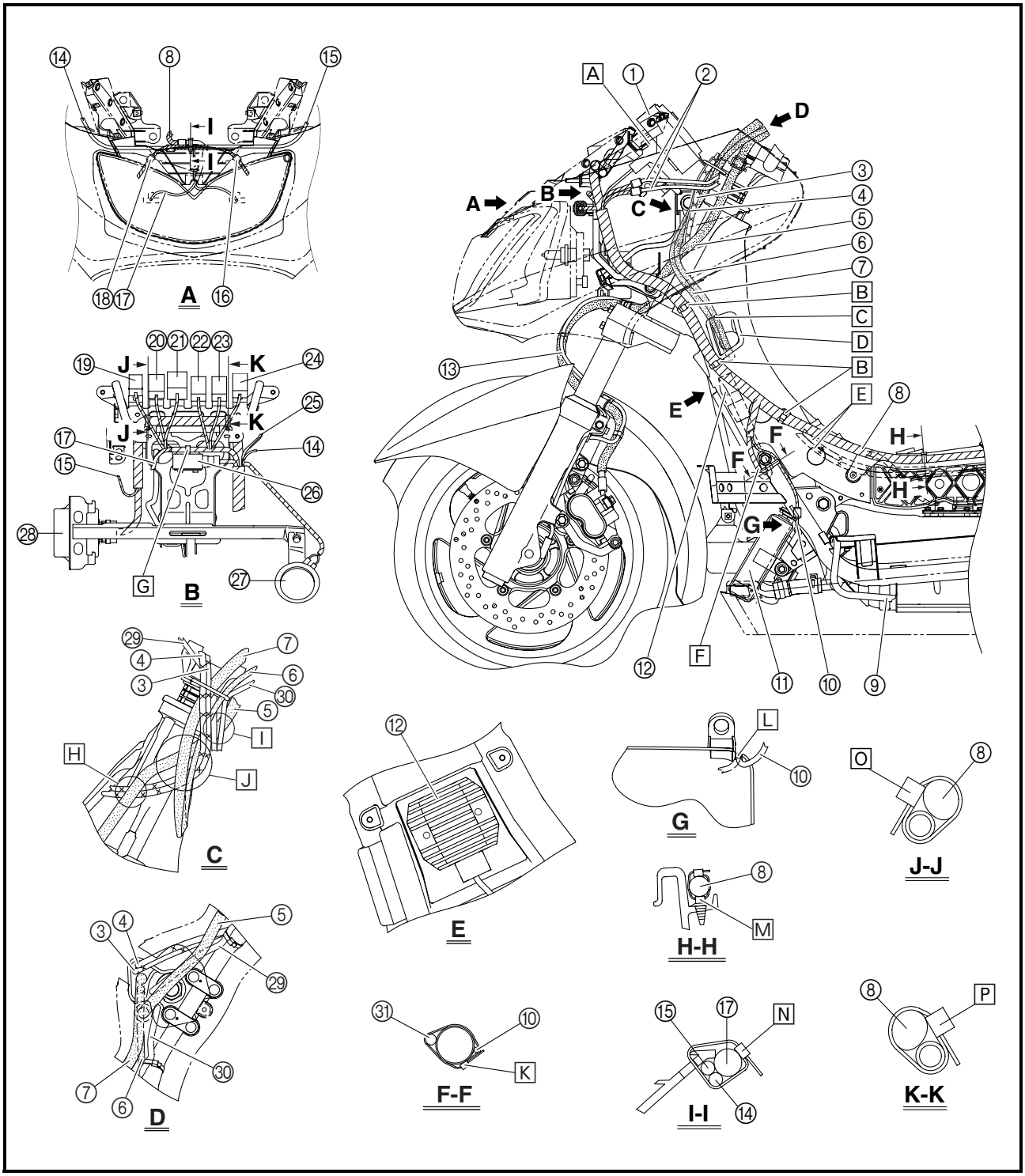
A Route the handlebar switch leads to the left of the cable guide (lower handlebar holder).
B Route the throttle cables in front of the handlebar.
C Fasten the right handlebar switch lead to the handlebar with a plastic locking tie.



D Fasten the left handlebar switch lead to the handlebar with a plastic locking tie.
E Route the rear brake lock lever cable in front of the handlebar.
F Route the throttle cables under the rear brake hose, rear brake lock lever cable, and front brake hose, and then to the right side of the scooter.
G Pass the throttle cables, rear brake hose, and rear brake lock lever cable through the cable guide (lower handlebar holder).
H Install the grommet on the front brake hose in the hole in the lower handlebar cover before connecting the hose.
I Pass the rear brake lock lever cable through the hole in the lower handlebar cover.
J Pass the throttle cables through the hole in the lower handlebar cover.

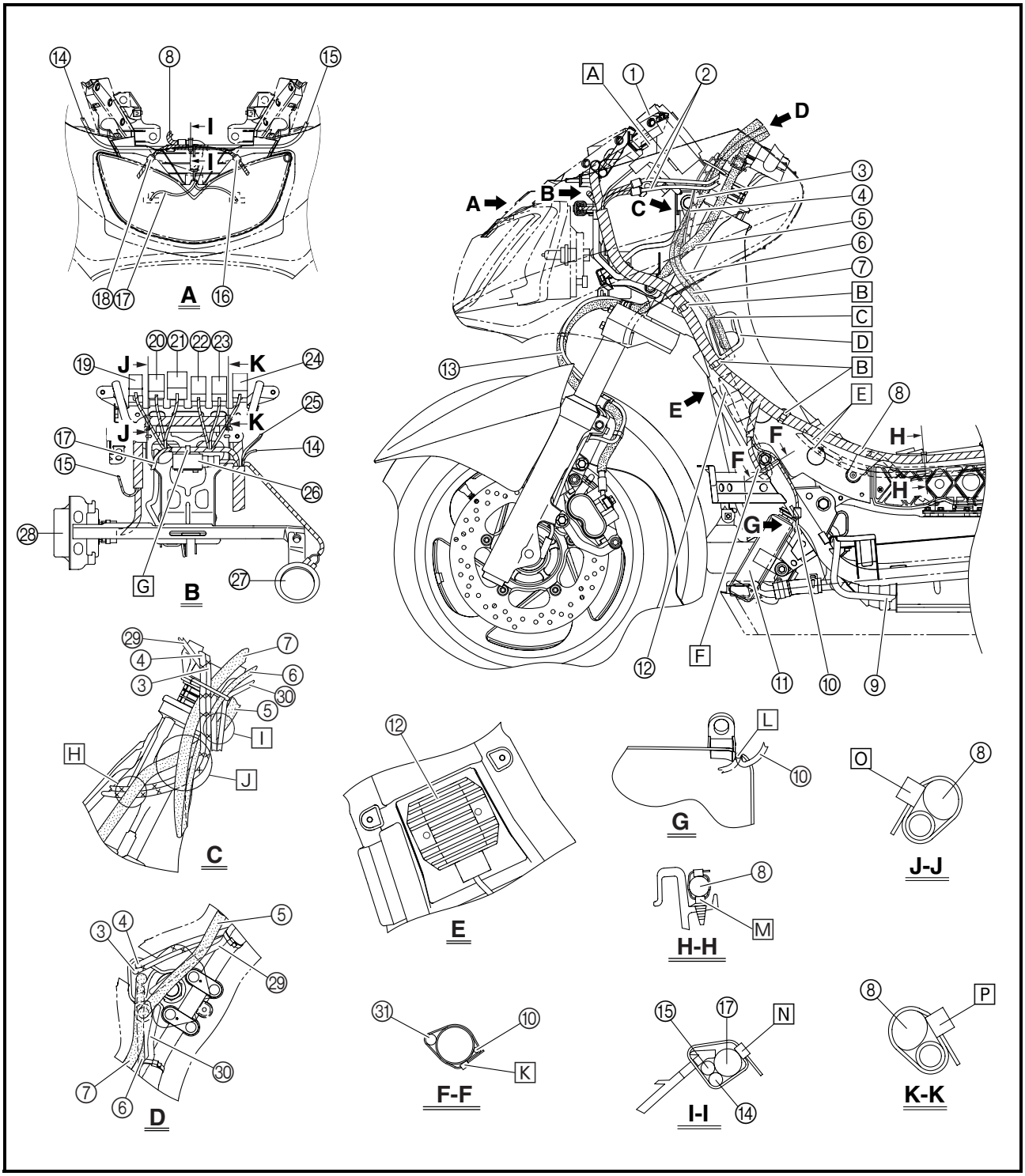


① Meter assembly
② Handlebar switch leads
③ Throttle cable (accelerator cable)
④ Throttle cable (decelerator cable)
⑤ Front brake hose
⑥ Rear brake lock lever cable
⑦ Rear brake hose
⑧ Wire harness
⑨ Fuel overflow hose
⑩ Radiator fan motor lead
⑪ Radiator
⑫ Rectifier/regulator
⑬ Speed sensor lead
⑭ Front turn signal/position light lead (right)
⑮ Front turn signal/position light lead (left)
⑯ Front turn signal/position light lead coupler (right)
⑰ Headlight lead
⑱ Front turn signal/position light lead coupler (left)
⑲ Starting circuit cut-off relay
⑳ Headlight relay 2
㉑ Turn signal relay

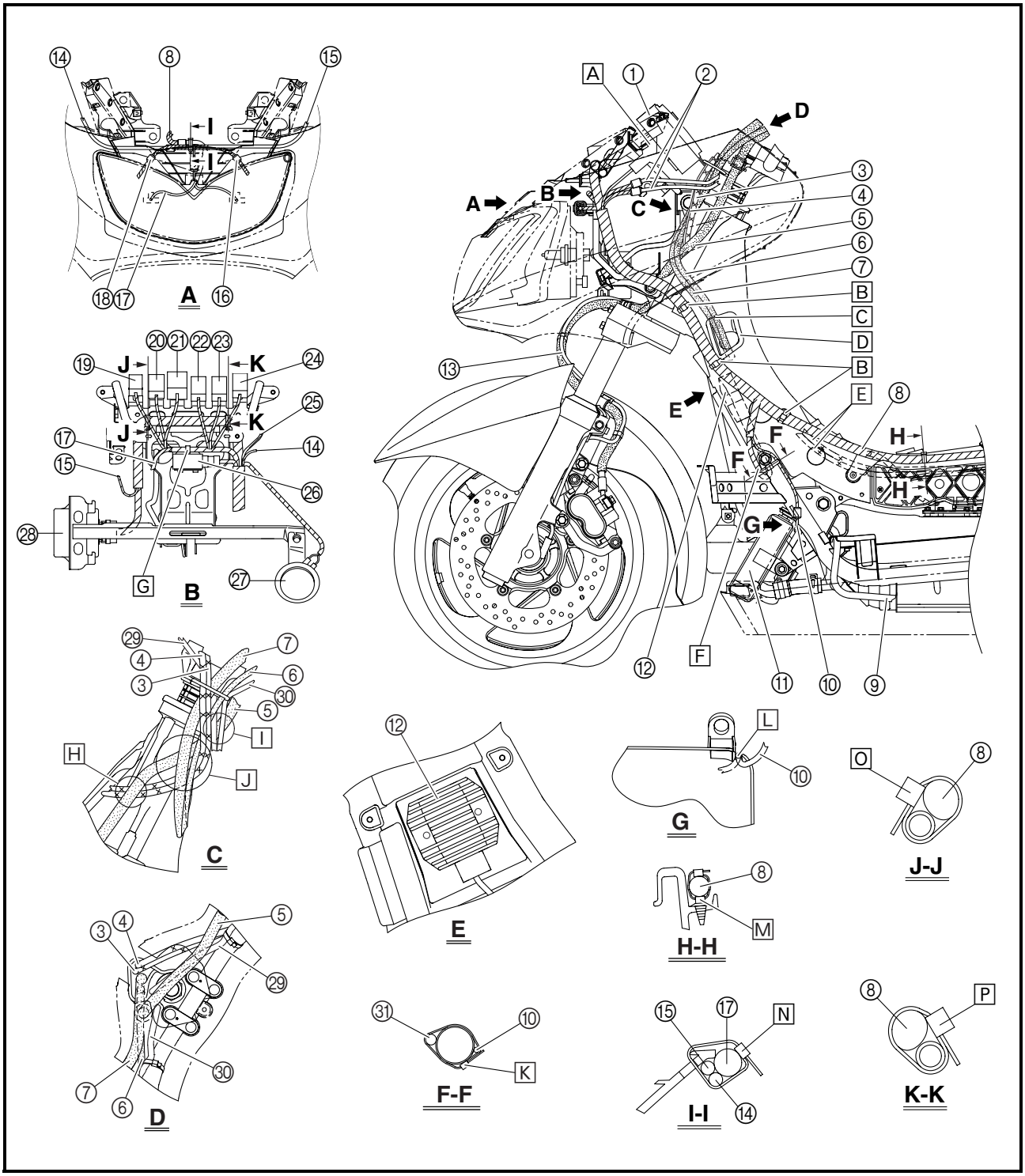


㉒ Radiator fan motor relay
㉓ Fuel injection system relay
㉔ Headlight relay 1
㉕ Meter assembly lead
㉖ Lean angle cut-off switch
㉗ Horn
㉘ ECU
㉙ Right handlebar switch lead
㉚ Left handlebar switch lead
㉛ Rectifier/regulator lead

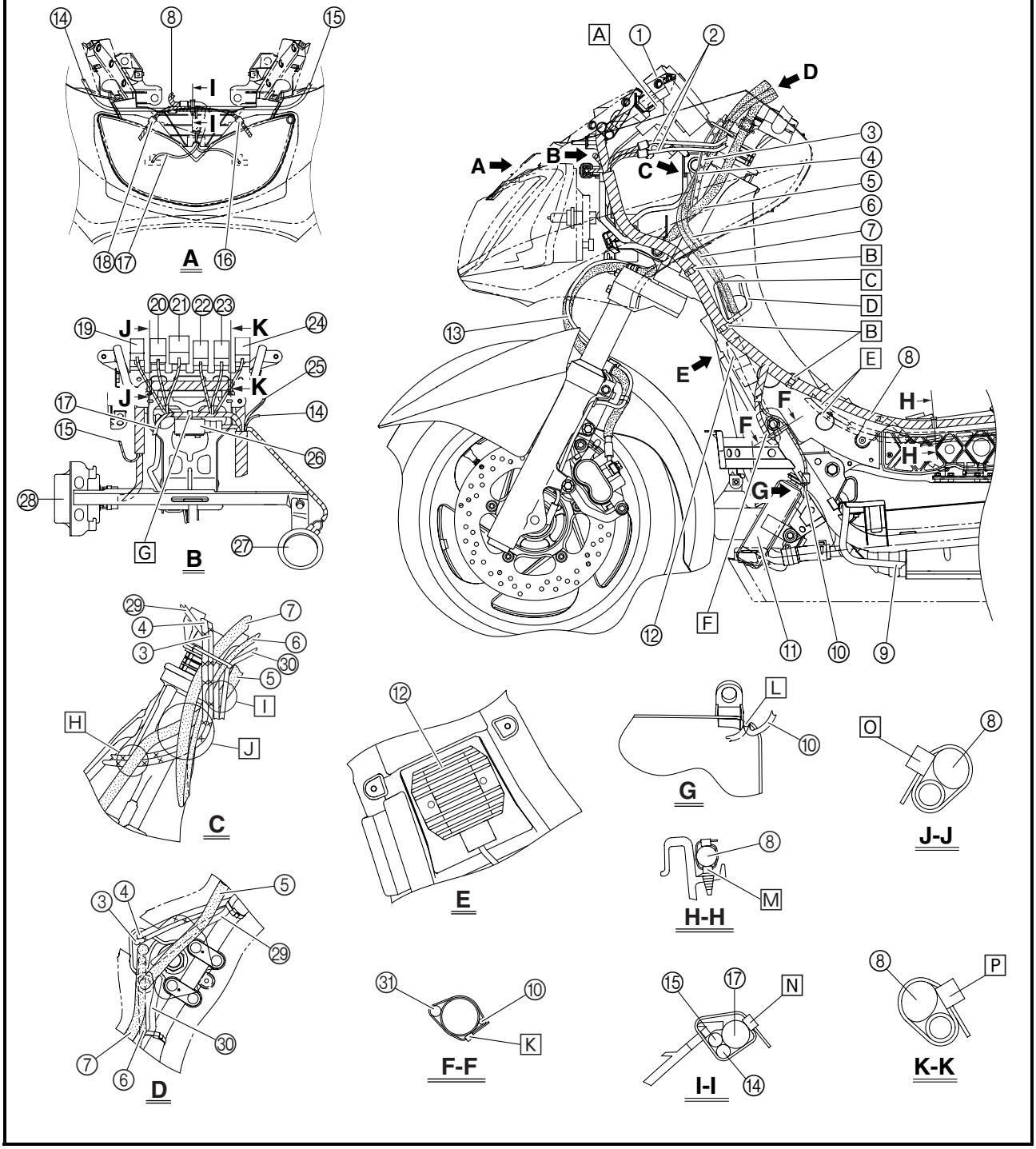
A After connecting the meter assembly coupler, install its cover.
B Fasten the wire harness to the frame with a plastic locking tie. Face the end of the plastic locking tie down.
C The paint marks on the rear brake lock lever cable and the rear brake hose should be within 20 mm (0.79 in) above or below the upper edge of the hole in the frame.



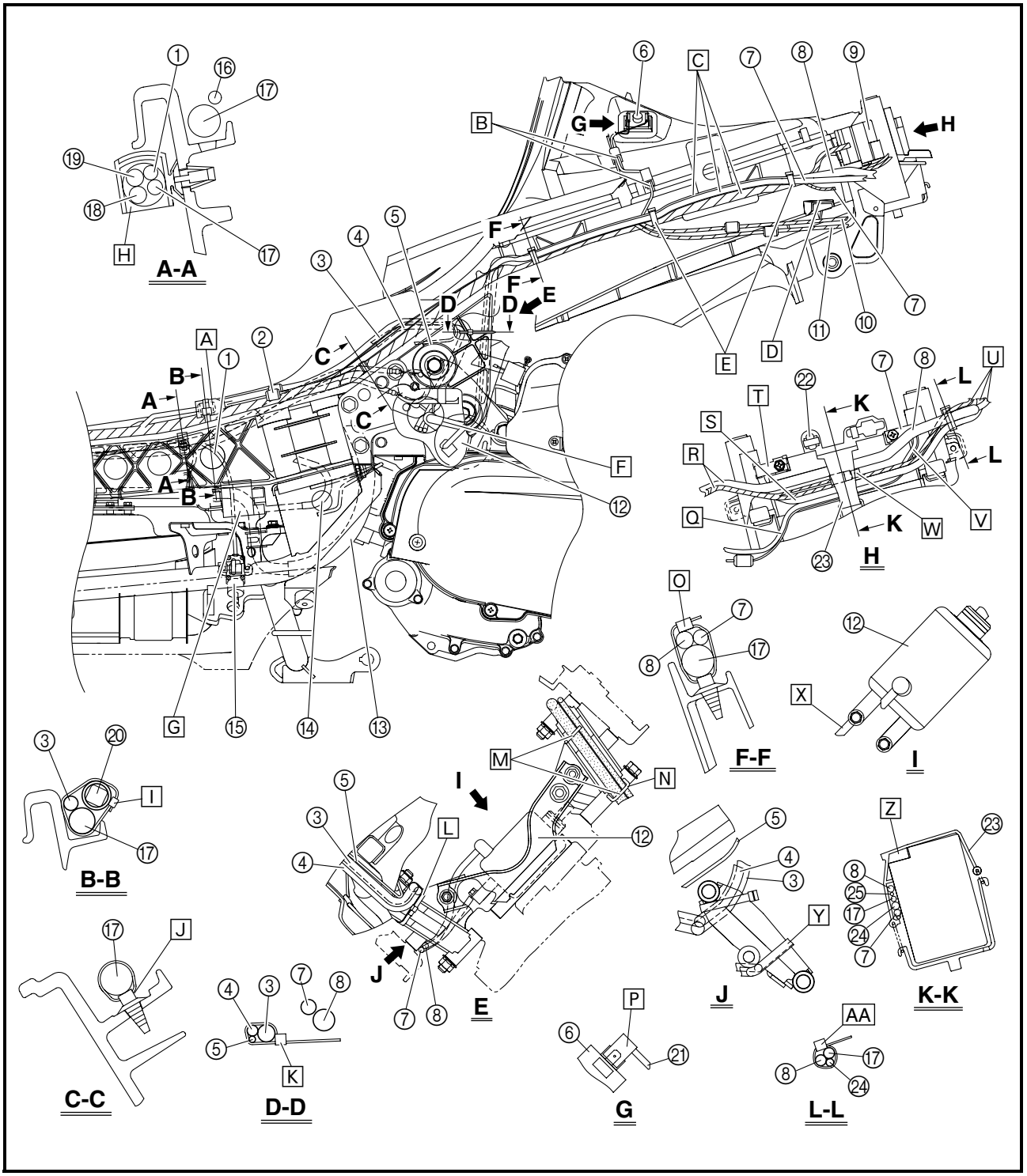
[D] Pass the rear brake lock lever cable and rear brake hose through the hole in the frame so that the rear brake lock lever cable is to the outside of the rear brake hose.
[E] Route the throttle cable (decelerator cable) above the throttle cable (accelerator cable).
[F] Connect the wire harness to the rectifier/regulator.
[G] Fasten the wire harness with a cable holder.
[H] Route the front brake hose in front of the throttle cables.
[I] Route the handlebar switch leads in front of the front brake hose.
[J] Route the rear brake hose and rear brake lock lever cable in front of the front brake hose and throttle cables.
[K] Fasten the rectifier/regulator lead and radiator fan motor lead to the sub-frame with a plastic band. Face the end of the plastic band towards the rear of the scooter.



[L] Pass the radiator fan motor lead through the cut-out in the left side of the bottom cover.
[M] Face the end of the plastic locking tie away from the scooter.
[N] Fasten the headlight lead, front turn signal/position light lead (left), and front turn signal/position light lead (right) to the front cowling with a plastic band. The end of the plastic band should be towards the rear of the scooter facing down.
[O] Fasten the wire harness to the front cowling stay with a plastic band. The end of the plastic band should be towards the rear of the scooter facing down.
[P] Fasten the wire harness at the white tape to the front cowling stay with a plastic band. The end of the plastic band should be towards the rear of the scooter facing down.

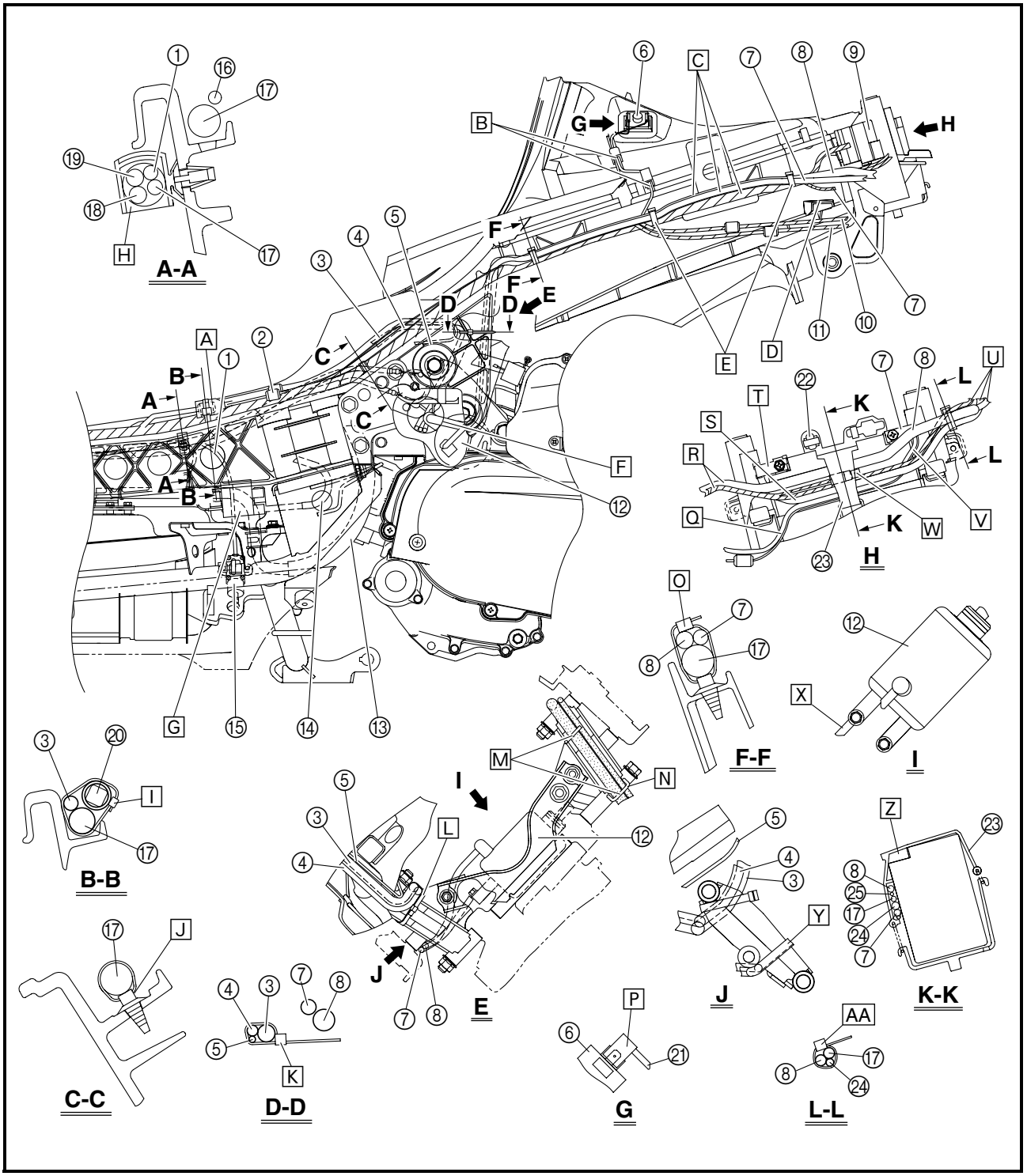


① Sidestand switch lead
② Crankshaft position sensor lead coupler
③ Sub-wire harness
④ Crankshaft position sensor/stator coil lead
⑤ Storage box light switch lead
⑥ Storage box light
⑦ Negative battery lead
⑧ Starter motor lead
⑨ Fuse box
⑩ Tail/brake light lead
⑪ Rear turn signal/license plate light lead
⑫ Starter motor
⑬ Fuel hose
⑭ Spark plug lead
⑮ Sidestand switch
⑯ Stator coil lead
⑰ Wire harness
⑱ Throttle cable (accelerator cable)
⑲ Throttle cable (decelerator cable)
⑳ Stator coil lead coupler
㉑ Storage box light lead
㉒ Turn signal/position light fuse

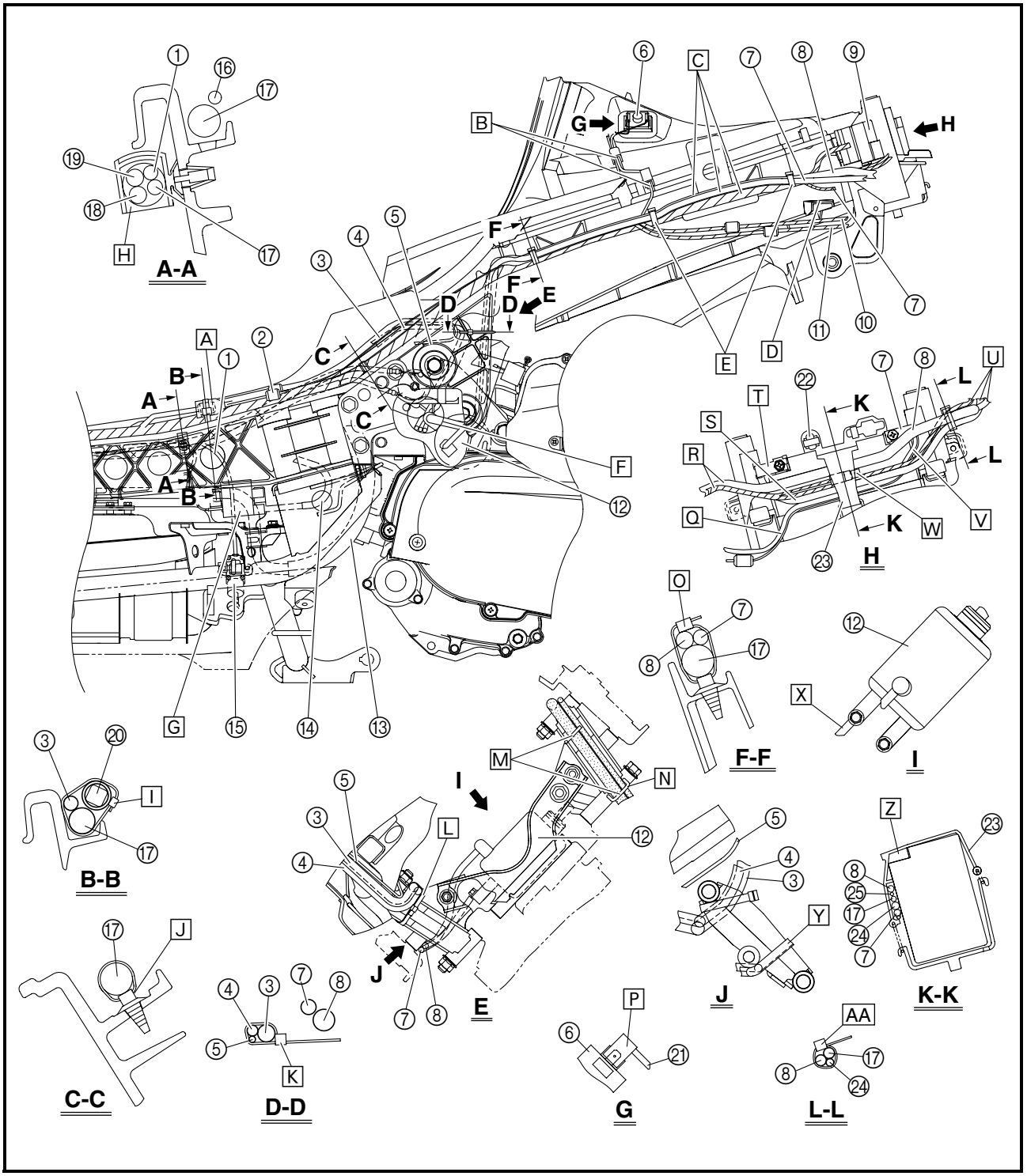


㉓ Battery band
㉔ Positive battery lead
㉕ V-belt replacement indicator reset coupler lead

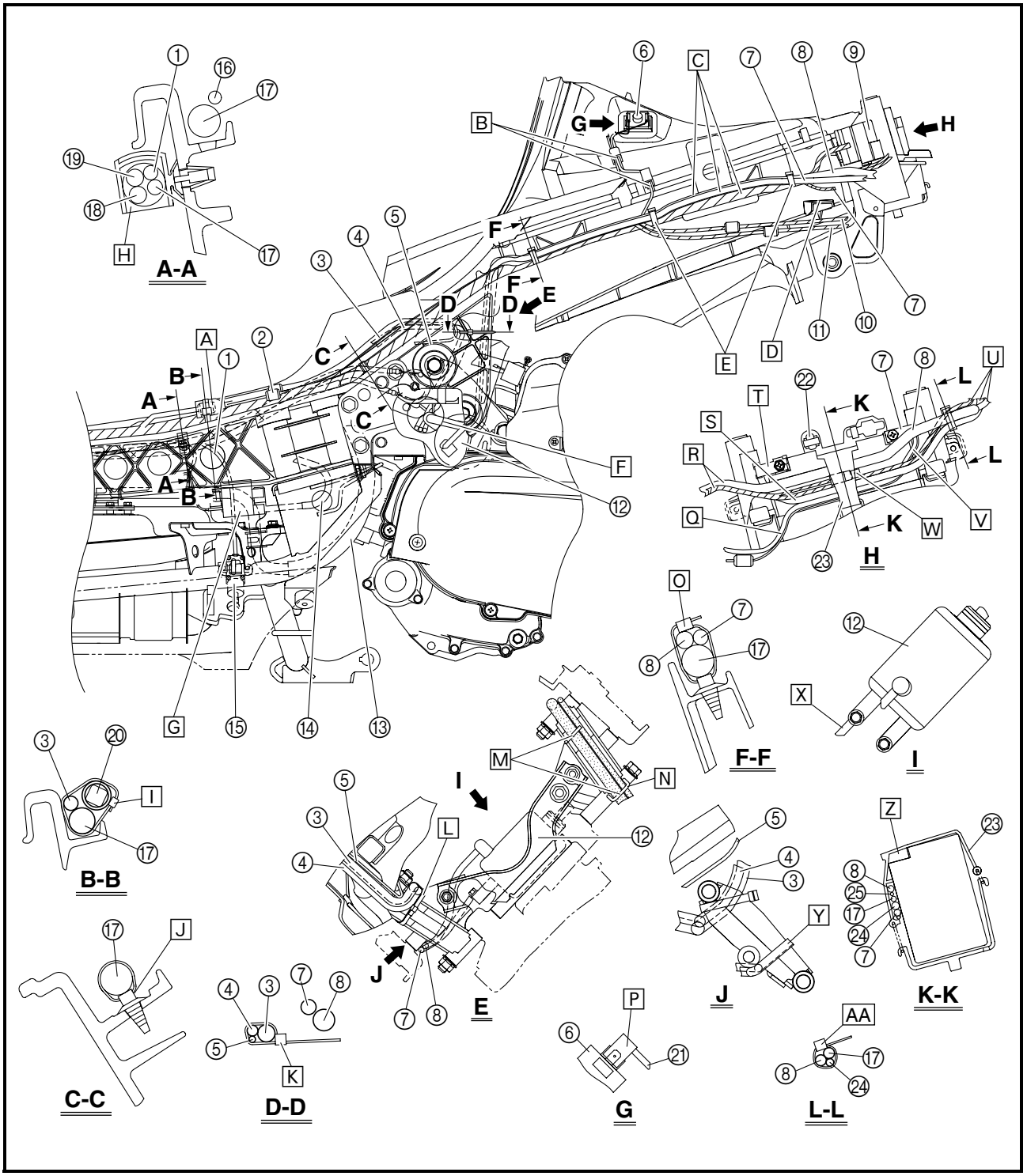
[A] After connecting the stator coil lead coupler, slide the cover over the coupler.
[B] Route the storage box light lead through the two guides in the storage box.
[C] Route the wire harness, starter motor lead, and negative battery lead on the outside of the grab bar bracket.
[D] Route the tail/brake light lead and rear turn signal/license plate light lead below the bracket on the frame.
[E] Fasten the wire harness, starter motor lead, and negative battery lead to the frame with plastic locking ties. Face the end of each plastic locking tie away from the scooter.
[F] Pass the sub-wire harness, crankshaft position sensor/stator coil lead, and fuel injector lead between the starter motor and the throttle body.



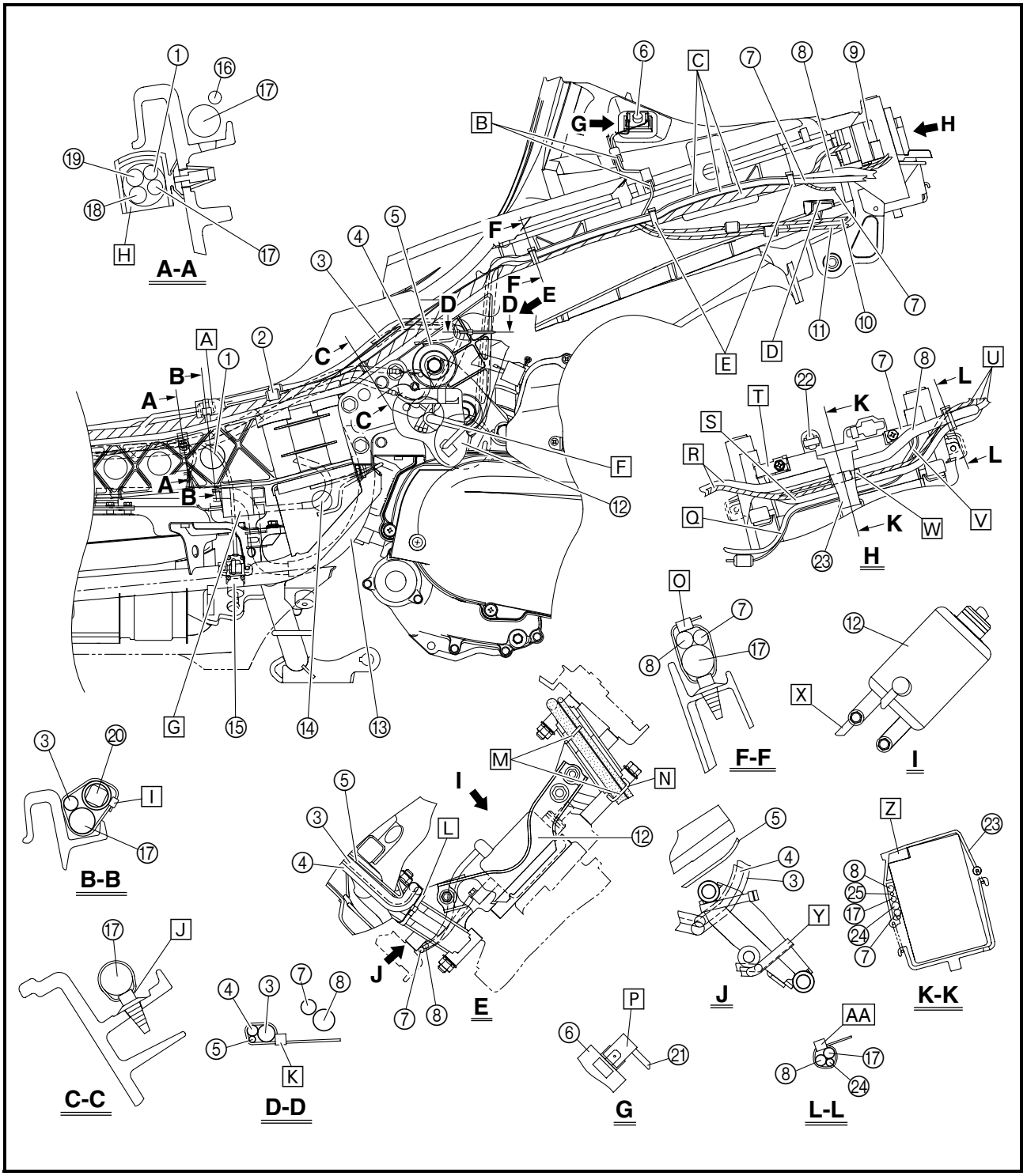
[G] Connect the orange lead to the upper terminal of the ignition coil and connect the red/black lead to the lower terminal.
[H] Fasten the throttle cables, sidestand switch lead, and wire harness with a plastic holder as shown.
[I] Fasten the sub-wire harness, stator coil lead coupler, and wire harness with a plastic locking tie. Face the end of the plastic locking tie down.
[J] Install the plastic locking tie in the hole above the footrest bracket.
[K] Fasten the sub-wire harness, crankshaft position sensor/stator coil lead, and storage box light switch lead with a plastic locking tie. Place the end of the plastic locking tie between the frame and the leads (negative battery lead and starter motor lead).
[L] Fasten the sub-wire harness at the white tape and the crankshaft position sensor/stator coil lead to the engine bracket with a plastic locking tie. Face the end of the plastic locking tie away from the scooter.



M Route the rear brake hose and rear brake lock lever cable through the two engine bracket guides so that the rear brake lock lever cable is towards the outside of the scooter.
N Align the paint mark on the rear brake lock lever cable with the engine bracket guide.
O Fasten the wire harness, starter motor lead, and negative battery lead to the frame with a plastic locking tie. Face the end of the plastic locking tie away from the scooter.
P Connect the storage box light lead coupler securely.
Q Route the negative battery lead below the bracket on the frame.
R Route the starter motor lead and wire harness over the boss of the upper rear cover.
S Route the positive battery lead between the leads and the battery.
T Install the cover over the positive battery terminal.

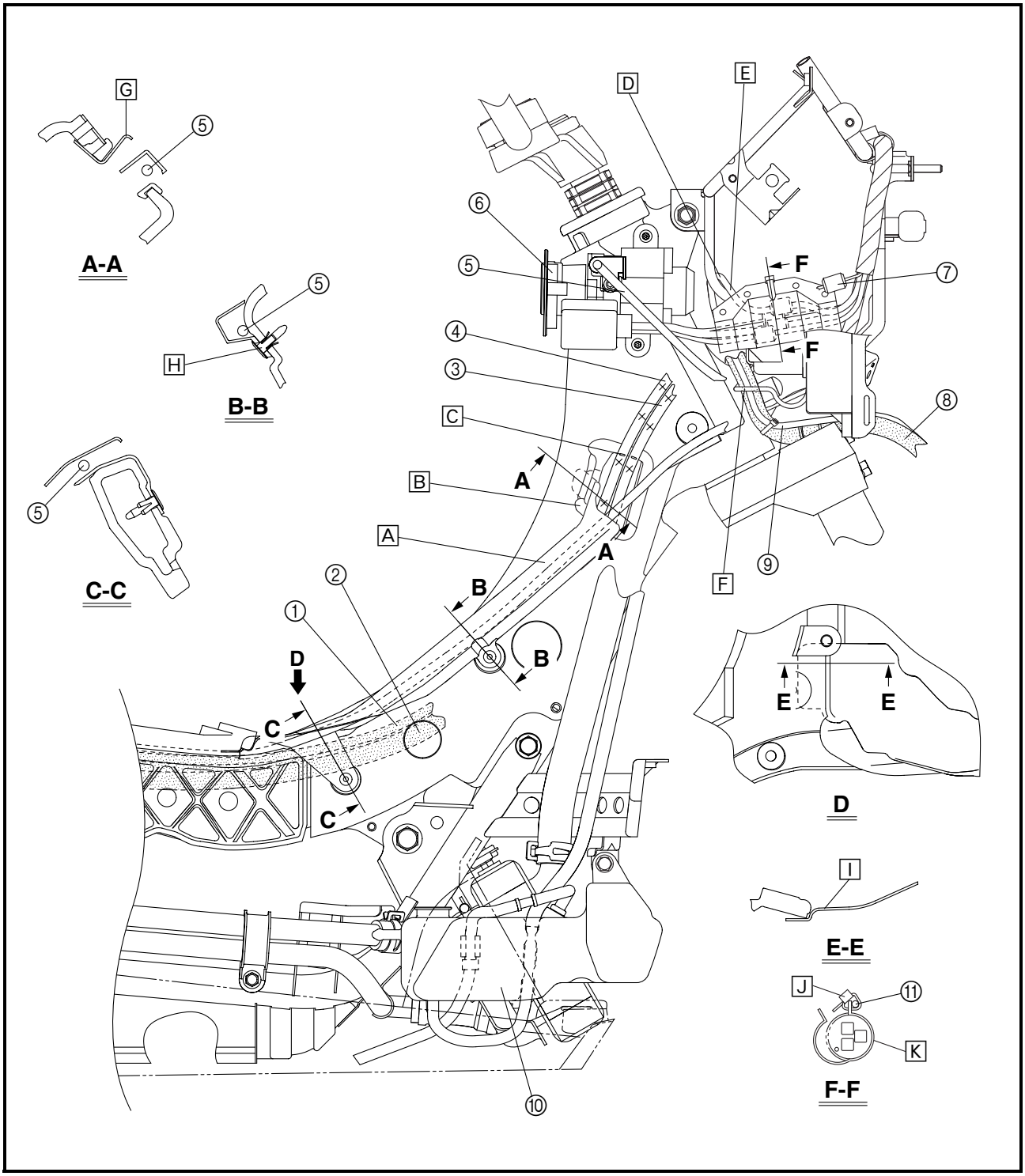


[U] Route the starter motor lead, wire harness, and positive battery lead over the boss of the upper rear cover.
[V] Route the negative battery lead between the leads and the battery.
[W] Fasten the V-belt replacement indicator reset coupler with the battery band.
[X] Install the negative battery lead terminal to the starter motor bolt hole that is closest to the cylinder.
[Y] Route the starter motor lead and negative battery lead below the boss on the left engine bracket as shown.
[Z] Install the battery band with its projection in the recess in the top of the battery case.
[A A] Fasten the starter motor lead, wire harness, and positive battery lead with a plastic band. Face the end of the plastic band towards the front of the scooter.

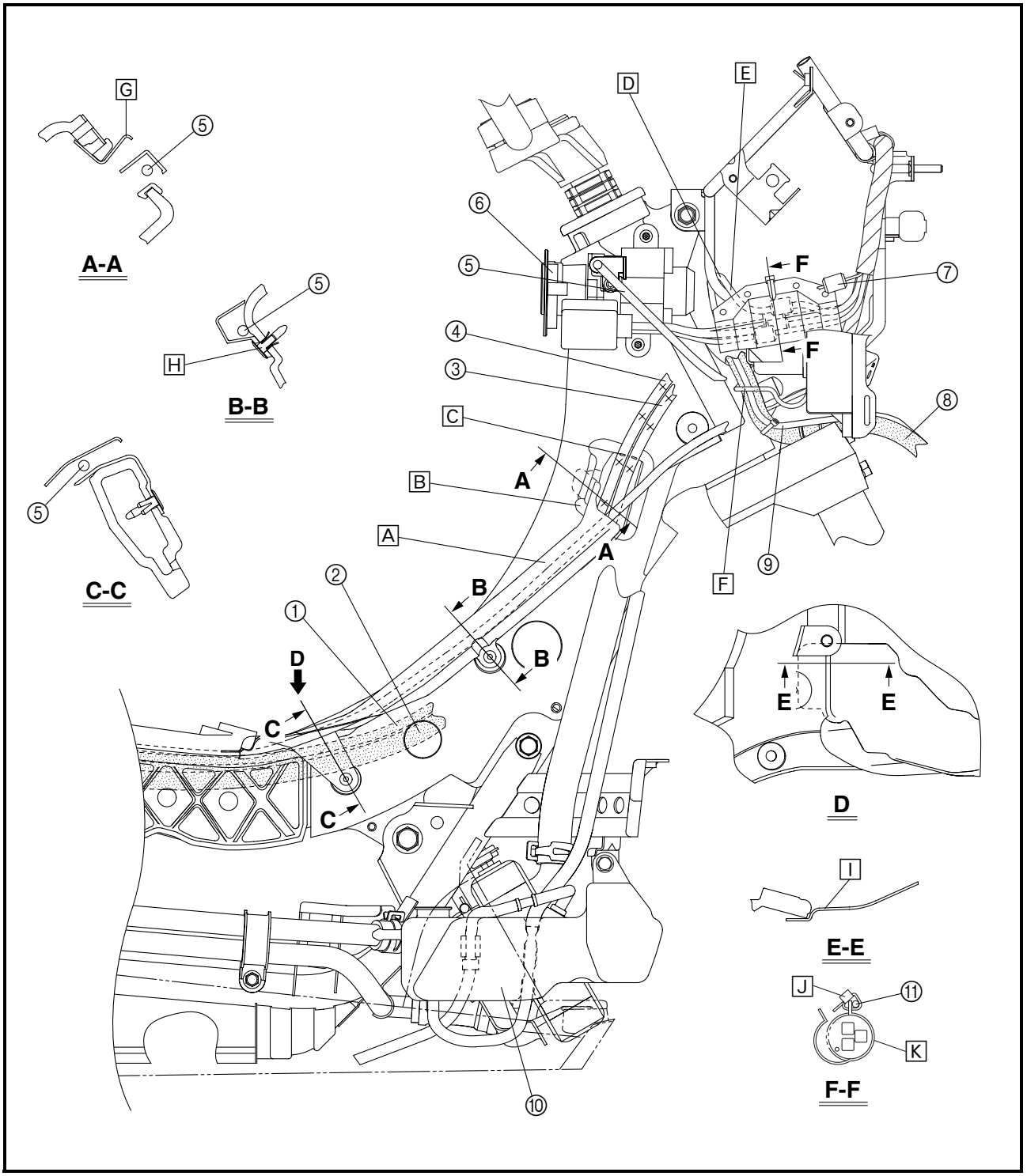


① Rear brake lock lever cable
② Rear brake hose
③ Throttle cable (accelerator cable)
④ Throttle cable (decelerator cable)
⑤ Seat lock cable
⑥ Main switch
⑦ Thermistor lead coupler
⑧ Front brake hose
⑨ Speed sensor lead
⑩ Coolant reservoir
⑪ Front cowling stay

A Route the seat lock cable through the cable cover.
B Pass the throttle cables through the hole in the frame.
C The paint marks on the throttle cables should be within 20 mm (0.79 in) above or below the upper edge of the hole in the frame.
D Route the speed sensor lead over the lower tube of the front cowling stay.

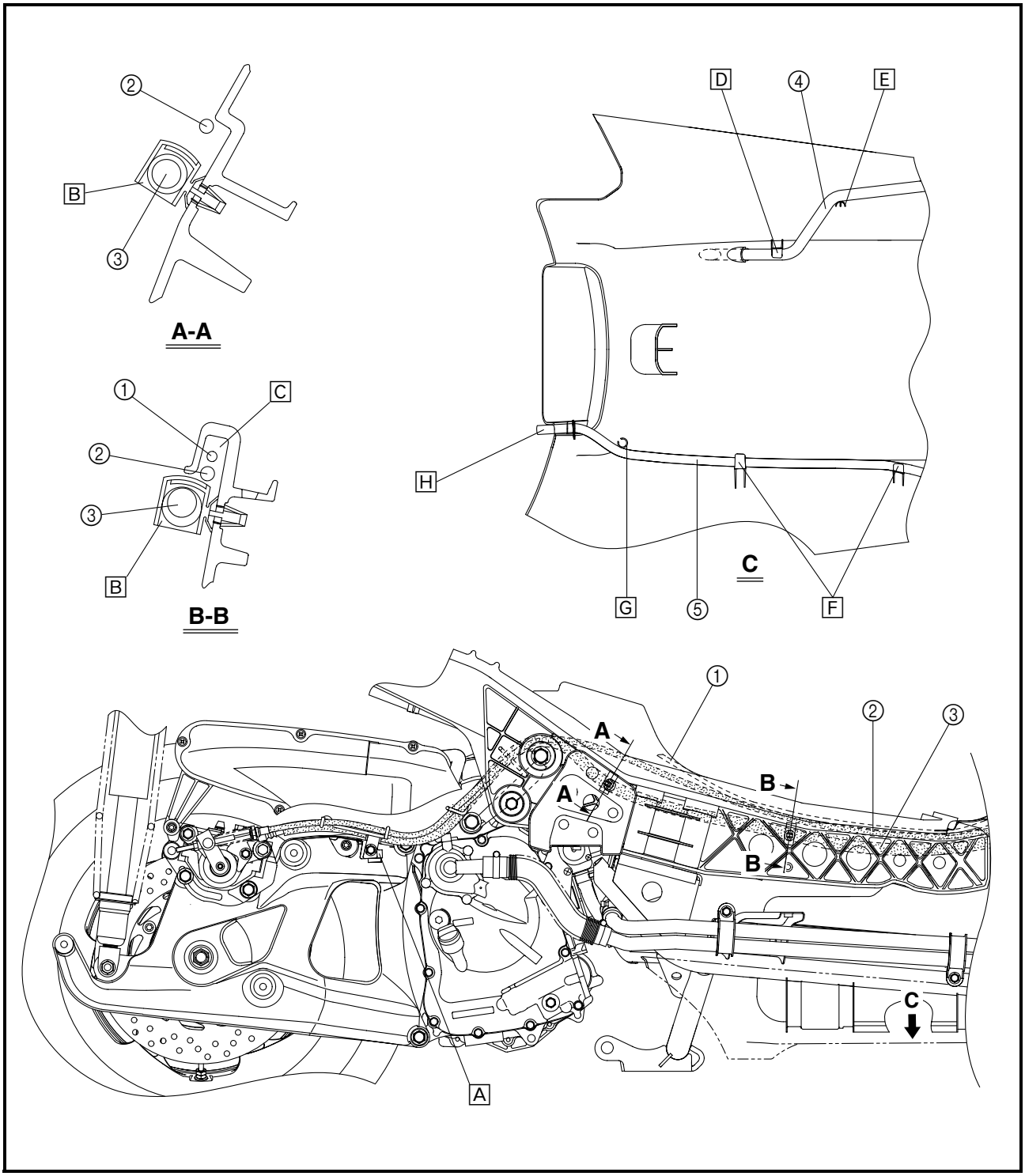


[E] Route the speed sensor lead as shown.
[F] Route the front brake hose and speed sensor lead through the guide on the front cowling stay so that the speed sensor lead is towards the outside of the scooter.
[G] Hook the end of the cable cover in the hole in the frame.
[H] Attach the cable cover by installing the quick fastener in the hole in the frame.
[I] Hook the end of the cable cover in the hole in the frame.
[J] Fasten a plastic band around the middle of the coupler cover, and then face the end of the plastic band down.
[K] After connecting the main switch lead and speed sensor lead, put the cover on the couplers.

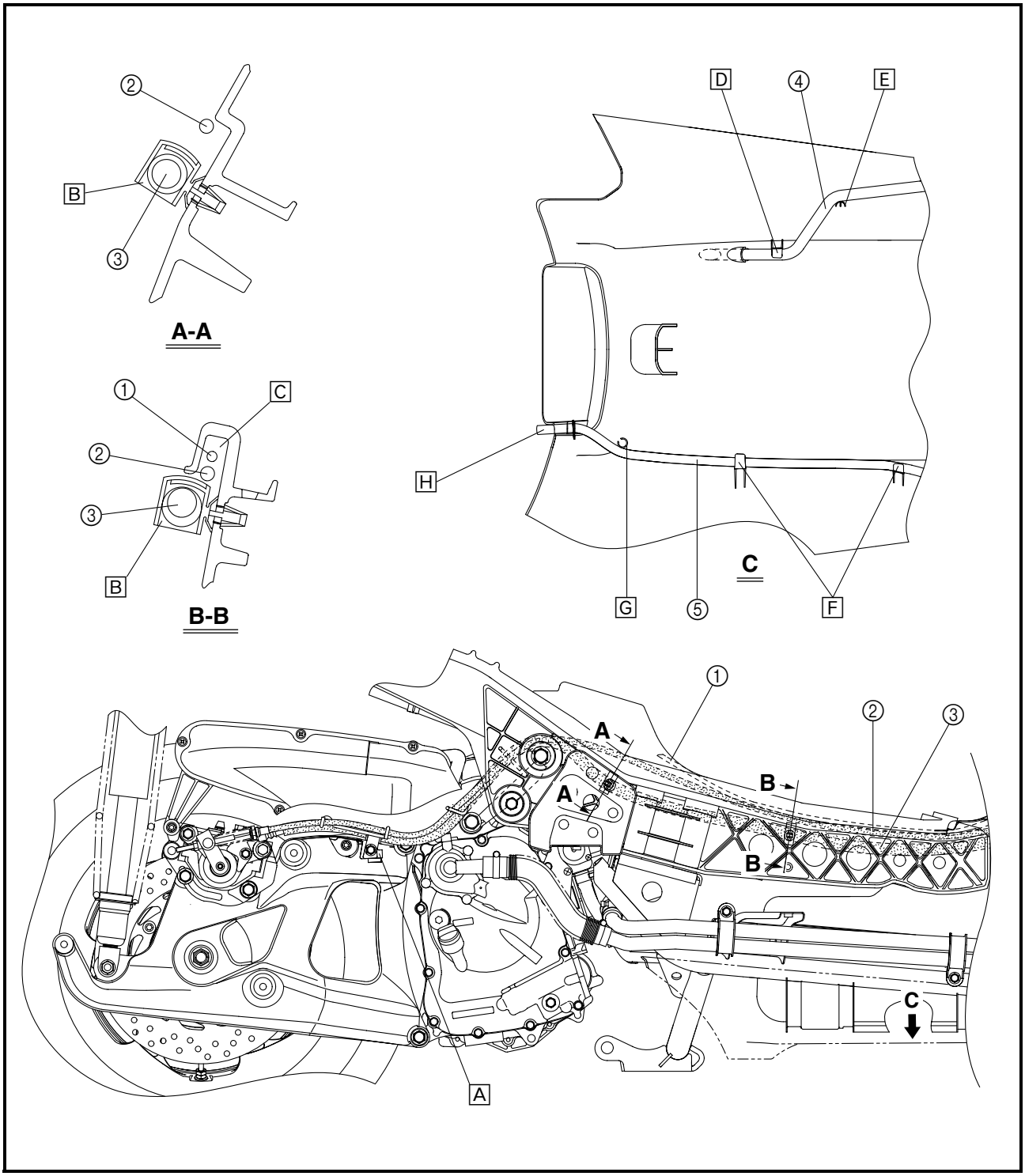


① Seat lock cable
② Rear brake lock lever cable
③ Rear brake hose
④ Fuel overflow hose
⑤ Coolant reservoir breather hose

A Fasten the rear brake hose with the brake hose holder and route the rear brake lock lever cable through the guide.
B Fasten the rear brake hose with the plastic holder.
C Route the seat lock cable above the rear brake lock lever cable.
D Align the white paint mark on the fuel overflow hose with the holder on the bottom cover.

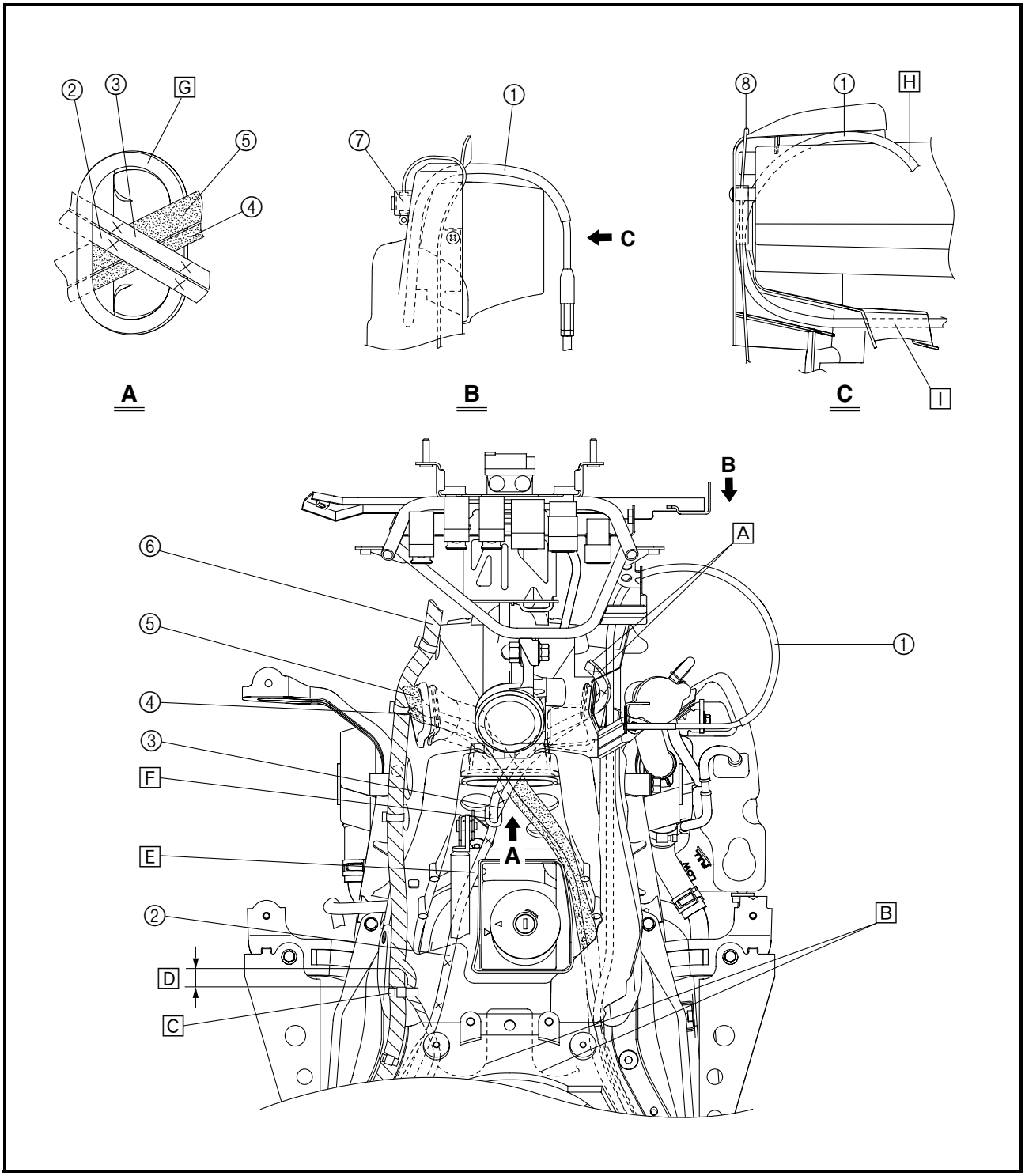


E Route the fuel overflow hose to the outside of the hose guide.
F Fasten the coolant reservoir breather hose with the two holders on the bottom cover.
G Route the coolant reservoir breather hose to the outside of the hose guide.
H The end of the coolant reservoir breather hose should extend 15 ± 10 mm (0.59 ± 0.39 in) past the end of the bottom cover.

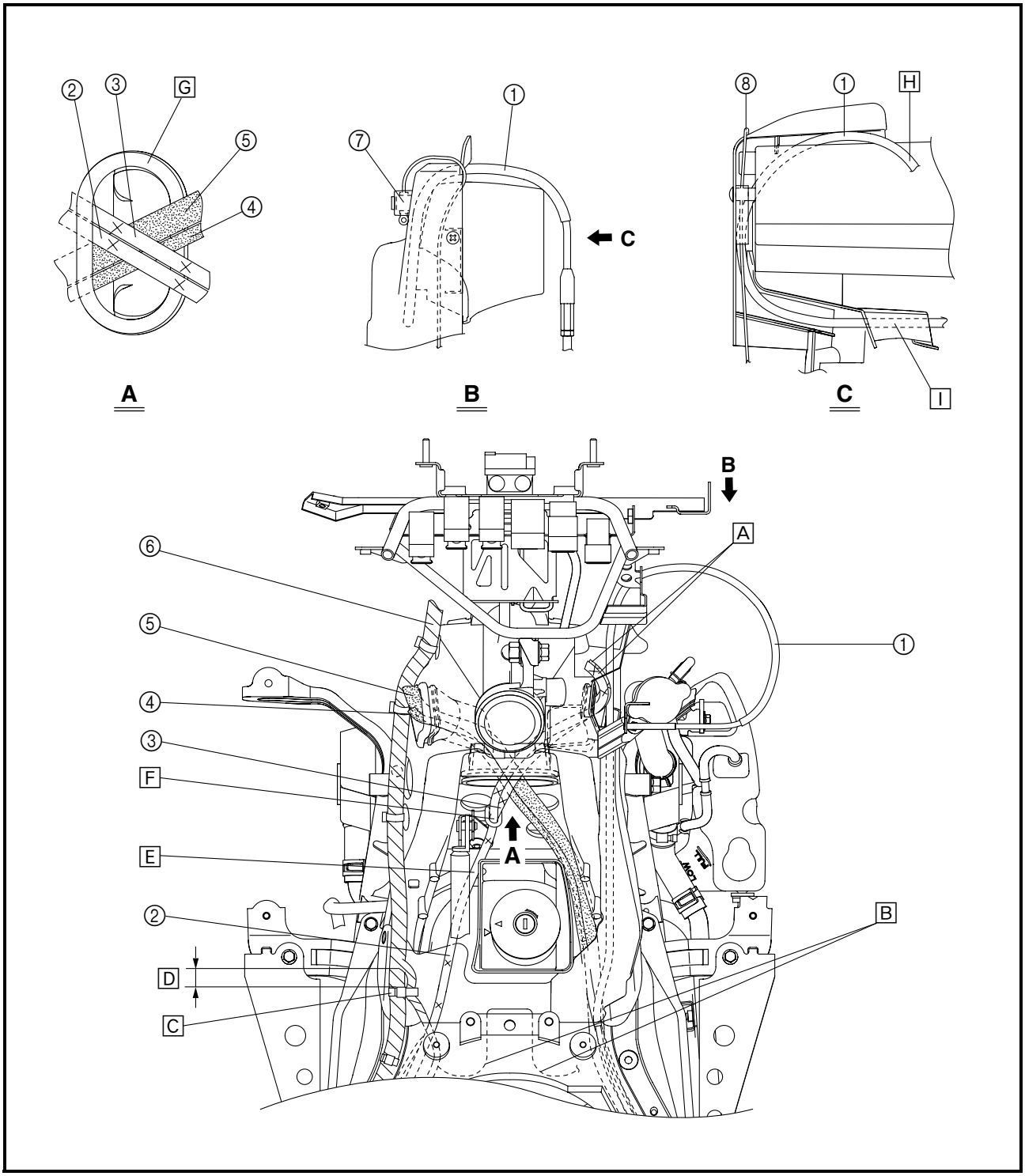


① Seat lock cable
② Throttle cable (decelerator cable)
③ Throttle cable (accelerator cable)
④ Rear brake lock lever cable
⑤ Rear brake hose
⑥ Wire harness
⑦ Thermistor
⑧ Thermistor lead

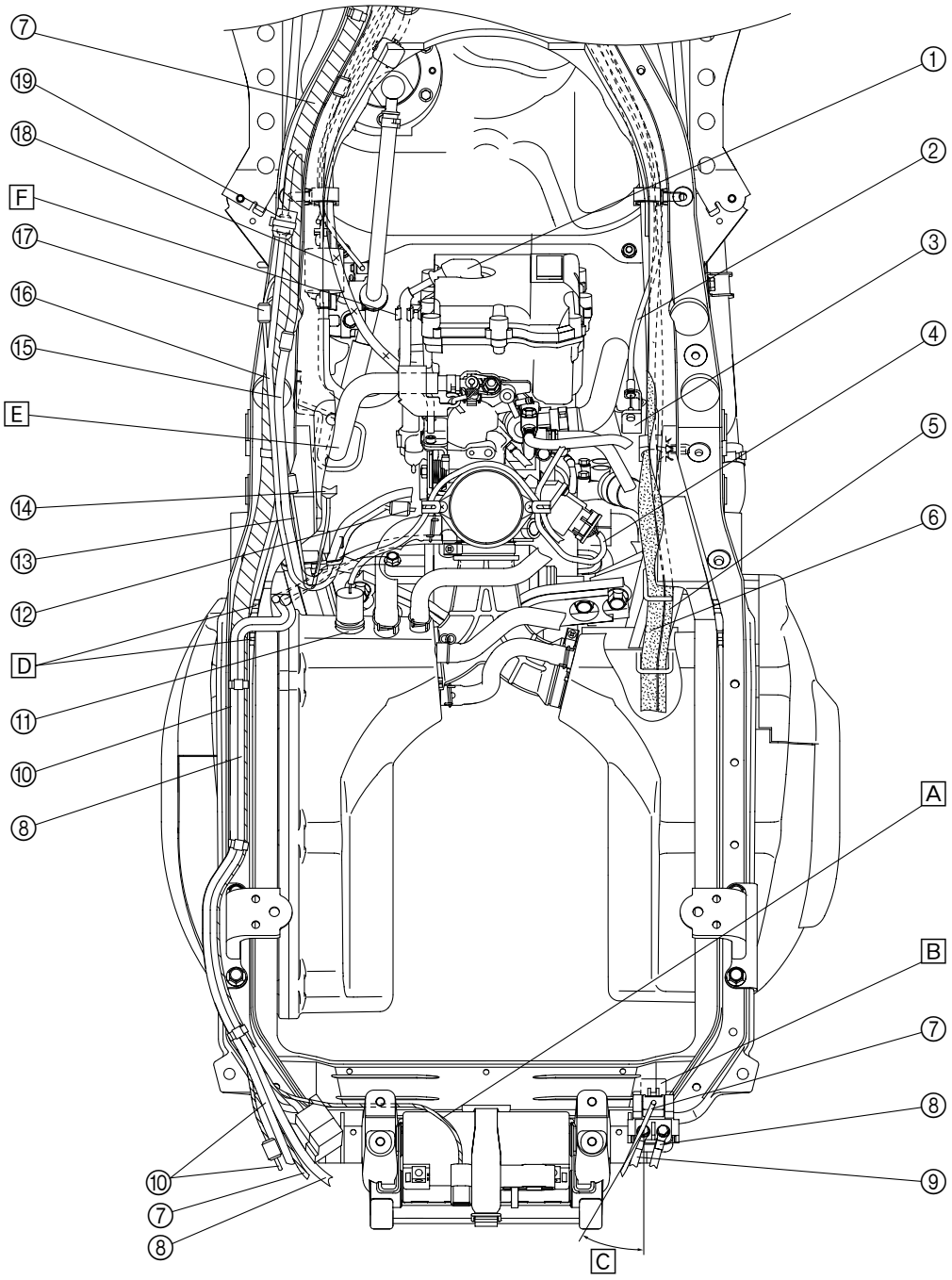
A Route the throttle cables above the seat lock cable guide.
B Route the seat lock cable, rear brake lock lever cable, rear brake hose, throttle cables, and wire harness so that they do not cause the rubber sheet to be folded or turned over.
C Fasten the wire harness with a plastic locking tie.
D 20 mm (0.79 in)



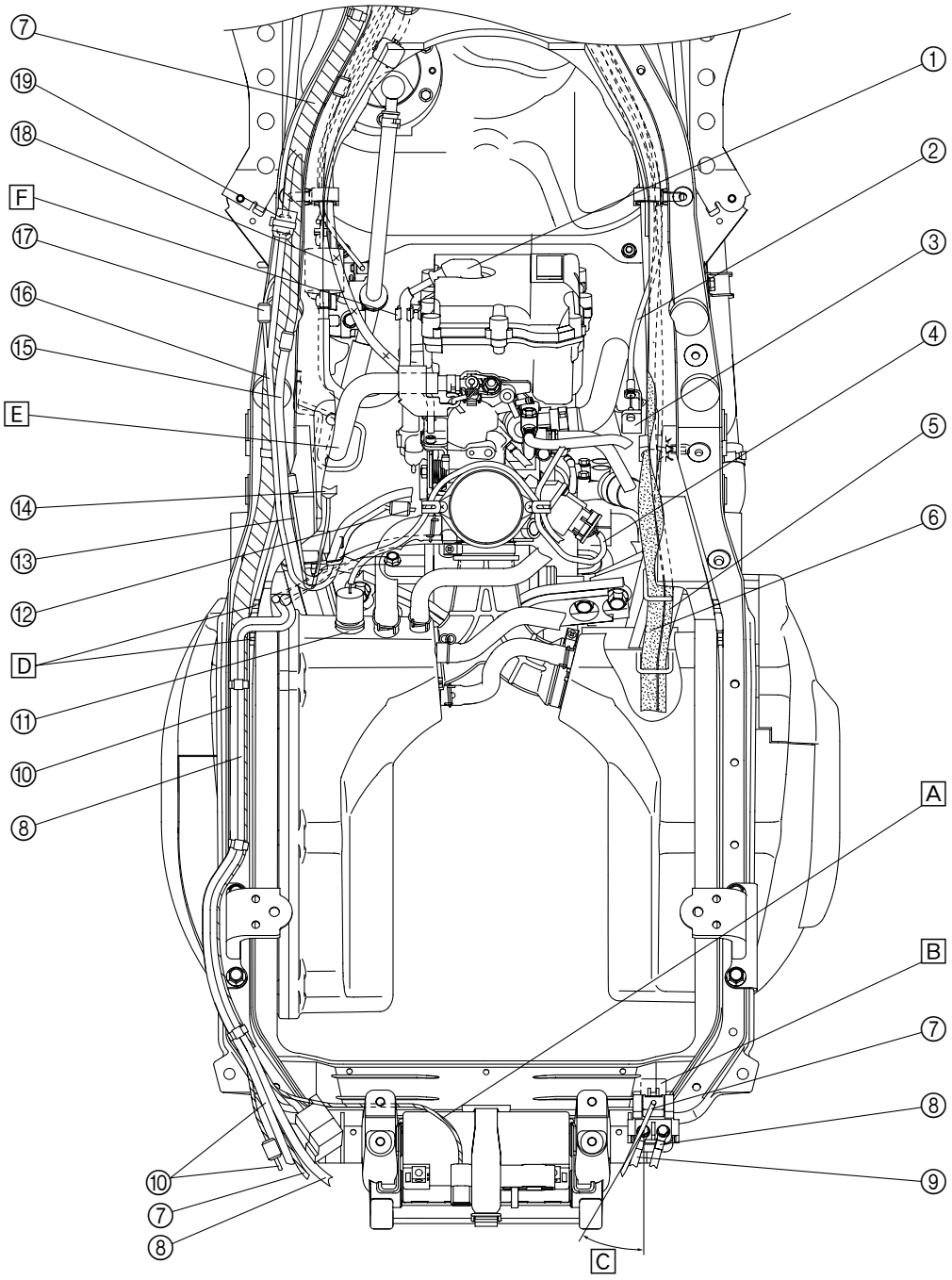
E Route the throttle cables below the gas spring assembly.
F Route the throttle cable (decelerator cable) above the throttle cable (accelerator cable).
G Route the throttle cables above the rear brake hose and rear brake lock lever cable.
H Pass the seat lock cable through the space between the storage compartment and seat lock cable guide.
I Route the seat lock cable through the lower section of the seat lock cable guide.



① Spark plug cap
② Seat lock cable
③ Seat lock assembly
④ ISC (idle speed control) valve lead
⑤ Rear brake lock lever cable
⑥ Rear brake hose
⑦ Wire harness
⑧ Starter motor lead
⑨ Positive battery lead
⑩ Negative battery leads
⑪ Intake air temperature sensor
⑫ Fuel injector lead
⑬ Storage box light switch lead
⑭ Storage box light switch
⑮ Sub-wire harness
⑯ Crankshaft position sensor/stator coil lead
⑰ Crankshaft position sensor lead coupler
⑱ Throttle cable (decelerator cable)
⑲ Stator coil lead coupler

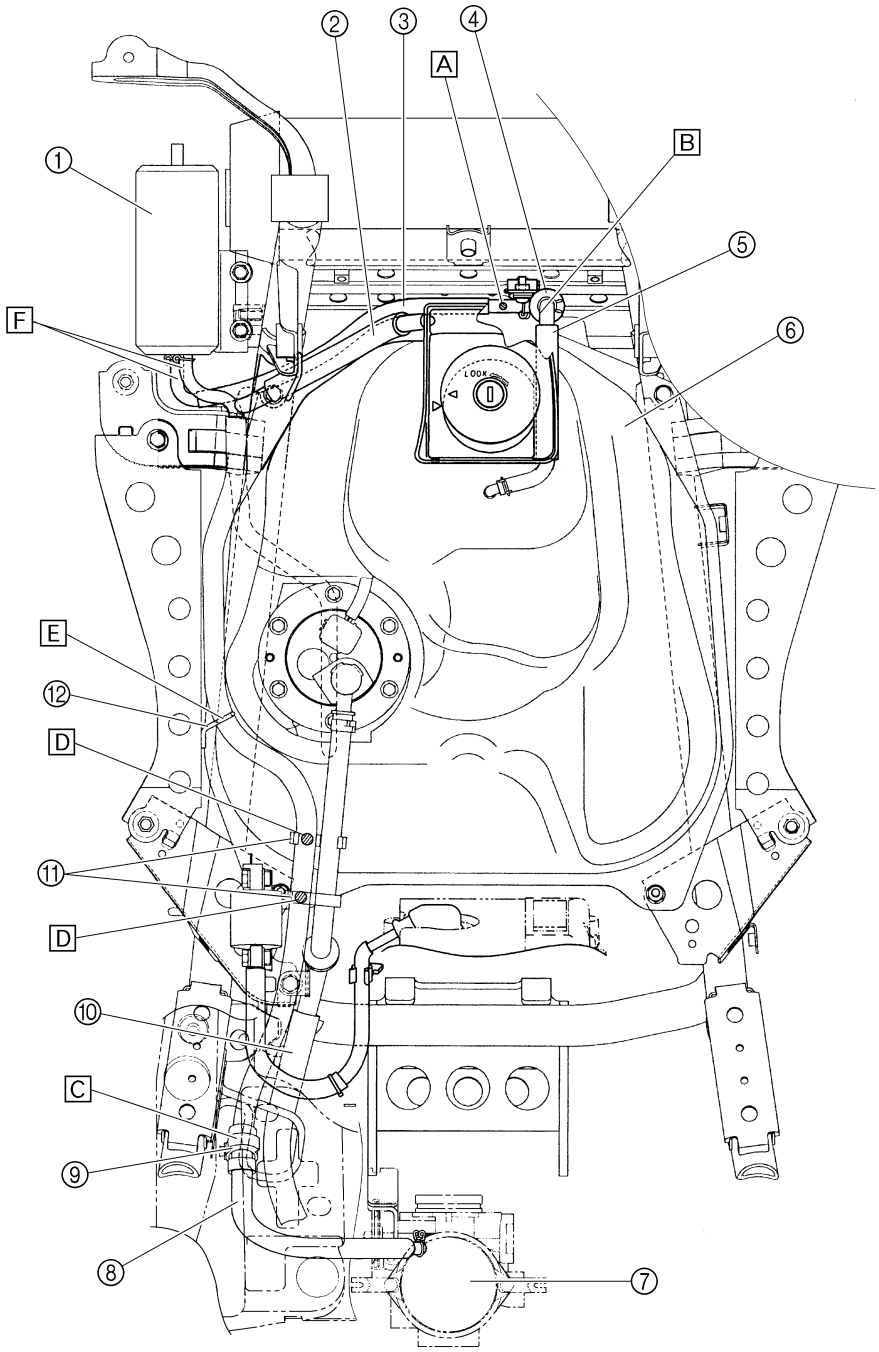


[A] Do not pinch any hoses, leads, etc., when installing the storage box.
[B] After connecting the positive battery lead, starter motor lead, and wire harness, install the starter relay cover.
[C] 30°
Connect the positive battery lead to the starter relay within the angle shown. Route the starter motor lead parallel to the positive battery lead.
[D] Route the starter motor lead and negative battery lead between the two projections on the frame.
[E] Pass the fuel hose through the hose guide on the sub-frame.
[F] After installing the spark plug cap, fasten the spark plug lead to the cylinder head with the lead holder.

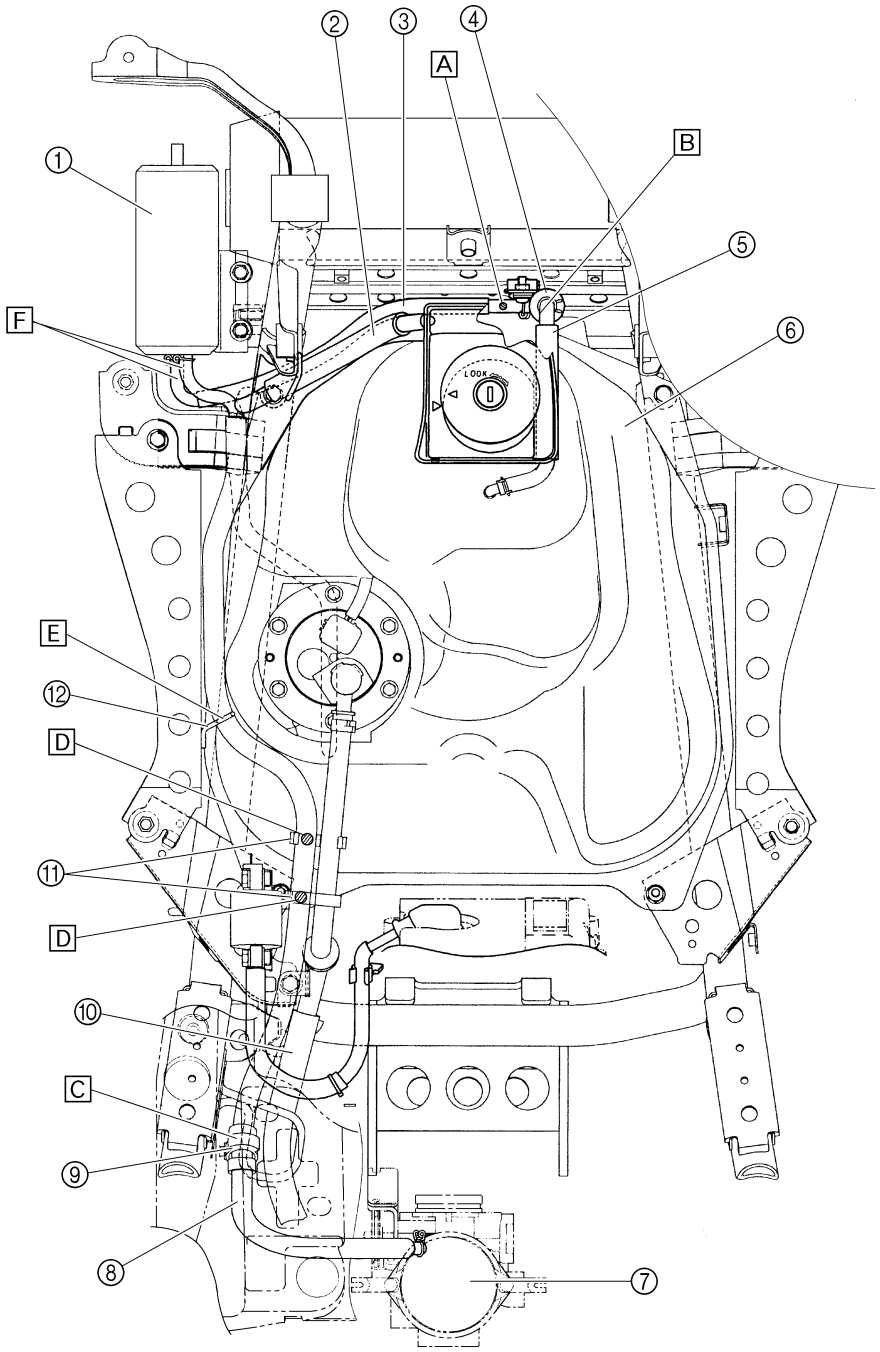


Canister

① Canister
② Fuel overflow hose
③ Rollover valve to canister hose
④ Rollover valve
⑤ Fuel tank to rollover valve hose
⑥ Fuel tank
⑦ Throttle body
⑧ Canister to throttle body hose
⑨ Plastic holder
⑩ Fuel hose
⑪ Plastic clip
⑫ Guide



[A] Install the rollover valve to canister hose with the paint mark facing up.
[B] Install the fuel tank to rollover valve hose with the paint mark facing to the left.
[C] Fasten the canister to throttle body hose with the plastic holder between the stoppers on the hose.
[D] Align the plastic clips with the paint marks on the canister to throttle body hose.
[E] Route the canister to throttle body hose through the guide.
[F] Install the canister to throttle body hose and the rollover valve to canister hose onto the canister, making sure they contact the canister body.



EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
1	*	**Fuel line (See page 3-30.)**	• Check fuel hoses for cracks or damage. • Replace if necessary.		√	√	√	√	√
2		**Spark plug (See page 3-18.)**	• Check condition. • Adjust gap and clean. • Replace every 12000 mi (19000 km) or 18 months.		√	√	**Replace.**	√	√
3	*	**Valve clearance (See page 3-11.)**	• Check and adjust valve clearance when engine is cold.	**Every 26600 mi (42000 km)**					
4	*	**Crankcase breather system (See page 3-31.)**	• Check breather hose for cracks or damage. • Replace if necessary.		√	√	√	√	√
5	*	**Electronic fuel injection (See page 3-17.)**	• Check engine idle speed.	√	√	√	√	√	√
6	*	**Evaporative emission control system (See page 7-41.)**	• Check control system for damage. • Replace if necessary.				√		
7	*	**Air induction system (See page 7-38.)**	• Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged parts.				√		

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

GENERAL MAINTENANCE AND LUBRICATION CHART

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
1		**Air filter elements (See page 3-28.)**	• Replace.	**Every 12000 mi (19000 km)**					
2		**V-belt case air filter element (See page 3-29.)**	• Clean.		√	√	√	√	√
3	*	**Front brake (See pages 3-38, 39, 40.)**	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
4	*	**Rear brake (See pages 3-38, 39, 40.)**	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
5	*	**Brake hoses (See page 3-39.)**	• Check for cracks or damage.		√	√	√	√	√
			• Replace.	**Every 4 years**					
6		**Rear brake lock (See page 3-37.)**	• Check operation. • Adjust.	√	√	√	√	√	√
7	*	**Wheels (See page 3-47.)**	• Check runout and for damage. • Replace if necessary.		√	√	√	√	√
8	*	**Tires (See page 3-44.)**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
9	*	**Wheel bearings (See page 4-4.)**	• Check bearings for smooth operation. • Replace if necessary.		√	√	√	√	√
10	*	**Steering bearings (See page 3-41.)**	• Check bearing assemblies for looseness.	√	√	√	√	√	√
			• Moderately repack with lithium-soap-based grease.	**Every 12000 mi (19000 km)**					
11	*	**Chassis fasteners (See page 2-21.)**	• Check all chassis fitting and fasteners. • Correct if necessary.		√	√	√	√	√
12		**Front and rear brake lever pivot (See page 3-48.)**	• Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	√	√
13		**Centerstand and sidestand pivots (See page 3-48.)**	• Check operation. • Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	√	√
14	*	**Sidestand switch (See page 8-4.)**	• Check operation and replace if necessary.	√	√	√	√	√	√
15	*	**Front fork (See page 3-43.)**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
16	*	**Shock absorber assemblies (See page 4-67.)**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
17		**Engine oil (See pages 3-23, 24.)**	• Change.	√	**When the oil change indicator flashes (every 3000 mi (5000 km))**				
			• Check oil level and vehicle for oil leakage.	**Every 3000 mi (5000 km)**					
18		**Engine oil filter element (See page 3-24.)**	• Replace.	√	**Every 12500 mi (20000 km)**				
19	*	**Cooling system (See pages 3-32, 33, 34.)**	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
			• Change.	**Every 3 years**					

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
20		**Final transmission oil (See page 3-27.)**	• Check vehicle for oil leakage. • Change.	√		√		√	
21	*	**V-belt (See page 5-37.)**	• Replace.	**Every 12500 mi (20000 km)**					
22	*	**Front and rear brake switches (See page 8-4.)**	• Check operation.	√	√	√	√	√	√
23	*	**Throttle grip housing and cable (See pages 3-18, 47.)**	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√
24	*	**Lights, signals and switches (See page 3-58.)**	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

NOTE:

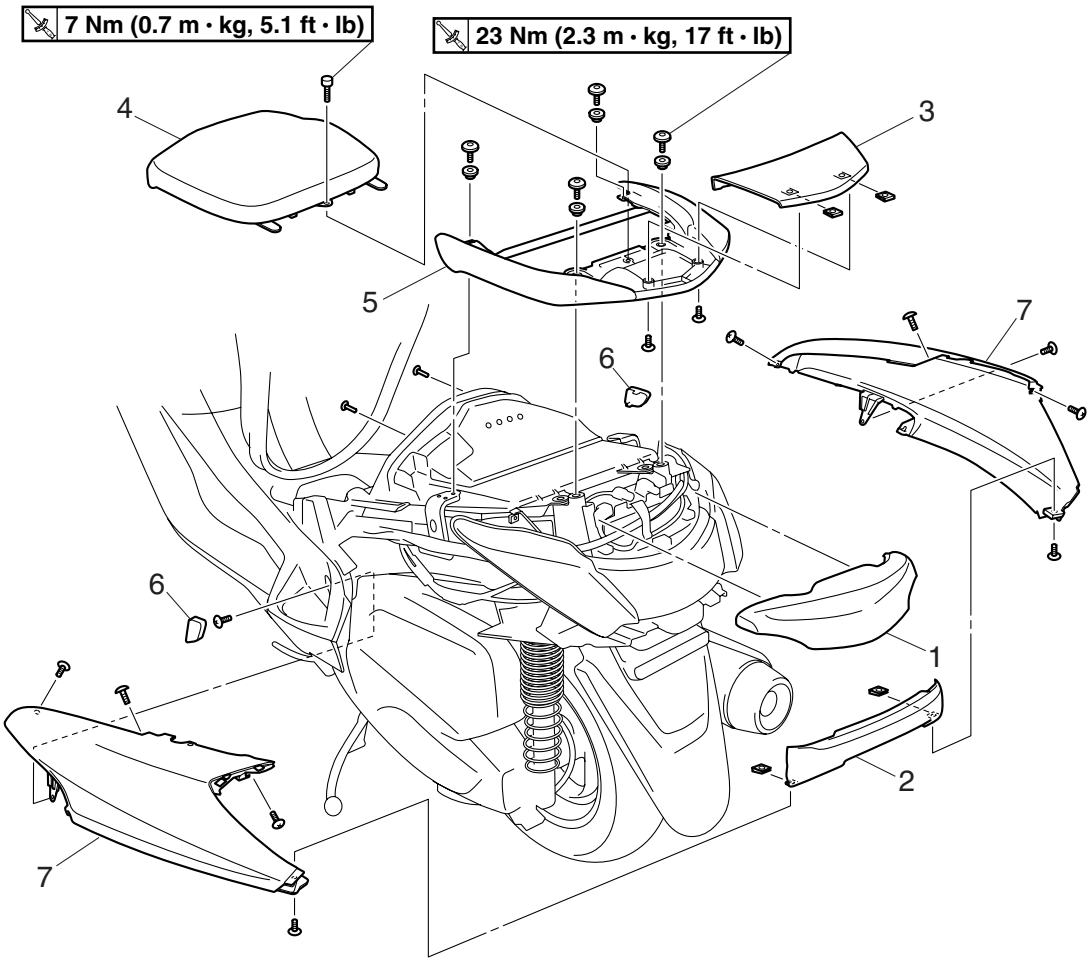
From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.

NOTE:

- The air filters and V-belt filter need more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
  - After disassembling the brake master cylinders and calipers, always change the fluid. Regularly check the brake fluid levels and fill the reservoirs as required.
  - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.

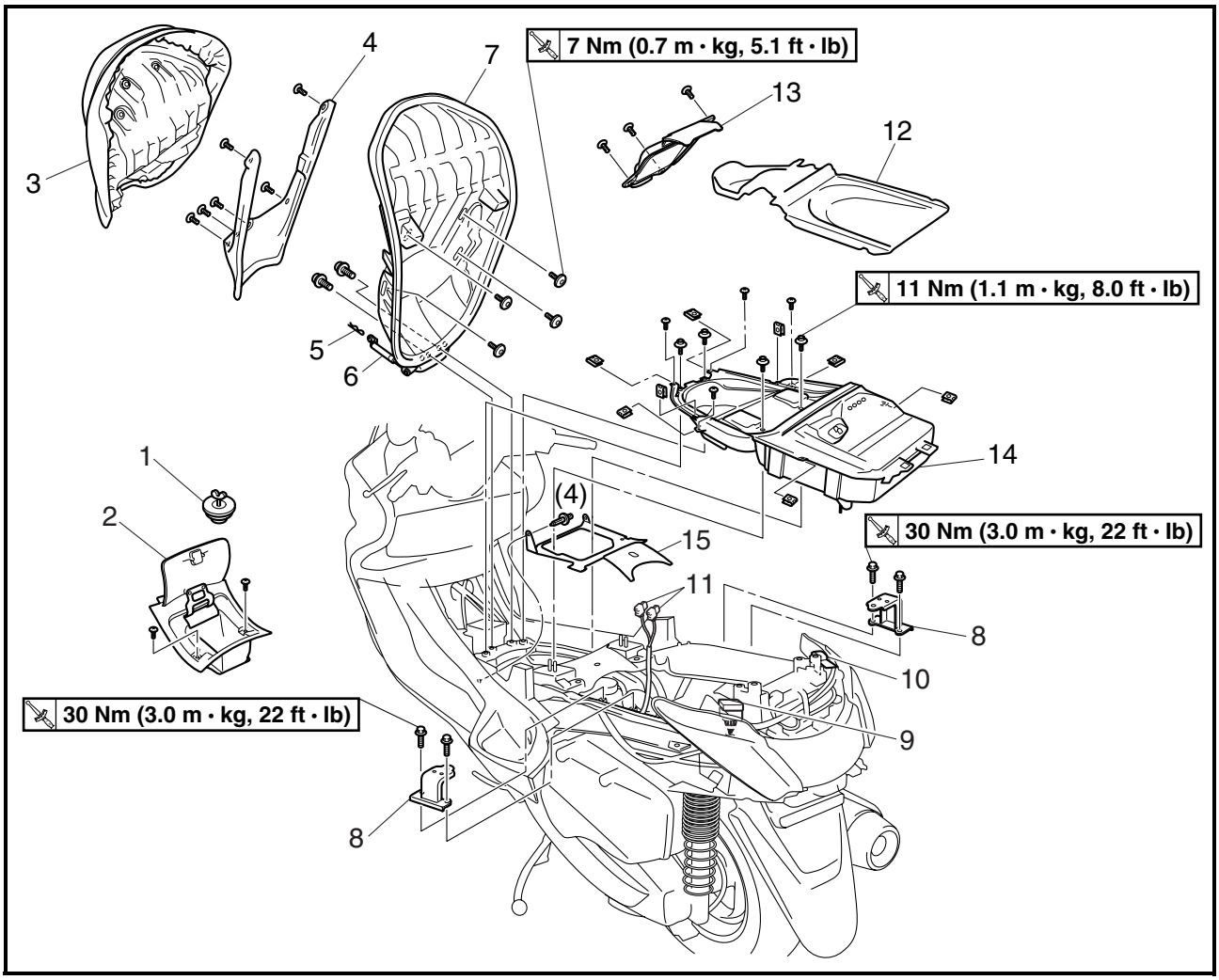
COWLING AND COVERS

PASSENGER SEAT AND SIDE COVERS

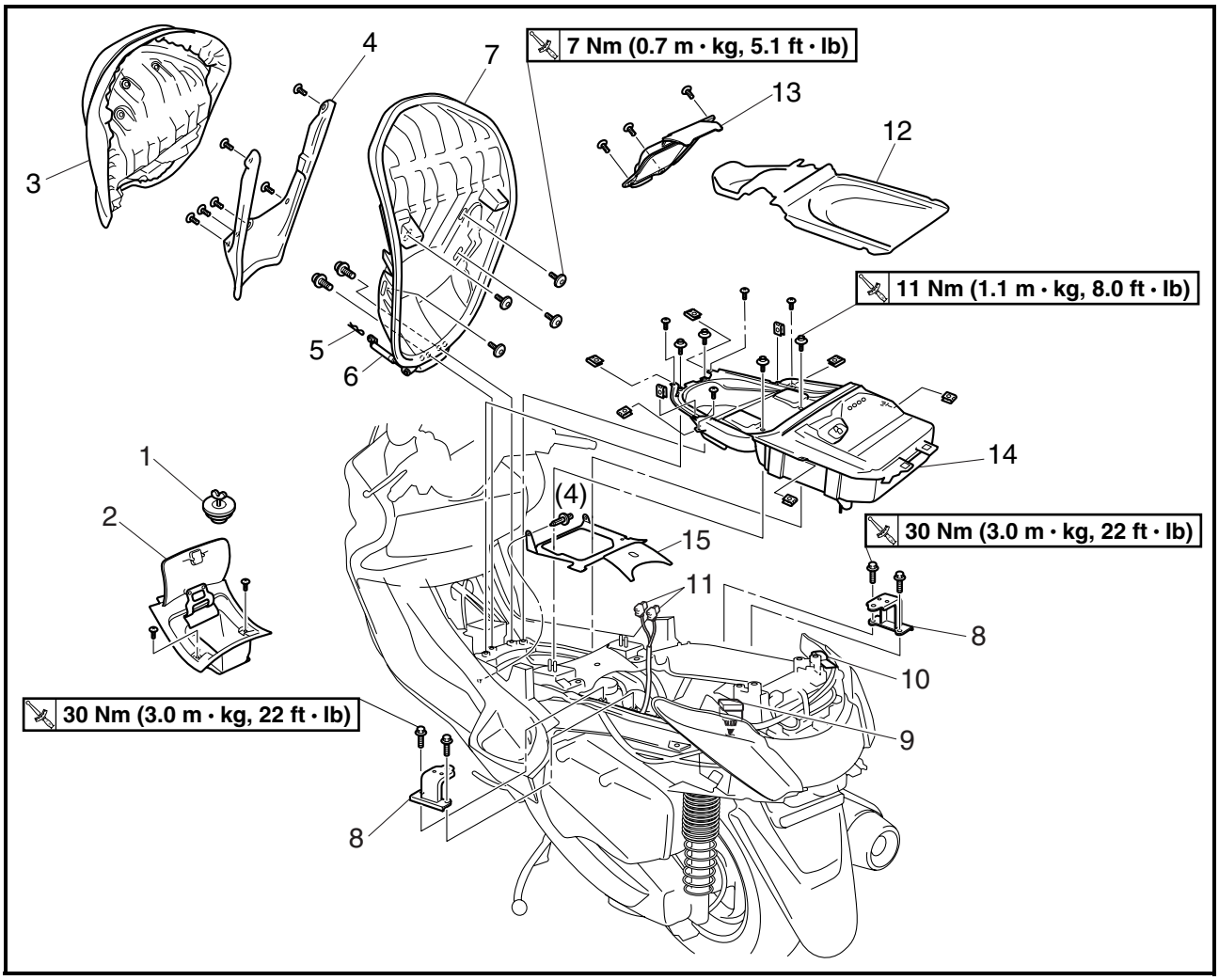


Order	Job/Part	Q'ty	Remarks
	Removing the passenger seat and side covers		Remove the parts in the order listed.
1	Upper rear cover	1	
2	Lower rear cover	1	
3	Grab bar cover	1	
4	Passenger seat	1	
5	Grab bar	1	
6	Cap	2	
7	Side cover (left and right)	2	
			For installation, reverse the removal procedure.

RIDER SEAT AND STORAGE BOX



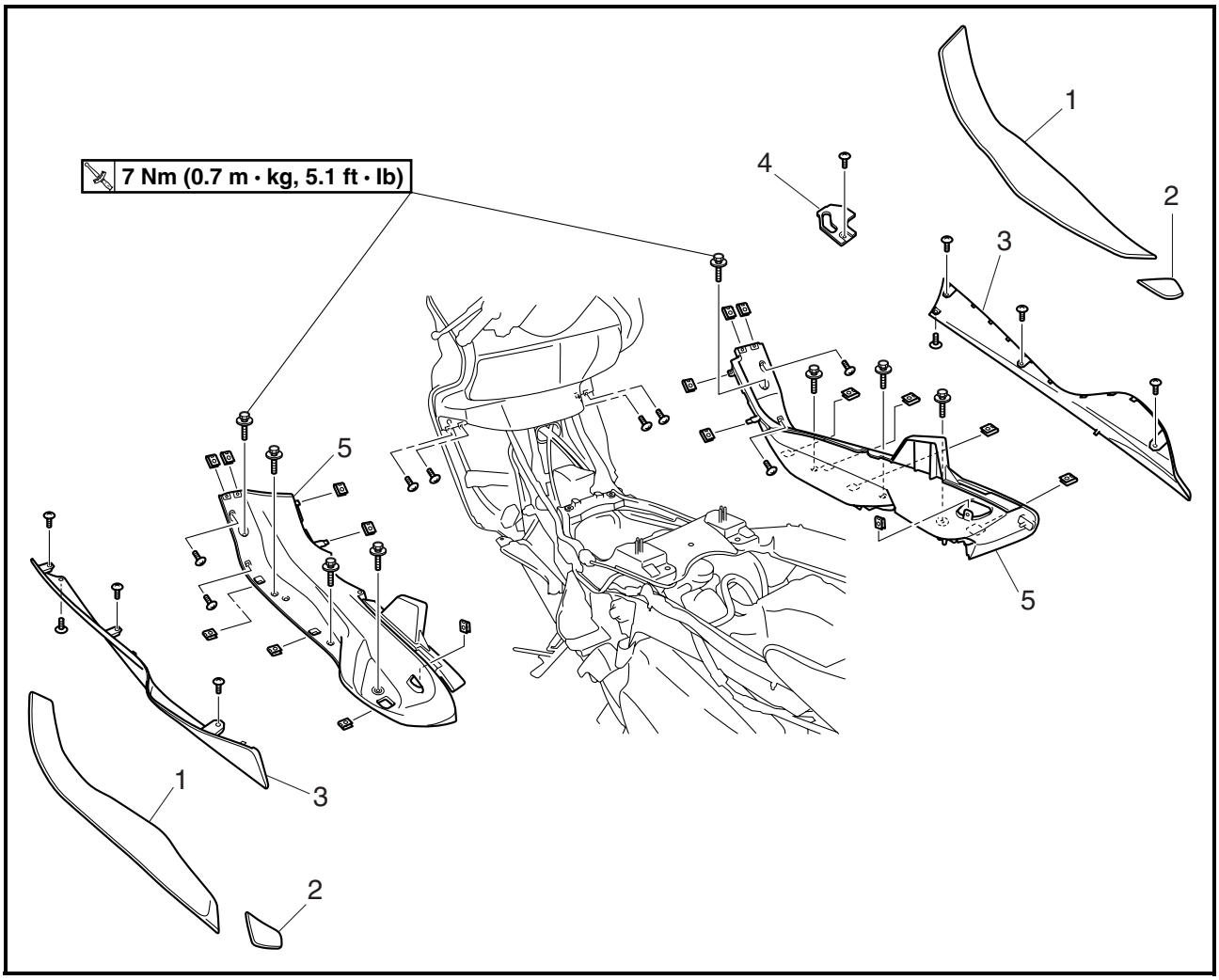
Order	Job/Part	Q'ty	Remarks
	Removing the rider seat and storage box		Remove the parts in the order listed.
	Side cover (left and right)		Refer to "PASSENGER SEAT AND SIDE COVERS".
1	Fuel tank cap	1	
2	Cover	1	
3	Rider seat	1	
4	Upper cover	1	
5	Clip	1	
6	Gas spring assembly	1	**NOTE:** Install the gas spring assembly to the frame and bottom plate with its rod side backward and labels upward.



Order	Job/Part	Q'ty	Remarks
7	Bottom plate	1	
8	Grab bar bracket	2	
9	Fuse box	1	
10	Starter relay	1	**CAUTION:** **First, disconnect the negative battery lead, and then the positive battery lead.**
11	Storage box light connector	2	Disconnect.
12	Storage box mat	1	
13	Storage box lower plate	1	
14	Storage box	1	
15	Rubber sheet	1	
			For installation, reverse the removal procedure.

EAS00040

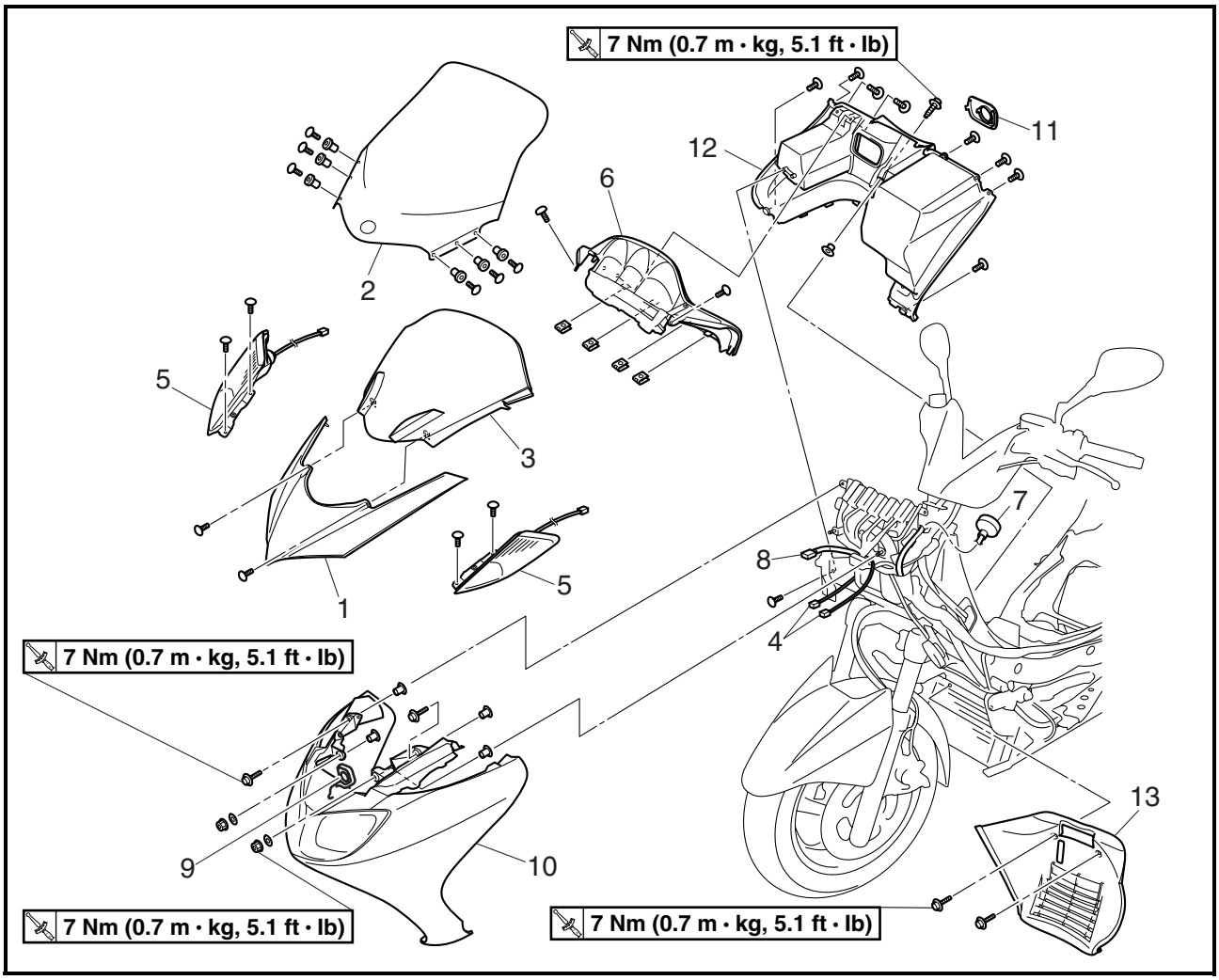
SIDE COVER MOULDINGS AND FOOTREST BOARDS



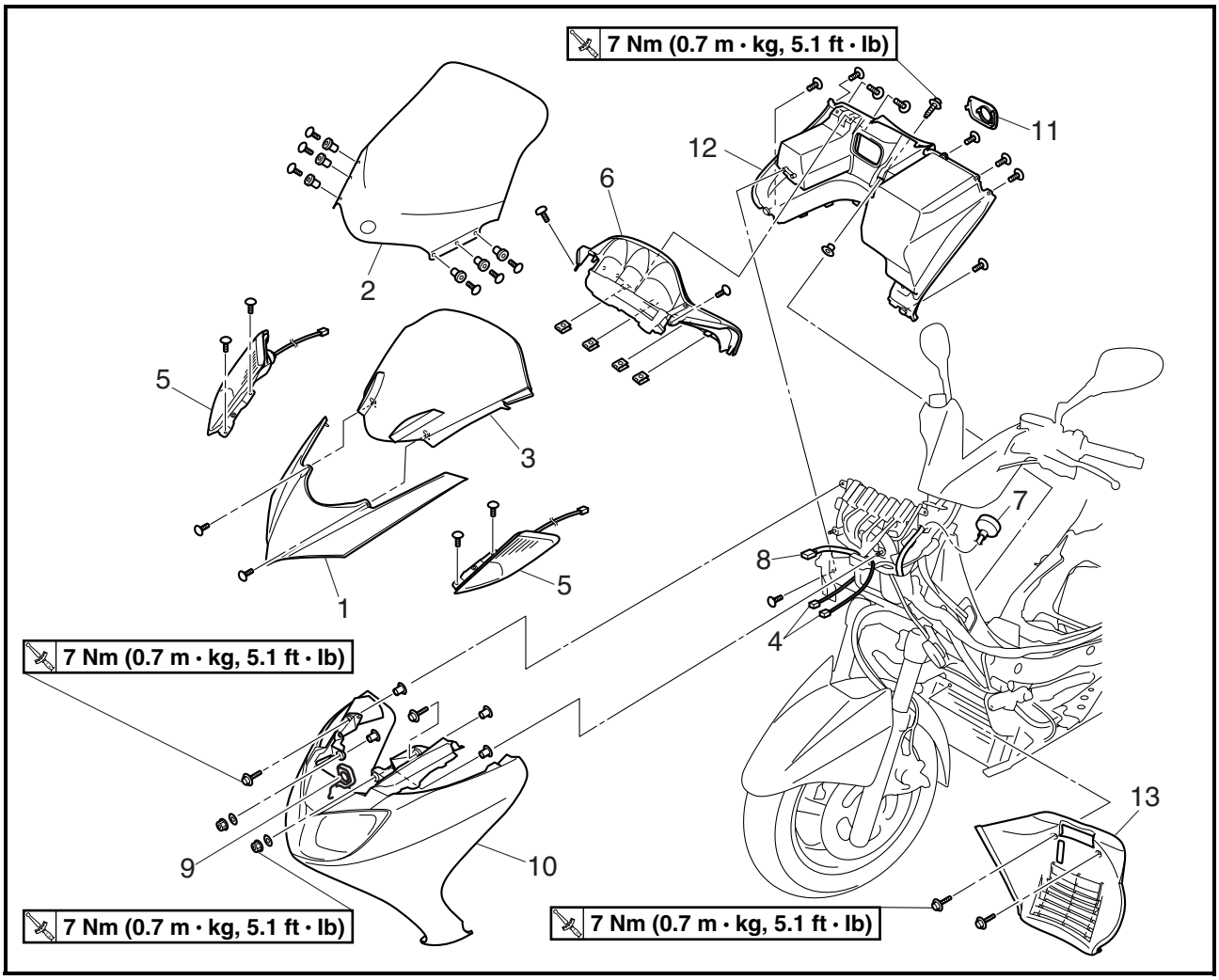
Order	Job/Part	Q'ty	Remarks
	Removing the side cover mouldings and footrest boards		Remove the parts in the order listed.
	Storage box		Refer to "RIDER SEAT AND STORAGE BOX".
1	Footrest board mat 1 (left and right)	2	
2	Footrest board mat 2 (left and right)	2	
3	Side cover moulding (left and right)	2	
4	Coolant reservoir cover	1	
5	Footrest board (left and right)	2	
			For installation, reverse the removal procedure.

