



**YZF-R6R  
YZF-R6SR  
YZF-R6RC  
YZF-R6SRC**

**SERVICE MANUAL**

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**YZF-R6R/YZF-R6SR  
YZF-R6RC/YZF-R6SRC  
SERVICE MANUAL**

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## 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.

## 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!



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

### CAUTION:

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

### NOTE:

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

## 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.

②

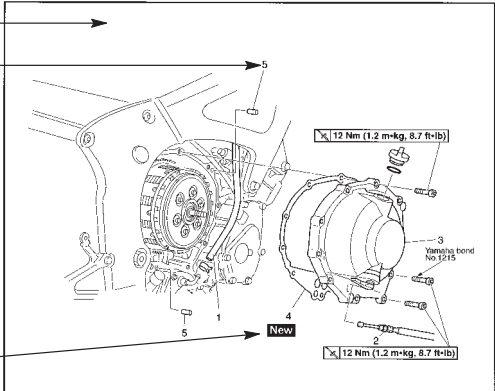
CLUTCH

①

ENG 

④


⑤



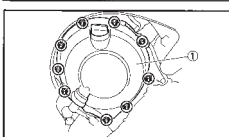
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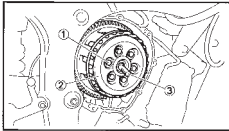
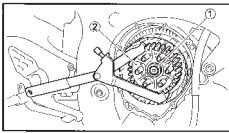
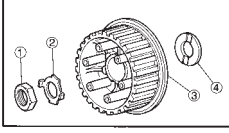
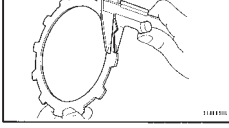
Order	Job/Part	Qty	Remarks
<b>Removing the clutch cover</b>			
	Bottom cowl		Removing the parts in the order listed.
	Right side cowl		Refer to “COWLINGS” in chapter 3.
	Engine oil		Drain.
			Refer to “CHANGING THE ENGINE OIL” in chapter 3.
	Coolant		Drain.
			Refer to “CHANGING THE COOLANT” in chapter 3.
			Disconnect.
1	Coolant hose	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	Clutch cover	1	
4	Clutch cover gasket	1	
5	Dowel pin	2	
For installation, reverse the removal procedure.			

CLUTCH 

③



⑧

③

**REMOVING THE CLUTCH**

1. Remove:

- clutch cover ①
- gasket

**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:

- compression spring bolts ①
- compression springs
- pressure plate ②
- pull rod ③
- friction plates
- clutch plates


3. Straighten the lock washer tab.

4. Loosen:

- clutch boss nut ①

**NOTE:**

While holding the clutch boss ② with the universal clutch holder, loosen the clutch boss nut.

 **Universal clutch holder**  
90890-04086, YM-91042

5. Remove:

- clutch boss nut ①
- lock washer ②
- clutch boss ③
- thrust plate ④

**CHECKING THE FRICTION PLATES**

























The following procedure applies to all of the friction plates.

1. Check:

- friction plate

Damage/wear → Replace the friction plates as a set.



① <b>GEN INFO</b> 	② <b>SPEC</b> 
③ <b>CHK ADJ</b> 	④ <b>CHAS</b> 
⑤ <b>ENG</b> 	⑥ <b>COOL</b> 
⑦ <b>FI</b> 	⑧ <b>ELEC</b> 
⑨ <b>TRBL SHTG</b> 	⑩ 
⑪ 	⑫ 
⑬ 	⑭ 
⑮ 	⑯ 
⑰ 	
⑱ 	⑲ 
	⑳ 
㉑ 	㉒ 
	㉓ 
㉔ 	㉕ <b>New</b>

## 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

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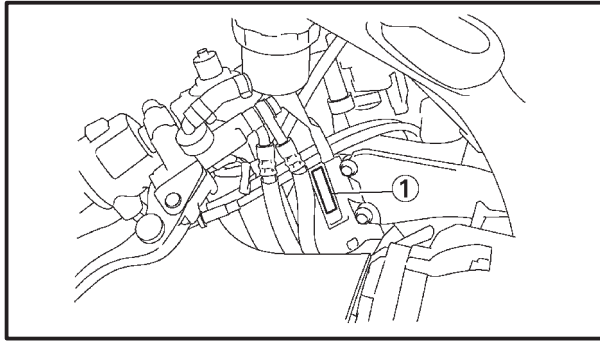
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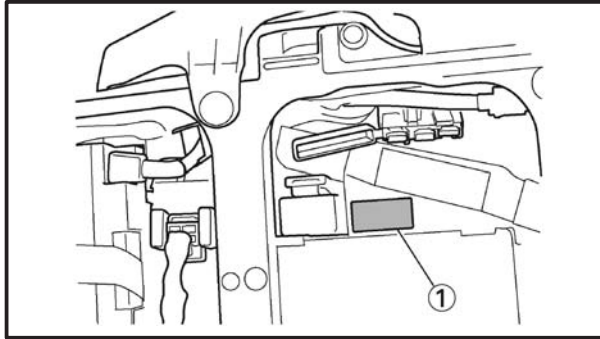
EAS00014

## GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

EAS00017

### VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the right side of the steering head pipe.



EAS00018

### MODEL LABEL

The model label ① is affixed to the frame. This information will be needed to order spare parts.

1



EAS00896

## FEATURES

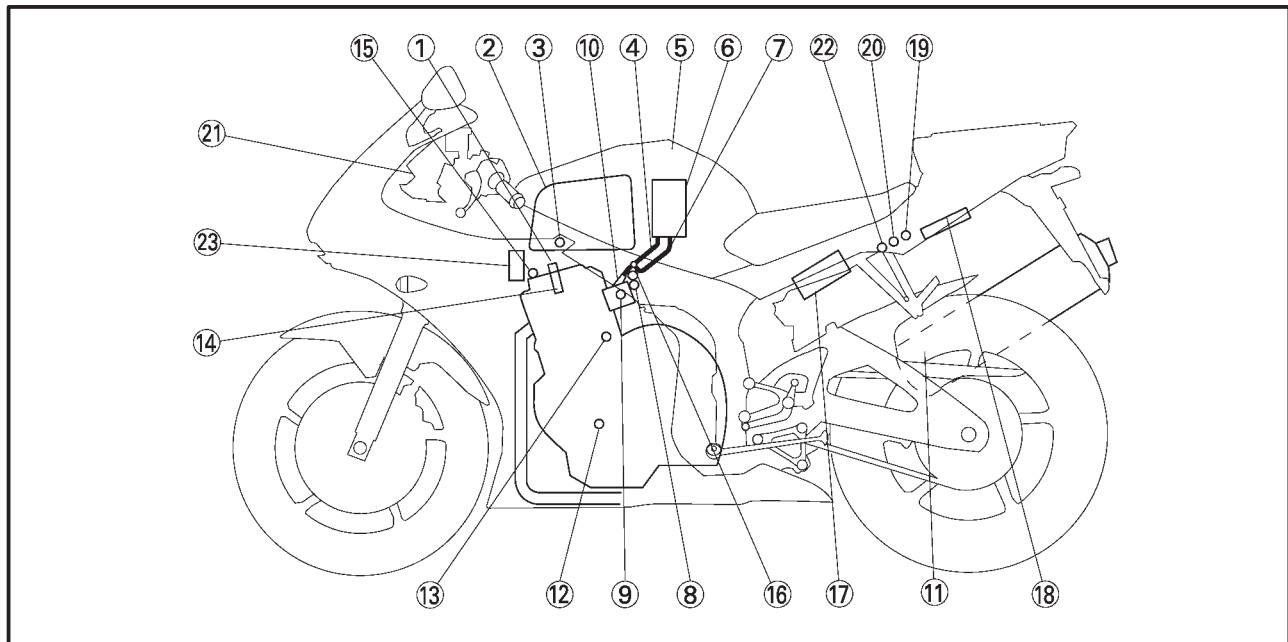
### OUTLINE OF FI SYSTEM

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 chamber.

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. Furthermore, the air induction system (AI system) has been placed under computer control together with the FI system in order to realize cleaner exhaust gases.



- |                             |                              |                                  |                                |
|-----------------------------|------------------------------|----------------------------------|--------------------------------|
| ① Ignition coil             | ⑧ Intake air pressure sensor | ⑭ Spark plug                     | ⑳ Fuel injection system relay  |
| ② Air filter case           | ⑨ Throttle position sensor   | ⑮ Cylinder identification sensor | ㉑ Engine trouble warning light |
| ③ Intake temperature sensor | ⑩ Fuel injector              | ⑯ Atmospheric pressure sensor    | ㉒ Lean angle cut-off switch    |
| ④ Fuel delivery hose        | ⑪ Catalytic converter        | ⑰ Battery                        | ㉓ Air cut-off valve            |
| ⑤ Fuel tank                 | ⑫ Crankshaft position sensor | ⑱ Pressure regulator             |                                |
| ⑥ Fuel pump                 | ⑬ Coolant temperature sensor | ㉔ ECU                            |                                |
| ⑦ Fuel return hose          |                              |                                  |                                |



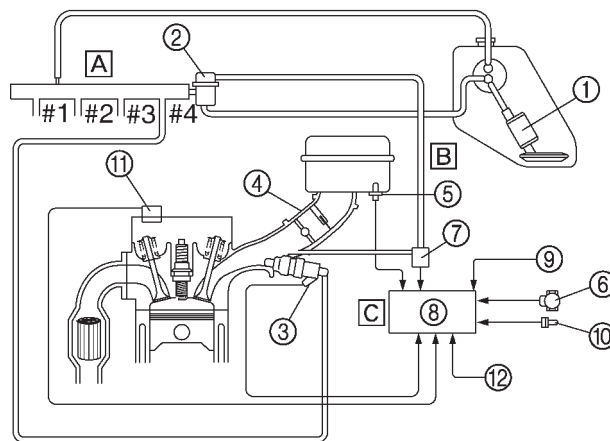
EAS00897

## FI SYSTEM

The fuel pump delivers fuel to the injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the injector at only 284 kPa (2.84 kg/cm<sup>2</sup>) higher than the intake manifold pressure. Accordingly, when the energizing signal from the ECU energizes the 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 injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the injector is energized (injection duration), the lesser the volume of fuel that is supplied.

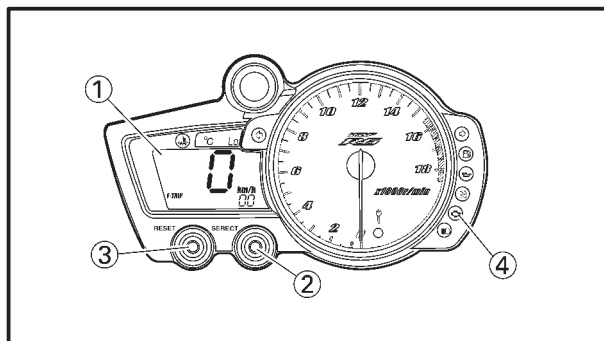
The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, atmospheric pressure sensor, intake temperature sensor and coolant temperature sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor and the cylinder identification 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                 | ⑥ Throttle position sensor    | ⑩ Coolant temperature sensor     | [A] Fuel system    |
| ② Pressure regulator        | ⑦ Intake air pressure sensor  | ⑪ Cylinder identification sensor | [B] Air system     |
| ③ Fuel injector             | ⑧ ECU                         | ⑫ Crankshaft position sensor     | [C] Control system |
| ④ Throttle body             | ⑨ Atmospheric pressure sensor |                                  |                    |
| ⑤ Intake temperature sensor |                               |                                  |                    |





- ① Multi-function display
- ② "SELECT" button
- ③ "RESET" button
- ④ Engine trouble warning light

## INSTRUMENT FUNCTION

### Multi-function display

The multi-function display is equipped with the following:

- a speedometer (which shows the riding speed)
- 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 fuel level warning light came on)
- a clock
- a self-diagnosis device
- a display brightness and engine speed warning light control mode

### NOTE:

- Be sure to turn the key to "ON" before using the "SELECT" and "RESET" buttons.
- For the U.K. only: To switch the speedometer and odometer/tripmeter display between kilometers and miles, press the "SELECT" button and "RESET" button together for at least two seconds.

### Odometer and tripmeter modes

Pushing the "SELECT" button switches the display between the odometer mode "ODO" and the tripmeter modes "TRIP 1" and "TRIP 2" in the following order:

ODO → TRIP 1 → TRIP 2 → ODO

If the fuel level warning light comes on, the odometer display will automatically change to the fuel reserve tripmeter mode "F-TRIP" 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:

F-TRIP → TRIP 1 → TRIP 2 → ODO → F-TRIP

To reset a tripmeter, select it by pushing the "SELECT" button, and then 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 (3.1 mi).

### Clock mode

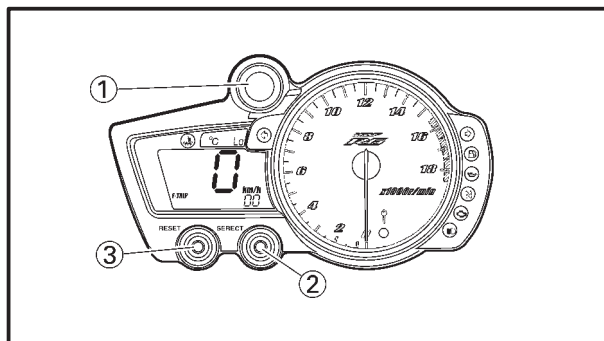
Turn the key to "ON".

To change the display to the clock mode, push the "SELECT" button for at least one second.

To change the display back to the prior mode, push the "SELECT" button.

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.



- ① Shift timing indicator light
- ② “SELECT” button
- ③ “RESET” button

### Display brightness and shift timing indicator light control mode

This mode cycles through five control functions, allowing you to make the following settings in the order listed below.

1. Display brightness: This function allows you to adjust the brightness of the multi-function display to suit the outside lighting conditions.
2. Shift timing indicator light activity: This function allows you to choose whether or not the indicator light should be activated and whether it should blink or stay on when activated.
3. Shift timing indicator light activation: This function allows you to select the shift timing at which the indicator light will be activated.
4. Shift timing indicator light deactivation: This function allows you to select the engine speed at which the indicator light will be deactivated.
5. Shift timing indicator light brightness: This function allows you to adjust the brightness of the indicator light to suit your preference.

#### NOTE:

- To make any settings in this mode, you have to cycle through all of its functions. However, if the key is turned to “OFF” or engine is started before completing the procedure, only the settings made before the “SELECT” button was last pushed will be applied.
- In this mode, the multi-function display shows the current setting for each function (except the shift timing indicator light activity function).

To adjust the display brightness

1. Turn the key to “OFF”.
2. Push and hold the “SELECT” button.
3. Turn the key to “ON”, and then, after five seconds, release the “SELECT” button.
4. Push the “RESET” button to select the desired display brightness level.
5. Push the “SELECT” button to confirm the selected display brightness level. The control mode changes to the shift timing indicator light activity function.

To set the shift timing indicator light activity function

1. Push the “RESET” button to select one of the following indicator light activity settings:
  - a. The indicator light will stay on when activated. (This setting is selected when the indicator light stays on.)
  - b. The indicator light will flash when activated. (This setting is selected when the indicator light flashes four times per second.)
  - c. The indicator light is deactivated; in other words, it will not come on or flash. (This setting is selected when the indicator light flashes once every two seconds.)
2. Push the “SELECT” button to confirm the selected indicator light activity. The control mode changes to the shift timing indicator light activation function.

To set the shift timing indicator light activation function

**NOTE:**

- The indicator light activation function can be set between 10,000 and 16,000 r/min.
- From 10,000 r/min to 12,000 r/min, the indicator light can be set in increments of 500 r/min.
- From 12,000 r/min to 16,000 r/min, the indicator light can be set in increments of 200 r/min.

1. Push the “RESET” button to select the desired engine speed for activating the indicator light.
2. Push the “SELECT” button to confirm the selected engine speed.  
The control mode changes to the shift timing indicator light deactivation function.

To set the shift timing indicator light deactivation function

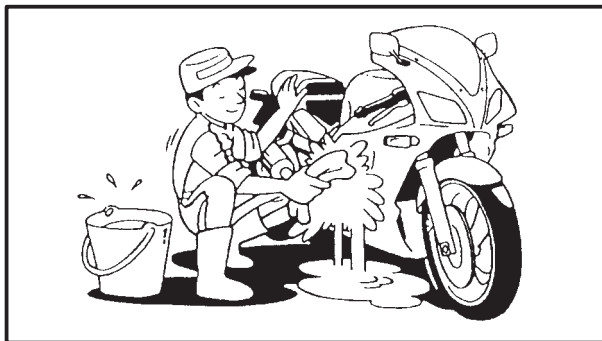
**NOTE:**

- The indicator light deactivation function can be set between 7,000 and 12,000 r/min in increments of 500 r/min.
- Be sure to set the deactivation function to a higher engine speed than for the activation function, otherwise the shift timing indicator light will remain deactivated.

1. Push the “RESET” button to select the desired engine speed for deactivating the indicator light.
2. Push the “SELECT” button to confirm the selected engine speed.  
The control mode changes to the shift timing indicator light brightness function.

To adjust the shift timing indicator light brightness

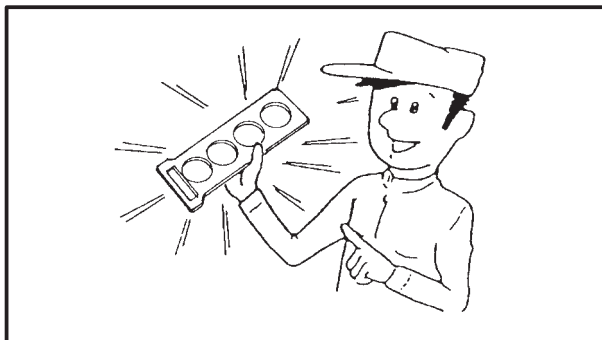
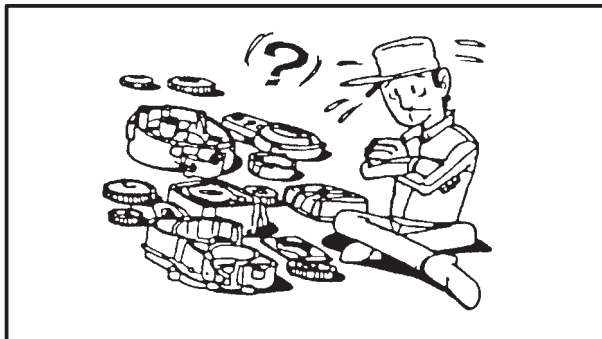
1. Push the “RESET” button to select the desired indicator light brightness level.
2. Push the “SELECT” button to confirm the selected indicator light brightness level. The multi-function display will return to the odometer, tripmeter or clock mode.



EAS00020

## IMPORTANT INFORMATION PREPARATION FOR REMOVAL AND DISASSEMBLY

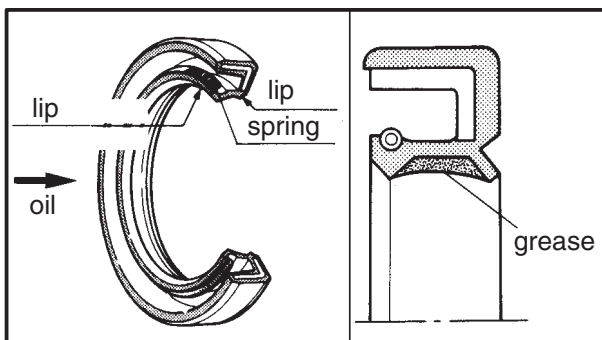
1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.  
Refer to the "SPECIAL TOOLS".
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" 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

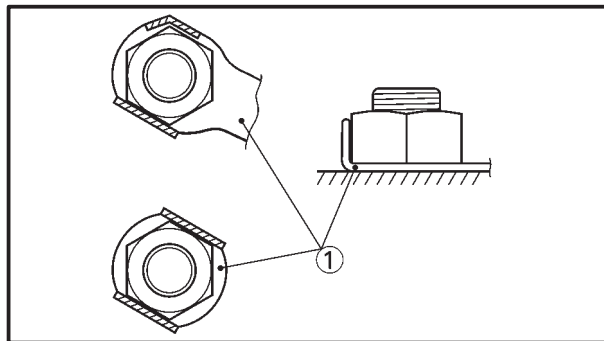
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS00022

## GASKETS, OIL SEALS AND O-RINGS

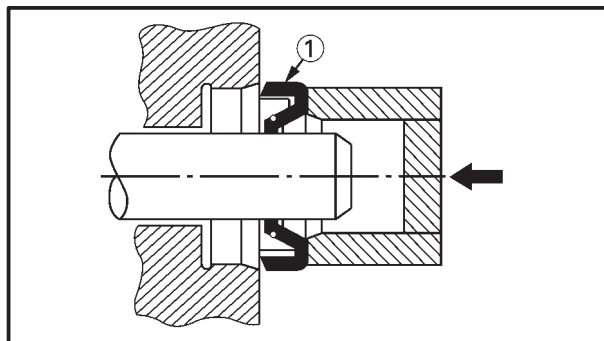
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



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

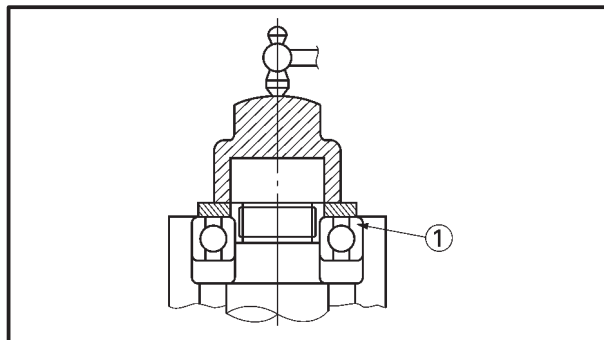
## BEARINGS AND OIL SEALS

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.

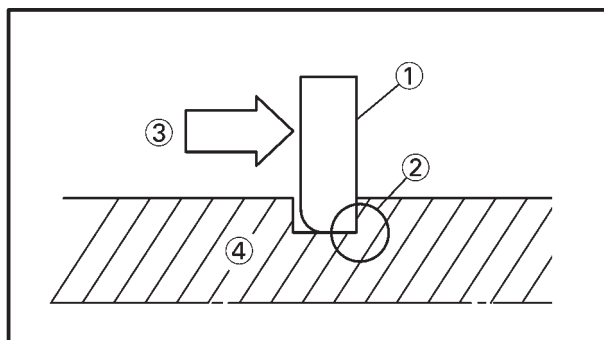
① Oil seal

### CAUTION:

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



① 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:

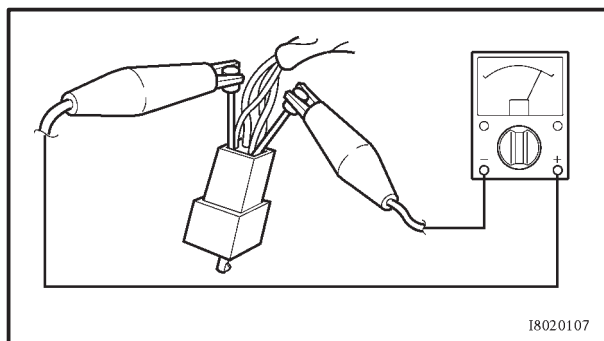
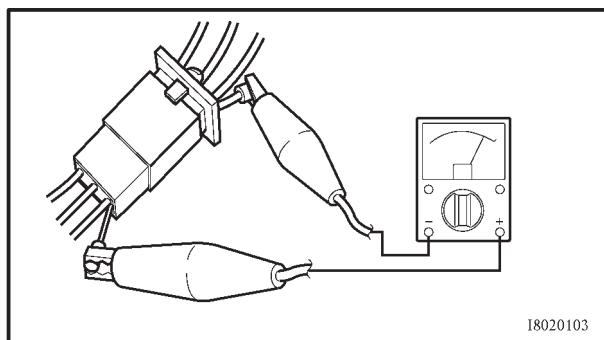
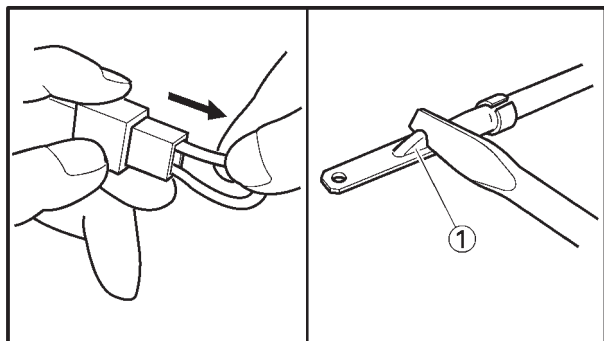
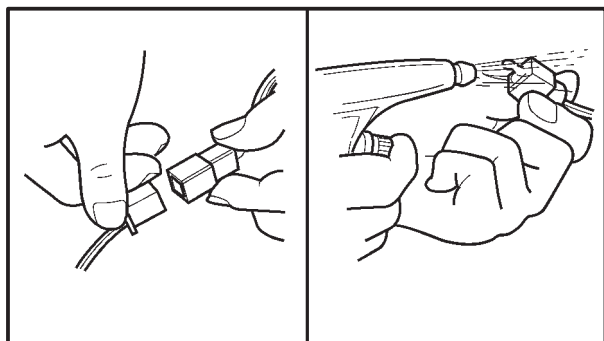
If the pin ① on the terminal is flattened, bend it up.

### 4. Connect:

- lead
- coupler
- connector

### NOTE:

Make sure all connections are tight.



### 5. Check:

- continuity  
(with the pocket tester)



**Pocket tester**

**90890-03112, YU-3112**

### 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
Flywheel puller 90890-01362 YU-33270-B Adapter 90890-04089 YM-33282	Flywheel puller Adapter  This tool is used to remove the generator rotor.	
90890-01701 YS-01880-A	Sheave holder  This tool is used to hold the generator rotor when removing or installing the generator rotor bolt or pickup coil rotor bolt.	
90890-01304 YU-01304	Piston pin puller  This tool is used to remove the piston pins.	
Radiator cap tester 90890-01325 YU-24460-01 Adapter 90890-01352 YU-33984	Radiator cap tester Adapter  These tools are used to check the cooling system.	
90890-01403 YU-33975	Steering nut wrench  This tool is used to loosen or tighten the steering stem ring nuts.	
90890-01473	Damper rod holder  This tool is used to hold the damper rod assembly when loosening or tightening the damper rod assembly bolt.	
Pivot shaft wrench 90890-01471 YM-01471 Pivot shaft wrench adapter 90890-01476	Pivot shaft wrench Pivot shaft wrench adapter  This tool is used to loosen or tighten the pivot adjust bolt and engine mount adjust bolt.	

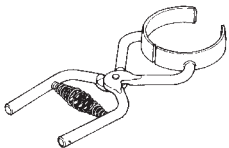
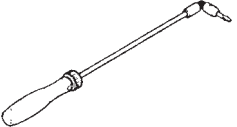
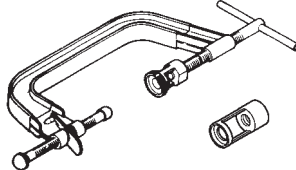
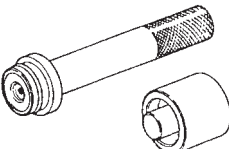
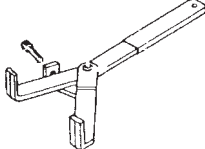
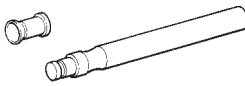

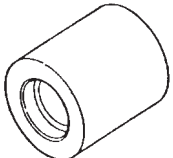
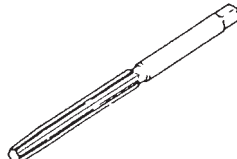
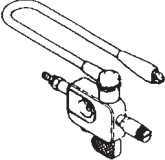




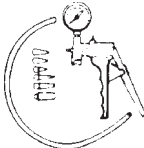
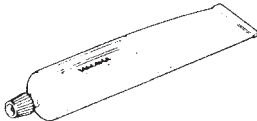
Tool No.	Tool name/Function	Illustration
90890-01426 YU-38411	Oil filter wrench  This tool is needed to loosen or tighten the oil filter cartridge.	
Rod puller 90890-01437 YM-01437 Rod puller attachment 90890-01436	Rod puller Rod puller attachment  These tools are used to pull up the front fork damper rod.	
Fork seal driver 90890-01367 YM-33963 Fork seal driver attachment 90890-01374 YM-8020-A	Fork seal driver weight Fork seal driver attachment  This tool is used to install the front fork's oil seal and dust seal.	
Vacuum gauge 90890-03094 YU-08030	Vacuum gauge  This gauge is used to synchronize the carburetors.	
Compression gauge 90890-03081 YU-33223 Adapter 90890-04136	Compression gauge Adapter  These tools are used to measure engine compression.	
90890-03112 YU-3112	Pocket tester  This tool is used to check the electrical system.	
Oil pressure gauge 90890-03153 YU-03153 Adapter 90890-03139	Oil pressure gauge Adapter  These tools are used to measure engine oil pressure.	
90890-03174	Digital circuit tester  This tool is used to check the electrical system.	
90890-03176 YM-03176	Fuel pressure adapter  This tool is needed to measure fuel pressure.	
90890-03153 YU-03153	Pressure gauge  This tool used is to measure fuel pressure.	





Tool No.	Tool name/Function	Illustration
90890-04044 YM-04044	Piston ring compressor  This tool is used to compress piston rings when installing the cylinder.	
90890-03158	Carburetor angle driver  This tool is used to turn the pilot screw when adjusting the engine idling speed.	
Valve spring compressor 90890-04019 YM-04019 Attachment 90890-04108 YM-01253	Valve spring compressor Attachment  These tools are used to remove or install the valve assemblies.	
Middle driven shaft bearing driver 90890-04058 YM-4058 Mechanical seal installer 90890-04078 YM-33221	Middle driven shaft bearing driver Mechanical seal installer  These tools are used to install the water pump seal.	
90890-04086 YM-91042	Clutch holding tool  This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
90890-04101	Valve lifter  This tool is needed to remove and install the valve lifter.	
90890-04111	Valve guide remover (φ4)  This tool is used to remove or install the valve guides.	
90890-04112	Valve guide installer (φ4)  This tool is used to install the valve guides.	
90890-04113 YM-04113	Valve guide reamer (φ4)  This tool is used to rebores the new valve guides.	
90890-06754 YM-34487	Ignition checker  This tool is used to check the ignition system components.	



Tool No.	Tool name/Function	Illustration
90890-06756 YB-35956	Vacuum/pressure pump gauge set  This tool used to measure the vacuum pressure.	
90890-85505 ACC-11001-05-01	Yamaha bond No. 1215  This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	



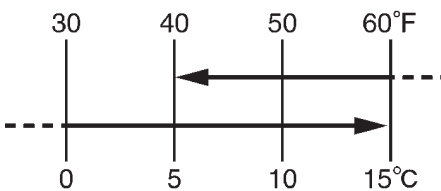
## SPECIFICATIONS

### GENERAL SPECIFICATIONS

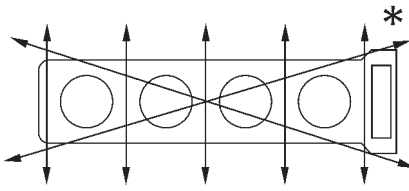
Item	Standard	Limit
<b>Model code</b>	5SL3 (USA except for CAL) 5SL4 (CAL) 5SL7 (USA except for CAL) 5SL8 (CAL)	...
<b>Dimensions</b>		
Overall length	2,025 mm (79.7 in)	...
Overall width	690 mm (27.2 in)	...
Overall height	1,090 mm (42.9 in)	...
Seat height	820 mm (32.3 in)	...
Wheelbase	1,380 mm (54.3 in)	...
Minimum ground clearance	135 mm (5.3 in)	...
Minimum turning radius	3,400 mm (133.9 in)	...
<b>Weight</b>		
Wet (with oil and a full fuel tank)	182 kg (401 lb) (USA except for CAL)	...
	183 kg (404 lb) (CAL)	...
Maximum load (except motorcycle)	193 kg (426 lb) (USA except for CAL)	...
	192 kg (423 lb) (CAL)	...



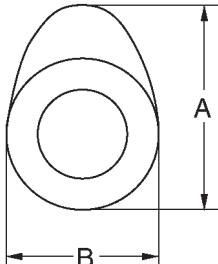
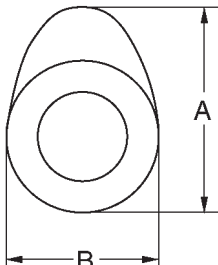
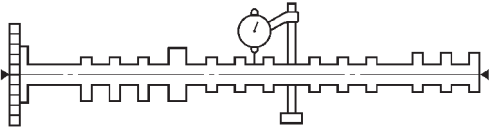
## ENGINE SPECIFICATIONS

Item	Standard	Limit
<b>Engine</b>		
Engine type	Liquid-cooled, 4-stroke, DOHC	...
Displacement	600 cm <sup>3</sup> (36.61 cu.in)	...
Cylinder arrangement	Forward-inclined parallel 4-cylinder	...
Bore × stroke	65.5 × 44.5 mm (2.58 × 1.75 in)	...
Compression ratio	12.4 : 1	...
Engine idling speed	1,250 ~ 1,350 r/min	...
Vacuum pressure at engine idling speed	24 kPa (180 mmHg, 7.0872inHg)	...
Standard compression pressure (at sea level)	1,550 kPa (15.50 kg/cm <sup>2</sup> , 15.50 bar, 220.46 psi) at 400 r/min	...
<b>Fuel</b>		
Recommended fuel	Premium unleaded gasoline only	...
Fuel tank capacity		
Total (including reserve)	17 L (3.74 Imp gal, 4.49 US gal)	...
Reserve only	3.5 L (0.77 Imp gal, 0.92 US gal)	...
<b>Engine oil</b>		
Lubrication system	Wet sump	...
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	... ...
Quantity		
Total amount	3.4 L (2.99 Imp qt, 3.59 US qt)	...
Without oil filter cartridge replacement	2.4 L (2.11 Imp qt, 2.54 US qt)	...
With oil filter cartridge replacement	2.6 L (2.29 Imp qt, 2.75 US qt)	...
Oil pressure	240 kPa at 6,600 r/min (2.4 kg/cm <sup>2</sup> at 6,600 r/min) (2.4 bar at 6,600 r/min) (34.1 psi at 6,600 r/min)	... ...
Engine oil temperature	96°C (205°F)	...
Relief valve opening pressure	450 ~ 550 kPa (4.5 ~ 5.5 kg/cm <sup>2</sup> , 4.5 ~ 5.5 bar, 65.3 ~ 79.8 psi)	...

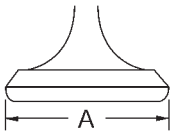
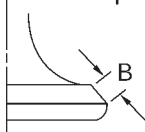
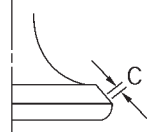
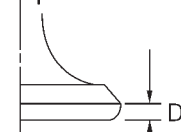
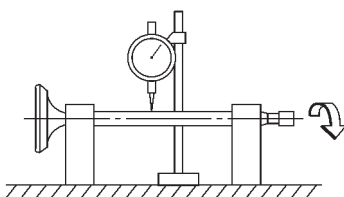


Item	Standard	Limit
<b>Oil filter</b> Oil filter type Bypass valve opening pressure	Formed 80 ~ 120 kPa (0.8 ~ 1.2 kg/cm <sup>2</sup> , 0.8 ~ 1.2 bar, 11.6 ~ 17.4 psi)	... ...
<b>Oil pump</b> Oil pump type Inner-rotor-to-outer-rotor-tip clearance Outer-rotor-to-oil-pump-housing clearance	Trochoid 0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in) 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)	... 0.15 mm (0.0059 in) 0.15 mm (0.0059 in)
<b>Cooling system</b> Radiator capacity Radiator cap opening pressure  Radiator core Width Height Depth Coolant reservoir Capacity Water pump Water pump type Reduction ratio Max. impeller shaft tilt	2.15 L (1.89 Imp qt, 2.27 US qt) 110 ~ 140 kPa (1.1 ~ 1.4 kg/cm <sup>2</sup> , 1.1 ~ 1.4 bar, 16.0 ~ 20.3 psi)  320 mm (12.6 in) 258 mm (10.2 in) 24 mm (0.94 in)  0.44 L (0.39 Imp qt, 0.47 US qt)  Single suction centrifugal pump 86/44 × 31/31 (1.955) ...	...  ... ... ...  ... ... ... 0.15 mm (0.006 in)
<b>Starting system type</b>	Electric starter	
<b>Electric fuel injection</b> Type Manufacturer	INP-250/4 NIPPON INJECTOR	... ...
<b>Spark plugs</b> Model (manufacturer) × quantity Spark plug gap	CR9EK or CR10EK (NGK) × 4 0.6 ~ 0.7 mm (0.0236 ~ 0.0276 in)	... ...
<b>Cylinder head</b> Volume Max. warpage  	10.3 ~ 10.9 cm <sup>3</sup> (0.63 ~ 0.67 cu.in) ...	... 0.05 mm (0.002 in)



Item	Standard	Limit
<b>Camshafts</b> Drive system Camshaft cap inside diameter Camshaft journal diameter Camshaft-journal-to-camshaft-cap clearance Intake camshaft lobe dimensions	Chain drive (right) 23.008 ~ 23.029 mm (0.9058 ~ 0.9067 in) 22.967 ~ 22.980 mm (0.9042 ~ 0.9047 in) 0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	... ... ... 0.08 mm (0.0031 in)
		
Measurement A	33.45 ~ 33.55 mm (1.317 ~ 1.321 in)	33.40 mm (1.315 in)
Measurement B	25.12 ~ 25.22 mm (0.989 ~ 0.993 in)	25.07 mm (0.987 in)
Exhaust camshaft lobe dimensions		
		
Measurement A	32.55 ~ 32.65 mm (1.282 ~ 1.285 in)	32.50 mm (1.280 in)
Measurement B	25.07 ~ 25.17 mm (0.987 ~ 0.991 in)	25.02 mm (0.985 in)
Max. camshaft runout	...	0.06 mm (0.0024 in)
		



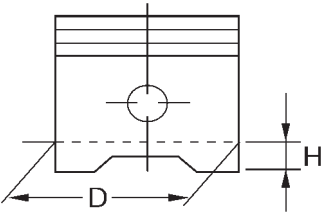
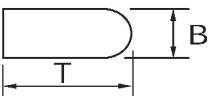
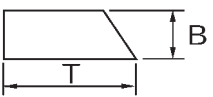
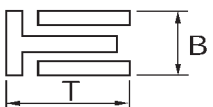
Item	Standard	Limit	
<b>Timing chain</b>			
Model/number of links	RH2015/120	...	
Tensioning system	Automatic	...	
<b>Valves, valve seats, valve guides</b>			
Valve clearance (cold)			
Intake	0.13 ~ 0.20 mm (0.0051 ~ 0.0079 in)	...	
Exhaust	0.23 ~ 0.30 mm (0.0091 ~ 0.0118 in)	...	
Valve dimensions			
			
Head Diameter	Face Width	Seat Width	Margin Thickness
Valve head diameter A			
Intake	24.9 ~ 25.1 mm (0.9803 ~ 0.9882 in)		...
Exhaust	21.9 ~ 22.1 mm (0.8622 ~ 0.8701 in)		...
Valve face width B			
Intake	1.14 ~ 1.98 mm (0.0449 ~ 0.0780 in)		...
Exhaust	1.14 ~ 1.98 mm (0.0449 ~ 0.0780 in)		...
Valve seat width C			
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)		1.6 mm (0.06 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)		1.6 mm (0.06 in)
Valve margin thickness D			
Intake	0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)		0.5 mm (0.02 in)
Exhaust	0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)		0.5 mm (0.02 in)
Valve stem diameter			
Intake	3.975 ~ 3.990 mm (0.1565 ~ 0.1571 in)		3.95 mm (0.1555 in)
Exhaust	3.960 ~ 3.975 mm (0.1559 ~ 0.1565 in)		3.935 mm (0.1549 in)
Valve guide inside diameter			
Intake	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)		4.042 mm (0.1591 in)
Exhaust	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)		4.042 mm (0.1591 in)
Valve-stem-to-valve-guide clearance			
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)		0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)		0.10 mm (0.0039 in)
Valve stem runout	...		0.04 mm (0.0016 in)
			
Valve seat width			
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)		1.6 mm (0.06 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)		1.6 mm (0.06 in)



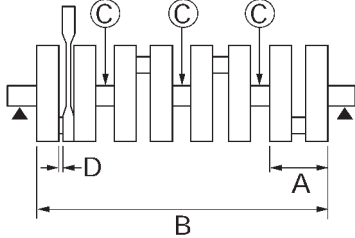
Item	Standard	Limit
<b>Valve springs</b>		
Free length		
Intake (inner)	35.7 mm (1.41 in)	33.9 mm (1.33 in)
(outer)	40.3 mm (1.59 in)	38.3 mm (1.50 in)
Exhaust	41.7 mm (1.64 in)	39.6 mm (1.56 in)
Installed length (valve closed)		
Intake (inner)	30 mm (1.18 in)	...
(outer)	32.5 mm (1.28 in)	...
Exhaust	36.1 mm (1.42 in)	...
Compressed spring force (installed)		
Intake (inner)	61.5 ~ 70.7 N (6.27 ~ 7.21 kg, 13.83 ~ 15.89 lb)	...
(outer)	139.1 ~ 160.1 N (14.18 ~ 16.33 kg, 31.27 ~ 35.99 lb)	...
Exhaust	160 ~ 184 N (16.32 ~ 18.76 kg, 35.97 ~ 41.36 lb)	...
Spring tilt		
Intake (inner)	...	2.5°/1.6 mm (0.06 in)
(outer)	...	2.5°/1.8 mm (0.07 in)
Exhaust	...	2.5°/1.8 mm (0.07 in)
Winding direction (top view)		
Intake (inner)	Counter clockwise	...
(outer)	Clockwise	...
Exhaust	Clockwise	...
<b>Cylinders</b>		
Cylinder arrangement	Forward-inclined, parallel 4-cylinder	...
Bore × stroke	65.5 mm × 44.5 mm (2.58 × 1.75 in)	...
Compression ratio	12.4 : 1	...
Bore	65.50 ~ 65.51 mm (2.5787 ~ 2.5791 in)	...
Max. out-of-round	...	0.05 mm (0.002 in)





Item	Standard	Limit
<b>Piston</b>		
Piston-to-cylinder clearance	0.010 ~ 0.035 mm (0.0004 ~ 0.0014 in)	0.055 mm (0.0022 in)
Diameter D	65.475 ~ 65.490 mm (2.5778 ~ 2.5783 in)	...
		
Height H	4 mm (0.16 in)	...
Piston pin bore (in the piston)		
Diameter	16.002 ~ 16.013 mm (0.6300 ~ 0.6304 in)	16.043 mm (0.6316 in)
Offset	0.5 mm (0.0197 in)	...
Offset direction	Intake side	...
Piston pins		
Outside diameter	15.991 ~ 16.000 mm (0.6296 ~ 0.6299 in)	15.971 mm (0.6288 in)
Piston-pin-to-piston-pin-bore clearance	0.002 ~ 0.022 mm (0.0001 ~ 0.0009 in)	0.072 mm (0.0028 in)
Piston rings		
Top ring		
Ring type	Barrel	...
Dimensions (B × T)	0.90 × 2.45 mm (0.04 × 0.10 in)	...
End gap (installed)	0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in)	0.60 mm (0.0236 in)
Ring side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.115 mm (0.0045 in)
2nd ring		
Ring type	Taper	...
Dimensions (B × T)	0.8 × 2.5 mm (0.03 × 0.10 in)	...
End gap (installed)	0.7 ~ 0.8 mm (0.0276 ~ 0.0315 in)	1.15 mm (0.0453 in)
Ring side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.125 mm (0.0049 in)
Oil ring		
Dimensions (B × T)	1.5 × 2.0 mm (0.06 × 0.08 in)	...
End gap (installed)	0.10 ~ 0.35 mm (0.0039 ~ 0.0138 in)	...



Item	Standard	Limit
<b>Connecting rods</b> Crankshaft-pin-to-big-end-bearing clearance Bearing color code	0.028 ~ 0.052 mm (0.0011 ~ 0.0020 in) 1 = Blue 2 = Black 3 = Brown 4 = Green	0.09 mm (0.0035 in) ...
<b>Crankshaft</b>  Width A Width B Max. runout C Big end side clearance D Big end radial clearance Small end free play Crankshaft-journal-to-crankshaft-journal-bearing clearance Bearing color code	51.85 ~ 52.55 mm (2.04 ~ 2.06 in) 268.8 ~ 270.0 mm (10.58 ~ 10.63 in) ... 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in) 0.028 ~ 0.052 mm (0.0011 ~ 0.0020 in) 0.32 ~ 0.50 mm (0.01 ~ 0.02 in) 0.034 ~ 0.058 mm (0.0013 ~ 0.0023 in) 0 = White 1 = Blue 2 = Black 3 = Brown 4 = Green	... ... 0.03 mm (0.0012 in) ... ... ... 0.10 mm (0.0039 in) ...
<b>Clutch</b> Clutch type Clutch release method Clutch release method operation Operation Clutch cable free play (at the end of the clutch lever) Friction plates Color code Thickness Plate quantity Color code Thickness Plate quantity Clutch plates Thickness Plate quantity Max. warpage Thickness Plate quantity Max. warpage Clutch springs Free length Spring quantity	Wet, multiple disc Outer pull, rack and pinion pull Cable operation Left-hand operation 10 ~ 15 mm (0.39 ~ 0.59 in) Brown 2.9 ~ 3.1 mm (0.114 ~ 0.122 in) 6 Purple 2.9 ~ 3.1 mm (0.114 ~ 0.112 in) 2 1.9 ~ 2.1 mm (0.07 ~ 0.08 in) 7 ... 2.2 ~ 2.4 mm (0.086 ~ 0.095 in) 1 ... 50 mm (1.97 in) 6	... ... ... ... ... ... 2.8 mm (0.110 in) ... 2.8 mm (0.110 in) ... ... 0.1 mm (0.0039 in) ... ... 0.1 mm (0.0039 in) 49 mm (1.93 in) ...



Item	Standard	Limit
<b>Transmission</b>		
Transmission type	Constant mesh, 6-speed	...
Primary reduction system	Spur gear	...
Primary reduction ratio	86/44 (1.955)	...
Secondary reduction system	Chain drive	...
Secondary reduction ratio	48/16 (3.000)	...
Operation	Left-foot operation	...
Gear ratios		
1st gear	37/13 (2.846)	...
2nd gear	37/19 (1.947)	...
3rd gear	28/18 (1.556)	...
4nd gear	32/24 (1.333)	...
5th gear	25/21 (1.190)	...
6th gear	26/24 (1.083)	...
Max. main axle runout	...	0.02 mm (0.0008 in)
Max. drive axle runout	...	0.02 mm (0.0008 in)
<b>Shifting mechanism</b>		
Shift mechanism type	Shift drum/Guide bar	...
Max. shift fork guide bar bending	...	0.05 mm (0.002 in)
<b>Air filter type</b>	Wet element	...
<b>Fuel pump</b>		
Pump type	Electrical	...
Model (manufacturer)	5PW (DENSO)	...
Output pressure	294 kPa (2.94 kg/cm <sup>2</sup> , 2.94 bar, 42.6 psi)	...



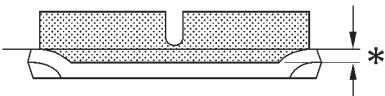
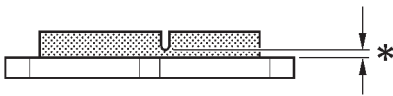
Item	Standard	Limit
<b>Throttle position sensor</b>		
Resistance	4.85 ~ 5.15 k $\Omega$ at 20°C (68°F)	...
Output voltage (at idle)	0.63 ~ 0.73 V	
<b>Throttle bodies</b>		
Model (manufacturer) $\times$ quantity	38EIS (MIKUNI) $\times$ 4	...
Intake vacuum pressure	24 kPa (180 mmHg, 7.0872 inHg)	...
Throttle cable free play (at the flange of the throttle grip)	6 ~ 8 mm (0.24 ~ 0.31 in)	...
ID mark	5SL1 00 (5SL3/5SL7), 5SL4 10 (5SL4/5SL8)	...
Throttle valve size	#100	...



## CHASSIS SPECIFICATIONS

Item	Standard	Limit
<b>Frame</b>		
Frame type	Diamond	...
Caster angle	24°	...
Trail	86 mm (3.39 in)	...
<b>Front wheel</b>		
Wheel type	Cast wheel	...
Rim		
Size	17 M/C × MT3.50	...
Material	Aluminum	...
Wheel travel	120 mm (4.72 in)	...
Wheel runout		
Max. radial wheel runout	...	1 mm (0.04 in)
Max. lateral wheel runout	...	0.5 mm (0.02 in)
<b>Rear wheel</b>		
Wheel type	Cast wheel	...
Rim		
Size	17 M/C × MT5.50	...
Material	Aluminum	...
Wheel travel	120 mm (4.72 in)	...
Wheel runout		
Max. radial wheel runout	...	1 mm (0.04 in)
Max. lateral wheel runout	...	0.5 mm (0.02 in)
<b>Front tire</b>		
Tire type	Tubeless	...
Size	120/60 ZR17 M/C (55W)	...
Model (manufacturer)	Pilot SPORT N (MICHELIN) D208FL (DUNLOP)	...
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	...
90 ~ 193 kg (198 ~ 426 lb) (USA except for CAL)	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	...
90 ~ 192 kg (198 ~ 423 lb) (CAL)	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	...
High-speed riding	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	...
Min. tire tread depth	...	1.6 mm (0.06 in)



Item	Standard	Limit
<b>Rear tire</b> Tire type Size Model (manufacturer)  Tire pressure (cold) 0 ~ 90 kg (0 ~ 198 lb) 90 ~ 193 kg (198 ~ 426 lb) (USA except for CAL) 90 ~ 192 kg (198 ~ 423 lb) (CAL) High-speed riding Min. tire tread depth	Tubeless 180/55 ZR17 M/C (73W) Pilot SPORT B (MICHELIN) D208L (DUNLOP)  250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi) 290 kPa (2.9 kgf/cm <sup>2</sup> , 2.9 bar, 41.3 psi)  290 kPa (2.9 kgf/cm <sup>2</sup> , 2.9 bar, 41.3 psi) 250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi) ...	... ... ...  ... ... ... ... 1.6 mm (0.06 in)
<b>Front brakes</b> Brake type Operation Recommended fluid Brake lever free play Brake discs Diameter × thickness Min. thickness  Max. deflection  Brake pad lining thickness   Master cylinder inside diameter Caliper cylinder inside diameter	Dual disc brake Right hand operation DOT 4 2.3 ~ 11.5 mm (0.09 ~ 0.45 in)  298 × 5 mm (11.73 × 0.20 in) ...  ...  4.5 mm (0.18 in)  14 mm (0.55 in) 30.2 mm and 27 mm (1.19 in and 1.06 in)	... ... ... ...  ... 4.5 mm (0.18 in) 0.1 mm (0.004 in) 0.5 mm (0.02 in)  ... ...
<b>Rear brake</b> Brake type Operation Brake pedal position (below the bottom of the footrest bracket) Recommended fluid Brake pedal freeplay Brake discs Diameter × thickness Min. thickness  Max. deflection  Brake pad lining thickness   Master cylinder inside diameter Caliper cylinder inside diameter	Single disc brake Right foot operation 7 ~ 11 mm (0.28 ~ 0.43 in)  DOT 4 4.3 ~ 9.3 mm (0.17 ~ 0.37 in)  220 × 5 mm (8.66 × 0.20 in) ...  ...  6.0 mm (0.24 in)  12.7 mm (0.5 in) 38.1 mm (1.5 in)	... ... ...  ... ... ... ... 4.5 mm (0.18 in) 0.15 mm (0.006 in) 1.0 mm (0.04 in)  ... ...



Item	Standard	Limit
<b>Front suspension</b>		
Suspension type	Telescopic fork	...
Front fork type	Coil spring/oil damper	...
Front fork travel	120 mm (4.72 in)	...
Spring		
Free length	249.3 mm (9.81 in)	244.3 mm (9.62 in)
Spacer length	100 mm (3.937 in)	...
Installed length	240.3 mm (9.46 in)	...
Spring rate (K1)	8.3 N/mm (0.83 kg/mm, 46.49 lb/in)	...
Spring stroke (K1)	0 ~ 120 mm (0 ~ 4.7244 in)	...
Inner tube outer diameter	43 mm (1.69 in)	...
Inner tube bending limit	...	0.2 mm (0.01 in)
Optional spring available	No	...
Fork oil		
Recommended oil	Suspension oil "01"	...
Quantity (each front fork leg)	0.49 L (0.43 Imp qt, 0.52 US qt)	...
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	106 mm (4.17 in)	...
Spring preload adjusting positions		
Minimum	8	...
Standard	7	...
Maximum	1	...
Rebound damping adjusting positions		
Minimum*	10	...
Standard*	9	...
Maximum*	1	...
Compression damping adjusting positions		
Minimum*	9	...
Standard*	7	...
Maximum*	1	...
*from the fully turned-in position		



Item	Standard	Limit
<b>Steering</b>		
Steering bearing type	Angular bearing	...
<b>Rear suspension</b>		
Suspension type	Swingarm (link suspension)	...
Rear shock absorber assembly type	Coil spring/gas-oil damper	...
Rear shock absorber assembly travel	60 mm (2.36 in)	...
Spring		
Free length	168.5 mm (6.63 in)	...
Installed length	157.5 mm (6.2 in)	...
Spring rate (K1)	98 N/mm (9.80 kg/mm, 548.87 lb/in)	...
Spring stroke (K1)	0 ~ 60 mm (0.00 ~ 2.36 in)	...
Optional spring available	No	...
Standard spring preload gas/air pressure	1,200 kPa (12 kg/cm <sup>2</sup> , 12 bar, 174 psi)	...
Spring preload adjusting positions		
Minimum	1	...
Standard	4	...
Maximum	9	...
Rebound damping adjusting positions		
Minimum*	20	...
Standard*	10	...
Maximum*	5	...
Compression damping adjusting positions		
Minimum*	20	...
Standard*	10	...
Maximum*	1	...
*from the fully turned-in position		
<b>Swingarm</b>		
Free play (at the end of the swingarm)		
Radial	...	1.0 mm (0.04 in)
Axial	...	1.0 mm (0.04 in)
<b>Drive chain</b>		
Model (manufacturer)	532ZLV KAI (DAIDO)	...
Link quantity	116	...
Drive chain slack	35 ~ 45 mm (1.38 ~ 1.77 in)	...
Maximum ten-link section	...	150.1 mm (5.91 in)





## ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
<b>System voltage</b>	12 V	...
<b>Ignition system</b>		
Ignition system type	DC. CDI	...
Ignition timing	10° BTDC at 1,300 r/min (USA except for CAL) 5° BTDC at 1,300 r/min (CAL)	...
Crankshaft position sensor resistance/color	248 ~ 372 Ω at 20°C (68°F)/Gy-B	...
CDI unit model (manufacturer)	F8T926 (MITSUBISHI)	...
<b>Ignition coils</b>		
Model (manufacturer)	J0454 (DENSO)	...
Minimum ignition spark gap	6 mm (0.24 in)	...
Primary coil resistance	0.17 ~ 0.23 Ω at 20°C (68°F)	...
Secondary coil resistance	4.8 ~ 7.2 kΩ at 20°C (68°F)	...
<b>Charging system</b>		
System type	A.C. magneto	...
Model (manufacturer)	LLZ68 (DENSO)	...
Normal output	14 V/300 W at 5,000 r/min	...
Stator coil resistance/color	0.18 ~ 0.26 Ω at 20°C (68°F)/W-W	...
<b>Rectifier/regulator</b>		
Regulator type	Semi conductor short circuit	...
Model (manufacture)	SH713AA (SHINDENGEN)	...
No-load regulated voltage	14.1 ~ 14.9 V	...
Rectifier capacity	35 A	...
Withstand voltage	200 V	...
<b>Battery</b>		
Battery type	GT9B-4	...
Battery voltage/capacity	12 V/8 Ah	...
Specific gravity	1.320	...
Manufacturer	GS	...
Ten hour rate amperage	0.8A	...
<b>Headlight type</b>	Halogen bulb	
<b>Bulbs (voltage/wattage × quantity)</b>		
Headlight	12 V 55 W × 2	...
Tail/brake light	LED × 1	...
Front turn signal/position light	12 V 21 W/5W × 2	...
Rear turn signal light	12 V 21 W × 2	...
Licence light	12 V 5 W × 1	...
Meter light	LED × 1	...



Item	Standard	Limit
<b>Indicator light</b> (voltage/wattage × quantity)		
Neutral indicator light	LED × 1	...
High beam indicator light	LED × 1	...
Oil level indicator light	LED × 1	...
Turn signal indicator light	LED × 2	...
Fuel level warning light	LED × 1	...
Coolant temperature indicator light	LED × 1	...
Engine trouble warning light	LED × 1	...
Shift timing indicator light	LED × 1	...
<b>Electric starting system</b>		
System type	Constant mesh	...
Starter motor		
Model (manufacturer)	SM-14 (MITSUBA)	...
Power output	0.6 kW	...
Brushes		
Overall length	10 mm (0.39 in)	3.5 mm (0.14 in)
Spring force	7.16 ~ 9.52 N (730 ~ 971 g, 25.77 ~ 34.27 oz)	...
Armature coil resistance	0.0012 ~ 0.0022 Ω at 20°C (68°F)	...
Commutator diameter	28 mm (1.1 in)	27 mm (1.06 in)
Mica undercut	0.7 mm (0.03 in)	...
<b>Starter relay</b>		
Model (manufacturer)	2768088-A (JIDECO)	...
Amperage	180 A	...
Coil resistance	4.18 ~ 4.62 Ω at 20°C (68°F)	...
<b>Horn</b>		
Horn type	Plain	...
Model (manufacturer) × quantity	YF-12 (NIKKO) × 1	...
Max. amperage	3 A	...
Performance	105 ~ 113 db/2 m	...
Coil resistance	1.15 ~ 1.25 Ω at 20°C (68°F)	...
<b>Turn signal relay</b>		
Relay type	Full transistor	...
Model (manufacturer)	FE246BH (DENSO)	...
Self-cancelling device built-in	No	...
Turn signal blinking frequency	75 ~ 95 cycles/min.	...
Wattage	21 W × 2 + 3.4 W	...
<b>Oil level switch</b>		
Model (manufacturer)	5SL (SOMIC ISHIKAWA)	...



Item	Standard	Limit
<b>Fuses (amperage × quantity)</b>		
Main fuse	40 A × 1	...
Fuel injection system fuse	15 A × 1	...
Headlight fuse	20 A × 1	...
Signaling system fuse	15 A × 1	...
Ignition fuse	15 A × 1	...
Radiator fan motor fuse	15 A × 1	...
Backup fuse (odometer and clock)	10 A × 1	...
Reserve fuse	40 A, 20 A, 15 A, 10 A × 1	...
<b>Fuel level sender</b>		
Model (manufacture)	5PW (DENSO)	...
Sender unit resistance-full	750 ~ 1,100 Ω	...
<b>Starting circuit at-off relay</b>		
Model (manufacture)	G8R-30Y-R (OMRON)	...
Coil resistance	162 ~ 198 Ω	...
<b>Headlight relay, Radiator fan motor relay</b>		
Model (manufacture)	ACA12115 (MATSUSHITA)	...
Coil resistance	72 ~ 88 Ω	...
<b>Fuel injection system relay</b>		
Model (manufacture)	G8R-30Y-R (OMRON)	...
Coil resistance	162 ~ 198 Ω	...
<b>Water temperature sensor</b>		
Model (manufacture)	K003T20191 (MITSUBISHI)	...
Resistance	0.2898 ~ 0.3542 Ω at 80°C (176°F)	...

# **CONVERSION TABLE/ GENERAL TIGHTENING TORQUE SPECIFICATIONS**

**SPEC**



EAS00028

EAS00030

## **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.

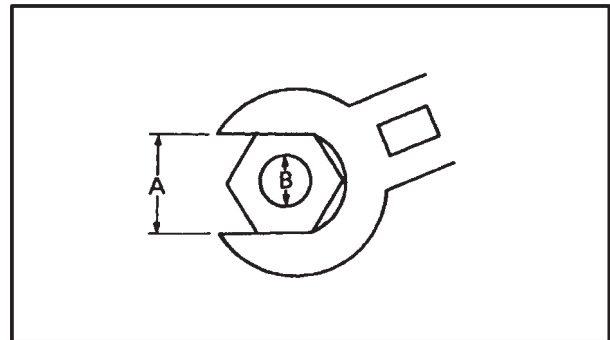
METRIC		MULTIPLIER		IMPERIAL
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

## **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 <sup>3</sup> )	0.03527	oz (IMP liq.)
	cc (cm <sup>3</sup> )	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 <sup>2</sup>	14.2234	psi (lb/in <sup>2</sup> )
	Centigrade (°C)	9/5+32	Fahrenheit (°F)

## **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		
Spark plugs	—	M10	4	13	1.3	9.4		
Cylinder head	Nut	M10	10	1st 19	1.9	14		
				2nd 50	5.0	36		
	Bolt	M6	2	12	1.2	8.7	Yamaha bond No.1215 	
Camshaft caps	Bolt	M6	20	10	1.0	7.2		
Cylinder head cover	Bolt	M6	6	12	1.2	8.7		
Camshaft cap oil check bolt	Bolt	M8	1	20	2.0	15		
Reed valve cover	Bolt	M6	4	10	1.0	7.2		
Air-cut valve stay	Bolt	M6	1	10	1.0	7.2		
Camshaft sprockets	Bolt	M7	4	24	2.4	17		
Connecting rod caps	Nut	M7	8	15 + 150°	1.5 + 150°	11 + 150°		
Generator rotor	Bolt	M12	1	75	7.5	54		
Timing chain tensioner	Bolt	M6	2	12	1.2	8.7		
Timing chain tensioner cap bolt	Bolt	M6	1	7.0	0.7	5.1		
Thermostat cover	Bolt	M6	2	12	1.2	8.7		
Coolant hose joint	Bolt	M6	2	10	1.0	7.2		
Water pump cover	Bolt	M6	2	10	1.0	7.2		
Water pump	Bolt	M6	2	12	1.2	8.7		
Radiator and frame	Bolt	M6	2	7.0	0.7	5.1		
Radiator stay and crankcase	Bolt	M6	1	10	1.0	7.2		
Oil pump cover	Bolt	M6	3	12	1.2	8.7		
Oil pump	Bolt	M6	3	12	1.2	8.7		
Oil pan	Bolt	M6	12	12	1.2	8.7		
Oil pan (center)	Bolt	M6	1	12	1.2	8.7		
Oil cooler	Bolt	M20	1	63	6.3	46		
Engine oil drain bolt	Bolt	M14	1	43	4.3	31		
Oil filter union bolt	Bolt	M20	1	70	7.0	51		
Oil filter	—	M20	1	17	1.7	12		
Oil pump chain guide	Bolt	M6	2	12	1.2	8.7		
Oil pipe	Bolt	M6	2	12	1.2	8.7		
Throttle body joint	Bolt	M6	8	10	1.0	7.2		
Air filter case cover	Screw	M5	6	3.0	0.3	2.2		
Air filter case and frame	Bolt	M6	1	10	1.0	7.2		
Throttle body and throttle body joint	Clamp	M4	4	3.0	0.3	2.2		
Throttle body and air filter case	Clamp	M5	4	3.0	0.3	2.2		
Exhaust pipe and cylinder head	Nut	M8	8	20	2.0	15		
Exhaust pipe and exhaust pipe stay	Bolt	M8	1	20	2.0	15		
Exhaust pipe and muffler	Bolt	M8	1	20	2.0	15		
Exhaust pipe stay and frame	Bolt	M8	1	34	3.4	25		
Crankcase (main journal)	Bolt	M8	10	See NOTE 2			   	
Crankcase	Bolt	M6	2	14	1.4	1.0		
Crankcase	Bolt	M6	13	12	1.2	8.7		
Crankcase	Bolt	M8	2	24	2.4	17		

# TIGHTENING TORQUES

**SPEC**



Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Generator rotor cover	Bolt	M6	9	12	1.2	8.7	Yamaha bond No.1215
Clutch cover	Bolt	M6	9	12	1.2	8.7	
Clutch cover	Bolt	M6	1	12	1.2	8.7	
Pickup coil rotor cover	Bolt	M6	5	12	1.2	8.7	
Clutch cable holder	Bolt	M6	2	12	1.2	8.7	
Pickup coil rotor cover	Bolt	M8	1	15	1.5	11	
Shift shaft cover	Bolt	M6	6	12	1.2	8.7	
Breather plate	Screw	M6	3	12	1.2	8.7	
Stator coil	Screw	M6	3	10	1.0	7.2	
Pickup rotor cover and clamp	Screw	M6	1	7.0	0.7	5.1	
Drive sprocket cover	Bolt	M6	3	10	1.0	7.2	      
Oil gallery bolt	—	M16	2	8	0.8	5.8	
Generator rotor cover and stator coil lead clamp	Screw	M6	1	10	1.0	7.2	
Breather hose cover	Bolt	M6	4	12	1.2	8.7	
Oil pipe	Bolt	M6	2	12	1.2	8.7	
Crankshaft position sensor	Bolt	M6	2	10	1.0	7.2	
Starter clutch	Screw	M8	3	32	3.2	23	
Clutch pressure plate	Bolt	M6	6	8.0	0.8	5.8	
Clutch boss	Nut	M20	1	70	7.0	51	
Drive sprocket	Nut	M18	1	90	9.0	65	
Transmission bearing housing	Screw	M6	3	12	1.2	8.7	   Left thread  
Shift drum retainer	Bolt	M6	2	10	1.0	7.2	
Shift shaft spring stopper	Screw	M8	1	22	2.2	16	
Shift rod	Nut	M8	1	10	1.0	7.2	
Shift rod	Nut	M6	1	6.5	0.65	4.7	
Shift rod joint	Bolt	M6	1	10	1.0	7.2	
Shift arm	Bolt	M6	1	10	1.0	7.2	
Pickup coil rotor	Bolt	M8	1	35	3.5	25	
Starter motor	Bolt	M6	2	10	1.0	7.2	
Neutral switch	—	M10	1	20	2.0	14	
Oil level switch	Bolt	M6	2	10	1.0	7.2	Yamaha bond No.1215
Speed sensor	Bolt	M6	1	10	1.0	7.2	
Cylinder identification sensor	Bolt	M6	1	10	1.0	7.2	

## NOTE 1:

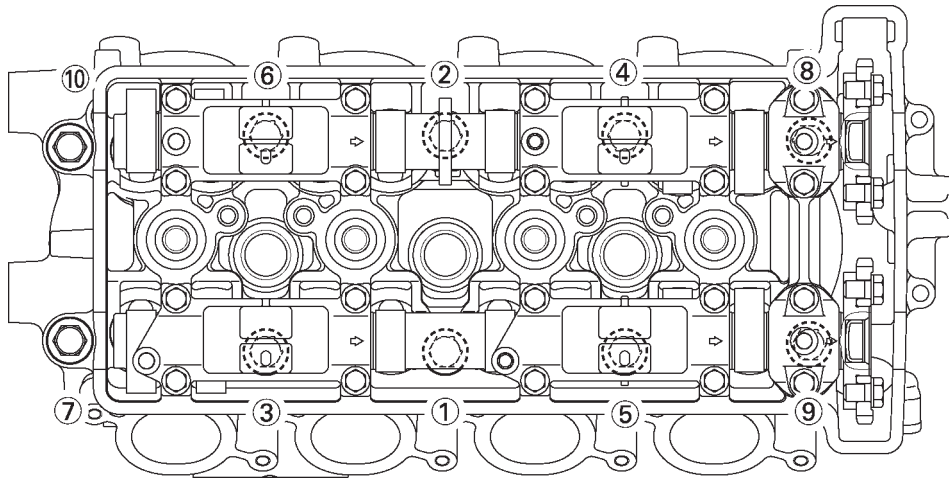
Retighten the bolt at 1000 km (600 ml).

## NOTE 2:

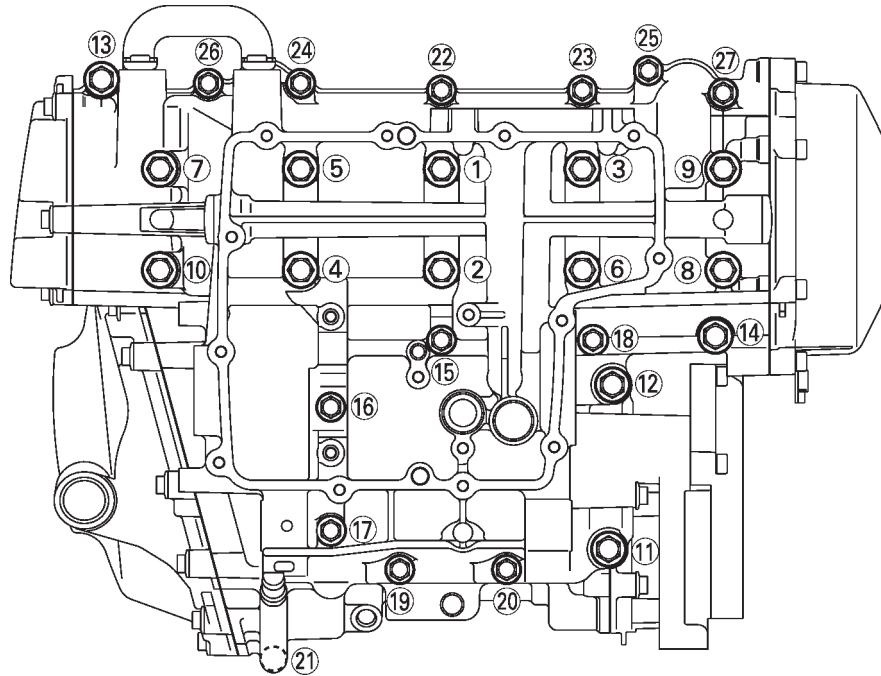
1. First, tighten the bolts to approximately 12 Nm (1.2 m•kg, 8.7 ft•lb) with a torque wrench.
2. Retighten the bolts 25 Nm (2.5 m•kg, 18 ft•lb) with a torque wrench.
3. Loosen the all bolts one by one following the tightening order and then tighten them to 27 Nm (2.7 m•kg, 20 ft•lb) again.



Cylinder head tightening sequence:



Crankcase tightening sequence.






## CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening			Remarks
		Nm	m•kg	ft•lb	
Upper bracket and front fork	M8	26	2.6	19	See NOTE 1
Steering stem nut	M28	113	11.3	82	
Handlebar and front fork	M8	33	3.3	24	
Handlebar and upper bracket	M6	13	1.3	9.4	
Lower ring nut	M30	14	1.4	10	
Under bracket pinch bolt	M8	23	2.3	17	
Main switch and upper bracket	M8	23	2.3	17	
Front brake master cylinder cap stopper	M4	1.2	0.12	0.9	
Front brake hose union bolts	M10	30	3.0	22	
Front brake master cylinder and bracket	M6	13	1.3	9.4	
Windshield and front cowling	M5	0.4	0.04	0.3	
Front cowling and headlight assembly	M5	1.7	0.17	1.23	
Headlight and front cowling stay	M5	2.5	0.25	1.81	
Meter assembly and front cowling stay	M5	1.3	0.13	0.94	
Front cowling stay and frame	M8	23	2.3	17	
Front cowling stay and duct	M5	1.3	0.13	0.94	
Duct and joint	M5	1.3	0.13	0.94	
Surge tank joint (front)	M4	1.2	0.12	0.87	
Surge tank joint (rear)	M5	1.2	0.12	0.87	
Rear view mirror and front cowling	M6	7	0.7	5.1	
Cowling and inner panel	M5	1.5	0.15	1.1	
Cowlings and frame	M6	4.5	0.45	3.3	
Engine mount bolts (front)	M10	45	4.5	33	
Engine mount bolts (rear upper)	M10	45	4.5	33	
Engine mount bolts (rear lower)	M10	45	4.5	33	
Engine mount adjust bolt	M16	7	0.7	5.1	
Frame and rear frame	M10	47	4.7	34	
Inner panel and frame	M5	3.8	0.38	2.7	
Clutch cable lock nut (engine side)	M8	7	0.7	5.1	
Throttle cable adjust nut (handlebar side)	M6	4.5	0.45	3.3	
Pivot shaft and nut	M18	95	9.5	69	
Connecting rod and frame	M10	44	4.4	32	
Relay arm and connecting rod	M10	44	4.4	32	
Relay arm and swingarm	M10	44	4.4	32	
Rear shockabsorber and relay arm	M10	44	4.4	32	
Rear shockabsorber and bracket	M10	44	4.4	32	
Bracket and frame	M14	52	5.2	38	
Fuel pump and fuel tank	M5	4	0.4	2.9	
Fuel tank bracket and frame	M6	7	0.7	5.1	
Fuel tank bracket and fuel tank	M6	7	0.7	5.1	
Fuel tank and rear frame	M6	7	0.7	5.1	
Rider seat and frame	M6	7	0.7	5.1	
Coolant reservoir tank and generator rotor cover	M6	6.5	0.65	4.7	
Footrest bracket and frame	M8	28	2.8	20	
Rear footrest and frame	M8	28	2.8	20	
Rear footrest and muffler	M8	23	2.3	17	
Rear brake master cylinder and footrest bracket	M8	18	1.8	13	

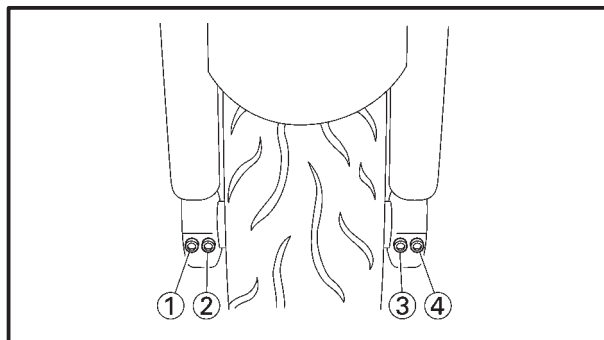




Item	Thread size	Tightening			Remarks
		Nm	m•kg	ft•lb	
Rear brake hose union bolt	M10	30	3.0	22	
Sidestand bracket and frame	M10	61	6.1	44	
Front wheel axle shaft and bolt	M14	91	9.1	66	
Rear wheel axle nut	M24	110	11.0	80	
Front brake caliper and front fork	M10	40	4.0	29	
Front brake disc and front wheel	M6	18	1.8	13	
Rear brake disc and rear wheel	M8	30	3.0	22	
Rear wheel sprocket and rear wheel drive hub	M10	100	10.0	72	
Brake caliper bleed screw	M8	6	0.6	4.3	
Pinch bolt (front wheel axle)	M8	18	1.8	13	
					See NOTE 2

**NOTE 1:**

1. First, tighten the ring nut to approximately 52 Nm (5.2 m•kg, 38 ft•lb) with a torque wrench, then loosen the ring nut completely.
2. Retighten the lower ring nut to specification.

**NOTE 2:**

- Tighten wheel axle pinch bolts ② and ① to specified torque.
- Retighten pinch bolt ② to specified torque.
- Tap the outer side of the left fork leg with a rubber mallet to align it with the end of the wheel axle.
- Tighten wheel axle pinch bolts ④ and ③ to specified torque.
- Retighten pinch bolt ④ to specified torque.



EAS00031

## LUBRICATION POINTS AND LUBRICANT TYPES

### ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Crankshaft pins	
Piston surfaces	
Piston pins	
Connecting rod bolts and nuts	
Crankshaft journals	
Camshaft lobes	
Camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Valve lifter surface	
Piston cooler (O-ring)	
Oil pump rotors (inner and outer)	
Oil pump housing	
Oil strainer	
Clutch (pull rod)	
Starter clutch idle gear inner surface	
Starter clutch assembly	
Primary driven gear	
Transmission gears (wheel and pinion)	
Main axle and drive axle	
Shift drum bearing	
Shift forks and shift fork guide bars	
Shift shaft	
Shift shaft boss	
Cylinder head cover mating surface	Yamaha bond No.1215
Crankcase mating surface	Yamaha bond No.1215
Generator rotor cover (stator coil assembly lead grommet)	Yamaha bond No.1215
Pickup rotor cover (crankshaft position sensor lead grommet)	Yamaha bond No.1215



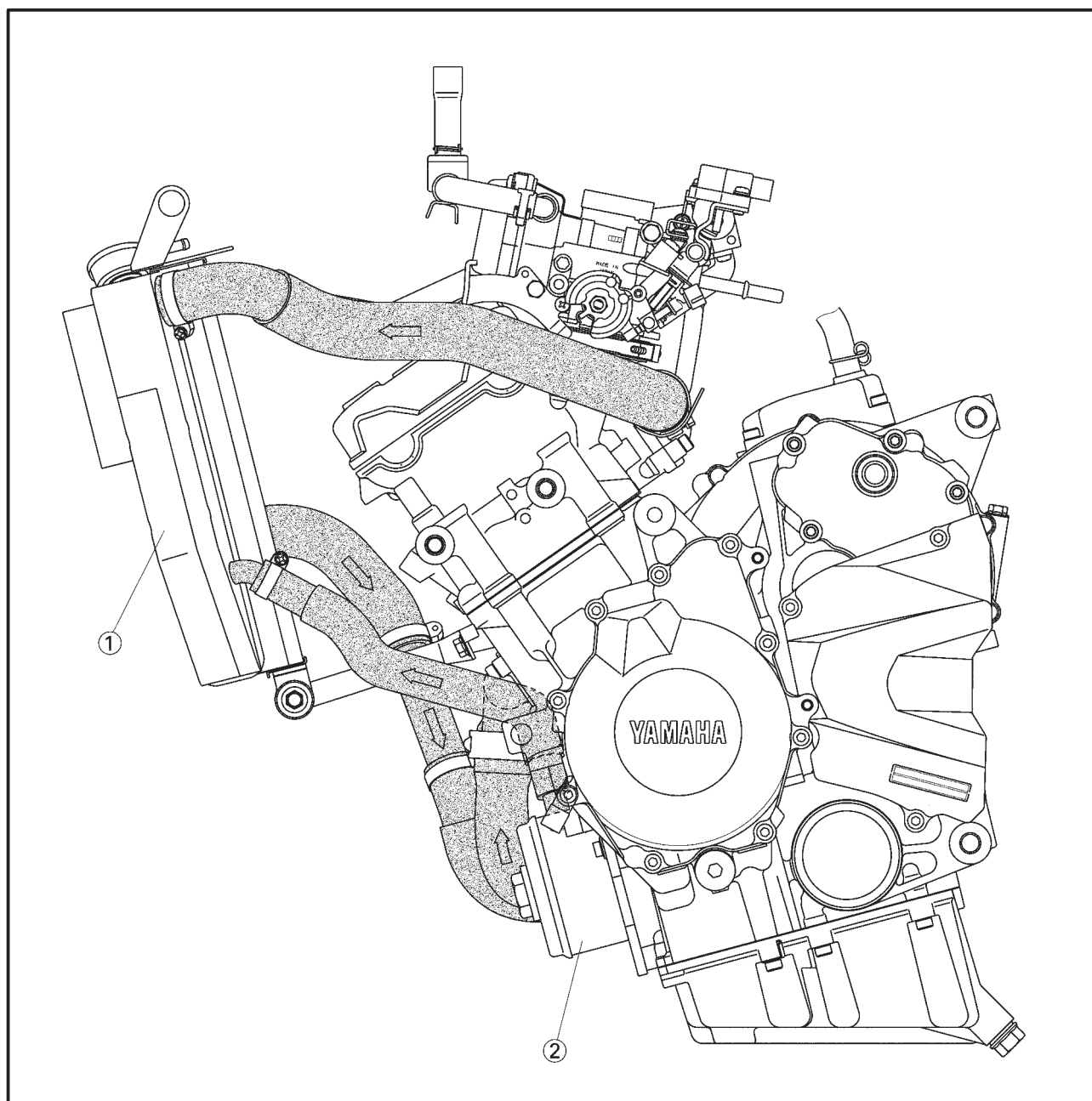
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### CHASSIS

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	
Front wheel oil seal (right and left)	
Rear wheel oil seal	
Front axle shaft	
Rear wheel drive hub oil seal	
Rear wheel drive hub mating surface	
Rear axle shaft	
Rear brake pedal shaft	
Sidestand pivoting point and metal-to-metal moving parts	
Link and sidestand switch contact point	
Sidestand hook and spring	
Throttle grip inner surface	
Brake lever pivoting point and metal-to-metal moving parts	
Clutch lever pivoting point and metal-to-metal moving parts	
Relay arm, connecting rod and rear shock absorber collar	
Pivot shaft	
Rear frame thread	
Swingarm pivot bearing	
Swingarm head pipe end, oil seal and bush	
Oil seal (relay arm, connecting arm and rear shock absorber)	
Engine mount bolts (rear upper and lower)	
Seat lock assembly	
Shift pedal shaft	
Shift shaft joint	