EAS00042

FRONT COWLING

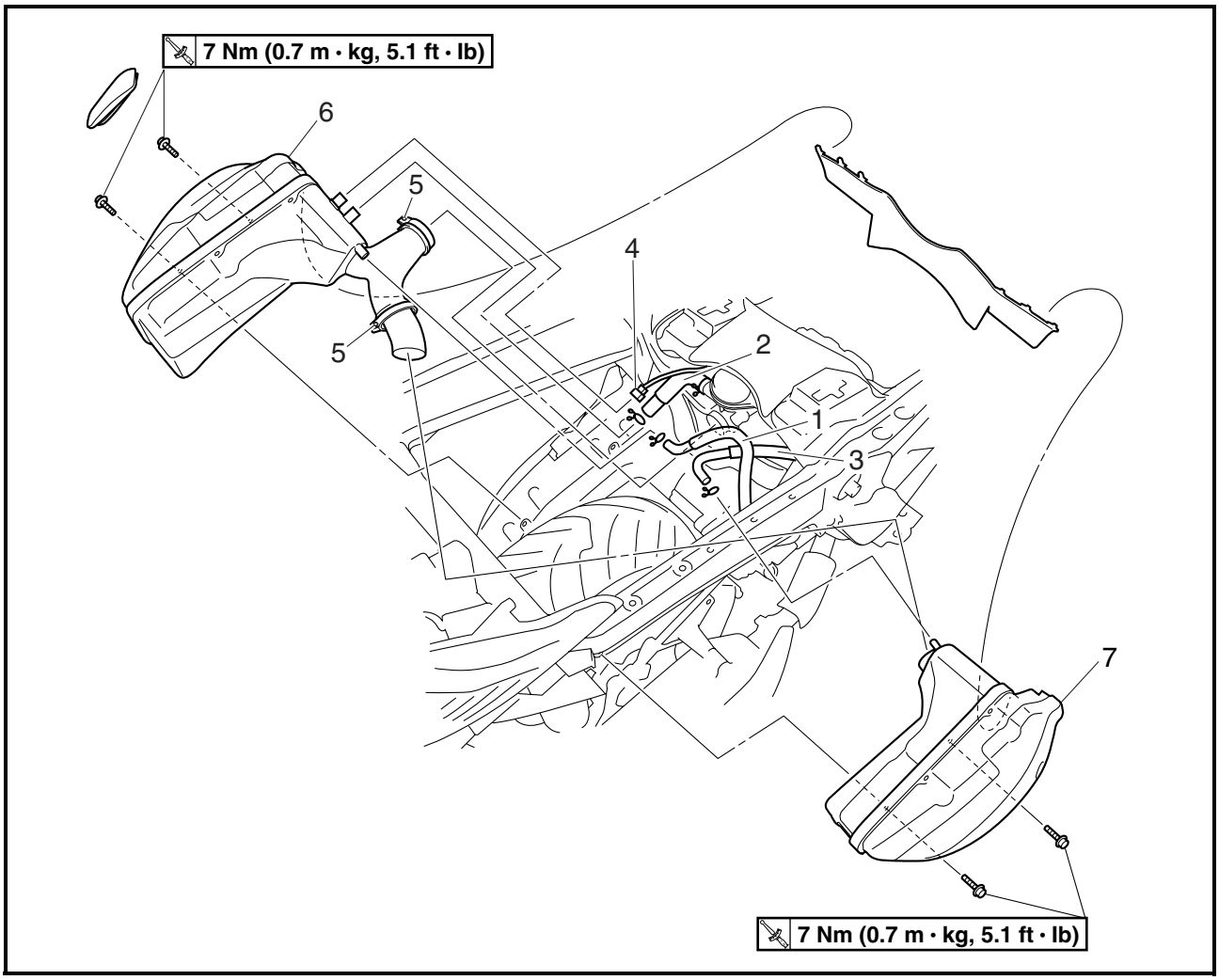


Order	Job/Part	Q'ty	Remarks
	Removing the front cowling		Remove the parts in the order listed.
	Footrest board (left and right)		Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".
1	Upper cover	1	
2	Windshield	1	
3	Inner panel	1	
4	Front turn signal/position light coupler	2	Disconnect.
5	Front turn signal/position light (left and right)	2	
6	Meter assembly	1	
7	Meter assembly coupler	1	Disconnect.
8	Headlight coupler	1	Disconnect.
9	Plastic clamp	1	
10	Front cowling	1	



Order	Job/Part	Q'ty	Remarks
11	Main switch cover	1	
12	Storage compartment	1	
13	Radiator cover	1	
			For installation, reverse the removal procedure.

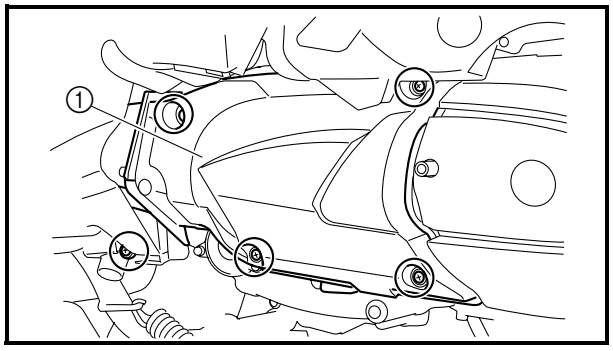
AIR FILTER CASES



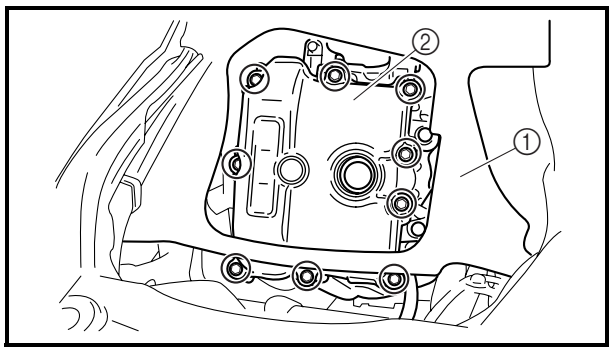
Order	Job/Part	Q'ty	Remarks
	Removing the air filter cases		Remove the parts in the order listed.
	Storage box		Refer to "RIDER SEAT AND STORAGE BOX".
1	Crankcase breather hose	1	Disconnect.
2	Air filter case to throttle body hose	1	Disconnect.
3	Air induction system hose (air filter case to air cut-off valve)	1	Disconnect.
4	Intake air temperature sensor coupler	1	Disconnect.
5	Air filter case clamp screw	2	Loosen.
6	Air filter case (left)	1	
7	Air filter case (right)	1	
			For installation, reverse the removal procedure.

EAS00048
ENGINE
ADJUSTING THE VALVE CLEARANCE
The following procedure applies to all of the valves.

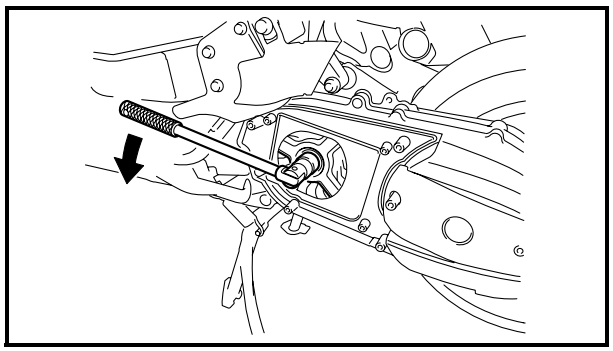
NOTE:
- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.



1. Remove:
   - storage box
     Refer to “RIDER SEAT AND STORAGE BOX”.
2. Remove:
   - V-belt case air filter cover ①
   - V-belt case air filter element

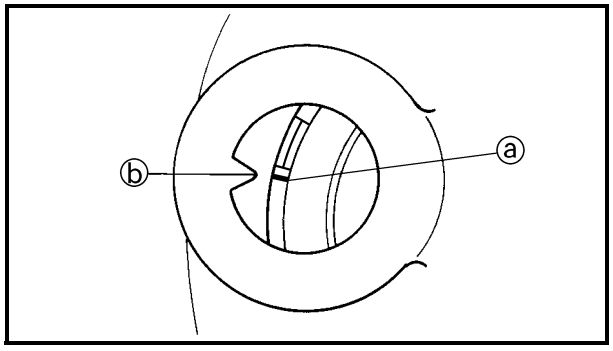


3. Remove:
   - timing plug
   - spark plug
   - rubber sheet ①
   - cylinder head cover ②
   - cylinder head cover gasket



4. Measure:
   - valve clearance
     Out of specification → Adjust.

Valve clearance (cold)
Intake valve
0.15 ~ 0.20 mm
(0.0059 ~ 0.0079 in)
Exhaust valve
0.25 ~ 0.30 mm
(0.0098 ~ 0.0118 in)



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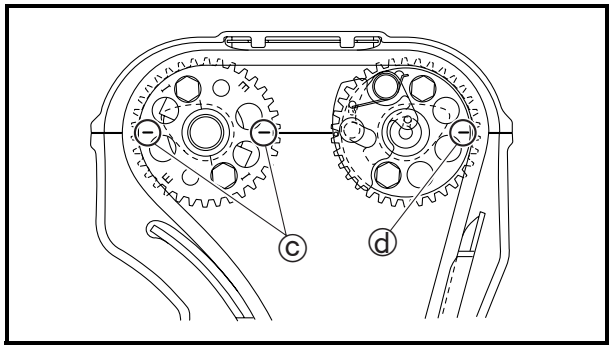
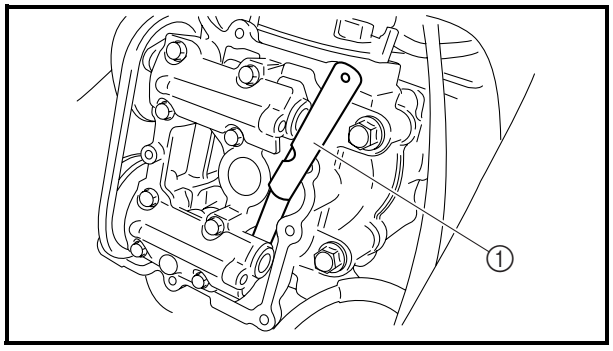
a. Turn the primary sheave nut on the left side of the crankshaft counterclockwise to turn the crankshaft.
b. Align the “I” mark ⓐ on the generator rotor with the stationary pointer ⓑ on the generator rotor cover to position the piston at TDC on the compression stroke.



NOTE:
- TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.
- In order to be sure that the piston is at TDC, the punch marks ⓒ on the intake camshaft sprocket and the punch mark ⓓ on the exhaust camshaft sprocket must align with the cylinder head mating surface as shown in the illustration.



c. Measure the valve clearance with a thickness gauge ①.

NOTE:
If the valve clearance is incorrect, record the measured reading.

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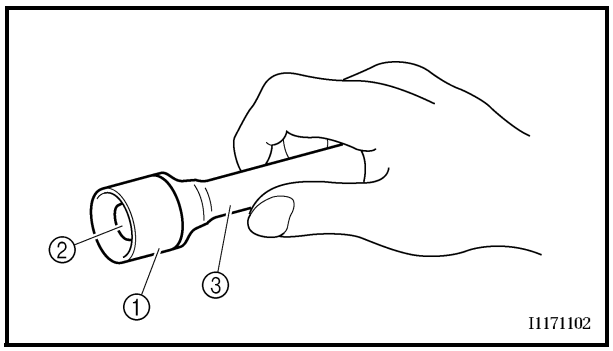
5. Remove:
   - intake camshaft
   - exhaust camshaft

NOTE:
- Refer to “CAMSHAFTS” in chapter 5.
- When removing the timing chain and camshafts, fasten a wire to the timing chain to retrieve it if it falls into the crankcase.



6. Adjust:
   - valve clearance

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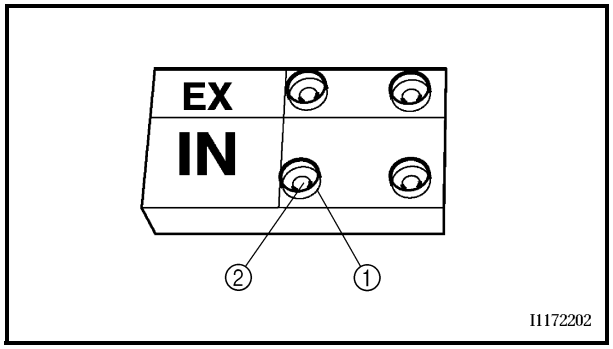
a. Remove the valve lifter ① and the valve pad ② with the valve lapper ③.

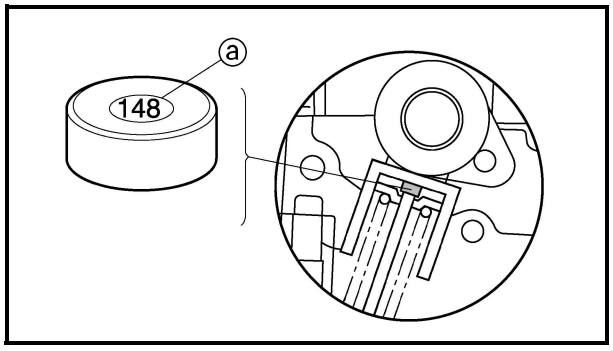
	**Valve lapper** **90890-04101**

NOTE:
- Cover the timing chain opening with a rag to prevent the valve pad from falling into the crankcase.
- Make a note of the position of each valve lifter ① and valve pad ② so that they can be installed in the correct place.



b. Select the proper valve pad from the following table.

Valve pad thickness range		Available valve pads
Nos. 120 ~ 240	1.20 ~ 2.40 mm (0.0472 ~ 0.0945 in)	25 thicknesses in 0.05 mm (0.002 in) increments



NOTE:
- The thickness ⓐ of each valve pad is marked in hundredths of millimeters on the side that touches the valve lifter.
- Since valve pads of various sizes are originally installed, the valve pad number must be rounded in order to reach the closest equivalent to the original.

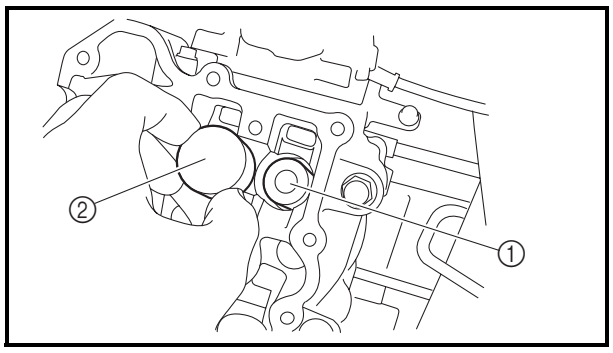
c. Round off the original valve pad number according to the following table.

Last digit	Rounded value
0 or 2	0
5	5
8	10

EXAMPLE:
Original valve pad number = 148 (thickness = 1.48 mm (0.058 in))
Rounded value = 150

d. Locate the rounded number of the original valve pad and the measured valve clearance in the valve pad selection table. The point where the column and row intersect is the new valve pad number.

NOTE:
The new valve pad number is only an approximation. The valve clearance must be measured again and the above steps should be repeated if the measurement is still incorrect.



e. Install the new valve pad ① and the valve lifter ②.

NOTE:
- Lubricate the valve pad with molybdenum disulfide grease.
- Lubricate the valve lifter with molybdenum disulfide oil.
- The valve lifter must turn smoothly when rotated by hand.
- Install the valve lifter and the valve pad in the correct place.

f. Install the exhaust and intake camshafts, timing chain and the camshaft caps.

Camshaft cap bolt
10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:
- Refer to “CAMSHAFTS” in chapter 5.
- Lubricate the camshaft bearings, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft sprocket marks with the edge of the cylinder head.
- Turn the crankshaft counterclockwise several full turns to seat the parts.

g. Measure the valve clearance again.
h. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

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INTAKE

MEASURED CLEARANCE	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.04				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.05 ~ 0.09			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.10 ~ 0.14		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.15 ~ 0.20	STANDARD CLEARANCE																								
0.21 ~ 0.25	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.26 ~ 0.30	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.31 ~ 0.35	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.36 ~ 0.40	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.41 ~ 0.45	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.46 ~ 0.50	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.51 ~ 0.55	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.56 ~ 0.60	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.61 ~ 0.65	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.66 ~ 0.70	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.71 ~ 0.75	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.76 ~ 0.80	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.81 ~ 0.85	185	190	195	200	205	210	215	220	225	230	235	240													
0.86 ~ 0.90	190	195	200	205	210	215	220	225	230	235	240														
0.91 ~ 0.95	195	200	205	210	215	220	225	230	235	240															
0.96 ~ 1.00	200	205	210	215	220	225	230	235	240																
1.01 ~ 1.05	205	210	215	220	225	230	235	240																	
1.06 ~ 1.10	210	215	220	225	230	235	240																		
1.11 ~ 1.15	215	220	225	230	235	240																			
1.16 ~ 1.20	220	225	230	235	240																				
1.21 ~ 1.25	225	230	235	240																					
1.26 ~ 1.30	230	235	240																						
1.31 ~ 1.35	235	240																							
1.36 ~ 1.40	240																								

VALVE CLEARANCE (cold):
0.15 ~ 0.20 mm (0.0059 ~ 0.0079 in)
Example: 175 pad is installed
Measured clearance is 0.27 mm (0.0106 in)
Replace pad 175 with pad 185
Pad number: (example)
Pad No. 175 = 1.75 mm (0.0689 in)
Pad No. 185 = 1.85 mm (0.0728 in)

EXHAUST

MEASURED CLEARANCE	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.04						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.05 ~ 0.09					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.10 ~ 0.14				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.15 ~ 0.19			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.20 ~ 0.24		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.25 ~ 0.30	STANDARD CLEARANCE																								
0.31 ~ 0.35	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.36 ~ 0.40	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.41 ~ 0.45	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.46 ~ 0.50	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.51 ~ 0.55	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.56 ~ 0.60	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.61 ~ 0.65	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.66 ~ 0.70	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.71 ~ 0.75	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.76 ~ 0.80	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.81 ~ 0.85	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.86 ~ 0.90	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.91 ~ 0.95	185	190	195	200	205	210	215	220	225	230	235	240													
0.96 ~ 1.00	190	195	200	205	210	215	220	225	230	235	240														
1.01 ~ 1.05	195	200	205	210	215	220	225	230	235	240															
1.06 ~ 1.10	200	205	210	215	220	225	230	235	240																
1.11 ~ 1.15	205	210	215	220	225	230	235	240																	
1.16 ~ 1.20	210	215	220	225	230	235	240																		
1.21 ~ 1.25	215	220	225	230	235	240																			
1.26 ~ 1.30	220	225	230	235	240																				
1.31 ~ 1.35	225	230	235	240																					
1.36 ~ 1.40	230	235	240																						
1.41 ~ 1.45	235	240																							
1.46 ~ 1.50	240																								

VALVE CLEARANCE (cold):
0.25 ~ 0.30 mm (0.0098 ~ 0.0118 in)
Example: 175 pad is installed
Measured clearance is 0.37 mm (0.0146 in)
Replace pad 175 with pad 185
Pad number: (example)
Pad No. 175 = 1.75 mm (0.0689 in)
Pad No. 185 = 1.85 mm (0.0728 in)

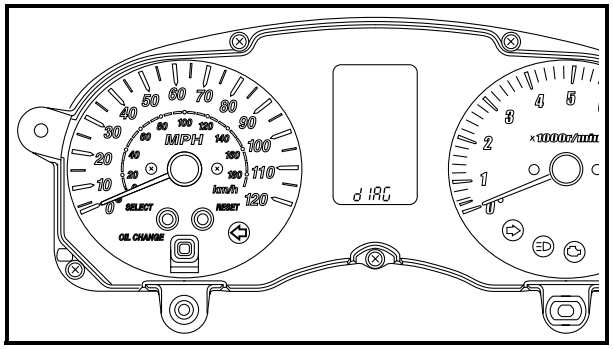
7. Install:
   • all removed parts
   Refer to “CYLINDER HEAD” in chapter 5.

NOTE:
For installation, reverse the removal procedure. Note the following points.

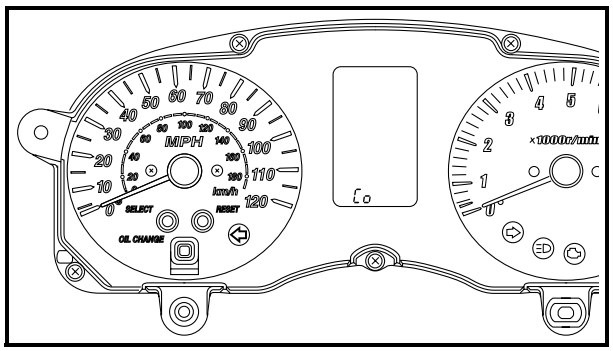
EAS00869
ADJUSTING THE EXHAUST GAS VOLUME

NOTE:
Be sure to set the CO density level to standard, and then adjust the exhaust gas volume.

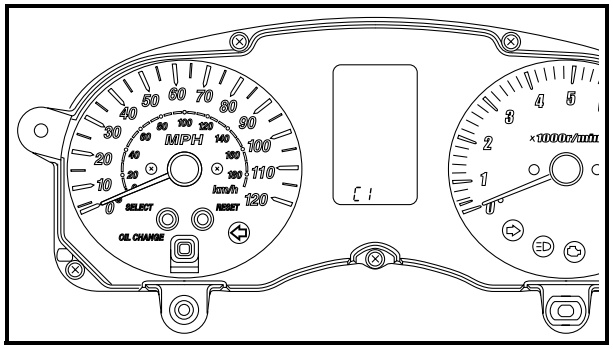
1. Turn the main switch to “OFF” and set the engine stop switch to “ON”.
2. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds or more.

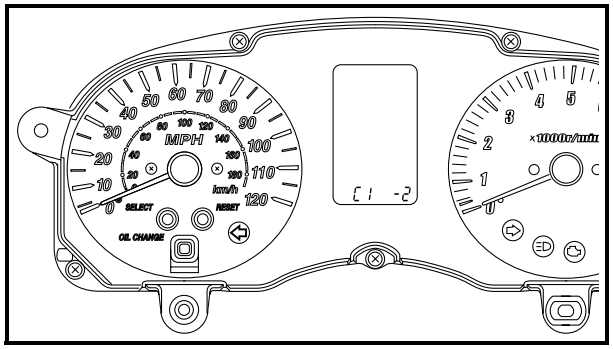


NOTE:
• All displays on the meter disappear except the odometer displays.
• “dIAG” appears on the odometer LCD.



3. Press the “SELECT” button to select the CO adjustment mode “CO” or the diagnostic mode “dIAG”.
4. After selecting “CO”, simultaneously press the “SELECT” and “RESET” buttons for 2 seconds or more to execute the selection.





5. Check that “C1” appears on the odometer LCD, and then simultaneously press the “SELECT” and “RESET” buttons for 2 seconds or more.
6. Change the CO adjustment volume by pressing the “SELECT” and “RESET” buttons.

NOTE:

The CO adjustment volume appears on the odometer LCD.

- To decrease the CO adjustment volume, press the “RESET” button.
- To increase the CO adjustment volume, press the “SELECT” button.

7. Release the “RESET” and “SELECT” buttons to execute the selection.
8. Turn the main switch to “OFF” to cancel the mode.

EAS00054

CHECKING THE ENGINE IDLING SPEED

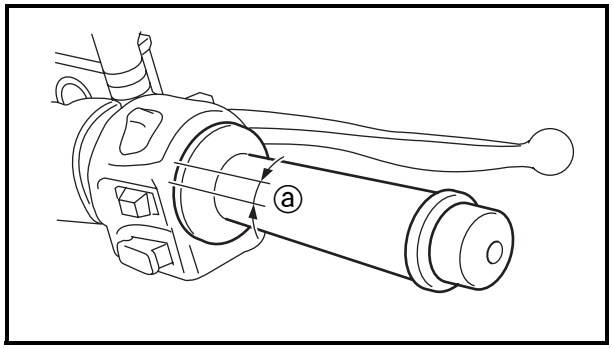
NOTE:

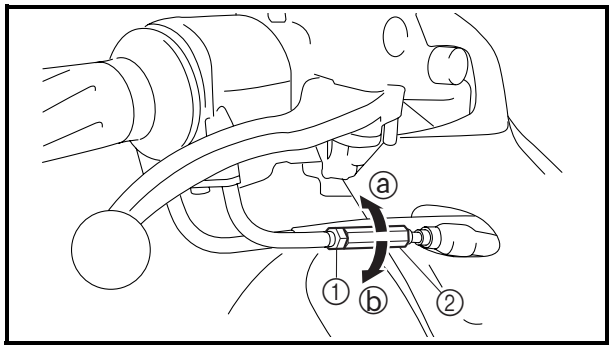
Prior to checking the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

1. Start the engine and let it warm up for several minutes.
2. Remove:
   - storage box lower plate
     Refer to “RIDER SEAT AND STORAGE BOX”.
3. Check:
   - engine idling speed
     Out of specification → Replace the throttle body.

	Engine idling speed **1,300 ~ 1,500 r/min**

4. Install:
   - storage box lower plate
     Refer to “RIDER SEAT AND STORAGE BOX”.





EAS00056
ADJUSTING THE THROTTLE CABLE FREE PLAY

1. Check:
   - throttle cable free play ⓐ
     Out of specification → Adjust.

Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm (0.12 ~ 0.20 in)

2. Adjust:
   - throttle cable free play

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a. Loosen the locknut ①.
b. Turn the adjusting nut ② in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.

Direction ⓐ	**Throttle cable free play is increased.**
Direction ⓑ	**Throttle cable free play is decreased.**

c. Tighten the locknut.

⚠ WARNING

After adjusting the throttle cable free play, start the engine and turn the handlebars to the right and to the left to ensure that this does not cause the engine idling speed to change.

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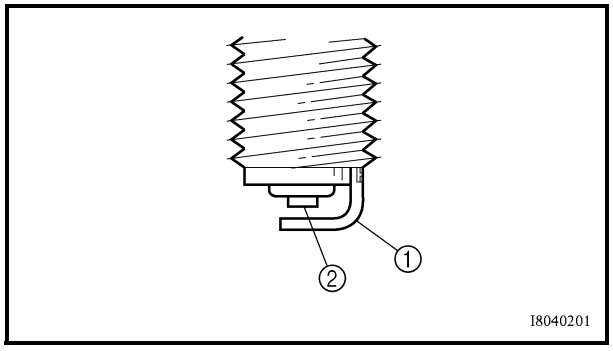
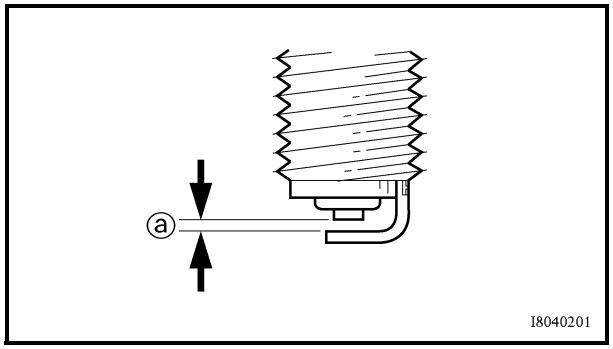
EAS00060
CHECKING THE SPARK PLUG

1. Remove:
   - storage box lower plate
     Refer to “RIDER SEAT AND STORAGE BOX”.
2. Disconnect:
   - spark plug cap





3. Remove:
   • spark plug

CAUTION:

Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

4. Check:
   • spark plug type
   Incorrect → Change.

Spark plug type (manufacturer)
CR7E (NGK)

5. Check:
   • electrode ①
   Damage/wear → Replace the spark plug.
   • insulator ②
   Abnormal color → Replace the spark plug.
   Normal color is medium-to-light tan.
6. Clean:
   • spark plug
   (with a spark plug cleaner or wire brush)
7. Measure:
   • spark plug gap ⓐ
   (with a wire thickness gauge)
   Out of specification → Regap.

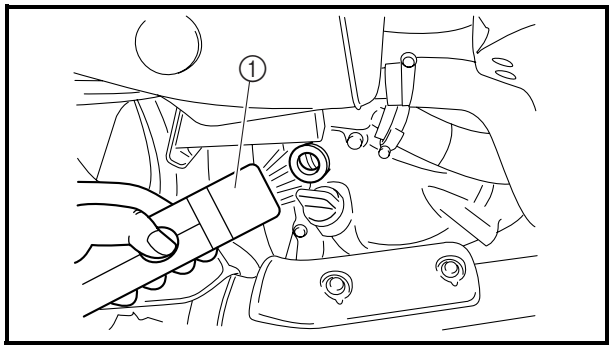
Spark plug gap
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

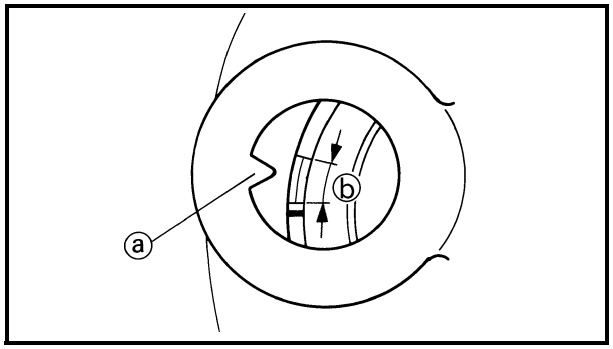
8. Install:
   • spark plug — **13 Nm (1.3 m · kg, 9.4 ft · lb)**

NOTE:

Before installing the spark plug, clean the spark plug and gasket surface.

9. Connect:
   • spark plug cap
10. Install:
   • storage box lower plate
   Refer to “RIDER SEAT AND STORAGE BOX”.





EAS00064
CHECKING THE IGNITION TIMING

NOTE:
Prior to checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

1. Remove:
   - storage box lower plate
     Refer to "RIDER SEAT AND STORAGE BOX".
2. Remove:
   - timing plug
3. Connect:
   - timing light ①

	Timing light **90890-03141, YU-03141**

4. Check:
   - ignition timing

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a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.

	Engine idling speed **1,300 ~ 1,500 r/min**

b. Check that the stationary pointer ⓐ is within the firing range ⓑ on the generator rotor.
   Incorrect firing range → Check the ignition system.

NOTE:
The ignition timing is not adjustable.

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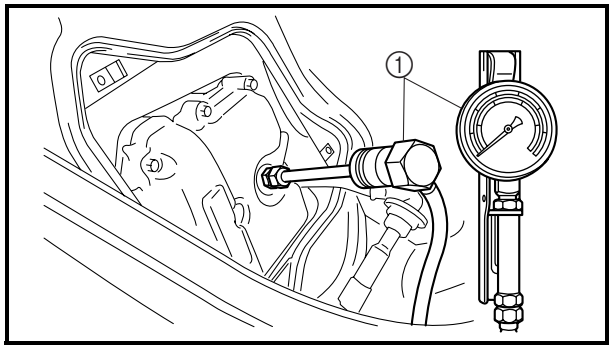
5. Install:
   - timing plug — **8 Nm (0.8 m · kg, 5.8 ft · lb)**
6. Install:
   - storage box lower plate
     Refer to "RIDER SEAT AND STORAGE BOX".

EAS00067
MEASURING THE COMPRESSION PRESSURE

NOTE:
Insufficient compression pressure will result in a loss of performance.

1. Remove:
   - storage box lower plate
     Refer to "RIDER SEAT AND STORAGE BOX".
2. Measure:
   - valve clearance
     Out of specification → Adjust.
     Refer to "ADJUSTING THE VALVE CLEARANCE".
3. Start the engine, warm it up for several minutes, and then turn it off.
4. Disconnect:
   - spark plug cap
5. Remove:
   - spark plug

CAUTION:
Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug well to prevent it from falling into the cylinder.



6. Install:
   - compression gauge ①

Compression gauge
90890-03081, YU-33223
Adapter (compression gauge)
90890-04082

7. Measure:
   • compression pressure
   Out of specification → Refer to steps (c) and (d).

Compression pressure (at sea level)
Minimum
870 kPa (8.7 kg/cm², 123.7 psi)
Standard
1,000 kPa
(10.0 kg/cm², 142.2 psi)
Maximum
1,120 kPa
(11.2 kg/cm², 159.3 psi)

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a. Set the main switch to "ON".
b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

⚠ WARNING

To prevent sparking, ground the spark plug lead before cranking the engine.

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces, and piston crown for carbon deposits.
   Carbon deposits → Eliminate.
d. If the compression pressure is below the minimum specification, pour a teaspoonful engine of oil into the spark plug bore and measure again.
   Refer to the following table.

Compression pressure (with oil applied into the cylinder)	
Reading	**Diagnosis**
Higher than without oil	**Piston wear or damage → Repair.**
Same as without oil	**Piston rings, valves, cylinder head gasket or piston possibly defective → Repair.**

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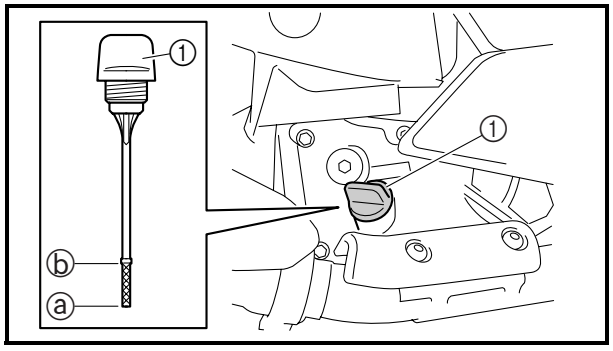
8. Install:
   - spark plug — 13 Nm (1.3 m · kg, 9.4 ft · lb)
9. Connect:
   - spark plug cap
10. Install:
    - storage box lower plate
      Refer to “RIDER SEAT AND STORAGE BOX”.

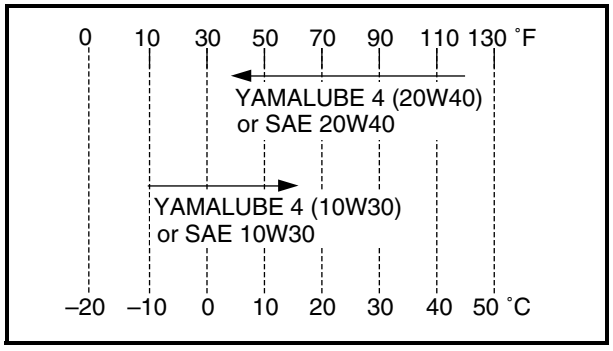
EAS00072
CHECKING THE ENGINE OIL LEVEL

1. Stand the scooter on a level surface.

NOTE:
- Place the scooter on a suitable stand.
- Make sure the scooter is upright.

2. Start the engine, warm it up for several minutes, and then turn it off.
3. Check:
   - engine oil level
     Wipe the dipstick ① clean, insert it into the oil filler hole (without screwing it in), and then remove it to check the oil level.
     The engine oil level should be between the minimum level mark ⓐ and maximum level mark ⓑ.
     Below the minimum level mark → Add the recommended engine oil to the proper level.





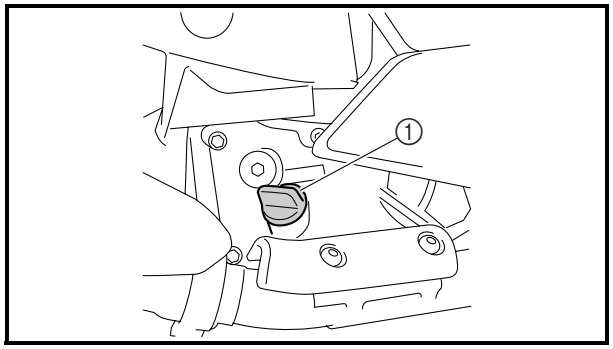
Recommended oil
At 5 °C (40 °F) or higher
Yamalube 4 (20W40) or SAE 20W40 type SE motor oil
At 15 °C (60 °F) or lower
Yamalube 4 (10W30) or SAE 10W30 type SE motor oil

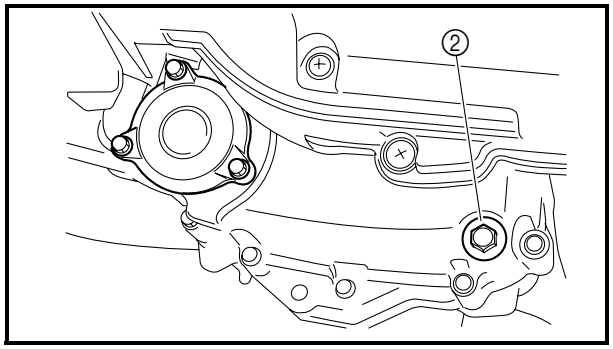
CAUTION:
Do not allow foreign materials to enter the crankcase.

NOTE:
- API Service “SE”, “SF” and “SG” type or equivalent (e.g., “SF-SE”, “SF-SE-CC”, “SF-SE-SD”)
- Before checking the engine oil level, wait a few minutes until the oil has settled.

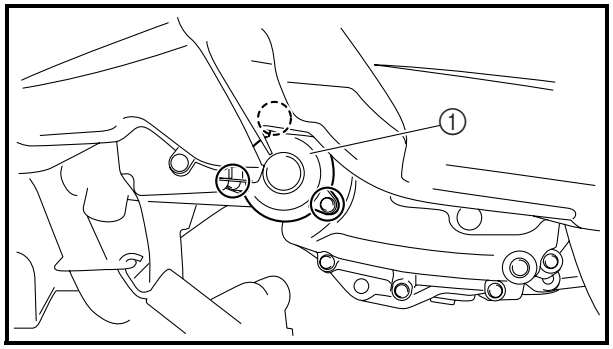
4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

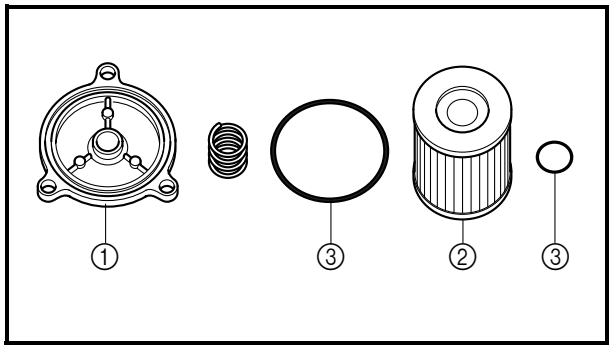
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

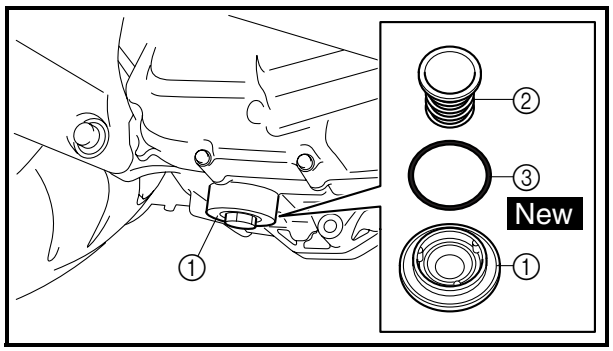




EAS00076
CHANGING THE ENGINE OIL
1. Remove:
   - storage box lower plate
     Refer to “RIDER SEAT AND STORAGE BOX”.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Place a container under the engine oil drain bolt.
4. Remove:
   - engine oil filler cap ①
   - engine oil drain bolt ②
     (along with the gasket)
5. Drain:
   - engine oil
     (completely from the crankcase)







6. If the oil filter element is also to be replaced, perform the following procedure.

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a. Remove the oil filter element cover ① and oil filter element ②.
b. Install new O-rings ③.
c. Install the new oil filter element and the oil filter element cover.

	Oil filter element cover bolt **10 Nm (1.0 m · kg, 7.2 ft · lb)**

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7. If the oil strainer is also to be cleaned, perform the following procedure.

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a. Remove the oil strainer cover ① and oil strainer ②.
b. Install new O-ring ③.
c. Install the oil strainer cover.

	Oil strainer cover **32 Nm (3.2 m · kg, 23 ft · lb)**

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8. Check:
   - engine oil drain bolt gasket
     Damage → Replace.
9. Install:
   - engine oil drain bolt
     (along with the gasket)

	20 Nm (2.0 m · kg, 14 ft · lb)

10.Fill:
- crankcase
  (with the specified amount of the recommended engine oil)

Quantity
Total amount
1.70 L (1.50 Imp qt, 1.80 US qt)
Without oil filter element replacement
1.50 L (1.32 Imp qt, 1.59 US qt)
With oil filter element replacement
1.70 L (1.50 Imp qt, 1.80 US qt)

11.Install:
- engine oil filler cap

12.Start the engine, warm it up for several minutes, and then turn it off.
13.Check:
- engine
  (for engine oil leaks)

14.Check:
- engine oil level
  Refer to "CHECKING THE ENGINE OIL LEVEL".

15.Check:
- engine oil pressure

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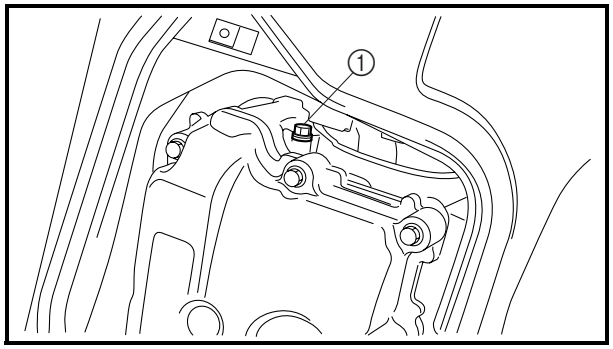
a. Slightly loosen the oil gallery bolt ①.
b. Start the engine and keep it idling until engine oil starts to seep from the oil gallery bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
c. Check the engine oil passages, the oil filter element and the oil pump for damage or leakage. Refer to "OIL PUMP" in chapter 5.
d. Start the engine after solving the problem(s) and check the engine oil pressure again.
e. Tighten the oil gallery bolt to specification.



Oil gallery bolt
10 Nm (1.0 m · kg, 7.2 ft · lb)

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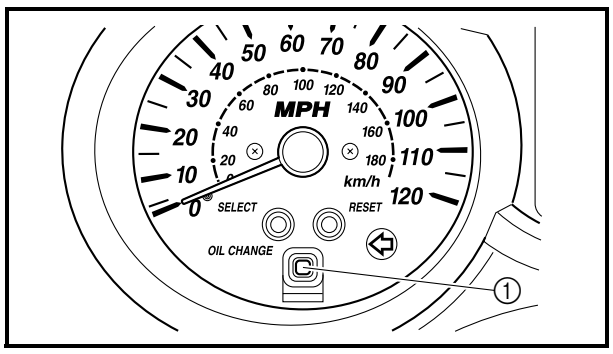

16.Reset:
- engine oil change indicator

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a. Turn the key to "ON".
b. Hold the reset button ① pushed for two to eight seconds.
c. Release the reset button and the engine oil change indicator will go off.

NOTE:

If the engine oil is changed before the engine oil change indicator comes on (i.e. before the periodic engine oil change interval has been reached), the indicator must be reset after the engine oil change for the next periodic engine oil change to be indicated at the correct time. To reset the engine oil change indicator before the periodic engine oil change interval has been reached, follow the above procedure, but note that the indicator will come on for 1.4 seconds after releasing the reset button, otherwise repeat the procedure.

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17.Install:
- storage box lower plate
  Refer to "RIDER SEAT AND STORAGE BOX".

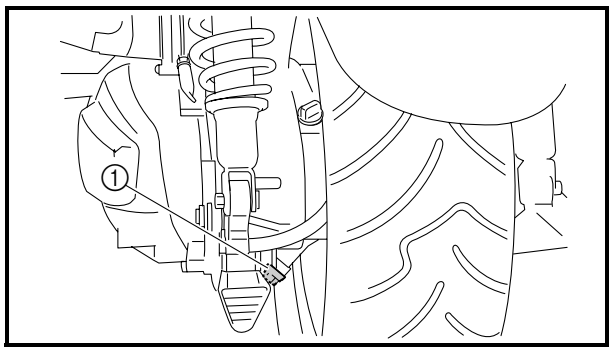
CHANGING THE TRANSMISSION OIL

1. Stand the scooter on a level surface.

NOTE:
- Place the scooter on a suitable stand.
- Make sure that the scooter is upright.

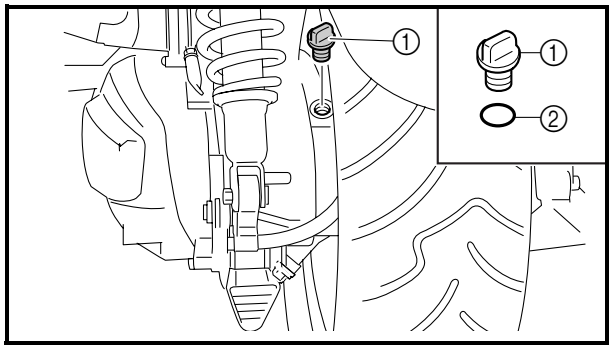
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Place a container under the transmission oil drain bolt.
4. Remove:
   - transmission oil filler plug
   - transmission oil drain bolt ①
5. Drain:
   - transmission oil
     (completely from the transmission case)
6. Install:
   - transmission oil drain bolt

20 Nm (2.0 m · kg, 14 ft · lb)

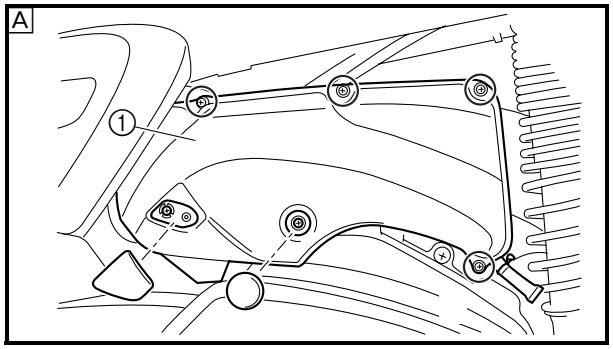


7. Fill:
   • transmission case
   (with the specified amount of the recommended transmission oil)

Recommended oil
SAE 10W30 type SE motor oil
Quantity
0.25 L (0.22 Imp qt, 0.26 US qt)



8. Install:
   • transmission oil filler plug ①
   • O-ring ②
9. Start the engine, warm it up for several minutes, and then turn it off.
10. Check:
   • transmission case
   (for transmission oil leaks)

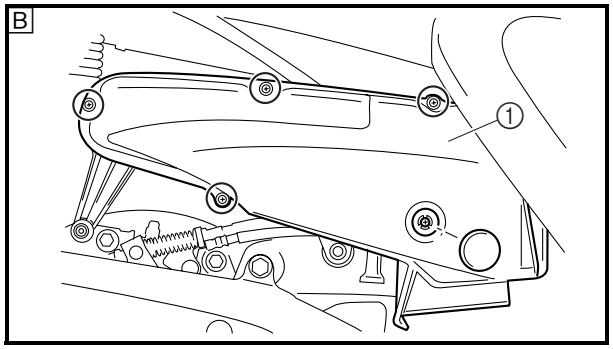


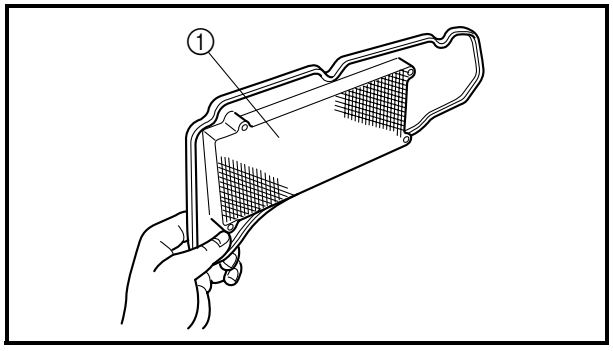
EAS00088
REPLACING THE AIR FILTER ELEMENTS

The following procedure applies to both air filter elements.

1. Remove:
   • air filter case cover ①
   • air filter element

Ⓐ Left air filter case cover
Ⓑ Right air filter case cover





2. Check:
   • air filter element ①
   Damage → Replace.

NOTE:
Replace the air filter element every 20,000 km. The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

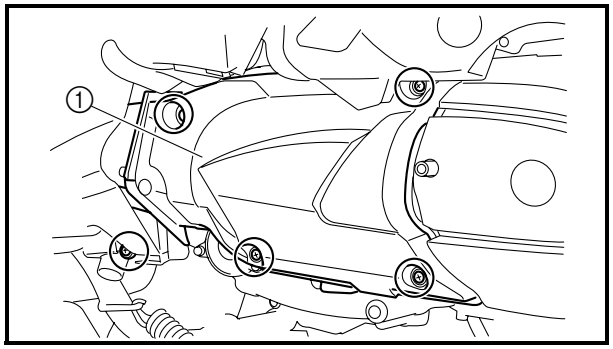
3. Install:
   - air filter element
   - air filter case cover
     (along with the gasket)

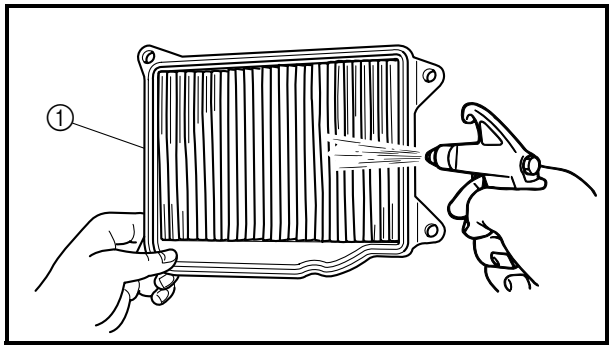
CAUTION:

Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect the carburetor tuning, leading to poor engine performance and possible overheating.

NOTE:

When installing the air filter element into the air filter case cover, be sure their sealing surfaces are aligned to prevent any air leaks.





EAS00091

CLEANING THE V-BELT CASE AIR FILTER ELEMENT

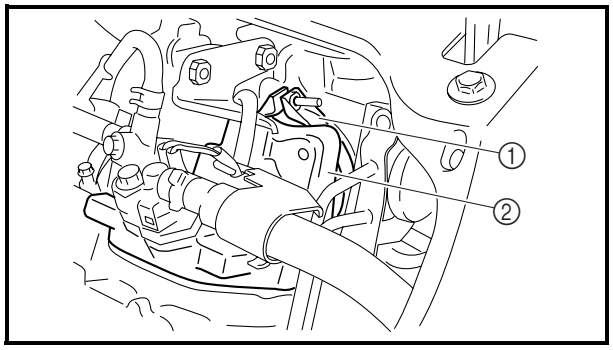
1. Remove:
   - footrest board (left)
     Refer to “RIDER SEAT AND STORAGE BOX”.
2. Remove:
   - V-belt case air filter cover ①
   - V-belt case air filter cover seal
   - V-belt case air filter element
3. Clean:
   - V-belt case air filter element ①
     Blow the compressed air to the outer surface of the V-belt case air filter element.
4. Check:
   - V-belt case air filter element
     Damage → Replace.

CAUTION:

Since the V-belt case air filter element is a dry type, do not let grease or water contact it.

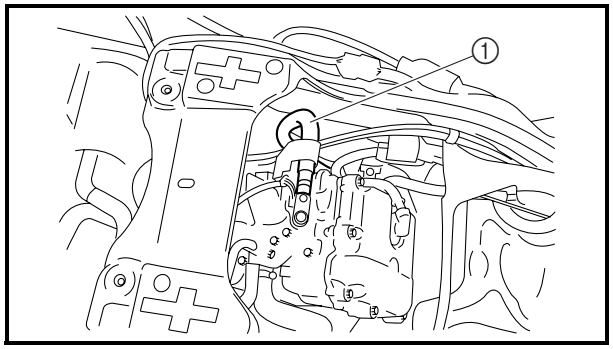
5. Install:
   - V-belt case air filter element
   - V-belt case air filter cover seal
   - V-belt case air filter cover
   - V-belt case air filter cover screw

6. Install:
   • footrest board (left)
   Refer to “RIDER SEAT AND STORAGE BOX”.



EAS00094
CHECKING THE THROTTLE BODY JOINT AND INTAKE MANIFOLD

1. Remove:
   • storage box
   Refer to “RIDER SEAT AND STORAGE BOX”.
2. Check:
   • throttle body joint ①
   • intake manifold ②
   Cracks/damage → Replace.
   Refer to “CYLINDER HEAD” in chapter 5.
3. Install:
   • storage box
   Refer to “RIDER SEAT AND STORAGE BOX”.

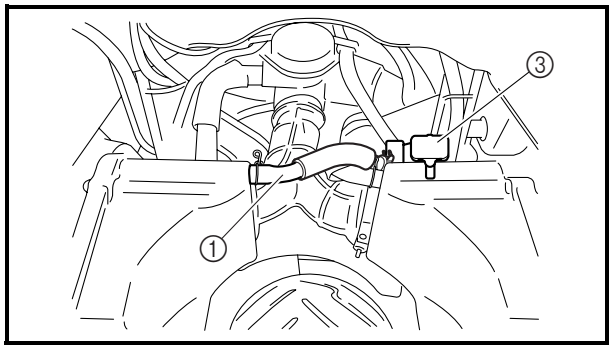


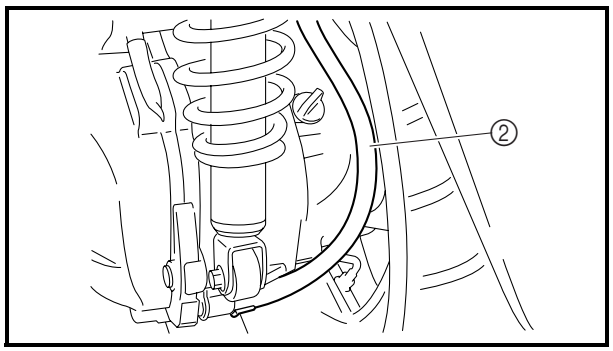
EAS00096
CHECKING THE FUEL HOSE

1. Remove:
   • storage box
   Refer to “RIDER SEAT AND STORAGE BOX”.
2. Check:
   • fuel hose ①
   Cracks/damage → Replace.
   Loose connection → Connect properly.
3. Install:
   • storage box
   Refer to “RIDER SEAT AND STORAGE BOX”.

EAS00098
CHECKING THE BREATHER HOSES

1. Remove:
   - storage box
     Refer to “RIDER SEAT AND STORAGE BOX”.





2. Check:
   - crankcase breather hose ①
   - transmission case breather hose ②
     Cracks/damage → Replace.
     Loose connection → Connect properly.

CAUTION:

Make sure the breather hoses are routed correctly.

3. Remove:
   - catch tank ③
4. Clean:
   - catch tank

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a. Thoroughly flush out the catch tank with clean water.
b. Hold the catch tank upside down to allow the water to drain out.
c. Repeat the flushing steps until the excess water is clear and free of debris.
d. Place the catch tank in an upright position to allow any remaining water to drain out of the lower drain tube.
e. Keep the catch tank upright to allow it to dry sufficiently.

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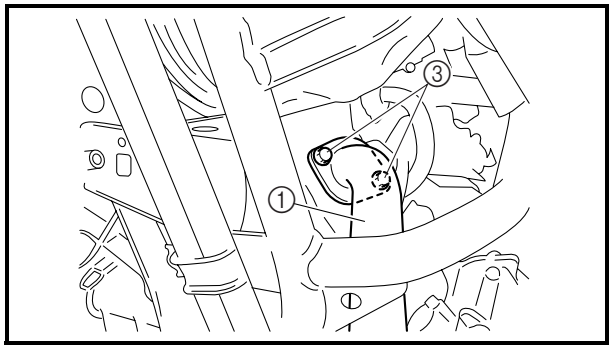
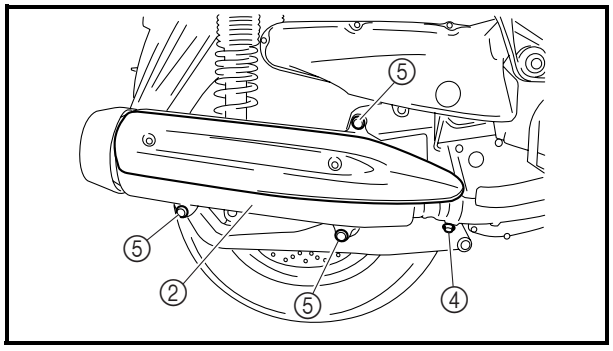
5. Install:
   - catch tank
6. Install:
   - storage box
     Refer to “RIDER SEAT AND STORAGE BOX”.





EAS00099
CHECKING THE EXHAUST SYSTEM

The following procedure applies to all of the exhaust pipes and gaskets.

1. Remove:
   - footrest board (right)
     Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".
2. Check:
   - exhaust pipe ①
   - muffler ②
     Cracks/damage → Replace.
   - gasket
     Exhaust gas leaks → Replace.
3. Check:
   - tightening torque

Exhaust pipe nut ③
20 Nm (2.0 m · kg, 14 ft · lb)
Muffler joint bolt ④
14 Nm (1.4 m · kg, 10 ft · lb)
Muffler mounting bolt ⑤
53 Nm (5.3 m · kg, 38 ft · lb)

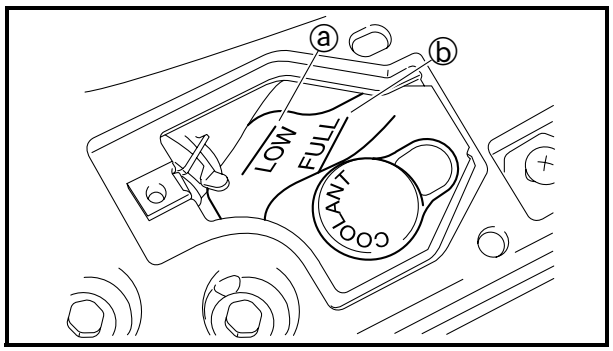
4. Install:
   - footrest board (right)
     Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".

EAS00103
CHECKING THE COOLANT LEVEL

1. Stand the scooter on a level surface.

NOTE:
- Place the scooter on a suitable stand.
- Make sure the scooter is upright.

2. Remove:
   - coolant reservoir cover
     Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".
3. Check:
   - coolant level
     The coolant level should be between the minimum level mark ⓐ and maximum level mark ⓑ.
     Below the minimum level mark → Add the recommended coolant to the proper level.



CAUTION:

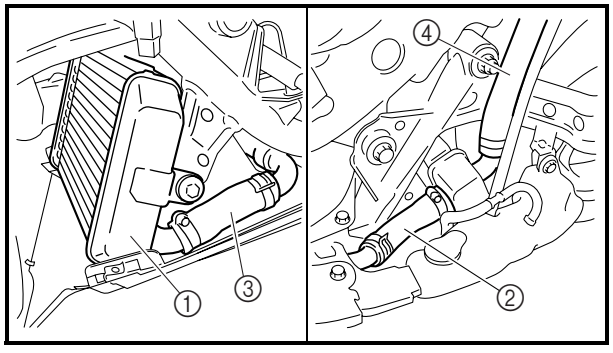
- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, if distilled water is not available, soft water may be used.**

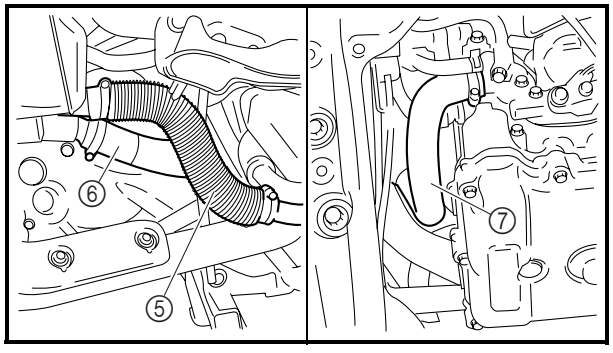
4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check:
   - coolant level

NOTE:

Before checking the coolant level, wait a few minutes until it settles.

6. Install:
   - coolant reservoir cover
     Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".

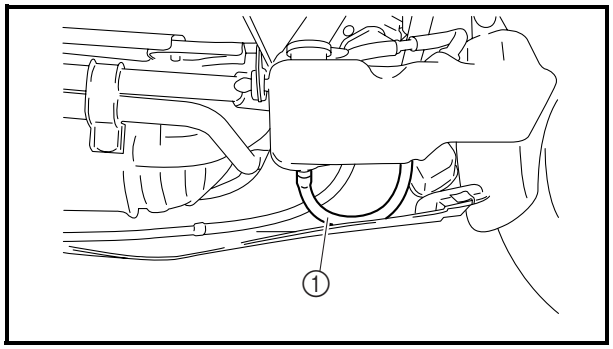


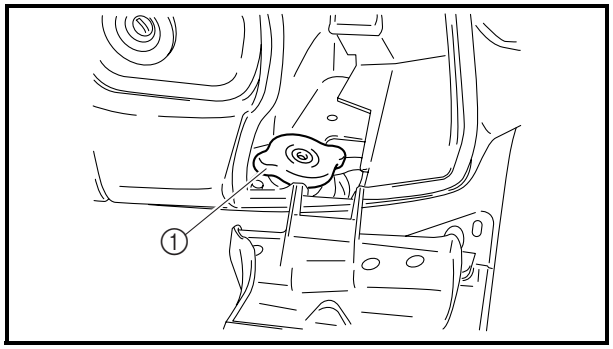


EAS00104
CHECKING THE COOLING SYSTEM

1. Remove:
   - footrest boards (left and right)
     Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".
2. Check:
   - radiator ①
   - radiator inlet hose ②
   - radiator outlet hose ③
   - radiator filler hose ④
   - oil cooler outlet hose
   - water pump inlet hose ⑤
   - water pump outlet hose ⑥
   - thermostat outlet hose ⑦
   - thermostat inlet hose
     Cracks/damage → Replace.
     Refer to "COOLING SYSTEM" in chapter 6.

3. Install:
   • footrest boards (left and right)
   Refer to “SIDE COVER MOULDINGS AND FOOTREST BOARDS”.



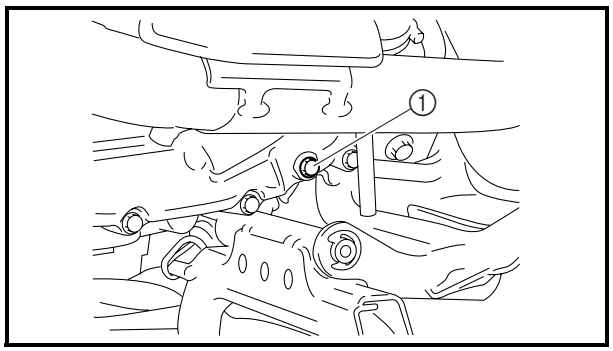


EAS00105
CHANGING THE COOLANT

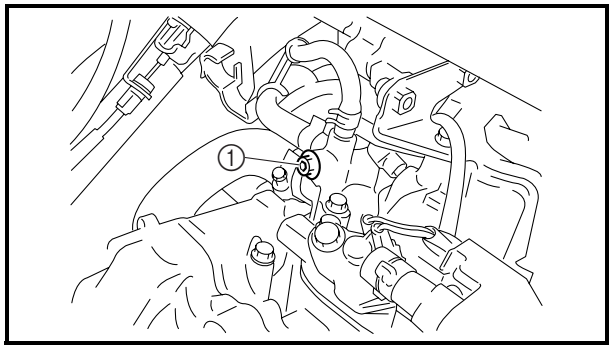
1. Remove:
   • storage box
   • footrest board (right)
   Refer to “SIDE COVER MOULDINGS AND FOOTREST BOARDS”.
2. Disconnect:
   • coolant reservoir hose ①
3. Drain:
   • coolant
   (from the coolant reservoir)
4. Remove:
   • radiator cap cover
   • radiator cap ①

⚠ WARNING

A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.



5. Remove:
   • coolant drain bolt ①
   (along with the copper washer)
6. Drain:
   • coolant
   (from the engine and radiator)



7. Install:
   - copper washer New
   - coolant drain bolt

   10 Nm (1.0 m · kg, 7.2 ft · lb)
8. Connect:
   - coolant reservoir hose
9. Remove:
   - air bleed bolt (coolant) ①
10. Fill:
    - cooling system
      (with the specified amount of the recommended coolant)

Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Quantity
Total amount
1.57 L (1.38 Imp qt, 1.66 US qt)
Coolant reservoir capacity
0.32 L (0.28 Imp qt, 0.34 US qt)
Up to the maximum level mark

NOTE:
The specified amount of coolant is a standard amount. Fill the cooling system with coolant until coolant comes out of the air bleed bolt hole.

Handling notes for coolant
Coolant is potentially harmful and should be handled with special care.

⚠ WARNING

- **If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.**
- **If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.**
- **If coolant is swallowed, induce vomiting and get immediate medical attention.**

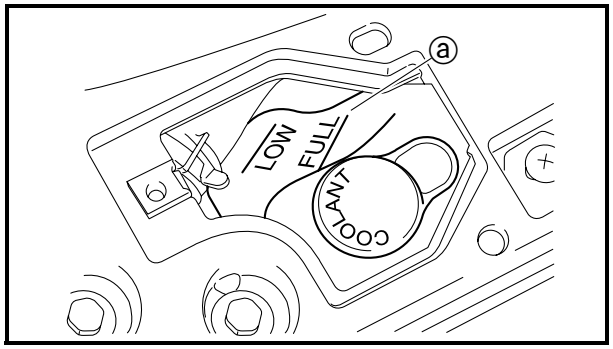
CAUTION:

- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, if distilled water is not available, soft water may be used.**
- **If coolant comes into contact with painted surfaces, immediately wash them with water.**
- **Do not mix different types of antifreeze.**

11. Install:
    - air bleed bolt (coolant)

6 Nm (0.6 m · kg, 4.3 ft · lb)

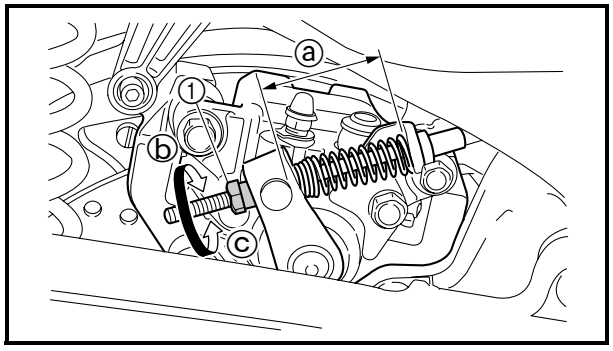
12. Install:
    - radiator cap
13. Fill:
    - coolant reservoir
      (with the recommended coolant to the maximum level mark ⓐ)
14. Install:
    - coolant reservoir cap
15. Start the engine, warm it up for several minutes, and then stop it.
16. Check:
    - coolant level
      Refer to "CHECKING THE COOLANT LEVEL".



NOTE:

Before checking the coolant level, wait a few minutes until the coolant has settled.

17. Install:
    - storage box
    - footrest board (right)
      Refer to "SIDE COVER MOULDINGS AND FOOTREST BOARDS".



EAS00116

CHASSIS

ADJUSTING THE REAR BRAKE LOCK LEVER CABLE

NOTE:

- Place the scooter on a suitable stand.
- Before adjusting the rear brake lock lever, check the rear brake fluid level.

1. Measure:
   - rear brake lock lever cable length ⓐ
     Out of specification → Adjust.

	Rear brake lock lever cable length 45 ~ 47 mm (1.77 ~ 1.85 in)

2. Adjust:
   - rear brake lock lever cable length

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a. Turn the adjusting nut ① in direction ⓑ or ⓒ until the rear brake lock lever cable length ⓐ is 42 ~ 44 mm (1.65 ~ 1.73 in) when the rear brake lock lever is released.
b. Slowly apply the rear brake several times.
c. Set the rear brake lock lever and wait more than 5 minutes.
d. Release the rear brake lock lever.
e. Turn the adjusting nut ① in direction ⓑ or ⓒ until the rear brake lock lever cable length ⓐ is 45 ~ 47 mm (1.77 ~ 1.85 in).

Direction ⓑ	**Rear brake lock lever cable length is increased.**
Direction ⓒ	**Rear brake lock lever cable length is decreased.**

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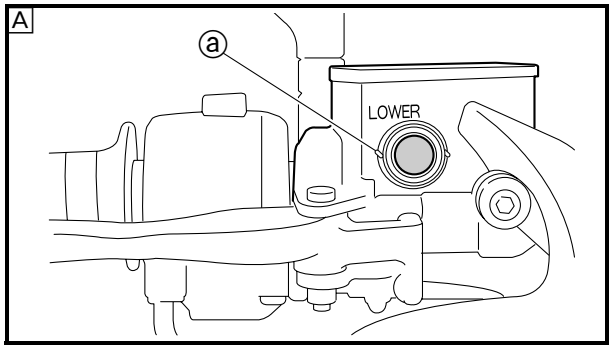
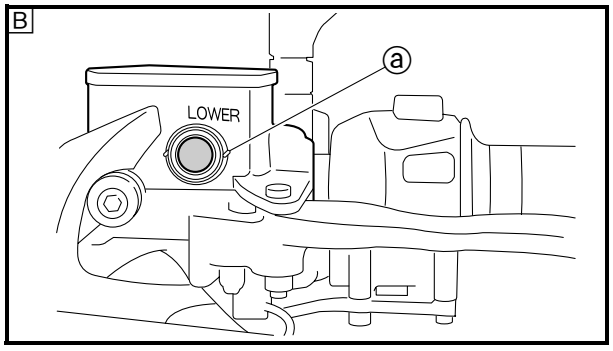




CHECKING THE BRAKE FLUID LEVEL

1. Stand the scooter on a level surface.

NOTE:

- Place the scooter on a suitable stand.
- Make sure the scooter is upright.

2. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.

Recommended brake fluid
DOT 4

A Front brake
B Rear brake

⚠ WARNING

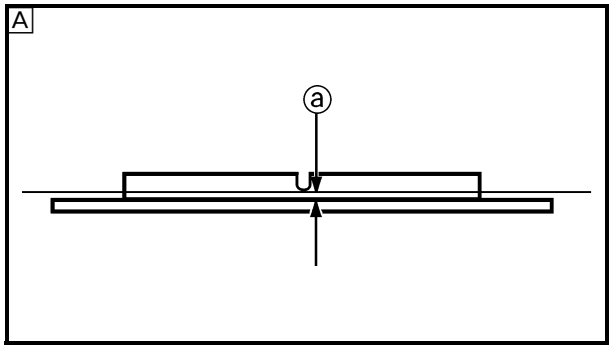
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

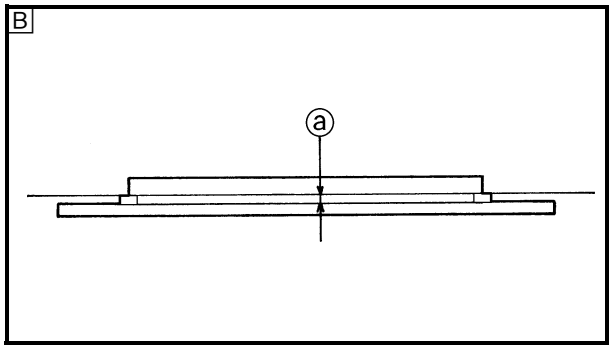
CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

NOTE:

In order to ensure a correct reading of the brake fluid level, make sure the top of the brake master cylinder reservoir is horizontal.



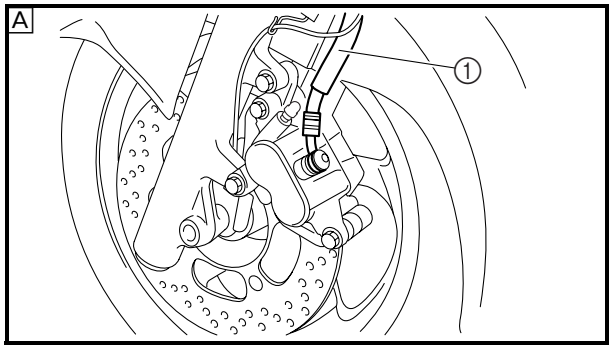


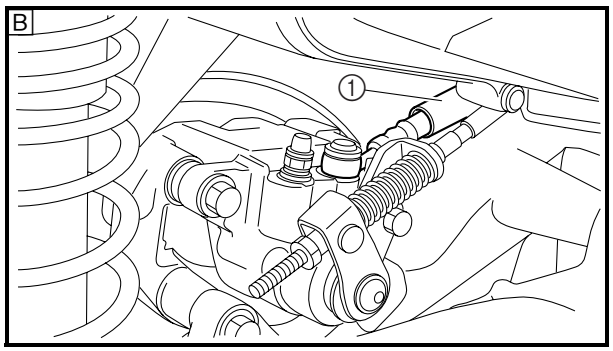
EAS00118
CHECKING THE FRONT AND REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
   - front brake pad
     Wear indicator groove ⓐ almost disappeared → Replace the brake pads as a set.
     Refer to "REPLACING THE FRONT BRAKE PADS" in chapter 4.
   - rear brake pad
     Wear indicator ⓐ almost touch the brake disc → Replace the brake pads as a set.
     Refer to "REPLACING THE REAR BRAKE PADS" in chapter 4.

A Front brake
B Rear brake





EAS00132
CHECKING THE FRONT AND REAR BRAKE HOSES

The following procedure applies to all of the brake hoses and brake hose clamps.

1. Check:
   - brake hose ①
     Cracks/damage/wear → Replace.

A Front brake
B Rear brake

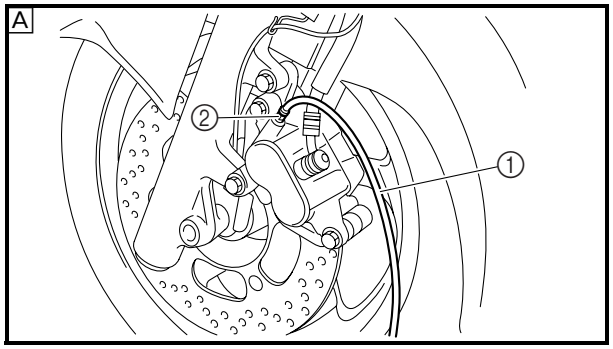
2. Check:
   - brake hose clamp
     Loose → Tighten the clamp bolt.
3. Hold the scooter upright and apply the brake several times.
4. Check:
   - brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to "FRONT AND REAR BRAKES" in chapter 4.

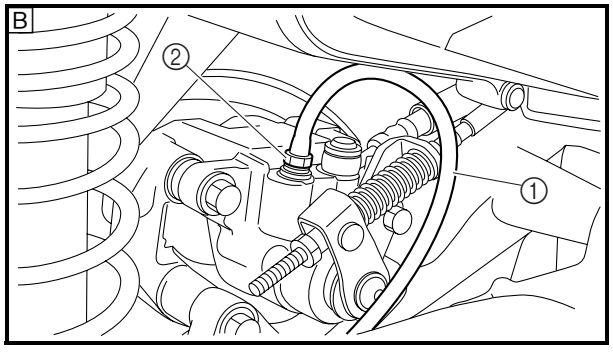
EAS00134
BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠ WARNING

Bleed the hydraulic brake system whenever:
- **the system is disassembled.**
- **a brake hose is loosened, disconnected or replaced.**
- **the brake fluid level is very low.**
- **brake operation is faulty.**

NOTE:
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.





1. Bleed:
   - hydraulic brake system

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a. Fill the brake master cylinder reservoir to the proper level with the recommended brake fluid.
b. Install the brake master cylinder reservoir diaphragm.
c. Connect a clear plastic hose ① tightly to the bleed screw ②.

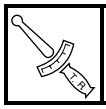
A Front
B Rear

d. Place the other end of the hose into a container.
e. Slowly apply the brake several times.
f. Fully squeeze the brake lever and do not release it.

g. Loosen the bleed screw.

NOTE:
Loosening the bleed screw will release the pressure and cause the brake levers to contact the handlebar.

h. Tighten the bleed screw and then release the brake lever.
i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
j. Tighten the bleed screw to specification.



Bleed screw
6 Nm (0.6 m · kg, 4.3 ft · lb)

k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
Refer to "CHECKING THE BRAKE FLUID LEVEL".

⚠ WARNING

After bleeding the hydraulic brake system, check the brake operation.

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EAS00148
CHECKING AND ADJUSTING THE STEERING HEAD

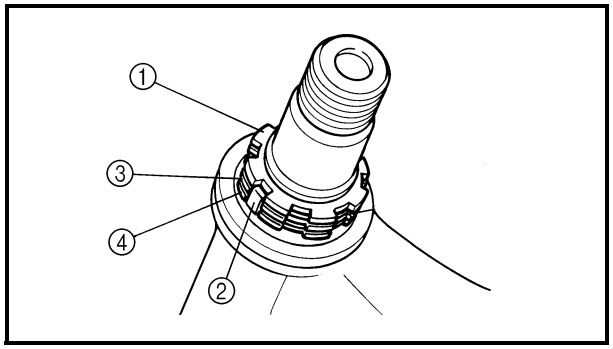
1. Stand the scooter on a level surface.

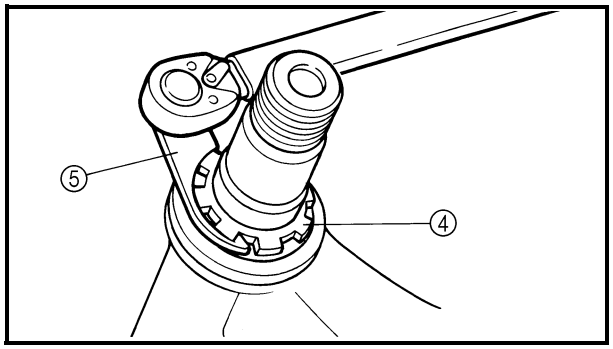
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:
Place the scooter on a suitable stand so that the front wheel is elevated.

2. Check:
- steering head
Grasp the bottom of the front fork legs and gently rock the front fork.
Binding/looseness → Adjust the steering head.





3. Remove:
   • lower handlebar holder
   Refer to "STEERING HEAD" in chapter 4.
4. Adjust:
   • steering head

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a. Remove the upper steering ring nut ①, the lock washer ②, the center steering ring nut ③ and the rubber washer.
b. Loosen the lower steering ring nut ④ and then tighten it to specification with the steering nut wrench ⑤.

NOTE:
Set a torque wrench at a right angle to the steering nut wrench.

	**Steering nut wrench** **90890-01403, YU-A9472**

	**Lower steering ring nut (initial tightening torque)** **36 Nm (3.6 m · kg, 25 ft · lb)**

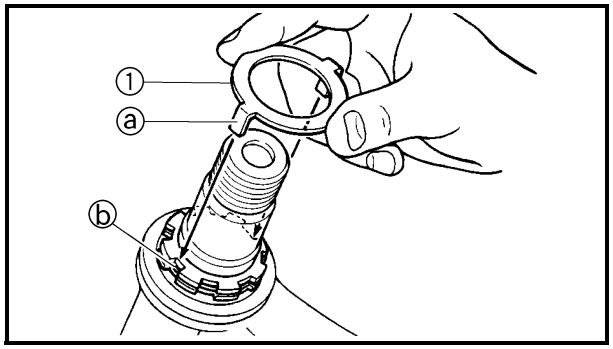
c. Loosen the lower steering ring nut ④ 1/4 turn, and then tighten it to the specified torque with a torque wrench and the steering nut wrench.

⚠ WARNING

Do not overtighten the lower steering ring nut.

	**Lower steering ring nut (final tightening torque)** **24 Nm (2.4 m · kg, 17 ft · lb)**

d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
   Refer to "STEERING HEAD" in chapter 4.
e. Install the rubber washer.
f. Install the center steering ring nut.



g. Finger tighten the center steering ring nut, and then align the slots of both ring nuts. If necessary, hold the lower steering ring nut and tighten the center steering ring nut until their slots are aligned.
h. Install the lock washer ①.

NOTE:
Make sure the lock washer tabs ⓐ sit correctly in the steering ring nut slots ⓑ.

i. Install the upper steering ring nut.
j. Hold the lower and center steering ring nuts with a steering nut wrench and tighten the upper steering ring nut with a steering nut wrench.

	**Steering nut wrench** **90890-01403, YU-A9472**

	**Upper steering ring nut** **90 Nm (9.0 m · kg, 65 ft · lb)**

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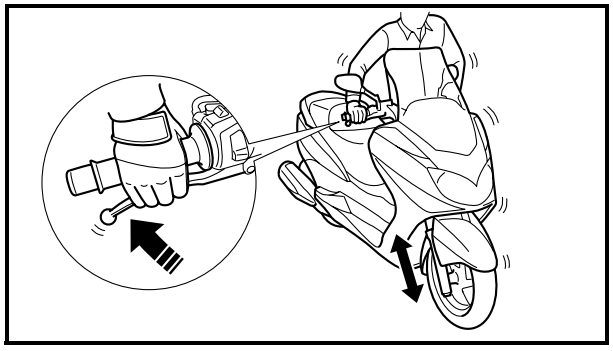
5. Install:
   • lower handlebar holder
   Refer to “STEERING HEAD” in chapter 4.



EAS00151
CHECKING THE FRONT FORK

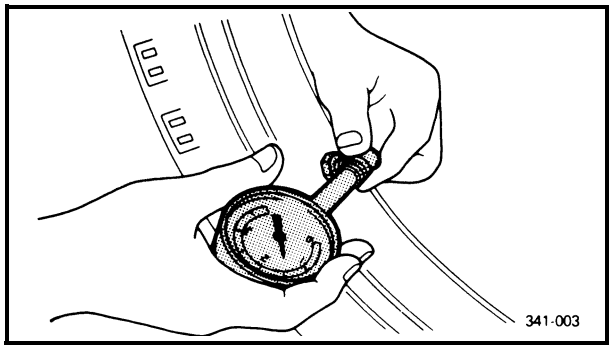
1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

2. Check:
   • inner tube
   Damage/scratches → Replace.
   • oil seal
   Oil leakage → Replace.
3. Hold the scooter upright and apply the front brake.

4. Check:
   • front fork operation
   Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
   Rough movement → Repair.
   Refer to “FRONT FORK” in chapter 4.



EAS00165
CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   • tire pressure
   Out of specification → Regulate.

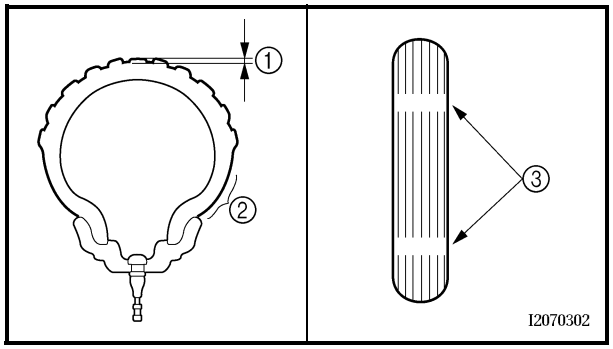
⚠ WARNING

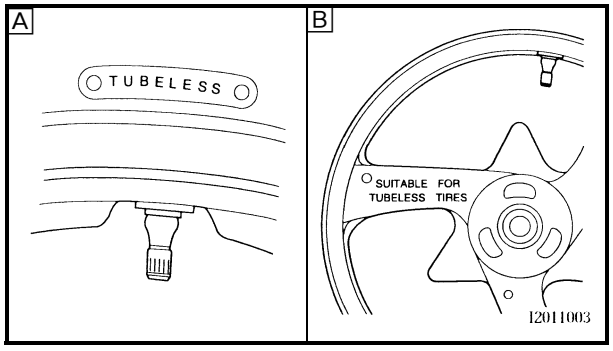
- **The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.**
- **The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.**
- **Operation of an overloaded scooter could cause tire damage, an accident or an injury.**

NEVER OVERLOAD THE SCOOTER.

Basic weight (with oil and a full fuel tank)	**212 kg (467 lb)**	
Maximum load*	**196 kg (432 lb)**	
Cold tire pressure	**Front**	**Rear**
Up to 90 kg load*	**200 kPa (2.00 kgf/cm², 29 psi)**	**250 kPa (2.50 kgf/cm², 36 psi)**
90 kg ~ maximum load*	**200 kPa (2.00 kgf/cm², 29 psi)**	**250 kPa (2.50 kgf/cm², 36 psi)**
High-speed riding	**200 kPa (2.00 kgf/cm², 29 psi)**	**250 kPa (2.50 kgf/cm², 36 psi)**

* Total weight of rider, passenger, cargo and accessories





⚠ WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

2. Check:
   - tire surfaces
     Damage/wear → Replace the tire.

	Minimum tire tread depth 1.0 mm (0.04 in)

① Tire tread depth
② Sidewall
③ Wear indicator

⚠ WARNING

- **Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.**
- **When using tube tires, be sure to install the correct tube.**
- **Always replace a new tube tire and a new tube as a set.**
- **To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.**
- **Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.**

A Tire
B Wheel

Tube wheel	**Tube tire only**
Tubeless wheel	**Tube or tubeless tire**

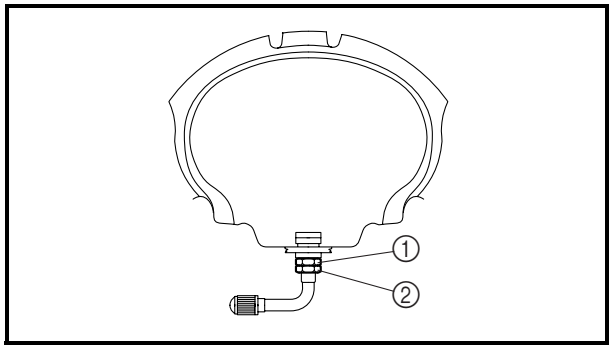
- **After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this scooter.**

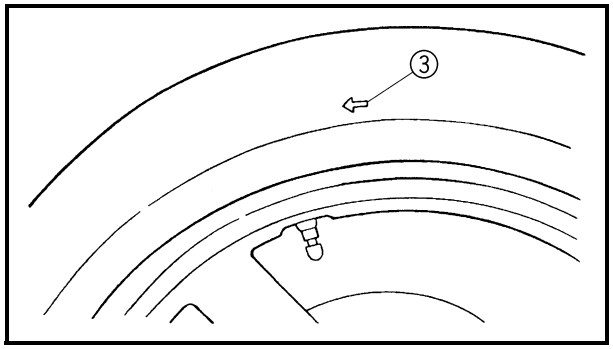
Front tire

Manufacturer	Size	Model
DUNLOP	120/80-14M/C 58S	D305FL
IRC	120/80-14M/C 58S	MB 67

Rear tire

Manufacturer	Size	Model
DUNLOP	150/70-13M/C 64S	D305L
IRC	150/70-13M/C 64S	MB 67





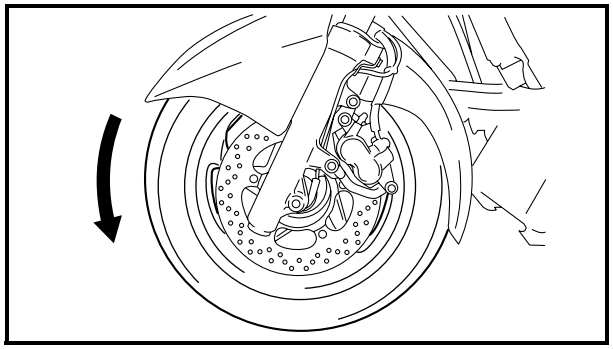
⚠ WARNING

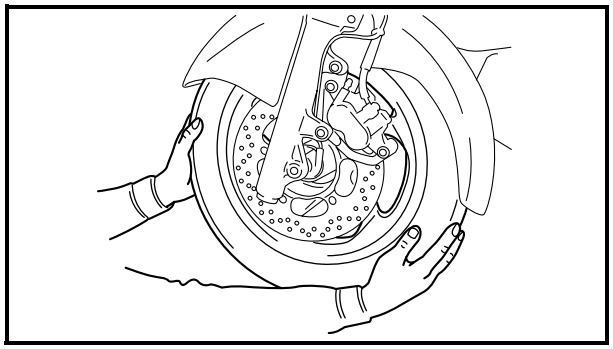
- **New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.**
- **After a tire has been repaired or replaced, be sure to tighten the tire air valve stem nut ① and locknut ② to specification. (rear tire only)**

NOTE:

For tires with a direction of rotation mark ③, install the tire with the mark pointing in the direction of wheel rotation.

Tire air valve stem (rear tire only)
Valve stem nut
1.5 Nm (0.15 m · kg, 1.1 ft · lb)
Valve stem locknut
3 Nm (0.3 m · kg, 2.2 ft · lb)





EAS00168
CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
   - wheel
     Damage/out-of-round → Replace.

⚠ WARNING

Never attempt to make any repairs to the wheel.

NOTE:

After a tire or wheel has been changed or replaced, always balance the wheel.

EAS00170
CHECKING AND LUBRICATING THE CABLES

The following procedure applies to all of the inner and outer cables.

⚠ WARNING

Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
   - outer cable
     Damage → Replace.
2. Check:
   - cable operation
     Rough movement → Lubricate.

Recommended lubricant
Engine oil or a suitable cable lubricant

NOTE:

Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.

EAS00171
LUBRICATING THE LEVERS

Lubricate the pivoting point and metal-to-metal moving parts of the levers.

	Recommended lubricant **Lithium-soap-based grease**

EAS00172
LUBRICATING THE SIDESTAND

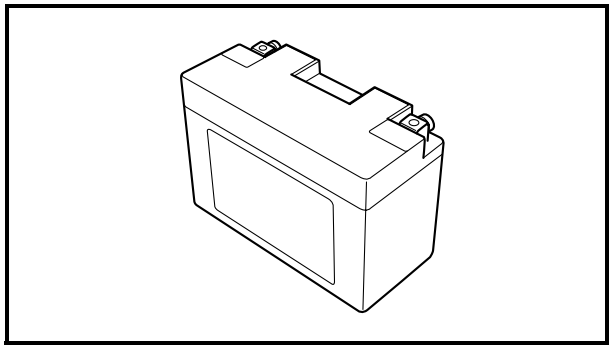
Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.

	Recommended lubricant **Lithium-soap-based grease**

EAS00173
LUBRICATING THE CENTERSTAND

Lubricate the pivoting point and metal-to-metal moving parts of the centerstand.

	Recommended lubricant **Lithium-soap-based grease**



EAS00179

ELECTRICAL SYSTEM

CHECKING AND CHARGING THE BATTERY

⚠ WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**

FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL

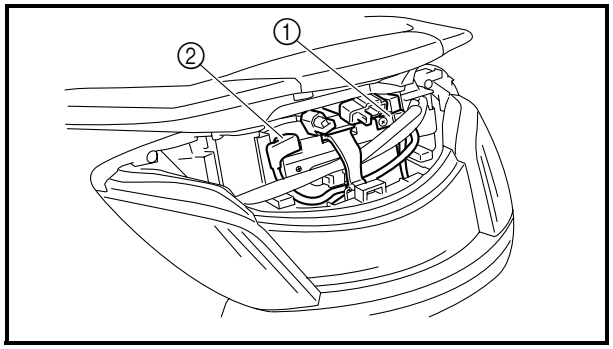
- **Skin — Wash with water.**
- **Eyes — Flush with water for 15 minutes and get immediate medical attention.**

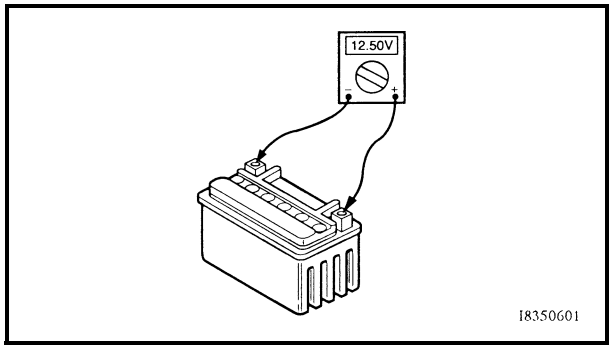
INTERNAL

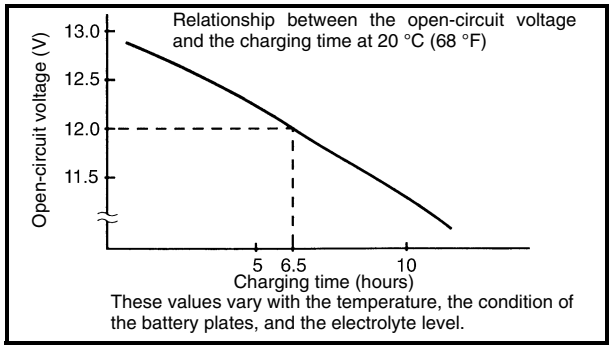
- **Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.**

CAUTION:

- **This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.**
- **Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**







NOTE:

Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
   - upper rear cover
     Refer to "PASSENGER SEAT AND SIDE COVERS".
2. Disconnect:
   - battery leads
     (from the battery terminals)

CAUTION:

First, disconnect the negative battery lead ①, and then the positive battery lead ②.

3. Remove:
   - battery
4. Check:
   - battery charge

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a. Connect a pocket tester to the battery terminals.

Positive tester probe →
positive battery terminal
Negative tester probe →
negative battery terminal

NOTE:

- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

b. Check the charge of the battery, as shown in the charts and the following example.

Example

c. Open-circuit voltage = 12.0 V
d. Charging time = 6.5 hours
e. Charge of the battery = 20 ~ 30%

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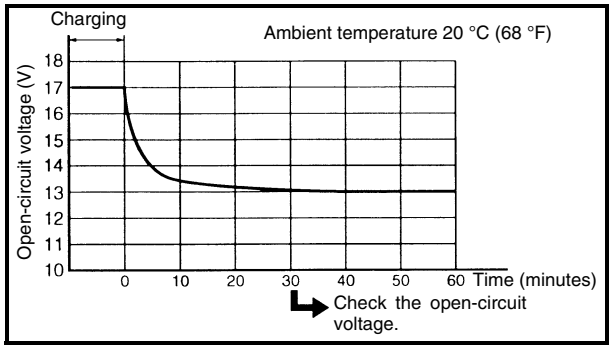
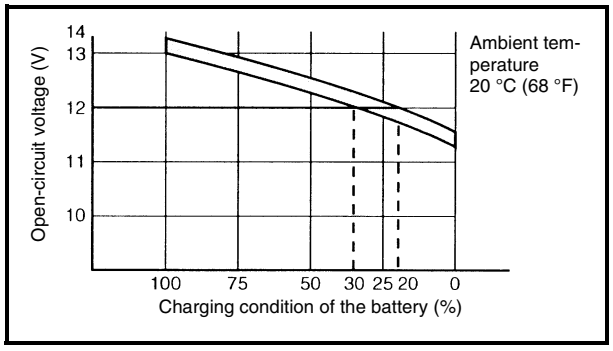




5. Charge:
   - battery
     (refer to the appropriate charging method illustration)

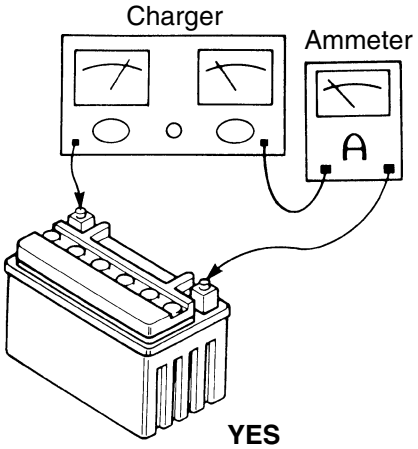
⚠ WARNING

Do not quick charge a battery.

CAUTION:

- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.**
- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **When charging a battery, be sure to remove it from the scooter. (If charging has to be done with the battery mounted on the scooter, disconnect the negative battery lead from the battery terminal.)**
- **To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.**
- **Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.**
- **Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.**
- **If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!**
- **As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.**

Charging method using a variable-current (voltage) charger



Measure the open-circuit voltage prior to charging.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

YES

NO

NOTE:
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

NOTE:
Set the charging voltage to 16 ~ 17 V. (If the charging voltage is lower, charging will be insufficient, if it is higher, the battery will be over-charged.)

Adjust the charging voltage to 20 ~ 25 V.

Monitor the amperage for 3 ~ 5 minutes. Is the standard charging amperage exceeded?

YES

NO

Adjust the voltage to obtain the standard charging amperage.

If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.

Set the timer to the charging time determined by the open-circuit voltage.
Refer to "CHECKING AND CHARGING THE BATTERY".

If the required charging time exceeds 5 hours, it is advisable to check the charging amperage after 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging amperage.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.
12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.
Under 12.0 V → Replace the battery.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

NOTE:
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

YES

Charge the battery until the charging voltage reaches 15 V.

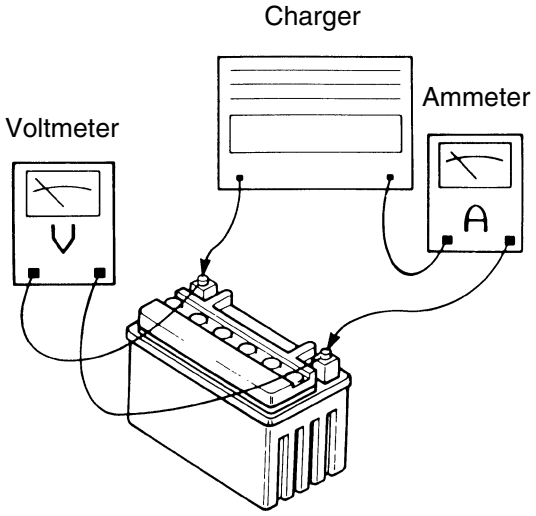
NOTE:
Set the charging time to a maximum of 20 hours.

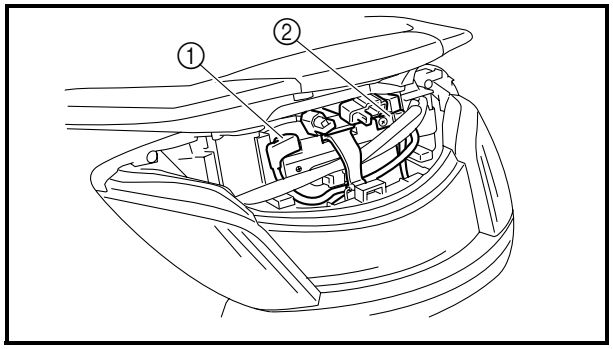
Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.
12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.
Under 12.0 V → Replace the battery.

CAUTION:
Constant amperage chargers are not suitable for charging MF batteries.

NO

This type of battery charger cannot charge an MF battery. A variable voltage charger is recommended.





6. Install:
   • battery
7. Connect:
   • battery leads
     (to the battery terminals)

CAUTION:

First, connect the positive battery lead ①, and then the negative battery lead ②.

8. Check:
   • battery terminals
     Dirt → Clean with a wire brush.
     Loose connection → Connect properly.
9. Lubricate:
   • battery terminals

	Recommended lubricant **Dielectric grease**

10. Install:
    • upper rear cover
      Refer to “PASSENGER SEAT AND SIDE COVERS”.

EAS00181

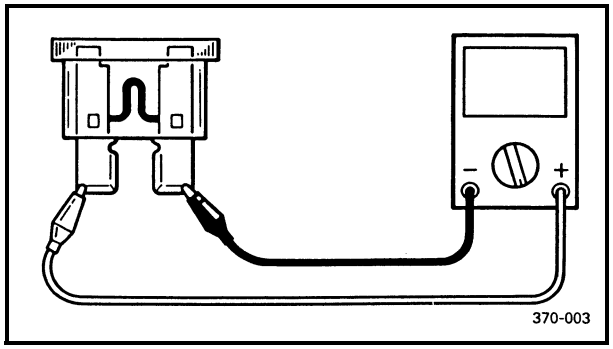
CHECKING THE FUSES

The following procedure applies to all of the fuses.

CAUTION:

To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
   • side covers (left and right)
     Refer to “PASSENGER SEAT AND SIDE COVERS”.



2. Check:
   • fuse

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a. Connect the pocket tester to the fuse and check the continuity.

NOTE:

Set the pocket tester selector to "Ω × 1".

	Pocket tester **90890-03112, YU-03112-C**

b. If the pocket tester indicates "∞", replace the fuse.

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3. Replace:
   • blown fuse

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a. Set the main switch to "OFF".
b. Install a new fuse of the correct amperage rating.
c. Set on the switches to verify if the electrical circuit is operational.
d. If the fuse immediately blows again, check the electrical circuit.

Fuses	Amperage rating	Q'ty
Main	40 A	1
Headlight	20 A	1
Signaling system	10 A	1
Ignition	10 A	1
Radiator fan motor	10 A	1
Turn signal/position light	10 A	1
Fuel injection system	10 A	1
Backup (storage box light and meter assembly)	10 A	1
Spare	40 A 25 A 10 A × 2	1 1 1

⚠ WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

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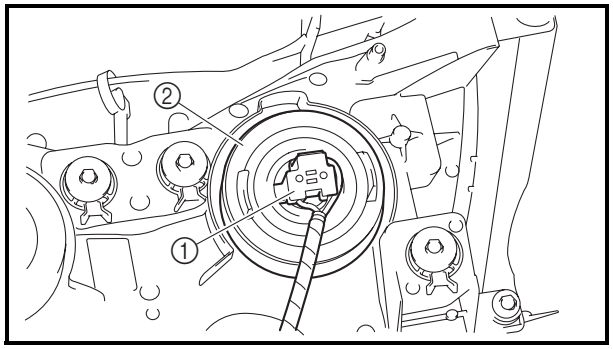
4. Install:
   - side covers (left and right)
     Refer to "PASSENGER SEAT AND SIDE COVERS".

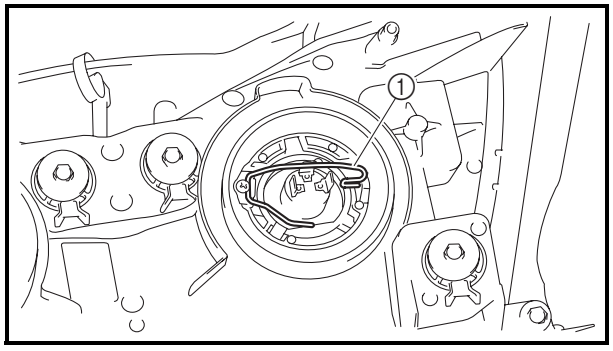
EAS00183
REPLACING THE HEADLIGHT BULBS

The following procedure applies to both of the headlight bulbs.

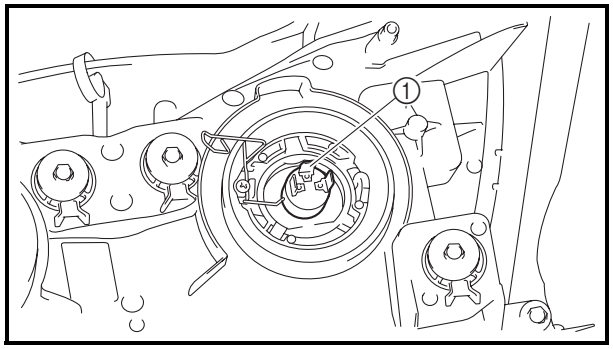
1. Remove:
   - front cowling
     Refer to "FRONT COWLING".



2. Disconnect:
   - headlight coupler ①
3. Remove:
   - headlight bulb holder cover ②



4. Detach:
   - headlight bulb holder ①



5. Remove:
   • headlight bulb ①

⚠ WARNING

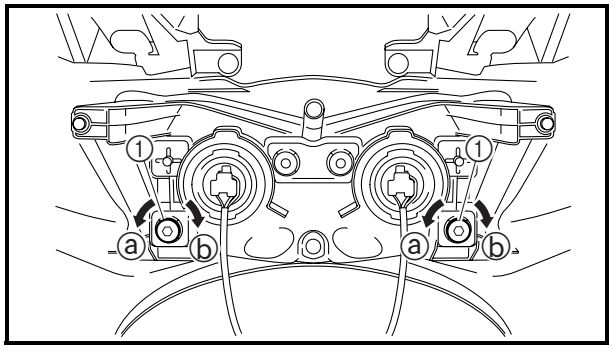
Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

6. Install:
   • headlight bulb New
   Secure the new headlight bulb with the headlight bulb holder.

CAUTION:

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

7. Attach:
   • headlight bulb holder
8. Install:
   • headlight bulb holder cover
9. Connect:
   • headlight coupler
10. Install:
   • front cowling
   Refer to “FRONT COWLING”.



EAS00185
ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

1. Adjust:
   • headlight beam (vertically)

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a. Turn the adjusting screw ① in direction ⓐ or ⓑ.

Direction ⓐ	**Headlight beam is raised.**
Direction ⓑ	**Headlight beam is lowered.**

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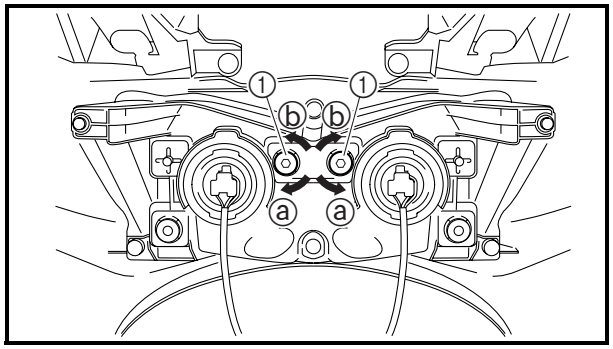

2. Adjust:
   • headlight beam (horizontally)

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a. Turn the adjusting screw ① in direction ⓐ or ⓑ.

Direction ⓐ	**Headlight beam moves to the right.**
Direction ⓑ	**Headlight beam moves to the left.**

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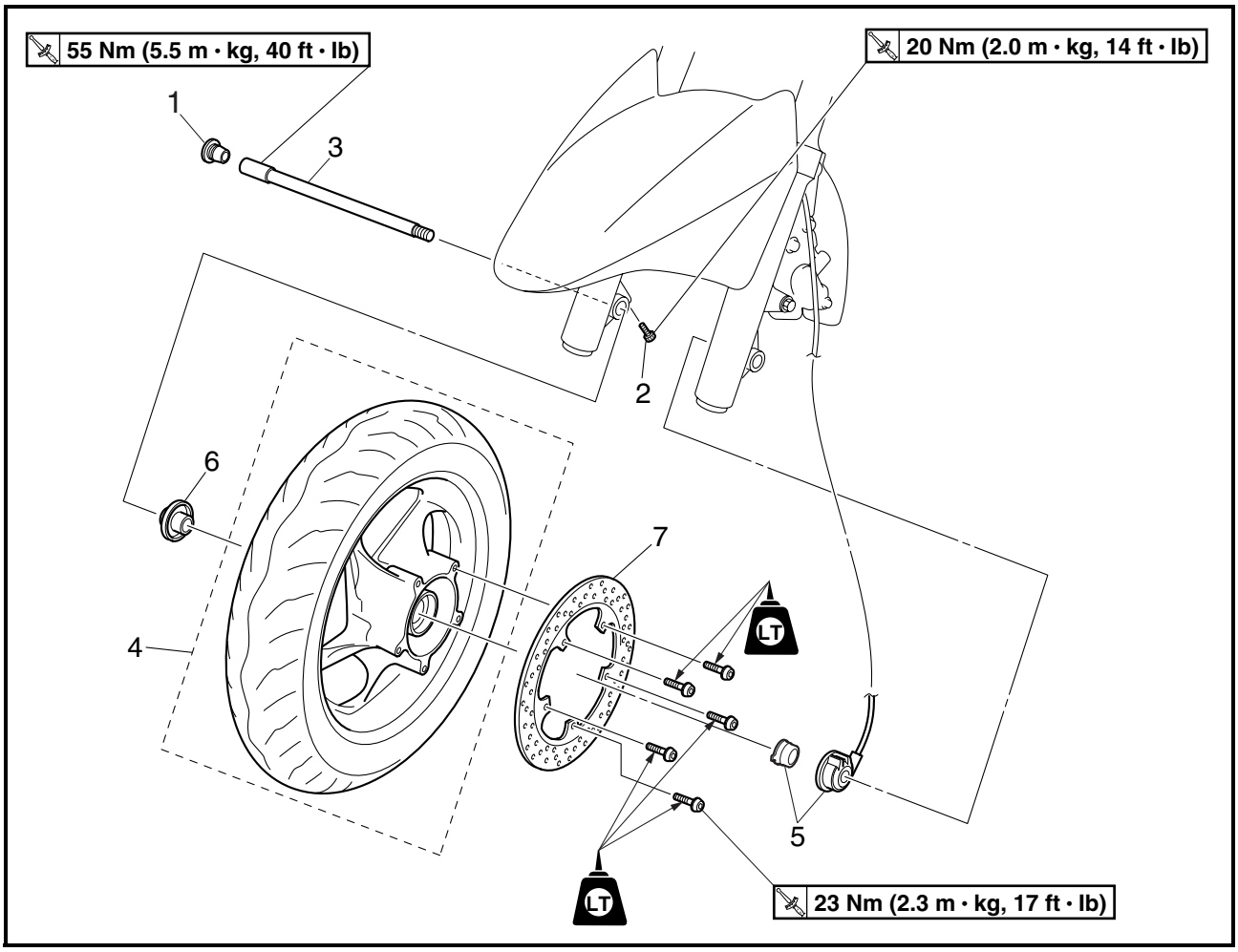
EAS00513

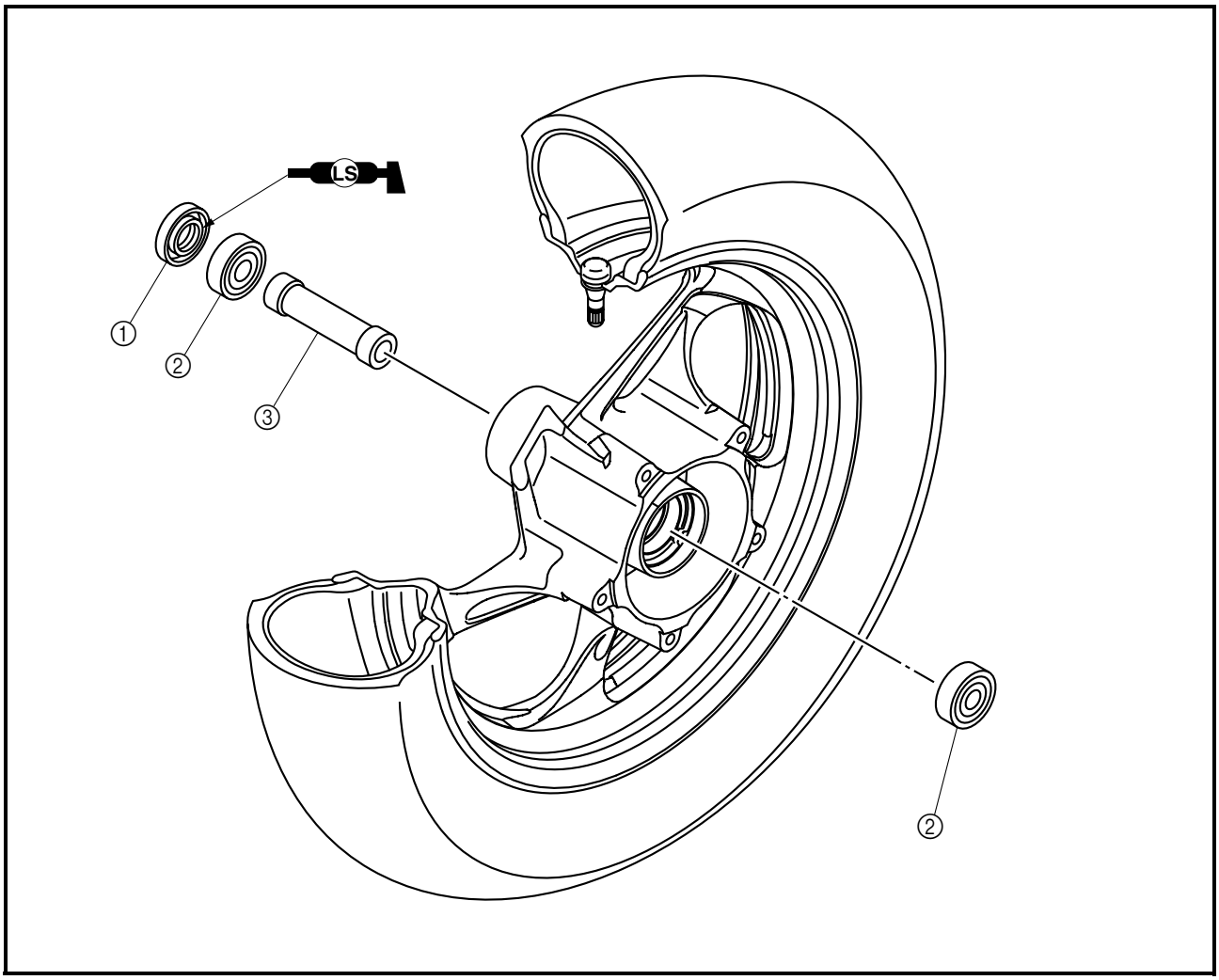
CHASSIS

FRONT WHEEL AND BRAKE DISC



Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake disc		Remove the parts in the order listed. **NOTE:** Place the scooter on a suitable stand so that the front wheel is elevated.
1	Front wheel axle end plug	1	
2	Front wheel axle pinch bolt	1	Loosen.
3	Front wheel axle	1	Refer to "REMOVING THE FRONT WHEEL" and "INSTALLING THE FRONT WHEEL".
4	Front wheel assembly	1	
5	Speed sensor	1	
6	Spacer	1	
7	Front brake disc	1	
			For installation, reverse the removal procedure.

EAS00518



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Remove the parts in the order listed.
①	Oil seal	1	
②	Bearing	2	
③	Collar	1	
			For assembly, reverse the disassembly procedure.

EAS00520
REMOVING THE FRONT WHEEL

1. Stand the scooter on a level surface.

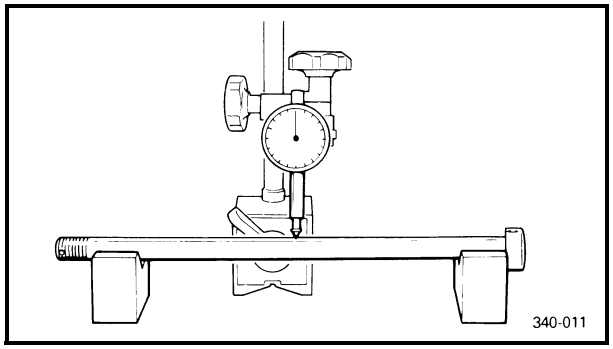
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

2. Elevate:
   - front wheel

NOTE:

Place the scooter on a suitable stand so that the front wheel is elevated.



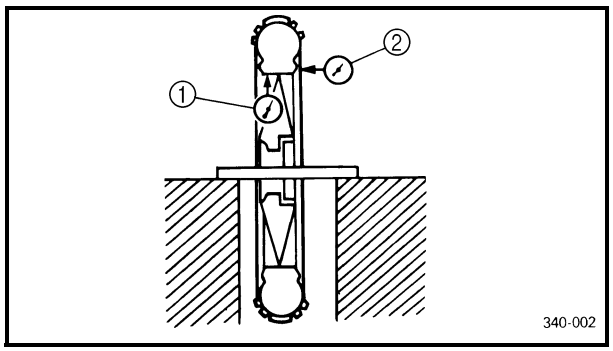
EAS00525
CHECKING THE FRONT WHEEL

1. Check:
   - wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

⚠ WARNING

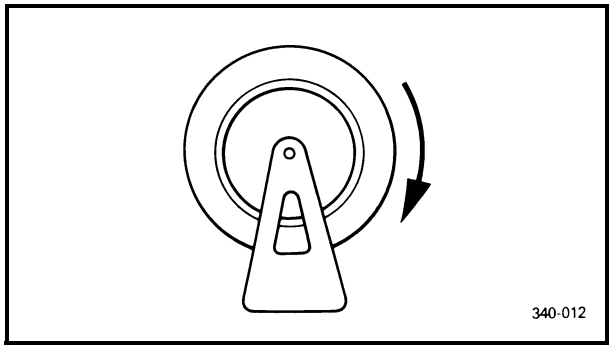
Do not attempt to straighten a bent wheel axle.

2. Check:
   - tire
   - front wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.

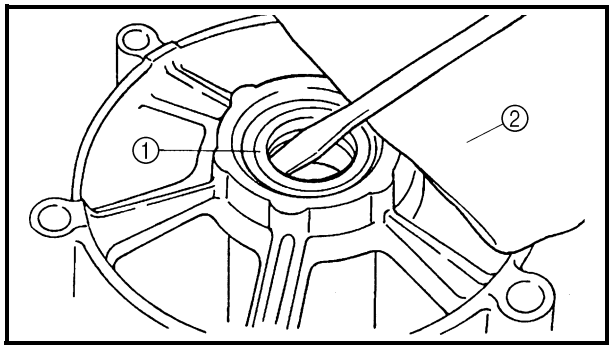


3. Measure:
   - radial wheel runout ①
   - lateral wheel runout ②
     Over the specified limits → Replace.

Radial wheel runout limit
1.0 mm (0.04 in)
Lateral wheel runout limit
0.5 mm (0.02 in)



4. Check:
   - wheel bearings
     Front wheel turns roughly or is loose → Replace the wheel bearings.
   - oil seals
     Damage/wear → Replace.



5. Replace:
   - wheel bearings New
   - oil seal New

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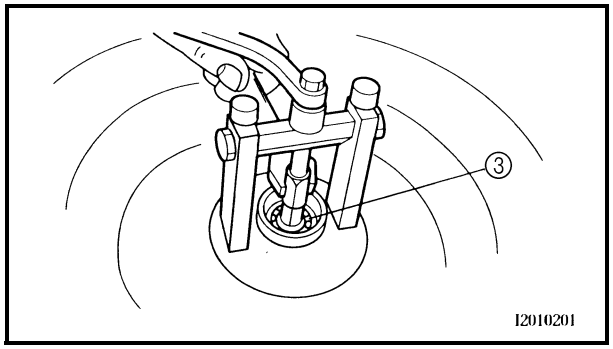
a. Clean the outside of the front wheel hub.
b. Remove the oil seals ① with a flat-head screwdriver.

NOTE:

To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.



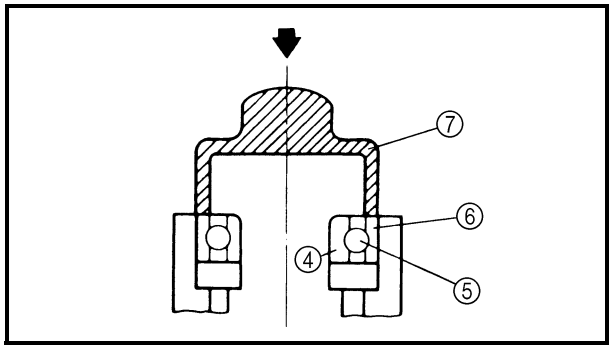
c. Remove the wheel bearings ③ with a general bearing puller.
d. Install the new wheel bearings and new oil seal in the reverse order of disassembly.

CAUTION:

Do not contact the wheel bearing inner race ④ or balls ⑤. Contact should be made only with the outer race ⑥.

NOTE:

Use a socket ⑦ that matches the diameter of the wheel bearing outer race and oil seal.



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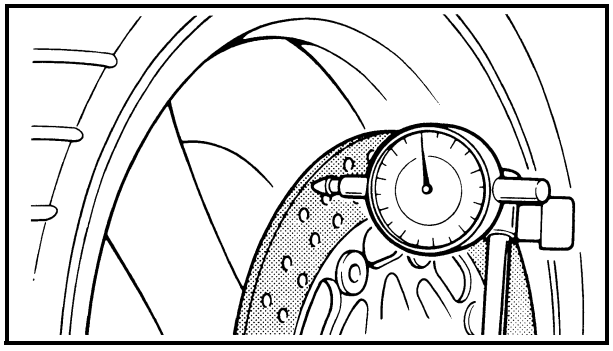
EAS00532
CHECKING THE BRAKE DISCS

The following procedure applies to each brake disc.

1. Check:
   - brake disc
     Damage/galling → Replace.



2. Measure:
   • brake disc deflection
   Out of specification → Correct the brake disc deflection or replace the brake disc.

Brake disc deflection limit (maximum)
Front: 0.15 mm (0.006 in)
Rear: 0.15 mm (0.006 in)

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a. Place the scooter on a suitable stand so that the wheel is elevated.
b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
c. Remove the brake caliper.
d. Hold the dial gauge at a right angle against the brake disc surface.
e. Measure the deflection 1.5 mm (0.06 in) below the edge of the brake disc.

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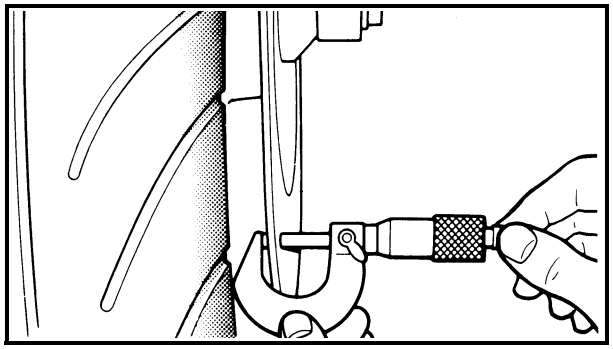
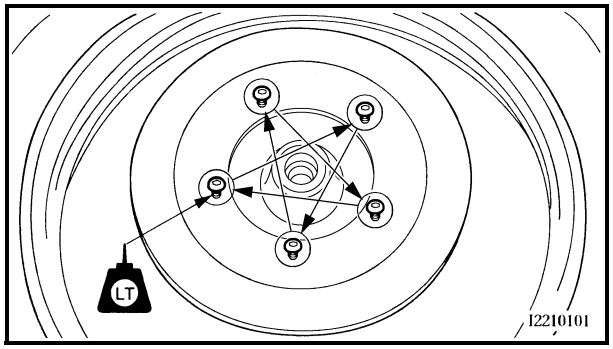


3. Measure:
   • brake disc thickness
   Measure the brake disc thickness at a few different locations.
   Out of specification → Replace.

Brake disc thickness limit (minimum)
Front: 4.5 mm (0.18 in)
Rear: 4.5 mm (0.18 in)



4. Adjust:
   • brake disc deflection

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a. Remove the brake disc.
b. Rotate the brake disc by one bolt hole.
c. Install the brake disc.

NOTE:

Tighten the brake disc bolts in stages and in a crisscross pattern.

	**Brake disc bolt** **23 Nm (2.3 m · kg, 17 ft · lb)** **LOCTITE®**

d. Measure the brake disc deflection.
e. If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.
f. If the brake disc deflection cannot be brought within specification, replace the brake disc.

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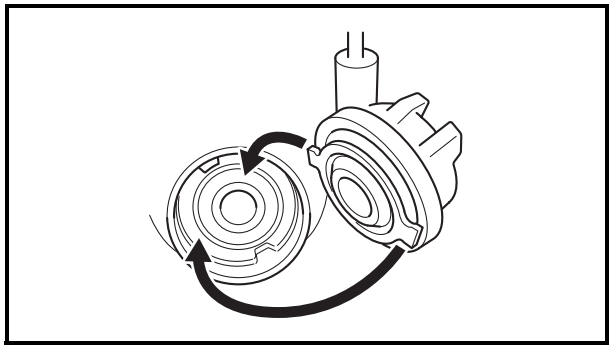
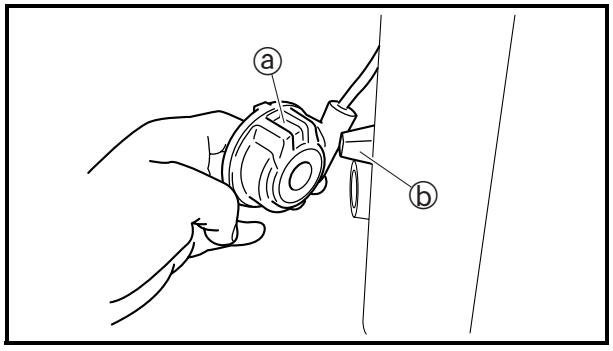
EAS00542
INSTALLING THE FRONT WHEEL

1. Lubricate:
   • wheel axle
   • wheel bearings
   • oil seal lips
   • speed sensor

	**Recommended lubricant** **Lithium-soap-based grease**





2. Install:
   - spacer
   - speed sensor
   - front wheel

NOTE:
- Make sure that the projections on the speed sensor are installed in the slots on the wheel hub.
- Make sure that the slot ⓐ in the speed sensor fits over the stopper ⓑ on the outer tube.

3. Tighten:
   - front wheel axle

55 Nm (5.5 m · kg, 40 ft · lb)

   - front wheel axle pinch bolt

20 Nm (2.0 m · kg, 14 ft · lb)

⚠ WARNING

Make sure the brake hose is routed properly.

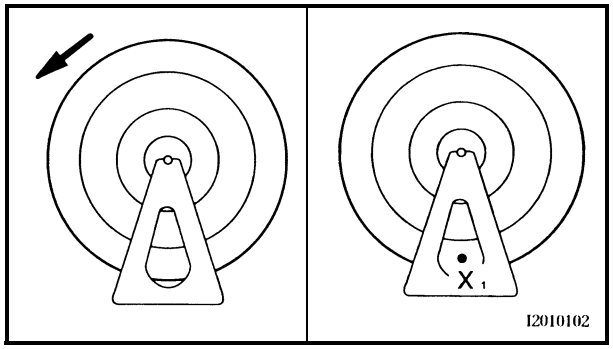
CAUTION:

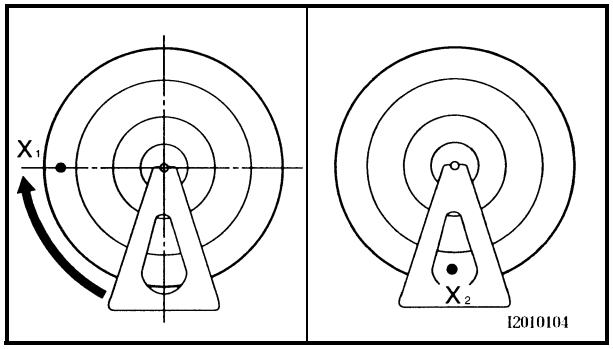
Before tightening the wheel axle nut, push down hard on the handlebar several times and check if the front fork rebounds smoothly.

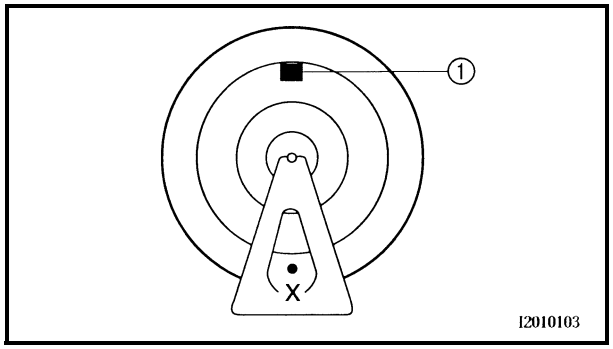
EAS00548
ADJUSTING THE FRONT WHEEL STATIC BALANCE

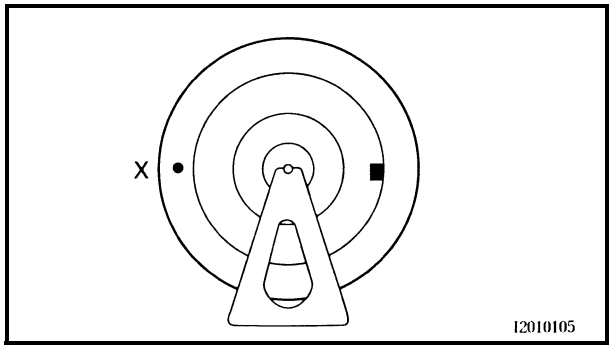
NOTE:
- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

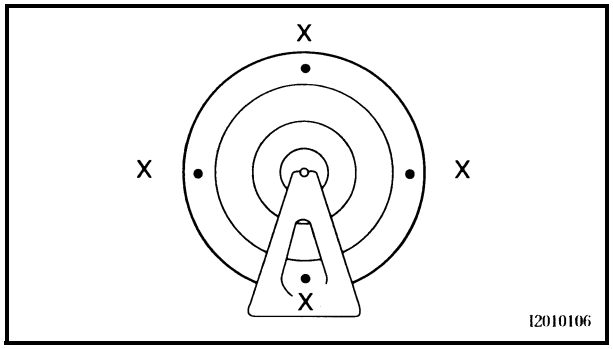
1. Remove:
   - balancing weight(s)











2. Find:
   • front wheel's heavy spot

NOTE:
Place the front wheel on a suitable balancing stand.

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a. Spin the front wheel.
b. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.
c. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.
d. Release the front wheel.
e. When the wheel stops, put an "X_2" mark at the bottom of the wheel.
f. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.
g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

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3. Adjust:
   • front wheel static balance

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a. Install a balancing weight ① onto the rim exactly opposite the heavy spot "X".

NOTE:
Start with the lightest weight.

b. Turn the front wheel 90° so that the heavy spot is positioned as shown.
c. If the heavy spot does not stay in that position, install a heavier weight.
d. Repeat steps (b) and (c) until the front wheel is balanced.

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4. Check:
   • front wheel static balance

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a. Turn the front wheel and make sure it stays at each position shown.
b. If the front wheel does not remain stationary at all of the positions, rebalance it.

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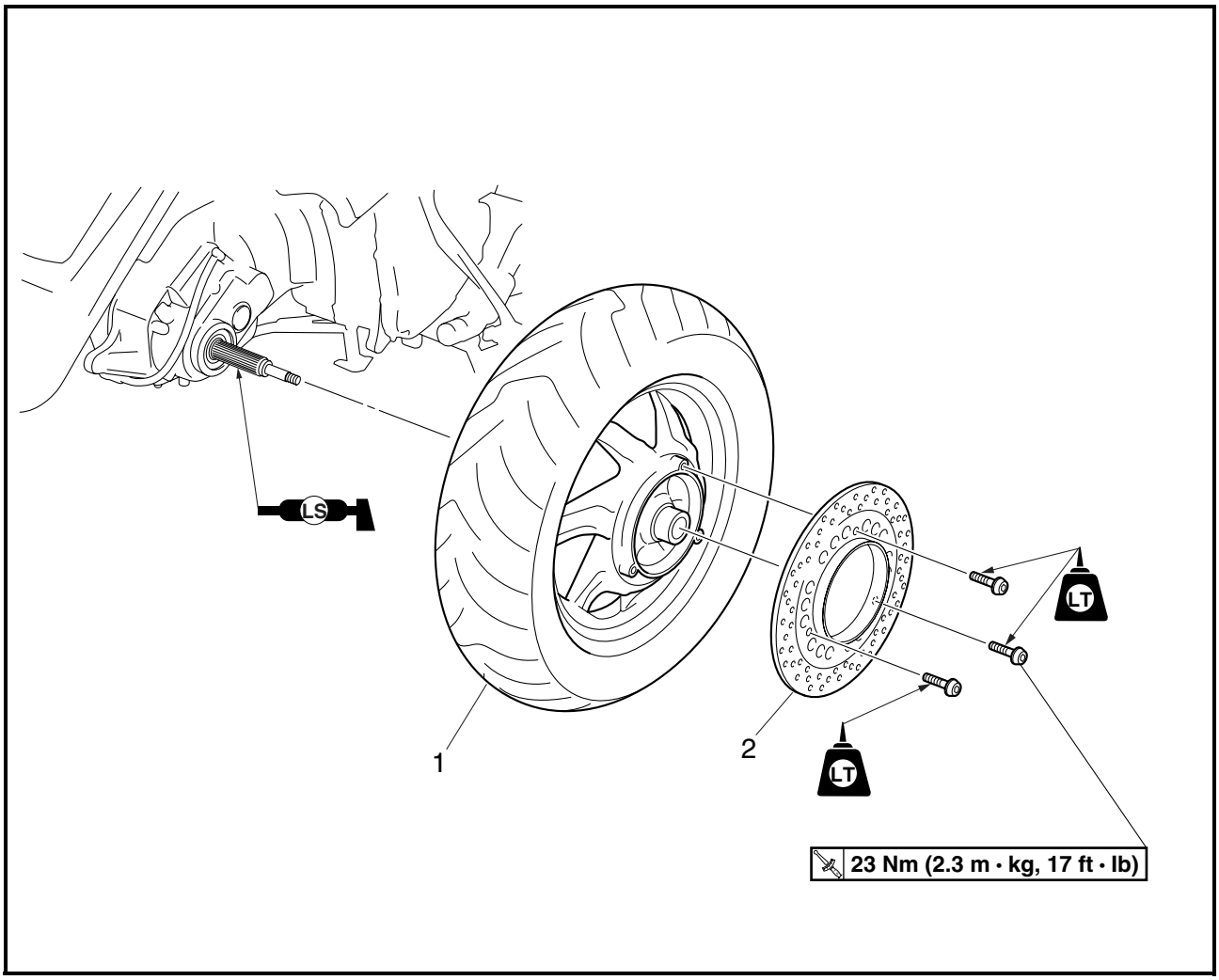
EAS00552
REAR WHEEL AND BRAKE DISC



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel and brake disc		Remove the parts in the order listed. **NOTE:** Place the scooter on a suitable stand so that the rear wheel is elevated.
	Muffler		Refer to "ENGINE REMOVAL" in chapter 5.
	Swingarm		Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM".
1	Rear wheel	1	Refer to "REMOVING THE REAR WHEEL".
2	Rear brake disc	1	For installation, reverse the removal procedure.

EAS00561
REMOVING THE REAR WHEEL

1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the rear wheel is elevated.

EAS00565
CHECKING THE REAR WHEEL

1. Check:
   - tire
   - rear wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.
2. Measure:
   - radial wheel runout
   - lateral wheel runout
     Refer to "CHECKING THE FRONT WHEEL".

EAS00575
ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:

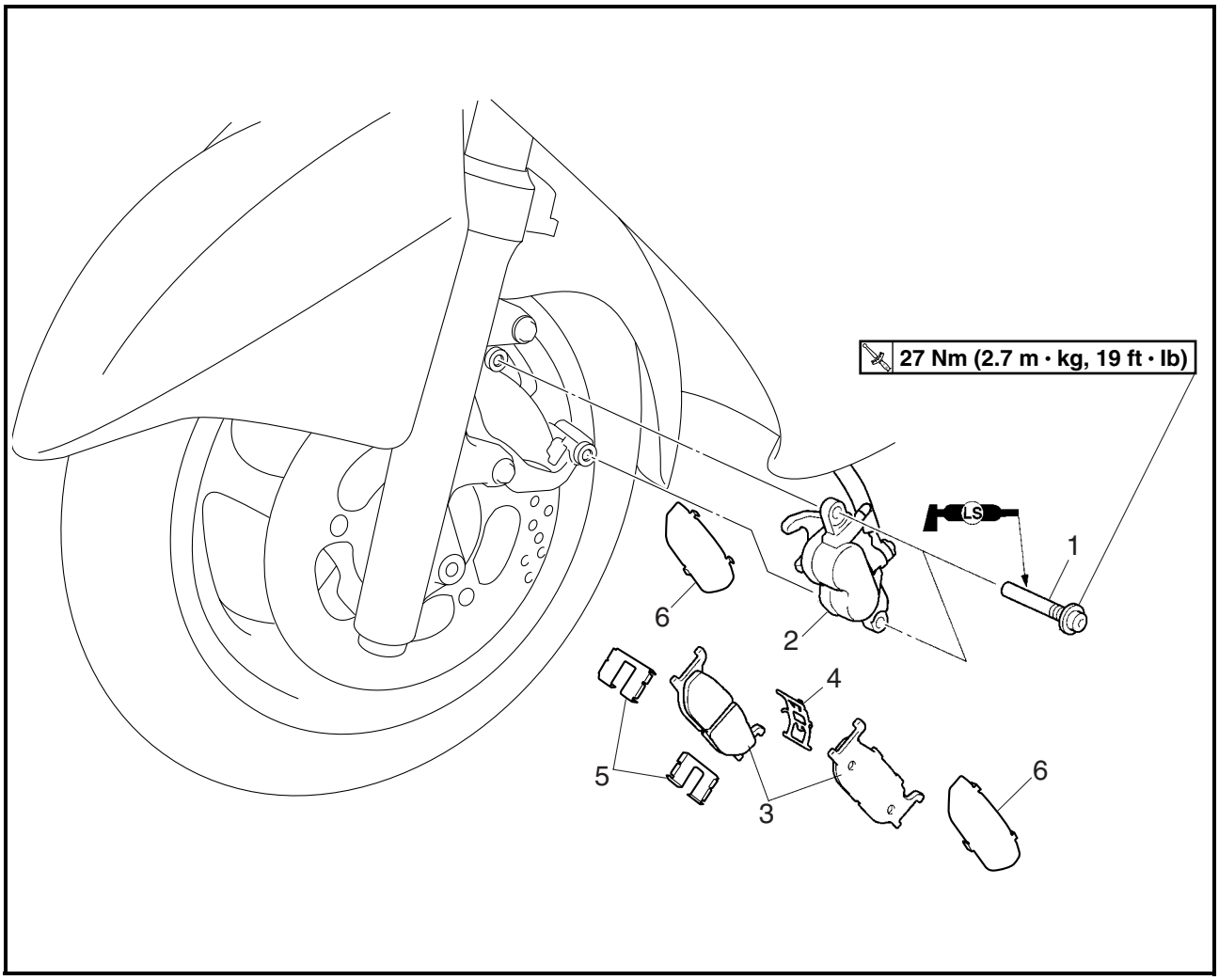
- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc installed.

1. Adjust:
   - rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE".

EAS00577

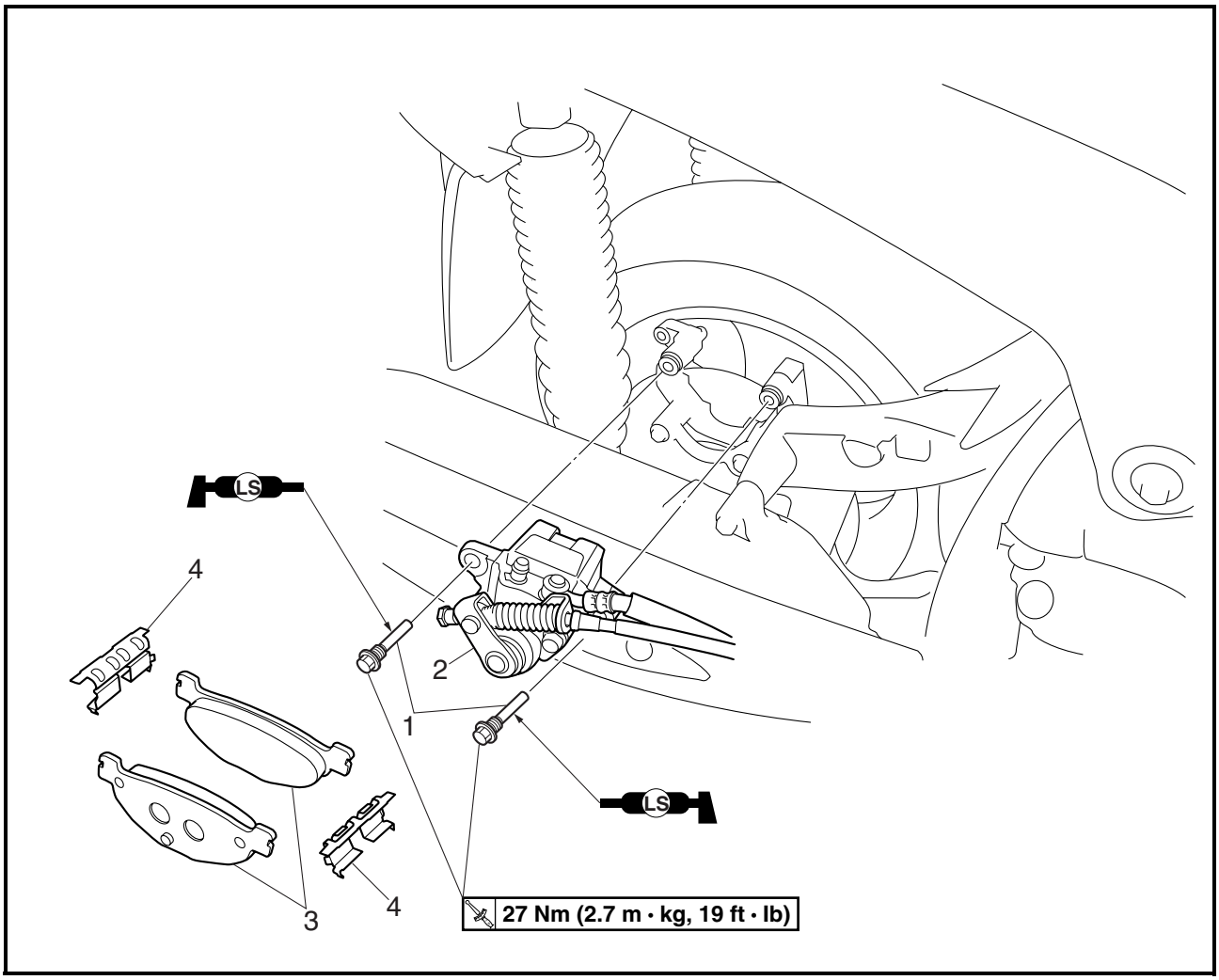
FRONT AND REAR BRAKES

FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed.
1	Front brake caliper retaining bolt	2	
2	Front brake caliper	1	
3	Brake pad	2	Refer to "REPLACING THE FRONT BRAKE PADS".
4	Brake pad spring	1	
5	Brake pad spring	2	
6	Brake pad shim	2	
			For installation, reverse the removal procedure.

REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		Remove the parts in the order listed.
	Air filter case (right)		Refer to "AIR FILTER CASES" in chapter 3.
1	Rear brake caliper retaining bolt	2	
2	Rear brake caliper	1	Refer to "REPLACING THE REAR BRAKE PADS".
3	Brake pad	2	
4	Brake pad spring	2	
			For installation, reverse the removal procedure.

EAS00579

CAUTION:

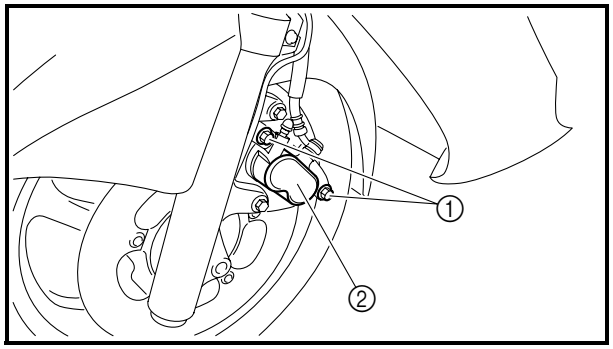
Disc brake components rarely require disassembly.

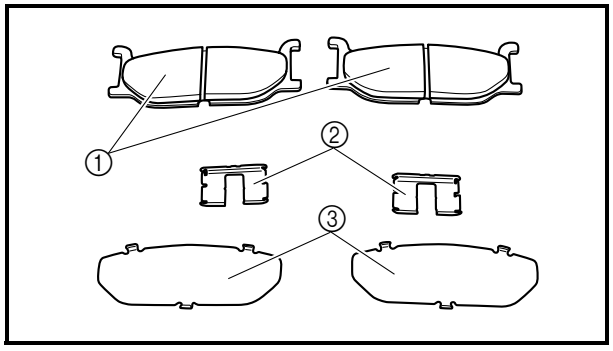
Therefore, always follow these preventive measures:

- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.**
- **Never use solvents on internal brake components.**
- **Use only clean or new brake fluid for cleaning brake components.**
- **Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.**
- **Avoid brake fluid coming into contact with the eyes as it can cause serious injury.**

FIRST AID FOR BRAKE FLUID ENTERING THE EYES:

- **Flush with water for 15 minutes and get immediate medical attention.**





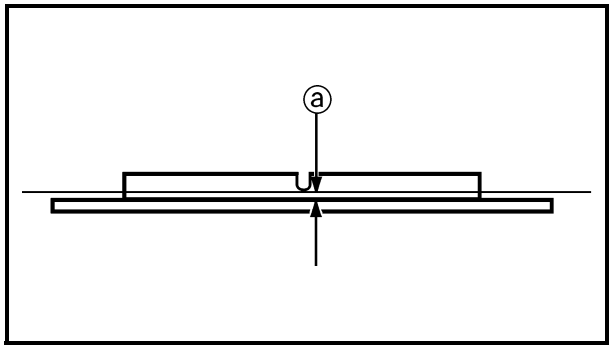
EAS00581

REPLACING THE FRONT BRAKE PADS

NOTE:

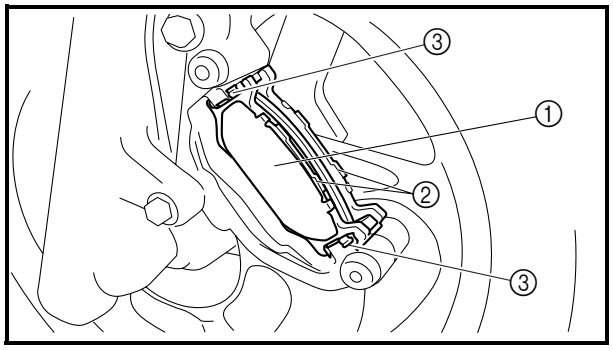
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Remove:
   - front brake caliper retaining bolts ①
   - front brake caliper ②
   - brake pad spring
2. Remove:
   - brake pads ①
   - brake pad springs ②
   - brake pad shims ③



3. Measure:
   • brake pad wear limit ⓐ
   Out of specification → Replace the brake pads as a set.

	Brake pad wear limit **0.8 mm (0.03 in)**



4. Install:
   • brake pad shims ①
   • brake pads ②
   • brake pad springs ③

NOTE:
Always install new brake pads, new brake pad shims, and a new brake pad springs as a set.

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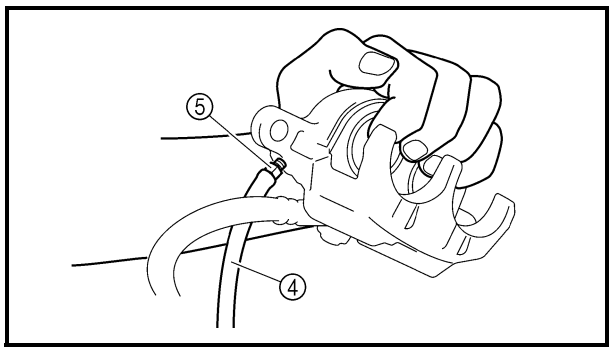
a. Connect a clear plastic hose ④ tightly to the bleed screw ⑤. Put the other end of the hose into an open container.
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
c. Tighten the bleed screw.



	Bleed screw **6 Nm (0.6 m · kg, 4.3 ft · lb)**

d. Install new brake pad shims, new brake pad pads and new brake pad springs.

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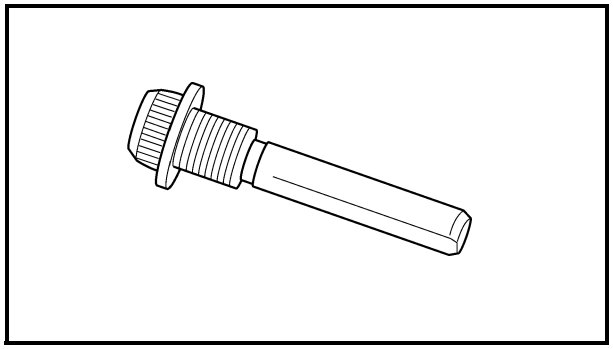
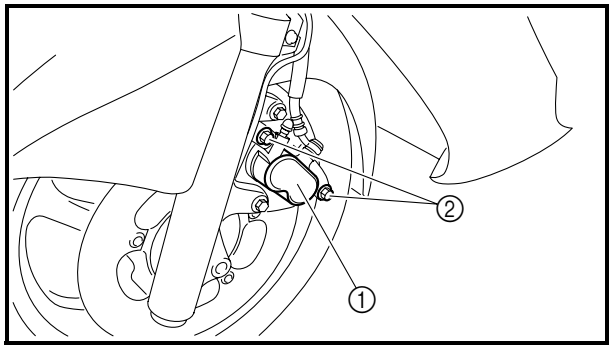
5. Lubricate:
   • front brake caliper retaining bolts



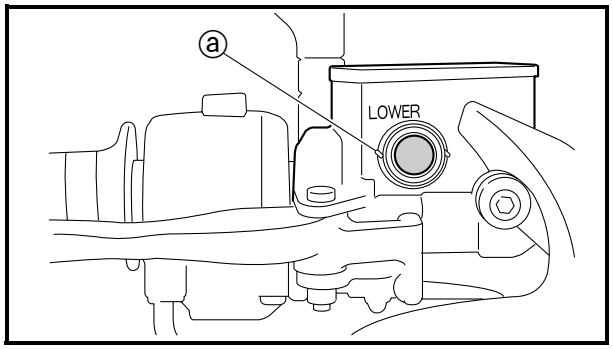
	Recommended lubricant **Lithium-soap-based grease**

CAUTION:
- **Do not allow grease to contact the brake pads.**
- **Remove any excess grease.**



6. Install:
   - front brake caliper ①
   - front brake caliper retaining bolts ②

27 Nm (2.7 m · kg, 19 ft · lb)



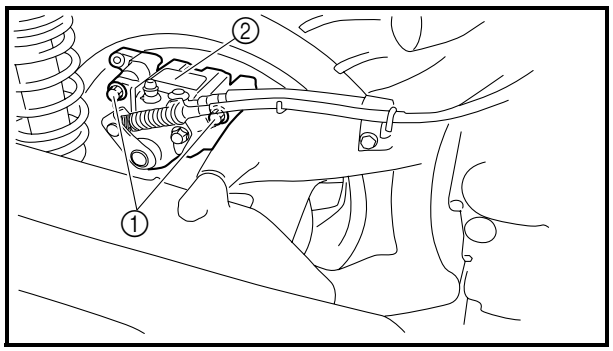
7. Check:
   - brake fluid level

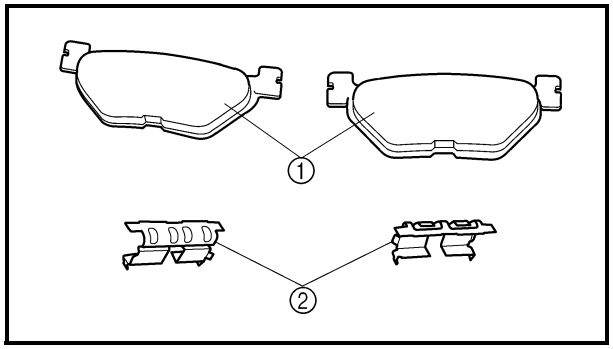
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.

   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
8. Check:
   - brake lever operation

   Soft or spongy feeling → Bleed the brake system.

   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



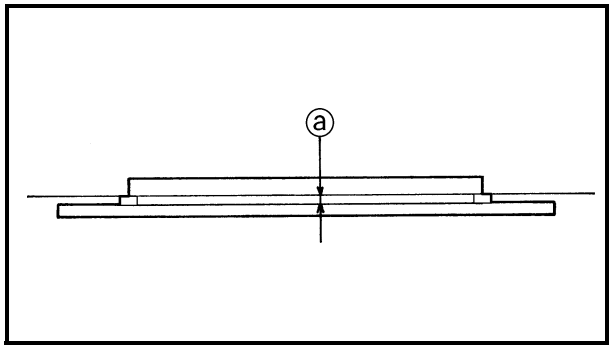


EAS00583
REPLACING THE REAR BRAKE PADS

NOTE:

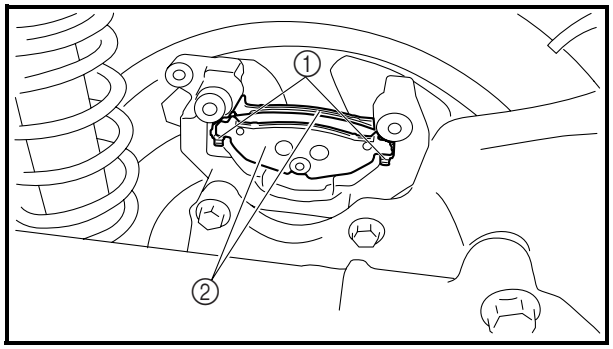
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Remove:
   - rear brake caliper retaining bolts ①
   - rear brake caliper ②
2. Remove:
   - brake pads ①
   - brake pad springs ②



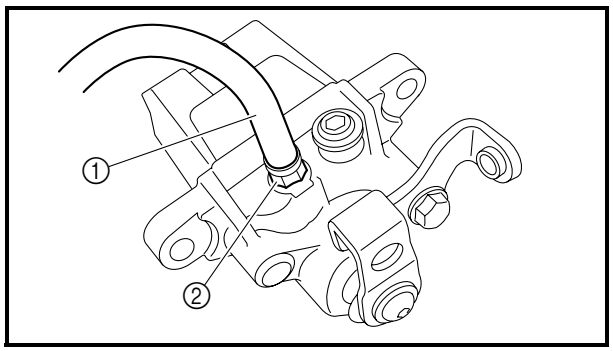
3. Measure:
   • brake pad wear limit ⓐ
   Out of specification → Replace the brake pads as a set.

Brake pad wear limit
0.8 mm (0.03 in)



4. Install:
   • brake pad springs ①
   • brake pads ②
   • rear brake caliper

NOTE:
Always install new brake pads, and new brake pad springs as a set.



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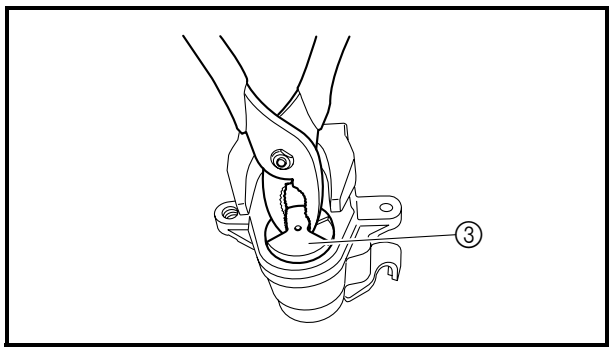
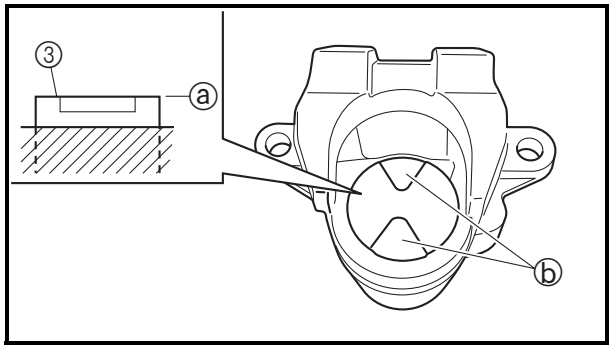
a. Connect a suitable hose ① tightly to the brake caliper bleed screw ②. Put the other end of this hose into an open container.
b. Loosen the brake caliper bleed screw, and then turn the brake caliper piston ③ clockwise until section ⓐ of the brake caliper piston is level with the surface of the brake caliper body.

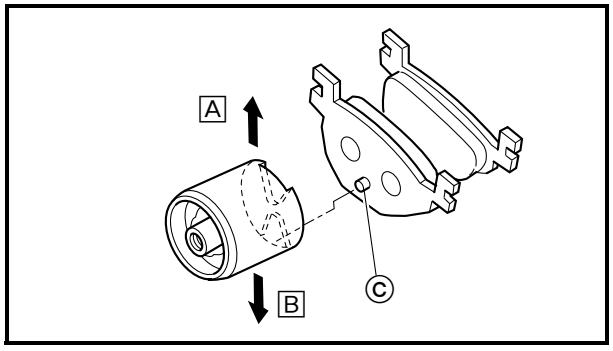
NOTE:
Align the recesses ⓑ in the brake caliper piston with the brake caliper body as shown in the illustration.



c. Tighten the brake caliper bleed screw.

Brake caliper bleed screw
6 Nm (0.6 m · kg, 4.3 ft · lb)





d. Install new brake pads, new pad springs, and the rear brake caliper.

NOTE:
Align the projection ⓒ on the piston side of the brake pad with the lower recess in the brake caliper piston.

A Up
B Down

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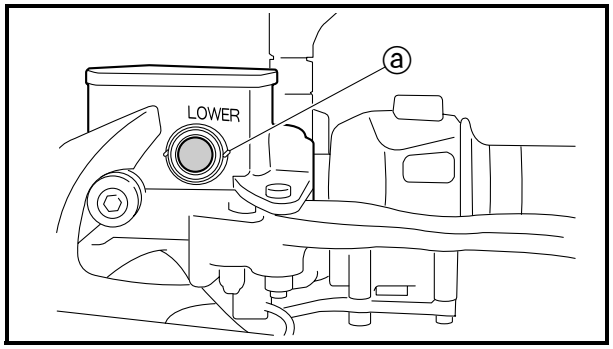
5. Lubricate:
   • rear brake caliper retaining bolts

	Recommended lubricant **Lithium-soap-based grease**

CAUTION:
- **Do not allow grease to contact the brake pads.**
- **Remove any excess grease.**

6. Install:
   • rear brake caliper retaining bolts

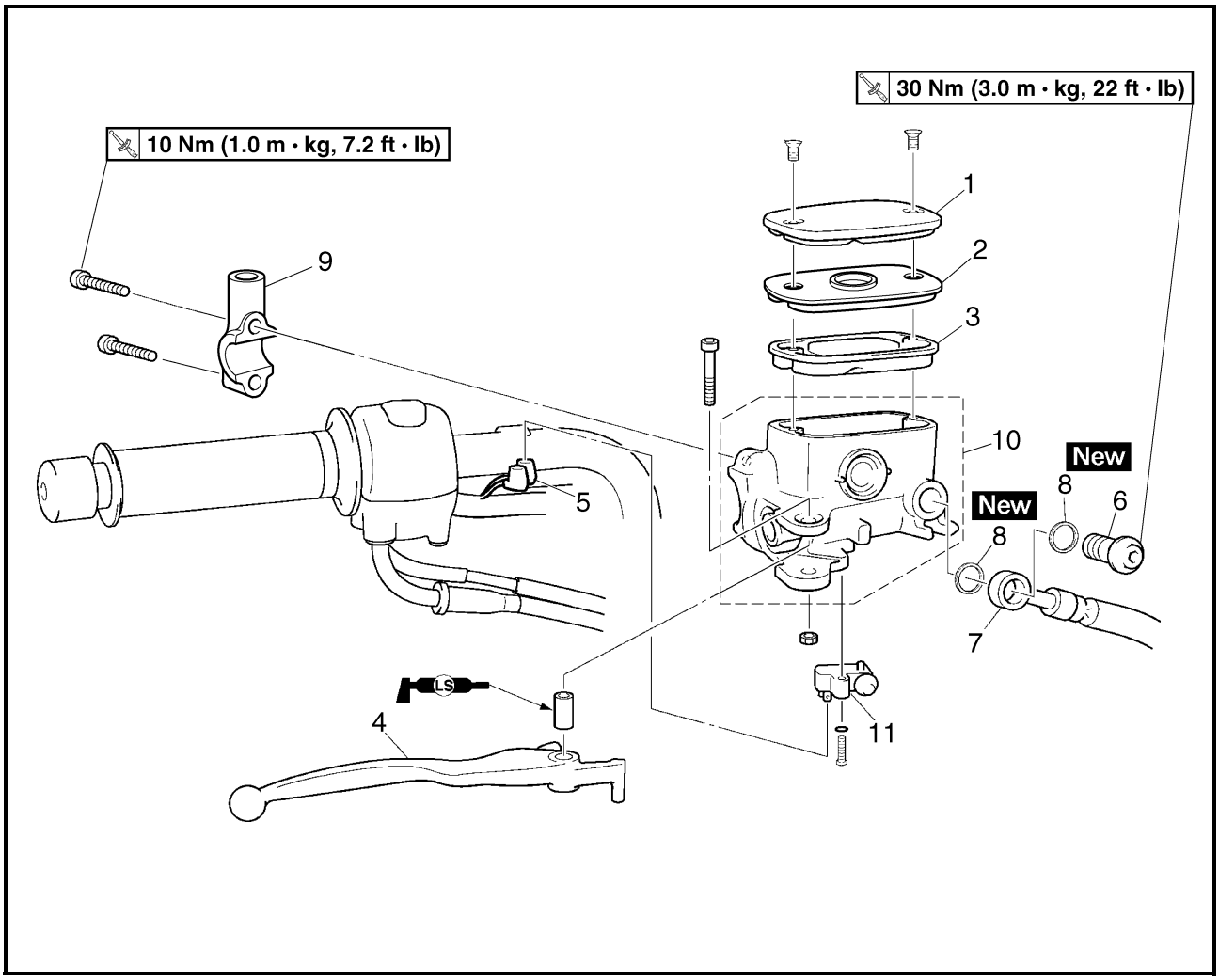
	27 Nm (2.7 m · kg, 19 ft · lb)



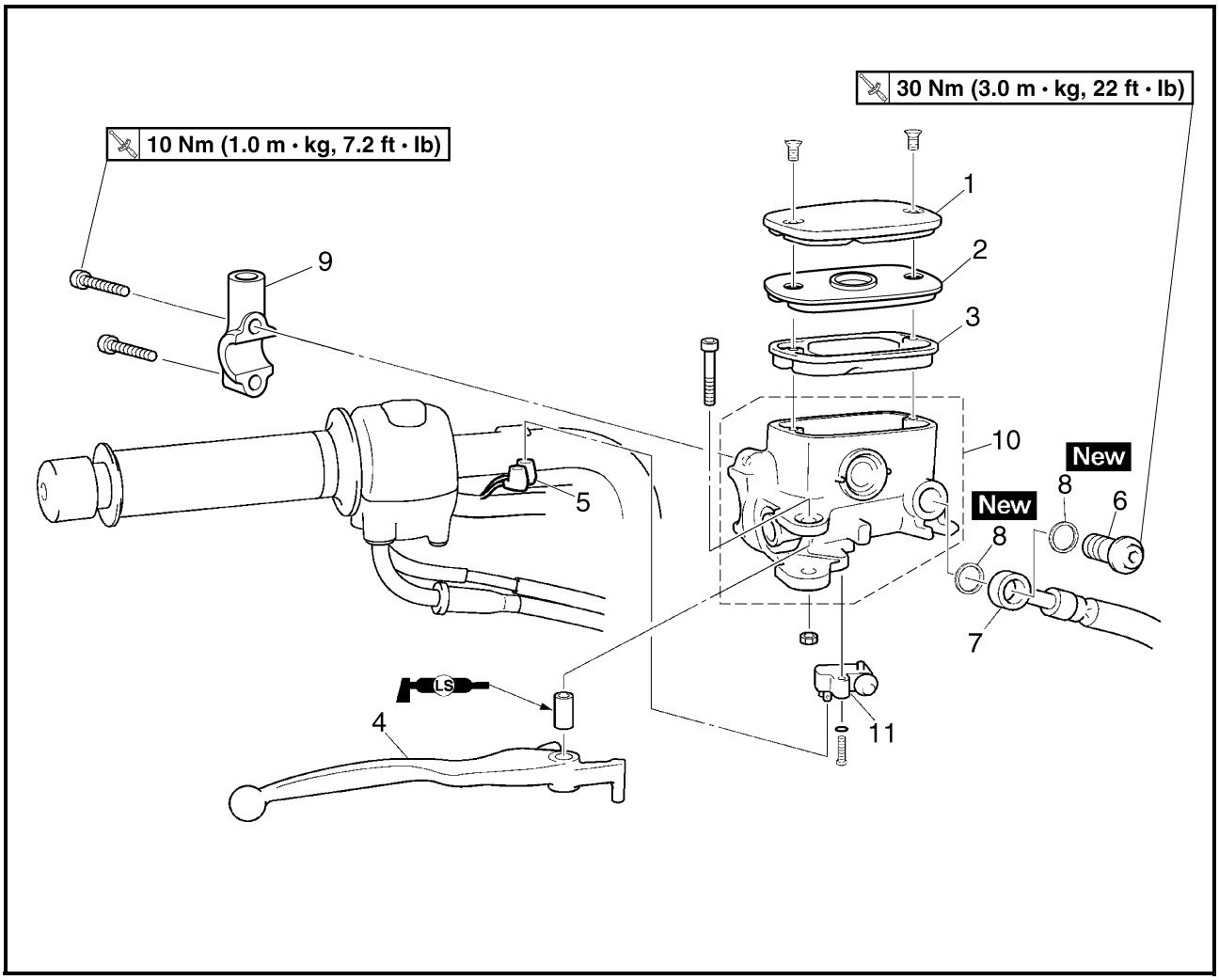
7. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
8. Check:
   • brake pedal operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

EAS00584

FRONT BRAKE MASTER CYLINDER

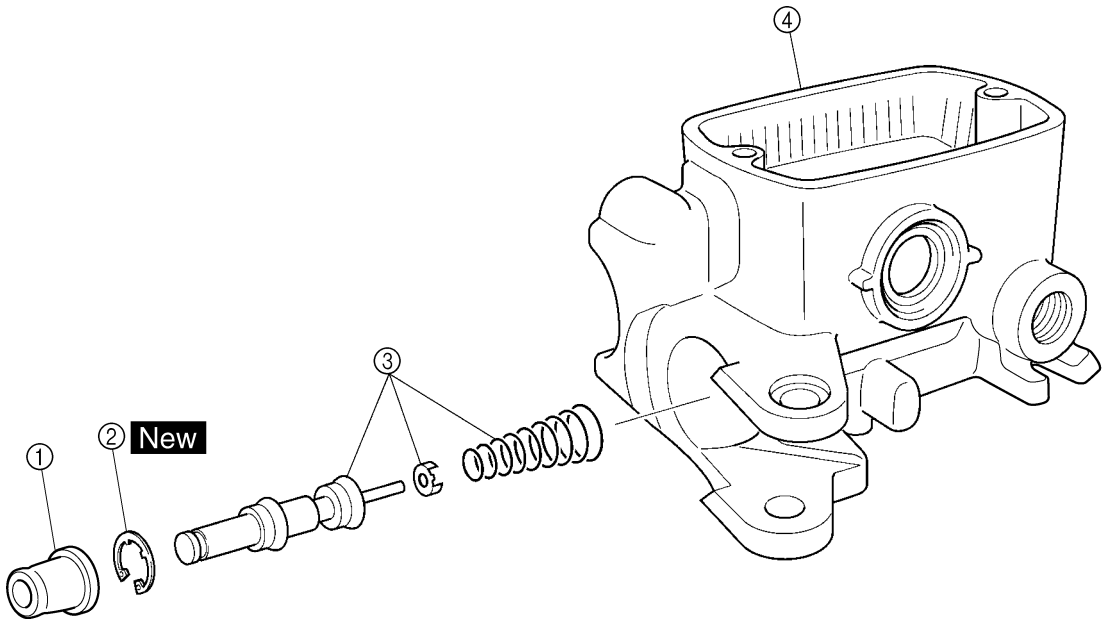


Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Upper handlebar cover		Refer to "HANDLEBAR".
	Brake fluid		Drain.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Brake lever	1	
5	Front brake light switch connector	2	Disconnect.
6	Union bolt	1	Refer to "DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER" and "ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER".
7	Brake hose	1	
8	Copper washer	2	



Order	Job/Part	Q'ty	Remarks
9	Brake master cylinder holder	1	Refer to "ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER".
10	Brake master cylinder	1	
11	Front brake light switch	1	For installation, reverse the removal procedure.

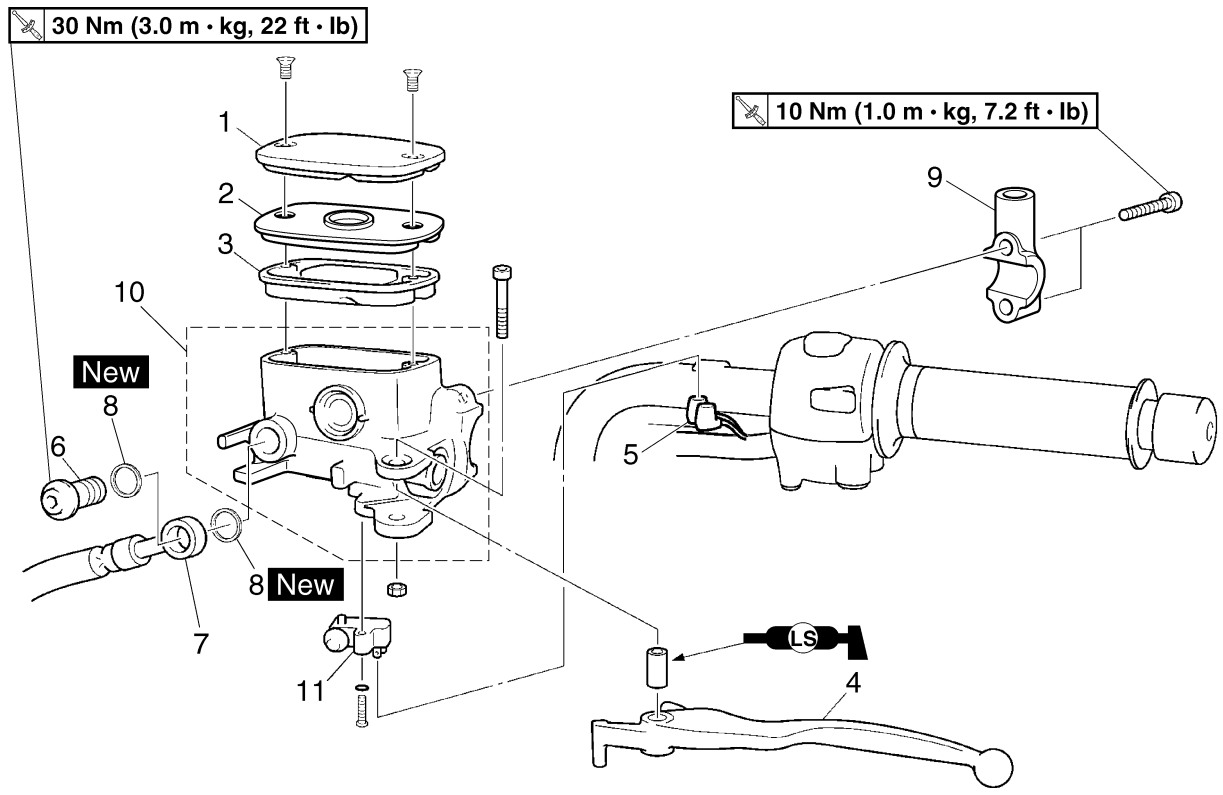
EAS00585



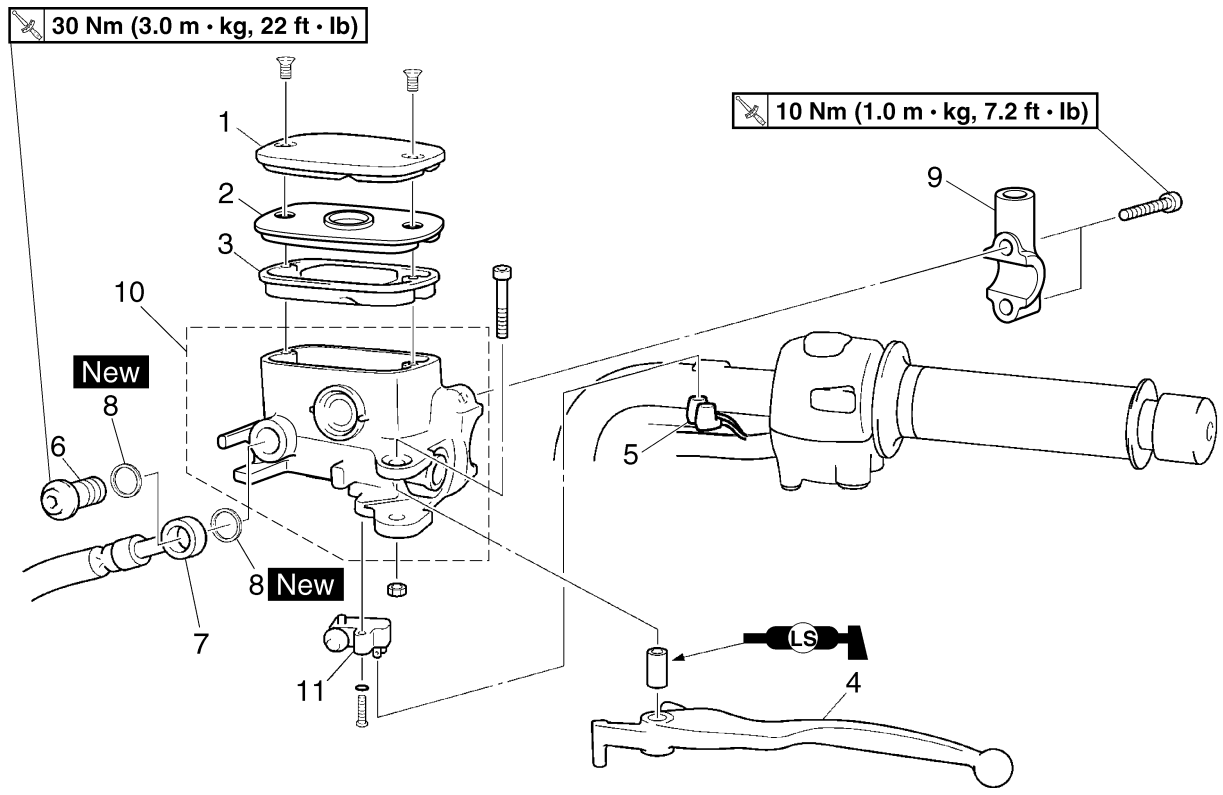
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Brake master cylinder kit	1	
④	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

EAS00586

REAR BRAKE MASTER CYLINDER

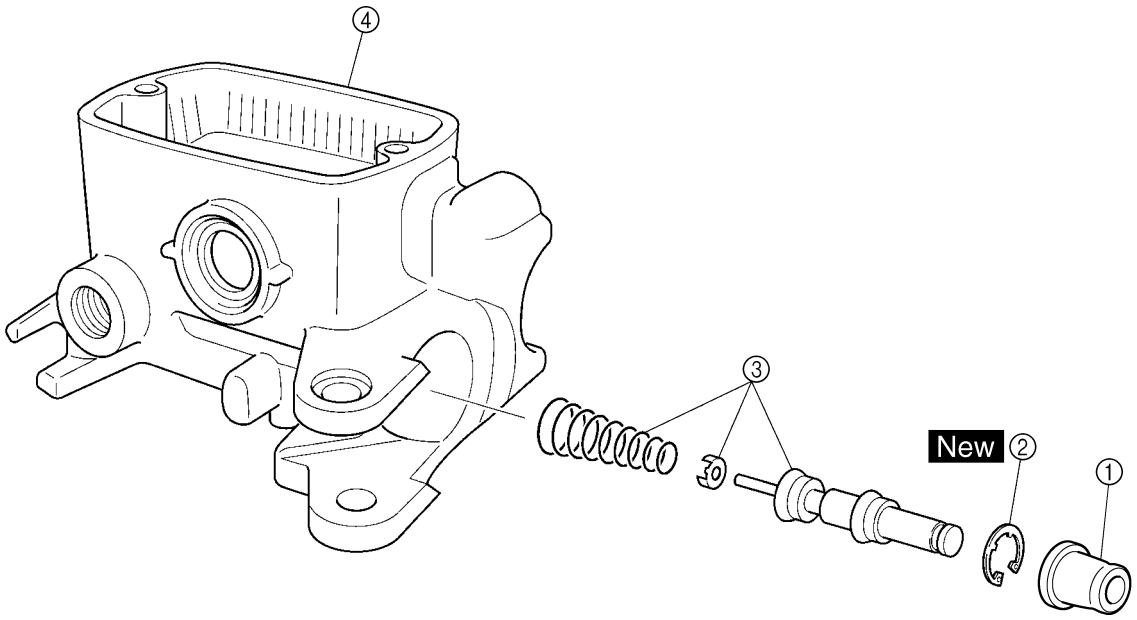


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Upper handlebar cover		Refer to "HANDLEBAR".
	Brake fluid		Drain.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Brake lever	1	
5	Rear brake light switch connector	2	Disconnect.
6	Union bolt	1	Refer to "DISASSEMBLING THE REAR BRAKE MASTER CYLINDER" and "ASSEMBLING AND INSTALLING THE REAR BRAKE MASTER CYLINDER".
7	Brake hose	1	
8	Copper washer	2	



Order	Job/Part	Q'ty	Remarks
9	Brake master cylinder holder	1	Refer to "ASSEMBLING AND INSTALLING THE REAR BRAKE MASTER CYLINDER".
10	Brake master cylinder	1	
11	Rear brake light switch	1	For installation, reverse the removal procedure.

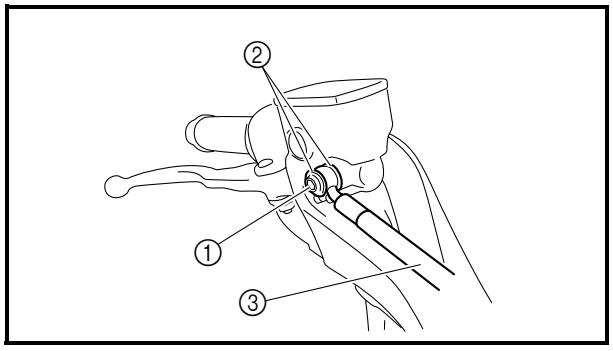
EAS00587



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Brake master cylinder kit	1	
④	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

EAS00588
DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

NOTE:
Before disassembling the front brake master cylinder, drain the brake fluid from the entire brake system.

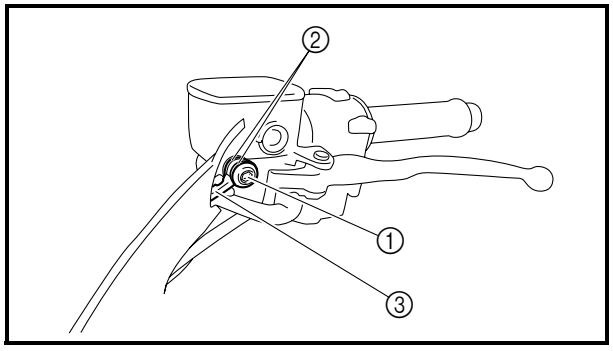


1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hoses ③

NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

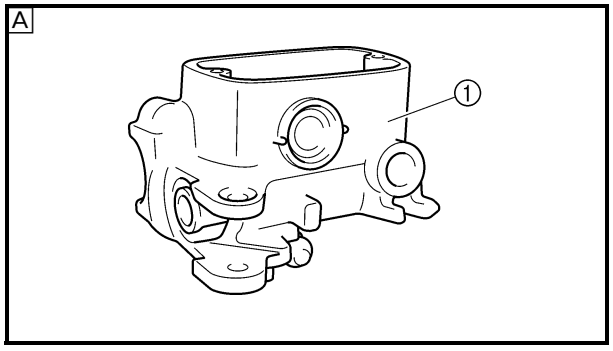
EAS00589
DISASSEMBLING THE REAR BRAKE MASTER CYLINDER

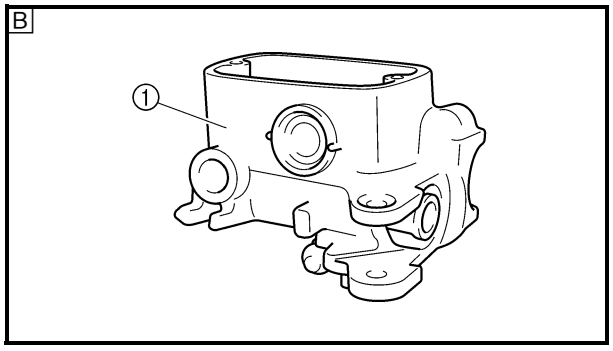
NOTE:
Before disassembling the rear brake master cylinder, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.



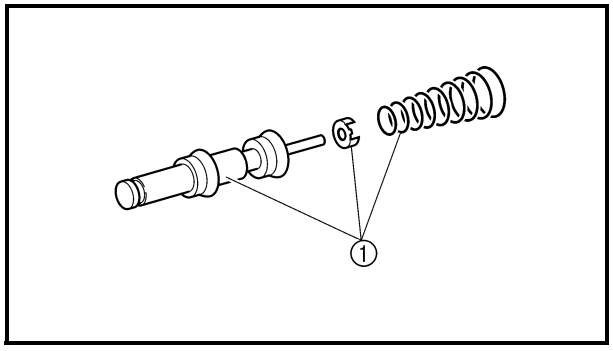


EAS00592
CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

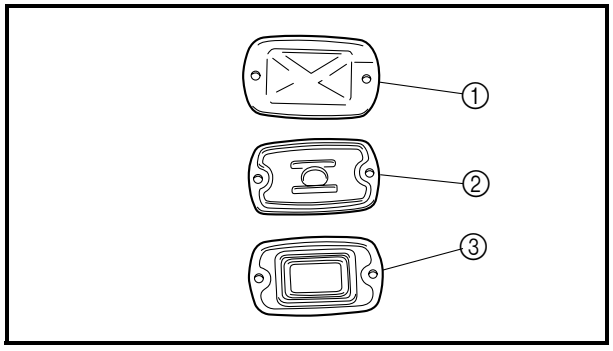
The following procedure applies to the both of the brake master cylinders.

1. Check:
   - brake master cylinder ①
     Damage/scratches/wear → Replace.
   - brake fluid delivery passages (brake master cylinder body)
     Obstruction → Blow out with compressed air.

A Front
B Rear



2. Check:
   - brake master cylinder kit ①
     Damage/scratches/wear → Replace.

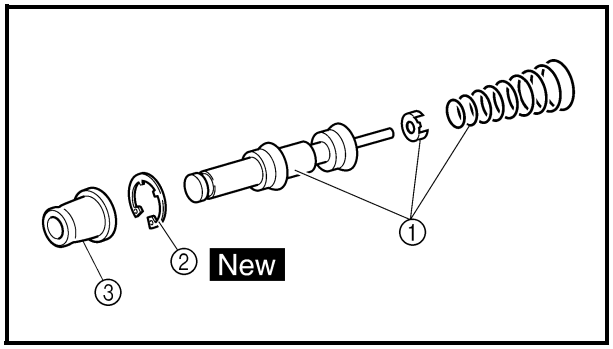


3. Check:
   - brake master cylinder reservoir cap ①
     Cracks/damage → Replace.
   - brake master cylinder reservoir diaphragm holder ②
   - brake master cylinder diaphragm ③
     Damage/wear → Replace.
4. Check:
   - brake hoses
     Cracks/damage/wear → Replace.

EAS00596
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

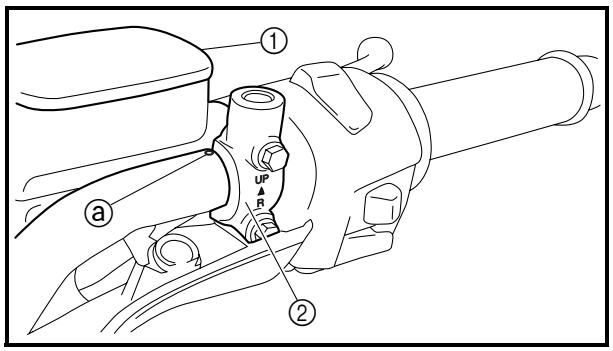
⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**



Recommended brake fluid
DOT 4

1. Install:
   - brake master cylinder kit ①
   - circlip ② New
   - dust boot ③



2. Install:
   - brake master cylinder ①
   - brake master cylinder holder ②

10 Nm (1.0 m · kg, 7.2 ft · lb)

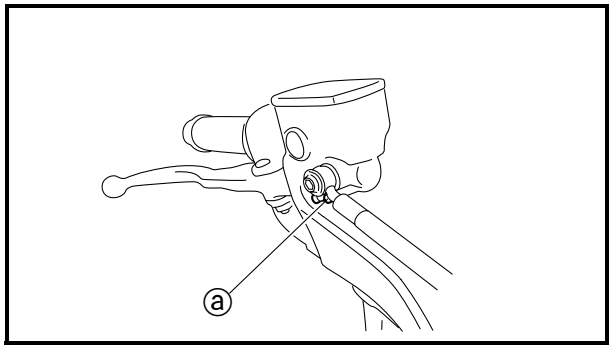
NOTE:

- Make sure to install the brake master cylinder holder that has the “R” mark.
- Install the brake master cylinder holder with the “UP” mark facing up.
- Align the end of the brake master cylinder holder with the punch mark ⓐ in the handlebar.
- First, tighten the upper bolt, then the lower bolt.

3. Install:
   - copper washers New
   - brake hose
   - union bolt **30 Nm (3.0 m · kg, 22 ft · lb)**

⚠ WARNING

Proper brake hose routing is essential to insure safe scooter operation. Refer to “CABLE ROUTING” in chapter 2.



NOTE:

- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.

CAUTION:

When installing the brake hose onto the brake master cylinder, make sure the brake pipe touches the projection ⓐ on the brake master cylinder.

4. Fill:
   - brake master cylinder reservoir
     (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

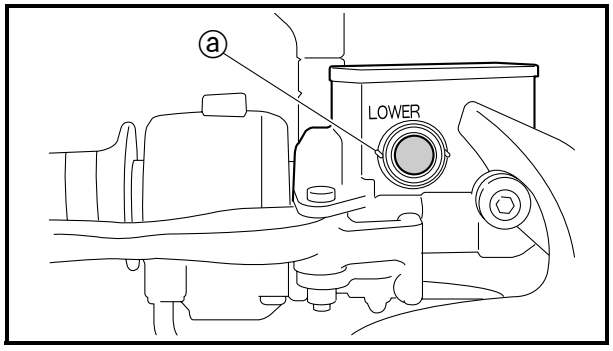
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:
   - brake system
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

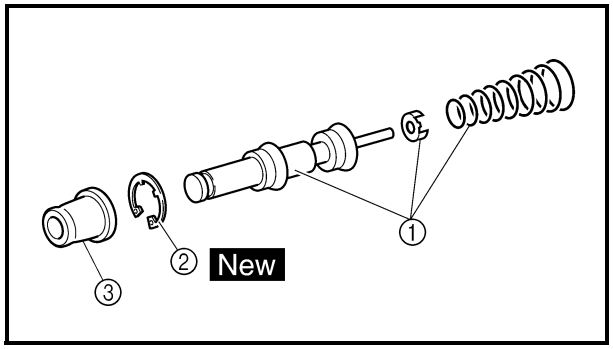


6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
7. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

EAS00596
ASSEMBLING AND INSTALLING THE REAR BRAKE MASTER CYLINDER

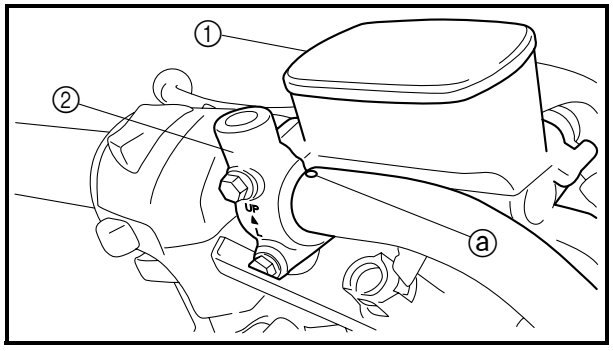
⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**



Recommended brake fluid
DOT 4

1. Install:
   • brake master cylinder kit ①
   • circlip ② New
   • dust boot ③



2. Install:
   - brake master cylinder ①
   - brake master cylinder holder ②

10 Nm (1.0 m · kg, 7.2 ft · lb)

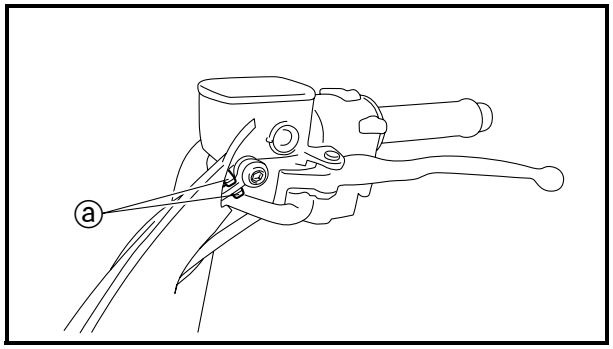
NOTE:
- Make sure to install the brake master cylinder holder that has the "L" mark.
- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark ⓐ on the handlebar.
- First, tighten the upper bolt, then the lower bolt.

3. Install:
   - copper washers New
   - brake hose
   - union bolt **30 Nm (3.0 m · kg, 22 ft · lb)**

⚠ WARNING

Proper brake hose routing is essential to insure safe scooter operation. Refer to "CABLE ROUTING" in chapter 2.

NOTE:
- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



CAUTION:

When installing the brake hose onto the brake master cylinder, make sure the brake pipe touches the projections ⓐ on the brake master cylinder.

4. Fill:
   • brake master cylinder reservoir
   (with the specified amount of the recommended brake fluid)

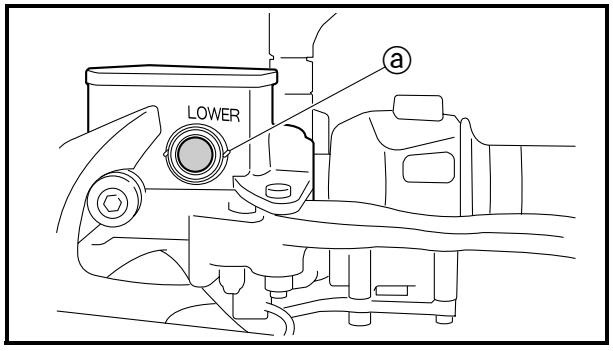
Recommended brake fluid
DOT 4

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

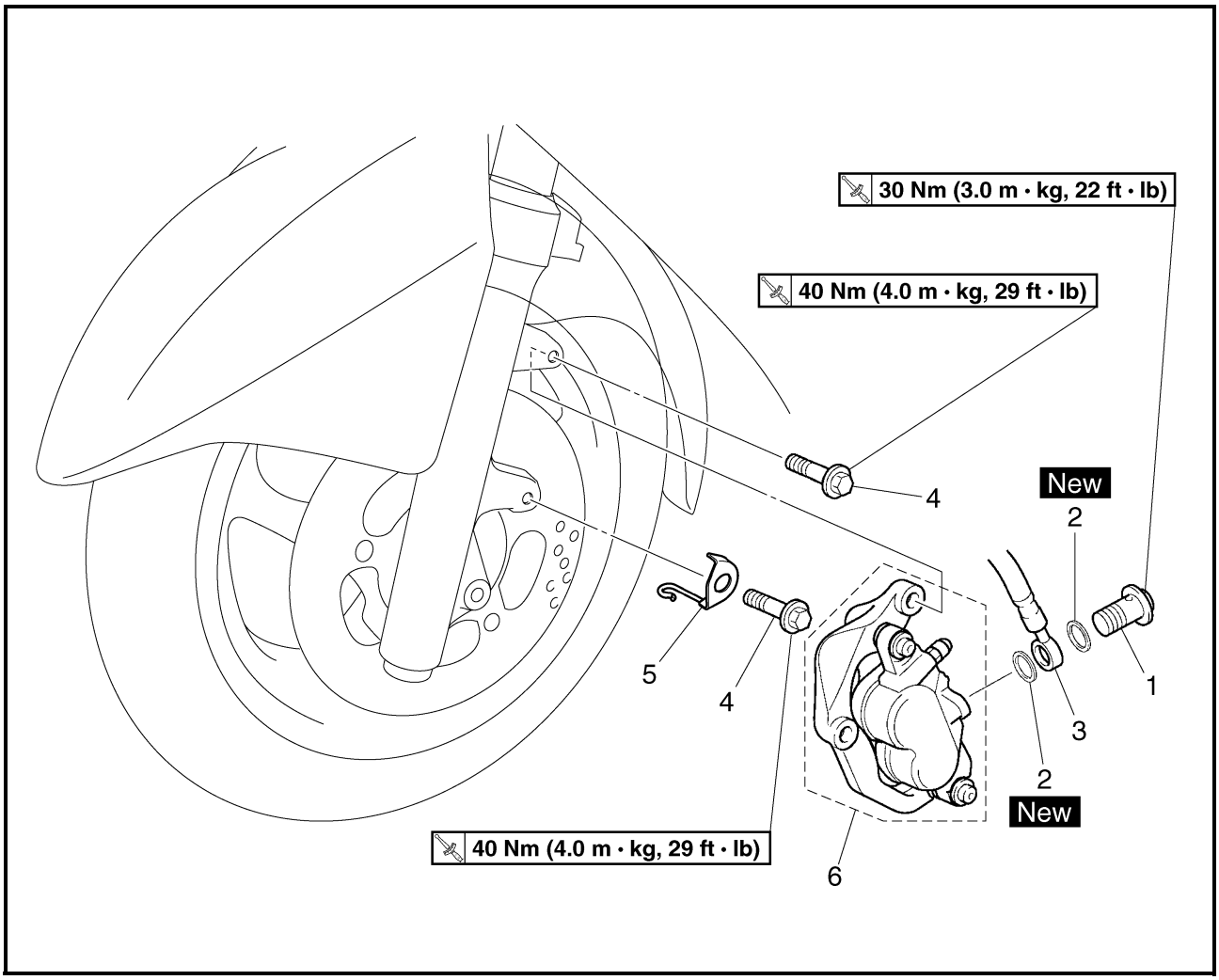
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.



5. Bleed:
   • brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
7. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

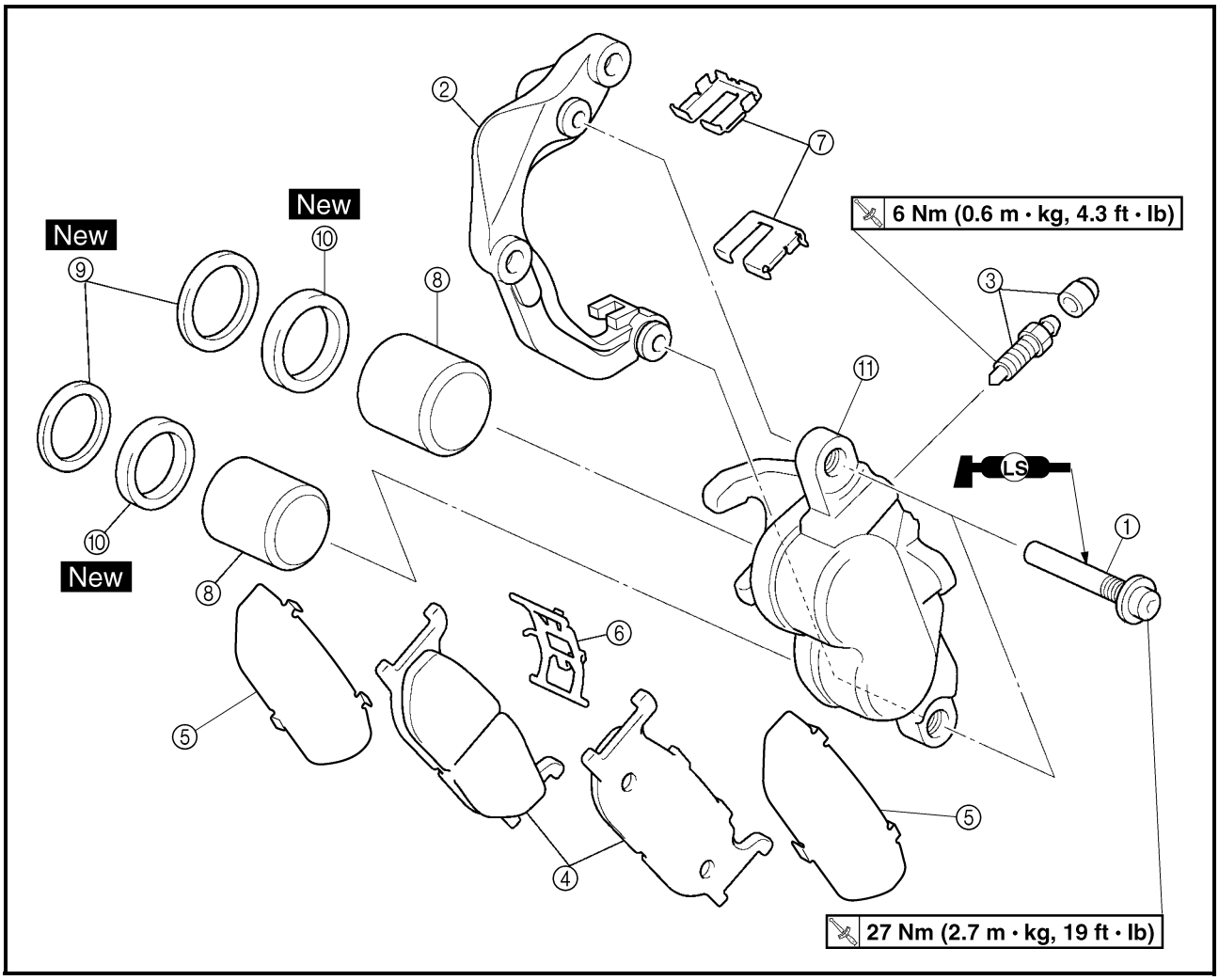
EAS00612

FRONT BRAKE CALIPER



Order	Job/Part	Q'ty	Remarks
	Removing the front brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Union bolt	1	Refer to "DISASSEMBLING THE FRONT BRAKE CALIPER" and "ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER".
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper bracket bolt	2	Refer to "ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER".
5	Speed sensor lead holder	1	
6	Front brake caliper	1	
			For installation, reverse the removal procedure.

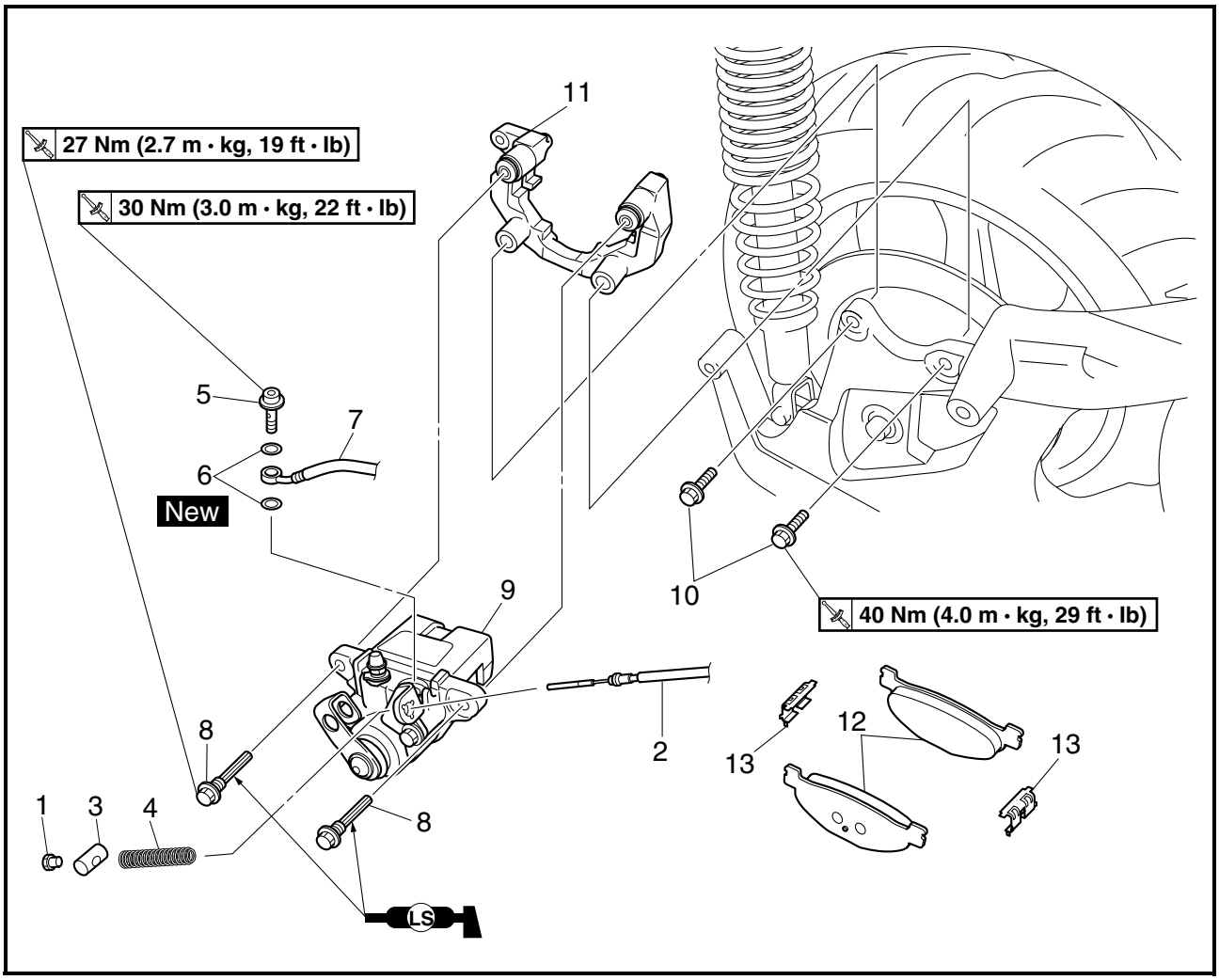
EAS00614



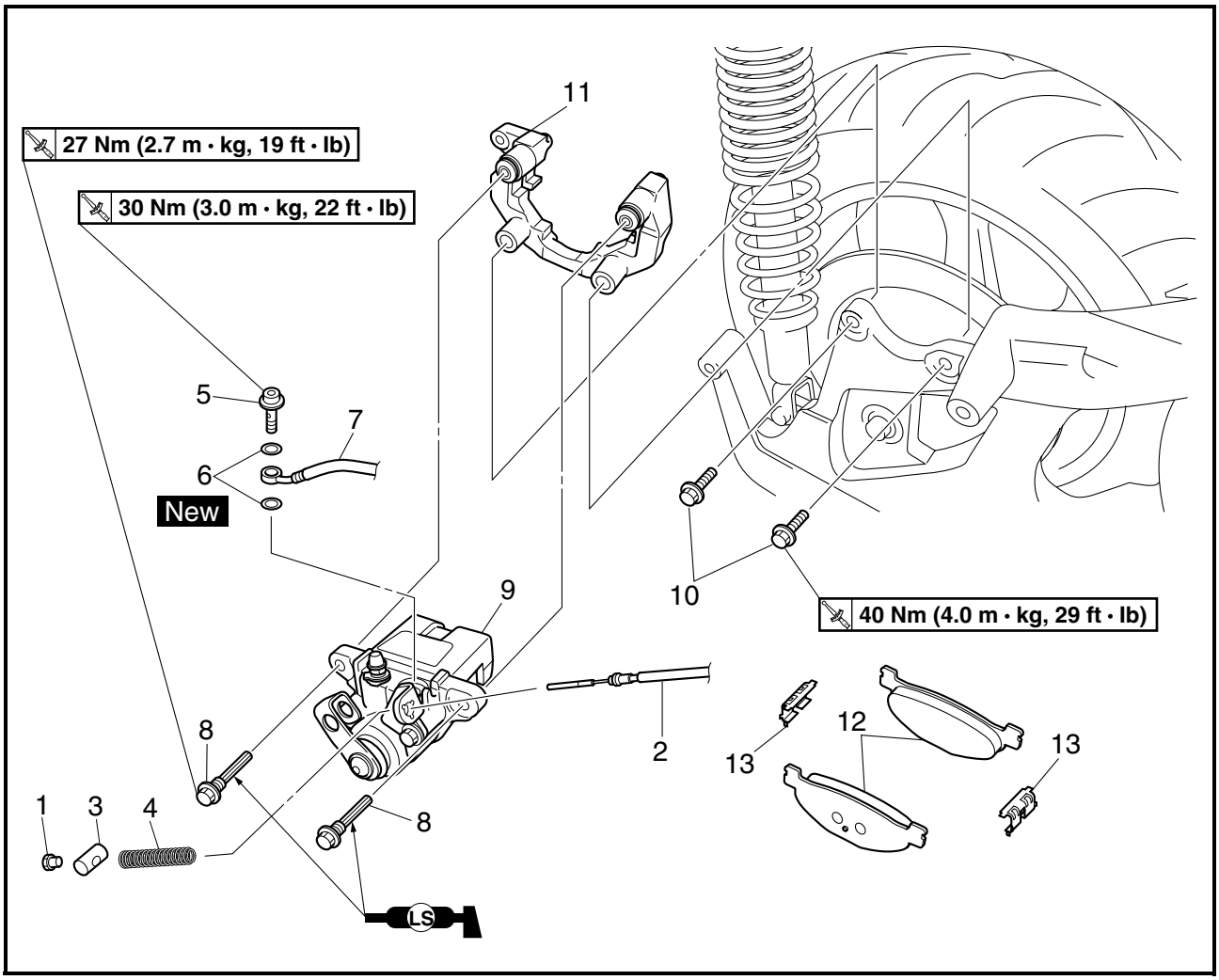
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake caliper		Remove the parts in the order listed.
①	Brake caliper retaining bolt	2	
②	Brake caliper bracket	1	
③	Bleed screw	1	
④	Brake pad	2	
⑤	Brake pad shim	2	
⑥	Brake pad spring	1	
⑦	Brake pad spring	2	
⑧	Brake caliper piston	2	Refer to "DISASSEMBLING THE FRONT BRAKE CALIPER" and "ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER".
⑨	Dust seal	2	
⑩	Brake caliper piston seal	2	
⑪	Brake caliper body	1	For assembly, reverse the disassembly procedure.

EAS00616

REAR BRAKE CALIPER

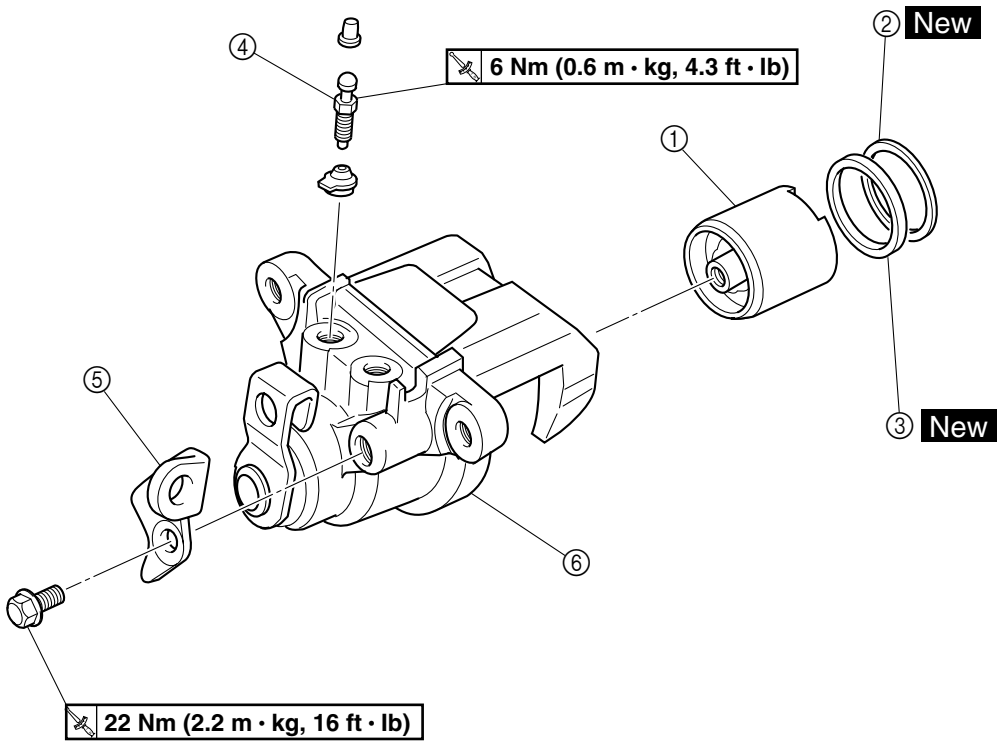


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake caliper		Remove the parts in the order listed.
	Air filter case (right)		Refer to "AIR FILTER CASES" in chapter 3.
	Muffler		Refer to "ENGINE REMOVAL" in chapter 5.
	Brake fluid		Drain.
1	Rear brake lock lever adjusting nut	1	
2	Rear brake lock lever cable	1	Disconnect.
3	Rear brake lock lever adjusting pin	1	
4	Rear brake lock lever spring	1	
5	Union bolt	1	Refer to "DISASSEMBLING THE REAR BRAKE CALIPER" and "ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER".
6	Copper washer	2	
7	Rear brake hose	1	



Order	Job/Part	Q'ty	Remarks
8	Rear brake caliper retaining bolt	2	Refer to "ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER".
9	Rear brake caliper	1	
10	Brake caliper bracket bolt	2	
11	Brake caliper bracket	1	
12	Brake pad	2	
13	Brake pad spring	2	
			For installation, reverse the removal procedure.

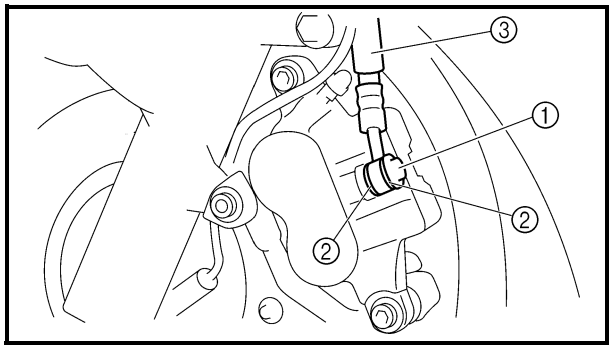
EAS00617



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Remove the parts in the order listed.
①	Brake caliper piston	1	Refer to "DISASSEMBLING THE REAR BRAKE CALIPER" and "ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER".
②	Dust seal	1	
③	Brake caliper piston seal	1	
④	Bleed screw	1	
⑤	Rear brake lock lever cable holder	1	
⑥	Brake caliper body	1	
			For assembly, reverse the disassembly procedure.

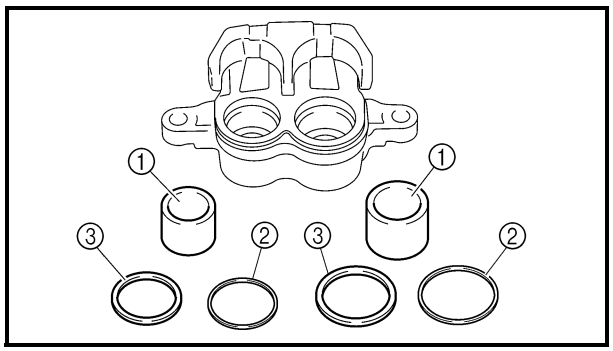
EAS00619
DISASSEMBLING THE FRONT BRAKE CALIPER

NOTE:
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
Put the end of the brake hose into a container and pump out the brake fluid carefully.



2. Remove:
   - brake caliper pistons ①
   - dust seals ②
   - brake caliper piston seals ③

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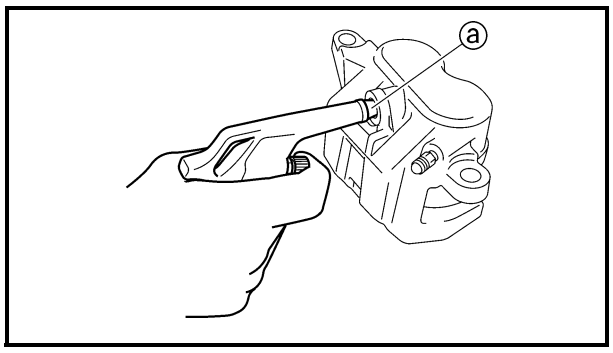
a. Blow compressed air into the brake hose joint opening ⓐ to force out the pistons from the brake caliper.



⚠ WARNING

- **Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**

b. Remove the brake caliper piston seals.

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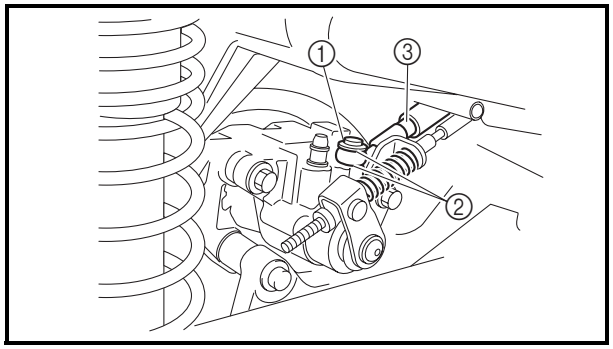
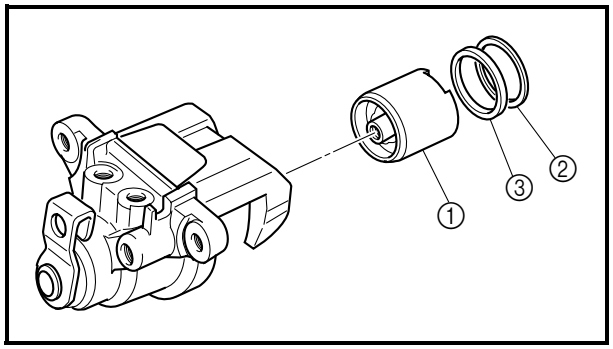
EAS00626
DISASSEMBLING THE REAR BRAKE CALIPER

NOTE:
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:
Put the end of the brake hose into a container and pump out the brake fluid carefully.



2. Remove:
   - brake caliper piston ①
   - dust seal ②
   - brake caliper piston seal ③

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Operate the rear brake lock lever ④ continuously in the direction shown by the arrow until the piston comes out.
b. Remove the dust seal and brake caliper piston seal.

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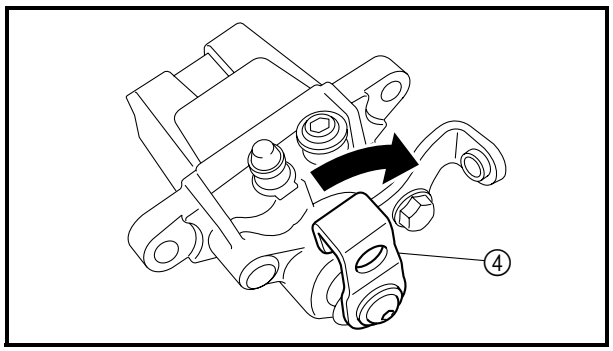
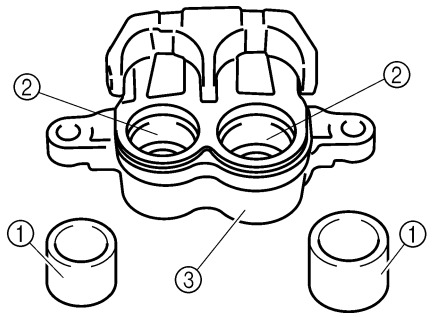


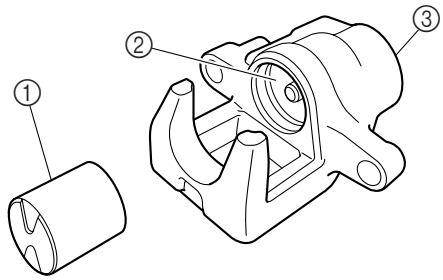
EAS00633
CHECKING THE FRONT AND REAR BRAKE CALIPERS

Recommended brake component replacement schedule	
Brake pads	**If necessary**
Piston seals	**Every two years**
Brake hoses	**Every four years**
Brake fluid	**Every two years and whenever the brake is disassembled**

A



B



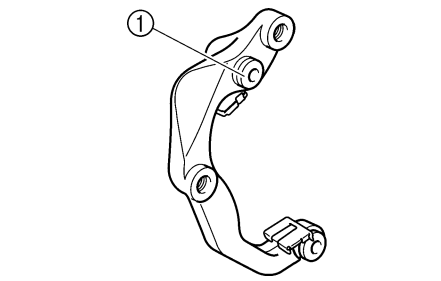
1. Check:
   - brake caliper pistons ①
     Rust/scratches/wear → Replace the brake caliper pistons.
   - brake caliper cylinders ②
     Scratches/wear → Replace the brake caliper assembly.
   - brake caliper body ③
     Cracks/damage → Replace the brake caliper assembly.
   - brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.

⚠ WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston seals.

A Front
B Rear

A



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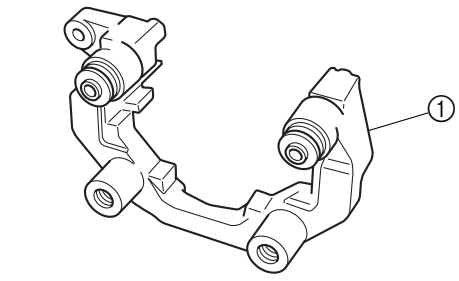


2. Check:
   - brake caliper brackets ①
     Cracks/damage → Replace.

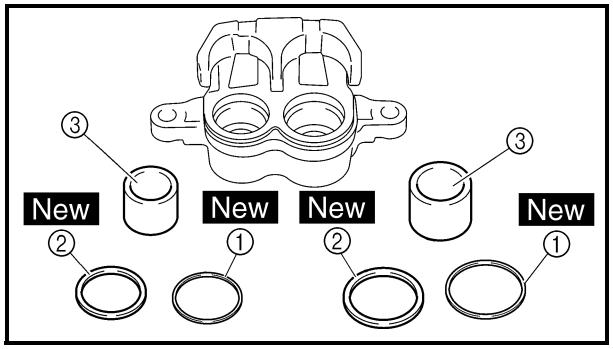
A Front
B Rear

EAS00635
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER

⚠ WARNING

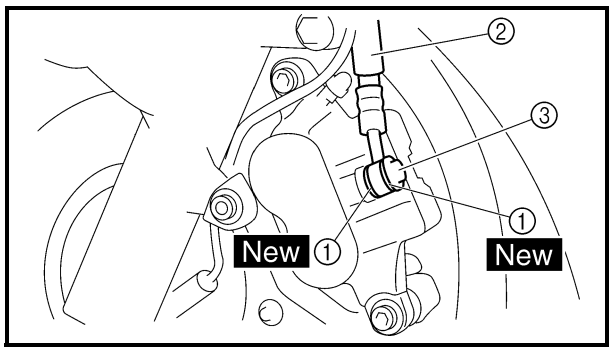
- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

Recommended brake fluid
DOT 4



1. Install:
   - brake caliper piston seals ① New
   - dust seals ② New
   - brake caliper piston ③
2. Install:
   - brake caliper bracket

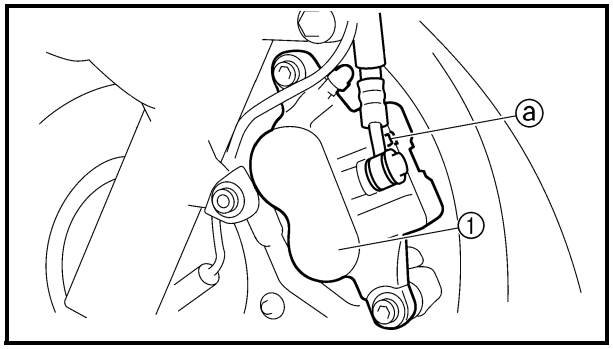
40 Nm (4.0 m · kg, 2.9 ft · lb)



3. Install:
   - brake caliper (temporarily)
   - copper washers ① New
   - brake hose ②
   - union bolt ③ **30 Nm (3.0 m · kg, 22 ft · lb)**

⚠ WARNING

Proper brake hose routing is essential to insure safe scooter operation. Refer to "CABLE ROUTING" in chapter 2.



CAUTION:

When installing the brake hose onto the brake caliper ①, make sure the brake pipe touches the projection ⓐ on the brake caliper.

4. Remove:
   • brake caliper
5. Install:
   • brake pad springs
   • brake pads
   • brake caliper retaining bolts

   27 Nm (2.7 m · kg, 19 ft · lb)

   Refer to "REPLACING THE FRONT BRAKE PADS".
6. Fill:
   • brake master cylinder reservoir
   (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

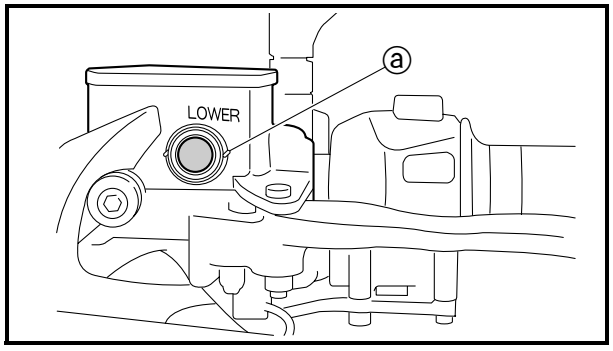
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

7. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



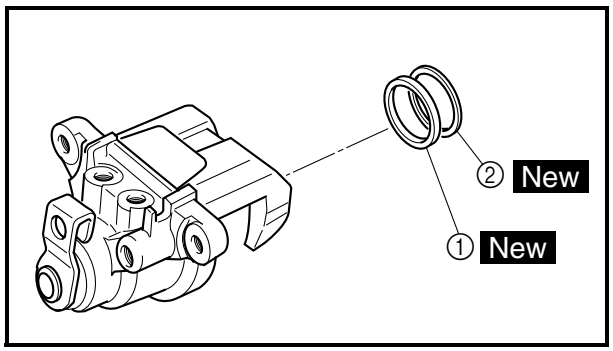
8. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
9. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

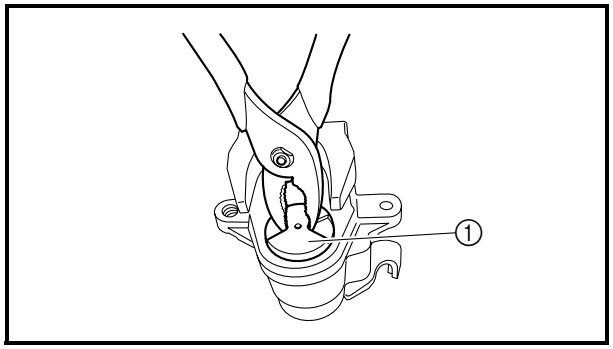
⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

	Recommended brake fluid **DOT 4**

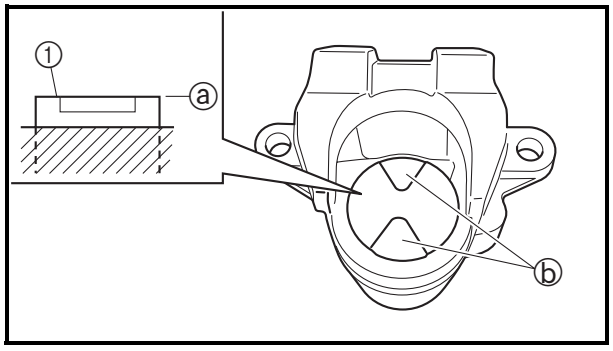


1. Install:
   - brake caliper piston seal ① New
   - dust seal ② New

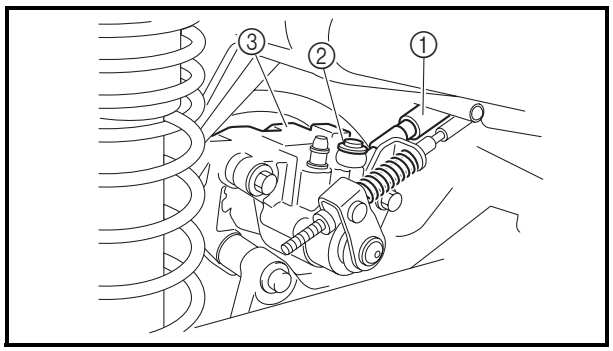


2. Install:
   • brake caliper piston ①
   Turn the brake caliper piston clockwise until section ⓐ of the brake caliper piston is level with the surface of the brake caliper body.