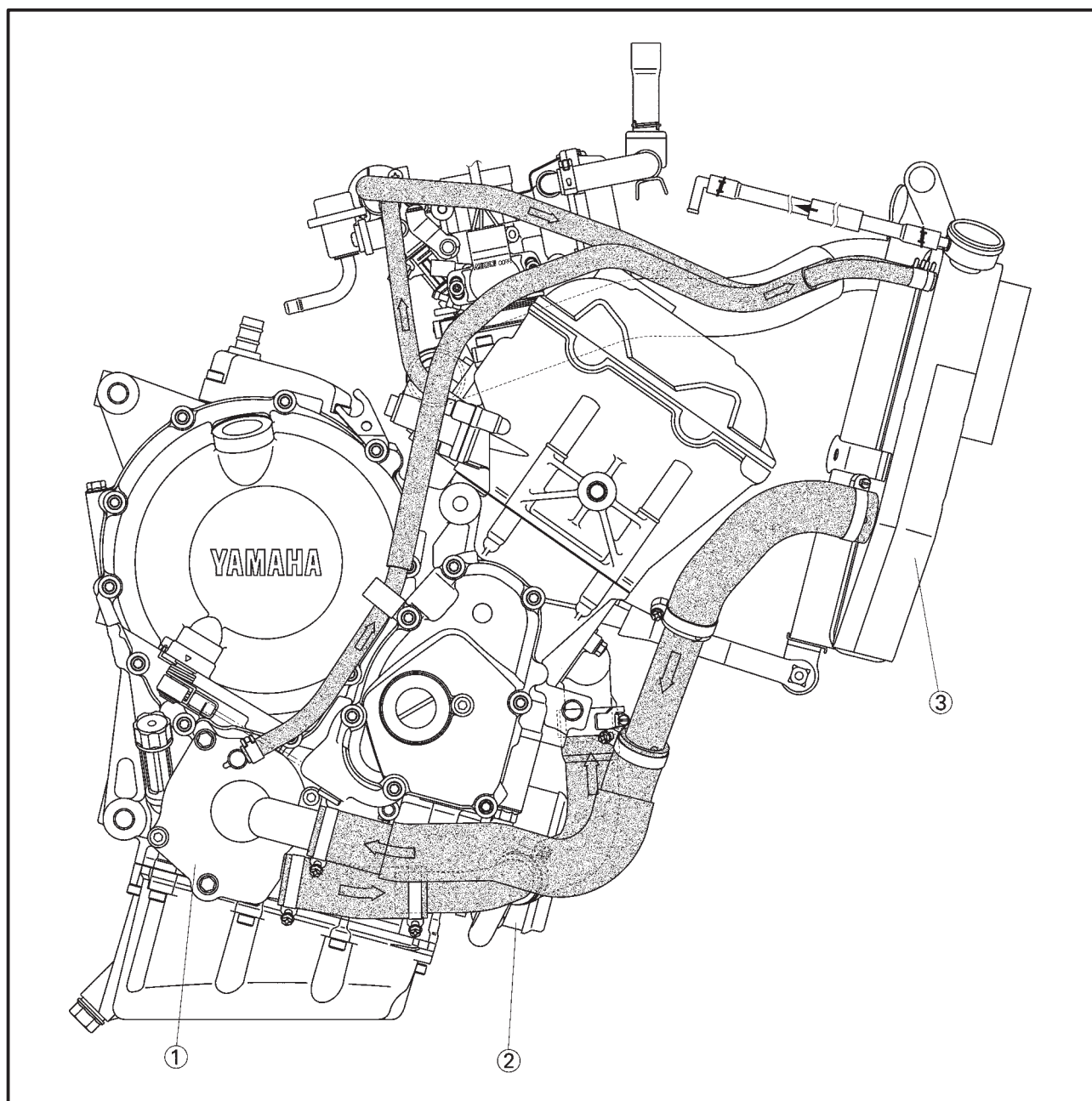
**COOLING SYSTEM DIAGRAMS**

- ① Radiator
- ② Oil cooler



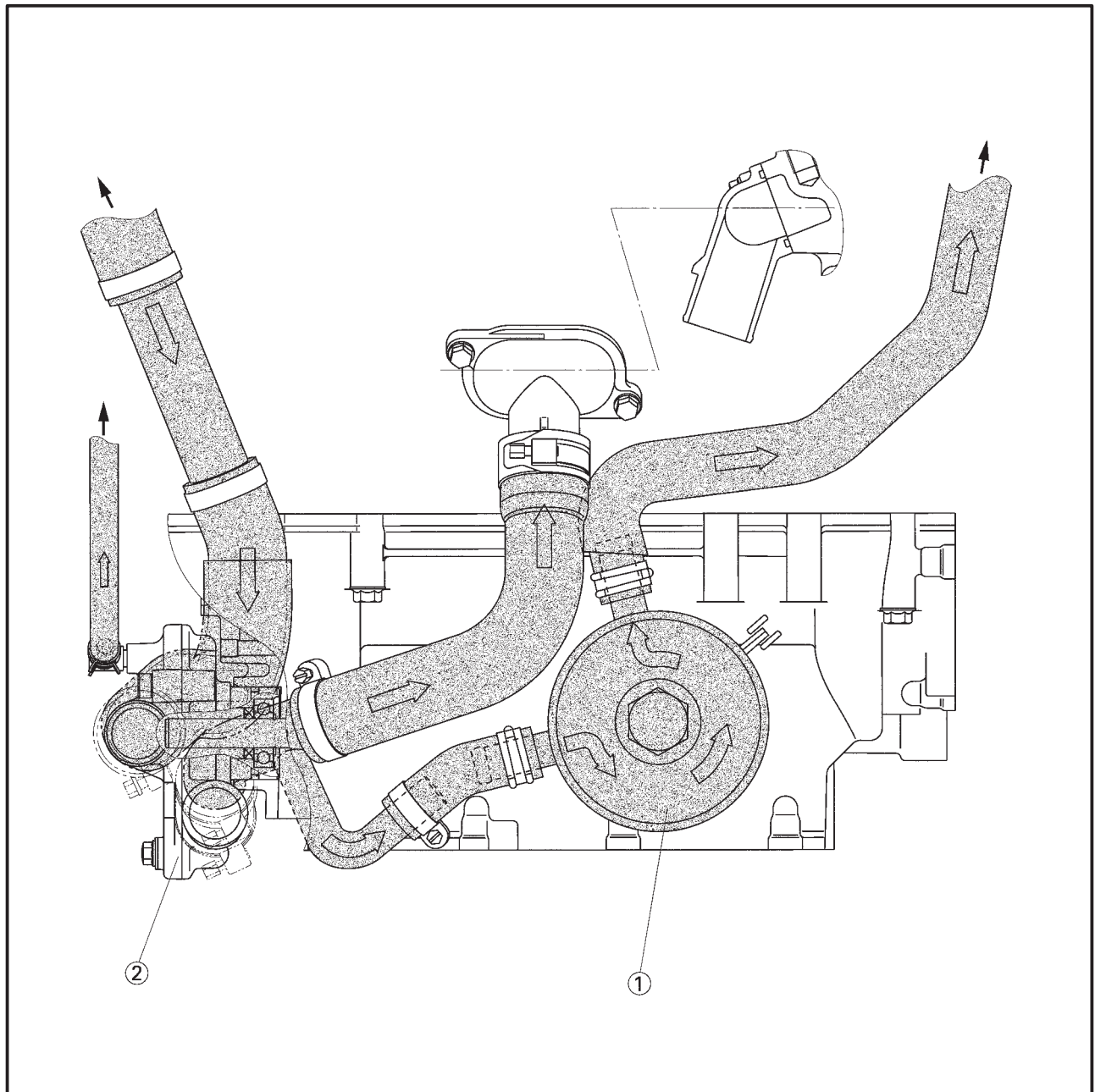


- ① Water pump
- ② Oil cooler
- ③ Radiator



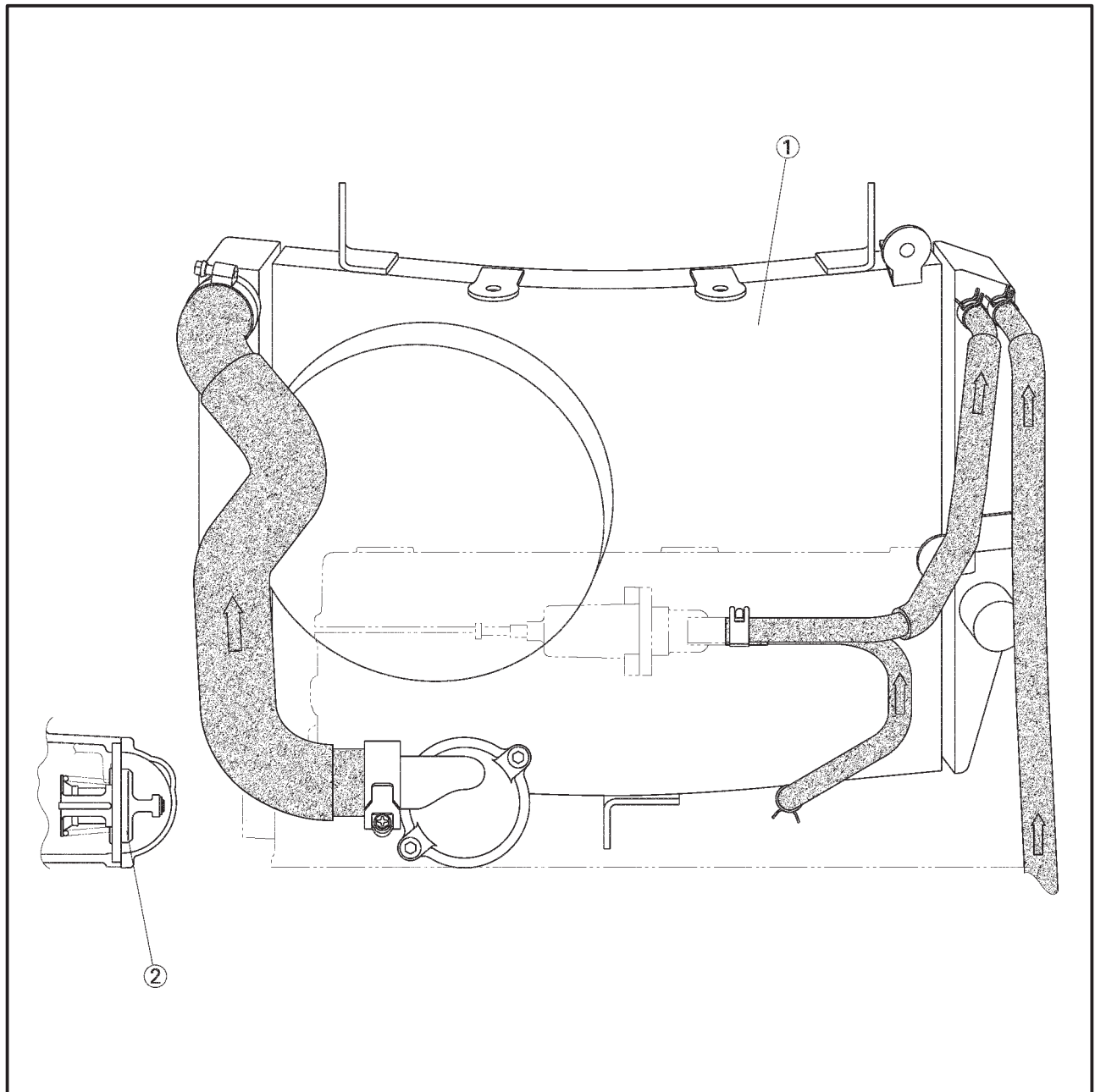


- ① Oil cooler
- ② Water pump



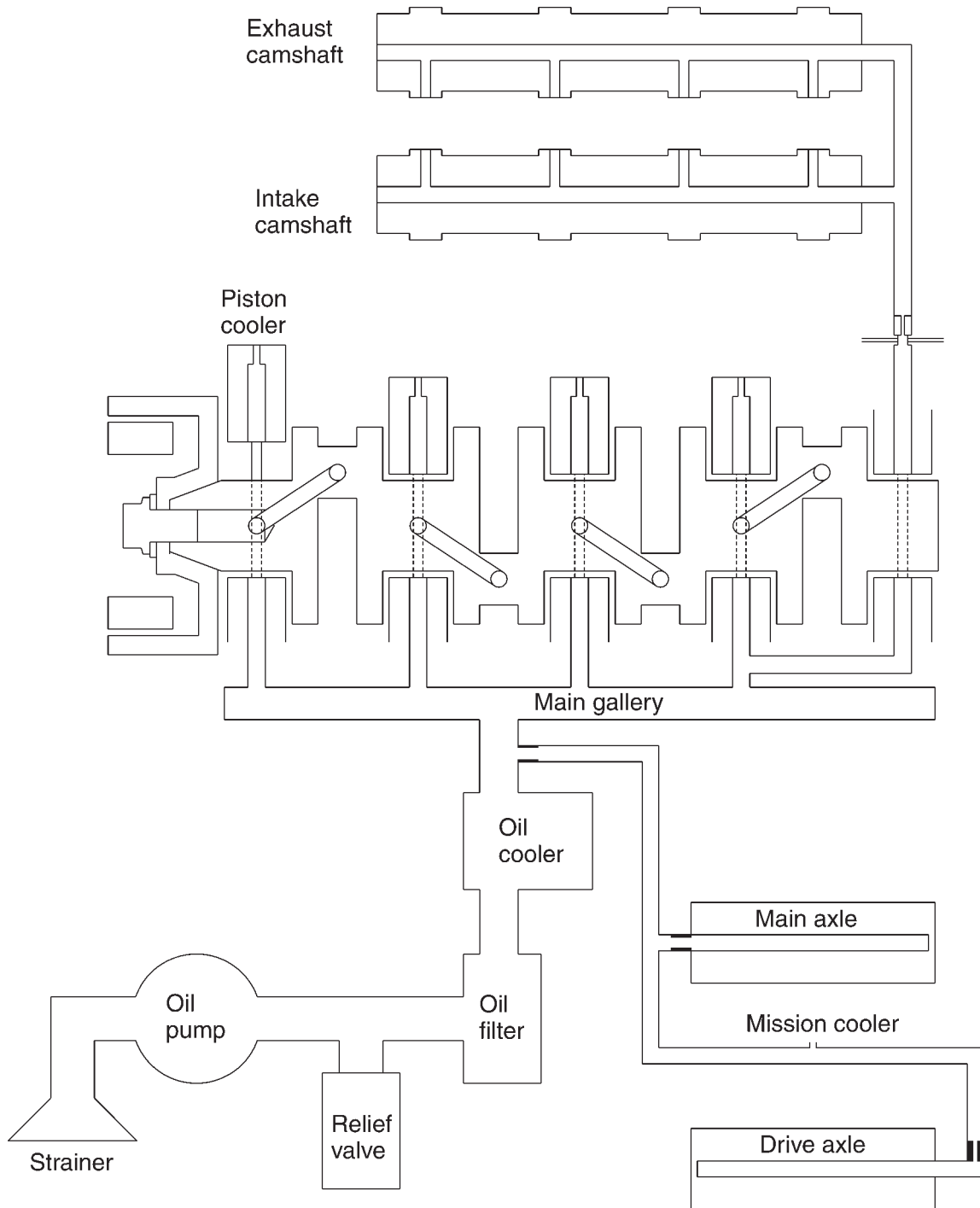


- ① Radiator
- ② Thermostat





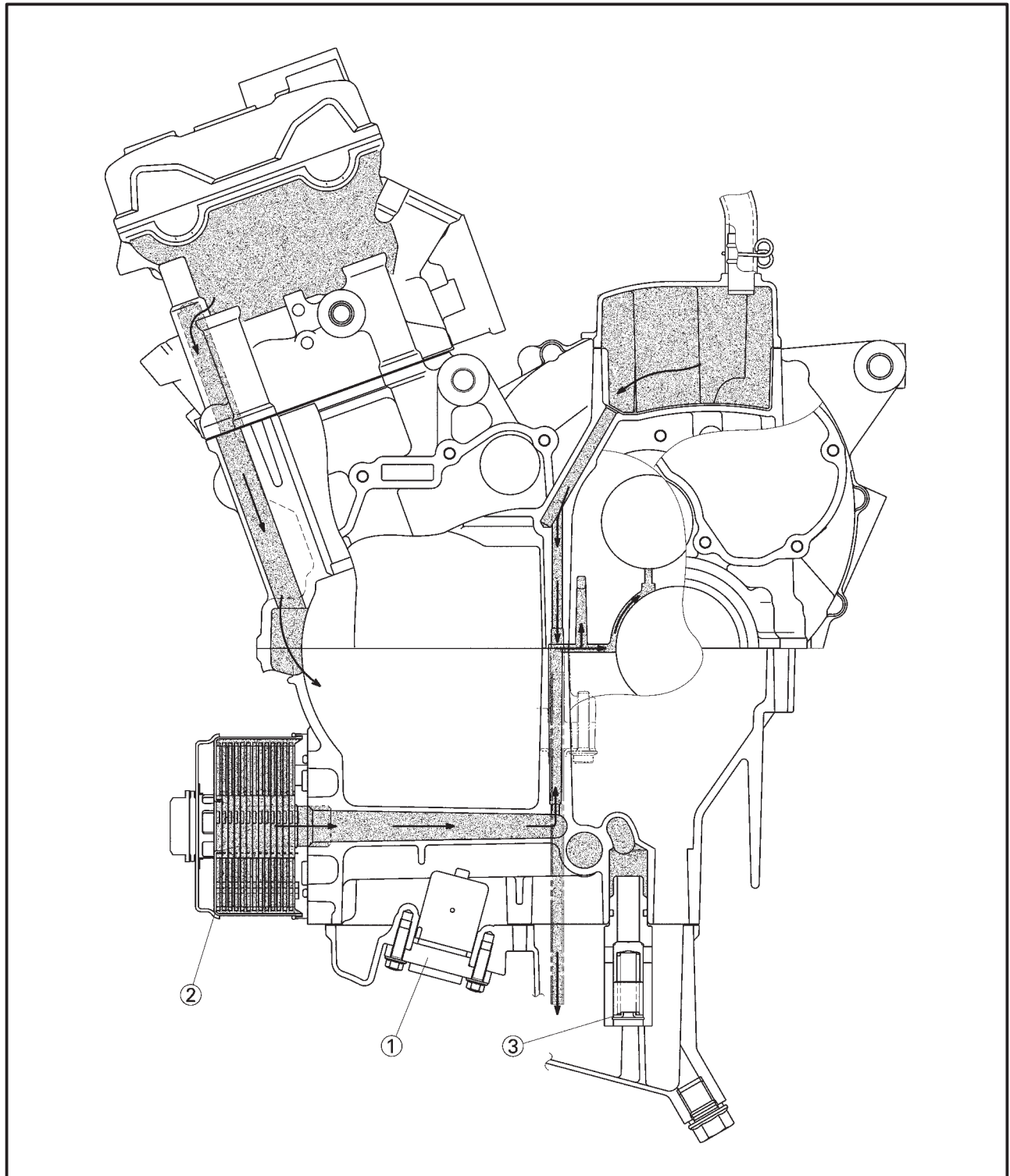
## ENGINE OIL LUBRICATION CHART





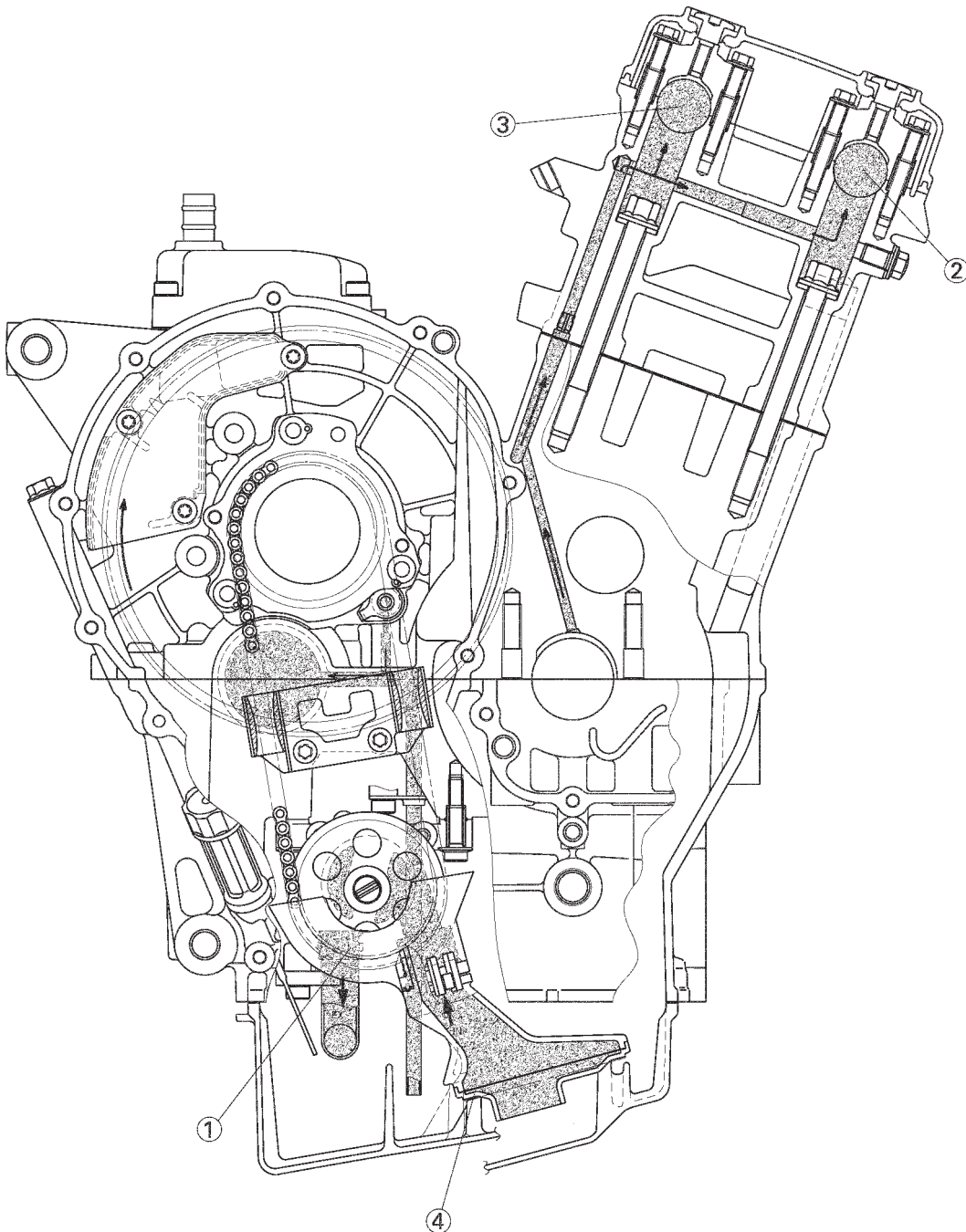
**LUBRICATION DIAGRAMS**

- ① Oil level switch
- ② Oil cooler
- ③ Relief valve



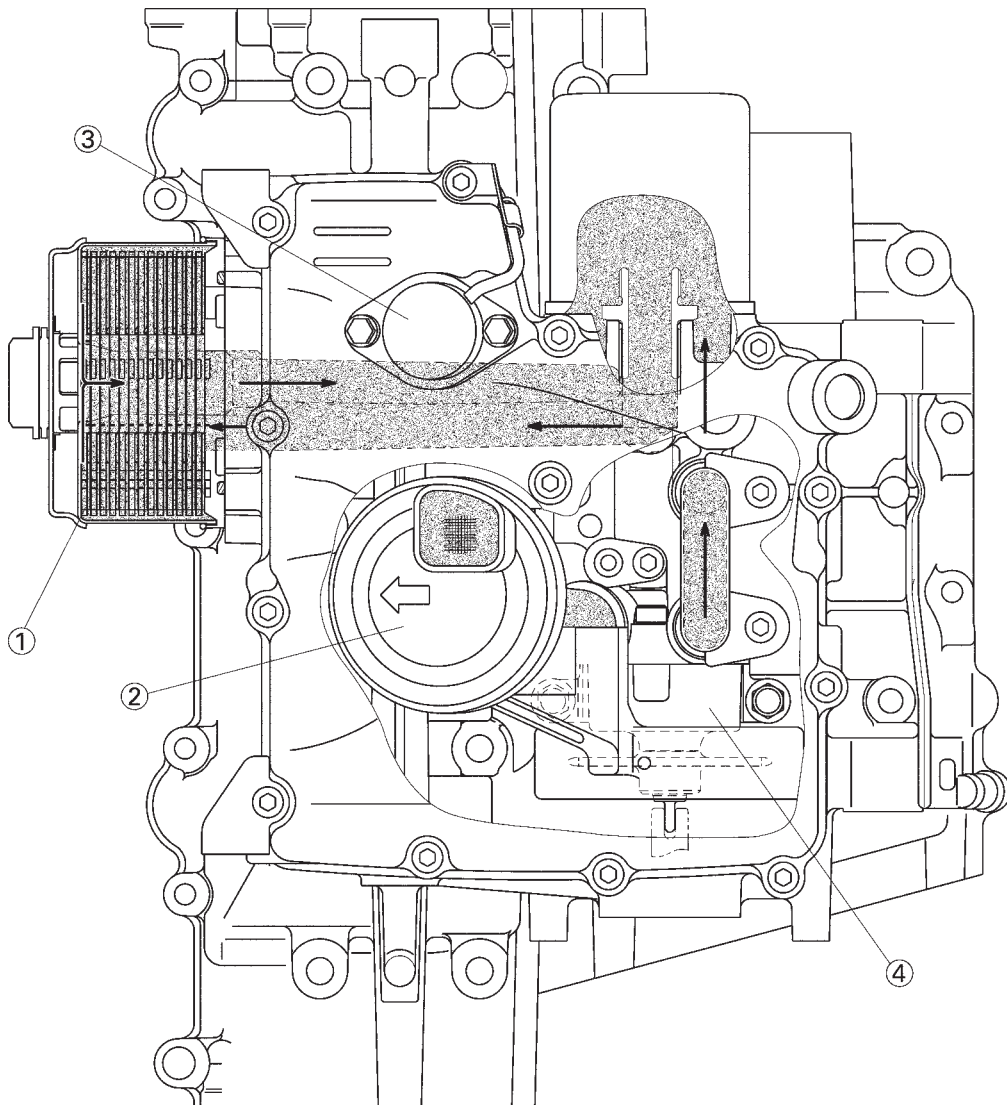


- ① Oil pump
- ② Exhaust camshaft
- ③ Intake camshaft
- ④ Oil strainer



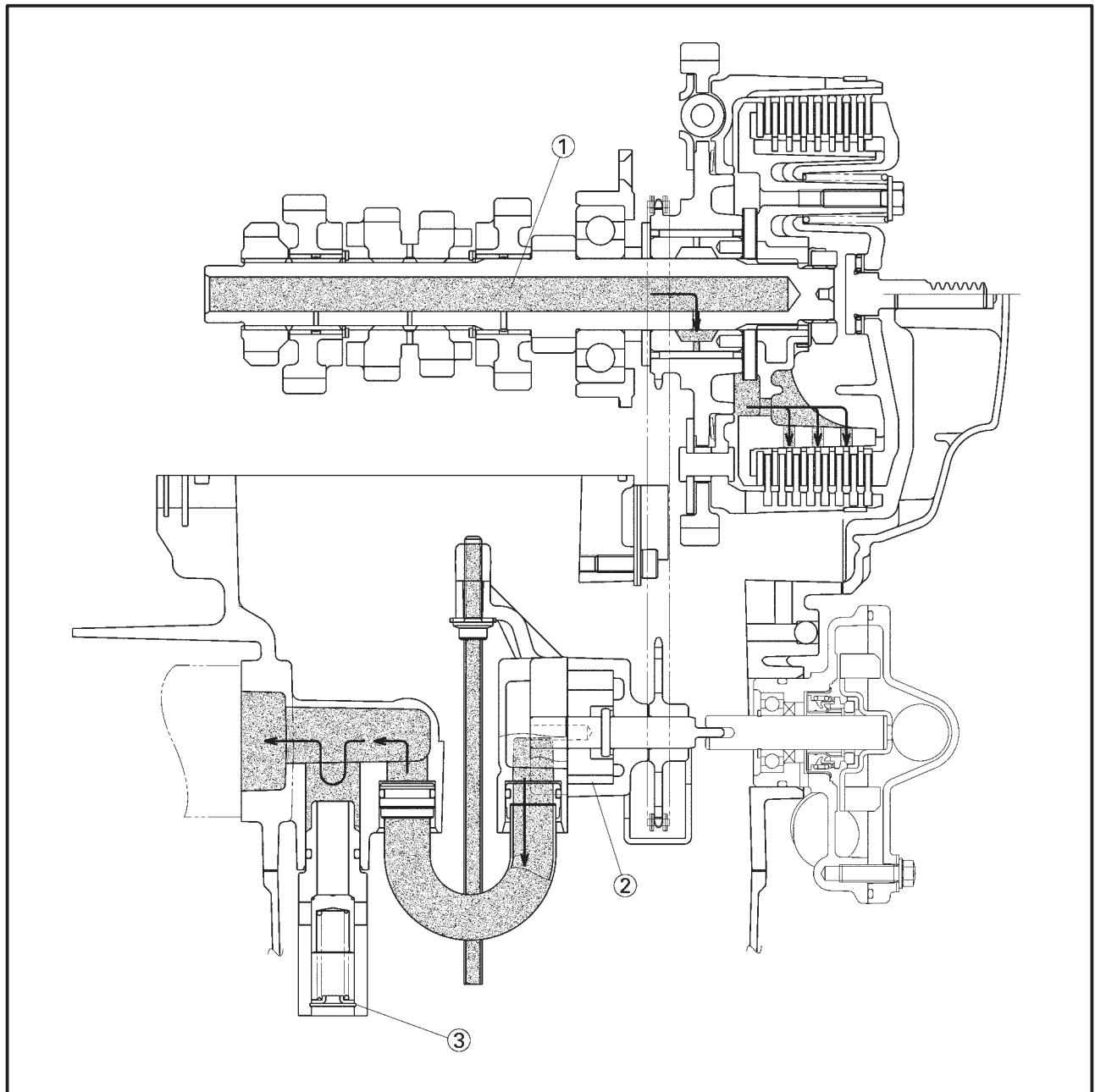


- ① Oil cooler
- ② Oil strainer
- ③ Oil level switch
- ④ Oil pump



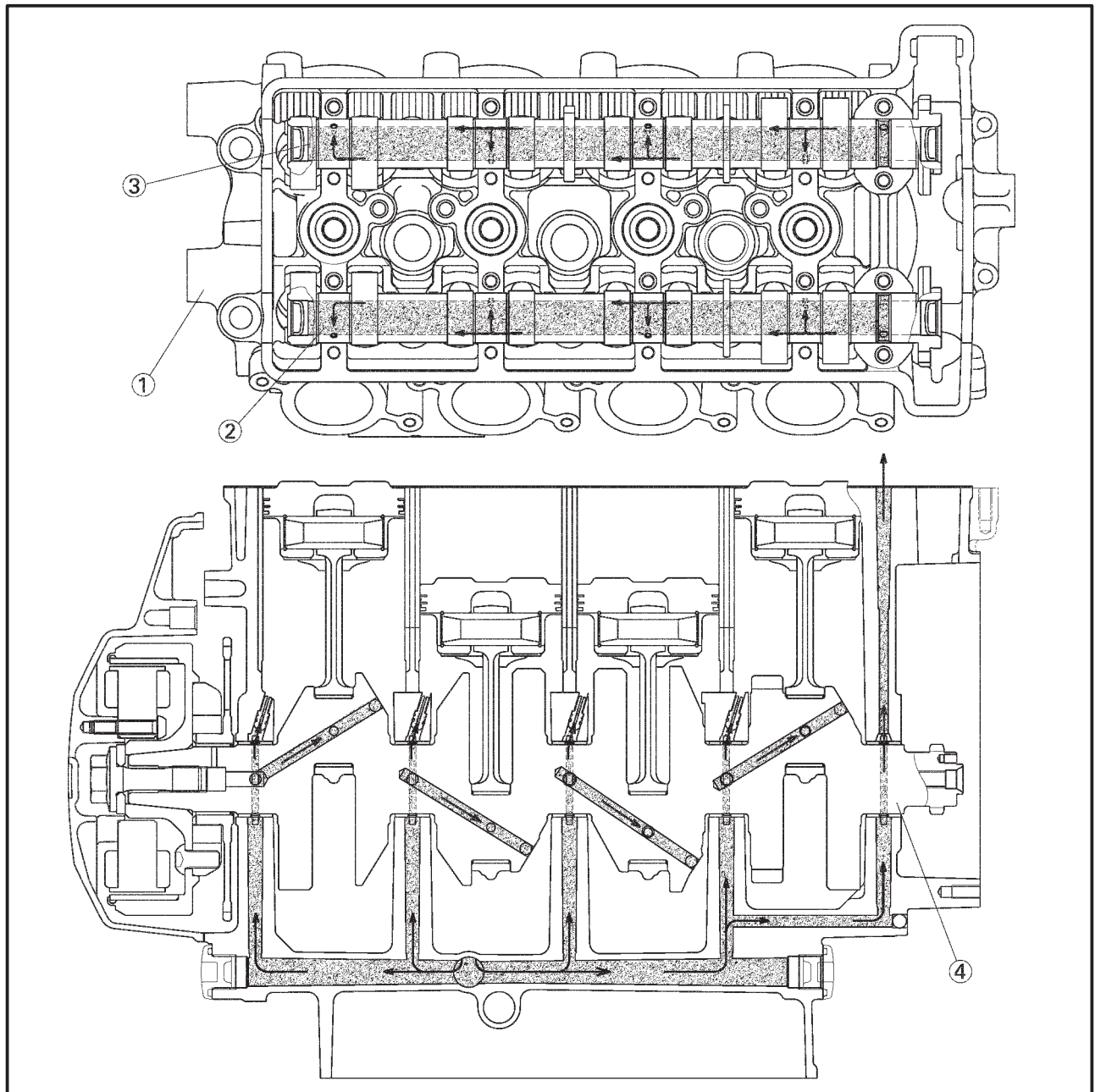


- ① Main axle
- ② Oil pump
- ③ Relief valve



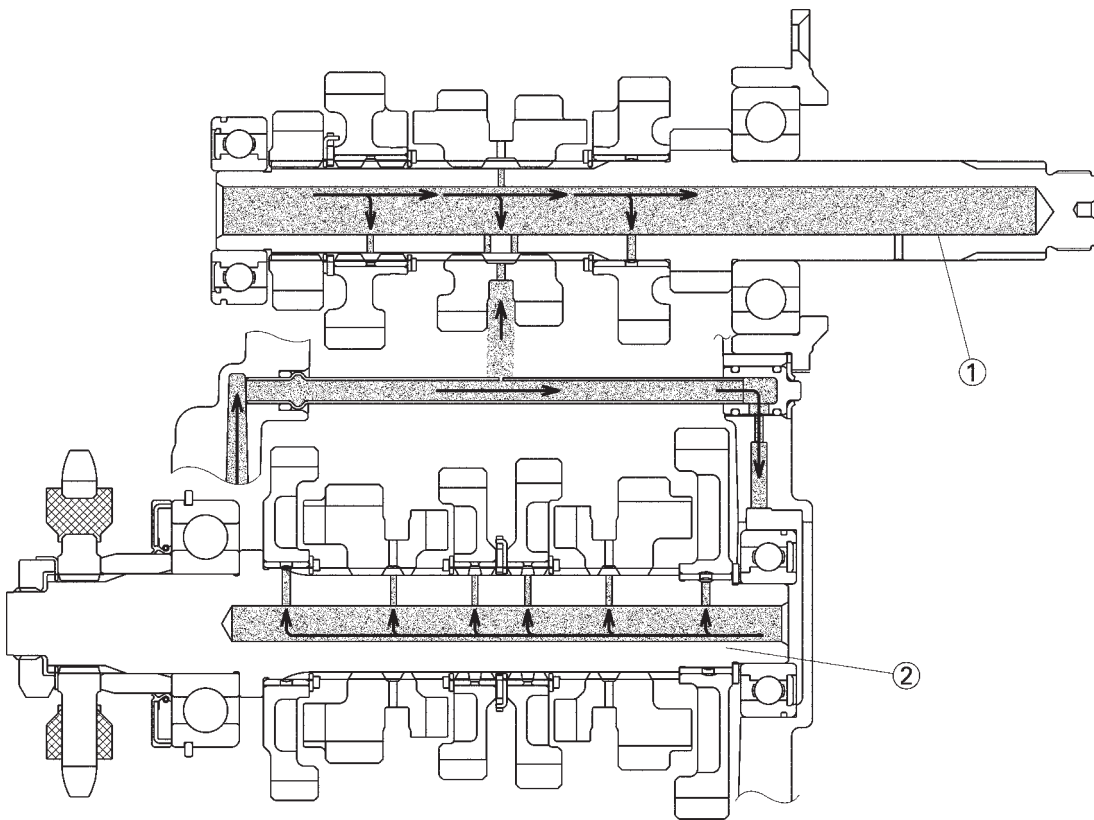


- ① Cylinder head
- ② Intake camshaft
- ③ Exhaust camshaft
- ④ Crankshaft





- ① Main axle
- ② Drive axle



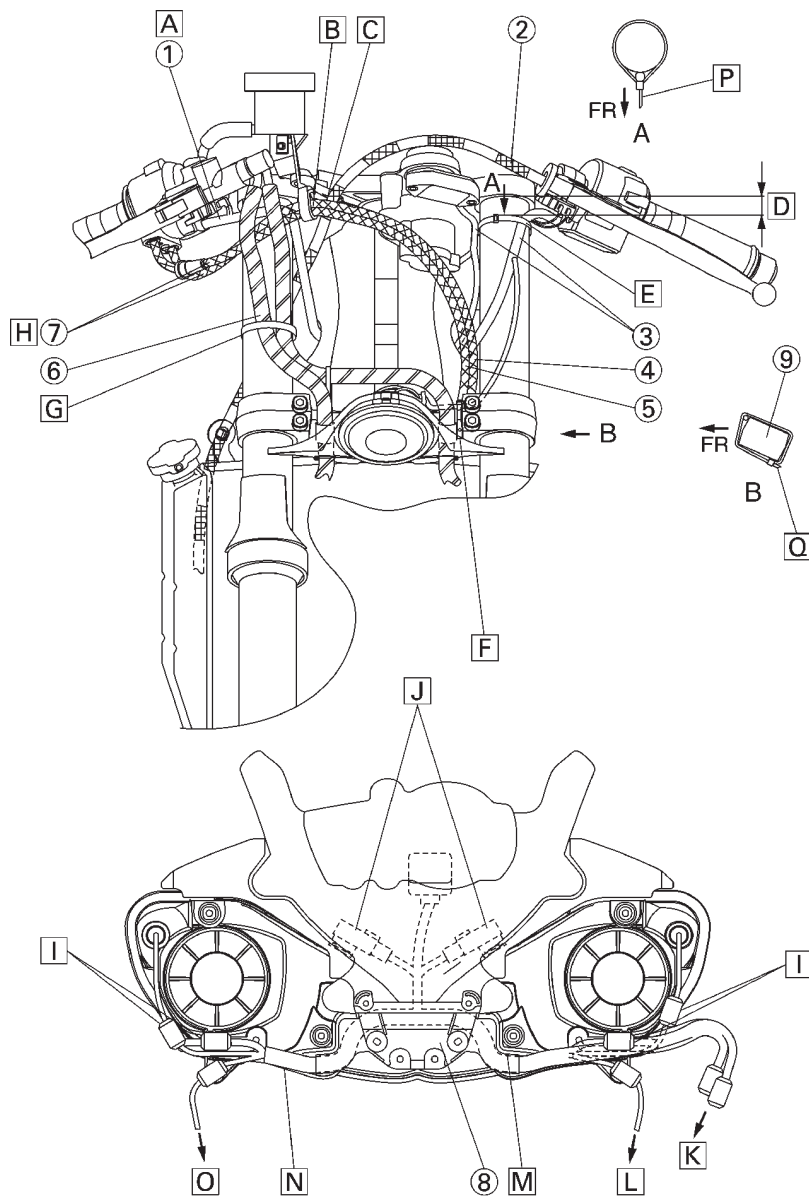




## CABLE ROUTING

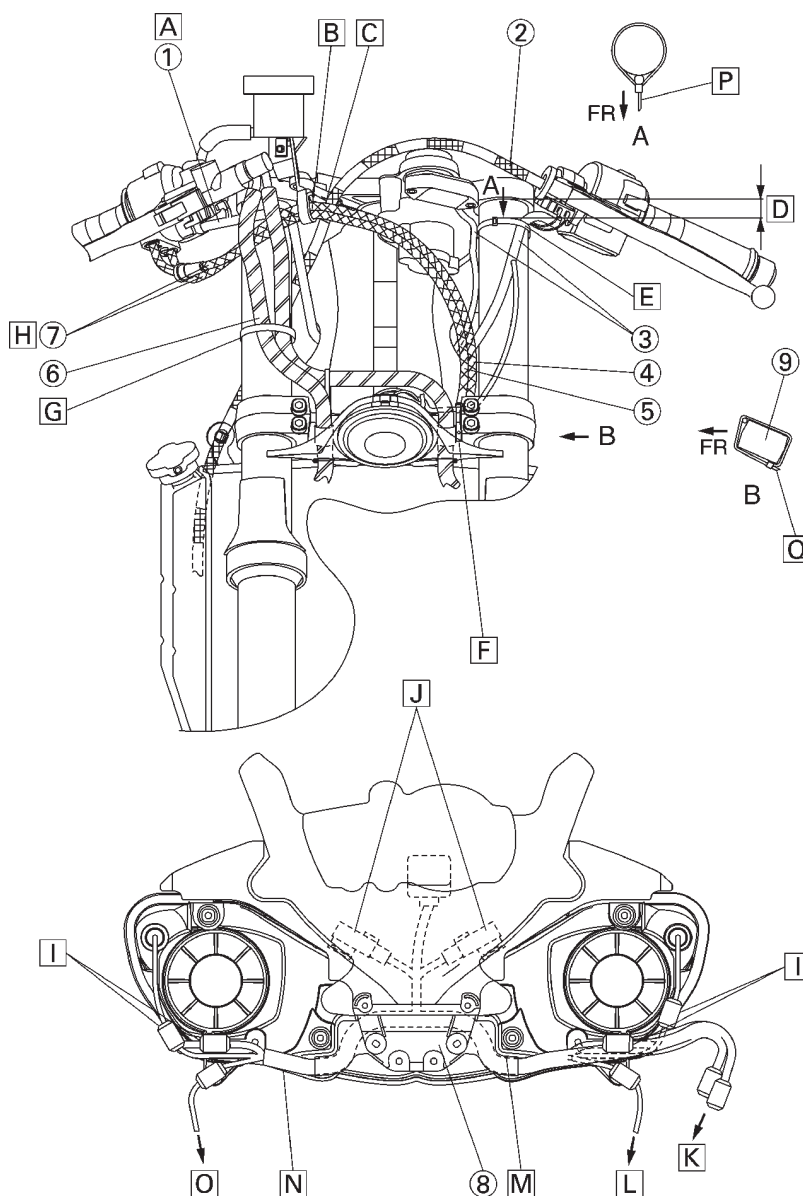
- ① Right handlebar switch lead
- ② Clutch cable
- ③ Main switch lead and left handlebar switch lead
- ④ Throttle cable (return side)
- ⑤ Throttle cable (pull side)
- ⑥ Front brake hoses
- ⑦ Throttle cables
- ⑧ Joint
- ⑨ Under bracket

- A Pass the right handlebar switch lead inside the front brake hoses and over the throttle cables.
- B Install the throttle cables to the hook so that the pulling side of the throttle cables is routed downward.
- C Pass the clutch cable through the guide.
- D Plastic locking tie shall be positioned at 10 mm (0.39 in.) below from the upper bracket.
- E Clamp the left handlebar switch lead to the front fork with the plastic locking tie and cut the tip of the tie. Clamp it to the protector section.





- F** Pass the horn lead by the outside of the throttle cables and clamp it to the forefront of upper face of the under bracket. And then route it under the front brake hose and clamp it to the pawl of the under cover.
- G** Clamp it at the position of 40 ~ 60 mm (1.57 ~ 2.36 in) from the upper face of the under bracket with the plastic locking tie. Cut the surplus part of the clamp tip leaving 2 ~ 4 mm (0.08 ~ 0.16 in). Point the tip of the clamp to the outside of vehicle.
- H** Pass the throttle cables inside the front brake hoses.
- I** Set in the coupler between the head light's hollow section and the duct.
- J** Install the relay to the rib of the headlight. (Location for the left and right relays is alternative.)
- K** To the wire harness
- L** To the front turn signal/position light (right)
- M** Set the sub wire harness in the joint.
- N** Do not catch the sub wire harness when the duct is assembled.
- O** To the front turn signal/position light (left)
- P** Point the tip of the plastic locking tie to the front side of the vehicle. Cut the tip leaving 2 ~ 10 mm (0.08 ~ 0.39 in).
- Q** Point the tip of the plastic locking tie under the under bracket and rear side of the vehicle. Cut the tip leaving 2 ~ 10 mm (0.08 ~ 0.39 in).







- ① Throttle stop screw
- ② Coolant reservoir tank hose
- ③ Crankshaft position sensor lead
- ④ Rear brake light switch lead
- ⑤ Water pump inlet hose
- ⑥ Clutch cable
- ⑦ Coolant hose protector
- ⑧ Hose clamp assembly
- ⑨ Hose clamp

- A Pass the rear brake light switch lead outside of rear engine mount bolt.
- B Pass the ignition coil lead outside of the radiator hose.
- C Pass the coolant reservoir tank hose under the frame and right side of the throttle body.

- D Pass the clutch cable inside of the coolant reservoir tank hose and radiator return hoses.

- E The punch mark starting point should be lower than the clamp's top end.

However, the aiming position of the punch mark starting point should be 5 mm (0.20 in) below the clamp's bottom end.

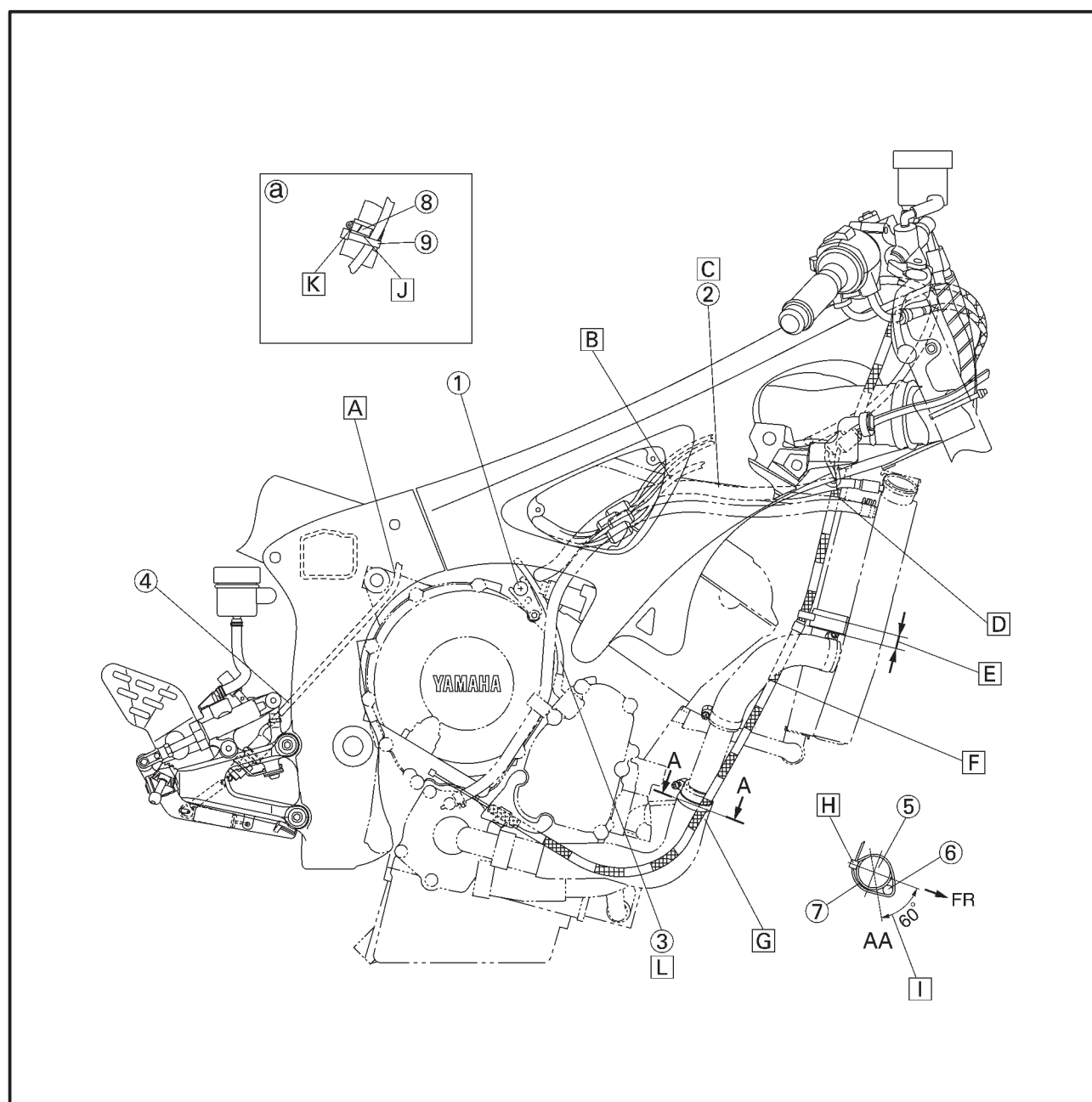
- F Pass the clutch cable inside of the radiator hose.

- G Assemble as "a" shown below when clamping.

- H Tip of the plastic locking tie shall be pointed to the inner side at the rear part of the vehicle.

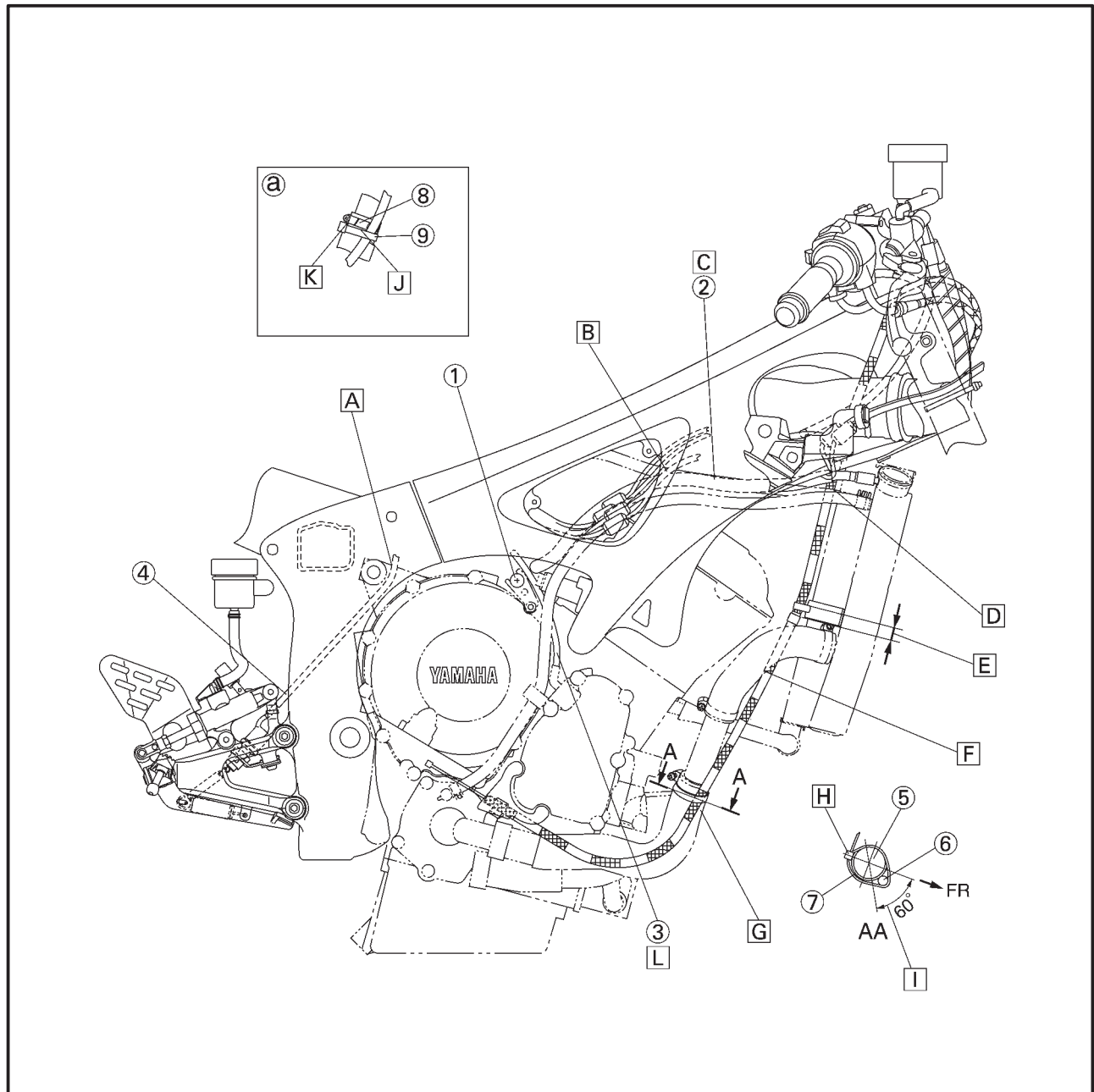
- I Clamp the clutch cable so that it is positioned in this range.

- J Clamp the clutch cable by routing the upper end of the clamp along with the bottom end of the hose clamp assembly.





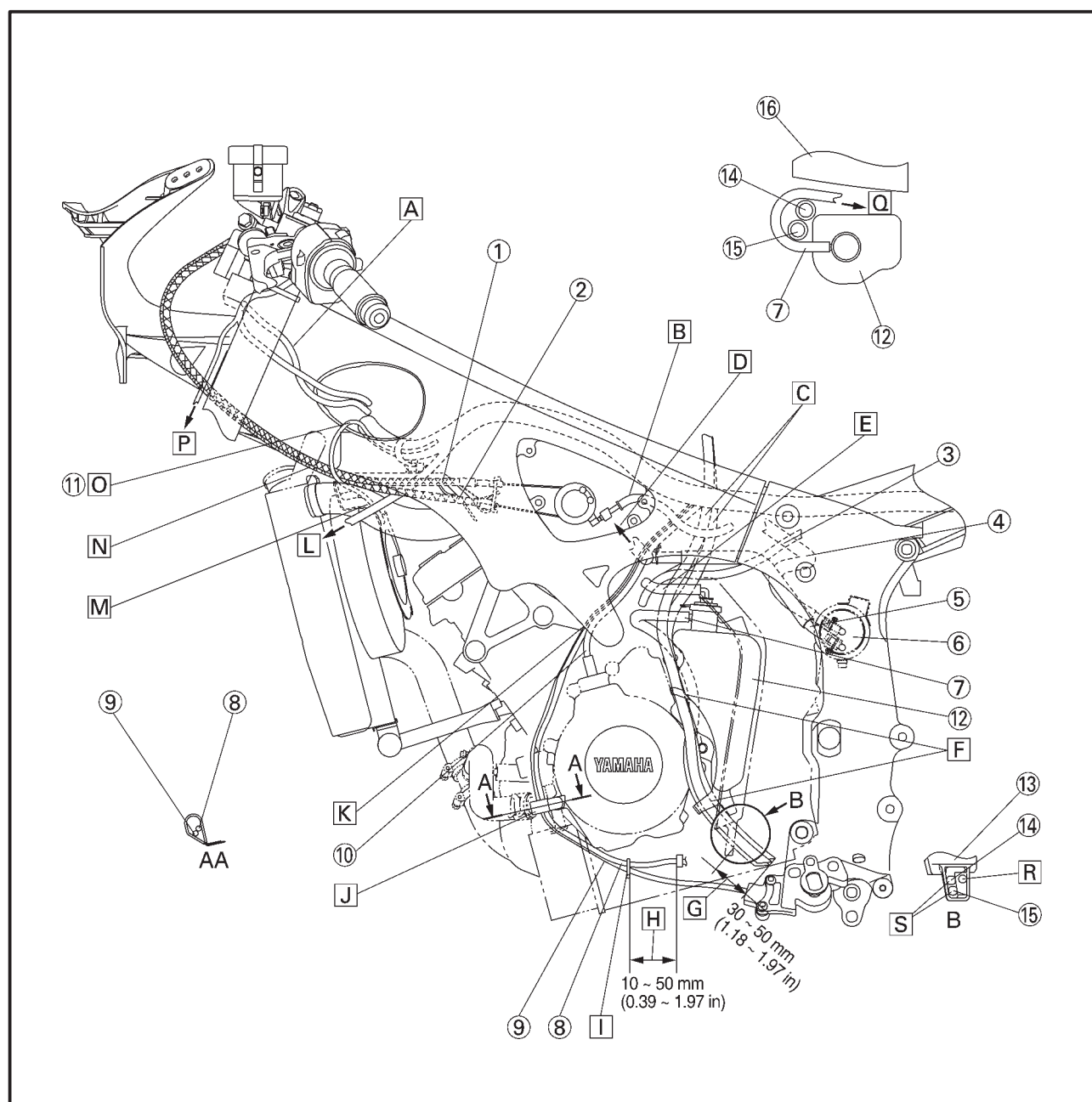
- K** Put and apply the hose clamp to it.
- L** Pass the crankshaft position sensor lead over the throttle stop screw.





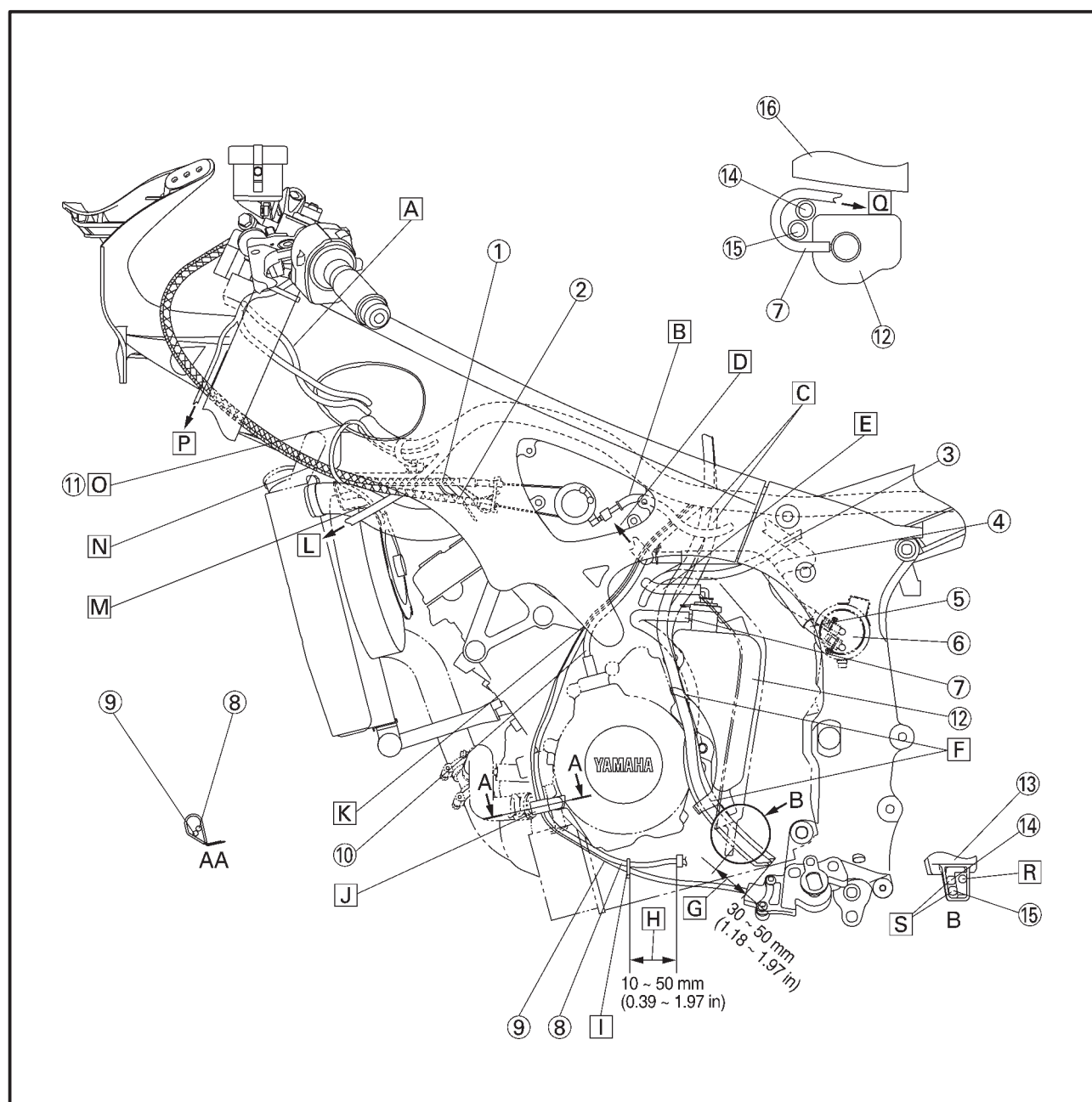
- ① Throttle cable (return side)
- ② Throttle cable (pull side)
- ③ Starter motor lead
- ④ Canister hose (for CAL)
- ⑤ Balance hose (for CAL)
- ⑥ Canister (for CAL)
- ⑦ Coolant reservoir tank breather hose
- ⑧ Oil level switch lead
- ⑨ Sidestand switch lead
- ⑩ A.C. magneto lead
- ⑪ Radiator fan motor lead
- ⑫ Coolant reservoir tank
- ⑬ Coolant reservoir tank cover
- ⑭ Fuel tank drain hose
- ⑮ Fuel tank breather hose
- ⑯ Drive sprocket cover

- A Pass the main switch lead under the left handlebar switch lead and then to the right side of the vehicle.
- B Pass the throttle stop cable by the left side of the sidestand switch lead, oil level switch lead, A.C. magneto lead, fuel tank drain hose and fuel tank breather hose, and then to the right side of the vehicle.
- C Pass the fuel tank drain hose and fuel tank breather hose inside of the reservoir tank breather hose and reservoir tank hose, wire harness and throttle stop cable and then route it by the out side of the starter motor lead.
- D To the throttle body.
- E Route the coolant reservoir tank hose by the outside of the fuel tank drain hose and the fuel tank breather hose.



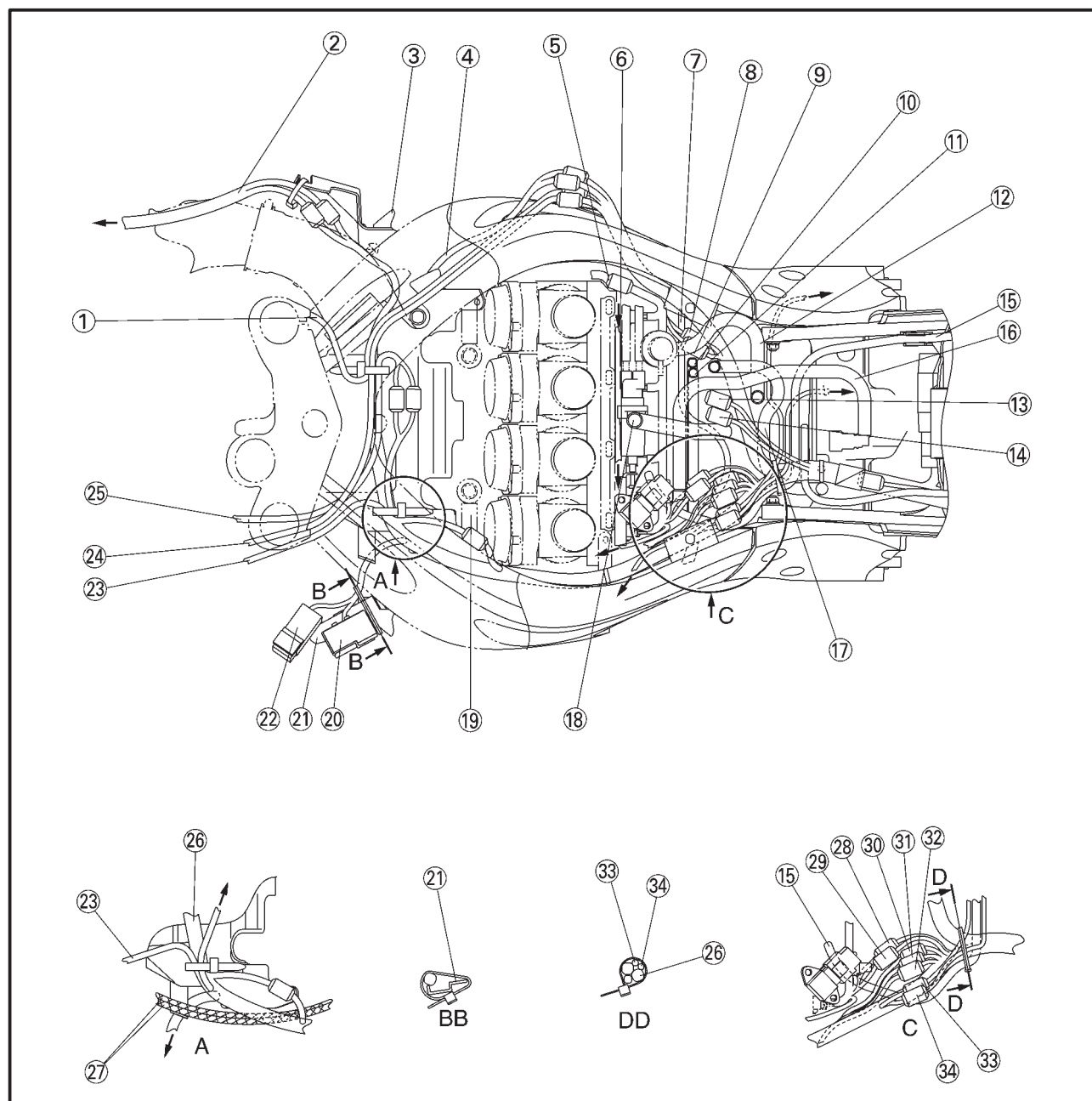


- F** Pass the fuel tank drain hose and fuel tank breather hose through the clamp of the coolant reservoir tank.
- G** Projection allowance from the coolant reservoir tank cover shall be 30 ~ 50 mm (1.18 ~ 1.97 in).
- H** 10 ~ 50 mm (0.39 ~ 1.97 in).
- I** Fasten the sidestand switch lead and oil level switch lead with a clamp.
- J** Pass the coolant reservoir tank breather hose, oil level switch lead and sidestand switch lead through the clamp.
- K** Pass the sidestand switch lead, oil level switch lead and A.C. magneto lead between the engine stay and the engine.
- L** To the radiator fan motor relay and fuse box
- M** Route it above the radiator hose.
- N** Pass the throttle cable between the guide of the cover 2 and the frame.
- O** Pass the radiator fan motor lead through the hole of the frame to the inner side of the vehicle.
- P** To the horn.
- Q** Route it below the coolant reservoir tank.
- R** Pass the coolant reservoir tank breather hose through the hole of the coolant reservoir tank cover.
- S** Order of ups and downs means no object.



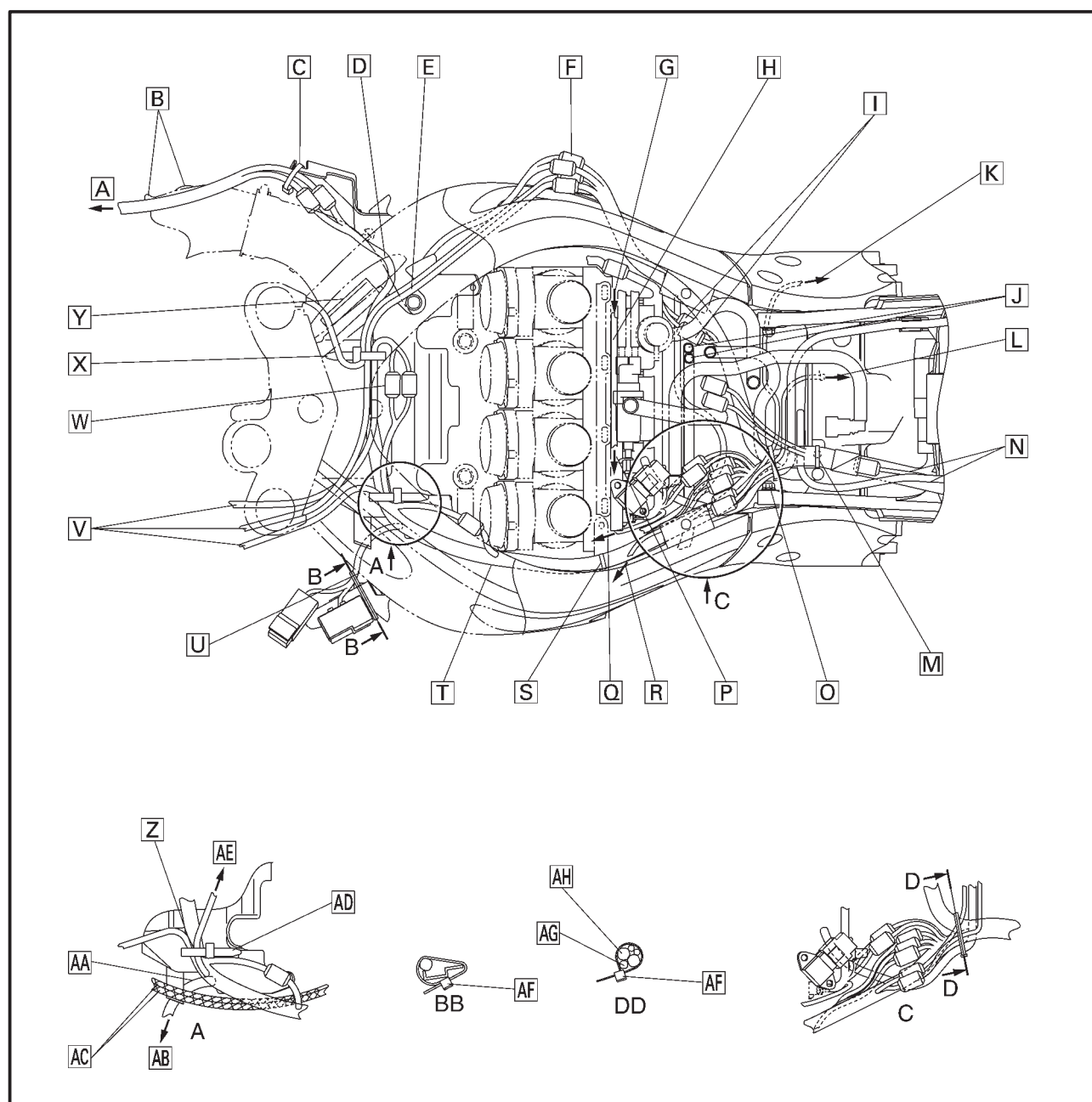


- |  |                                       |  |
|--|---------------------------------------|--|
| ① Right handlebar switch lead              | ⑮ Starter motor lead                  | ⑳ Throttle sub-lead 2 (black 6 poles)                  |
| ② Sub wire harness                         | ⑯ Fuel hose (feed side)               | ㉑ Oil level switch lead coupler (white 1 pole)         |
| ③ Cover 8                                  | ⑰ Canister hose (for CAL)             | ㉒ Sidestand switch lead coupler (blue 2 poles)         |
| ④ Ignition coil lead                       | ⑱ Crankcase breather hose             | ㉓ A.C. magneto lead coupler (white 3 poles)            |
| ⑤ Throttle position sensor coupler         | ⑲ Air vent hose                       | ㉔ Rear brake light switch lead coupler (brown 2 poles) |
| ⑥ Coolant reservoir tank hose              | ⑳ Fuse box                            | ㉕ Neutral switch lead coupler (connector 1 pole)       |
| ⑦ Throttle stop cable                      | ㉑ Cover 7                             |  |
| ⑧ Speed sensor lead coupler                | ㉒ Radiator fan motor relay            |  |
| ⑨ Crankshaft position sensor lead coupler  | ㉓ Radiator fan motor lead             |  |
| ⑩ Fuel tank breather hose (except for CAL) | ㉔ Left handlebar switch lead          |  |
| ⑪ Fuel tank drain hose                     | ㉕ Main switch lead                    |  |
| ⑫ Fuel hose (return side)                  | ㉖ Wire harness                        |  |
| ⑬ Fuel pump 2 coupler                      | ㉗ Throttle cables                     |  |
| ⑭ Fuel pump 1 coupler                      | ㉘ Throttle sub-lead 1 (white 6 poles) |  |





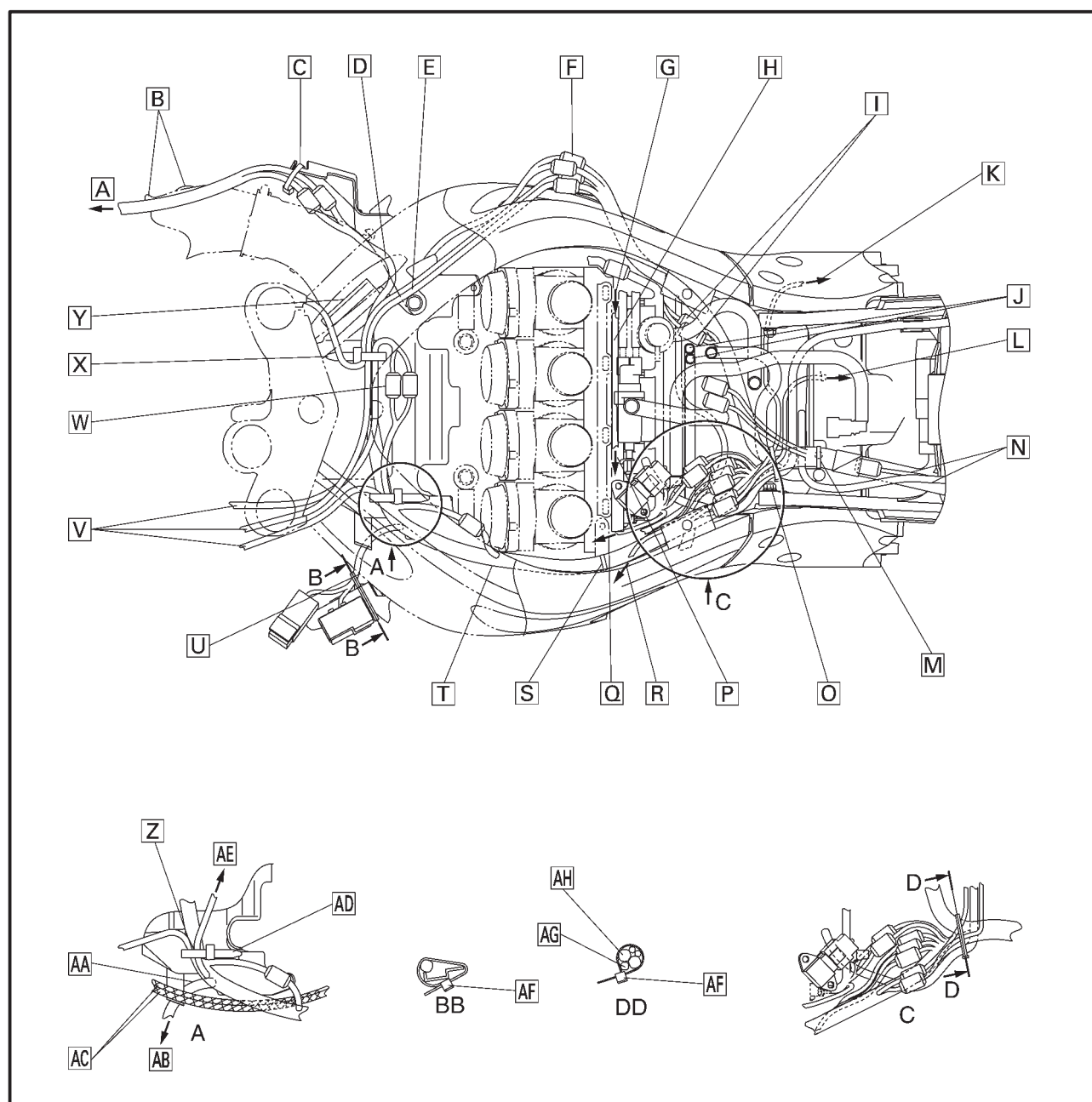
- A** To the headlight
- B** Make sure not to drop the headlight sub wire harness beneath the projection of the duct. Check it when installing the side cowling.
- C** Clamp the plastic locking tie to the cover 8. Place the coupler at the rear side of the vehicle against the plastic locking tie. Point the tip of the plastic locking tie to the downward in the inner side of the vehicle.
- D** Route the head light and meter leads under the frame's lower part from the hollow section of the cover 2.
- E** Pass the left and right handlebar switch leads outside of the air filter case air vent hose.
- F** Connect the couplers (4 units) at the frame side hole. Do not catch each lead and wire harness when the cover 8 is attached.
- G** From the radiator
- H** Pass the coolant reservoir tank hose through forward the starter motor lead and speed sensor lead.
- I** Pass the speed sensor lead coupler and crankshaft position sensor lead coupler over the throttle stop cable.
- J** Pass the fuel tank breather hose and fuel tank drain hose under the fuel hose.
- K** To the rear brake light switch lead.
- L** To the neutral switch
- M** Insert the wire harness wrapping clamp to the frame hole.
- N** Pass the battery negative lead over the wire harness.
- O** There should be no interference between the wire harness and the tip of the rear frame attaching bolts.





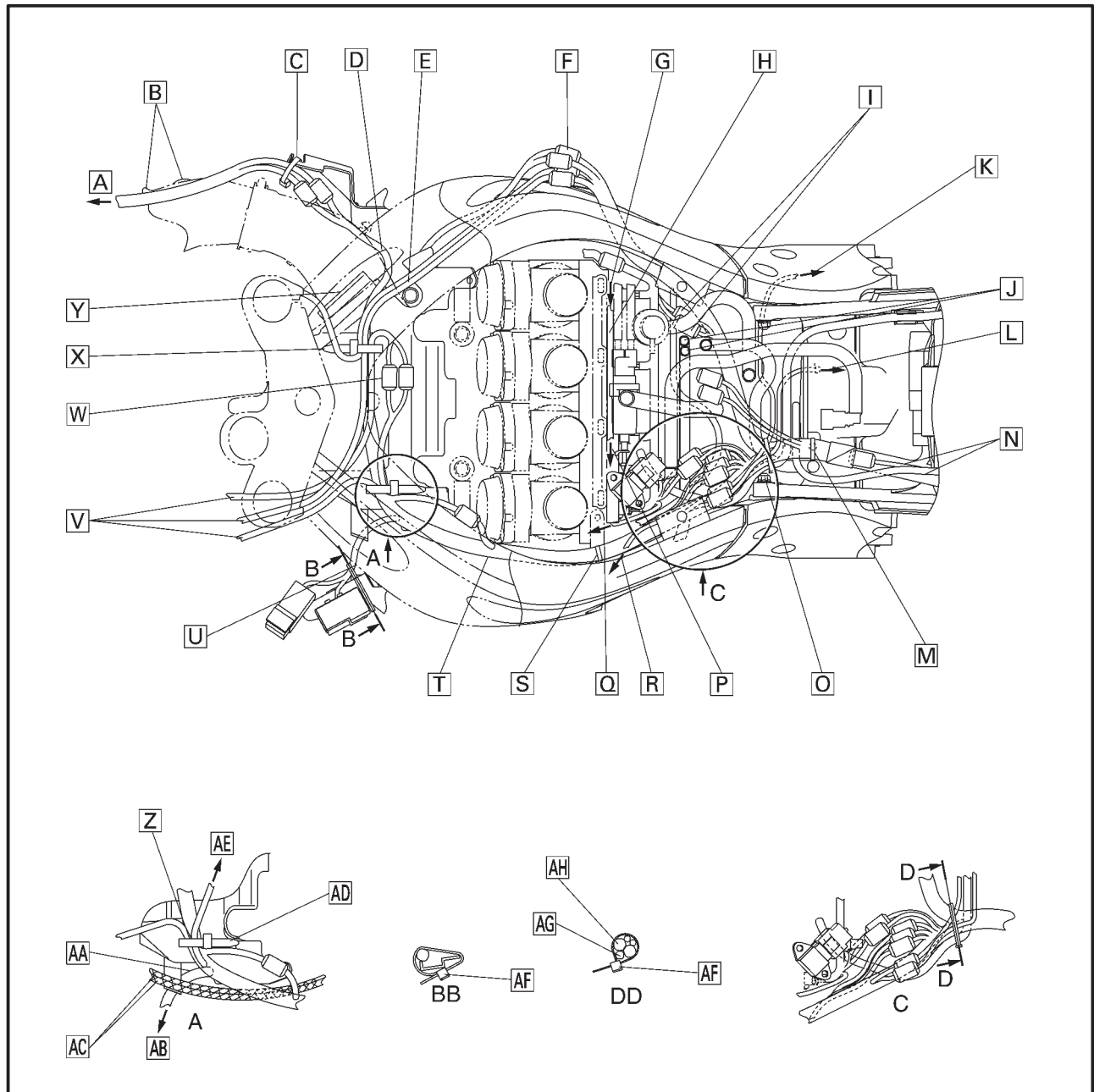


- [P]** To the coolant reservoir tank
- [Q]** To the intake air temperature sensor (air filter case)
- [R]** To the oil level switch, sidestand switch and A.C. magneto
- [S]** Install the wire harness wrapping clamp to the stay of the throttle body.
- [T]** Pass the wire harness over the throttle air vent hose.
- [U]** Pass the wire harness between frame and coolant hose.
- [V]** Pass it through the frame hole.
- [W]** Do not catch the coupler when the air filter case is assembled.
- [X]** Clamp the wire harness, left and right handlebar switch leads and main switch lead. Align the tapping positions of three leads except the wire harness. Point the tip of the clamp to the front side of the vehicle.
- [Y]** Sealing set of the cover can be either upper or lower against the frame lower end. However, it should not be caught.
- [Z]** Clamp the wire harness, main switch lead branch section and radiator fan motor lead.
- [AA]** Branching leads to the fuse box and radiator fan motor relay shall pass through the guide section of the cover 2 under the wire harness and then to the outside of the frame.





- AB** To the fuse box and fan motor relay
- AC** Pass the throttle cables over the cover 2.
- AD** Point the tip of the plastic locking tie to the rear side of the vehicle.
- AE** To the main switch lead coupler
- AF** Tip of the plastic locking tie should point to the downward outside of the vehicle.
- AG** Use the plastic locking tie to clamp the starter motor lead at the protector section.
- AH** Branching harness from the wire harness.

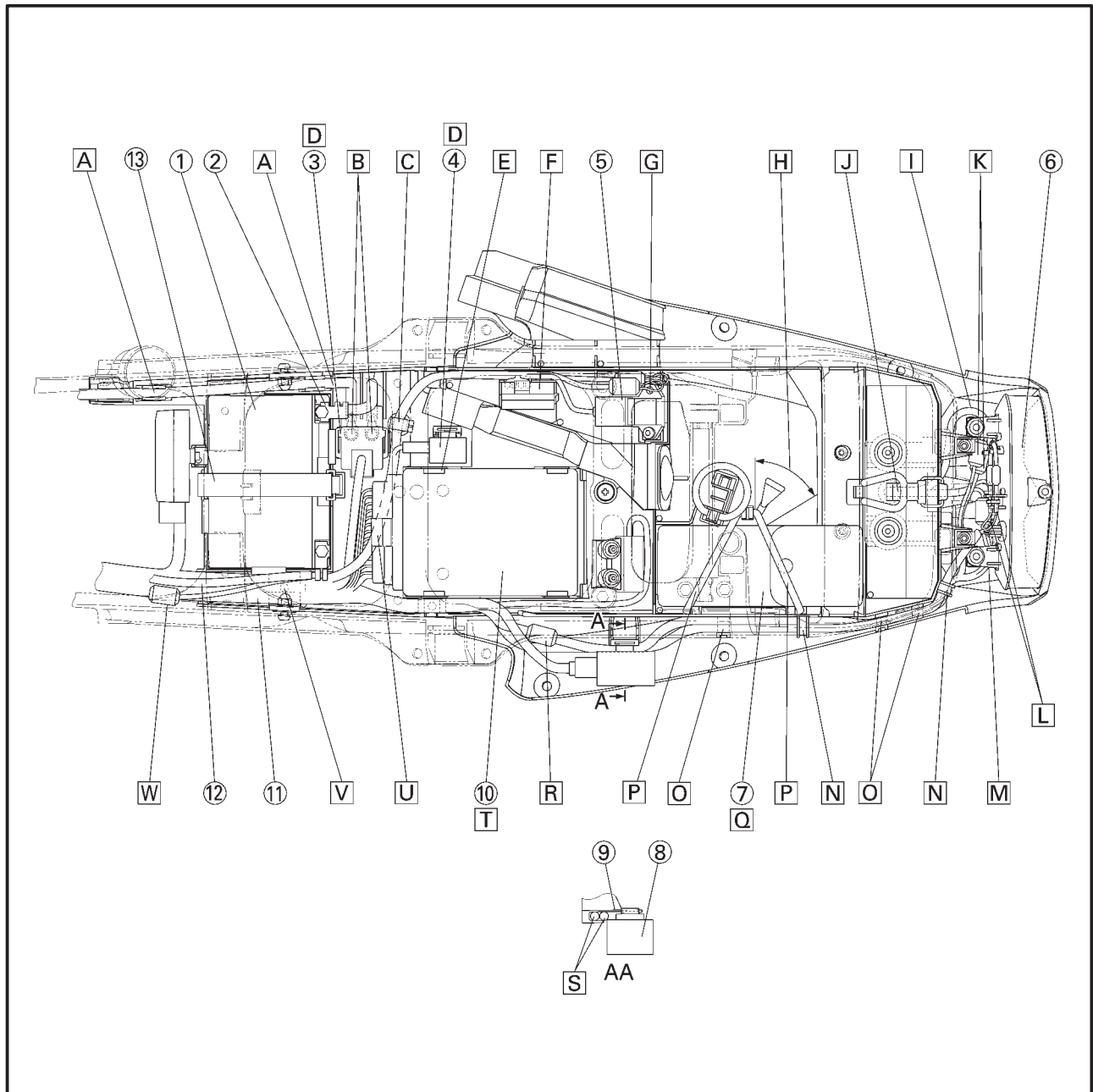






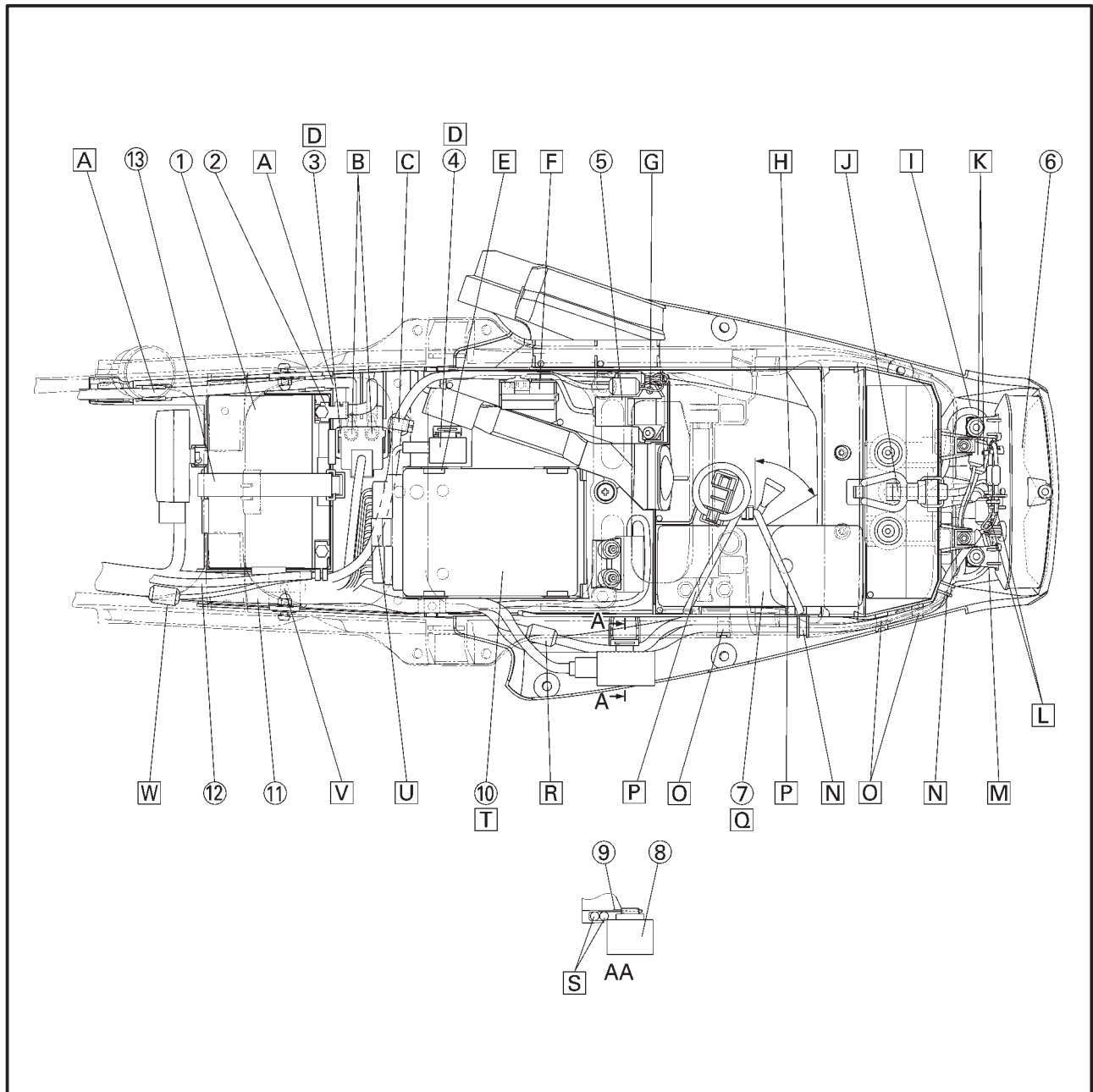
- ① Battery
- ② Battery positive lead
- ③ Starter relay
- ④ Turn signal relay
- ⑤ Pressure sensor
- ⑥ Tail/brake light
- ⑦ Tool kit
- ⑧ Starting circuit cut-off relay
- ⑨ Battery box
- ⑩ ECU
- ⑪ Wire harness
- ⑫ Battery negative lead
- ⑬ Battery band

- A Push the starter motor lead in the clamping sections (two points) or the battery box assembly and secure it.
- B Fit the plastic cover in the starter relay after the flange bolts are installed.
- C Make sure to clamp the wire harness. (Tighten it until the clamp latchet stops.)
- D Install to the deepest position of the rib of the battery box assembly.
- E When installing the ECU, make sure to hook the pawls of the battery box assembly (at four points).
- F Hook of the battery box assembly shall hook on the upper face of the fuse box. (It should not be put on the side face.)
- G Install the pin of the battery box assembly to its base.





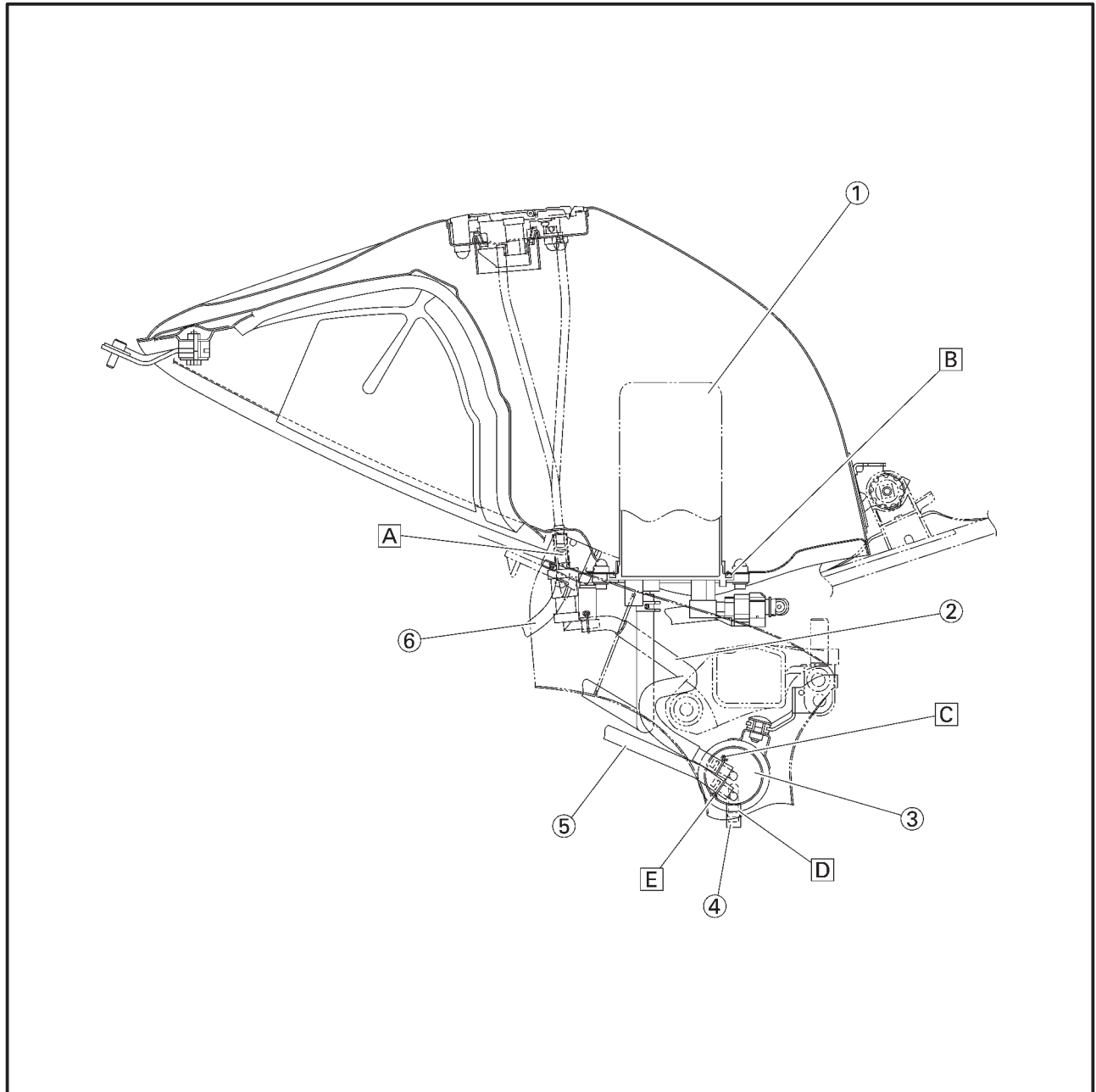
- H** The knob section should be positioned in this area.
- I** Pass the turn signal lead by the outside of the right side attaching boss of the tail/brake light.
- J** Pass the turn signal light and license light leads between the rear side ribs of the battery box assembly and to the rear part of the vehicle.
- K** Connect the turn signal lead couplers.
- L** Connect the license light leads.
- M** Route the branching lead to the license light behind the tail/brake light left side attaching boss.
- N** Route the tail/brake light lead under the projection part.
- O** Route the tail/brake light lead above the projection part.
- P** There should be no significant difference between right and left side of the tension rate on the band.
- Q** Point the opening to the rear side of the vehicle.
- R** Connect the tail/brake light lead coupler.
- S** Install the starting circuit cut-off relay to the deepest position after placing the tail/brake light lead and turn signal lead in the guide.
- T** The hook of the battery box assembly should hook on the surface.
- U** Route the fuse box lead under the ECU connection coupler.
- V** Install the wrapping clamp of the wire harness to the hole of the battery box assembly.
- W** Connect the negative lead and the wire harness.



**For California**

- ① Fuel pump assembly
- ② Canister hose
- ③ Canister
- ④ Breather hose
- ⑤ Blance hose
- ⑥ Fuel tank drain hose

- A Install the roll over valve until it contacts with the fuel tank's nipple.
- B Install the O-ring with its lip pointed upward.
- C Install the clip with its tab pointed in the upward direction.
- D Install the breather hose without projecting canister nipple out of the breather hose.
- E Install the clip with its tab pointed in the downward direction.





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	REMARKS	INITIAL	ODOMETER READINGS					
				600 mi (1,000 km) or 1 month	4,000mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months	
1	*	Valve clearance (See page 3-10)	• Check and adjust valve clearance when engine is cold.	Every 26,600 mi (42,000 km)						
2	*	Spark plugs (See page 3-21)	• Check condition. • Adjust gap and clean. • Replace at 8,000 mi (13,000 km) or 12 months.		✓	Replace.	✓	Replace.	✓	
3	*	Crankcase ventilation system (See page 3-32)	• Check ventilation hose for cracks or damage. • Replace if necessary.		✓	✓	✓	✓	✓	
4	*	Fuel line (See page 3-32)	• Check fuel hoses for cracks or damage. • Replace if necessary.		✓	✓	✓	✓	✓	
5	*	Exhaust system (See page 3-33)	• Check for leakage. • Tighten if necessary. • Replace gasket(s) if necessary.		✓	✓	✓	✓	✓	
6	*	Electronic fuel injection (See page 3-16, 18)	• Check and adjust engine idle speed and synchronization.	✓	✓	✓	✓	✓	✓	
7	*	Evaporative emission control system**	• Check control system for damage. • Replace if necessary.				✓			
8	*	Air induction system (See page 7-35)	• 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.

\*\* California only

### GENERAL MAINTENANCE AND LUBRICATION CHART

NO.		ITEM	REMARKS	INITIAL	ODOMETER READINGS					
				600 mi (1,000 km) or 1 month	4,000mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months	
1		Engine oil (See page 3-24, 25)	• Replace (warm engine before draining).	✓	✓	✓	✓	✓	✓	
2	*	Engine oil filter cartridge (See page 3-25)	• Replace at initial 600 mi (1,000 km) or 1 month, and thereafter every 8,000 mi (13,000 km) or 12 months.	✓		✓		✓		
3	*	Air filter element (See page 3-30)	• Check condition and damage. • Replace if necessary.		✓	✓	✓	✓	✓	
4	*	Cooling system (See page 3-34, 35)	• Check hoses for cracks or damage. • Replace if necessary.		✓	✓	✓	✓	✓	
			• Replace with ethylene glycol antifreeze coolant every 24 months.					Replace.		
5	*	Brake system (See page 3-39, 40, 41, 43)	• Check operation, pad wear, and fluid leakage. • Correct if necessary.	✓	✓	✓	✓	✓	✓	
6	*	Clutch (See page 3-29)	• Check operation. • Adjust or replace cable.	✓	✓	✓	✓	✓	✓	

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

# GENERAL MAINTENANCE AND LUBRICATION CHART

**CHK  
ADJ**



NO.		ITEM	REMARKS	INITIAL	ODOMETER READINGS					
				600 mi (1,000 km) or 1 month	4,000mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months	
7	*	Control cables (See page 3-58)	• Apply Yamaha chain and cable lube or engine oil 10W-30 thoroughly.	✓	✓	✓	✓	✓	✓	
8	*	Swingarm pivot bearing (See page 4-75)	• Check bearing assembly for looseness. • Moderately repack with lithium-soap-based grease every 16,000 mi (25,000 km) or 24 months.			✓		✓ Repack.		
9	*	Rear suspension link pivots (See page 4-75)	• Check operation. • Correct if necessary.			✓		✓		
10	*	Shock absorber assembly (See page 4-71)	• Check operation and for oil leakage. • Replace if necessary.		✓	✓	✓	✓	✓	
11	*	Front fork (See page 3-50)	• Check operation and oil leakage. • Replace if necessary.		✓	✓	✓	✓	✓	
12	*	Steering bearings (See page 3-48)	• Check bearing assembly for looseness. • Moderately repack with lithium-soap-based grease every 16,000 mi (25,000 km) or 24 months.	✓	✓	✓	✓	✓ Repack.	✓	
13		Brake and clutch lever pivot shafts (See page 3-58)	• Apply lithium-soap-based grease (all-purpose grease) lightly.		✓	✓	✓	✓	✓	
14		Brake and shift pedal pivot shafts (See page 3-58)	• Apply lithium-soap-based grease (all-purpose grease) lightly.		✓	✓	✓	✓	✓	
15		Drive chain (See page 3-46)	• Check chain slack/alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 500 mi (800 km) or after washing the motorcycle or riding in the rain.						
16	*	Wheel bearings (See page 4-3)	• Check bearing for smooth operation.		✓	✓	✓	✓	✓	
17		Sidestand pivot (See page 3-58)	• Check operation and lubricate. • Apply lithium-soap-based grease (all-purpose grease) lightly.		✓	✓	✓	✓	✓	
18	*	Sidestand switch (See page 8-4)	• Check operation and replace if necessary.	✓	✓	✓	✓	✓	✓	
19	*	Chassis fasteners (See page 2-22)	• Check all chassis fitting and fasteners. • Correct if necessary.		✓	✓	✓	✓	✓	
20	*	Brake hoses (See page 3-43)	• Check for cracks or damage. • Replace.		✓	✓	✓	✓	✓	
21	*	Wheels (See page 4-3)	• Check runout and for damage. • Replace if necessary.		✓	✓	✓	✓		
22	*	Tires (See page 3-55)	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		✓	✓	✓	✓	✓	

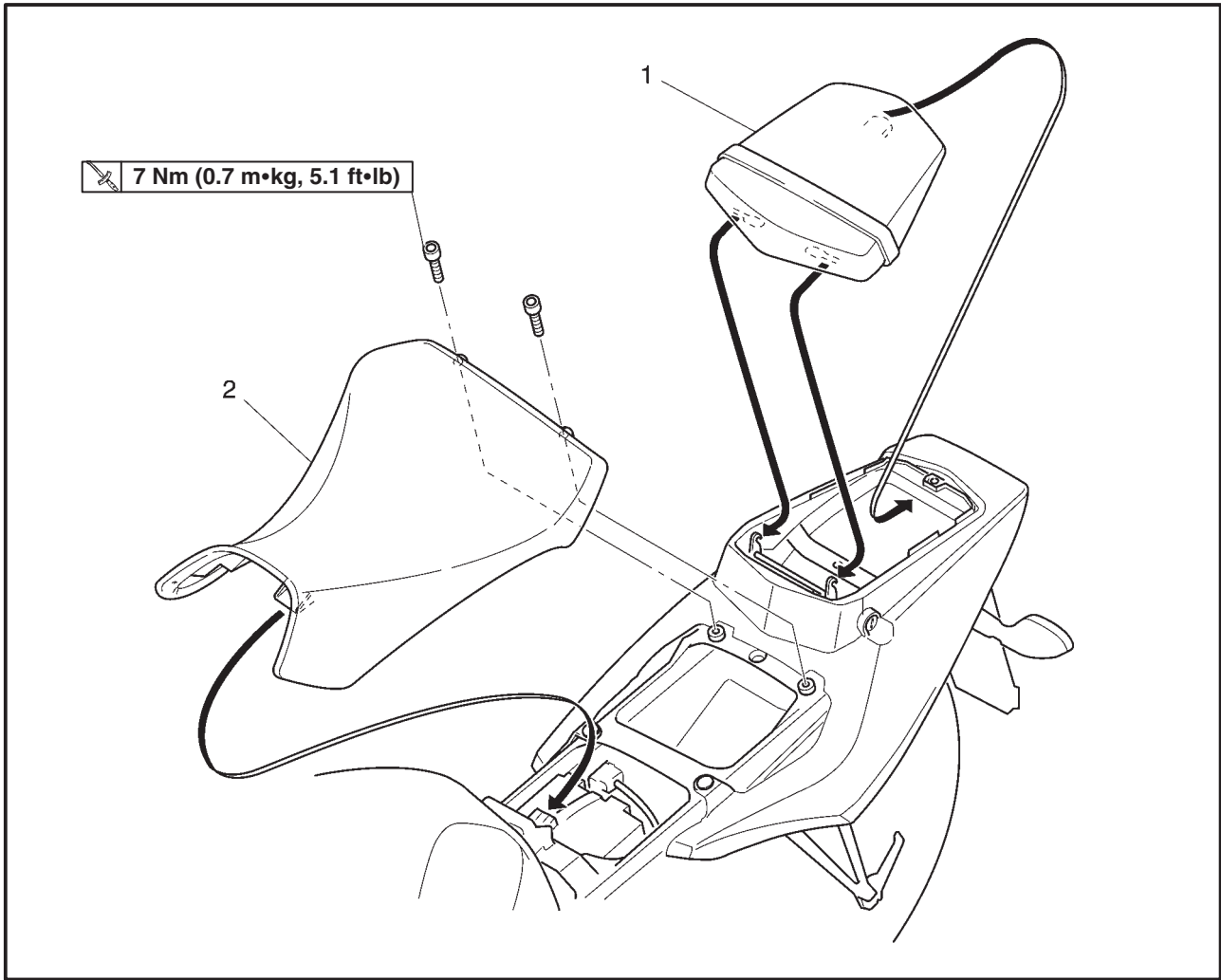
\* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

## NOTE:

From 24,000 mi (37,000 km) 36 months, repeat the maintenance intervals starting from 4,000 mi (7,000 km) or 6 months.

## NOTE:

- The air filter needs 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.

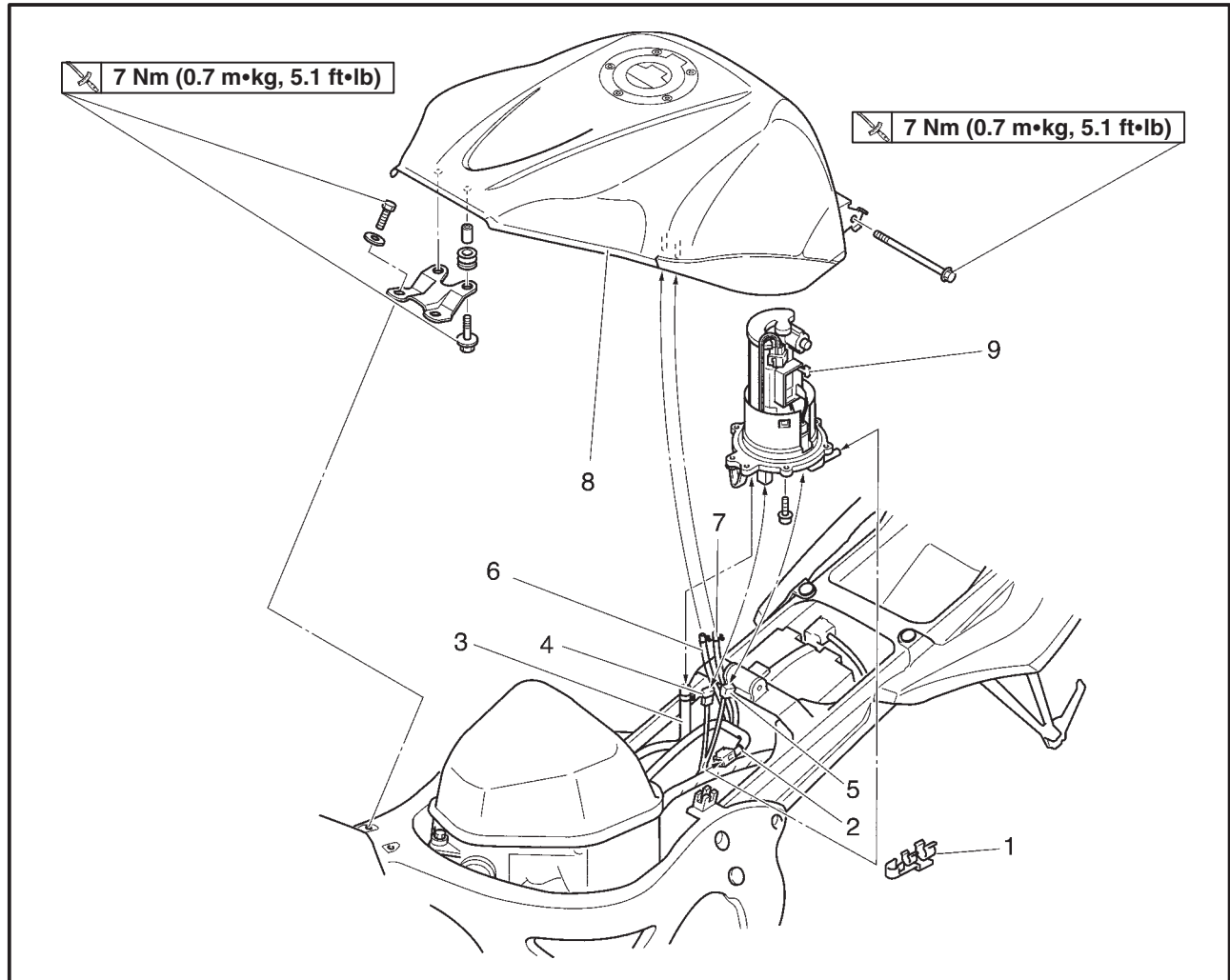


Order	Job/Part	Q'ty	Remarks
1	<b>Removing the seats</b>	1	Remove the parts in the order listed.
2	Passenger seat	1	For installation, reverse the removal procedure.
	Rider seat		



EAS00040

## FUEL TANK



Order	Job/Part	Q'ty	Remarks
	<b>Removing the fuel tank</b>		
	Rider seat		Remove the parts in the order listed. Refer to "SEATS".
1	Fuel hose connector cover	1	
2	Fuel hose	1	
3	Fuel return hose	1	
4	Fuel sender coupler	1	Disconnect.
5	Fuel pump coupler	1	Disconnect.
6	Fuel tank overflow hose	1	
7	Fuel tank breather hose	1	
8	Fuel tank	1	
9	Fuel pump	1	
			For installation, reverse the removal procedure.



---

**REMOVING THE FUEL TANK**

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
  - fuel return hose
  - fuel hose

**CAUTION:** \_\_\_\_\_

**Although the fuel has been removed from the fuel tank, be careful when removing the fuel hoses, since there may be fuel remaining in it.**

---

**NOTE:** \_\_\_\_\_

Before removing the hoses, place a few rags in the area under where it will be removed.

---

3. Remove:
  - fuel tank

**NOTE:** \_\_\_\_\_

Do not set the fuel tank down so that the installation surface of the fuel pump is directly under the tank. Be sure to lean the fuel tank in an upright position.

---

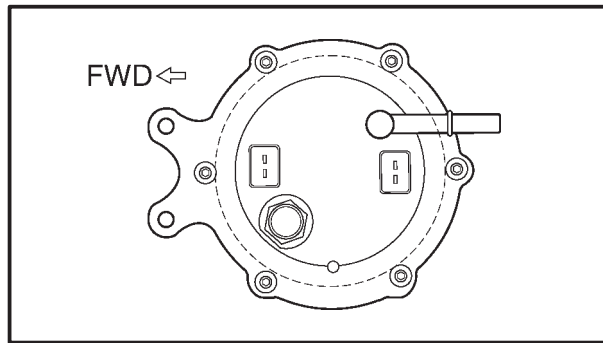
**REMOVING THE FUEL PUMP**

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.
-



**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.
- Install the fuel pump as shown in the illustration.
- Tighten the fuel pump bolts in stages in a criss-cross pattern and to the specified torque.

**INSTALLING THE FUEL TANK**

## 1. Install:

- fuel hose
- fuel return hose
- fuel hose connector cover

**CAUTION:**

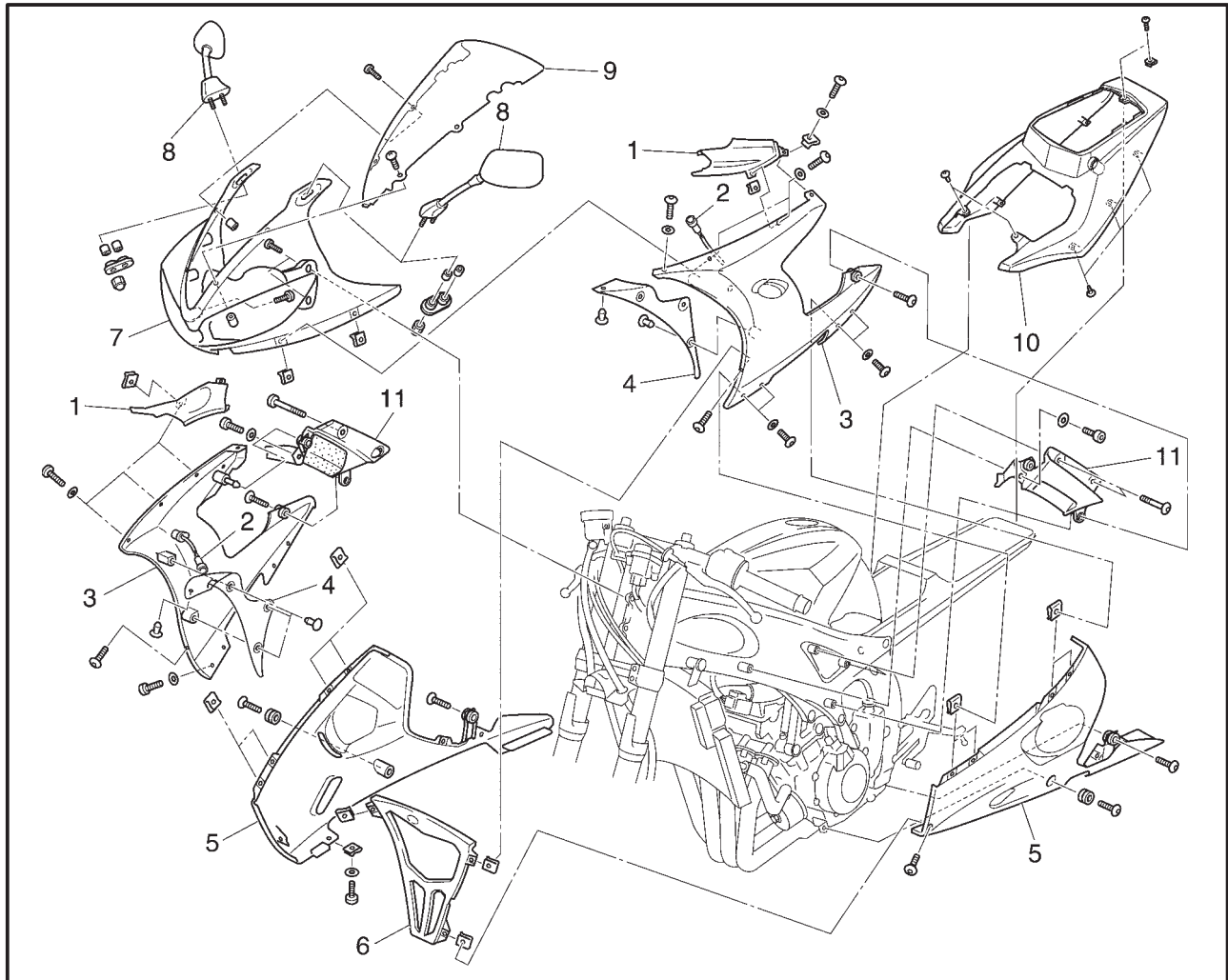
**When installing the fuel hose, make sure that it is securely connected, and that the fuel hose holders are in the correct position, otherwise the fuel hose will not be properly installed.**

## 2. Install:

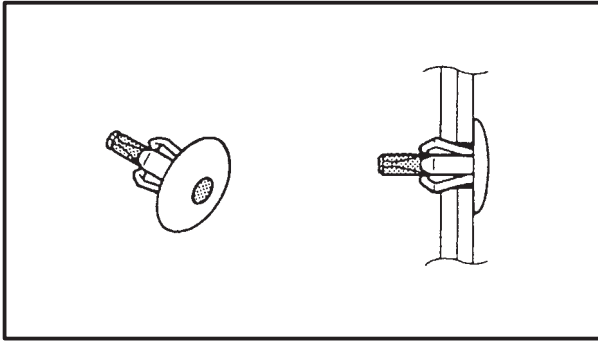
- fuel sender coupler
- fuel pump coupler
- fuel tank breather hose
- fuel tank overflow hose



## COWLINGS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the cowlings</b>		
	Rider and passenger seats		Remove the parts in the order listed. Refer to "SEATS".
1	Front cowling inner panel (left and right)	2	
2	Front turn signal light lead couplers	2	Disconnect.
3	Side cowlings (left and right)	2	
4	Side cowlings inner panels (left and right)	2	
5	Bottom cowlings (left and right)	2	
6	Bottom cowling front cover	1	
7	Front cowling	1	
8	Rear view mirrors (left and right)	2	
9	Windshield	1	
10	Rear cowling	1	
11	Frame side cover	2	
			For installation, reverse the removal procedure.