NOTE:
Align the recesses ⓑ in the brake caliper piston with the brake caliper body as shown in the illustration.

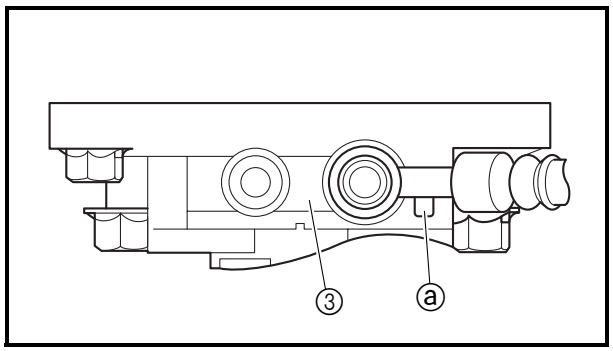


3. Install:
   • brake caliper bracket
   40 Nm (4.0 m · kg, 29 ft · lb)



4. Install:
   • brake caliper (temporarily)
   • brake hose ①
   • copper washers New
   • union bolt ② **30 Nm (3.0 m · kg, 22 ft · lb)**

⚠ WARNING
Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" in chapter 2.



CAUTION:
When installing the brake hose onto the brake caliper ③, make sure the brake pipe touches the projection ⓐ on the brake caliper.

5. Remove:
   • brake caliper
6. Install:
   • brake pad springs
   • brake pads
   • brake caliper retaining bolts
   27 Nm (2.7 m · kg, 19 ft · lb)
   Refer to "REPLACING THE REAR BRAKE PADS".
7. Fill:
   • brake master cylinder reservoir
   (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

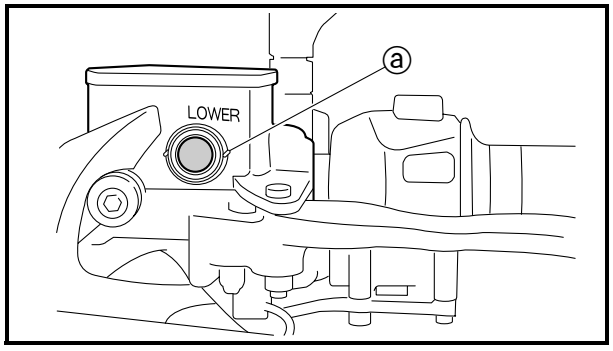
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

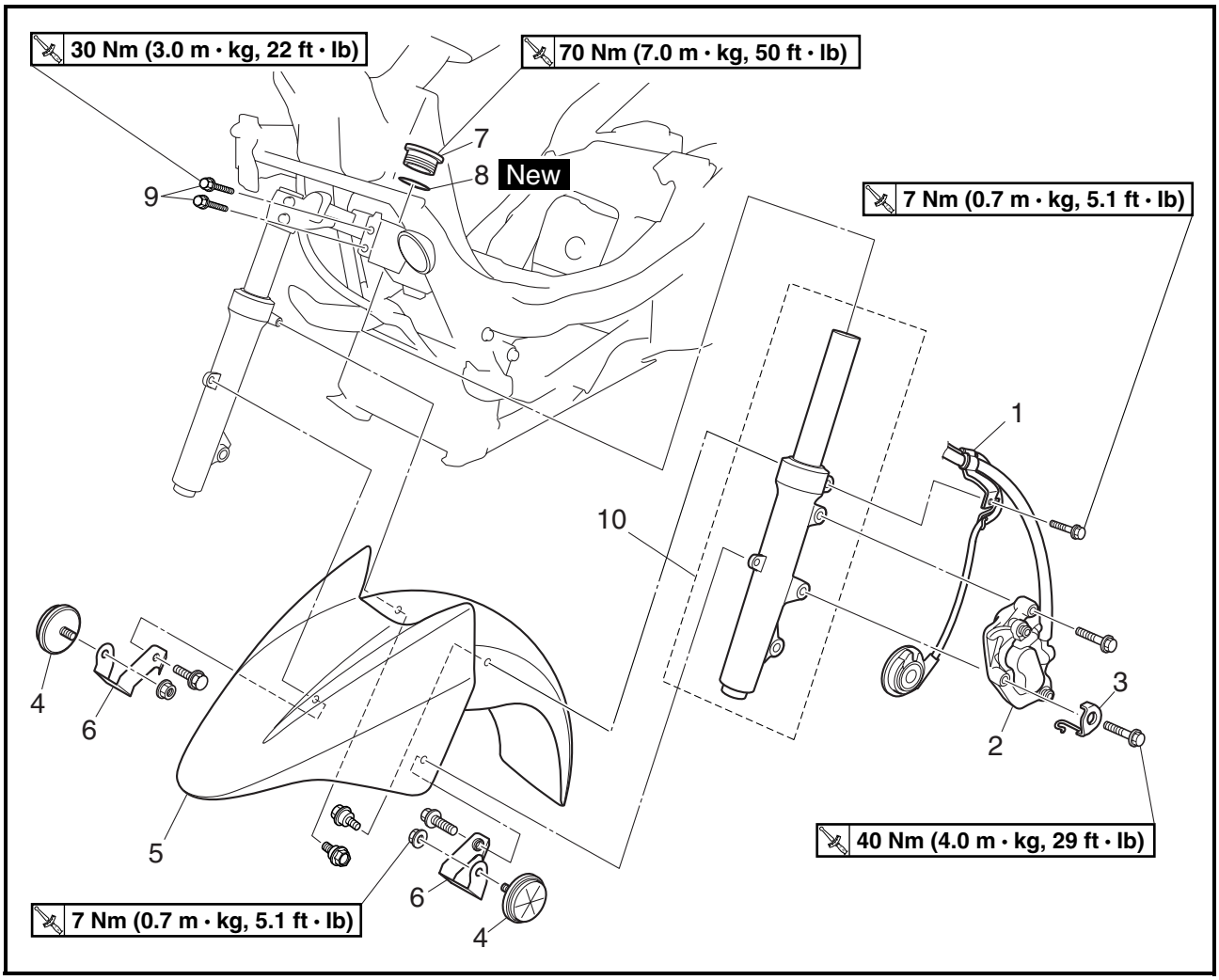
CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

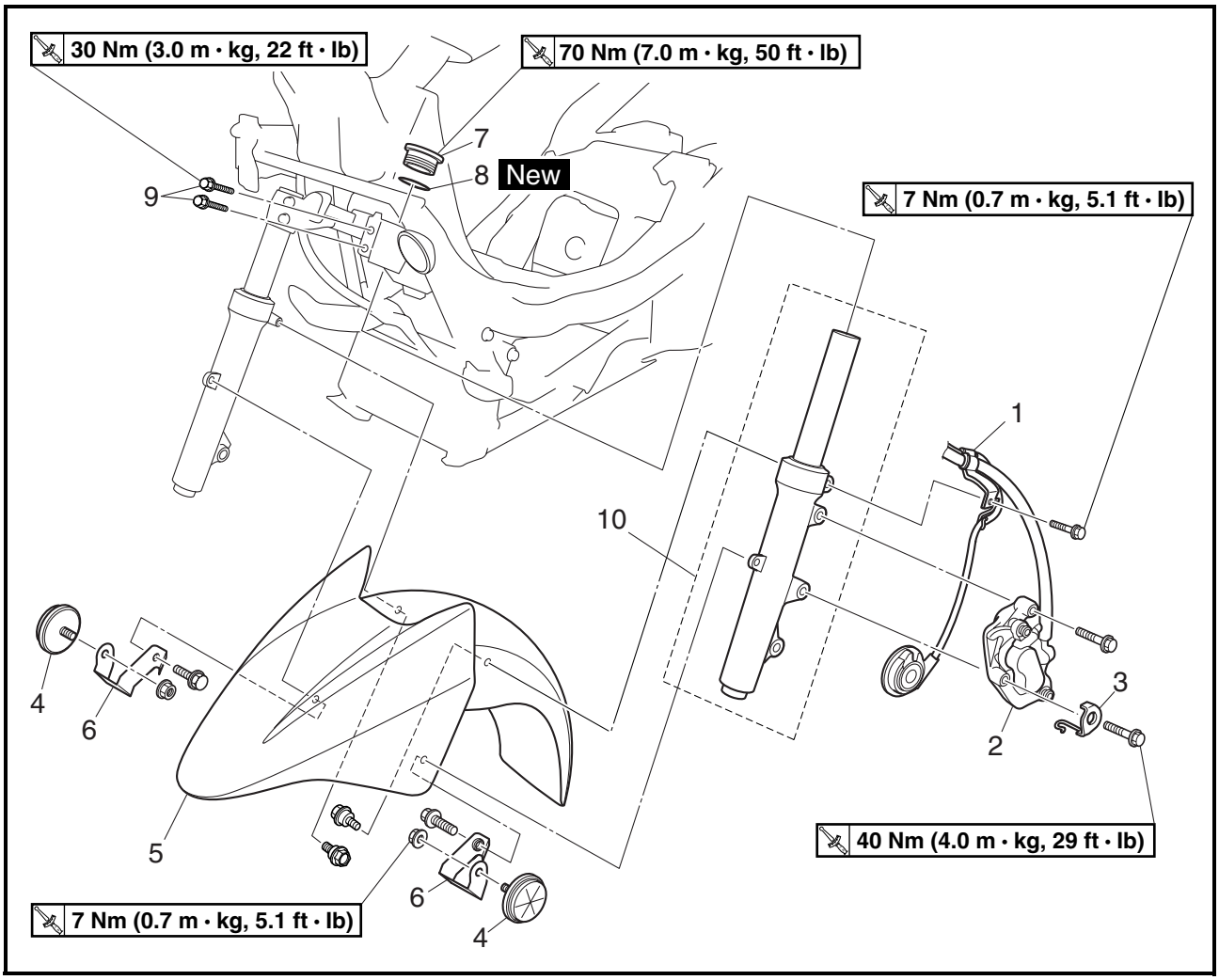
8. Bleed:
   - brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
9. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
10. Check:
    - brake lever operation
      Soft or spongy feeling → Bleed the brake system.
      Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
11. Adjust:
    - rear brake lock lever cable length
      Refer to "ADJUSTING THE REAR BRAKE LOCK LEVER CABLE" in chapter 3.



EAS00646
FRONT FORK

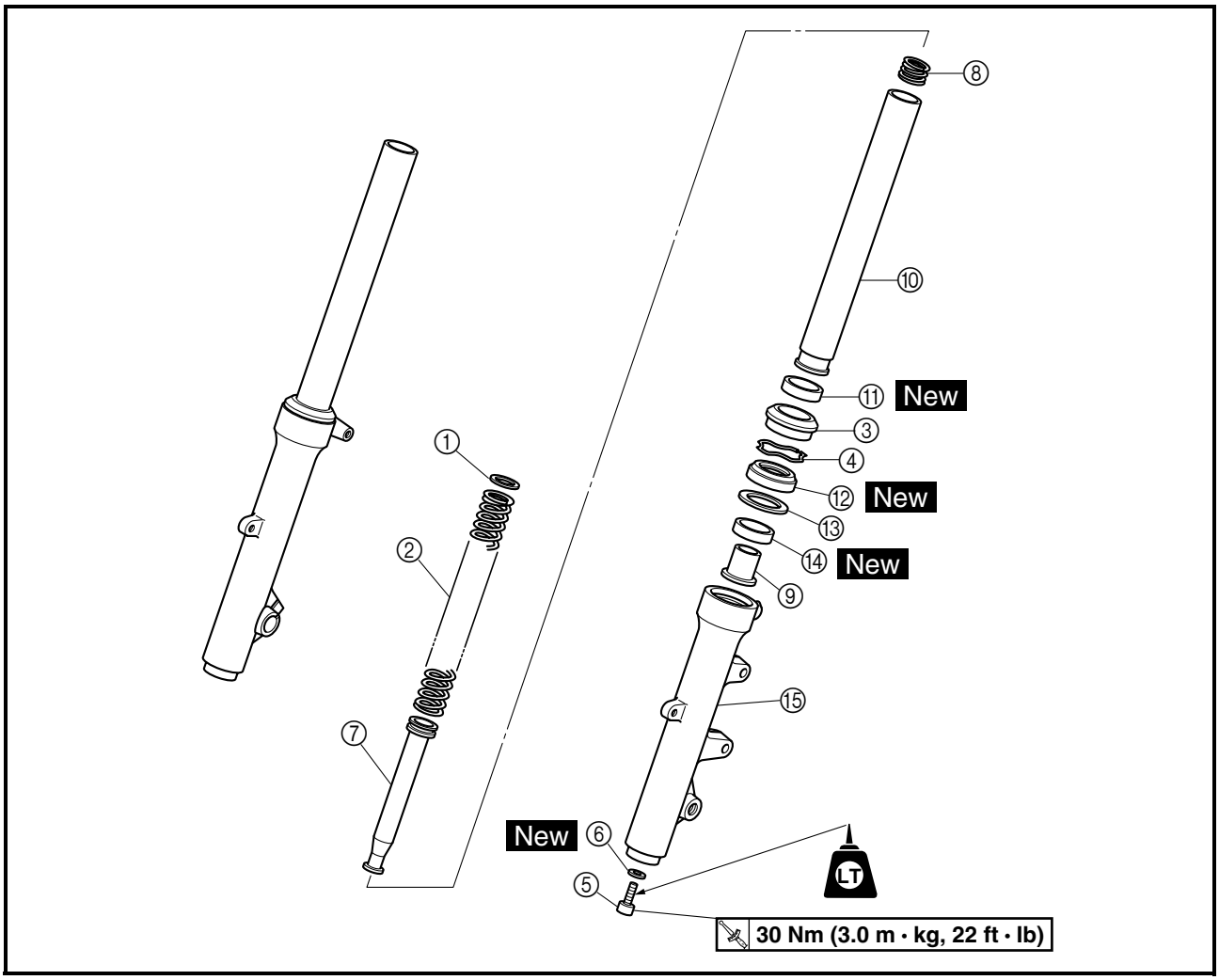


Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
	Storage compartment		Refer to "COWLING AND COVERS" in chapter 3.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
1	Brake hose holder	1	
2	Front brake caliper	1	
3	Speed sensor lead holder	1	
4	Front reflector	2	
5	Front fender	1	
6	Front reflector bracket	2	

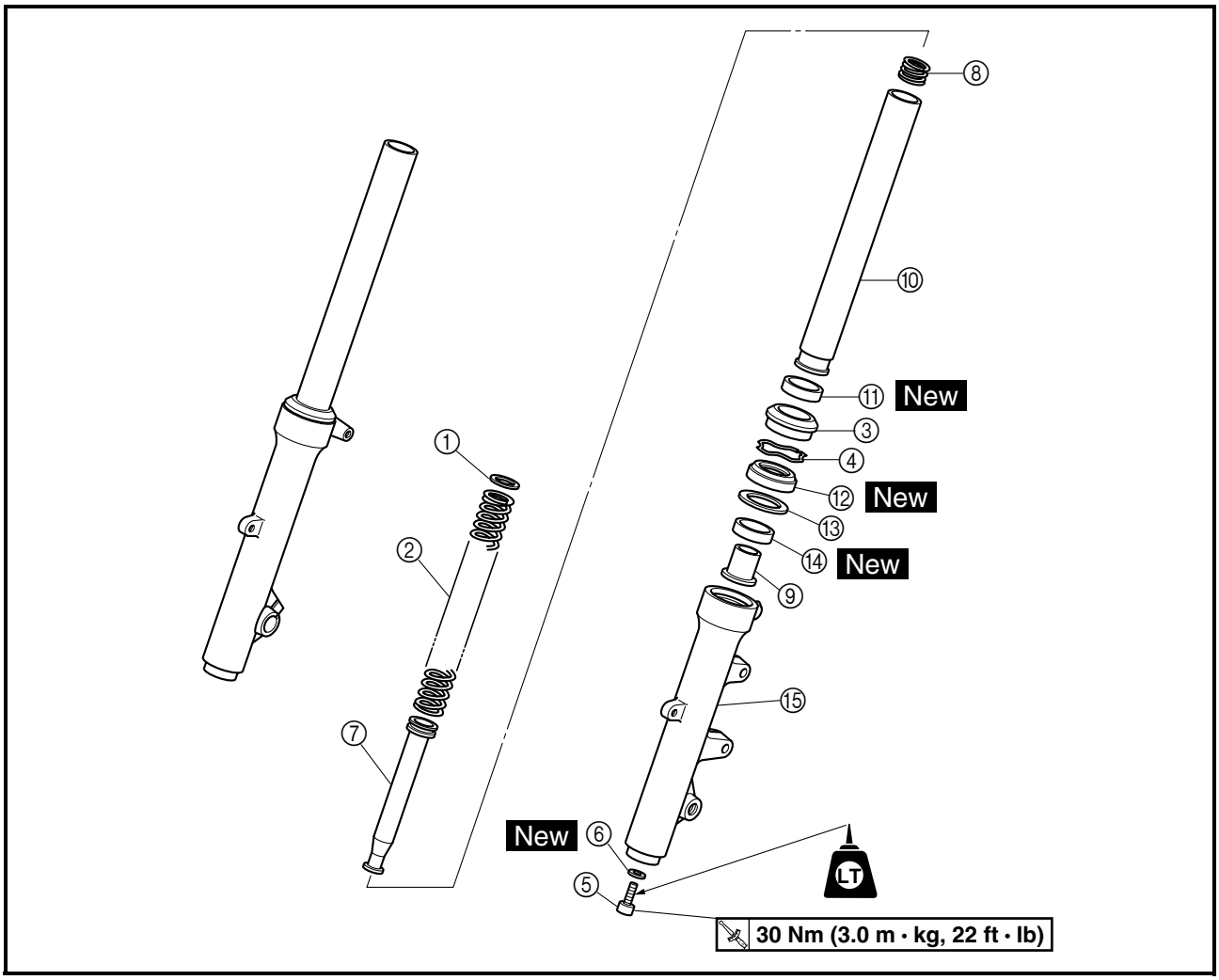


Order	Job/Part	Q'ty	Remarks
7	Cap bolt	1	Refer to "REMOVING THE FRONT FORK LEGS" and "INSTALLING THE FRONT FORK LEGS".
8	O-ring	1	
9	Lower bracket pinch bolt	2	Loosen.
10	Front fork leg	1	
			For installation, reverse the removal procedure.

EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
①	Fork spring seat	1	Refer to "DISASSEMBLING THE FRONT FORK LEGS" and "ASSEMBLING THE FRONT FORK LEGS".
②	Fork spring	1	
③	Dust seal	1	
④	Oil seal clip	1	
⑤	Damper rod bolt	1	
⑥	Copper washer	1	
⑦	Damper rod	1	
⑧	Rebound spring	1	
⑨	Oil flow stopper	1	
⑩	Inner tube	1	
⑪	Inner tube bushing	1	
⑫	Oil seal	1	



Order	Job/Part	Q'ty	Remarks
⑬	Washer	1	Refer to "DISASSEMBLING THE FRONT FORK LEGS" and "ASSEMBLING THE FRONT FORK LEGS".
⑭	Outer tube bushing	1	
⑮	Outer tube	1	
			For assembly, reverse the disassembly procedure.

EAS00651
REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

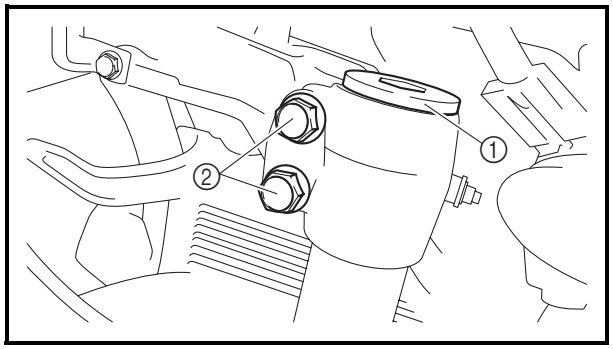
1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the front wheel is elevated.

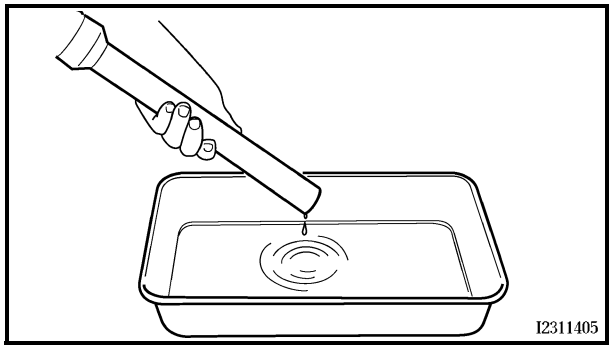


2. Remove:
   - cap bolt ①
     (with a 17-mm hexagonal wrench)
3. Loosen:
   - lower bracket pinch bolt ②

⚠ WARNING

Before loosening the lower bracket pinch bolts, support the front fork leg.

4. Remove:
   - front fork leg



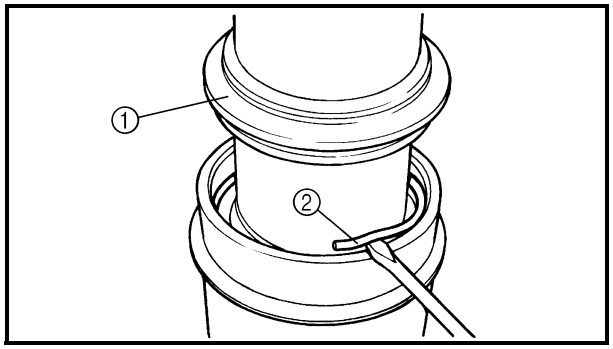
EAS00652
DISASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Remove:
   - fork spring seat
   - fork spring
2. Drain:
   - fork oil

NOTE:

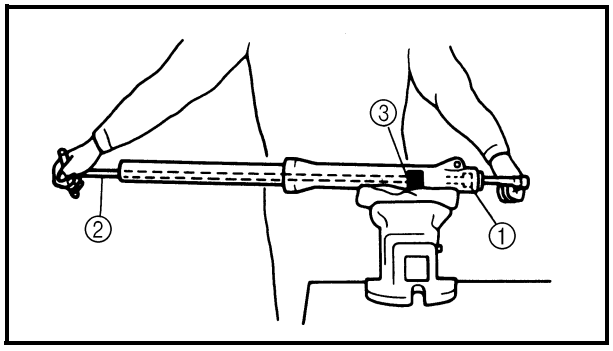
Stroke the outer tube several times while draining the fork oil.



3. Remove:
   - dust seal ①
   - oil seal clip ②
     (with a flat-head screwdriver)

CAUTION:

Do not scratch the inner tube.

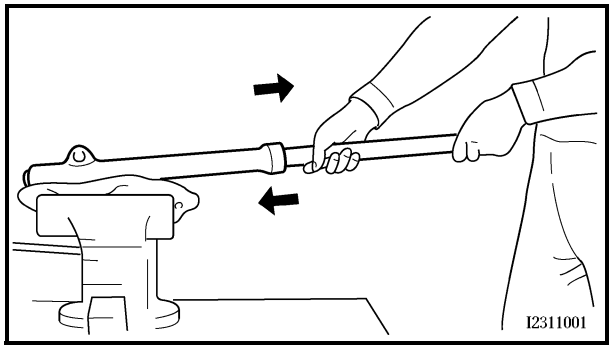


4. Remove:
   - damper rod bolt ①

NOTE:

While holding the damper rod with the damper rod holder ② and T-handle ③, loosen the damper rod bolt.

Damper rod holder
90890-01460
T-handle
90890-01326



5. Remove:
   - inner tube

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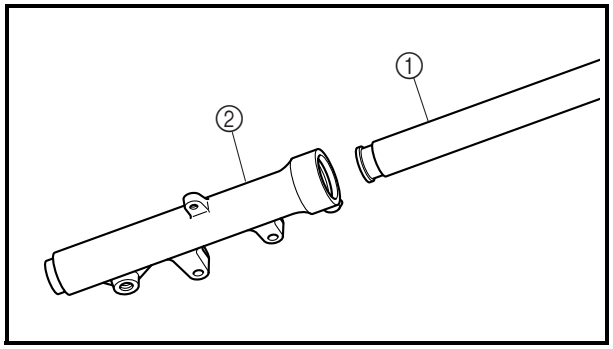
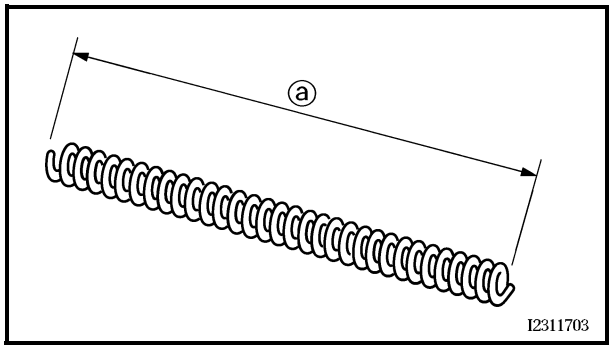
a. Hold the front fork leg horizontally.
b. Securely clamp the brake caliper bracket in a vise with soft jaws.
c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

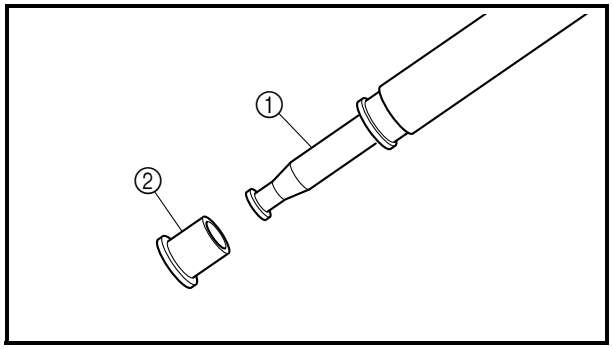
CAUTION:

- **Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.**
- **Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲







EAS00656
CHECKING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Check:
   - inner tube ①
   - outer tube ②
     Bends/damage/scratches → Replace.

⚠ WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:
   - spring free length ⓐ
     Out of specification → Replace.

Spring free length
316.7 mm (12.47 in)
<Limit>: 310.4 mm (12.22 in)

3. Check:
   - damper rod ①
     Damage/wear → Replace.
     Obstruction → Blow out all of the oil passages with compressed air.
   - oil flow stopper ②
     Damage → Replace.

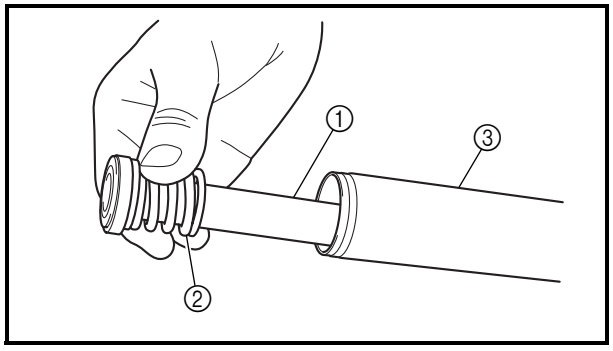
EAS00659
ASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

⚠ WARNING

- **Make sure the oil levels in both front fork legs are equal.**
- **Uneven oil levels can result in poor handling and a loss of stability.**

NOTE:
- When assembling the front fork leg, be sure to replace the following parts:
  - inner tube bushing
  - outer tube bushing
  - oil seal
  - dust seal
  - cap bolt O-ring
- Before assembling the front fork leg, make sure all of the components are clean.



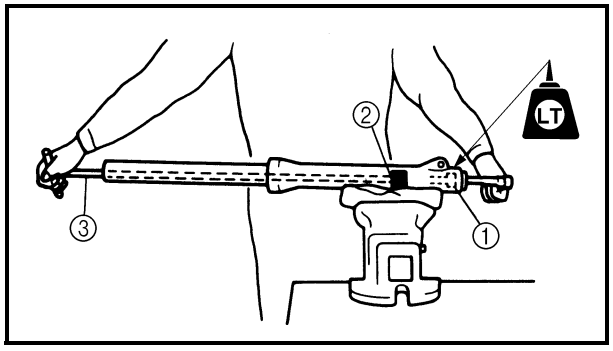
1. Install:
   - damper rod ①
   - rebound spring ②

CAUTION:

Allow the damper rod to slide slowly down the inner tube ③ until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

2. Lubricate:
   - inner tube's outer surface

	Recommended lubricant **Yamaha fork oil 10 WT**



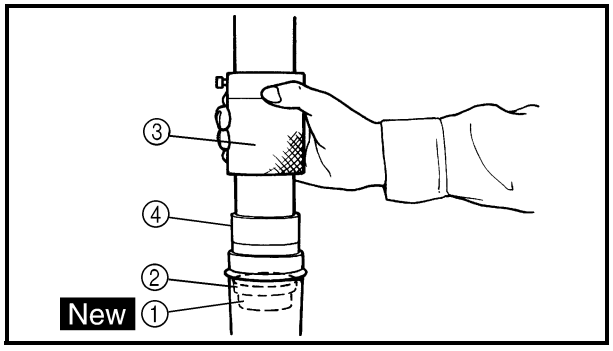
3. Tighten:
   - copper washer New
   - damper rod bolt ①

	Damper rod bolt **30 Nm (3.0 m · kg, 22 ft · lb)** **LOCTITE®**

NOTE:

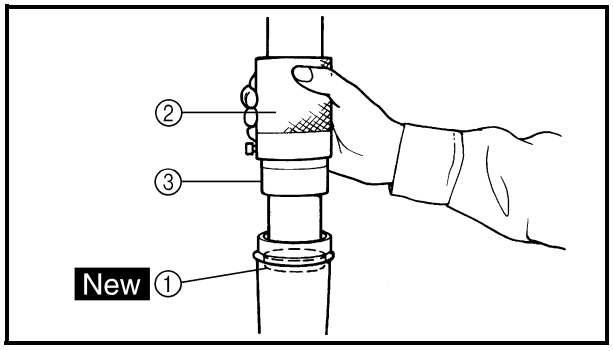
While holding the damper rod assembly with the damper rod holder ② and T-handle ③, tighten the damper rod bolt.

	Damper rod holder **90890-01460** **T-handle** **90890-01326**



4. Install:
   - outer tube bushing ① New
   - washer ②
     (with the fork seal driver weight ③ and fork seal driver attachment ④)

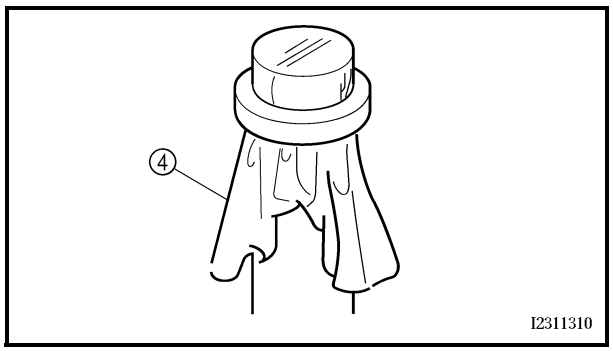
	Fork seal driver weight **90890-01367, YM-A9409-7** **Fork seal driver attachment (41 mm)** **90890-01381, YM-A5142-2**



5. Install:
   - oil seal ① New
     (with the fork seal driver weight ② and fork seal driver attachment ③)

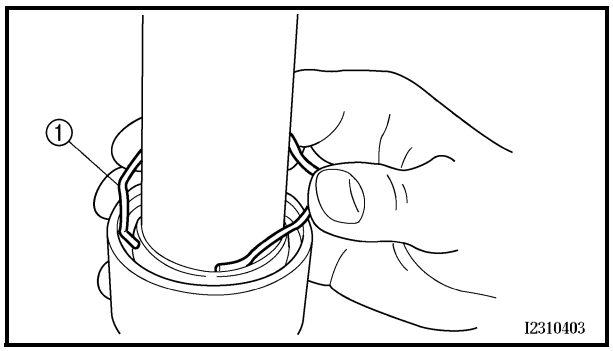
CAUTION:

Make sure the numbered side of the oil seal faces up.



NOTE:

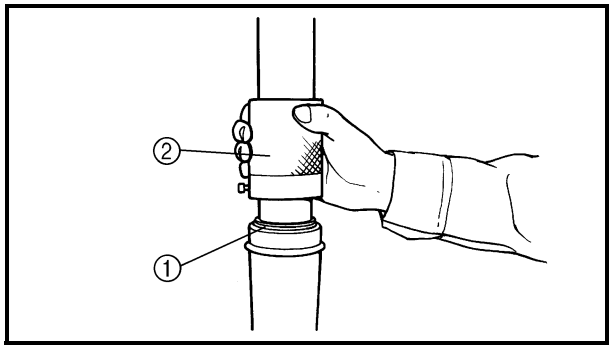
- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag ④ to protect the oil seal during installation.



6. Install:
   - oil seal clip ①

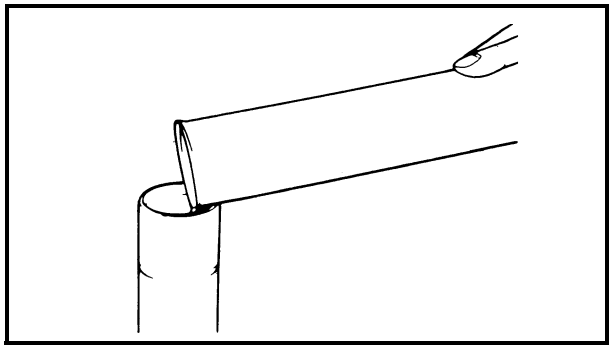
NOTE:

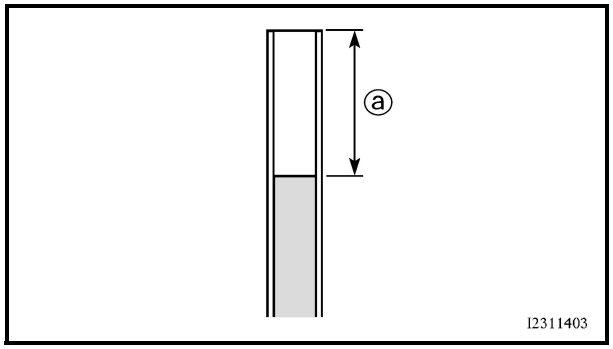
Adjust the oil seal clip so that it fits into the outer tube's groove.

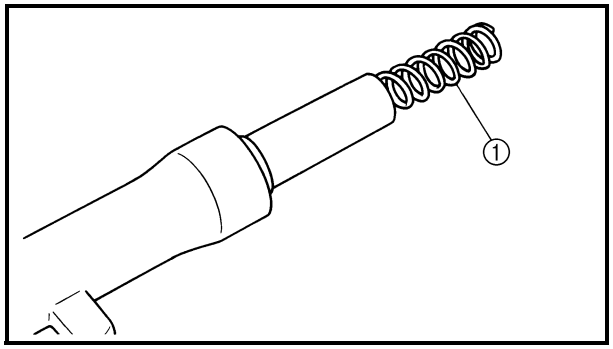


7. Install:
   - dust seal ①
     (with the fork seal driver weight ②)

	Fork seal driver weight **90890-01367, YM-A9409-7**







8. Fill:
   - front fork leg
     (with the specified amount of the recommended fork oil)

Quantity (each front fork leg)
0.298 L
(0.262 Imp qt, 0.315 US qt)
Recommended oil
Yamaha fork oil 10 WT

Front fork leg oil level ⓐ (from the top of the inner tube, with the inner tube fully compressed and without the fork spring)
88 mm (3.46 in)

NOTE:
- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.

9. Install:
   - fork spring ①
   - fork spring seat

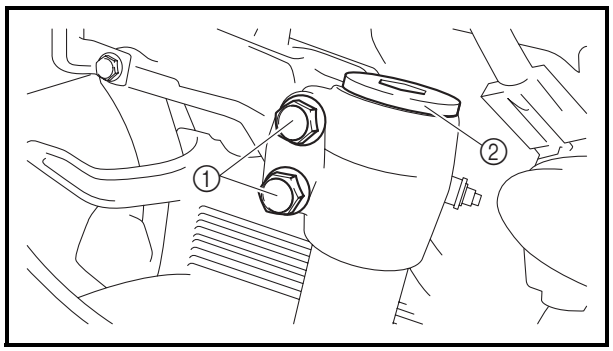
NOTE:
Install the fork spring with the smaller pitch facing up.

EAS00663
INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

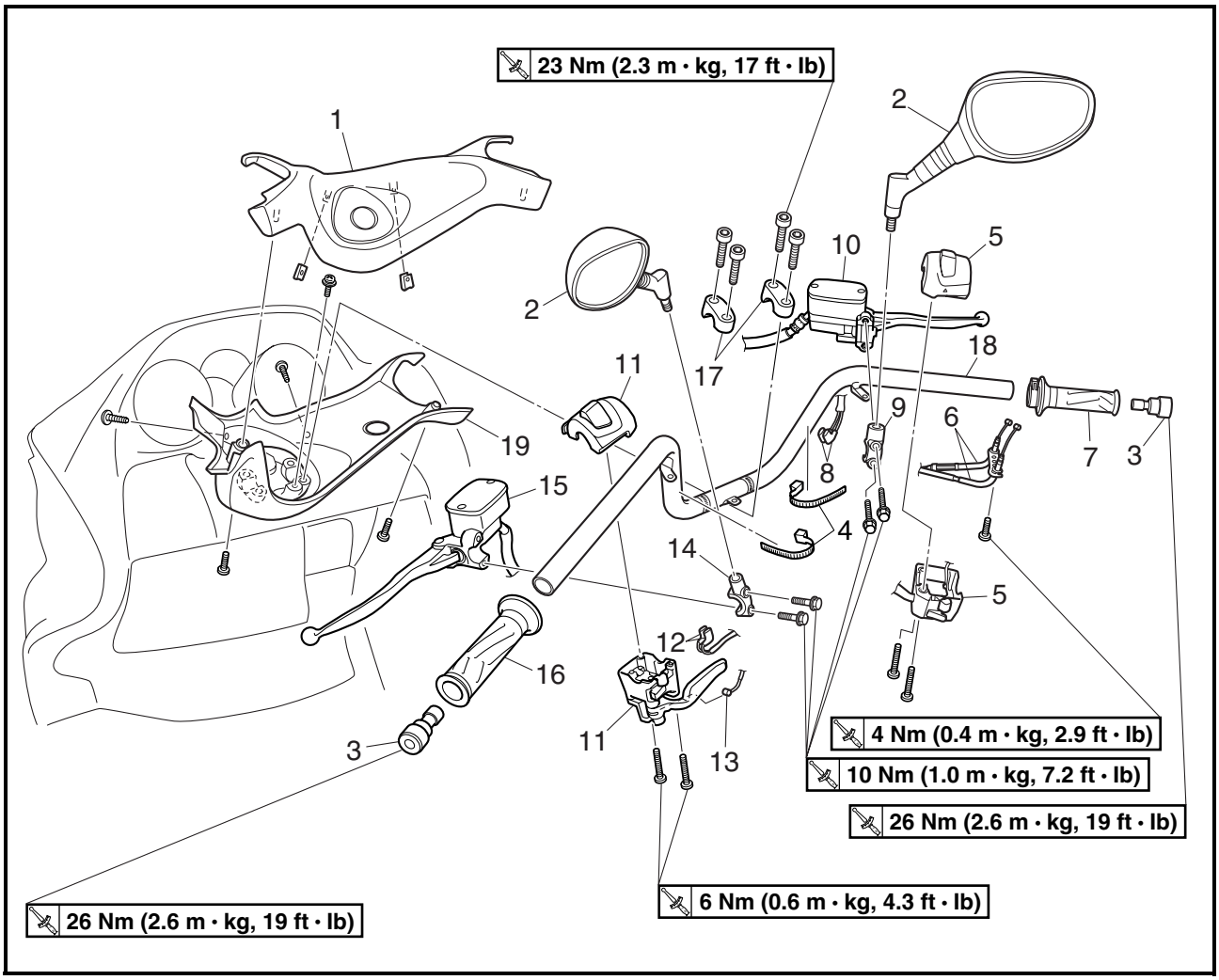
1. Install:
   - front fork leg

NOTE:
- Before installing the cap bolt, lubricate its O-ring with grease.
- Pull up the inner tube until it stops.

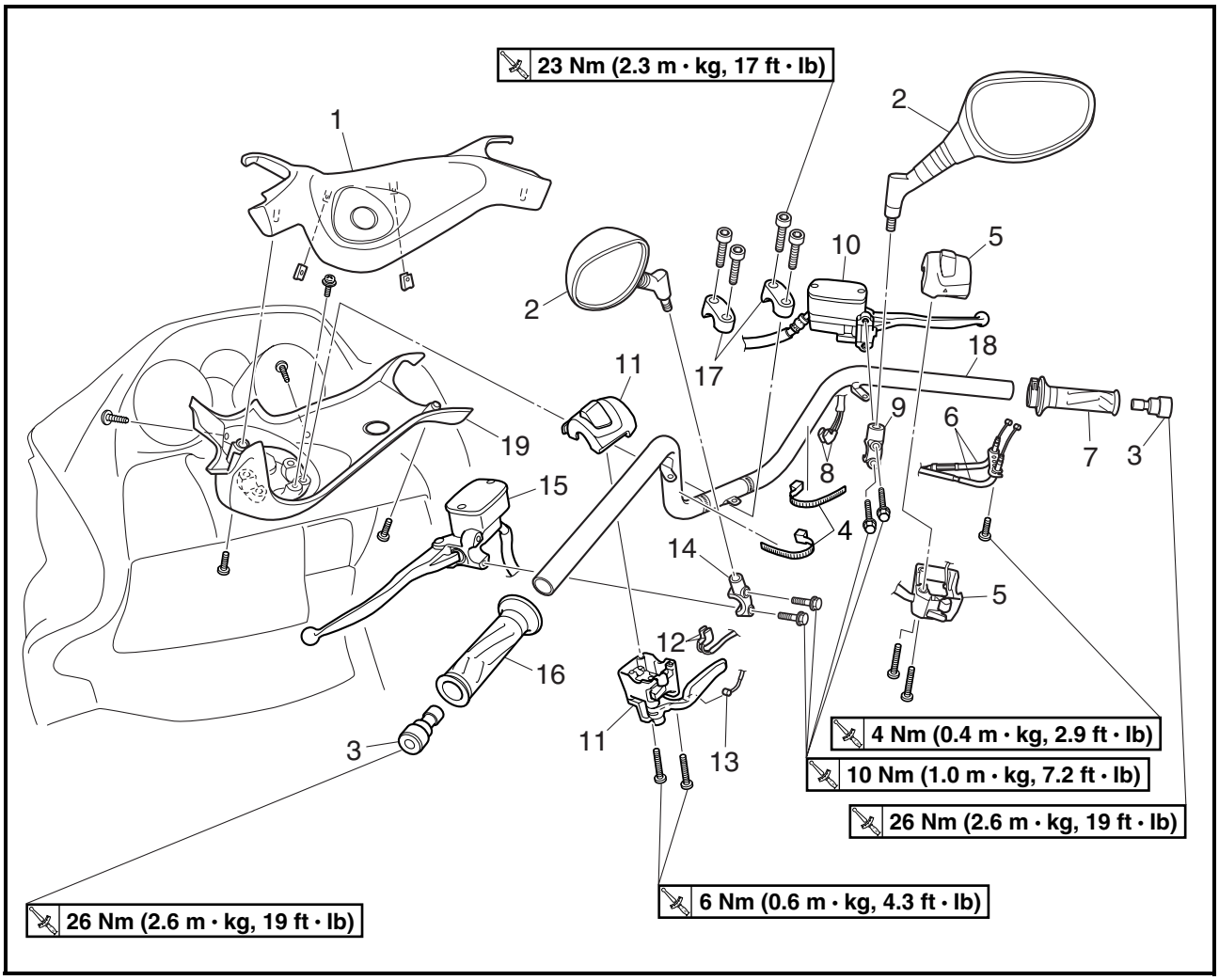


2. Tighten:
   - lower bracket pinch bolt ① **30 Nm (3.0 m · kg, 22 ft · lb)**
   - cap bolt ② **70 Nm (7.0 m · kg, 50 ft · lb)**

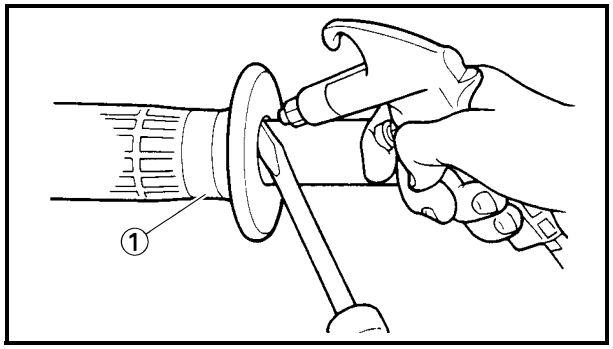
EAS00664
HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
	Windshield		Refer to "COWLING AND COVERS" in chapter 3.
1	Upper handlebar cover	1	
2	Rearview mirror (left and right)	2	
3	Grip end	2	Refer to "INSTALLING THE HANDLEBAR".
4	Plastic locking tie	2	
5	Right handlebar switch	1	
6	Throttle cable	2	Disconnect.
7	Throttle grip	1	
8	Front brake light switch connector	2	Disconnect.
9	Front brake master cylinder holder	1	
10	Front brake master cylinder	1	
11	Left handlebar switch	1	



Order	Job/Part	Q'ty	Remarks
12	Rear brake light switch connector	2	Disconnect.
13	Rear brake lock lever cable	1	Disconnect.
14	Rear brake master cylinder holder	1	Refer to "INSTALLING THE HANDLEBAR".
15	Rear brake master cylinder	1	
16	Handlebar grip	1	Refer to "REMOVING THE HANDLEBAR" and "INSTALLING THE HANDLEBAR".
17	Upper handlebar holder	2	Refer to "INSTALLING THE HANDLEBAR".
18	Handlebar	1	
19	Lower handlebar cover	1	
			For installation, reverse the removal procedure.



EAS00666
REMOVING THE HANDLEBAR

1. Stand the scooter on a level surface.

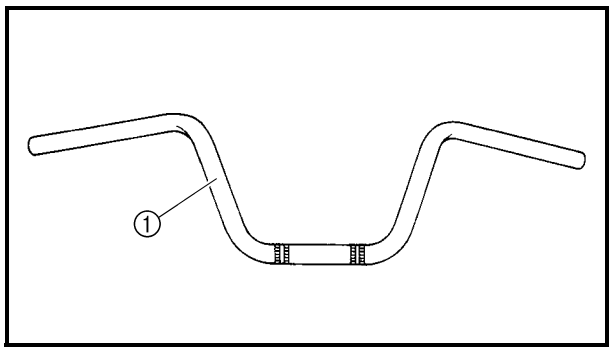
⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

2. Remove:
   - handlebar grip ①

NOTE:

Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.



EAS00668
CHECKING THE HANDLEBAR

1. Check:
   - handlebar ①
     Bends/cracks/damage → Replace.

⚠ WARNING

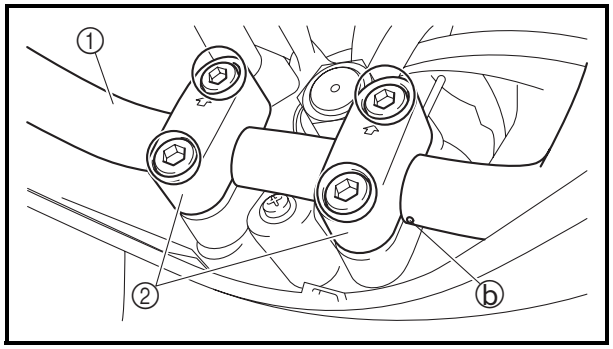
Do not attempt to straighten a bent handlebar as this may dangerously weaken it.

EAS00671
INSTALLING THE HANDLEBAR

1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

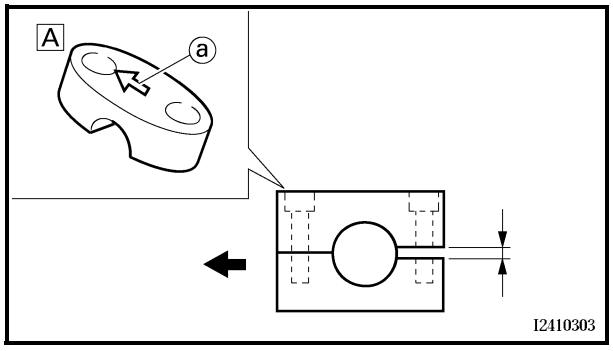


2. Install:
   - handlebar ①
   - upper handlebar holders ②

23 Nm (2.3 m · kg, 17 ft · lb)

CAUTION:

First, tighten the bolts on the front side of the handlebar holders, and then on the rear side.



NOTE:

- The upper handlebar holders should be installed with the arrow marks ⓐ facing forward A.
- Align the match marks ⓑ on the handlebar with the upper surface of the lower handlebar holder.

3. Install:
   - handlebar grip

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a. Apply a thin coat of rubber adhesive onto the left end of the handlebar.
b. Slide the handlebar grip over the left end of the handlebar.
c. Wipe off any excess rubber adhesive with a clean rag.

⚠ WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

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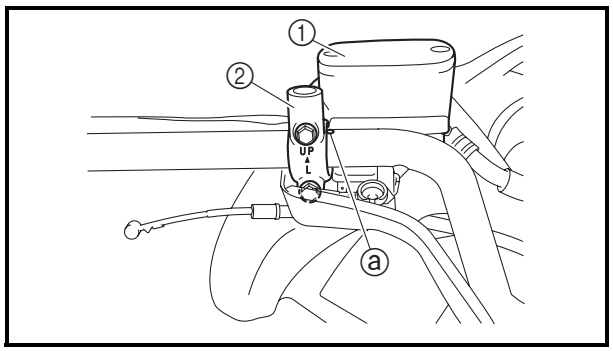
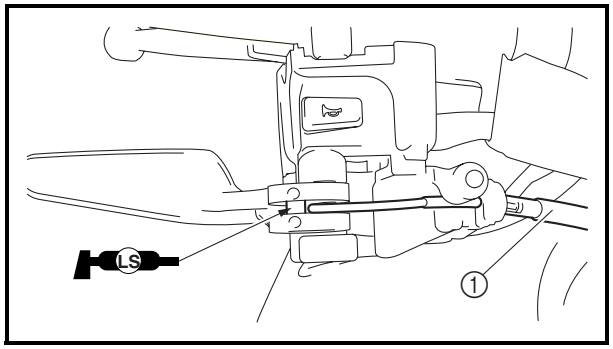
4. Install:
   - rear brake master cylinder ①
   - rear brake master cylinder holder ②

10 Nm (1.0 m · kg, 7.2 ft · lb)



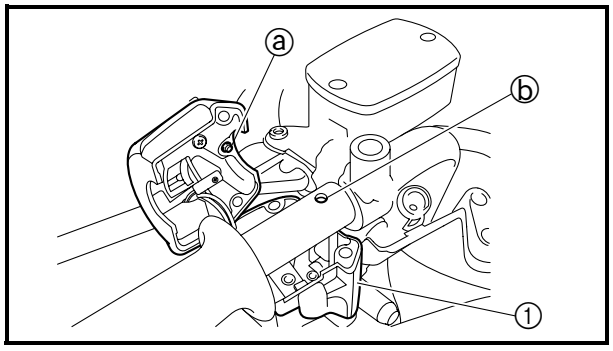
NOTE:

- Make sure to install the brake master cylinder holder that has the “L” mark.
- Install the rear brake master cylinder holder with the “UP” mark facing up.
- Align the end of the rear brake master cylinder holder with the punch mark ⓐ in the handlebar.
- First, tighten the upper bolt, then the lower bolt.



5. Install:
   - rear brake lock lever cable ①

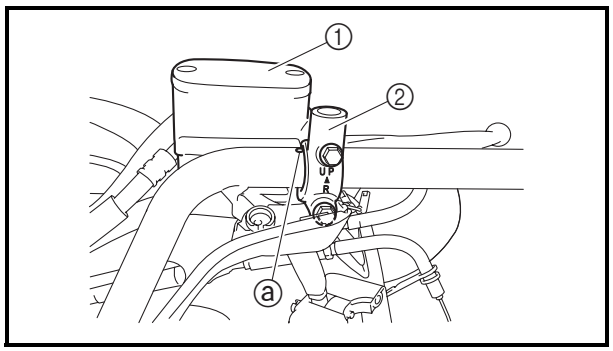
NOTE:
Lubricate the inside of the rear brake lock lever cable and rear brake lock lever with a thin coat of lithium-soap-based grease.



6. Install:
   - left handlebar switch ①

6 Nm (0.6 m · kg, 4.3 ft · lb)

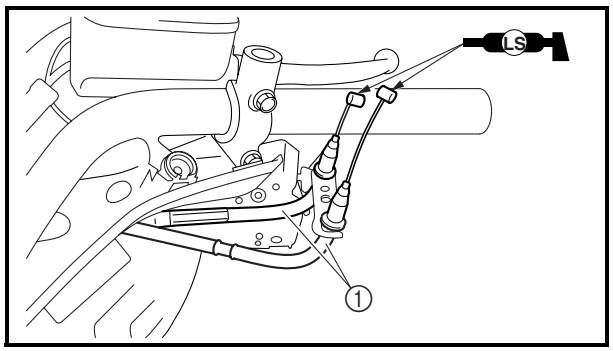
NOTE:
Align the projection ⓐ on the left handlebar switch with the hole ⓑ in the handlebar.



7. Install:
   - front brake master cylinder ①
   - front brake master cylinder holder ②

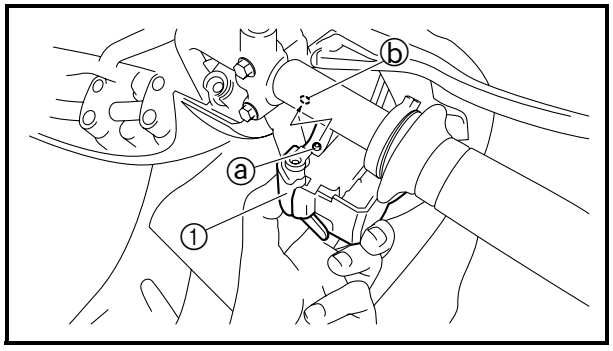
10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:
- Make sure to install the brake master cylinder holder that has the “R” mark.
- Install the front brake master cylinder holder with the “UP” mark facing up.
- Align the end of the front brake master cylinder holder with the punch mark ⓐ in the handlebar.
- First, tighten the upper bolt, then the lower bolt.



8. Install:
   - throttle grip
   - throttle cables ①

NOTE:
Lubricate the inside of the throttle grip with a thin coat of lithium-soap-based grease and install it onto the handlebar.

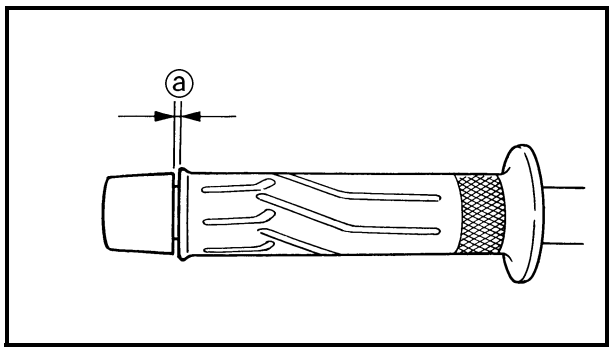


9. Install:
   • right handlebar switch ①

⚠ WARNING

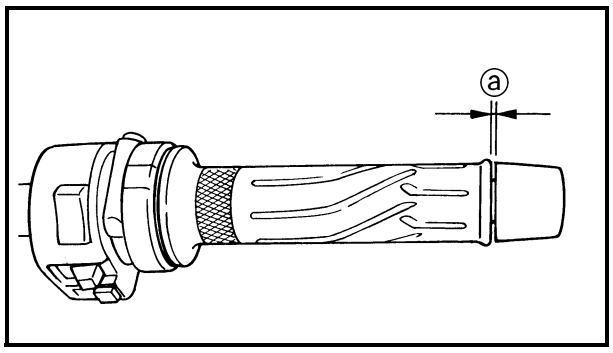
Make sure the throttle grip operates smoothly.

NOTE:
Align the projection ⓐ on the right handlebar switch with the hole ⓑ in the handlebar.



10. Install:
   • grip end (left)

NOTE:
There should be 1 ~ 3 mm (0.04 ~ 0.12 in) of clearance ⓐ between the throttle grip and the grip end.



11. Install:
   • grip end (right)

NOTE:
There should be 2.4 ~ 4.4 mm (0.09 ~ 0.17 in) of clearance ⓐ between the throttle grip and the grip end.

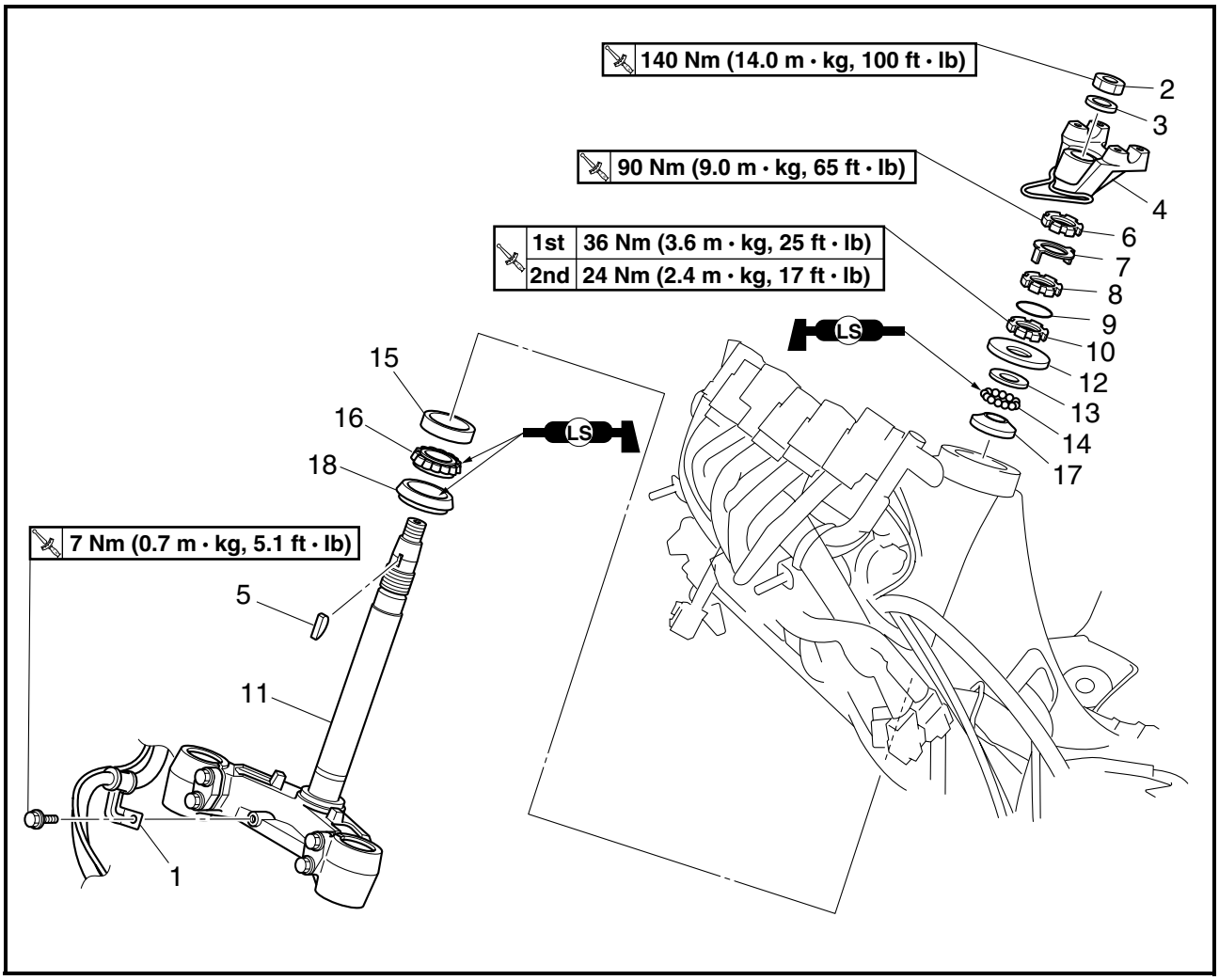
12. Adjust:
   • throttle cable free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm (0.12 ~ 0.20 in)

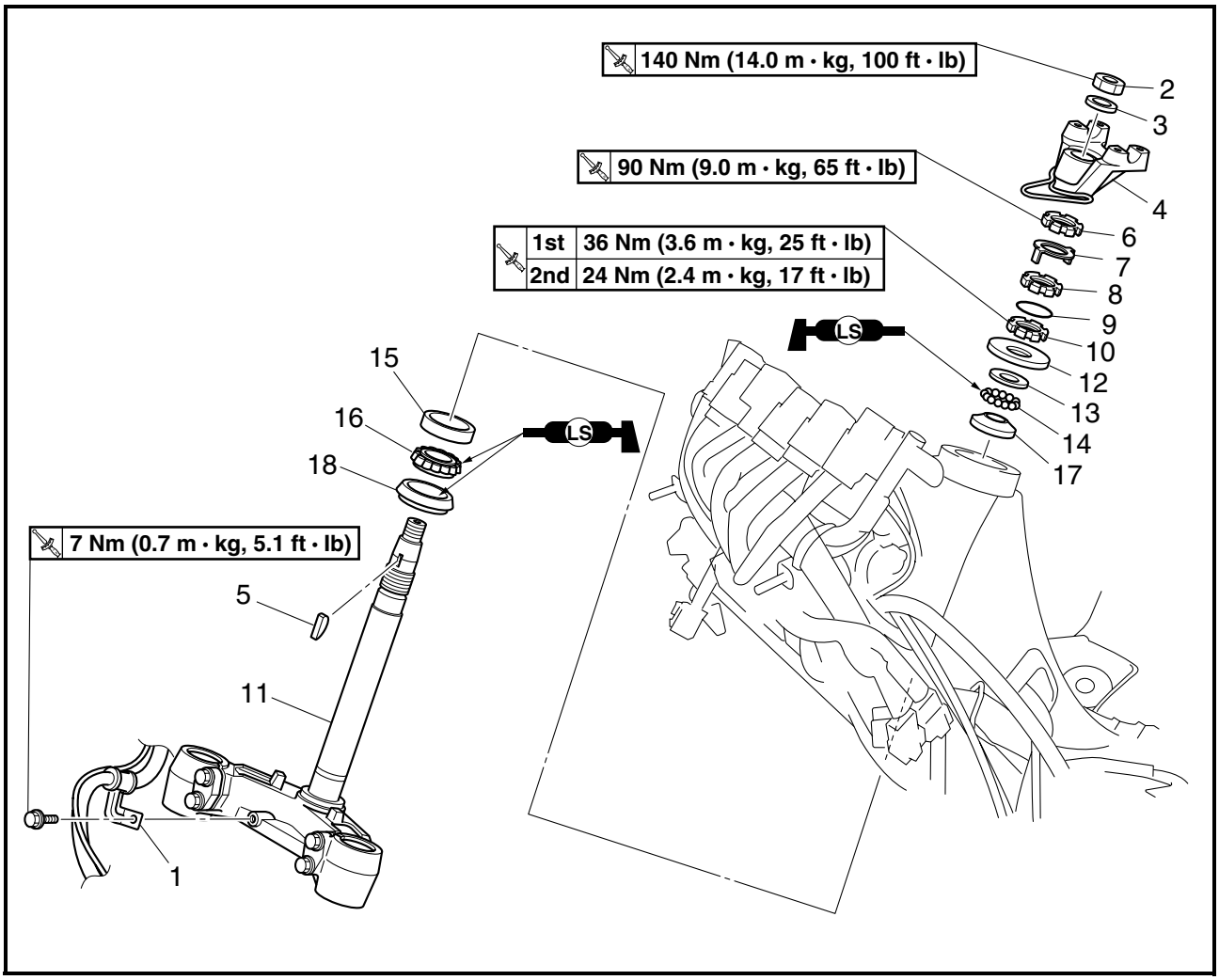
EAS00675

STEERING HEAD

LOWER BRACKET



Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
	Front fork legs		Refer to "FRONT FORK".
	Storage compartment		Refer to "COWLING AND COVERS" in chapter 3.
	Handlebar		Refer to "HANDLEBAR".
1	Brake hose holder	1	
2	Steering stem nut	1	
3	Washer	1	
4	Lower handlebar holder	1	Refer to "REMOVING THE LOWER BRACKET" and "INSTALLING THE STEERING HEAD".
5	Woodruff key	1	
6	Upper steering ring nut	1	
7	Lock washer	1	
8	Center steering ring nut	1	



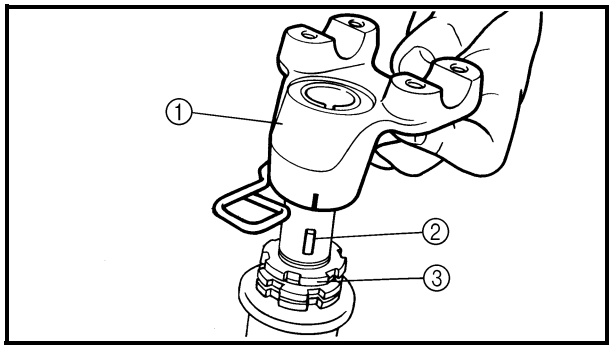
Order	Job/Part	Q'ty	Remarks
9	Rubber washer	1	Refer to "REMOVING THE LOWER BRACKET" and "INSTALLING THE STEERING HEAD".
10	Lower steering ring nut	1	
11	Lower bracket	1	
12	Bearing cover	1	
13	Upper bearing inner race	1	Refer to "INSTALLING THE STEERING HEAD".
14	Upper bearing	1	
15	Lower bearing outer race	1	
16	Lower bearing	1	
17	Upper bearing outer race	1	
18	Dust seal	1	
			For installation, reverse the removal procedure.

EAS00680
REMOVING THE LOWER BRACKET

1. Stand the scooter on a level surface.

⚠ WARNING

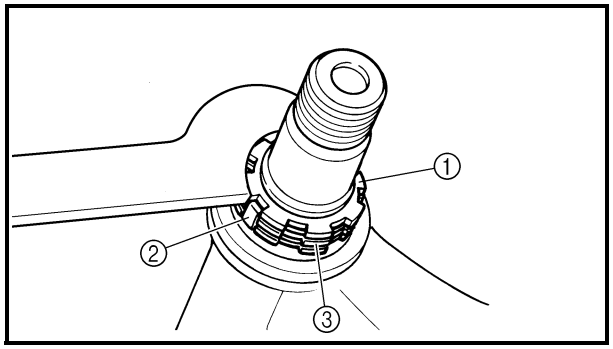
Securely support the scooter so that there is no danger of it falling over.



2. Remove:
   - handlebar lower holder ①
   - woodruff key ②

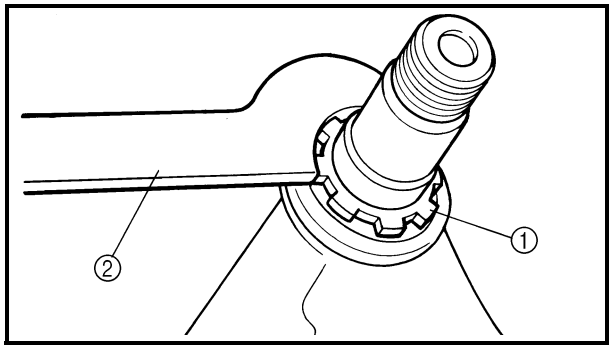
NOTE:

Remove the handlebar lower holder by loosening the upper steering ring nut ③ gradually.



3. Remove:
   - upper steering ring nut ①
     (with the ring nut wrench)
   - lock washer ②
   - center steering ring nut ③
   - rubber washer

Ring nut wrench
90890-01268, YU-01268



4. Remove:
   - lower steering ring nut ①
     (with the ring nut wrench ②)

Ring nut wrench
90890-01268, YU-01268

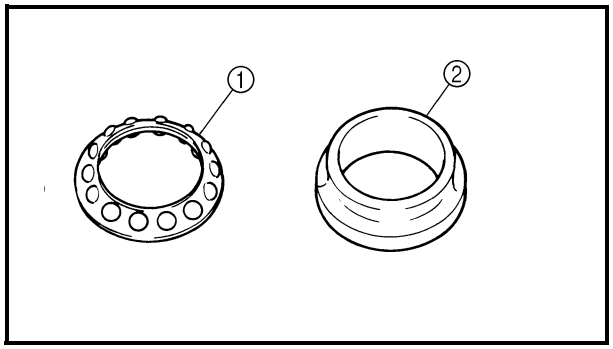
⚠ WARNING

Securely support the lower bracket so that there is no danger of it falling.

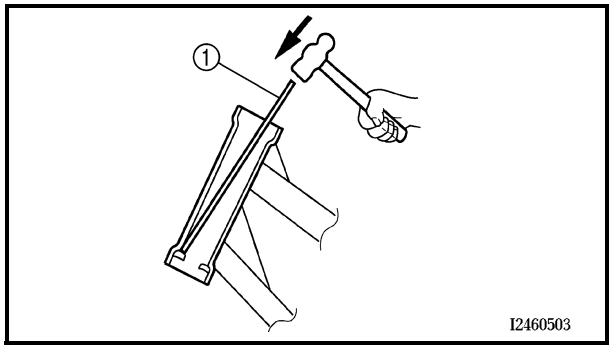
EAS00681
CHECKING THE STEERING HEAD

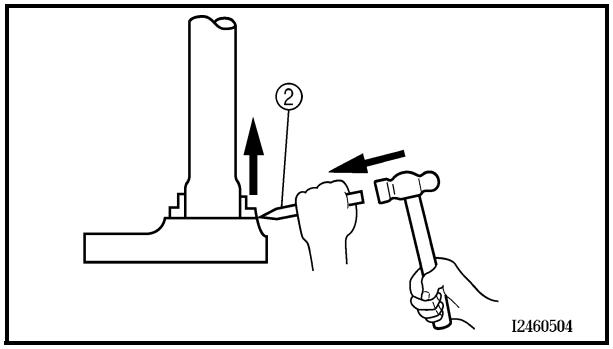
1. Wash:
   - bearings
   - bearing races

	Recommended cleaning solvent **Kerosene**



2. Check:
   - bearings ①
   - bearing races ②
     Damage/pitting → Replace.





3. Replace:
   - bearings
   - bearing races

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a. Remove the bearing races from the steering head pipe with a long rod ① and hammer.
b. Remove the bearing race from the lower bracket with a floor chisel ② and hammer.
c. Install a new rubber seal and new bearing races.

CAUTION:

If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE:

- Always replace the bearings and bearing races as a set.
- Whenever the steering head is disassembled, replace the rubber seal.

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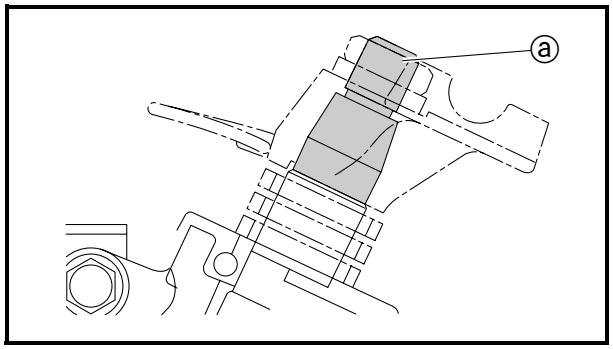
4. Check:
   - upper bracket
   - lower bracket
     (along with the steering stem)
     Bends/cracks/damage → Replace.

EAS00684
INSTALLING THE STEERING HEAD

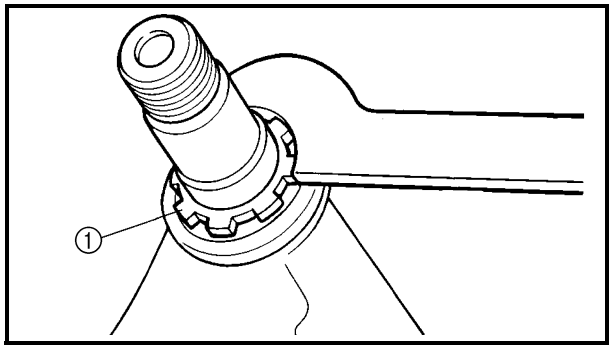
1. Lubricate:
   - upper bearing
   - lower bearing
   - bearing races

	Recommended lubricant **Lithium-soap-based grease**



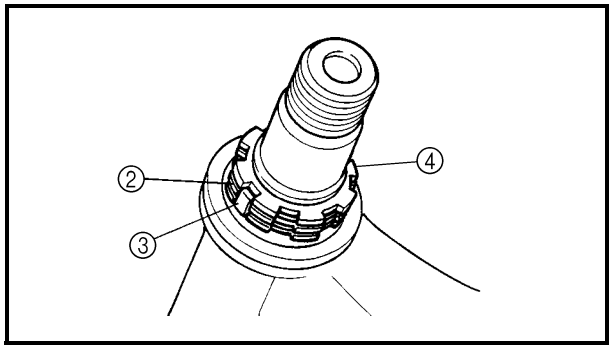
2. Clean:
   - lower bracket
   - lower handlebar holder

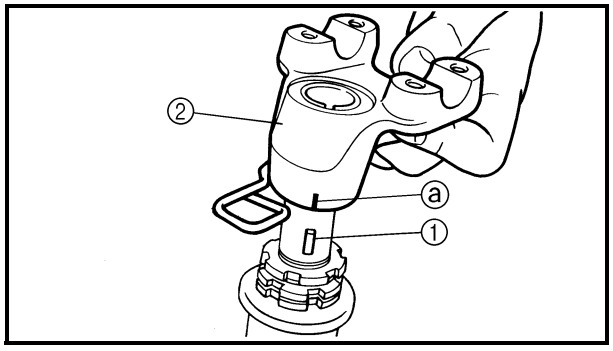
NOTE:
Clean the area ⓐ of the lower bracket indicated in the illustration and the inner surfaces of the lower handlebar holder.



3. Install:
   - lower steering ring nut ①
   - rubber washer
   - center steering ring nut ②
   - lock washer ③
   - upper steering ring nut ④

   Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" in chapter 3.





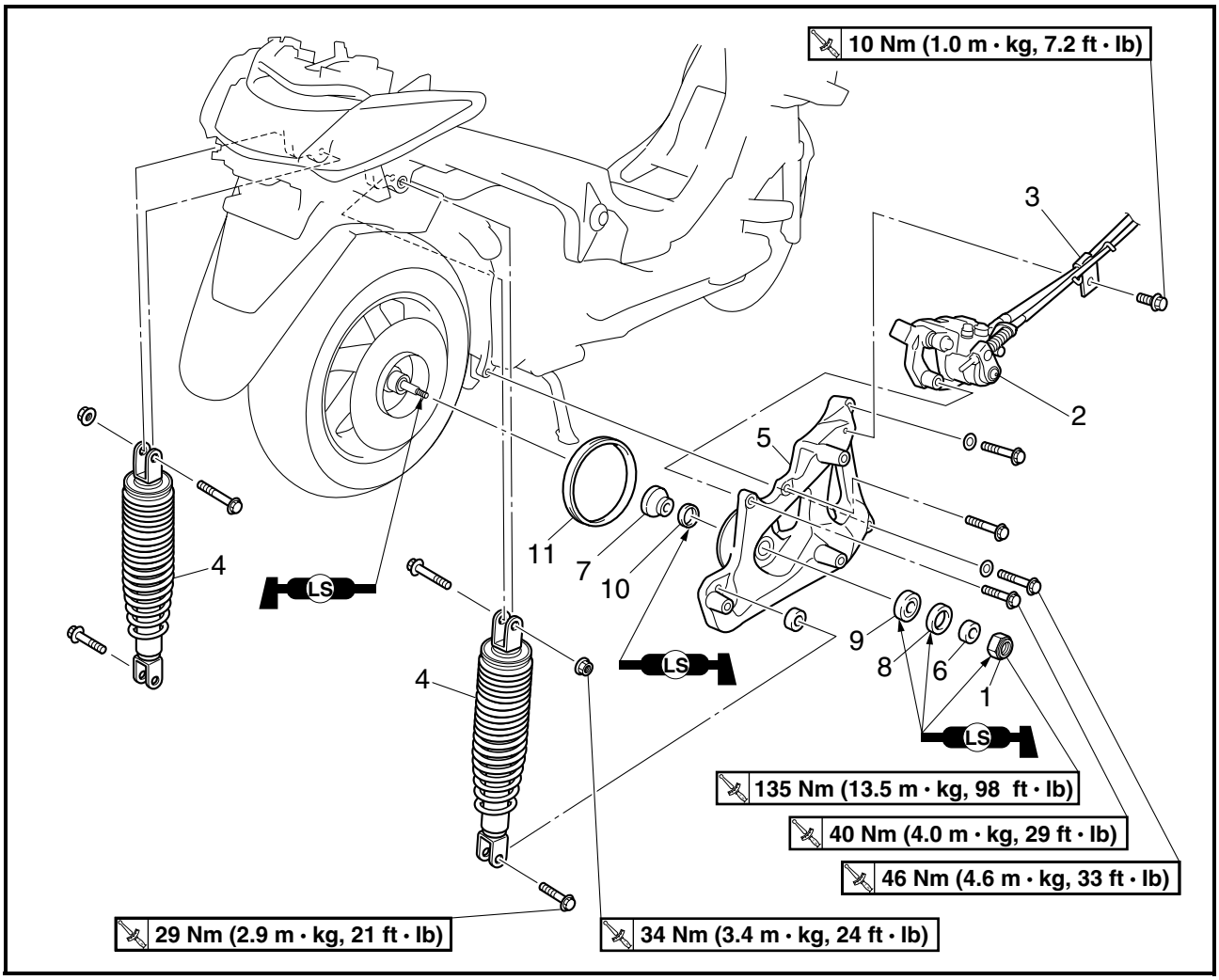
4. Install:
   - woodruff key ①
   - lower handlebar holder ②

140 Nm (14.0 m · kg, 100 ft · lb)

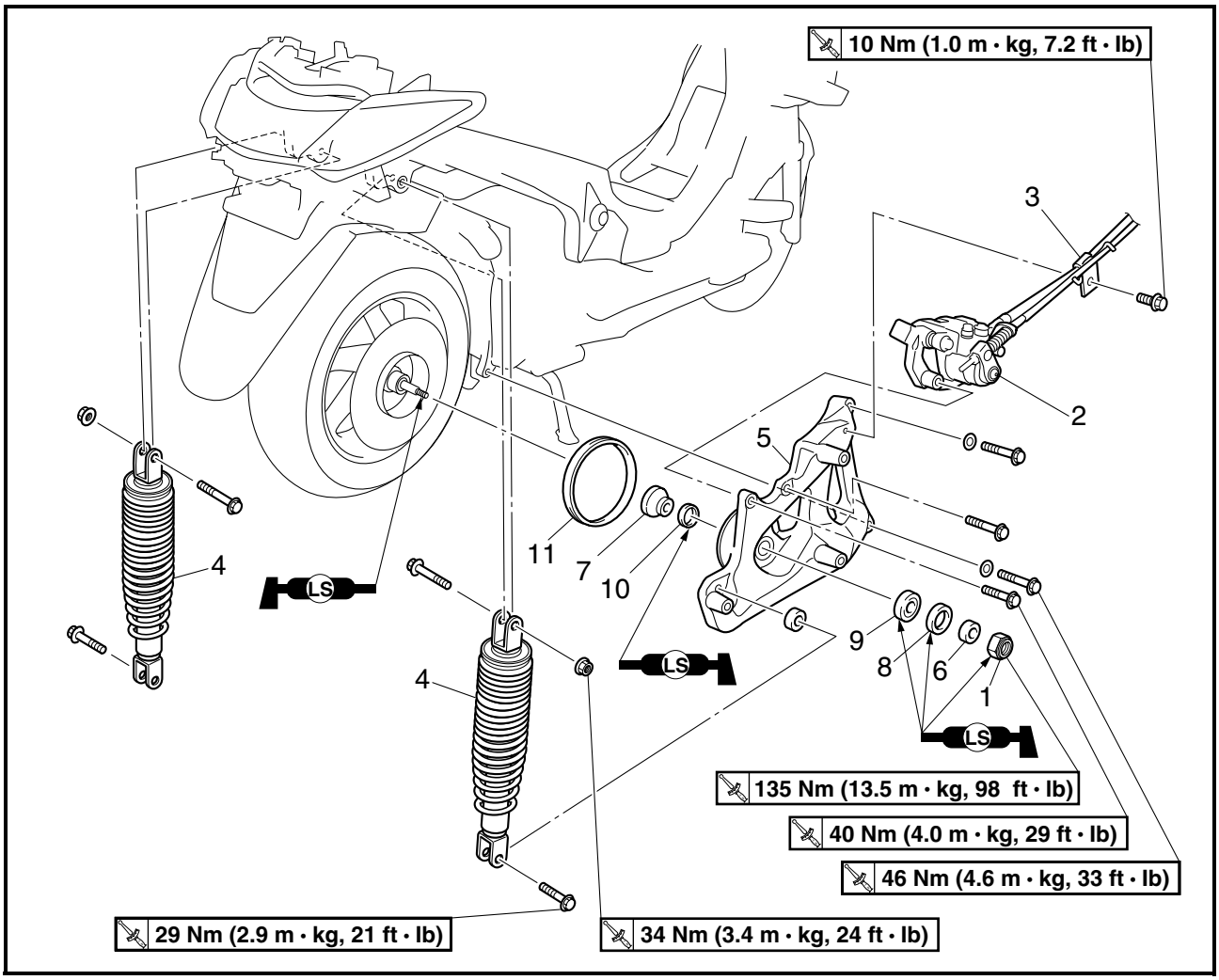
NOTE:
Align the alignment mark ⓐ on the lower handlebar holder with the woodruff key.

EAS00685

REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assemblies and swingarm		Remove the parts in the order listed.
	Storage box		Refer to "COWLING AND COVERS" in chapter 3.
	Air filter case (right)		Refer to "AIR FILTER CASES" in chapter 3.
	Muffler		Refer to "ENGINE REMOVAL" in chapter 5.
1	Rear axle nut	1	Refer to "REMOVING THE SWINGARM" and "INSTALLING THE SWINGARM".
2	Rear brake caliper	1	
3	Brake hose holder	1	
4	Rear shock absorber (left and right)	2	Refer to "REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES" and "INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES".
5	Swingarm	1	



Order	Job/Part	Q'ty	Remarks
6	Spacer	1	Refer to "REMOVING THE SWINGARM" and "INSTALLING THE SWINGARM".
7	Collar	1	
8	Oil seal	1	
9	Bearing	1	
10	Oil seal	1	
11	Dust seal	1	
			For installation, reverse the removal procedure.

EAS00693
REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES

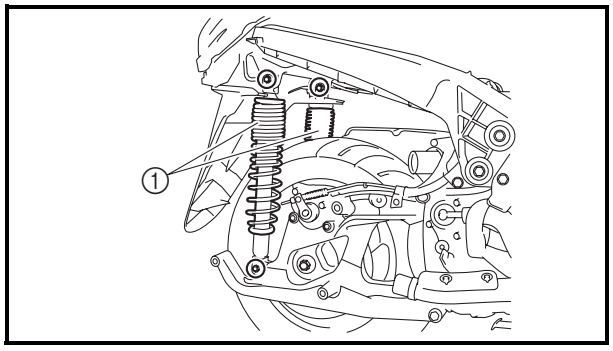
1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the rear wheel is elevated.

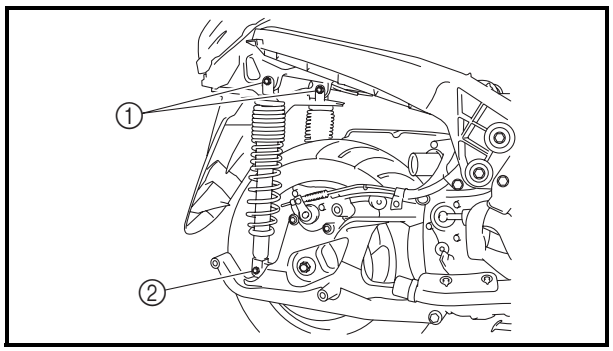


2. Remove:
   - rear shock absorber assemblies ①

EAS00695
CHECKING THE REAR SHOCK ABSORBER ASSEMBLIES

The following procedure applies both of the rear shock absorber assemblies.

1. Check:
   - rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - rear shock absorber
     Oil leaks → Replace the rear shock absorber assembly.
   - spring
     Damage/wear → Replace the rear shock absorber assembly.
   - bolts
     Bends/damage/wear → Replace.



EAS00699
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES

1. Install:
   - rear shock absorber assembly upper nuts ①
     34 Nm (3.4 m · kg, 24 ft · lb)
   - rear shock absorber assembly lower bolts ②
     29 Nm (2.9 m · kg, 21 ft · lb)

EAS00702
REMOVING THE SWINGARM

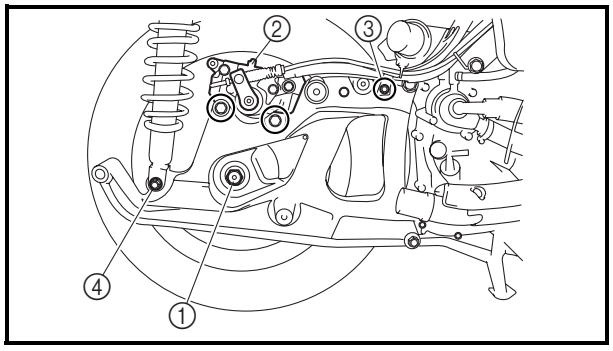
1. Stand the scooter on a level surface.

⚠ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:

Place the scooter on a suitable stand so that the rear wheel is elevated.

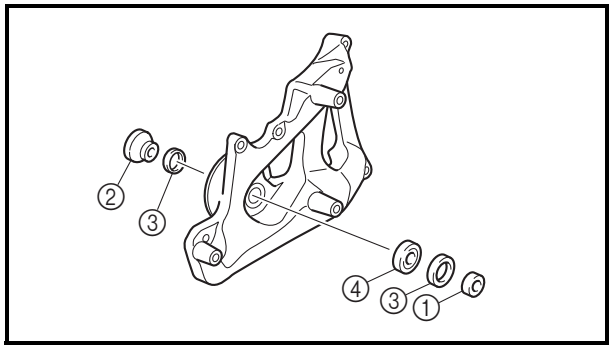


2. Remove:
   - rear axle nut ①
   - rear brake caliper ②
   - brake hose holder ③
   - rear shock absorber assembly lower bolt (right) ④

NOTE:

Do not squeeze the brake lever when removing the brake caliper.

3. Remove:
   - swingarm



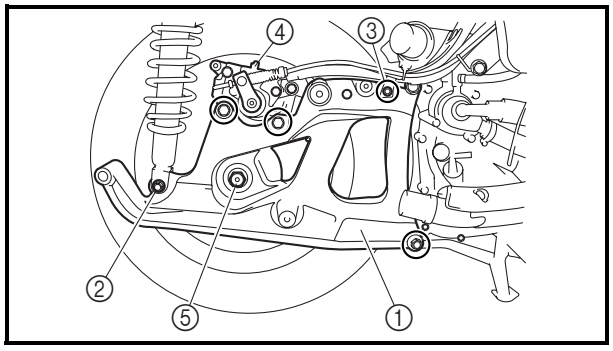
EAS00708
CHECKING THE SWINGARM

1. Check:
   - swingarm
     Bends/cracks/damage → Replace.
2. Check:
   - spacer ①
   - collar ②
   - oil seals ③
   - bearing ④
   - bushing
     Damage/wear → Replace.
   - dust seal
     Damage/wear → Replace.

EAS00711
INSTALLING THE SWINGARM

1. Lubricate:
   - bearing
   - oil seal lips
   - drive axle splines

	Recommended lubricant **Lithium-soap-based grease**



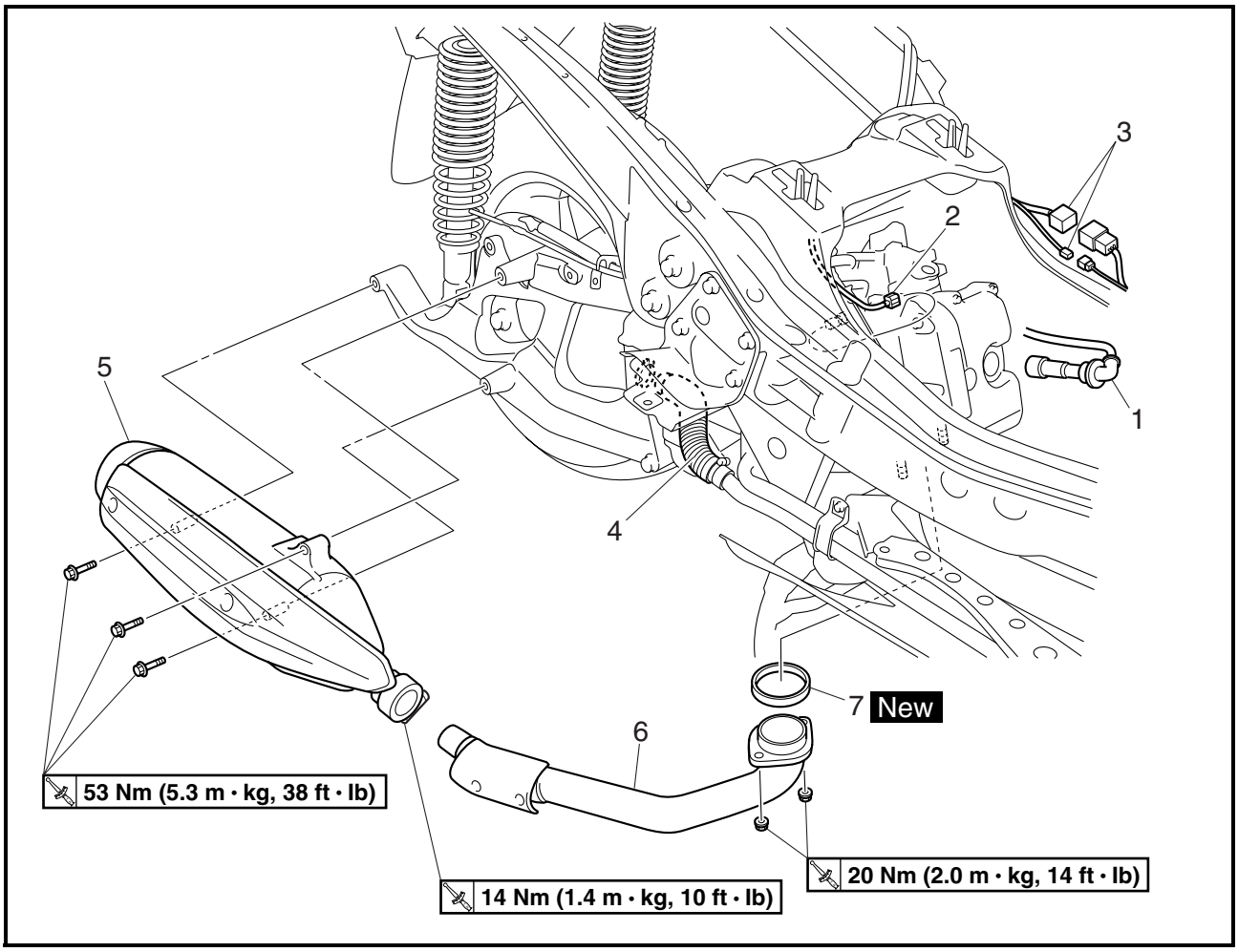
2. Install:
   - swingarm ① **46 Nm (4.6 m · kg, 33 ft · lb)**
   - rear shock absorber assembly lower bolt (right) ② **29 Nm (2.9 m · kg, 21 ft · lb)**
   - brake hose holder ③ **10 Nm (1.0 m · kg, 7.2 ft · lb)**
   - rear brake caliper ④ **40 Nm (4.0 m · kg, 29 ft · lb)**
   - rear axle nut ⑤ **135 Nm (13.5 m · kg, 98 ft · lb)**

EAS00188

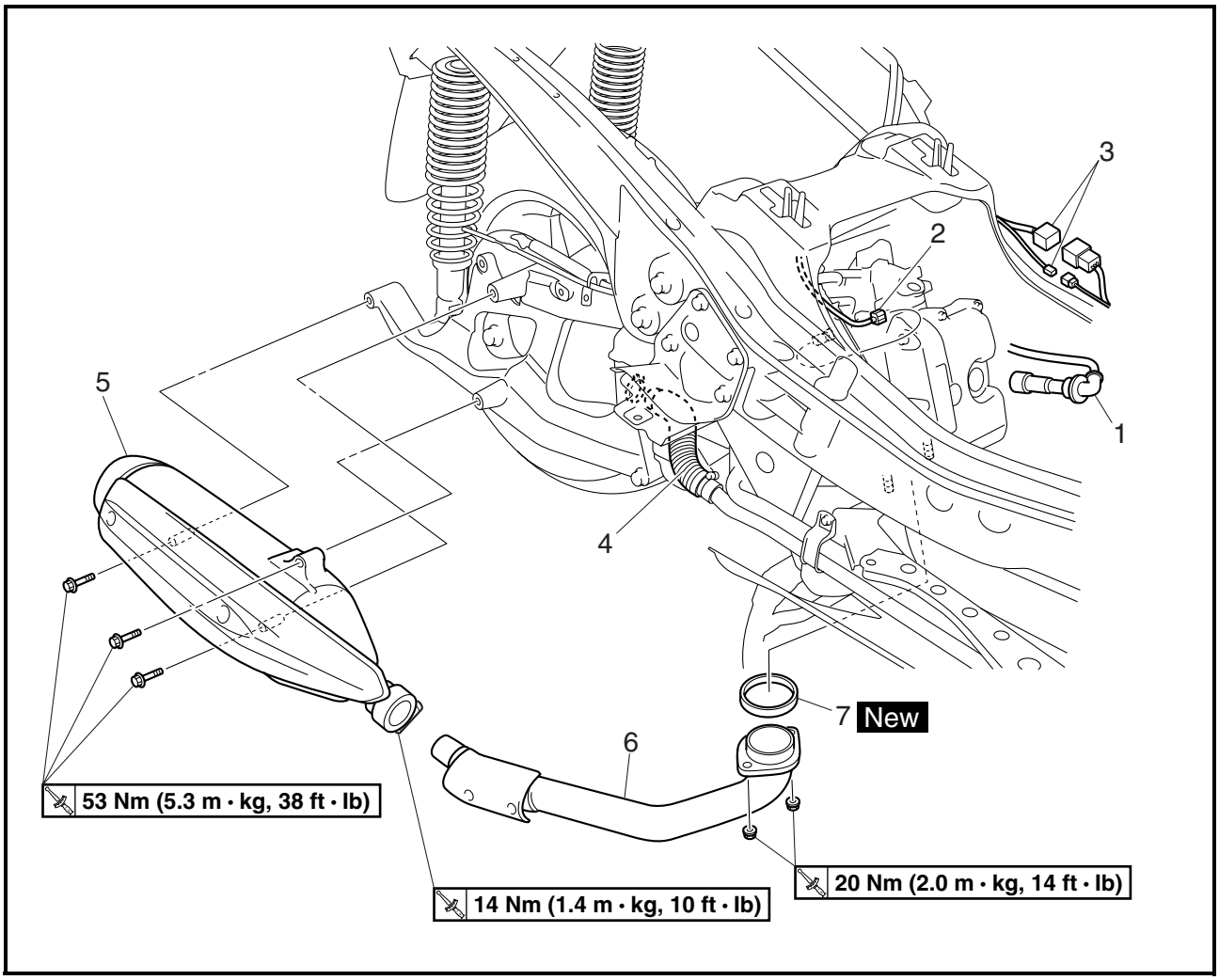
ENGINE

ENGINE REMOVAL

LEADS, HOSES, EXHAUST PIPE AND MUFFLER



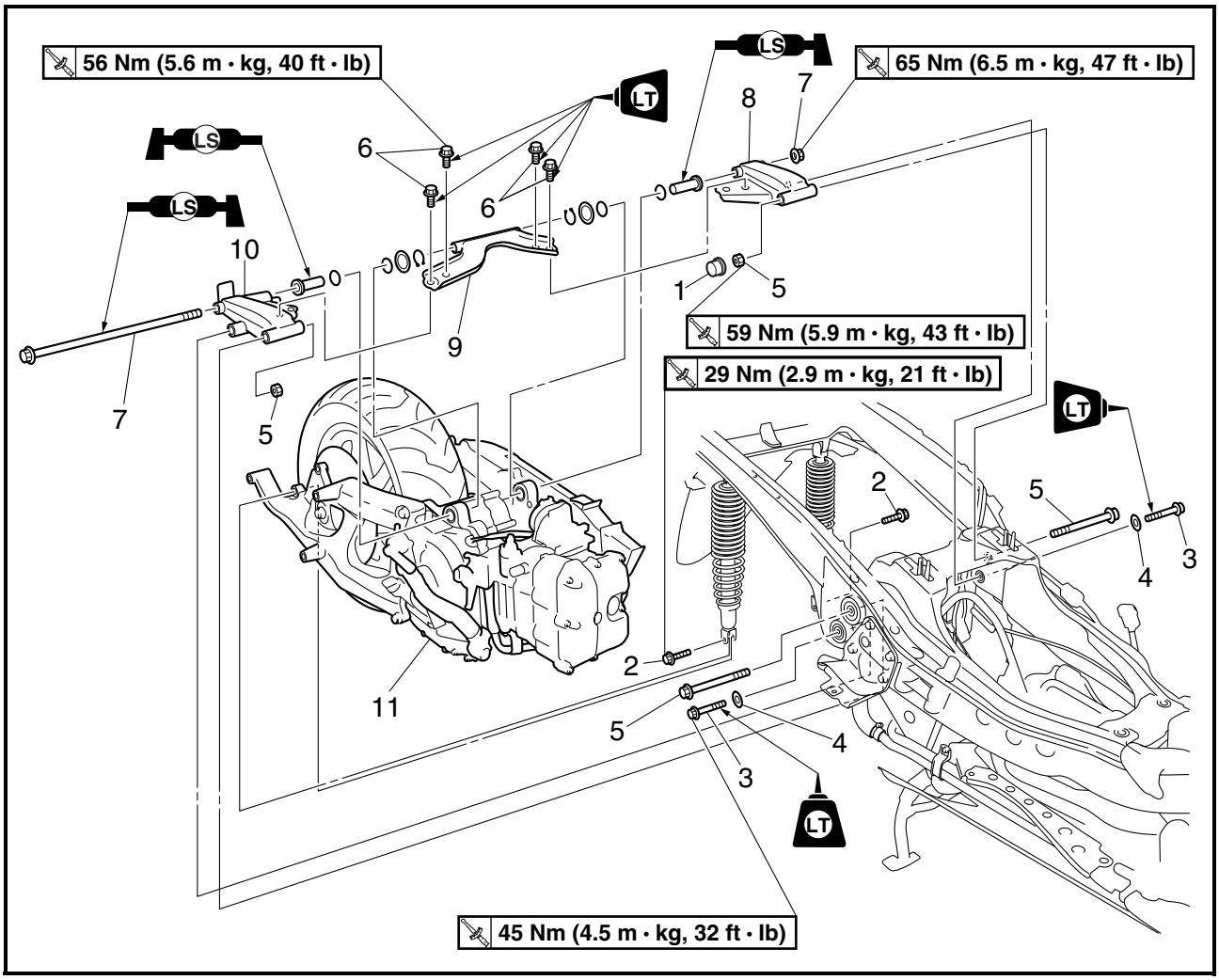
Order	Job/Part	Q'ty	Remarks
	Removing the leads, hoses, exhaust pipe and muffler		Remove the parts in the order listed.
	Negative battery lead Positive battery lead		Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.
			CAUTION: **• First, disconnect the negative battery lead, and then the positive battery lead.** **• For connecting, reverse the disconnection procedure.**
	Air filter case (left and right)		Refer to "AIR FILTER CASES" in chapter 3.
	Throttle body and fuel injector		Refer to "THROTTLE BODY AND FUEL INJECTOR" in chapter 7.



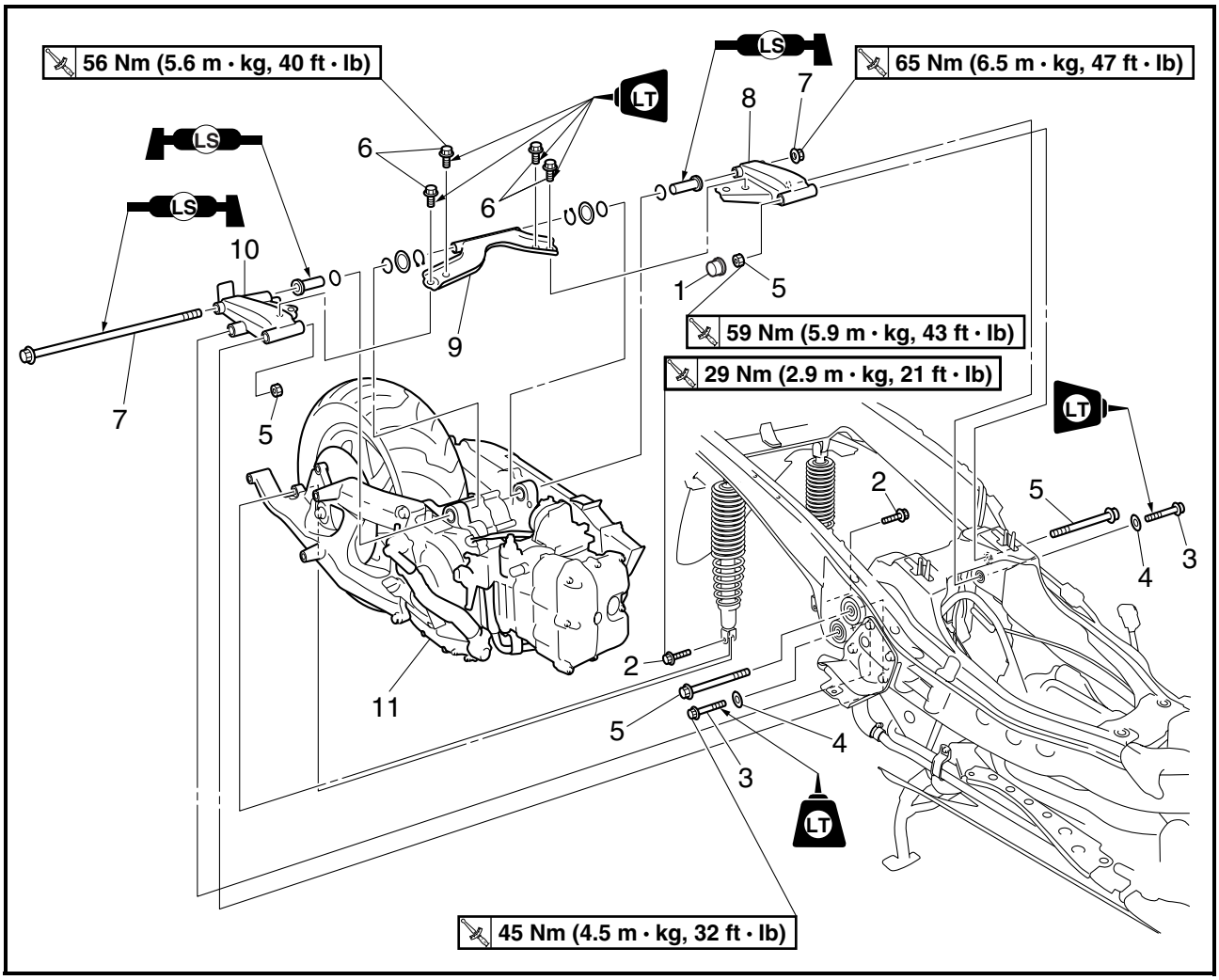
Order	Job/Part	Q'ty	Remarks
	Starter motor		Refer to "STARTER MOTOR" in chapter 8.
	Thermostat cover and thermostat		Refer to "THERMOSTAT" in chapter 6.
	Rear brake caliper		Refer to "FRONT AND REAR BRAKES" in chapter 4.
1	Spark plug cap	1	Disconnect.
2	Coolant temperature sensor coupler	1	Disconnect.
3	Crankshaft position sensor/stator assembly coupler	2	Disconnect.
4	Water pump inlet hose	1	Disconnect.
5	Muffler	1	
6	Exhaust pipe	1	
7	Gasket	1	
			For installation, reverse the removal procedure.

EAS00191

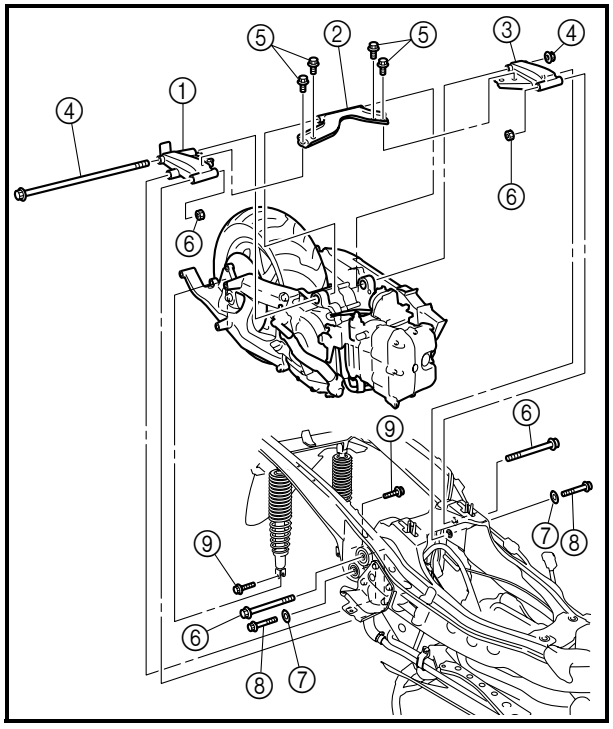
ENGINE



Order	Job/Part	Q'ty	Remarks
	Removing the engine		Remove the parts in the order listed. **NOTE:** Place a suitable stand under the frame and engine.
1	Plug	1	
2	Rear shock absorber assembly lower bolt	2	Refer to "INSTALLING THE ENGINE".
3	Engine bracket lower mounting bolt	2	
4	Washer	2	
5	Engine bracket upper mounting nut/bolt	2/2	
6	Engine bracket bolt	4	
7	Engine mounting nut/bolt	1/1	
8	Left engine bracket	1	
9	Center engine bracket	1	



Order	Job/Part	Q'ty	Remarks
10	Right engine bracket	1	Refer to "INSTALLING THE ENGINE".
11	Engine	1	
			For installation, reverse the removal procedure.



EAS00192
INSTALLING THE ENGINE

1. Install:
   - right engine bracket ①
   - center engine bracket ②
   - left engine bracket ③
   - engine mounting bolt/nut ④
   - engine bracket bolts ⑤ LT

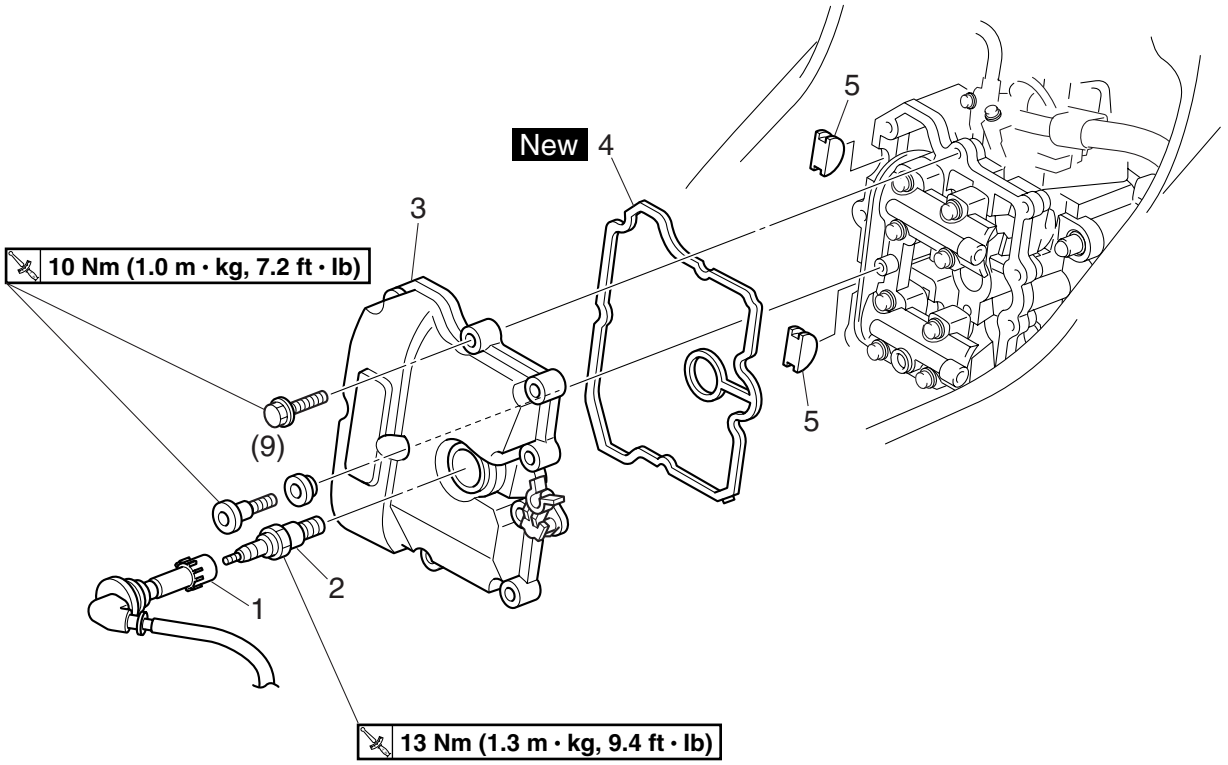
NOTE:
- Apply lithium-soap-based grease to the unthreaded portion of the engine mounting bolt shaft.
- Do not fully tighten the engine mounting bolt and engine bracket bolts.