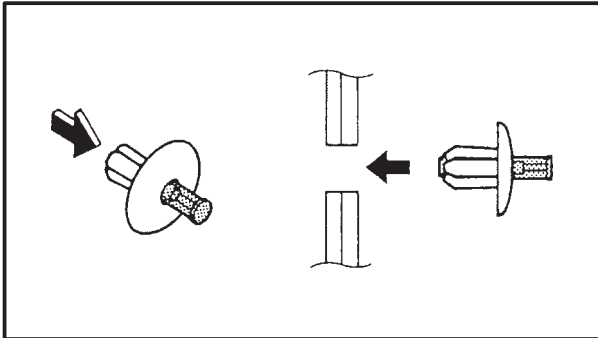
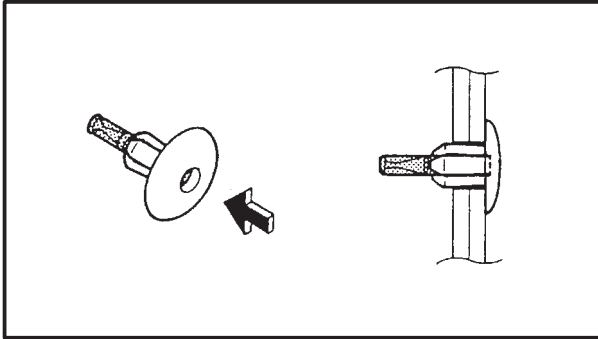
**REMOVAL**

1. Remove:

- rear cowl
- side cowlings

**NOTE:**

To remove the quick fastener, push its center with a screwdriver, then pull the fastener out.

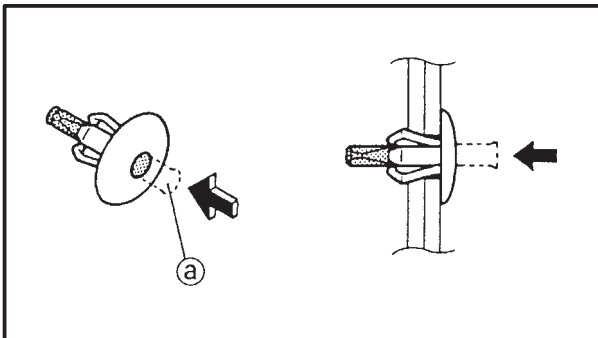
**INSTALLATION**

1. Install:

- side cowlings
- rear cowl

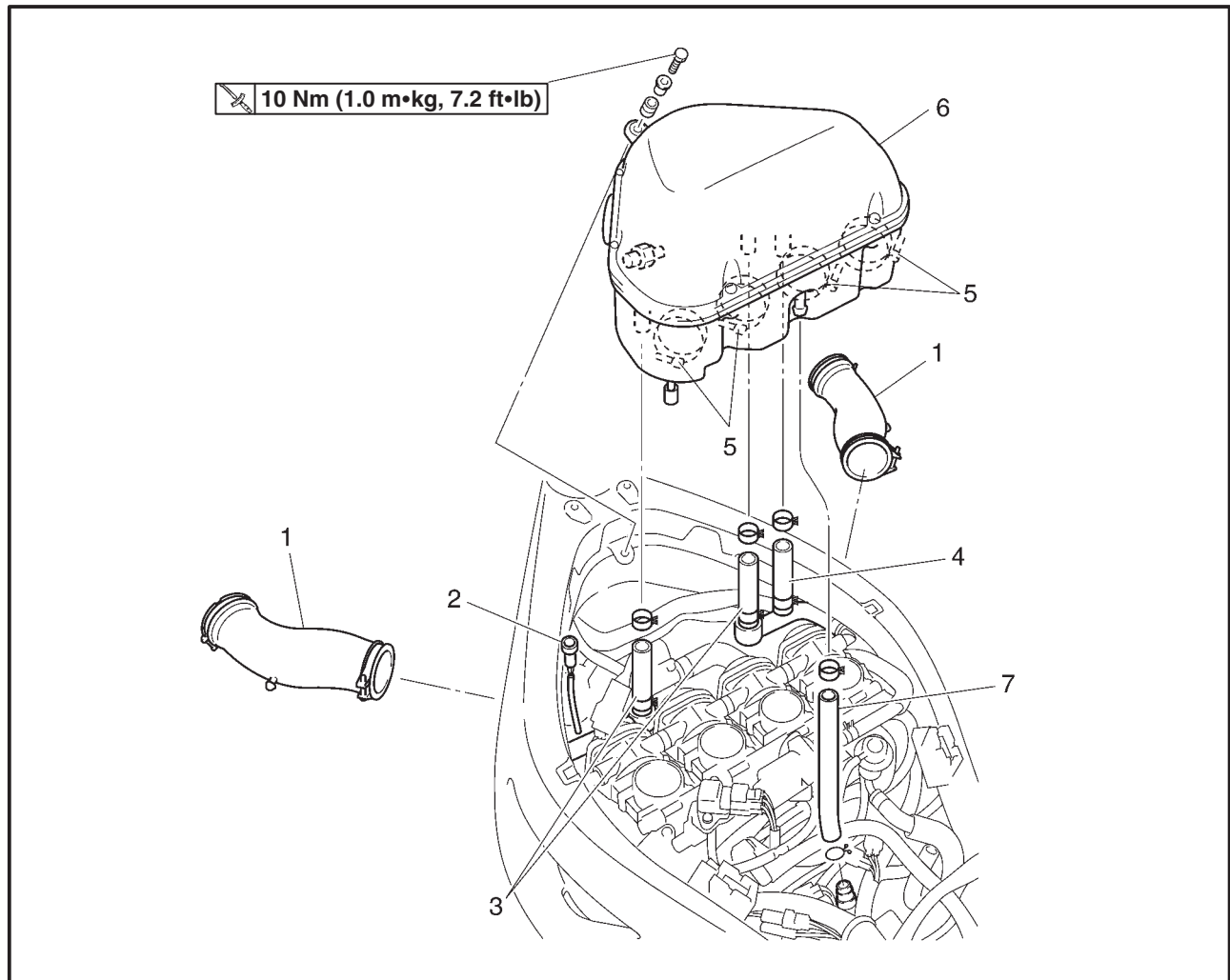
**NOTE:**

To install the quick fastener, push its pin so that it protrudes from the fastener head, then insert the fastener into the cowl and push the pin <sup>a</sup> in with a screwdriver. Make sure that the pin is flush with the fastener's head.





## AIR FILTER CASE



Order	Job/Part	Q'ty	Remarks
	<b>Removing the air filter case</b>		
	Rider seat		Remove the parts in the order listed.
	Fuel tank		Refer to "SEATS".
1	Air intake duct	2	Refer to "FUEL TANK".
2	Intake temperature sensor coupler	1	Disconnect.
3	Throttle body hose	2	Disconnect.
4	Air induction system hose	1	Disconnect.
5	Clamp	4	Loosen.
6	Air filter case	1	
7	Crankcase breather hose	1	Disconnect.
			For installation, reverse the removal procedure.



EAS00045

## 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

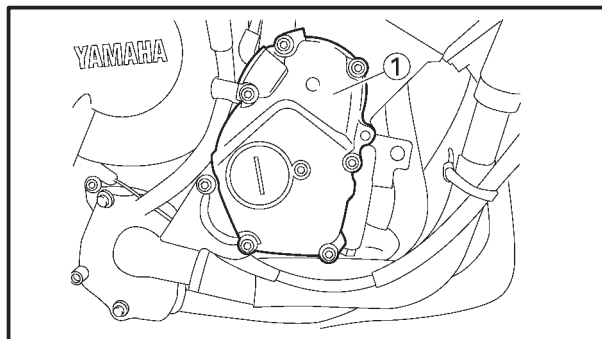
- rider seat  
Refer to "SEATS".
- fuel tank  
Refer to "FUEL TANK".
- air filter case  
Refer to "AIR FILTER CASE".
- bottom cowlings
- side cowlings  
Refer to "COWLINGS".
- throttle body assembly  
Refer to "THROTTLE BODIES" in chapter 7.
- air cut-off valve  
Refer to "AIR INDUCTION SYSTEM" in chapter 7.
- radiator
- radiator fan motor  
Refer to "RADIATOR" in chapter 6.

#### 2. Remove

- ignition coils
- spark plugs
- cylinder head cover
- cylinder head cover gasket  
Refer to "CAMSHAFT" in chapter 5.

#### 3. Remove

- pickup rotor cover ①









- 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

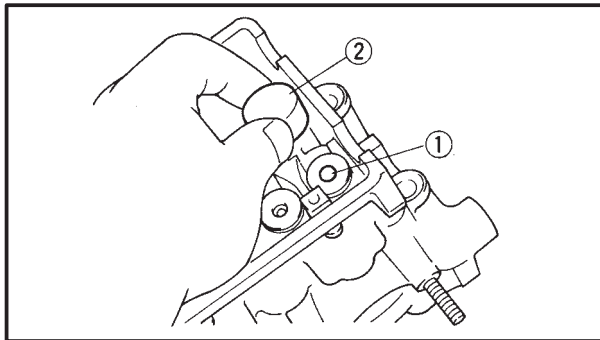
## EXAMPLE:

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 camshaft caps.



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



- Refer to “ASSEMBLING AND ADJUSTING THE ENGINE – CYLINDER HEAD AND CAM-SHAFT” in chapter 5.
- Lubricate the camshaft bearings, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft marks with the camshaft cap marks.
- 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.



# ADJUSTING THE VALVE CLEARANCE

CHK  
ADJ



## 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 ~ 0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.03 ~ 0.07			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	
0.08 ~ 0.12		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	
0.13 ~ 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):

0.13 ~ 0.20 mm (0.0051 ~ 0.0079 in)

Example: Installed is 175

Measured clearance is 0.27 mm (0.0106 in)

Replace 175 pad with 185 pad

Pad number: (example)

Pad No.175 = 1.75 mm (0.0689 in)

Pad No.185 = 1.85 mm (0.0728 in)

VALVE CLEARANCE (cold):

0.13 ~ 0.20 mm (0.0051 ~ 0.0079 in)

Example: Installed is 175

Measured clearance is 0.27 mm (0.0106 in)

Replace 175 pad with 185 pad

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 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.12				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.22		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.23 ~ 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):  
0.23 ~ 0.30 mm (0.0091 ~ 0.0118 in)

Example: Installed is 175  
Measured clearance is 0.35 mm (0.0138 in)  
Replace 175 pad with 185 pad  
Pad number: (example)  
Pad No.175 = 1.75 mm (0.0689 in)  
Pad No.185 = 1.85 mm (0.0728 in)

VALVE CLEARANCE (cold):

0.23 ~ 0.30 mm (0.0091 ~ 0.0118 in)

Example: Installed is 175

Measured clearance is 0.35 mm (0.0138 in)

Replace 175 pad with 185 pad

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

**NOTE:** \_\_\_\_\_

For installation, reverse the removal procedure.

### SYNCHRONIZING THE THROTTLE BODIES

**NOTE:** \_\_\_\_\_

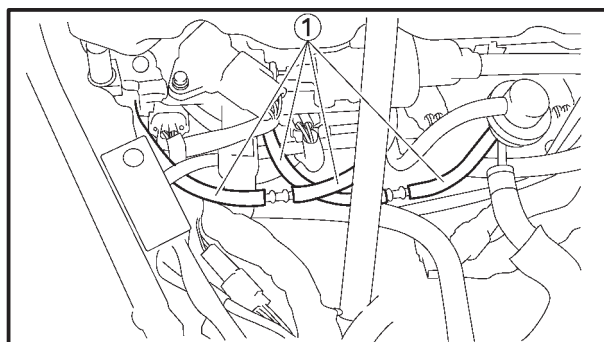
Prior to synchronizing the throttle bodies, the valve clearance and the engine idling speed should be properly adjusted and the ignition timing should be checked.

1. Stand the motorcycle on a level surface.

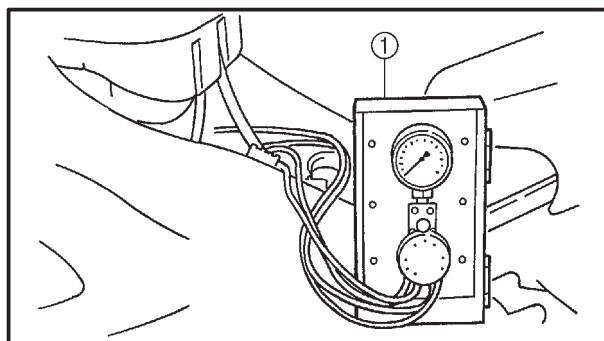
**NOTE:** \_\_\_\_\_

Place the motorcycle on a suitable stand.

2. Remove:
- rider seat  
Refer to "SEATS".
  - fuel tank  
Refer to "FUEL TANK".
  - air filter case  
Refer to "AIR FILTER CASE".



3. Remove:
- synchronizing hose ①



4. Install:
- vacuum gauge ①  
(onto the synchronizing hose)
  - digital tachometer  
(near the spark plug)



**Vacuum gauge**  
**90890-03094, YU-08030**





9. Measure:

- engine idling speed

Out of specification → Adjust.

Make sure that the vacuum pressure is within specification.

10. Stop the engine and remove the measuring equipment.

11. Adjust:

- throttle cable free play

Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY”.



**Throttle cable free play  
(at the flange of the throttle grip)**  
**6 ~ 8 mm (0.24 ~ 0.31 in)**

12. Remove:

- digital tachometer
- vacuum gauge

13. Install:

- air filter case  
Refer to “AIR FILTER CASE”.
- fuel tank  
Refer to “FUEL TANK”.
- rider seat  
Refer to “SEATS”.

EAS00052

### ADJUSTING THE ENGINE IDLING SPEED

**NOTE:**

Prior to adjusting the engine idling speed, the throttle bodies synchronization should be adjusted properly, and the engine should have adequate compression.

1. Start the engine and let it warm up for several minutes.

2. Install:

- digital tachometer  
(to the ignition of cylinder #1)

3. Check:

- engine idling speed  
Out of specification → Adjust.



**Engine idling speed**  
**1,250 ~ 1,350 r/min**







4. Install:
  - left frame side cover  
Refer to “COWLINGS”.
  - air filter case  
Refer to “AIR FILTER CASE”.
  - fuel tank  
Refer to “FUEL TANK”.
  - rider seat  
Refer to “SEATS”.

EAS00059

## CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:
  - rider seat  
Refer to “SEATS”.
  - fuel tank  
Refer to “FUEL TANK”.
  - air filter case  
Refer to “AIR FILTER CASE”.
2. Remove:
  - heat protector plate
  - ignition coils
  - spark plugs

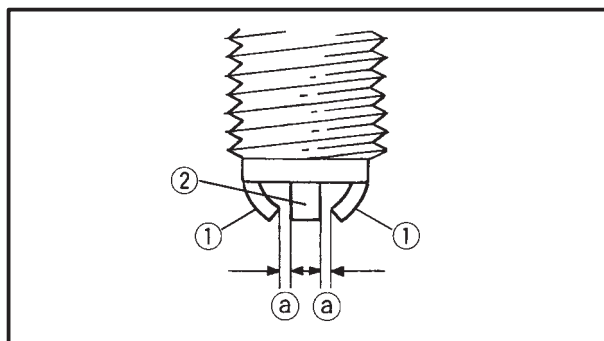
### CAUTION:

**Before removing the spark plugs, blow away any dirt accumulated in the spark plug wells with compressed air to prevent it from falling into the cylinders.**

3. Check:
  - spark plug type  
Incorrect → Change.



**Spark plug type (manufacturer)  
CR9EK or CR10EK (NGK)**



4. Check:
  - electrode ①  
Damage/wear → Replace the spark plug.
  - insulator ②  
Abnormal color → Replace the spark plug.  
Normal color is medium-to-light tan.
5. Clean:
  - spark plug  
(with a spark plug cleaner or wire brush)



6. Measure:


- spark plug gap ①  
(with a wire Thickness gauge)  
Out of specification → Regap.



**Spark plug gap**  
**0.6 ~ 0.7 mm**  
**(0.0236 ~ 0.0276 in)**

7. 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.

8. Install:

- air filter case  
Refer to “AIR FILTER CASE”.
- fuel tank  
Refer to “FUEL TANK”.
- rider seat  
Refer to “SEATS”.

EAS00065

**MEASURING THE COMPRESSION  
PRESSURE**

The following procedure applies to all of the cylinders.

**NOTE:**

Insufficient compression pressure will result in a loss of performance.

1. Measure:

- valve clearance  
Out of specification → Adjust.  
Refer to “ADJUSTING THE VALVE CLEARANCE”.

2. Start the engine, warm it up for several minutes, and then turn it off.

3. Remove:

- rider seat  
Refer to “SEATS”.
- fuel tank  
Refer to “FUEL TANK”.
- air filter case  
Refer to “AIR FILTER CASE”.

4. Remove:

- cover
- ignition coils
- spark plugs



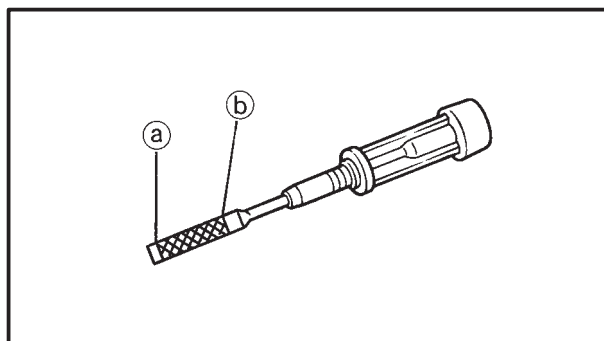
- | Compression pressure<br>(with oil applied into the cylinder) |   |
|--|---|
| Reading  | Diagnosis   |
| Higher than without oil                                      | Piston ring(s) wear or damage → Repair.                                     |
| Same as without oil  | Piston, valves, cylinder head gasket or piston possibly defective → Repair. |

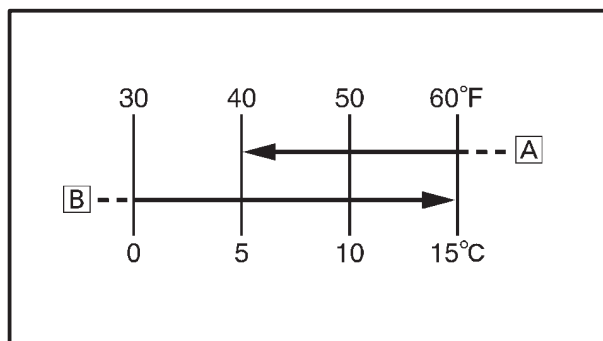


- EAS00069

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

3. Check:
- engine oil level
- The engine oil level should be between the minimum level mark (a) and maximum level mark (b).
- Below the minimum level mark → Add the recommended engine oil to the proper level.





## Recommended oil

At 5°C (40°F) or higher **A**

Yamalube 4 (20W40) or  
SAE 20W40 type SE motor  
oil

At 15°C (60°F) or lower **B**

Yamalube 4 (10W30) or  
SAE 10W30 type SE motor  
oil

## NOTE:

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.

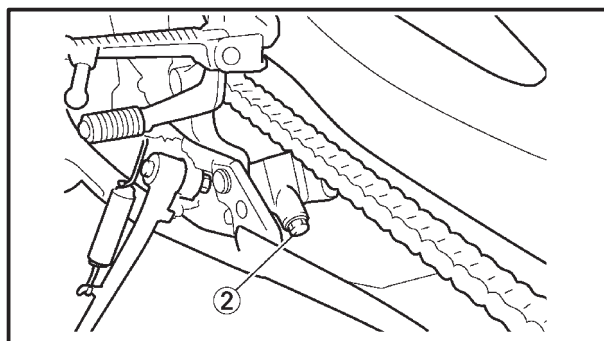
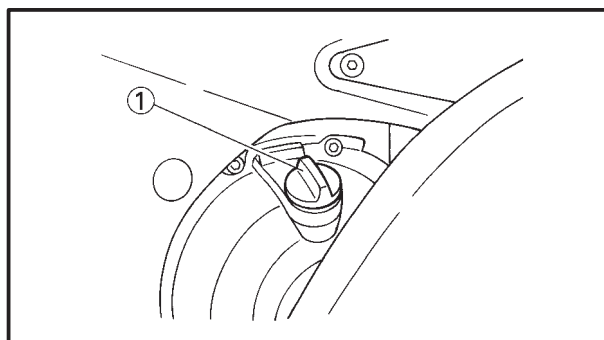
## NOTE:

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

EAS00074

## CHANGING THE ENGINE OIL

1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
  - bottom cowling  
Refer to "COWLINGS".
  - coolant reservoir tank  
Refer to "CHANGING THE COOLANT".
4. Remove:
  - engine oil filler cap ①
  - engine oil drain bolt ②  
(along with the gasket)
5. Drain:
  - engine oil  
(completely from the crankcase)







10. Install:
  - engine oil filler cap
  - coolant reservoir tankRefer to “CHANGING THE COOLANT”.
- bottom cowlings
- Refer to “COWLINGS”.
11. Start the engine, warm it up for several minutes, and then turn it off.

EAS00077

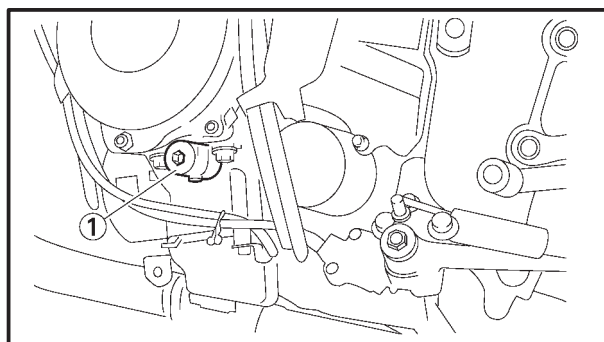
### MEASURING THE ENGINE OIL PRESSURE

1. Check:
  - engine oil levelBelow the minimum level mark → Add the recommended engine oil to the proper level.
2. Start the engine, warm it up for several minutes, and then turn it off.

#### CAUTION:

When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

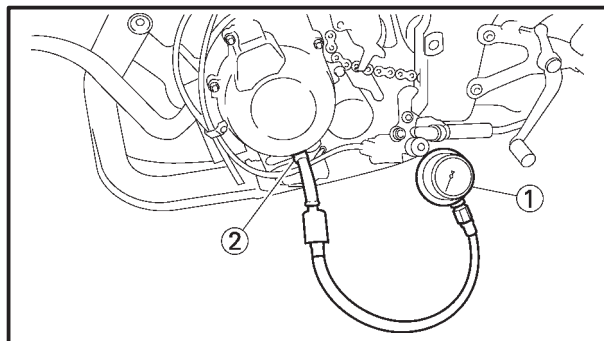
3. Remove:
  - bottom cowlingsRefer to “COWLINGS”.



4. Remove:
  - oil gallery bolt ①

#### ⚠ WARNING

The engine, muffler and engine oil are extremely hot.



5. Install:
  - oil pressure gauge ①
  - adapter ②



**Pressure gauge**  
90890-03153, YU-03153  
**Oil pressure adapter**  
90890-03139



6. Measure:
- engine oil pressure  
(at the following conditions)

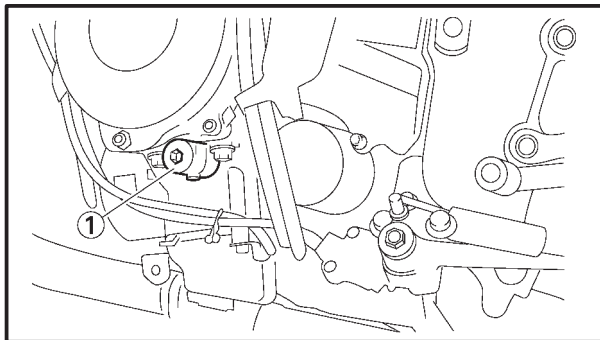


**Engine oil pressure**  
**240 kPa**  
 (2.4 kg/cm<sup>2</sup>, 2.4 bar, 34.1 psi)  
**Engine speed**  
**Approx. 6,600 r/min**  
**Engine oil temperature**  
**96°C (205°F)**


**NOTE:**

Regarding the oil pressure as its own data may fluctuate depending on the oil temperature and viscosity, the oil pressure may fluctuate when measuring. The following data should be used only as a reference when measuring the engine oil pressure.

Engine oil pressure	Possible causes
<b>Below specification</b>	<b>Faulty oil pump</b>
	<b>Clogged oil filter</b>
	<b>Leaking oil passage</b>
	<b>Broken or damaged oil seal</b>
<b>Above specification</b>	<b>Leaking oil passage</b>
	<b>Faulty oil filter</b>
	<b>Oil viscosity too high</b>



7. Install:
- oil gallery bolt ①

 **8 Nm (0.8 m•kg, 5.8 ft•lb)**

8. Install:
- bottom cowling  
Refer to “COWLINGS”.

EAS00078

## ADJUSTING THE CLUTCH CABLE FREE PLAY

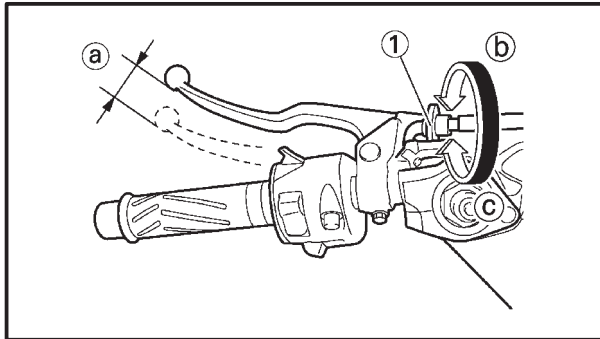
### 1. Check:

- clutch cable free play (a)  
Out of specification → Adjust.



**Clutch cable free play (at the end of the clutch lever)**

**10 ~ 15 mm (0.39 ~ 0.59 in)**



### 2. Adjust:

- clutch cable free play



#### Handlebar side

- Turn the adjusting dial (1) in direction (b) or (c) until the specified clutch cable free play is obtained.

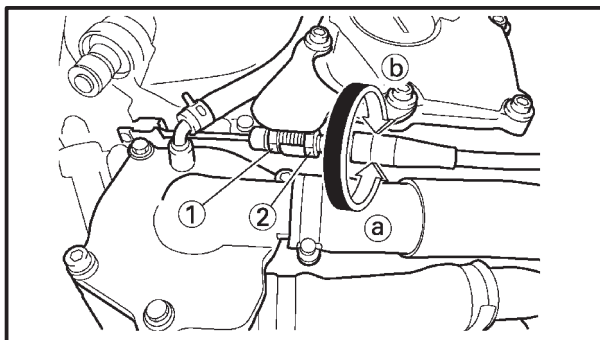
Direction (b)	Clutch cable free play is increased.
Direction (c)	Clutch cable free play is decreased.

#### NOTE:

If the specified clutch cable free play cannot be obtained on the handlebar side of the cable, use the adjusting nut on the engine side.

#### Engine side

- Remove the bottom cowling. Refer to "COWLINGS".
- Loosen the locknuts (1).
- Turn the adjusting nut (2) in direction (a) or (b) until the specified clutch cable free play is obtained.



Direction (a)	Clutch cable free play is increased.
Direction (b)	Clutch cable free play is decreased.

- Tighten the locknuts.

- Install the bottom cowling. Refer to "COWLINGS".

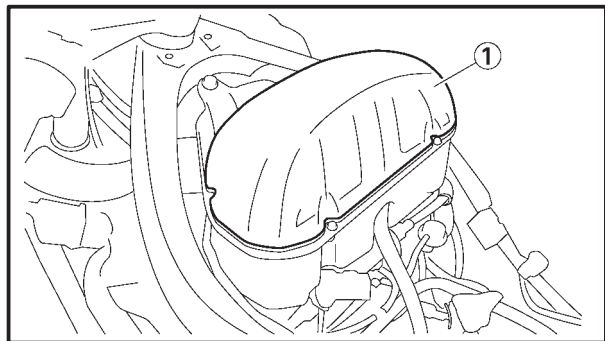






EAS00086

## CLEANING THE AIR FILTER ELEMENT

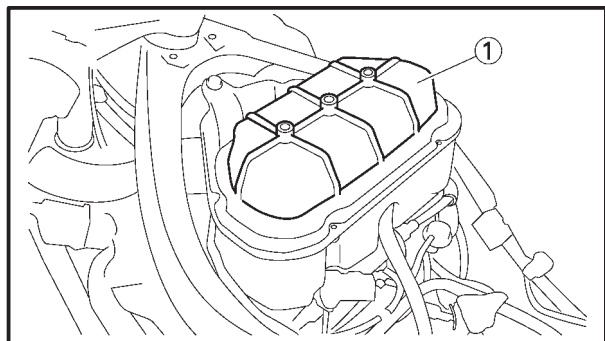


### 1. Remove:

- rider seat  
Refer to "SEATS".
- fuel tank  
Refer to "FUEL TANK".

### 2. Remove:

- air filter case cover ①
- air filter element



### 3. Clean:

- air filter element ①  
Use solvent to clean the air filter element. After cleaning the air filter element, remove the solvent from the air filter element.

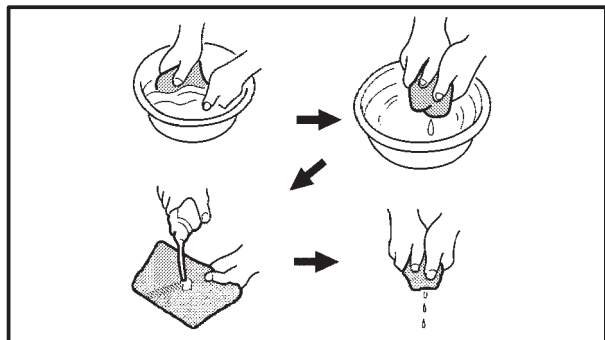
### 4. Apply the engine oil to the entire surface of the filter and remove the excess oil. The air filter should be wet but not dripping.

### 5. Check:

- air filter element  
Damage → Replace.

### 6. Install:

- air filter element
- air filter case cover



## 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 throttle bodies tuning, leading to poor engine performance and possible overheating.

## NOTE:

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

### 7. Install:

- fuel tank  
Refer to "FUEL TANK".
- rider seat  
Refer to "SEATS".





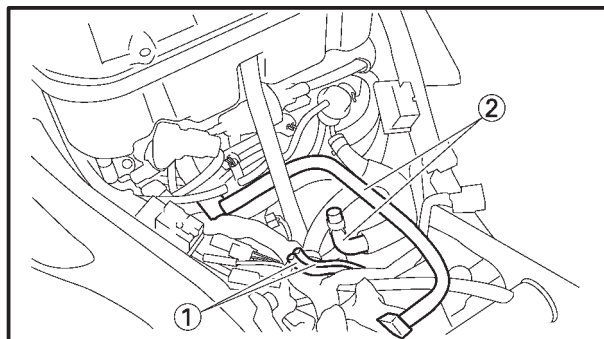
EAS00096

## CHECKING THE FUEL AND BREATHER HOSES

The following procedure applies to all of the fuel and breather hoses.

1. Remove:

- rider seat  
Refer to "SEATS".
- fuel tank  
Refer to "FUEL TANK".



2. Check:

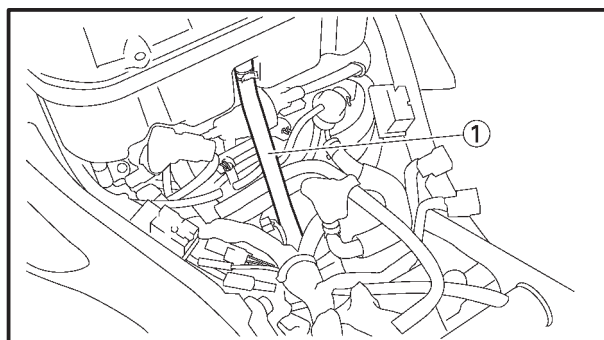
- breather hoses ①
- fuel hoses ②  
Cracks/damage → Replace.  
Loose connection → Connect properly.

**NOTE:**

Before removing the fuel hoses, place a few rags in the area under where it will be removed.

3. Install:

- fuel tank  
Refer to "FUEL TANK".
- rider seat  
Refer to "SEATS".



EAS00098

## CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:

- rider seat  
Refer to "SEATS".
- fuel tank  
Refer to "FUEL TANK".

2. Check:

- crankcase breather hose ①  
Cracks/damage → Replace.  
Loose connection → Connect properly.

**CAUTION:**

**Make sure the crankcase breather hose is routed correctly.**

3. Install:

- fuel tank  
Refer to "FUEL TANK".
- rider seat  
Refer to "SEATS".



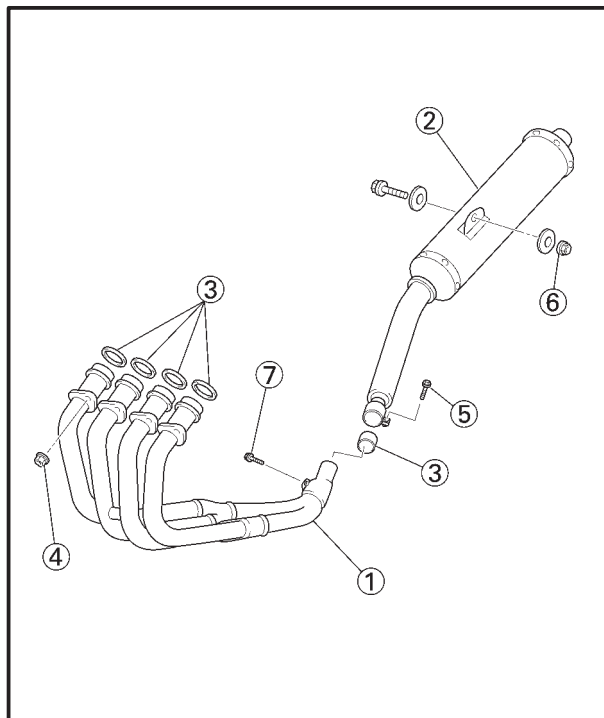
EAS00099

**CHECKING THE EXHAUST SYSTEM**

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

**1. Remove:**

- bottom cowlings  
Refer to “COWLINGS”.
- radiator  
Refer to “RADIATOR” in chapter 6.



**2. Check:**

- exhaust pipe ①
- muffler ②  
Cracks/damage → Replace.
- gasket ③  
Exhaust gas leaks → Replace.

**3. Check:**

- tightening torque

	<b>Exhaust pipe nut ④</b>
	<b>20 Nm (2.0 m•kg, 15 ft•lb)</b>
	<b>Exhaust pipe and muffler bolt ⑤</b>
	<b>20 Nm (2.0 m•kg, 15 ft•lb)</b>
	<b>Muffler and rear footrest nut ⑥</b>
	<b>23 Nm (2.3 m•kg, 17 ft•lb)</b>
	<b>Exhaust pipe and exhaust pipe stay ⑦</b>
	<b>20 Nm (2.0 m•kg, 15 ft•lb)</b>

**4. Install:**

- radiator  
Refer to “RADIATOR” in chapter 6.
- bottom cowlings  
Refer to “COWLINGS”.

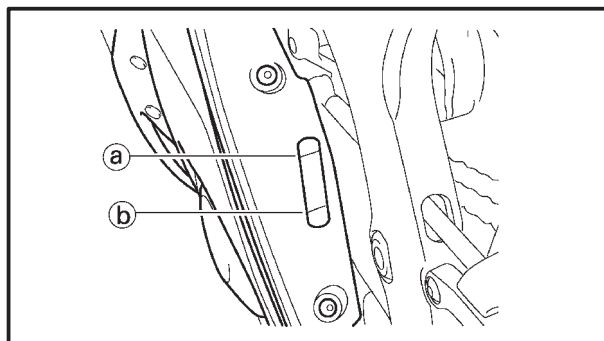
EAS00102

**CHECKING THE COOLANT LEVEL**

- 1. Stand the motorcycle on a level surface.**

**NOTE:**

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



2. Check:

- coolant level

The coolant level should be between the maximum level mark (a) and minimum level mark (b).

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.

3. Start the engine, warm it up for several minutes, and then turn it off.

4. Check:

- coolant level

**NOTE:**

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

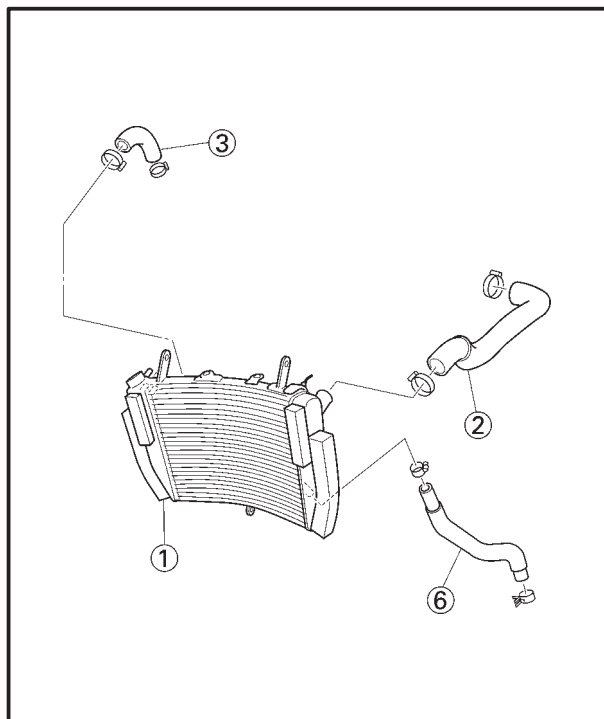
EAS00104

**CHECKING THE COOLING SYSTEM**

1. Remove:

- bottom cowlings
- side cowlings

Refer to "COWLINGS".



## 2. Check:

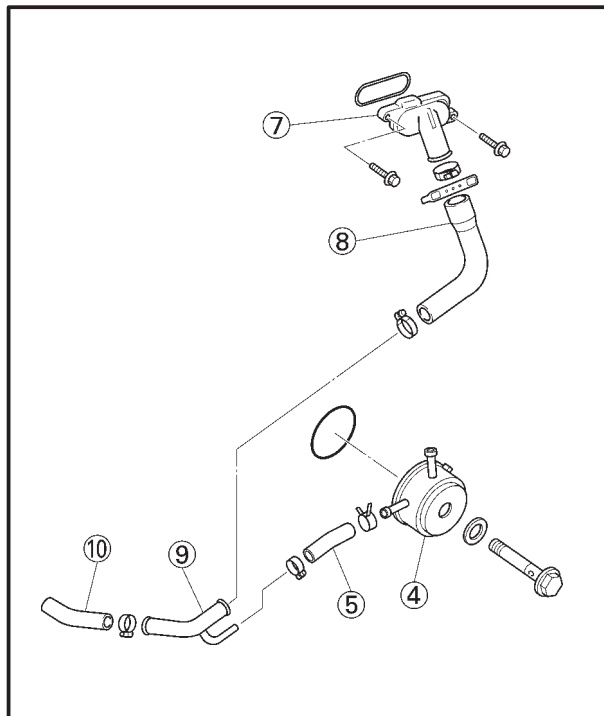
- radiator ①
- radiator inlet hose ②
- radiator outlet hose ③
- oil cooler ④
- oil cooler inlet hose ⑤
- oil cooler outlet hose ⑥
- water jacket outlet joint ⑦
- water jacket hose ⑧
- water pump outlet pipe ⑨
- water pump outlet hose ⑩

Cracks/damage → Replace.

Refer to "COOLING SYSTEM" in chapter 6.

## 3. Install:

- side cowlings
  - bottom cowling
- Refer to "COWLINGS".



EAS00105

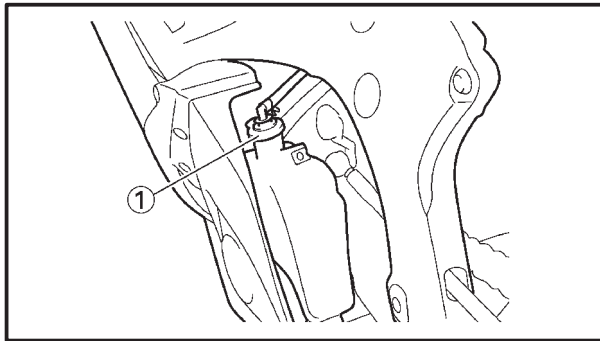
## CHANGING THE COOLANT

### 1. Remove:

- bottom cowlings
  - left side cowling
- Refer to "COWLINGS".
- coolant reservoir tank cover

### 2. Remove:

- coolant reservoir tank

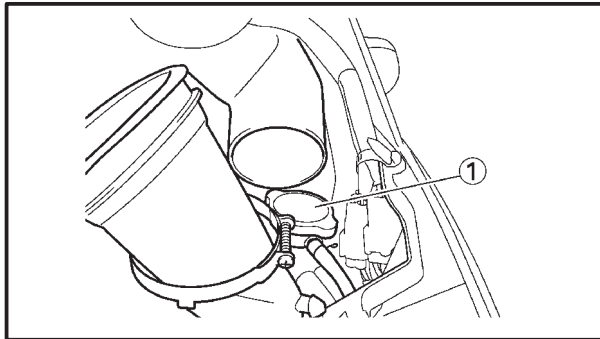


3. Disconnect:

- coolant reservoir cap (1)

4. Drain:

- coolant  
(from the coolant reservoir tank)



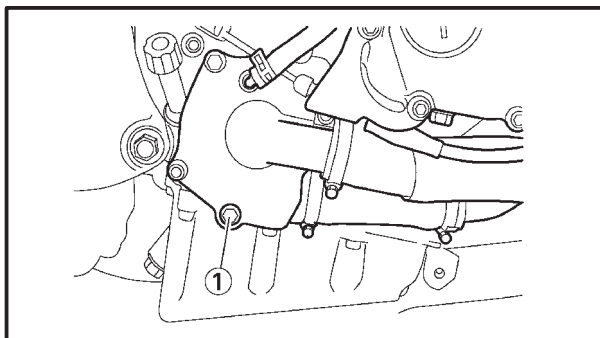
5. Remove:

- radiator cap (1)

## CAUTION:

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:

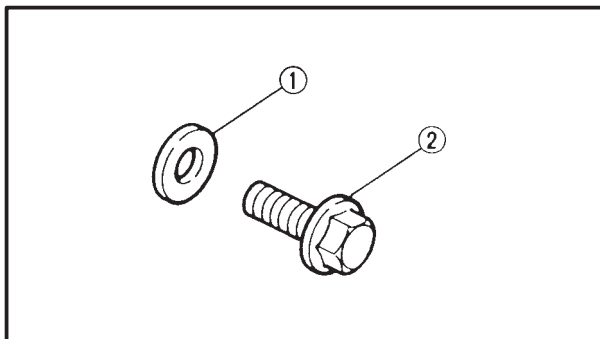
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.



The following procedure applies to all of the coolant drain bolts and copper washers.

6. Remove:

- coolant drain bolt (water pump) (1)  
(along with the copper washer)



7. Drain:

- coolant  
(from the engine and radiator)

8. Check:

- copper washer (1) **New**  
(coolant drain bolt-water pump (2))

9. Install:

- coolant drain bolt (water pump)  
(with copper washer)

10 Nm (1.0 m•kg, 7.2 ft•lb)



10. Install:
  - coolant reservoir tank
11. Connect:
  - coolant reservoir hose

12. 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**  
**2.15 L (1.89 Imp qt,**  
**2.27 US qt)**  
**Coolant reservoir capacity**  
**0.44 L (0.39 Imp qt,**  
**0.47 US qt)**

## Handling notes for coolant

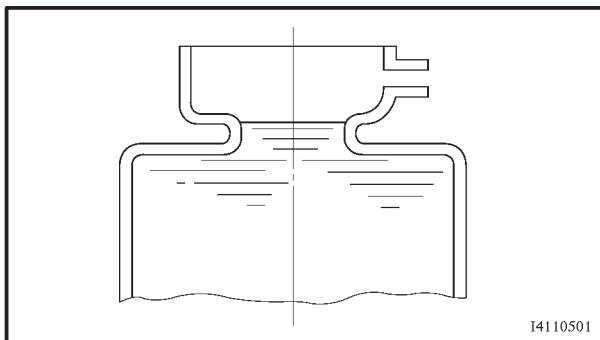
Coolant is potentially harmful and should be handled with special care.

## ⚠ 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.

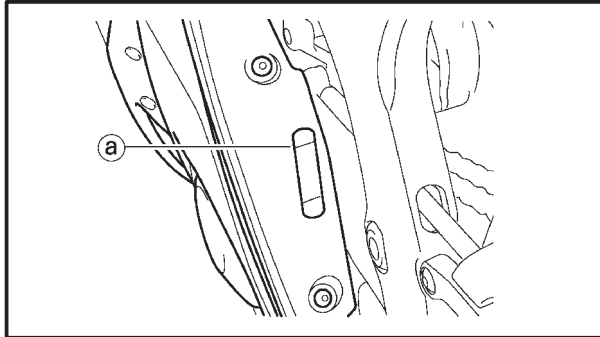


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- Use only distilled water. However, if distilled water is not available, soft water may be used.
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of antifreeze.



13. Install:
  - radiator cap
14. Fill:
  - coolant reservoir tank  
(with the recommended coolant to the maximum level mark ①)
15. Install:
  - coolant reservoir cap
16. Start the engine, warm it up for several minutes, and then stop it.
17. Check:
  - coolant level  
Refer to "CHECKING THE COOLANT LEVEL".

**NOTE:** \_\_\_\_\_

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

18. Install:
  - coolant reservoir tank cover
  - bottom cowling
  - left side cowling  
Refer to "COWLINGS".



EAS00107

## CHASSIS

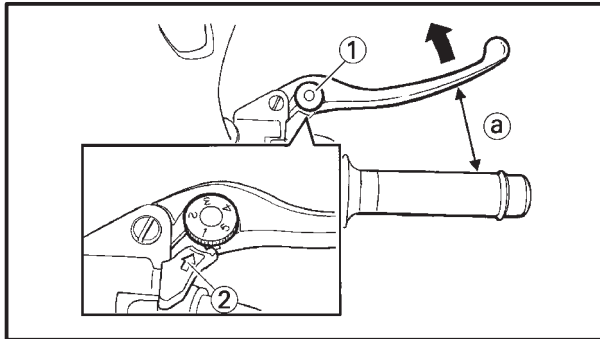
### ADJUSTING THE FRONT BRAKE

#### 1. Adjust:

- brake lever position  
(distance ① from the throttle grip to the brake lever)

#### NOTE:

- While pushing the brake lever forward, turn the adjusting dial ① until the brake lever is in the desired position.
- Be sure to align the setting on the adjusting dial with the arrow mark ② on the brake lever holder.



Position #1	Distance ① is the largest.
Position #5	Distance ① is the smallest.

#### ⚠ WARNING

- After adjusting the brake lever position, make sure the pin on the brake lever holder is firmly inserted in the hole in the adjusting dial.
- A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce in loss of control and possibly an accident. Therefore, check and if necessary, bleed the brake system.

#### CAUTION:

After adjusting the brake lever position, make sure there is no brake drag.





### 3. Adjust:

- rear brake light switch

Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH”.

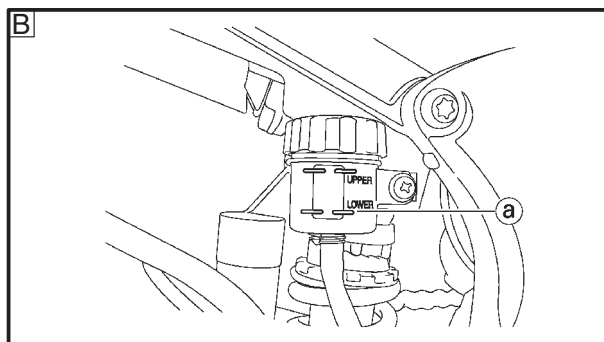
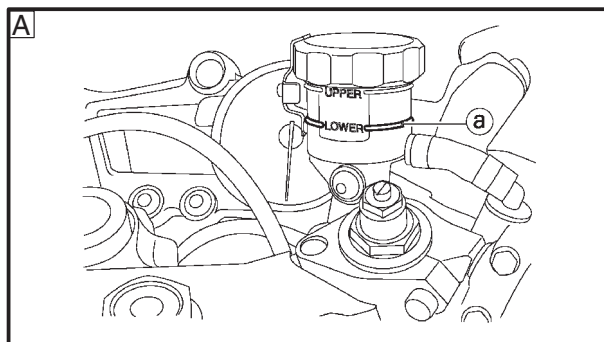
EAS00115

### CHECKING THE BRAKE FLUID LEVEL

1. Stand the motorcycle on a level surface.

#### NOTE:

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



### 2. Check:

- brake fluid level

Below the minimum level mark (a) → 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 fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.



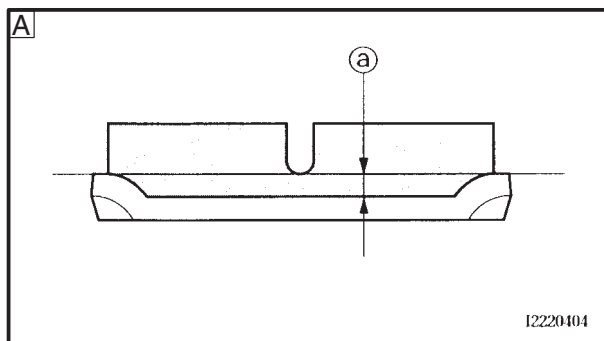


EAS00122

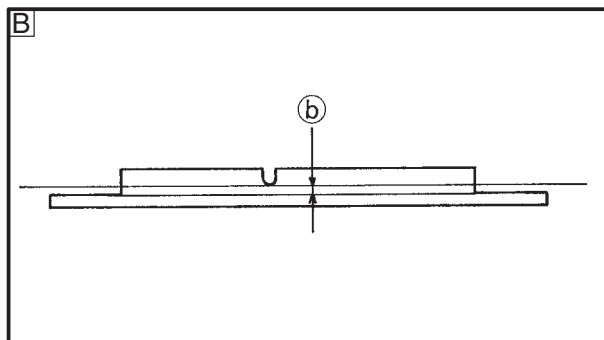
## CHECKING THE FRONT AND REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.



12220404



2. Check:

- front brake pad
- rear brake pad

Brake pad wear limit (a), (b)

Wear limit reached → Replace the brake pads as a set.

Refer to “FRONT AND REAR BRAKES” in chapter 7.



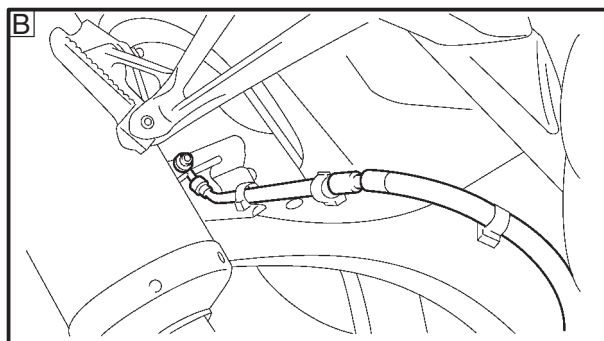
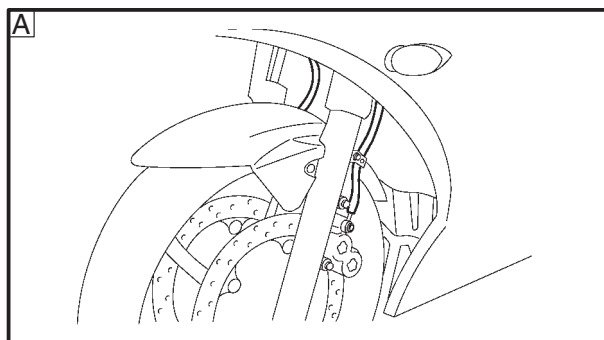
### Brake pad wear limit

(a) 0.5 mm (0.02 in.)

(b) 1.0 mm (0.04 in.)

**A** Front brake

**B** Rear brake



EAS00131

## 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

Cracks/damage/wear → Replace.

**A** Front

**B** Rear

2. Check:

- brake hose clamp

Loose → Tighten the clamp bolt.

3. Hold the motorcycle 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.



- 



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[illegible]

- |                      |                                |
|----------------------|--------------------------------|
| <b>Direction (b)</b> | <b>Shift pedal is raised.</b>  |
| <b>Direction (c)</b> | <b>Shift pedal is lowered.</b> |

- [illegible]







EAS00140

## ADJUSTING THE DRIVE CHAIN SLACK

### NOTE:

The drive chain slack must be checked at the tightest point on the chain.

### CAUTION:

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the motorcycle on a level surface.

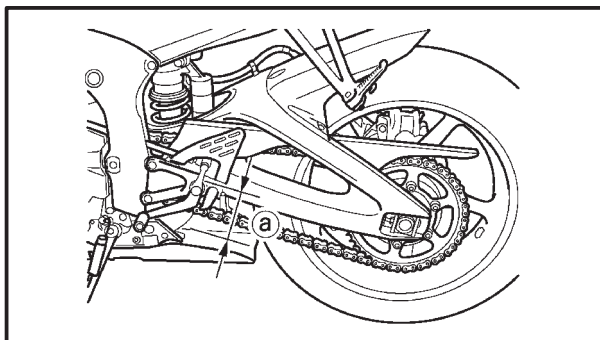
### ⚠ WARNING

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

### NOTE:

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

2. Spin the rear wheel several times and find the tightest position of drive chain.



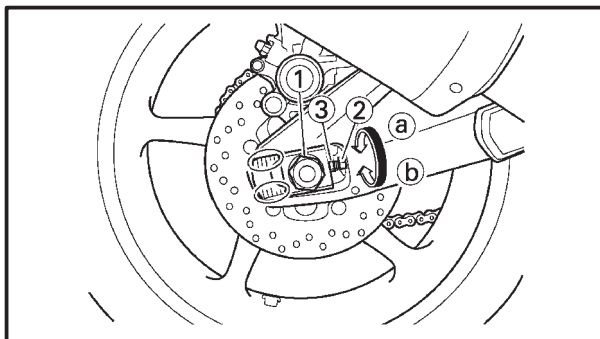
3. Check:

- drive chain slack (a)  
Out of specification → Adjust.



#### Drive chain slack

35 ~ 45 mm (1.38 ~ 1.77 in)



4. Adjust:

- drive chain slack



- a. Loosen the wheel axle nut ①.
- b. Loosen both locknuts ②.
- c. Turn both adjusting bolts ③ in direction (a) or (b) until the specified drive chain slack is obtained.



Direction (a)	Drive chain is tightened.
Direction (b)	Drive chain is loosened.

**NOTE:** \_\_\_\_\_  
To maintain the proper wheel alignment, adjust both sides evenly.

d. Tighten both locknuts to specification.

	<b>Locknut</b> <b>16 Nm (1.6 m•kg, 12 ft•lb)</b>
--	---

e. Tighten the wheel axle nut to specification.

	<b>Wheel axle nut</b> <b>110 Nm (11 m•kg, 80 ft•lb)</b>
--	--

EAS00142

## LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the motorcycle is used in dusty areas.

This motorcycle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains. Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.

	<b>Recommended lubricant</b> <b>Engine oil or chain lubricant</b> <b>suitable for O-ring chains</b>
--	---



EAS00146

## CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the motorcycle on a level surface.

### **WARNING**

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

### **NOTE:**

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

2. Check:

- steering head

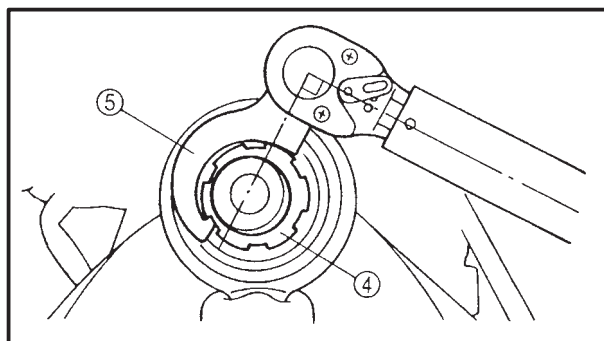
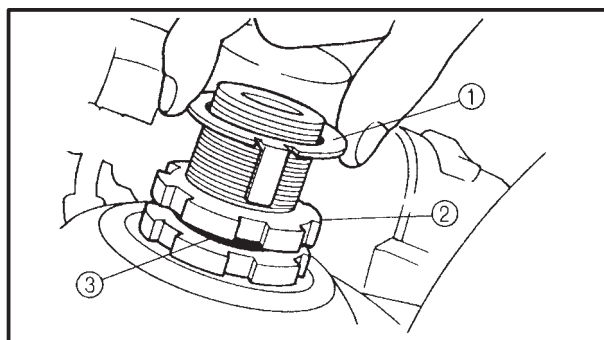
Grasp the bottom of the front fork legs and gently rock the front fork.

Binding/looseness → Adjust the steering head.

3. Remove:

- upper bracket

Refer to “HANDLEBAR” and “STEERING HEAD” in chapter 4.



4. Adjust:

- steering head

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

### **NOTE:**

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



**Steering nut wrench**  
90890-01403, YU-33975



**Lower ring nut (initial tightening torque)**  
52 Nm (5.2 m•kg, 38 ft•lb)



- c. Loosen the lower ring nut ④ completely, then tighten it to specification.

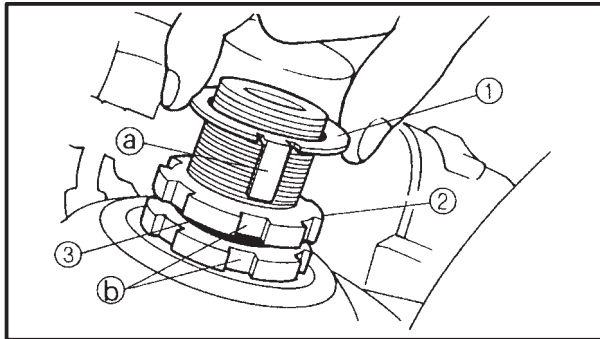
## ⚠ WARNING

**Do not overtighten the lower ring nut.**



**Lower ring nut (final tightening torque)**

**14 Nm (1.4 m•kg, 10 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 under bracket and check the upper and lower bearings.

Refer to “STEERING HEAD” in chapter 4.

- e. Install the rubber washer ③.
- f. Install the upper ring nut ②.
- g. Finger tighten the upper ring nut ②, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- h. Install the lock washer ①.

## NOTE:

Make sure the lock washer tabs ① sit correctly in the ring nut slots ②.

5. Install:

- upper bracket

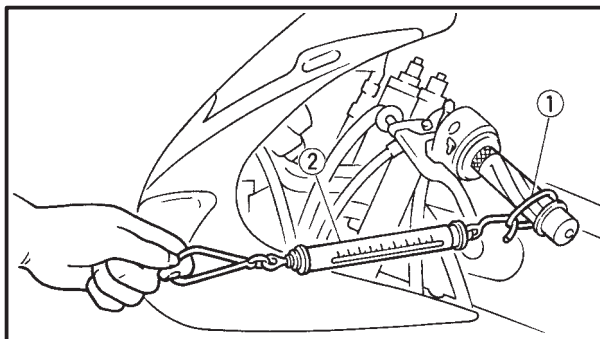
Refer to “HANDLEBAR” and “STEERING HEAD” in chapter 4.

6. Measure:

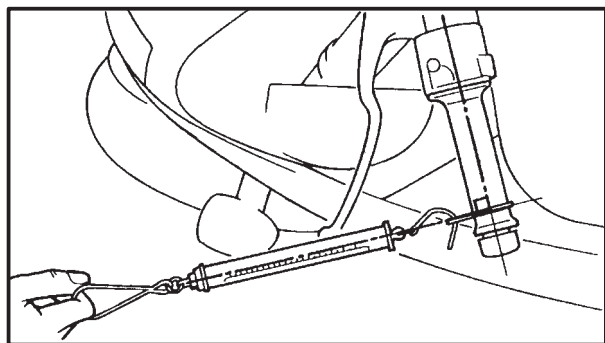
- steering head tension

## NOTE:

Make sure all of the cables and wires are properly routed.

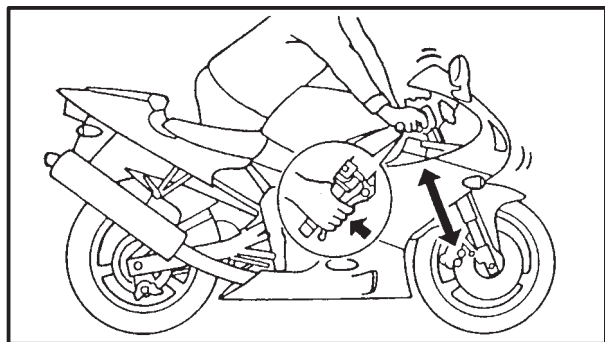
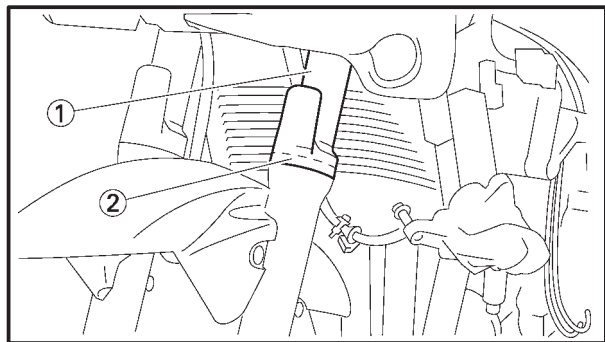


- a. Point the front wheel straight ahead.
- b. Install a plastic locking tie ① loosely around the end of the handlebar as shown.
- c. Hook a spring gauge ② onto the plastic locking tie.
- d. Hold the spring gauge at a 90° angle from the handlebar, pull the spring gauge, and then record the measurement when the handlebar starts to run.



**Steering head tension**  
200 ~ 500 g

- e. Repeat the above procedure on the opposite handlebar.
  - f. If the steering head tension is out of specification (both handlebars should be within specification), remove the upper bracket and loosen or tighten the upper ring nut.
  - g. Reinstall the upper bracket and measure the steering head tension again as described above.
  - h. Repeat the above procedure until the steering head tension is within specification.
  - i. Grasp the bottom of the front fork legs and gently rock the front fork.
- Binding/looseness → Adjust the steering head.



EAS00150

## CHECKING THE FRONT FORK

1. Stand the motorcycle on a level surface.



**⚠ WARNING**

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

2. Check:
  - inner tube ①  
Damage/scratches → Replace.
  - oil seal ②  
Oil leakage → Replace.
3. Hold the motorcycle upright and apply the front brake.
4. Check:
  - front fork operation  
Push down hard on the handlebars several times and check if the front fork rebounds smoothly.  
Rough movement → Repair.  
Refer to “FRONT FORK” in chapter 4.













EAS00162

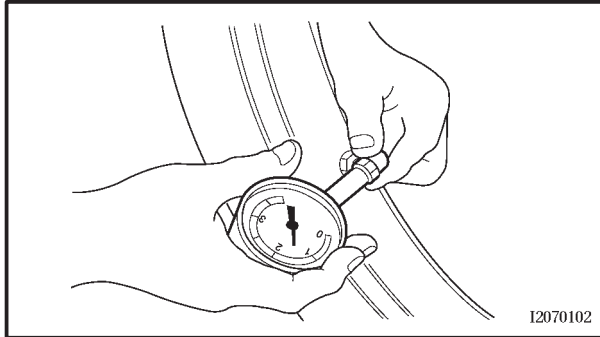
**CHECKING THE TIRES**

The following procedure applies to both of the tires.

## 1. Check:

- tire pressure

Out of specification → Regulate.



I2070102

**! 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 motorcycle could cause tire damage, an accident or an injury.

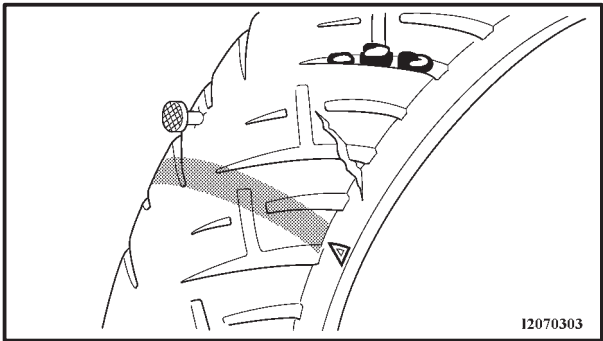
**NEVER OVERLOAD THE MOTORCYCLE.**

Basic weight (with oil and a full fuel tank)	182 kg (401 lb) (USA except for CAL) 183 kg (404 lb) (CAL)	
Maximum load*	193 kg (426 lb) (USA except for CAL) 192 kg (423 lb) (CAL)	
Cold tire pressure	Front	Rear
Up to 90 kg load*	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	250 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)
90 kg ~ maximum load*	2.5 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	290 kPa (29 kgf/cm <sup>2</sup> , 2.9 bar, 41.3 psi)
High- speed riding	2.5 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 psi)	2.5 kPa (2.5 kgf/cm <sup>2</sup> , 2.5 bar, 35.6 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.



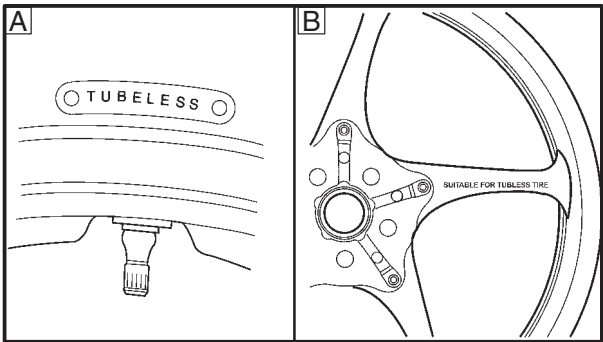
2. Check:
- tire surfaces
- Damage/wear → Replace the tire.



Minimum tire tread depth  
1.6 mm (0.06 in)

**⚠ 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 a tube tire, 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

**⚠ WARNING**

- 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 motorcycle.



## Front tire

Manufacturer	Size	Model
DUNLOP	120/60ZR 17 M/C (55W)	D208FL
MICHELIN	120/60ZR 17 M/C (55W)	Pilot SPORTS N

## Rear tire

Manufacturer	Size	Model
DUNLOP	180/55ZR 17 M/C (73W)	D208L
MICHELIN	180/55ZR 17 M/C (73W)	Pilot SPORTS B

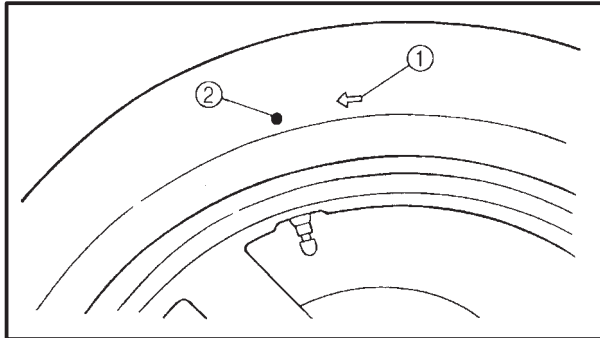
**⚠ WARNING**

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.

**NOTE:**

For tires with a direction of rotation mark ①:

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ② with the valve installation point.



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 AND PEDALS

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



**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**

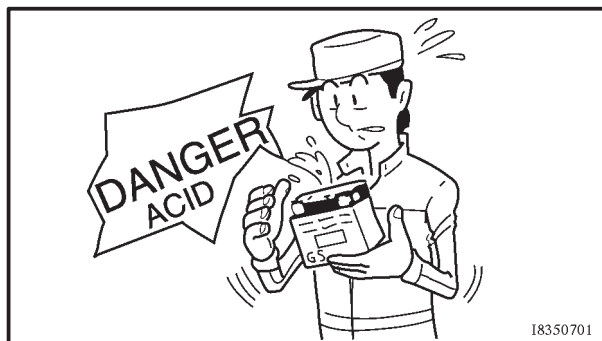
EAS00174

## LUBRICATING THE REAR SUSPENSION

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



**Recommended lubricant**  
**Molybdenum-disulfide grease**



EAS00178

**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.

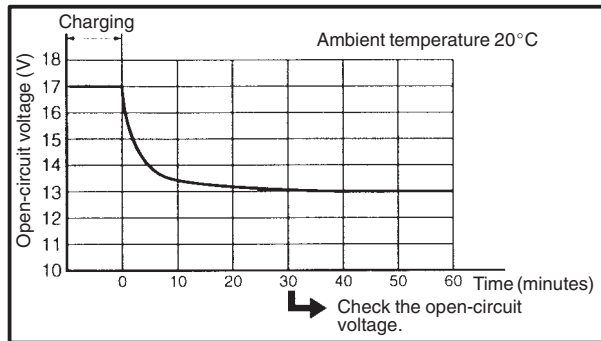
**INTERNAL**

- 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.





## 5. Charge:

- battery

(refer to the appropriate charging method illustration)

**⚠ WARNING**

Do not quick charge a battery.

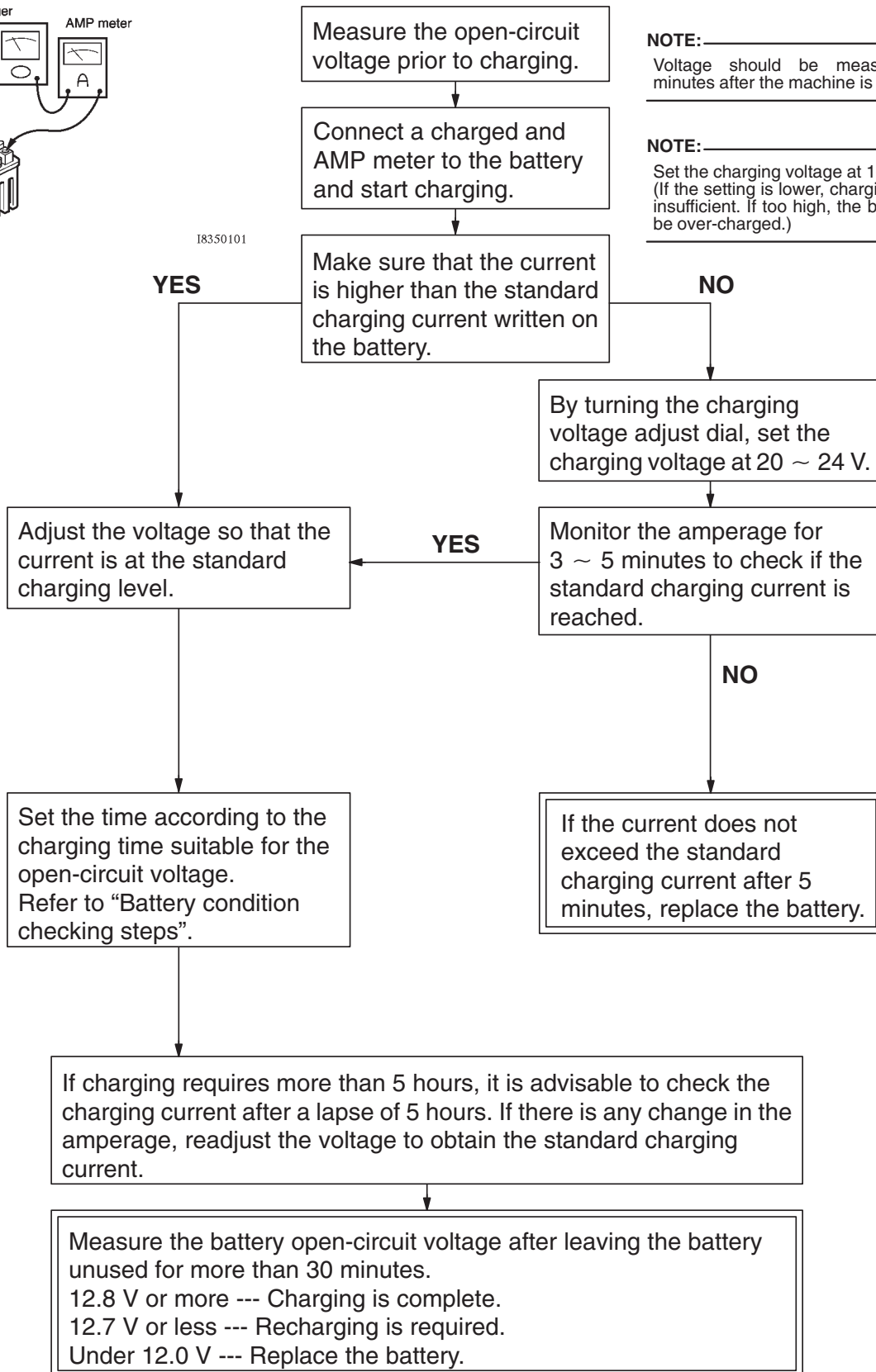
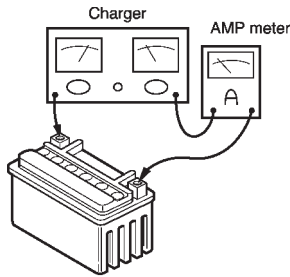
**CAUTION:**

- 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 motorcycle. (If charging has to be done with the battery mounted on the motorcycle, 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.



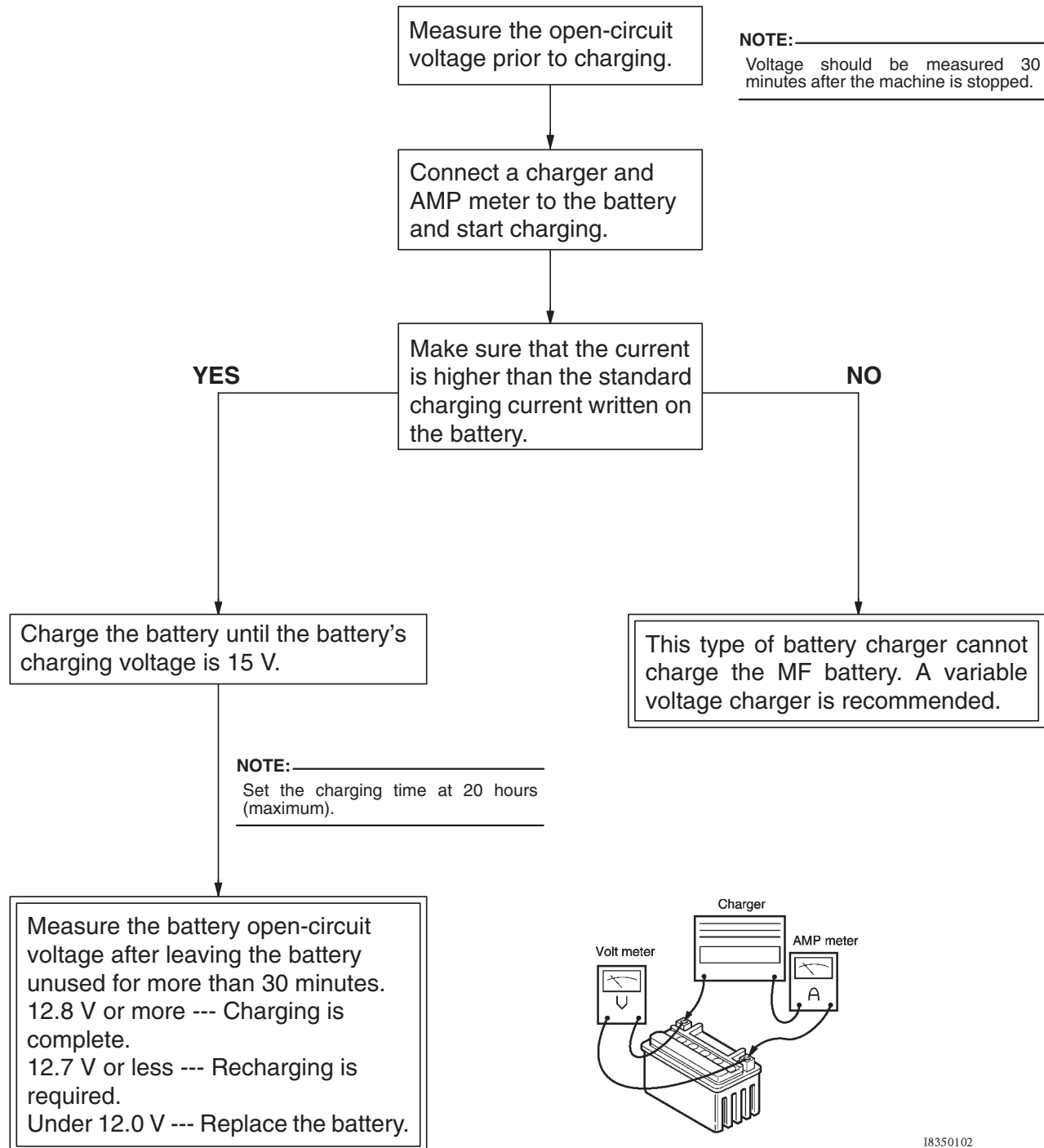


## Charging method using a variable-current (voltage) charger





## Charging method using a constant voltage charger



18350102





**Pocket tester**  
**90890-03112, YU-3112**

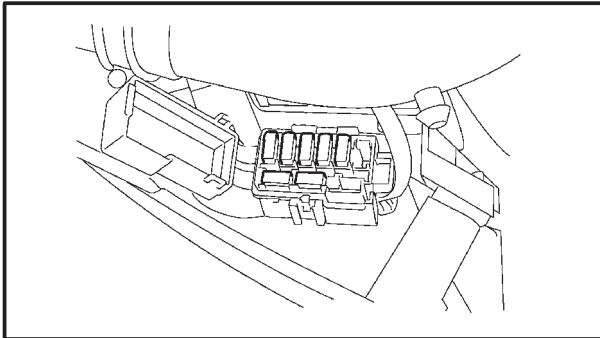
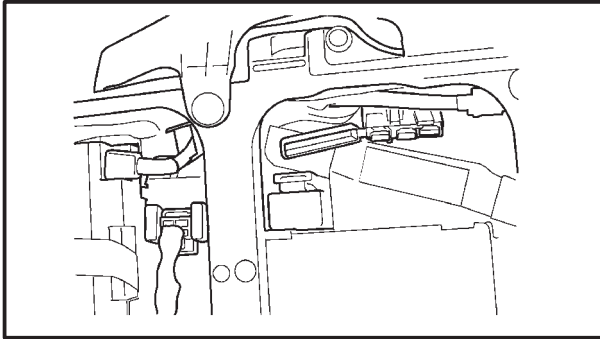
- b. If the pocket tester indicates “∞”, replace the fuse.

▲ ▲

- 3. Replace:
  - blown fuse

[illegible]

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



Fuses	Amperage rating	Q'ty
Main	40 A	1
Fuel injection system	15 A	1
Headlight	20 A	1
Signaling system	15 A	1
Ignition	15 A	1
Backup fuse (odometer and clock)	10 A	1
Radiator fan motor	15 A	1
Reserve	40 A, 20 A, 15 A, 10 A	1

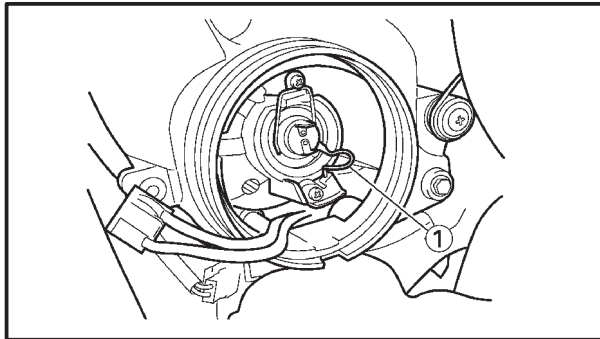
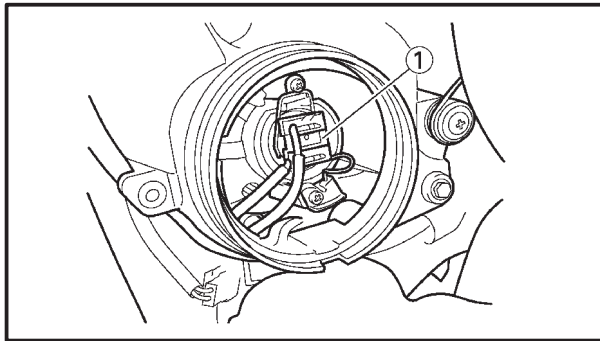


**⚠ WARNING**

**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.**

[illegible]

4. Install:
- front cowling inner panel (left)  
Refer to “COWLINGS”.
  - rider seat  
Refer to “SEATS”.



EAS00183

## REPLACING THE HEADLIGHT BULBS

The following procedure applies to both of the headlight bulbs.

1. Remove:
  - front cowling inner panels  
Refer to "COWLINGS".
2. Disconnect:
  - headlight bulb cover
  - headlight coupler ①
3. Remove:
  - headlight bulb holder ①
4. Remove:
  - headlight bulb

### ⚠ WARNING

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

5. 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.

6. Install:
  - headlight bulb holder
7. Install:
  - headlight bulb cover
8. Connect:
  - headlight coupler
9. Install:
  - front cowling inner panels  
Refer to "COWLINGS".

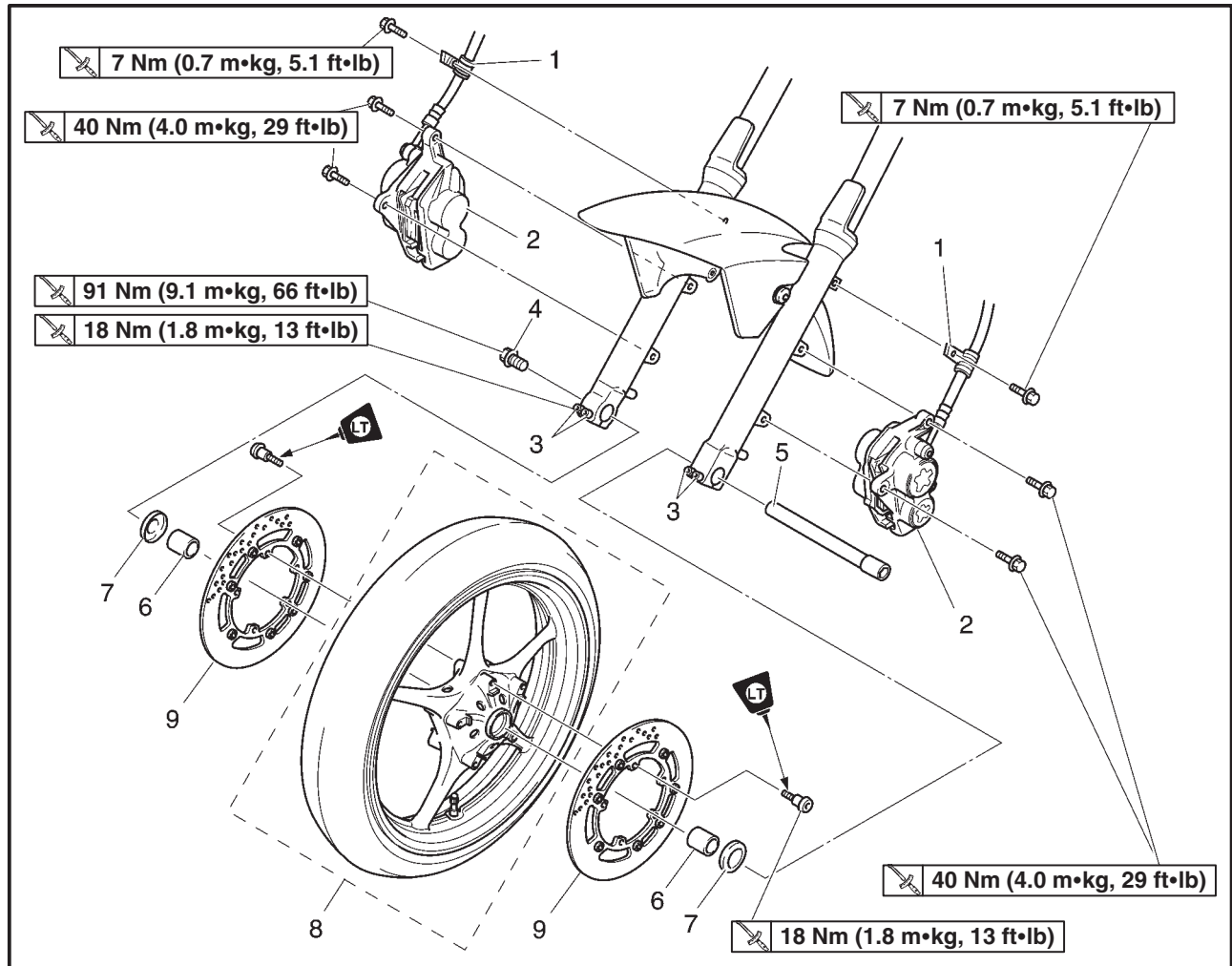




EAS00514

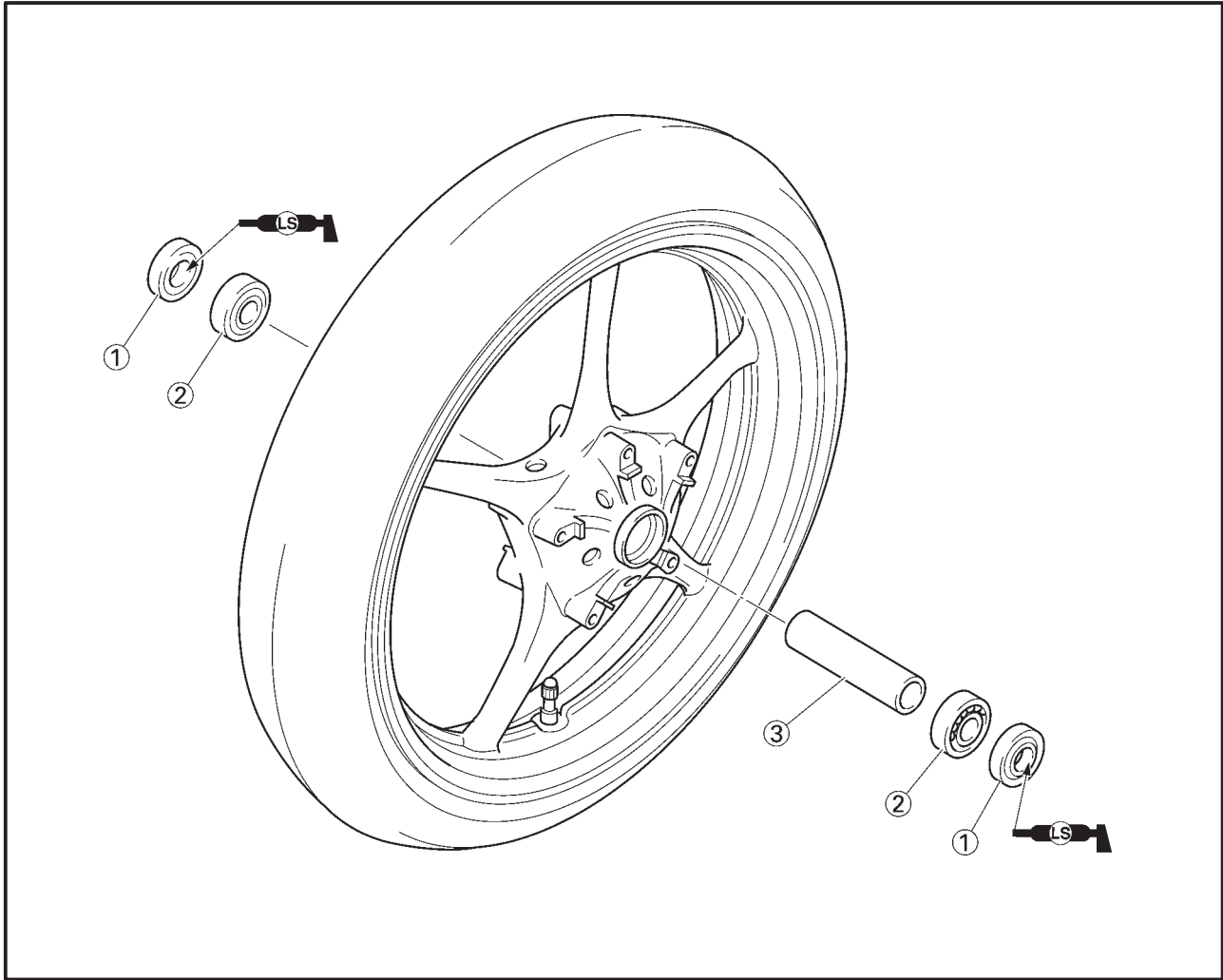
## CHASSIS

## FRONT WHEEL AND BRAKE DISCS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the front wheel and brake discs</b>		Remove the parts in the order listed. <b>NOTE:</b> _____ Place the motorcycle on a suitable stand so that the front wheel is elevated.
1	Brake hose holder (left and right)	2	Loosen.
2	Front brake caliper (left and right)	2	
3	Front wheel axle pinch bolt	4	
4	Front wheel axle bolt	1	
5	Front wheel axle	1	
6	Collar (left and right)	2	
7	Oil seal cover (left and right)	2	
8	Front wheel	2	
9	Front brake disc (left and right)	2	
			For installation, reverse the removal procedure.

EAS00518



4

Order	Job/Part	Q'ty	Remarks
①	<b>Disassembling the front wheel</b>	2	Remove the parts in the order listed.
②	Oil seal (left and right)	2	
③	Wheel bearing (left and right)	1	
	Spacer		For assembly, reverse the disassembly procedure.





EAS00521

## REMOVING THE FRONT WHEEL

1. Stand the motorcycle on a level surface.

### **WARNING**

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

### **NOTE:**

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

2. Remove:

- left brake caliper
- right brake caliper

Refer to "FRONT BRAKE CALIPERS".

### **NOTE:**

Do not apply the brake lever when removing the brake calipers.

3. Elevate:

- front wheel

### **NOTE:**

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

4. Remove:

- front wheel axle
- front wheel axle bolt
- front wheel

EAS00525

## CHECKING THE FRONT WHEEL

1. Check:

- wheel axle

Roll the wheel axle on a flat surface.

Bends → Replace.

### **WARNING**

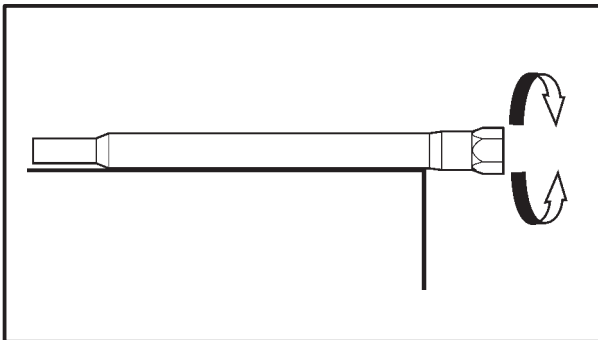
**Do not attempt to straighten a bent wheel axle.**

2. Check:

- tire
- front wheel

Damage/wear → Replace.

Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.







EAS00533

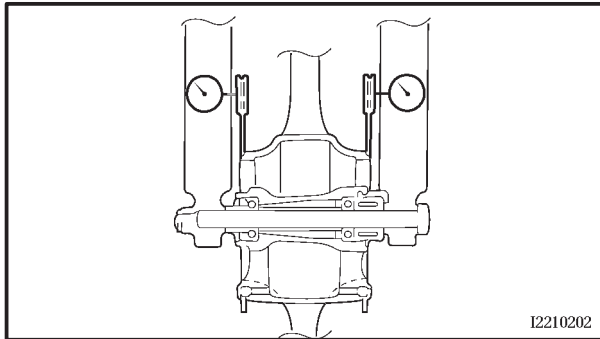
## CHECKING THE BRAKE DISCS

The following procedure applies to all of the brake discs.

### 1. Check:

- brake discs

Damage/galling → Replace.



### 2. Measure:

- brake disc deflection

Out of specification → Correct the brake disc deflection or replace the brake disc.

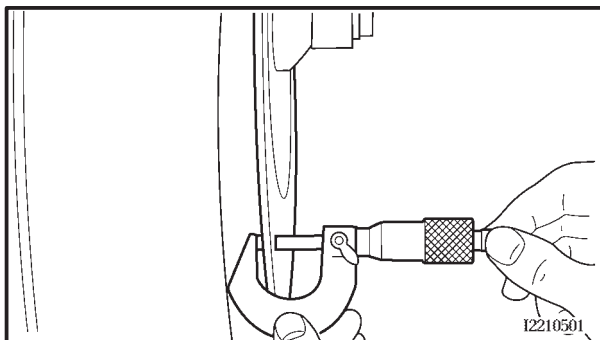


#### Brake disc deflection limit (maximum)

Front: 0.1 mm (0.004 in)

Rear: 0.15 mm (0.006 in)

- Place the motorcycle on a suitable stand so that the wheel is elevated.
- Before measuring the front brake disc deflection, turn the handlebars to the left or right to ensure that the front wheel is stationary.
- Remove the brake caliper.
- Hold the dial gauge at a right angle against the brake disc surface.
- Measure the deflection 2 ~ 3 mm (0.08 ~ 0.12 in) below the edge of the brake disc.



### 3. Measure:

- brake disc thickness

Measure the brake disc thickness at a few different locations.

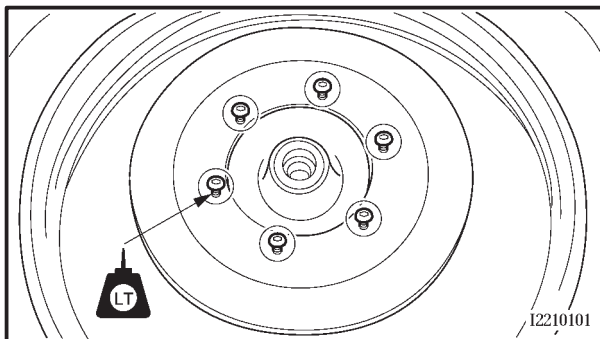
Out of specification → Replace.



#### Brake disc thickness limit (minimum)

Front: 4.5 mm (0.18 in)

Rear: 4.5 mm (0.18 in)



### 4. Adjust:

- brake disc deflection

- Remove the brake disc.
- Rotate the brake disc by one bolt hole.
- Install the brake disc.

#### NOTE:

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



## Brake disc bolt

**Front: 18 Nm (1.8 m•kg, 13 ft•lb)**

**Rear: 30 Nm (3.0 m•g, 22 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.



EAS00545

## INSTALLING THE FRONT WHEEL

The following procedure applies to both brake discs.

1. Lubricate:
  - wheel axle
  - oil seal lips



### Recommended lubricant

## Lithium-soap-based grease

2. Lift the wheel up between the fork legs.
3. Insert the wheel axle.

**NOTE:**

Install the tire with the mark ① pointing in the direction of wheel rotation.

4. Lower the front wheel so that it is on the ground.
5. Install the brake calipers by installing the bolts, and then tightening them to the specified torque.

**NOTE:**

Make sure that there is enough space between the brake pads before installing the brake calipers onto the brake discs.



**Brake caliper bolt:**

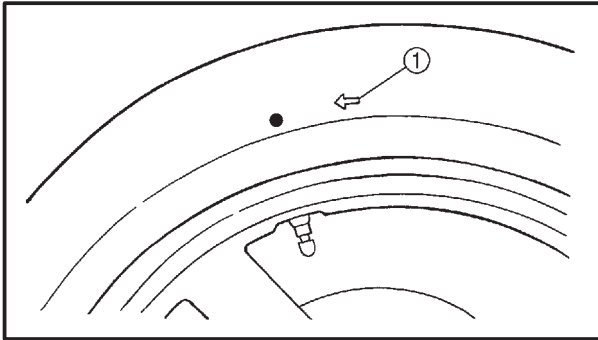
**40 Nm (4.0 m•kg, 29 ft•lb)**

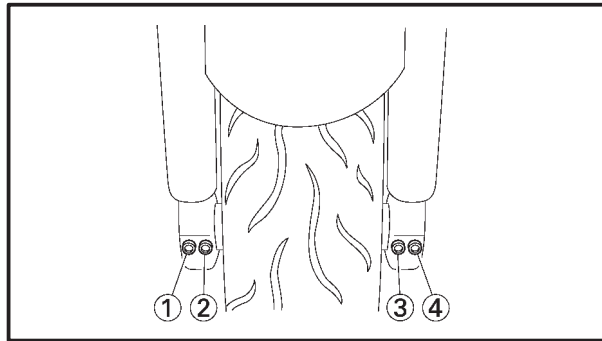
6. Install the brake hose holders by installing the bolts and nuts.
7. Secure the wheel axle by installing the axle bolt, and then tightening it to the specified torque.



**Axle bolt:**

**91 Nm (9.1 m•kg, 66 ft•lb)**





8. Tighten wheel axle pinch bolt ②, and then pinch bolt ① to specified torque.
9. Retighten pinch bolt ② to the specified torque.



**Wheel axle pinch bolt:**  
**18 Nm (1.8 m•kg, 13 ft•lb)**

10. Tap the outer side of the left fork leg with a rubber mallet to align it with the end of the wheel axle.
11. Tighten wheel axle pinch bolt ④, and then pinch bolt ③ to specified torque.
12. Retighten pinch bolt ④ to the specified torque.



**Wheel axle pinch bolt:**  
**18 Nm (1.8 m•kg, 13 ft•lb)**

13. While applying the front brake, push down hard on the handlebar several times to check for proper fork operation.

EAS00549

## 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 discs installed.

1. Remove:
  - balancing weight(s)
2. Find:
  - front wheel's heavy spot

**NOTE:** \_\_\_\_\_

Place the front wheel on a suitable balancing stand.

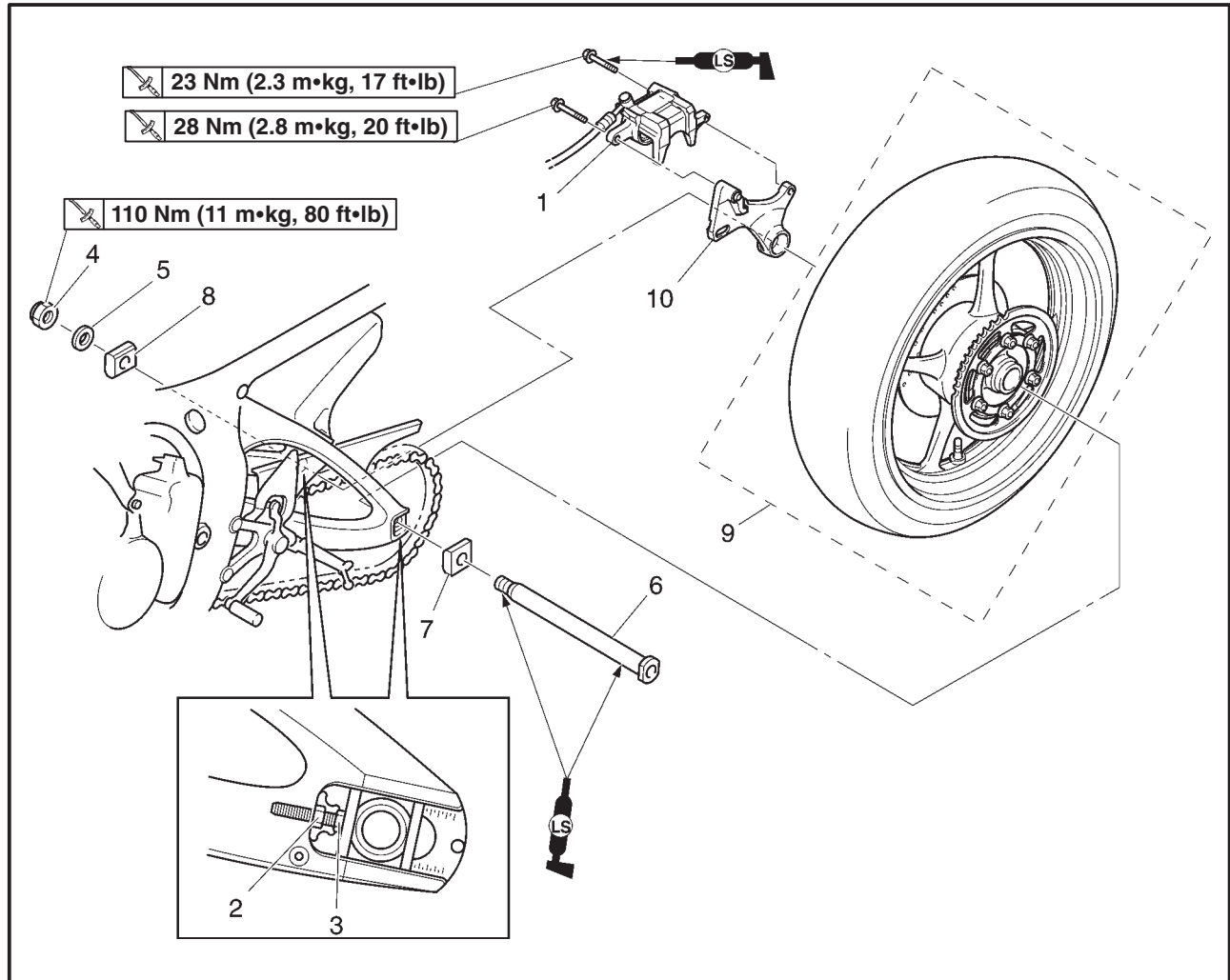




EAS00551

## REAR WHEEL AND BRAKE DISC

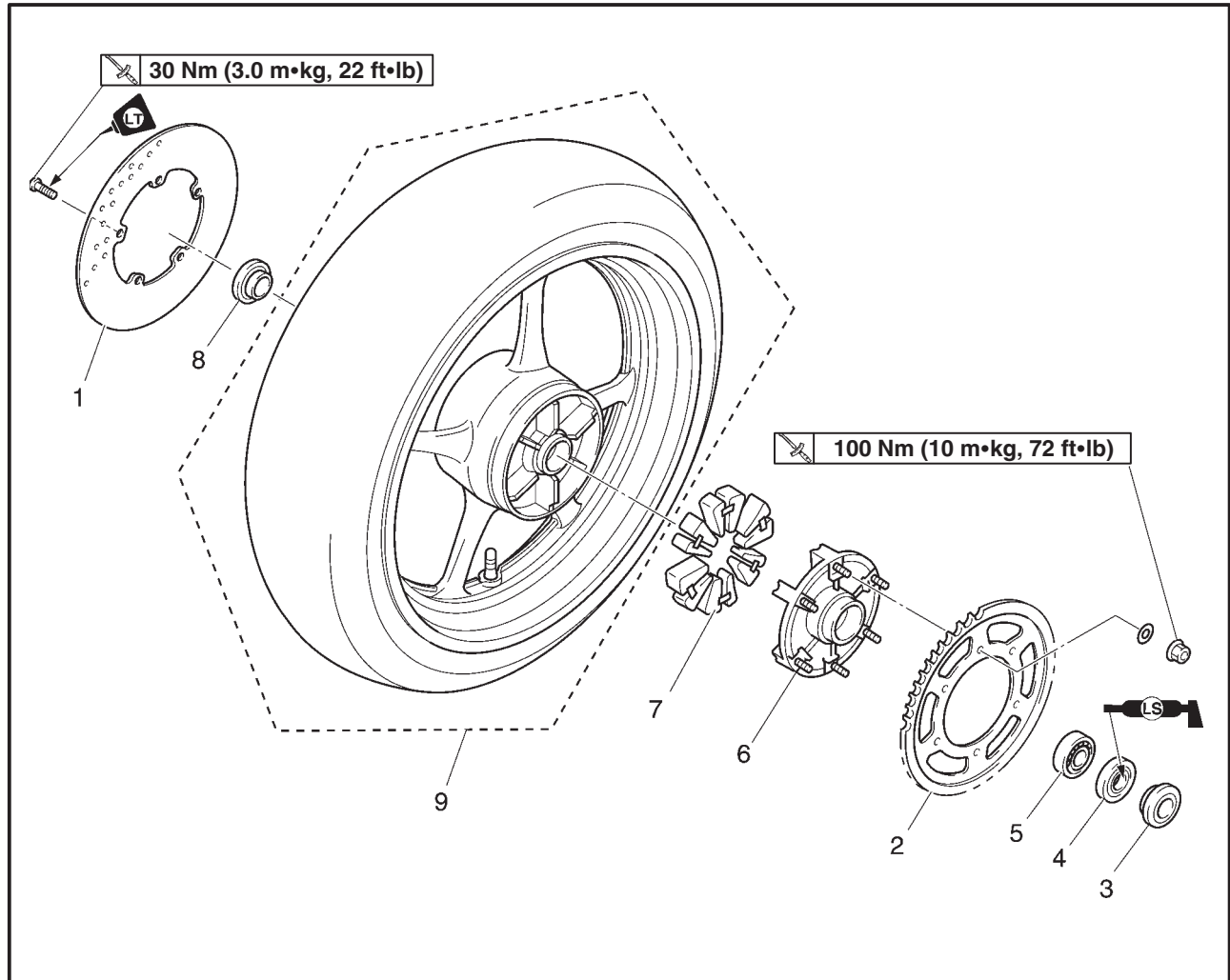
### REAR WHEEL



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear wheel</b>		Remove the parts in the order listed. <b>NOTE:</b> _____ Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Rear brake caliper	1	
2	Locknut (left and right)	2	Loosen.
3	Adjusting bolt (left and right)	2	Loosen.
4	Wheel axle nut	1	
5	Washer	1	
6	Rear wheel axle	1	
7	Left adjusting block	1	
8	Right adjusting block	1	
9	Rear wheel	1	
10	Rear brake caliper bracket	1	
			For installation, reverse the removal procedure.

EAS00556

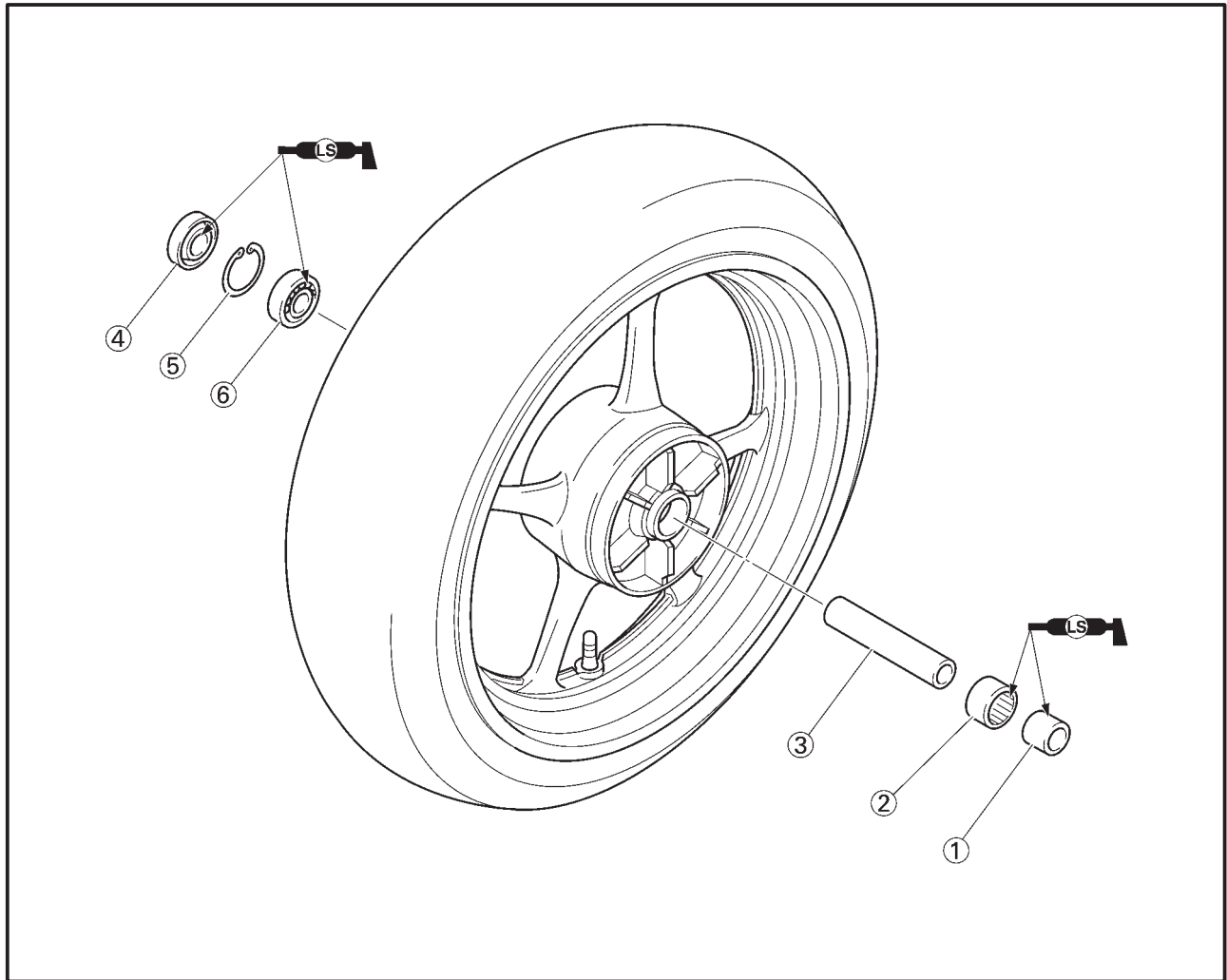
## REAR BRAKE DISC AND REAR WHEEL SPROCKET



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear brake disc and rear wheel sprocket</b>		Remove the parts in the order listed.
1	Rear brake disc	1	
2	Rear wheel sprocket	1	
3	Collar	1	
4	Oil seal	1	
5	Bearing	2	
6	Rear wheel drive hub	1	
7	Rear wheel drive hub damper	6	
8	Collar	1	
9	Rear wheel	1	
			For installation, reverse the removal procedure.



EAS00560



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the rear wheel</b>		
①	Collar	1	Disassemble the parts in the order listed.
②	Bearing	1	
③	Spacer	1	
④	Oil seal	1	
⑤	Circlip	1	
⑥	Bearing	1	
			For installation, reverse the disassembly procedure.



EAS00561

## REMOVING THE REAR WHEEL

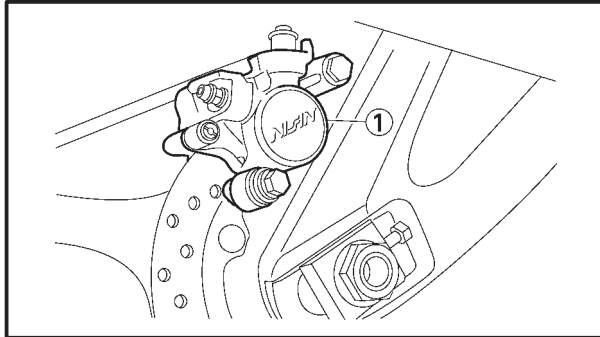
1. Stand the motorcycle on a level surface.

### **WARNING**

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

### NOTE:

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

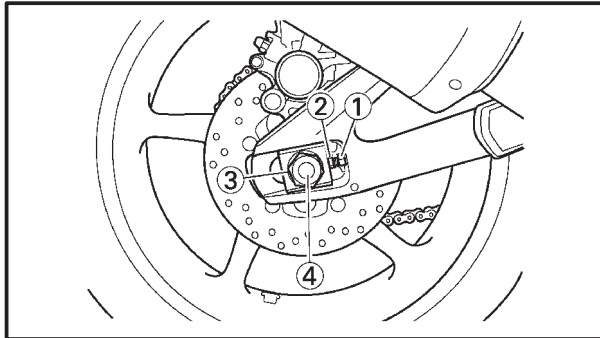


2. Remove:

- brake caliper (1)

### NOTE:

Do not depress the brake pedal when removing the brake caliper.



3. Loosen:

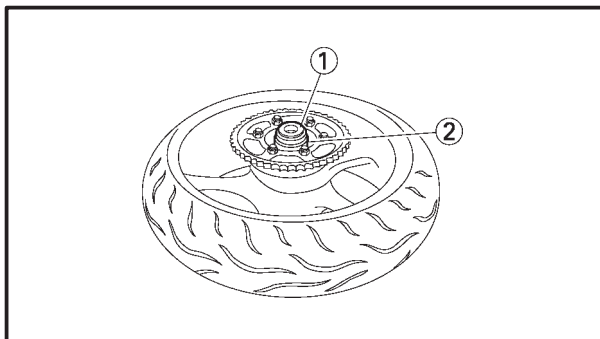
- locknuts (1) (left and right)
- adjusting bolts (2) (left and right)

4. Remove:

- wheel axle nut (3)
- wheel axle (4)
- rear wheel

### NOTE:

Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.



5. Remove:

- left collar (1)
- rear wheel drive hub (2)
- rear wheel drive hub damper
- right collar



EAS00565

## CHECKING THE REAR WHEEL

### 1. Check:

- wheel axle
- rear wheel
- wheel bearings
- oil seals

Refer to "CHECKING THE FRONT WHEEL".

### 2. Check:

- tire
- rear wheel

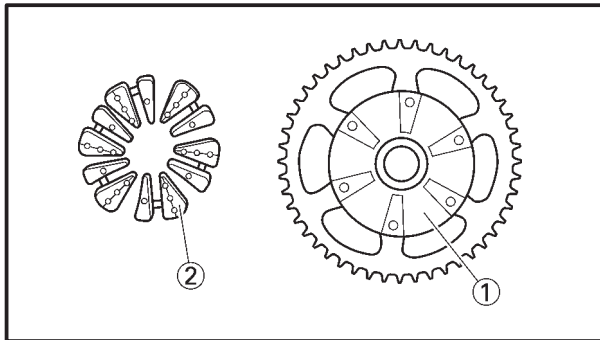
Damage/wear → Replace.

Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.

### 3. Measure:

- radial wheel runout
- lateral wheel runout

Refer to "CHECKING THE FRONT WHEEL".

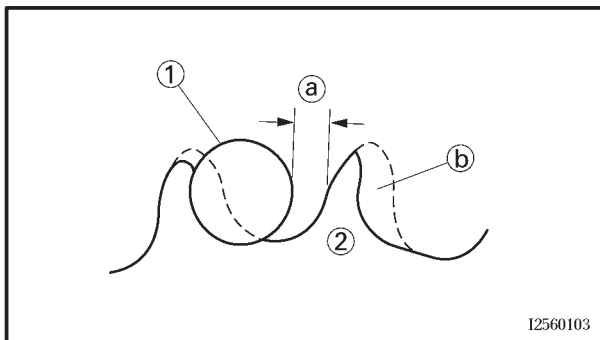


EAS00567

## CHECKING THE REAR WHEEL DRIVE HUB

### 1. Check:

- rear wheel drive hub (1)  
Cracks/damage → Replace.
- rear wheel drive hub dampers (2)  
Damage/wear → Replace.



EAS00568

## CHECKING AND REPLACING THE REAR WHEEL SPROCKET

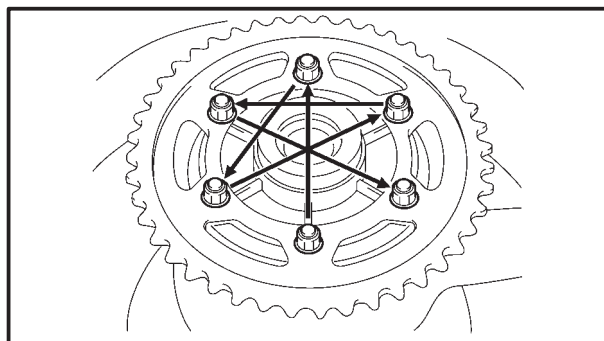
### 1. Check:

- rear wheel sprocket  
More than 1/4 tooth (a) wear → Replace the rear wheel sprocket.  
Bent teeth → Replace the rear wheel sprocket.

(b) Correct

(1) Drive chain roller

(2) Rear wheel sprocket



2. Replace:
  - rear wheel sprocket



- a. Remove the self-locking nuts and the rear wheel sprocket.
- b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
- c. Install the new rear wheel sprocket.



**Rear wheel sprocket self-locking nut**

**100 Nm (10 m•kg, 72 ft•lb)**

**NOTE:** Tighten the self-locking nuts in stages and in a crisscross pattern.



EAS00572

## INSTALLING THE REAR WHEEL

1. Lubricate:
  - wheel axle
  - wheel bearings
  - oil seal lips






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

2. Install:
  - rear brake caliper bracket
  - rear wheel
  - adjusting blocks
  - rear wheel axle
3. Adjust:
  - drive chain slack



**Drive chain slack**  
**35 ~ 45 mm (1.38 ~ 1.77 in)**

Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.

4. Tighten:
  - wheel axle nut  **110 Nm (11 m•kg, 80 ft•lb)**
  - brake caliper bolt (front)  **28 Nm (2.8 m•kg, 20 ft•lb)**
  - (rear)  **23 Nm (2.3 m•kg, 17 ft•lb)**



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 and rear wheel drive hub installed.
- 

1. Adjust:

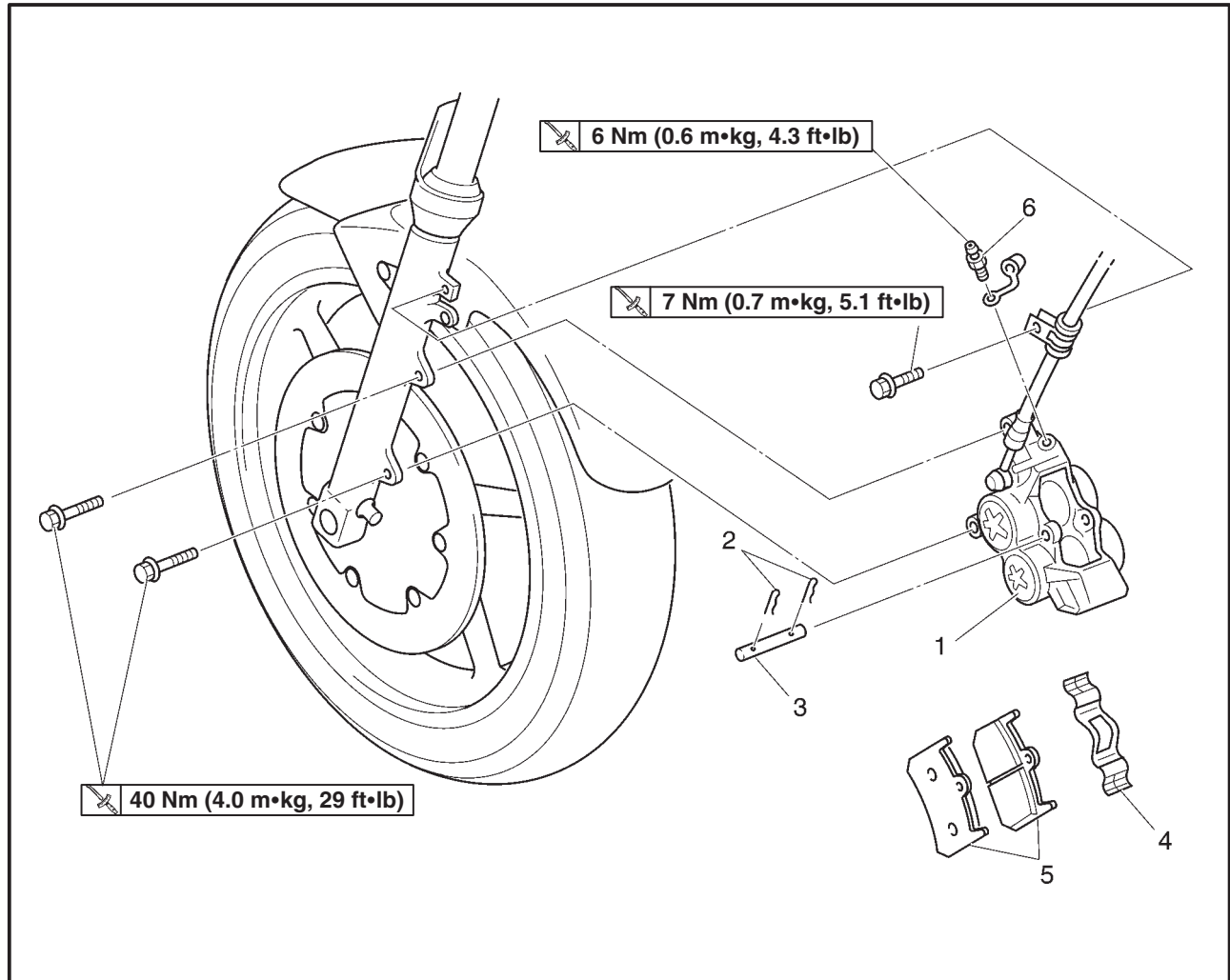
- rear wheel static balance

Refer to “ADJUSTING THE FRONT WHEEL STATIC BALANCE”.

EAS00577

## FRONT AND REAR BRAKES

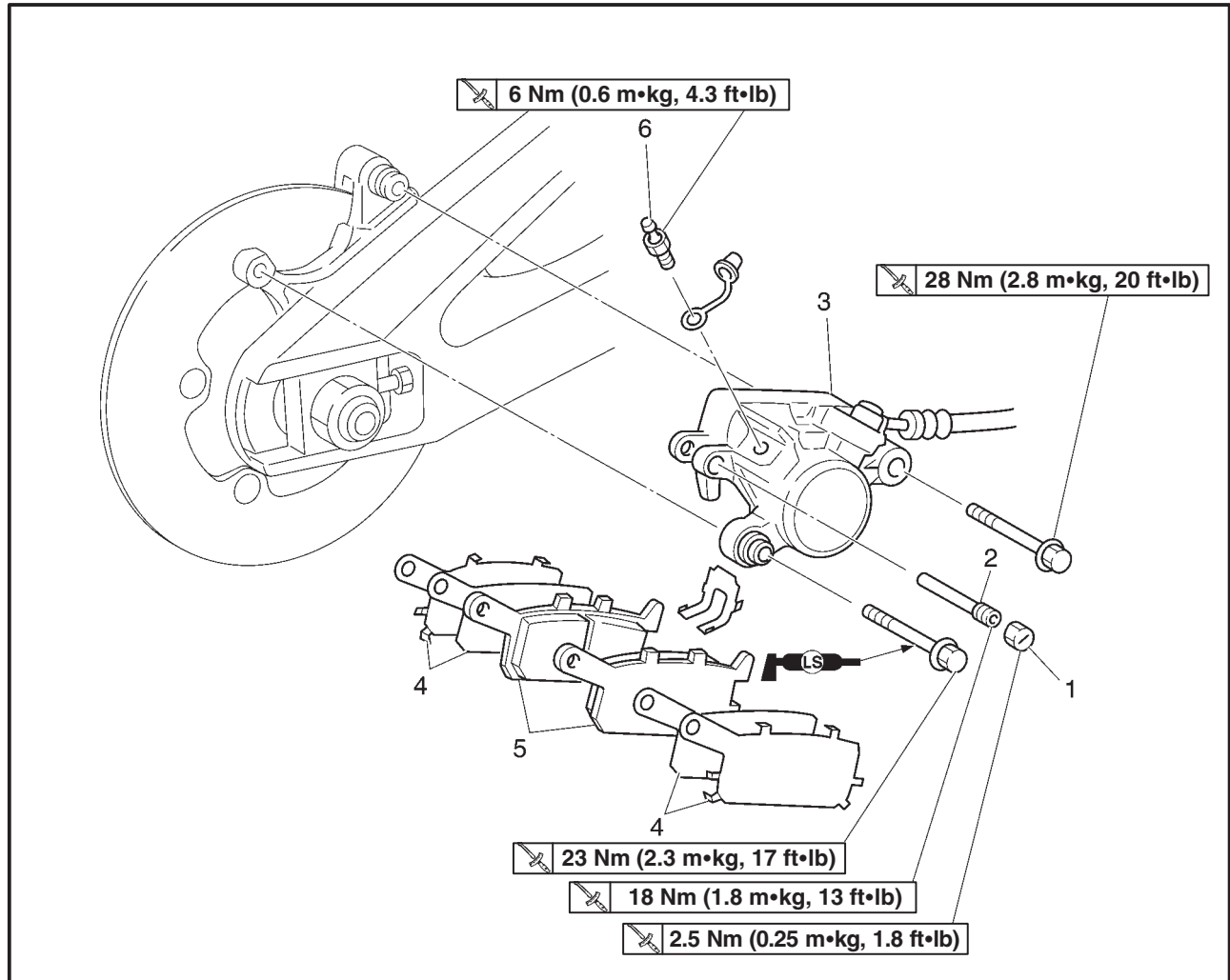
### FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the front brake pads</b>		Remove the parts in the order listed. <b>NOTE:</b> _____ The following procedure applies to both of the front brake calipers.
1	Front brake caliper	1	
2	Brake pad clip	2	
3	Brake pad pin	1	
4	Brake pad spring	1	
5	Brake pad	2	
6	Bleed screw	1	
			For installation, reverse the removal procedure.



### REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear brake pads</b>		
1	Screw plug	1	Remove the parts in the order listed.
2	Brake pad pin	2	
3	Rear brake caliper	1	
4	Brake pad shim	4	
5	Brake pad	2	
6	Bleed screw	1	For installation, reverse the removal procedure.



EAS00579

## CAUTION:

Disc brake components rarely require disassembly.

Therefore, always follow these preventive measures:

## ⚠ WARNING

- 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.

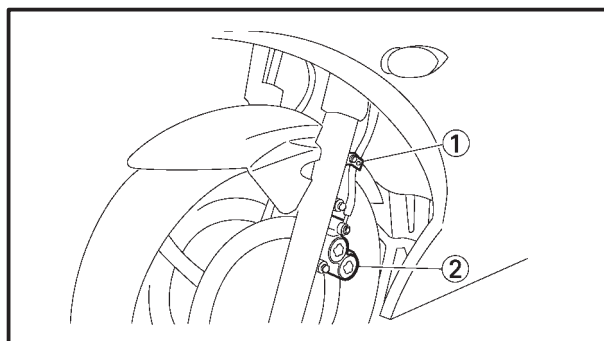
EAS00582

## REPLACING THE FRONT BRAKE PADS

The following procedure applies to both brake calipers.

### NOTE:

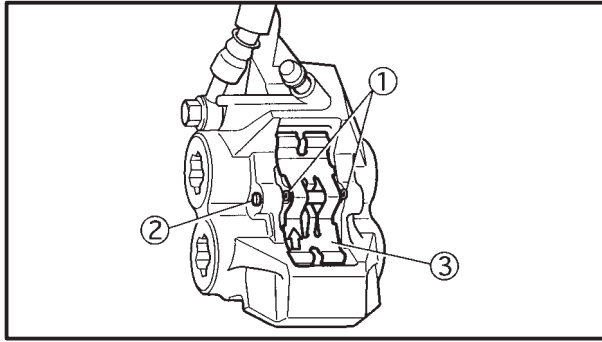
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



### 1. Remove:

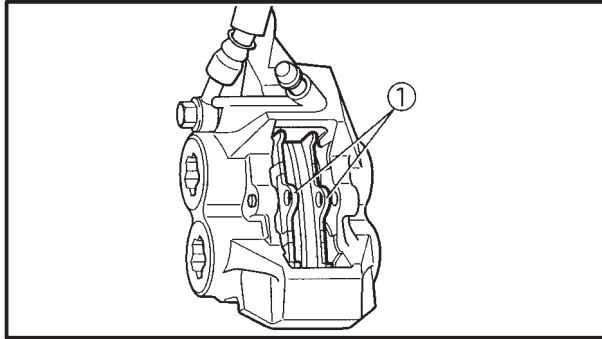
- brake hose holder ①
- brake caliper ②





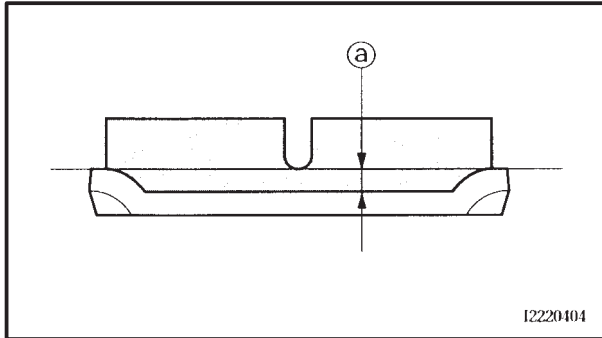
2. Remove:

- brake pad clips ①
- brake pad pin ②
- brake pad spring ③



3. Remove:

- brake pads ①



4. Measure:

- brake pad wear limit ①

Out of specification → Replace the brake pads as a set.



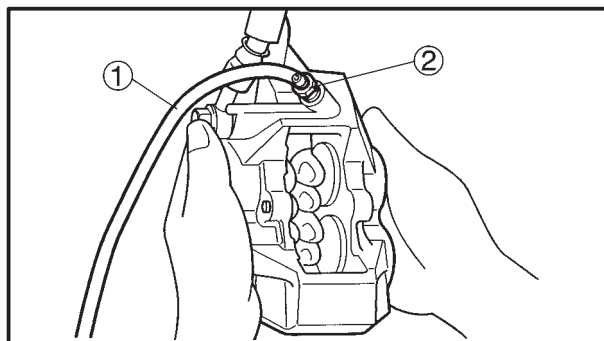
**Brake pad wear limit**  
**0.5 mm (0.02 in)**

5. Install:

- brake pads
- brake pad spring

**NOTE:**

Always install new brake pads, and a brake pad spring as a set.



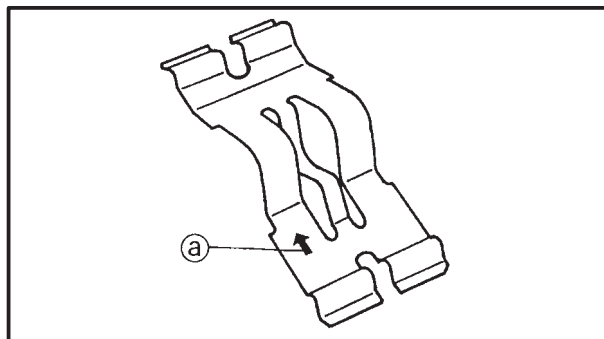
- a. Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.
- b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
- c. Tighten the bleed screw.



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

### NOTE:

The arrow mark (a) on the brake pad spring must point in the direction of disc rotation.

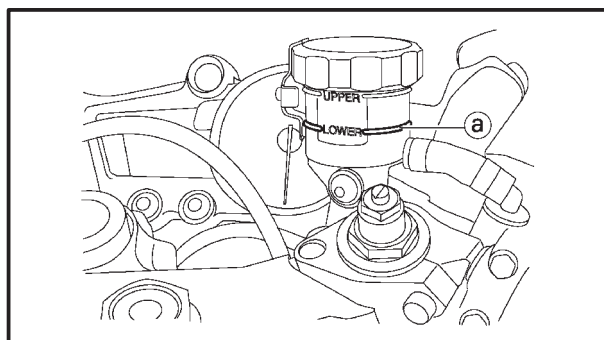


- d. Install new brake pads and a new brake pad spring.

### 6. Install:

- brake pad pins
- brake pad clips
- brake caliper

40 Nm (4.0 m•kg, 29 ft•lb)



### 7. Check:

- brake fluid level  
Below the minimum level mark (a) → 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.

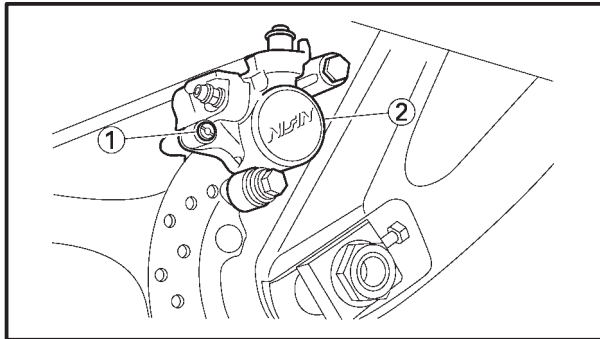


EAS00583

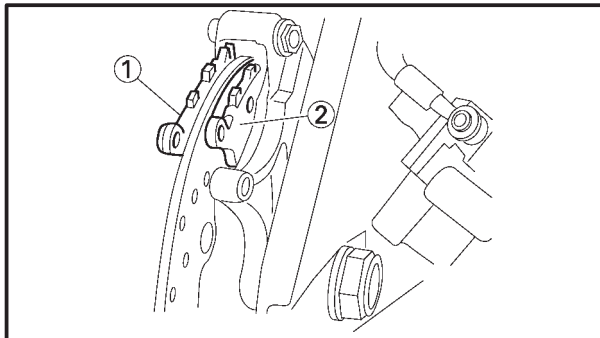
### REPLACING THE REAR BRAKE PADS

#### NOTE:

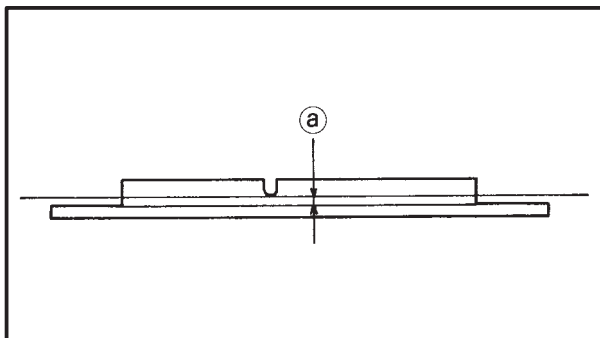
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



1. Remove:
  - screw plug ①
  - brake pad pin
  - brake caliper ②
2. Remove:
  - brake pad spring



3. Remove:
  - brake pads ①
  - (along with the brake pad shims ②)



4. Measure:
  - brake pad wear limit ①

Out of specification → Replace the brake pads as a set.

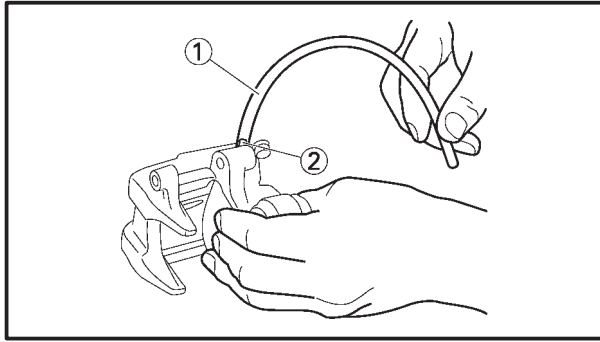


**Brake pad wear limit**  
1.0 mm (0.04 in)

5. Install:
  - brake pad shims
  - (onto the brake pads)
  - brake pads
  - brake pad spring

#### NOTE:

Always install new brake pads, brake pad shims, and a brake pad spring as a set.

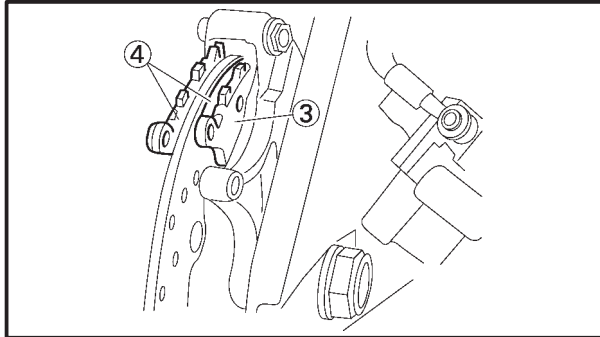


- a. Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.
- b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
- c. Tighten the bleed screw.



## Bleed screw

6 Nm (0.6 m•kg, 4.3 ft•lb)



- d. Install a new brake pad shim ③ onto each new brake pad ④.

## 6. Install:

- rear brake caliper (front)

28 Nm (2.8 m•kg, 20 ft•lb)  
(rear)

23 Nm (2.3 m•kg, 17 ft•lb)

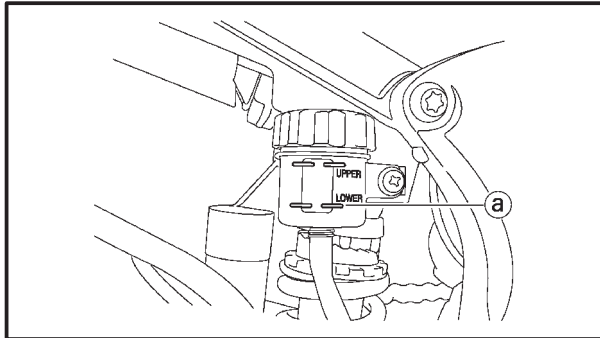
- brake pad pin
- screw plug

## 7. Check:

- brake fluid level  
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level. Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

## 8. Check:

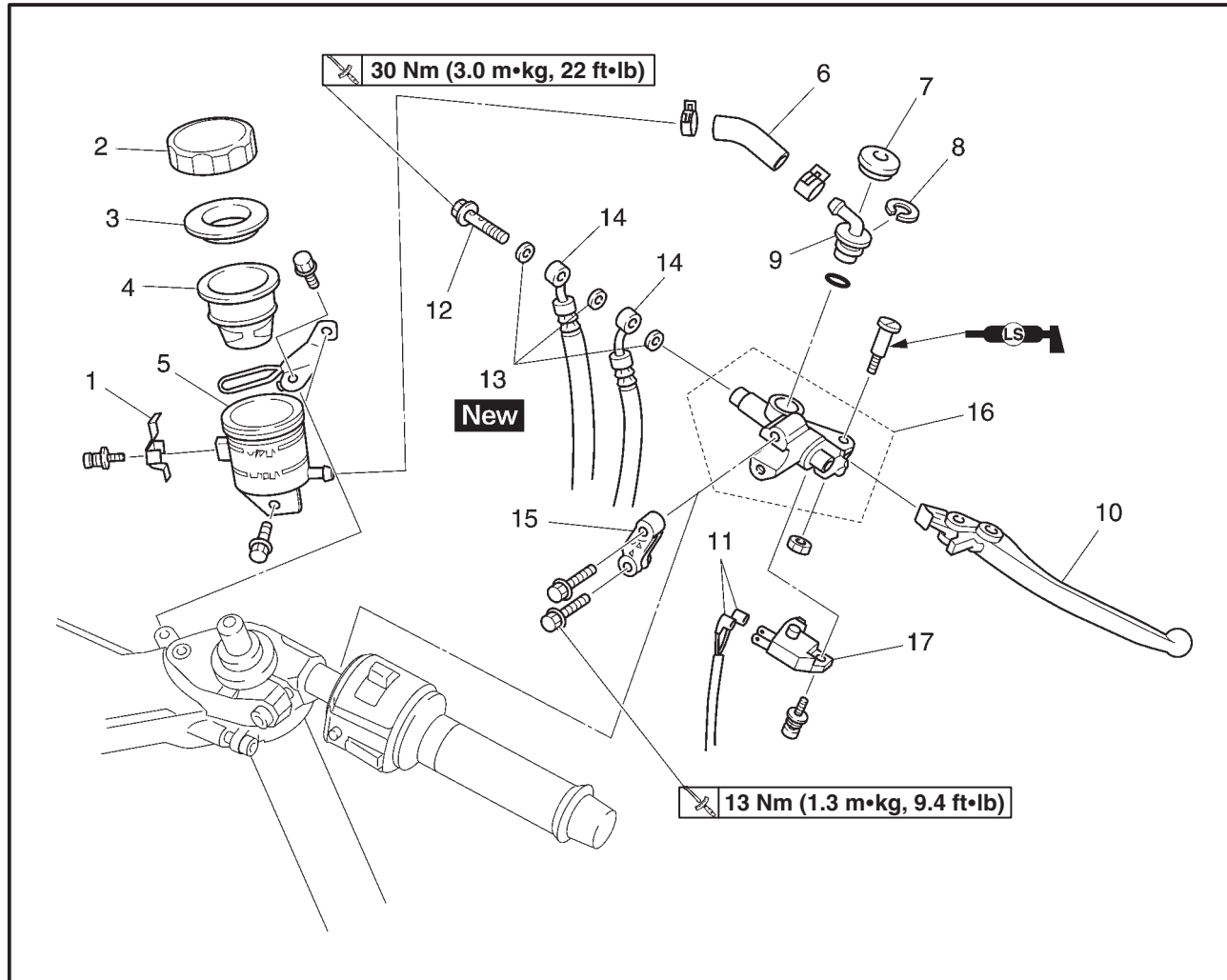
- brake pedal operation  
Soft or spongy feeling → Bleed the brake system.  
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



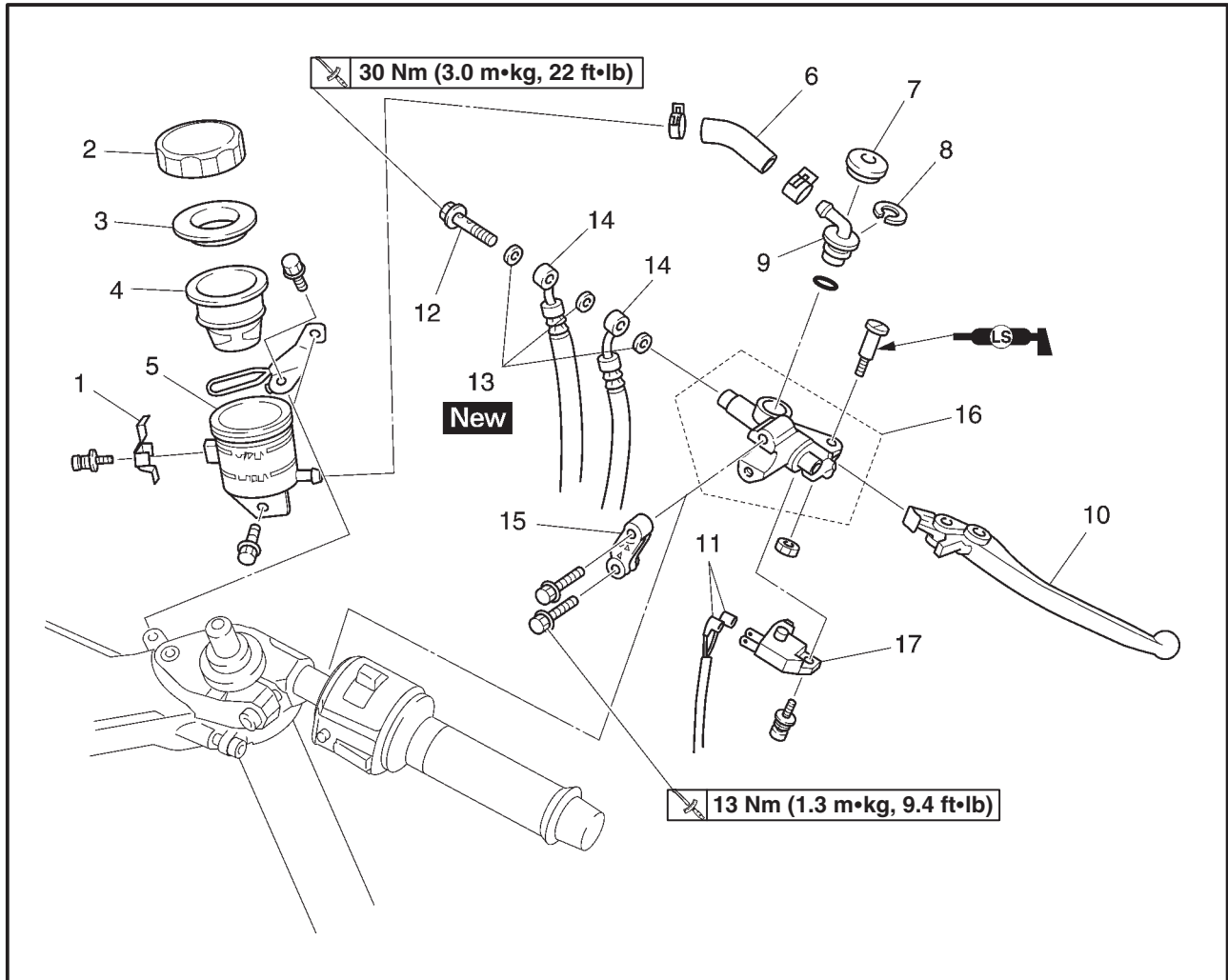


EAS00584

### FRONT BRAKE MASTER CYLINDER

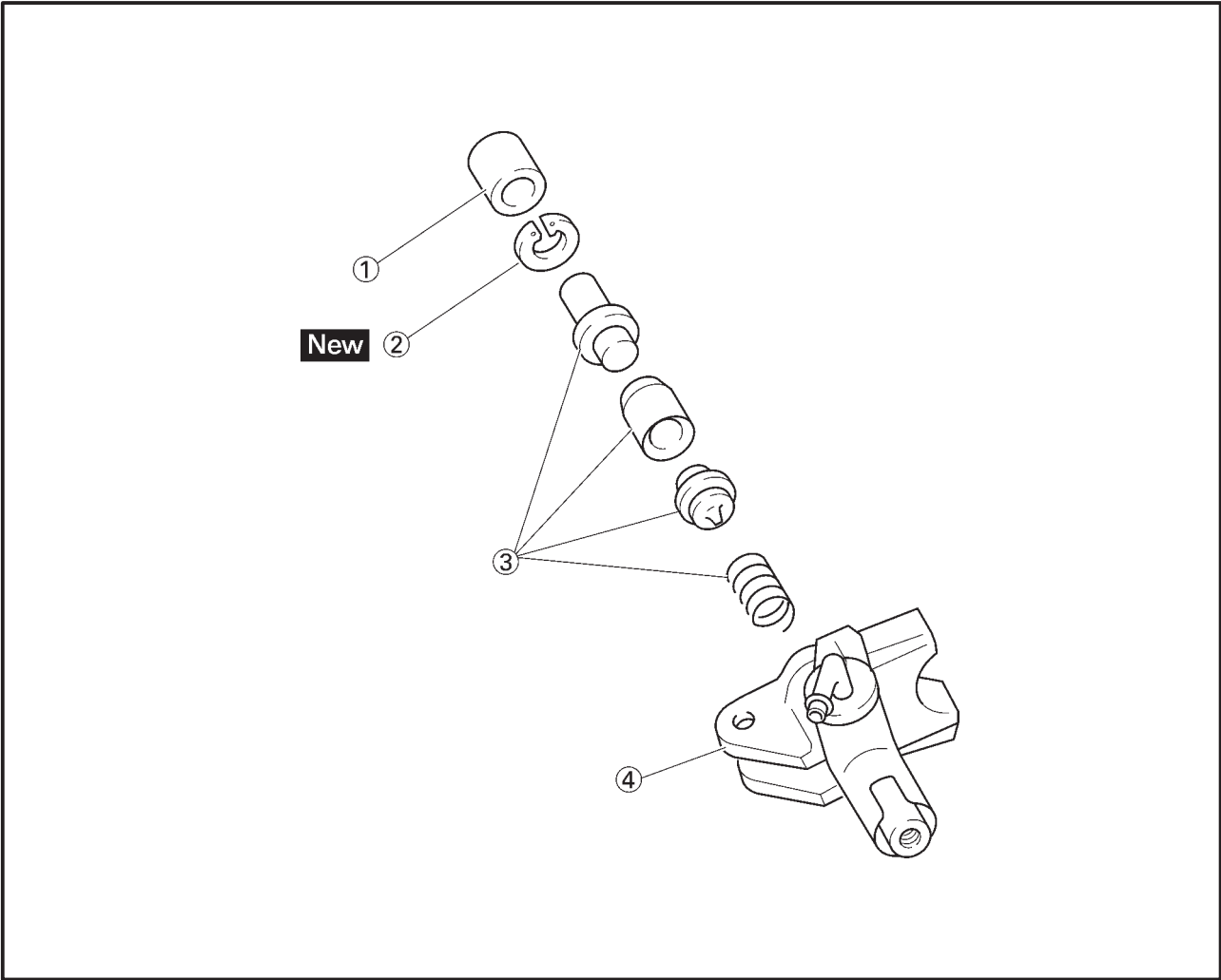


Order	Job/Part	Q'ty	Remarks
	<b>Removing the front brake master cylinder</b>		Remove the parts in the order listed. Drain. Refer to "CHANGING THE BRAKE FLUID" in chapter 3.
	Brake fluid		
1	Stopper	1	Disconnect.
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir tank	1	
6	Brake fluid reservoir hose	1	
7	Dust cover	1	
8	Circlip	1	
9	Hose joint	1	
10	Brake lever	1	
11	Front brake switch connector	2	
12	Union bolt	1	
13	Copper washer	3	
14	Brake hose	2	



Order	Job/Part	Q'ty	Remarks
15	Brake master cylinder bracket	1	For installation, reverse the removal procedure.
16	Brake master cylinder	1	
17	Front brake switch	1	

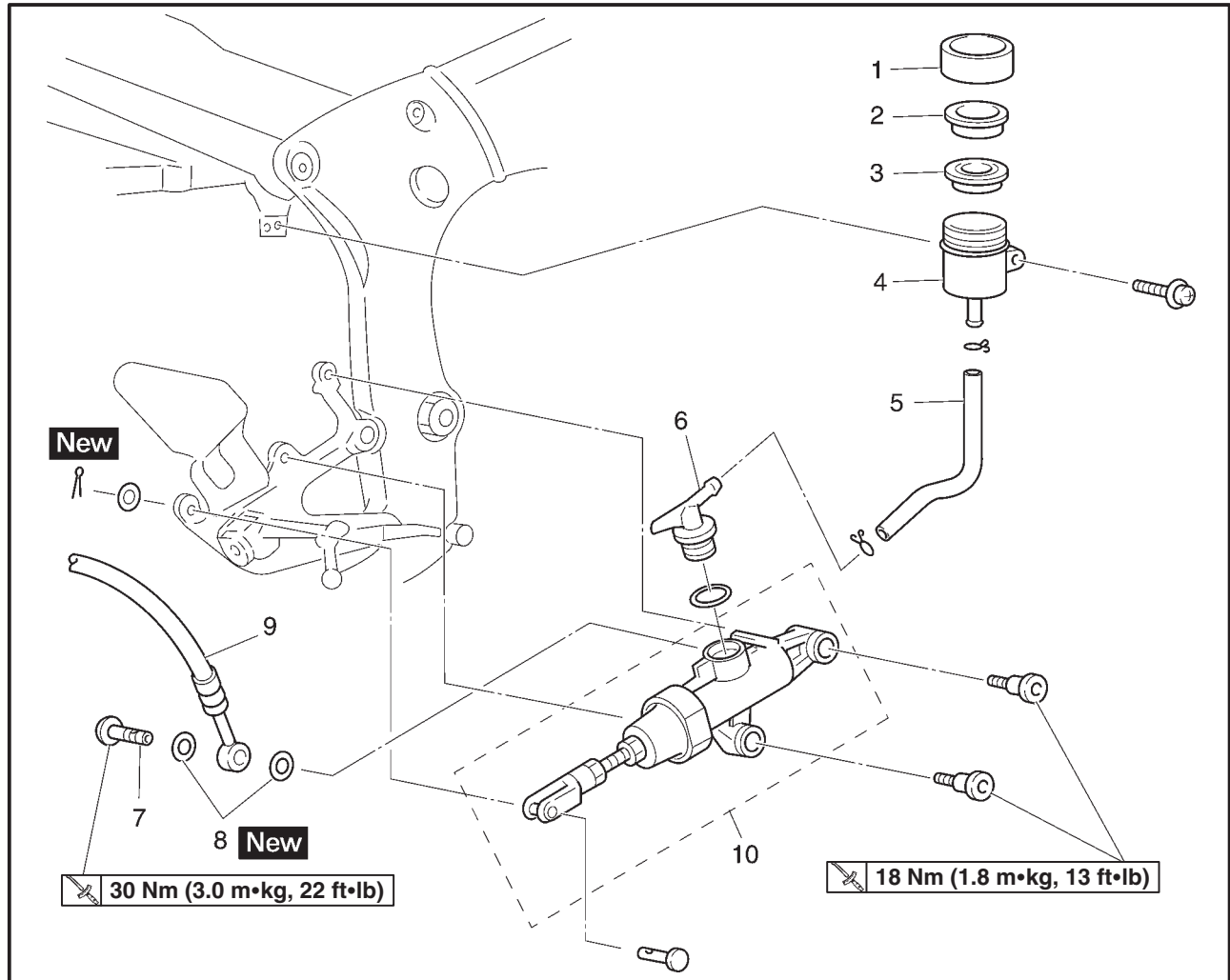
EAS00585



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

EAS00586

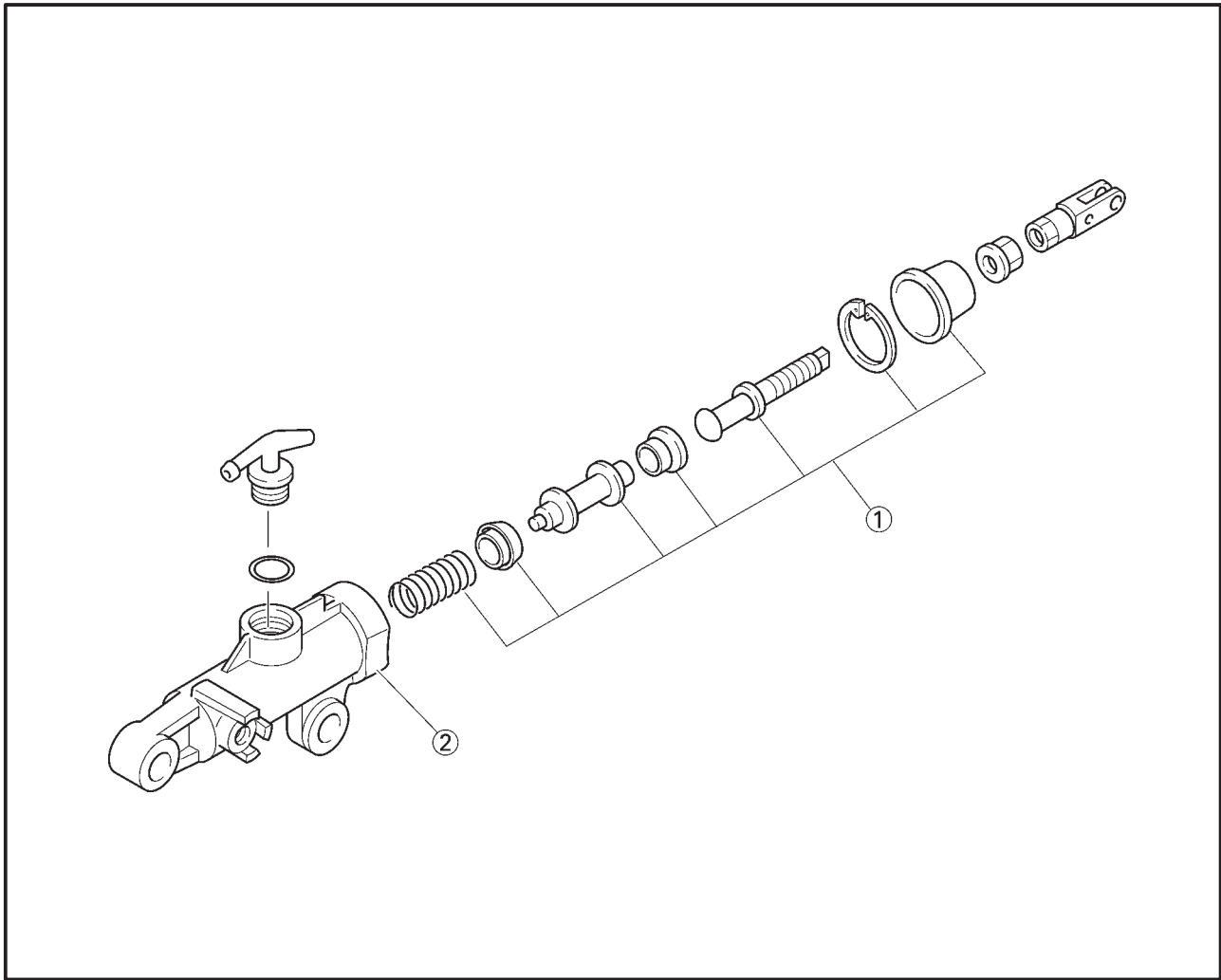
## REAR BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear brake master cylinder</b>		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "CHANGING THE BRAKE FLUID" in chapter 3.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm holder	1	
3	Brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir tank	1	
5	Brake fluid reservoir hose	1	
6	Hose joint	1	
7	Union bolt	1	
8	Copper washer	2	
9	Brake hose	1	
10	Brake master cylinder	1	
			For installation, reverse the removal procedure.



EAS00587



Order	Job/Part	Q'ty	Remarks
①	<b>Disassembling the rear brake master cylinder</b>	1	Disassemble the parts in the order listed.
②	Brake master cylinder kit	1	
	Brake master cylinder body		For assembly, reverse the disassembly procedure.

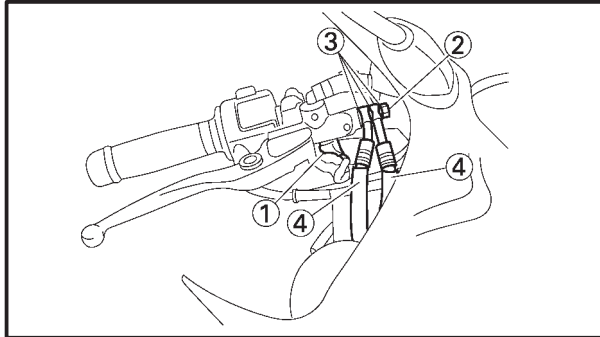


EAS00588

## DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

### NOTE:

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

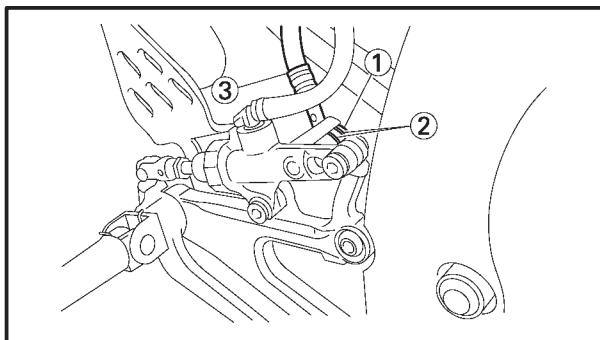


1. Disconnect:  
brake light switch connector ①  
(from the brake light switch)
2. Remove:  
• union bolt ②  
• copper washers ③  
• brake hoses ④

### NOTE:

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

3. Remove:  
• brake master cylinder bracket  
• brake master cylinder assembly
4. Remove:  
• dust boot  
• circlip



EAS00589

## DISASSEMBLING THE REAR BRAKE MASTER CYLINDER

### 1. Remove:

- union bolt ①
- copper washers ②
- brake hose ③

### NOTE:

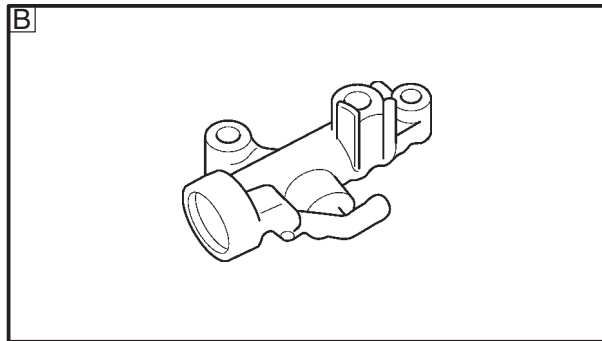
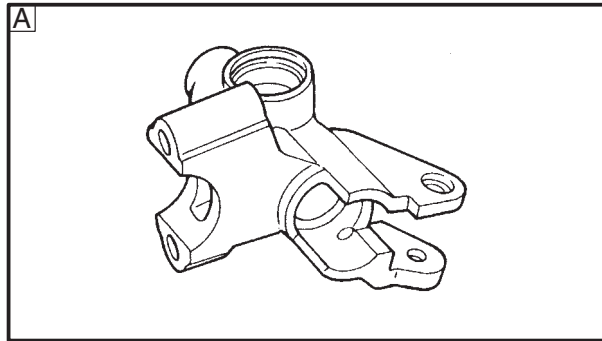
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

### 2. Remove:

- brake master cylinder assembly

### 3. Remove:

- dust boot
- circlip



EAS00593

### CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

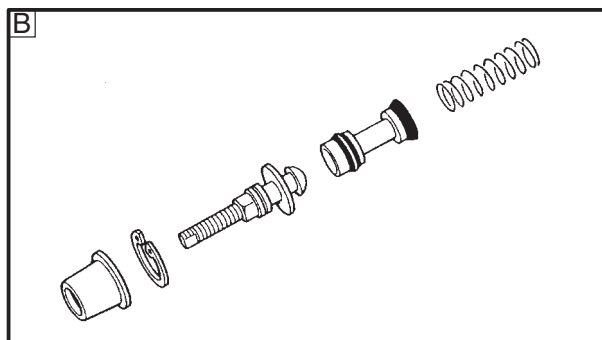
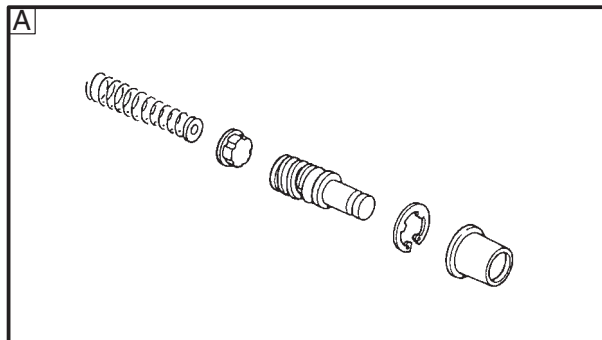
The following procedure applies to both of the brake master cylinders.

#### 1. Check:

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

**A** Front

**B** Rear

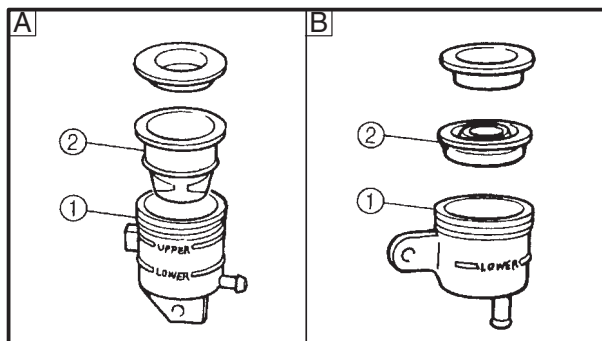


#### 2. Check:

- brake master cylinder kit  
Damage/scratches/wear → Replace.

**A** Front

**B** Rear



#### 3. Check:

- brake fluid reservoir ①  
Cracks/damage → Replace.
- brake fluid reservoir diaphragm ②  
Cracks/damage → Replace.

#### 4. Check:

- brake hoses  
Cracks/damage/wear → Replace.

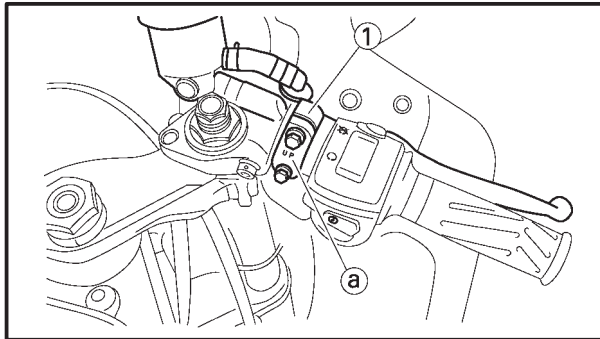


EAS00607

## 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.



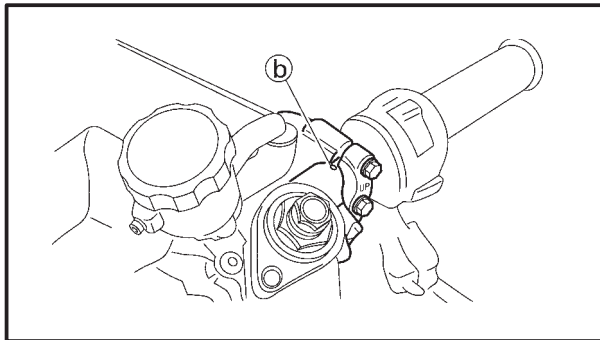
**Recommended brake fluid  
DOT 4**

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

**13 Nm (1.3 m•kg, 9.4 ft•lb)**

### NOTE:

- Install the brake master cylinder holder with the “UP” mark ① facing up.
- Align the mating surfaces of the brake master cylinder holder with the punch mark ② on the right handlebar.
- First, tighten the upper bolt, then the lower bolt. There should be 8.2 mm (0.32 in.) for clearance between the right handlebar switch and the brake master cylinder holder.

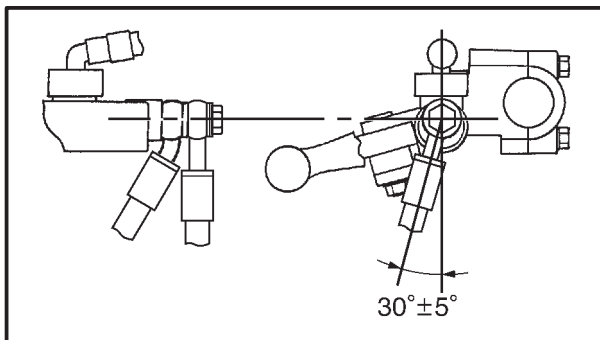


3. Install:
  - copper washers **New**
  - brake hose
  - union bolt
  - brake light switch coupler

**30 Nm (3.0 m•kg, 22 ft•lb)**

### ⚠ WARNING

**Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.**



**NOTE:**

- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebars 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.

## 4. Fill:

- brake fluid reservoir  
(with the specified amount of the recommended brake fluid)



**Recommended brake fluid  
DOT 4**

**WARNING**

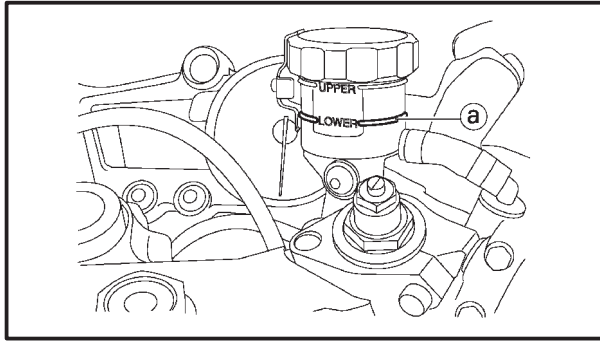
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid 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

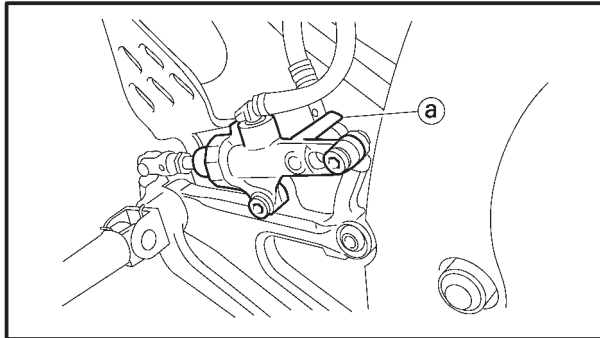
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level. Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

7. Check:

- brake lever operation

Soft or spongy feeling → Bleed the brake system.

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



EAS00610

## ASSEMBLING THE REAR BRAKE MASTER CYLINDER

1. Install:

- brake master cylinder kit
- circlip
- dust boot

2. Install:

- copper washers
- brake hose

New

30 Nm (3.0 m•kg, 22 ft•lb)

### CAUTION:

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

### WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.

3. Fill:

- brake fluid reservoir  
(to the maximum level mark)



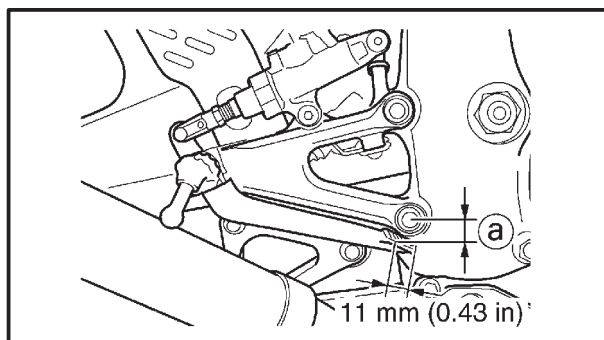
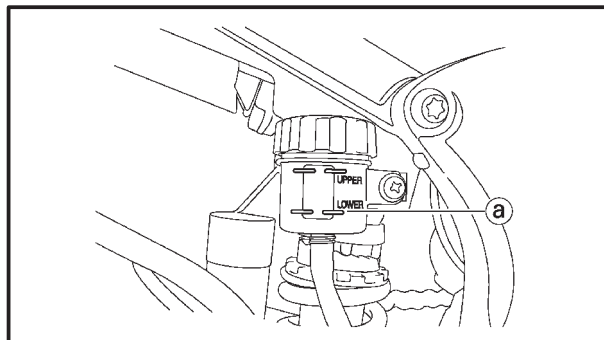
Recommended brake fluid  
DOT 4

**! 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 fluid 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.



4. Bleed:
  - brake system  
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
5. Check:
  - brake fluid level  
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.  
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
6. Adjust:
  - brake pedal position (a)  
Refer to “ADJUSTING THE REAR BRAKE” in chapter 3.

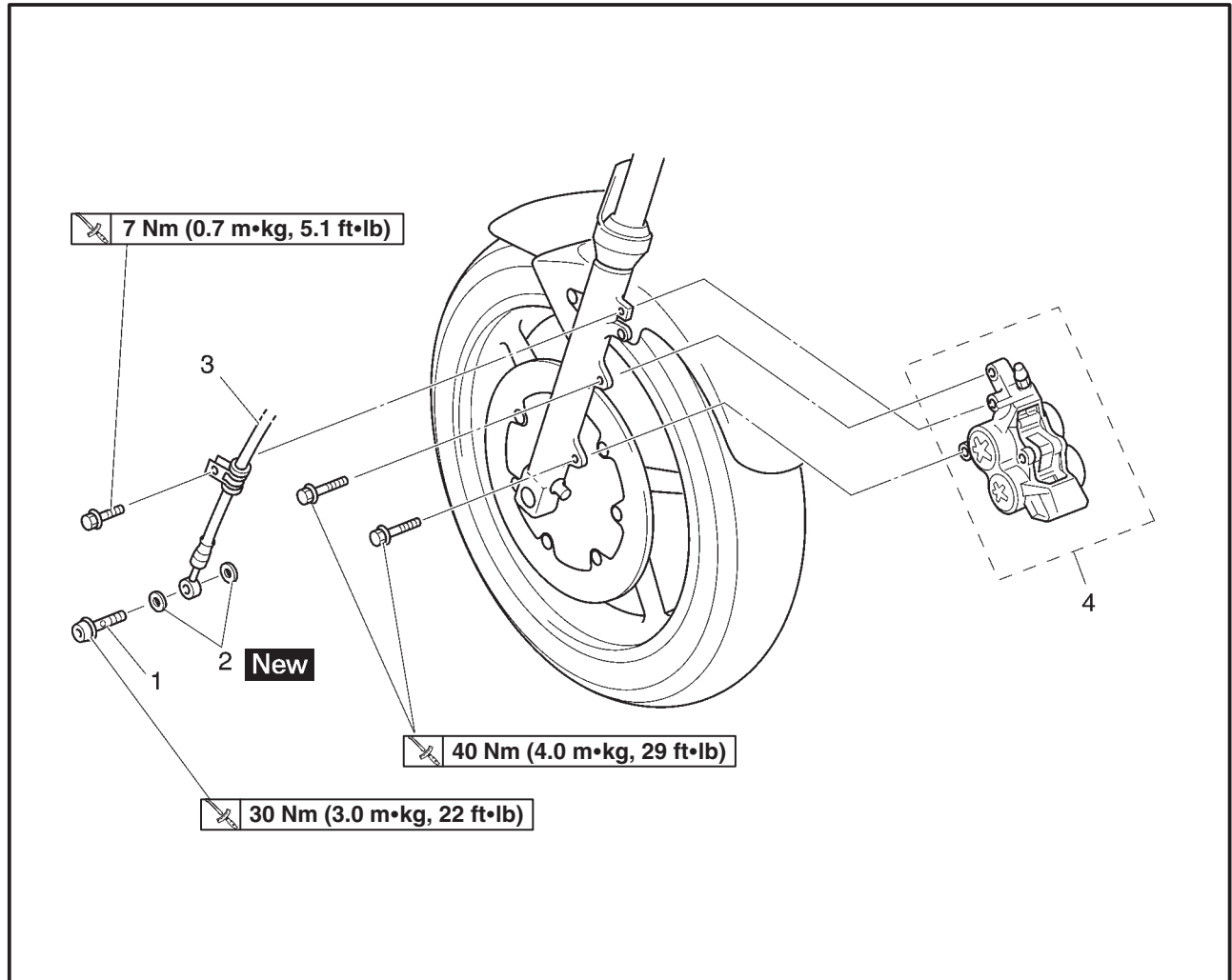
**Brake pedal position**

Brake pedal position (below the bottom of the footrest bracket)  
7 ~ 11 mm (0.28 ~ 0.43 in)

7. Adjust:
  - rear brake light operation timing  
Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” in chapter 3.

EAS00613

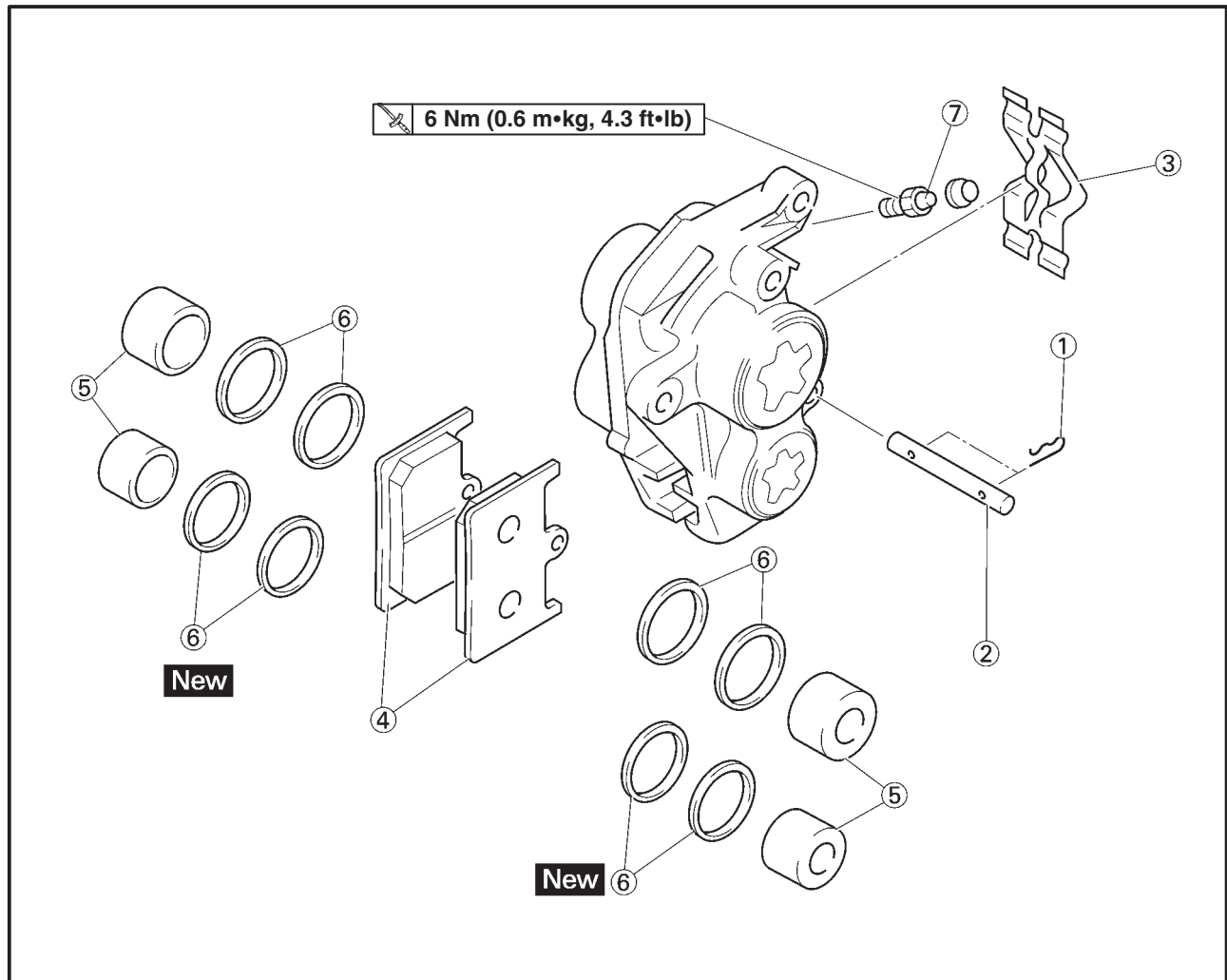
## FRONT BRAKE CALIPERS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the front brake calipers</b>		Remove the parts in the order listed. <b>NOTE:</b> _____ The following procedure applies to both of the front brake calipers.
1	Brake fluid	1	Drain.
2	Union bolt	2	
3	Copper washer	1	
4	Brake hose	1	
	Brake caliper		For installation, reverse the removal procedure.



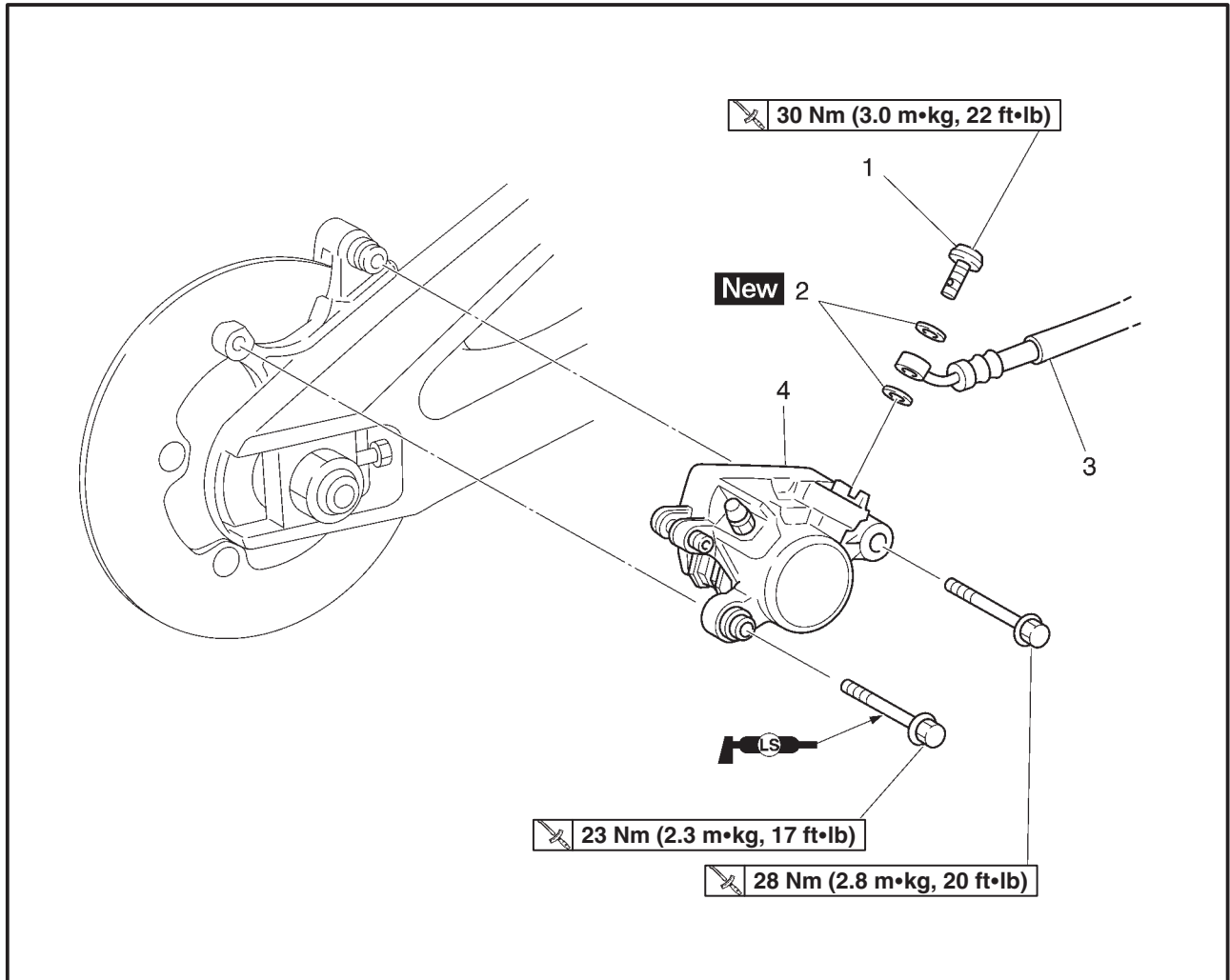
EAS00615



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the front brake calipers</b>		Disassemble the parts in the order listed. <b>NOTE:</b> _____ The following procedure applies to both of the front brake calipers.
①	Brake pad clip	2	
②	Brake pad pin	1	
③	Brake pad spring	1	
④	Brake pad	2	
⑤	Brake caliper piston	4	
⑥	Brake caliper piston seal	8	
⑦	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

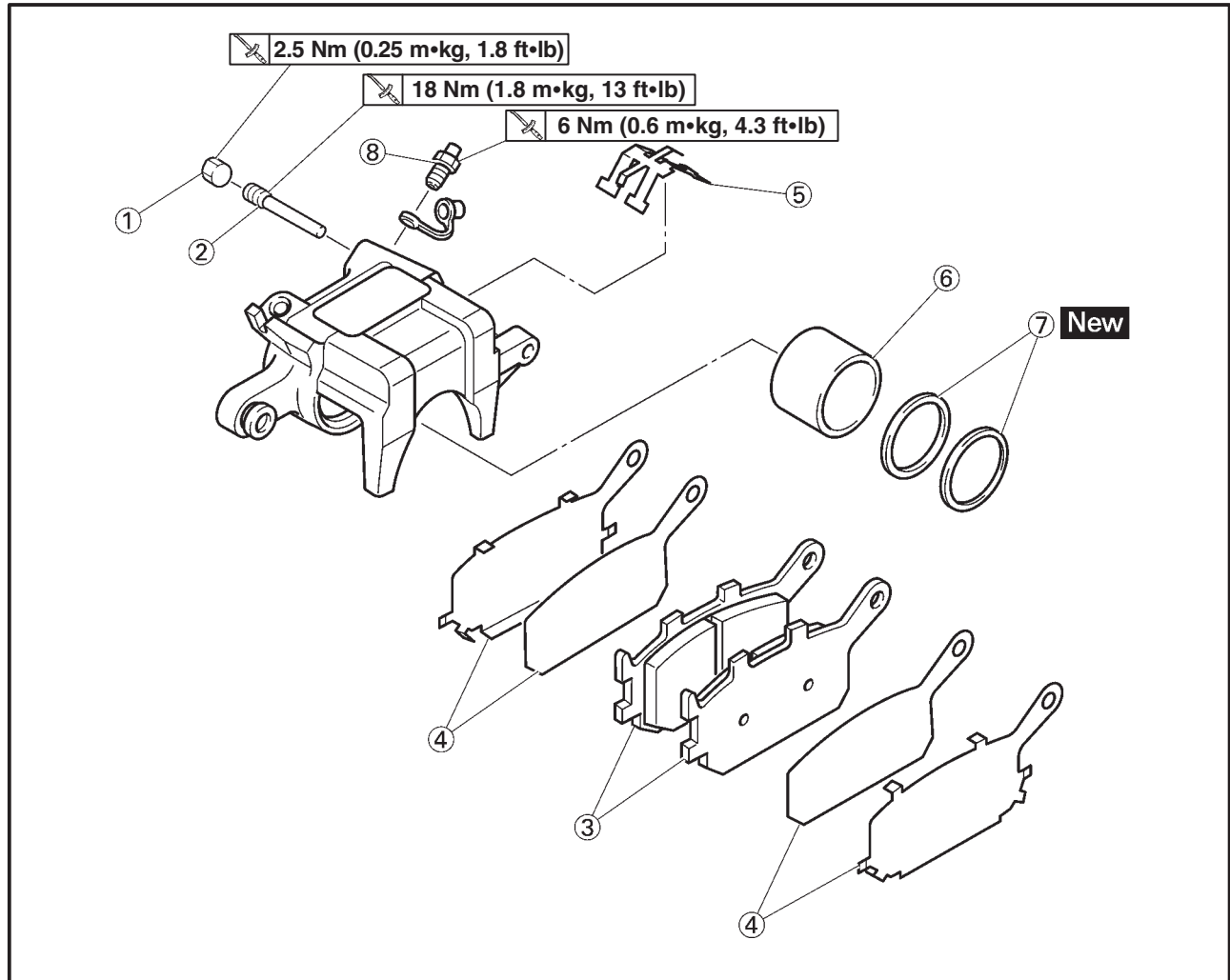
EAS00616

## REAR BRAKE CALIPER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear brake caliper</b>		
1	Brake fluid	1	Remove the parts in the order listed. Drain.
2	Union bolt	1	
3	Copper washer	2	
4	Brake hose	1	
	Brake caliper	1	For installation, reverse the removal procedure.

EAS00617



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the rear brake caliper</b>		Disassemble the parts in the order listed.
①	Screw plug	1	
②	Brake pad pin	1	
③	Brake pad	2	
④	Brake pad shim	4	
⑤	Brake pad spring	1	
⑥	Brake caliper piston	1	
⑦	Brake caliper piston seal	2	
⑧	Bleed screw	1	
			For assembly, reverse the disassembly procedure.



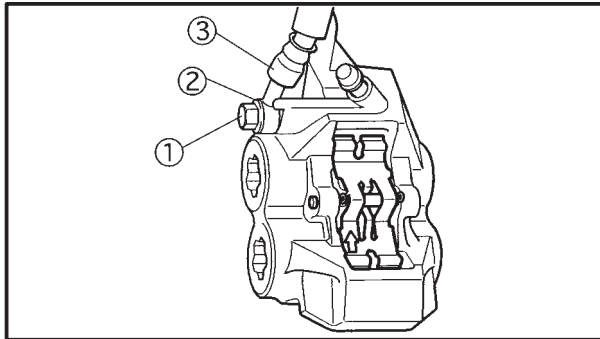
EAS00625

### DISASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

#### NOTE:

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

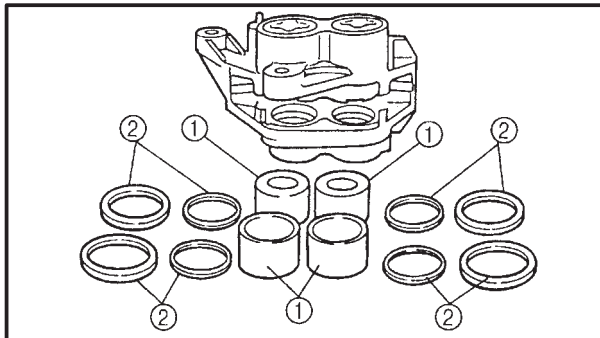


#### 1. Remove:

- union bolt ①
- copper washers ②
- brake hose ③

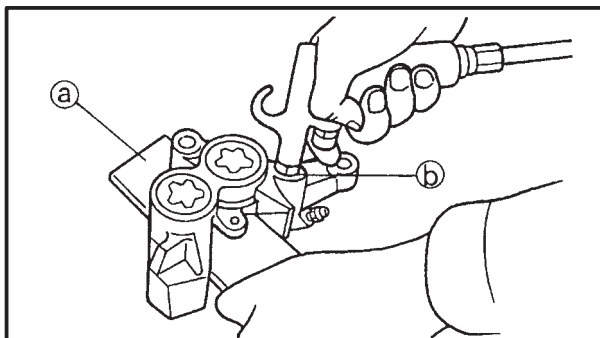
#### NOTE:

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



#### 2. Remove:

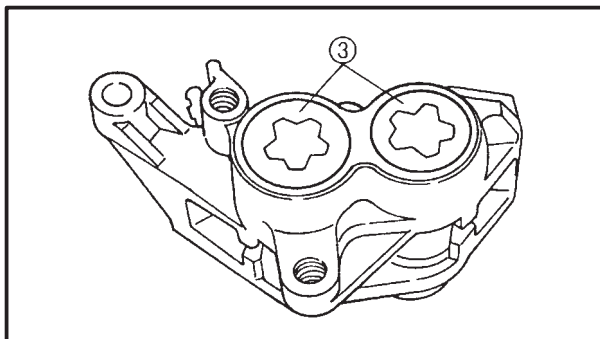
- brake caliper pistons ①
- brake caliper piston seals ②



- Secure the right side brake caliper pistons with a piece of wood (a).
- Blow compressed air into the brake hose joint opening (b) to force out the left side pistons from the brake caliper.

#### ⚠ WARNING

- Never try to pry out the brake caliper pistons.
- Do not loosen the bolts ③.



- Remove the brake caliper piston seals.
- Repeat the previous steps to force out the right side pistons from the brake caliper.

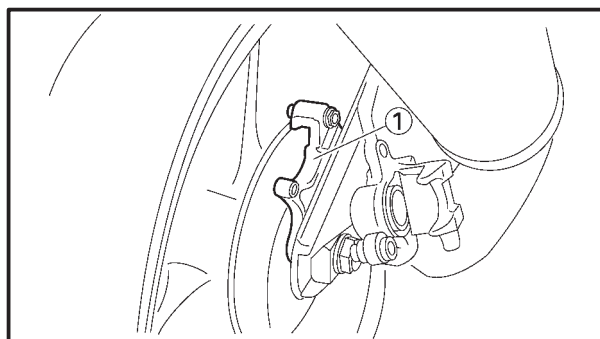
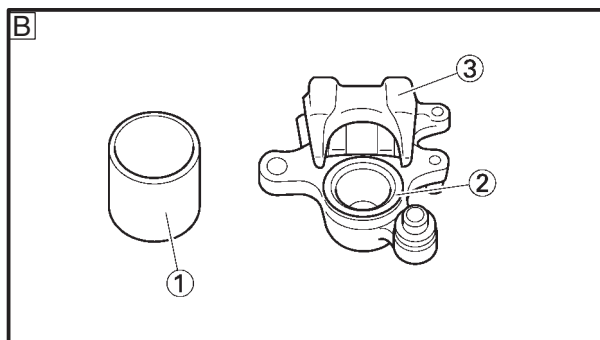
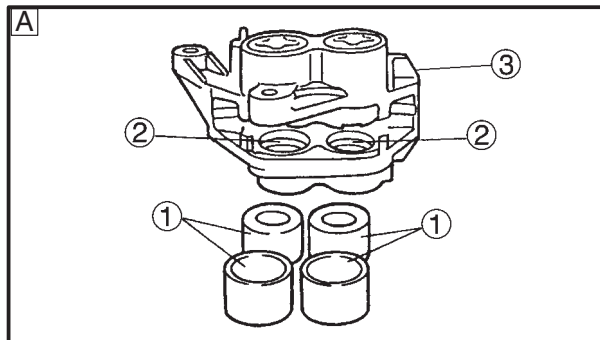




EAS00633

### 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



#### 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

#### 2. Check:

- rear brake caliper bracket ①  
Cracks/damage → Replace.



EAS00640

### ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

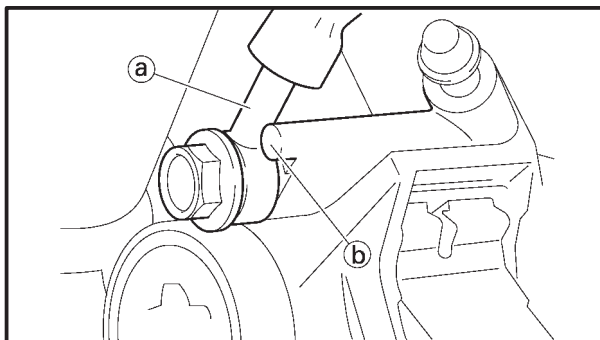
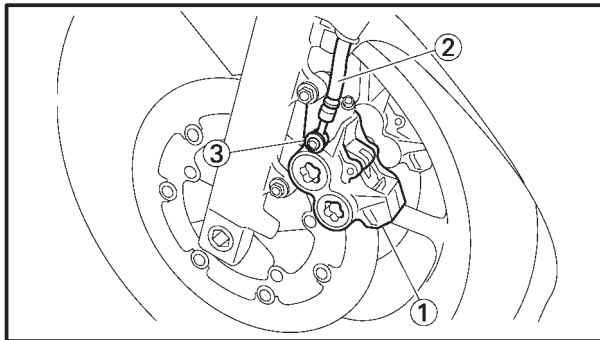
The following procedure applies to both of the brake calipers.

#### **⚠ 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 pads
  - brake pad spring
  - brake pad pin
2. Install:
  - brake caliper ①

**40 Nm (4.0 m•kg, 29 ft•lb)**

- copper washers **New**

- brake hose ②

• union bolt ③ **30 Nm (3.0 m•kg, 22 ft•lb)**

- brake hose holder

**7 Nm (0.7 m•kg, 5.1 ft•lb)**

Refer to “REPLACING THE BRAKE PADS”.

#### **⚠ WARNING**

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.

#### **CAUTION:**

When installing the brake hose onto the brake caliper, make sure the brake pipe ① touches the projection ② on the brake caliper.



### 3. Fill:

- brake fluid reservoir  
(with the specified amount of the recommended brake fluid)



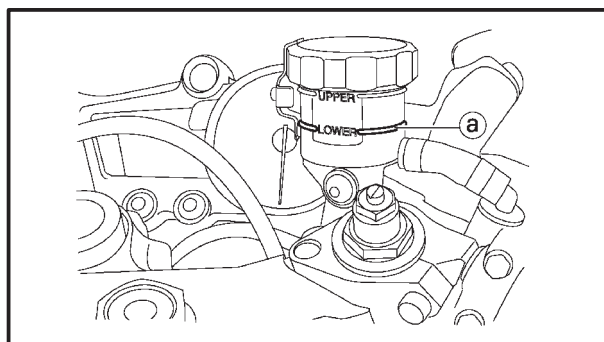
**Recommended brake fluid  
DOT 4**

### **⚠ 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 fluid 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.**



### 4. Bleed:

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

### 5. Check:

- brake fluid level  
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level. Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

### 6. Check:

- brake lever operation  
Soft or spongy feeling → Bleed the brake system.  
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.





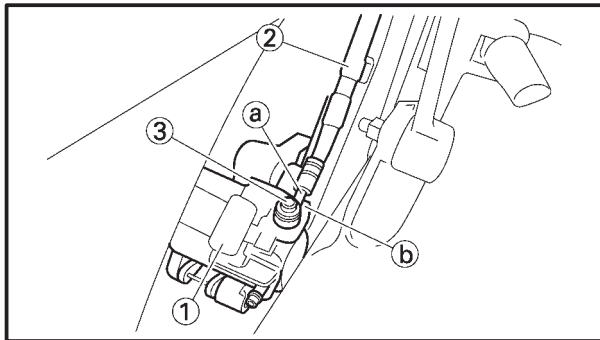
### ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

#### ⚠ 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 ①

(front)

⚠ 28 Nm (2.8 m•kg, 20 ft•lb)

(rear)

⚠ 23 Nm (2.3 m•kg, 17 ft•lb)

- brake pad pin
- screw plug
- copper washers **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 motorcycle operation. Refer to "CABLE ROUTING".

#### CAUTION:

When installing the brake hose onto the brake caliper, make sure that the brake pipe ① touches the projection ② on the brake caliper.