2. Tighten:
   - engine mounting nut ④
     65 Nm (6.5 m · kg, 47 ft · lb)
   - engine bracket bolts ⑤
     56 Nm (5.6 m · kg, 40 ft · lb)
3. Install:
   - engine bracket upper mounting bolts/nuts ⑥
   - washers ⑦
   - engine bracket lower mounting bolts ⑧ LT

NOTE:
Do not fully tighten the bolts.

4. Tighten:
   - engine bracket upper mounting nuts ⑥
     59 Nm (5.9 m · kg, 43 ft · lb)
   - engine bracket lower mounting bolts ⑧
     45 Nm (4.5 m · kg, 32 ft · lb)
   - rear shock absorber assembly lower bolts ⑨
     29 Nm (2.9 m · kg, 21 ft · lb)

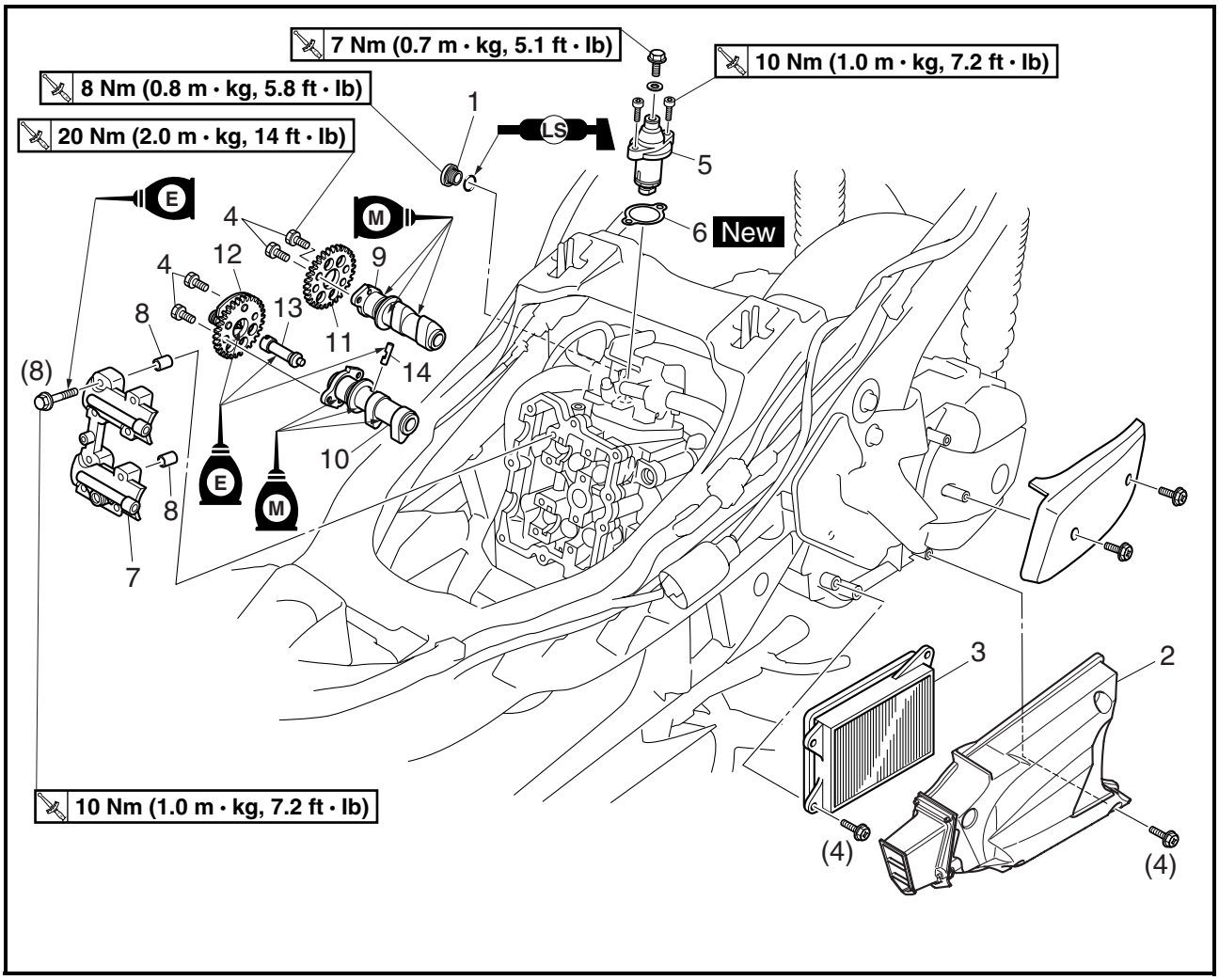
EAS00194
CAMSHAFTS
CYLINDER HEAD COVER



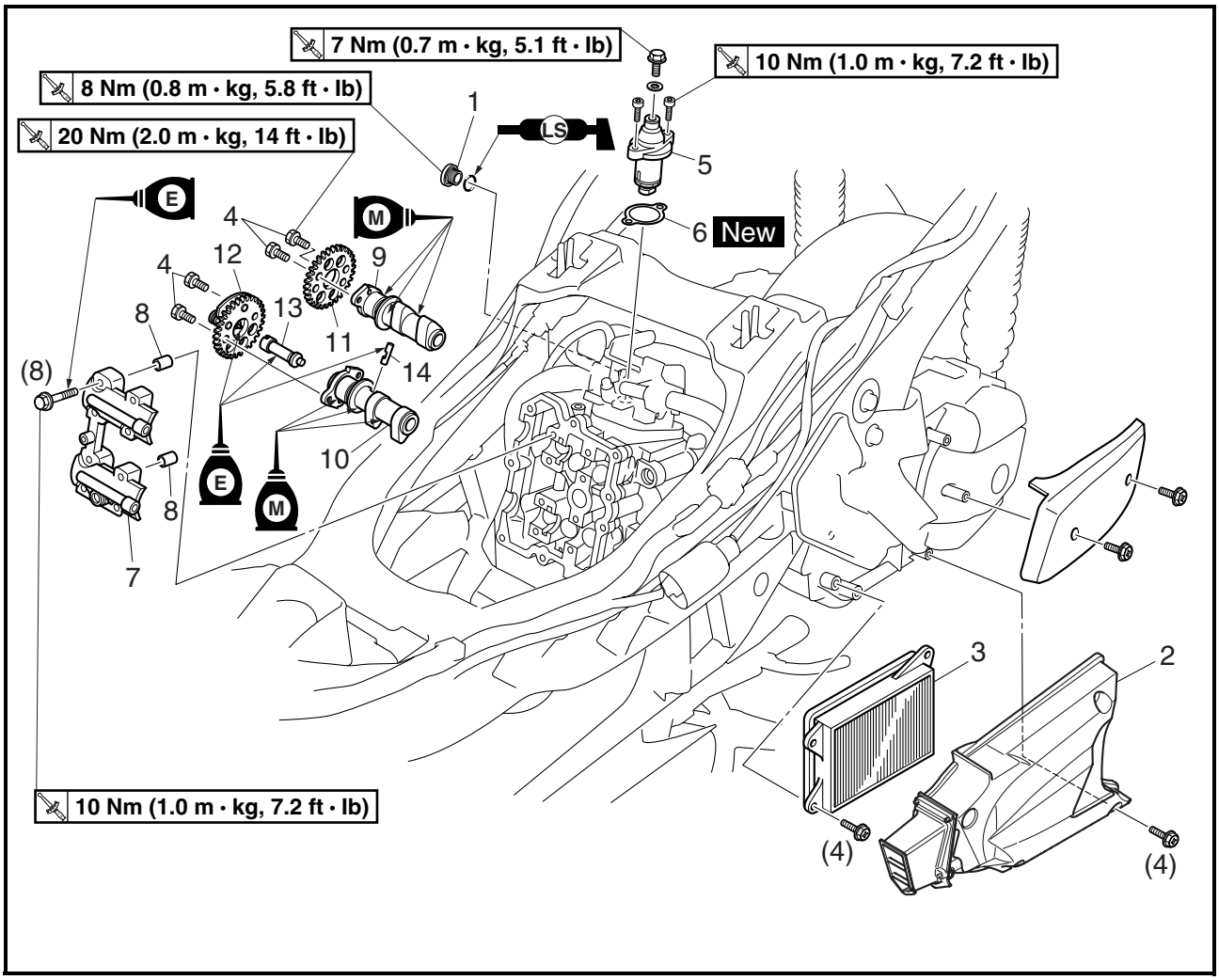
Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head cover		Remove the parts in the order listed.
	Storage box and rubber sheet		Refer to "COWLING AND COVERS" in chapter 3.
	Throttle body and fuel injector		Refer to "THROTTLE BODY AND FUEL INJECTOR" in chapter 7.
1	Spark plug cap	1	
2	Spark plug	1	
3	Cylinder head cover	1	
4	Cylinder head cover gasket	1	
5	Semicircular plug	2	
			For installation, reverse the removal procedure.

EAS00196

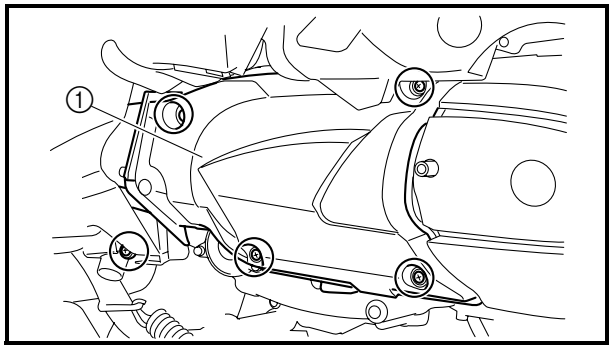
CAMSHAFTS

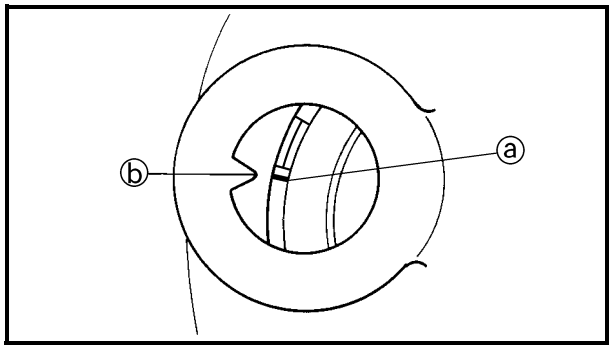


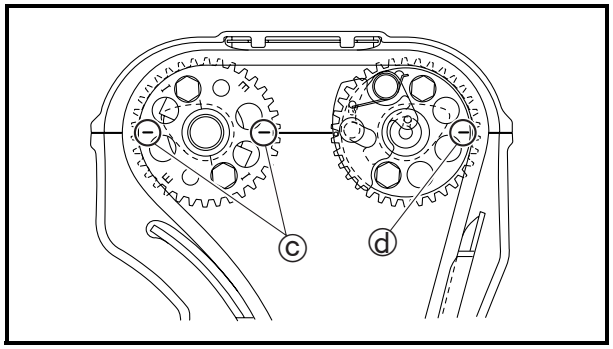
Order	Job/Part	Q'ty	Remarks
	Removing the camshafts		Remove the parts in the order listed.
1	Timing plug	1	
2	V-belt case air filter cover	1	
3	V-belt case air filter element	1	
4	Camshaft sprocket bolt	4	Loosen.
5	Timing chain tensioner assembly	1	Refer to "REMOVING THE CAMSHAFTS" and "INSTALLING THE CAMSHAFTS".
6	Gasket	1	
7	Camshaft cap	1	
8	Dowel pin	2	
9	Intake camshaft	1	
10	Exhaust camshaft	1	
11	Intake camshaft sprocket	1	
12	Exhaust camshaft sprocket	1	

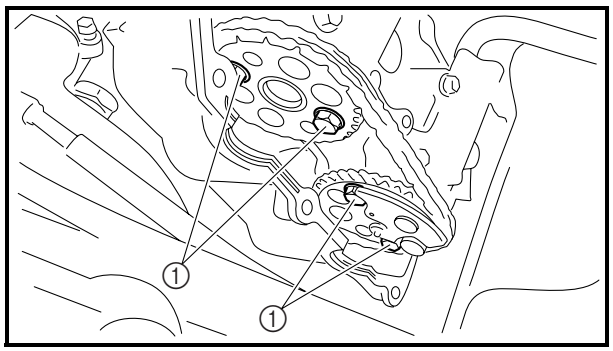


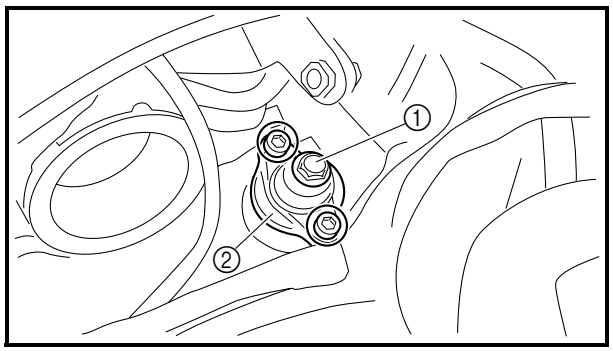
Order	Job/Part	Q'ty	Remarks
13	Decompressor lever	1	Refer to "INSTALLING THE CAMSHAFTS".
14	Decompressor lever pin	1	
			For installation, reverse the removal procedure.











EAS00198
REMOVING THE CAMSHAFTS

1. Remove:
   - timing plug
   - V-belt case air filter cover ①
   - V-belt case air filter element
2. Align:
   - TDC mark on the generator rotor (with the stationary pointer on the generator rotor cover)

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a. Turn the primary sheave nut on the left side of the crankshaft counterclockwise to turn the crankshaft.
b. Align the "I" mark ⓐ on the generator rotor with the stationary pointer ⓑ on the generator rotor cover to position the piston at TDC on the compression stroke.

NOTE:

- TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.
- In order to be sure that the piston is at TDC, the punch marks ⓒ on the intake camshaft sprocket and the punch mark ⓓ on the exhaust camshaft sprocket must align with the cylinder head mating surface as shown in the illustration.

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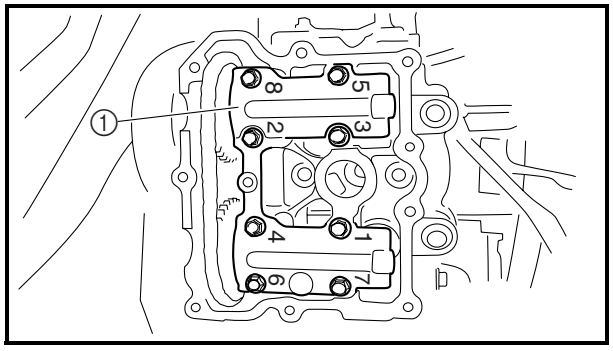
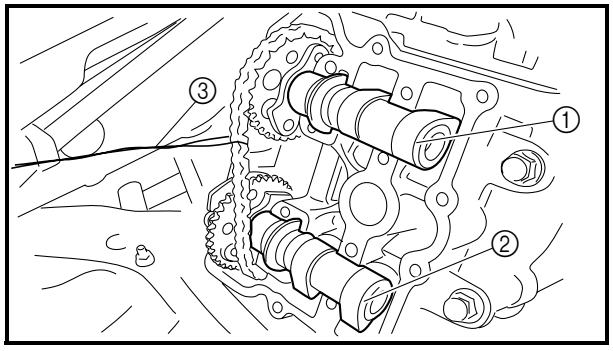
3. Loosen:
   - camshaft sprocket bolts ①

4. Loosen:
   - timing chain tensioner cap bolt ①
5. Remove:
   - timing chain tensioner ②
   - gasket





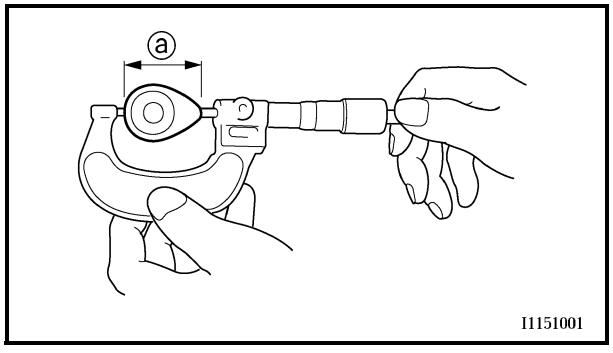
6. Remove:
   - camshaft cap ①
   - dowel pins

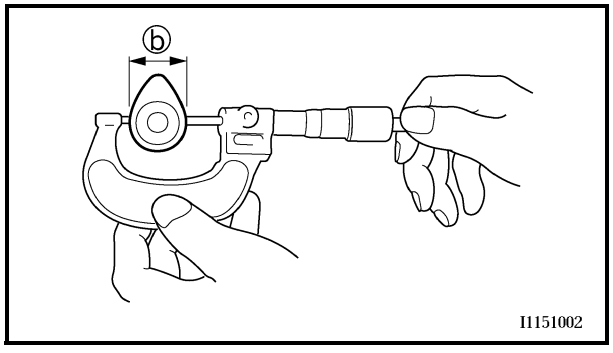
NOTE:
- Loosen the camshaft cap bolts in the descending order of the embossed numbers on the camshaft cap.
- Loosen each camshaft cap bolt 1/2 of a turn at a time. After all of the camshaft cap bolts are fully loosened, remove them.

7. Remove:
   - intake camshaft ①
   - exhaust camshaft ②

NOTE:
To prevent the timing chain from falling into the crankcase, fasten it with a wire ③.

8. Remove:
   - camshaft sprockets

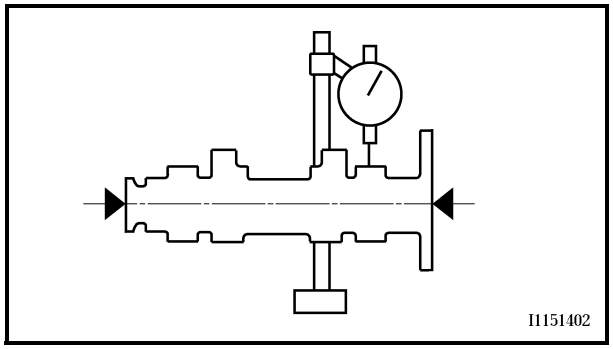




EAS00204
CHECKING THE CAMSHAFTS

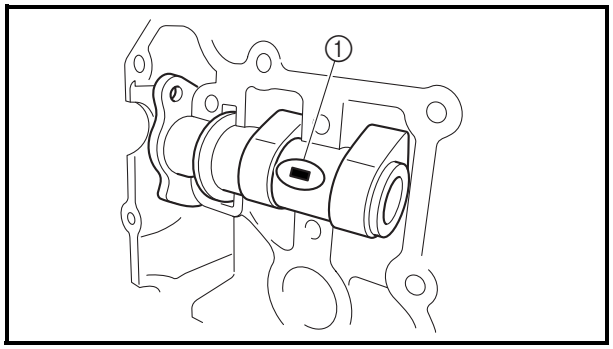
1. Check:
   - camshaft lobes
     Blue discoloration/pitting/scratches → Replace the camshaft.
2. Measure:
   - camshaft lobe dimensions ⓐ and ⓑ
     Out of specification → Replace the camshaft.

Camshaft lobe dimension limit
Intake camshaft
ⓐ 34.250 mm (1.3484 in)
ⓑ 24.850 mm (0.9783 in)
Exhaust camshaft
ⓐ 33.350 mm (1.3130 in)
ⓑ 24.856 mm (0.9786 in)



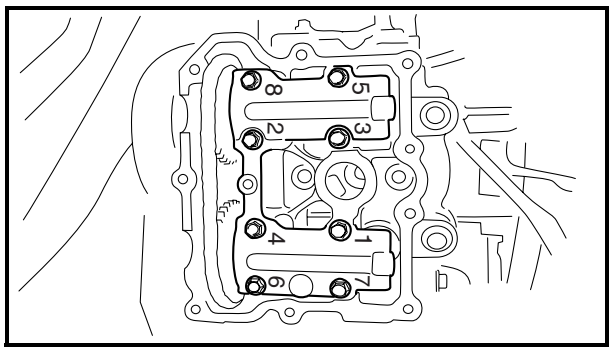
3. Measure:
   • camshaft runout
   Out of specification → Replace.

Camshaft runout limit
0.03 mm (0.0012 in)



4. Measure:
   • camshaft-journal-to-camshaft-cap clearance
   Out of specification → Measure the camshaft journal diameter.

Camshaft-journal-to-camshaft-cap clearance limit
0.08 mm (0.0031 in)



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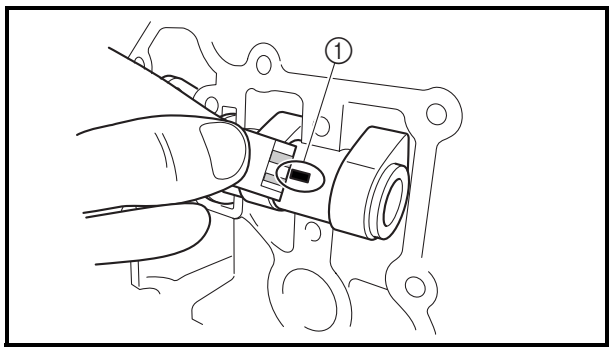
a. Install the camshaft into the cylinder head (without the dowel pins and camshaft cap).
b. Position a strip of Plastigauge® ① onto the camshaft journal as shown.
c. Install the dowel pins and camshaft cap.

NOTE:

- Tighten the camshaft cap bolts in the order of the embossed numbers on the camshaft cap.
- Do not turn the camshaft when measuring the camshaft journal-to-camshaft cap clearance with the Plastigauge® ①.



Camshaft cap bolt
10 Nm (1.0 m · kg, 7.2 ft · lb)

d. Remove the camshaft cap and then measure the width of the Plastigauge®.

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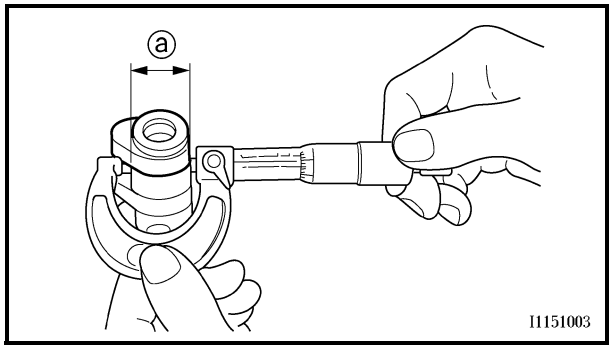
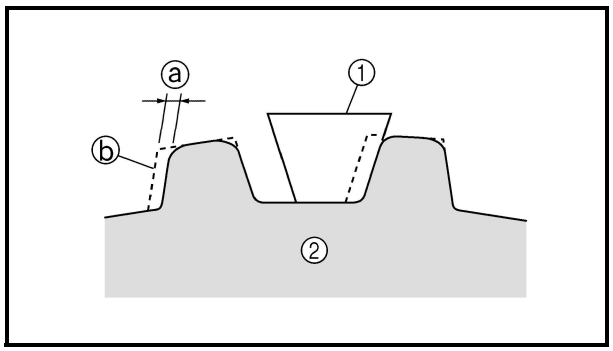


5. Measure:
   • camshaft journal diameter ⓐ
   Out of specification → Replace the camshaft.
   Within specification → Replace the cylinder head and the camshaft cap as a set.

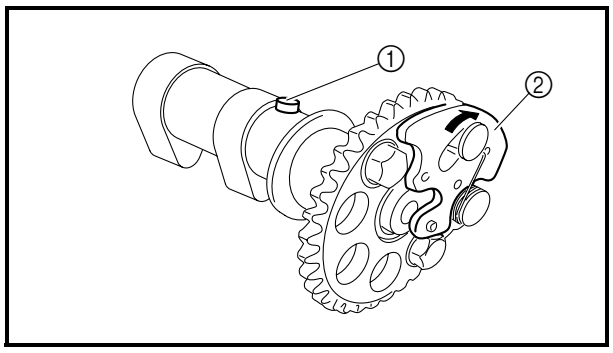
Camshaft journal diameter
24.459 ~ 24.472 mm
(0.9630 ~ 0.9635 in)



CHECKING THE CAMSHAFT SPROCKETS

1. Check:
   • camshaft sprockets
   Wear/damage → Replace the camshaft sprockets and timing chain as a set.

ⓐ 1/4 of a tooth
ⓑ Correct
① Roller
② Sprocket



CHECKING THE DECOMPRESSION SYSTEM

1. Check:
   • decompression system

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a. Check that the decompressor lever pin ① projects from the camshaft.
b. Check that the decompressor cam ② moves smoothly.

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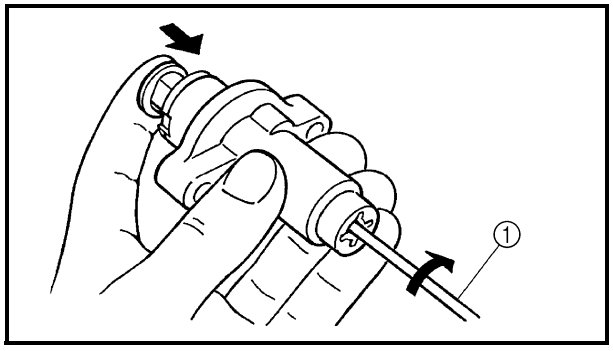

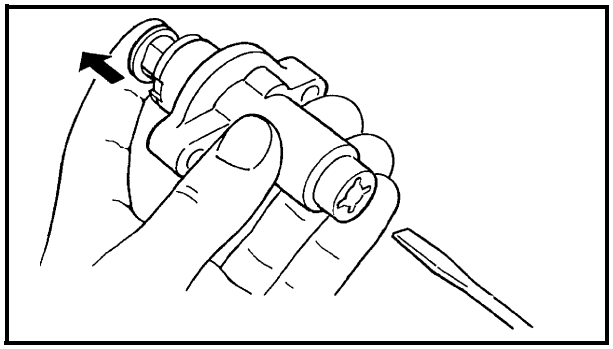

EAS00210
CHECKING THE TIMING CHAIN TENSIONER

1. Check:
   - timing chain tensioner
     Cracks/damage/rough movement → Replace.

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a. While lightly pressing the timing chain tensioner rod by hand, turn the tensioner rod fully clockwise with a thin screwdriver ①.
b. Remove the screwdriver and slowly release the timing chain tensioner rod.
c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

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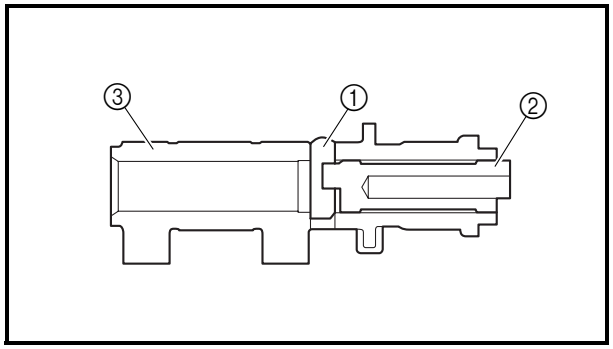
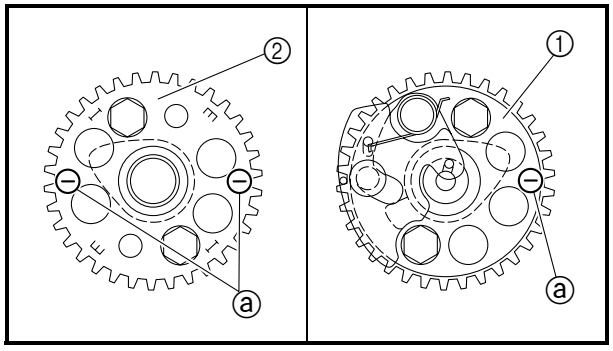


EAS00217
INSTALLING THE CAMSHAFTS

1. Install:
   - decompressor lever pin ①
   - decompressor lever ②
   - exhaust camshaft ③

NOTE:

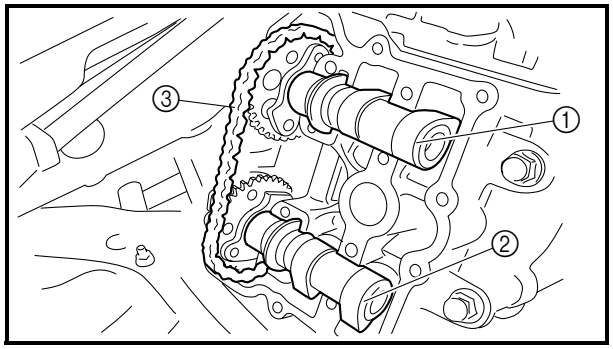
Install the decompressor lever pin ① and decompressor lever ② in the exhaust camshaft ③ as shown in the illustration.

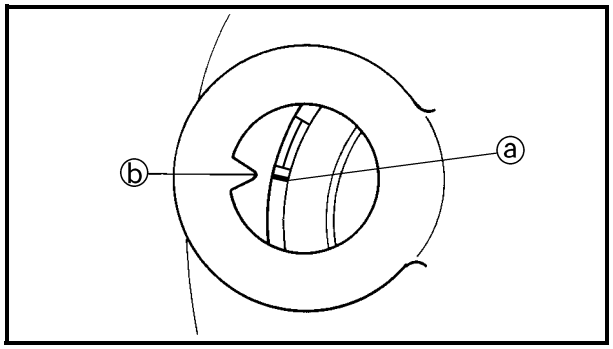


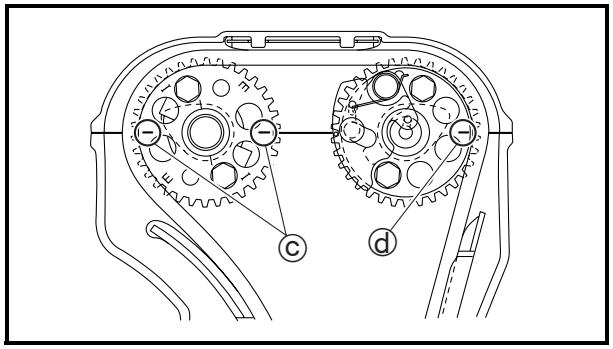
2. Install:
   - exhaust camshaft sprocket ①
   - intake camshaft sprocket ②

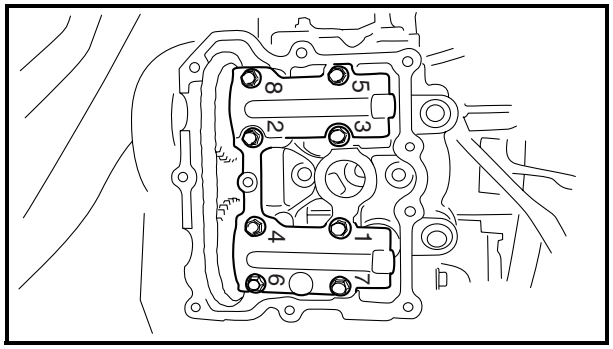
NOTE:

- Make sure that the punch marks ⓐ on the camshaft sprockets are in the position shown in the illustration.
- Temporarily tighten the camshaft sprocket bolts.









3. Install:
   - intake camshaft ①
   - exhaust camshaft ②

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a. Turn the primary sheave nut on the left side of the crankshaft counterclockwise to turn the crankshaft.
b. When piston is at TDC on the compression stroke, align the "I" mark ⓐ on the generator rotor with the stationary pointer ⓑ on the generator rotor cover.
c. Install the timing chain ③ onto both camshaft sprockets, and then install the camshafts onto the cylinder head.

NOTE:

The camshafts should be installed onto the cylinder head so that the punch marks ⓒ on the intake camshaft sprocket and the punch mark ⓓ on the exhaust camshaft sprocket align with the cylinder head mating surface, as shown in the illustration.

CAUTION:

Do not turn the crankshaft when installing the camshafts to avoid damage or improper valve timing.

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4. Install:
   - dowel pins
   - camshaft cap
   - camshaft cap bolts

NOTE:

- Lubricate the camshaft cap bolt threads with engine oil.
- Finger tighten the camshaft cap bolts.

5. Tighten:
   - camshaft cap bolts

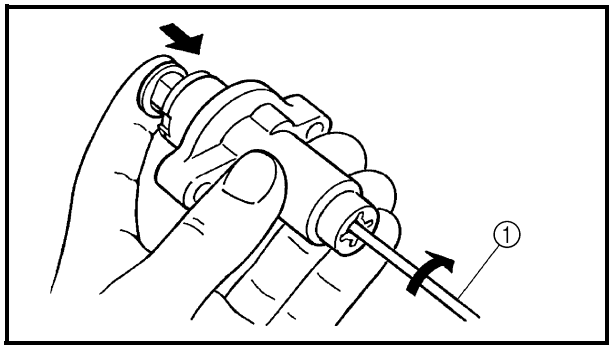
10 Nm (1.0 m · kg, 7.2 ft · lb)

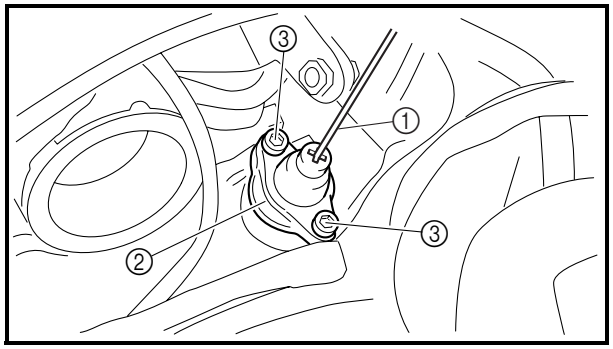
NOTE:

Tighten the camshaft cap bolts in the order of the embossed numbers on the camshaft cap.

CAUTION:

The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft cap, and camshafts will result.





6. Install:
   - timing chain tensioner

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a. While lightly pressing the timing chain tensioner rod by hand, turn the tensioner rod fully clockwise with a thin screwdriver ①.
b. With the timing chain tensioner rod turned all the way into the timing chain tensioner housing (with the thin screwdriver still installed), install the gasket and the timing chain tensioner ② onto the cylinder block.

⚠ WARNING

Always use a new gasket.

c. Tighten the timing chain tensioner bolts ③ to the specified torque.

	Timing chain tensioner bolt **10 Nm (1.0 m · kg, 7.2 ft · lb)**

d. Remove the screwdriver, make sure the timing chain tensioner rod releases, and then tighten the cap bolt to the specified torque.

	Cap bolt **7 Nm (0.7 m · kg, 5.1 ft · lb)**

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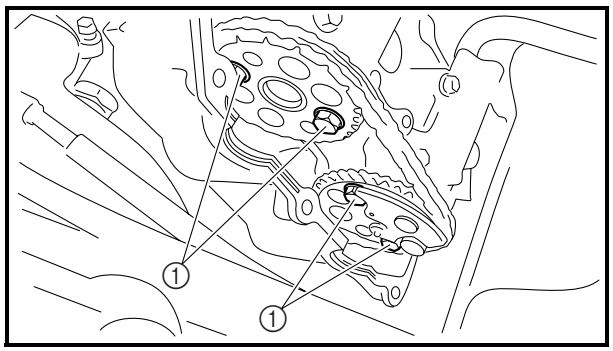
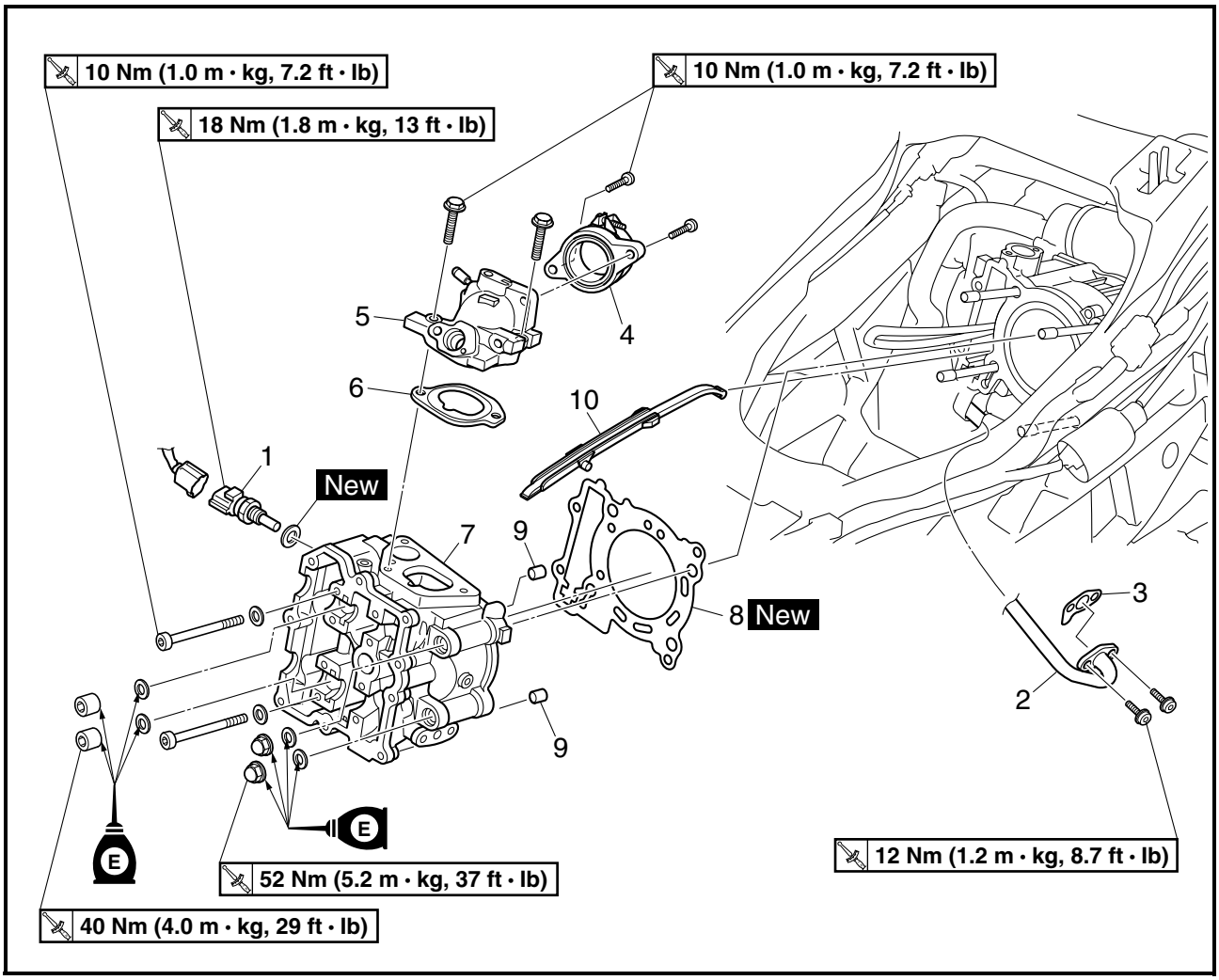


7. Tighten:
   - camshaft sprocket bolts ①

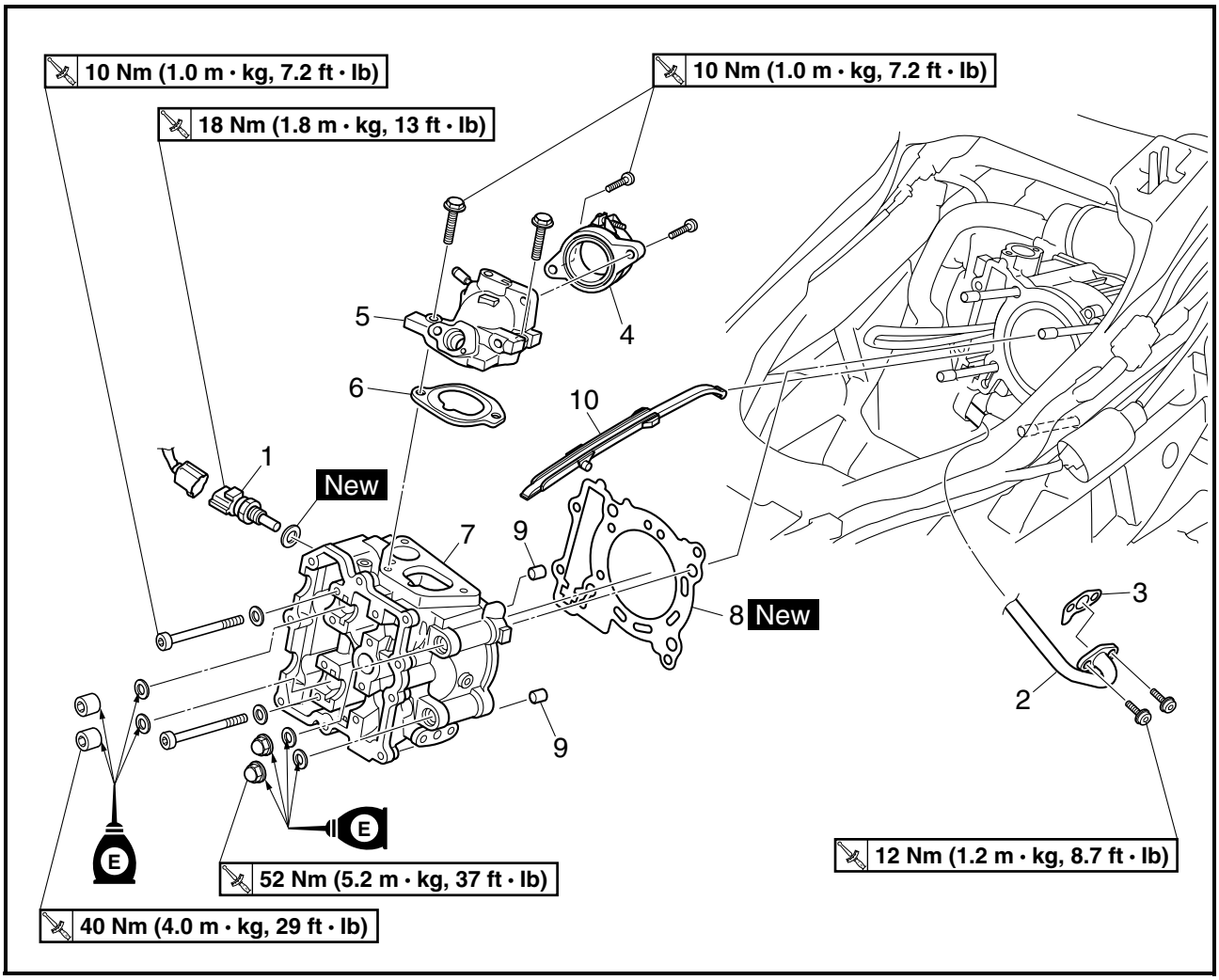
20 Nm (2.0 m · kg, 14 ft · lb)

8. Turn:
   • crankshaft
   (turn the primary sheave nut on the left side of the crankshaft several turns counter-clockwise)
9. Check:
   • "I" mark
   Make sure the "I" mark on the generator rotor is aligned with the stationary pointer on the generator rotor cover.
   • camshaft sprocket punch marks
   Make sure the punch marks on the camshaft sprockets are aligned with the cylinder head mating surface.
   Out of alignment → Adjust.
   Refer to the installation steps above.
10. Measure:
   • valve clearance
   Out of specification → Adjust.
   Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3.

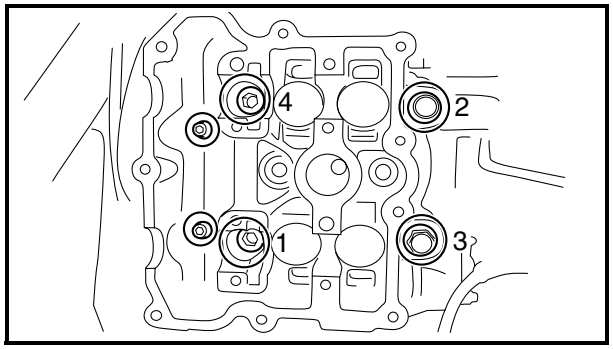
EAS00221
CYLINDER HEAD

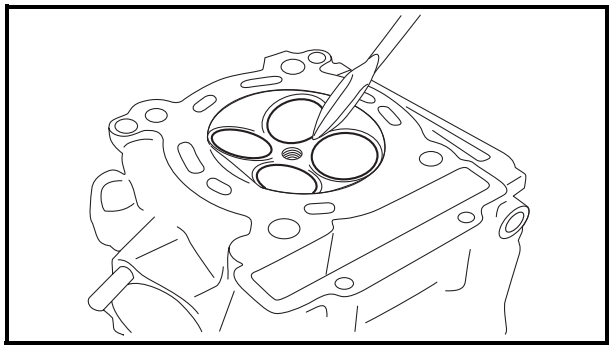


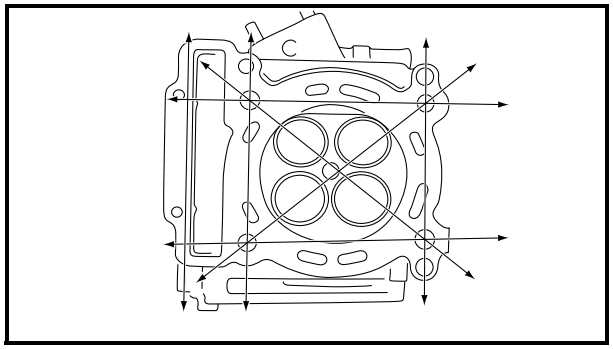
Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head		Remove the parts in the order listed.
	Exhaust pipe and muffler		Refer to "ENGINE REMOVAL".
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Thermostat		Refer to "THERMOSTAT" in chapter 6.
	Camshafts		Refer to "CAMSHAFTS".
1	Coolant temperature sensor	1	
2	Air induction system pipe	1	
3	Gasket	1	
4	Throttle body joint	1	
5	Intake manifold	1	
6	Gasket	1	

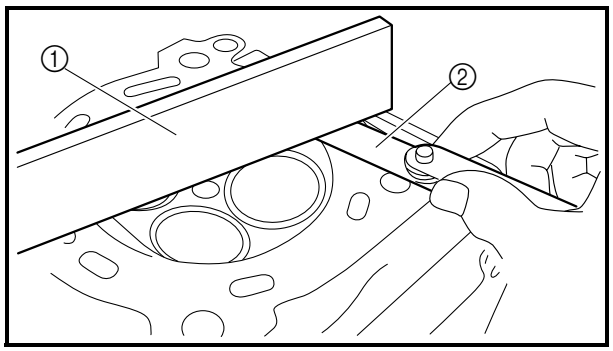


Order	Job/Part	Q'ty	Remarks
7	Cylinder head	1	Refer to "REMOVING THE CYLINDER HEAD" and "INSTALLING THE CYLINDER HEAD".
8	Cylinder head gasket	1	Refer to "INSTALLING THE CYLINDER HEAD".
9	Dowel pin	2	
10	Timing chain guide (exhaust side)	1	
			For installation, reverse the removal procedure.









EAS00222
REMOVING THE CYLINDER HEAD

1. Remove:
   • cylinder head nuts

NOTE:
- Loosen the cylinder head nuts in the proper sequence as shown.
- Loosen each cylinder head nut 1/2 of a turn at a time. After all of the cylinder head nuts are fully loosened, remove them.

EAS00229
CHECKING THE CYLINDER HEAD

1. Eliminate:
   • combustion chamber carbon deposits (with a rounded scraper)

NOTE:
Do not use a sharp instrument to avoid damaging or scratching:
- spark plug bore threads
- valve seats

2. Check:
   • cylinder head
   Damage/scratches → Replace.
   • cylinder head water jacket
   Mineral deposits/rust → Eliminate.
3. Measure:
   • cylinder head warpage
   Out of specification → Resurface the cylinder head.

Maximum cylinder head warpage
0.05 mm (0.002 in)

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a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
b. Measure the warpage.
c. If the limit is exceeded, resurface the cylinder head as follows.
d. Place a 400 ~ 600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE:
To ensure an even surface, rotate the cylinder head several times.

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CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)

1. Check:
   - timing chain guide (exhaust side)
     Damage/wear → Replace.

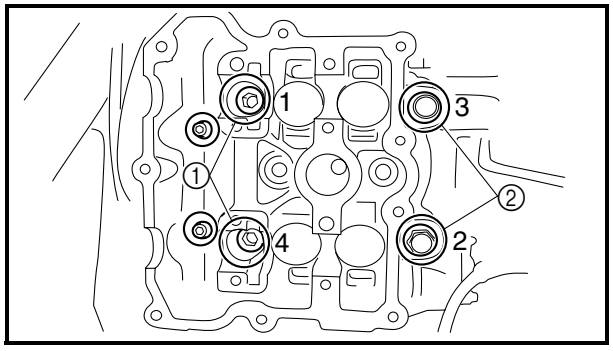
EAS00232

INSTALLING THE CYLINDER HEAD

1. Install:
   - timing chain guide (exhaust side)
   - cylinder head gasket New
   - dowel pins
2. Install:
   - cylinder head

NOTE:

Pass the timing chain through the timing chain cavity.



3. Tighten:
   - cylinder head nuts ①

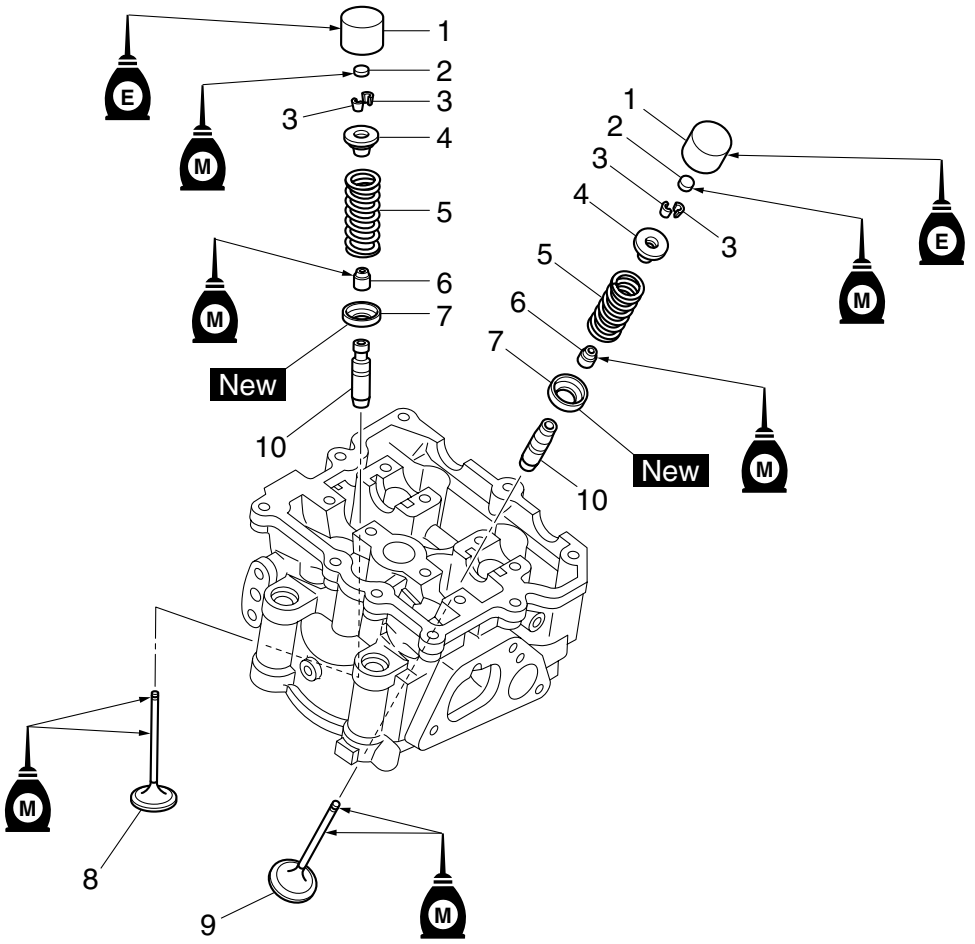
     40 Nm (4.0 m · kg, 29 ft · lb)
   - cylinder head nuts ②

     52 Nm (5.2 m · kg, 37 ft · lb)

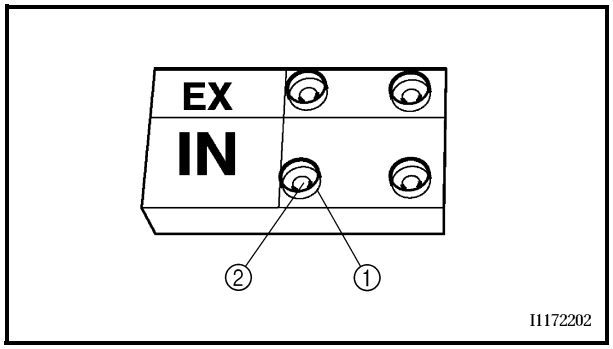
NOTE:

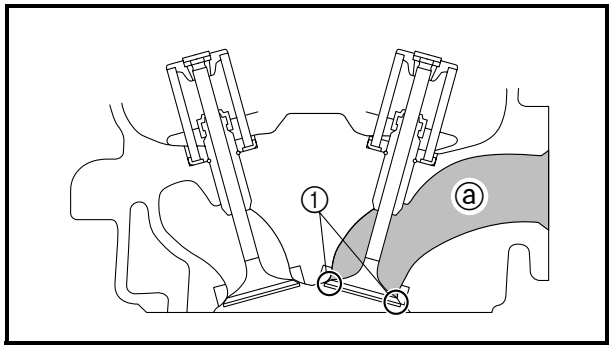
- Lubricate the cylinder head nuts with engine oil.
- Tighten the cylinder head nuts in the proper tightening sequence as shown and torque them in two stages.

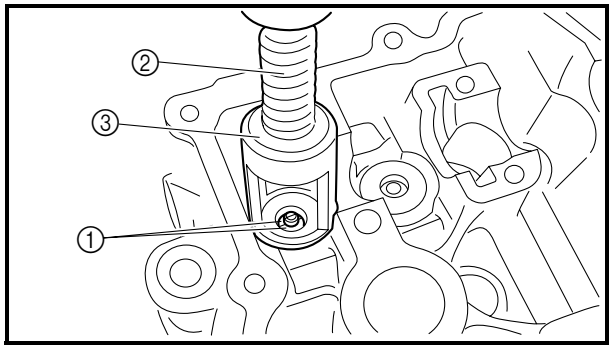
EAS00236
VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Valve lifter	4	Refer to "REMOVING THE VALVES" and "INSTALLING THE VALVES".
2	Adjusting pad	4	
3	Valve cotter	8	
4	Upper valve spring seat	4	
5	Valve spring	4	
6	Stem seal	4	
7	Lower valve spring seat	4	
8	Exhaust valve	2	
9	Intake valve	2	
10	Valve guide	4	
			For installation, reverse the removal procedure.







EAS00237
REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

NOTE:

Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

1. Remove:
   - valve lifter ①
   - valve pad ②

NOTE:

Make a note of the position of each valve lifter and valve pad so that they can be reinstalled in their original place.

2. Check:
   - valve sealing
     Leakage at the valve seat → Check the valve face, valve seat, and valve seat width. Refer to "CHECKING THE VALVE SEATS".

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a. Pour a clean solvent ⓐ into the intake and exhaust ports.
b. Check that the valves properly seal.

NOTE:

There should be no leakage at the valve seat ①.

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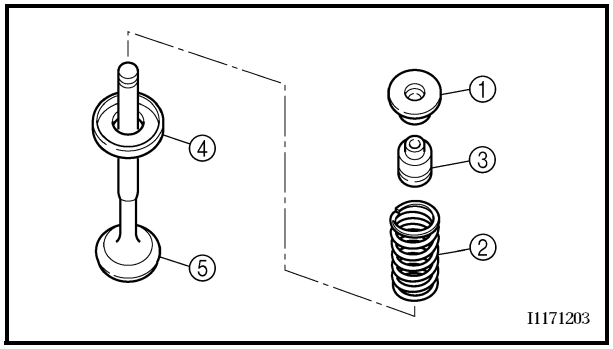
3. Remove:
   - valve cotters ①

NOTE:

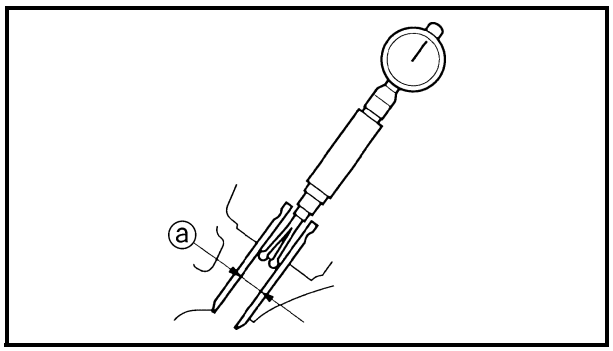
Remove the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.

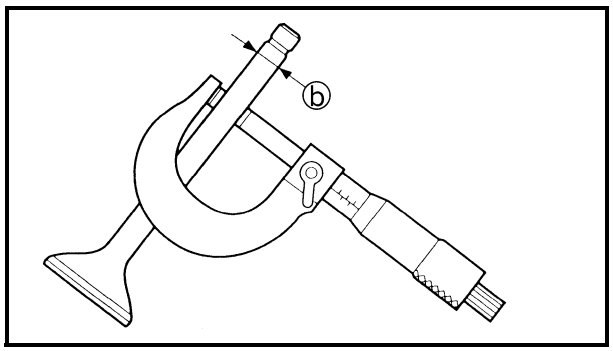
Valve spring compressor
90890-04019, YM-04019
Valve spring compressor attachment
90890-01243, YM-01253-1



4. Remove:
   - upper spring seat ①
   - valve spring ②
   - valve stem seal ③
   - lower spring seat ④
   - valve ⑤

NOTE:
Identify the position of each part very carefully so that it can be reinstalled in its original place.





EAS00239
CHECKING THE VALVES AND VALVE GUIDES

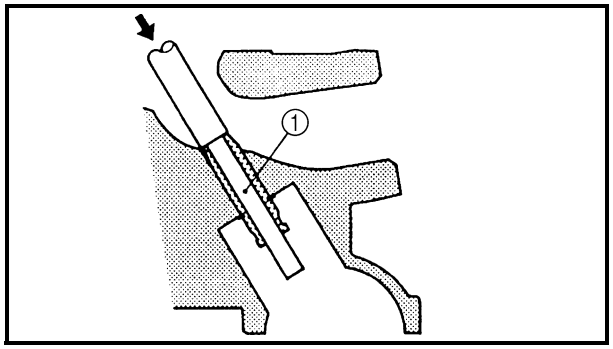
The following procedure applies to all of the valves and valve guides.

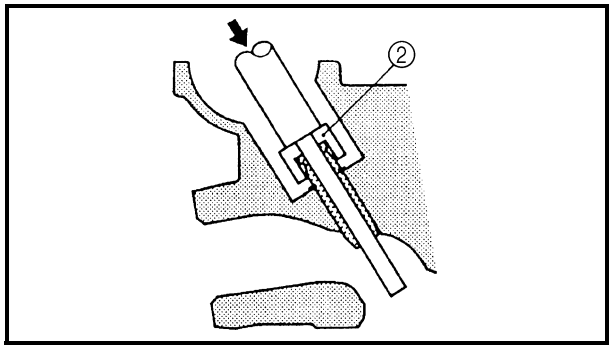
1. Measure:
   - valve-stem-to-valve-guide clearance

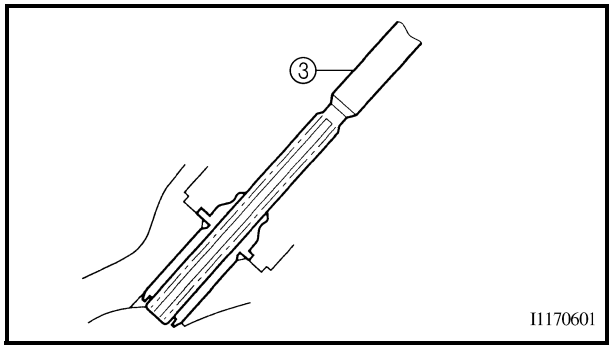
Valve-stem-to-valve-guide clearance =
Valve guide inside diameter ⓐ –
Valve stem diameter ⓑ

Out of specification → Replace the valve guide.

Valve-stem-to-valve-guide clearance
Intake
0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)
<Limit>: 0.080 mm (0.0031 in)
Exhaust
0.025 ~ 0.052 mm
(0.0010 ~ 0.0020 in)
<Limit>: 0.100 mm (0.0039 in)







2. Replace:
   - valve guide

NOTE:
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.

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a. Remove the valve guide with the valve guide remover ①.
b. Install the new valve guide with the valve guide installer ② and valve guide remover ①.
c. After installing the valve guide, bore the valve guide with the valve guide reamer ③ to obtain the proper valve-stem-to-valve-guide clearance.

NOTE:
After replacing the valve guide, reface the valve seat.

Valve guide remover (5 mm)
90890-04097, YM-04097
Valve guide installer (5 mm)
90890-04098, YM-04098
Valve guide reamer (5 mm)
90890-04099, YM-04099

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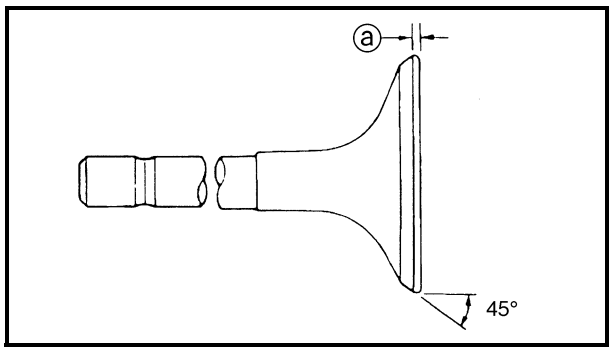
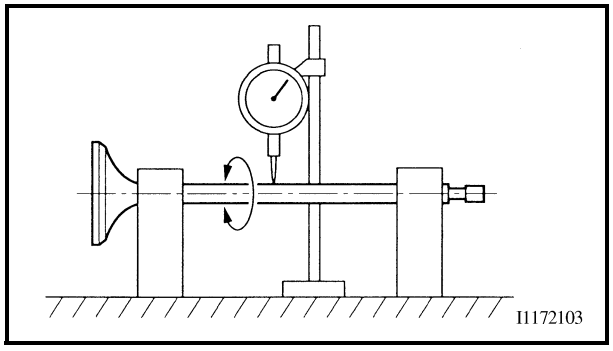
3. Eliminate:
   - carbon deposits
     (from the valve face and valve seat)
4. Check:
   - valve face
     Pitting/wear → Grind the valve face.
   - valve stem end
     Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.



5. Measure:
   - valve margin thickness ⓐ
     Out of specification → Replace the valve.

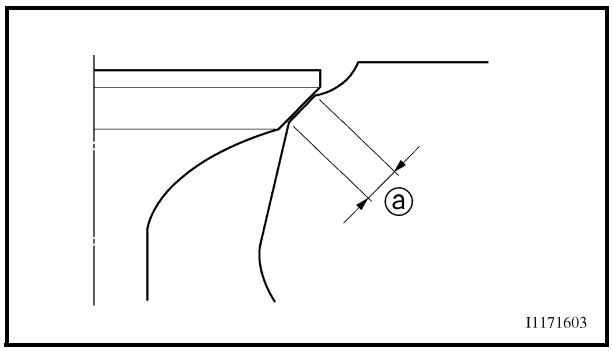
Valve margin thickness
0.85 ~ 1.15 mm
(0.0335 ~ 0.0453 in)

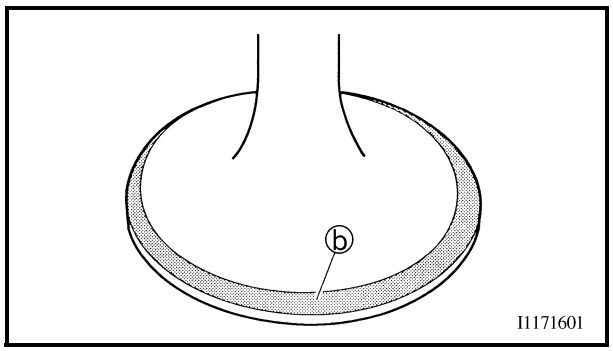


6. Measure:
   • valve stem runout
     Out of specification → Replace the valve.

NOTE:
- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.

Valve stem runout
0.01 mm (0.0004 in)





EAS00240
CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

1. Eliminate:
   • carbon deposits
     (from the valve face and valve seat)
2. Check:
   • valve seat
     Pitting/wear → Replace the cylinder head.
3. Measure:
   • valve seat width ⓐ
     Out of specification → Replace the cylinder head.

Valve seat width limit
1.6 mm (0.06 in)

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a. Apply Mechanic's blueing dye (Dykem) ⓑ onto the valve face.
b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
d. Measure the valve seat width.

NOTE:
Where the valve seat and valve face contacted one another, the blueing will have been removed.

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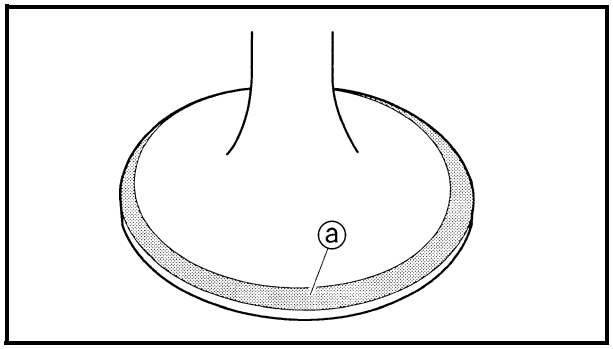

4. Lap:
   - valve face
   - valve seat

NOTE:
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

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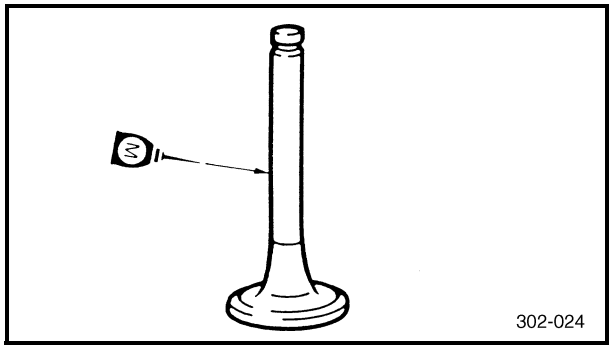
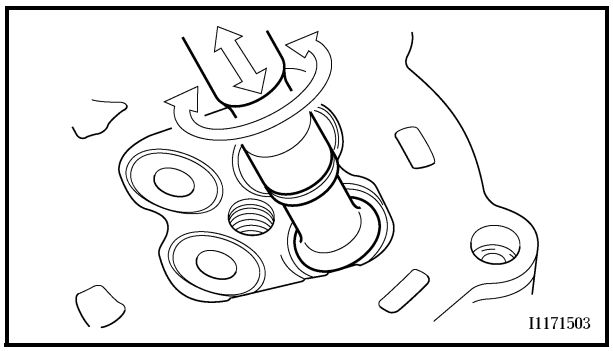


a. Apply a coarse lapping compound ⓐ to the valve face.

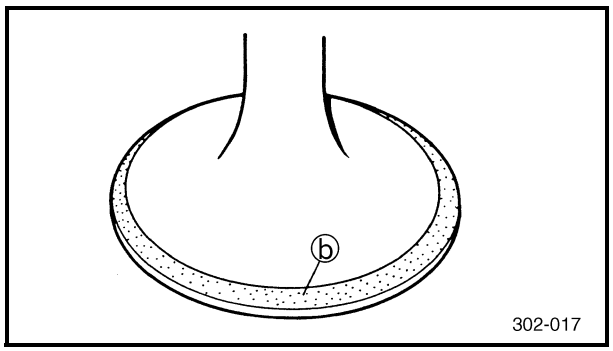
CAUTION:
Do not let the lapping compound enter the gap between the valve stem and the valve guide.

b. Apply molybdenum disulfide oil onto the valve stem.
c. Install the valve into the cylinder head.
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.



NOTE:
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

e. Apply a fine lapping compound to the valve face and repeat the above steps.
f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
g. Apply Mechanic's blueing dye (Dykem) ⓑ onto the valve face.
h. Install the valve into the cylinder head.
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.



j. Measure the valve seat width again. If the valve seat width is out of specification, reface and lap the valve seat.

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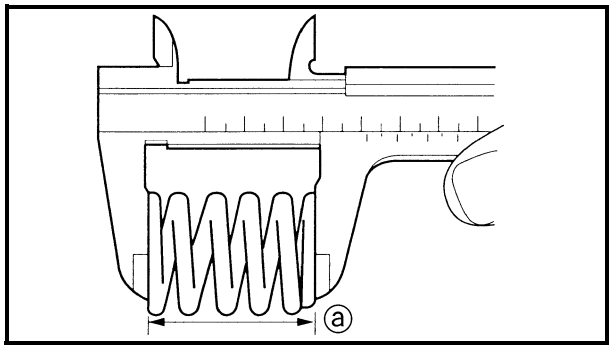
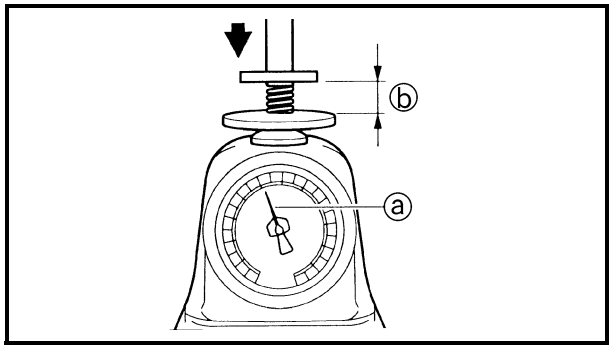


EAS00241
CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

1. Measure:
   - valve spring free length ⓐ
     Out of specification → Replace the valve spring.

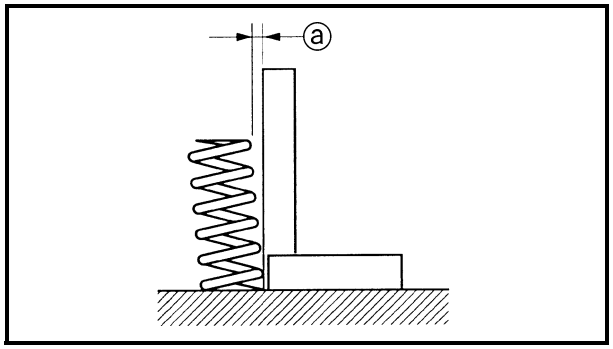
Valve spring free length
46.45 mm (1.83 in)
<Limit>: 44.13 mm (1.74 in)



2. Measure:
   - compressed valve spring force ⓐ
     Out of specification → Replace the valve spring.

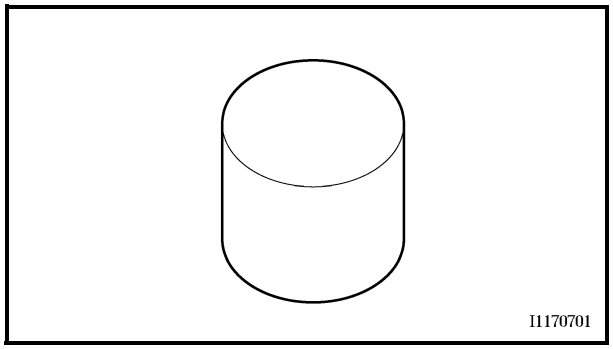
ⓑ Installed length

Compressed valve spring force (installed)
160.5 ~ 184.7 N at 35.10 mm
(16.37 ~ 18.83 kg at 35.10 mm,
36.08 ~ 41.52 lb at 1.38 in)



3. Measure:
   • valve spring tilt ⓐ
   Out of specification → Replace the valve spring.

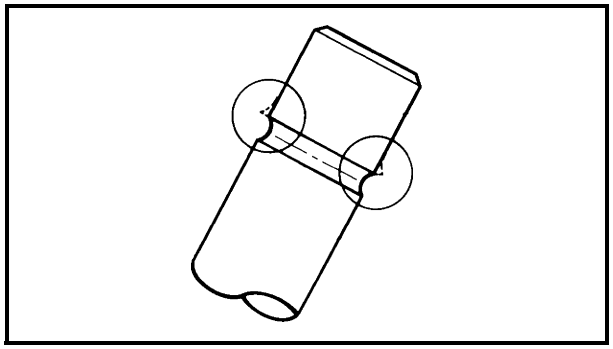
	Spring tilt limit **2.0 mm (0.08 in)**



EAS00242
CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

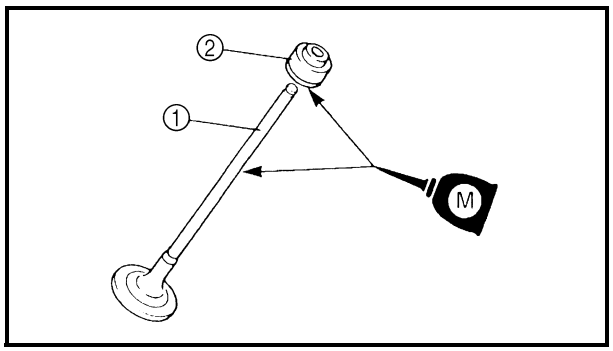
1. Check:
   • valve lifter
   Damage/scratches → Replace the valve lifters and cylinder head.



EAS00245
INSTALLING THE VALVES

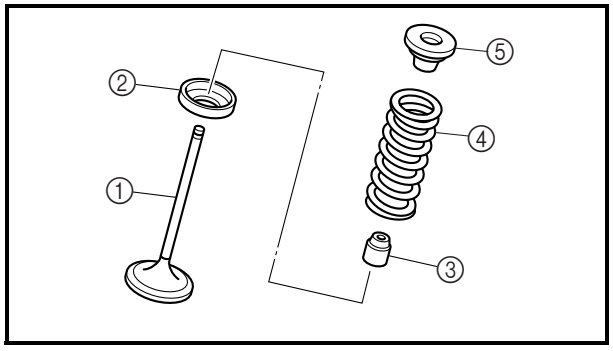
The following procedure applies to all of the valves and related components.

1. Deburr:
   • valve stem end
   (with an oil stone)

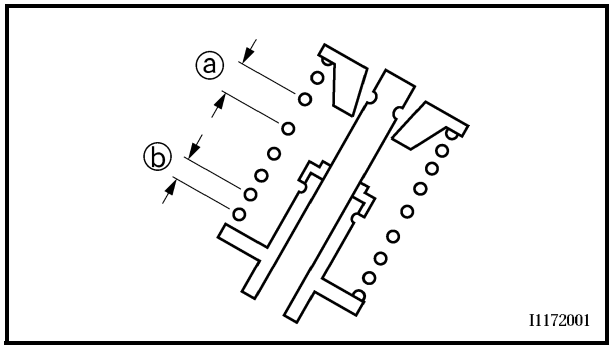


2. Lubricate:
   • valve stem ①
   • valve stem seal ②
   (with the recommended lubricant)

	Recommended lubricant **Molybdenum disulfide oil**

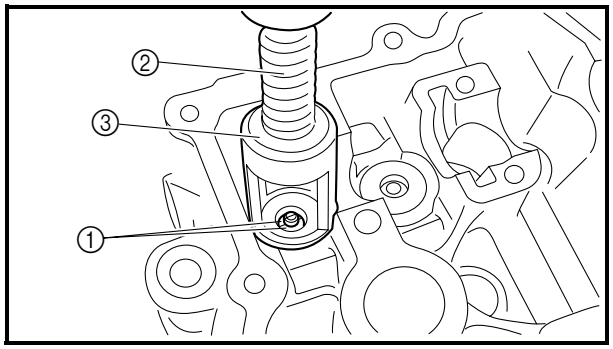


3. Install:
   • valve ①
   • lower spring seat ②
   • valve stem seal ③
   • valve spring ④
   • upper spring seat ⑤
   (into the cylinder head)



NOTE:
Install the valve spring with the larger pitch ⓐ facing up.

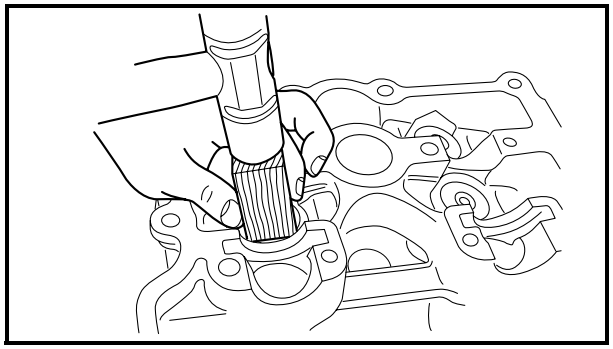
ⓑ Smaller pitch



4. Install:
   • valve cotters ①

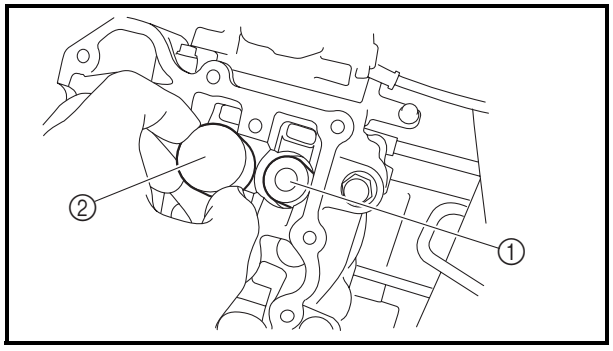
NOTE:
Install the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.

Valve spring compressor
90890-04019, YM-04019
Valve spring compressor attachment
90890-01243, YM-01253-1



5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

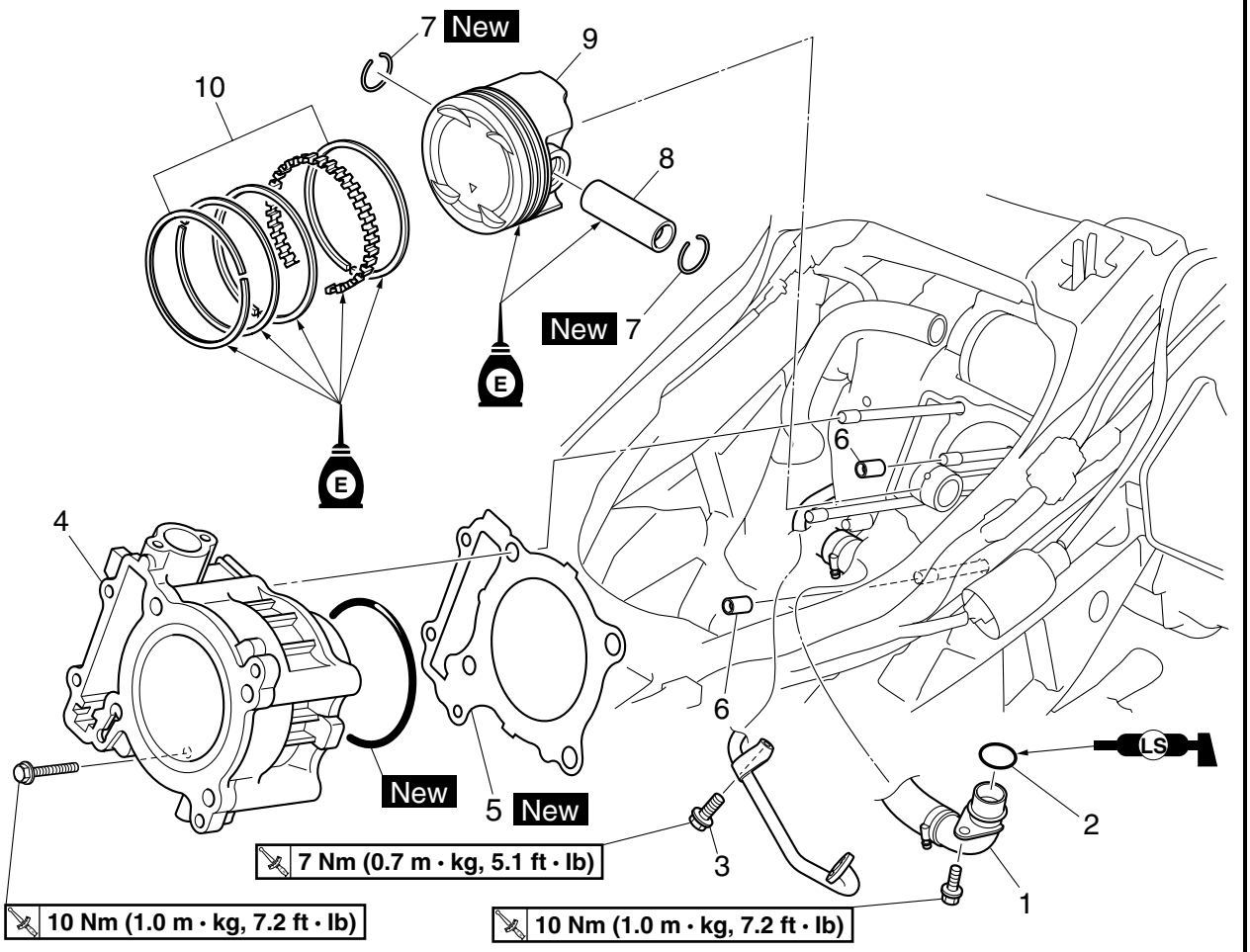
CAUTION:
Hitting the valve tip with excessive force could damage the valve.



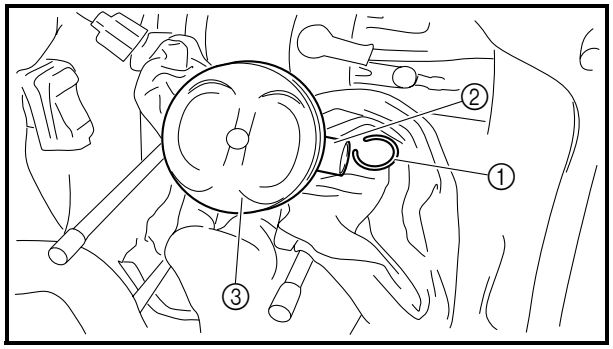
6. Install:
   • valve pad ①
   • valve lifter ②

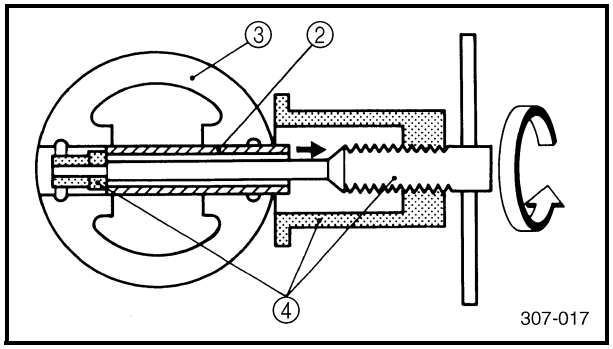
NOTE:
- Lubricate the valve lifter and valve pad with molybdenum disulfide oil.
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.

EAS00251
CYLINDER AND PISTON



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder and piston		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Water jacket inlet pipe	1	
2	O-ring	1	
3	Air induction system pipe stay bolt	1	
4	Cylinder	1	Refer to "INSTALLING THE PISTON AND CYLINDER".
5	Cylinder gasket	1	
6	Dowel pin	2	
7	Piston pin clip	2	Refer to "REMOVING THE PISTON" and "INSTALLING THE PISTON AND CYLINDER".
8	Piston pin	1	
9	Piston	1	
10	Piston ring set	1	
			For installation, reverse the removal procedure.





EAS00253
REMOVING THE PISTON

1. Remove:
   - piston pin clip ①
   - piston pin ②
   - piston ③

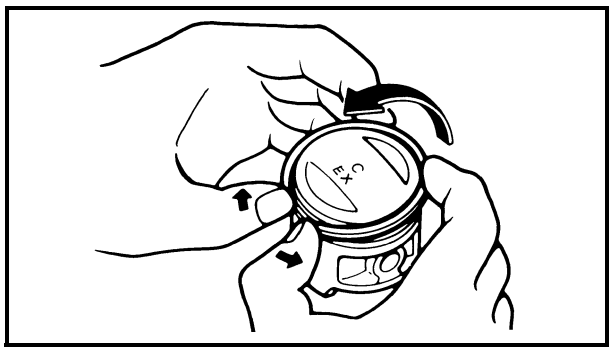
CAUTION:

Do not use a hammer to drive the piston pin out.

NOTE:

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set ④.

	**Piston pin puller set 90890-01304, YU-01304**



2. Remove:
   - top ring
   - 2nd ring
   - oil ring

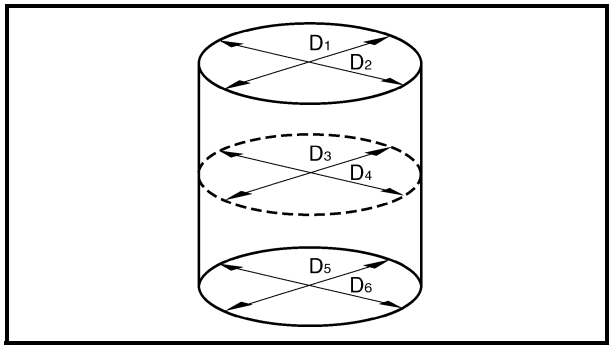
NOTE:

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

EAS00255
CHECKING THE CYLINDER AND PISTON

1. Check:
   - piston wall
   - cylinder wall

   Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.



2. Measure:
   • piston-to-cylinder clearance

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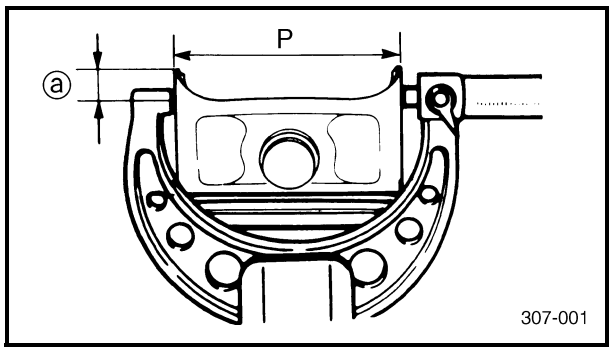
a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE:

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

Cylinder bore "C"	**83.000 ~ 83.010 mm (3.2677 ~ 3.2681 in)**
Taper limit "T"	**0.05 mm (0.002 in)**

"C" = maximum of D_1 ~ D_2
"T" = maximum of D_1 or D_2 – maximum of D_5 or D_6



b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter "P" with the micrometer.
ⓐ 5 mm (0.20 in) from the bottom edge of the piston

	Piston size "P"
Standard	**82.930 ~ 82.945 mm (3.2650 ~ 3.2656 in)**

d. If out of specification, replace the piston and piston rings as a set.
e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance = Cylinder bore "C" – Piston skirt diameter "P"

Piston-to-cylinder clearance
0.060 ~ 0.075 mm
(0.0024 ~ 0.0030 in)
<Limit>: 0.15 mm (0.0059 in)

f. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

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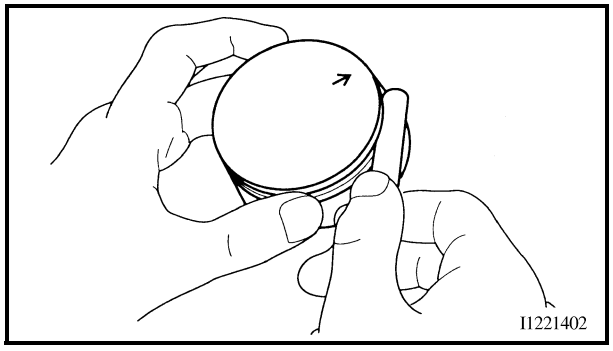
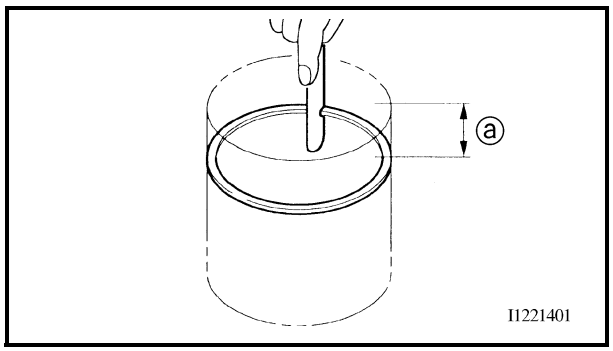


EAS00263
CHECKING THE PISTON RINGS

1. Measure:
   • piston ring side clearance
   Out of specification → Replace the piston and piston rings as a set.

NOTE:
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Piston ring side clearance
Top ring
0.030 ~ 0.070 mm
(0.0012 ~ 0.0028 in)
<Limit>: 0.100 mm (0.0039 in)
2nd ring
0.020 ~ 0.055 mm
(0.0008 ~ 0.0022 in)
<Limit>: 0.100 mm (0.0039 in)



2. Install:
   • piston ring
   (into the cylinder)

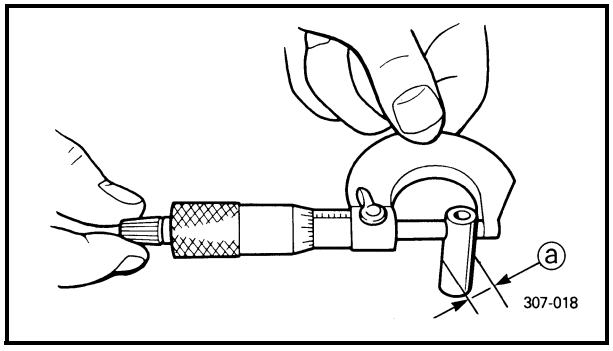
NOTE:
Level the piston ring into the cylinder with the piston crown.

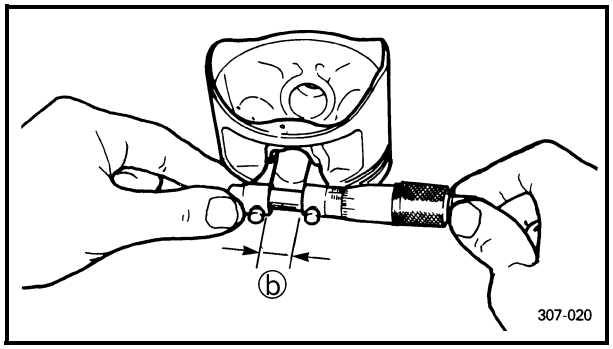
ⓐ 40 mm (1.6 in)

3. Measure:
   • piston ring end gap
   Out of specification → Replace the piston ring.

NOTE:
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring end gap
Top ring
0.20 ~ 0.35 mm
(0.0079 ~ 0.0138 in)
<Limit>: 0.50 mm (0.0197 in)
2nd ring
0.40 ~ 0.55 mm
(0.0157 ~ 0.0217 in)
<Limit>: 0.80 mm (0.0315 in)
Oil ring
0.10 ~ 0.40 mm
(0.0039 ~ 0.0157 in)





EAS00265
CHECKING THE PISTON PIN

1. Check:
   - piston pin
     Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
   - piston pin outside diameter ⓐ
     Out of specification → Replace the piston pin.

Piston pin outside diameter
19.991 ~ 20.000 mm
(0.7870 ~ 0.7874 in)
<Limit>: 19.971 mm (0.7863 in)

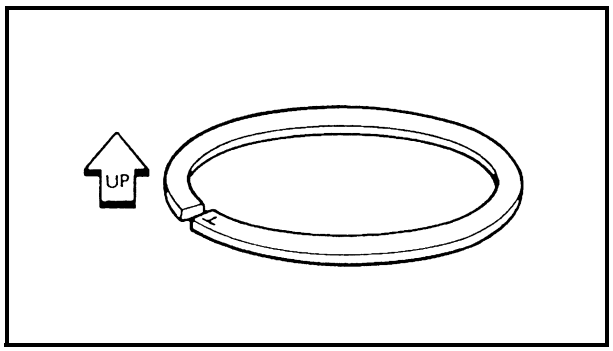
3. Measure:
   - piston pin bore diameter ⓑ (in the piston)
     Out of specification → Replace the piston.

Piston pin bore diameter
20.004 ~ 20.015 mm
(0.7876 ~ 0.7880 in)
<Limit>: 20.045 mm (0.7892 in)

4. Calculate:
   - piston-pin-to-piston-pin-bore clearance
     Out of specification → Replace the piston pin and piston as a set.

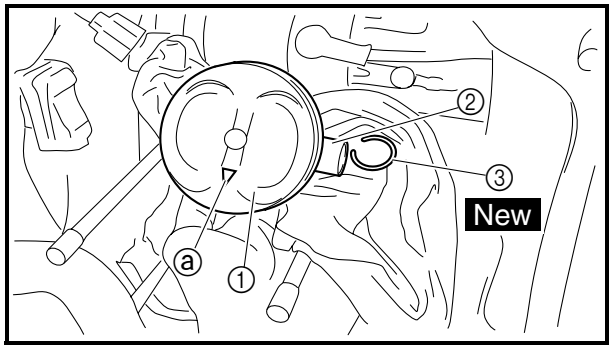
Piston-pin-to-piston-pin-bore clearance =
Piston pin bore diameter ⓑ –
Piston pin outside diameter ⓐ

Piston-pin-to-piston-pin-bore clearance
0.004 ~ 0.024 mm
(0.0002 ~ 0.0009 in)
<Limit>: 0.074 mm (0.0029 in)



EAS00267
INSTALLING THE PISTON AND CYLINDER

1. Install:
   - top ring
   - 2nd ring
   - lower oil ring rail
   - upper oil ring rail
   - oil ring expander



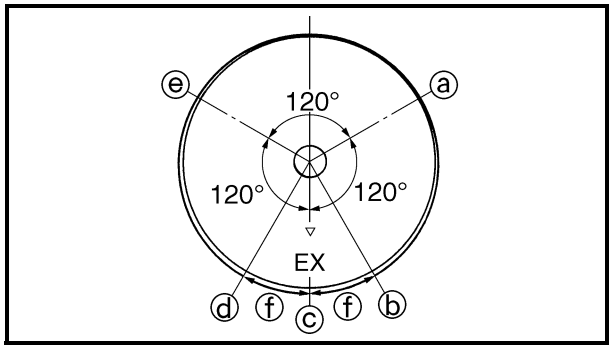
NOTE:
Be sure to install the top and 2nd rings so that the manufacturer's marks or numbers face up.

2. Install:
   - piston ①
   - piston pin ②
   - piston pin clips ③ New

NOTE:
- Apply engine oil onto the piston pin.
- Make sure the arrow mark ⓐ on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.

3. Install:
   - cylinder gasket New
   - dowel pins
4. Lubricate:
   - piston
   - piston rings
   - cylinder
     (with the recommended lubricant)

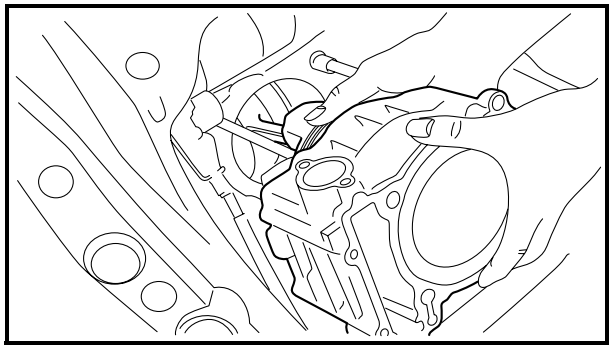
	Recommended lubricant **Engine oil**



5. Position:
   - top ring
   - 2nd ring
   - oil ring

   Offset the piston ring end gaps as shown.

ⓐ Top ring end
ⓑ Upper oil ring rail end
ⓒ Oil ring expander end
ⓓ Lower oil ring rail end
ⓔ 2nd ring end
ⓕ 20 mm (0.79 in)



6. Install:
   - dowel pins
   - cylinder gasket New
   - cylinder
   - cylinder bolt **10 Nm (1.0 m · kg, 7.2 ft · lb)**

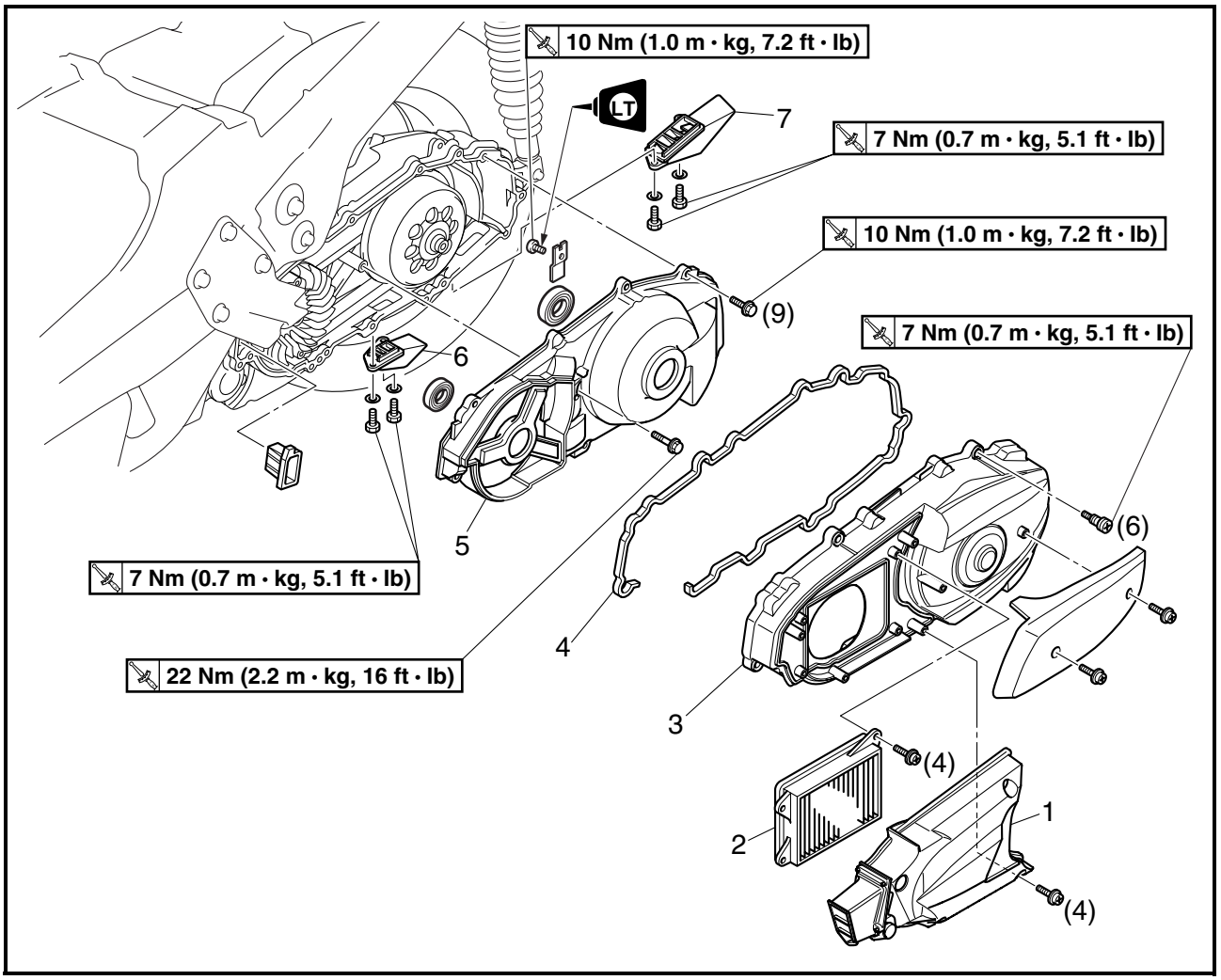
NOTE:

- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.

EAS00316

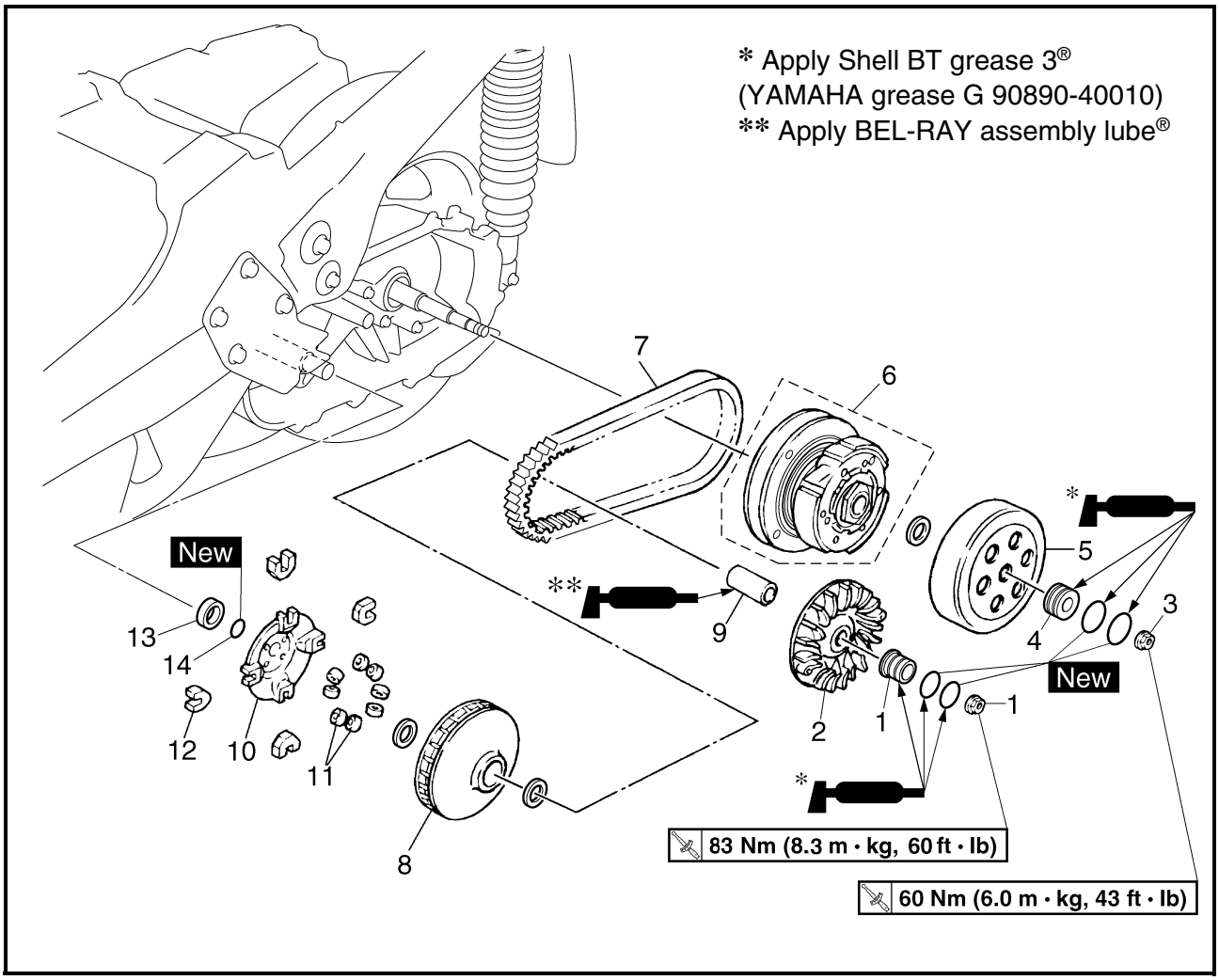
BELT DRIVE

V-BELT CASE COVER

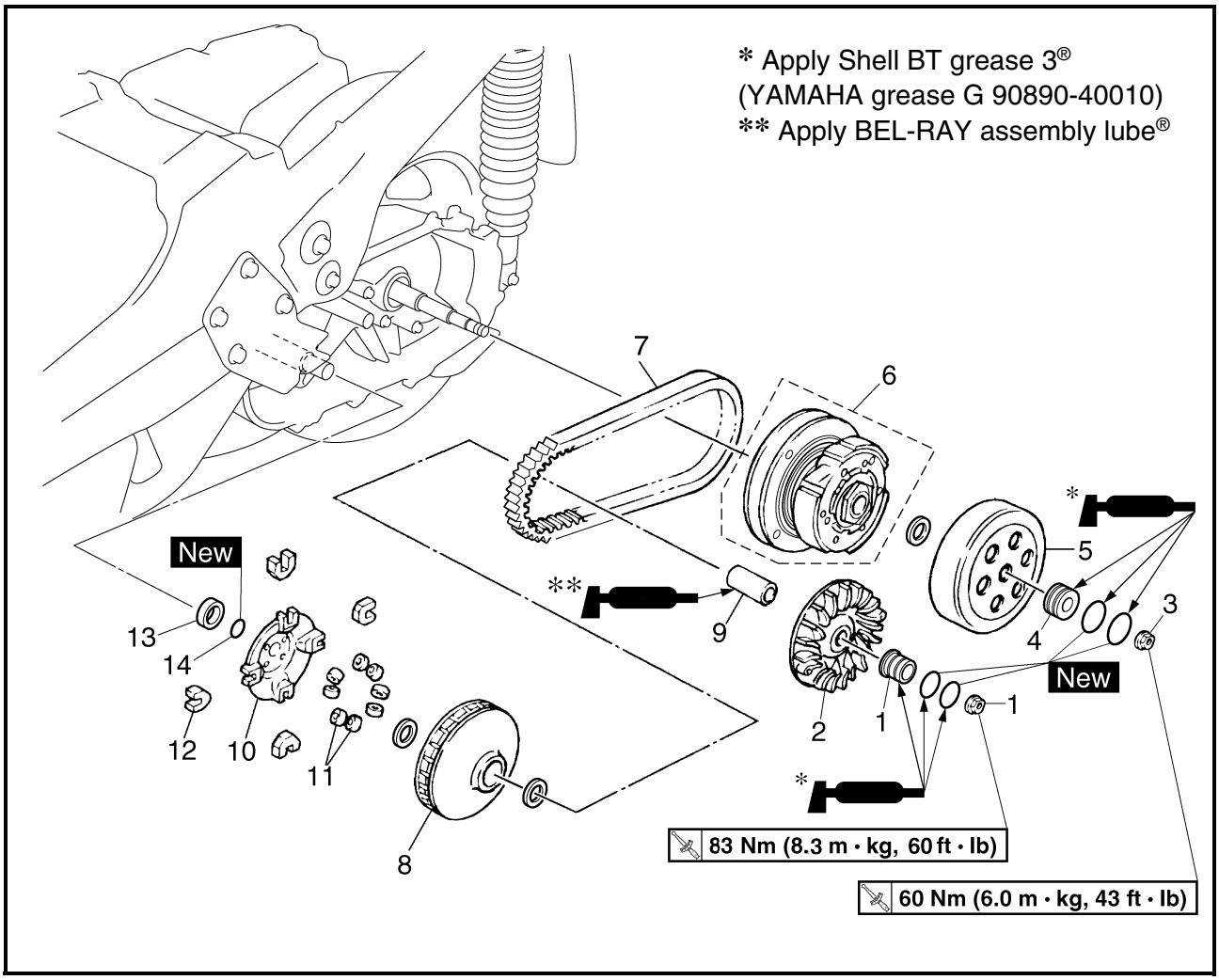


Order	Job/Part	Q'ty	Remarks
	Removing the V-belt case cover		Remove the parts in the order listed.
	Side cover (left)		Refer to "COWLING AND COVERS" in chapter 3.
	Air filter case (left)		Refer to "AIR FILTER CASES" in chapter 3.
1	V-belt case air filter cover	1	
2	V-belt case air filter element	1	
3	V-belt case cover	1	
4	V-belt case gasket	1	
5	V-belt case	1	
6	V-belt case air duct 1	1	
7	V-belt case air duct 2	1	
			For installation, reverse the removal procedure.