#### 2. Fill:

- brake fluid reservoir  
(with the specified amount of the recommended brake fluid)



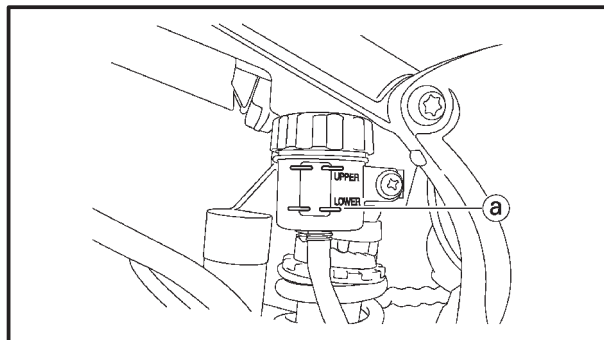
Recommended brake fluid  
DOT 4

**⚠ 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 fluid 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.



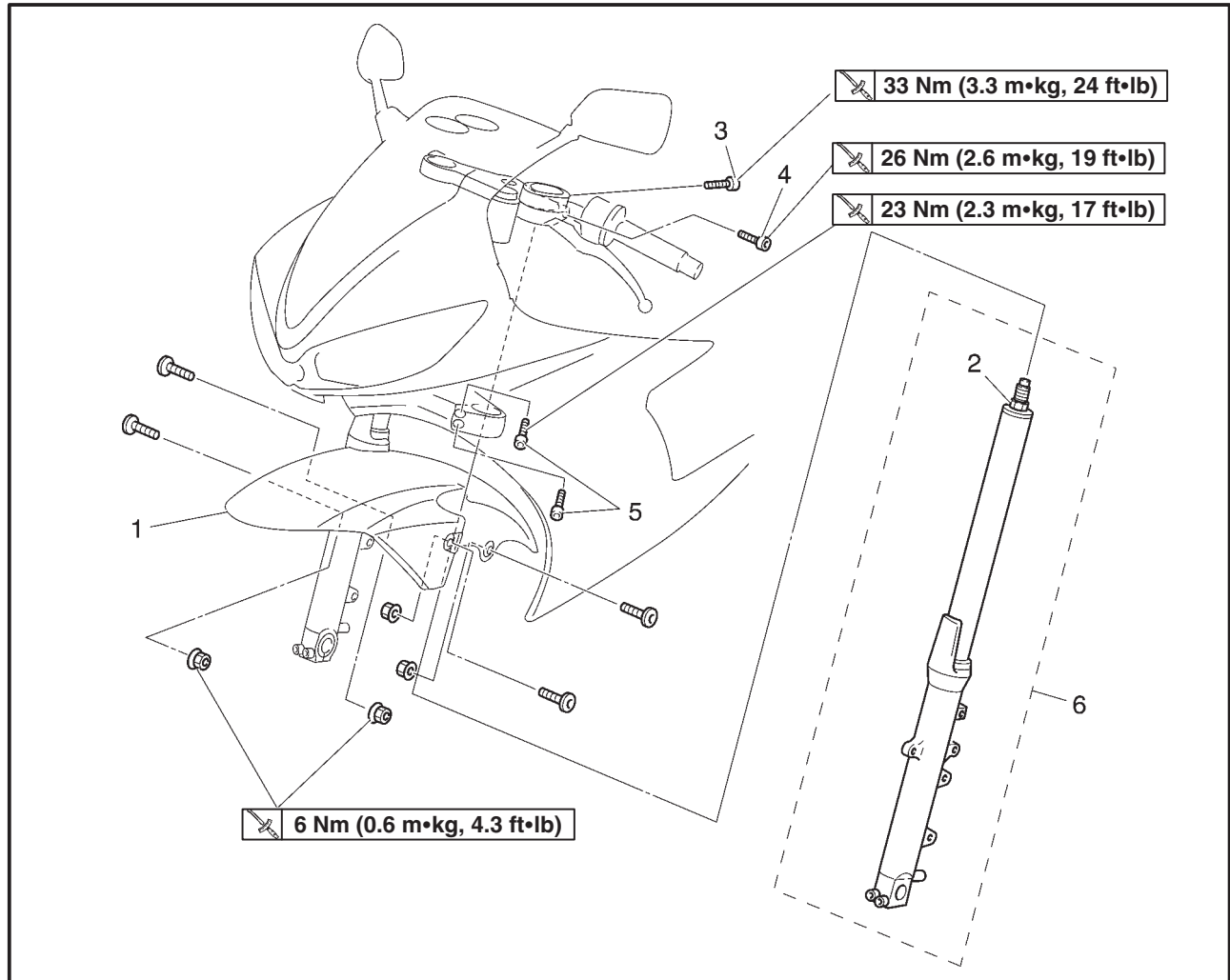
3. Bleed:
  - brake system  
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
4. Check:
  - brake fluid level  
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.  
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
5. Check:
  - brake pedal operation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



EAS00647

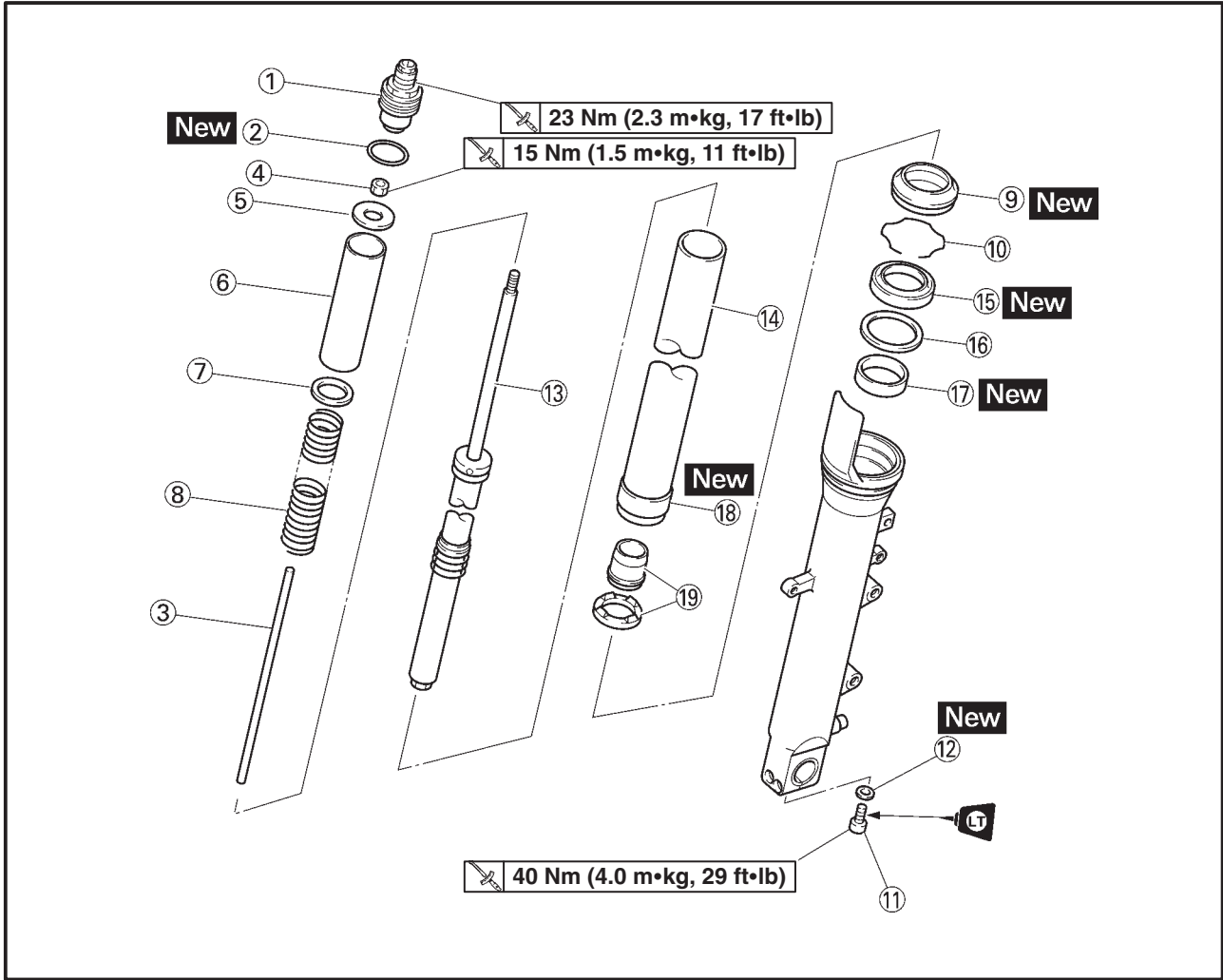
## FRONT FORK

### FRONT FORK LEGS

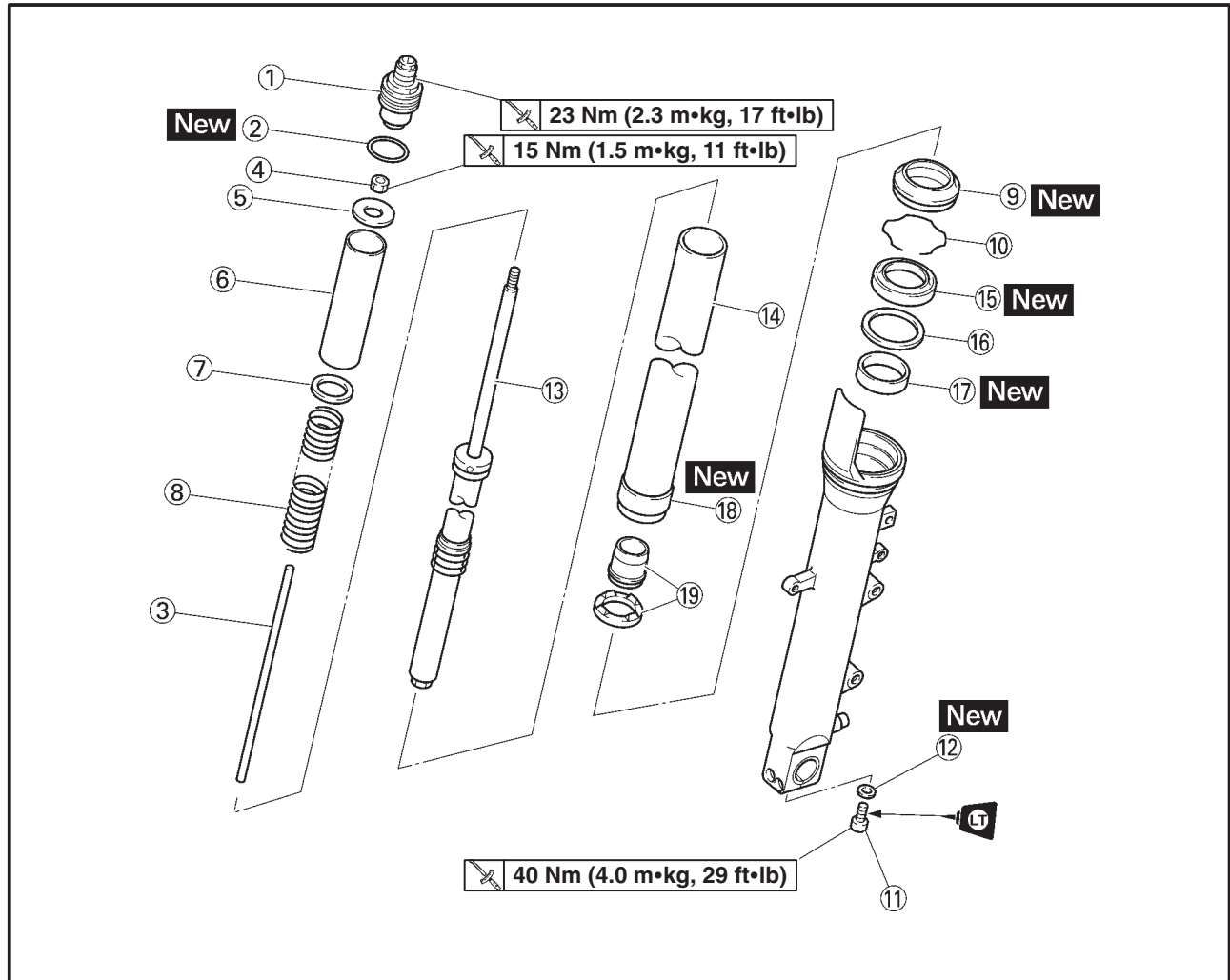


Order	Job/Part	Q'ty	Remarks
	<b>Removing the front fork legs</b>		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT AND REAR BRAKES".
	Front brake calipers		Refer to "COWLINGS" in chapter 3.
	Front cowling inner panels		
1	Front fender	1	
2	Cap bolt	1	Loosen.
3	Handlebar pinch bolt	1	Loosen.
4	Upper bracket pinch bolt	1	Loosen.
5	Under bracket pinch bolt	2	Loosen.
6	Front fork leg	1	For installation, reverse the removal procedure.

EAS00648



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the front fork legs</b>		Disassemble the parts in the order listed. <b>NOTE:</b> _____ The following the procedure applies to both of the front fork legs.
①	Cap bolt	1	
②	O-ring	1	
③	Damper adjusting rod	1	
④	Nut	1	
⑤	Washer	1	
⑥	Spacer	1	
⑦	Washer	1	
⑧	Fork spring	1	
⑨	Dust seal	1	
⑩	Oil seal clip	1	
⑪	Damper rod assembly bolt	1	
⑫	Copper washer	1	



Order	Job/Part	Q'ty	Remarks
⑬	Damper rod assembly	1	For assembly, reverse the disassembly procedure.
⑭	Inner tube	1	
⑮	Oil seal	1	
⑯	Washer	1	
⑰	Outer tube bushing	1	
⑱	Inner tube bushing	1	
⑲	Oil lock piece	1	



EAS00649

**REMOVING THE FRONT FORK LEGS**

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

1. Stand the motorcycle on a level surface.

**⚠ WARNING**

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

**NOTE:**

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

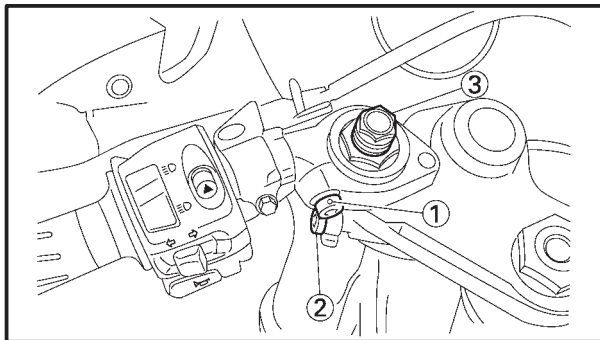
2. Remove

- front wheel
- front brake caliper

Refer to "FRONT WHEEL AND BRAKE DISCS".

3. Remove:

- front cowlings inner panels  
Refer to "COWLINGS" in chapter 3.
- handlebar

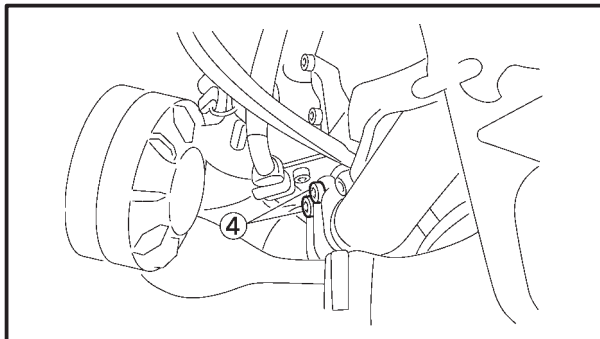


4. Loosen:

- handlebar pinch bolt ①
- upper bracket pinch bolt ②
- cap bolt ③
- under bracket pinch bolt ④

**⚠ WARNING**

**Before loosening the upper and under bracket pinch bolts, support the front fork leg.**



5. Remove:

- front fork leg

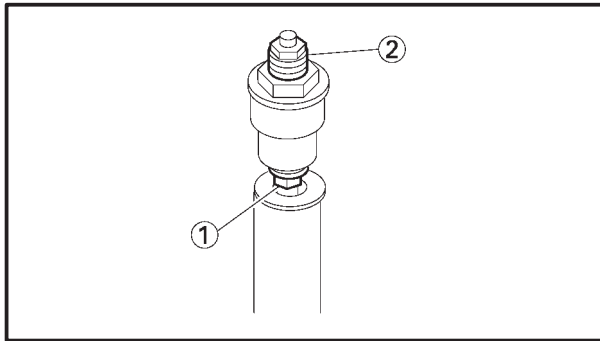


EAS00655

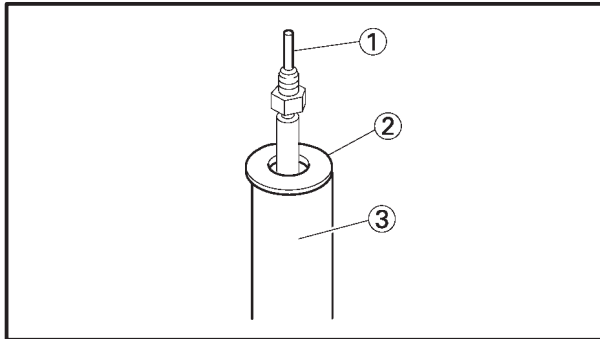
### DISASSEMBLING THE FRONT FORK LEGS

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

1. Loosen:
  - nut ①
2. Remove:
  - cap bolt ② (from the damper rod assembly)



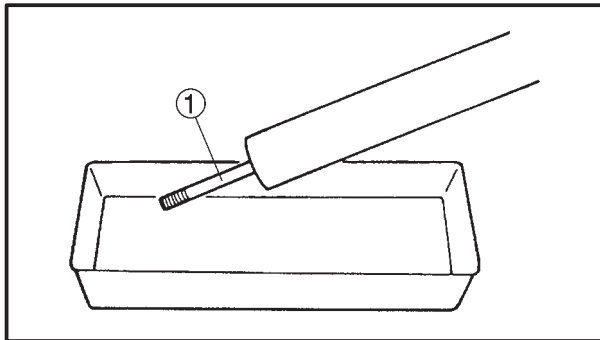
3. Remove:
  - damper adjusting rod ①
  - washer ②
  - spacer ③
  - fork spring



4. Drain:
  - fork oil

#### NOTE:

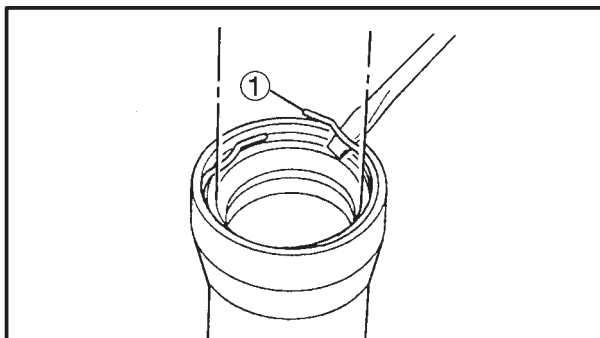
Stroke the damper rod ① several times while draining the fork oil.



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

#### CAUTION:

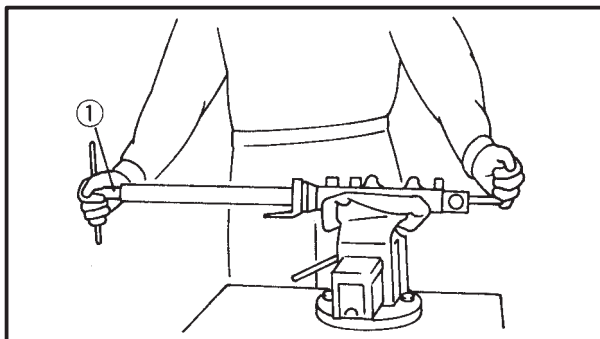
Do not scratch the inner tube.



6. Remove:
  - damper rod assembly bolt
  - copper washer

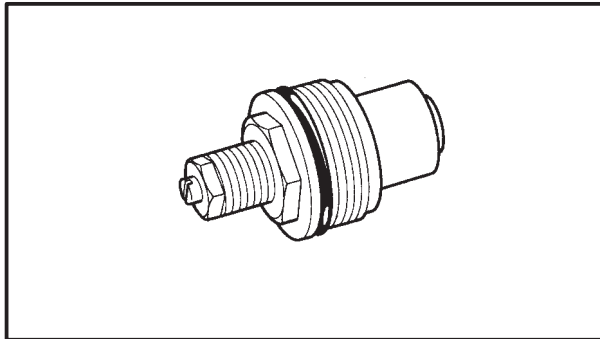
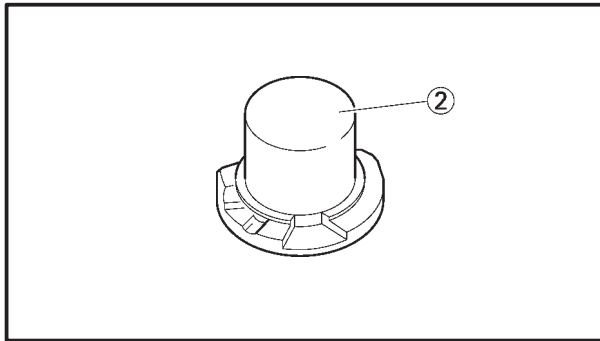
#### NOTE:

While holding the damper rod with the damper rod holder ①, loosen the damper rod assembly bolt.









### CAUTION:

- The front fork leg has a built-in damper adjusting rod and a very sophisticated internal construction, which are particularly sensitive to foreign material.
- When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.

#### 4. Check:

- cap bolt O-ring  
Damage/wear → Replace.

EAS00661

### ASSEMBLING THE FRONT FORK LEGS

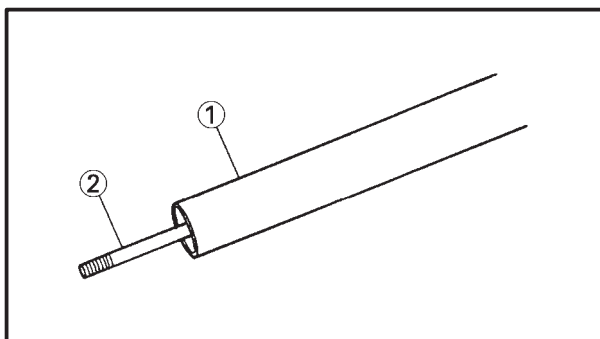
The following procedure applies to both of the front fork legs.

### ⚠ 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
- Before assembling the front fork leg, make sure all of the components are clean.



#### 1. Install:

- inner tube bushing
- oil lock piece
- inner tube ①
- damper rod assembly ②
- damper rod assembly bolt
- copper washer **New**

**⚠ WARNING**

Always use new copper washers.

**CAUTION:**

Allow the damper rod assembly to slide slowly down the inner tube ① 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**  
Suspension oil "01" or  
equivalent

## 3. Tighten:

- damper rod assembly bolt ①



**40 Nm (4.0 m•kg, 29 ft•lb)**

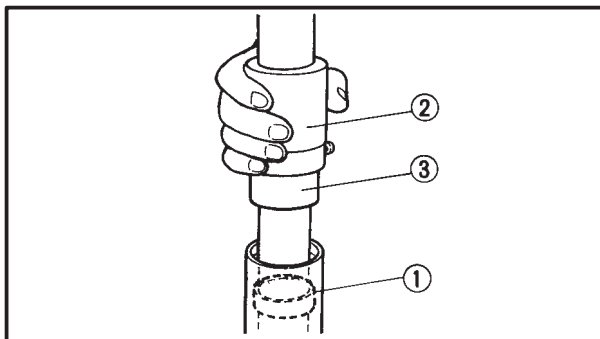
LOCTITE®

**NOTE:**

While holding the damper rod assembly with the damper rod holder ②, tighten the damper rod assembly bolt.



**Damper rod holder**  
90890-01473

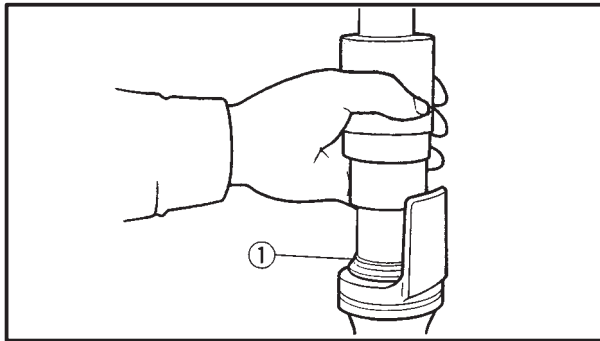


## 4. Install:

- outer tube bushing ①  
(with the fork seal driver weight ② and fork  
seal driver attachment ③)



**Fork seal driver weight**  
90890-01367, YM-33963  
**Fork seal driver attachment**  
90890-01374, YM-8020-A



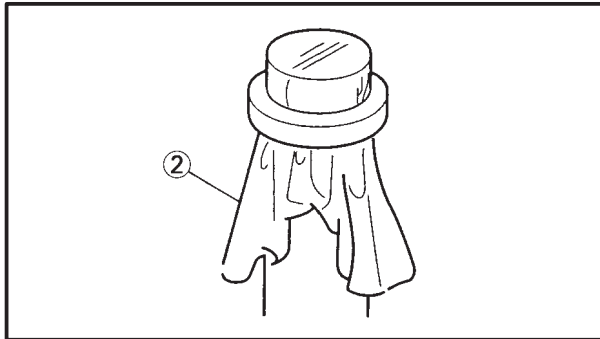
5. Install:

- washer
- oil seal ①

(with the fork seal driver weight and fork seal driver attachment)

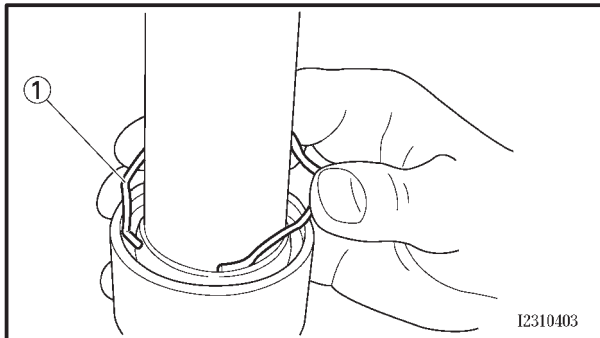
### CAUTION:

**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 ② to protect the oil seal during installation.

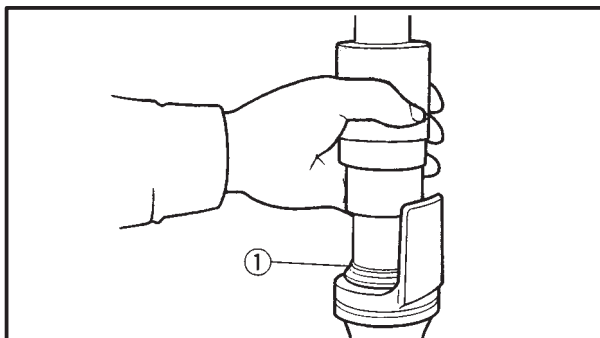


6. Install:

- oil seal clip ①

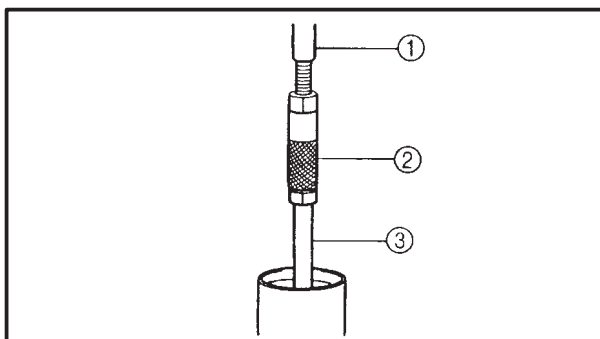
NOTE:

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)



8. Install:

- rod puller ①
  - adapter ②
- (onto the damper rod ③)



**Rod puller**  
90890-01437, YM-01437  
**Rod puller attachment**  
90890-01436



9. Fully compress the front fork leg.

10. Fill:

- front fork leg

(with the specified amount of the recommended fork oil)



**Quantity (each front fork leg)**

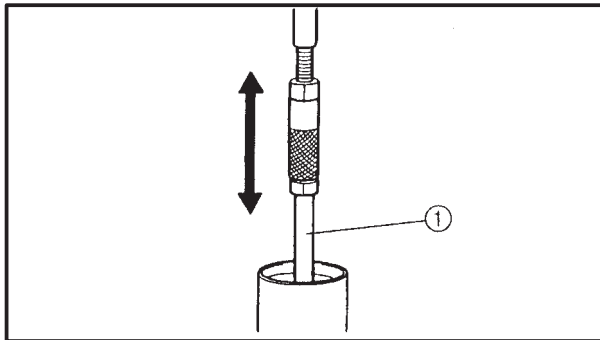
**0.49 L (0.43 Imp qt, 0.52 US qt)**

**Recommended oil**

**Suspension oil "01"**

### CAUTION:

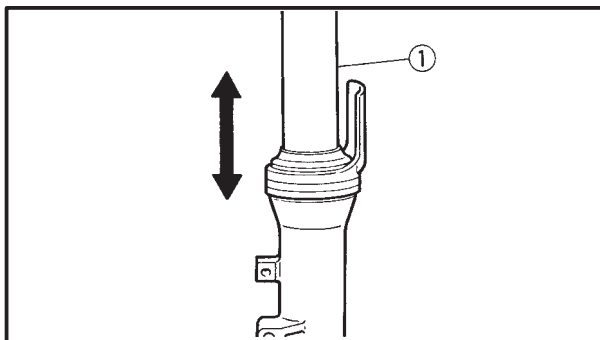
- **Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**



11. After filling the front fork leg, slowly stroke the damper rod ① up and down (at least ten times) to distribute the fork oil.

### NOTE:

Be sure to stroke the damper rod slowly because the fork oil may spurt out.



12. Slowly stroke the inner tube ① up and down to distribute the fork oil once more (1 stroke = about 100 mm (3.94 in)).

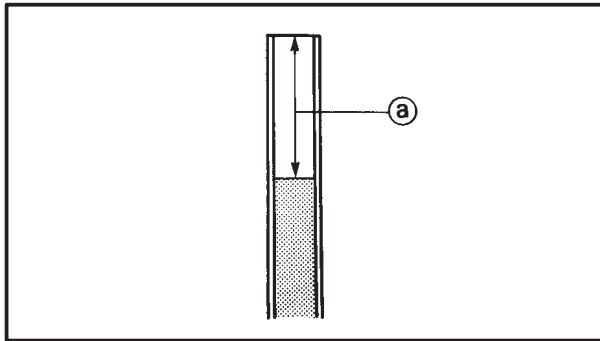
### NOTE:

Be careful not to stroke the inner tube over 100 mm (3.94 in) as this will cause air to enter. If the inner tube is stroked more than 100 mm (3.94 in), repeat steps (12) and (13).

13. Before measuring the fork oil level, wait ten minutes until the oil has settled and the air bubbles have dispersed.

### NOTE:

Be sure to bleed the front fork leg of any residual air.



### 14. Measure:

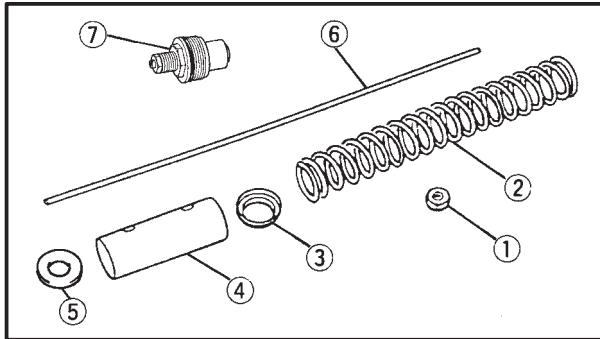
- front fork leg oil level ①

Out of specification → Correct.



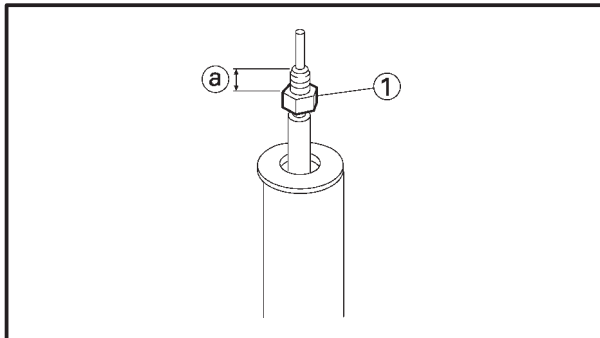
**Front fork leg oil level (from the top of the inner tube, with the inner tube fully compressed, and without the spring)**

**106 mm (4.17 in)**



### 15. Install:

- nut ①
- fork spring ②
- washer ③
- spacer ④
- washer ⑤
- damper adjusting rod ⑥
- cap bolt ⑦



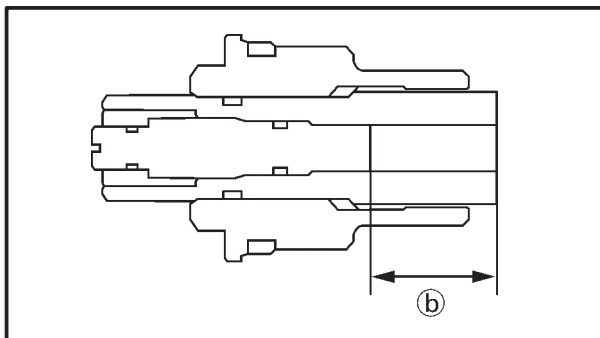
a. Remove the rod puller and rod puller attachment.

b. Install the damper adjusting rod locknut ① and position it as specified ①.



**Damper adjusting rod nut position (from the top of the rod to the top of the nut) ①**

**11 mm (0.43 in)**

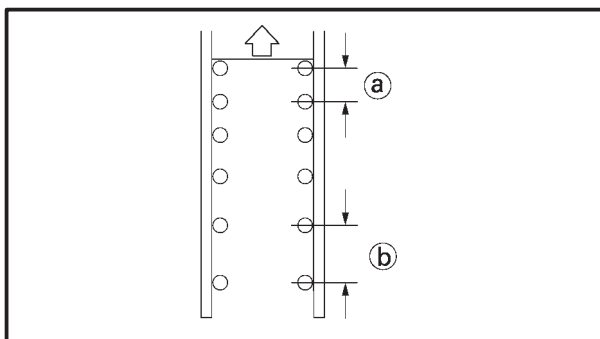


c. Set the cap bolt distance ② to specification.



**Distance ②**

**25 mm (0.98 in)**



d. Install the damper adjusting rod, fork spring, washer (lower), spacer and washer (upper).

### NOTE:

Install the fork spring with the smaller pinch ① facing up.

② Larger pitch



e. Install the cap bolt and finger tighten it.

## ⚠ WARNING

- Before installing the cap bolt, apply grease onto the O-ring.
- Always use a new cap bolt O-ring.

f. Hold the cap bolt and tighten the nut to specification.



**Nut**

**15 Nm (1.5 m•kg, 11 ft•lb)**



EAS00662

## INSTALLING THE FRONT FORK LEGS

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

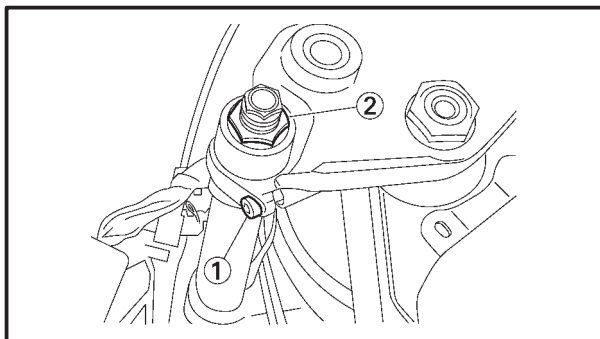
1. Install:
  - handlebar (temporarily)
2. Install:
  - front fork leg

Temporarily tighten the upper and under bracket pinch bolts.

## NOTE:

Make sure the inner fork tube is flush with the top of the handlebar.

3. Remove:
  - handlebar



4. Tighten:

- under bracket pinch bolt

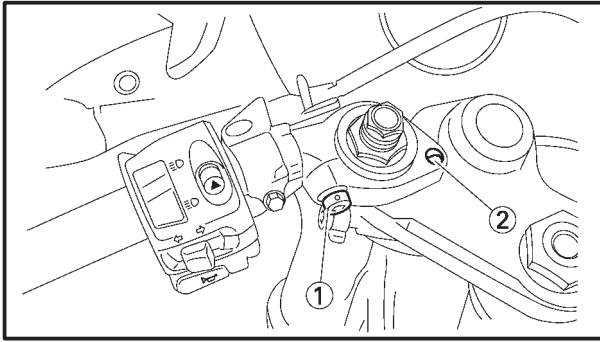
**23 Nm (2.3 m•kg, 17 ft•lb)**

- upper bracket pinch bolt ①

**26 Nm (2.6 m•kg, 19 ft•lb)**

- cap bolt ②

**23 Nm (2.3 m•kg, 17 ft•lb)**



## 5. Install:

- handlebar
- handlebar pinch bolt ①

33 Nm (3.3 m•kg, 24 ft•lb)

- handlebar bolt ②

13 Nm (1.3 m•kg, 9.4 ft•lb)

**⚠ WARNING**

**Make sure the brake hoses are routed properly.**

## 6. Adjust:

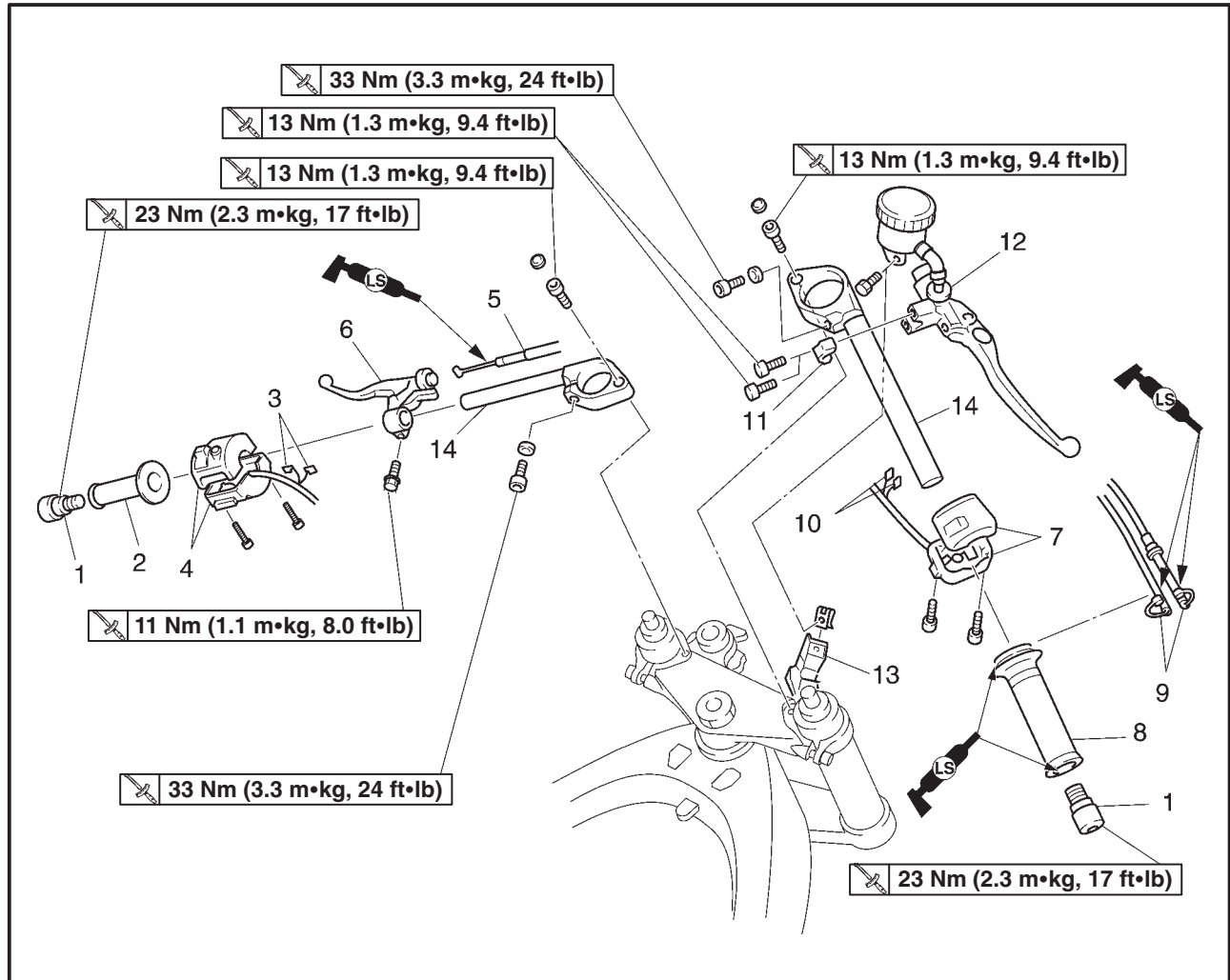
- spring preload
- rebound damping
- compression damping

Refer to “ADJUSTING THE FRONT FORK LEGS” in chapter 3.



EAS00665

## HANDLEBARS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the handlebars</b>		
1	Grip end	2	Remove the parts in the order listed.
2	Handlebar grip	1	
3	Clutch switch connector	1	Disconnect.
4	Left handlebar switch	1	
5	Clutch cable	1	
6	Clutch lever	1	
7	Right handlebar switch	1	
8	Throttle grip	1	
9	Throttle cables	2	
10	Front brake light switch connector	2	Disconnect.
11	Front brake master cylinder holder	1	
12	Front brake master cylinder	1	
13	Reservoir tank bracket	1	
14	Handlebar	2	For installation, reverse the removal procedure.





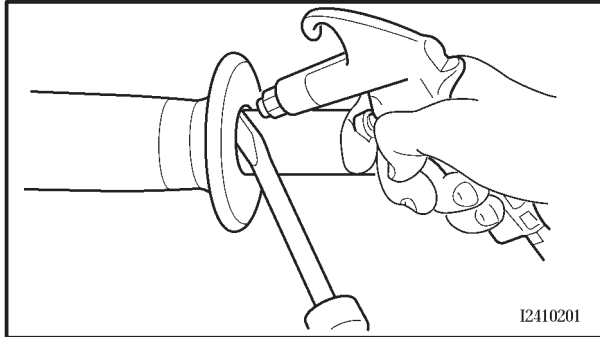
EAS00667

**REMOVING THE HANDLEBARS**

1. Stand the motorcycle on a level surface.

**⚠ WARNING**

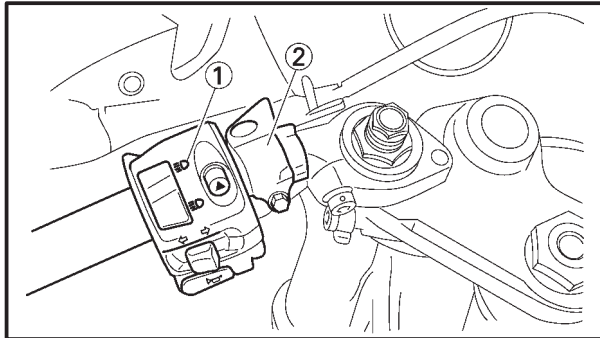
Securely support the motorcycle so that there is no danger of it falling over.



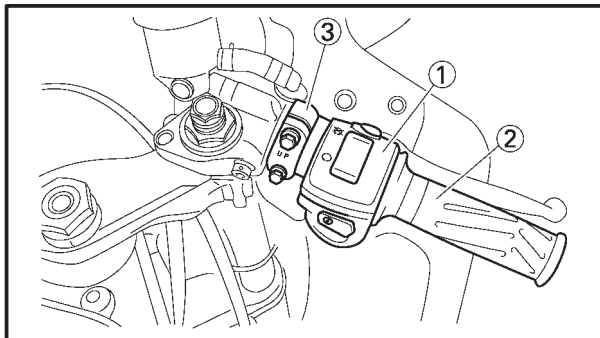
2. Remove:
  - grip end
  - handlebar grip

**NOTE:**

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



3. Remove:
  - left handlebar switch ①
  - clutch lever holder ②



4. Remove:
  - grip end
  - right handlebar switch ①
  - throttle grip ②
  - front brake master cylinder ③

EAS00669

**CHECKING THE HANDLEBARS**

1. Check:
  - left handlebar
  - right handlebar

Bends/cracks/damage → Replace.

**⚠ WARNING**

Do not attempt to straighten bent handlebars as this may dangerously weaken them.



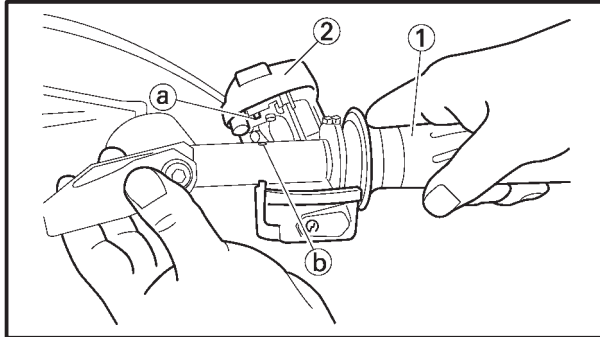
EAS00674

**INSTALLING THE HANDLEBARS**

1. Stand the motorcycle on a level surface.

**⚠ WARNING**

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

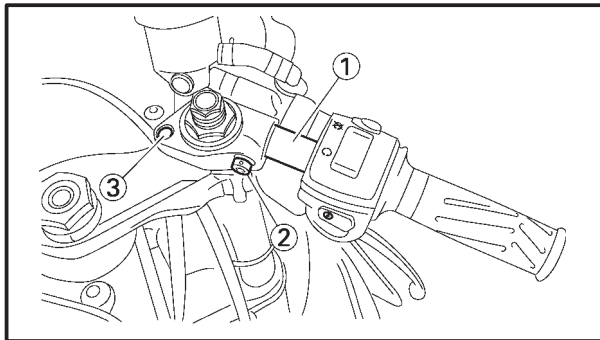


2. Install:

- throttle cables
- throttle grip ①
- right handlebar switch ②

**NOTE:**

Align the projection (a) on the right handlebar switch with the hole (b) in the right handlebar.



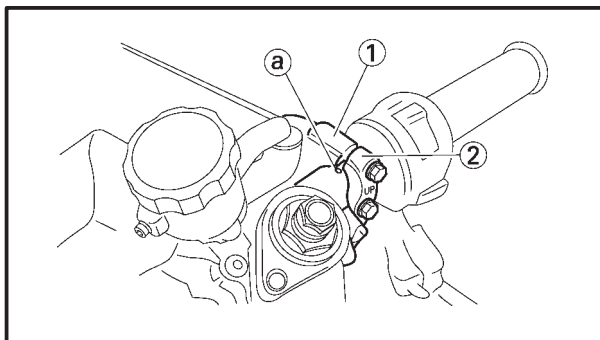
3. Install:

- right handlebar ①
- right handlebar pinch bolt ②

**33 Nm (3.3 m•kg, 24 ft•lb)**

- right handlebar bolt ③

**13 Nm (1.3 m•kg, 9.4 ft•lb)**



4. Install:

- front brake master cylinder ①
- master cylinder holder ②

**13 Nm (1.3 m•kg, 9.4 ft•lb)**

**CAUTION:**

- **Install the brake master cylinder holder with the “UP” mark facing up.**
- **First, tighten the upper bolt, and then the lower bolt.**

**NOTE:**

- Align the mating surfaces of the brake master cylinder holder with the punch mark (a) on the right handlebar.
- There should be 8.2 mm (0.32 in) of clearance between the right handlebar switch and the brake master cylinder holder.





## 10. Adjust:

- clutch cable free play

Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” in chapter 3.



**Clutch cable free play  
(at the end of the clutch lever)**  
10 ~ 15 mm (0.39 ~ 0.59 in)

## 11. Adjust:

- throttle cable free play

Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in chapter 3.

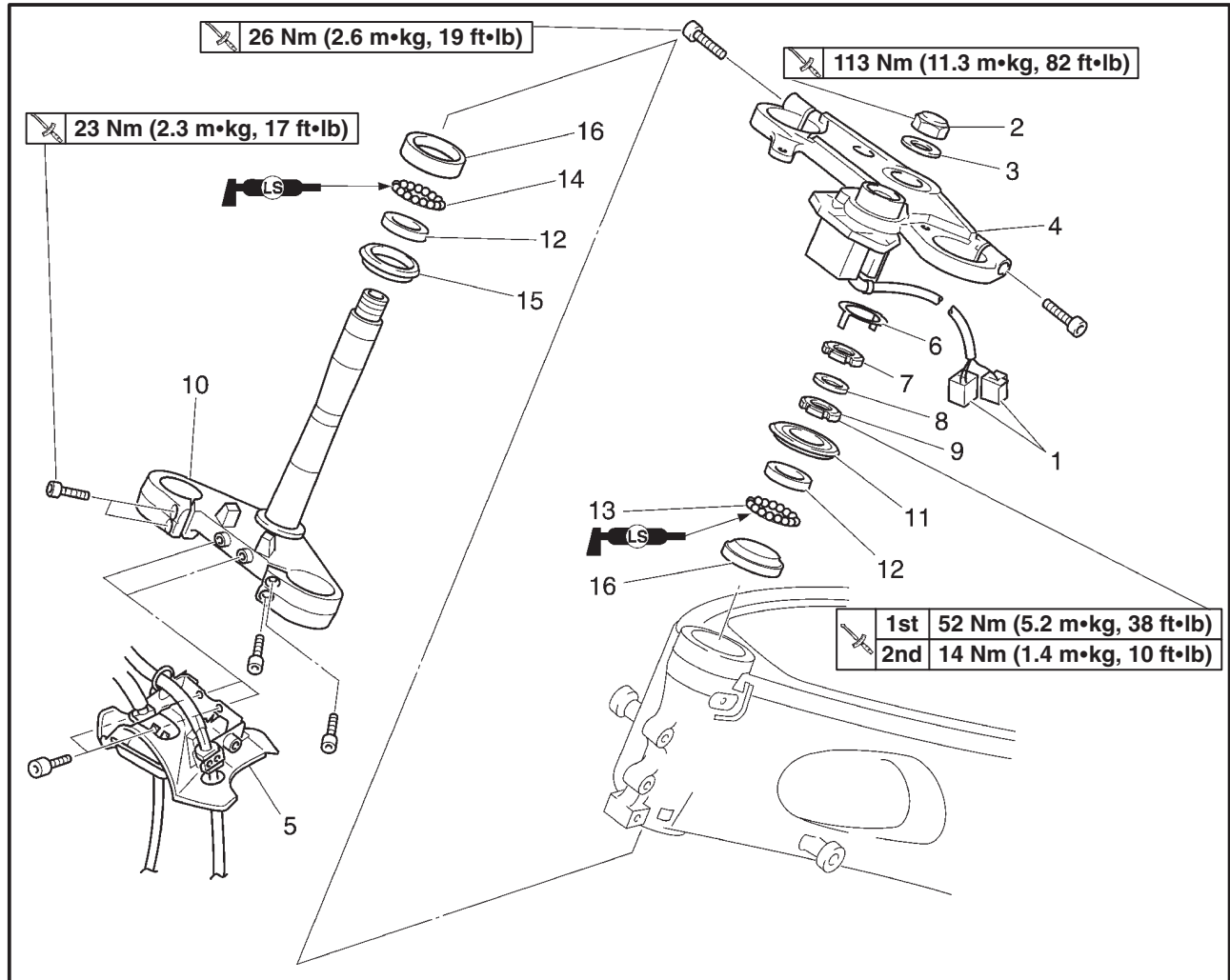


**Throttle cable free play  
(at the flange of the throttle grip)**  
6 ~ 8 mm (0.24 ~ 0.31 in)

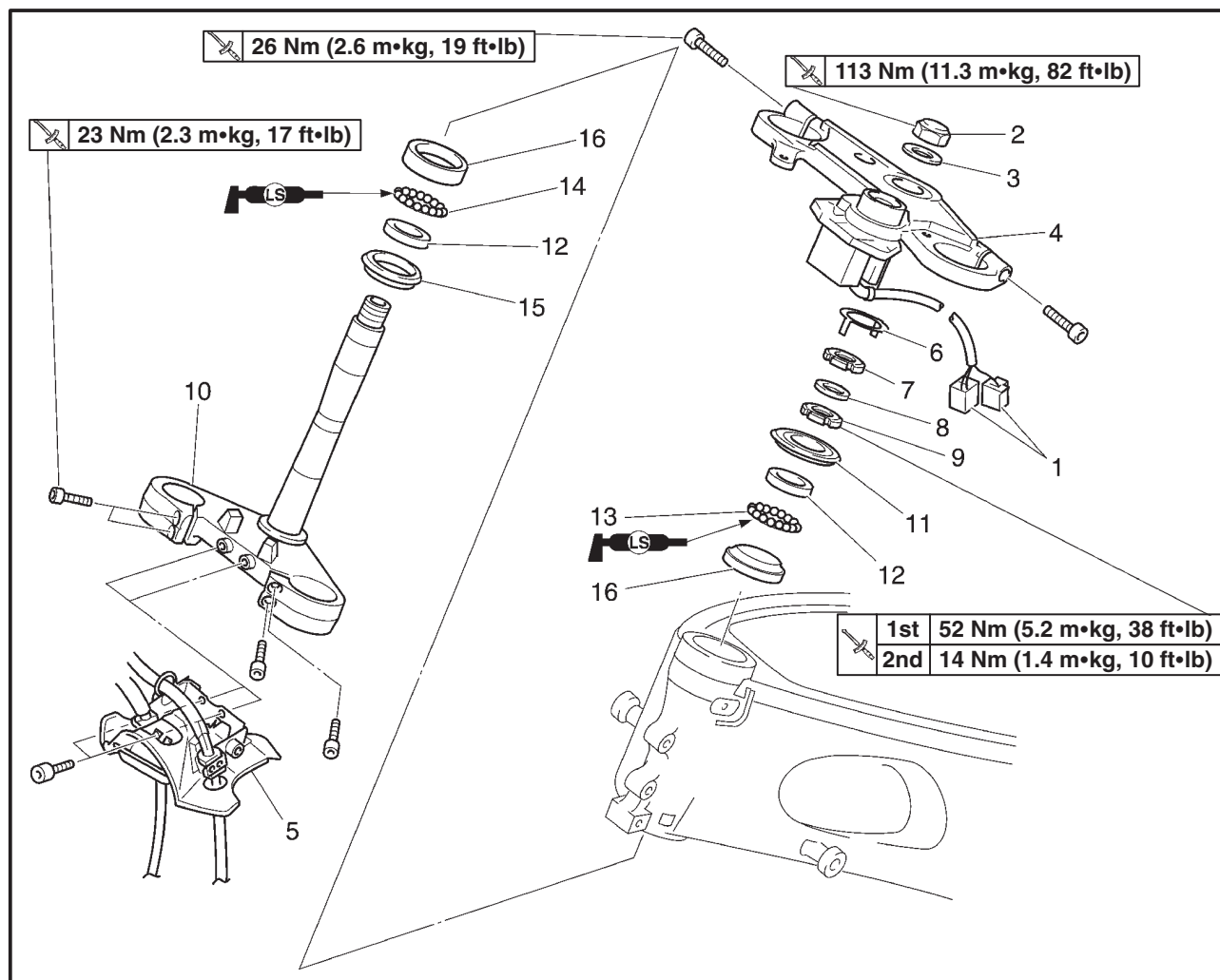


EAS00676

## STEERING HEAD UNDER BRACKET



Order	Job/Part	Q'ty	Remarks
	<b>Removing the under bracket</b>		
	Front wheel		Remove the parts in the order listed.
	Front brake calipers		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front fork legs		Refer to "FRONT FORK".
	Front fender		
	Handlebars		Refer to "HANDLEBARS".
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
1	Main switch coupler	2	Disconnect
2	Steering stem nut	1	
3	Washer	1	
4	Upper bracket	1	
5	Under bracket panel	1	
6	Lock washer	1	
7	Upper ring nut	1	



Order	Job/Part	Q'ty	Remarks
8	Rubber washer	1	
9	Lower ring nut	1	
10	Under bracket	1	
11	Bearing cover	1	
12	Bearing inner race	2	
13	Upper bearing	1	
14	Lower bearing	1	
15	Dust seal	1	
16	Bearing outer race	2	
			For installation, reverse the removal procedure.



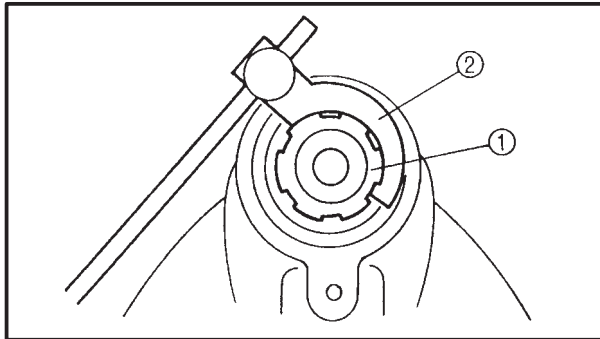
EAS00679

**REMOVING THE UNDER BRACKET**

1. Stand the motorcycle on a level surface.

**⚠ WARNING**

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



2. Remove:

- steering stem nut
  - washer
  - upper bracket
  - lock washer
  - rubber washer
  - ring nut ①
- (with the steering nut wrench ②)

**NOTE:**

Hold the lower ring nut with the exhaust and steering nut wrench, and then remove the upper ring nut with the ring nut wrench.



**Steering nut wrench**  
90890-01403, YU-33975

**⚠ WARNING**

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

EAS00681

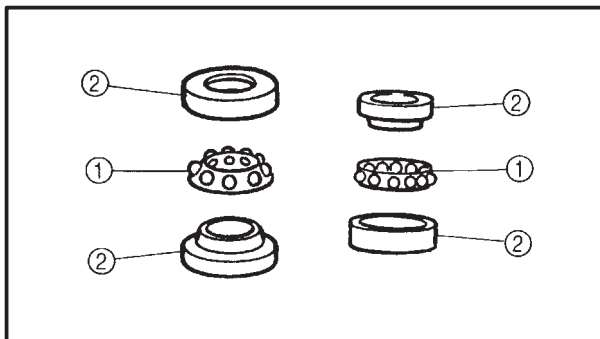
**CHECKING THE STEERING HEAD**

1. Wash:

- bearings
- bearing races



**Recommended cleaning solvent**  
**Kerosene**



2. Check:

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








---

**3. Install:**

- upper bracket
- washer
- steering stem nut

 **113 Nm (11.3 m•kg, 82 ft•lb)**

**NOTE:** 

---

Temporarily tighten the steering stem nut.

---

**4. Install:**

- front fork legs

Refer to “INSTALLING THE FRONT FORK LEGS”.

**NOTE:** 

---

Temporarily tighten the upper and under bracket pinch bolts.

---

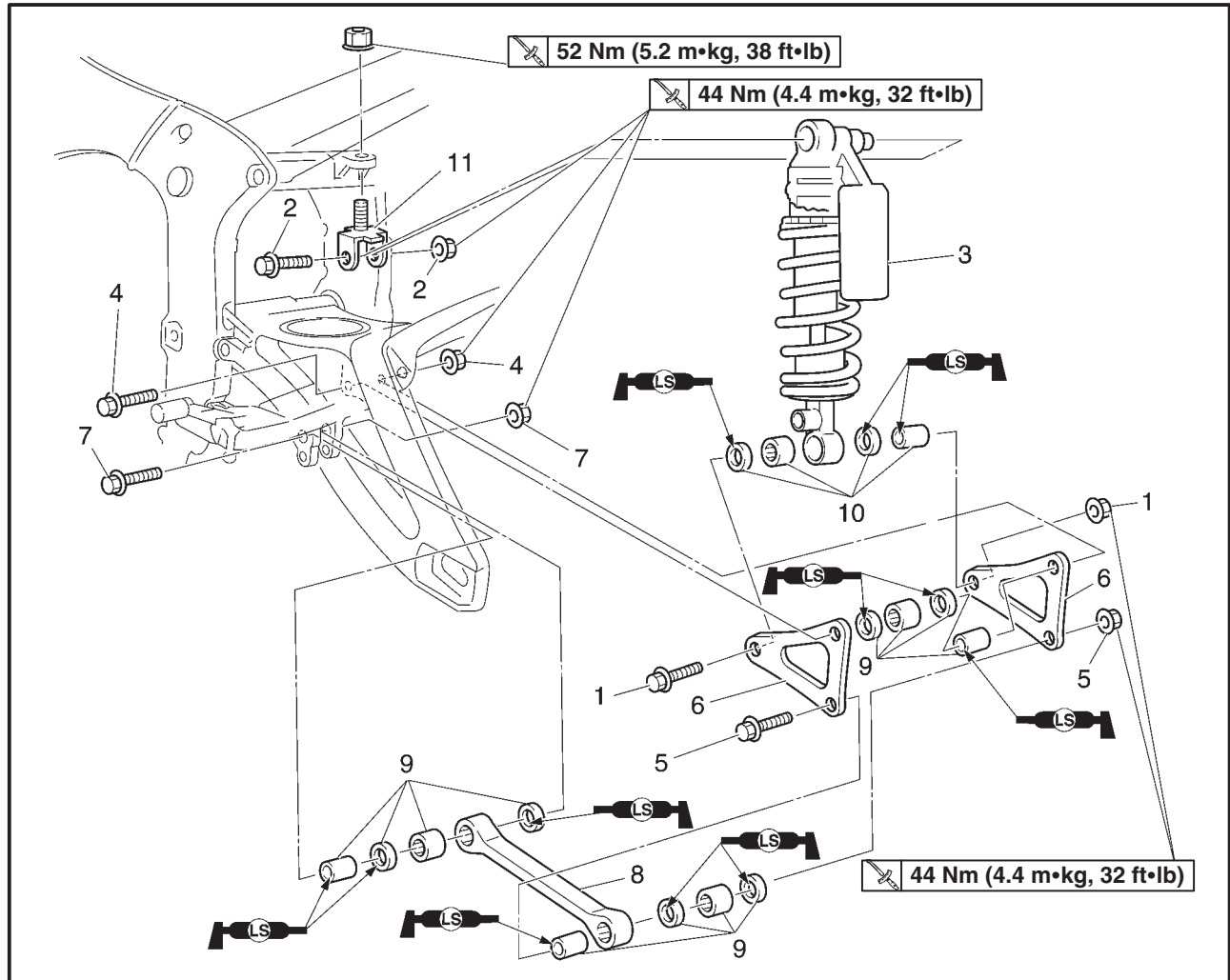
**5. Install:**

- front wheel

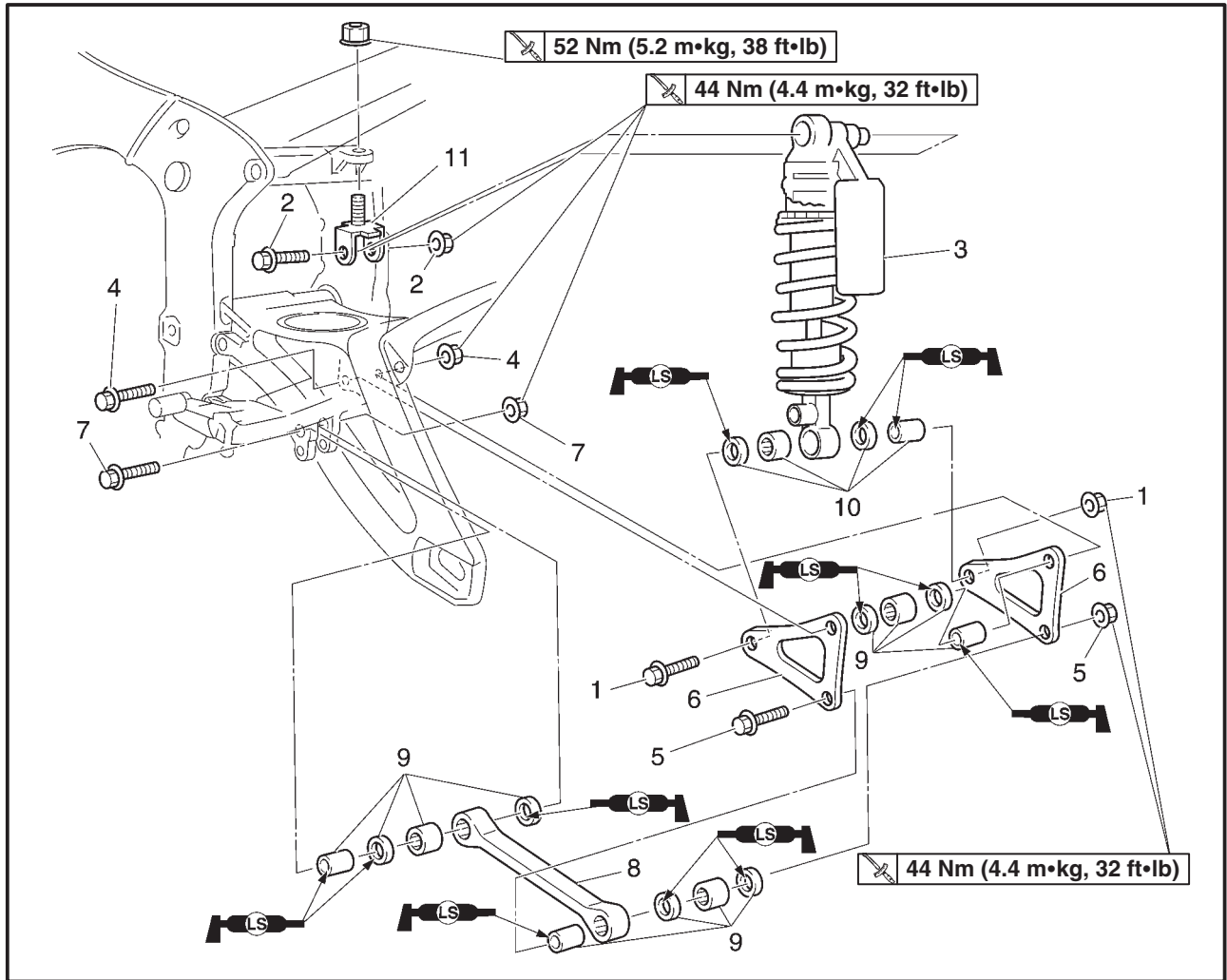
Refer to “FRONT WHEEL AND BRAKE DISCS”.

EAS00685

## REAR SHOCK ABSORBER ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear shock absorber assembly</b>		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL AND BRAKE DISC".
1	Self-locking nut/bolt (Relay arm – rear shock absorber)	1/1	
2	Self-locking nut/bolt (Rear shock absorber upper)	1/1	
3	Rear shock absorber	1	
4	Self-locking nut/bolt (Relay arm – swingarm)	1/1	
5	Self-locking nut/bolt (Relay arm – connecting rod)	1/1	
6	Relay arm	2	
7	Self-locking nut/nut (Connecting rod – frame)	1/1	
8	Connecting rod	1	



Order	Job/Part	Q'ty	Remarks
9	Oil seal/bearing/collar	6/3/3	For installation, reverse the removal procedure.
10	Oil seal/bearing/collar	2/1/1	
11	Bracket	1	



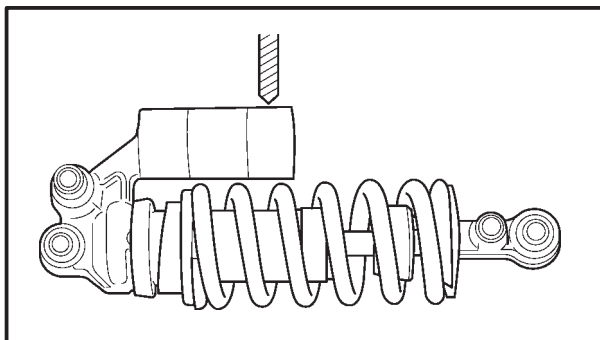
EAS00687

## HANDLING THE REAR SHOCK ABSORBER AND GAS CYLINDER

### **⚠ WARNING**

This rear shock absorber and gas cylinder contain highly compressed nitrogen gas. Before handling the rear shock absorber or gas cylinder, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber and gas cylinder.

- Do not tamper or attempt to open the rear shock absorber or gas cylinder.
- Do not subject the rear shock absorber or gas cylinder to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.
- Do not deform or damage the rear shock absorber or gas cylinder in any way. If the rear shock absorber, gas cylinder or both are damaged, damping performance will suffer.



EAS00689

## DISPOSING OF A REAR SHOCK ABSORBER AND GAS CYLINDER

Gas pressure must be released before disposing of a rear shock absorber and gas cylinder. To release the gas pressure, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the gas cylinder at a point 15 ~ 20 mm (0.59 ~ 0.79 in) from its end as shown.

### **⚠ WARNING**

Wear eye protection to prevent eye damage from released gas or metal chips.



EAS00694

## REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the motorcycle on a level surface.

### **⚠ WARNING**

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

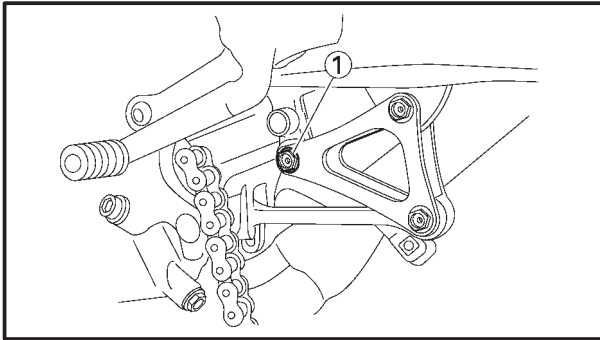
### **NOTE:**

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

2. Remove:

- rear wheel

Refer to "REAR WHEEL AND BRAKE DISC".

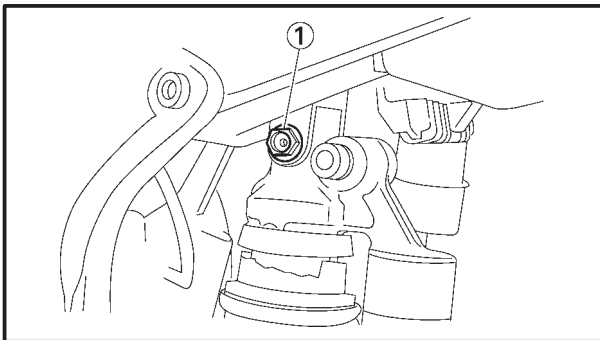


3. Remove:

- rear shock absorber assembly lower bolt ①

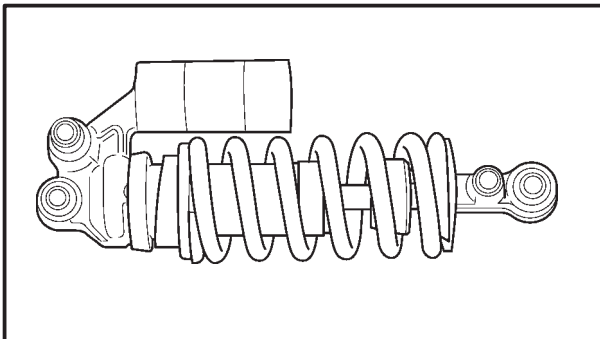
### **NOTE:**

While removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



4. Remove:

- rear shock absorber assembly upper bolt ①
- rear shock absorber assembly



EAS00696

## CHECKING THE REAR SHOCK ABSORBER ASSEMBLY AND GAS CYLINDER

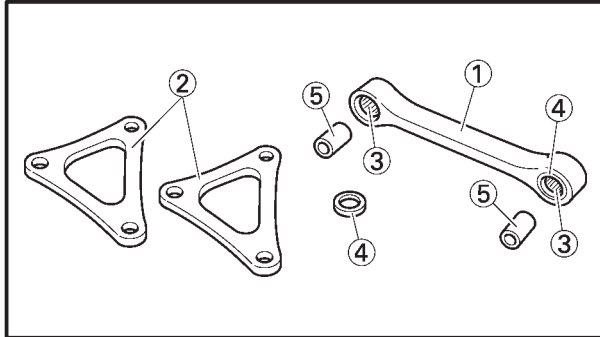
1. Check:

- rear shock absorber rod

Bends/damage → Replace the rear shock absorber assembly.

- rear shock absorber

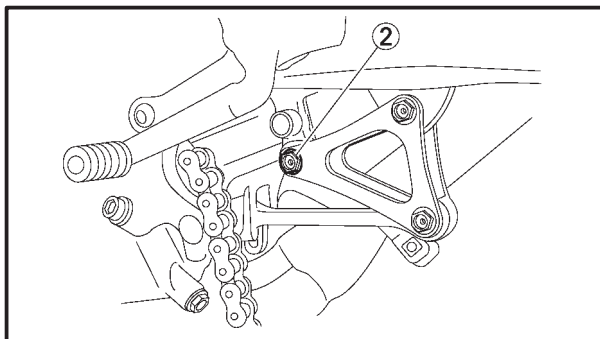
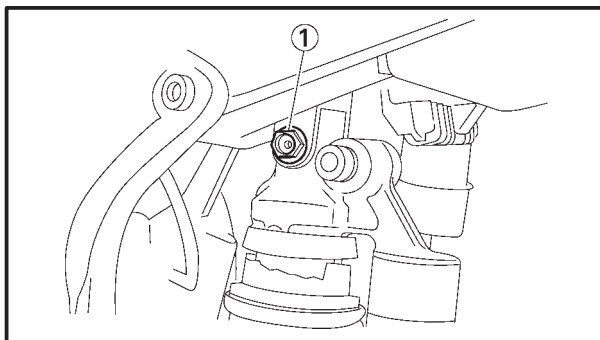
Gas leaks/oil leaks → Replace the rear shock absorber assembly.



- spring  
Damage/wear → Replace the rear shock absorber assembly.
- gas cylinder  
Damage/gas leaks → Replace.
- bushings  
Damage/wear → Replace.
- dust seals  
Damage/wear → Replace.
- bolts  
Bends/damage/wear → Replace.

## CHECKING THE CONNECTING ROD AND RELAY ARMS

1. Check:
  - connecting rod (1)
  - relay arms (2)  
Damage/wear → Replace.
2. Check:
  - bearings (3)
  - oil seals (4)  
Damage/pitting → Replace.
3. Check:
  - collars (5)  
Damage/scratches → Replace.



EAS00698

## INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
  - spacers
  - bearings

	<b>Recommended lubricant</b> <b>Lithium-soap-based grease</b>
--	--

2. Install:
  - rear shock absorber assembly

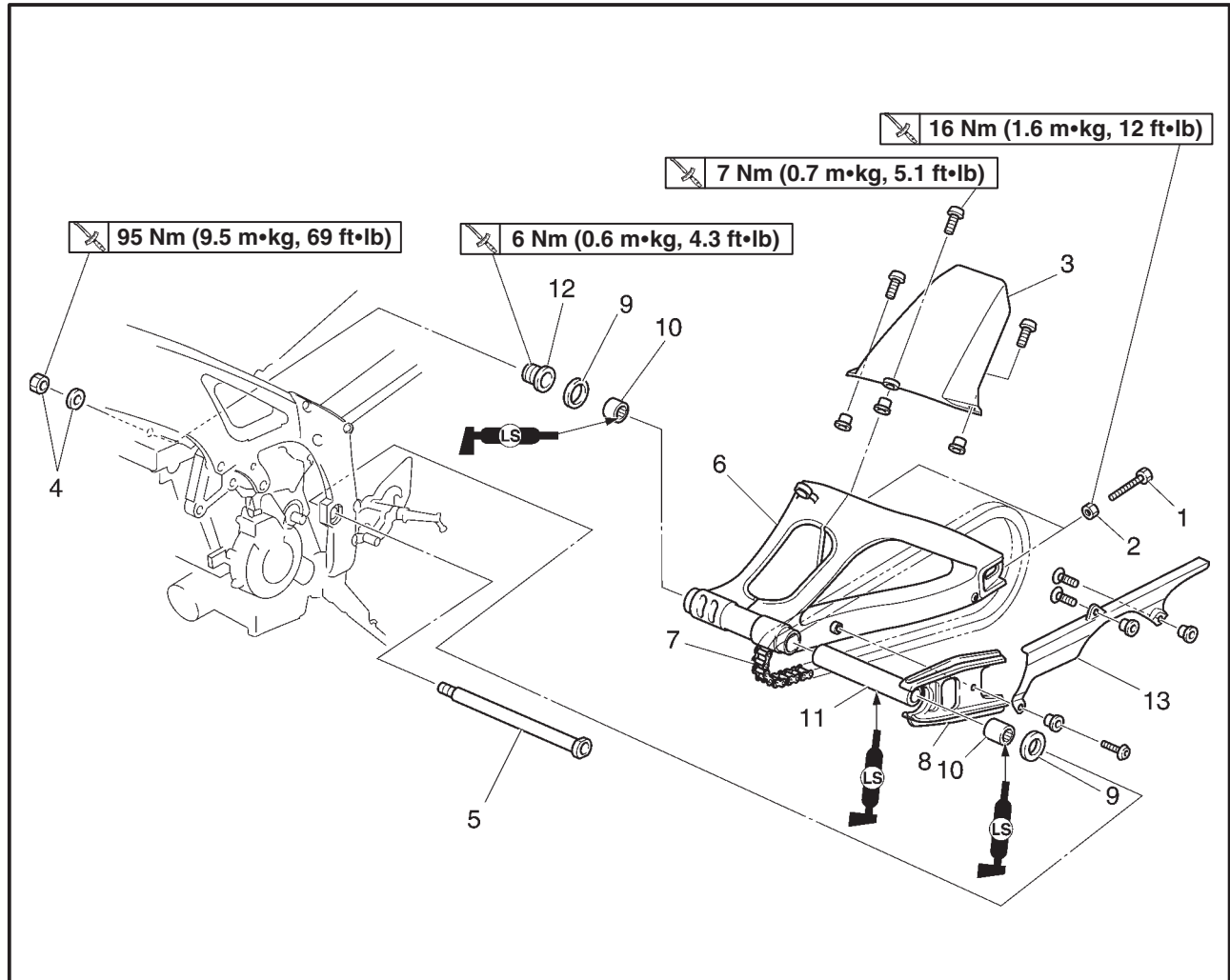
### NOTE:

When installing the rear shock absorber assembly, lift up the swingarm.

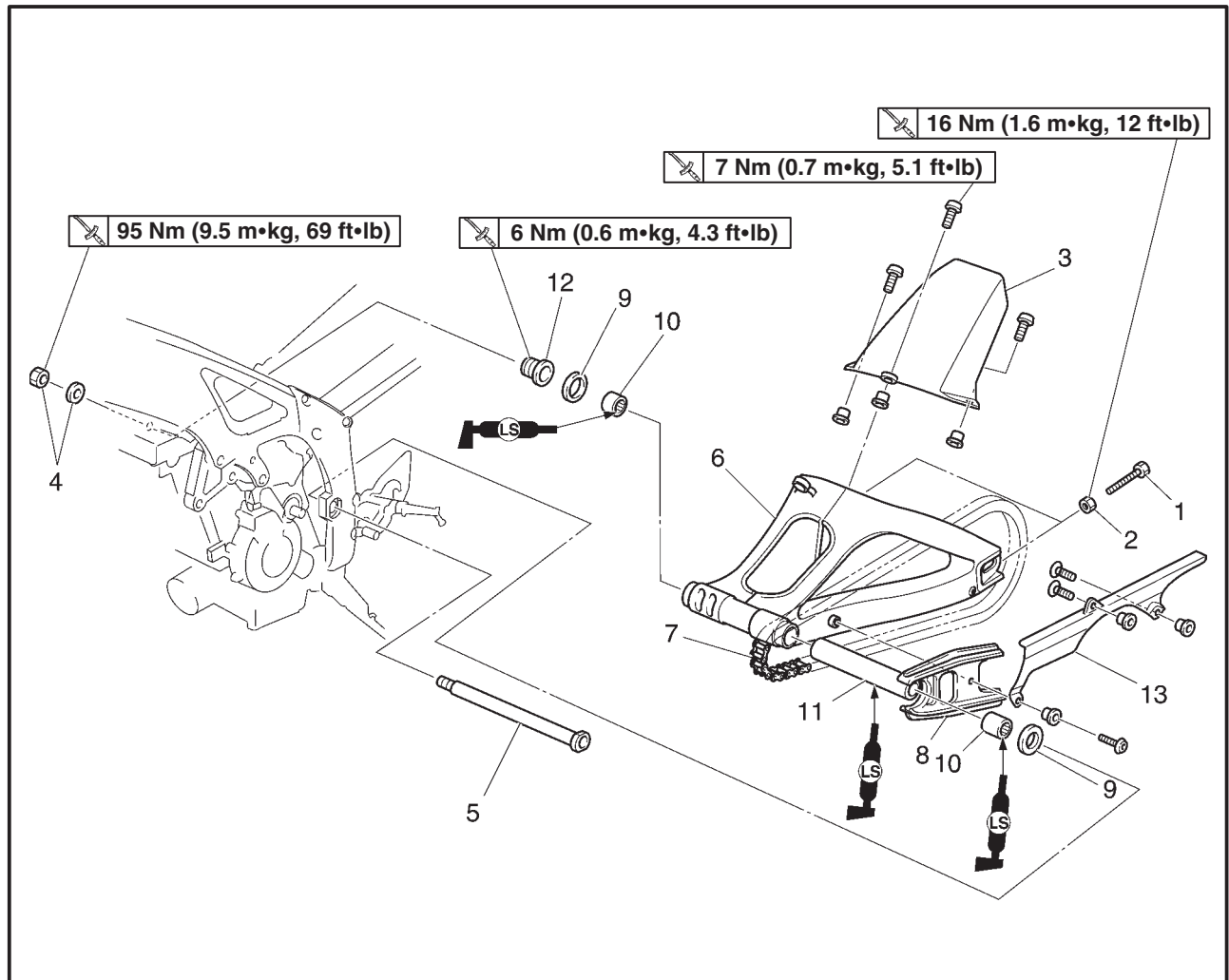
3. Tighten:
  - rear shock absorber assembly upper nut (1)  
 **44 Nm (4.4 m•kg, 32 ft•lb)**
  - rear shock absorber assembly lower nut (2)  
 **44 Nm (4.4 m•kg, 32 ft•lb)**

EAS00700

## SWINGARM AND DRIVE CHAIN



Order	Job/Part	Q'ty	Remarks
	<b>Removing the swingarm and drive chain</b>		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL AND BRAKE DISC".
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY".
	Relay arms and connecting rod		Refer to "REAR SHOCK ABSORBER ASSEMBLY".
	Drive sprocket cover		Refer to "ENGINE" in chapter 5.
1	Adjusting bolt	2	
2	Locknut	2	
3	Rear fender	1	
4	Pivot shaft nut/washer	1/1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Drive chain	1	
8	Drive chain guide	1	
9	Dust cover	2	



Order	Job/Part	Q'ty	Remarks
10	Bearing	2	For installation, reverse the removal procedure.
11	Spacer	1	
12	Pivot shaft adjust bolt	1	
13	Drive chain case	1	







EAS00704

## REMOVING THE DRIVE CHAIN

1. Stand the motorcycle on a level surface.

### **⚠ WARNING**

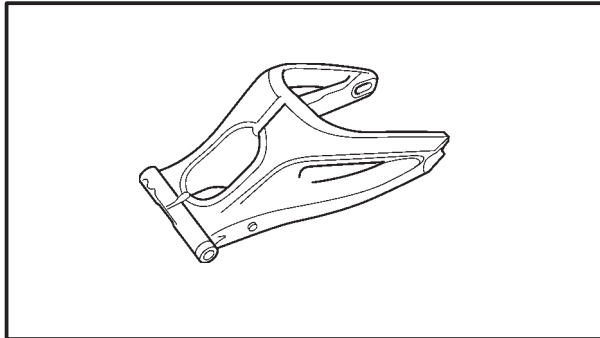
**Securely support the motorcycle so that there is no danger of it falling over.**

### **NOTE:**

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

2. Remove:

- drive chain (with the drive chain cutter)

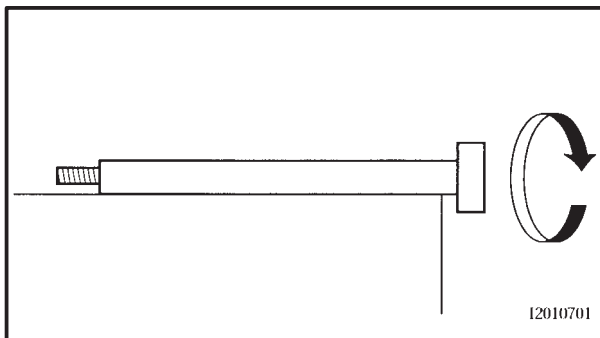


EAS00707

## CHECKING THE SWINGARM

1. Check:

- swingarm  
Bends/cracks/damage → Replace.



2. Check:

- pivot shaft  
Roll the pivot shaft on a flat surface.  
Bends → Replace.

### **⚠ WARNING**

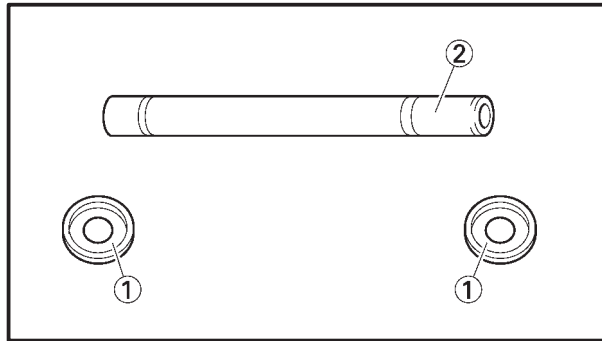
**Do not attempt to straighten a bent pivot shaft.**

3. Wash:

- pivot shaft
- dust covers
- spacer
- washers
- bearings

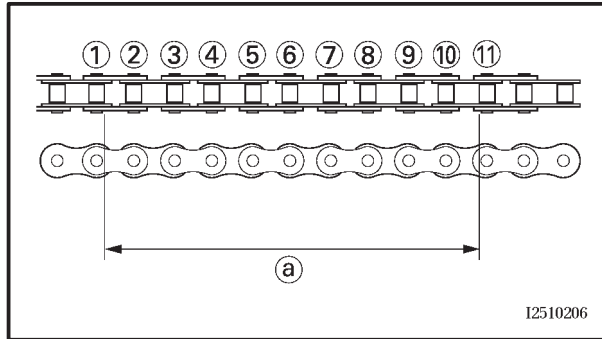


**Recommended cleaning solvent**  
**Kerosene**



## 4. Check:

- dust covers ①
- spacer ②
- Damage/wear → Replace.
- bearings
- Damage/pitting → Replace.



EAS00709

## CHECKING THE DRIVE CHAIN

### 1. Measure:

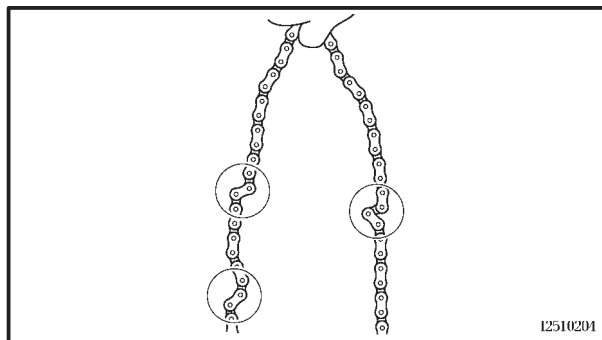
- ten-link section (a) of the drive chain
- Out of specification → Replace the drive chain.



**Ten-link drive chain section limit (maximum)**  
**150.1 mm (5.91 in)**

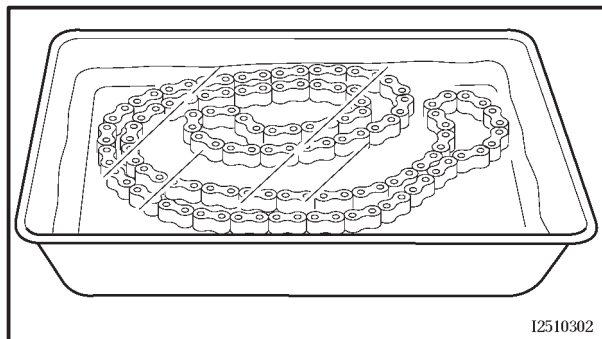
### NOTE:

- While measuring the ten-link section, push down on the drive chain to increase its tension.
- Measure the length between drive chain roller ① and ⑪ as shown.
- Perform this measurement at two or three different places.



## 2. Check:

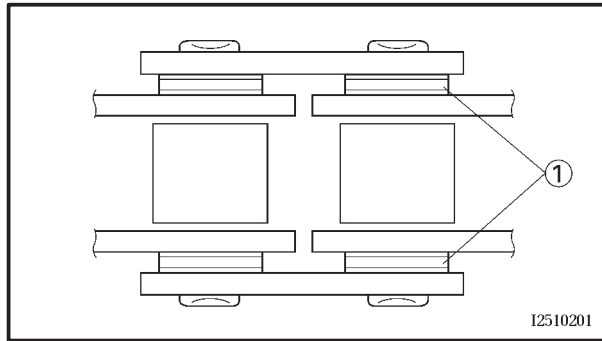
- drive chain
- Stiffness → Clean and lubricate or replace.



## 3. Clean:

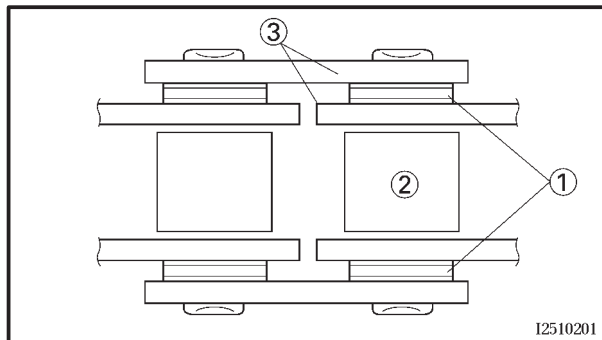
- drive chain

- Wipe the drive chain with a clean cloth.
- Put the drive chain in kerosene and remove any remaining dirt.
- Remove the drive chain from the kerosene and completely dry it.



## CAUTION:

This motorcycle has a drive chain with small rubber O-rings ① between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's internals, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only kerosene to clean the drive chain. Don't soak drive chain in kerosene more than ten minutes. O-ring is damage by kerosene.



## 4. Check:

- O-rings ①

Damage → Replace the drive chain.

- drive chain rollers ②

Damage/wear → Replace the drive chain.

- drive chain side plates ③

Damage/wear → Replace the drive chain.

Cracks → Replace the drive chain and make sure the battery breather hose is properly routed away from the drive chain and below the swingarm.

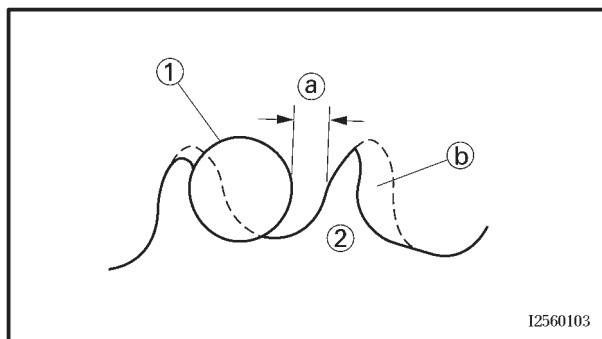
## 5. Lubricate:

- drive chain



## Recommended lubricant

Engine oil or chain lubricant  
suitable for O-ring chains



## 6. Check:

- drive sprocket

- rear wheel sprocket

More than 1/4 tooth (a) wear → Replace the drive chain sprockets as a set.

Bent teeth → Replace the drive chain sprockets as a set.

- (b) Correct

- ① Drive chain roller

- ② Drive chain sprocket



EAS00711

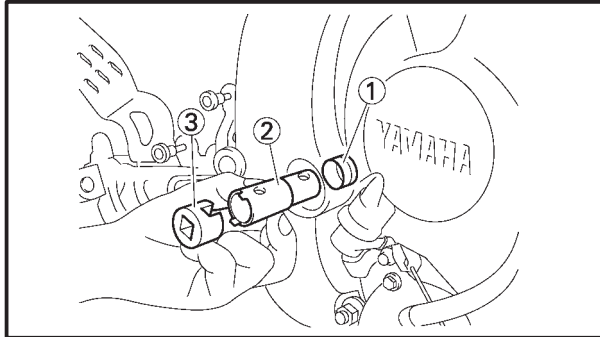
### INSTALLING THE SWINGARM

#### 1. Lubricate:

- bearings
- spacers
- dust covers
- pivot shaft



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



#### 2. Install:

- pivot shaft adjust bolt ①

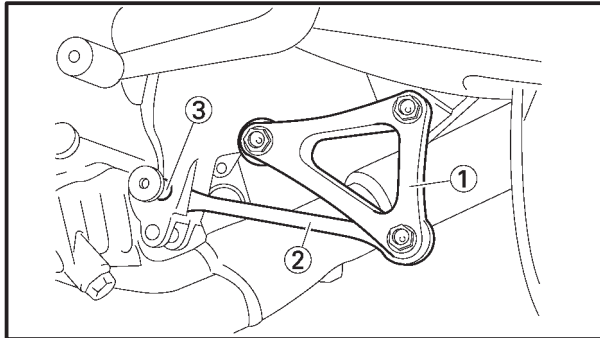
**6 Nm (0.6 m•kg, 4.3 ft•lb)**

- swingarm
- pivot shaft

**95 Nm (9.5 m•kg, 69 ft•lb)**

#### NOTE:

Use the pivot shaft wrench ② and adapter ③ to tighten the pivot adjust bolt to specification torque.



**Pivot shaft wrench:**  
**90890-01471, YM-01471**  
**Pivot shaft wrench adapter**  
**90890-01476**

#### 3. Install:

- relay arms ①

**44 Nm (4.4 m•kg, 32 ft•lb)**

- connecting rod ②

**44 Nm (4.4 m•kg, 32 ft•lb)**

#### NOTE:

Install the connecting rod front bolt ③ from the left.

#### 4. Install:

- rear shock absorber assembly
- rear wheel

Refer to “INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY” and “INSTALLING THE REAR WHEEL”.

#### 5. Adjust:

- drive chain slack

Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.

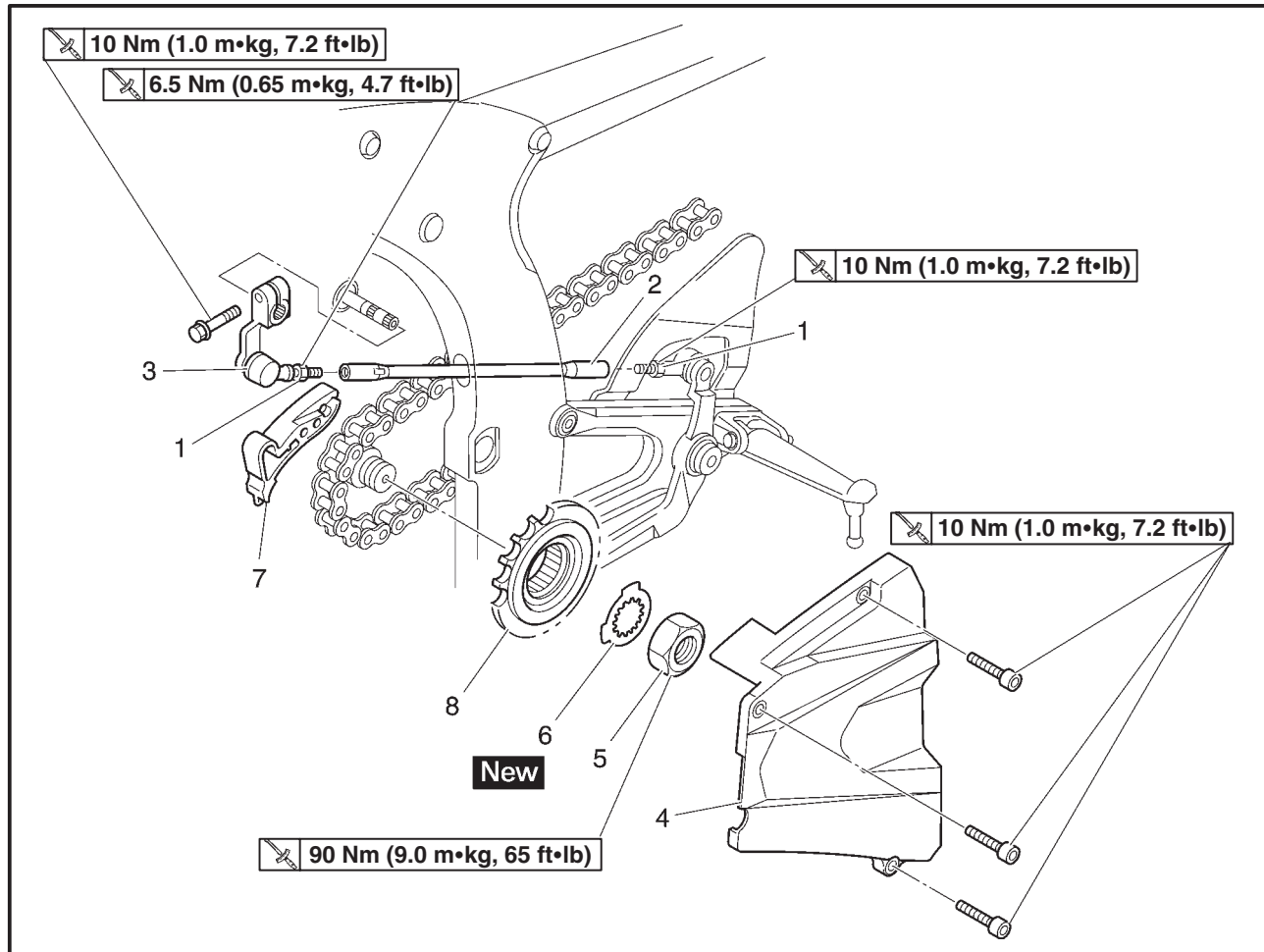


**Drive chain slack**  
**35 ~ 45 mm (1.38 ~ 1.77 in)**



## OVERHAULING THE ENGINE

### ENGINE DRIVE SPROCKET



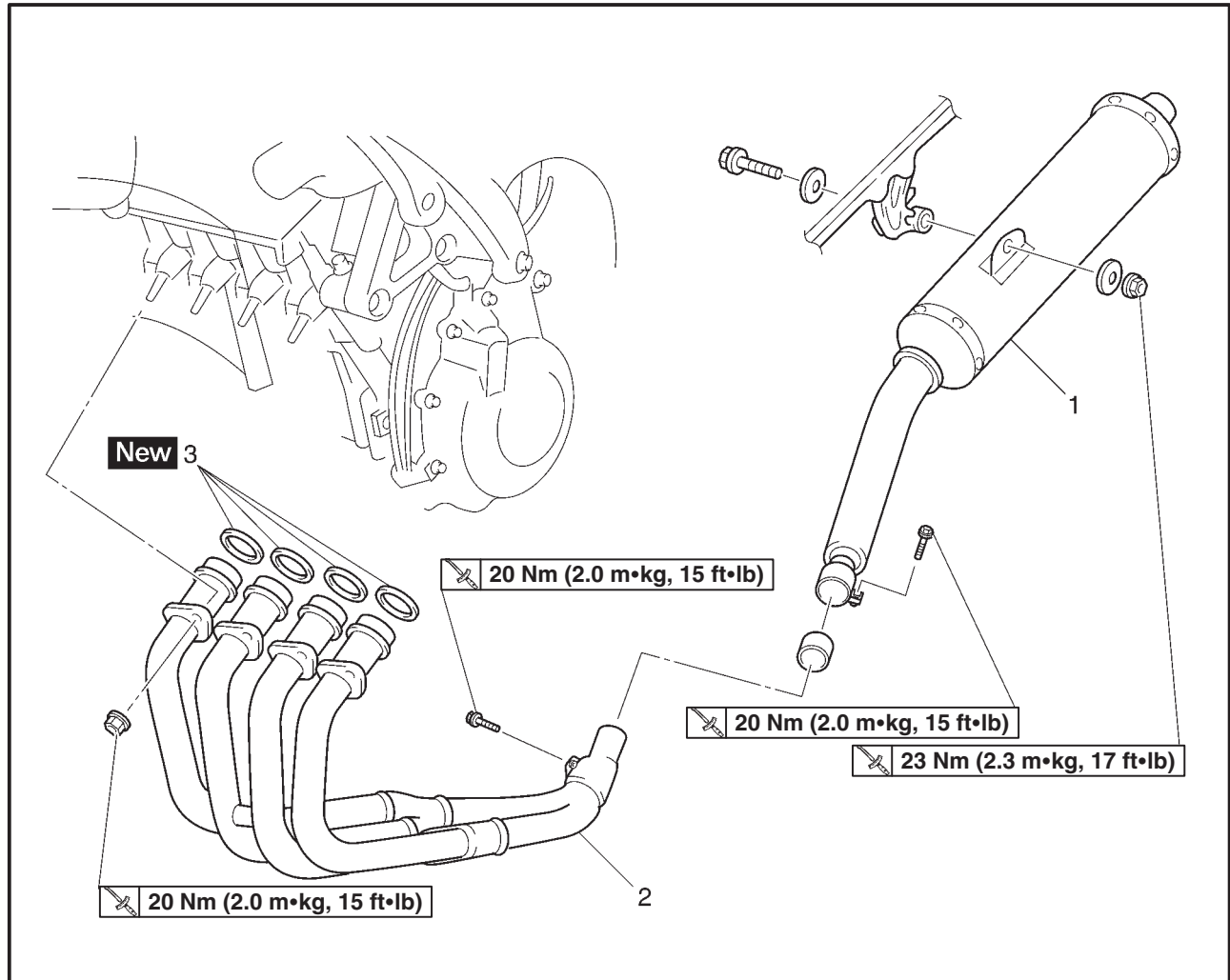
# 5

Order	Job/Part	Q'ty	Remarks
	<b>Removing the drive sprocket</b>		
	Bottom cowlings		Remove the parts in the order listed.
	Side cowlings		Refer to "COWLINGS" in chapter 3.
	Drive chain		Loosen.
			Refer to "ADJUSTING THE DRIVE CHAIN" in chapter 3.
1	Lock nut	2	Loosen.
2	Shift rod	1	
3	Shift arm	1	
4	Drive sprocket cover	1	
5	Nut	1	
6	Lock washer	1	
7	Chain guide	1	
8	Drive sprocket	1	
			For installation, reverse the removal procedure.