V-BELT AND PRIMARY/SECONDARY SHEAVE

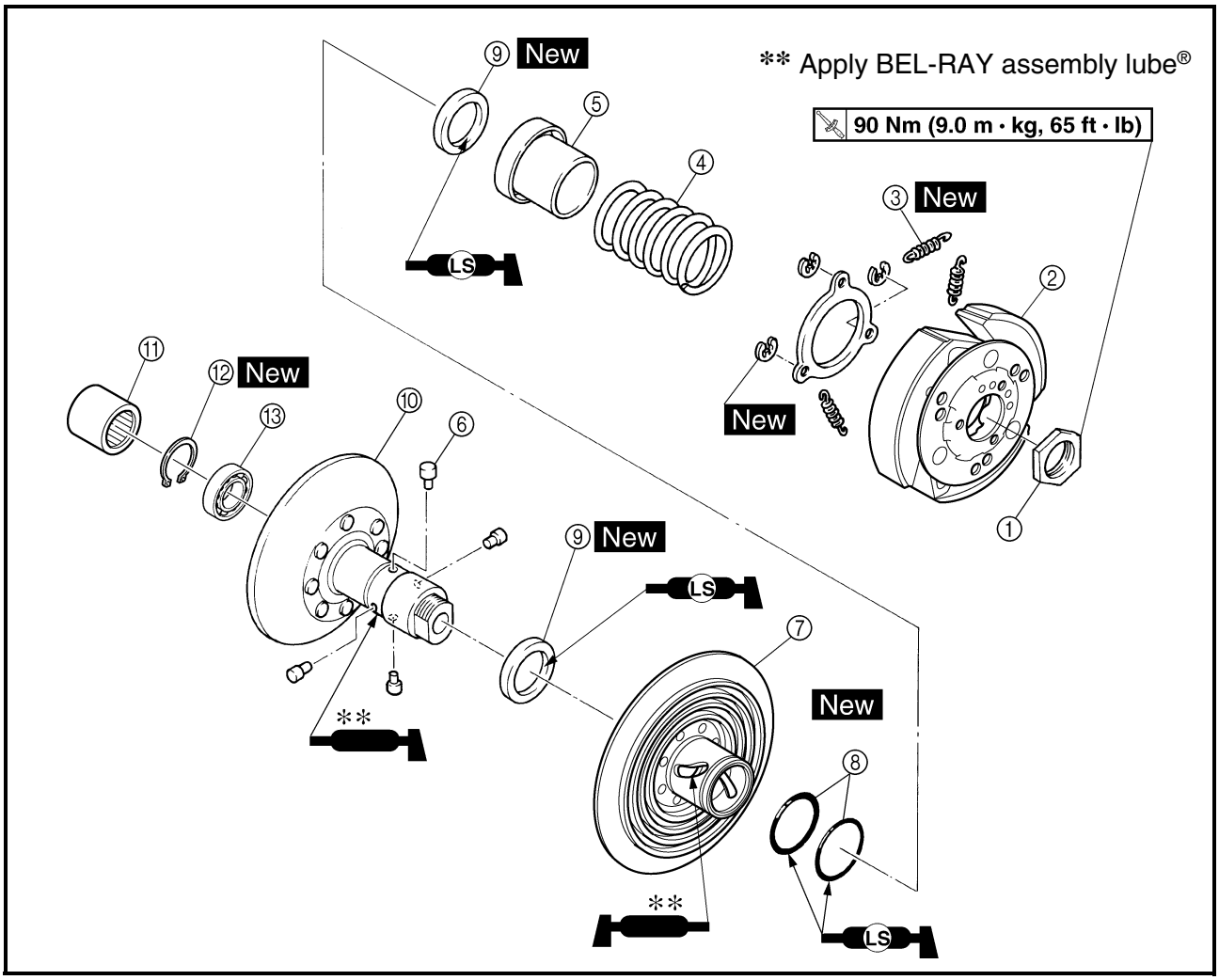


Order	Job/Part	Q'ty	Remarks
	Removing the V-belt and primary/ secondary sheave		Remove the parts in the order listed.
1	Primary sheave nut/collar	1/1	Refer to "REMOVING THE PRIMARY SHEAVE" and "INSTALLING THE SECONDARY SHEAVE, V-BELT AND PRIMARY SHEAVE".
2	Primary fixed sheave	1	
3	Secondary sheave nut	1	Refer to "REMOVING THE SECONDARY SHEAVE AND V-BELT" and "INSTALLING THE SECONDARY SHEAVE, V-BELT AND PRIMARY SHEAVE".
4	Collar	1	
5	Clutch housing	1	
6	Secondary sheave assembly	1	
7	V-belt	1	
8	Primary sliding sheave	1	
9	Spacer	1	
10	Cam	1	

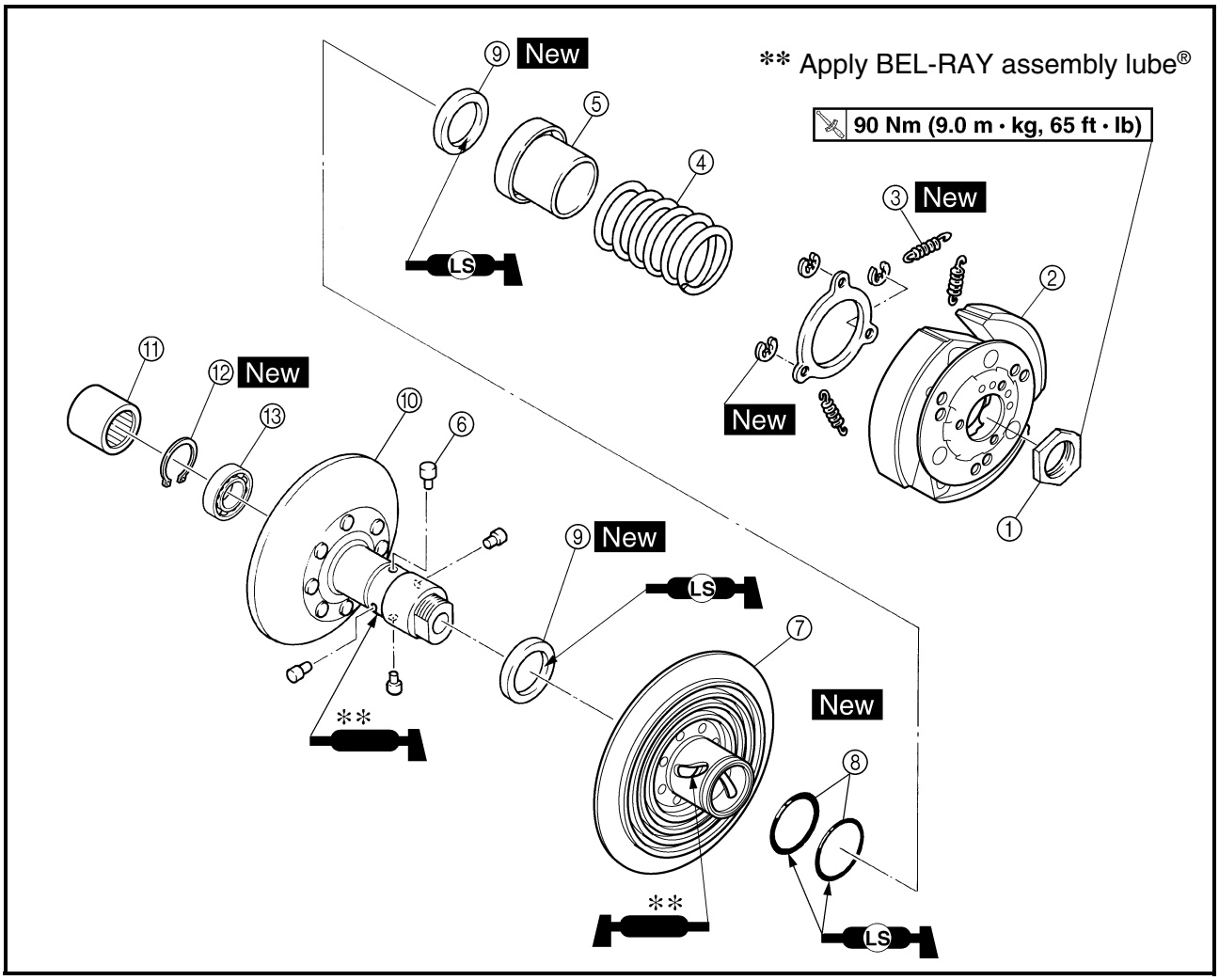


Order	Job/Part	Q'ty	Remarks
11	Weight	8	
12	Slider	4	
13	Spacer	1	
14	O-ring	1	
			For installation, reverse the removal procedure.

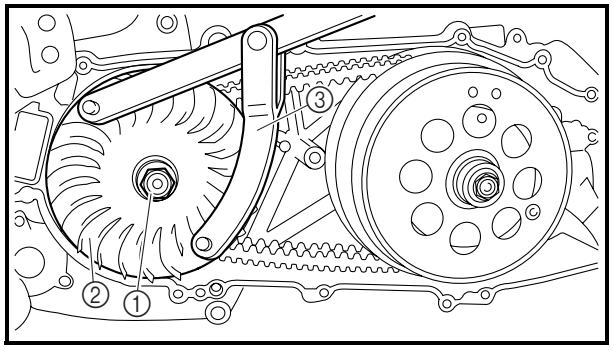
SECONDARY SHEAVE



Order	Job/Part	Q'ty	Remarks
	Disassembling the secondary sheave		Remove the parts in the order listed.
①	Clutch shoe assembly nut	1	Refer to "DISASSEMBLING THE SECONDARY SHEAVE" and "ASSEMBLING THE SECONDARY SHEAVE".
②	Clutch shoe assembly	1	
③	Clutch shoe spring	3	
④	Compression spring	1	Refer to "ASSEMBLING THE SECONDARY SHEAVE".
⑤	Spring seat	1	
⑥	Guide pin	4	
⑦	Secondary sliding sheave	1	
⑧	O-ring	2	
⑨	Oil seal	2	
⑩	Secondary fixed sheave	1	
⑪	Bearing	1	



Order	Job/Part	Q'ty	Remarks
⑫	Circlip	1	
⑬	Bearing	1	
			For assembly, reverse the disassembly procedure.

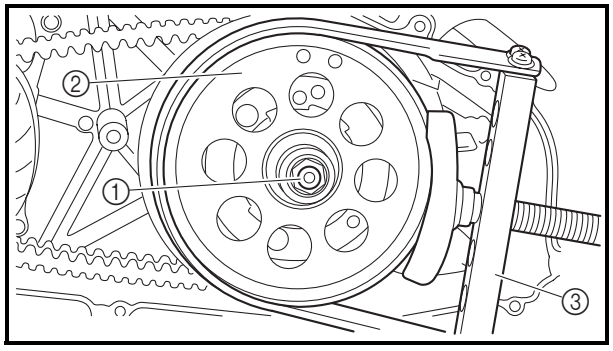


EAS00317
REMOVING THE PRIMARY SHEAVE

1. Remove:
   - primary sheave nut ①
   - collar
   - primary fixed sheave ②

NOTE:
While holding the primary fixed sheave with the rotor holding tool ③, loosen the primary sheave nut.

	Rotor holding tool **90890-01235, YU-01235**

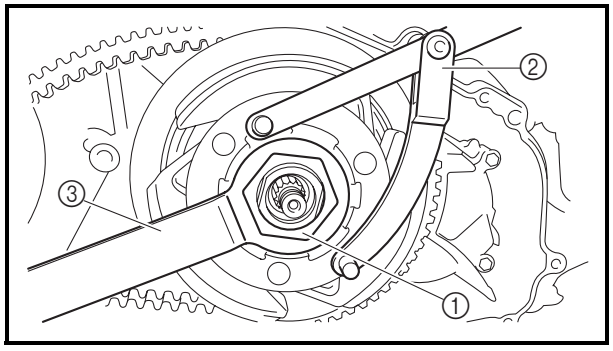


EAS00318
REMOVING THE SECONDARY SHEAVE AND V-BELT

1. Remove:
   - secondary sheave nut ①
   - collar
   - clutch housing ②

NOTE:
While holding the clutch housing with the sheave holder ③, loosen the secondary sheave nut.

	Sheave holder **90890-01701, YS-01880-A**



2. Loosen:
   • clutch shoe assembly nut ①

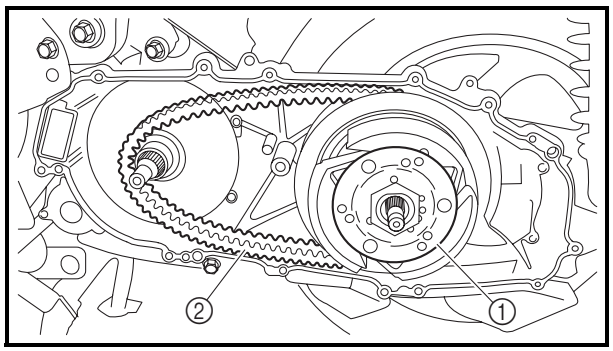
CAUTION:

Do not remove the clutch shoe assembly nut at this stage.

NOTE:

While holding the clutch shoe assembly with the rotor holding tool ②, loosen the clutch shoe assembly nut one full turn with the locknut wrench ③.

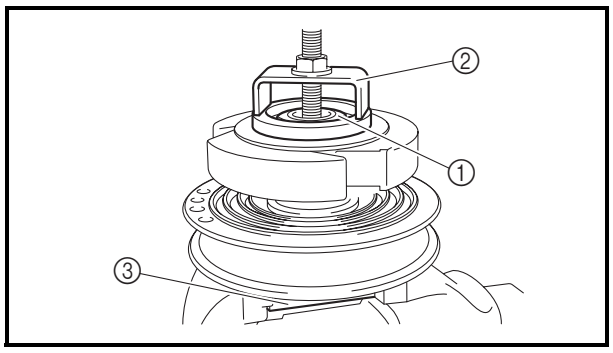
Rotor holding tool
90890-01235, YU-01235
Locknut wrench
90890-01348, YM-01348



3. Remove:
   • secondary sheave assembly ①
   • V-belt ②

NOTE:

Remove the V-belt and secondary sheave assembly from the primary sheave side.



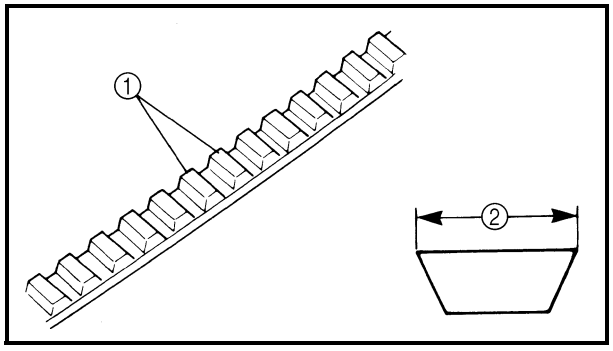
EAS00319
DISASSEMBLING THE SECONDARY SHEAVE

1. Remove:
   • clutch shoe assembly nut ①

NOTE:

Install the sheave spring compressor ② and sheave fixed block ③ onto the secondary sheave assembly as shown. Then, compress the spring, and remove the clutch shoe assembly nut.

Sheave spring compressor
90890-04134, YM-04134
Sheave fixed block
90890-04135, YM-04135



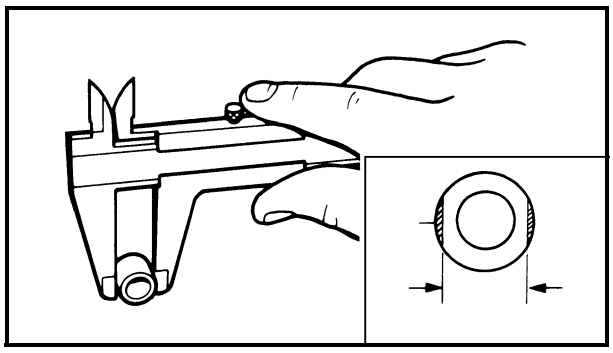
EAS00320
CHECKING THE V-BELT
1. Check:
   - V-belt ①
     Cracks/damage/wear → Replace.
     Grease/oil → Clean the primary and secondary sheaves.
2. Measure:
   - V-belt width ②
     Out of specification → Replace.

V-belt width
30 mm (1.18 in)
<Limit>: 27 mm (1.06 in)

CHECKING THE V-BELT CASE AIR DUCTS
1. Check:
   - V-belt case air ducts
     Cracks/damage → Replace.

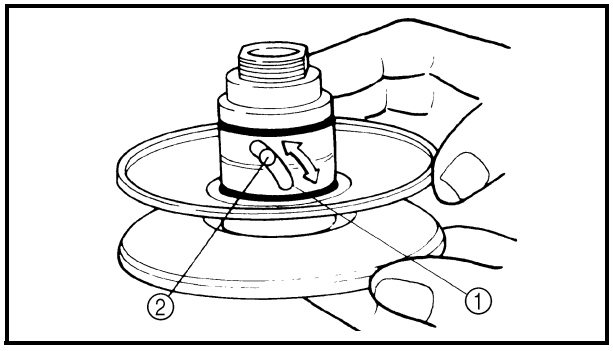
CHECKING THE PRIMARY SHEAVE
1. Check:
   - primary fixed sheave
   - primary sliding sheave
   - spacer
     Cracks/damage/wear → Replace.

NOTE:
Replace the primary sliding sheave and spacer as a set.



EAS00321
CHECKING THE PRIMARY SHEAVE WEIGHTS
The following procedure applies to all of the primary sheave weights.
1. Check:
   - primary sheave weight
     Cracks/damage/wear → Replace.
2. Measure:
   - primary sheave weight outside diameter
     Out of specification → Replace.

Primary sheave weight outside diameter
25.0 mm (0.98 in)
<Limit>: 24.5 mm (0.96 in)



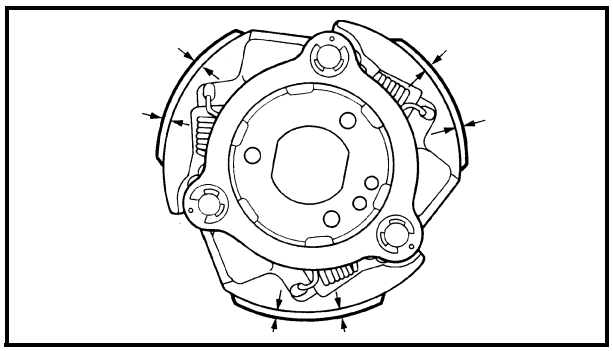
EAS00322
CHECKING THE SECONDARY SHEAVE

1. Check:
   - secondary fixed sheave
   - secondary sliding sheave

   Cracks/damage/wear → Replace the secondary fixed and sliding sheaves as a set.
2. Check:
   - torque cam groove ①

   Damage/wear → Replace the secondary fixed and sliding sheaves as a set.
3. Check:
   - guide pin ②

   Damage/wear → Replace the secondary fixed and sliding sheaves as a set.



CHECKING THE CLUTCH SHOES

The following procedure applies to all of the clutch shoes.

1. Check:
   - clutch shoe

   Damage/wear → Replace the clutch shoes and springs as a set.

   Glazed areas → Sand with coarse sandpaper.

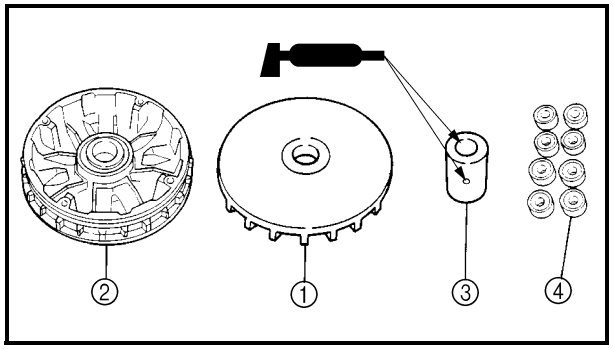
Clutch shoe thickness
4.0 mm (0.16 in)
<Limit>: 2.5 mm (0.10 in)

NOTE:

After sanding the glazed areas, clean the clutch with a cloth.

2. Measure:
   - clutch shoe thickness

   Out of specification → Replace the clutch shoes and springs as a set.

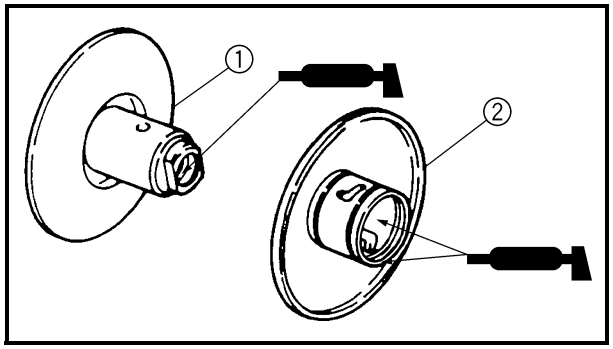


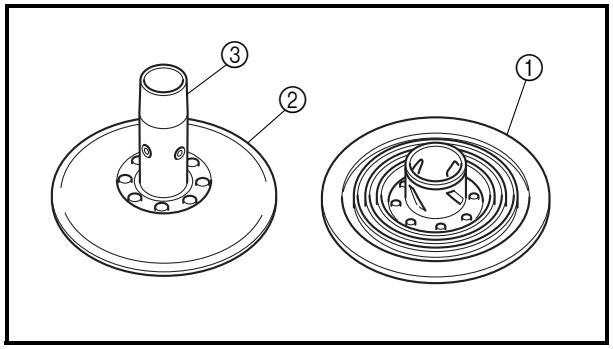
EAS00323
ASSEMBLING THE PRIMARY SHEAVE

1. Clean:
   - primary fixed sheave ①
   - primary sliding sheave ②
   - collar ③
   - primary sheave weights ④
   - cam
2. Lubricate:
   - collar's inner and outer surface

	Recommended lubricant **BEL-RAY assembly lube**

3. Install:
   - primary sheave weights
   - collar
4. Install:
   - sliders
   - cam





EAS00324
ASSEMBLING THE SECONDARY SHEAVE

1. Lubricate:
   - secondary fixed sheave's inner surface ①
   - secondary sliding sheave's inner surface ②
   - oil seals
   - bearings
     (with the recommended lubricant)

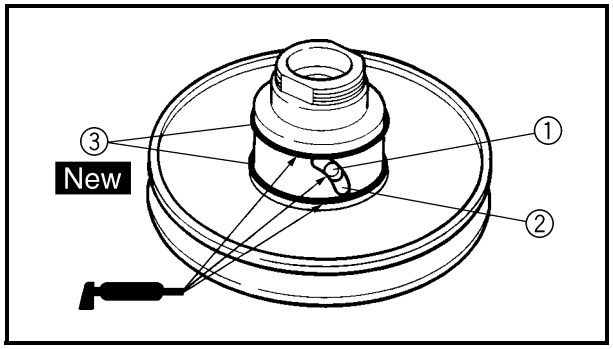
	Recommended lubricant **BEL-RAY assembly lube**

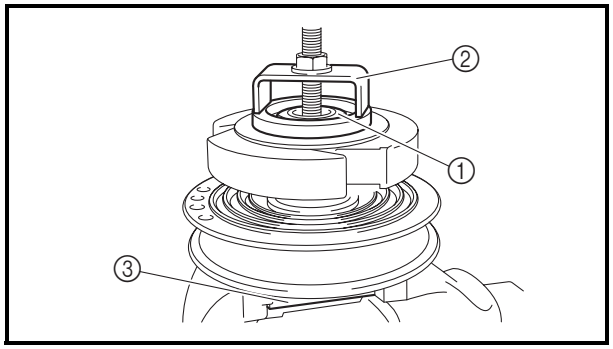
2. Install:
   - secondary sliding sheave ①

NOTE:

Install the secondary sliding sheave onto the secondary fixed sheave ② with the oil seal guide ③.

	Oil seal guide **90890-01396**





3. Install:
   - guide pin ①
4. Lubricate:
   - guide pin groove ②
   - O-ring ③ New
     (with the recommended lubricant)

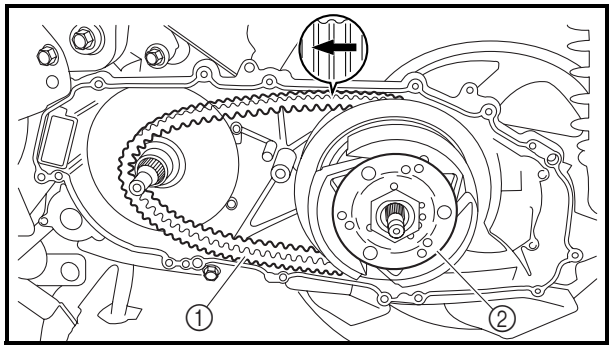
	Recommended lubricant **BEL-RAY assembly lube**

5. Install:
   - spring seat
   - compression spring
   - clutch shoe assembly
   - clutch shoe assembly nut ①

NOTE:

Attach the sheave spring compressor ② and sheave fixed block ③ onto the secondary sheave assembly as shown. Then, compress the spring, and tighten the clutch shoe assembly nut.

	Sheave spring compressor **90890-04134, YM-04134** **Sheave fixed block** **90890-04135, YM-04135**



EAS00325

INSTALLING THE SECONDARY SHEAVE, V-BELT AND PRIMARY SHEAVE

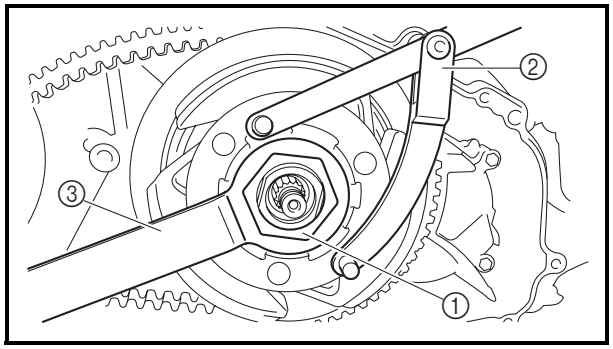
1. Install:
   - V-belt ①
   - secondary sheave assembly ②

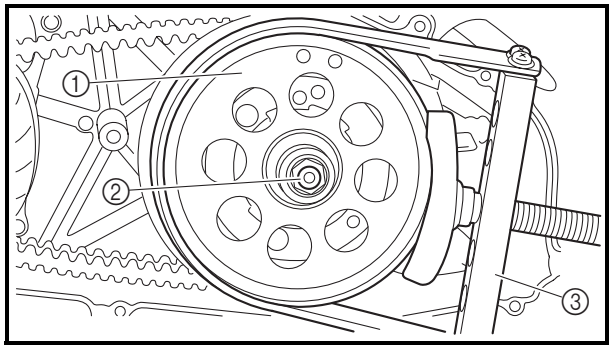
CAUTION:

Do not allow grease to contact the V-belt and the secondary sheave assembly.

NOTE:

- Install the V-belt onto the primary sheave side.
- Install the V-belt with the printed arrow mark on the V-belt facing in the direction shown in the illustration.





2. Tighten:
   - clutch shoe assembly nut ①

90 Nm (9.0 m · kg, 65 ft · lb)

NOTE:

While holding the clutch shoe assembly with the rotor holding tool ②, tighten the clutch shoe assembly nut with the locknut wrench ③.

Rotor holding tool
90890-01235, YU-01235
Locknut wrench
90890-01348, YM-01348

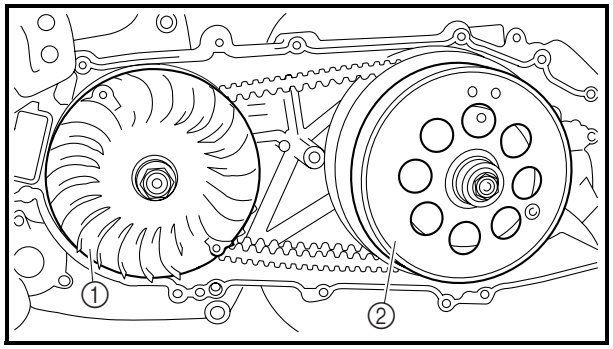
3. Install:
   - washer
   - clutch housing ①
   - collar
   - secondary sheave nut ②

60 Nm (6.0 m · kg, 43 ft · lb)

NOTE:

While holding the clutch housing with the sheave holder ③, tighten the secondary sheave nut.

Sheave holder
90890-01701, YS-01880-A



4. Install:
   - V-belt
   - primary fixed sheave
   - collar
   - primary sheave nut

83 Nm (8.3 m · kg, 60 ft · lb)

NOTE:

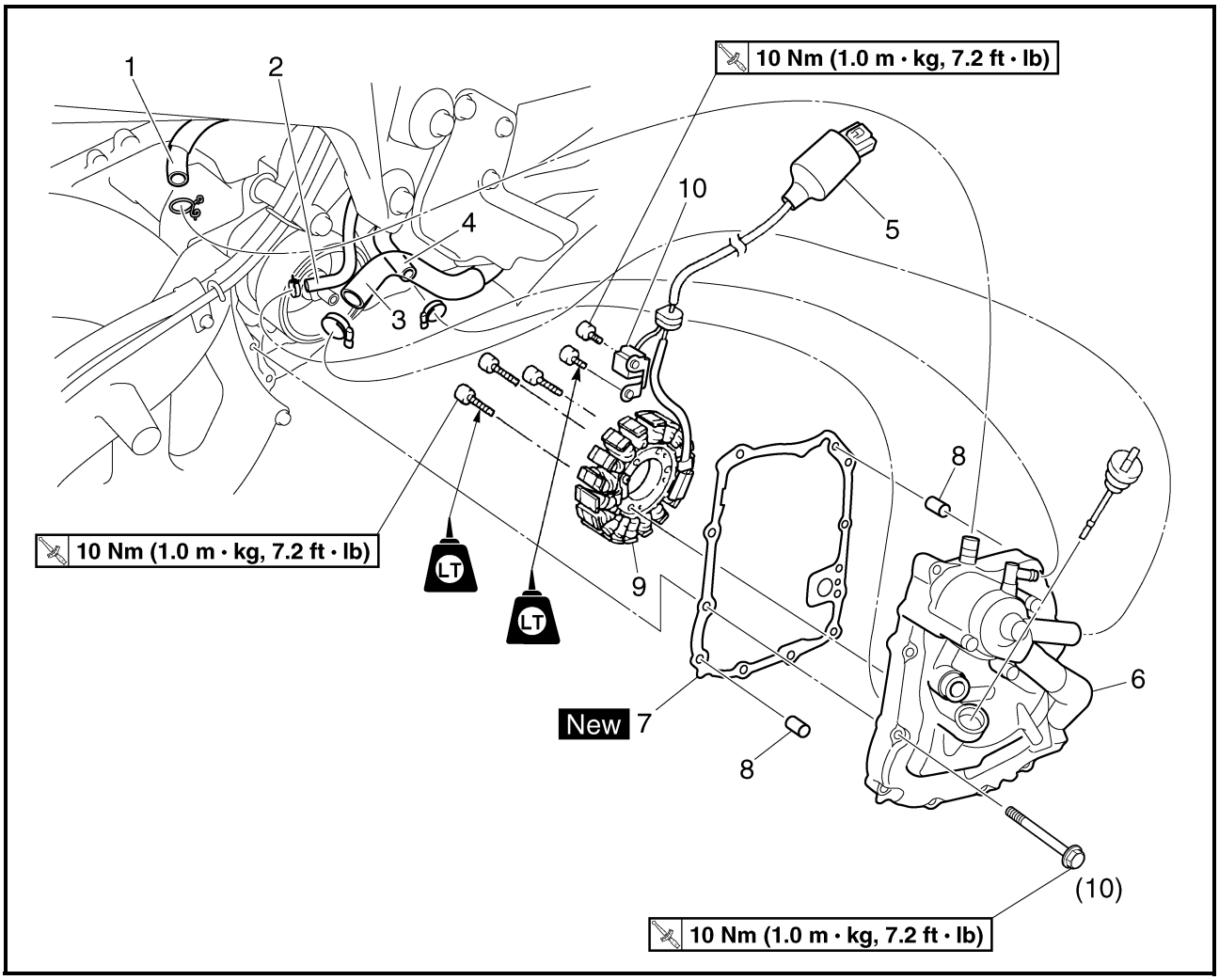
- Install the V-belt onto the primary sheave ① (when the pulley is at its widest position) and onto the secondary sheave assembly ② (when the pulley is at its narrowest position), and make sure the V-belt is tight.
- While holding the primary fixed sheave with the rotor holding tool, tighten the primary sheave nut.

Rotor holding tool
90890-01235, YU-01235

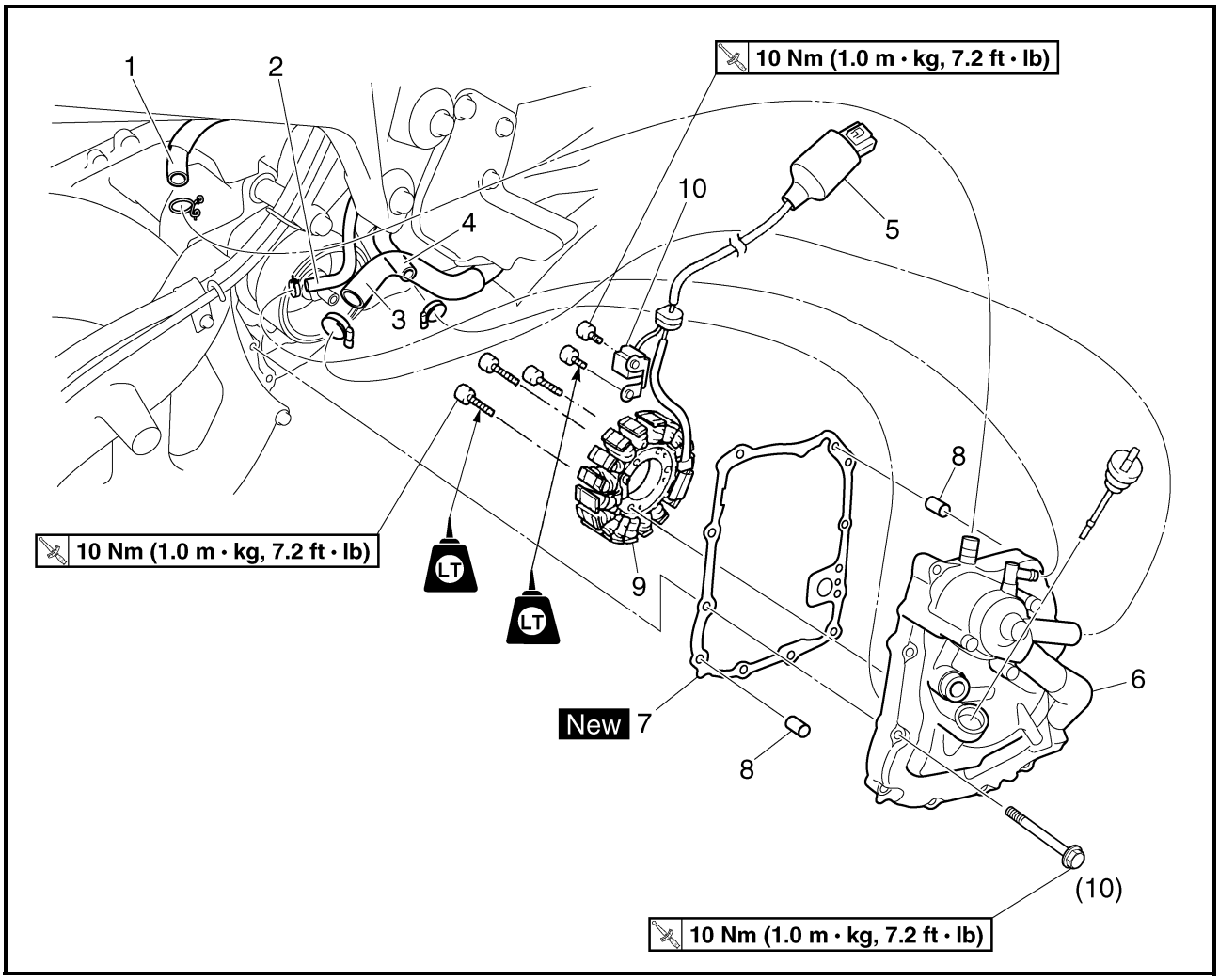
EAS00341

STARTER CLUTCH AND GENERATOR

GENERATOR ROTOR COVER AND STATOR COIL



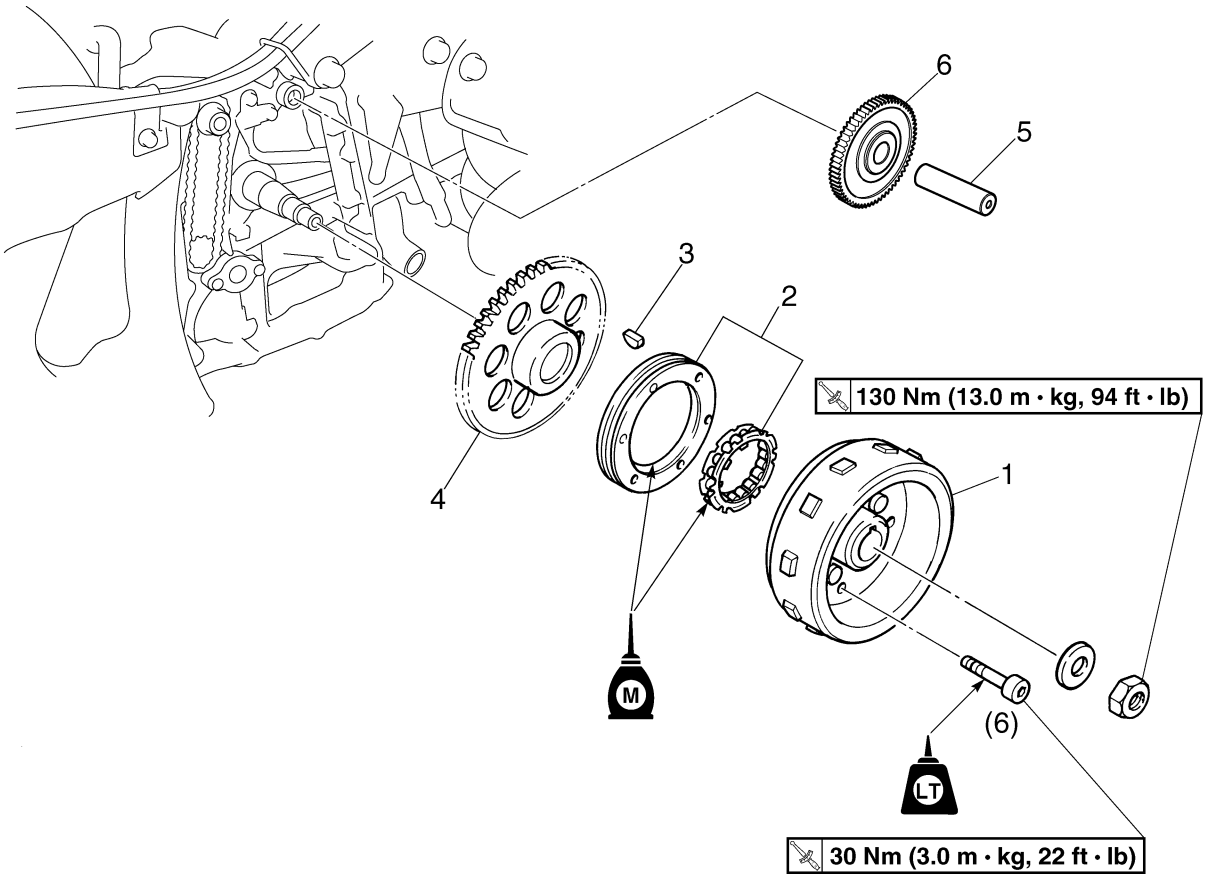
Order	Job/Part	Q'ty	Remarks
	Removing the generator rotor cover and stator coil		Remove the parts in the order listed.
	Side cover (right)		Refer to "COWLING AND COVERS" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Exhaust pipe and muffler		Refer to "ENGINE REMOVAL".
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" in chapter 7.
1	Crankcase breather hose	1	Disconnect.
2	Thermostat inlet hose	1	Disconnect.



Order	Job/Part	Q'ty	Remarks
3	Water pump inlet hose	1	Disconnect.
4	Oil cooler outlet hose	1	Disconnect.
5	Crankshaft position sensor/stator assembly coupler	2	Disconnect.
6	Generator rotor cover	1	Refer to "INSTALLING THE GENERATOR".
7	Gasket	1	
8	Dowel pin	2	
9	Stator coil	1	Refer to "INSTALLING THE GENERATOR".
10	Crankshaft position sensor	1	
			For installation, reverse the removal procedure.

EAS00343

STARTER CLUTCH AND GENERATOR

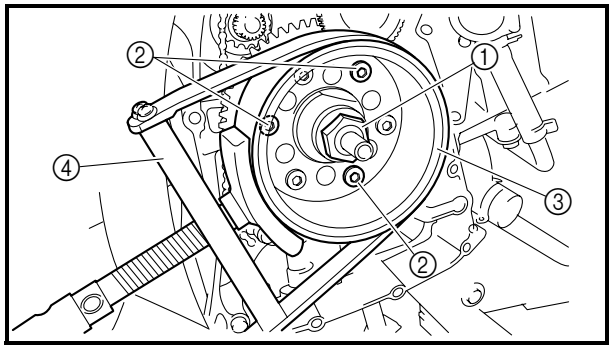


Order	Job/Part	Q'ty	Remarks
	Removing the starter clutch and generator		Remove the parts in the order listed.
1	Generator rotor	1	Refer to "REMOVING THE GENERATOR", "INSTALLING THE STARTER CLUTCH" and "INSTALLING THE GENERATOR".
2	Starter clutch	1	
3	Woodruff key	1	
4	Starter clutch gear	1	
5	Starter clutch idle gear shaft	1	
6	Starter clutch idle gear	1	
			For installation, reverse the removal procedure.

EAS00347
REMOVING THE GENERATOR

1. Remove:
   - generator rotor cover bolts
   - generator rotor cover

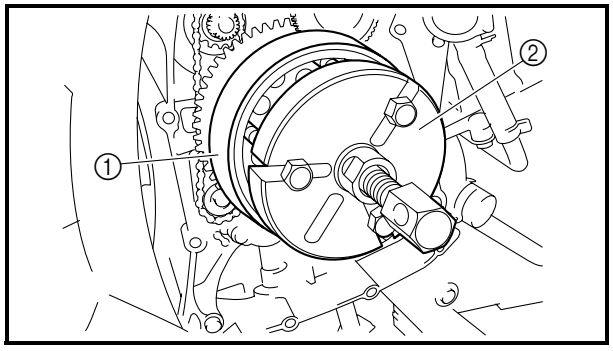
NOTE:
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
After all of the bolts are fully loosened, remove them.



2. Remove:
   - generator rotor nut ①
   - washer
   - starter clutch bolts ②

NOTE:
- While holding the generator rotor ③ with the sheave holder ④, loosen the generator rotor nut and all starter clutch bolts.
- Do not allow the sheave holder to touch the projection on the generator rotor.
- Remove every other starter clutch bolt (3 bolts only) to install the flywheel puller.

Sheave holder
90890-01701, YS-01880-A



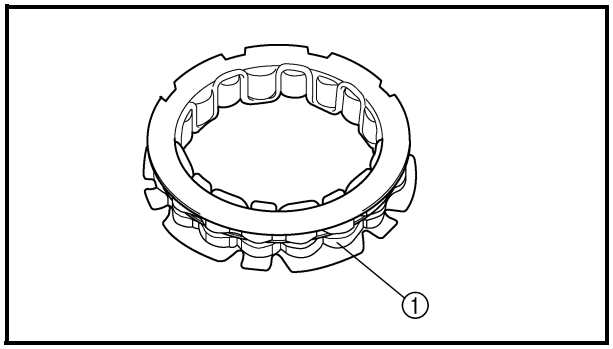
3. Remove:
   - generator rotor ①
     (with the starter clutch ②)
   - woodruff key
   - starter clutch gear

CAUTION:
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set's center bolt and the crankshaft.

NOTE:
- Install the flywheel puller bolts to the threaded holes of the starter clutch.
- Make sure the flywheel puller is centered over the generator rotor.

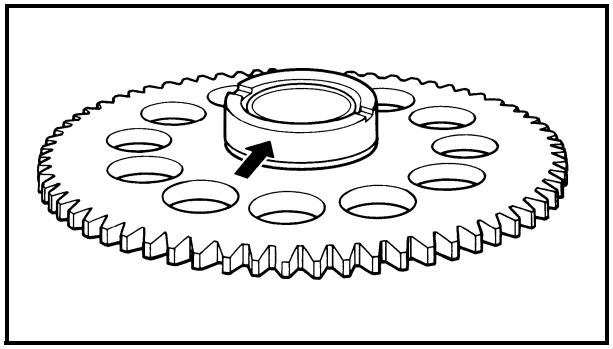
Flywheel puller
90890-01362
Flywheel puller attachment
90890-04089, YM-33282

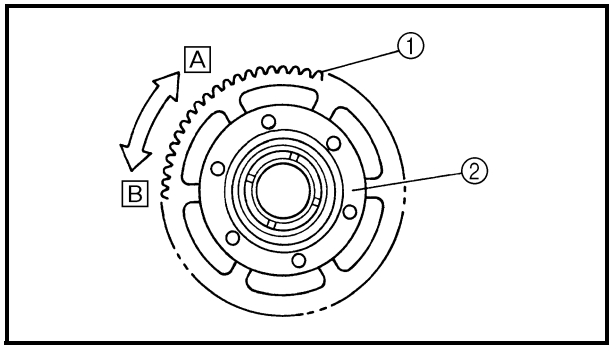
4. Remove:
   - starter clutch bolts
   - starter clutch



EAS00351
CHECKING THE STARTER CLUTCH

1. Check:
   - starter clutch rollers ①
     Damage/wear → Replace.
2. Check:
   - starter clutch idle gear
   - starter clutch gear
     Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
   - starter clutch gear's contacting surfaces
     Damage/pitting/wear → Replace the starter clutch gear.





4. Check:
   - starter clutch operation

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a. Install the starter clutch drive gear ① onto the starter clutch ② and hold the starter clutch.
b. When turning the starter clutch drive gear clockwise [A], the starter clutch and the starter clutch drive gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter clutch drive gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.

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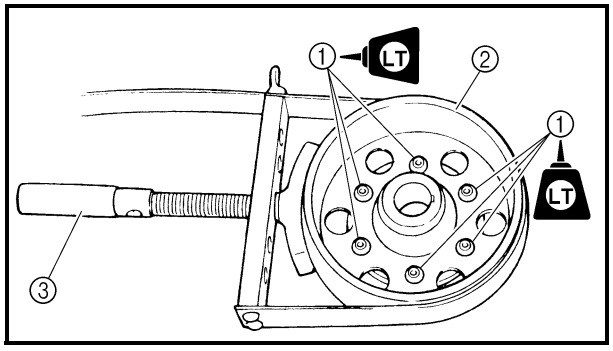
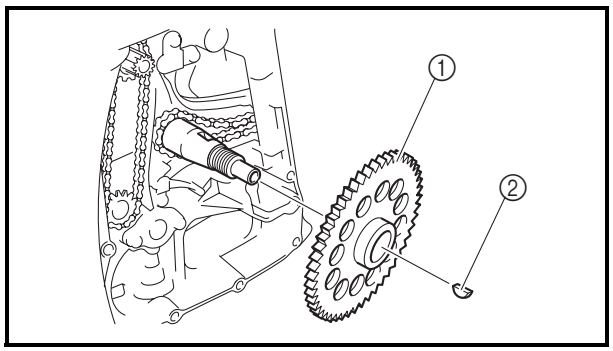


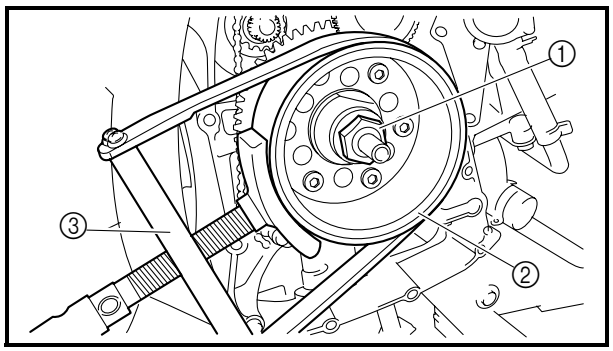
EAS00355
INSTALLING THE STARTER CLUTCH

1. Install:
   - starter clutch bolts ① LT
     30 Nm (3.0 m · kg, 22 ft · lb)

NOTE:
- While holding the generator rotor ② with the sheave holder ③, tighten the starter clutch bolts.
- Do not allow the sheave holder to touch the projection on the generator rotor.

	Sheave holder **90890-01701, YS-01880-A**





EAS00354
INSTALLING THE GENERATOR

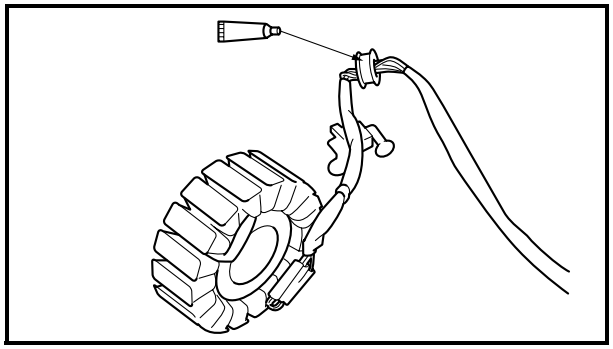
1. Install:
   - starter clutch gear ①
   - woodruff key ②
   - generator rotor
   - washer
   - generator rotor nut

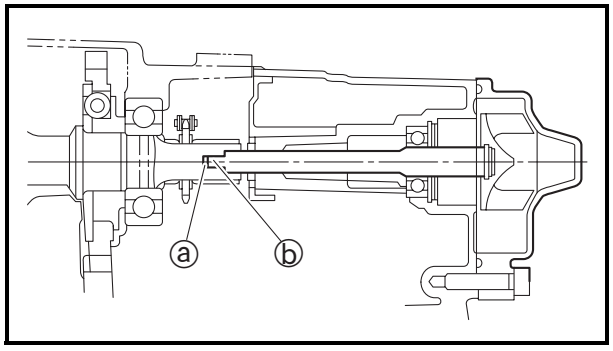
NOTE:
- Clean the tapered portion of the crankshaft and the generator rotor hub.
- When installing the generator rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.

2. Tighten:
   - generator rotor nut ①
     130 Nm (13.0 m · kg, 94 ft · lb)

NOTE:
- While holding the generator rotor ② with the sheave holder ③, tighten the generator rotor nut.
- Do not allow the sheave holder to touch the projection on the generator rotor.

	Sheave holder **90890-01701, YS-01880-A**





3. Apply:
   - sealant
     (onto the crankshaft position sensor/stator assembly lead grommet)

	Yamaha bond No. 1215 **90890-85505** **Sealant (Quick Gasket®)** **ACC-11001-05-01**

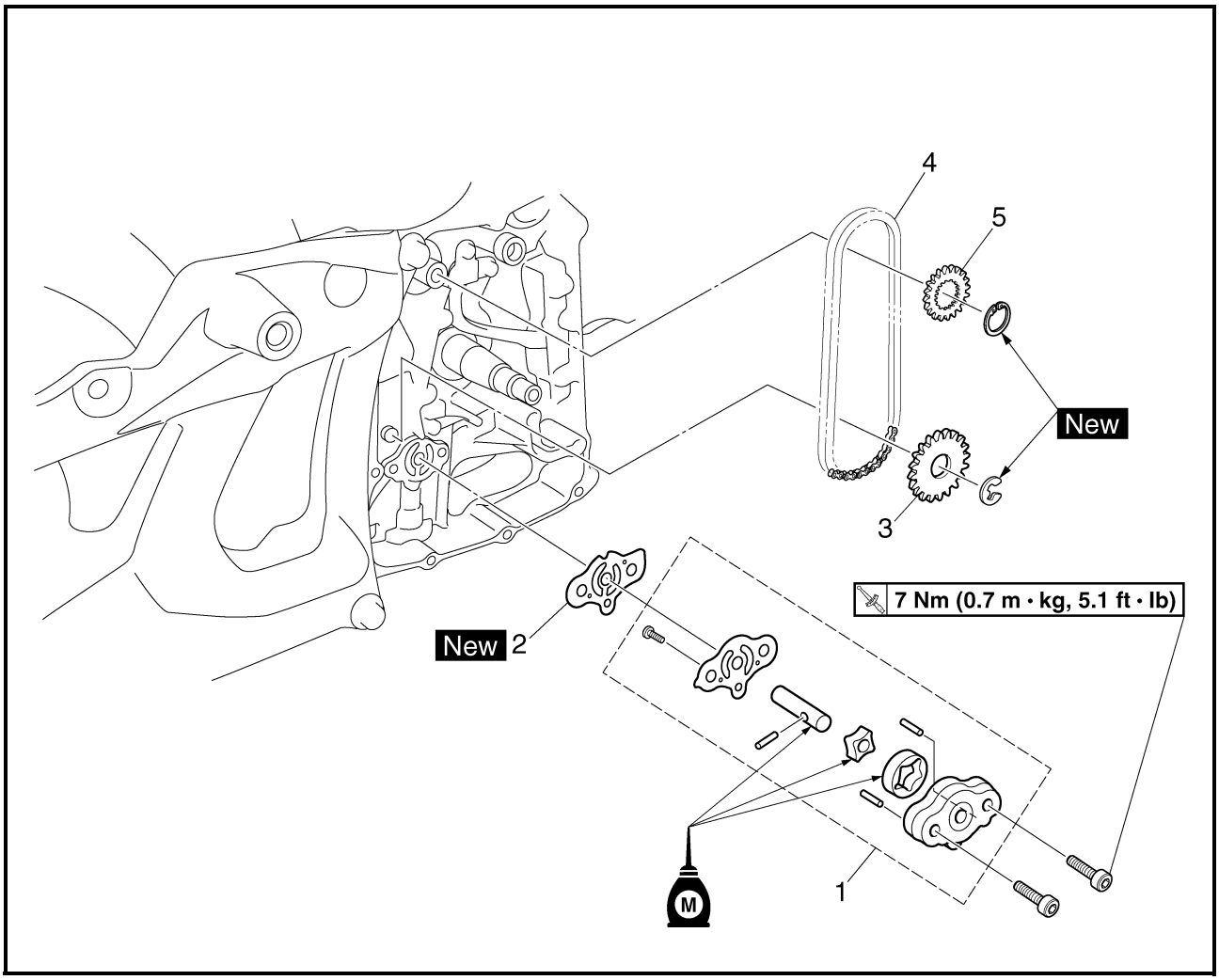
4. Install:
   - generator rotor cover
   - generator rotor cover bolts

10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:

- Align the projection ⓐ on the impeller shaft with the slit ⓑ on the balancer shaft.
- Tighten the generator rotor cover bolts in stages and in a crisscross pattern.

EAS00356
OIL PUMP

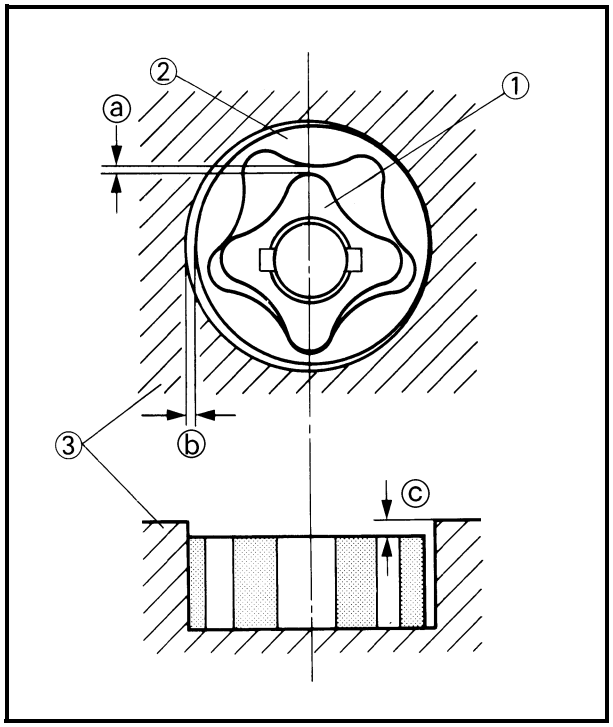


Order	Job/Part	Q'ty	Remarks
	Removing the oil pump		Remove the parts in the order listed.
	Generator rotor		Refer to "STARTER CLUTCH AND GENERATOR".
1	Oil pump assembly	1	Refer to "ASSEMBLING THE OIL PUMP" and "INSTALLING THE OIL PUMP".
2	Oil pump gasket	1	Refer to "INSTALLING THE OIL PUMP".
3	Oil pump driven sprocket	1	
4	Oil pump drive chain	1	
5	Oil pump drive sprocket	1	
			For installation, reverse the removal procedure.

EAS00364
CHECKING THE OIL PUMP

1. Check:
   - oil pump drive sprocket
   - oil pump driven sprocket
   - oil pump housing
   - oil pump housing cover

   Cracks/damage/wear → Replace the defective part(s).



2. Measure:
   - inner-rotor-to-outer-rotor-tip clearance ⓐ
   - outer-rotor-to-oil-pump-housing clearance ⓑ
   - oil-pump-housing-to-inner-rotor-and-outer-rotor clearance ⓒ

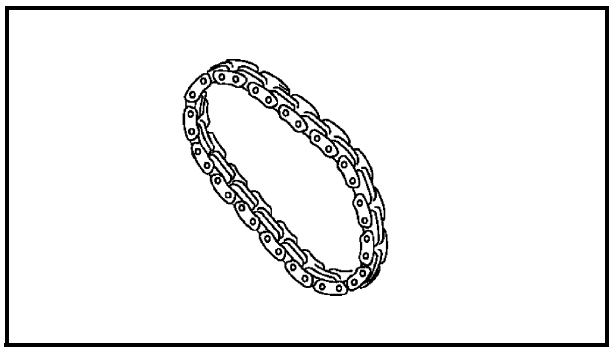
   Out of specification → Replace the oil pump.

① Inner rotor
② Outer rotor
③ Oil pump housing

Inner-rotor-to-outer-rotor-tip clearance
0.07 mm (0.0028 in)
<Limit>: 0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance
0.013 ~ 0.036 mm
(0.0005 ~ 0.0014 in)
<Limit>: 0.106 mm (0.0042 in)
Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance
0.040 ~ 0.096 mm
(0.0016 ~ 0.0038 in)
<Limit>: 0.166 mm (0.0065 in)

3. Check:
   - oil pump operation

   Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



CHECKING THE OIL PUMP DRIVE CHAIN

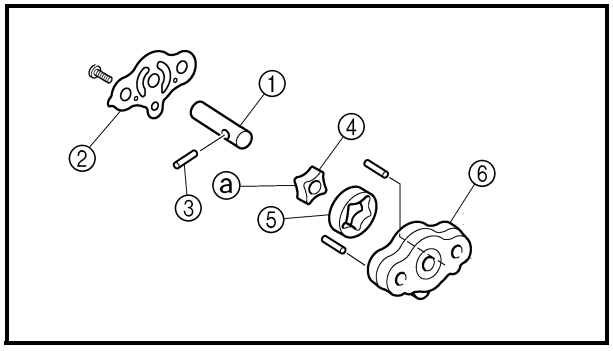
1. Check:
   - oil pump drive chain

   Cracks/stiffness → Replace the oil pump chain, oil pump drive and driven sprocket as a set.

EAS00375
ASSEMBLING THE OIL PUMP

1. Lubricate:
   - inner rotor
   - outer rotor
   - oil pump shaft
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

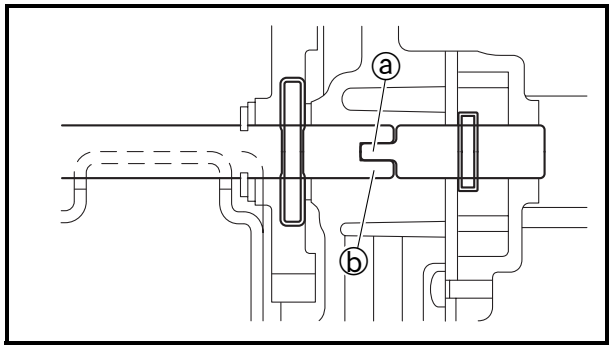


2. Install:
   - oil pump shaft ①
     (to the oil pump cover ②)
   - pin ③
   - inner rotor ④
   - outer rotor ⑤
   - oil pump housing ⑥
   - screw

NOTE:

When installing the inner rotor, align the pin ③ in the oil pump shaft with the groove ⓐ in the inner rotor ④.

3. Check:
   - oil pump operation
     Refer to “CHECKING THE OIL PUMP”.



EAS00376
INSTALLING THE OIL PUMP

1. Install:
   - oil pump gasket New
   - oil pump assembly

7 Nm (0.7 m · kg, 5.1 ft · lb)

CAUTION:

After tightening the bolts, make sure the oil pump turns smoothly.

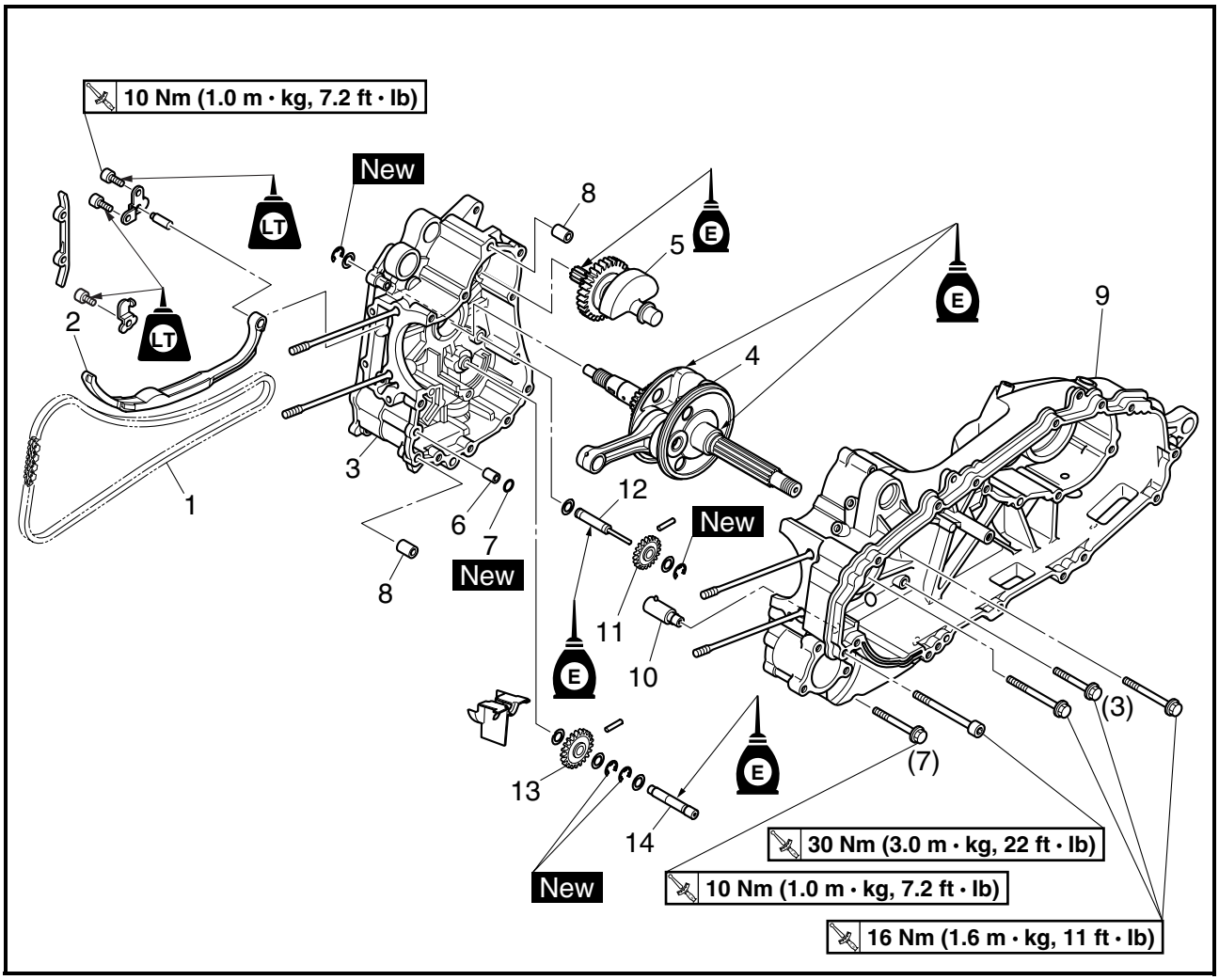
NOTE:

Align the projection ⓐ on the oil pump shaft with the slot ⓑ in the oil pump driven gear shaft.

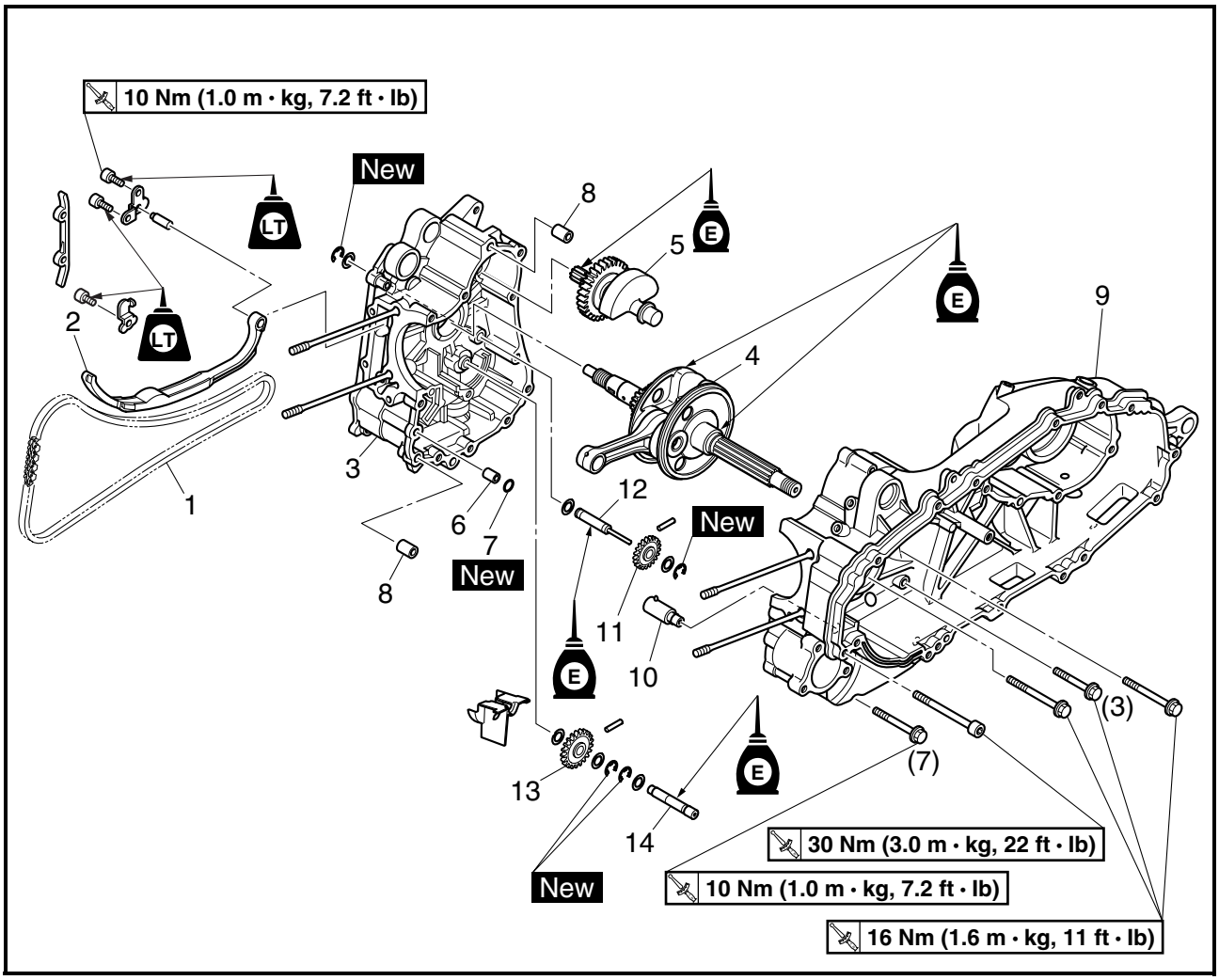
EAS00381

CRANKSHAFT

CRANKSHAFT ASSEMBLY AND BALANCER SHAFT ASSEMBLY

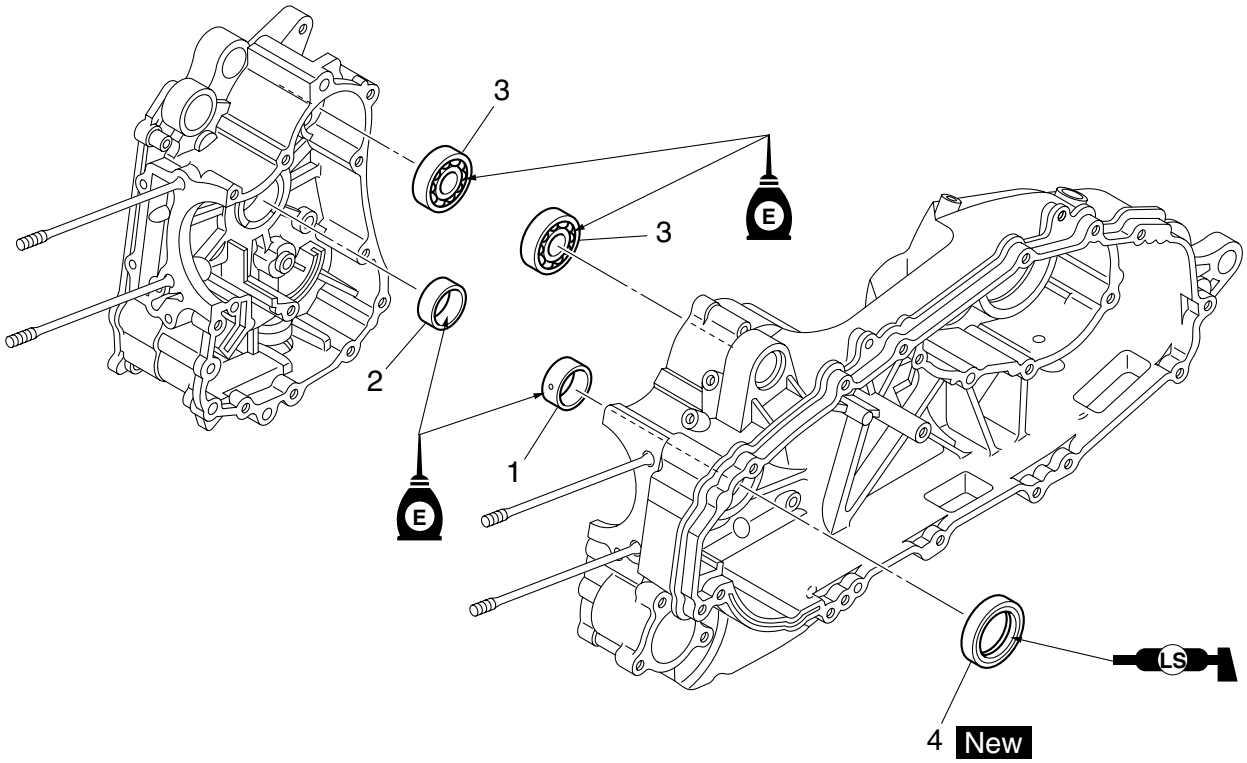


Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft assembly and balancer shaft assembly		Remove the parts in the order listed.
	Engine		Refer to "ENGINE REMOVAL".
	Cylinder and piston		Refer to "CYLINDER AND PISTON".
	Belt drive		Refer to "BELT DRIVE".
	Oil pump		Refer to "OIL PUMP".
	Transmission		Refer to "TRANSMISSION".
1	Timing chain	1	
2	Timing chain guide (intake side)	1	
3	Right crankcase	1	Refer to "DISASSEMBLING THE CRANKCASE" and "ASSEMBLING THE CRANKCASE".
4	Crankshaft assembly	1	Refer to "INSTALLING THE CRANKSHAFT ASSEMBLY AND BALANCER SHAFT ASSEMBLY".
5	Balancer shaft assembly	1	

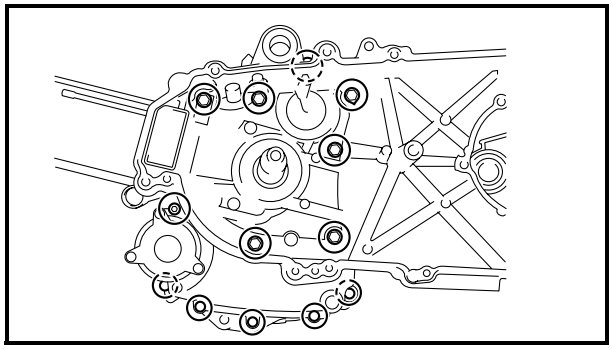


Order	Job/Part	Q'ty	Remarks
6	Dowel pin	1	
7	O-ring	1	
8	Dowel pin	2	
9	Left crankcase	1	
10	Relief valve assembly	1	
11	Oil pump drive gear	1	
12	Oil pump drive gear shaft	1	
13	Oil pump driven gear	1	
14	Oil pump driven gear shaft	1	
			For installation, reverse the removal procedure.

CRANKCASE BEARINGS



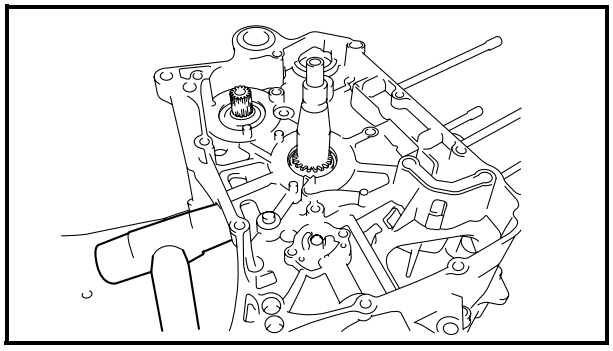
Order	Job/Part	Q'ty	Remarks
	Removing the crankcase bearings		Remove the parts in the order listed.
1	Left crankshaft journal bearing	1	Refer to "REMOVING THE CRANKSHAFT JOURNAL BEARINGS" and "INSTALLING THE CRANKSHAFT JOURNAL BEARINGS".
2	Right crankshaft journal bearing	1	
3	Bearing	2	
4	Oil seal	1	
			For installation, reverse the removal procedure.



EAS00385
DISASSEMBLING THE CRANKCASE

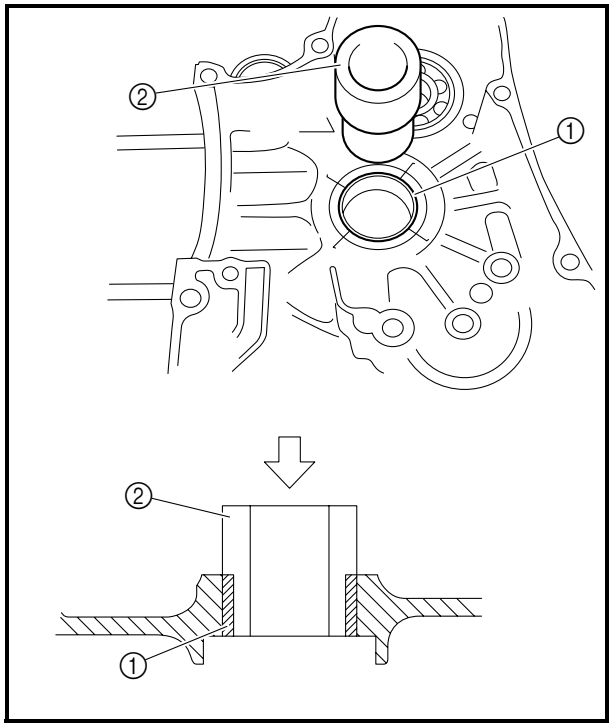
1. Remove:
   • crankcase bolts

NOTE:
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



2. Remove:
   • right crankcase

CAUTION:
Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.



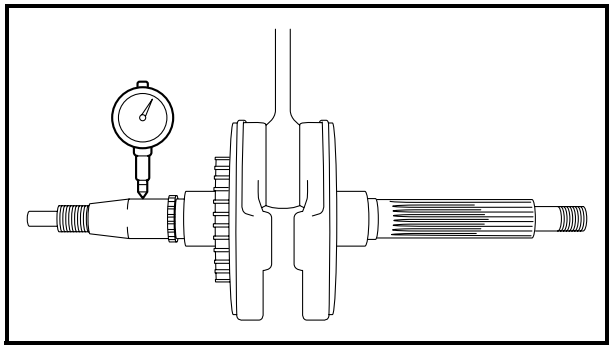
EAS00387
REMOVING THE CRANKSHAFT JOURNAL BEARINGS

1. Remove:
   • crankshaft journal bearings ①

NOTE:
Remove the journal bearings with the plane bearing installer/remover ②.

	Plane bearing installer/remover 90890-04146, YM-04146

NOTE:
Identify the position of each crankshaft journal bearing so that they can be reinstalled in their original places.



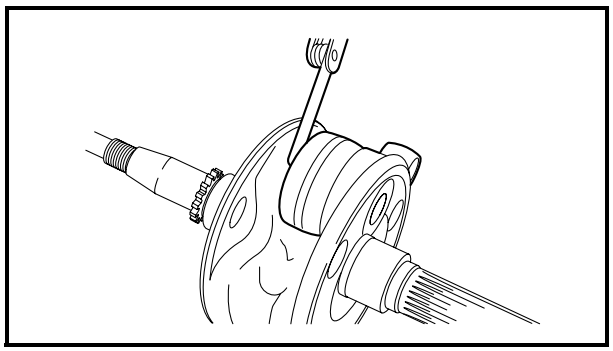
EAS00394
CHECKING THE CRANKSHAFT AND CONNECTING ROD

1. Measure:
   • crankshaft runout
   Out of specification → Replace the crankshaft, bearing or both.

NOTE:
Turn the crankshaft slowly.

Maximum crankshaft runout
0.030 mm (0.0012 in)

2. Check:
   • crankshaft journal surfaces
   Scratches/wear → Replace the crankshaft.



3. Measure:
   • big end side clearance
   Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.

Big end side clearance
0.350 ~ 0.850 mm
(0.0138 ~ 0.0335 in)

4. Measure:
   • crankshaft-journal-to-crankshaft-journal-bearing clearance
   Out of specification → Replace the crankshaft journal bearings as a set.

Crankshaft-journal-to-crankshaft-journal-bearing clearance
0.030 ~ 0.077 mm
(0.0012 ~ 0.0030 in)

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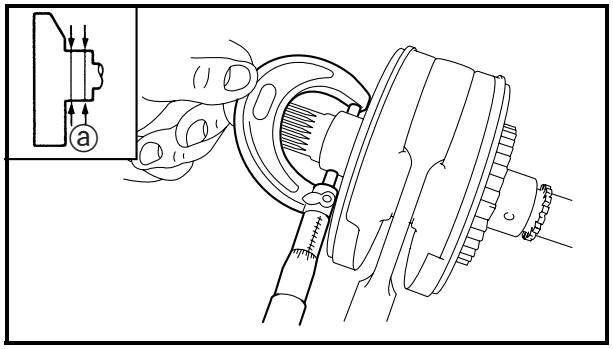
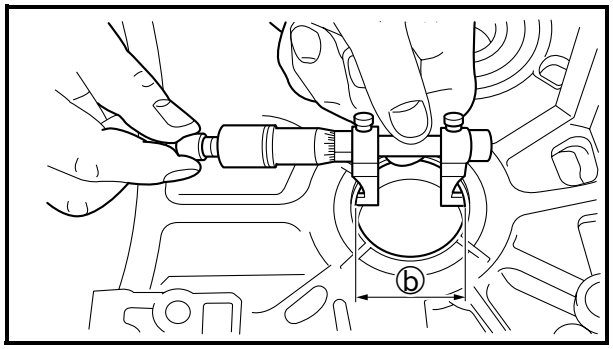
The following procedure applies to each crankshaft journal and its corresponding journal bearing.

a. Clean the surface of the journal and the journal bearing.
b. Check the bearing surface. If the bearing surface is worn or scratched, replace the bearings as a set.





NOTE:

If either the left or right journal bearing is worn or scratched, replace both bearings as a set.

c. Measure the crankshaft journal outside diameter ⓐ in two places. If it is out of specification, replace the crankshaft.
d. Measure the journal bearing inside diameter ⓑ in two places.

CAUTION:

When calculating the journal oil clearance, use the larger of the two values from the crankshaft journal and use the smaller of the two values from the journal bearing.

e. If the journal bearing inside diameter is "35.064" and the crankshaft journal outside diameter is "35.014", then the journal oil clearance is:

Journal oil clearance:
Journal bearing inside diameter – Crankshaft journal outside diameter = 35.064 – 35.014 = 0.050 mm

If the oil clearance is out of specification, select replacement bearings.

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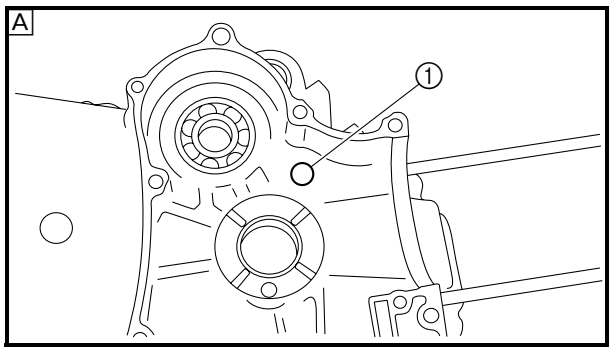

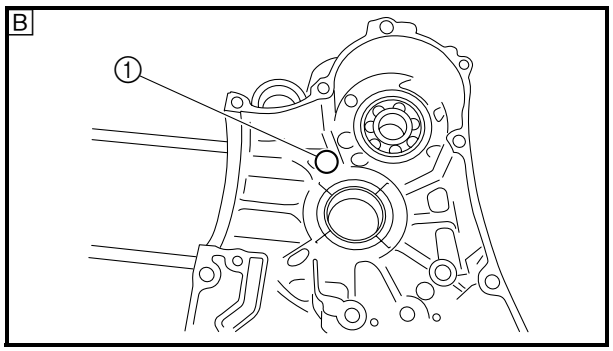

5. Select:
   • crankshaft journal bearings

NOTE:

The numbers ① on the crankcase are used to determine the replacement crankshaft journal bearing size.
A Left crankcase
B Right crankcase

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Select the crankshaft journal bearings from the following table according to the number stamped on the inside of the crankcase.

Left crankshaft journal bearing:

BEARING COLOR CODE		BEARING THICKNESS
0	white	1.981 ~ 1.991 mm (0.0780 ~ 0.0784 in)
1	blue	1.977 ~ 1.987 mm (0.0778 ~ 0.0782 in)
2	black	1.973 ~ 1.983 mm (0.0777 ~ 0.0781 in)
3	brown	1.969 ~ 1.979 mm (0.0775 ~ 0.0779 in)
4	green	1.965 ~ 1.975 mm (0.0774 ~ 0.0778 in)

Right crankshaft journal bearing:

BEARING COLOR CODE		BEARING THICKNESS
0	white	1.985 ~ 1.995 mm (0.0781 ~ 0.0785 in)
1	blue	1.981 ~ 1.991 mm (0.0780 ~ 0.0784 in)
2	black	1.977 ~ 1.987 mm (0.0778 ~ 0.0782 in)
3	brown	1.973 ~ 1.983 mm (0.0777 ~ 0.0781 in)
4	green	1.969 ~ 1.979 mm (0.0775 ~ 0.0779 in)

After replacing the crankshaft journal bearings, be sure to check the journal oil clearance.

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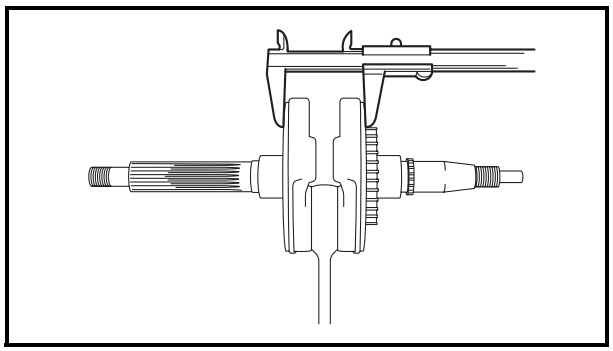
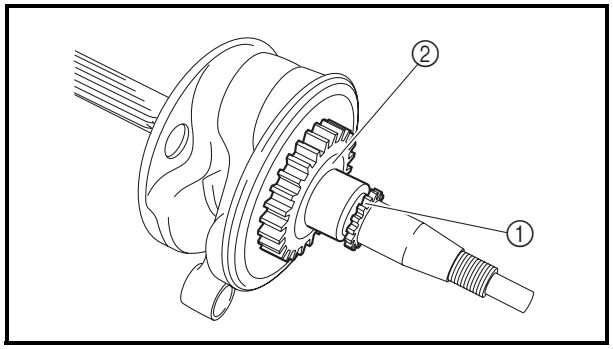
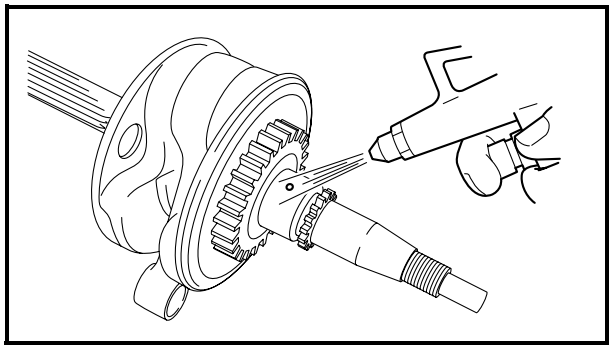


6. Measure:
   - crankshaft width
     Out of specification → Replace the crankshaft.

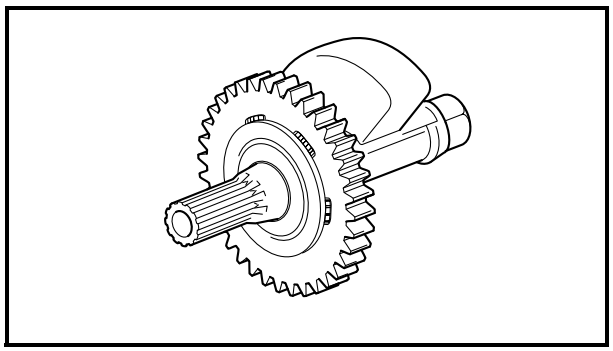
Crankshaft width
63.95 ~ 64.00 mm
(2.518 ~ 2.520 in)



7. Check:
   - crankshaft sprocket ①
     Damage/wear → Replace the crankshaft.
   - balancer drive gear ②
     Damage/wear → Replace the crankshaft.



8. Check:
   - crankshaft journal
     Scratches/wear → Replace the crankshaft.
   - crankshaft journal oil passage
     Obstruction → Blow out with compressed air.



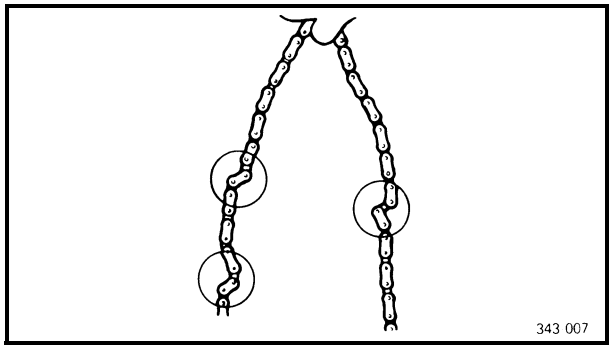
CHECKING THE BALANCER SHAFT ASSEMBLY

1. Check:
   - balancer shaft assembly
     Cracks/damage → Replace.

EAS00399

CHECKING THE CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
   - crankcase
     Cracks/damage → Replace.
   - oil delivery passages
     Obstruction → Blow out with compressed air.

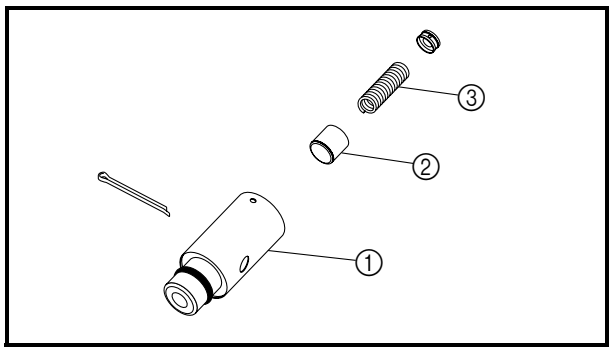


EAS00207
CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE (INTAKE SIDE)

1. Check:
   - timing chain
     Damage/stiffness → Replace the timing chain and camshaft sprockets as a set.
2. Check:
   - timing chain guide (intake side)
     Damage/wear → Replace.

CHECKING THE OIL PUMP GEARS AND SHAFTS

1. Check:
   - oil pump drive gear
   - oil pump driven gear
   - oil pump drive gear shaft
   - oil pump driven gear shaft
     Cracks/damage/wear → Replace the defective part(s).



EAS00365
CHECKING THE RELIEF VALVE

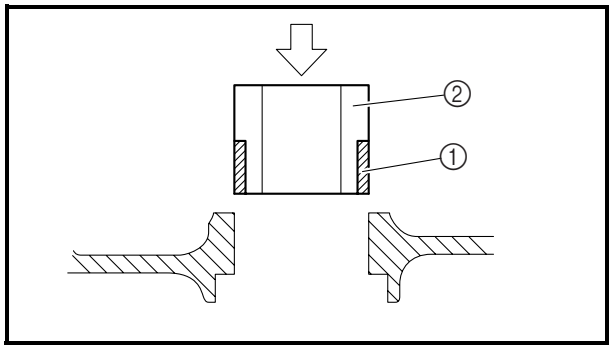
1. Check:
   - relief valve body ①
   - relief valve ②
   - spring ③
     Damage/wear → Replace the defective part(s).

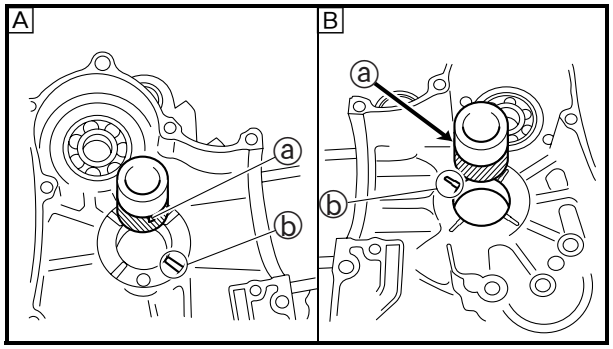
EAS00401
CHECKING THE BEARINGS AND OIL SEALS

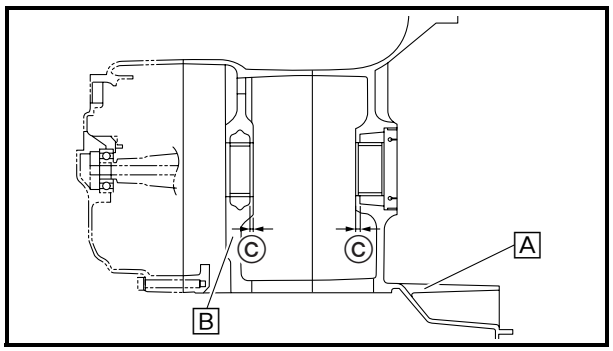
1. Check:
   - bearings
     Clean and lubricate the bearings, then rotate the inner race with your finger.
     Rough movement → Replace.
2. Check:
   - oil seals
     Damage/wear → Replace.

EAS00402
CHECKING THE CIRCLIPS AND WASHERS

1. Check:
   - circlips
     Bends/damage/looseness → Replace.
   - washers
     Bends/damage → Replace.







INSTALLING THE CRANKSHAFT JOURNAL BEARINGS

1. Attach:
   - crankshaft journal bearings ①

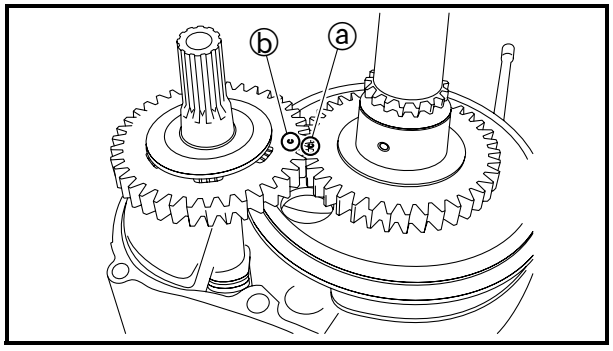
NOTE:
Attach the crankshaft journal bearing to the installer ②.

Plane bearing installer/remover
90890-04146, YM-04146

2. Install:
   - crankshaft journal bearings

NOTE:
- Install each crankshaft journal bearing from the inside of the crankcase with the notch ⓐ aligned with groove ⓑ on the crankcase journal as shown.
- To install the crankshaft journal bearings, press each bearing into the crankcase as shown in the illustration.

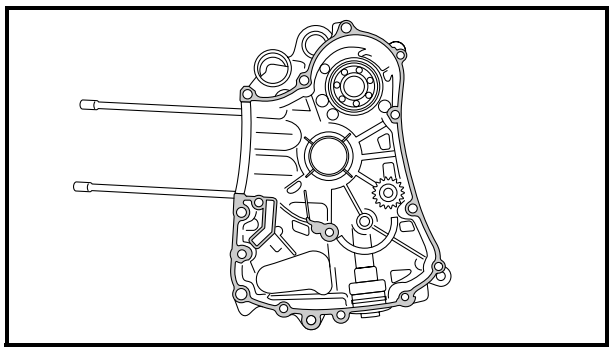
ⓒ 1.9 ~ 2.7 mm (0.075 ~ 0.106 in)
A Left crankcase
B Right crankcase



EAS00410
INSTALLING THE CRANKSHAFT ASSEMBLY AND BALANCER SHAFT ASSEMBLY

1. Install:
   - crankshaft assembly
   - balancer shaft assembly

NOTE:
Align the punch mark ⓐ in the balancer drive gear with the punch mark ⓑ in the balancer driven gear.

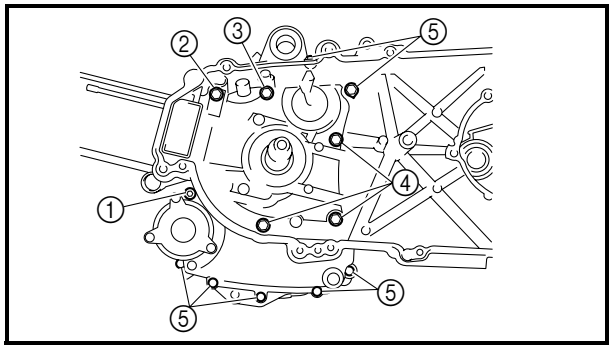


EAS00418
ASSEMBLING THE CRANKCASE

1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
   - sealant
     (onto the crankcase mating surfaces)

Yamaha bond No. 1215
90890-85505
Sealant (Quick Gasket®)
ACC-11001-05-01

NOTE:
Do not allow any sealant to come into contact with the oil gallery.



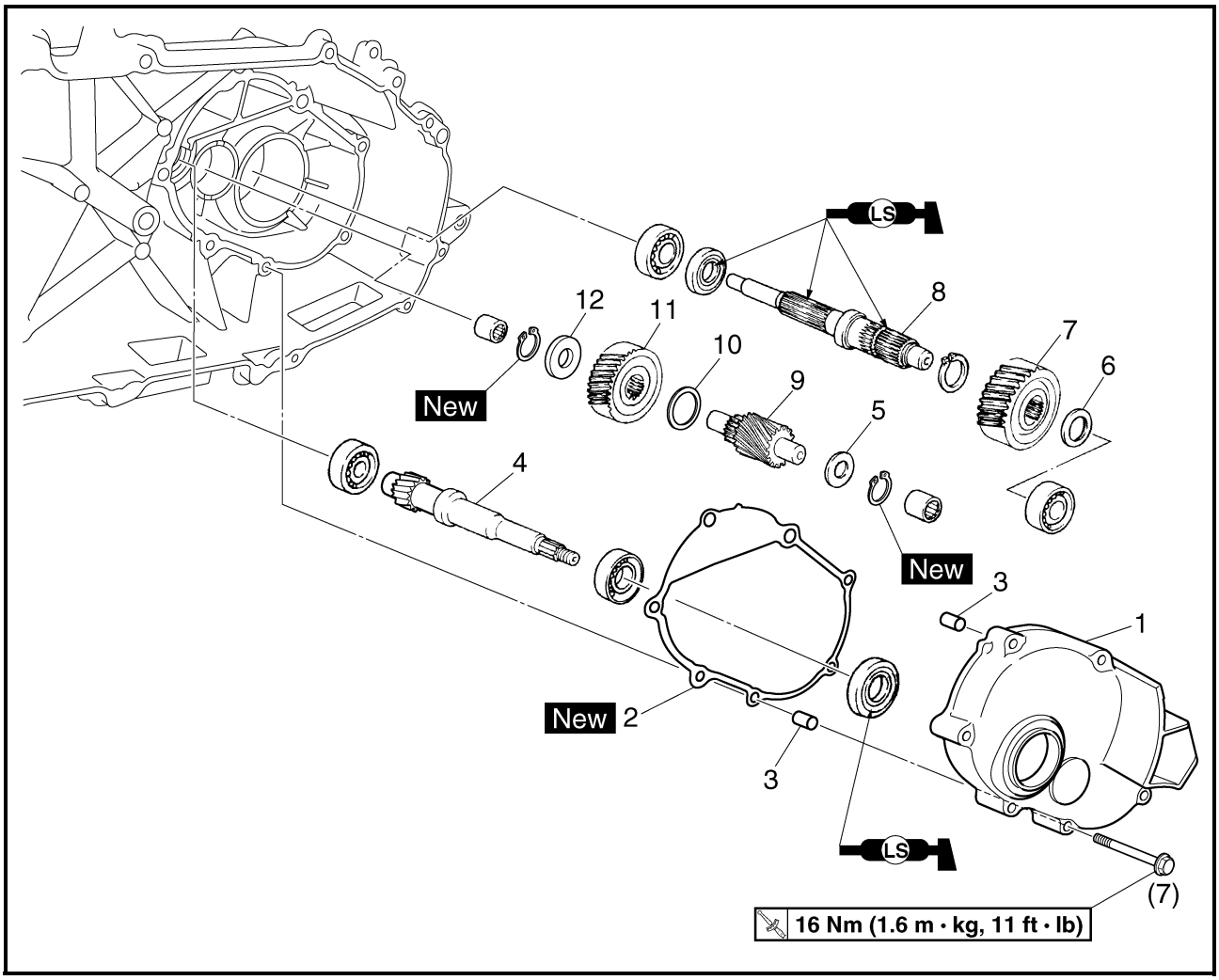
3. Tighten:
   • crankcase bolts

NOTE:
Tighten the crankcase bolts in stages and in a crisscross pattern.

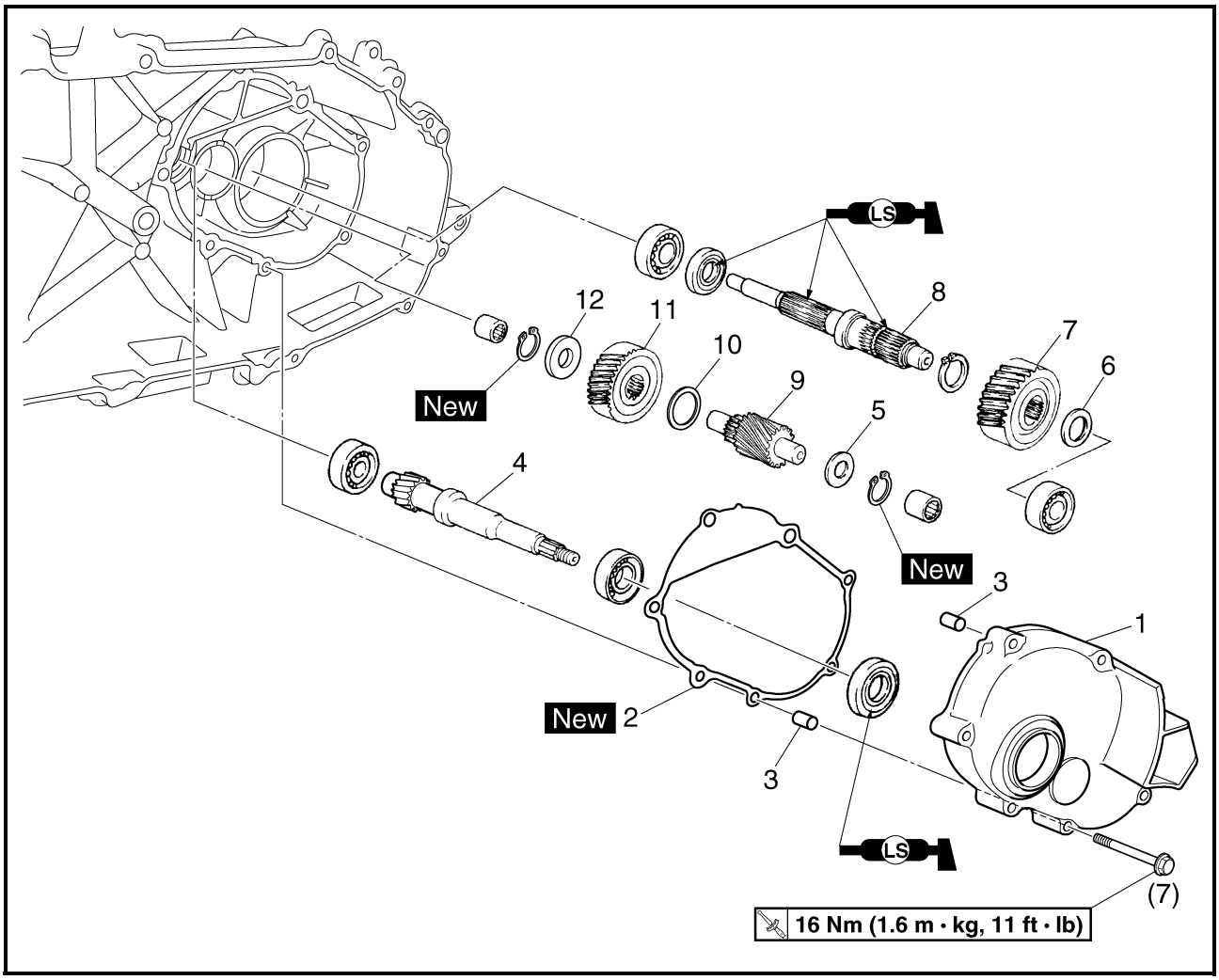
- M8 × 100 mm (3.94 in) bolt: ①
- M8 × 90 mm (3.54 in) bolt: ②
- M8 × 80 mm (3.15 in) bolt: ③
- M8 × 60 mm (2.36 in) bolts: ④
- M6 × 70 mm (2.76 in) bolts: ⑤

Crankcase bolt
Bolt ①
30 Nm (3.0 m · kg, 22 ft · lb)
Bolt ② ~ ④
16 Nm (1.6 m · kg, 11 ft · lb)
Bolt ⑤
10 Nm (1.0 m · kg, 7.2 ft · lb)

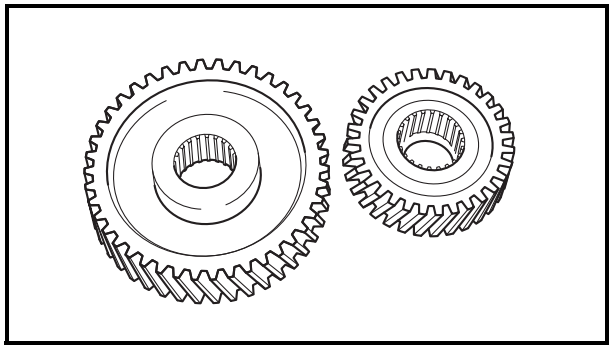
EAS00419
TRANSMISSION



Order	Job/Part	Q'ty	Remarks
	Removing the transmission		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL AND BRAKE DISC" in chapter 4.
	Transmission oil		Drain. Refer to "CHANGING THE TRANSMISSION OIL" in chapter 3.
	Secondary sheave assembly		Refer to "BELT DRIVE".
1	Transmission case cover	1	
2	Transmission case cover gasket	1	
3	Dowel pin	2	
4	Primary drive gear	1	
5	Washer	1	
6	Washer	1	
7	1st wheel gear	1	

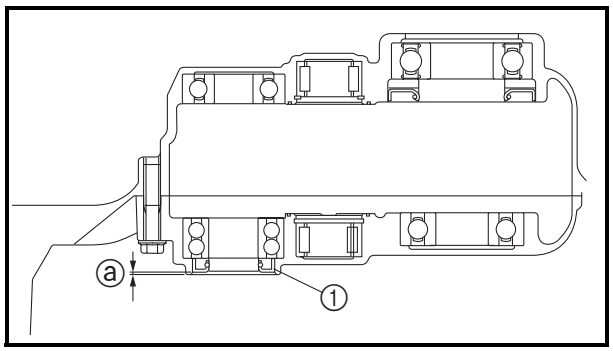


Order	Job/Part	Q'ty	Remarks
8	Drive axle	1	
9	Main axle	1	
10	Washer	1	
11	Primary driven gear	1	
12	Washer	1	
			For installation, reverse the removal procedure.



EAS00425
CHECKING THE TRANSMISSION

1. Check:
   - transmission gears
     Blue discoloration/pitting/wear → Replace the defective gear(s).
   - transmission gear dogs
     Cracks/damage/rounded edges → Replace the defective gear(s).
2. Check:
   - transmission gear movement
     Rough movement → Replace the defective part(s).
3. Check:
   - circlips
     Bends/damage/looseness → Replace.



INSTALLING THE PRIMARY DRIVE GEAR OIL SEAL

1. Install:
   - primary drive gear oil seal ①

NOTE:

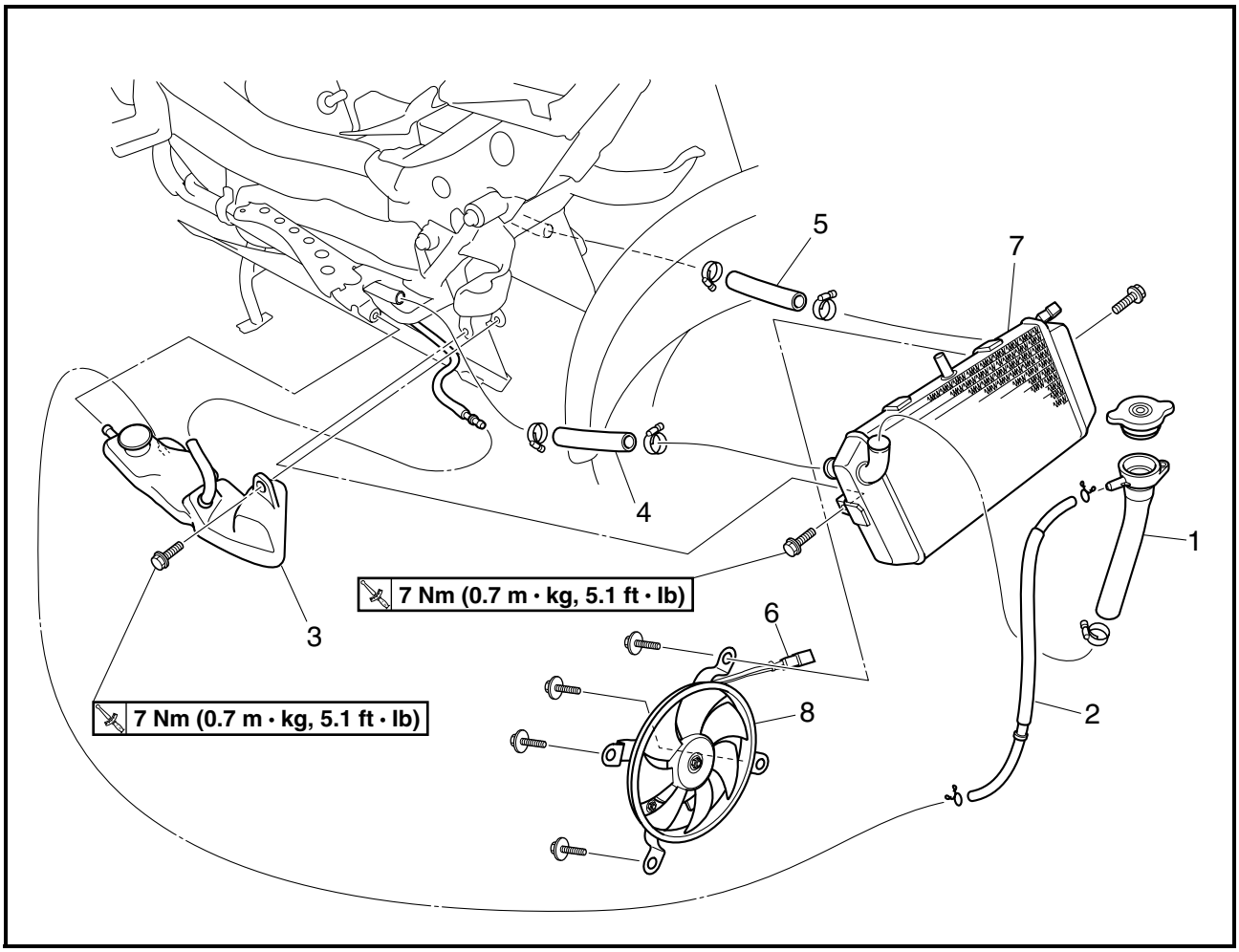
Press the primary drive gear oil seal into the transmission case cover as shown in the illustration.

ⓐ 1.5 ~ 2.0 mm (0.059 ~ 0.079 in)

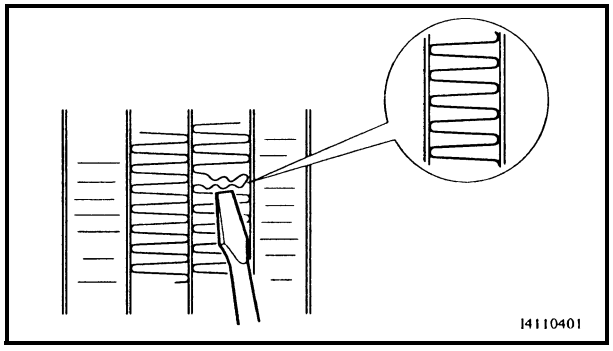
EAS00454

COOLING SYSTEM

RADIATOR



Order	Job/Part	Q'ty	Remarks
	Removing the radiator		Remove the parts in the order listed.
	Radiator cover		Refer to "COWLING AND COVERS" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator filler hose	1	
2	Coolant reservoir hose	1	
3	Coolant reservoir	1	
4	Radiator inlet hose	1	Disconnect.
5	Radiator outlet hose	1	Disconnect.
6	Radiator fan motor coupler	1	Disconnect.
7	Radiator	1	
8	Radiator fan	1	
			For installation, reverse the removal procedure.

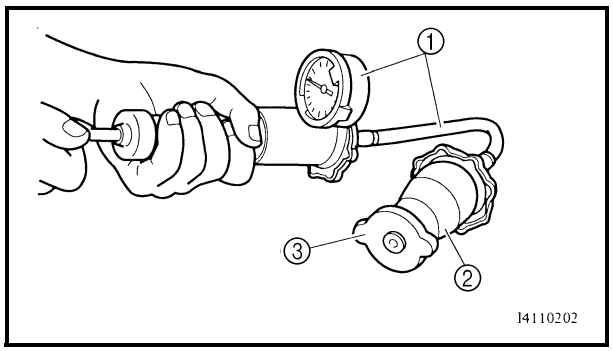


EAS00455
CHECKING THE RADIATOR

1. Check:
   - radiator fins
     Obstruction → Clean.
     Apply compressed air to the rear of the radiator.
     Damage → Repair or replace.

NOTE:
Straighten any flattened fins with a thin, flat-head screwdriver.

2. Check:
   - radiator inlet hose
   - radiator outlet hose
   - radiator filler hose
   - coolant reservoir hose
   - radiator pipe assembly
     Cracks/damage → Replace.



3. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.

Radiator cap opening pressure
110.0 ~ 140.0 kPa
(1.10 ~ 1.40 kg/cm², 15.6 ~ 19.9 psi)

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a. Install the radiator cap tester ① and radiator cap tester adapter ② to the radiator cap ③.

Radiator cap tester
90890-01325, YU-24460-01
Radiator cap tester adapter
90890-01352, YU-33984

b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.

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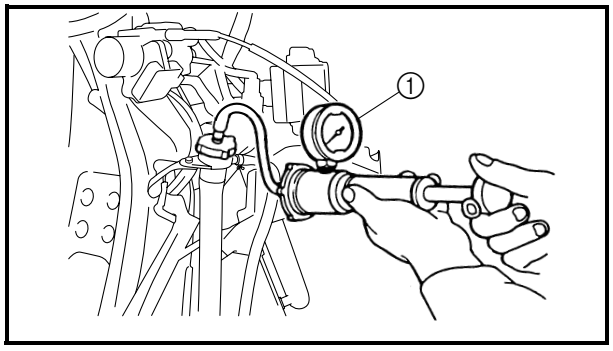
4. Check:
   - radiator fan motor
     Damage → Replace.
     Malfunction → Check and repair.
     Refer to “COOLING SYSTEM” in chapter 8.