EAS00189

## EXHAUST PIPE

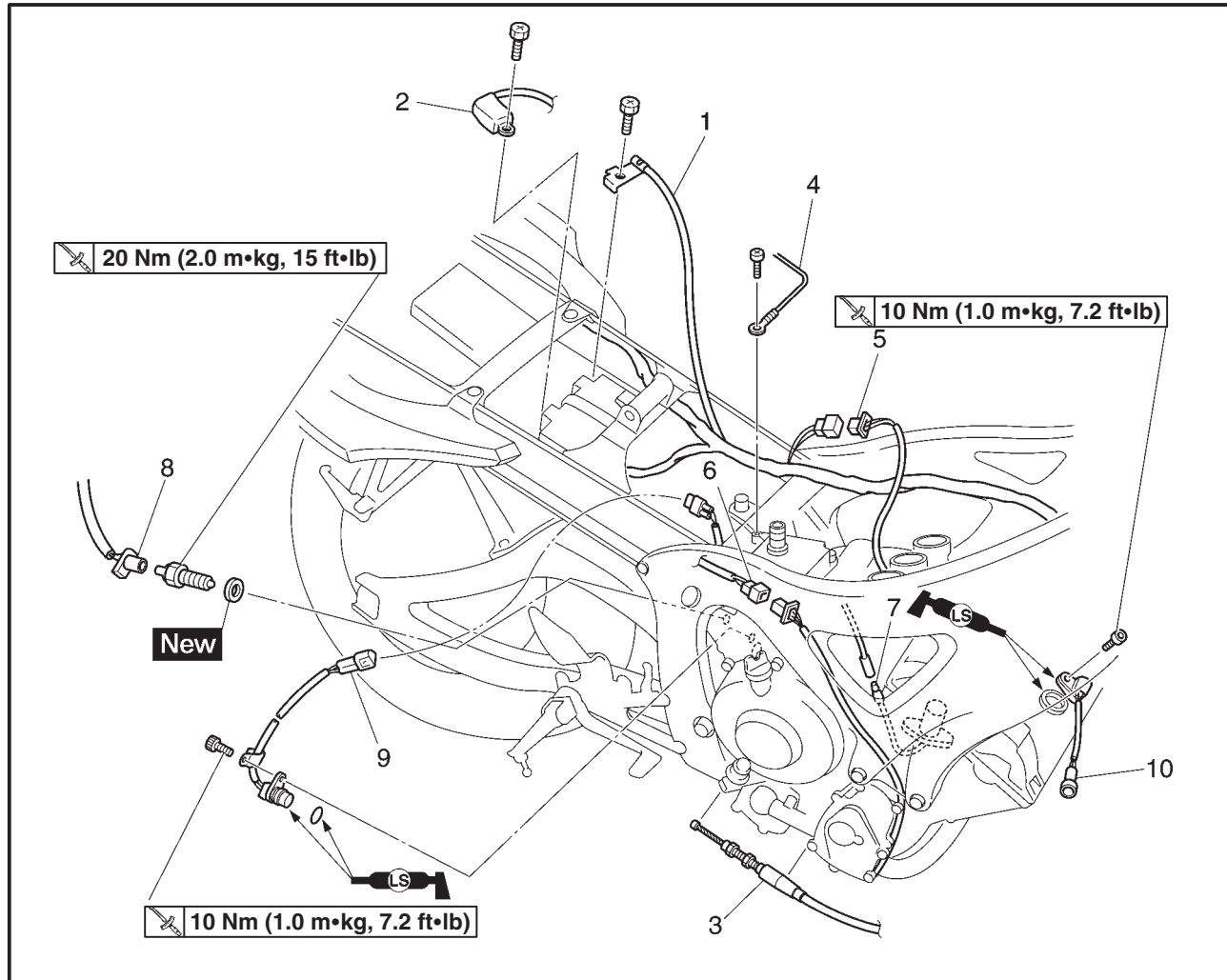


Order	Job/Part	Q'ty	Remarks
	<b>Removing the exhaust pipe</b>		
	Bottom cowl		Remove the parts in the order listed.
	Side cowlings		Refer to "COWLINGS" in chapter 3.
1	Muffler	1	
2	Exhaust pipe assembly	1	
3	Exhaust pipe gasket	4	For installation, reverse the removal procedure.



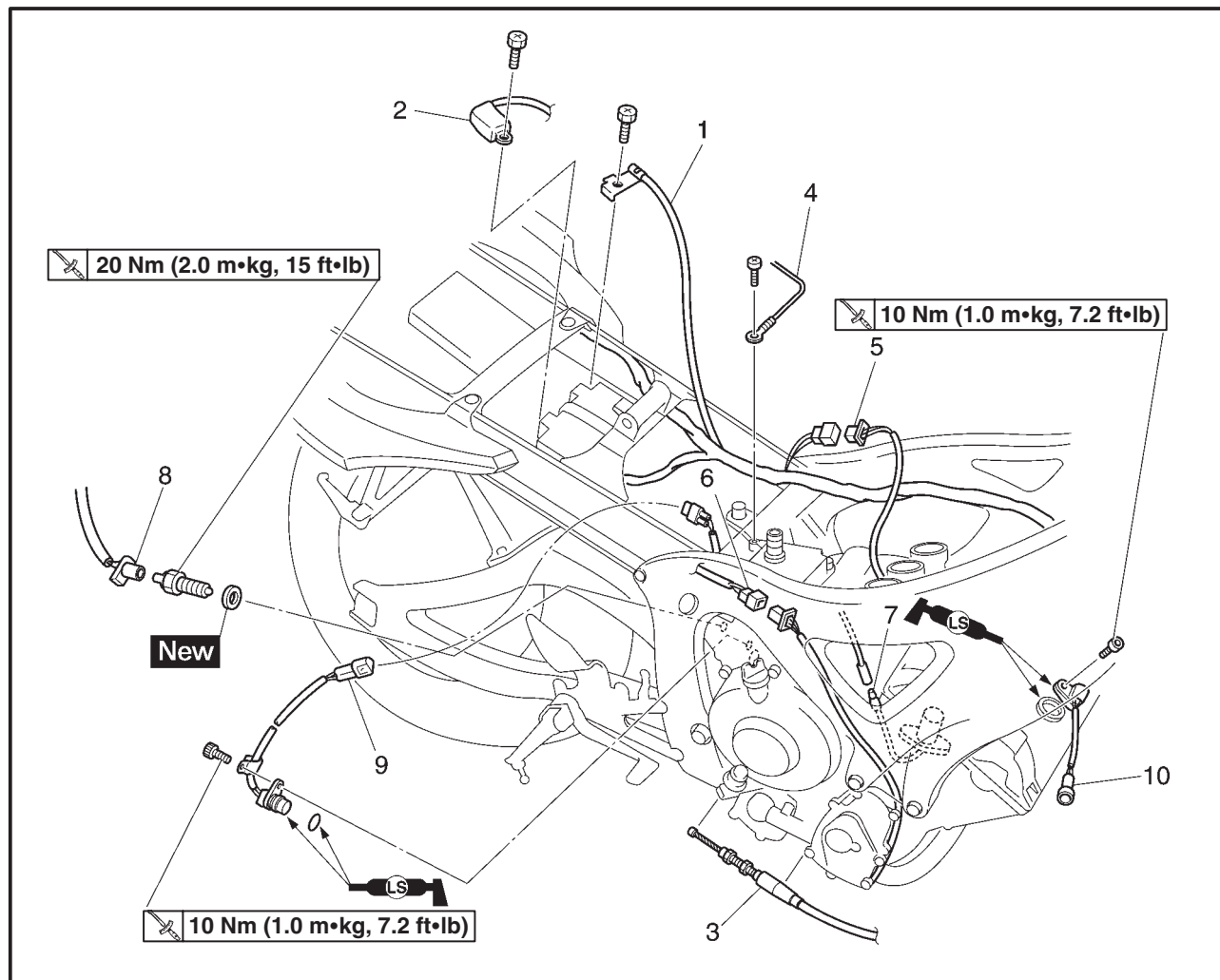
EAS00188

## LEADS AND HOSES



Order	Job/Part	Q'ty	Remarks
	<b>Disconnecting the leads and hoses</b>		
	Air filter case		Disconnect the parts in the order listed.
	Throttle body assembly		Refer to "AIR FILTER CASE" in chapter 3.
	Engine oil		Refer to "THROTTLE BODIES" in chapter 7.
	Oil filter cartridge		Drain.
	Oil cooler		Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Air cut-off valve		Refer to "OIL COOLER" in chapter 6.
	Starter motor		Refer to "AIR INDUCTION SYSTEM" in chapter 7.
1	Battery negative lead	1	Refer to "STARTING SYSTEM" in chapter 8.
2	Battery positive lead	1	
			<b>CAUTION:</b> _____
			First, disconnect the negative battery lead, and then the positive battery lead. For connecting, reverse the disconnection procedure.



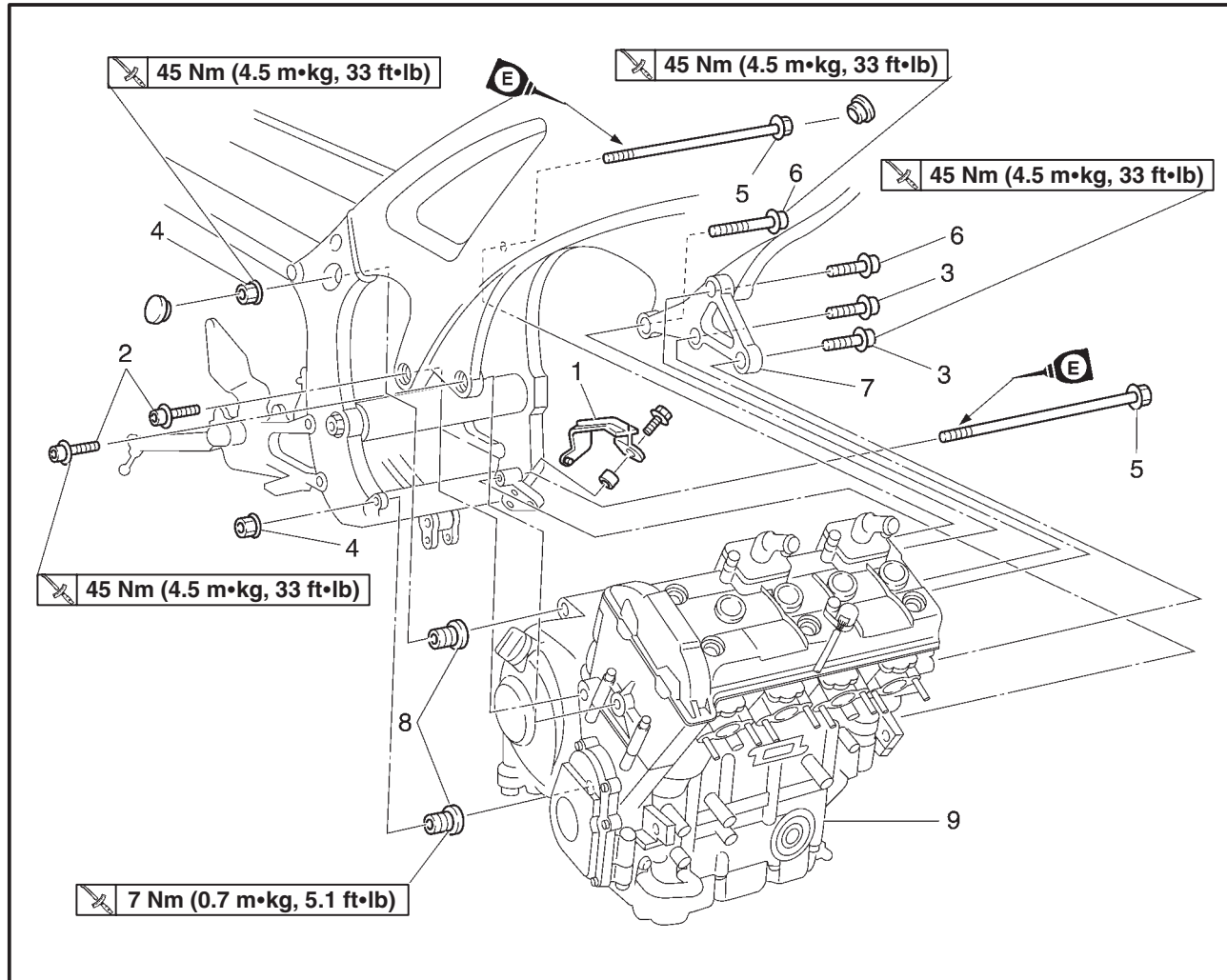


Order	Job/Part	Q'ty	Remarks
3	Clutch cable	1	
4	Ground lead	1	
5	Stator coil assembly coupler	1	Disconnect.
6	Crankshaft position sensor coupler	1	Disconnect.
7	Oil level switch connector	1	Disconnect.
8	Neutral switch connector	1	Disconnect.
9	Speed sensor coupler	1	Disconnect.
10	Cylinder identification sensor coupler	1	Disconnect.
			For connecting reverse the disconnection procedure.



EAS00191

## ENGINE



Order	Job/Part	Q'ty	Remarks
	<b>Removing the engine</b>		Removing the parts in the order listed. <b>NOTE:</b> _____ Place a suitable stand under the frame and engine.
1	Drive chain guide	1	Refer to "INSTALLING THE ENGINE".
2	Right front engine mounting bolt	2	
3	Left front engine mounting bolt	2	
4	Self-locking nut	2	
5	Rear engine mounting bolt	2	
6	Engine bracket bolt	2	
7	Engine bracket	1	
8	Engine mounting adjust bolt	2	<b>NOTE:</b> _____
9	Engine	1	Use the pivot shaft wrench and adapter to loosen the engine mounting adjust bolts.
			For installation, reverse the removal procedure.



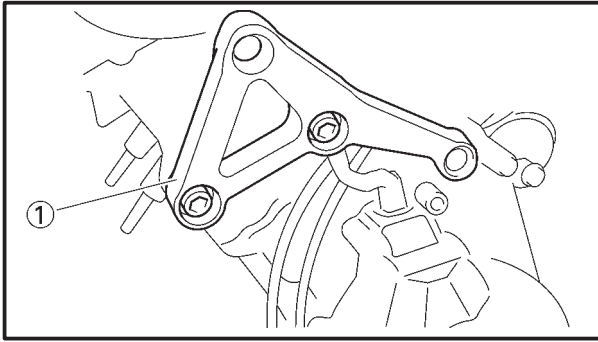
EAS00192

**INSTALLING THE ENGINE****1. Install:**

- engine bracket ① (to the engine)

**45 Nm (4.5 m•kg, 33 ft•lb)**

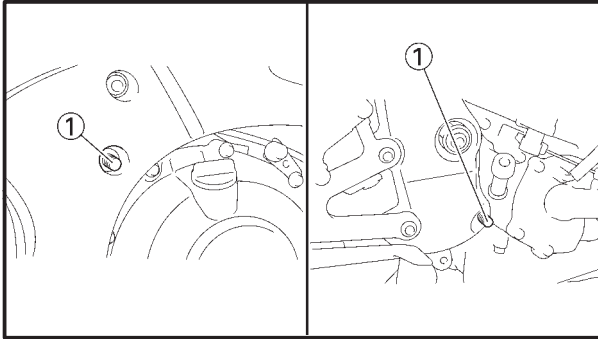
- engine mounting adjust bolts (temporary tighten)

**2. Install:**

- rear engine mounting bolts ①

**NOTE:**

- Lubricate the rear engine mounting bolt threads with lithium-soap-based grease.

**3. Install:**

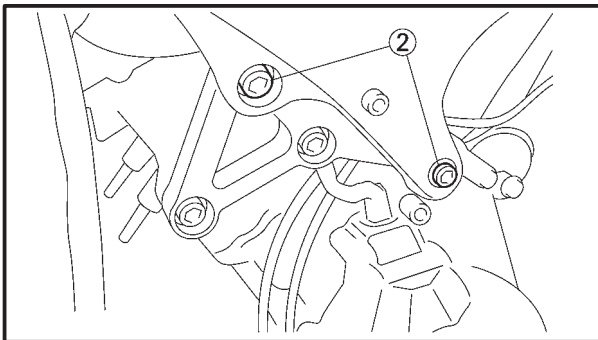
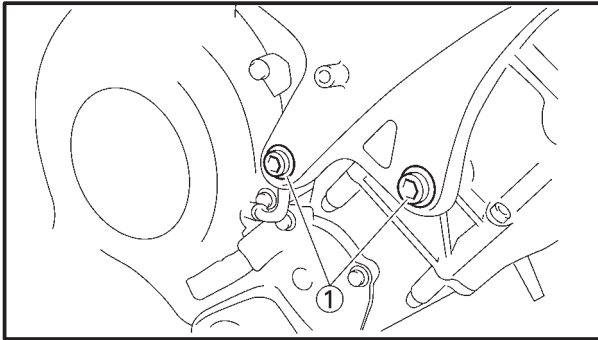
- right front engine mounting bolts ① (temporary tighten)

- left front engine mounting bolts ②

**45 Nm (4.5 m•kg, 33 ft•lb)**

**NOTE:**

First tighten the rear side engine mounting bolt.

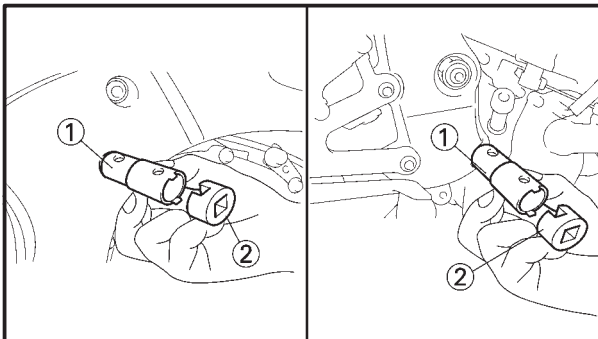
**4. Tighten:**

- engine mounting adjust bolts

**7 Nm (0.7 m•kg, 5.1 ft•lb)**

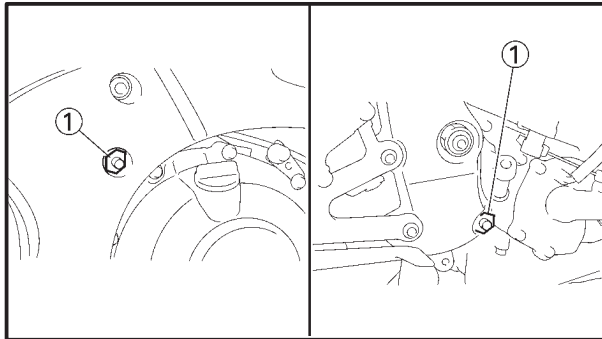
**NOTE:**

- First tighten the lower engine mounting adjust bolt.
- Use the pivot shaft wrench ① and pivot shaft wrench adapter ② to tighten the engine mounting adjust bolts.





**Pivot shaft wrench**  
90890-01471, YM-01471  
**Pivot shaft wrench adapter**  
90890-01476

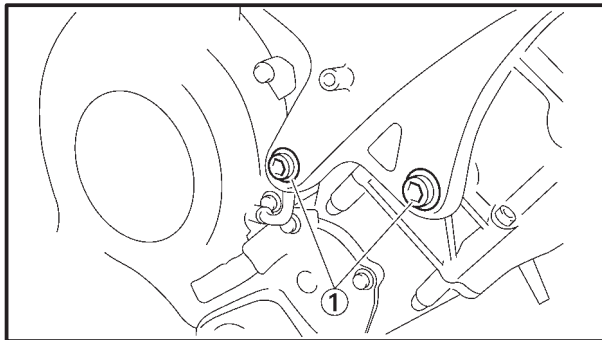


5. Tighten:  
• nuts ① (rear engine mounting bolts)

**45 Nm (4.5 m•kg, 33 ft•lb)**

**NOTE:**

First tighten the lower self-locking nut.

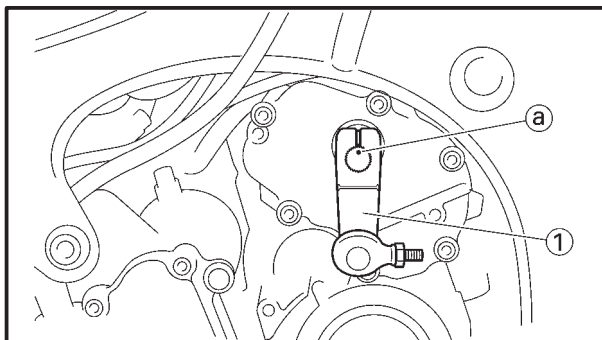


6. Tighten:  
• right front engine mounting bolts ①

**45 Nm (4.5 m•kg, 33 ft•lb)**

**NOTE:**

First tighten the rear side engine mounting bolt.

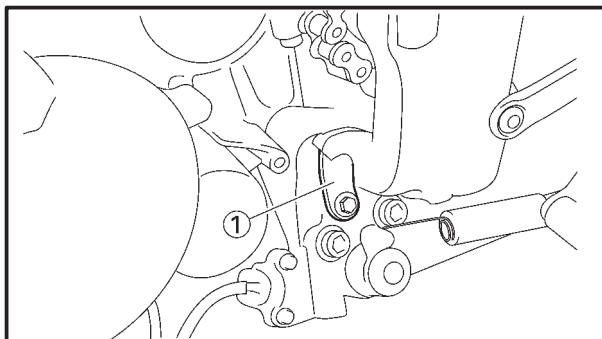


7. Install:  
• shift arm ①

**10 Nm (1.0 m•kg, 7.2 ft•lb)**

**NOTE:**

- Align the punch mark ① in the shift shaft with the slot in the shift arm.
- Align the bottom edge of the shift pedal with the mark on the frame-to-swingarm bracket.



8. Install:  
• drive chain guide ①

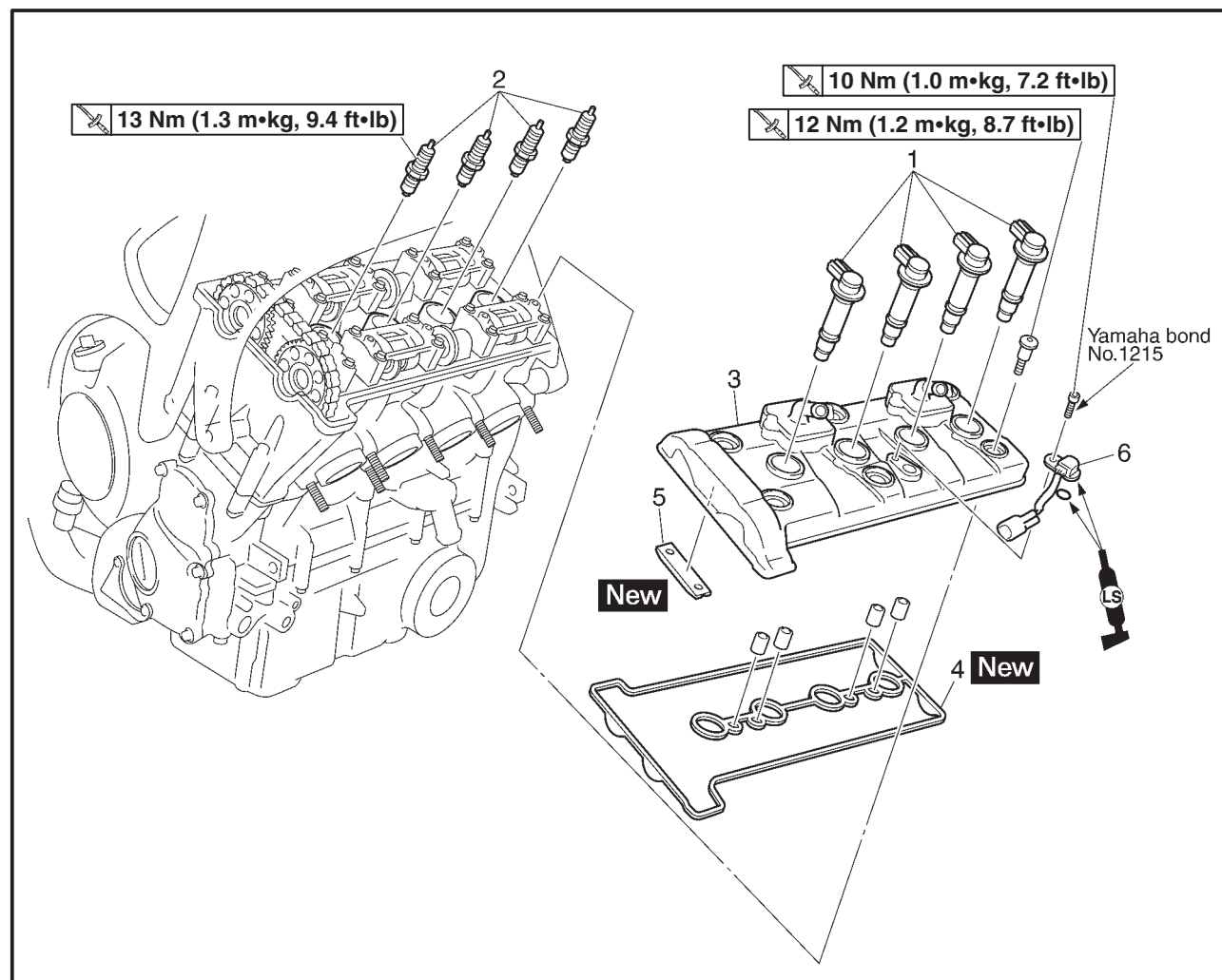
**7 Nm (0.7 m•kg, 5.1 ft•lb)**



EAS00194

# CAMSHAFTS

## CYLINDER HEAD COVER

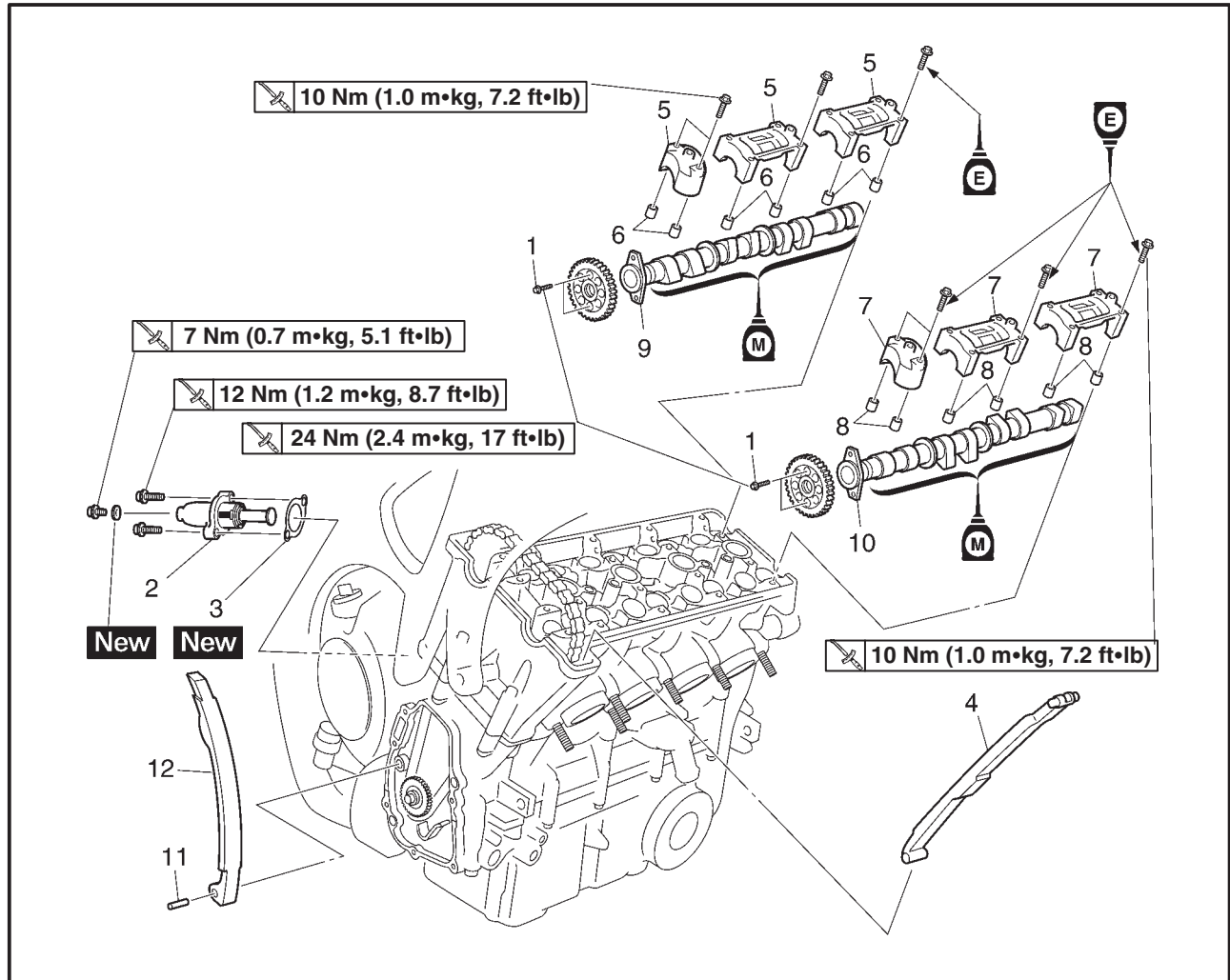


Order	Job/Part	Q'ty	Remarks
	<b>Removing the cylinder head cover</b>		
	Throttle body assembly		Remove the parts in the order listed. Refer to "THROTTLE BODIES" in chapter 7.
	Radiator assembly		Refer to "RADIATOR" in chapter 6.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" in chapter 7.
1	Ignition coil	4	
2	Spark plug	4	
3	Cylinder head cover	1	
4	Cylinder head cover gasket	1	
5	Timing chain guide (top side)	1	
6	Cylinder identification sensor	1	
			For installation, reverse the removal procedure.

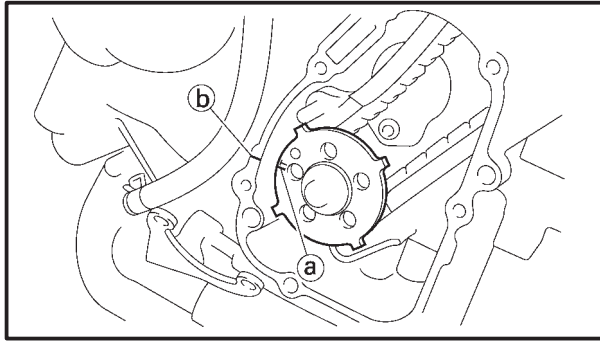


EAS00196

## CAMSHAFTS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the camshafts</b>		
	Pickup rotor cover		Remove the parts in the order listed. Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR". Loosen.
1	Camshaft sprocket bolt	4	
2	Timing chain tensioner	1	
3	Timing chain tensioner gasket	1	
4	Timing chain guide (exhaust side)	1	
5	Intake camshaft cap	3	<b>NOTE:</b> _____
6	Dowel pin	6	During removal, the dowel pins may still be connected to the camshaft caps.
7	Exhaust camshaft cap	3	
8	Dowel pin	6	
9	Intake camshaft	1	
10	Exhaust camshaft	1	
11	Pin	1	
12	Timing chain guide (intake side)	1	For installation, reverse the removal procedure.



EAS00198

**REMOVING THE CAMSHAFTS****1. Remove:**

- pickup rotor cover  
Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR".

**2. Align:**

- "T" mark (a) on the pickup rotor  
(with the crankcase mating surface (b))

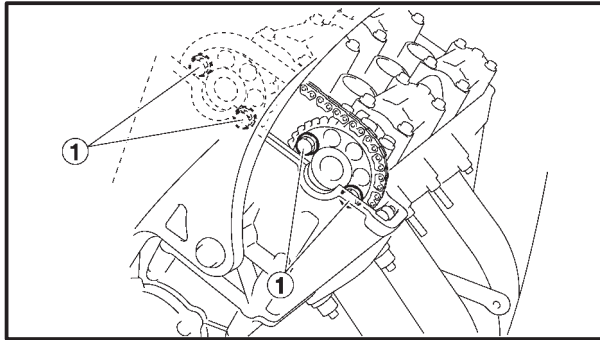


a. Turn the crankshaft clockwise.

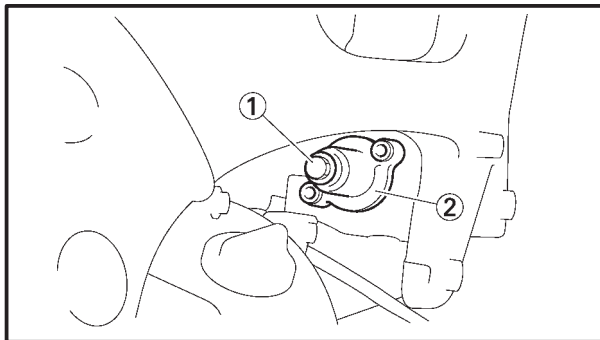
b. When piston #1 is at TDC on the compression stroke, align the "T" mark (a) on the pickup rotor with the crankcase mating surface (b).

**NOTE:**

TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.

**3. Loosen:**

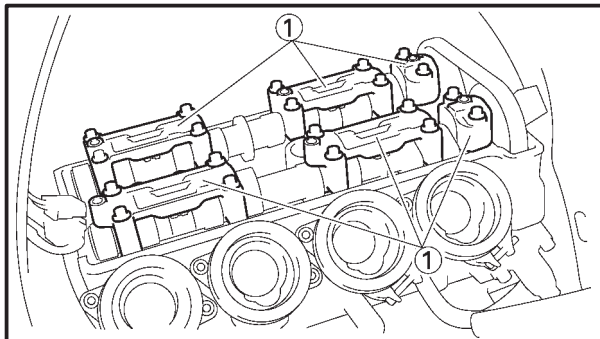
- camshaft sprocket bolts (1)

**4. Loosen:**

- cap bolt (1)

**5. Remove:**

- timing chain tensioner (2)
- gasket

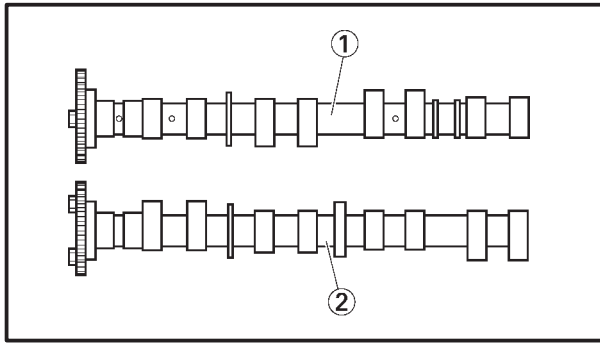
**6. Remove:**

- timing chain guide (exhaust side)
- camshaft caps (1)
- dowel pins

**CAUTION:**

To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a criss-cross pattern, working from the outside in.



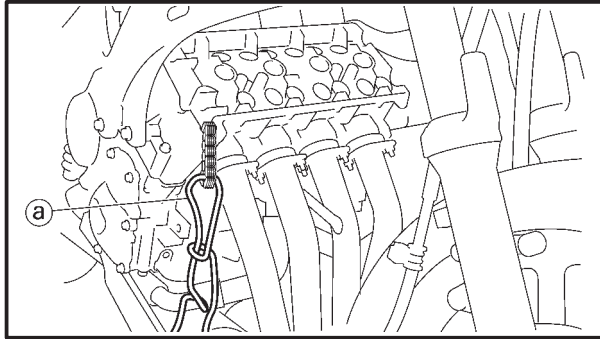


7. Remove:

- intake camshaft ①
- exhaust camshaft ②

**NOTE:**

To prevent the timing chain from falling into the crankcase, fasten it with a wire (a).



8. Remove:

- camshaft sprockets

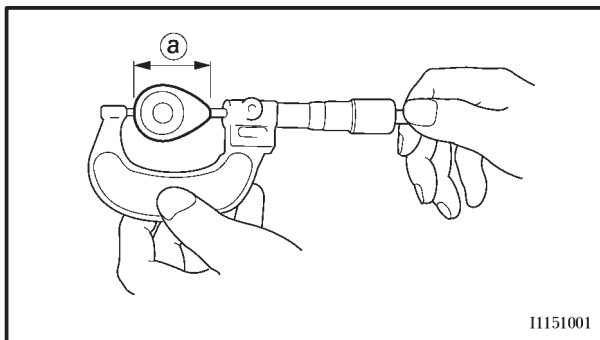
EAS00204

### CHECKING THE CAMSHAFTS

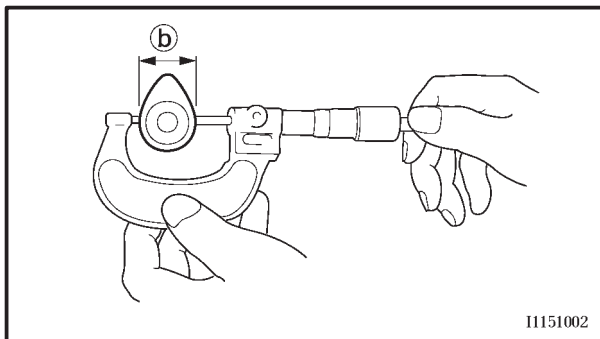
1. Check:

- camshaft lobes

Blue discoloration/pitting/scratches → Replace the camshaft.



11151001



11151002

2. Measure:

- camshaft lobe dimensions (a) and (b)

Out of specification → Replace the camshaft.



#### Camshaft lobe dimension limit

##### Intake camshaft

① 33.45 ~ 33.55 mm

(1.317 ~ 1.321 in)

<Limit>: 33.40 mm (1.315 in)

② 25.12 ~ 25.22 mm

(0.989 ~ 0.993 in)

<Limit>: 25.07 mm (0.987 in)

##### Exhaust camshaft

① 32.55 ~ 32.65 mm

(1.282 ~ 1.285 in)

<Limit>: 32.50 mm (1.280 in)

② 25.07 ~ 25.17 mm

(0.987 ~ 0.991 in)

<Limit>: 25.02 mm (0.985 in)







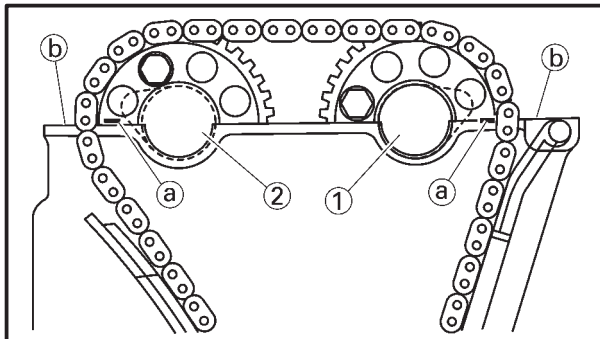
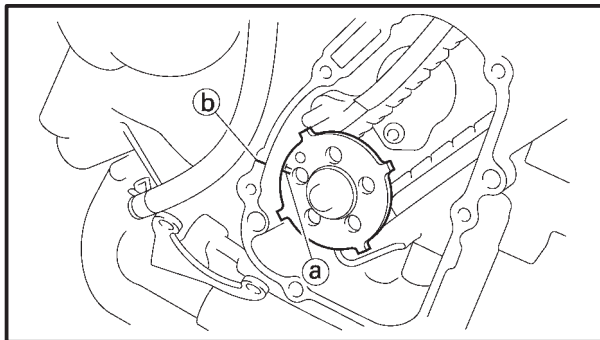


- b. Remove the screwdriver and slowly release the timing chain tensioner rod.
- c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

### 3. Check:

- cap bolt
- copper washer **New**
- gasket **New**

Damage/wear → Replace the defective part(s).



EAS00215

## INSTALLING THE CAMSHAFTS

1. Align:

- “T” mark (a) on the pickup rotor  
(with the crankcase mating surface (b))

a. Turn the crankshaft clockwise.

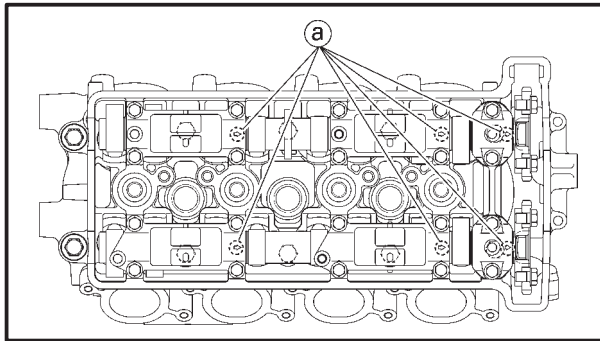
- b. When piston #1 is at TDC, align the “T” mark  
 Ⓐ with the crankcase mating surface Ⓑ.

## 2. Install:

- exhaust camshaft ①
- intake camshaft ②  
(with the camshaft sprocket temporarily tightened)

**NOTE:**

Make sure the match mark (a) on the camshaft sprocket is aligned with the cylinder head edge (b).

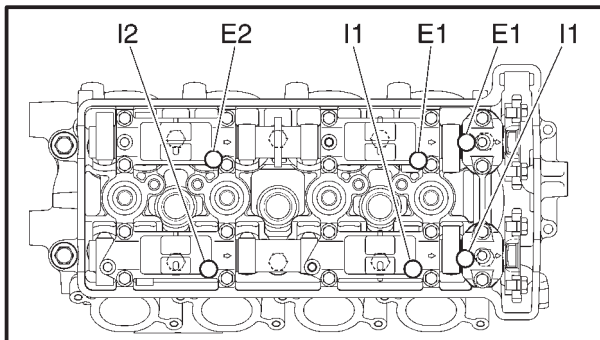


## 3. Install:

- dowel pins
- exhaust camshaft caps
- intake camshaft caps


**NOTE:**

- Make sure each camshaft cap is installed in its original place.
- Make sure the arrow mark (a) on each camshaft cap points towards the right side of the engine.



## 4. Install:

- camshaft cap bolts

 **10 Nm (1.0 m•kg, 7.2 ft•lb)****NOTE:**

Tighten the camshaft cap bolts in stages and in a crisscross pattern, working from the inner caps out.

I1, I2: Intake side camshaft cap mark

E1, E2: Exhaust side camshaft cap mark

**CAUTION:**

- Lubricate the camshaft cap bolts with the engine oil.
- The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.
- Do not turn the crankshaft when installing the camshaft to avoid damage or improper valve timing.

## 5. Install:

- timing chain guide (exhaust side)

**NOTE:**

When installing the timing chain guide, be sure to keep the timing chain as tight as possible on the exhaust side.





10. Measure:

- valve clearance

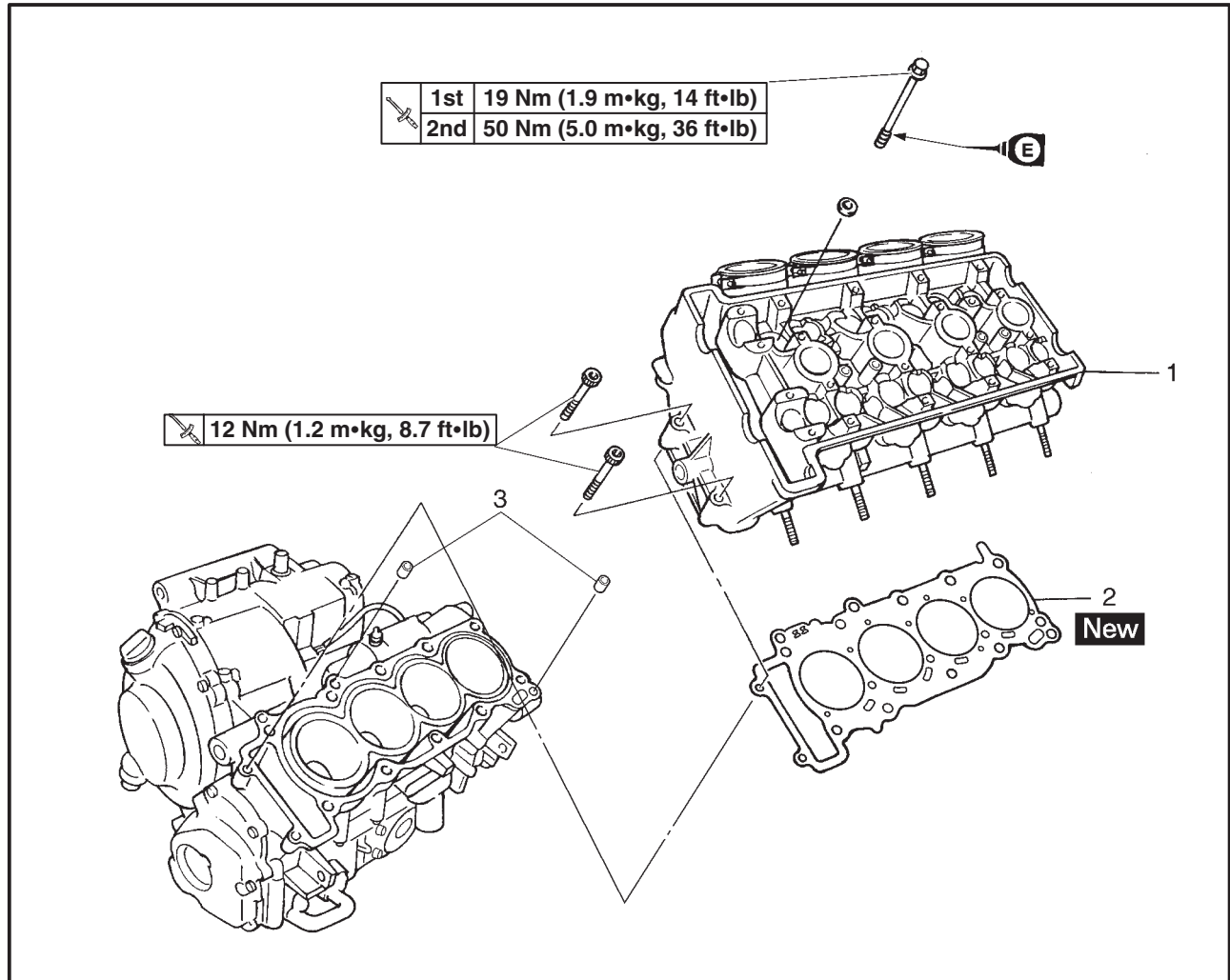
Out of specification → Adjust.

Refer to “ADJUSTING THE VALVE CLEAR-  
ANCE” in chapter 3.



EAS00221

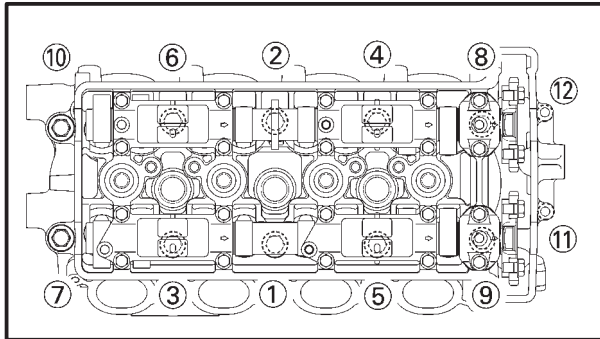
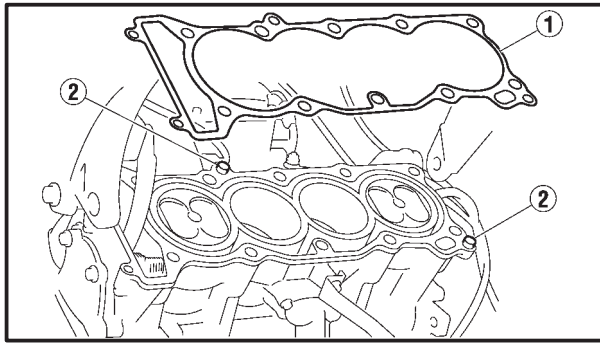
## CYLINDER HEAD



Order	Job/Part	Q'ty	Remarks
	<b>Removing the cylinder head</b>		
	Intake and exhaust camshaft		Remove the parts in the order listed.
	Engine bracket		Refer to "CAMSHAFTS".
1	Cylinder head	1	Refer to "ENGINE".
2	Cylinder head gasket	1	
3	Dowel pin	2	
			For installation, reverse the removal procedure.







EAS00233

**INSTALLING THE CYLINDER HEAD**

1. Install:
  - gasket **New** (1)
  - dowel pins (2)
2. Install:
  - cylinder head

**NOTE:**

Pass the timing chain through the timing chain cavity.

## 3. Tighten:

- cylinder head bolts (1) ~ (10)

1st	19 Nm (1.9 m•kg, 14 ft•lb)
-----	----------------------------

2nd	50 Nm (5.0 m•kg, 36 ft•lb)
-----	----------------------------

- cylinder head bolts (11), (12)

	12 Nm (1.2 m•kg, 8.7 ft•lb)
--	-----------------------------

**NOTE:**

- First, tighten the bolts (1) ~ (10) to approximately 19 Nm (1.9 m•kg, 14 ft•lb) with a torque wrench and then tighten the 50 Nm (5.0 m•kg, 36 ft•lb).
- Lubricate the cylinder head bolts with engine oil.
- Tighten the cylinder head bolts in the proper tightening sequence as shown and torque them in two stages.

## 4. Install:

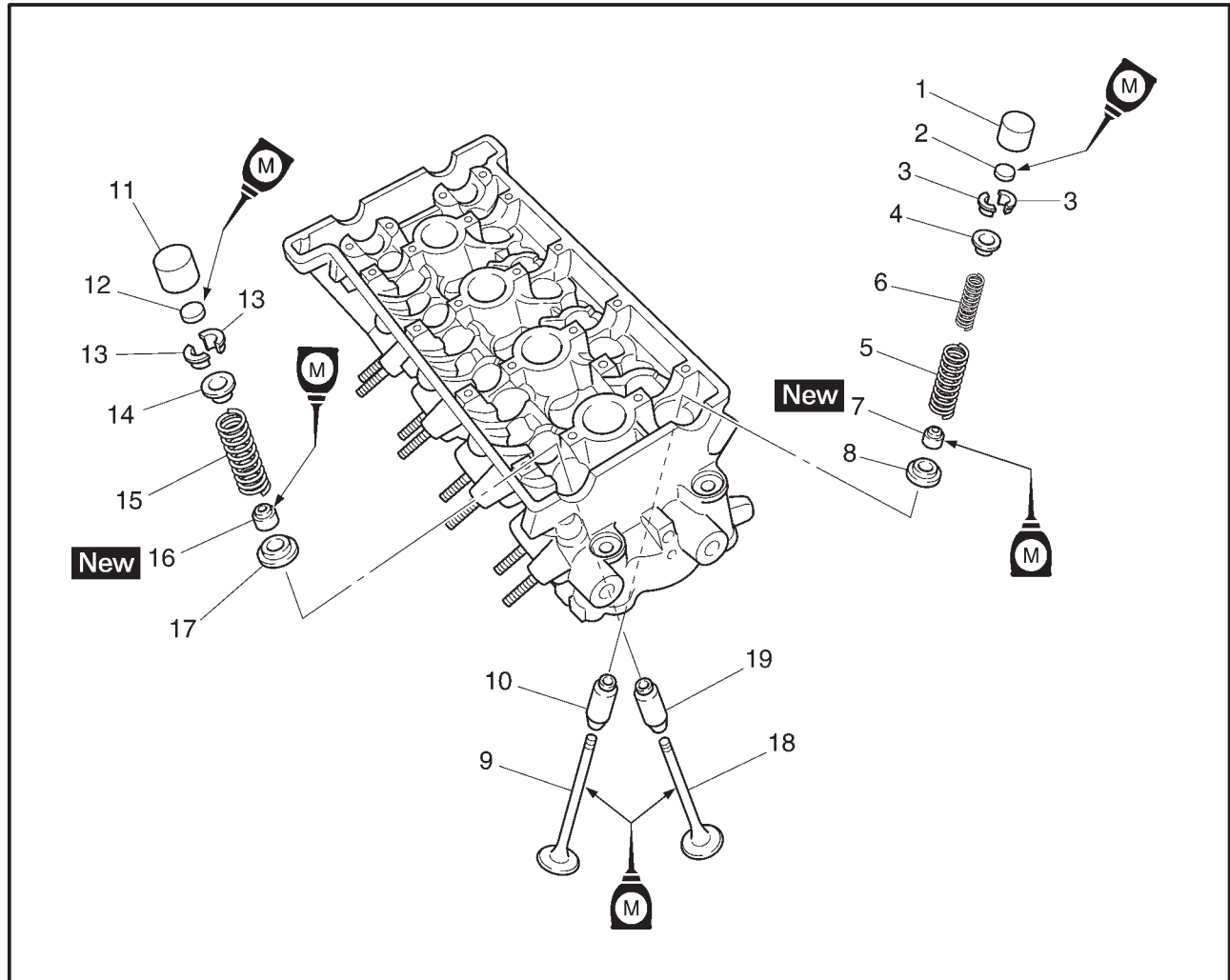
- exhaust camshaft
- intake camshaft

Refer to "INSTALLING THE CAMSHAFTS".

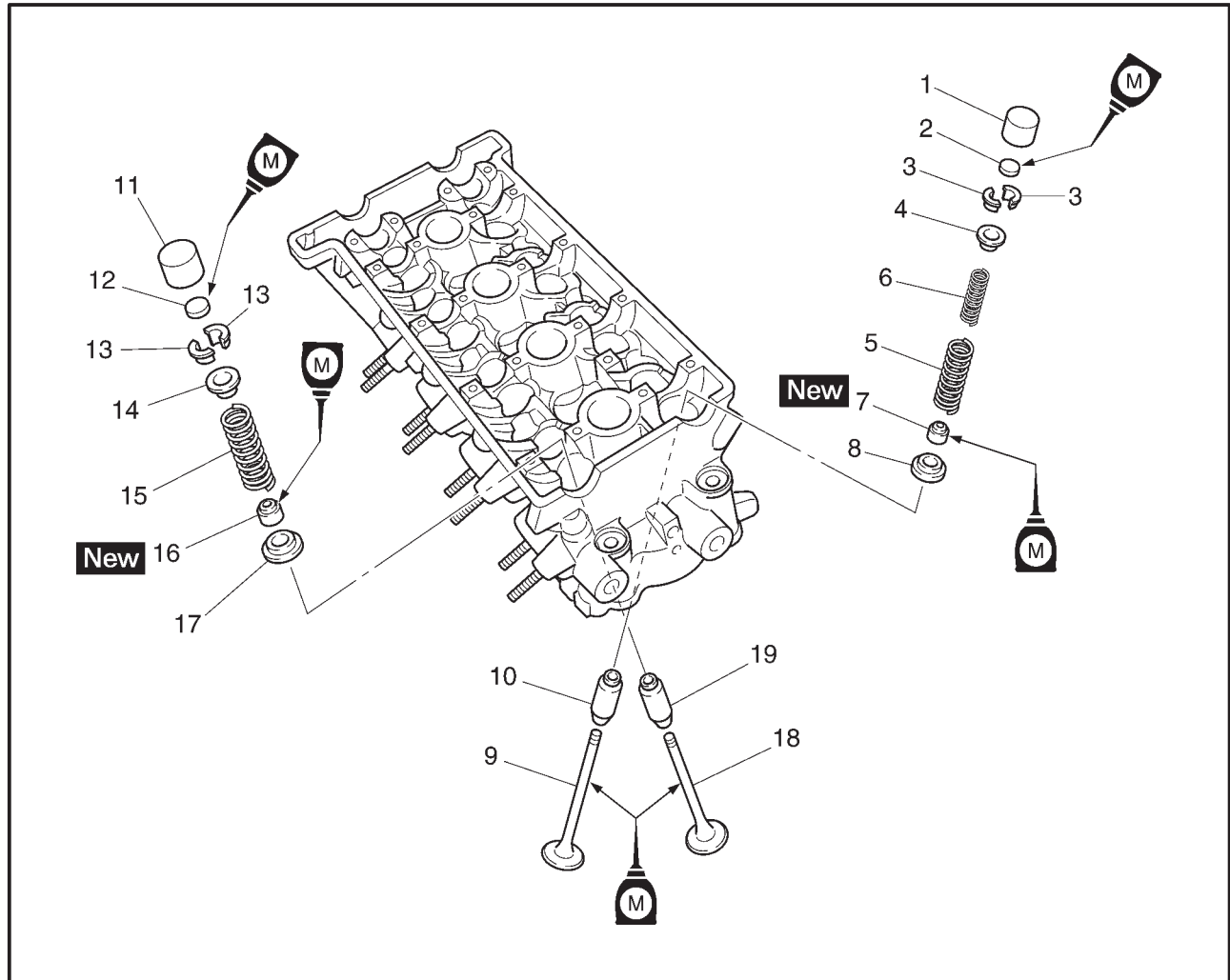


EAS00236

## VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	<b>Remove the valves and valve springs</b>		
	Cylinder head		Remove the parts in the order listed. Refer to "CYLINDER HEAD".
1	Intake valve lifter	8	Refer to "REMOVING/INSTALLING THE VALVES".
2	Intake valve pad	8	
3	Intake valve cotter	16	
4	Intake valve upper spring seat	8	
5	Intake valve spring outer	8	
6	Intake valve spring inner	8	
7	Intake valve oil seal	8	
8	Intake valve lower spring seat	8	
9	Intake valve	8	
10	Intake valve guide	8	
11	Exhaust valve lifter	8	
12	Exhaust valve pad	8	
13	Exhaust valve cotter	16	

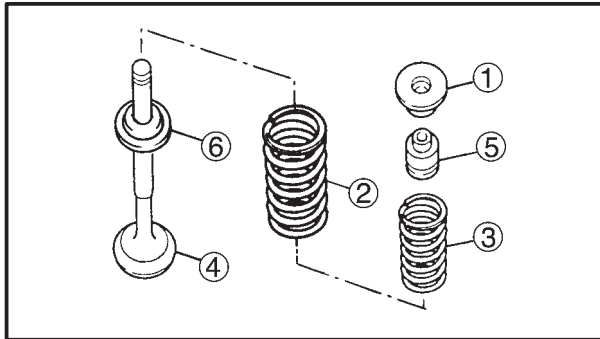


Order	Job/Part	Q'ty	Remarks
14	Exhaust valve upper spring seat	8	Refer to "REMOVING/INSTALLING THE VALVES".
15	Exhaust valve spring	8	
16	Exhaust valve oil seal	8	
17	Exhaust valve lower spring seat	8	
18	Exhaust valve	8	
19	Exhaust valve guide	8	For installation, reverse the removal procedure.





**Valve spring compressor**  
90890-04019, YM-04019  
**Valve spring compressor**  
**attachment**  
90890-04108, YM-01253



4. Remove:

- upper spring seat ①
- valve spring outer ②
- valve spring inner (intake only) ③
- valve ④
- oil seal ⑤
- lower spring seat ⑥

**NOTE:**

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

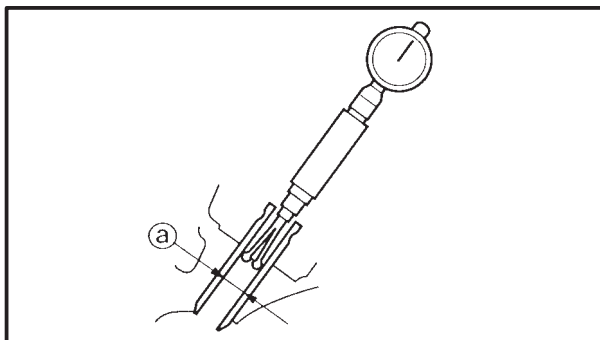
EAS00239

## CHECKING THE VALVES AND VALVE GUIDES

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

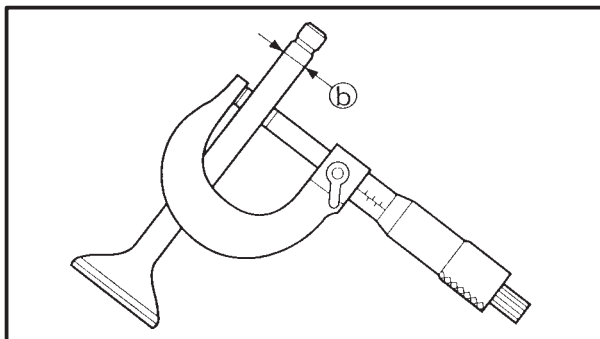
1. Measure:

- valve-stem-to-valve-guide clearance



**Valve-stem-to-valve-guide clearance =**  
**Valve guide inside diameter ① –**  
**Valve stem diameter ②**

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>: 0.08 mm (0.0031 in)

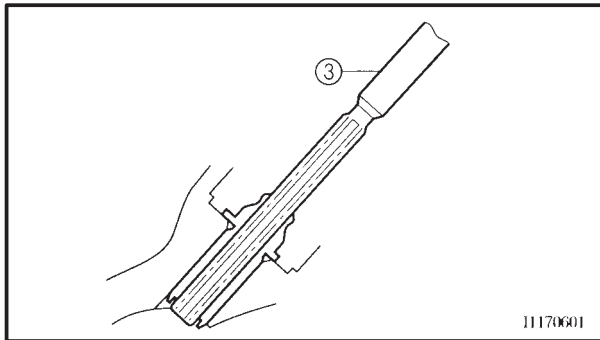
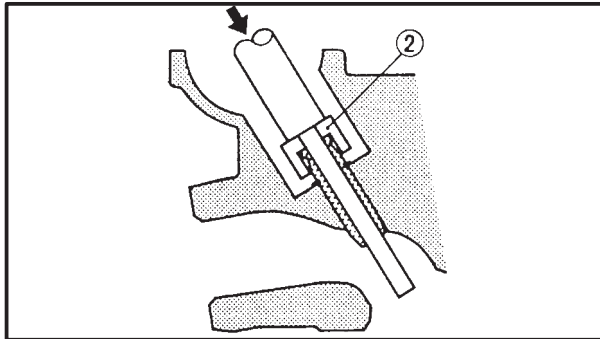
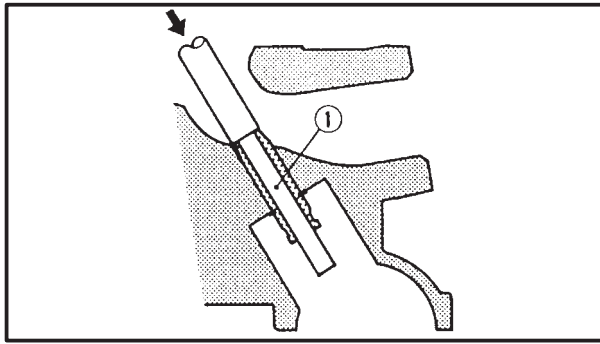
**Exhaust**

0.025 ~ 0.052 mm

(0.0010 ~ 0.0020 in)

<Limit>: 0.10 mm

(0.0039 in)



11170601

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.



- 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**  
(4 mm, 0.16 in)

90890-04111,

**Valve guide installer**

(4 mm, 0.16 in)

90890-04112,

**Valve guide reamer (4 mm, 0.16 in)**

90890-04113, YM-04113



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.



**NOTE:**

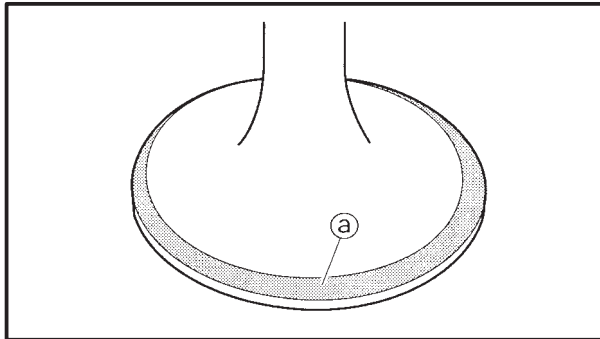
Where the valve seat and valve face contacted one another, the blueing will have been removed.

**4. Lap:**

- valve face
- valve seat

**NOTE:**

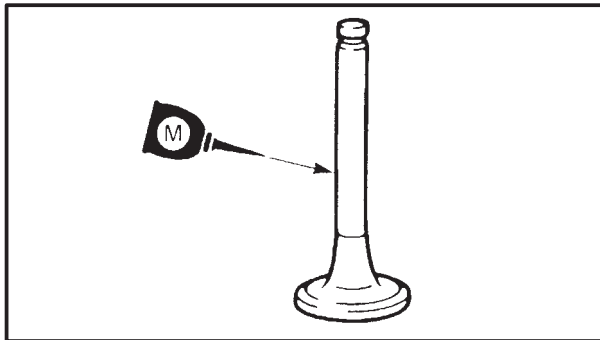
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.



- a. Apply a coarse lapping compound (a) to the valve face.

**CAUTION:**

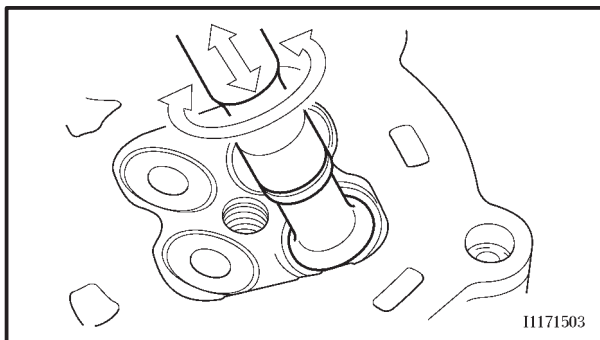
**Do not let the lapping compound enter the gap between the valve stem and the valve guide.**



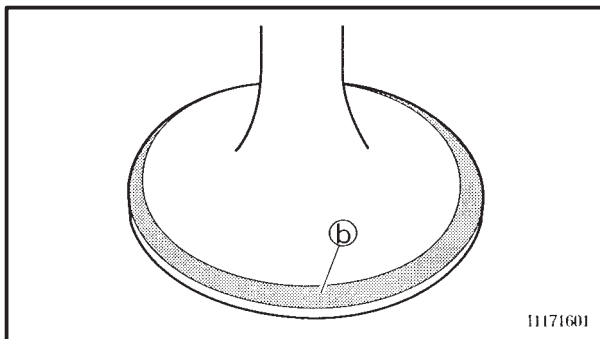
- b. Apply molybdenum disulfide oil onto the valve stem.  
c. Install the valve into the cylinder head.  
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

**NOTE:**

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

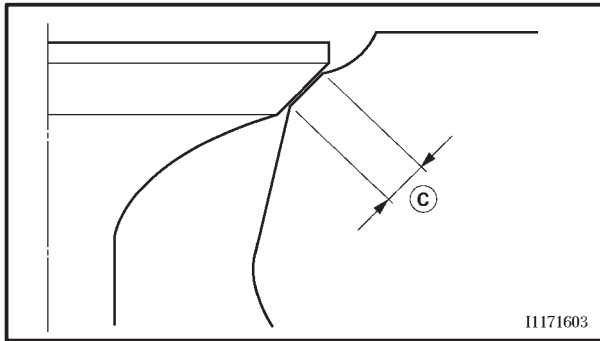


- e. Apply a fine lapping compound to the valve face and repeat the above steps.  
f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.

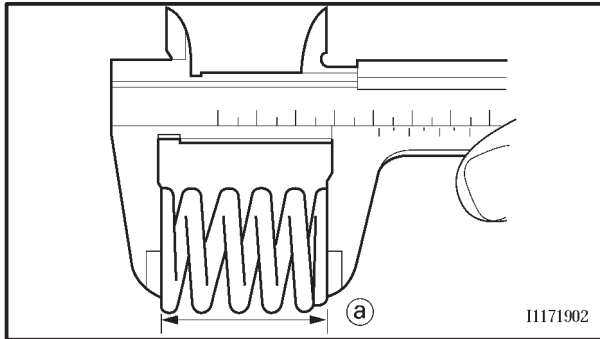


- g. Apply Mechanic's blueing dye (Dykem) (b) onto the valve face.  
h. Install the valve into the cylinder head.  
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.





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



EAS00241

## CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

### 1. Measure:

- valve spring free length (a)

Out of specification → Replace the valve spring.



### Valve spring free length

Intake valve spring (inner)  
35.7 mm (1.41 in)

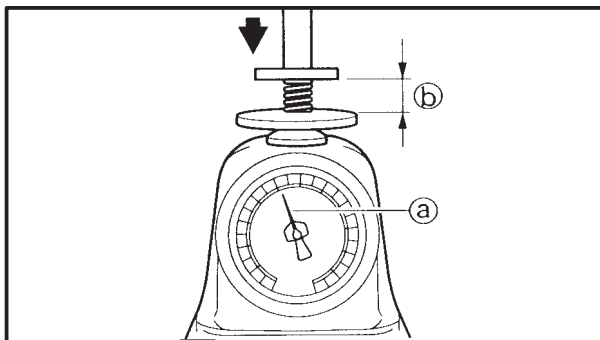
<Limit>: 33.9 mm (1.33 in)

Intake valve spring (outer)  
40.3 mm (1.59 in)

<Limit>: 38.3 mm (1.50 in)

Exhaust valve spring  
41.7 mm (1.64 in)

<Limit>: 39.6 mm (1.56 in)



### 2. Measure:

- compressed valve spring force (a)

Out of specification → Replace the valve spring.

### (b) Installed length



### Compressed valve spring force (installed)

Intake valve spring (inner)  
61.5 ~ 70.7 N

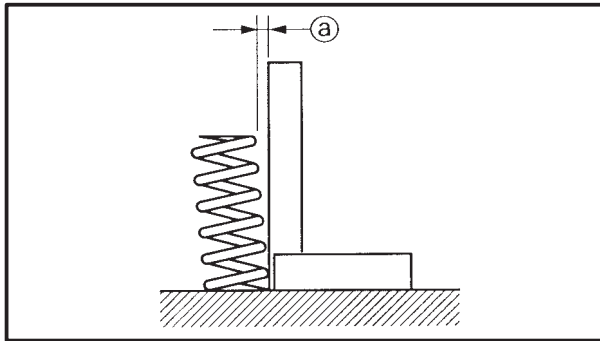
(6.27 ~ 7.21 kg,  
13.83 ~ 15.89 lb)

Intake valve spring (outer)  
139.1 ~ 160.1 N

(14.18 ~ 16.33 kg,  
31.27 ~ 35.99 lb)

Exhaust valve spring  
160 ~ 184 N

(16.32 ~ 18.76 kg,  
35.97 ~ 41.36 lb)



### 3. Measure:

- valve spring tilt ①

Out of specification → Replace the valve spring.



### Spring tilt limit

**Intake valve spring (inner)**

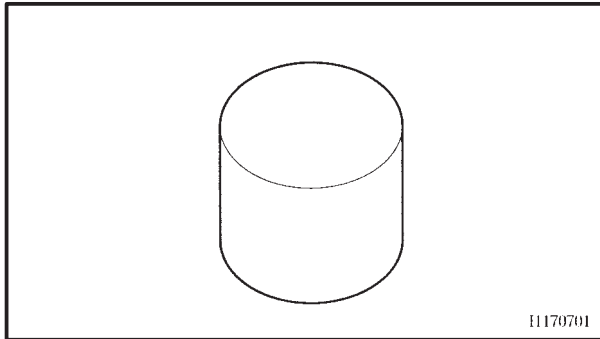
2.5° / 1.6 mm (0.06 in)

**(outer)**

2.5° / 1.8 mm (0.07 in)

**Exhaust valve spring**

2.5° / 1.8 mm (0.07 in)



E1170701

EAS00242

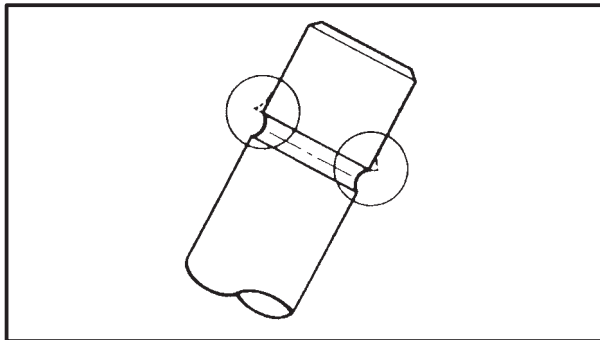
### CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

#### 1. Check:

- valve lifter

Damage/scratches → Replace the valve lifters and cylinder head.



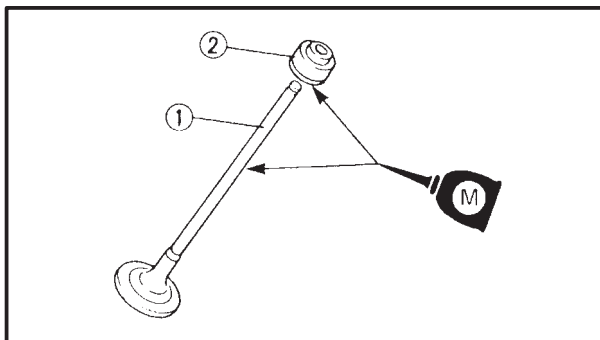
EAS00246

### INSTALLING THE VALVES

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

#### 1. Deburr:

- valve stem end  
(with an oil stone)



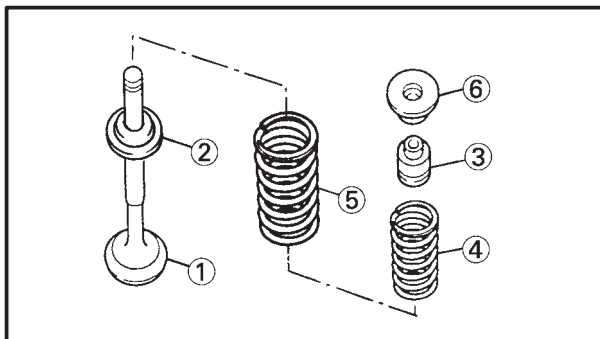
#### 2. Lubricate:

- valve stem ①
- valve stem seal ②  
(with the recommended lubricant)



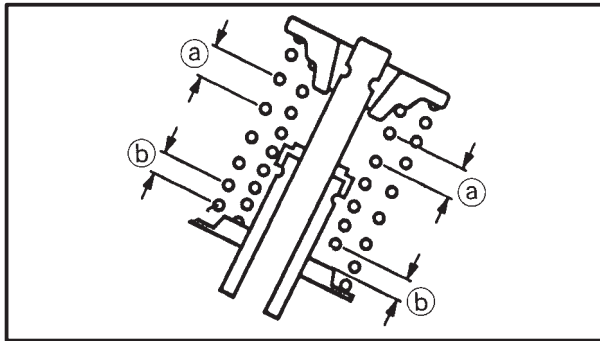
**Recommended lubricant**

**Molybdenum disulfide oil**



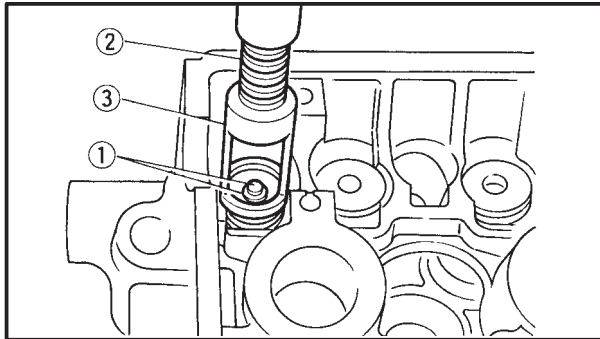
#### 3. Install:

- valve ①
- lower spring seat ②
- valve stem seal ③
- valve spring inner (intake only) ④
- valve spring outer ⑤
- upper spring seat ⑥  
(into the cylinder head)

**NOTE:**

- Make sure that each valve is installed in its original place.
- Install the valve springs with the larger pitch (a) facing up.

(b) Smaller pitch



## 4. Install:

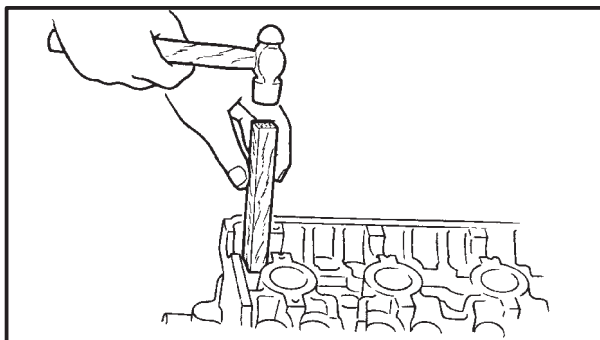
- valve cotters (1)

**NOTE:**

Install the valve cotters by compressing the valve springs with the valve spring compressor (2) and the valve spring compressor attachment (3).



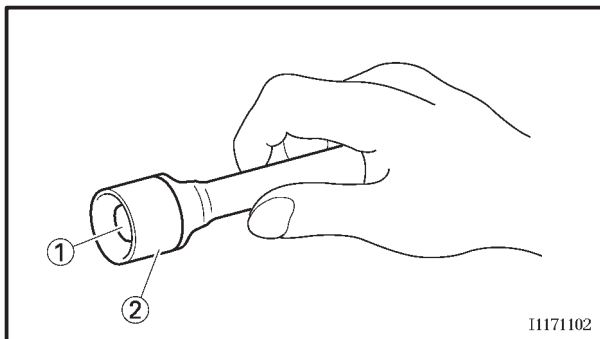
**Valve spring compressor**  
90890-04019, YM-04019  
**Valve spring compressor attachment**  
90890-04108, YM-01253



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:**

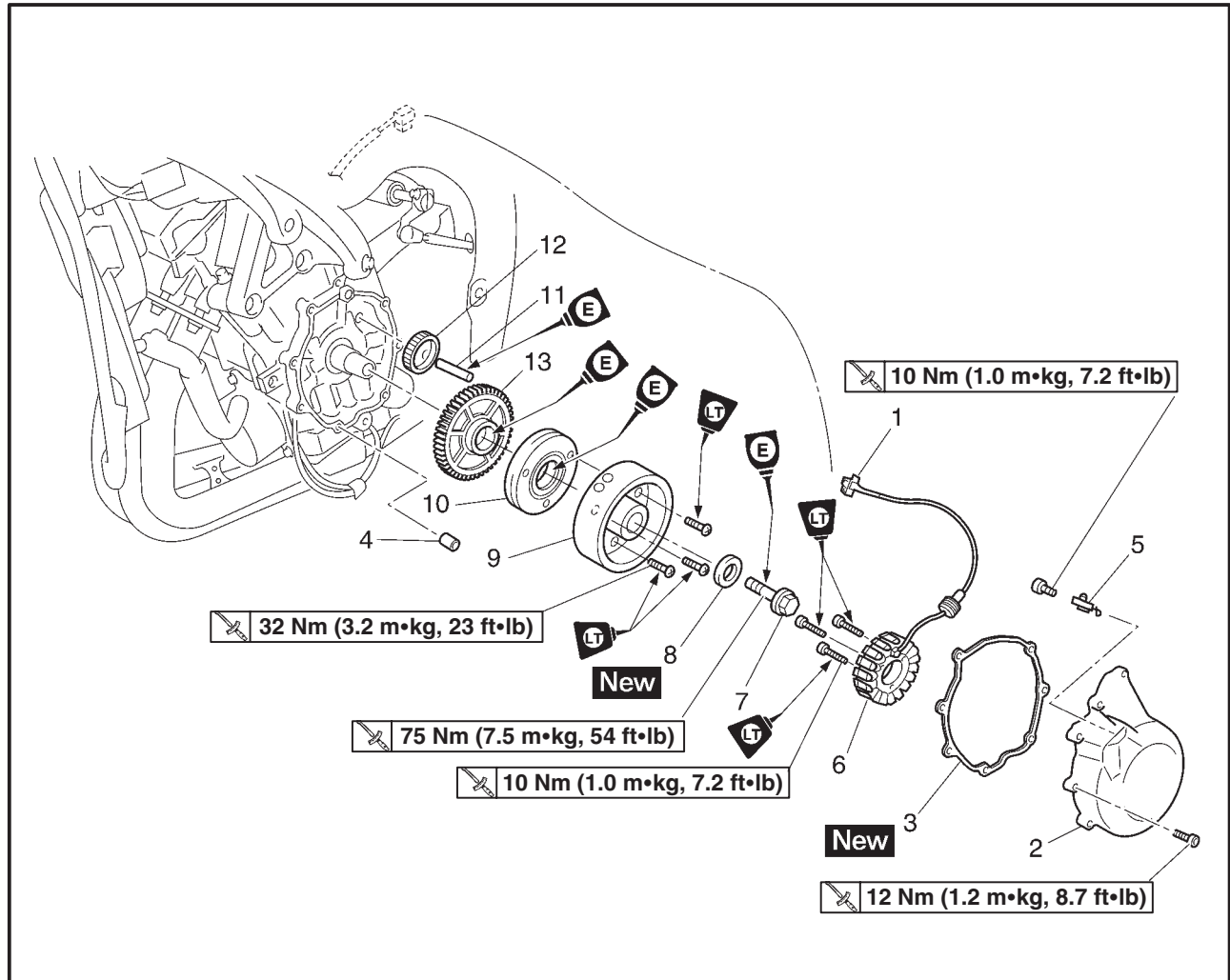
- Lubricate the valve lifter and valve pad with molybdenum disulfide oil.
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.

I1171102

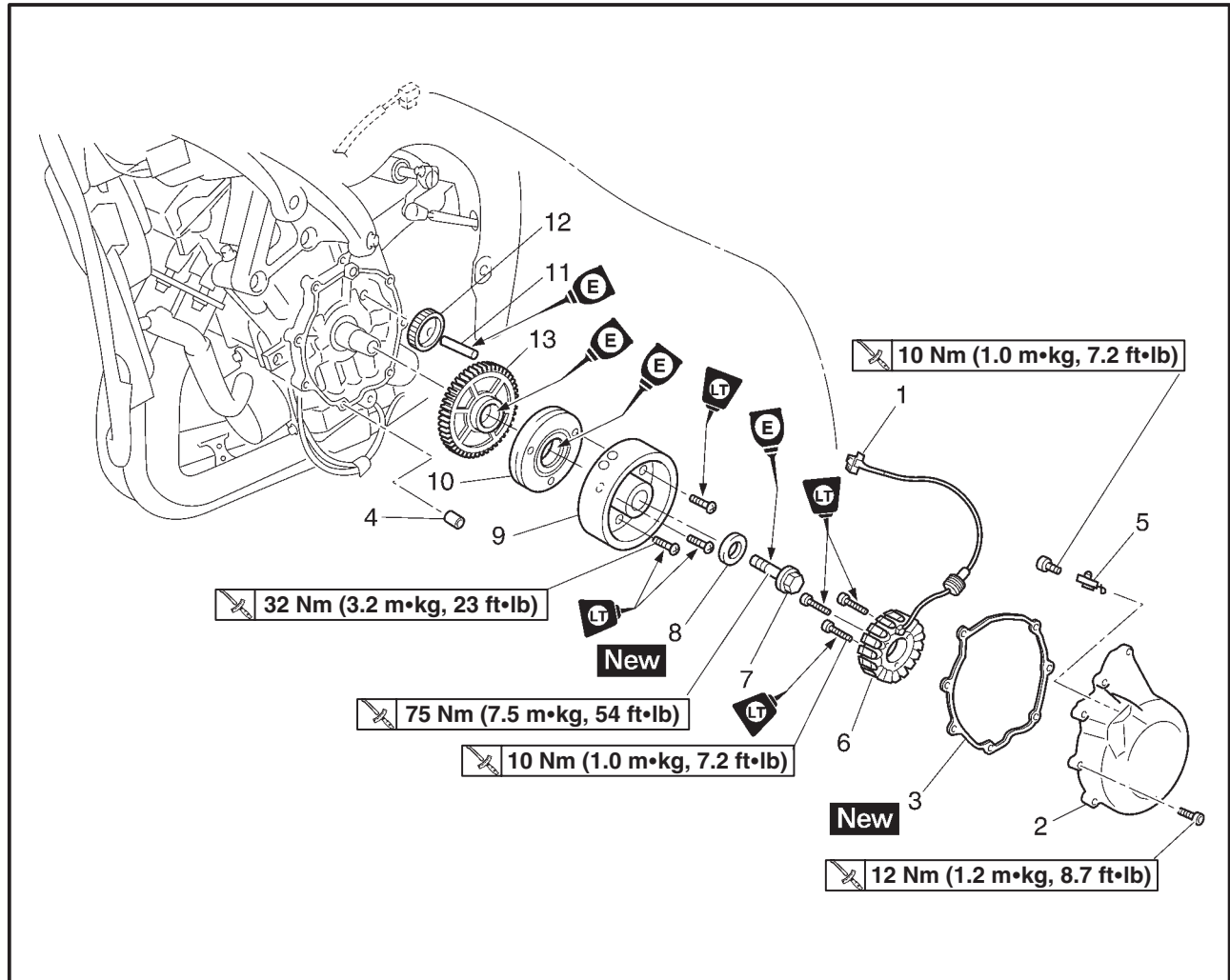


EAS00341

# STARTER CLUTCH AND GENERATOR STATOR COIL ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	<b>Removing the stator coil assembly</b>		
	Rider seat and fuel tank		Remove the parts in the order listed. Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Bottom cowling		Refer to "COWLINGS" in chapter 3.
	Left side cowling		
	Coolant		Drain.
	Coolant reservoir tank		Refer to "CHANGING THE COOLANT" in chapter 3.
	Engine oil		Drain.
			Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Stator coil assembly coupler	1	Disconnect.
2	Generator rotor cover	1	
3	Generator rotor cover gasket	1	
4	Dowel pin	2	
5	Stator coil assembly lead holder	1	



Order	Job/Part	Q'ty	Remarks
6	Stator coil assembly	1	Refer to "REMOVING/INSTALLING THE GENERATOR".
7	Generator rotor bolt	1	
8	Washer	1	
9	Generator rotor	1	
10	Starter clutch assembly	1	
11	Idler gear shaft	1	For installation, reverse the removal procedure.
12	Idler gear	1	
13	Starter clutch drive gear	1	



EAS00347

## REMOVING THE GENERATOR

### 1. Remove:

- rider seat and fuel tank  
Refer to “SEATS” and “FUEL TANK” in chapter 3.
- bottom cowling
- left side cowling  
Refer to “COWLINGS” in chapter 3.

### 2. Drain:

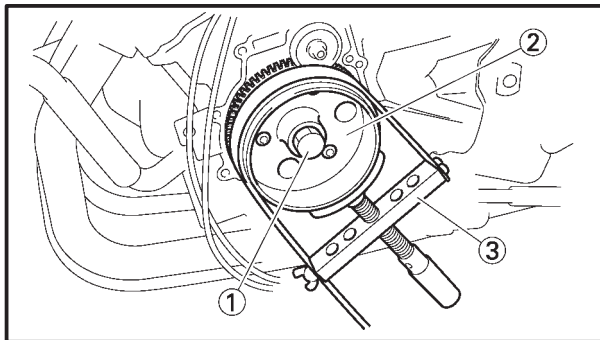
- coolant  
Refer to “CHANGING THE COOLANT” in chapter 3.
- engine oil  
Refer to “CHANGING THE ENGINE OIL” in chapter 3.

### 3. Remove:

- 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.



### 4. Remove:

- generator rotor bolt ①
- washer

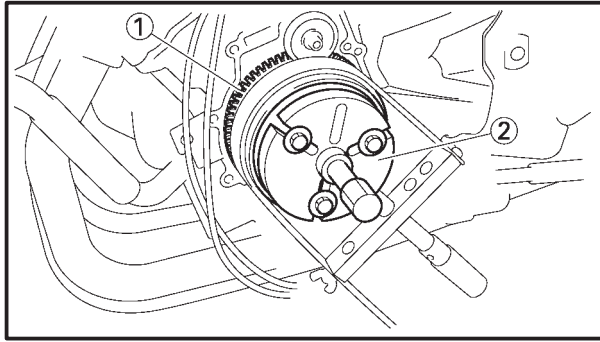
### NOTE:

- While holding the generator rotor ② with the sheave holder ③, loosen the generator rotor bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.



**Sheave holder**

90890-01701, YS-01880-A



5. Remove:

- generator rotor ①  
(with the flywheel puller ② and flywheel puller attachment)
- woodruff key

## 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:

Make sure the flywheel puller is centered over the generator rotor.

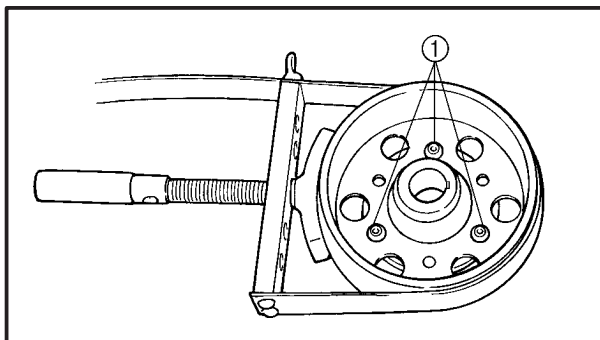


**Flywheel puller**

90890-01362, YU-33270

**Flywheel puller attachment**

90890-04089, YM-33282



## REMOVING THE STARTER CLUTCH

1. Remove:

- starter clutch bolt ①

## NOTE:

- While holding the generator rotor with the sheave holder, remove the starter clutch bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.



**Sheave holder**

90890-01701, YS-01880-A

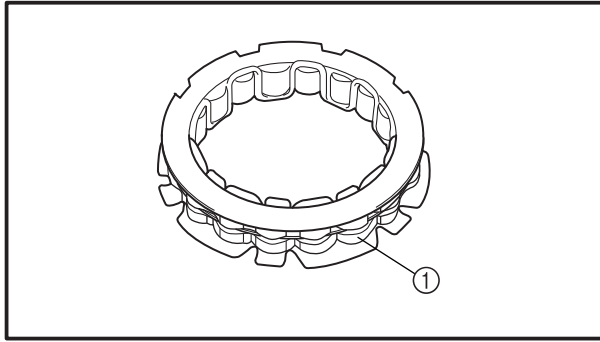


EAS00351

## CHECKING THE STARTER CLUTCH

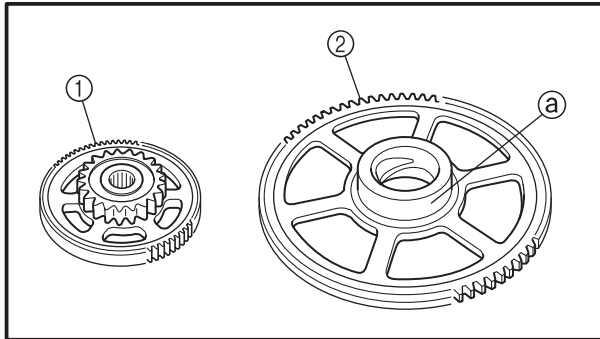
### 1. Check:

- starter clutch rollers ①  
Damage/wear → Replace.



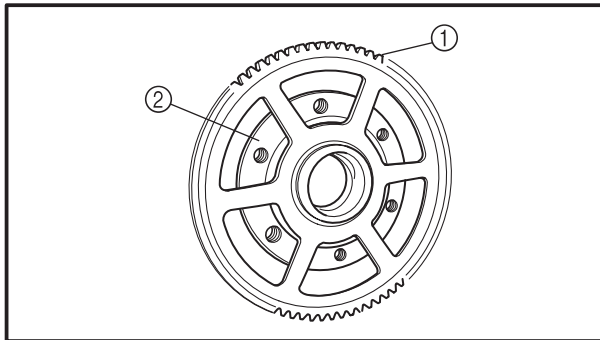
### 2. Check:

- starter clutch idle gear ①
- starter clutch drive gear ②  
Burrs/chips/roughness/wear → Replace the defective part(s).



### 3. Check:

- starter clutch gear's contacting surfaces (a)  
Damage/pitting/wear → Replace the starter clutch gear.

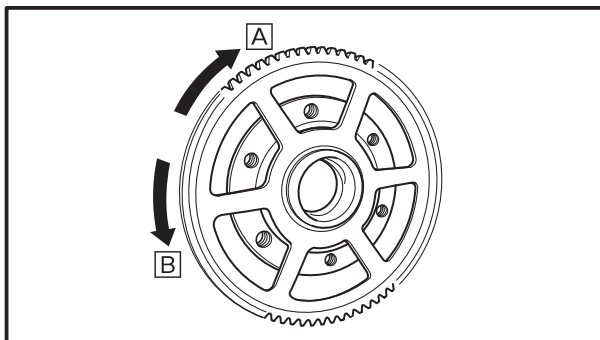


### 4. Check:

- starter clutch operation



- Install the starter clutch drive gear ① onto the starter clutch ② and hold the starter clutch.
- 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.
- When turning the starter clutch drive gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.

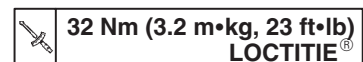


EAS00355

## INSTALLING THE STARTER CLUTCH

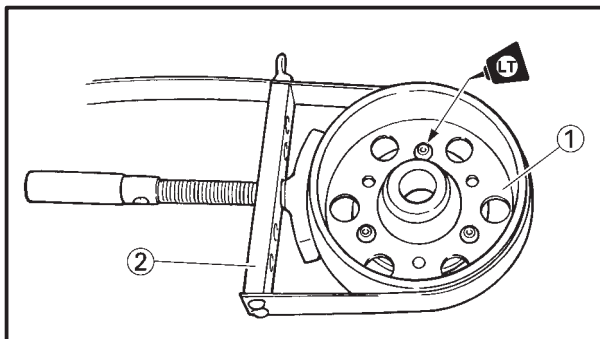
### 1. Install:

- starter clutch



### NOTE:

- While holding the generator rotor ① with the sheave holder ②, tighten the starter clutch bolt.







- Do not allow the sheave holder to touch the projection on the generator rotor.



**Sheave holder**  
90890-01701, YS-01880-A

EAS00354

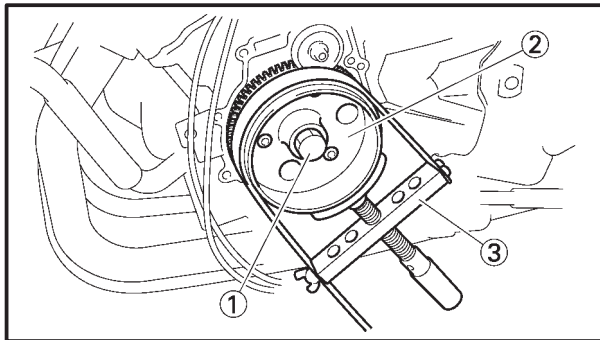
## INSTALLING THE GENERATOR

### 1. Install:

- generator rotor
- washer **New**
- generator rotor bolt

### NOTE:

- Clean the tapered portion of the crankshaft and the generator rotor hub.
- Replace the washer with new one.



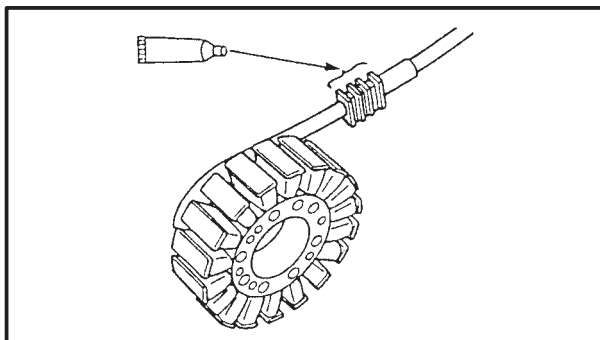
### 2. Tighten:

- generator rotor bolt (1)

**75 Nm (7.5 m•kg, 54 ft•lb)**

### NOTE:

- While holding the generator rotor (2) with the sheave holder (3), tighten the generator rotor bolt.
- 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 stator coil assembly lead grommet)



**Yamaha bond No.1215**  
90890-85505, ACC-11001-05-01

### 4. Install:

- stator coil

### 5. Install:

- generator rotor cover

**12 Nm (1.2 m•kg, 8.7 ft•lb)**

**NOTE:**

Tighten the generator rotor cover bolts in stages and in a crisscross pattern.

---

**6. Fill:**

- engine oil

Refer to “CHANGING THE ENGINE OIL” in chapter 3.

- coolant

Refer to “CHANGING THE COOLANT” in chapter 3.

**7. Install:**

- left side cowling

- bottom cowling

Refer to “COWLINGS” in chapter 3.

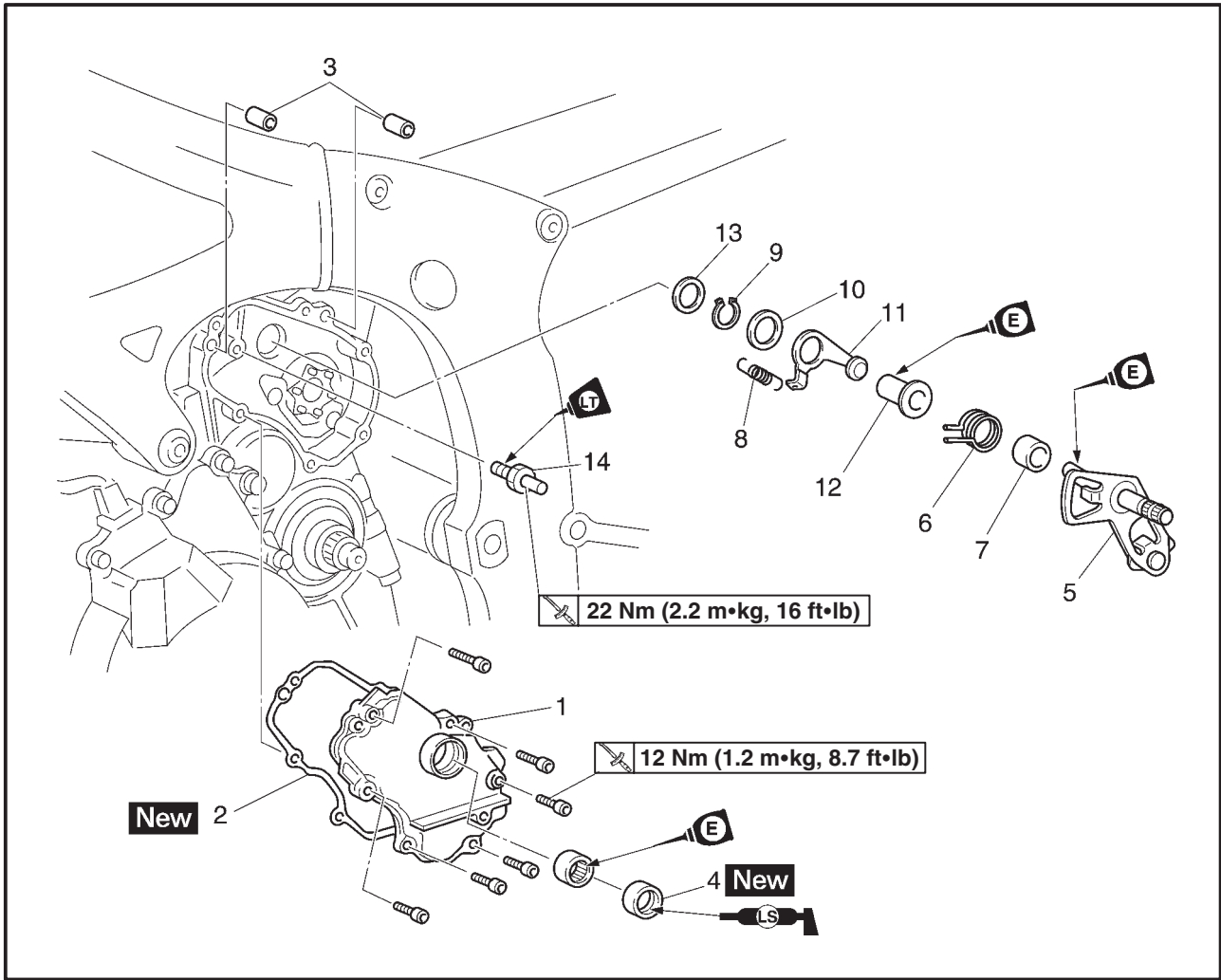
- rider seat and fuel tank

Refer to “SEATS” and “FUEL TANK” in chapter 3.

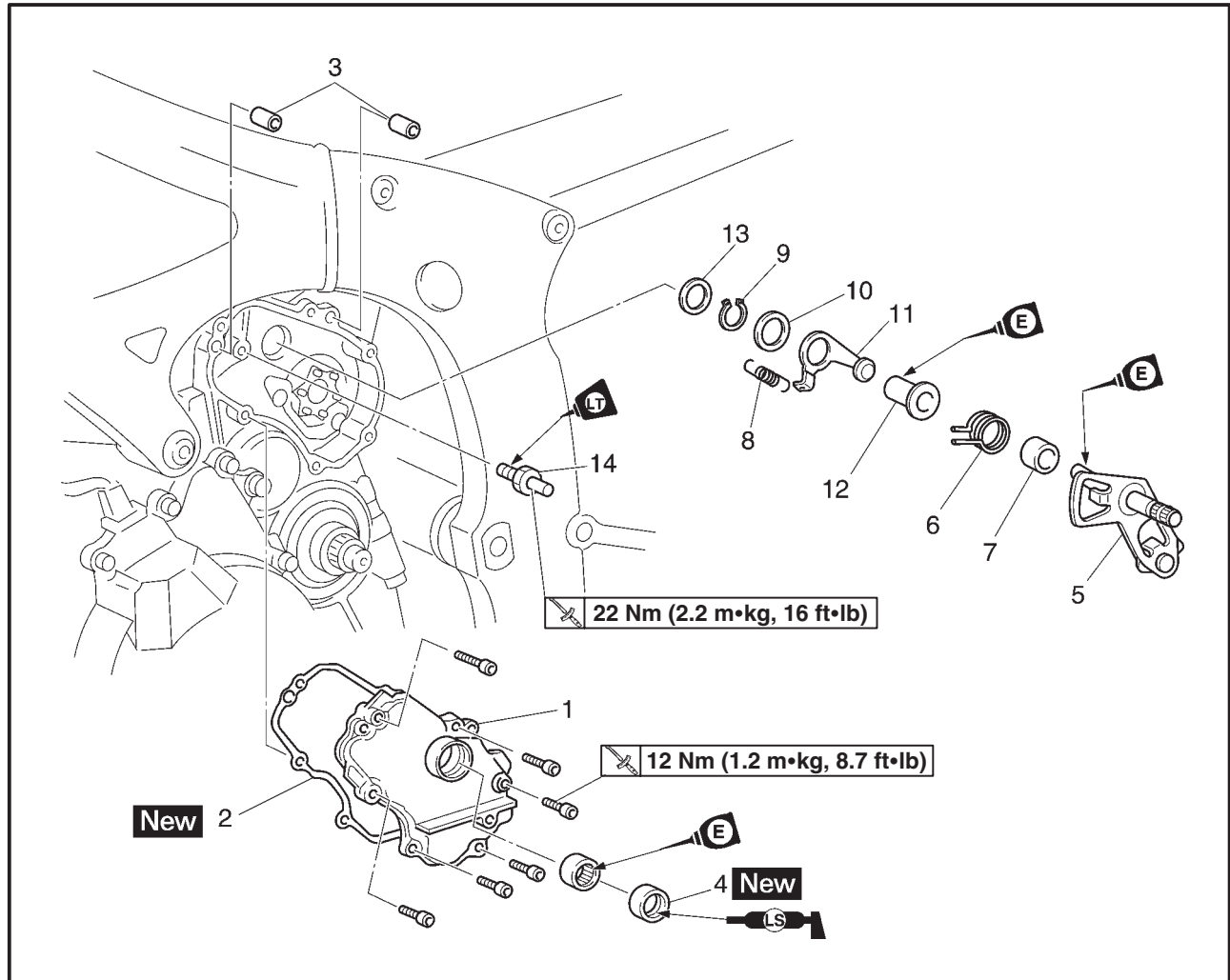


EAS00327

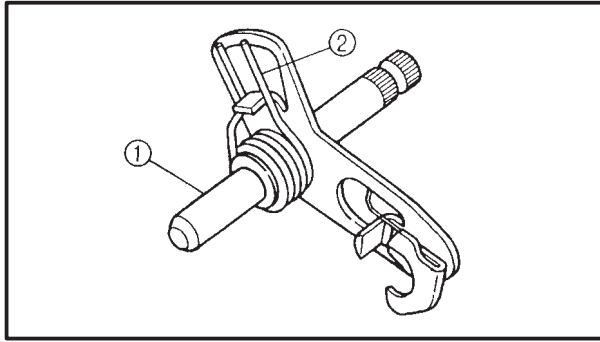
SHIFT SHAFT  
SHIFT SHAFT AND STOPPER LEVER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the shift shaft and stopper lever</b>		Remove the parts in the order listed.
	Coolant reservoir tank		Drain.
	Coolant		Refer to "CHANGING THE COOLANT" in chapter 3.
	Drive sprocket cover		Refer to "ENGINE".
1	Shift shaft cover	1	
2	Shift shaft cover gasket	1	
3	Dowel pin	1	
4	Oil seal	1	
5	Shift shaft	1	
6	Shift shaft spring	1	
7	Collar	1	
8	Stopper lever spring	1	
9	Circlip	1	
10	Washer	1	



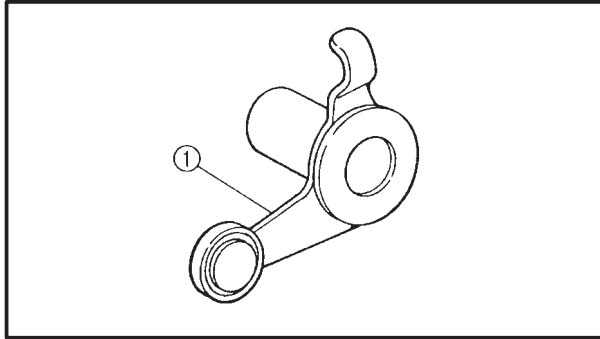
Order	Job/Part	Q'ty	Remarks
11	Stopper lever	1	For installation, reverse the removal procedure.
12	Collar	1	
13	Washer	1	
14	Shift shaft spring stopper	1	



EAS00328

### CHECKING THE SHIFT SHAFT

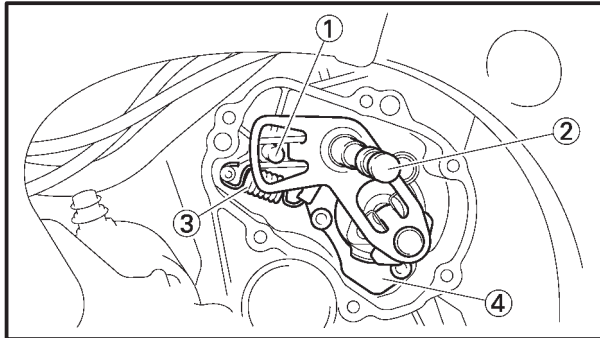
1. Check:
  - shift shaft ①  
Bends/damage/wear → Replace.
  - shift shaft spring ②  
Damage/wear → Replace.



EAS00330

### CHECKING THE STOPPER LEVER

1. Check:
  - stopper lever ①  
Bends/damage → Replace.  
Roller turns roughly → Replace the stopper lever.



EAS00332

### INSTALLING THE SHIFT SHAFT

1. Install:
  - shift shaft spring stopper ①

22 Nm (2.2 m•kg, 16 ft•lb)

- washers
- shift shaft ②

#### NOTE:

- Apply LOCTITE® to the threads of the shift shaft spring stopper.
- Hook the ends ③ of the stopper lever spring onto the stopper lever ④ and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.

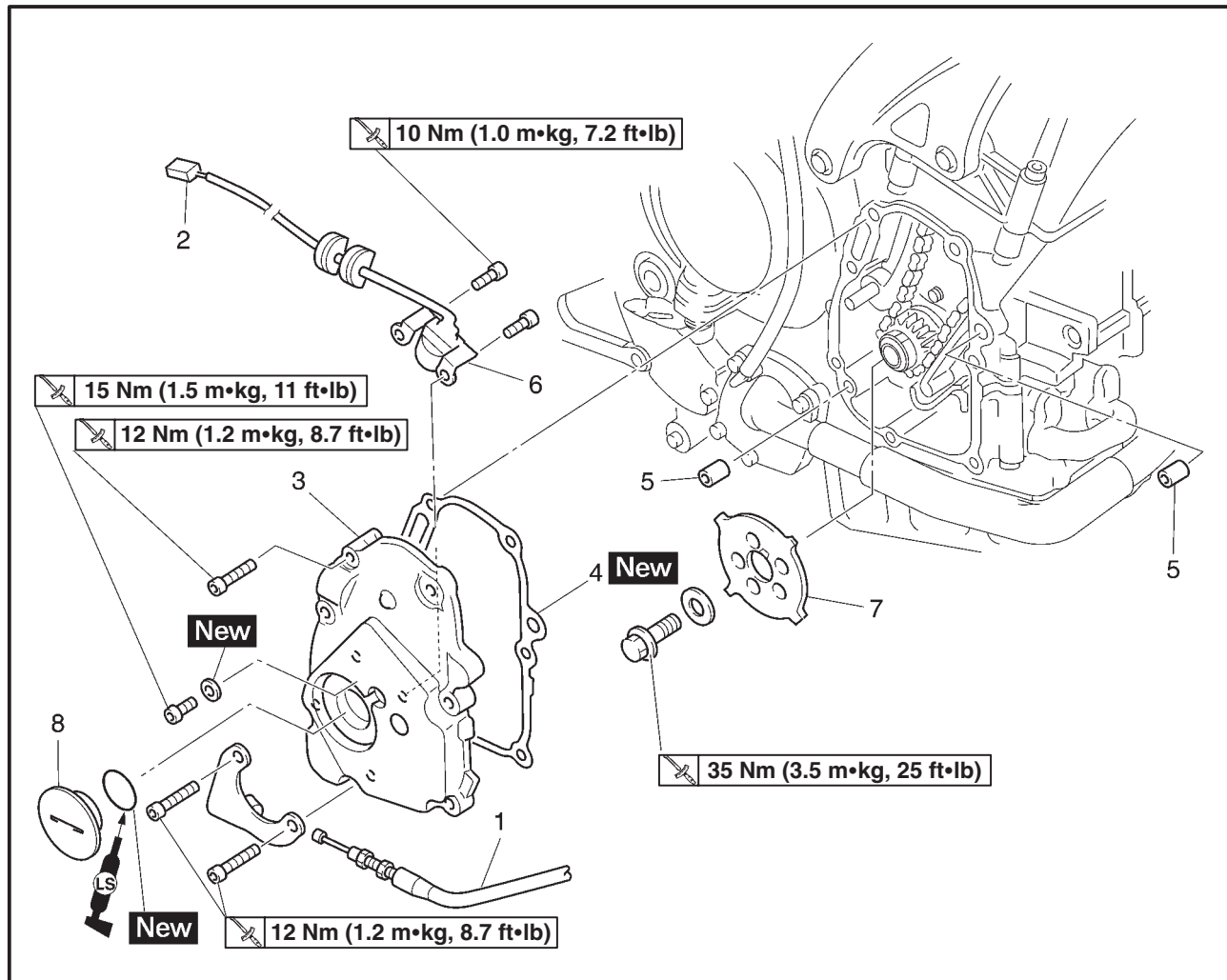
2. Install:
  - shift shaft cover

#### NOTE:

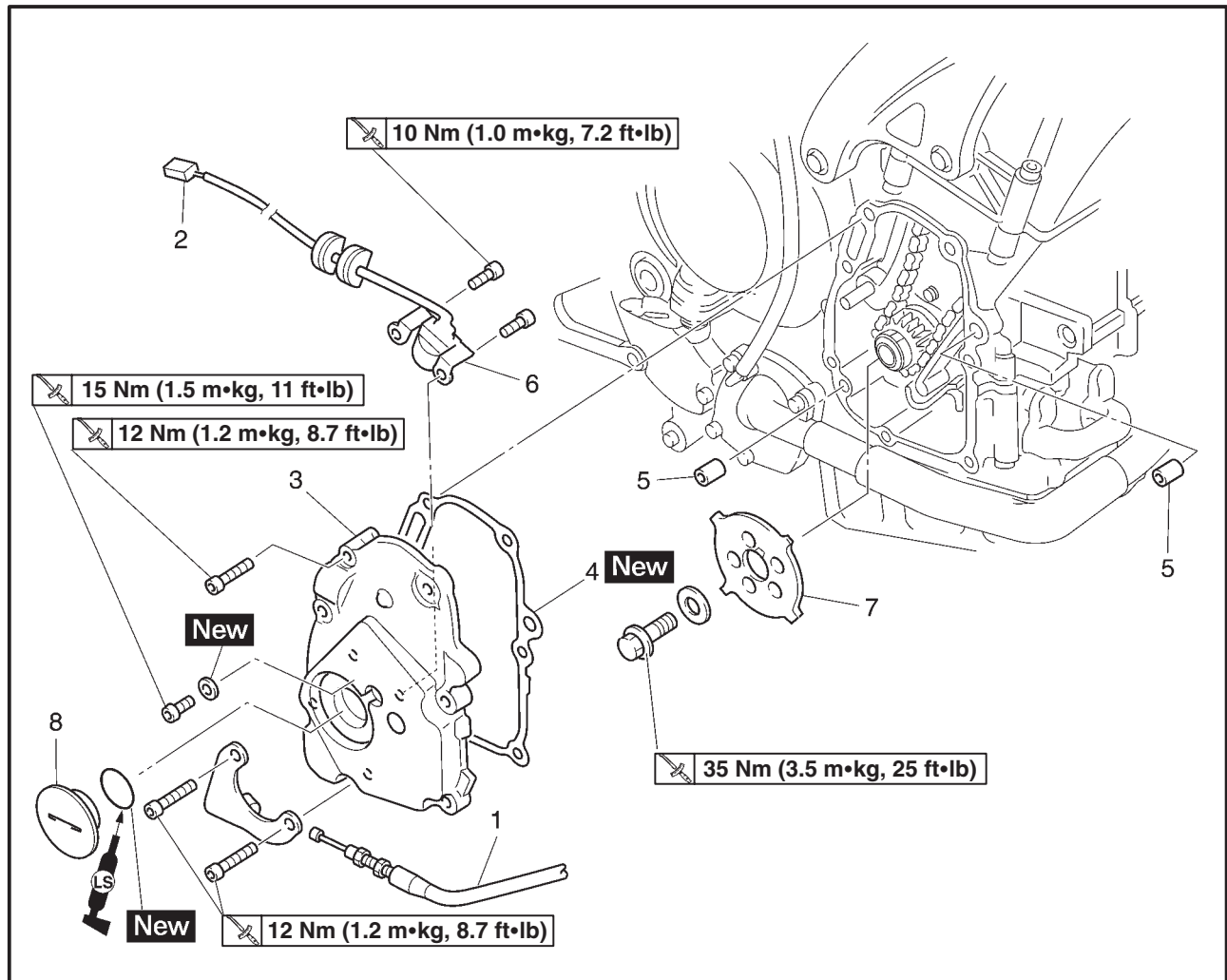
Lubricate the oil seal lips with lithium-soap-based grease.



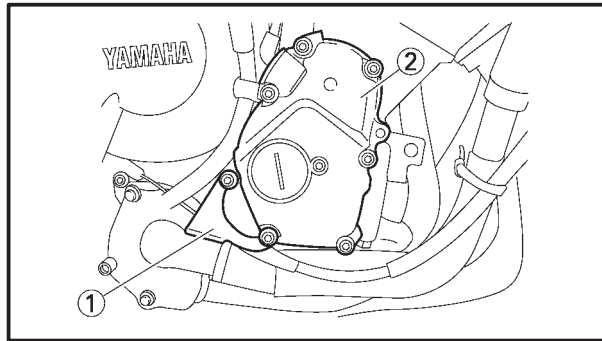
## CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR



Order	Job/Part	Q'ty	Remarks
	<b>Removing the crankshaft position sensor and pickup rotor</b>		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Right side cowling		Refer to "COWLINGS" in chapter 3.
	Bottom cowling		
	Engine oil		Drain.
	Generator cover		Refer to "CHANGING THE ENGINE OIL" in chapter 3.
			Refer to "STARTER CLUTCH AND GENERATOR".
1	Clutch cable	1	Disconnect.
2	Crankshaft position sensor lead coupler	1	Disconnect.
3	Pickup rotor cover	1	
4	Pickup rotor cover gasket	1	
5	Dowel pin	2	



Order	Job/Part	Q'ty	Remarks
6	Crankshaft position sensor	1	For installation, reverse the removal procedure.
7	Pickup rotor	1	
8	Plug screw	1	



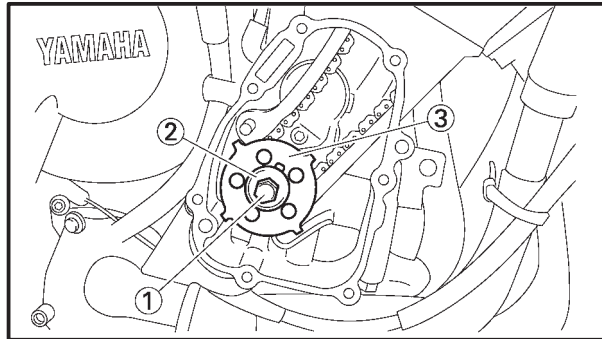
## REMOVING THE PICKUP ROTOR

1. Remove:

- clutch cable holder ①
- pickup rotor cover ②

### 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.

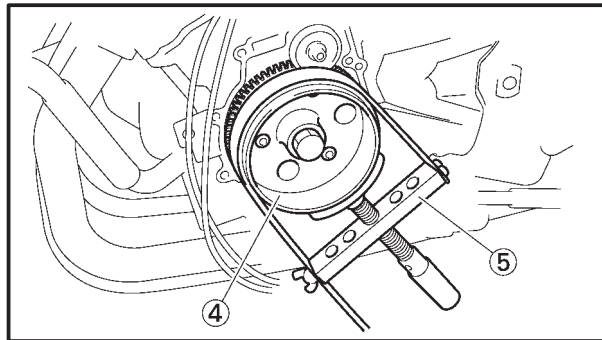


2. Remove:

- pickup rotor bolt ①
- washer ②
- pickup rotor ③

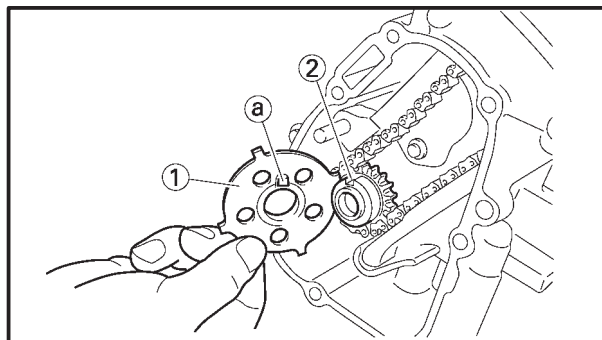
### NOTE:

While holding the generator rotor ④ with the rotor holding tool ⑤, loosen the pickup rotor bolt.



**Sheave holder**

90890-01701, YS-01880-A



## INSTALLING THE PICKUP ROTOR

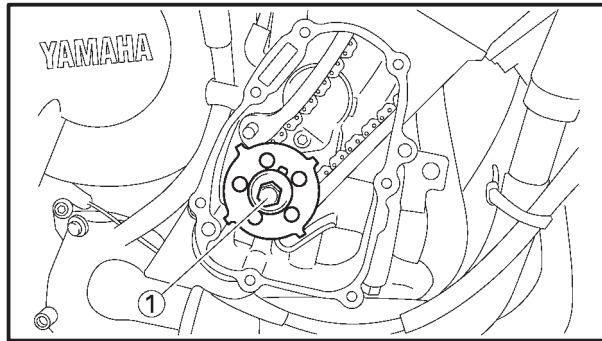
1. Install:

- pickup rotor ①
- washer
- pickup rotor bolt

### NOTE:

When installing the pickup rotor, align the groove ② in the crankshaft sprocket with the point ① in the pickup rotor.





2. Tighten:

- pickup rotor bolt ①

35 Nm (3.5 m•kg, 25 ft•lb)

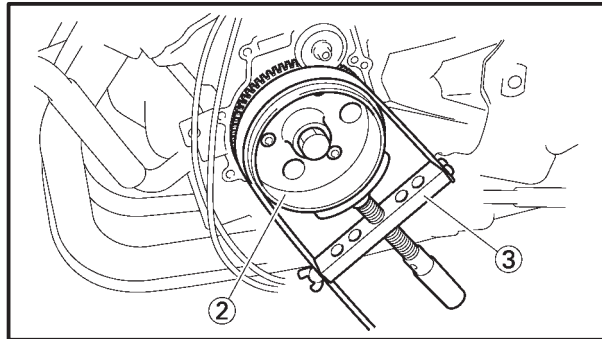
**NOTE:**

While holding the generator rotor ② with the sheave holder ③, tighten the pickup rotor bolt.



**Sheave holder**

90890-01701, YS-01880-A



3. Apply:

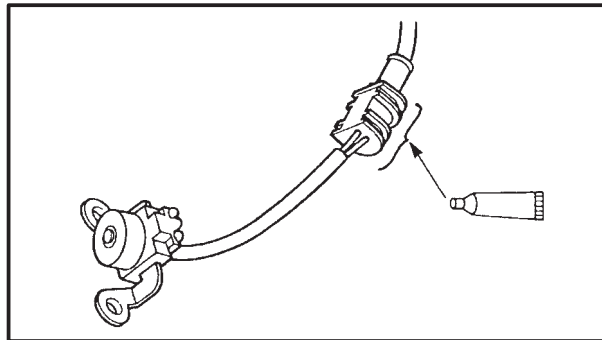
- sealant

(onto the crankshaft position sensor lead grommet)



**Yamaha bond No.1215**

90890-85505, ACC-11001-5-01

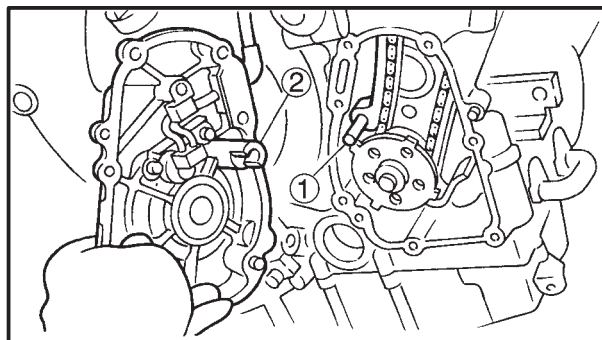


4. Install:

- pickup rotor cover
- clutch cable holder

**NOTE:**

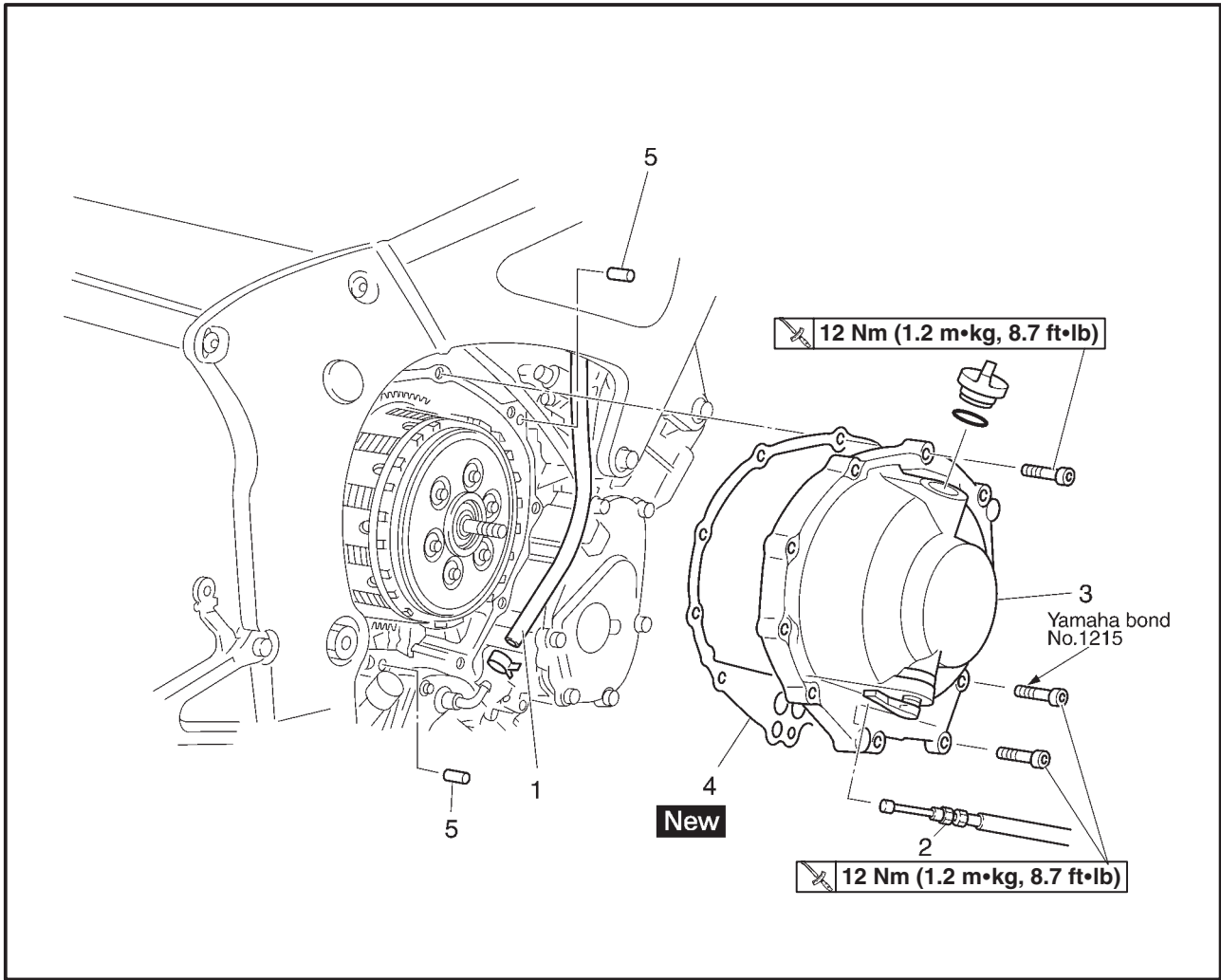
- When installing the pickup rotor cover, align the timing chain guide (intake side) pin ① of the with the hole ② in the pickup rotor cover.
- Tighten the pickup rotor cover bolts in stages and in a crisscross pattern.



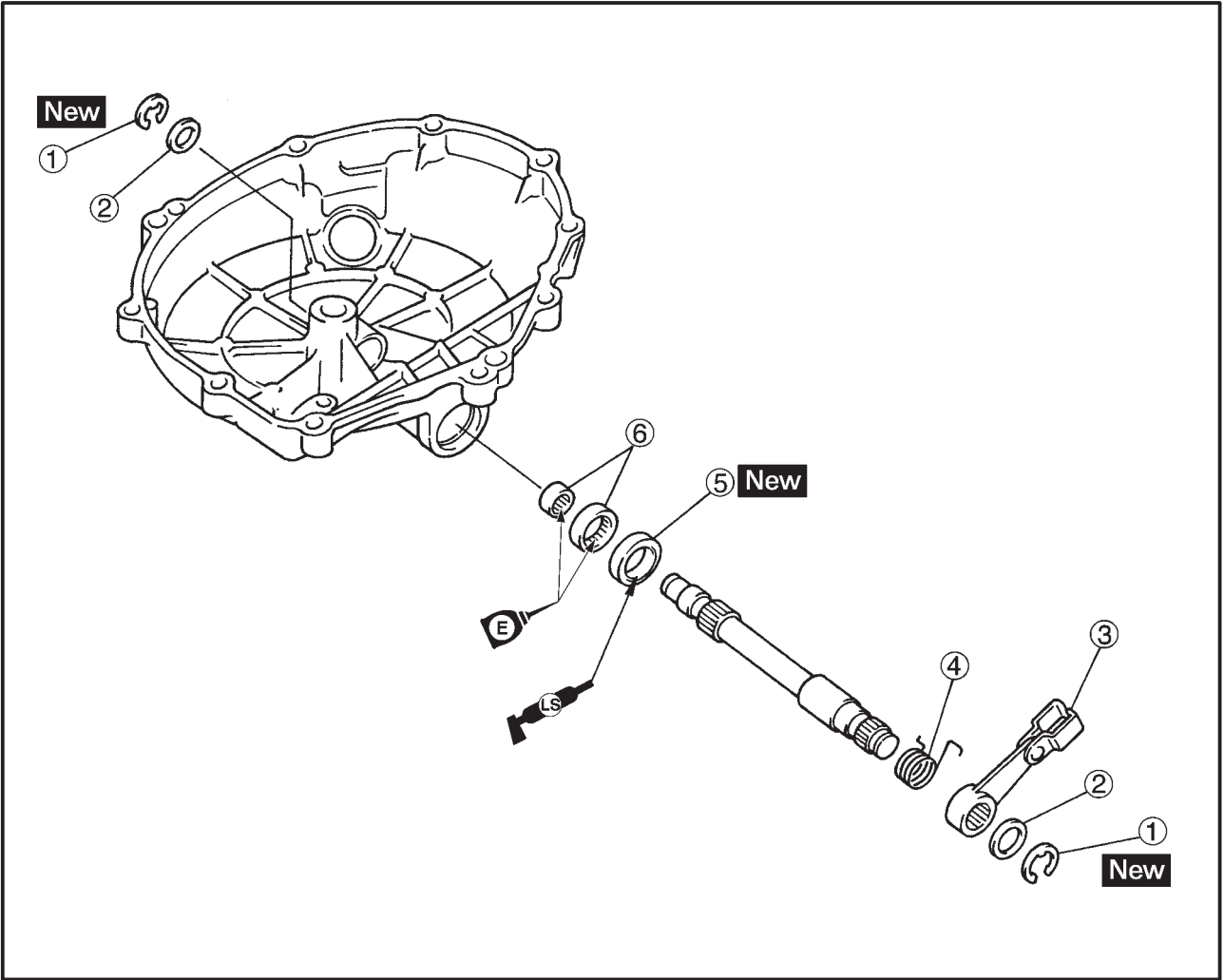


EAS00273

CLUTCH  
CLUTCH COVER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the clutch cover</b>		Removing the parts in the order listed.
	Bottom cowlng		Refer to "COWLINGS" in chapter 3.
	Right side cowlng		
	Engine oil		Drain.
			Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Coolant		Drain.
			Refer to "CHANGING THE COOLANT" in chapter 3.
1	Coolant hose	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	Clutch cover	1	
4	Clutch cover gasket	1	
5	Dowel pin	2	
			For installation, reverse the removal procedure.

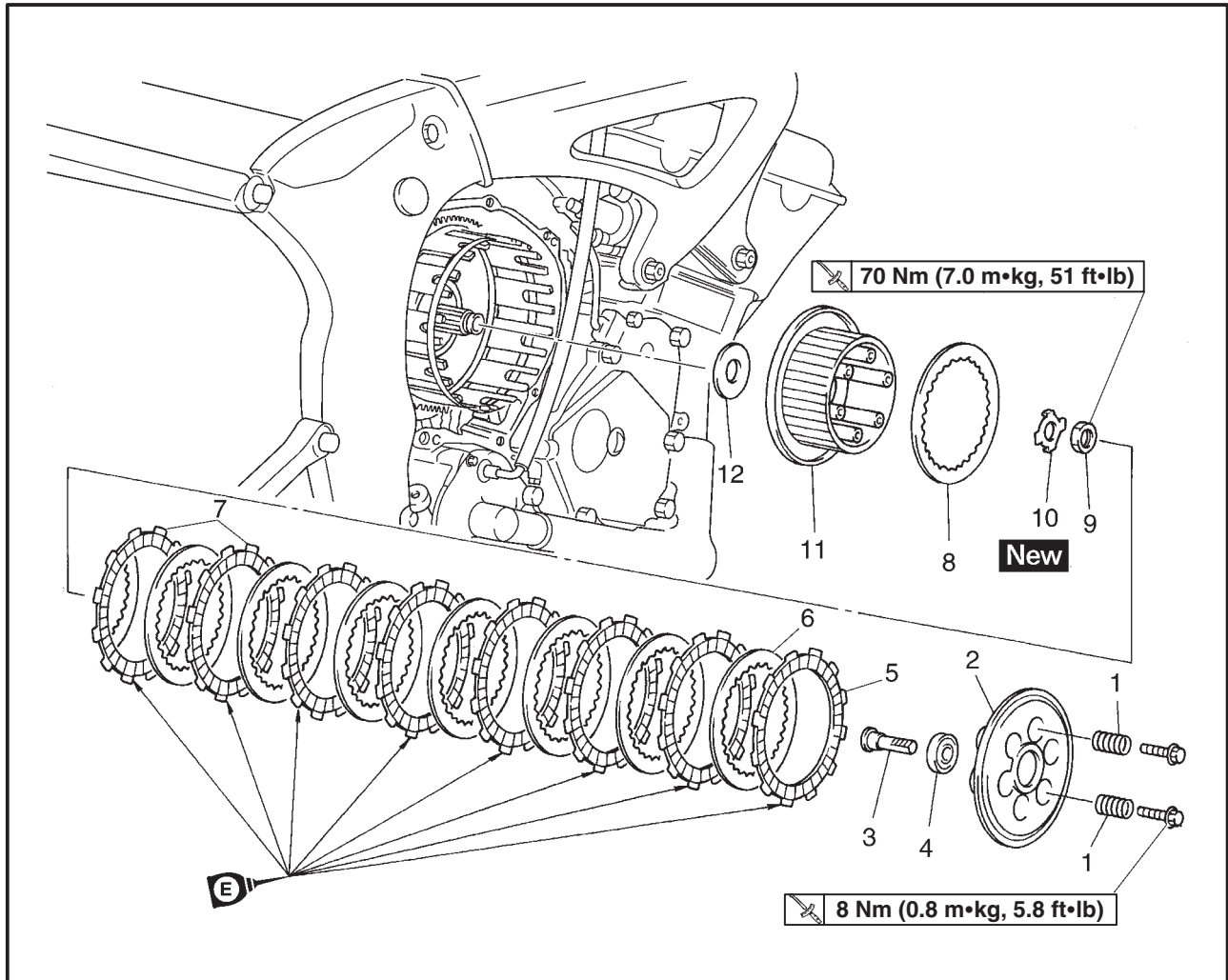


Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the clutch cover</b>		
①	Circlip	2	Disassemble the parts in the order listed.
②	Washer	2	
③	Pull lever	1	
④	Pull lever spring	1	
⑤	Oil seal	1	
⑥	Bearing	2	
			For assembly, reverse the disassembly procedure.

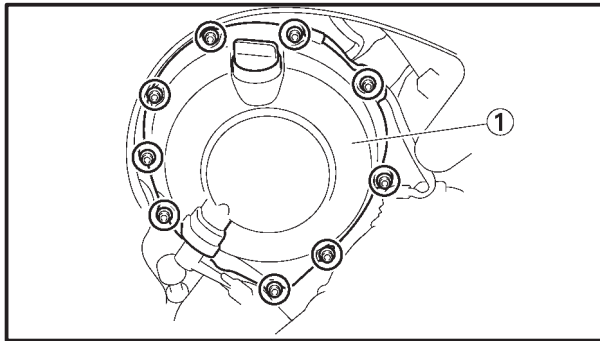


EAS00274

## CLUTCH



Order	Job/Part	Q'ty	Remarks
	<b>Removing the clutch</b>		Remove the parts in the order listed.
1	Compression spring	6	
2	Pressure plate	1	
3	Pull rod	1	
4	Bearing	1	
5	Friction plate (Brown)	6	
6	Clutch plate (t=2.0 mm, 0.08 in)	7	
7	Friction plate (Purple)	2	
8	Clutch plate (t=2.3 mm, 0.09 in)	1	
9	Clutch boss nut	1	
10	Lock plate	1	
11	Clutch boss	1	
12	Thrust plate	1	
			For installation, reverse the removal procedure.



EAS00276

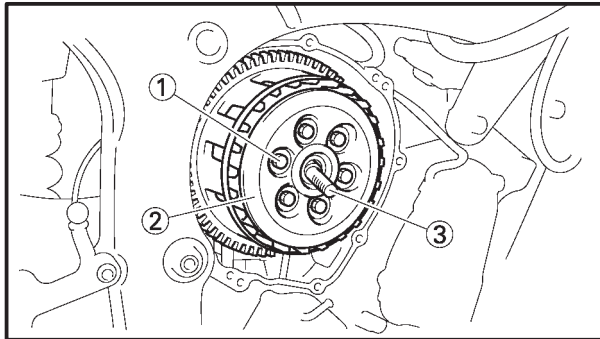
**REMOVING THE CLUTCH**

## 1. Remove:

- clutch cover ①
- gasket

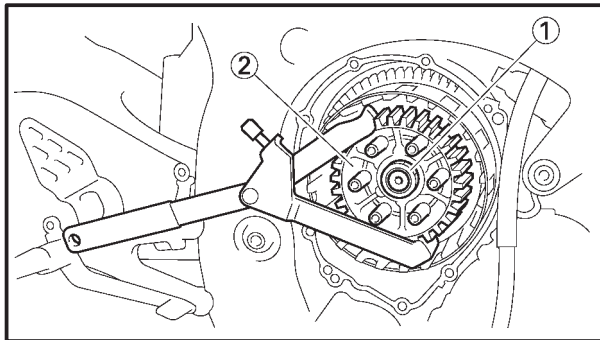
**NOTE:**

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:

- compression spring bolts ①
- compression springs
- pressure plate ②
- pull rod ③
- friction plates
- clutch plates



## 3. Straighten the lock washer tab.

## 4. Loosen:

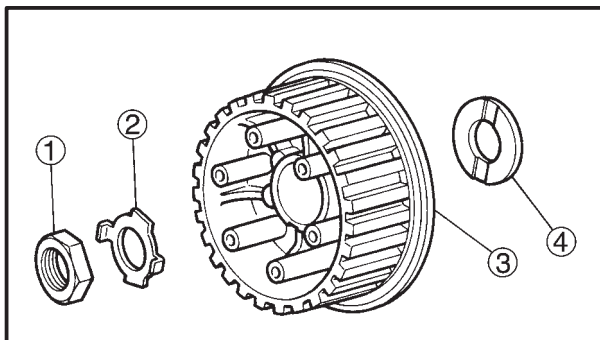
- clutch boss nut ①

**NOTE:**

While holding the clutch boss ② with the universal clutch holder, loosen the clutch boss nut.

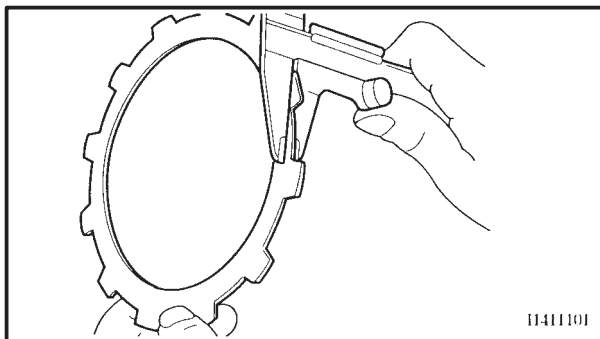


**Universal clutch holder**  
90890-04086, YM-91042



## 5. Remove:

- clutch boss nut ①
- lock washer ②
- clutch boss ③
- thrust plate ④



EAS00280

**CHECKING THE FRICTION PLATES**

The following procedure applies to all of the friction plates.

## 1. Check:

- friction plate
- Damage/wear → Replace the friction plates as a set.

11411101



## 2. Measure:

- friction plate thickness

Out of specification → Replace the friction plates as a set.

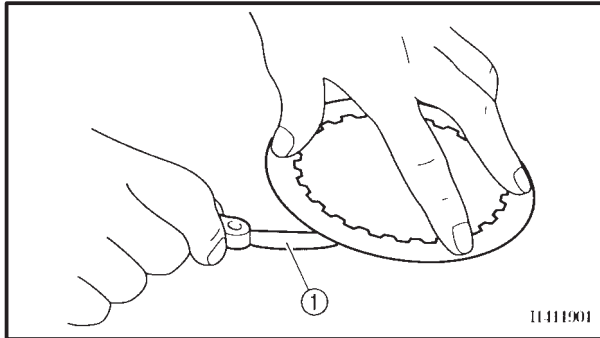
**NOTE:**

Measure the friction plate at four places.

**Friction plate thickness**

2.9 ~ 3.1 mm (0.114 ~ 0.122 in)

<Limit>: 2.8 mm (0.110 in)



EAS00281

**CHECKING THE CLUTCH PLATES**

The following procedure applies to all of the clutch plates.

## 1. Check:

- clutch plate

Damage → Replace the clutch plates as a set.

## 2. Measure:

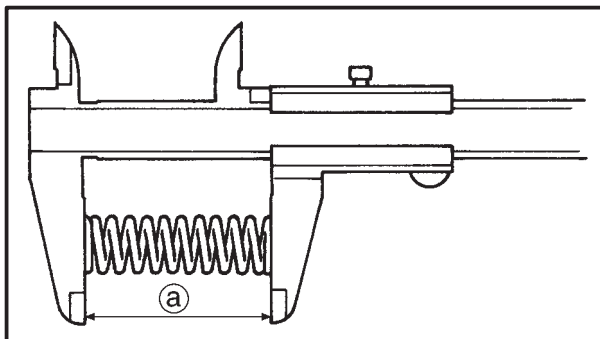
- clutch plate warpage

(with a surface plate and thickness gauge ①)

Out of specification → Replace the clutch plates as a set.

**Clutch plate warpage limit**

0.1 mm (0.0039 in)



EAS00282

**CHECKING THE CLUTCH SPRINGS**

The following procedure applies to all of the clutch springs.

## 1. Check:

- clutch spring

Damage → Replace the clutch springs as a set.



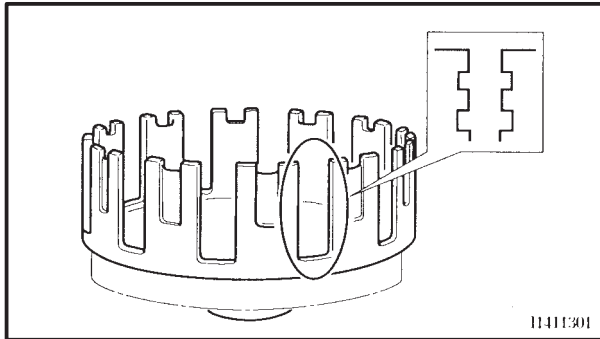
## 2. Measure:

- clutch spring free length ①

Out of specification → Replace the clutch springs as a set.



**Clutch spring free length**  
**50 mm (1.97 in)**  
**<Limit>: 49 mm (1.93 in)**



EAS00284

**CHECKING THE CLUTCH HOUSING**

## 1. Check:

- clutch housing dogs

Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

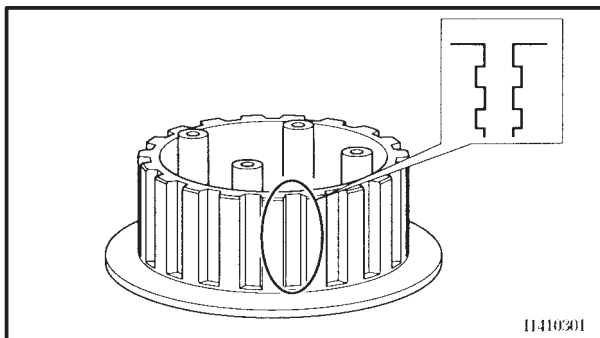
**NOTE:**

Pitting on the clutch housing dogs will cause erratic clutch operation.

## 2. Check:

- bearing

Damage/wear → Replace the bearing and clutch housing.



EAS00285

**CHECKING THE CLUTCH BOSS**

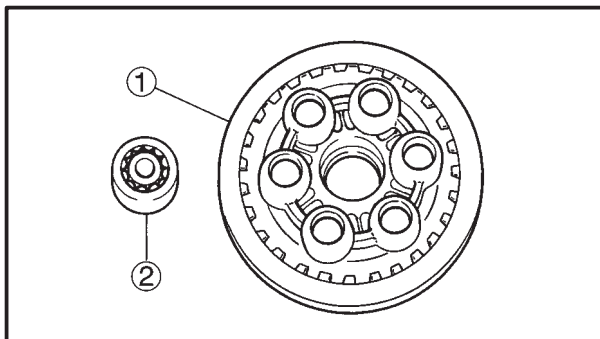
## 1. Check:

- clutch boss splines

Damage/pitting/wear → Replace the clutch boss.

**NOTE:**

Pitting on the clutch boss splines will cause erratic clutch operation.



EAS00286

**CHECKING THE PRESSURE PLATE**

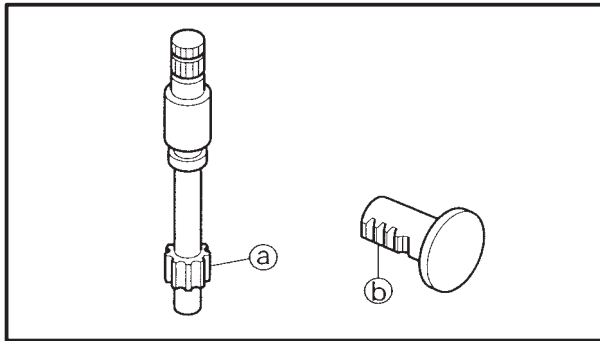
## 1. Check:

- pressure plate ①

Cracks/damage → Replace.

- bearing ②

Damage/wear → Replace.



EAS00287

### CHECKING THE PULL LEVER SHAFT AND PULL ROD

#### 1. Check:

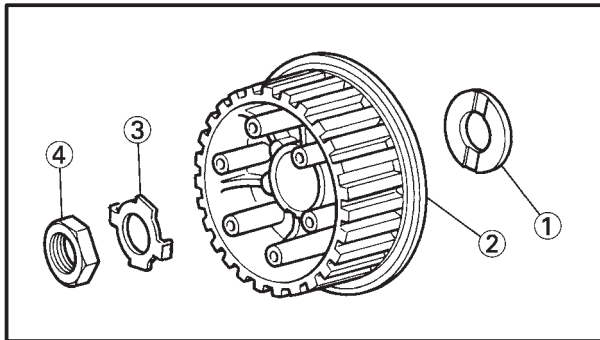
- pull lever shaft pinion gear teeth (a)
- pull rod teeth (b)

Damage/wear → Replace the pull rod and pull lever shaft pinion gear as a set.

#### 2. Check:

- pull rod bearing

Damage/wear → Replace.



EAS00299

### INSTALLING THE CLUTCH

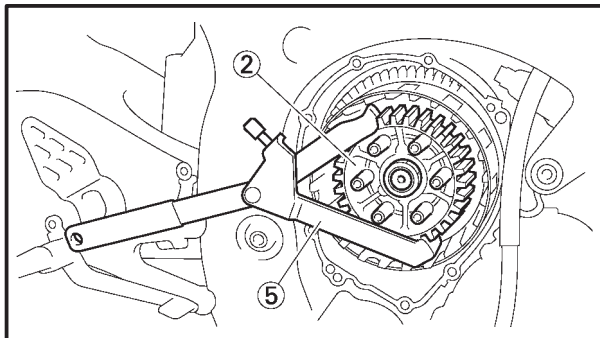
#### 1. Install:

- thrust plate (1)
- clutch boss (2)
- lock washer (3) **New**
- clutch boss nut (4)

70 Nm (7.0 m•kg, 51 ft•lb)

#### NOTE:

While holding the clutch boss (2) with the clutch holding tool (5), tighten the clutch boss nut.



**Universal clutch holder**  
90890-04089, YM-91042

3. Bend the lock washer tab along a flat side of the nut.

#### 4. Lubricate:

- friction plates
- clutch plates

(with the recommended lubricant)



**Recommended lubricant**  
Engine oil





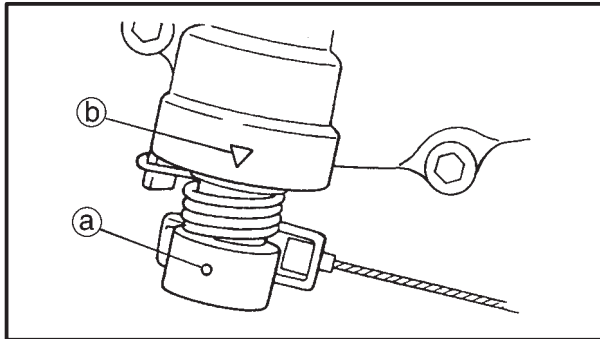


## 9. Install:

- clutch cover
- gasket **New**

**NOTE:**

- Install the pull rod so that the teeth face towards the rear of the motorcycle. Then, install the clutch cover.
- Apply oil onto the bearing.
- Apply molybdenum disulfide grease onto the pull rod.
- When installing the clutch cover, push the pull lever and check that the punch mark (a) on the pull lever aligns with the mark (b) on the clutch cover. Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.
- Tighten the clutch cover bolts in stages and in a crisscross pattern.



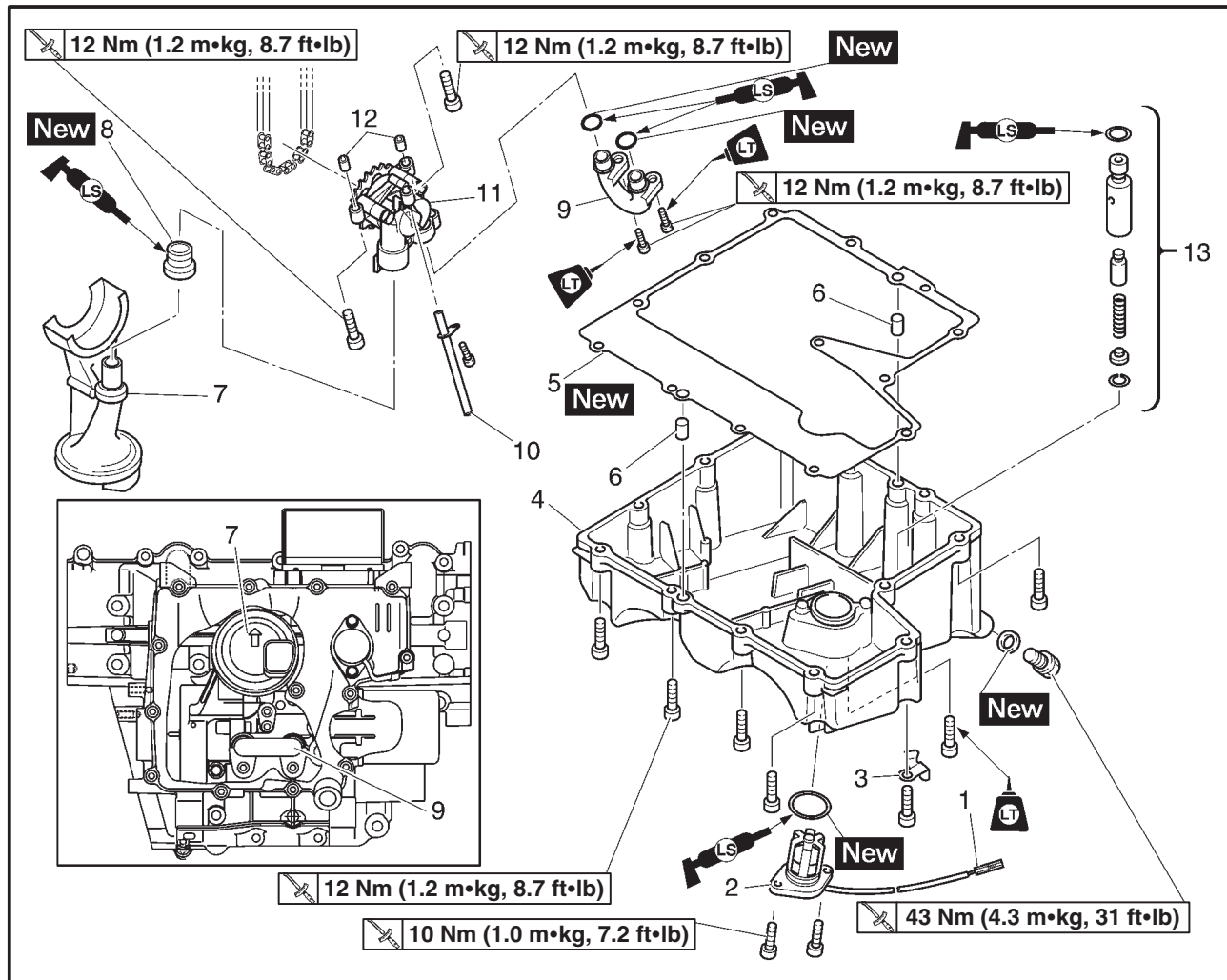
## 10. Adjust:

- clutch cable free play  
Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” in chapter 3.

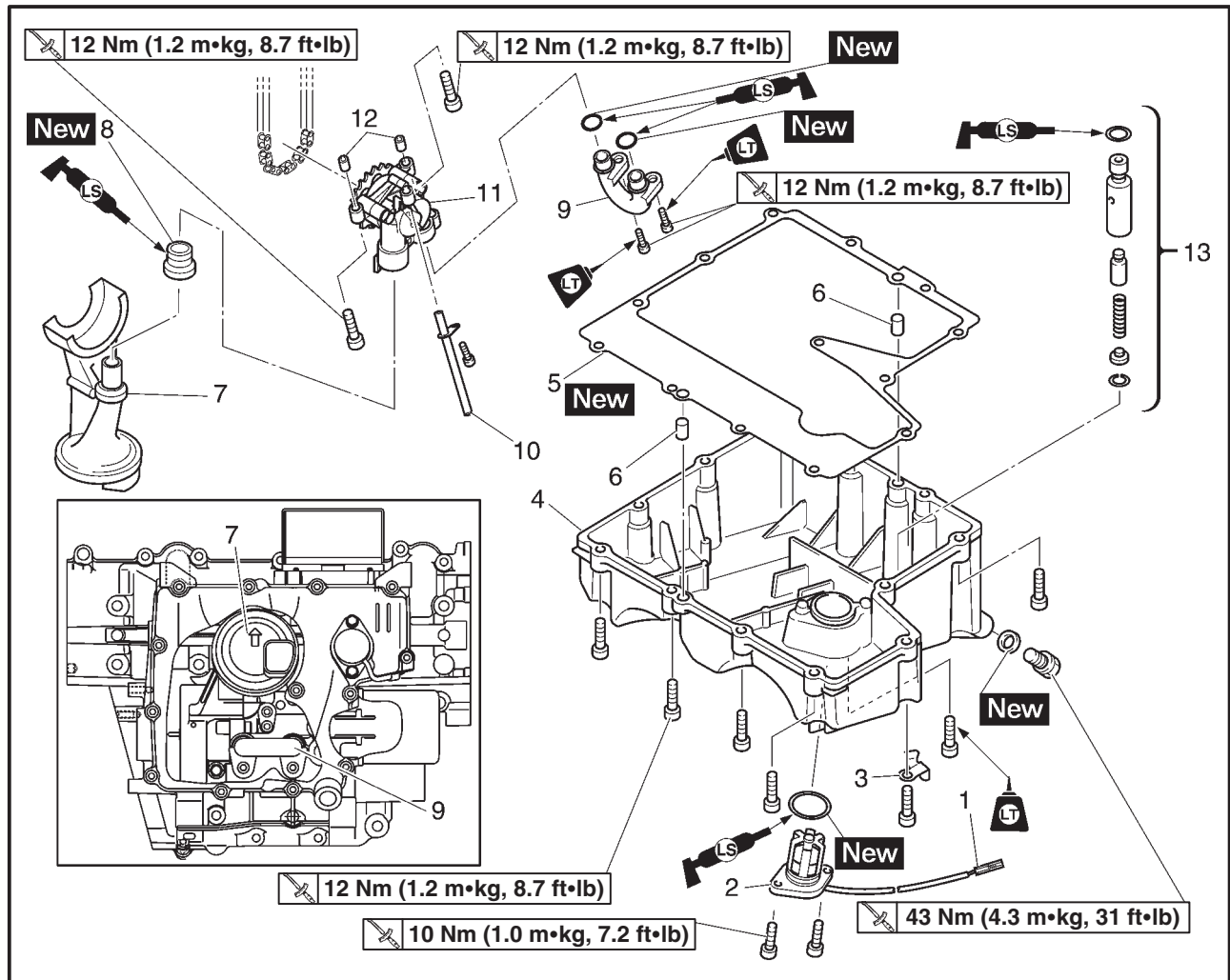


EAS00356

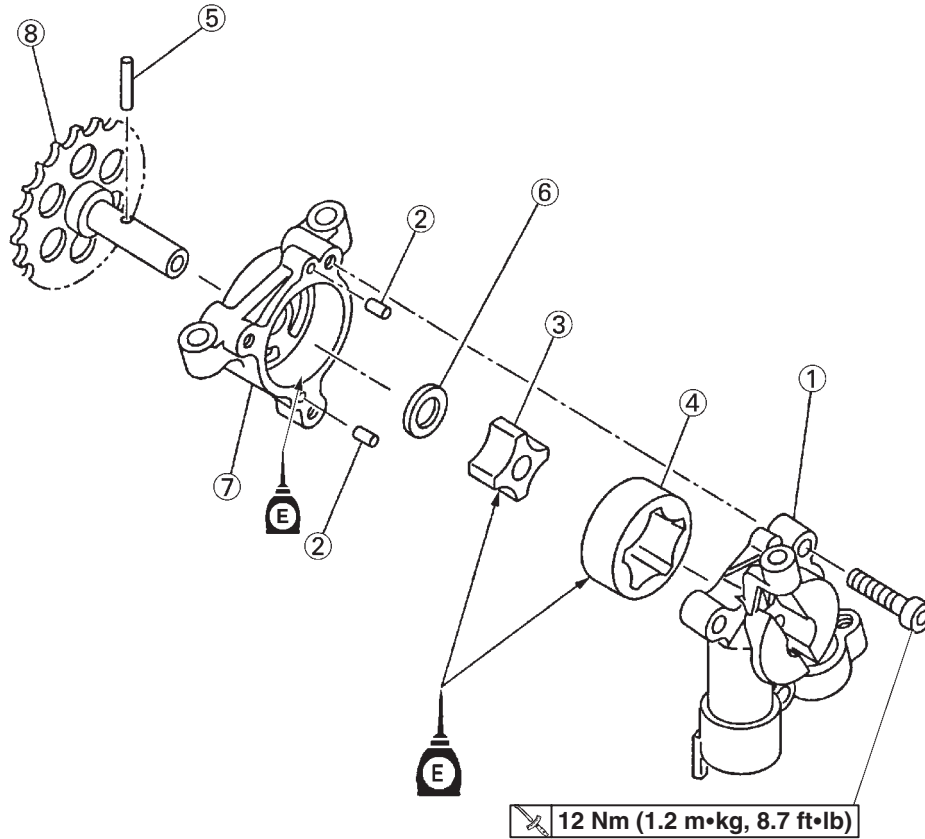
## OIL PAN AND OIL PUMP



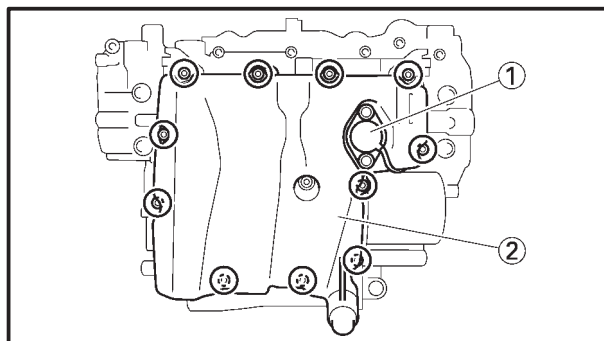
Order	Job/Part	Q'ty	Remarks
	<b>Removing the oil pan and oil pump</b>		Remove the parts in the order listed.
	Engine oil		Drain.
	Coolant		Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Exhaust pipe assembly		Refer to "CHANGING THE COOLANT" in chapter 3.
	Water pump		Refer to "ENGINE".
			Refer to "WATER PUMP" in chapter 6.
1	Oil level switch coupler	1	Disconnect.
2	Oil level switch	1	
3	Oil level switch lead holder	1	
4	Oil pan	1	
5	Oil pan gasket	1	
6	Dowel pin	2	
7	Oil strainer	1	
8	Oil strainer gasket	1	



Order	Job/Part	Q'ty	Remarks
9	Oil pipe	1	For installation, reverse the removal procedure.
10	Oil delivery pipe	1	
11	Oil pump assembly	1	
12	Dowel pin	2	
13	Relief valve assembly	1	



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the oil pump assembly</b>		Disassemble the parts in the order listed.
①	Oil pump cover	1	
②	Pin	2	
③	Oil pump inner rotor	1	
④	Oil pump outer rotor	1	
⑤	Pin	1	
⑥	Washer	1	
⑦	Oil pump rotor housing	1	
⑧	Oil pump driver sprocket	1	
			For assembly, reverse the disassembly procedure.



EAS00362

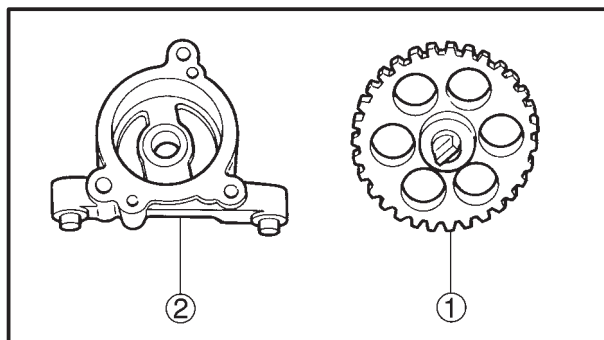
**REMOVING THE OIL PAN**

## 1. Remove:

- oil level switch ①
- oil pan ②
- oil pan gasket
- dowel pins

**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.



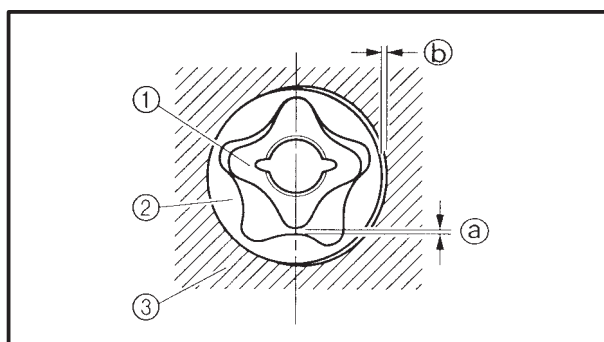
EAS00364

**CHECKING THE OIL PUMP**

## 1. Check:

- oil pump driven gear ①
- oil pump rotor housing ②
- oil pump cover

Cracks/damage/wear → Replace the defective part(s).



## 2. Measure:

- inner-rotor-to-outer-rotor-tip clearance ①
- outer-rotor-to-oil-pump-housing clearance ②

- ① Inner rotor
- ② Outer rotor
- ③ Oil pump housing

**Inner-rotor-to-outer-rotor-tip clearance**

0.03 ~ 0.09 mm

(0.0012 ~ 0.0035 in)

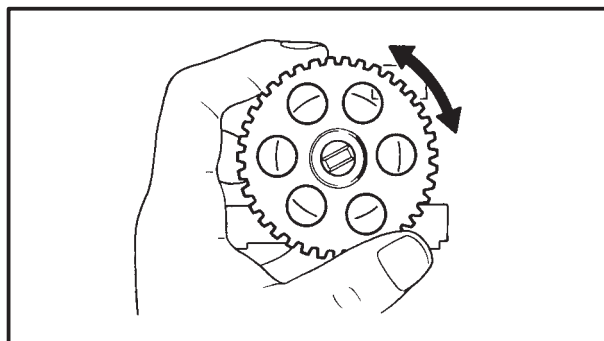
<Limit>: 0.15 mm (0.0059 in)

**Outer-rotor-to-oil-pump-housing clearance**

0.03 ~ 0.08 mm

(0.0012 ~ 0.0031 in)

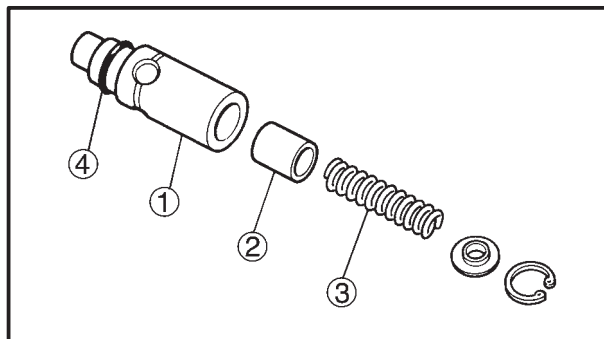
<Limit>: 0.15 mm (0.0059 in)



## 3. Check:

- oil pump operation

Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



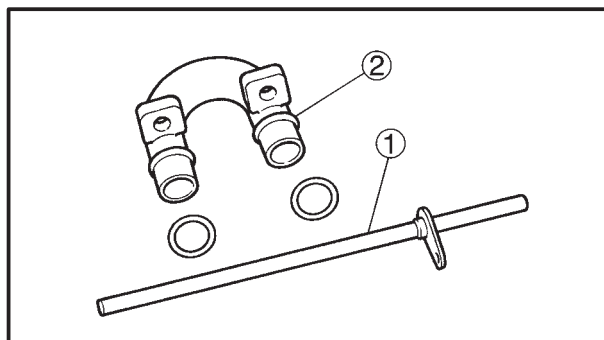
EAS00365

**CHECKING THE RELIEF VALVE**

## 1. Check:

- relief valve body ①
- relief valve ②
- spring ③
- O-ring ④

Damage/wear → Replace the defective part(s).



EAS00367

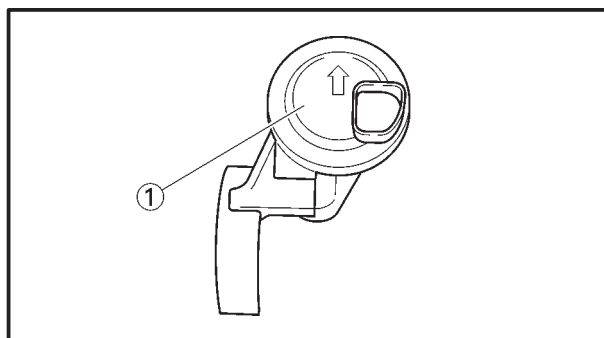
**CHECKING THE OIL DELIVERY PIPE AND OIL PIPE**

## 1. Check:

- oil delivery pipe ①
- oil pipe ②

Damage → Replace.

Obstruction → Wash and blow out with compressed air.



EAS00368

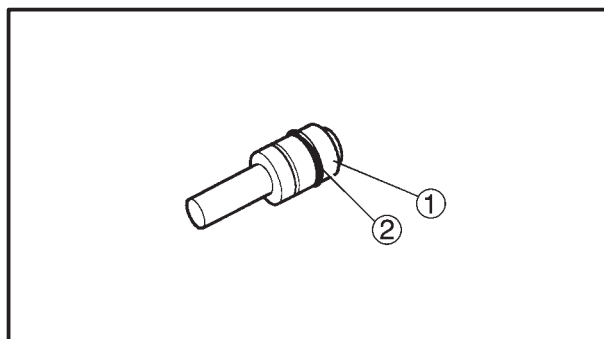
**CHECKING THE OIL STRAINER**

## 1. Check:

- oil strainer ①

Damage → Replace.

Contaminants → Clean with solvent.



EAS00373

**CHECKING THE OIL NOZZLES**

The following procedure applies to all of the oil nozzles.

## 1. Check:

- oil nozzle ①

Damage/wear → Replace the oil nozzle.

- O-ring ②

Damage/wear → Replace.

- oil nozzle passage

Obstruction → Blow out with compressed air.

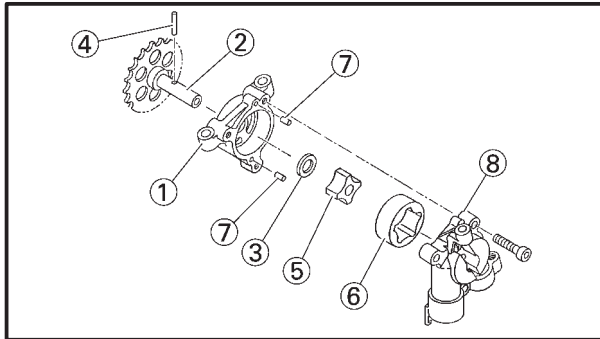


EAS00374

**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 housing ①
- oil pump shaft ②
- washer ③
- pin ④
- inner rotor ⑤
- outer rotor ⑥
- dowel pins ⑦
- oil pump cover ⑧

 **12 Nm (1.2 m•kg, 8.7 ft•lb)****NOTE:**

When installing the inner rotor, align the pin ④ in the oil pump shaft with the groove in the inner rotor ⑤.

## 3. Check:


- oil pump operation  
Refer to “CHECKING THE OIL PUMP”.

EAS00376

**INSTALLING THE OIL PUMP**

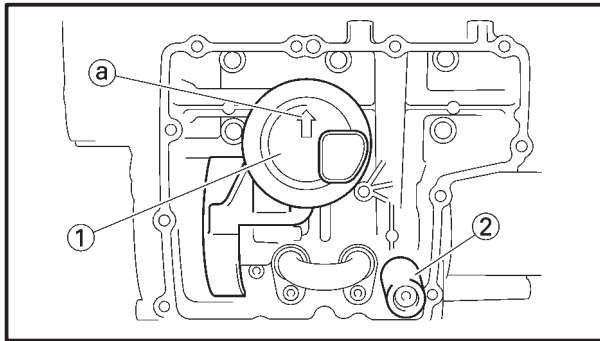
## 1. Install:

- oil pump drive chain
- gear cover
- oil pump

 **12 Nm (1.2 m•kg, 8.7 ft•lb)****CAUTION:**

**After tightening the bolts, make sure the oil pump turns smoothly.**





EAS00378

**INSTALLING THE OIL STRAINER**

## 1. Install:

- oil strainer ①
- relief valve ②

**NOTE:**

Make sure to check the arrow mark (a) located on the oil strainer housing for the front and rear direction of the engine and then install the oil strainer so that its arrow mark points to the front side of the engine.

EAS00380

**INSTALLING THE OIL PAN**

## 1. Install:

- oil pipe
- oil delivery pipe

## 2. Install:

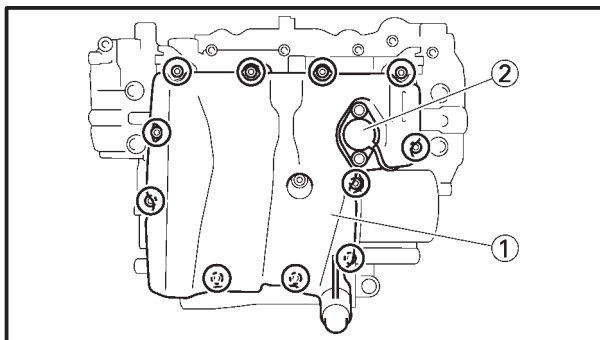
- dowel pins
- gasket **New**
- oil pan ①
- oil level switch ②

12 Nm (1.2 m•kg, 8.7 ft•lb)

10 Nm (1.0 m•kg, 7.2 ft•lb)

- engine oil drain bolt

43 Nm (4.3 m•kg, 31 ft•lb)

**⚠ WARNING**

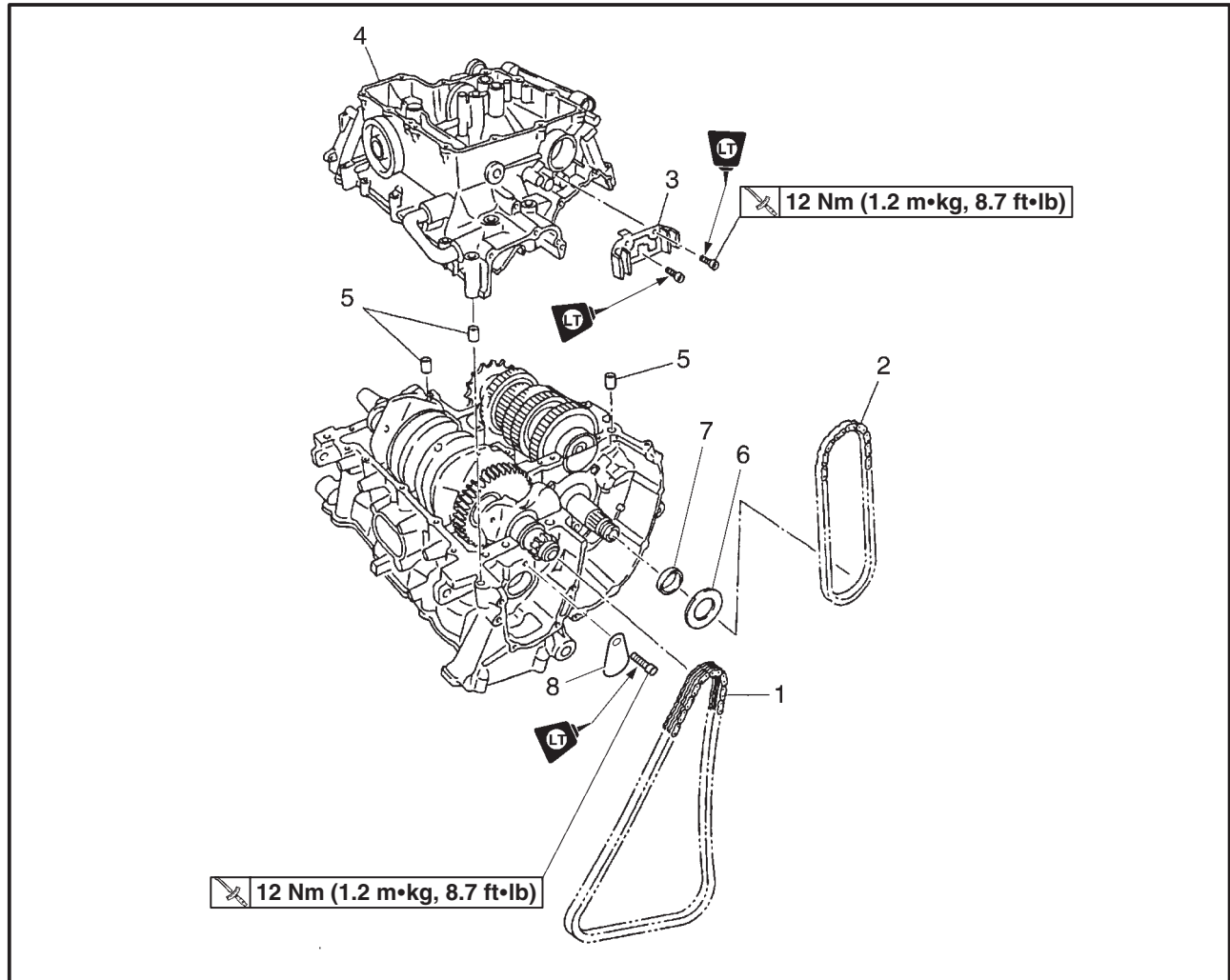
Always use new copper washers.

**NOTE:**

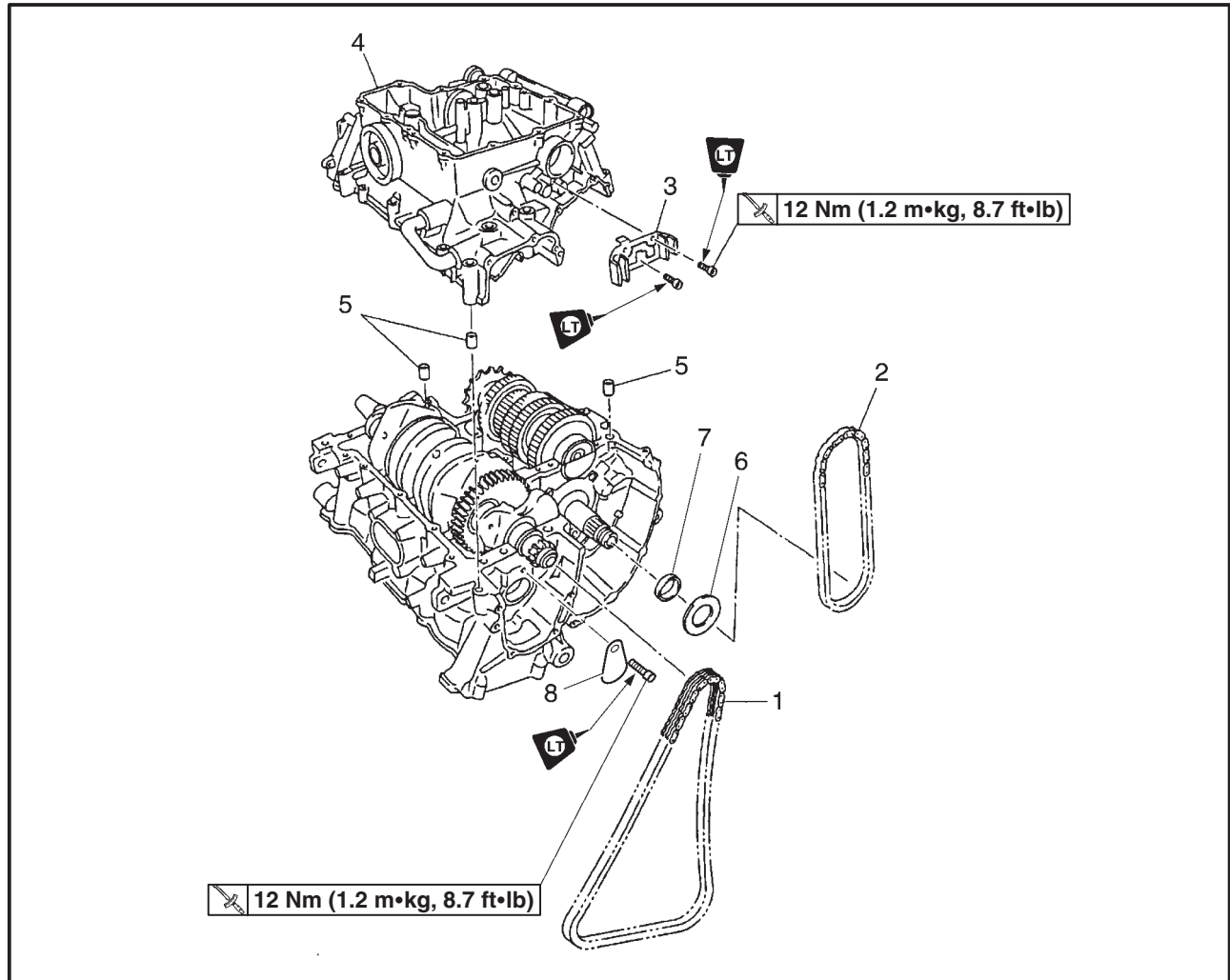
- Tighten the oil pan bolts in stages and in a crisscross pattern.
- Lubricate the oil level switch O-ring with engine oil.



## CRANKCASE



Order	Job/Part	Q'ty	Remarks
	<b>Removing the crankcase</b>		
	Engine		Remove the parts in the order listed.
	Cylinder head		Refer to "ENGINE".
	Starter clutch and generator		Refer to "CYLINDER HEAD".
	Shift shaft		Refer to "STARTER CLUTCH AND GENERATOR".
	Crankshaft position sensor and pickup rotor		Refer to "SHIFT SHAFT".
	Clutch		Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR".
	Water pump assembly		Refer to "CLUTCH".
	Oil pan and oil pump		Refer to "WATER PUMP" in chapter 6.
1	Timing chain	1	Refer to "OIL PAN AND OIL PUMP".
2	Oil pump drive chain	1	
3	Oil pump drive chain guide	1	
4	Lower crankcase	1	
5	Dowel pin	3	



Order	Job/Part	Q'ty	Remarks
6	Thrust plate	1	For installation, reverse the removal procedure.
7	Washer	1	
8	Plate	1	



EAS00384

## DISASSEMBLING THE CRANKCASE

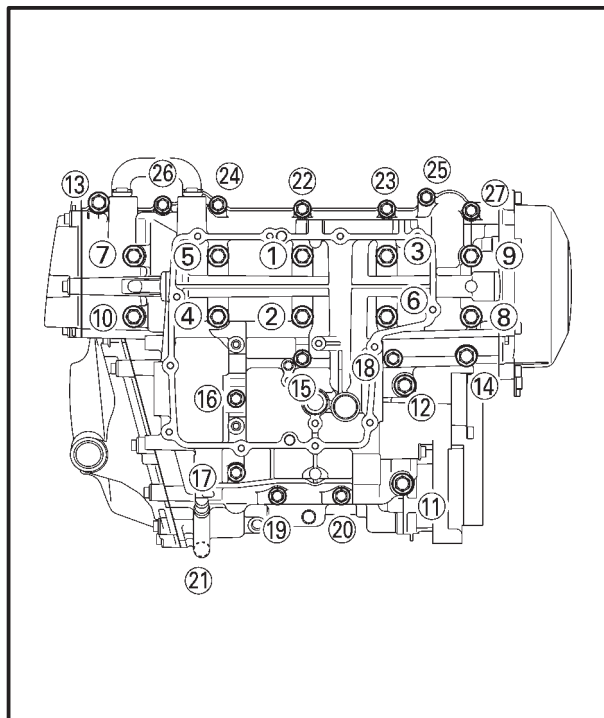
1. Place the engine upside down.

2. 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.
- Loosen the bolts in decreasing numerical order (refer to the numbers in the illustration).
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.



M8 × 85 mm (3.3 in) bolts: ① ~ ⑦, ⑩

M8 × 115 mm (4.5 in) bolts: ⑧, ⑨

M8 × 65 mm (2.6 in) bolts: ⑪, ⑫

M6 × 65 mm (2.6 in) bolts: ⑬, ⑭

M6 × 55 mm (2.2 in) bolts: ⑮, ⑲ ~ ⑳

M6 × 45 mm (1.8 in) bolts: ⑰, ⑱, ⑳

M6 × 65 mm (2.6 in) bolts: ⑰, ⑲

M6 × 75 mm (3.0 in) bolt: ⑱

M6 × 100 mm (3.9 in) bolts: ㉑

3. Remove:

- lower 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.**

4. Remove:

- dowel pins

5. Remove:

- crankshaft journal lower bearing (from the lower crankcase)

### NOTE:

Identify the position of each crankshaft journal lower bearing so that it can be reinstalled in its original place.



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.

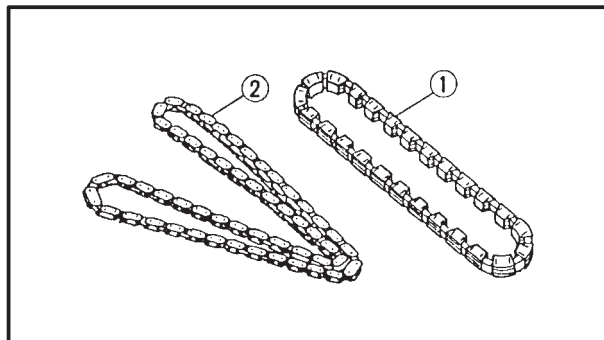
EAS00401

## 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.

## CHECKING THE TIMING CHAIN

- 1 Check:
  - timing chain ②  
Damage/stiffness → Replace the timing chain and crankshaft sprocket as a set.
  - oil/water pump assembly drive chain ①  
Damage/stiffness → Replace the oil/water pump assembly drive chain and oil/water pump assembly drive sprocket as a set.

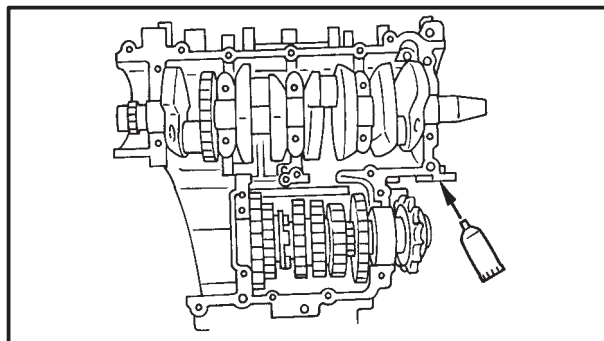


## ASSEMBLING THE CRANKCASE

1. Lubricate:
  - crankshaft journal bearings  
(with the recommended lubricant)



**Recommended lubricant**  
**Engine oil**



2. Apply:
  - sealant



**Yamaha bond No. 1215**  
**90890-85505, ACC-1109-05-01**



## NOTE:

Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings. Do not apply sealant to within 2 ~ 3 mm of the crankshaft journal bearings.

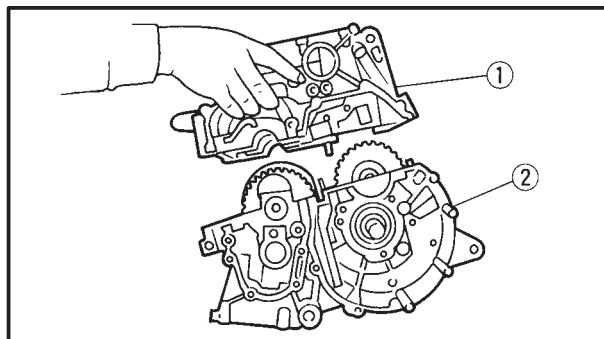
## 3. Install:

- dowel pin

## 4. Set the shift drum assembly and transmission gears in the neutral position.

## 5. Install:

- lower crankcase ①  
(onto the upper crankcase ②)



## CAUTION:

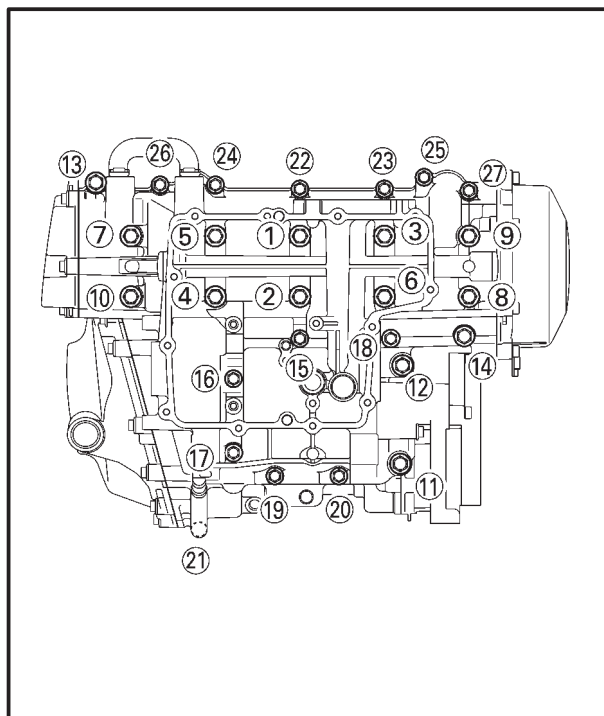
**Before tightening the crankcase bolts, make sure that the transmission gears shift correctly when the shift drum assembly is turned by hand.**

## 6. Install:

- crankcase bolts

## NOTE:

- Lubricate the bolt threads with engine oil.
- Install a washer on bolts ① ~ ⑩.
- Seal bolt ⑱
- Tighten the bolts in the tightening sequence cast on the crankcase.



M8 × 85 mm (3.3 in) bolts: ① ~ ⑦, ⑩

M8 × 115 mm (4.5 in) bolts: ⑧, ⑨

M8 × 65 mm (2.6 in) bolts: ⑪, ⑫

M6 × 65 mm (2.6 in) bolts: ⑬, ⑭

M6 × 55 mm (2.2 in) bolts: ⑮, ⑲ ~ ⑳

M6 × 45 mm (1.8 in) bolts: ⑯, ⑱, ⑳

M6 × 65 mm (2.6 in) bolts: ⑰, ⑱

M6 × 75 mm (3.0 in) bolt: ⑱

M6 × 100 mm (3.9 in) bolt: ㉑



## Crankcase bolt

**Bolt ① ~ ⑩**

**1st: 12 Nm (1.2 m•kg, 8.7 ft•lb)**

**2nd: 25 Nm (2.5 m•kg, 18 ft•lb)**

**\*3rd: 27 Nm (2.7 m•kg, 20 ft•lb)**

**Bolt ⑪, ⑫**

**24 Nm (2.4 m•kg, 17 ft•lb)**

**Bolt ⑬ ~ ⑳**

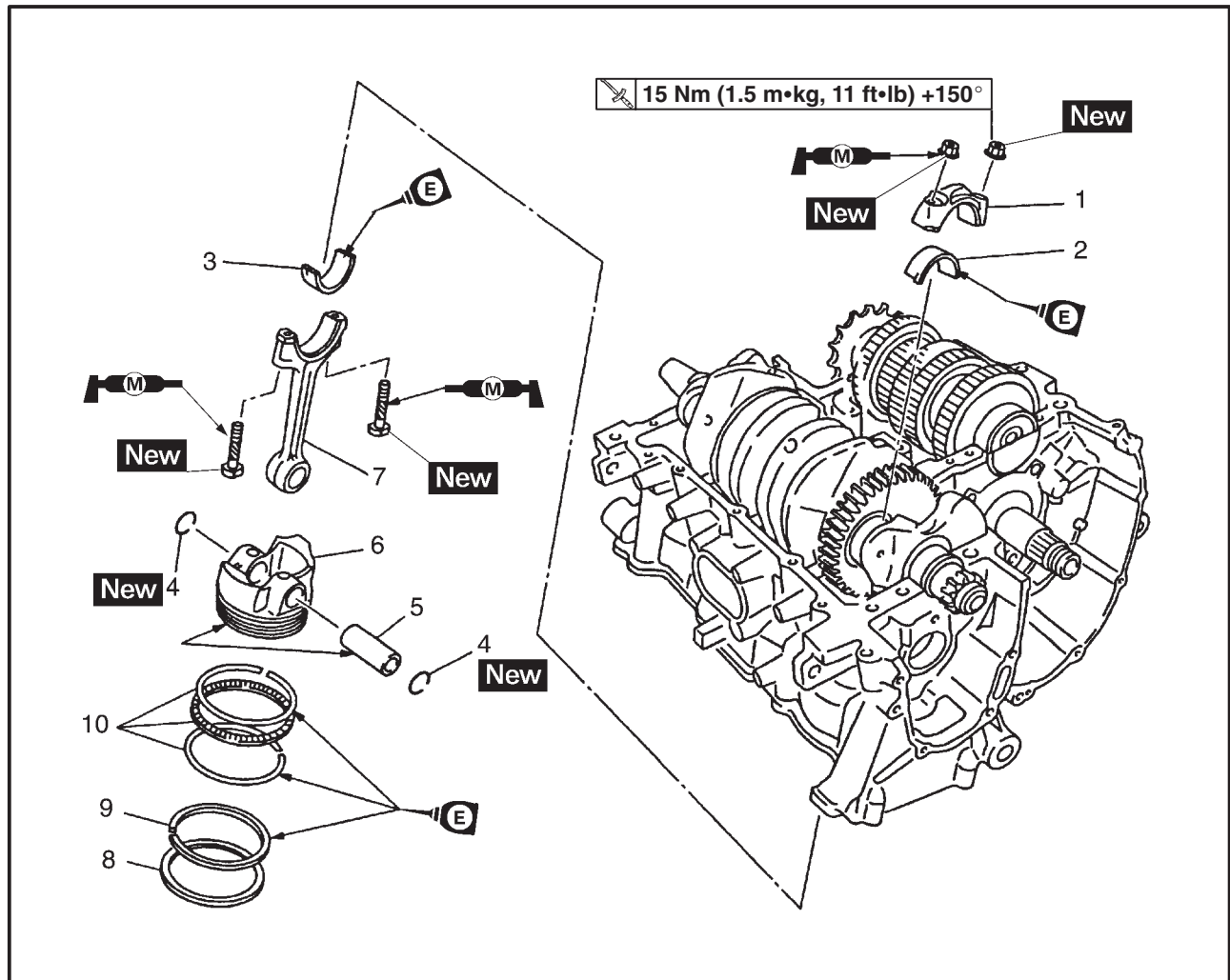
**12 Nm (1.2 m•kg, 8.7 ft•lb)**

\* Loosen the all bolts following the tightening order and then tighten to specification torque.

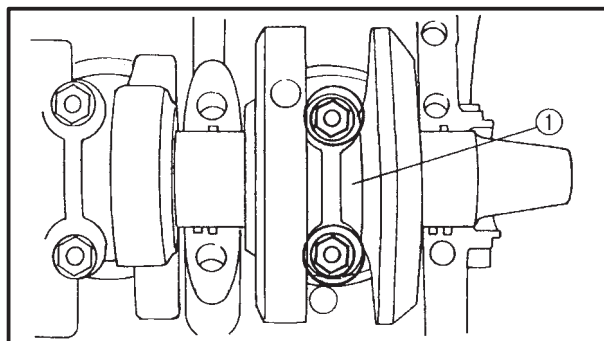


EAS00252

## CONNECTING RODS AND PISTONS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the connecting rods and pistons</b>		Remove the parts in the order listed.
	Lower crankcase		Refer to "CRANKCASE".
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Big end upper bearing	4	
4	Piston pin clip	8	
5	Piston pin	4	
6	Piston	4	
7	Connecting rod	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	
			For installation, reverse the removal procedure.



EAS00393

## REMOVING THE CONNECTING RODS AND PISTONS

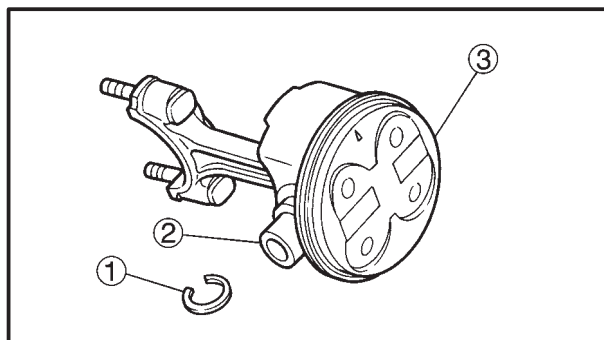
The following procedure applies to all of the connecting rods and pistons.

### 1. Remove:

- connecting rod cap ①
- big end bearings

### NOTE:

Identify the position of each big end bearing so that it can be reinstalled in its original place.



### 2. Remove:

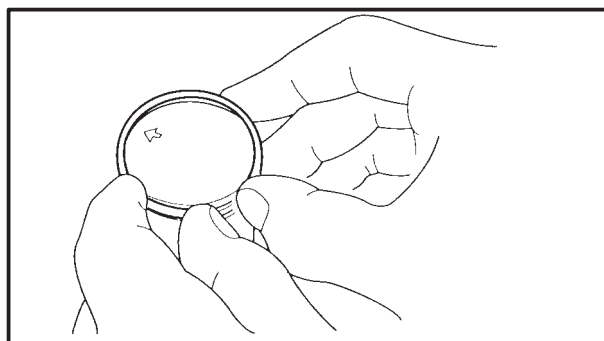
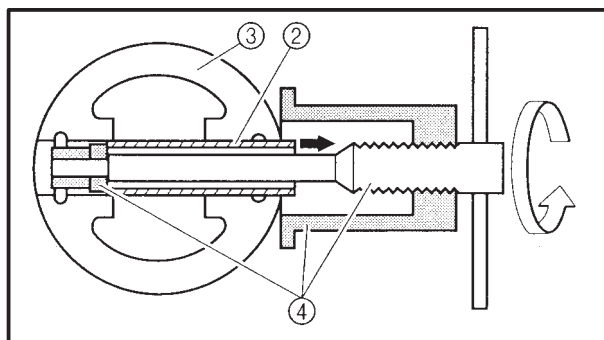
- piston pin clips ①
- piston pin ②
- piston ③

### CAUTION:

Do not use a hammer to drive the piston pin out.

### NOTE:

- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston 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.



### 3. 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.



**Piston pin puller set**  
90890-01304, YU-01304





EAS00387

## REMOVING THE CRANKSHAFT ASSEMBLY

### 1. Remove:

- crankshaft assembly
  - crankshaft journal upper bearings  
(from the upper crankcase)
- Refer to "CRANKSHAFT".

### NOTE:

Identify the position of each crankshaft journal upper bearing so that it can be reinstalled in its original place.

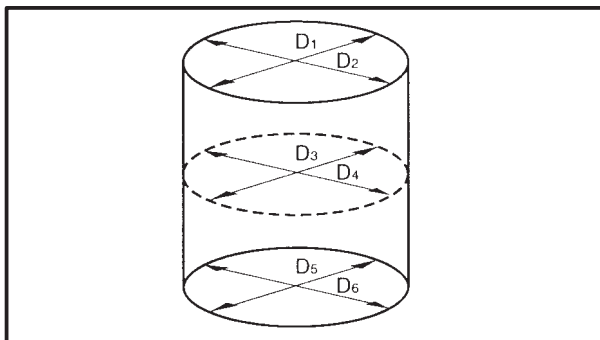
EAS00261

## CHECKING THE CYLINDER AND PISTON

### 1. Check:

- piston wall
- cylinder wall

Vertical scratches → Replace the cylinder, and the piston and piston rings as a set.



### 2. Measure:

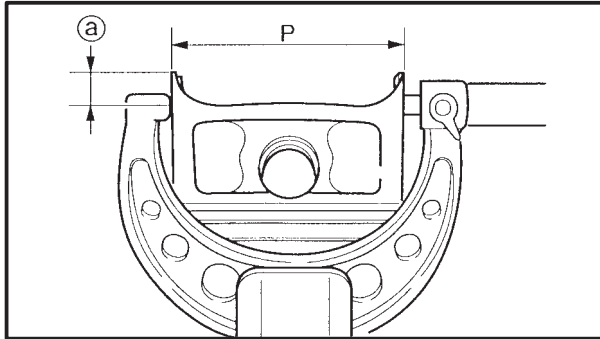
- piston-to-cylinder clearance



- 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.



<b>Cylinder bore “C”</b>	<b>65.50 ~ 65.51 mm (2.5787 ~ 2.5791 in)</b>
<b>Wear limit</b>	<b>65.56 mm (2.5811 in)</b>
<b>Taper limit “T”</b>	<b>0.05 mm (0.002 in)</b>
<b>Out of round “R”</b>	<b>0.05 mm (0.002 in)</b>

**“C” = maximum of  $D_1 \sim D_6$**

**“T” = maximum of D<sub>1</sub> or D<sub>2</sub> – maximum of D<sub>5</sub> or D<sub>6</sub>**

**“R” = maximum of D<sub>1</sub> D<sub>3</sub> or D<sub>5</sub> –  
minimum of D<sub>2</sub> D<sub>4</sub> or D<sub>6</sub>**

- b. If out of specification, replace the cylinder, and the pistons and piston rings as a set.
- c. Measure piston skirt diameter "P" with the micrometer.