EAS00456
INSTALLING THE RADIATOR

1. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
2. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.

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a. Attach the radiator cap tester ① to the radiator.

Radiator cap tester
90890-01325, YU-24460-01
Radiator cap tester adapter
90890-01352, YU-33984

b. Apply 100 kPa (1.0 kg/cm^2, 14.22 psi) of pressure.
c. Measure the indicated pressure with the gauge.

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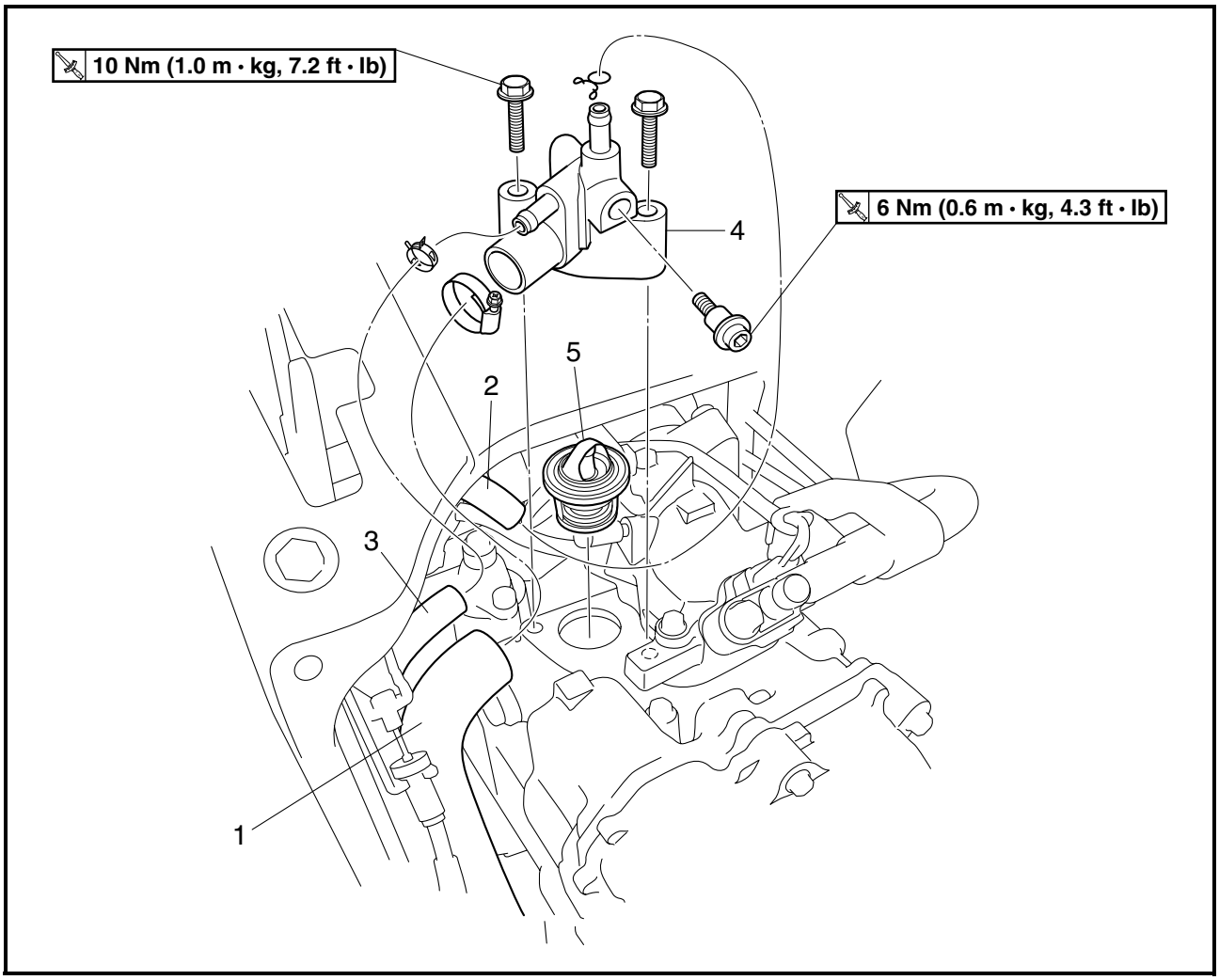
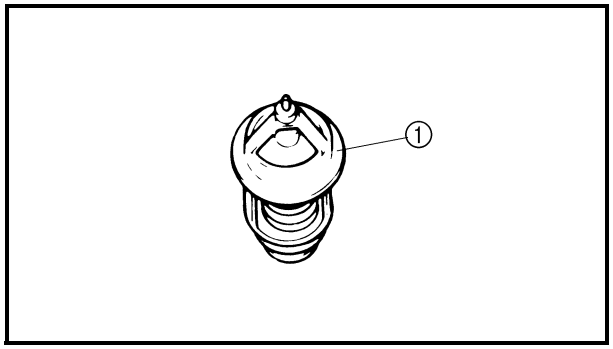
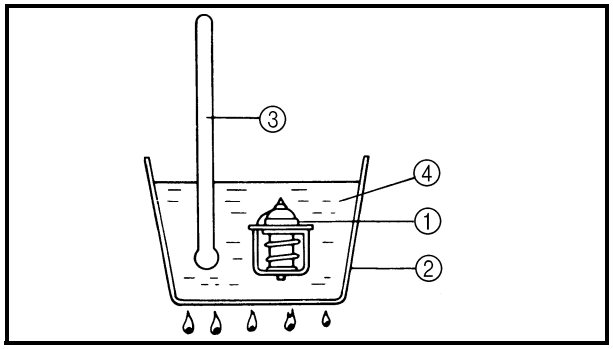
3. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR”.

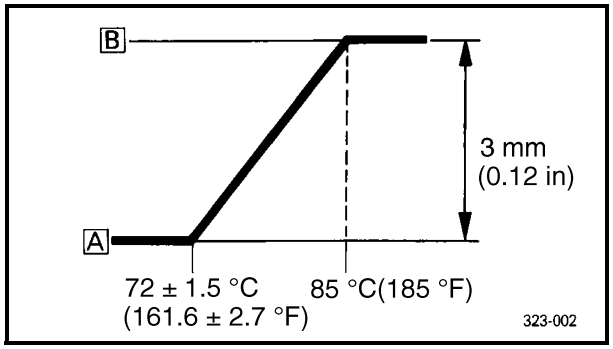
EAS00460
THERMOSTAT



Order	Job/Part	Q'ty	Remarks
	Removing the thermostat		Remove the parts in the order listed.
	Storage box Rubber sheet		Refer to "COWLING AND COVERS" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Thermostat outlet hose	1	Disconnect.
2	Cooling system air bleed hose	1	Disconnect.
3	Thermostat inlet hose	1	Disconnect.
4	Thermostat cover	1	
5	Thermostat	1	
			For installation, reverse the removal procedure.







EAS00462
CHECKING THE THERMOSTAT

1. Check:
   - thermostat ①
     Does not open at 70.5 ~ 73.5 °C (158.9 ~ 164.3 °F) → Replace.

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a. Suspend the thermostat in a container filled with water.
b. Slowly heat the water.
c. Place a thermometer in the water.
d. While stirring the water, observe the thermostat and thermometer's indicated temperature.

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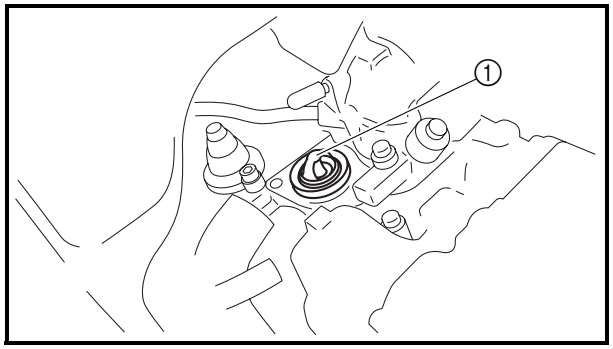
① Thermostat
② Container
③ Thermometer
④ Water
A Fully closed
B Fully open

NOTE:

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

2. Check:
   - thermostat cover
     Cracks/damage → Replace.
3. Check:
   - thermostat inlet hose
   - thermostat outlet hose
     Cracks/damage → Replace.

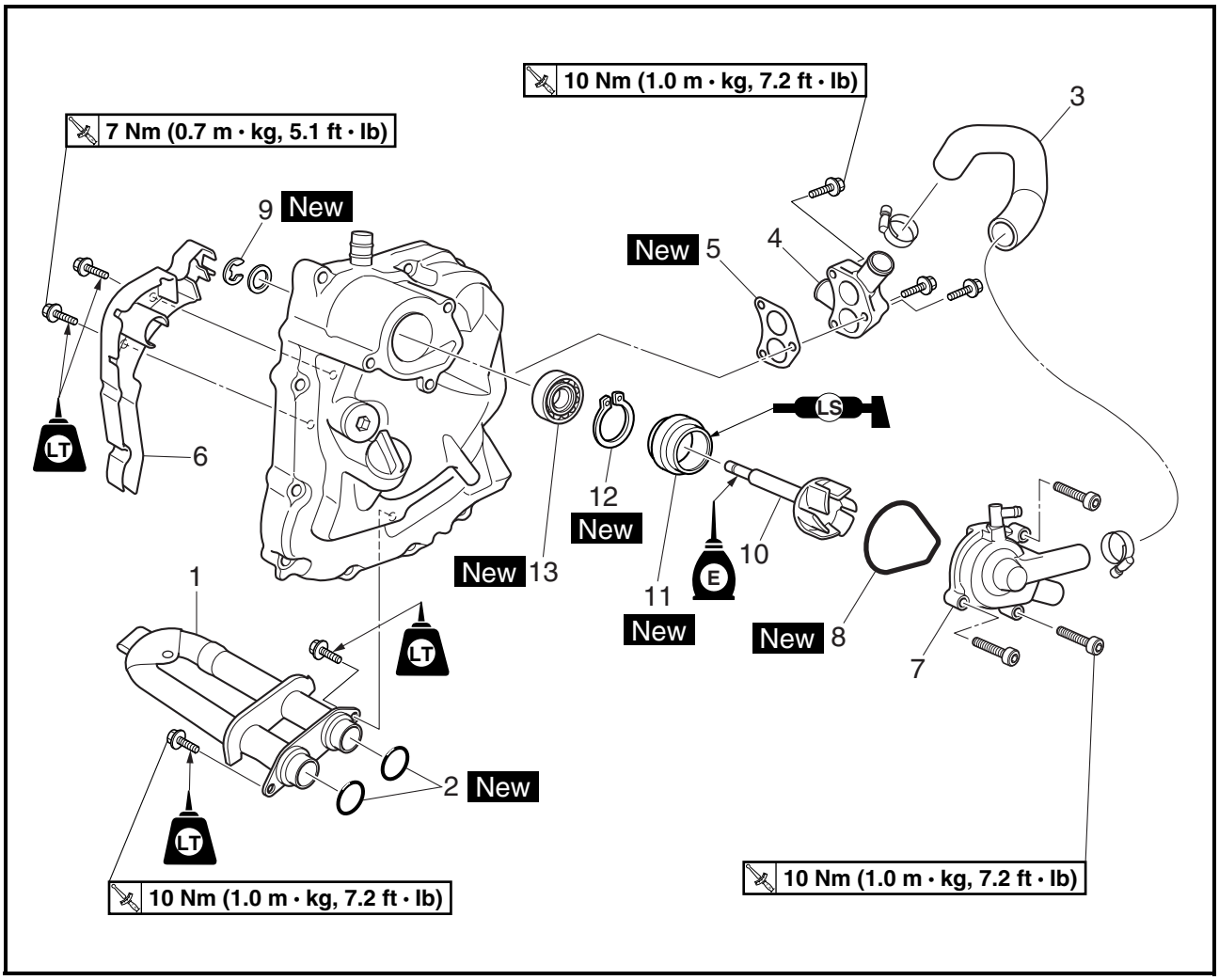


EAS00467
INSTALLING THE THERMOSTAT

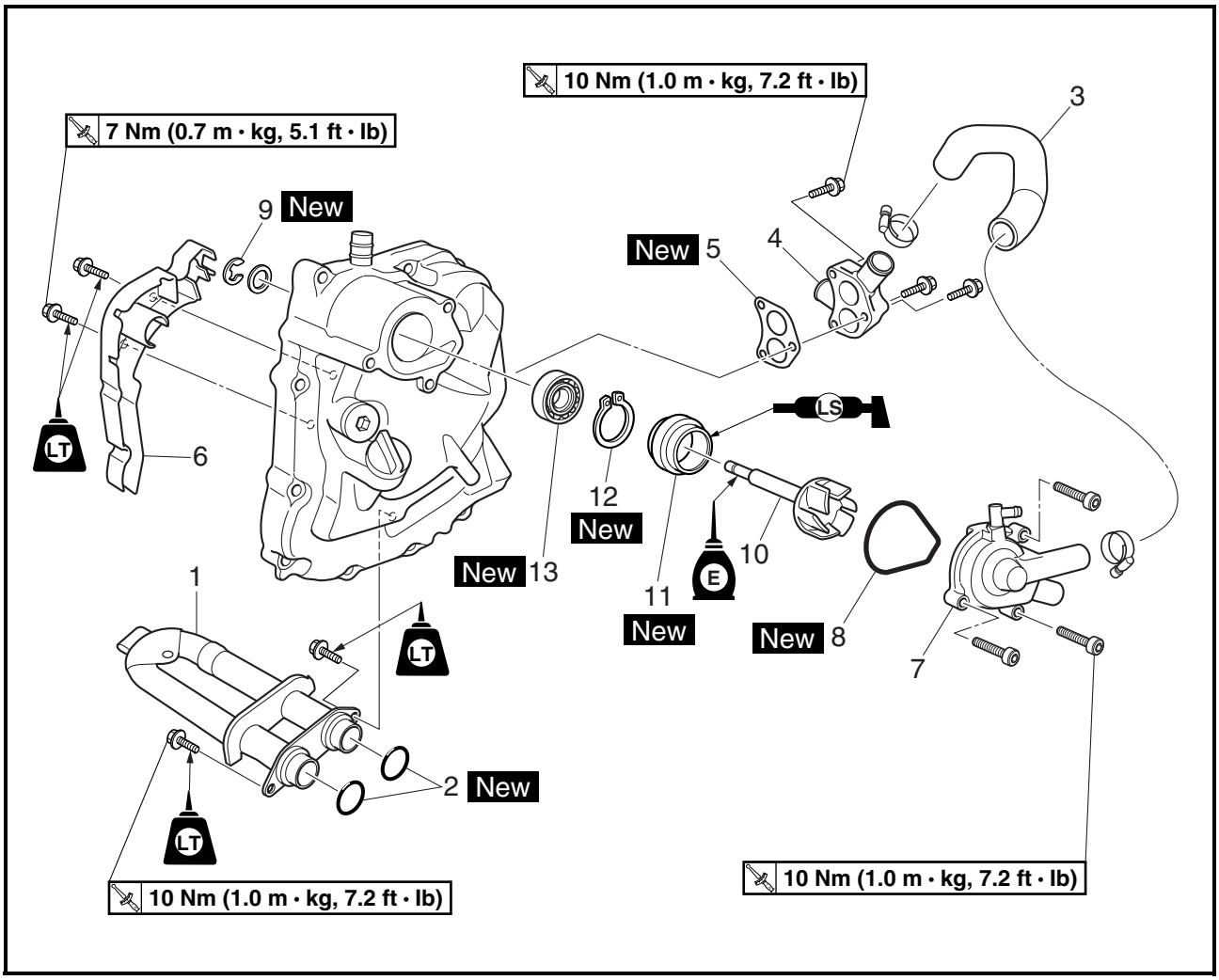
1. Install:
   - thermostat ①
   - thermostat cover

   10 Nm (1.0 m · kg, 7.2 ft · lb)
2. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
3. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
4. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR”.

EAS00469
WATER PUMP AND OIL COOLER

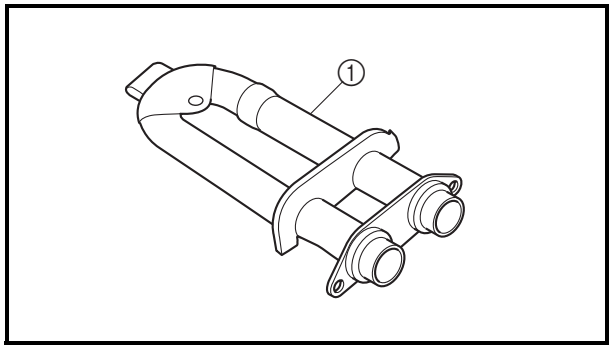


Order	Job/Part	Q'ty	Remarks
	Removing the water pump and oil cooler		Remove the parts in the order listed.
	Generator rotor cover		Refer to "STARTER CLUTCH AND GENERATOR" in chapter 5.
1	Oil cooler pipe	1	
2	O-ring	2	
3	Water pump outlet hose	1	
4	Oil cooler cover	1	
5	Oil cooler cover gasket	1	
6	Generator rotor cover inner bracket	1	
7	Water pump cover	1	
8	O-ring	1	
9	Circlip	1	
10	Impeller shaft	1	

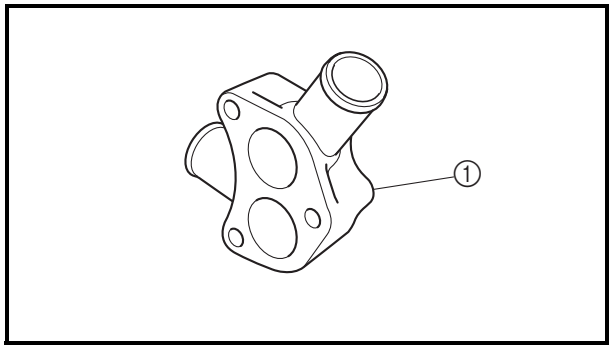


Order	Job/Part	Q'ty	Remarks
11	Water pump seal	1	
12	Circlip	1	
13	Bearing	1	
			For installation, reverse the removal procedure.

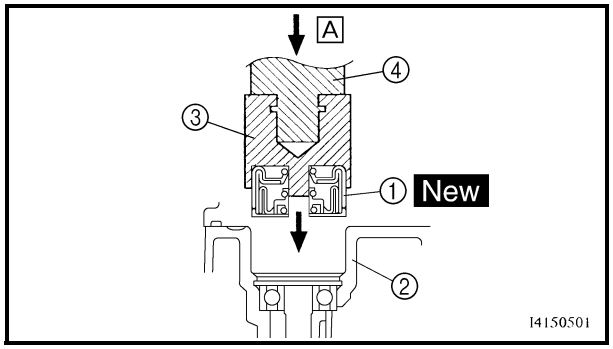
EAS00473
CHECKING THE WATER PUMP
1. Check:
   - water pump cover
   - impeller shaft
   - water pump seal
   Cracks/damage/wear → Replace.
2. Check:
   - bearing
   Rough movement → Replace.
3. Check:
   - water pump inlet hose
   - water pump outlet hose
   - thermostat inlet hose
   Cracks/damage → Replace.



CHECKING THE OIL COOLER
1. Check:
   - oil cooler pipe ①
   Cracks/damage → Replace.



2. Check:
   - oil cooler cover ①
   Cracks/damage → Replace.
3. Check:
   - oil cooler outlet hose
   Cracks/damage → Replace.



EAS00475
ASSEMBLING THE WATER PUMP

1. Install:
   - bearing New
   - circlip New
   - water pump seal ① New
     (into the generator rotor cover ②)

NOTE:
Install the water pump seal with the special tools.

Mechanical seal installer
90890-04145, YM-04145 ③
Middle driven shaft bearing driver
90890-04058, YM-04058 ④

A Push down.

2. Lubricate:
   - water pump seal

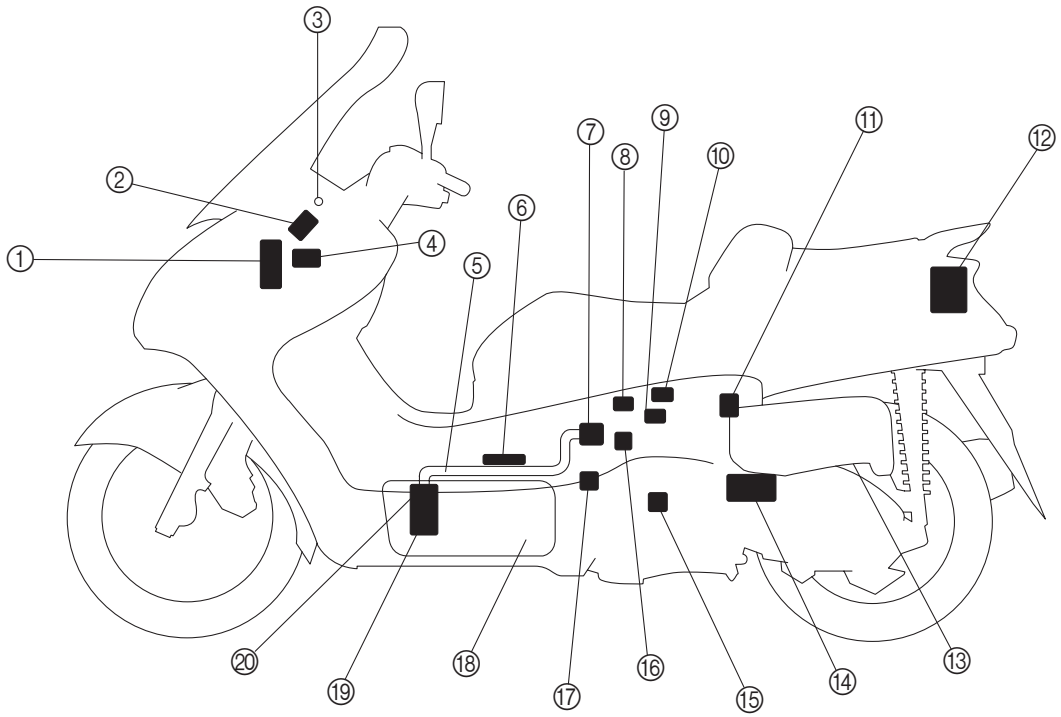
Recommended lubricant
Lithium-soap-based grease

EAS00894

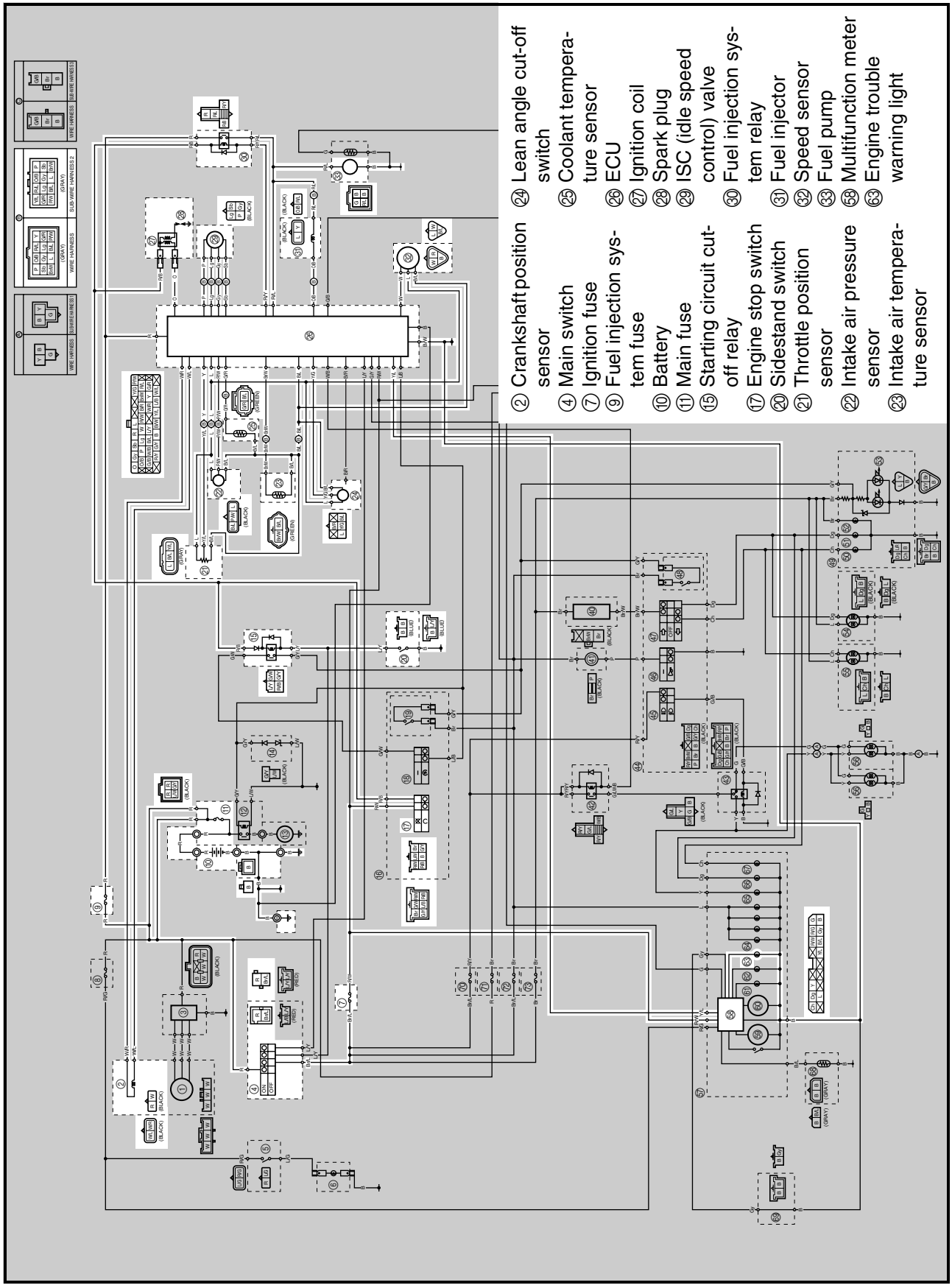
FUEL INJECTION SYSTEM

FUEL INJECTION SYSTEM

① ECU
② Fuel injection system relay
③ Engine trouble warning light
④ Lean angle cut-off switch
⑤ Fuel hose
⑥ Ignition coil
⑦ Fuel injector
⑧ Intake air pressure sensor
⑨ Throttle position sensor
⑩ ISC (idle speed control) valve
⑪ Intake air temperature sensor
⑫ Battery
⑬ Air filter case
⑭ Catalytic converter
⑮ Crankshaft position sensor
⑯ Coolant temperature sensor
⑰ Spark plug
⑱ Fuel tank
⑲ Fuel pump
⑳ Pressure regulator



WIRING DIAGRAM



ECU'S SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the engine control system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning correctly, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, this mode provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the LCD meter. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

EAS00900

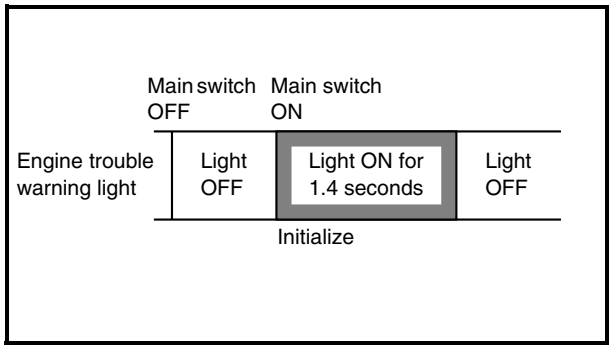
Engine trouble warning light indication and FI system operating condition

Warning light indication	ECU's operation	FI operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Unable
Remains ON	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Able/Unable depending on the self-diagnostic fault code

* The warning light flashes when any one of the conditions listed below is present and the start switch is pushed.

12: Crankshaft position sensor
19: Broken or disconnected blue/yellow lead of the ECU
30: Lean angle cut-off switch (latch up detected)
33: Faulty ignition
39: Fuel injector (open or short circuit)
41: Lean angle cut-off switch (open or short circuit)
50: ECU internal malfunction (memory check error)

EAS00901
Checking for a defective engine trouble warning light bulb
The engine trouble warning light comes on for 1.4 seconds after the main switch has been turned "ON" and when the start switch is being pushed. If the warning light does not come on under these conditions, the warning light bulb may be defective.



EAS00902
ALTERNATE INSTRUCTIONS OPERATION CONTROL (FAIL-SAFE ACTION)
If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.
When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.
The ECU takes fail-safe actions in two ways: one in which the sensor output is set to a prescribed value, and the other in which the ECU directly operates an actuator. Details on the fail-safe actions are given in the table below.

FAIL-SAFE ACTIONS TABLE

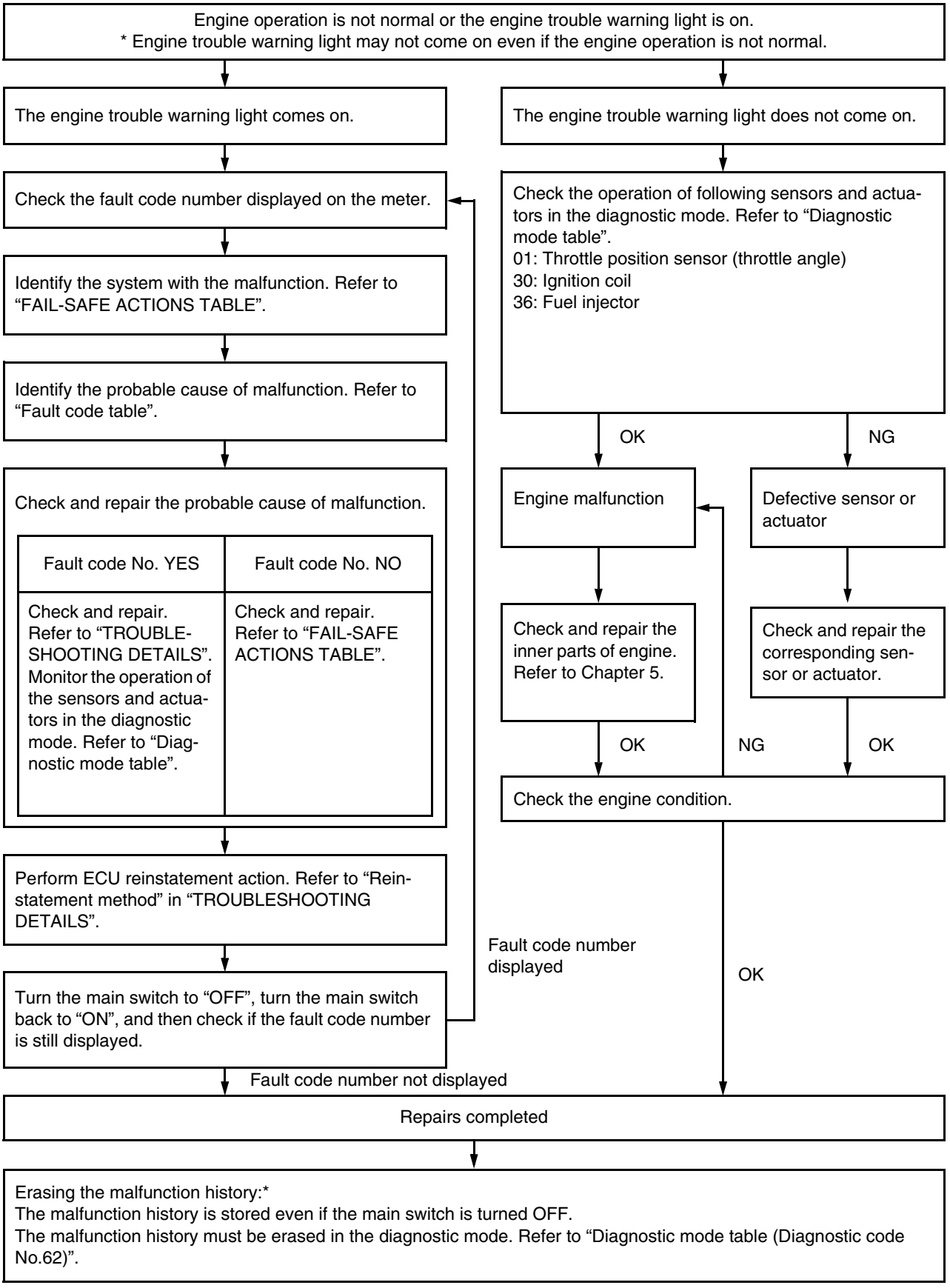
Fault code No.	Item	Symptom	Fail-safe action	Engine start-ability	Vehicle drive-ability
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	• Stops the engine (by stopping the injection and ignition).	Unable	Unable
13 14	Intake air pressure sensor (open or short circuit) (pipe system)	Intake air pressure sensor-open or short circuit detected. Faulty intake air pressure sensor pipe system.	• Fixes the intake air pressure to 101.3 kPa (1.01 kgf/cm^2, 14.4 psi).	Able	Able
15 16	Throttle position sensor (open or short circuit) (stuck)	Throttle position sensor-open or short circuit detected. A stuck throttle position sensor is detected.	• Fixes the throttle position sensor to middle open.	Able	Able
19	Broken or disconnected blue/yellow lead of the ECU	Open circuit in the input line (blue/yellow lead) of the ECU is detected.	-- (No start)	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor-open or short circuit is detected.	• Fixes the coolant temperature to 80 °C.	Able	Able
22	Intake temperature sensor	Intake temperature sensor-open or short circuit is detected.	• Fixes the intake temperature to 20 °C.	Able	Able
33	Faulty ignition	Open circuit detected in the primary lead of the ignition coil.	--	Unable	Unable

Fault code No.	Item	Symptom	Fail-safe action	Engine start-ability	Vehicle drive-ability
37	ISC (idle speed control) valve (stuck fully open)	Engine speed is high when the engine is idling.	--	Able	Able
39	Fuel injector	Fuel injector open or short circuit is detected.	--	Unable	Unable
30 41	Lean angle cut-off switch (latch up detected) (open or short circuit)	The scooter has overturned. Lean angle cut-off switch-open or short circuit is detected.	--	Unable	Unable
42	Speed sensor	No normal signals are received from the speed sensor.	--	Able	Able
43	Fuel system voltage (monitoring voltage)	Supply power to the fuel injector and fuel pump is not normal.	• Fixes the battery voltage to 12 V.	Able	Able
44	Error in reading from or writing on EEPROM	An error is detected while reading from or writing on EEPROM (CO adjustment value, code re-registering key code, and throttle valve fully closed notification value).	--	Able	Able
46	Vehicle system power supply (monitoring voltage)	Power supply to the FI system not normal	--	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	--	Unable	Unable
61	ISC (idle speed control) valve unit (open or short circuit)	ISC (idle speed control) valve unit-open or short circuit detected.	--	Able	Able
—	Start unable warning	Relay is not activated even if the crank signal is input while the start switch is pushed. The start switch is pushed when fault code No.12, 19, 30, 33, 39, 41, or 50 is displayed to indicate an error.	Engine trouble warning light flashes when the start switch is turned ON.	Unable	Unable

Communication error with the meter

Fault code No.	Item	Symptom	Fail-safe action	Engine start-ability	Vehicle drive-ability
Er-1	ECU internal malfunction (output signal error)	No signals are received from the ECU.	–	Unable	Unable
Er-2	ECU internal malfunction (output signal error)	No signals are received from the ECU within the specified duration.	–	Unable	Unable
Er-3	ECU internal malfunction (output signal error)	Data from the ECU cannot be received correctly.	–	Unable	Unable
Er-4	ECU internal malfunction (input signal error)	Non-registered data has been received from the meter.	–	Unable	Unable

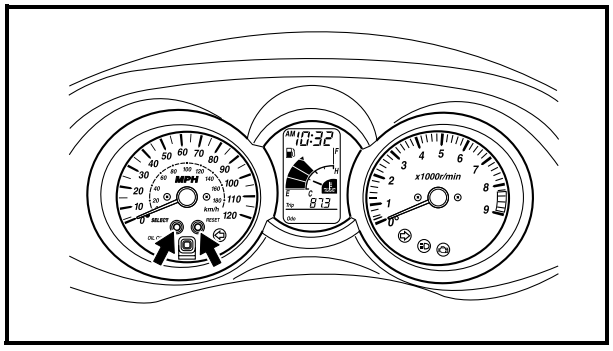
EAS00904
TROUBLESHOOTING CHART



* Operated when the engine trouble warning light is on.

EAS00905
DIAGNOSTIC MODE

It is possible to monitor the sensor output data or check the activation of actuators without connecting the measurement equipment by simply switching the meter indication from the normal mode to the diagnostic monitoring mode.



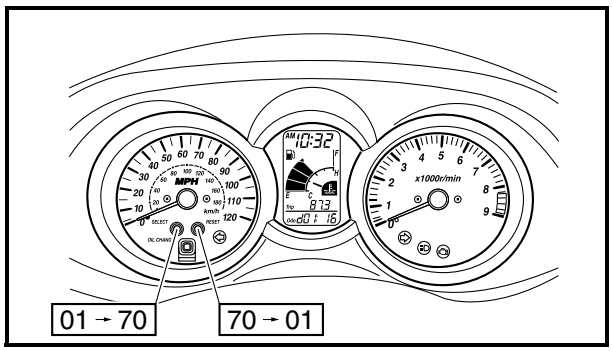
Setting the diagnostic mode

1. Turn the main switch to “OFF” and set the engine stop switch to “OFF”.
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds or more.

NOTE:

- All displays on the meter disappear except the clock and tripmeter displays.
- “dIAG” appears on the LCD meter.

4. Press the “SELECT” button to select the CO adjustment mode “Co” or the diagnostic mode “dIAG”.
5. After selecting “dIAG”, simultaneously press the “SELECT” and “RESET” buttons for 2 seconds or more to execute the selection.
6. Select the diagnostic code number that applies to the item that was verified with the fault code number by pressing the “SELECT” and “RESET” buttons.



NOTE:

- The diagnostic code number appears on the LCD meter (01-70).
- To decrease the selected diagnostic code number, press the “RESET” button. Press the “RESET” button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the “SELECT” button. Press the “SELECT” button for 1 second or longer to automatically increase the diagnostic code numbers.

7. Verify the operation of the sensor or actuator.
   - Sensor operation
     The data representing the operating conditions of the sensor appears on the trip LCD.
   - Actuator operation
     Set the engine stop switch to “ON” to operate the actuator.
   * If the engine stop switch is set to “ON”, set it to “OFF”, and then set it to “ON” again.
8. Turn the main switch to “OFF” to cancel the the diagnostic mode.

NOTE:

To perform a reliable diagnosis, make sure to turn “OFF” the power supply before every check and then start right from the beginning.

Fault code table

Fault Code No.	Symptom	Probable cause of malfunction	Diagnostic code
12	No normal signals are received from the crankshaft position sensor.	• Open or short circuit in wiring harness. • Defective crankshaft position sensor. • Malfunction in pickup rotor. • Malfunction in ECU. • Improperly installed sensor.	—
13	Intake air pressure sensor-open or short circuit detected.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective intake air pressure sensor. • Malfunction in ECU.	03
14	Faulty intake air pressure sensor pipe system • disconnected hose • clogged hose	• Intake air pressure sensor hose is disconnected, clogged, kinked, or pinched. • Malfunction in ECU.	03
15	Throttle position sensor-open or short circuit detected.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective throttle position sensor. • Malfunction in ECU. • Improperly installed throttle position sensor.	01
16	A stuck throttle position sensor is detected.	• Stuck throttle position sensor. • Malfunction in ECU.	01
19	Open circuit in the input line (blue/yellow lead) of ECU is detected when the start switch is pressed.	• Open circuit in wiring harness (ECU coupler). • Malfunction in ECU.	20
21	Coolant temperature sensor-open or short circuit detected.	• Open or short circuit in wiring harness. • Defective coolant temperature sensor. • Malfunction in ECU. • Improperly installed sensor.	06
22	Intake air temperature sensor-open or short circuit detected.	• Open or short circuit in wiring harness. • Defective intake temperature sensor. • Malfunction in ECU. • Improperly installed sensor.	05
30	The scooter has overturned.	• Overturned. • Malfunction in ECU.	08
33	Open circuit is detected in the primary lead of the ignition coil.	• Open circuit in wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	30
37	The ISC (idle speed control) valve is stuck fully open.	• Defective speed sensor. • Malfunction in throttle body. • Malfunction in throttle cables. • ISC (idle speed control) valve is stuck fully open. • Malfunction in ECU.	54
39	Fuel injector open or short circuit is detected.	• Open or short circuit in wiring harness. • Defective fuel injector. • Malfunction in ECU.	36
41	Lean angle cut-off switch-open or short circuit detected.	• Open or short circuit in wiring harness. • Defective lean angle cut-off switch. • Malfunction in ECU.	08
42	No normal signals are received from the speed sensor.	• Open or short circuit in wiring harness. • Defective speed sensor. • Malfunction in vehicle speed sensor detected unit. • Malfunction in ECU.	07
43	Supply power to the fuel injector and fuel pump is not normal.	• Open circuit in wiring harness. (red or red/blue lead) • Malfunction in ECU.	09

Fault Code No.	Symptom	Probable cause of malfunction	Diagnostic code
44	An error is detected while reading or writing on EEPROM.	• Malfunction in ECU. (The CO adjustment value and throttle valve fully closed notification value are not properly written on or read from the internal memory.)	60
46	Power supply to the FI system is not normal.	• Malfunction in charging system.	—
50	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	• Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.)	—
61	ISC (idle speed control) valve open or short circuit is detected.	• Open or short circuit in wiring harness. • Defective ISC (idle speed control) valve. • Malfunction in ECU.	54
Er-1	No signals are received from the ECU.	• Open or short circuit in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-2	No signals are received from the ECU within the specified duration.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-3	Data from the ECU cannot be received correctly.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-4	Non-registered data has been received from the meter.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—

EAS00907

Diagnostic mode table

Switch the meter display from the regular mode to the diagnostic mode. To switch the display, refer to “DIAGNOSTIC MODE”.

NOTE:

- Check the intake air temperature and coolant temperature as close as possible to the intake air temperature sensor and the coolant temperature sensor respectively.
- If it is not possible to check the intake air temperature, use the ambient temperature as reference.

Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
01	Throttle angle	Displays the throttle angle. • Check with throttle fully closed. • Check with throttle fully open.	0 ~ 125 degrees • Fully closed position (8 ~ 22) • Fully open position (88 ~ 102)
03	Pressure difference (atmospheric pressure-intake air pressure)	Displays the pressure difference (atmospheric pressure-intake air pressure). Engine stop switch is on. • Generate the pressure difference by cranking the engine with the starter, without actually starting the engine.	When engine is stopped: Atmospheric pressure 101.3 kPa (760 mmHg, 30 inHg) when cranking the engine with the start switch. 0 ~ 126 kPa (1.26 kgf/cm^2, 17.9 psi)
05	Intake air temperature	Displays the intake air temperature. • Check the temperature in the air cleaner case.	Compare it to the value displayed on the meter.
06	Coolant temperature	Displays the coolant temperature. • Check the temperature of the coolant.	Compare it to the value displayed on the meter.
07	Vehicle speed pulse	Displays the accumulation of the vehicle pulses that are generated when the tire is spun.	(0 ~ 999; resets to 0 after 999) OK if the numbers appear on the meter.
08	Lean angle cut-off switch	Displays the lean angle cut-off switch values.	Upright: 0.4 ~ 1.4 V Overturned: 3.8 ~ 4.2 V

Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
09	Fuel system voltage (battery voltage)	Displays the fuel system voltage (battery voltage). Engine stop switch is on.	0 ~ 18.7 V Normally, approximately 12.0 V
20	Sidestand switch	Displays that the switch is ON or OFF.	Stand retracted: ON Stand extended: OFF
30	Ignition coil	When the engine stop switch is turned from OFF to ON, the ignition coil is actuated five times per second and the engine trouble warning light comes on. • Connect an ignition checker. • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.
36	Fuel injector	When the engine stop switch is turned from OFF to ON, the fuel injector is actuated five times per second and the engine trouble warning light comes on. • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	Check the operating sound of the fuel injector five times with engine stop switch ON.
50	Fuel injection system relay	When the engine stop switch is turned from OFF to ON, the fuel injection system relay is actuated five times per second and the engine trouble warning light comes on (the light is OFF when the relay is ON, and the light is ON when the relay is OFF). • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	Check the fuel injection system relay operating sound 5 times with the engine stop switch ON.
51	Radiator fan motor relay	When the engine stop switch is turned from OFF to ON, the radiator fan motor relay is actuated five times every 5 seconds and the engine trouble warning light comes on. (ON 2 seconds, OFF 3 seconds) • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	Check the radiator fan motor relay operating sound 5 times with the engine stop switch ON. (At that time, the fan motor rotates.)
52	Headlight relay 1	When the engine stop switch is turned from OFF to ON, the headlight relay is actuated five times every 5 seconds and the engine trouble warning light comes on. (ON 2 seconds, OFF 3 seconds) • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	Check the headlight relay operating sound 5 times with the engine stop switch ON. (At that time, the headlight turns ON.)
54	ISC (idle speed control) valve	When the engine stop switch is turned from OFF to ON, the ISC (idle speed control) valve fully closes, and then it opens until it is at the standby opening position when the engine is started. This operation takes approximately 12 seconds until it is completed. • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	The ISC (idle speed control) valve unit vibrates when the ISC (idle speed control) valve operates.
57	Grip warmer relay	When the engine stop switch is turned from OFF to ON, the grip warmer relay is actuated and the engine trouble warning light comes on. (the light is OFF when the relay is OFF, and the light is ON when the relay is ON). • If the engine stop switch is ON, turn it OFF, and then turn it back ON.	Check the grip warmer relay operating sound 1 time with the engine stop switch ON.
60	EEPROM fault code display	• Transmits the abnormal portion of the data in the EEPROM that has been detected as a fault code 44. • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.	01 CO adjustment value is detected. 04 Throttle valve fully closed notification value is detected. (00) Displays when there is no malfunction.

Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
61	Malfunction history code display	• Displays the codes of the history of the self-diagnosis malfunctions (i.e., a code of a malfunction that occurred once and which has been corrected). • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.	12 ~ 61 (00) Displays when there is no malfunction.
62	Malfunction history code erasure	• Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history. • Erases only the history codes when the engine stop switch is turned from OFF to ON. If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	00 ~ 19 (00) Displays when there is no malfunction.
70	Control number	• Displays the program control number.	00 ~ 255

EAS00908

TROUBLESHOOTING DETAILS

This section describes the countermeasures per fault code number displayed on the meter. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioned part has been completed, reset the meter display according to the “Reinstatement method”.

Fault code No.:

Fault code number displayed on the meter when the engine failed to work normally. Refer to “Fault code table”.

Diagnostic code No.:

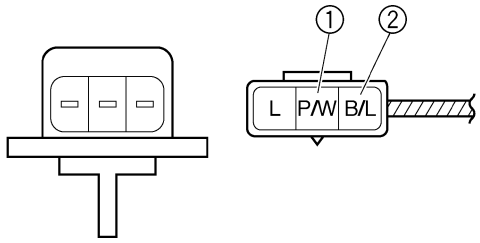
Diagnostic code number to be used when the diagnostic mode is operated. Refer to “DIAGNOSTIC MODE”.

Fault code No.	12	Symptom	No normal signals are received from the crankshaft position sensor.
Used diagnostic code No. – –			

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor.	Check the installed area for looseness or pinching.	Reinstated by cranking the engine.
2	Connected condition of connector. Inspect the coupler for any pins that may have pulled out. Check that the coupler is connected securely. **NOTE:** Set the main switch to OFF before connecting or disconnecting the connector.	If there is a malfunction, repair it and connect it securely. Crankshaft position sensor coupler Main wiring harness ECU coupler	
3	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit between the main wiring harnesses. Between sensor coupler and ECU coupler. white/blue – white/blue white/red – white/red	
4	Defective crankshaft position sensor.	Replace if defective. Refer to “IGNITION SYSTEM” in chapter 8.	

Fault code No.	13	Symptom	Intake air pressure sensor - open or short circuit detected.

Used diagnostic code No. 03 (intake air pressure sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler. **NOTE:** Set the main switch to OFF before connecting or disconnecting the connector.	If there is a malfunction, repair it and connect it securely. Intake air pressure sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by turning the main switch ON.
2	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue – black/blue pink/white – pink/white blue – blue	
3	Defective intake air pressure sensor	Execute the diagnostic mode (code No. 03) Replace if defective. 1. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler as shown. **Positive tester probe → pink/white ①** **Negative tester probe → black/blue ②**  2. Set the main switch to “ON”. 3. Measure the intake air pressure sensor output voltage. **Intake air pressure sensor output voltage** **3.4 ~ 3.8 V** 4. Is the intake air pressure sensor OK?	

Fault code No.	14	Symptom	Intake air pressure sensor - hose system malfunction (clogged or detached hose).

Used diagnostic code No. 03 (intake air pressure sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Intake air pressure sensor hose detached, clogged, kinked, or pinched. Intake air pressure sensor malfunction at intermediate electrical potential.	Repair or replace the sensor hose. Inspect and repair the connection.	Reinstated by starting the engine and operating it at idle.
2	Connected state of connector Intake air pressure sensor coupler Main wiring harness ECU coupler	Check the coupler for any pins that may have pulled out. Check that the coupler is connected securely. If there is a malfunction, repair it and connect it securely.	
3	Defective intake air pressure sensor.	Execute the diagnostic mode (code No. 03) Replace if defective. Refer to “Fault code No. 13”.	

Fault code No.	15	Symptom	Throttle position sensor - open or short circuit detected.

Used diagnostic code No. 01 (throttle position sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of throttle position sensor.	Check the installed area for looseness or pinching. Check that it is installed in the specified position. Refer to “THROTTLE BODY AND FUEL INJECTOR”.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Throttle position sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue – black/blue yellow – yellow, yellow/blue – yellow/blue blue – blue	
4	Throttle position sensor lead wire open circuit output voltage check.	Check for open circuit and replace the throttle position sensor. black/blue – yellow/blue	
5	Defective throttle position sensor.	Execute the diagnostic mode (code No. 01) Replace if defective. Refer to “THROTTLE BODY AND FUEL INJECTOR”.	

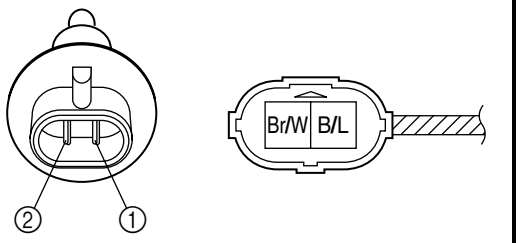
Fault code No.	16	Symptom	Stuck throttle position sensor detected.	
Used diagnostic code No. 01 (throttle position sensor)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Installed condition of throttle position sensor.		Check the installed area for looseness or pinching. Check that it is installed in the specified position. Refer to “THROTTLE BODY AND FUEL INJECTOR”.	Reinstated by starting the engine, operating it at idle, and then racing it.
2	Defective throttle position sensor		Execute the diagnostic mode (code No. 01) Replace if defective. Refer to “THROTTLE BODY AND FUEL INJECTOR”.	
3	When fault code No. 15 has been detected.		Refer to “Fault code No. 15”.	Refer to “Fault code No. 15”.

Fault code No.	19	Symptom	Open circuit in the input line of ECU (blue/yellow lead) detected.	
Used diagnostic code No. 20 (sidestand switch)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected state of connector Main wiring harness ECU coupler (blue/yellow connector)		Execute the diagnostic mode (code No. 20) Check the coupler for any pins that may have pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect it securely.	Reinstated by reconnecting the wiring and retracting the sidestand.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open circuit. Sidestand switch signal input line of ECU coupler blue/yellow	

Fault code No.	21	Symptom	Coolant temperature sensor open or short circuit is detected.	
Used diagnostic code No. 06 (coolant temperature sensor)				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor		Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Coolant temperature sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue – black/blue green/red – green/red	
4	Defective coolant temperature sensor.		Execute the diagnostic mode (code No. 06) Replace if defective. Refer to “COOLING SYSTEM” in chapter 8.	

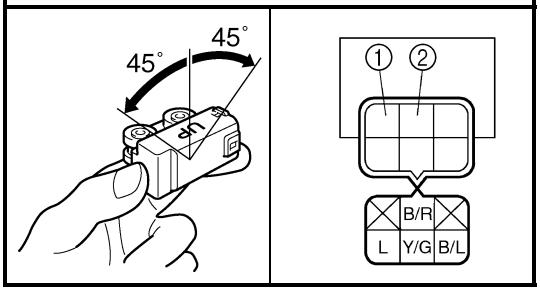
Fault code No.	22	Symptom	Intake temperature sensor open or short circuit is detected.

Used diagnostic code No. 05 (intake air temperature sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Intake air temperature sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue – black/blue brown/white – brown/white	
4	Defective intake air temperature sensor.	Execute the diagnostic mode (code No. 05) Replace if defective. 1. Remove the intake air temperature sensor from the air filter case. 2. Connect the pocket tester ($\Omega \times 100$) to the intake air temperature sensor terminal as shown. **Positive tester probe → brown/white ①** **Negative tester probe → black/blue ②**  3. Measure the intake air temperature sensor resistance. **Intake air temperature sensor resistance** **2.3 ~ 2.6 kΩ at 20 °C (68 °F)** **⚠ WARNING** **• Handle the intake air temperature sensor with special care.** **• Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.** 4. Is the intake air temperature sensor OK?	

Fault code No.	30	Symptom	The scooter has overturned.

Used diagnostic code No. 08 (lean angle cut-off switch)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	The scooter has overturned.	Raise the scooter upright.	Reinstated by turning the main switch ON (however, the engine cannot be restarted unless the main switch is first turned OFF).
2	Installed condition of the lean angle cut-off switch	Check the installed area for looseness or pinching.	
3	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Lean angle cut-off switch coupler Main wiring harness ECU coupler	
4	Defective lean angle cut-off switch	Execute the diagnostic mode (code No. 08) Replace if defective. 1. Remove the lean angle cut-off switch from the scooter. 2. Connect the lean angle cut-off switch coupler to the wire harness. 3. Connect the pocket tester (DC 20 V) to the lean angle cut-off switch terminals as shown. **Positive tester probe → blue ①** **Negative tester probe → yellow/green ②**  4. When turning the lean angle cut-off switch approximately 45 °, the voltage reading change from 0.9 V to 4.1 V. 5. Is the lean angle cut-off switch OK?	

Fault code No.	33	Symptom	Open circuit detected in the primary lead of the ignition coil.

Used diagnostic code No. 30

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Ignition coil primary side coupler – orange Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by starting the engine and operating it at idle.
2	Open or short circuit in lead.	Repair or replace if there is an open or short circuit. Between ignition coil coupler and ECU coupler/main harness orange – orange	
3	Defective ignition coil (test the primary and secondary coils for continuity).	Execute the diagnostic mode (code No. 30) Replace if defective. Refer to “IGNITION SYSTEM” in chapter 8.	

Fault code No.	37	Symptom	Engine speed is high when the engine is idling.

Used diagnostic code No. 54 (ISC (idle speed control) valve)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Incorrect speed sensor signal	Check the speed sensor. Check the speed sensor leads. Check the speed sensor coupler.	Reinstated if the engine idle speed is within specification after starting the engine.
2	Throttle valve does not fully close	Check the throttle body. Refer to “THROTTLE BODY AND FUEL INJECTOR”. Check the throttle cables. Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in chapter 3.	
3	ISC (idle speed control) valve stuck fully open	The ISC (idle speed control) valve is stuck fully open if it does not operate when the main switch is set to OFF. (Touch the ISC (idle speed control) valve unit with your hand and check if it is vibrating to confirm if the ISC (idle speed control) valve is operating.) **NOTE:** Do not remove the ISC (idle speed control) valve unit.	
4	ISC (idle speed control) valve not moving correctly	Execute the diagnostic mode (code No. 54) After the ISC (idle speed control) valve is fully closed, it opens until it is at the standby opening position when the engine is started. This operation takes approximately 12 seconds until it is completed. Start the engine. If the error recurs, replace the throttle body assembly.	

Fault code No.	39	Symptom	Fuel injector open or short circuit is detected.

Used diagnostic code No. 36 (fuel injector)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Fuel injector coupler – orange/black Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by starting the engine.
2	Open or short circuit in lead wire.	Repair or replace if there is an open or short circuit. Between fuel injector coupler and ECU coupler/main harness orange/black – orange/black	
3	Defective fuel injector	Execute the diagnostic mode (code No. 36) Replace if defective.	

Fault code No.	41	Symptom	Lean angle cut-off switch open or short circuit is detected.

Used diagnostic code No. 08 (lean angle cut-off switch)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Lean angle cut-off switch coupler Main wiring harness ECU coupler	Reinstated by turning the main switch ON.
2	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit. Between switch coupler and ECU coupler black/blue – black/blue yellow/green – yellow/green blue – blue	
3	Defective lean angle cut-off switch	Execute the diagnostic mode (code No. 08) Replace if defective. Refer to Fault code No. 30.	

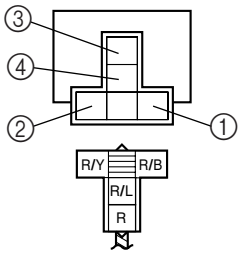
Fault code No.	42	Symptom	No normal signals are received from the speed sensor.

Used diagnostic code No. 07 (speed sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of speed sensor connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Speed sensor coupler Main wiring harness ECU coupler	Reinstated by starting the engine, and inputting the vehicle speed signals by operating the scooter at a low speed of 20 to 30 km/h.
2	Open or short circuit in speed sensor lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler blue – blue white – white black/blue – black/blue	
3	Defective speed sensor	Execute the diagnostic mode (code No. 07) Replace if defective. Refer to “SIGNALING SYSTEM” in chapter 8.	

Fault code No.	43	Symptom	Supply power to the fuel injector and fuel pump is not normal.

Used diagnostic code No. 09 (fuel system voltage)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Fuel injection system relay coupler Fuel pump coupler Fuel injector coupler ECU coupler	Reinstated by starting the engine and operating it at idle.
2	Malfunction in ECU	Fuel injection system relay is on.	
3	Open or short circuit in the wiring harness.	Repair or replace if there is an open or short circuit. Between battery and ECU coupler red – red red/blue – red/blue	
4	Malfunction or open circuit in fuel injection system relay	Execute the diagnostic mode (code No. 09) **NOTE:** When the leads are disconnected, the voltage check by the code No. 09 is impossible. Replace if defective. 1. Remove the fuel injection system relay. 2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starting circuit cut-off relay terminals as shown. **Positive battery terminal → red/black ①** **Negative battery terminal → red/yellow ②** **Positive tester probe → red ③** **Negative tester probe → red/blue ④**  3. Does the fuel injection system relay have continuity between red and red/blue?	

Fault code No.	44	Symptom	Error is detected while reading from or writing on EEPROM (code re-registering key code and throttle valve fully closed notification value).

Used diagnostic No. 60 (EEPROM improper cylinder indication)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Malfunction in ECU	Execute diagnostic mode (code No. 60) • 01 is displayed on meter. Readjust the CO of the displayed cylinder. Refer to “ADJUSTING THE EXHAUST GAS VOLUME” in chapter 3. Replace ECU if defective. • 03 is displayed on meter. Replace the ECU. • 04 is displayed on meter. Turn the main switch to ON, and turn the throttle grip to full open and then to full close position. Replace ECU if defective.	Reinstated by turning the main switch ON.

Fault code No.	46	Symptom	Power supply to the FI system relay is not normal.

Used diagnostic code No. – –

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. ECU coupler	Reinstated by starting the engine and operating it at idle.
2	Faulty battery	Replace or charge the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.	
3	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit. • Between battery and main switch red – red • Between main switch and fuse (ignition) brown/blue – brown/blue • Between fuse (ignition) and engine stop switch red/white – red/white • Between engine stop switch and fuel injection system relay red/black – red/black • Between fuel injection system relay and ECU red/yellow – red/yellow	

Fault code No.	50	Symptom	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)
Used diagnostic code No. – –			

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Malfunction in ECU	Replace the ECU.	Reinstated by turning the main switch ON.

Fault code No.	61	Symptom	ISC (idle speed control) valve open or short circuit is detected.
Used diagnostic code No. – –			

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. ISC (idle speed control) valve coupler Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by setting the main switch to ON. The ISC (idle speed control) valve fully closes, and then it opens until it is at the standby opening position when the engine is started.
2	Open or short circuit in lead.	Repair or replace if there is an open or short circuit. Between ISC (idle speed control) valve and ECU coupler/main harness pink – pink light green – light green gray – gray sky blue – sky blue	
3	Detective ISC (idle speed control) valve	Execute diagnostic mode (code No. 54) Replace if defective. Refer to “THROTTLE BODY AND FUEL INJECTOR”.	

Fault code No.	Er-1	Symptom	No signals are received from the ECU.
Used diagnostic code No. – –			

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated if normal signal is received from the ECU when the main switch is set to ON.
2	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue – yellow/blue	
3	Malfunction in meter	Replace the meter.	
4	Malfunction in ECU	Replace the ECU.	

Fault code No.	Er-2	Symptom	No signals are received from the ECU within the specified duration.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated if normal signal is received from the ECU when the main switch is set to ON.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue – yellow/blue	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

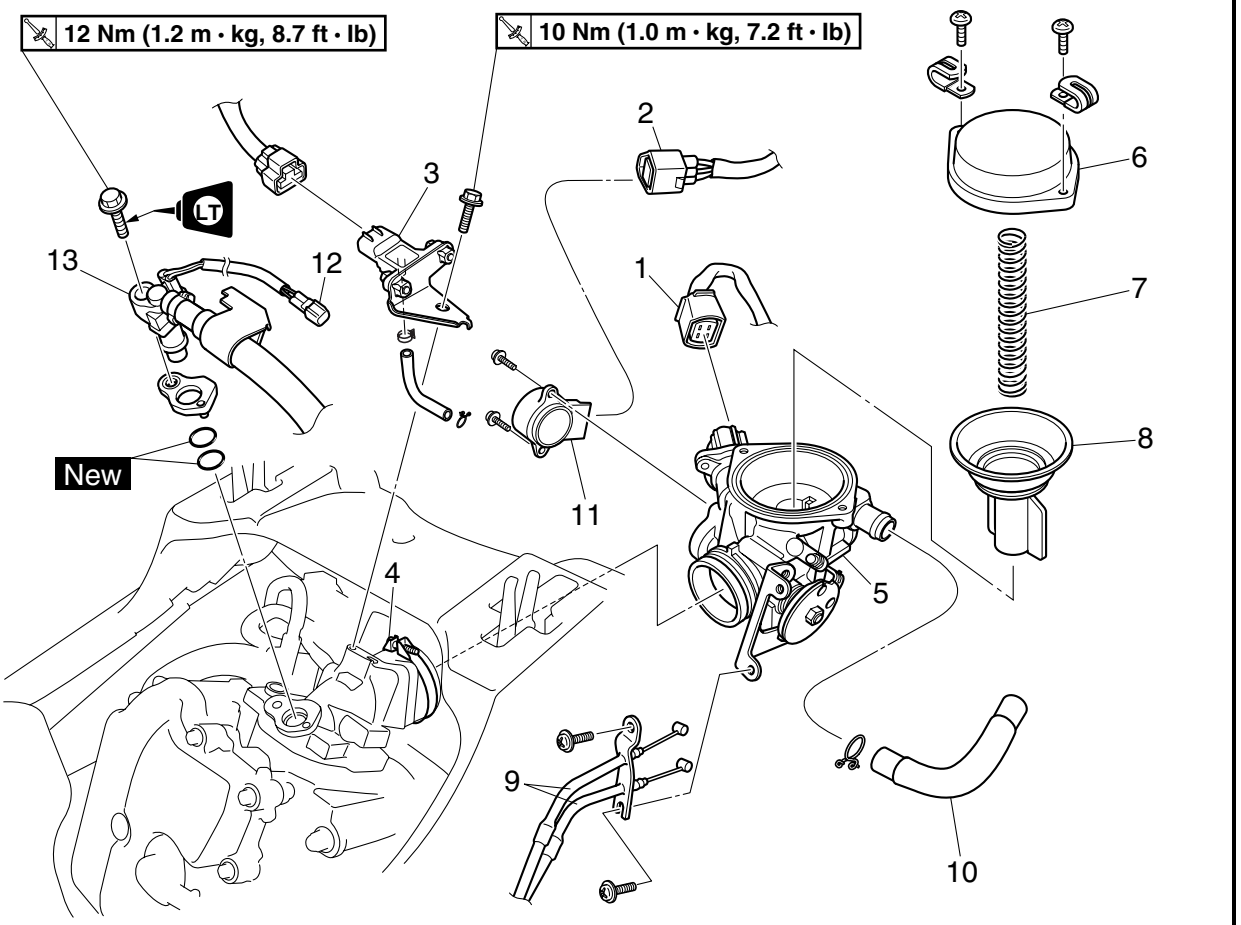
Fault code No.	Er-3	Symptom	Data from the ECU cannot be received correctly.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated if normal signal is received from the ECU when the main switch is set to ON.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue – yellow/blue	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

Fault code No.	Er-4	Symptom	Non-registered data has been received from the meter.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated if normal signal is received from the ECU when the main switch is set to ON.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue – yellow/blue	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

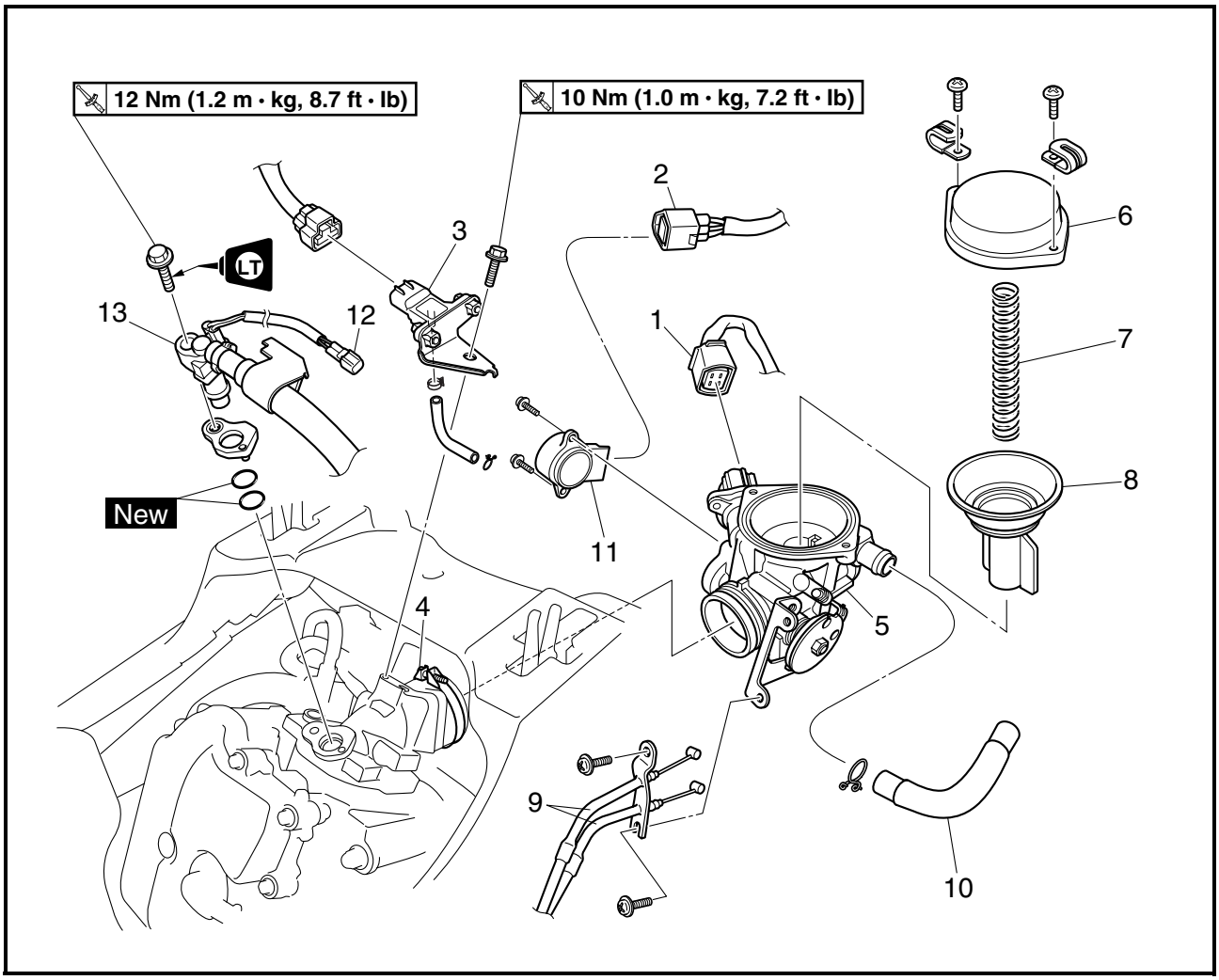
EAS00909

THROTTLE BODY AND FUEL INJECTOR

THROTTLE BODY AND FUEL INJECTOR

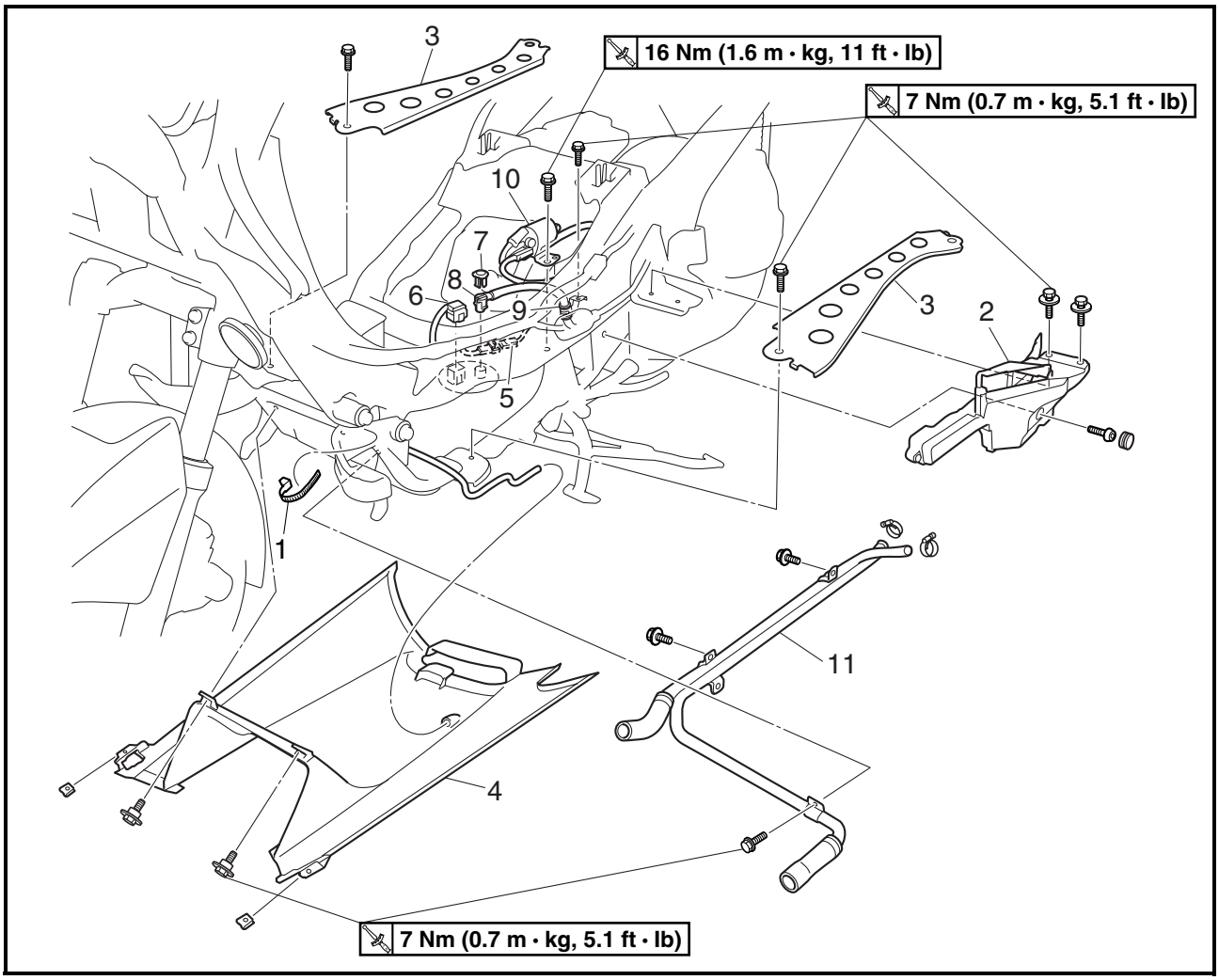


Order	Job/Part	Q'ty	Remarks
	Removing the throttle body and fuel injector		Remove the parts in the order listed.
	Air filter case (left and right)		Refer to "AIR FILTER CASES" in chapter 3.
1	ISC (idle speed control) valve coupler	1	Disconnect.
2	Throttle position sensor coupler	1	Disconnect.
3	Intake air pressure sensor	1	
4	Throttle body clamp screw	1	Loosen.
5	Throttle body	1	
6	Vacuum chamber cover	1	
7	Piston valve spring	1	
8	Piston valve	1	
9	Throttle cable	2	Disconnect.
10	Air filter case to throttle body hose	1	Disconnect.



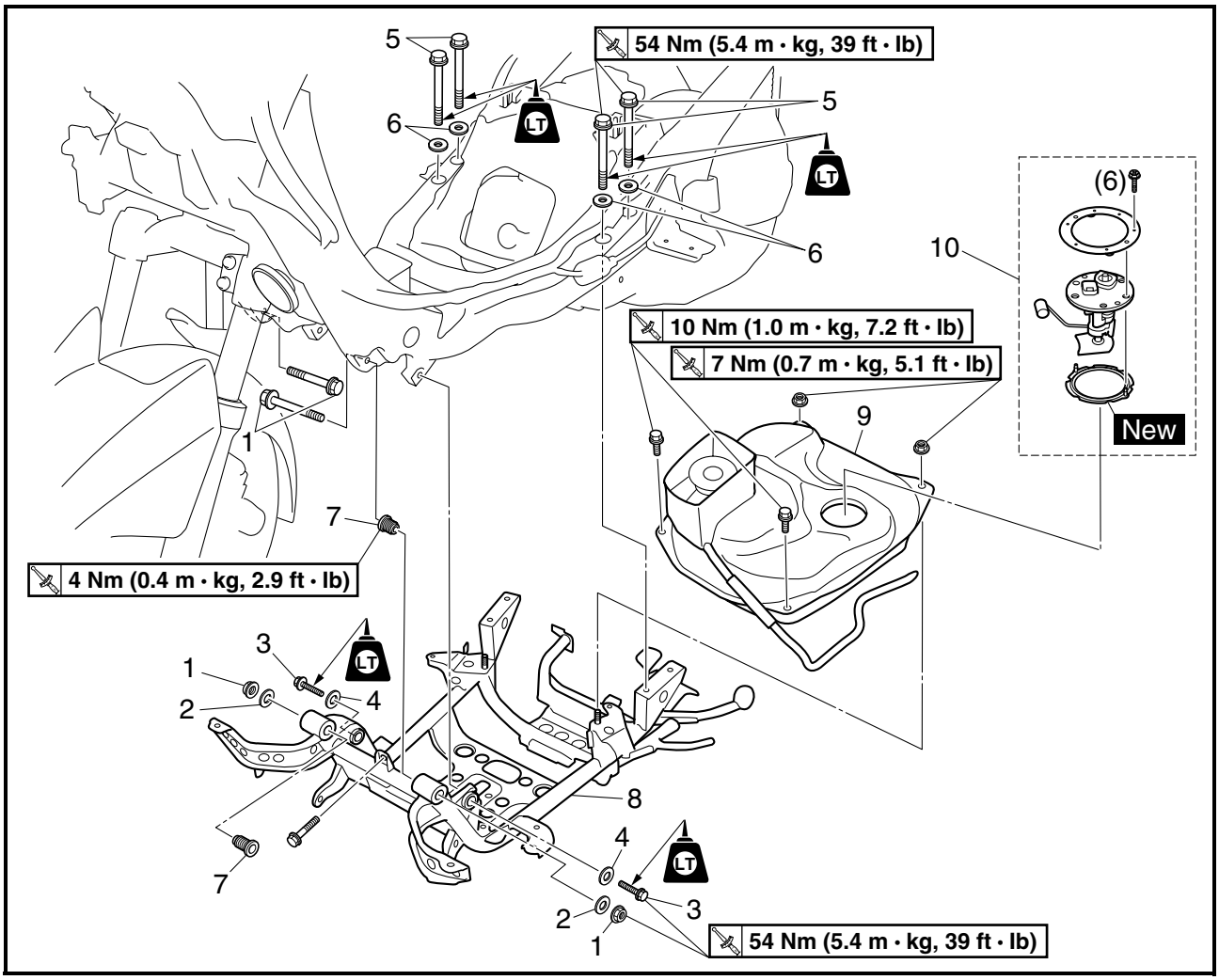
Order	Job/Part	Q'ty	Remarks
11	Throttle position sensor	1	
12	Fuel injector coupler	1	Disconnect.
13	Fuel injector assembly	1	For installation, reverse the removal procedure.

FUEL HOSE

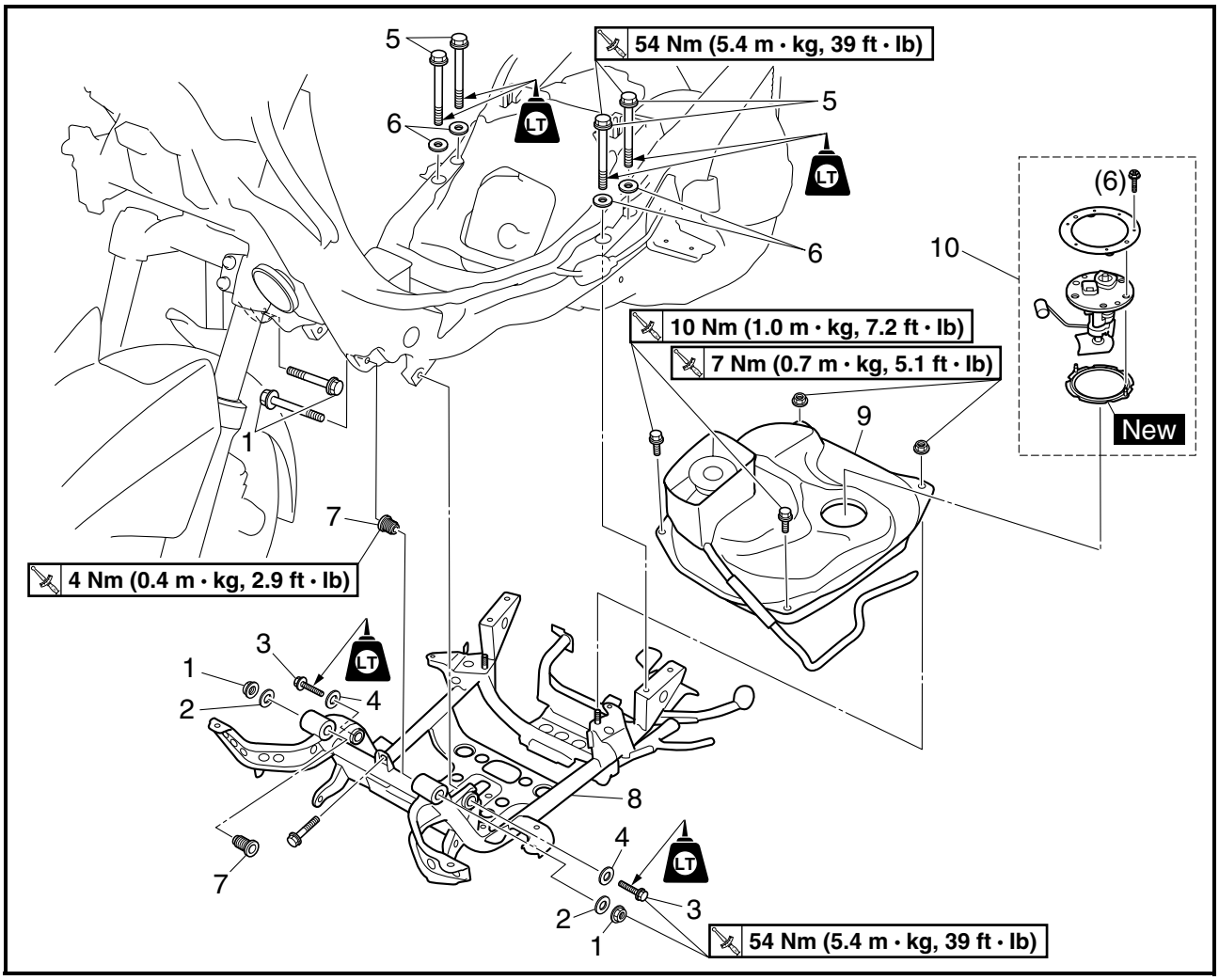


Order	Job/Part	Q'ty	Remarks
	Removing the fuel hose		Remove the parts in the order listed.
	Radiator		Refer to "RADIATOR" in chapter 6.
1	Plastic band	1	
2	Cover	1	
3	Footrest board plate (left and right)	2	
4	Bottom cover	1	
5	Sidestand switch coupler	1	Disconnect.
6	Fuel pump coupler	1	Disconnect.
7	Fuel hose connector cover	1	Refer to "REMOVING THE FUEL HOSE" and "INSTALLING THE FUEL HOSE".
8	Fuel hose	1	
9	Fuel hose holder	1	
10	Ignition coil bracket	1	
11	Radiator pipe assembly	1	
			For installation, reverse the removal procedure.

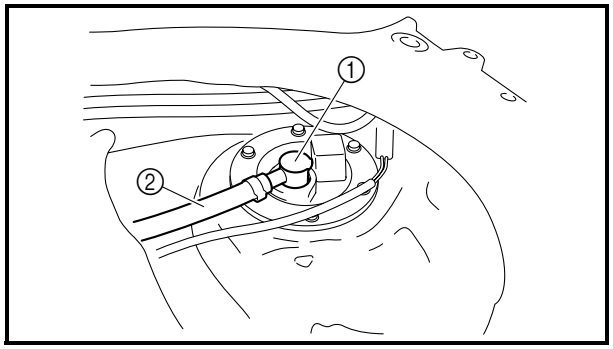
FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		Remove the parts in the order listed. **NOTE:** Place a suitable stand under the frame and engine.
	Fuel hose		Refer to "FUEL HOSE".
1	Sub-frame front upper mounting bolt/ nut (left and right)	2/2	Refer to "INSTALLING THE SUB-FRAME".
2	Washer	2	
3	Sub-frame front lower mounting bolt (left and right)	2	
4	Washer	2	
5	Sub-frame rear mounting bolt (left and right)	4	
6	Washer	4	



Order	Job/Part	Q'ty	Remarks
7	Sub-frame adjusting bolt (left and right)	2	Refer to "INSTALLING THE SUB-FRAME".
8	Sub-frame (with centerstand)	1	
9	Fuel tank	1	Refer to "REMOVING THE FUEL HOSE".
10	Fuel pump	1	Refer to "REMOVING THE FUEL PUMP" and "INSTALLING THE FUEL PUMP". For installation, reverse the removal procedure.



REMOVING THE FUEL HOSE

1. Extract the fuel in the fuel tank through the fuel tank filler hole with a pump.
2. Remove:
   - fuel hose connector cover ①
3. Disconnect:
   - fuel hose ②

CAUTION:

- **Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.**
- **Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.**
- **Do not disconnect the fuel hose from the fuel hose connector. Disconnect the connector from the fuel pump.**

NOTE:

Before removing the hose, place a few rags in the area under where it will be removed.

3. Remove:
   - fuel tank

REMOVING THE FUEL PUMP

1. Remove:
   - fuel pump

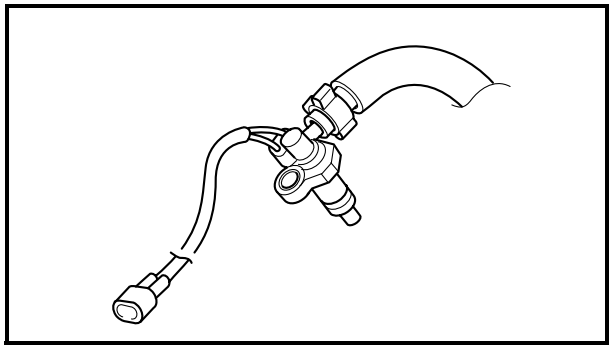
CAUTION:

- **Do not drop the fuel pump or give it a strong shock.**
- **Do not touch the base section of the fuel sender.**

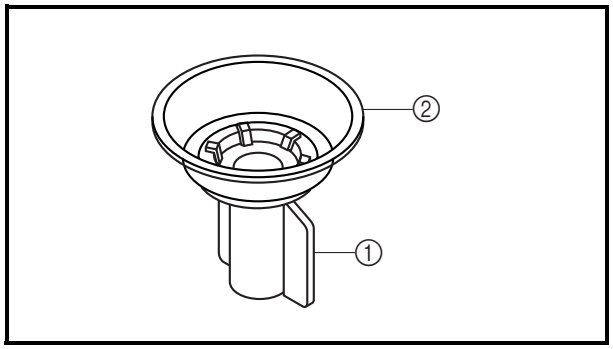
EAS00911

CAUTION:

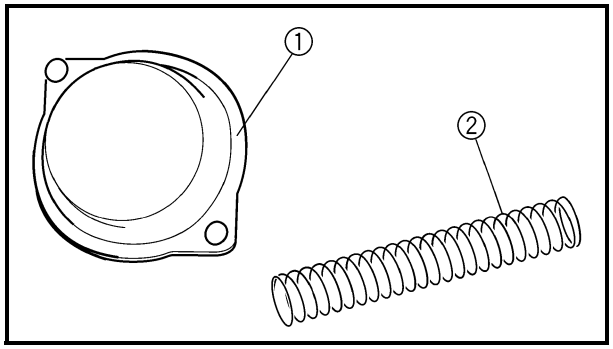
The throttle body should not be disassembled.



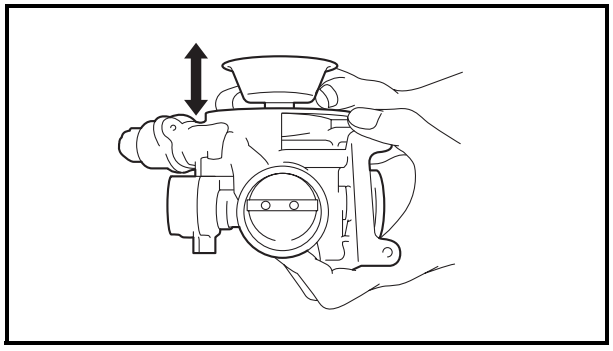
EAS00912
CHECKING THE FUEL INJECTOR
1. Check:
   • fuel injector
   Damage → Replace.



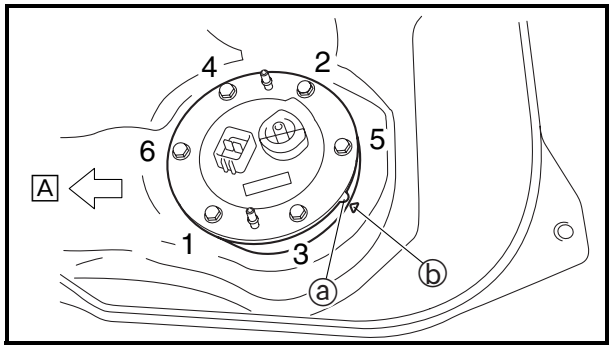
EAS00913
CHECKING THE THROTTLE BODY
1. Check:
   • throttle body
   Cracks/damage → Replace the throttle body.
2. Check:
   • piston valve ①
   Damage/scratches/wear → Replace.
   • piston valve diaphragm ②
   Cracks/tears → Replace.



3. Check:
   • vacuum chamber cover ①
   • piston valve spring ②
   Cracks/damage → Replace.



4. Check:
   • piston valve movement
   Insert the piston valve into the throttle body and move it up and down.
   Tightness → Replace the piston valve.



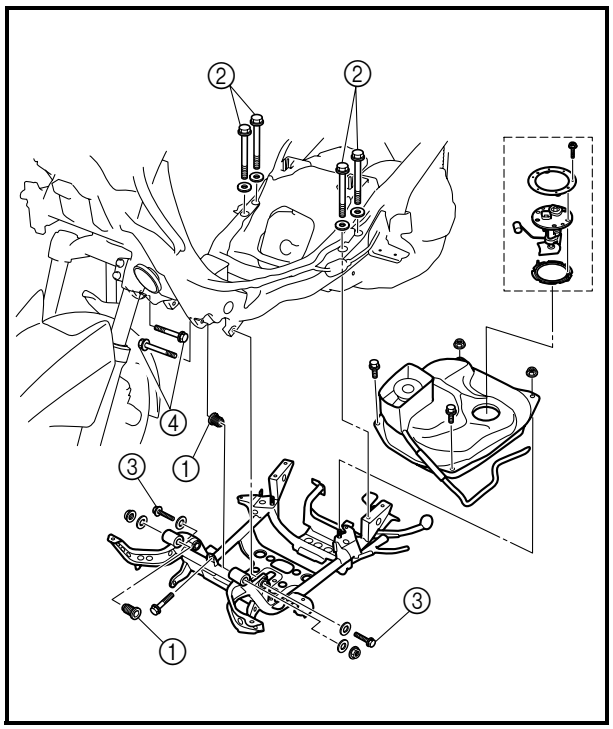
INSTALLING THE FUEL PUMP

1. Install:
   - fuel pump — **4 Nm (0.4 m · kg, 2.9 ft · lb)**

NOTE:

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Align the projection ⓐ on the fuel pump with the alignment mark ⓑ on the fuel tank.
- Tighten the fuel pump bolts in the proper tightening sequence as shown and torque them in two stages.

Ⓐ Forward



INSTALLING THE SUB-FRAME

1. Install:
   - sub-frame adjusting bolts ①
   - sub-frame rear mounting bolts ②
   - sub-frame front lower mounting bolts ③
   - sub-frame front upper mounting bolts ④

NOTE:

Do not fully tighten the bolts.

2. Tighten:
   - sub-frame rear mounting bolts — **54 Nm (5.4 m · kg, 39 ft · lb)**

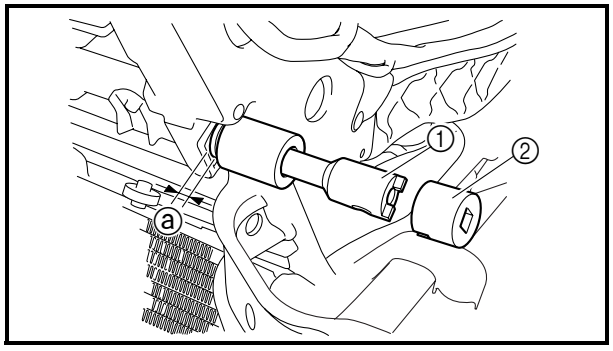
NOTE:

Tighten the bolts on the left side of the scooter first.

3. Tighten:
   - sub-frame front lower mounting bolts — **54 Nm (5.4 m · kg, 39 ft · lb)**

NOTE:

Tighten the bolt on the left side of the scooter first.



4. Tighten:
   • sub-frame adjusting bolts

	4 Nm (0.4 m · kg, 2.9 ft · lb)

NOTE:
- Tighten the bolt on the left side of the scooter first.
- Use the pivot shaft wrench ① and pivot shaft wrench adapter ② to tighten the sub-frame adjusting bolts.
- When tightening the sub-frame adjusting bolts, make sure that the gap ⓐ shown between the frame and the sub-frame is the same on both sides of the scooter.

Pivot shaft wrench
90890-01471, YM-01471
Pivot shaft wrench adapter
90890-01476

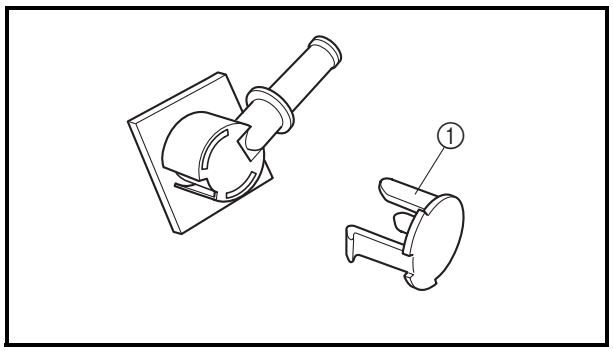
5. Tighten:
   • sub-frame front upper mounting nuts

	54 Nm (5.4 m · kg, 39 ft · lb)

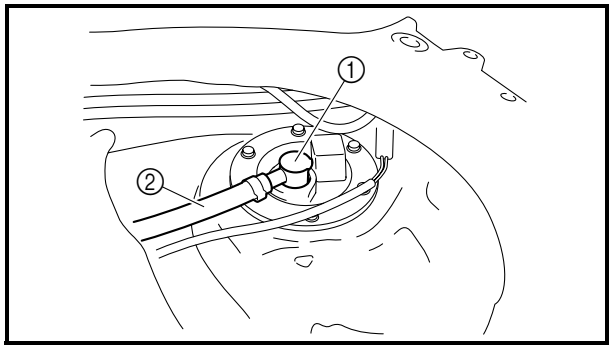
NOTE:
Tighten the nut on the left side of the scooter first.

INSTALLING THE FUEL HOSE
1. Install:
   • fuel hose
   • fuel hose connector cover

CAUTION:
Be sure to connect the fuel hose securely and install the fuel hose connector cover in the correct position, otherwise the fuel hose will not be properly installed.



NOTE:
- Install the fuel hose connector securely onto the fuel tank until a distinct “click” is heard, and then make sure that it does not come loose.
- After installing the fuel hose connector cover ①, make sure that it is installed securely.



EAS00915
CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OPERATION

1. Check:
   • pressure regulator operation

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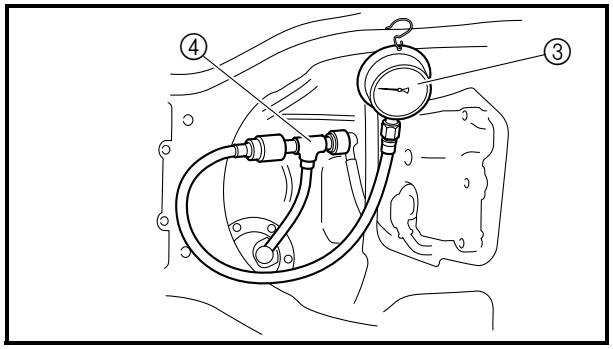
a. Remove the storage box.
   Refer to "COWLING AND COVERS" in chapter 3.
b. Remove the fuel hose connector cover ① and disconnect the fuel hose ② from the fuel pump.

CAUTION:

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

NOTE:

Before removing the hose, place a few rags in the area under where it will be removed.



c. Connect the pressure gauge ③ and adapter ④ onto the fuel hose.

Pressure gauge
90890-03153, YU-03153
Adapter
90890-03181, YM-03181

d. Start the engine.
e. Measure the fuel pressure.

Fuel pressure
246 ~ 254 kPa
(2.46 ~ 2.54 kg/cm², 35.0 ~ 36.1 psi)

Faulty → Replace the fuel pump.

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EAS00916
CHECKING THE THROTTLE POSITION SENSOR

1. Check:
   • throttle position sensor

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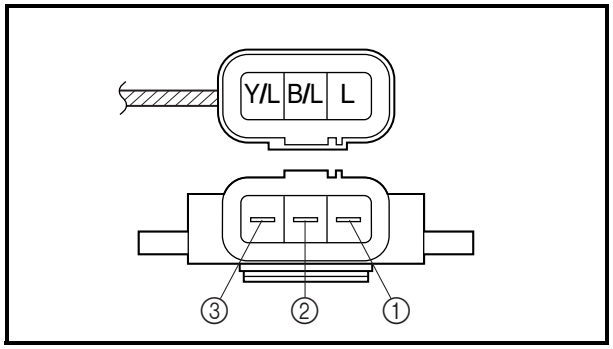
a. Connect the pocket tester (DC 20 V) to the terminals of the throttle position sensor.



Positive tester probe → blue terminal ①
Negative tester probe →
black/blue terminal ②

Pocket tester
90890-03112, YU-03112-C

b. Measure the throttle position sensor voltage.
Out of specification → Replace or repair the wire harness.

Throttle position sensor voltage
5 V
(blue–black/blue)

c. Connect the pocket tester (DC 20 V) to the terminals of the throttle position sensor.

Positive tester probe →
yellow/blue terminal ③
Negative tester probe →
black/blue terminal ②

d. While slowly opening the throttle, check that the throttle position sensor voltage is increased.
Voltage does not change or it changes abruptly → Replace the throttle position sensor.
Out of specification (closed position) → Replace the throttle position sensor.

Throttle position sensor voltage
(closed position)
0.4 ~ 0.9 V
(yellow/blue–black/blue)

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EAS00916
CHECKING THE ISC (IDLE SPEED CONTROL) VALVE

NOTE:
Do not remove the ISC (idle speed control) valve unit completely from the throttle body assembly.

1. Check:
   • ISC (idle speed control) valve

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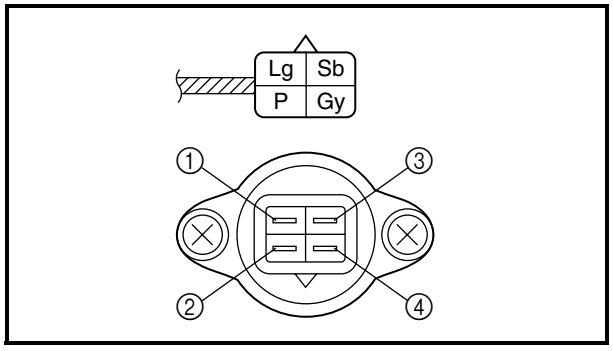
a. Disconnect the ISC (idle speed control) valve coupler from the ISC (idle speed control) valve.
b. Connect the pocket tester ($\Omega \times 10$) to the terminals of the ISC (idle speed control) valve.



Positive tester probe → pink terminal ①
Negative tester probe → light green terminal ②

Positive tester probe → gray terminal ③
Negative tester probe → sky blue terminal ④

Pocket tester
90890-03112, YU-03112-C

c. Measure the ISC (idle speed control) valve resistance.
   Out of specification → Replace the throttle body.

ISC (idle speed control) valve resistance
27 ~ 33 Ω at 20 °C (68 °F)

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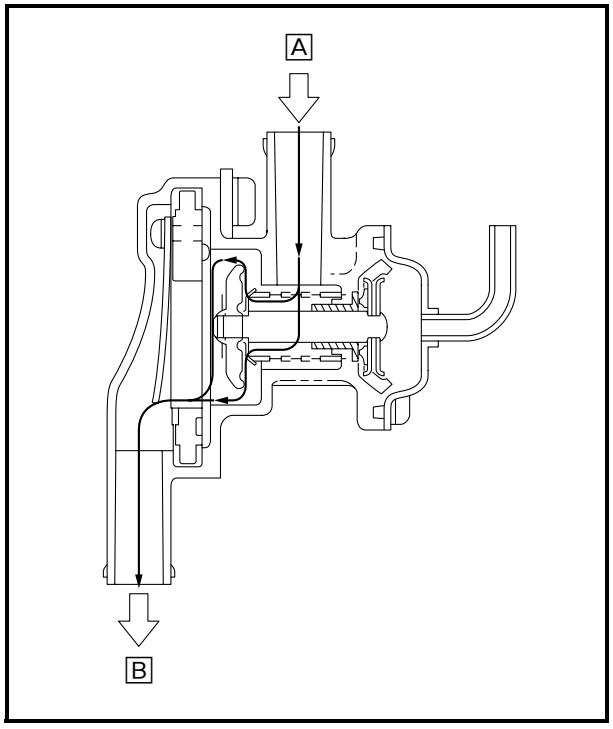
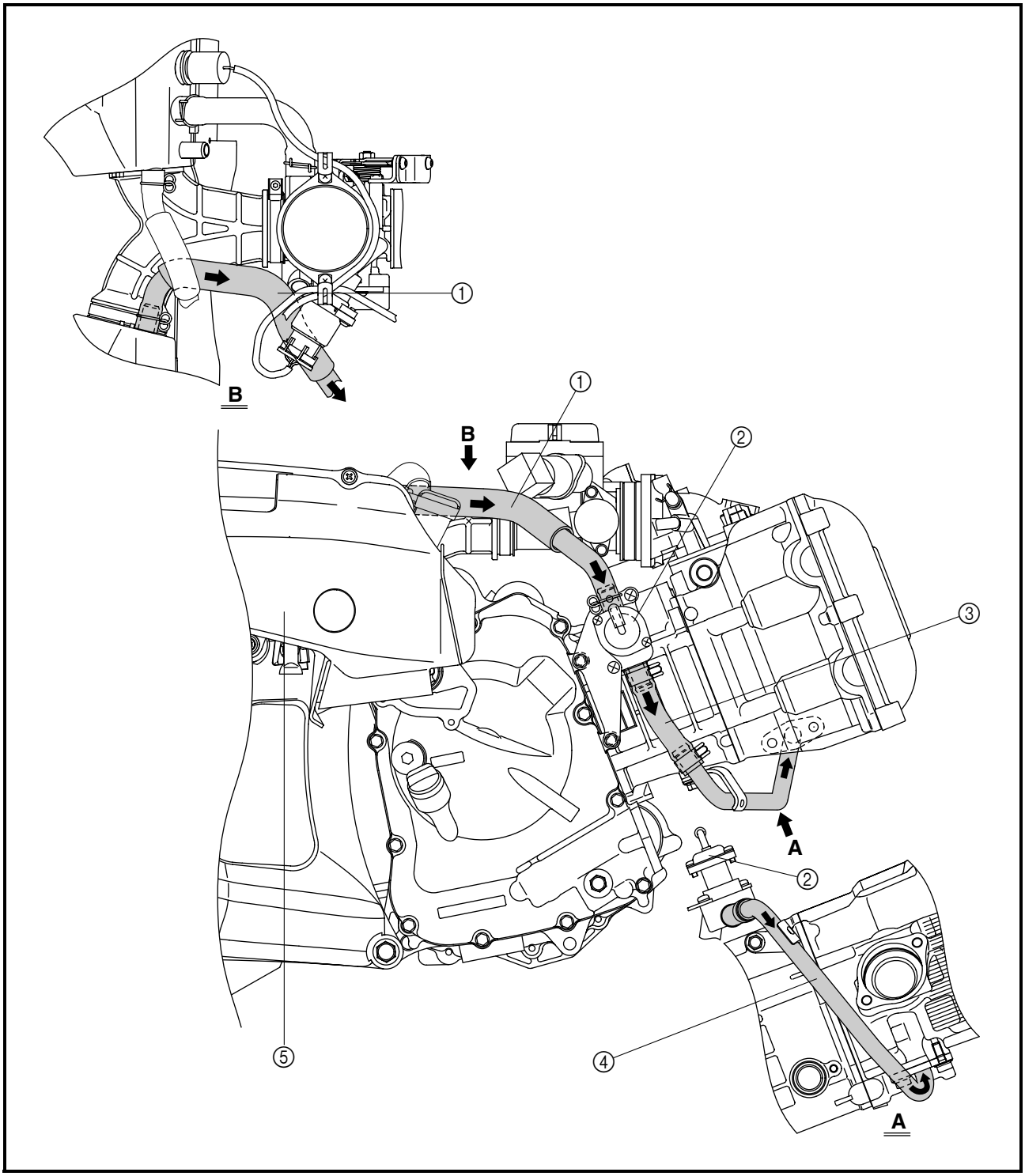
EAS00507
AIR INDUCTION SYSTEM
AIR INJECTION
The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons.
When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700 °C (1,112 to 1,292 °F).



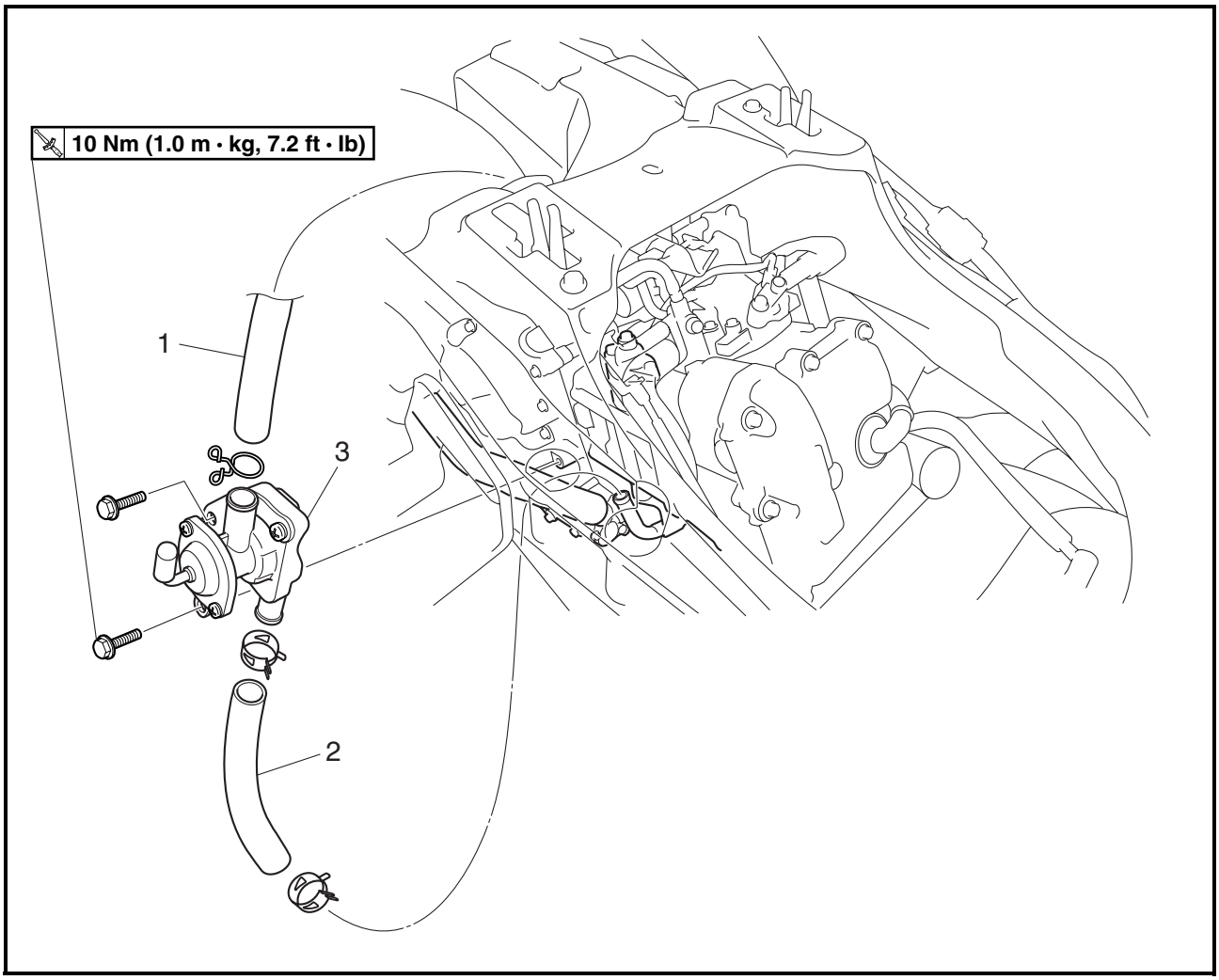
EAS00917
AIR CUT-OFF VALVE
The air cut-off valve prevents air backflow from the exhaust port of the cylinder head to the air filter.
A From the air filter
B To the cylinder head

EAS00509
AIR INDUCTION SYSTEM DIAGRAMS

① Air induction system hose (air filter case to air cut-off valve)
② Air cut-off valve
③ Air induction system hose (air cut-off valve to cylinder head)
④ Air induction system pipe
⑤ Air filter case cover (right)



AIR CUT-OFF VALVE AND AIR INDUCTION SYSTEM HOSES

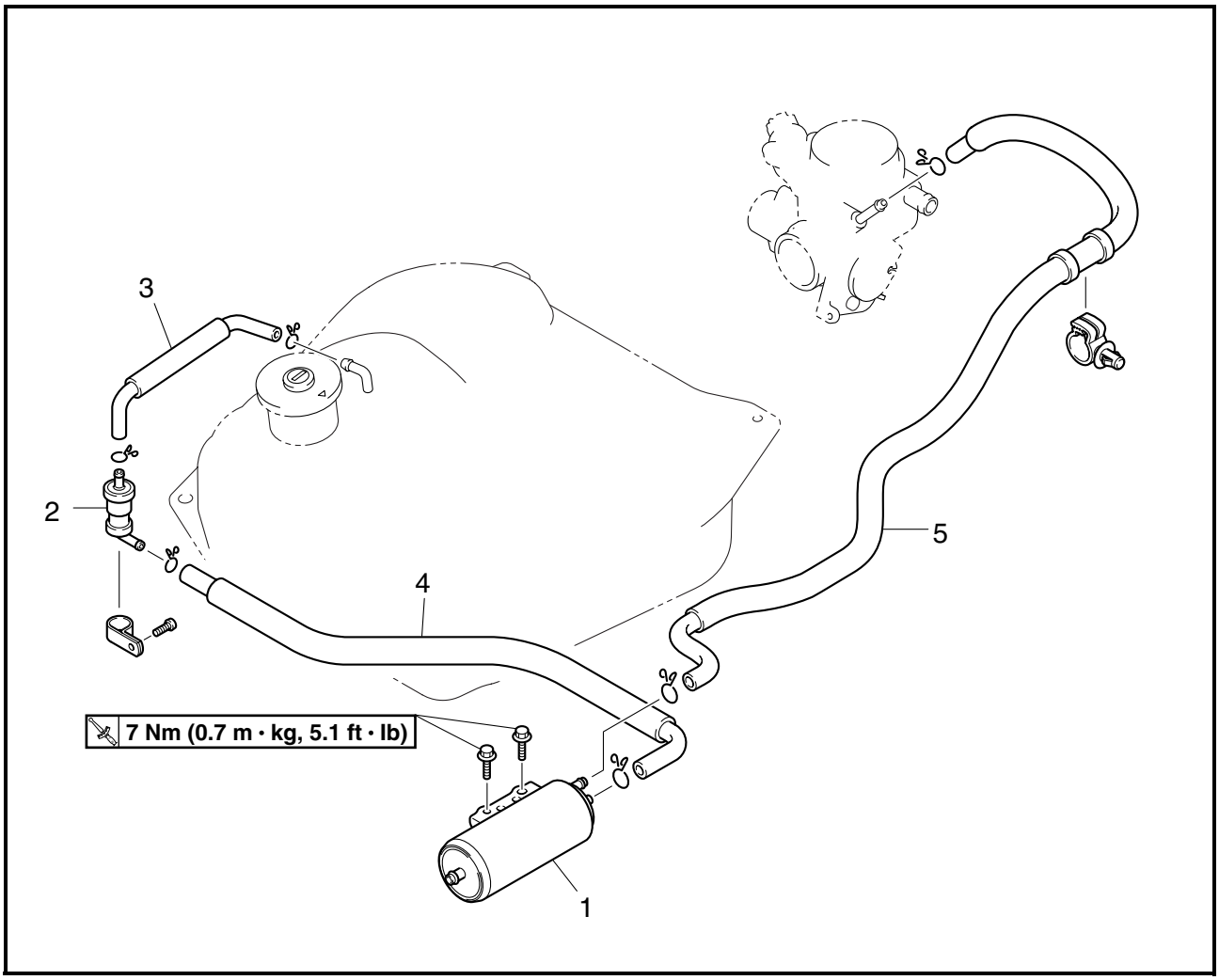


Order	Job/Part	Q'ty	Remarks
	Removing the air cut-off valve and air induction system hoses		Remove the parts in the order listed.
1	Air induction system hose (air filter case to air cut-off valve)	1	Disconnect.
2	Air induction system hose (air cut-off valve to air filter case)	1	Disconnect.
3	Air cut-off valve	1	For installation, reverse the removal procedure.

EAS00918
CHECKING THE AIR INDUCTION SYSTEM

1. Check:
   - hoses
     Loose connections → Connect properly.
     Cracks/damage → Replace.
   - pipes
     Cracks/damage → Replace.
2. Check:
   - reed valve
   - reed valve stopper
   - reed valve seat
     Cracks/damage → Replace the reed valve.
3. Check:
   - air cut-off valve
     Cracks/damage → Replace.

CANISTER



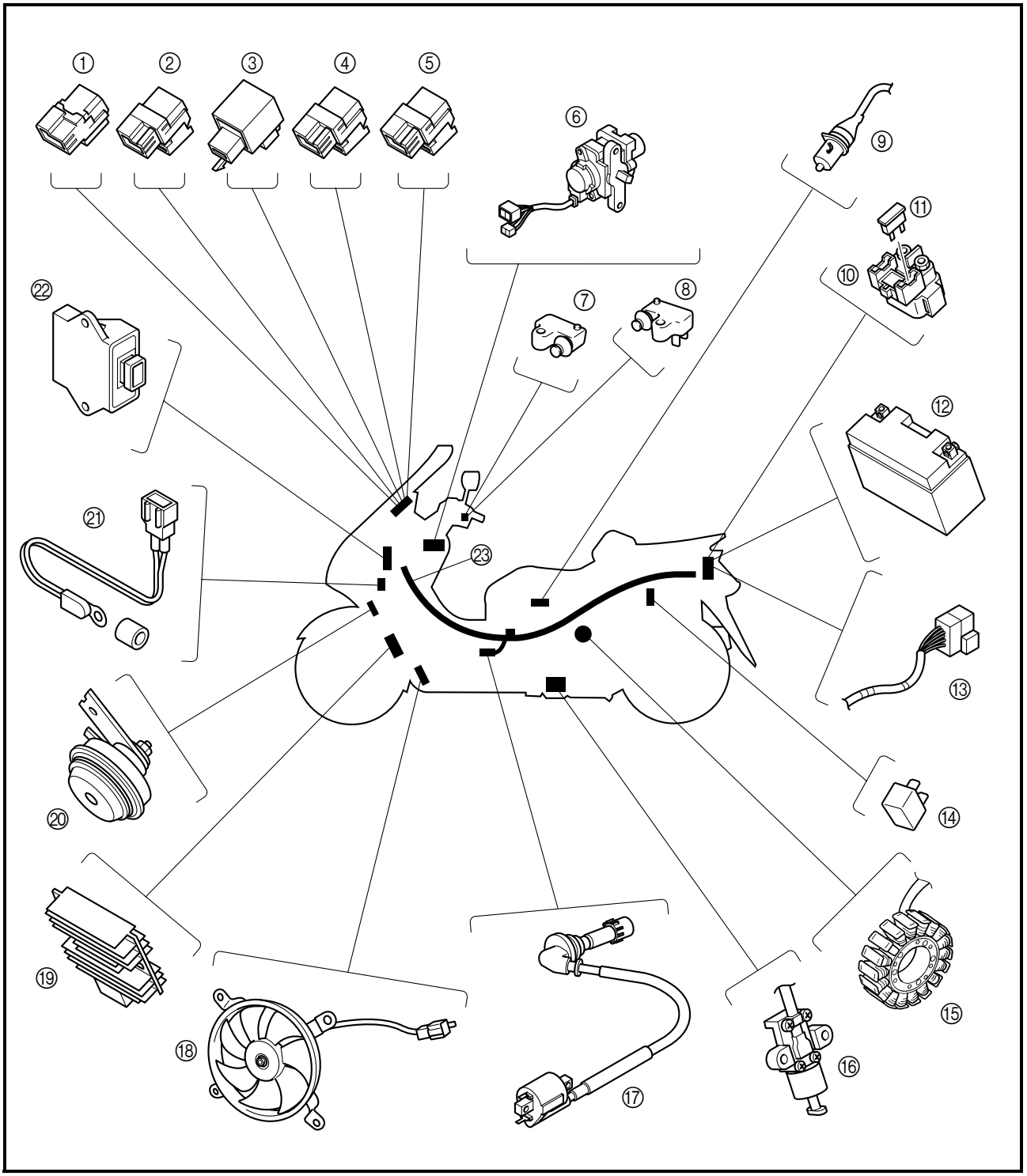
Order	Job/Part	Q'ty	Remarks
	Removing the canister		Remove the parts in the order listed.
1	Canister	1	
2	Rollover valve	1	
3	Fuel tank to rollover valve hose	1	
4	Rollover valve to canister hose	1	
5	Canister to throttle body hose	1	
			For installation, reverse the removal procedure.

EAS00729

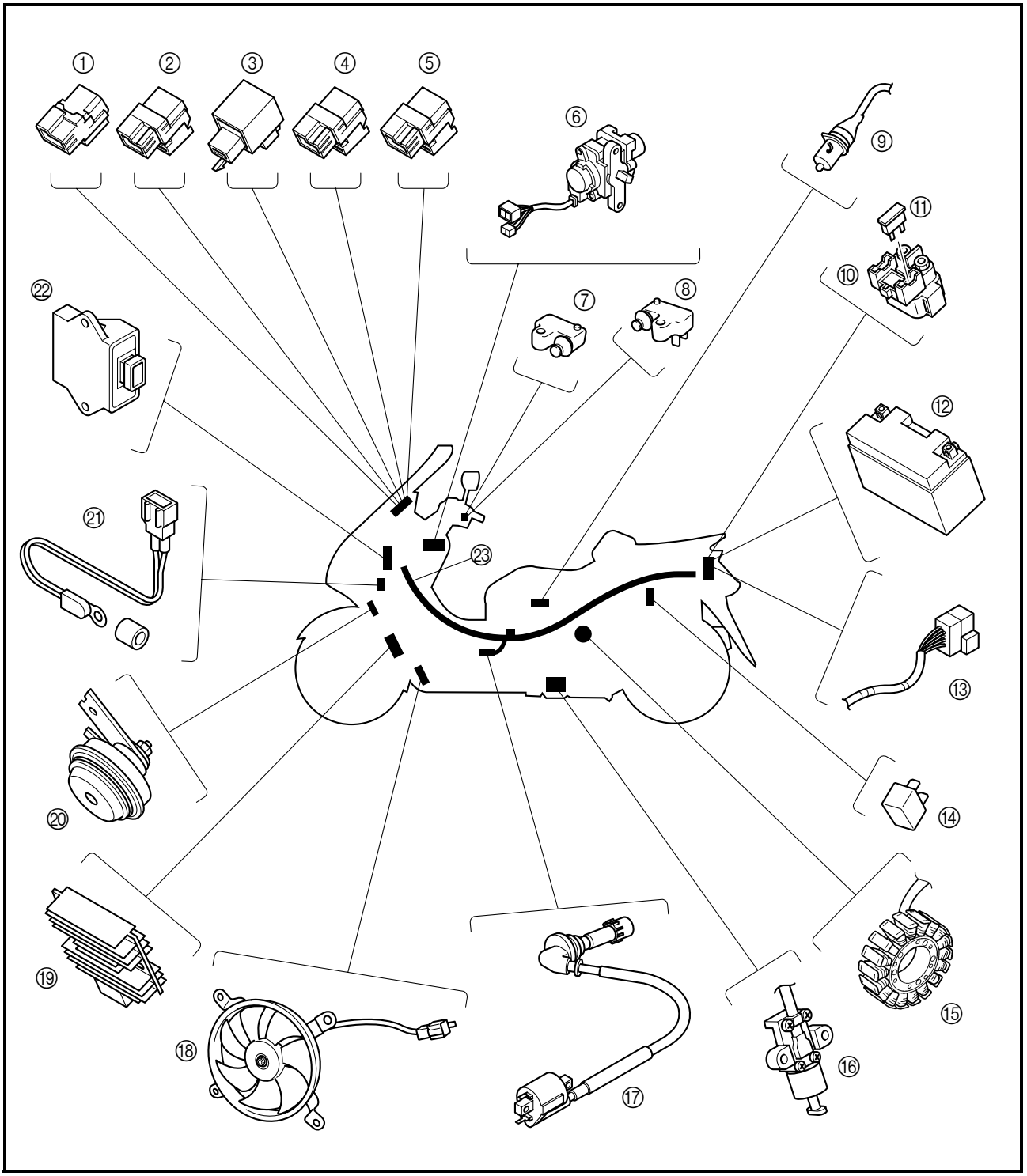
ELECTRICAL SYSTEM

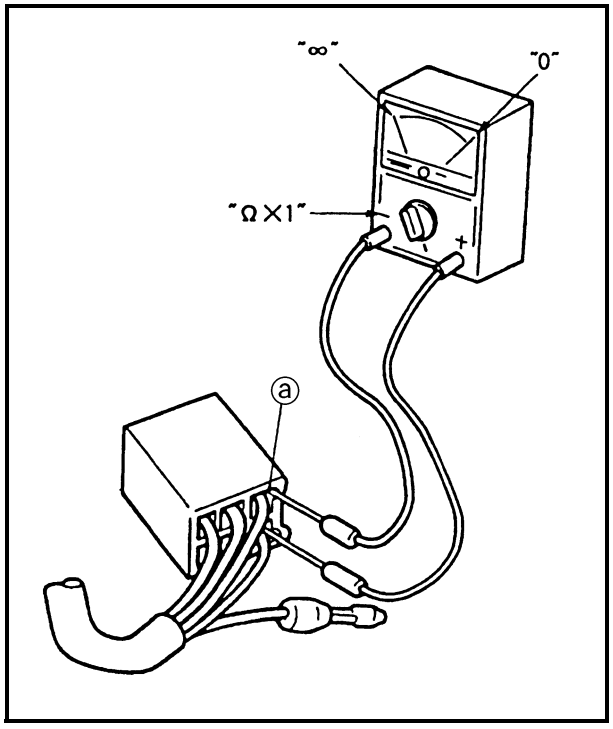
ELECTRICAL COMPONENTS

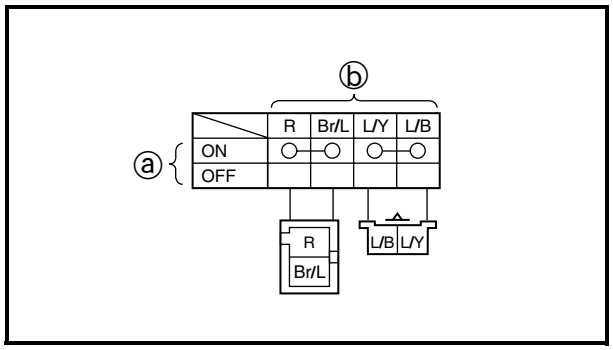
① Starting circuit cut-off relay
② Headlight relay 1
③ Turn signal relay
④ Radiator fan motor relay
⑤ Headlight relay 2
⑥ Main switch
⑦ Front brake light switch
⑧ Rear brake light switch
⑨ Storage box light switch
⑩ Starter relay
⑪ Main fuse
⑫ Battery
⑬ Fuse box
⑭ Diode



⑮ Stator coil
⑯ Sidestand switch
⑰ Ignition coil
⑱ Radiator fan motor
⑲ Rectifier/regulator
⑳ Horn
㉑ Thermistor
㉒ ECU
㉓ Wire harness







EAS00730

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

Never insert the tester probes into the coupler terminal slots ⓐ. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

Pocket tester
90890-03112, YU-03112-C

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:

"○——○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

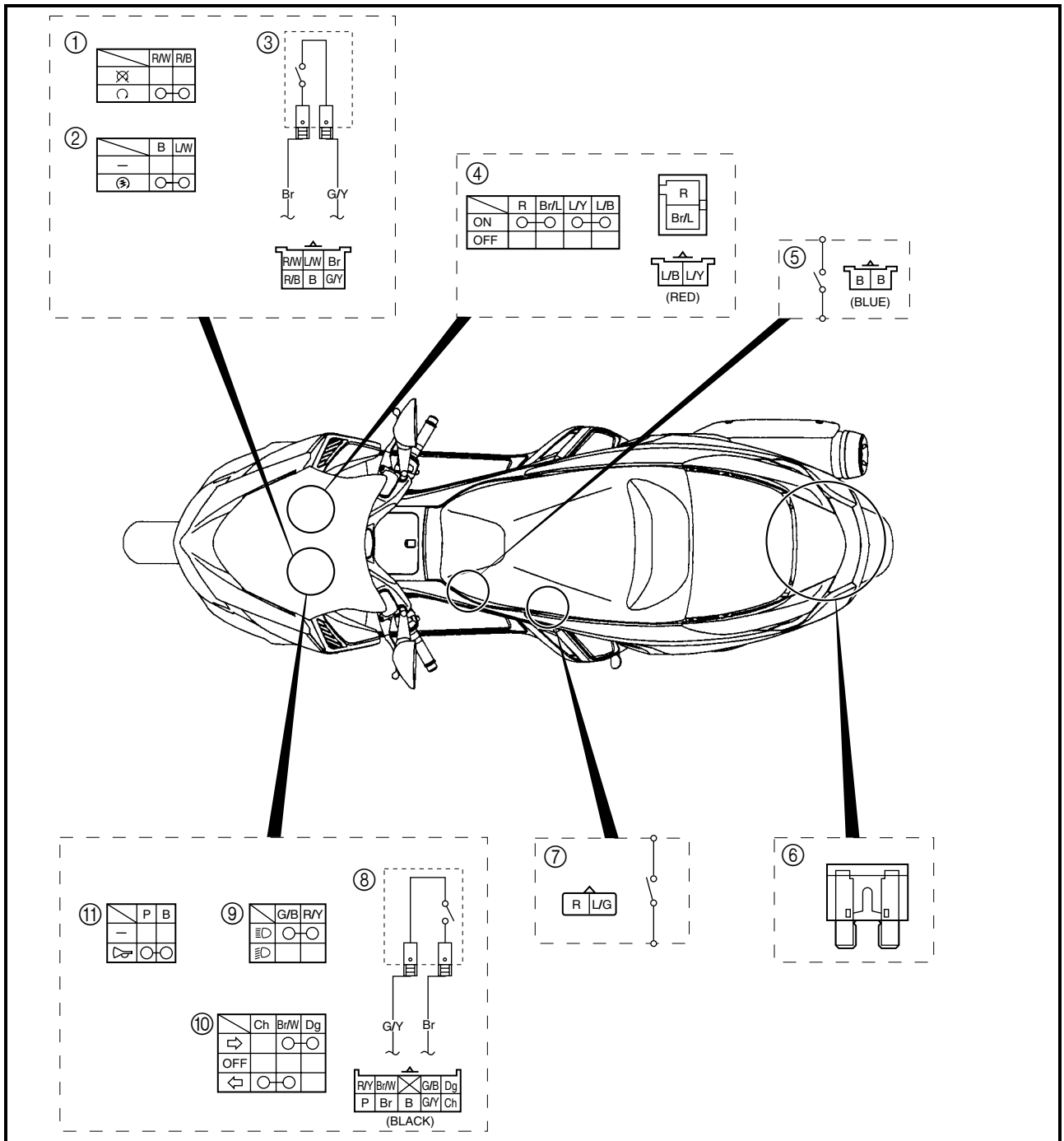
The example illustration on the left shows that:

There is continuity between red and brown/blue, blue/yellow and blue/black when the switch is set to "ON".

EAS00731
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.

Damage/wear → Repair or replace.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.



① Engine stop switch
② Start switch
③ Front brake light switch
④ Main switch
⑤ Sidestand switch
⑥ Fuse
⑦ Storage box light switch
⑧ Rear brake light switch
⑨ Dimmer switch
⑩ Turn signal switch
⑪ Horn switch

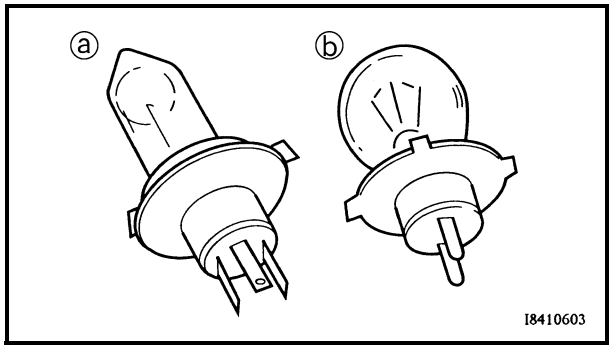
EAS00733
CHECKING THE BULBS AND BULB SOCKETS

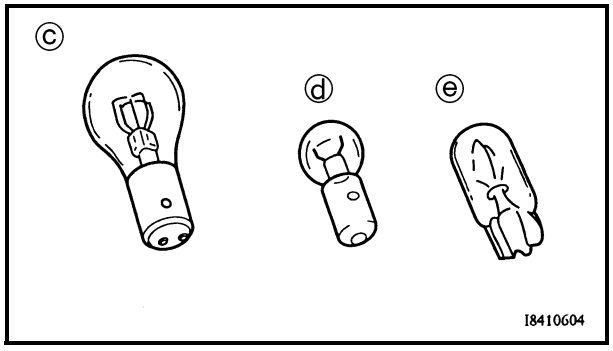
Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

Improperly connected → Properly connect.

No continuity → Repair or replace the bulb, bulb socket or both.





TYPES OF BULBS

The bulbs used on this scooter are shown in the illustration on the left.

- Bulbs ⓐ and ⓑ are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb ⓒ is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs ⓓ and ⓔ are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

1. Remove:
   • bulb

⚠ WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

CAUTION:

- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**

2. Check:
   • bulb (for continuity)
   (with the pocket tester)
   No continuity → Replace.

	**Pocket tester** **90890-03112, YU-03112-C**

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ②, and check the continuity.
b. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ③, and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

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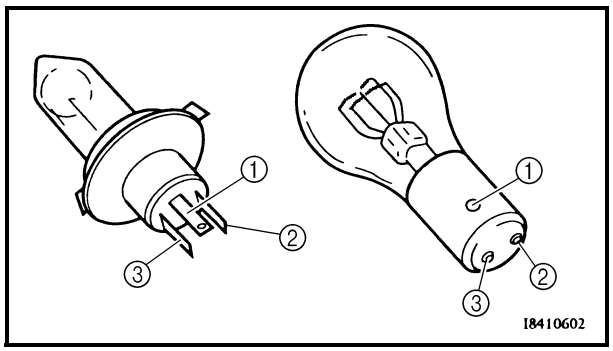


CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

1. Check:
   - bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

Pocket tester
90890-03112, YU-03112-C

NOTE:

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

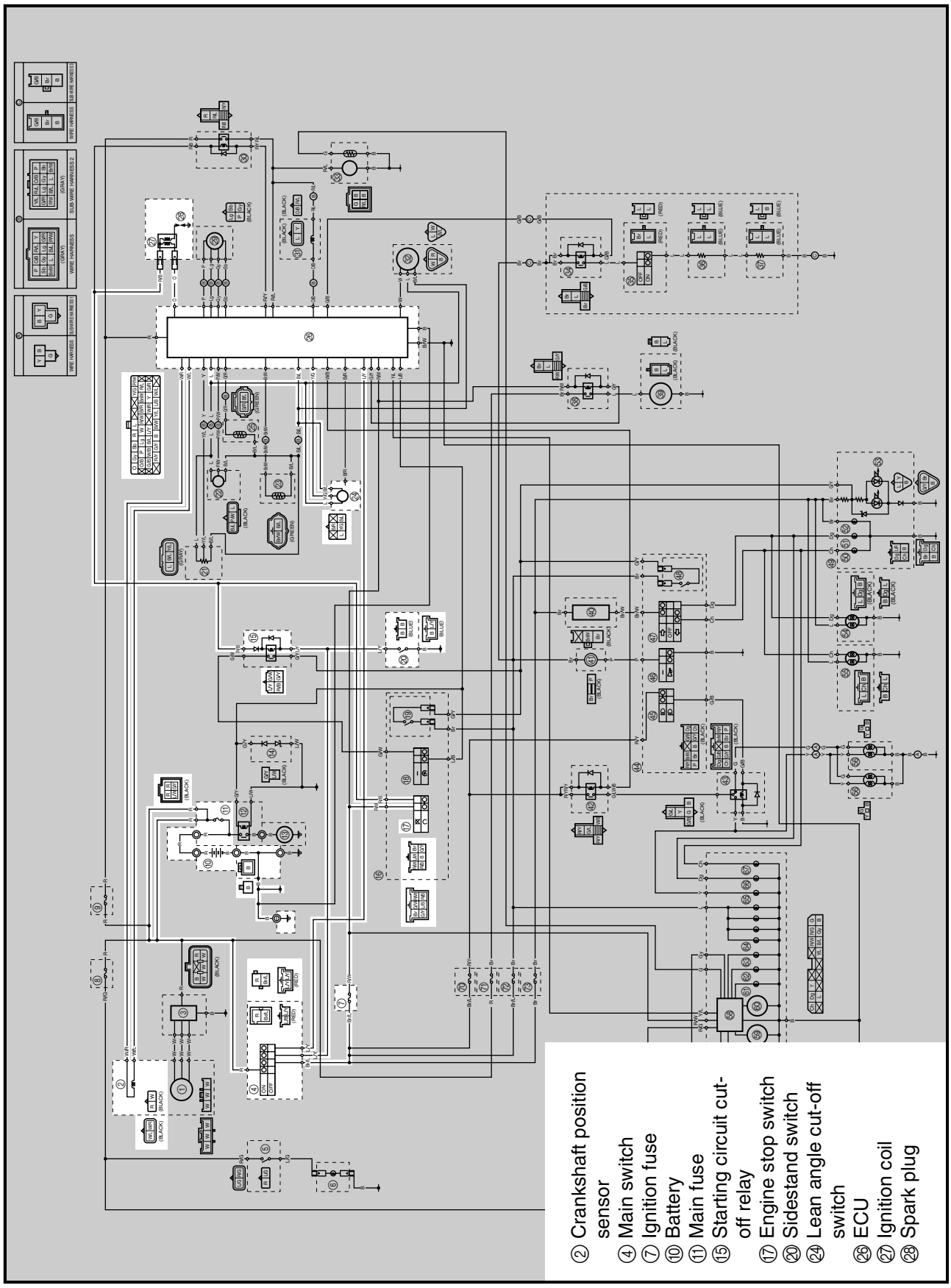
a. Install a good bulb into the bulb socket.
b. Connect the pocket tester probes to the respective leads of the bulb socket.
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00734

IGNITION SYSTEM

CIRCUIT DIAGRAM



EAS00736
TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:
1. main and ignition fuses
2. battery
3. spark plug
4. ignition spark gap
5. spark plug cap resistance
6. ignition coil resistance
7. crankshaft position sensor resistance
8. main switch
9. engine stop switch
10. sidestand switch
11. starting circuit cut-off relay
12. lean angle cut-off switch
13. wiring connections (of the entire ignition system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. storage box
2. front cowling

- Troubleshoot with the following special tool(s).

Ignition checker
90890-06754, YM-34487
Pocket tester
90890-03112, YU-03112-C

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and ignition fuses OK?

YES

NO → Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00740

3. Spark plug

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.
  Refer to "CHECKING THE SPARK PLUG" in chapter 3.

Standard spark plug
CR7E (NGK)
Spark plug gap
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?

YES

NO → Re-gap or replace the spark plug.

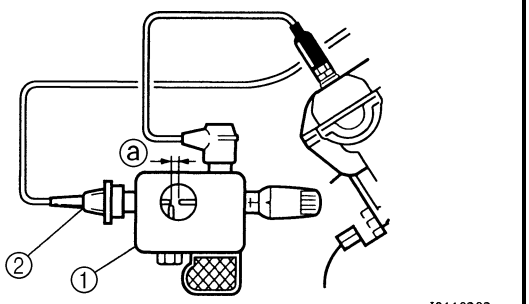
EAS00742

4. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.

② Spark plug cap

- Set the main switch to "ON".
- Measure the ignition spark gap ⓐ.
- Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.



Minimum ignition spark gap
6 mm (0.24 in)

- Is there a spark and is the spark gap within specification?

YES

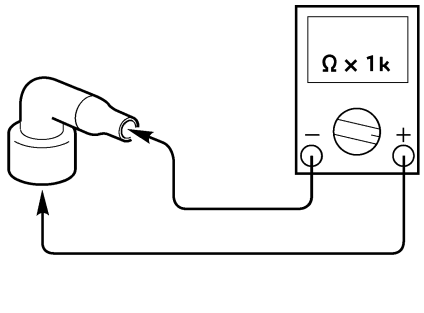
The ignition system is OK.

NO

EAS00744

5. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
10 kΩ at 20 °C (68 °F)

- Is the spark plug cap OK?

YES

NO

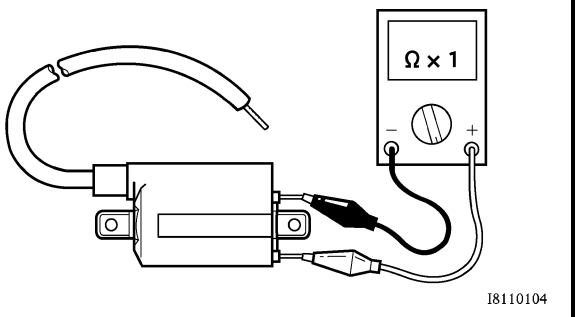
Replace the spark plug cap.

EAS00746

6. Ignition coil resistance

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Positive tester probe → red/black
Negative tester probe → orange



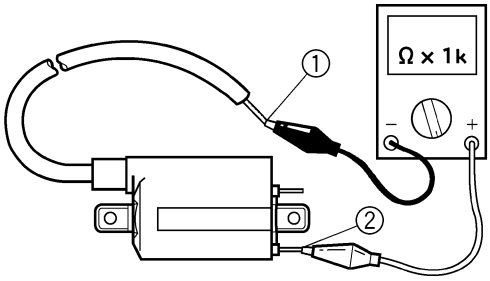
- Measure the primary coil resistance.

Primary coil resistance
2.16 ~ 2.64 Ω at 20 °C (68 °F)

- Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

Negative tester probe → spark plug lead ①
Positive tester probe → red/black ②

- Measure the secondary coil resistance.



Secondary coil resistance
8.64 ~ 12.96 kΩ at 20 °C (68 °F)

- Is the ignition coil OK?

YES → NO

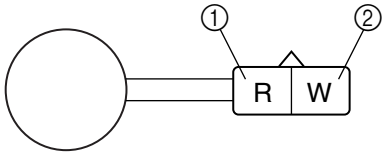
Replace the ignition coil.

EAS00748

7. Crankshaft position sensor resistance

- Disconnect the crankshaft position sensor coupler from the wire harness.
- Connect the pocket tester (Ω × 100) to the crankshaft position sensor coupler as shown.

Positive tester probe → red ①
Negative tester probe → white ②



- Measure the crankshaft position sensor resistance.

Crankshaft position sensor resistance
248 ~ 372 Ω at 20 °C (68 °F)
(between red and white)

- Is the crankshaft position sensor OK?

YES → NO

Replace crankshaft position sensor/stator assembly.

EAS00749

8. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES → NO

Replace the main switch.

EAS00750

9. Engine stop switch

- Check the engine stop switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

YES ⇩ NO ⇩

Replace the right handlebar switch.

EAS00752

10.Sidestand switch

- Check the sidestand switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?

YES ⇩ NO ⇩

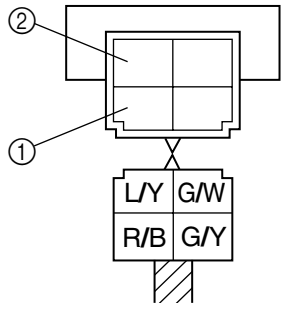
Replace the sidestand switch.

EAS00753

11.Starting circuit cut-off relay

- Remove the starting circuit cut-off relay.
- Connect the pocket tester (Ω × 1) to the starting circuit cut-off relay terminals as shown.
- Check the starting circuit cut-off relay for continuity.

Positive tester probe → **blue/yellow ①** **Negative tester probe →** **red/black ②**	**Continuity**
Positive tester probe → **red/black ②** **Negative tester probe →** **blue/yellow ①**	**No continuity**



NOTE:
When you switch the positive and negative tester probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

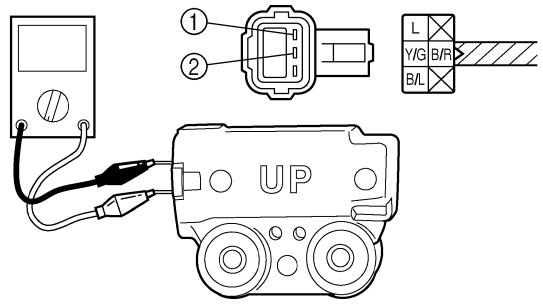
YES ⇩ NO ⇩

Replace the starting circuit cut-off relay.

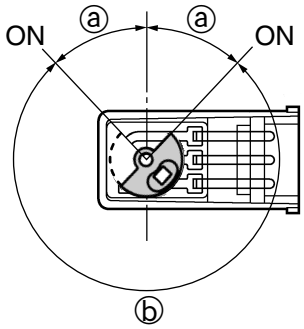
12.Lean angle cut-off switch

- Remove the lean angle cut-off switch.
- Connect the pocket tester ($\Omega \times 1$) to the lean angle cut-off switch terminals as shown.

Positive tester probe → blue ①
Negative tester probe → yellow/green ②



Lean angle cut-off switch voltage
Less than 45° ⓐ →
Approximately 1 V
More than 45° ⓑ →
Approximately 4 V



- Is the lean angle cut-off switch OK?

YES

NO → Replace the lean angle cut-off switch.

EAS00754

13.Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

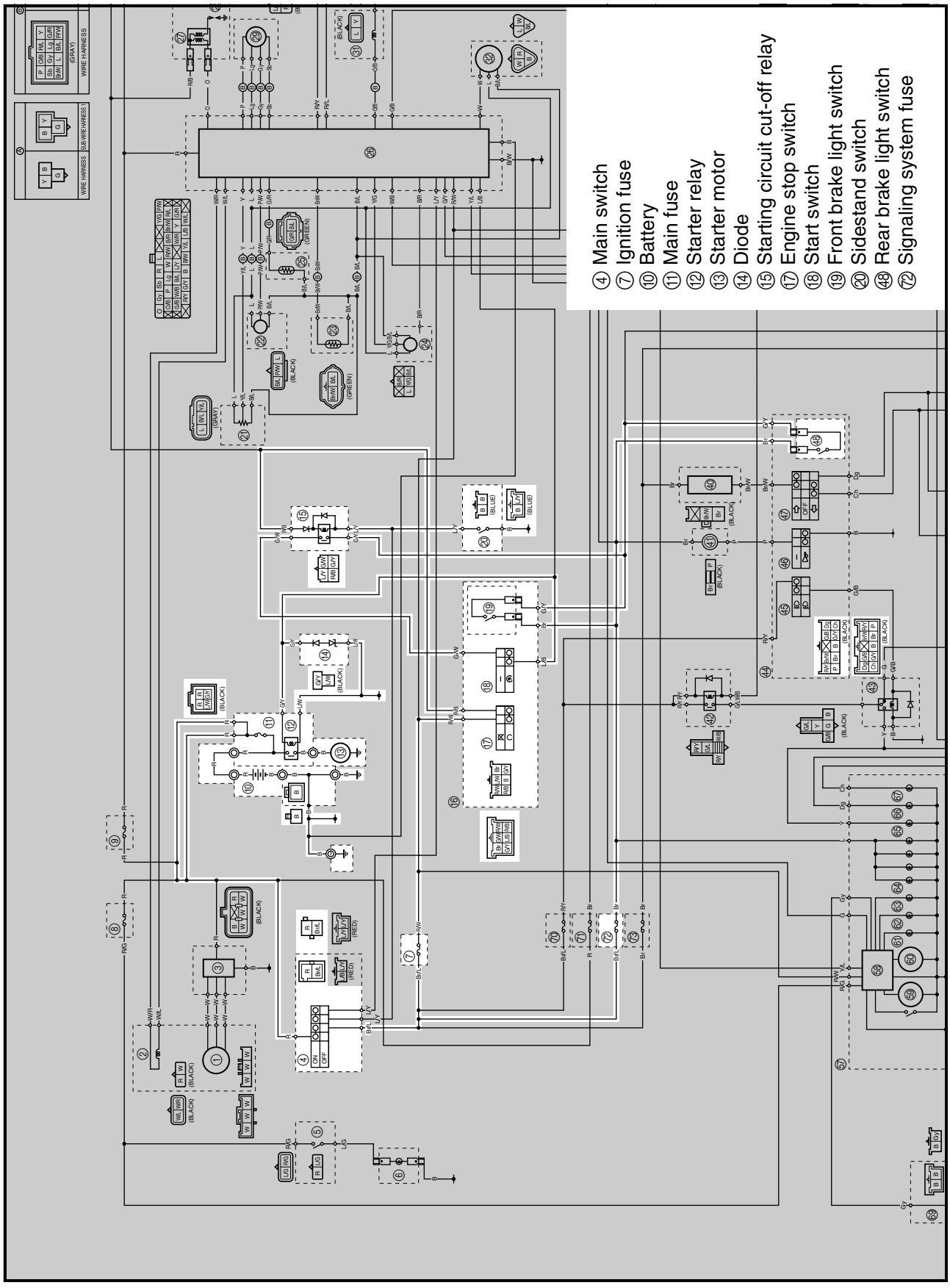
YES → Replace the ECU.

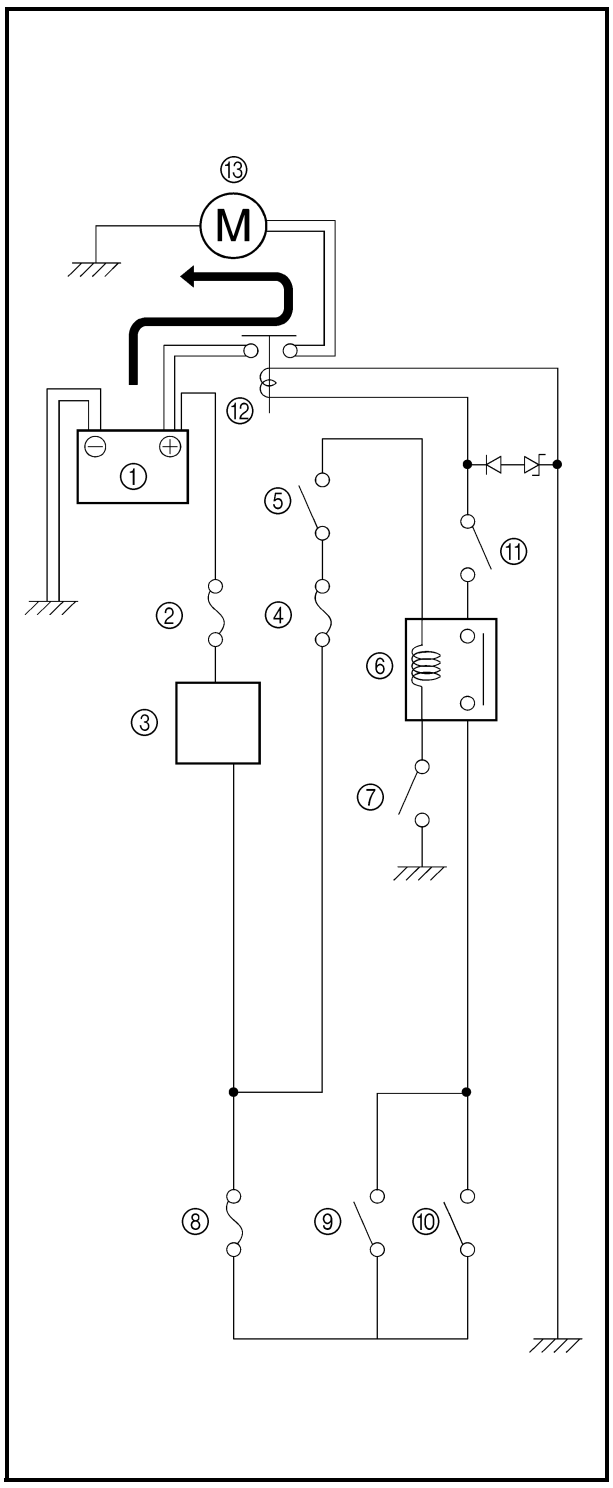
NO → Properly connect or repair the ignition system's wiring.

EAS00755

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM





EAS00756
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to "◯" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if the following conditions are met:

- A brake lever is pulled to the handlebar (the brake light switch is closed) and the sidestand is up (the sidestand switch is closed).

① Battery
② Main fuse
③ Main switch
④ Ignition fuse
⑤ Engine stop switch
⑥ Starting circuit cut-off relay
⑦ Sidestand switch
⑧ Signaling system fuse
⑨ Front brake light switch
⑩ Rear brake light switch
⑪ Start switch
⑫ Starter relay
⑬ Starter motor

EAS00757
TROUBLESHOOTING

The starter motor fails to turn.

Check:
1. main, ignition, and signaling system fuses
2. battery
3. starter motor
4. starting circuit cut-off relay
5. starter relay
6. main switch
7. engine stop switch
8. brake light switch (front and rear)
9. sidestand switch
10. start switch
11. wiring connections
    (of the entire starting system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. storage box
2. front cowling

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-03112-C

EAS00738

1. Main, ignition, and signaling system fuses

- Check the main, ignition, and signaling system fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, ignition, and signaling system fuses OK?

YES

NO → Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

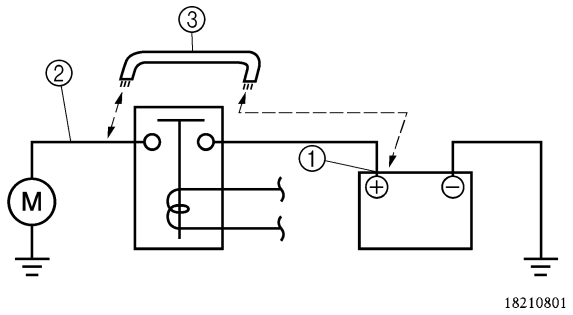
YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00758

3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



⚠ WARNING
- **A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.**

- Does the starter motor turn?

YES

NO → Repair or replace the starter motor.

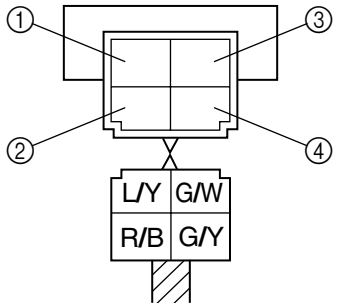
EAS00759

4. Starting circuit cut-off relay

- Remove the starting circuit cut-off relay.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starting circuit cut-off relay terminals as shown.

Positive battery terminal → **red/black** ①
Negative battery terminal → **blue/yellow** ②

Positive tester probe → **green/yellow** ③
Negative tester probe → **green/white** ④



- Does the starting circuit cut-off relay have continuity between green/yellow and green/white?

YES → NO

Replace the starting circuit cut-off relay.

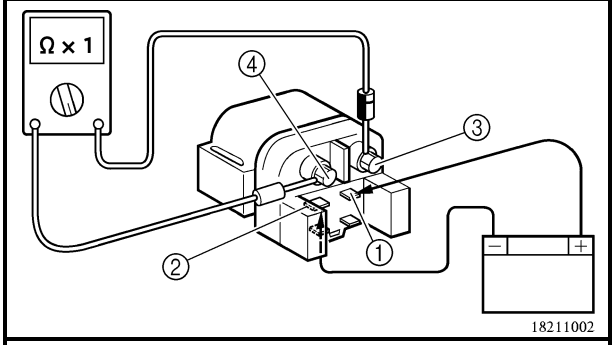
EAS00761

5. Starter relay

- Remove the starter relay.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starter relay terminal as shown.

Positive battery terminal → **green/yellow** ①
Negative battery terminal → **blue/white** ②

Positive tester probe → **black** ③
Negative tester probe → **red** ④



- Does the starter relay have continuity between black and black?

YES → NO

Replace the starter relay.

EAS00749

6. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES → NO

Replace the main switch.

EAS00750

7. Engine stop switch
- Check the engine stop switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

YES ⇩ NO ⇩

Replace the right handlebar switch.

EAS00751

8. Brake light switch (front and rear)
- Check the brake light switches for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is each brake light switch OK?

YES ⇩ NO ⇩

Replace the brake light switch(s).

EAS00752

9. Sidestand switch
- Check the sidestand switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES ⇩ NO ⇩

Replace the sidestand switch.

EAS00764

10.Start switch
- Check the start switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the start switch OK?

YES ⇩ NO ⇩

Replace the right handlebar switch.

EAS00766

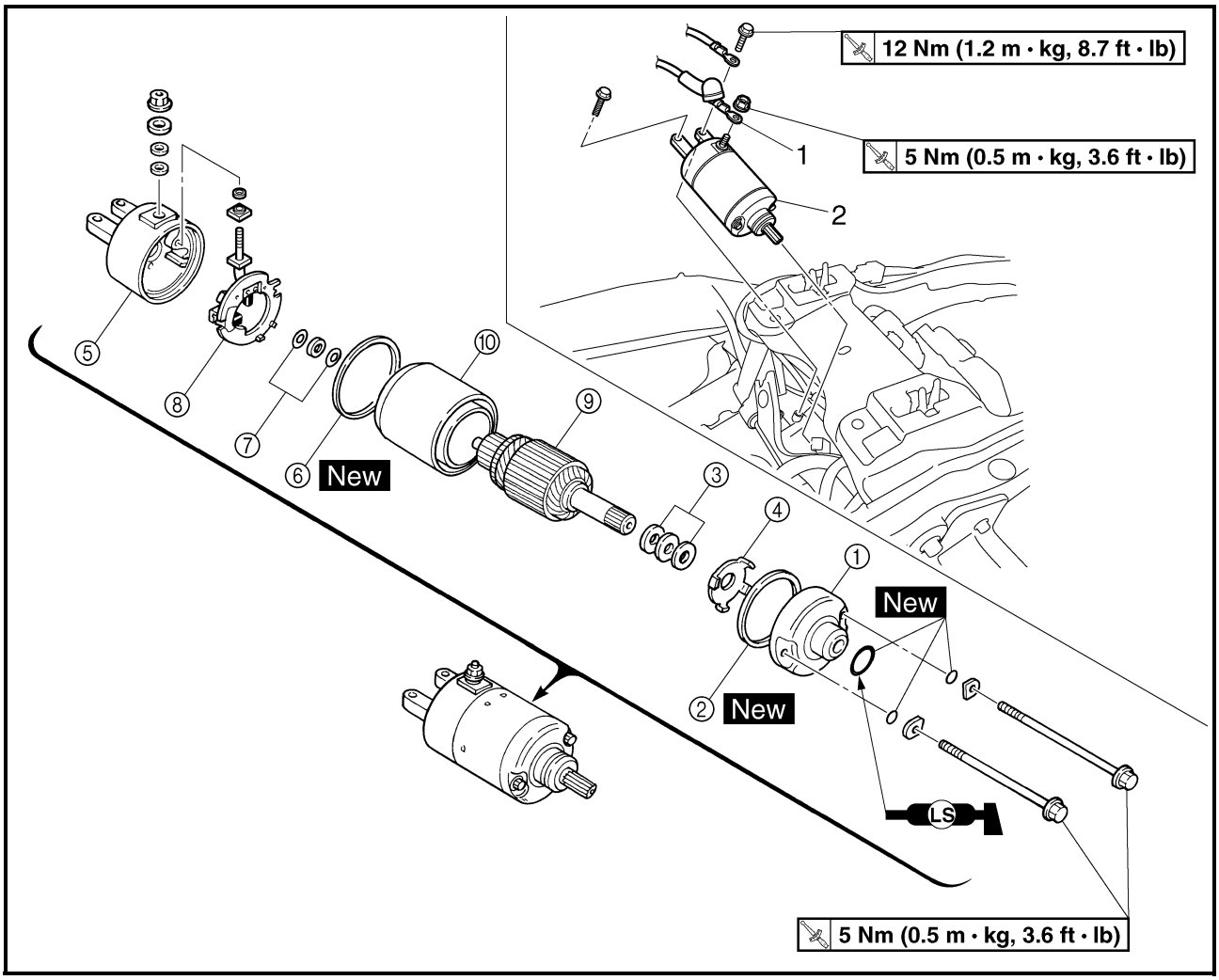
11.Wiring
- Check the entire starting system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the starting system’s wiring properly connected and without defects?

YES ⇩ NO ⇩

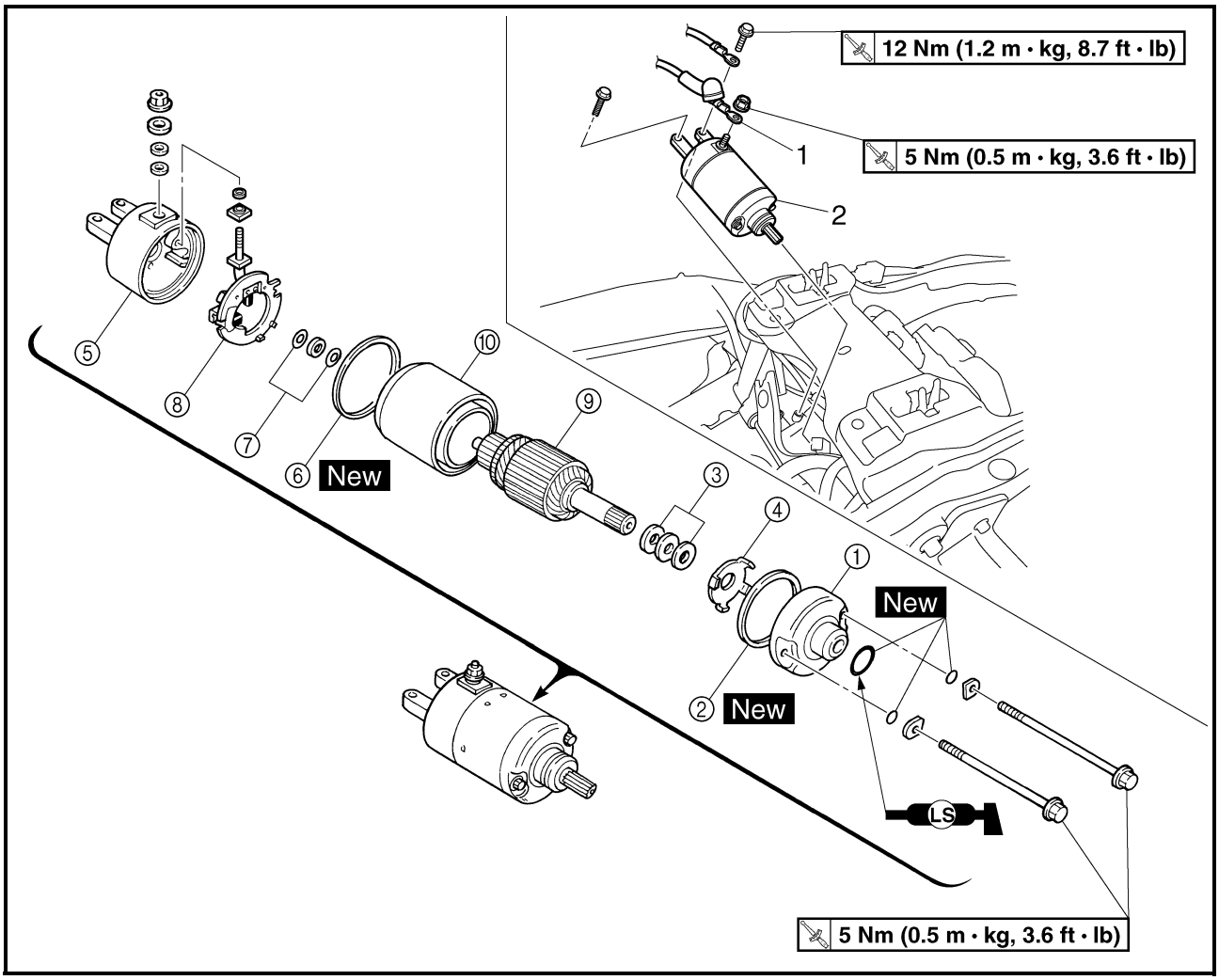
The starting system circuit is OK.

Properly connect or repair the starting system’s wiring.

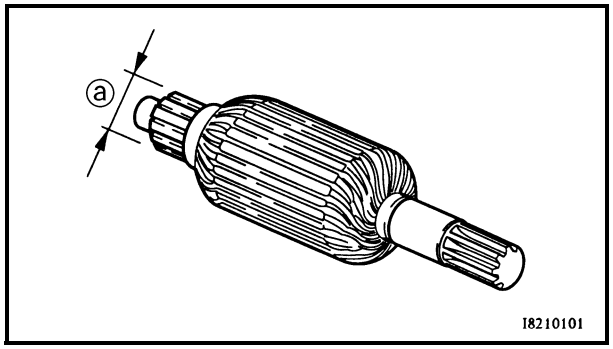
EAS00767
STARTER MOTOR

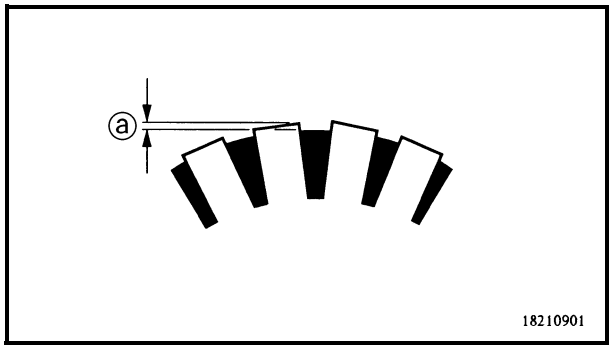


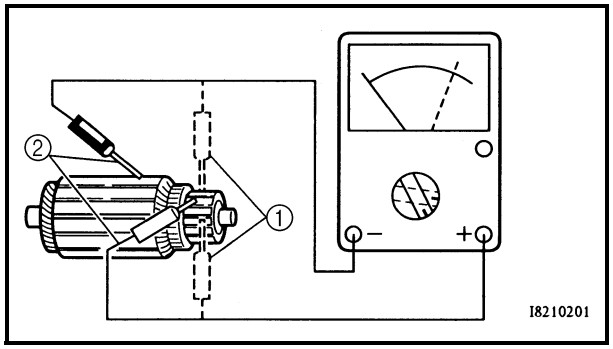
Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
	Throttle body		Refer to "THROTTLE BODY AND FUEL INJECTOR" in chapter 7.
1	Starter motor lead	1	
2	Starter motor	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Remove the parts in the order listed.
①	Front bracket	1	
②	O-ring	1	
③	Shim	1	
④	Lock washer	1	
⑤	Rear bracket	1	Refer to "ASSEMBLING THE STARTER MOTOR".
⑥	O-ring	1	
⑦	Shim	1	
⑧	Brush holder set	1	
⑨	Armature assembly	1	
⑩	Starter motor yoke	1	
			For assembly, reverse the disassembly procedure.







EAS00770
CHECKING THE STARTER MOTOR

1. Check:
   • commutator
   Dirt → Clean with 600 grit sandpaper.
2. Measure:
   • commutator diameter ⓐ
   Out of specification → Replace the starter motor.

Commutator wear limit
27 mm (1.06 in)

3. Measure:
   • mica undercut ⓐ
   Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut
0.7 mm (0.028 in)

NOTE:
The mica of the commutator must be undercut to ensure proper operation of the commutator.

4. Measure:
   • armature assembly resistances (commutator and insulation)
   Out of specification → Replace the starter motor.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

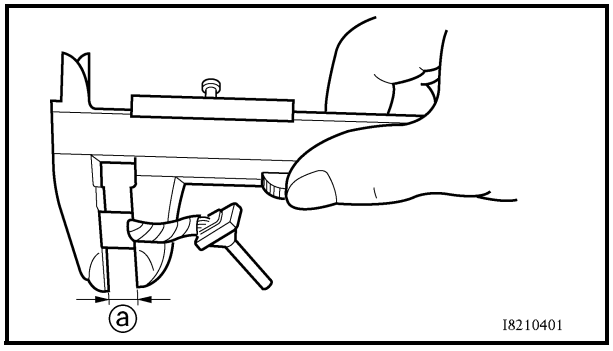
a. Measure the armature assembly resistances with the pocket tester.

Pocket tester
90890-03112, YU-03112-C

Armature coil
Commutator resistance ①
0.0012 ~ 0.0022 Ω at 20 °C (68 °F)
Insulation resistance ②
Above 1 MΩ at 20 °C (68 °F)

b. If any resistance is out of specification, replace the starter motor.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



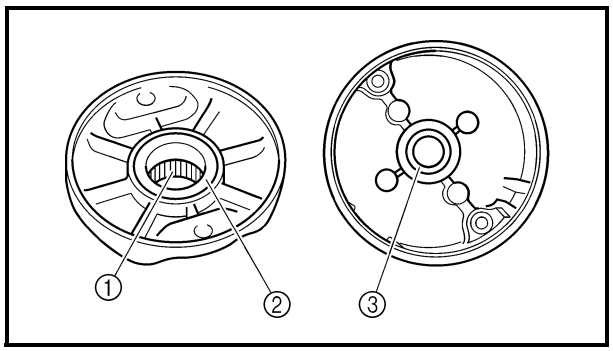
5. Measure:
   • brush length ⓐ
   Out of specification → Replace the brushes as a set.

Brush length wear limit
4.0 mm (0.16 in)

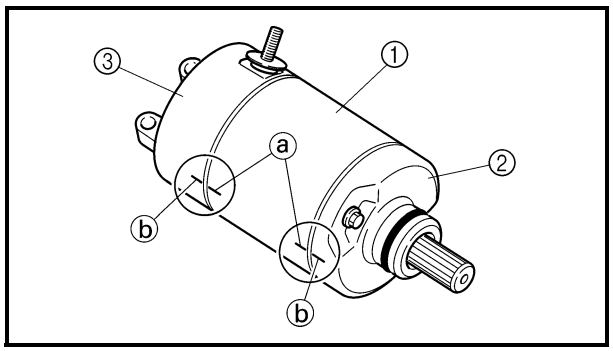
6. Measure:
   • brush spring force
   Out of specification → Replace the brush springs as a set.

Brush spring force
7.65 ~ 10.01 N
(780 ~ 1,021 gf, 27.54 ~ 36.03 oz)

7. Check:
   • gear teeth
   Damage/wear → Replace the gear.



8. Check:
   • bearing ①
   • oil seal ②
   • bushing ③
   Damage/wear → Replace the defective part(s).



EAS00772
ASSEMBLING THE STARTER MOTOR

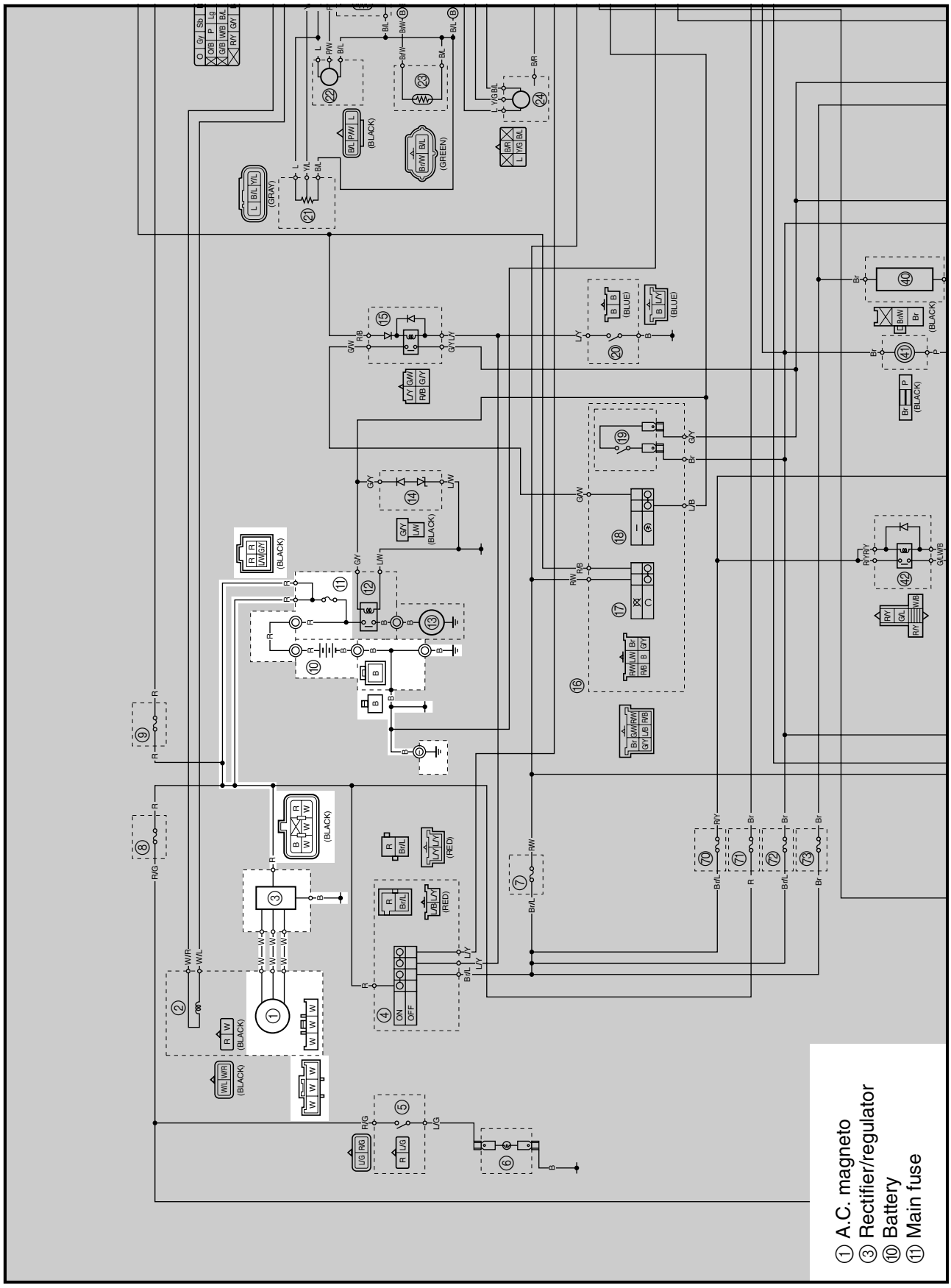
1. Install:
   • starter motor yoke ①
   • front bracket ②
   • rear bracket ③

NOTE:
Align the match marks ⓐ on the starter motor yoke with the match marks ⓑ on the front and rear brackets.

EAS00773

CHARGING SYSTEM

CIRCUIT DIAGRAM



EAS00774
TROUBLESHOOTING

The battery is not being charged.

Check:
1. main fuse
2. battery
3. charging voltage
4. stator coil resistance
5. wiring connections
   (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. footrest board (left)

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-03112-C

EAS00738

1. Main fuse

- Check the main fuse for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?

YES

NO

Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES

NO

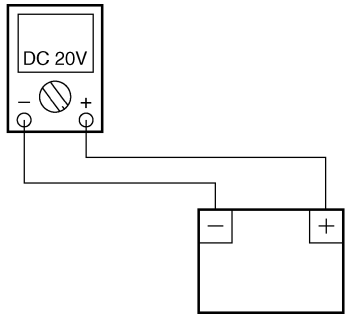
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00775

3. Charging voltage

- Connect the pocket tester (DC 20 V) to the battery as shown.

Positive tester probe →
positive battery terminal
Negative tester probe →
negative battery terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.

Charging voltage
14 V at 5,000 r/min

NOTE:
Make sure the battery is fully charged.

- Is the charging voltage within specification?

NO

YES

The charging circuit is OK.

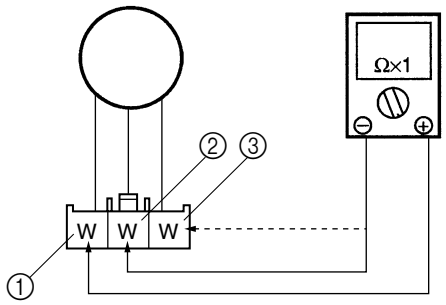
EAS00776

4. Stator coil resistance

- Disconnect the stator coil coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the stator coil as shown.

Positive tester probe → white ①
Negative tester probe → white ②

Positive tester probe → white ①
Negative tester probe → white ③



- Measure the stator coil resistances.

Stator coil resistance
0.184 ~ 0.276 Ω at 20 °C (68 °F)

- Is the stator coil OK?

YES

NO

Replace the crankshaft position sensor/ stator assembly.

EAS00779

5. Wiring

- Check the wiring connections of the entire charging system.
  Refer to “CIRCUIT DIAGRAM”.
- Is the charging system’s wiring properly connected and without defects?

YES

NO

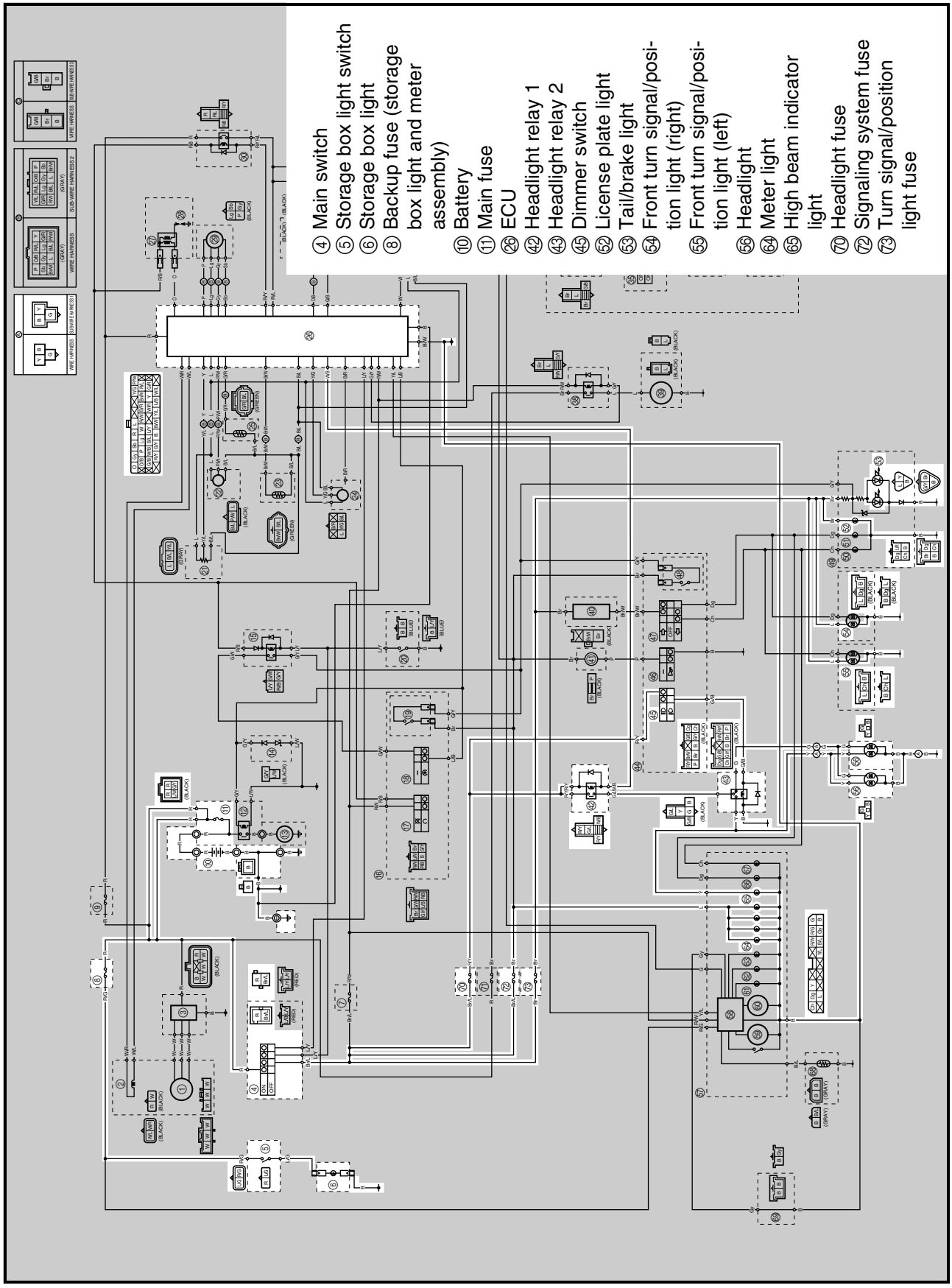
Replace the rectifier/ regulator.

Properly connect or repair the charging system’s wiring.

EAS00780

LIGHTING SYSTEM

CIRCUIT DIAGRAM



EAS00781
TROUBLESHOOTING

Any of the following fail to light: headlights, high beam indicator light, tail/brake light, license plate light, front turn signal/position light, storage box light or meter light.

Check:
1. main, headlight, signaling system, turn signal/position light, and backup fuses
2. battery
3. main switch
4. dimmer switch
5. storage box light switch
6. headlight relay 1
7. headlight relay 2
8. wiring connections (of the entire lighting system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. storage box
2. front cowling
3. meter assembly

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-03112-C

EAS00738

1. Main, headlight, signaling system, turn signal/position light, and backup fuses

- Check the main, headlight, signaling system, turn signal/position light, and backup fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, headlight, signaling system, turn signal/position light, and backup fuses OK?

YES → NO

Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES → NO

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO

Replace the main switch.

EAS00784

4. Dimmer switch

- Check the dimmer switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?

YES → NO

The dimmer switch is faulty. Replace the left handlebar switch.

5. Storage box light switch

- Check the storage box light switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the storage box light switch OK?

YES

NO

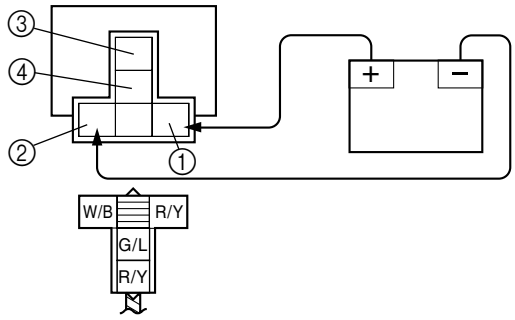
The storage box light switch is faulty. Replace the storage box light switch.

6. Headlight relay 1

- Remove the headlight relay 1.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the headlight relay 1 terminals as shown.
- Check the headlight relay 1 for continuity.

Positive battery terminal → red/yellow ①
Negative battery terminal → white/black ②

Positive tester probe → red/yellow ③
Negative tester probe → green/blue ④



- Does the headlight relay 1 have continuity between red/yellow and green/blue?

YES

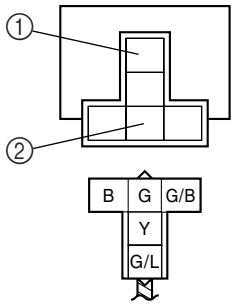
NO

Replace the headlight relay 1.

7. Headlight relay 2

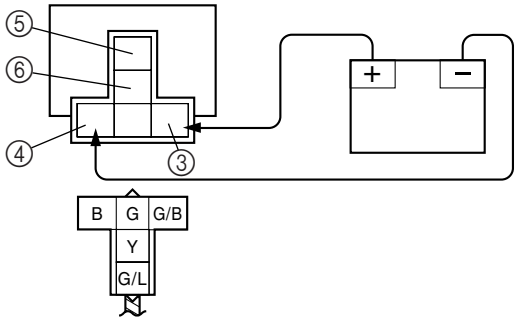
- Remove the headlight relay 2.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the headlight relay 2 terminal as shown.
- Check the headlight relay 2 for continuity.

Positive tester probe → green/blue ①
Negative tester probe → green ②



Positive battery terminal → green/black ③
Negative battery terminal → black ④

Positive tester probe → green/blue ⑤
Negative tester probe → yellow ⑥



- Does the headlight relay 2 have continuity between green/blue and green or yellow?

YES

NO

Replace the headlight relay 2.

EAS00787

8. Wiring
- Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?

YES → Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".

NO → Properly connect or repair the lighting system's wiring.

EAS00788

CHECKING THE LIGHTING SYSTEM

1. The headlights and the high beam indicator light fail to come on.

1. Headlight bulb and socket
- Check the headlight bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the headlight bulb and socket OK?

YES → 2. High beam indicator light bulb and socket

NO → Replace the headlight bulb, socket or both.

2. High beam indicator light bulb and socket
- Check the high beam indicator light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Is the high beam indicator light bulb and socket OK?

YES → Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".

NO → Replace the high beam indicator light bulb, socket or both.

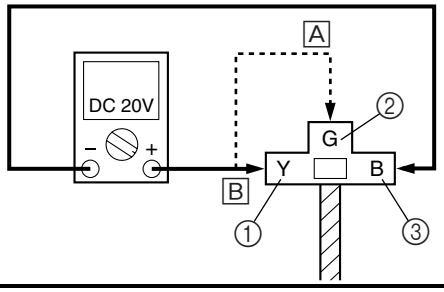
3. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and meter assembly couplers as shown.

A When the dimmer switch is set to "≣D"
B When the dimmer switch is set to "≣D"

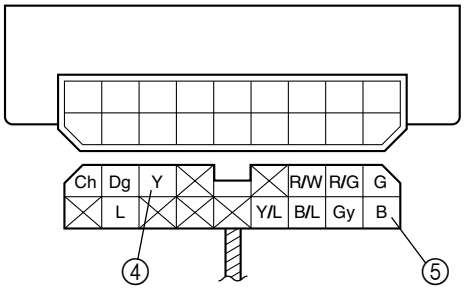
Headlight
Positive tester probe →
yellow ① or green ②
Negative tester probe → black ③

Headlight coupler



High beam indicator light
Positive tester probe → yellow ④
Negative tester probe → black ⑤

Meter assembly coupler



- Set the main switch to "ON".
- Start the engine.
- Set the dimmer switch to "≣D" or "≣D".
- Measure the voltage (DC 12 V) of yellow ① (green ②) on the headlight coupler and yellow ④ on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the headlight coupler or meter assembly coupler is faulty and must be repaired.

EAS00789
2. The meter light fails to come on.

1. Meter light bulb and socket

- Check the meter light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the meter light bulb and socket OK?

YES

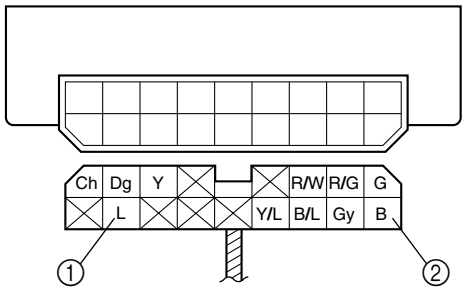
NO

Replace the meter light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EAS00790

3. The tail/brake light fails to come on.

1. Tail/brake light LEDs

- Check the tail/brake light LEDs.
- Are the tail/brake light LEDs OK?

YES

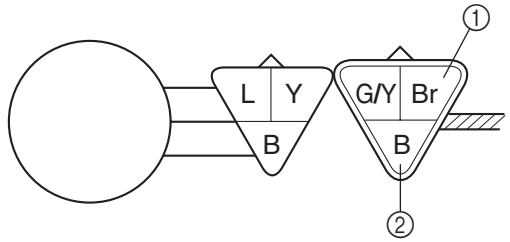
NO

Replace the tail/brake light assembly.

2. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00791

4. The front turn signal/position lights fail to come on.

1. Front turn signal/position light bulb and socket

- Check the front turn signal/position light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the front turn signal/position light bulb and socket OK?

YES

NO

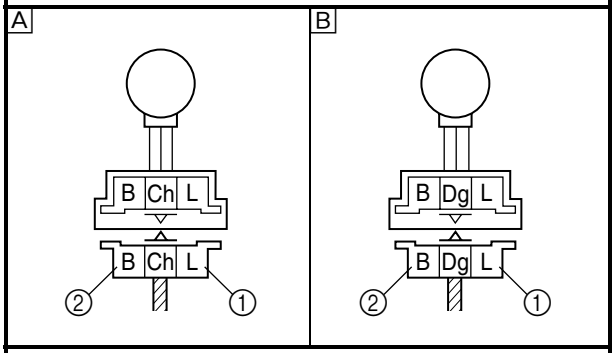
Replace the front turn signal/position light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the front turn signal/position light coupler (wire harness side) as shown.

A Front turn signal/position light (left)
B Front turn signal/position light (right)

Positive tester probe → blue ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ① on the front turn signal/position light coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the front turn signal/position light coupler is faulty and must be repaired.

EAS00792

5. The license plate light fails to come on.

1. License plate light bulb and socket

- Check the license plate light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the license plate light bulb and socket OK?

YES

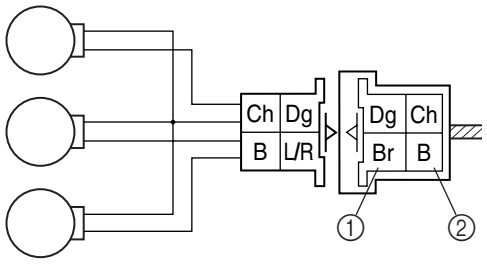
NO

Replace the license plate light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the rear turn signal/license plate light coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown ① on the rear turn signal/license plate light coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the rear turn signal/license plate light coupler is faulty and must be repaired.

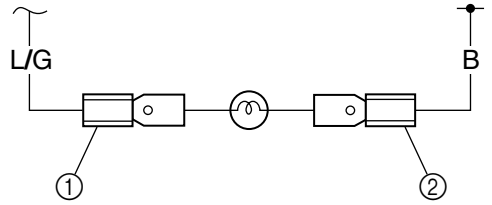
EAS00792
6. The storage box light fails to come on.

1. Storage box light bulb and socket
• Check the storage box light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”. • Are the storage box light bulb and socket OK?

YES

NO

Replace the storage box light bulb, socket or both.

2. Voltage
• Connect the pocket tester (DC 20 V) to the storage box light connectors (wire harness side) as shown.
Positive tester probe → blue/green ① **Negative tester probe → black ②**

• Set the main switch to “ON”. • Measure the voltage (DC 12 V) of blue/green ① on the storage box light connector (wire harness side). • Is the voltage within specification?

YES

NO

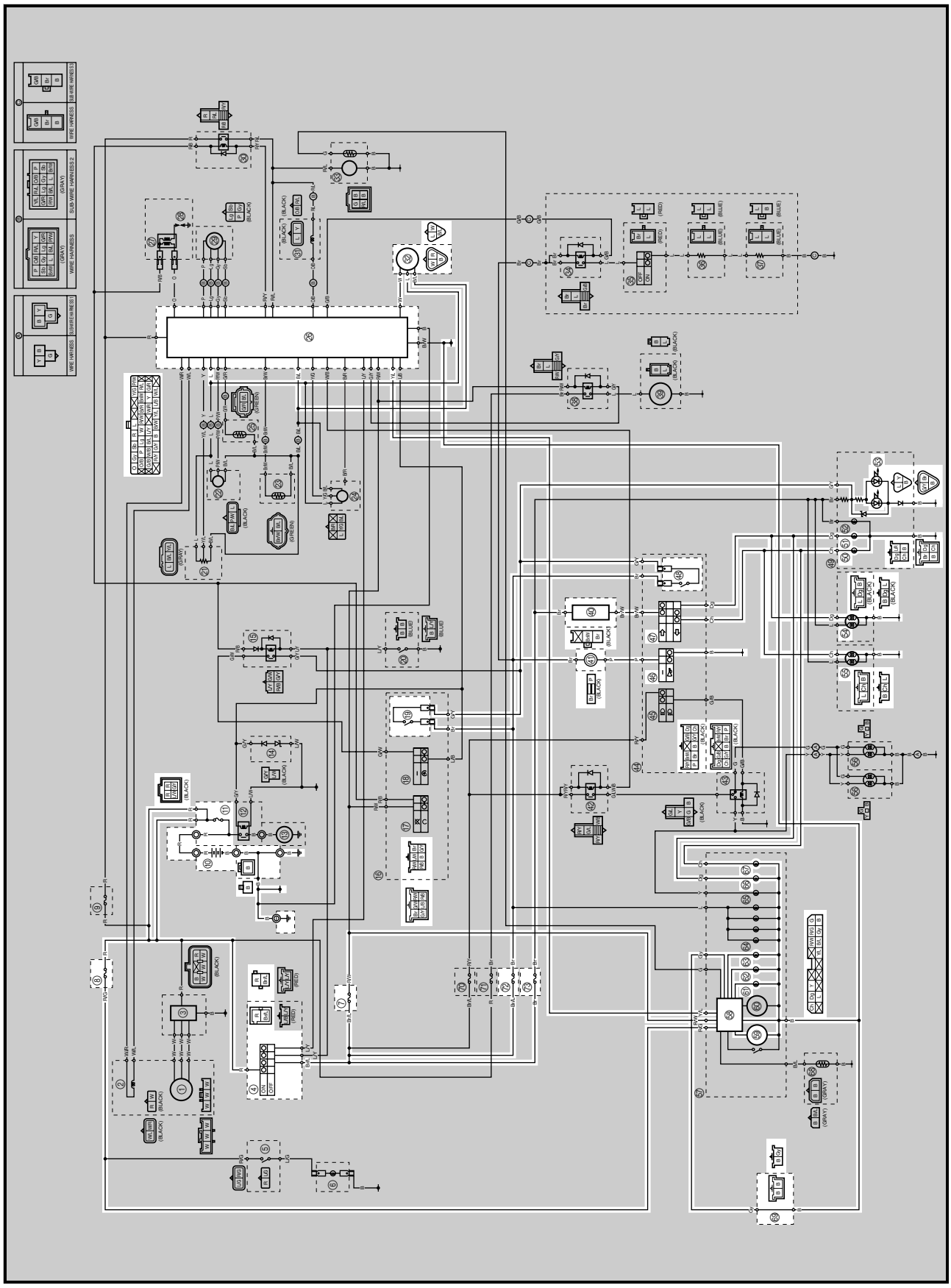
This circuit is OK.

The wiring circuit from the main switch to the storage box light connector is faulty and must be repaired.

EAS00793

SIGNALING SYSTEM

CIRCUIT DIAGRAM



④ Main switch
⑦ Ignition fuse
⑧ Backup fuse (storage box light and meter assembly)
⑩ Battery
⑪ Main fuse
⑲ Front brake light switch
㉖ ECU
㉜ Speed sensor
㊵ Turn signal relay
㊶ Horn
㊻ Horn switch
㊼ Turn signal switch
㊽ Rear brake light switch
㊿ Rear turn signal light (left)
(51) Rear turn signal light (right)
(53) Tail/brake light
(54) Front turn signal/position light (right)
(55) Front turn signal/position light (left)
(58) Multifunction meter
(59) Speedometer
(61) Engine oil change indicator
(62) V-belt replacement indicator
(63) Engine trouble warning light
(66) Right turn signal indicator light
(67) Left turn signal indicator light
(69) V-belt replacement indicator reset coupler
(72) Signaling system fuse
(73) Turn signal/position light fuse

EAS00794
TROUBLESHOOTING

- **Any of the following fail to light: turn signal light, brake light or an indicator light.**
- **The horn fails to sound.**

Check:
1. main, ignition, signaling system, turn signal/position light, and backup fuses
2. battery
3. main switch
4. wiring connections
   (of the entire signaling system)

NOTE:
- Before troubleshooting, remove the following part(s):
1. storage box
2. front cowling
3. meter assembly
- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-03112-C

EAS00738

1. Main, ignition, signaling system, turn signal/position light, and backup fuses

- Check the main, ignition, signaling system, turn signal/position light, and backup fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, ignition, signaling system, turn signal/position light, and backup fuses OK?

YES

NO → Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES

NO → Replace the main switch.

EAS00795

4. Wiring

- Check the entire signal system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

YES → Check the condition of each of the signaling system's circuits. Refer to "CHECKING THE SIGNALING SYSTEM".

NO → Properly connect or repair the signaling system's wiring.

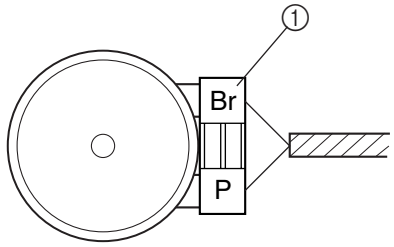
EAS00796
CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

1. Horn switch
• Check the horn switch for continuity. Refer to “CHECKING THE SWITCHES”. • Is the horn switch OK?

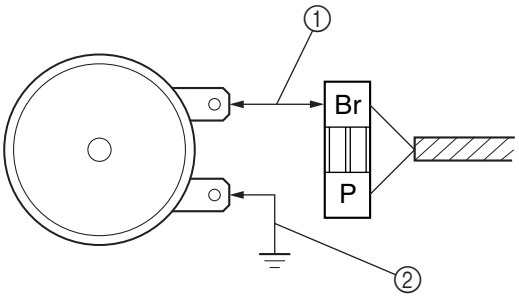
YES ⇩ NO ⇩

Replace the left handlebar switch.

2. Voltage
• Connect the pocket tester (DC 20 V) to the horn coupler as shown.
Positive tester probe → brown ① **Negative tester probe → ground**

• Set the main switch to “ON”. • Measure the voltage (DC 12 V) of brown at the horn coupler. • Is the voltage within specification?

YES ⇩ NO ⇩

The wiring circuit from the main switch to the horn coupler is faulty and must be repaired.

3. Horn
• Disconnect the horn coupler at the horn. • Connect a jumper lead ① to the brown terminal in the horn coupler and the horn terminal. • Connect a jumper lead ② to the horn terminal and ground. • Set the main switch to “ON”. • Does the horn sound?


NO ⇩ YES ⇩

The wiring circuit from the horn coupler to the horn switch coupler and/or horn switch to ground are faulty and must be repaired.

The horn is OK.

EAS00798

2. The tail/brake light fails to come on.

1. Tail/brake light LEDs
• Check the tail/brake light LEDs. • Are the tail/brake light LEDs OK?

YES ⇩ NO ⇩

Replace the tail/brake light assembly.

2. Brake light switches

- Check the brake light switches for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the brake light switch OK?

YES

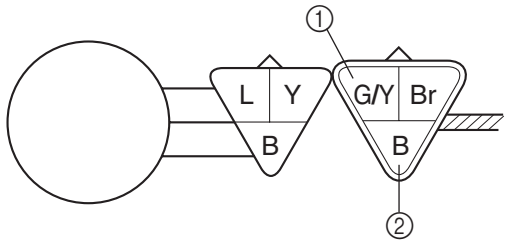
NO

Replace the brake light switch(s).

3. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → green/yellow ①
Negative tester probe → black ②



- Set the main switch to “ON”.
- Pull in the brake levers.
- Measure the voltage (DC 12 V) of green/yellow ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES

NO

This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00799

3. The turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal light bulb and socket

- Check the turn signal light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the turn signal light bulb and socket OK?

YES

NO

Replace the turn signal light bulb, socket or both.

2. Turn signal indicator light bulb and socket

- Check the turn signal indicator light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the turn signal indicator light bulb and socket OK?

YES

NO

Replace the turn signal indicator light bulb, socket or both.

3. Turn signal switch

- Check the turn signal switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the turn signal switch OK?

YES

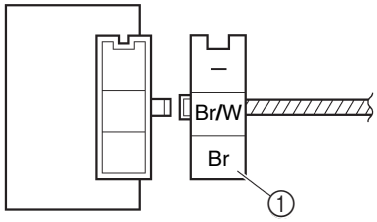
NO

Replace the left handlebar switch.

4. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → ground



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

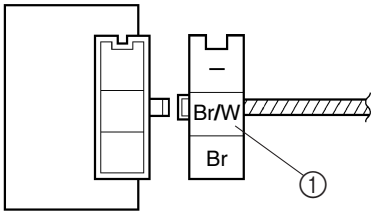
NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown/white ①
Negative tester probe → ground



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

NO

The turn signal relay is faulty and must be replaced.

6. Voltage

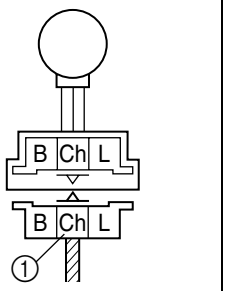
- Connect the pocket tester (DC 20 V) to the front turn signal/position light coupler, rear turn signal/license plate light coupler or meter assembly coupler (wire harness side) as shown.

A Front turn signal/position light (left)
B Front turn signal/position light (right)
C Rear turn signal/license plate light
D Meter assembly

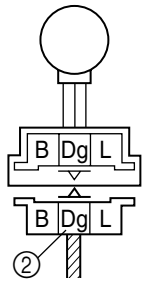
Left turn signal light
Positive tester probe → chocolate ①
Negative tester probe → ground

Right turn signal light
Positive tester probe → dark green ②
Negative tester probe → ground

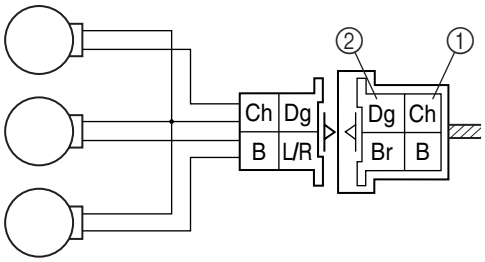
A



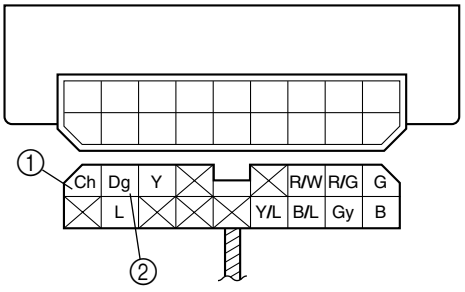
B



C



D



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (DC 12 V) of the chocolate ① or dark green ② at the front turn signal/position light coupler, rear turn signal/license plate light coupler or meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the turn signal switch to the front turn signal/position light coupler, rear turn signal/license plate light coupler or meter assembly coupler is faulty and must be repaired.

4. The V-belt replacement indicator fails to come on.

1. V-belt replacement indicator bulb and socket

- Check the V-belt replacement indicator bulb and socket for continuity.
- Are the V-belt replacement indicator bulb and socket OK?

YES

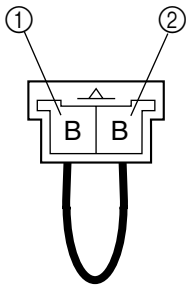
NO

Replace the V-belt replacement indicator bulb, socket or both.

2. V-belt replacement indicator reset coupler

- Connect the pocket tester (Ω × 1) to the V-belt replacement indicator reset coupler as shown.
- Check the V-belt replacement indicator reset coupler for continuity.

Positive tester probe → black ①
Negative tester probe → black ②



- Is the V-belt replacement indicator reset coupler OK?

YES

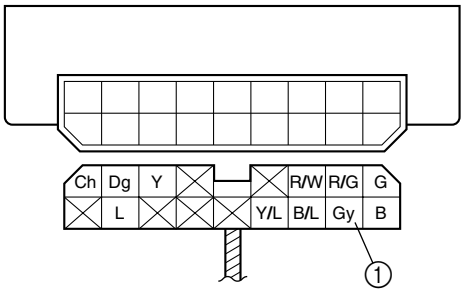
NO

Replace the V-belt replacement indicator reset coupler.

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → gray ①
Negative tester probe → ground



- Set the main switch to "ON".
- Measure the voltage (12 V) of gray ① at the meter assembly coupler.
- Is the voltage within specification?

YES

NO

Replace the meter assembly.

The wiring circuit from the V-belt replacement indicator reset coupler to the meter assembly coupler (wire harness side) is faulty and must be repaired.

EAS00803
5. The engine oil change indicator fails to come on.

1. Engine oil change indicator bulb and socket
- Check the engine oil change indicator bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the engine oil change indicator bulb and socket OK?

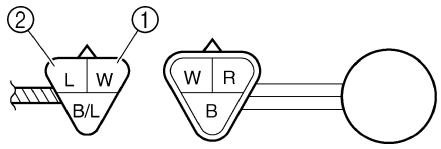
YES → Replace the meter assembly.

NO → Replace the engine oil change indicator bulb, socket or both.

EAS00806
6. The speedometer fails to operate.

1. Speed sensor
- Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.

Positive tester probe → **white** ①
Negative tester probe → **blue** ②



- Set the main switch to "ON".
- Elevate the front wheel and slowly rotate it.
- Measure the voltage (DC 5 V) of white and blue. With each full rotation of the front wheel, the voltage reading should cycle from 0.6 V to 4.8 V to 0.6 V to 4.8 V.
- Does the voltage reading cycle correctly?

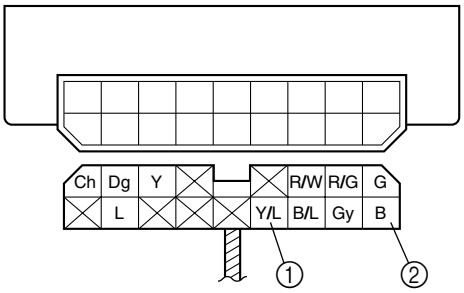
YES

NO → Replace the speed sensor.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → yellow/blue ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of yellow/blue ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

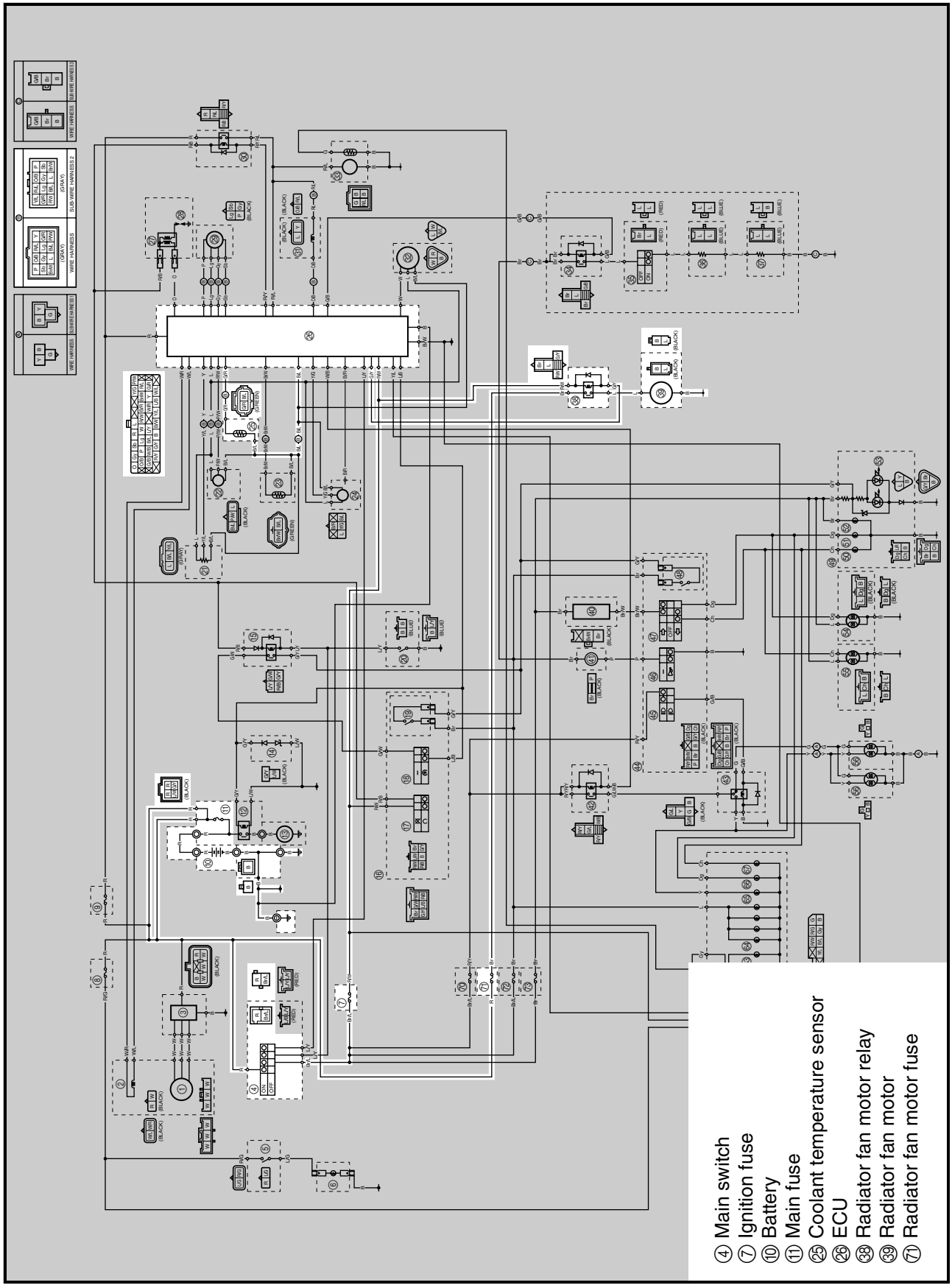
YES → This circuit is OK.

NO → Replace the meter assembly.

EAS00807

COOLING SYSTEM

CIRCUIT DIAGRAM



EAS00808
TROUBLESHOOTING

- **The radiator fan motor fails to turn.**
- **The coolant temperature meter (meter assembly) fails to indicate.**

Check:
1. main, ignition, and radiator fan motor fuses
2. battery
3. main switch
4. radiator fan motor
5. radiator fan motor relay
6. coolant temperature sensor
7. wiring connections
   (the entire cooling system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. storage box
2. front cowling
3. radiator cover

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-03112-C

EAS00738

1. Main, ignition, and radiator fan motor fuses

- Check the main, ignition, and radiator fan motor fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, ignition, and radiator fan motor fuses OK?

YES

NO → Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES

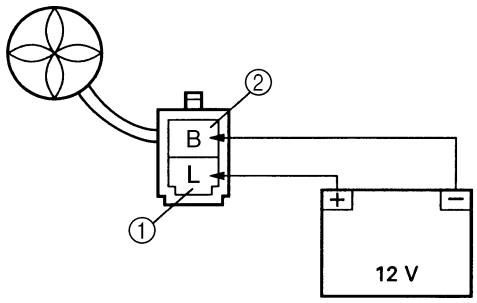
NO → Replace the main switch.

EAS00809

4. Radiator fan motor

- Disconnect the radiator fan motor coupler from the wire harness.
- Connect the battery (DC 12 V) as shown.

Positive battery lead → blue ①
Negative battery lead → black ②



- Does the radiator fan motor turn?

YES

NO

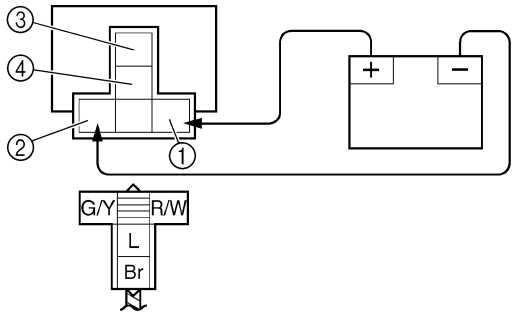
The radiator fan motor is faulty and must be replaced.

5. Radiator fan motor relay

- Remove the radiator fan motor relay.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the radiator fan motor terminal as shown.
- Check the radiator fan motor relay of continuity.

Positive battery terminal → red/white ①
Negative battery terminal → green/yellow ②

Positive tester probe → brown ③
Negative tester probe → blue ④



- Does the radiator fan motor relay have continuity between brown and blue?

YES

NO

Replace the radiator fan motor relay.

EAS00812

6. Coolant temperature sensor

- Remove the coolant temperature sensor.
- Connect the pocket tester (Ω × 1k) to the coolant temperature sensor ① as shown.
- Immerse the coolant temperature sensor in a container filled with coolant ②.

NOTE:
Make sure the coolant temperature sensor terminals do not get wet.

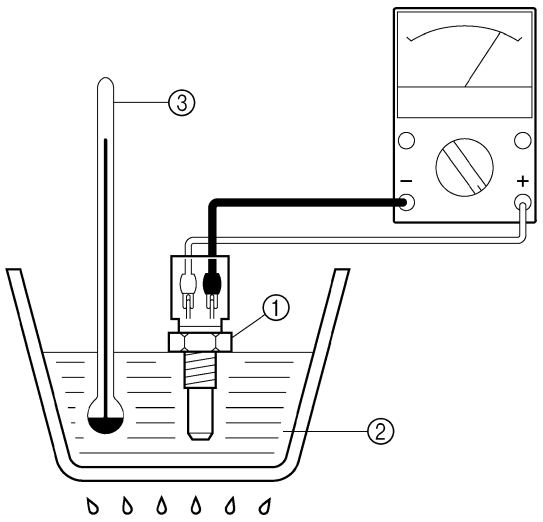
- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.
- Check the coolant temperature sensor for continuity at the temperatures indicated below.

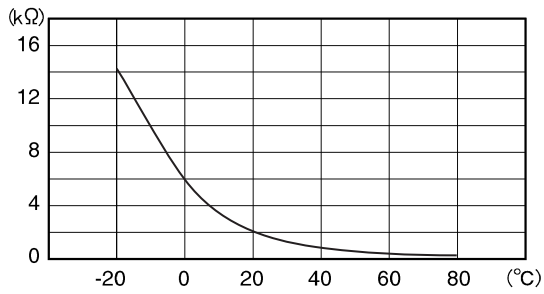
Coolant temperature sensor resistance
20 °C (68 °F): 2.32 ~ 2.59 kΩ
80 °C (176 °F): 0.310 ~ 0.326 kΩ
110 °C (230 °F): 0.140 ~ 0.144 kΩ

⚠ WARNING

- **Handle the coolant temperature sensor with special care.**
- **Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.**

Coolant temperature sensor
18 Nm (1.8 m · kg, 13 ft · lb)





- Does the coolant temperature sensor operate properly?

YES → NO

Replace the coolant temperature sensor.

EAS00813

7. Wiring

- Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the cooling system's wiring properly connected and without defects?

YES → This circuit is OK.

NO → Properly connect or repair the cooling system's wiring.

EAS00845

TROUBLESHOOTING

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING FAILURE/HARD STARTING

ENGINE

Cylinder and cylinder head

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Piston and piston ring(s)

- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter

- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft

- Improperly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank

- Empty fuel tank
- Clogged fuel tank cap breather hole
- Deteriorated or contaminated fuel
- Clogged or damaged fuel hose

Fuel pump

- Faulty fuel pump
- Faulty fuel injection system relay
- Improperly routed hose

Throttle body

- Deteriorated or contaminated fuel
- Sucked-in air

ELECTRICAL SYSTEMS

Battery
- Discharged battery
- Faulty battery

Fuse(s)
- Blown, damaged or incorrect fuse
- Improperly installed fuse

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil
- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system
- Faulty ECU
- Faulty crankshaft position sensor
- Broken generator rotor woodruff key

Switches and wiring
- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty front, rear or both brake light switches
- Faulty start switch
- Faulty sidestand switch
- Improperly grounded circuit
- Loose connections

Starting system
- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

EAS00847
INCORRECT ENGINE IDLING SPEED

ENGINE

Cylinder and cylinder head
- Incorrect valve clearance
- Damaged valve train components

Air filter
- Clogged air filter element

FUEL SYSTEM

Throttle body
- Damaged or loose throttle body joint
- Improper throttle cable free play
- Flooded throttle body
- Faulty air induction system

ELECTRICAL SYSTEMS

Battery
- Discharged battery
- Faulty battery

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil
- Faulty spark plug lead

Ignition system
- Faulty ECU
- Faulty crankshaft position sensor

EAS00848
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURE/HARD STARTING”.

ENGINE

Air filter
- Clogged air filter element

FUEL SYSTEM

Throttle body
- Faulty diaphragm

Fuel pump
- Faulty fuel pump

EAS00853
FAULTY CLUTCH

ENGINE OPERATES BUT SCOOTER WILL NOT MOVE

V-belt
- Bent, damaged or worn V-belt
- Slipping V-belt

Primary pulley cam and primary pulley slider(s)
- Damaged or worn primary pulley cam
- Damaged or worn primary pulley slider

Transmission gear(s)
- Damaged transmission gear

CLUTCH SLIPS

Clutch shoe spring(s)
- Damaged, loose or worn clutch shoe spring

Clutch shoe
- Damaged or worn clutch shoe

Primary sliding sheave
- Seized primary sliding sheave

POOR STARTING PERFORMANCE

V-belt
- V-belt slips
- Oil or grease on the V-belt

Primary sliding sheave
- Worn primary sliding sheave

Clutch shoe
- Bent, damaged or worn clutch shoe

POOR SPEED PERFORMANCE

V-belt
- Oil or grease on the V-belt

Primary pulley weight(s)
- Faulty operation
- Worn primary pulley weight

Primary fixed sheave
- Worn primary fixed sheave

Primary sliding sheave
- Worn primary sliding sheave

Secondary fixed sheave
- Worn secondary fixed sheave

Secondary sliding sheave
- Worn secondary sliding sheave

EAS00855
OVERHEATING

ENGINE

Clogged coolant passages
- Cylinder head and piston
- Heavy carbon buildup

Engine oil
- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

COOLING SYSTEM

Coolant
- Low coolant level

Radiator
- Damaged or leaking radiator
- Faulty radiator cap
- Bent or damaged radiator fin

Water pump
- Damaged or faulty water pump
- Thermostat
- Thermostat stays closed
- Oil cooler
- Hose(s) and pipe(s)
- Damaged hose
- Improperly connected hose
- Damaged pipe
- Improperly connected pipe

FUEL SYSTEM

Throttle body
- Damaged or loose throttle body joint

Air filter
- Clogged air filter element

CHASSIS

Brake(s)
- Dragging brake

ELECTRICAL SYSTEMS

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system
- Faulty radiator fan motor relay
- Faulty coolant temperature sensor
- Faulty ECU

EAS00856
OVERCOOLING

COOLING SYSTEM

Thermostat
- Thermostat stays open

EAS00857
POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS00861
FAULTY FRONT FORK LEGS

LEAKING OIL

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

MALFUNCTION

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS00862
UNSTABLE HANDLING

Handlebar

- Bent or improperly installed handlebar

Steering head components

- Improperly installed lower handlebar holder
- Improperly installed lower bracket (improperly tightened steering ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)

- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Rear shock absorber assembly(-ies)

- Faulty rear shock absorber spring
- Leaking oil

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

EAS00866

FAULTY LIGHTING OR SIGNALING SYSTEM

HEADLIGHT DOES NOT COME ON
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main switch)
- Burnt-out headlight bulb
- Faulty headlight relay (on/off)

HEADLIGHT BULB BURNT OUT
- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT COME ON
- Too many electrical accessories
- Incorrect connection

TAIL/BRAKE LIGHT BULB BURNT OUT
- Faulty battery
- Incorrectly adjusted brake light switch(s)

TURN SIGNAL DOES NOT COME ON
- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

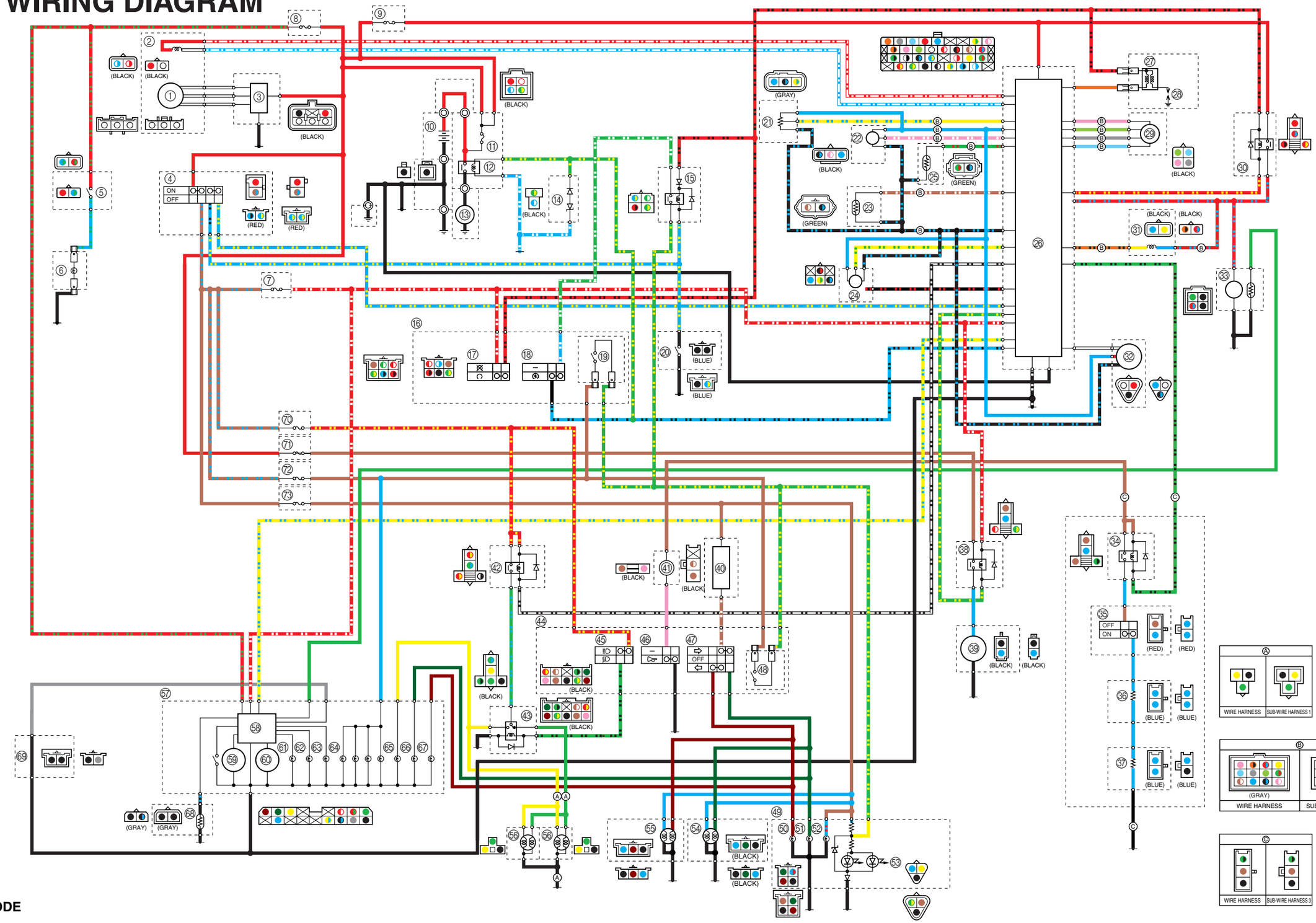
TURN SIGNAL BLINKS SLOWLY
- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

TURN SIGNAL REMAINS LIT
- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND
- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

YP400T WIRING DIAGRAM



COLOR CODE

Black	Dark green	Orange	White	Black/White	Blue/White	Green/Black	Green/Yellow	Red/Blue	White/Black	Yellow/Green
Blue	Green	Pink	Yellow	Blue/Black	Blue/Yellow	Green/Blue	Orange/Black	Red/Green	White/Blue	
Brown	Gray	Red	Black/Blue	Blue/Green	Brown/Blue	Green/Red	Pink/White	Red/White	White/Red	
Chocolate	Light green	Sky blue	Black/Red	Blue/Red	Brown/White	Green/White	Red/Black	Red/Yellow	Yellow/Blue	

YP400T WIRING DIAGRAM

① A.C. magneto
② Crankshaft position sensor
③ Rectifier/regulator
④ Main switch
⑤ Storage box light switch
⑥ Storage box light
⑦ Ignition fuse
⑧ Backup fuse (storage box light and meter assembly)
⑨ Fuel injection system fuse
⑩ Battery
⑪ Main fuse
⑫ Starter relay
⑬ Starter motor
⑭ Diode
⑮ Starting circuit cut-off relay
⑯ Right handlebar switch
⑰ Engine stop switch
⑱ Start switch
⑲ Front brake light switch
⑳ Sidestand switch
㉑ Throttle position sensor
㉒ Intake air pressure sensor
㉓ Intake air temperature sensor
㉔ Lean angle cut-off switch
㉕ Coolant temperature sensor
㉖ ECU
㉗ Ignition coil
㉘ Spark plug
㉙ ISC (idle speed control) valve
㉚ Fuel injection system relay
㉛ Fuel injector
㉜ Speed sensor
㉝ Fuel pump
㉞ Grip warmer relay (optional)
㉟ Grip warmer switch (optional)
㊱ Left grip warmer-heater (optional)
㊲ Right grip warmer-heater (optional)
㊳ Radiator fan motor relay
㊴ Radiator fan motor
㊵ Turn signal relay
㊶ Horn
㊷ Headlight relay 1
㊸ Headlight relay 2
㊹ Left handlebar switch
㊺ Dimmer switch
㊻ Horn switch
㊼ Turn signal switch
㊽ Rear brake light switch
㊾ Tail/brake light assembly
㊿ Rear turn signal light (left)
(51) Rear turn signal light (right)
(52) License plate light
(53) Tail/brake light
(54) Front turn signal/position light (right)
(55) Front turn signal/position light (left)
(56) Headlight
(57) Meter assembly
(58) Multifunction meter
(59) Speedometer
(60) Tachometer
(61) Engine oil change indicator
(62) V-belt replacement indicator
(63) Engine trouble warning light
(64) Meter light
(65) High beam indicator light
(66) Right turn signal indicator light
(67) Left turn signal indicator light
(68) Thermistor
(69) V-belt replacement indicator reset coupler
(70) Headlight fuse
(71) Radiator fan motor fuse
(72) Signaling system fuse
(73) Turn signal/position light fuse

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