④ 4 mm (0.16 in) from the bottom edge of the piston

### Piston size “P”

**65.475 ~ 65.490 mm**  
**(2.5778 ~ 2.5783 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”**

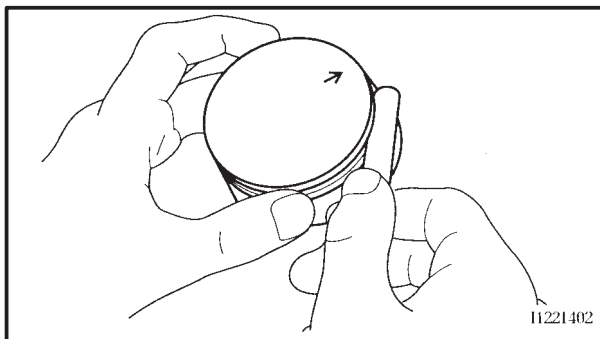


### Piston-to-cylinder clearance

**0.010 ~ 0.035 mm**  
**(0.0004 ~ 0.0014 in)**

**<Limit>: 0.055 mm (0.0022 in)**

- f. If out of specification, replace the cylinder, and the piston and piston rings as a set.



EAS00263

## CHECKING THE PISTON RINGS

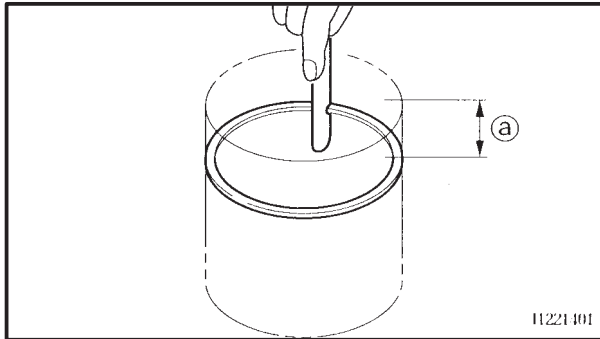
1. Measure:

- 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 ~ 0.065 mm  
 (0.0012 ~ 0.0026 in)  
 <Limit>: 0.115 mm (0.0045 in)

**2nd ring**

0.030 ~ 0.065 mm  
 (0.0012 ~ 0.0026 in)  
 <Limit>: 0.125 mm (0.0049 in)

**2. Install:**

- piston ring  
 (into the cylinder)

**NOTE:**

Level the piston ring into the cylinder with the piston crown.

Ⓐ 5 mm (0.20 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**

0.25 ~ 0.35 mm  
 (0.0098 ~ 0.0138 in)  
 <Limit>: 0.60 mm (0.0236 in)

**2nd ring**

0.7 ~ 0.8 mm  
 (0.0276 ~ 0.0315 in)  
 <Limit>: 1.15 mm (0.0453 in)

**Oil ring**

0.10 ~ 0.35 mm  
 (0.0039 ~ 0.0138 in)

**CHECKING THE PISTON PINS**

The following procedure applies to all of the piston pins.

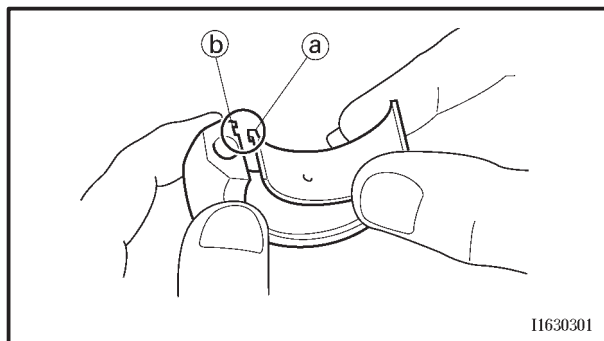
**1. Check:**

- piston pin  
 Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.



**CAUTION:**

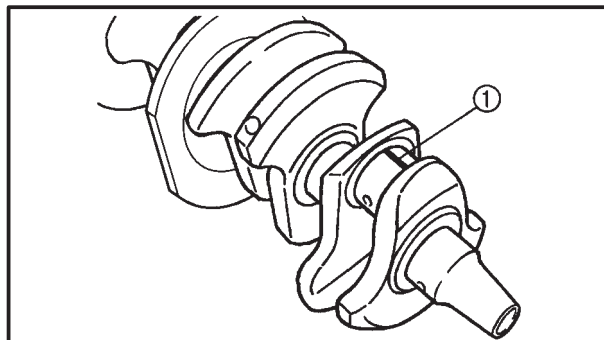
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.



- a. Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
- b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

**NOTE:**

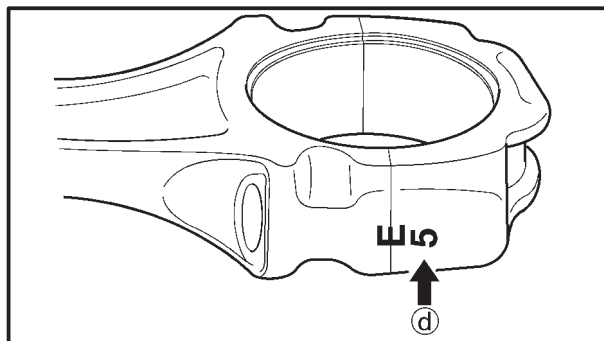
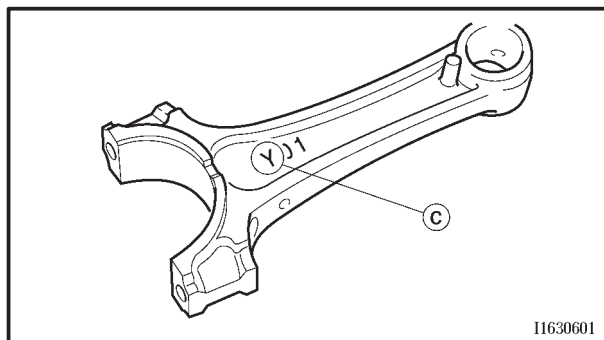
Align the projections (a) on the big end bearings with the notches (b) in the connecting rod and connecting rod cap.



- c. Put a piece of Plastigauge® (1) on the crankshaft pin.
- d. Assemble the connecting rod halves.

**NOTE:**

- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Lubricate the bolt threads and nut seats with molybdenum disulfide grease.
- Make sure that the “Y” mark (c) on the connecting rod faces towards the left side of the crankshaft.
- Make sure that the characters (d) on both the connecting rod and connecting rod cap are aligned.





- e. Tighten the connecting rod nuts.

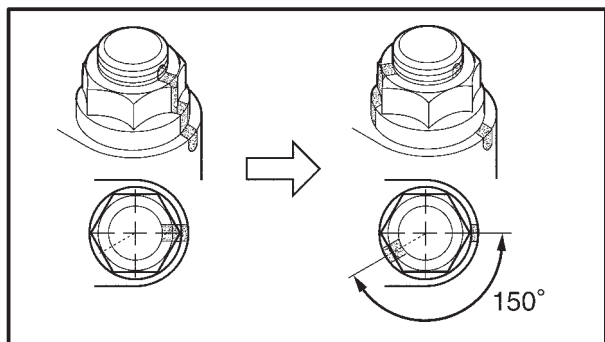
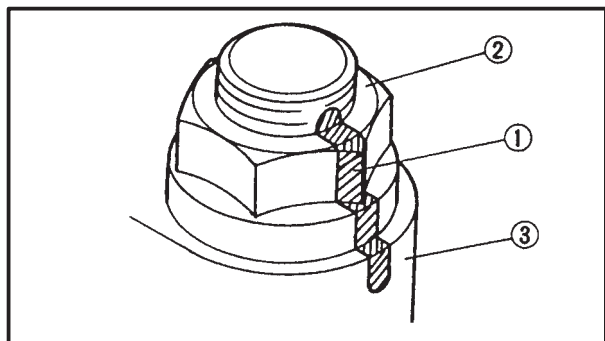


**Connecting rod nut**  
15 Nm (1.5 m•kg, 11 ft•lb) + 150°

- f. Replace the connecting rod bolts and nuts with new ones.

**CAUTION:**

**Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts and nuts.**



- g. Clean the connecting rod bolts and nuts.
- h. Tighten the connecting rod nuts.
- i. Put a mark ① on the corner of the connecting rod nut ② and the connecting rod ③.

- j. Tighten the nut further to reach the specified angle ( $150^{\circ}$ ).

**⚠ WARNING**

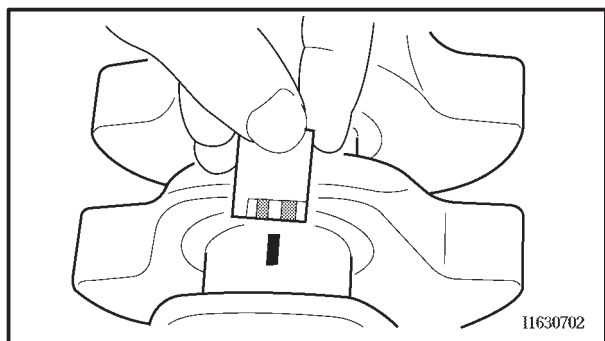
**When the nut is tightened more than the specified angle, do not loosen the nut and then retighten it.  
Replace the bolt with a new one and perform the procedure again.**

**CAUTION:**

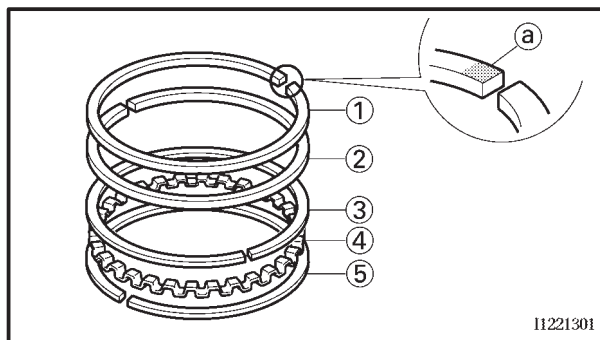
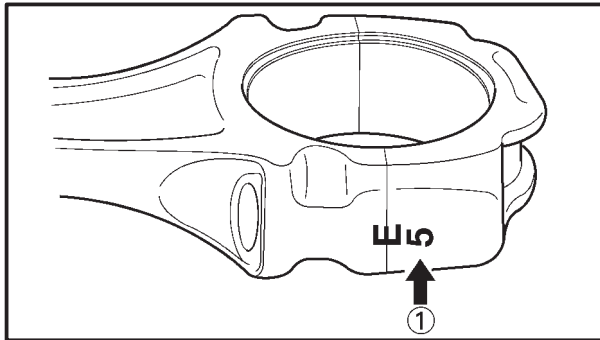
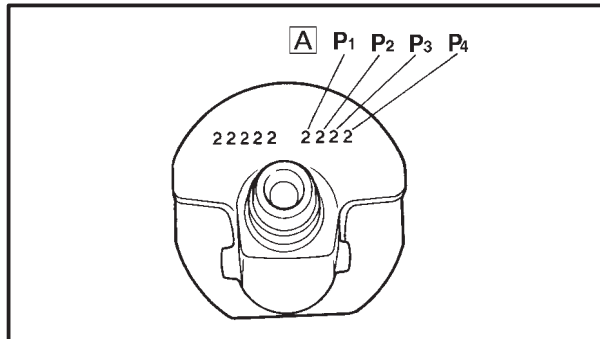
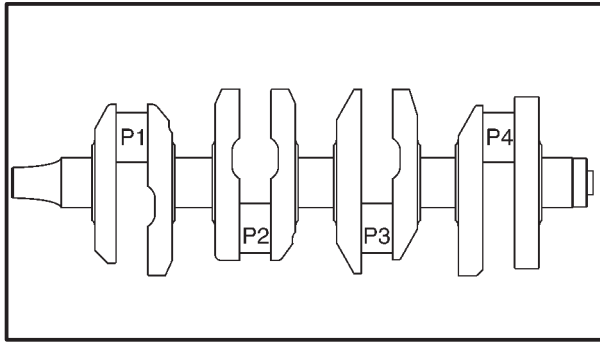
- Do not use a torque wrench to tighten the nut to the specified angle.
- Tighten the nut until it is at the specified angles.

**NOTE:**

When using a hexagonal nut, note that the angle from one corner to another is  $60^\circ$



- k. Remove the connecting rod and big end bearings.  
Refer to “REMOVING THE CONNECTING RODS”.
- l. Measure the compressed Plastigauge® width on the crankshaft pin.  
If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



2. Select:

- big end bearings (P1 ~ P4)

**NOTE:**

- The numbers **A** stamped into the crankshaft web and the numbers **①** on the connecting rods are used to determine the replacement big end bearing sizes.
- “P1” ~ “P4” refer to the bearings shown in the crankshaft illustration.

For example, if the connecting rod “P<sub>1</sub>” and the crankshaft web “P<sub>1</sub>” numbers are “5” and “2” respectively, then the bearing size for “P<sub>1</sub>” is:

$$\begin{aligned} &\text{“P}_1\text{” (connecting rod) – “P}_1\text{”} \\ &\text{(crankshaft) =} \\ &5 - 2 = 3 \text{ (brown)} \end{aligned}$$

## BIG END BEARING COLOR CODE

1	Blue
2	Black
3	Brown
4	Green

## INSTALLING THE CONNECTING ROD AND PISTON

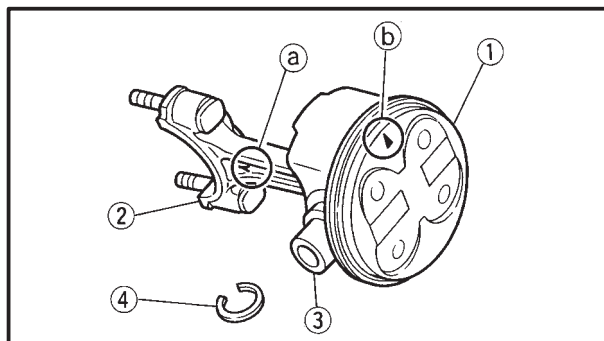
The following procedure applies to all of the connecting rods and pistons.

1. Install:

- top ring **①**
- 2nd ring **②**
- upper oil ring rail **③**
- oil ring expander **④**
- lower oil ring rail **⑤**

**NOTE:**

Be sure to install the piston rings so that the manufacturer’s marks or numbers **a** face up.



### 2. Install:

- piston ①  
(onto the respective connecting rod ②)
- piston pin ③
- piston pin clip **New** ④

### NOTE:

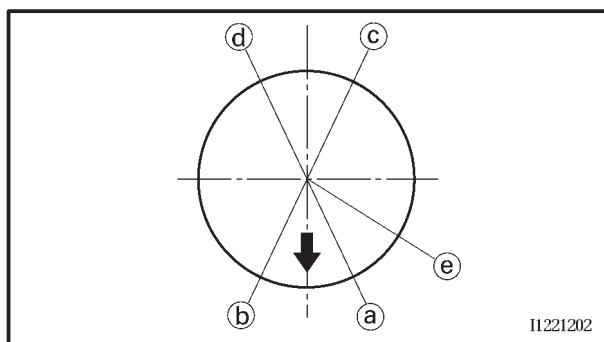
- Apply engine oil onto the piston pin.
- Make sure that the “Y” mark (a) on the connecting rod faces left when the arrow mark (b) on the piston is pointing up. Refer to the illustration.
- Reinstall each piston into its original cylinder (numbering order starting from the left: #1 to #4).

### 3. Lubricate:

- piston
- piston rings
- cylinder  
(with the recommended lubricant)



**Recommended lubricant**  
**Engine oil**



### 4. Offset:

- piston ring end gaps

- ① Top ring
- ② Lower oil ring rail
- ③ Upper oil ring rail
- ④ 2nd ring
- ⑤ Oil ring expander

### 5. Lubricate:

- crankshaft pins
- big end bearings
- connecting rod big end inner surface  
(with the recommended lubricant)



**Recommended lubricant**  
**Engine oil**

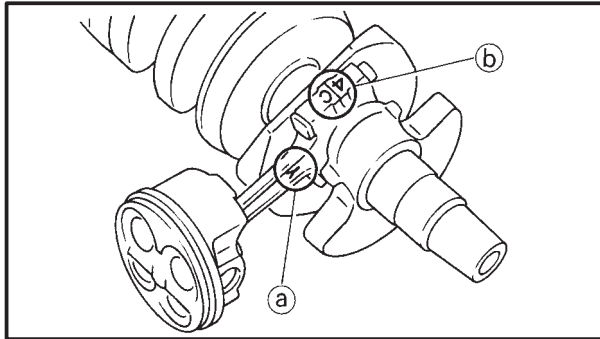




6. Install:
  - big end bearings
  - connecting rod assembly  
(into the cylinder and onto the crankshaft pin)
  - connecting rod cap  
(onto the connecting rod)

**NOTE:**

- Align the projections on the big end bearings with the notches in the connecting rods and connecting rod caps.
- Be sure to reinstall each big end bearing in its original place.
- While compressing the piston rings with one hand, install the connecting rod assembly into the cylinder with the other hand.
- Make sure that the “Y” marks (a) on the connecting rods face towards the left side of the crankshaft.
- Make sure that the characters (b) on both the connecting rod and connecting rod cap are aligned.



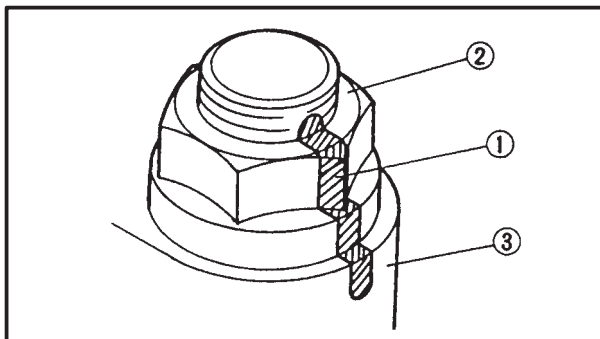
7. Align:
  - bolt heads  
(with the connecting rod caps)
8. Tighten:
  - connecting rod nuts

 **15 Nm (1.5 m•kg, 11 ft•lb) + 150°**

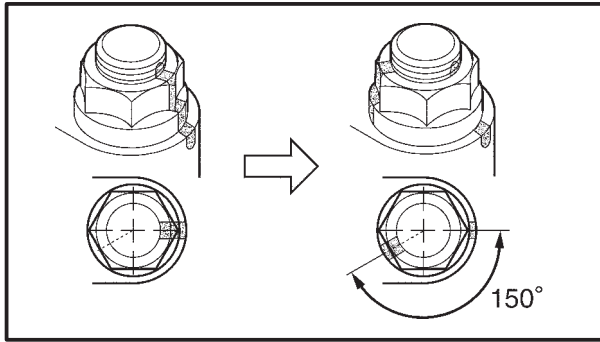
- a. Replace the connecting rod bolts and nuts with new ones.

**CAUTION:**

**Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts and nuts.**



- b. Clean the connecting rod bolts and nuts.
- c. Tighten the connecting rod nuts.
- d. Put a mark ① on the corner of the connecting rod nut ② and the connecting rod ③.



- e. Tighten the nut further to reach the specified angle ( $150^{\circ}$ ).

**⚠ WARNING**

When the nut is tightened more than the specified angle, do not loosen the nut and then retighten it.

Replace the bolt with a new one and perform the procedure again.

**CAUTION:**

- Do not use a torque wrench to tighten the nut to the specified angle.
- Tighten the nut until it is at the specified angles.

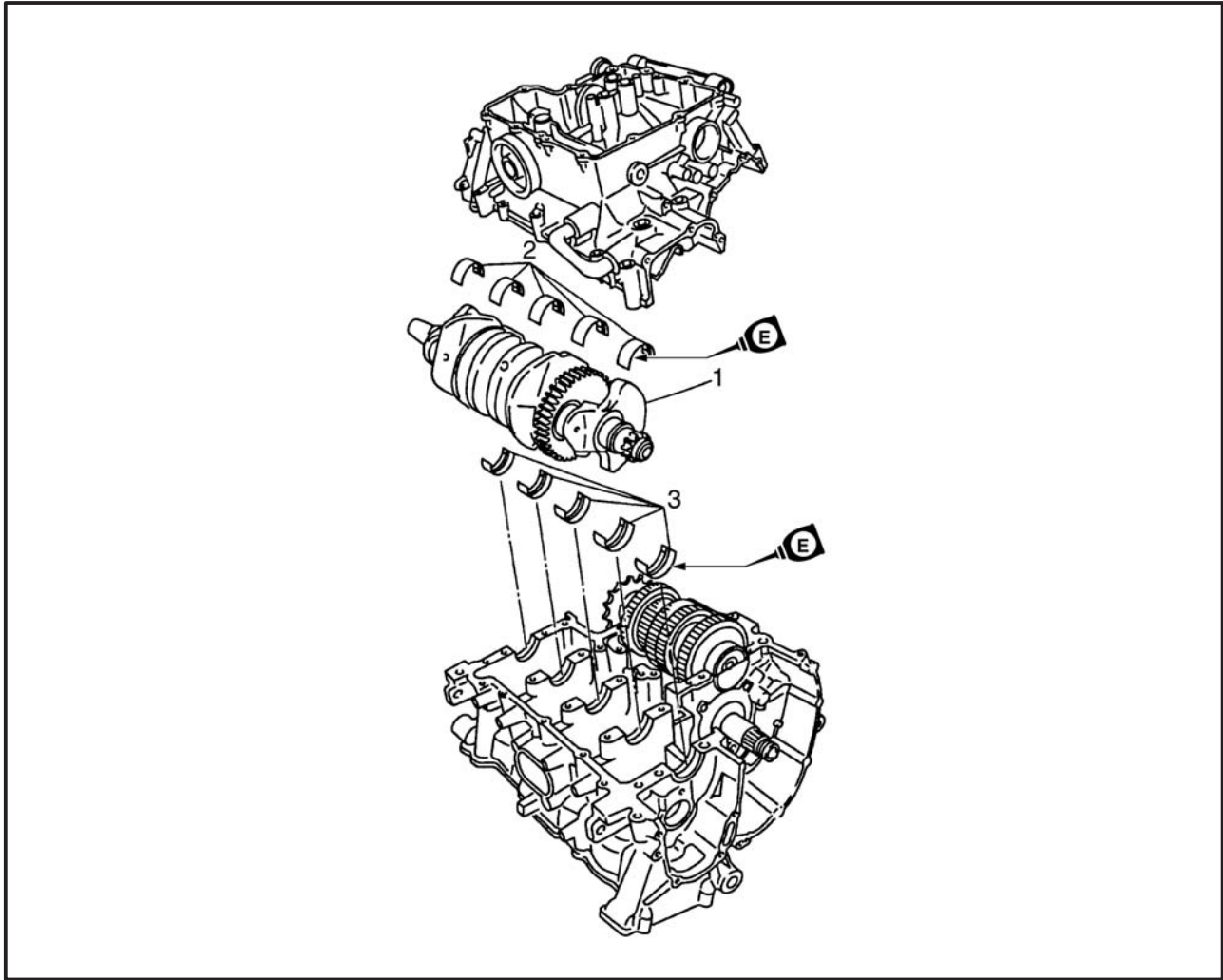
**NOTE:**

When using a hexagonal nut, note that the angle from one corner to another is  $60^{\circ}$ .

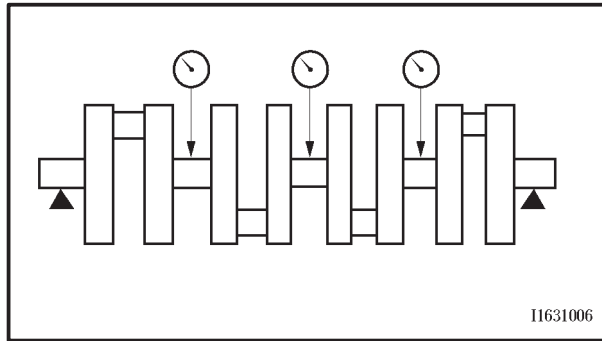


EAS00381

CRANKSHAFT



Order	Job/Part	Q'ty	Remarks
	<b>Removing the crankshaft</b>		
	Crankcase		Remove the parts in the order listed. Separate. Refer to "CRANKCASE".
	Connecting rod caps		Refer to "CONNECTING RODS AND PISTONS".
1	Crankshaft	1	
2	Crankshaft journal lower bearing	5	
3	Crankshaft journal upper bearing	5	
			For installation, reverse the removal procedure.



EAS00395

## CHECKING THE CRANKSHAFT

1. Measure:

- crankshaft runout  
Out of specification → Replace the crankshaft.



**Crankshaft runout**  
**Less than 0.03 mm (0.0012 in)**

2. Check:

- crankshaft journal surfaces
  - crankshaft pin surfaces
  - bearing surfaces
- Scratches/wear → Replace the crankshaft.

## CHECKING THE CRANKSHAFT JOURNAL BEARINGS

1. Measure:

- crankshaft-journal-to-crankshaft-journal-bearing clearance  
Out of specification → Replace the crankshaft journal bearings.

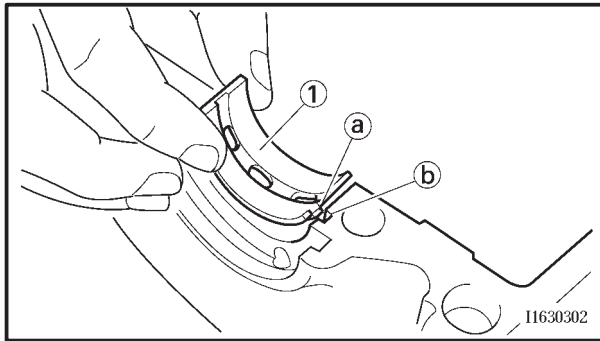


**Crankshaft-journal-to-crankshaft-journal-bearing clearance**  
0.034 ~ 0.058 mm  
(0.0013 ~ 0.0023 in)

**CAUTION:**

**Do not interchange the crankshaft journal bearings. To obtain the correct crankshaft-journal-to-crankshaft-journal-bearing clearance and prevent engine damage, the crankshaft journal bearings must be installed in their original positions.**

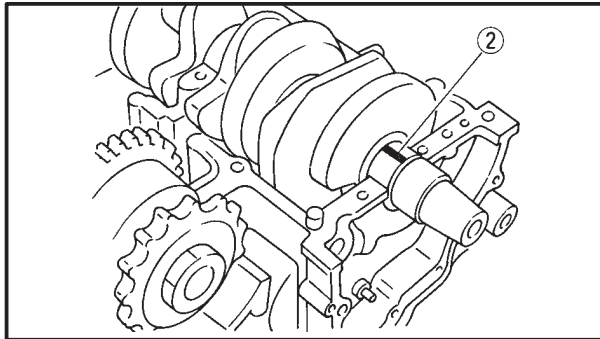
- Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
- Place the upper crankcase upside down on a bench.



- c. Install the crankshaft journal upper bearings ① and the crankshaft into the upper crankcase.

**NOTE:**

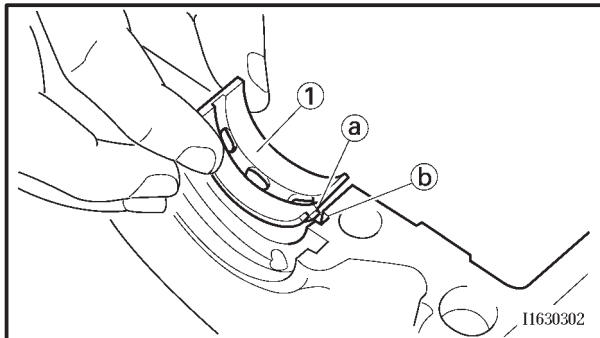
Align the projections (a) on the crankshaft journal upper bearings with the notches (b) in the upper crankcase.



- d. Put a piece of Plastigauge® ② on each crankshaft journal.

**NOTE:**

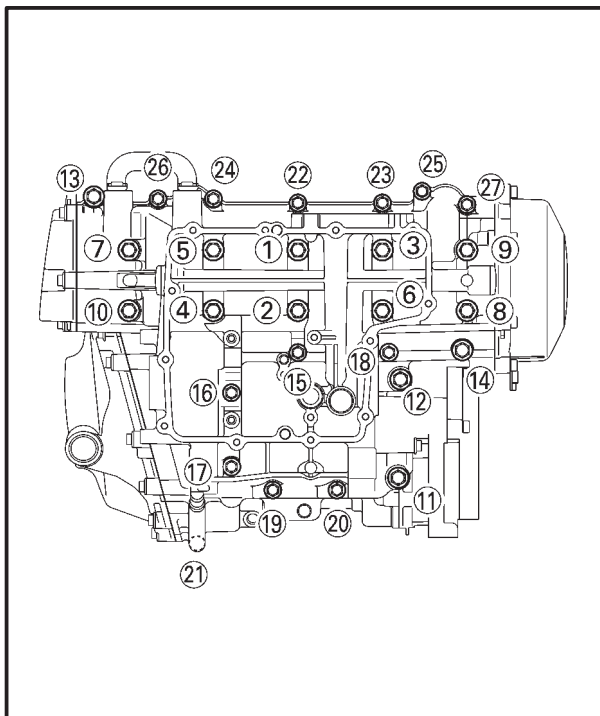
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



- e. Install the crankshaft journal lower bearings ① into the lower crankcase and assemble the crankcase halves.

**NOTE:**

- Align the projections (a) of the crankshaft journal lower bearings with the notches (b) in the lower crankcase.
- Do not move the crankshaft until the clearance measurement has been completed.



- f. Tighten the bolts to specification in the tightening sequence cast on the crankcase.



**Crankcase bolt**

**Bolt ① ~ ⑩**

**1st: 12 Nm (1.2 m•kg, 8.7 ft•lb)**

**2nd: 25 Nm (2.5 m•kg, 18 ft•lb)**

**\*3rd: 27 Nm (2.7 m•kg, 20 ft•lb)**

**Bolt ⑪, ⑫**

**24 Nm (2.4 m•kg, 17 ft•lb)**

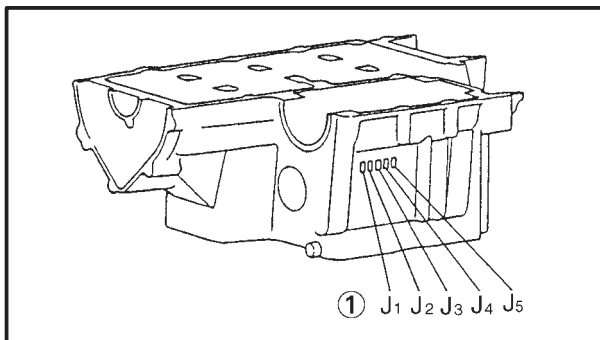
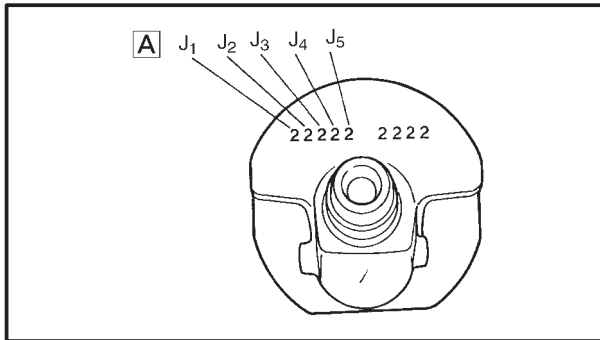
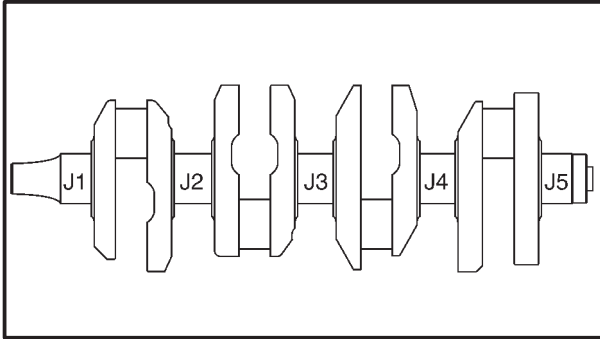
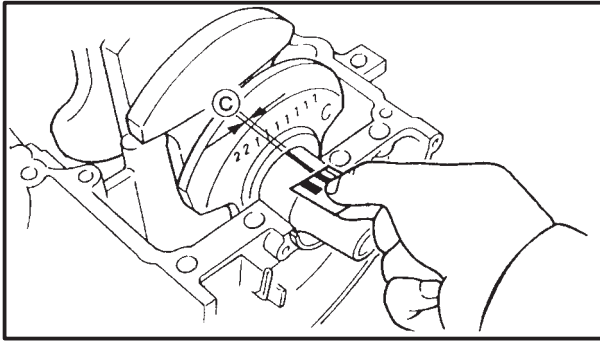
**Bolt ⑬ ~ ⑳**

**12 Nm (1.2 m•kg, 8.7 ft•lb)**

\* Loosen the all bolts following the tightening order and then tighten to specification torque.

**NOTE:**

Lubricate the crankcase bolt threads with engine oil.  
Refer to "CRANKCASE".



- g. Remove the lower crankcase and the crankshaft journal lower bearings.
- h. Measure the compressed Plastigauge® width ③ on each crankshaft journal.  
If the crankshaft-journal-to-crankshaft-journal-bearing clearance is out of specification, select replacement crankshaft journal bearings.

[illegible]

2. Select:
- crankshaft journal bearings (J1 ~ J5)

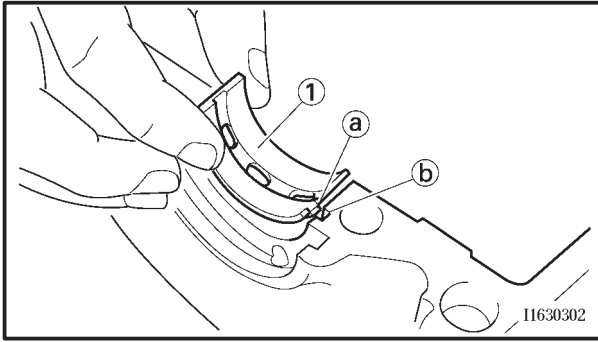
**NOTE:**

- The numbers **A** stamped into the crankshaft web and the numbers **①** stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.
- “J1 ~ J5” refer to the bearings shown in the crankshaft illustration.
- If “J1 ~ J5” are the same, use the same size for all of the bearings.
- If the size is the same for all “J<sub>1</sub> to J<sub>5</sub>” one digit for that size is indicated. (Crankcase side only)

For example, if the crankcase “J<sub>1</sub>” and crankshaft web “J<sub>1</sub>” numbers are “6” and “2” respectively, then the bearing size for “J1” is:

**“J<sub>1</sub>” (crankcase) – “J<sub>1</sub>” (crankshaft web) – 1 = 6 – 2 – 1 = 3 (brown)**

CRANKSHAFT JOURNAL BEARING COLOR CODE	
0	White
1	Blue
2	Black
3	Brown
4	Green



EAS00407

**INSTALLING THE CRANKSHAFT****1. Install:**

- crankshaft journal upper bearings ① (into the upper crankcase)

**NOTE:**

- Align the projections (a) on the crankshaft journal upper bearings with the notches (b) in the upper crankcase.
- Be sure to install each crankshaft journal upper bearing in its original place.

**2. Install:**

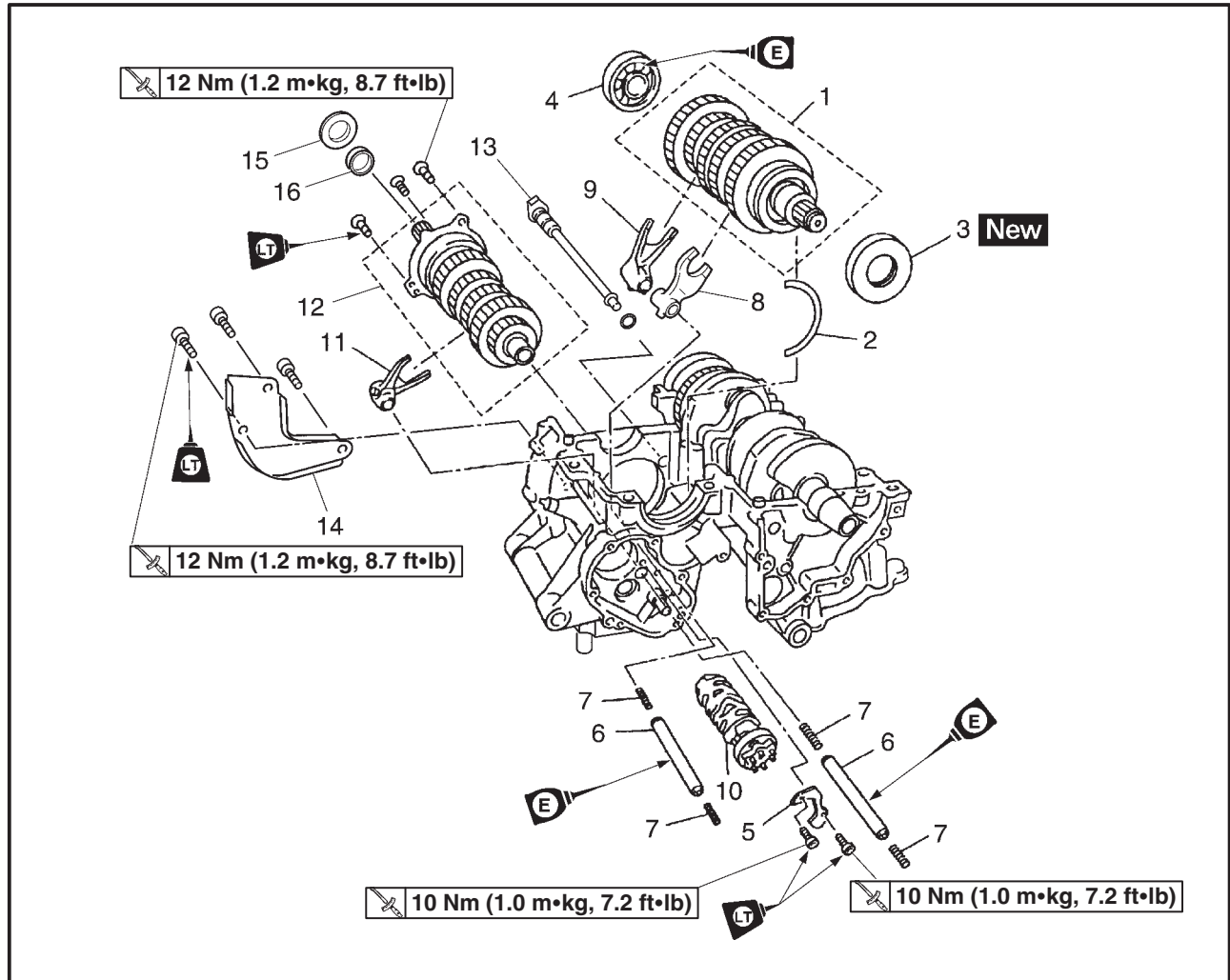
- crankshaft

**3. Install:**

- crankcase (lower)  
Refer to "CRANKCASE".

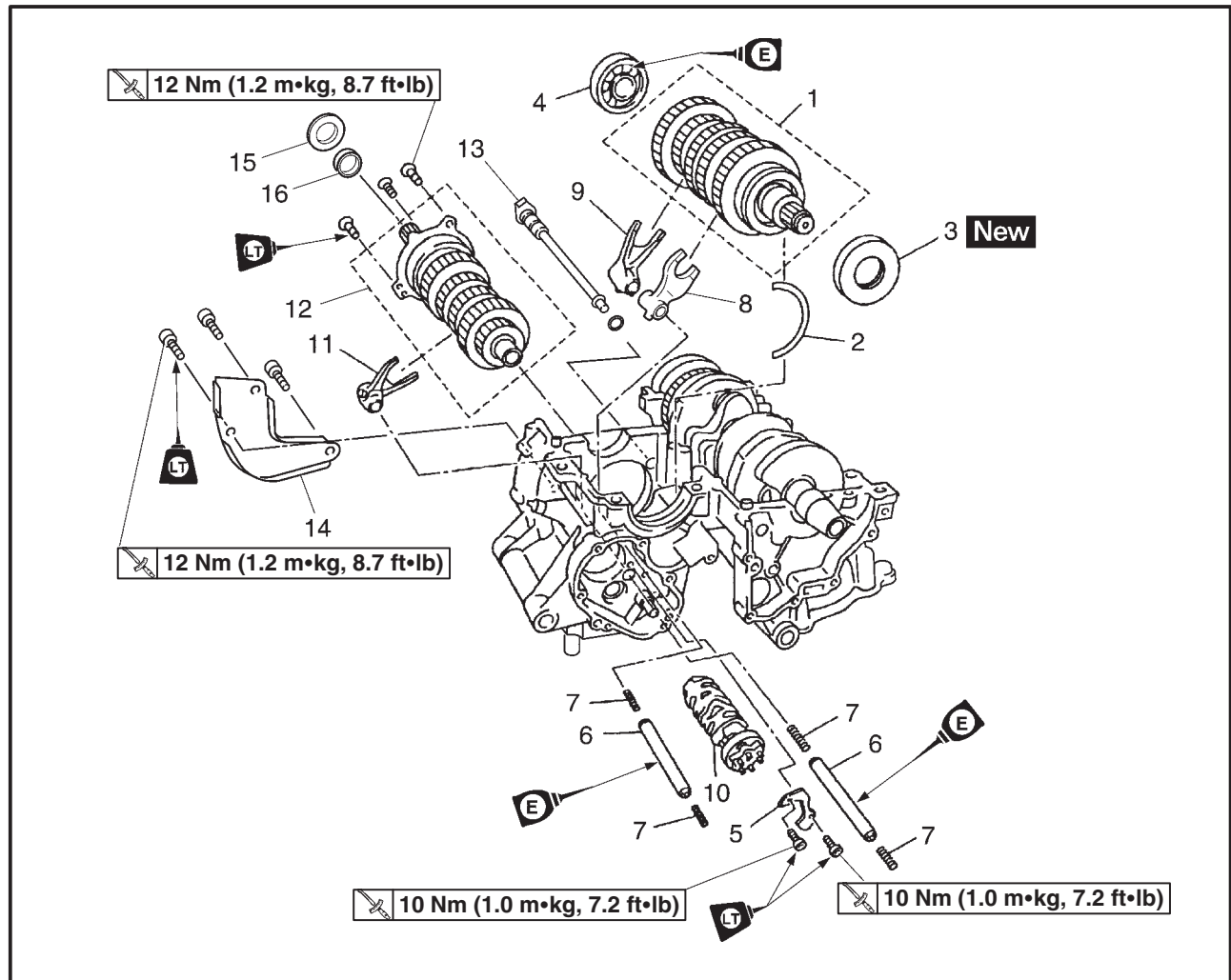


EAS00419

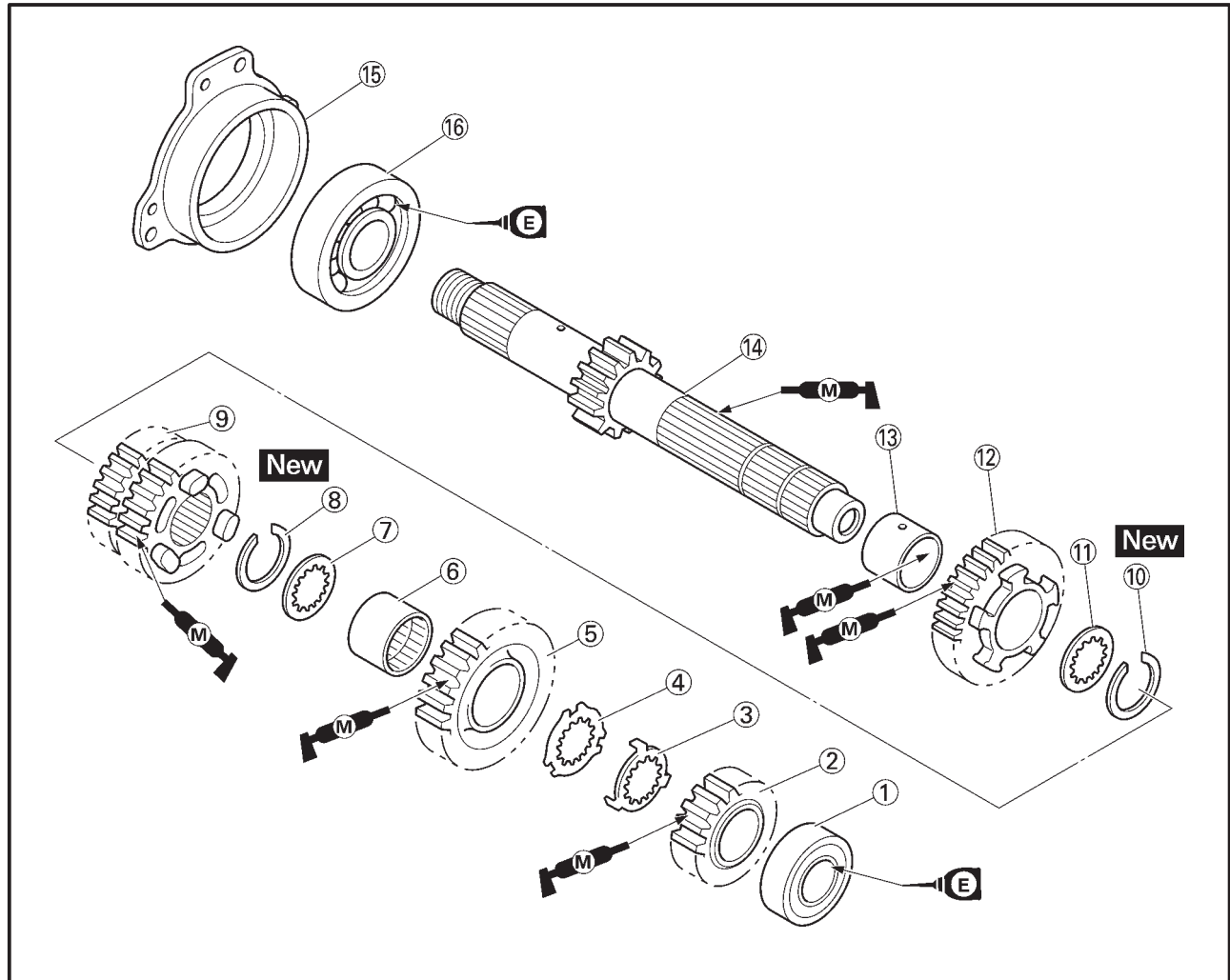
**TRANSMISSION****TRANSMISSION, SHIFT DRUM ASSEMBLY AND SHIFT FORKS**

Order	Job/Part	Q'ty	Remarks
	<b>Removing the transmission, shift drum assembly, and shift forks</b>		
	Crankcase lower		Remove the part in the order listed.
			Separate. Refer to "CRANKCASE".
1	Drive axle assembly	1	
2	Circlip	1	
3	Oil seal	1	
4	Bearing	1	
5	Shift drum retainer	1	
6	Shift fork guide bar	2	
7	Spring	4	
8	Shift fork "L"	1	
9	Shift fork "R"	1	
10	Shift drum assembly	1	
11	Shift fork "C"	1	

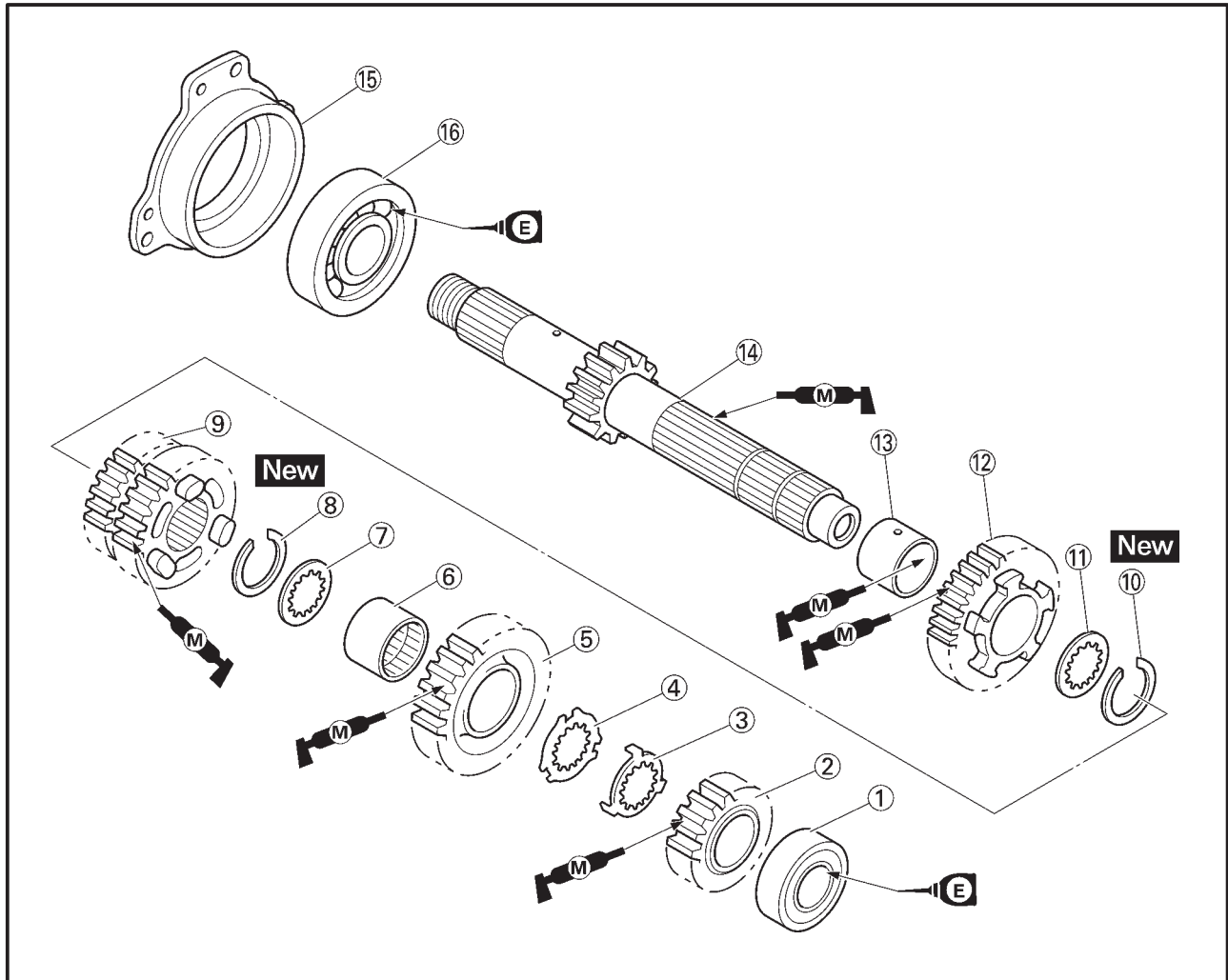




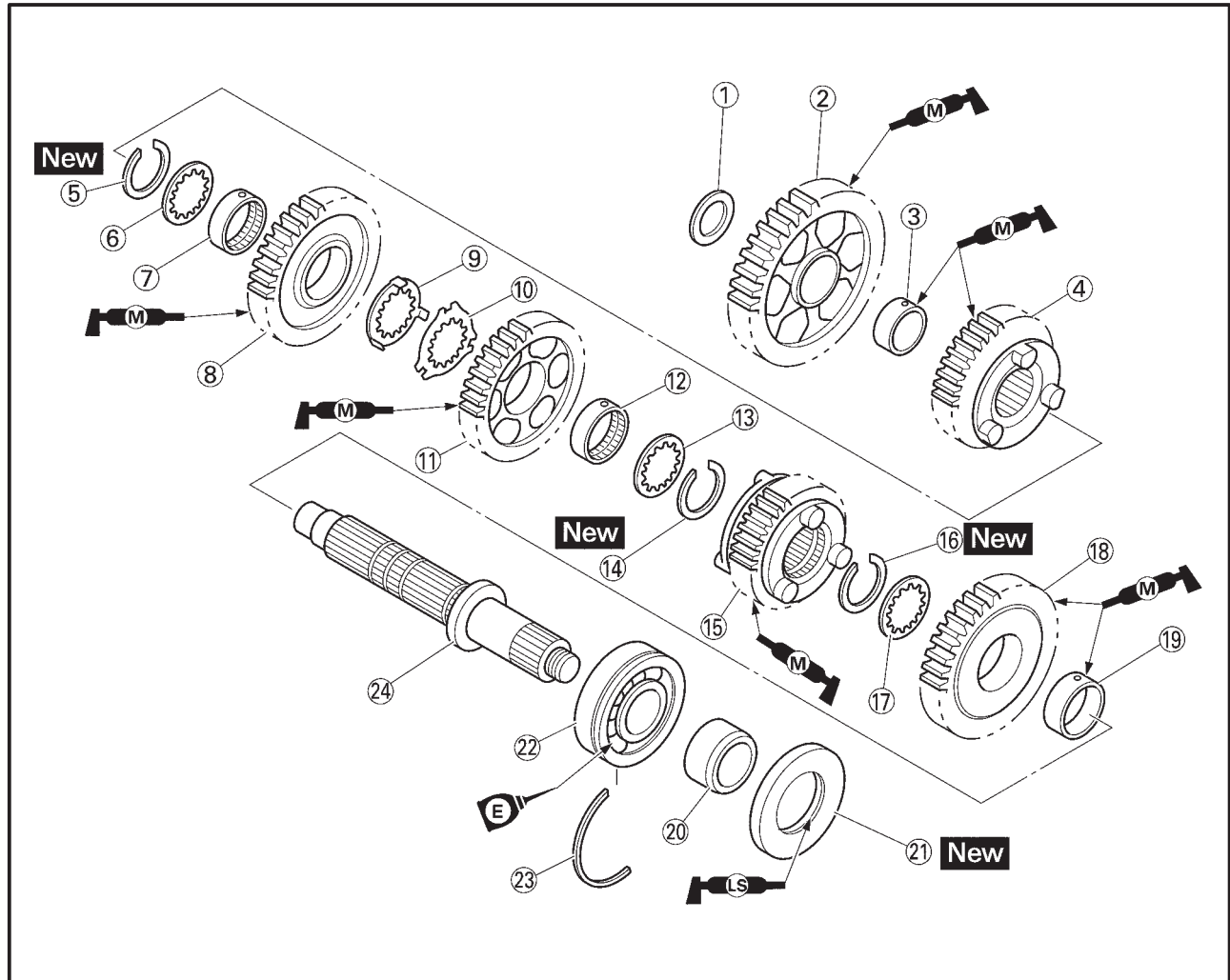
Order	Job/Part	Q'ty	Remarks
12	Main axle assembly	1	For installation, reverse the removal procedure.
13	Oil pipe	1	
14	Oil baffle plate	1	
15	Thrust plate	1	
16	Washer	1	



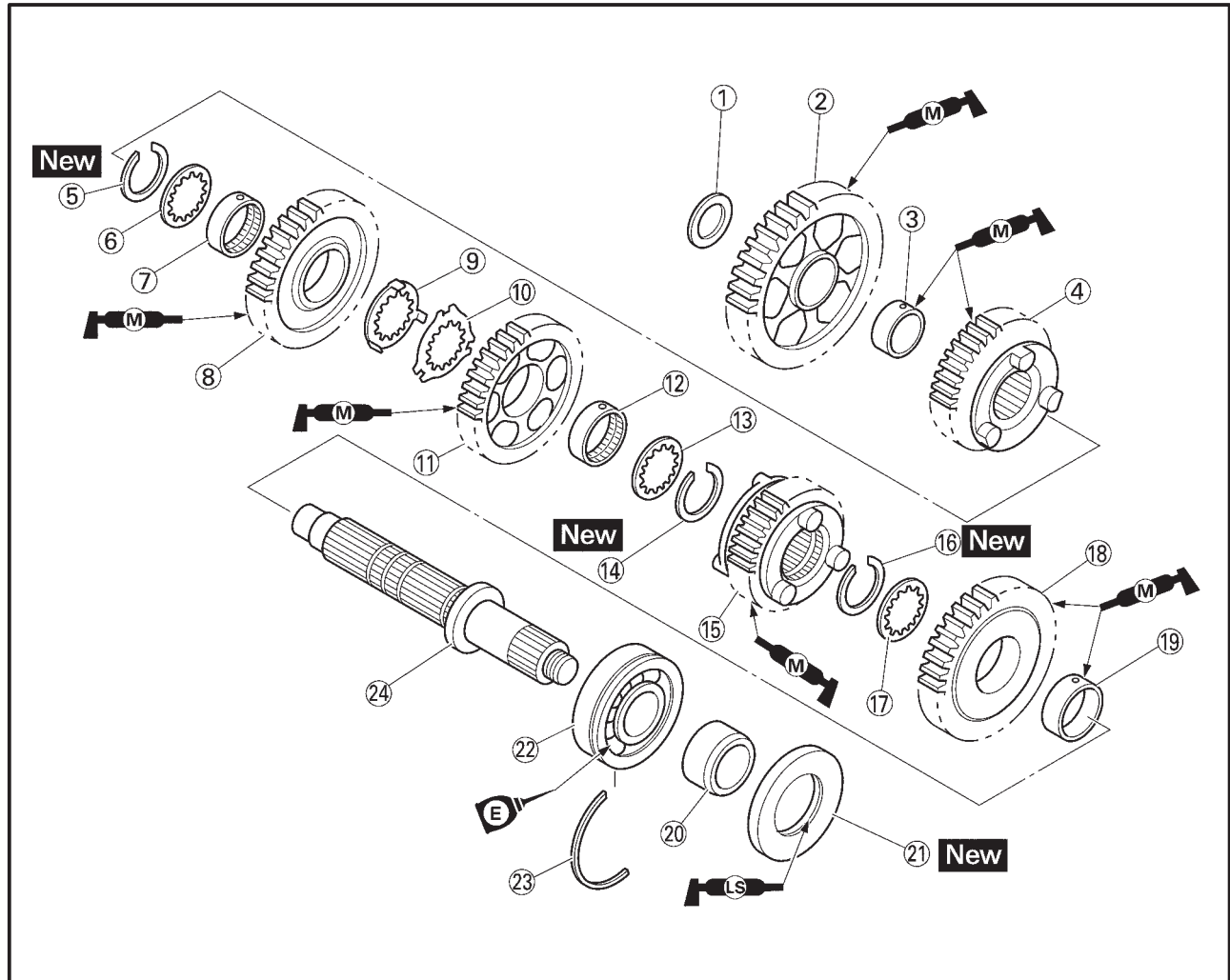
Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the main axle assembly</b>		Disassemble the parts in the order listed.
①	Bearing	1	
②	2nd pinion gear	1	
③	Toothed lock washer	1	
④	Toothed lock washer retainer	1	
⑤	6th pinion gear	1	
⑥	Collar	1	
⑦	Washer	1	
⑧	Circlip	1	
⑨	3rd pinion gear	1	
⑩	Circlip	1	
⑪	Washer	1	
⑫	5th pinion gear	1	
⑬	Collar	1	
⑭	Main axle	1	



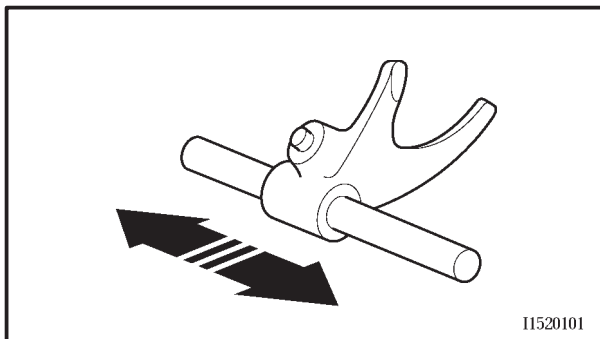
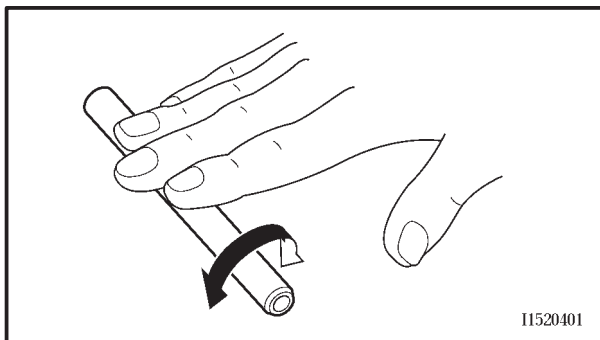
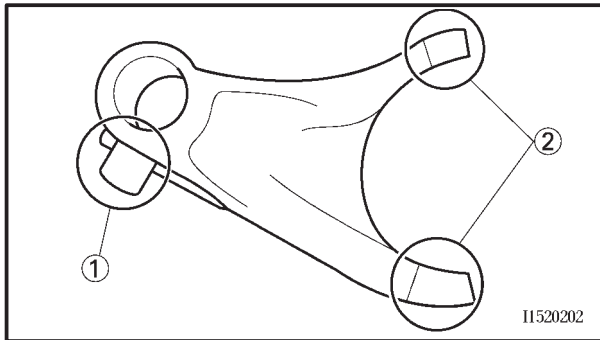
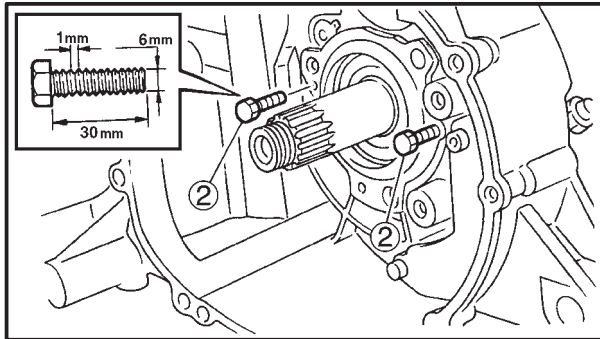
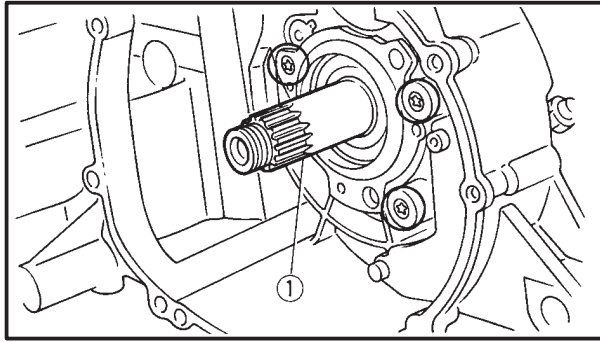
Order	Job/Part	Q'ty	Remarks
⑮	Bearing housing	1	For installation, reverse the removal procedure.
⑯	Bearing	1	



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the drive axle assembly</b>		Disassemble the parts in the order listed.
①	Washer	1	
②	1st wheel gear	1	
③	Collar	1	
④	5th wheel gear	1	
⑤	Circlip	1	
⑥	Washer	1	
⑦	Collar	1	
⑧	3rd wheel gear	1	
⑨	Toothed lock washer	1	
⑩	Toothed lock washer retainer	1	
⑪	4th wheel gear	1	
⑫	Collar	1	
⑬	Washer	1	
⑭	Circlip	1	



Order	Job/Part	Q'ty	Remarks
15	6th wheel gear	1	For installation, reverse the removal procedure.
16	Circlip	1	
17	Washer	1	
18	2nd wheel gear	1	
19	Collar	1	
20	Collar	1	
21	Oil seal	1	
22	Bearing	1	
23	Circlip	1	
24	Drive axle	1	



EAS00420

## REMOVING THE TRANSMISSION

1. Remove:

- main axle assembly ①  
(with the Torx<sup>®</sup> wrench T30)

▼▼▼

- Insert two bolts ② of the proper size, as shown in the illustration, into the main axle assembly bearing housing.
- Tighten the bolts until they contact the crankcase surface.
- Continue tightening the bolts until the main axle assembly comes free from the upper crankcase.

**▲ ▲**

EAS00421

## CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

1. Check:

- shift fork cam follower ①
- shift fork pawl ②

Bends/damage/scoring/wear → Replace the shift fork.

2. Check:

- shift fork guide bar

Roll the shift fork guide bar on a flat surface.  
Bends → Replace.

**⚠ WARNING**

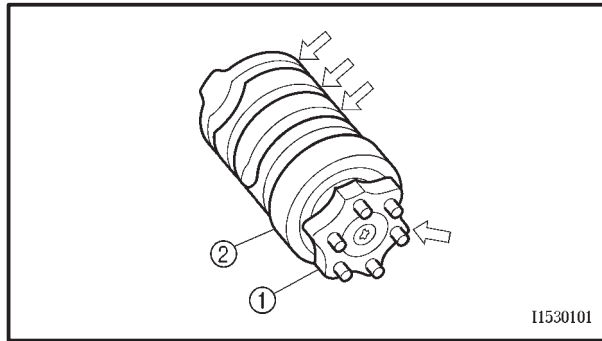
**Do not attempt to straighten a bent shift fork guide bar.**

### 3. Check:

- shift fork movement

(along the shift fork guide bar)

Rough movement → Replace the shift forks and shift fork guide bar as a set.

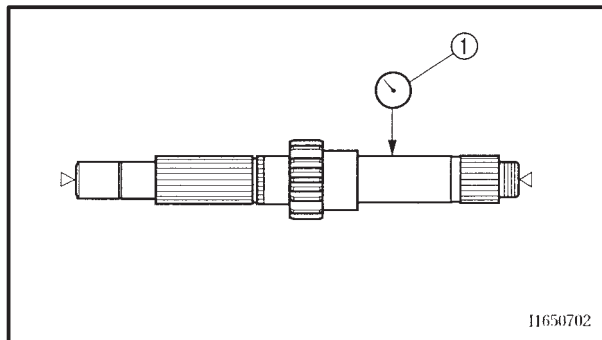


I1530101

EAS00422

**CHECKING THE SHIFT DRUM ASSEMBLY****1. Check:**

- shift drum grooves  
Damage/scratches/wear → Replace the shift drum assembly.
- shift drum segment ①  
Damage/wear → Replace the shift drum assembly.
- shift drum bearing ②  
Damage/pitting → Replace the shift drum assembly.



I1650702

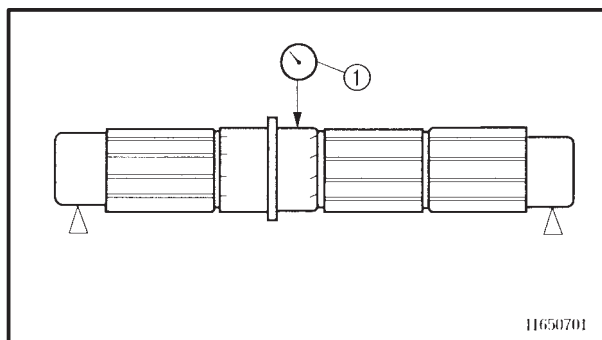
EAS00425

**CHECKING THE TRANSMISSION****1. Measure:**

- main axle runout  
(with a centering device and dial gauge ①)  
Out of specification → Replace the main axle.



**Main axle runout limit**  
**0.02 mm (0.0008 in)**



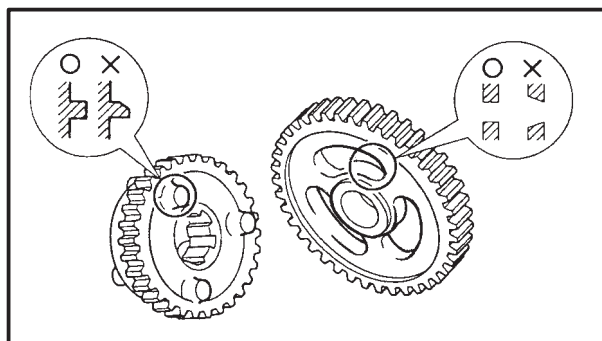
I1650701

**2. Measure:**

- drive axle runout  
(with a centering device and dial gauge ①)  
Out of specification → Replace the drive axle.



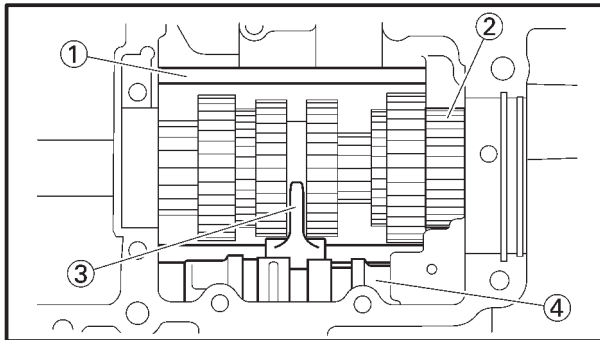
**Drive axle runout limit**  
**0.02 mm (0.0008 in)**

**3. Check:**

- transmission gears  
Blue discoloration/pitting/wear → Replace the defective gear(s).
- transmission gear dogs  
Cracks/damage/rounded edges → Replace the defective gear(s).



4. Check:
  - transmission gear engagement  
(each pinion gear to its respective wheel gear)  
Incorrect → Reassemble the transmission axle assemblies.
5. Check:
  - transmission gear movement  
Rough movement → Replace the defective part(s).
6. Check:
  - circlips  
Bends/damage/looseness → Replace.



EAS00430

**INSTALLING THE TRANSMISSION**

1. Install:
  - oil pipe ①
  - main axle assembly ②  
(with the Torx® wrench T30)

**NOTE:**

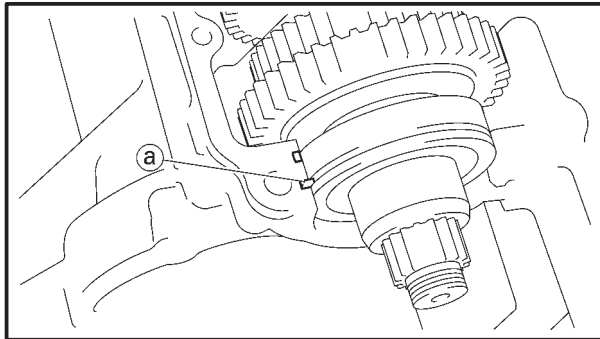
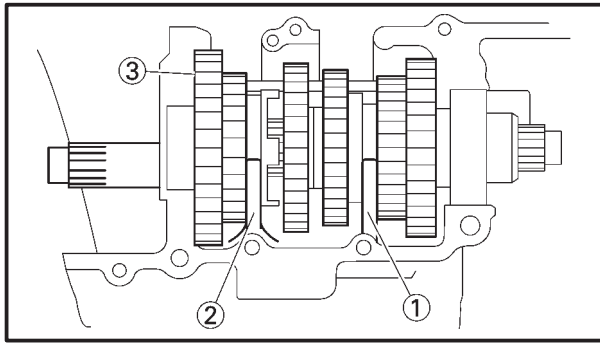
Make sure to caulk the bolts at three positions after installing the bearing housing.

2. Install:
  - shift fork “C” ③
  - shift drum assembly ④
  - shift fork guide bar

**NOTE:**


- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: “R”, “C”, “L”.
- Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install shift fork “C” into the groove in the 3rd and 4th pinion gear on the main axle.





## 3. Install:

- shift fork “R” ① and “L” ②
- drive axle ③
- shift fork guide bar
- shift drum retainer

 10 Nm (1.0 m•kg, 7.2 ft•lb)

**NOTE:**

- Install shift fork “L” into the groove in the 6th wheel gear and shift fork “R” into the groove in the 5th wheel gear on the drive axle.
- Make sure that the drive axle bearing circlip (a) is inserted into the grooves in the upper crankcase.

## 9. Check:

- transmission  
Rough movement → Repair.

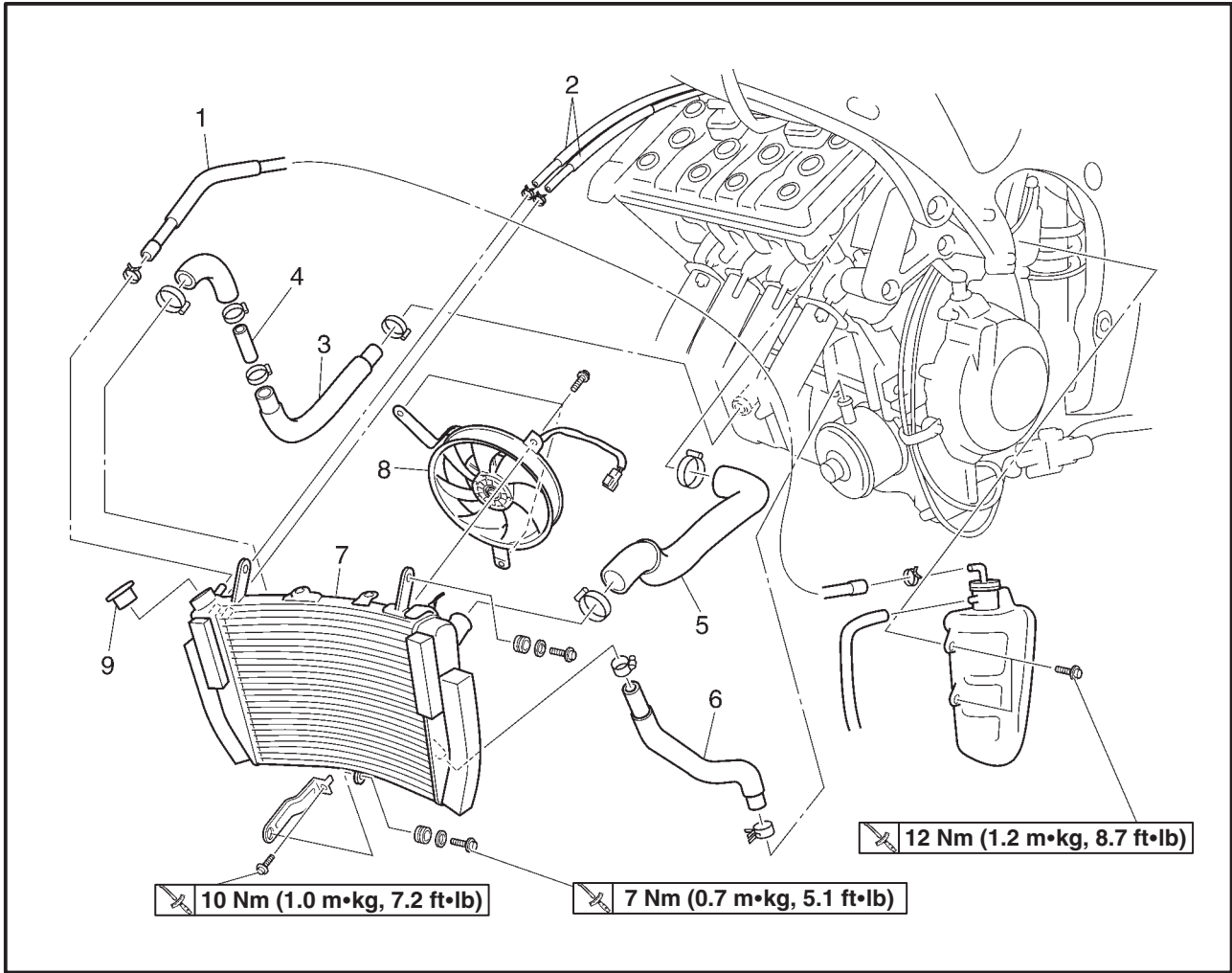
**NOTE:**

Oil each gear, shaft, and bearing thoroughly.

EAS00454

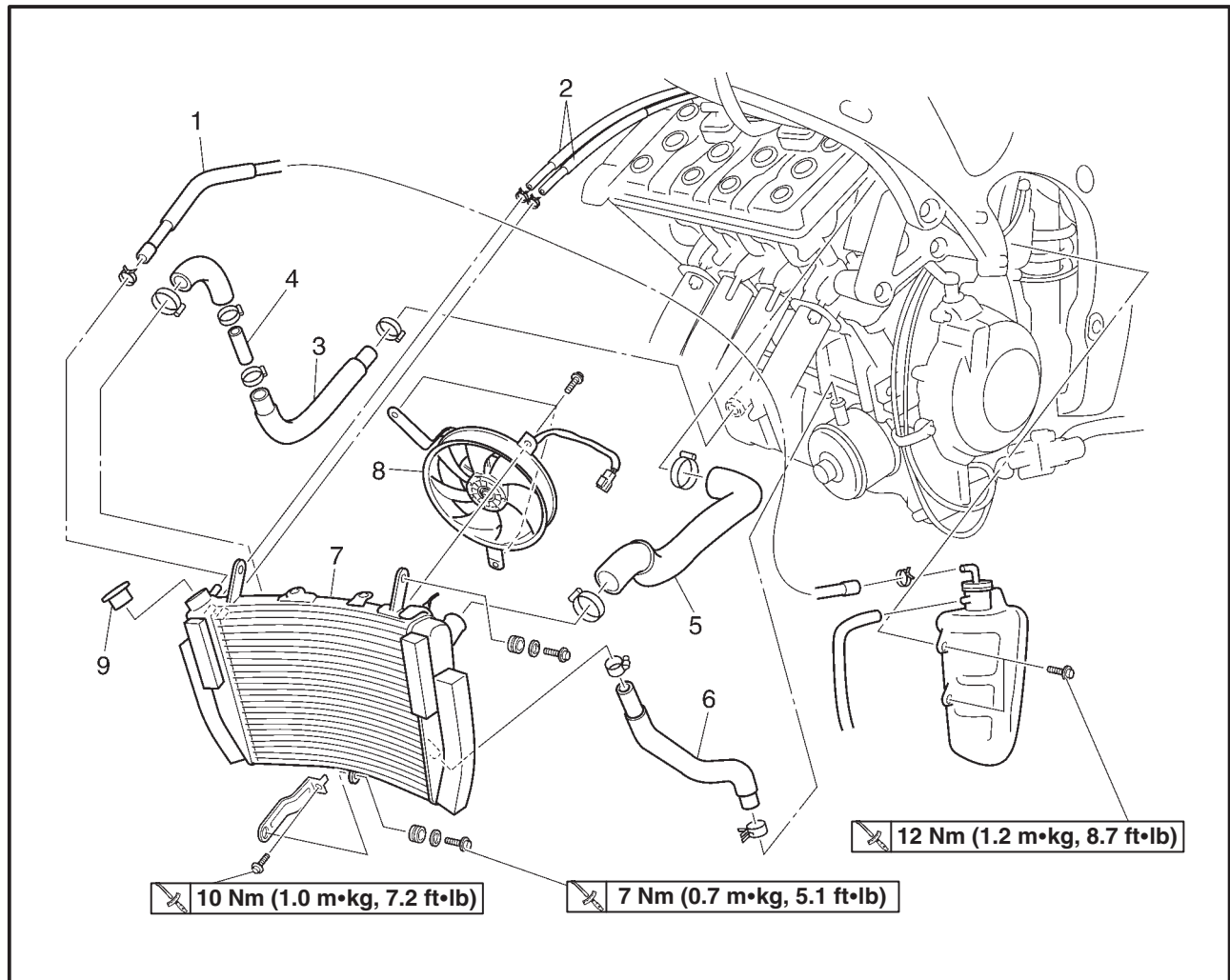
COOLING SYSTEM

RADIATOR



6

Order	Job/Part	Q'ty	Remarks
	<b>Removing the radiator</b> Rider seat Fuel tank Air filter case Side cowlings and bottom cowling Coolant		Remove the parts in the order listed. Refer to "SEATS" in chapter 3. Refer to "FUEL TANK" in chapter 3. Refer to "AIR FILTER CASE" in chapter 3. Refer to "COWLINGS" in chapter 3. Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Coolant reservoir hose	1	
2	Throttle body hose	2	
3	Radiator outlet hose	1	
4	Coolant pipe	1	
5	Radiator inlet hose	1	
6	Oil cooler outlet hose	1	
7	Radiator	1	
8	Radiator fan	1	



Order	Job/Part	Q'ty	Remarks
9	Radiator cap	1	For installation, reverse the removal procedure.





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.

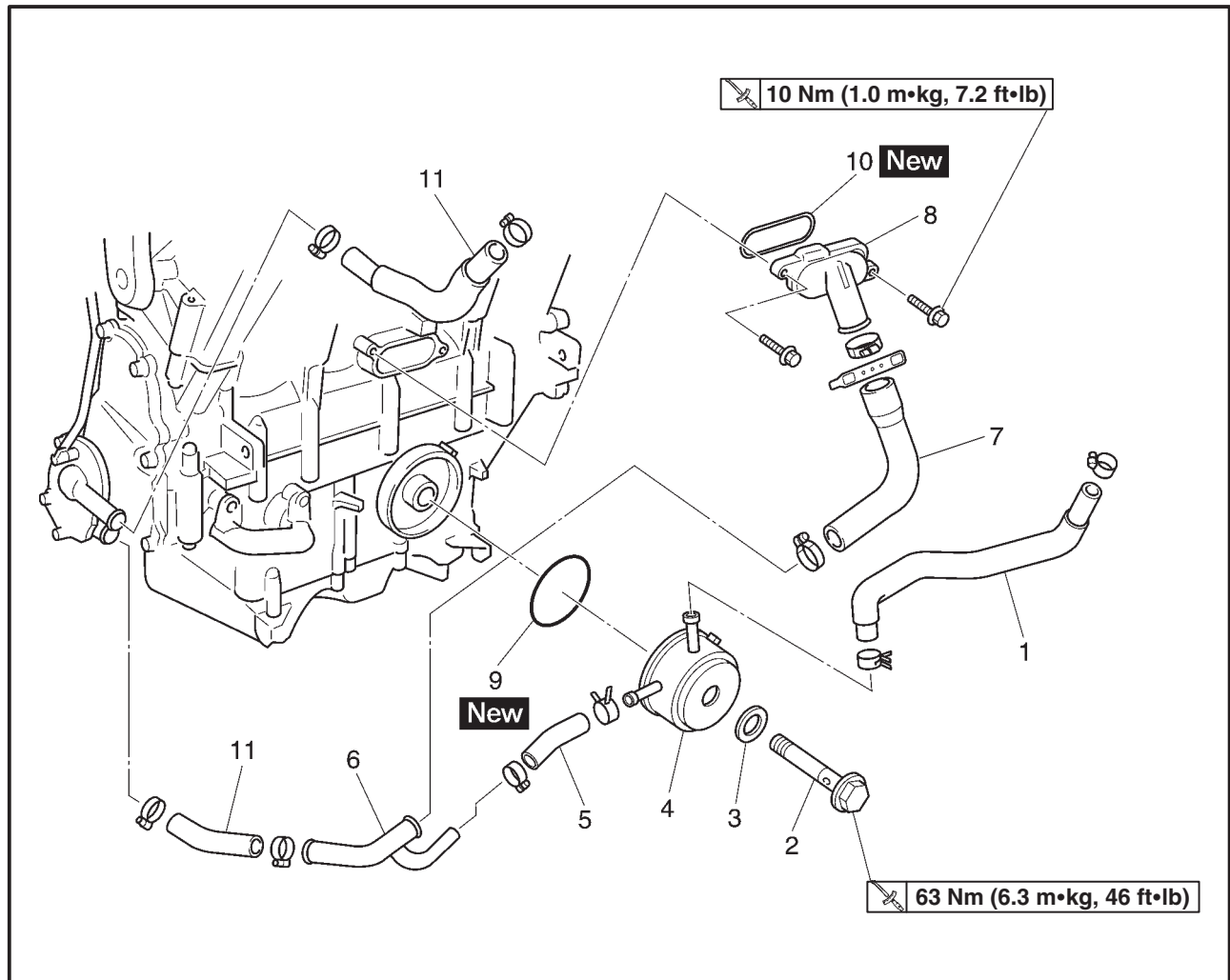
**3. Measure:**

- radiator cap opening pressure  
Below the specified pressure → Replace the radiator cap.  
Refer to “CHECKING THE RADIATOR”.

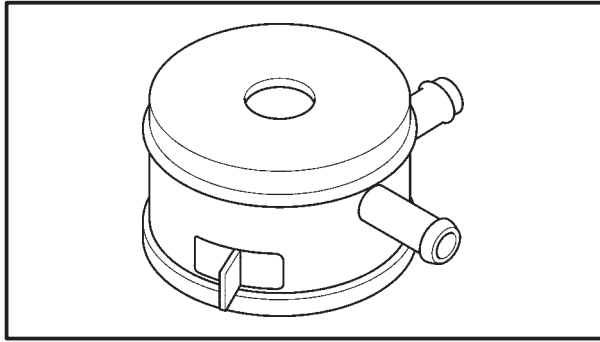


EAS00457

## OIL COOLER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the oil cooler</b>		
	Radiator assembly		Remove the parts in the order listed. Refer to "RADIATOR".
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Oil cooler outlet hose	1	
2	Union bolt	1	
3	Washer	1	
4	Oil cooler	1	
5	Oil cooler inlet hose	1	
6	Oil cooler inlet pipe	1	
7	Water jacket joint hose	1	
8	Water jacket joint	1	
9	O-ring	1	
10	O-ring	1	
11	Water pump hose	2	
			For installation, reverse the removal procedure.




EAS00458

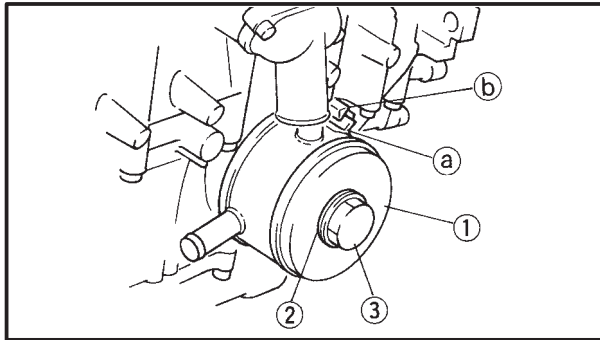
**CHECKING THE OIL COOLER**

1. Check:
  - oil cooler  
Cracks/damage → Replace.
2. Check:
  - oil cooler inlet hose
  - oil cooler outlet hose  
Cracks/damage/wear → Replace.

EAS00459

**INSTALLING THE OIL COOLER**

1. Clean:
  - mating surfaces of the oil cooler and the crankcase  
(with a cloth dampened with lacquer thinner)
2. Install:
  - O-ring **New**
  - oil cooler ①
  - washer ② **New**
  - bolt ③  **63 Nm (6.3 m•kg, 46 ft•lb)**

**NOTE:**

- Before installing the oil cooler, lubricate the oil cooler bolt and O-ring with a thin coat of engine oil.
- Make sure that the O-ring is positioned properly.
- Align the projection (a) on the oil cooler with the slot (b) in the crankcase.

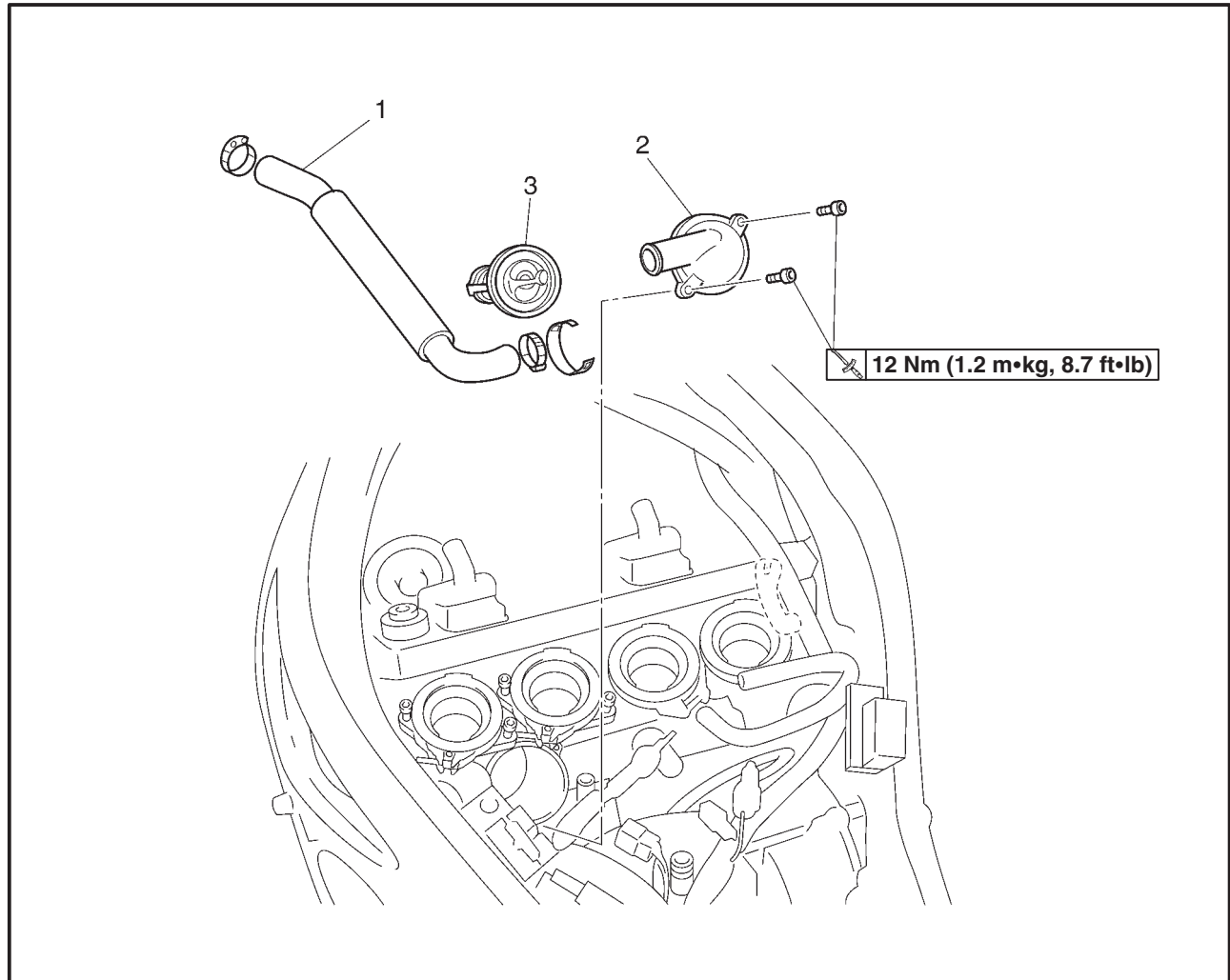
**3. Fill:**

- cooling system  
(with the specified amount of the recommended coolant)  
Refer to “CHANGING THE COOLANT” in chapter 3.
  - crankcase  
(with the specified amount of the recommended engine oil)  
Refer to “CHANGING THE ENGINE OIL” in chapter 3.
4. Check:
    - cooling system  
Leaks → Repair or replace any faulty part.
  5. Measure:
    - radiator cap opening pressure  
Below the specified pressure → Replace the radiator cap.  
Refer to “CHECKING THE RADIATOR”.



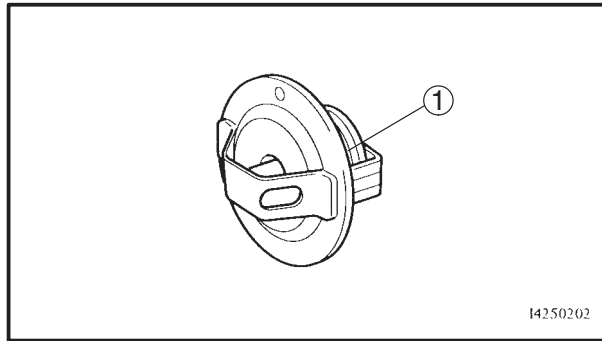
EAS00461

## THERMOSTAT

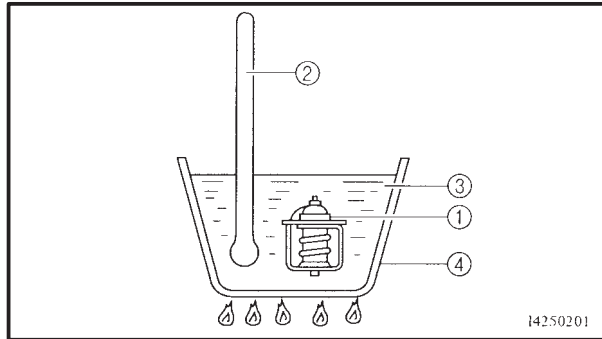


Order	Job/Part	Q'ty	Remarks
	<b>Removing the thermostat</b>		
	Rider seat		Remove the parts in the order listed.
	Air filter case		Refer to "SEATS" chapter 3.
	Throttle body assembly		Refer to "AIR FILTER CASE" in chapter 3.
	Coolant		Refer to "THROTTLE BODIES" in chapter 7.
			Drain.
			Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator inlet hose	1	
2	Thermostat cover	1	
3	Thermostat	1	
			For installation, reverse the removal procedure.

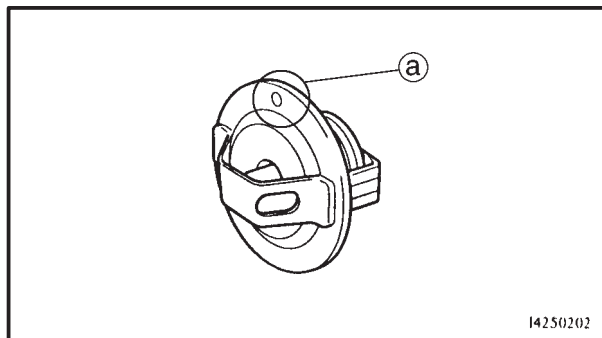
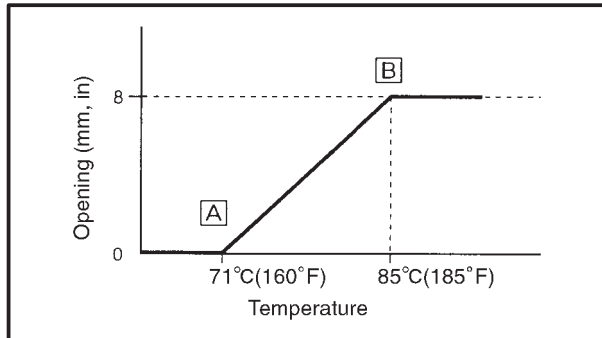




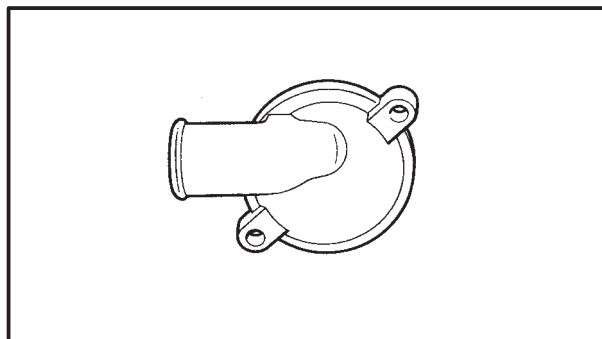
I4250202



I4250201



I4250202



EAS00462

## CHECKING THE THERMOSTAT

### 1. Check:

- thermostat ①

Does not open at 71 ~ 85°C (160 ~ 185°F)

→ Replace.



- Suspend the thermostat in a container filled with water.
- Slowly heat the water.
- Place a thermometer in the water.
- While stirring the water, observe the thermostat and thermometer's indicated temperature.



- ① Thermostat
- ② Thermometer
- ③ Water
- ④ Container
- 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 housing cover
- Cracks/damage → Replace.

## INSTALLING THE THERMOSTAT

### 1. Install:

- thermostat

### NOTE:

Install the thermostat with its breather hole ① facing up.

### 2. Install

- thermostat cover

12 Nm (1.2 m•kg, 8.7 ft•lb)

### NOTE:

Before installing the thermostat cover to the cylinder head, lubricate the O-ring with a thin coat of lithium soap based grease.



---

3. Fill:

- cooling system

(with the specified amount of the recommended coolant)

Refer to “CHANGING THE COOLANT” in chapter 3.

4. Check:

- cooling system

Leaks → Repair or replace any faulty part.

5. Measure:

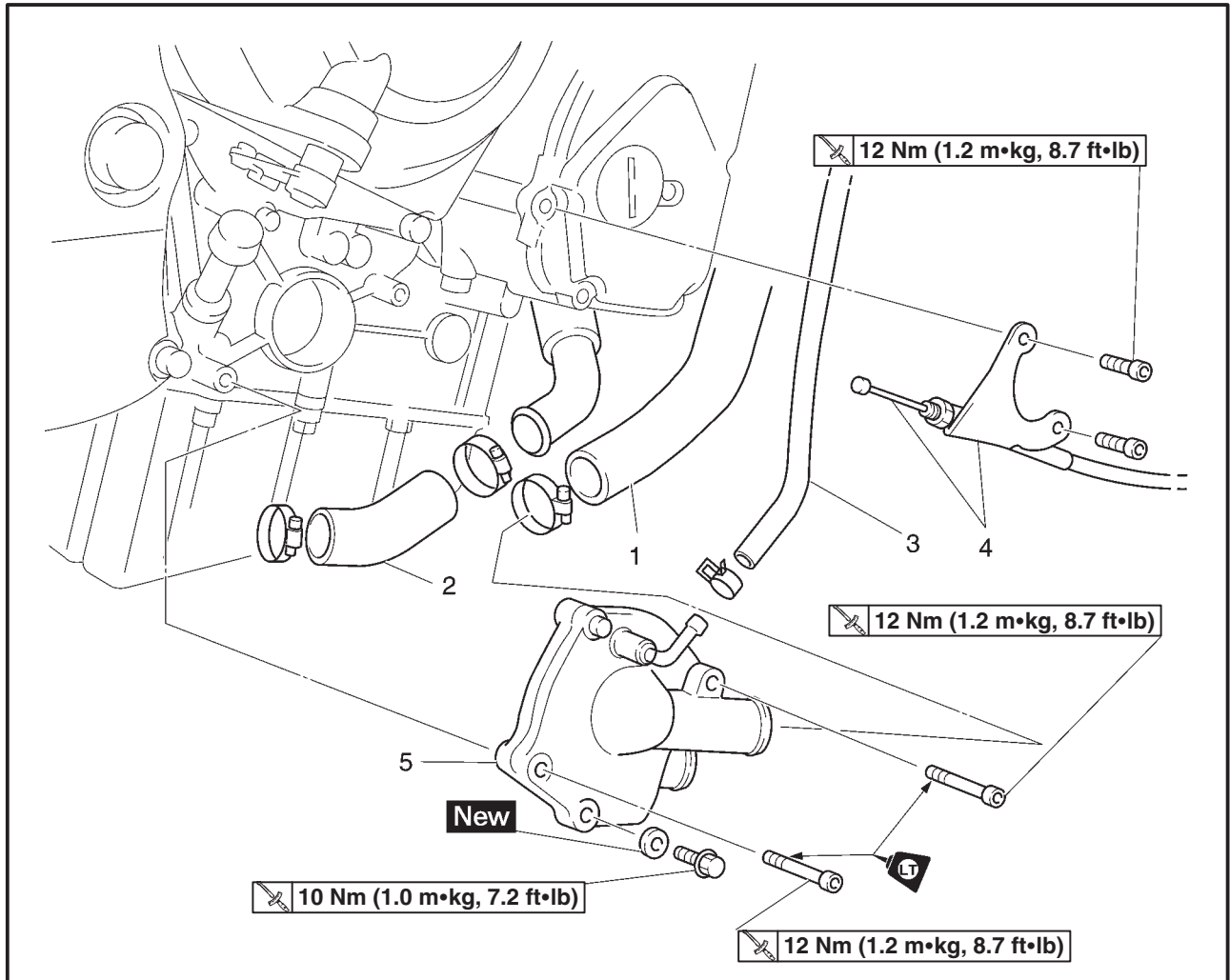
- radiator cap opening pressure

Below the specified pressure → Replace the radiator cap.

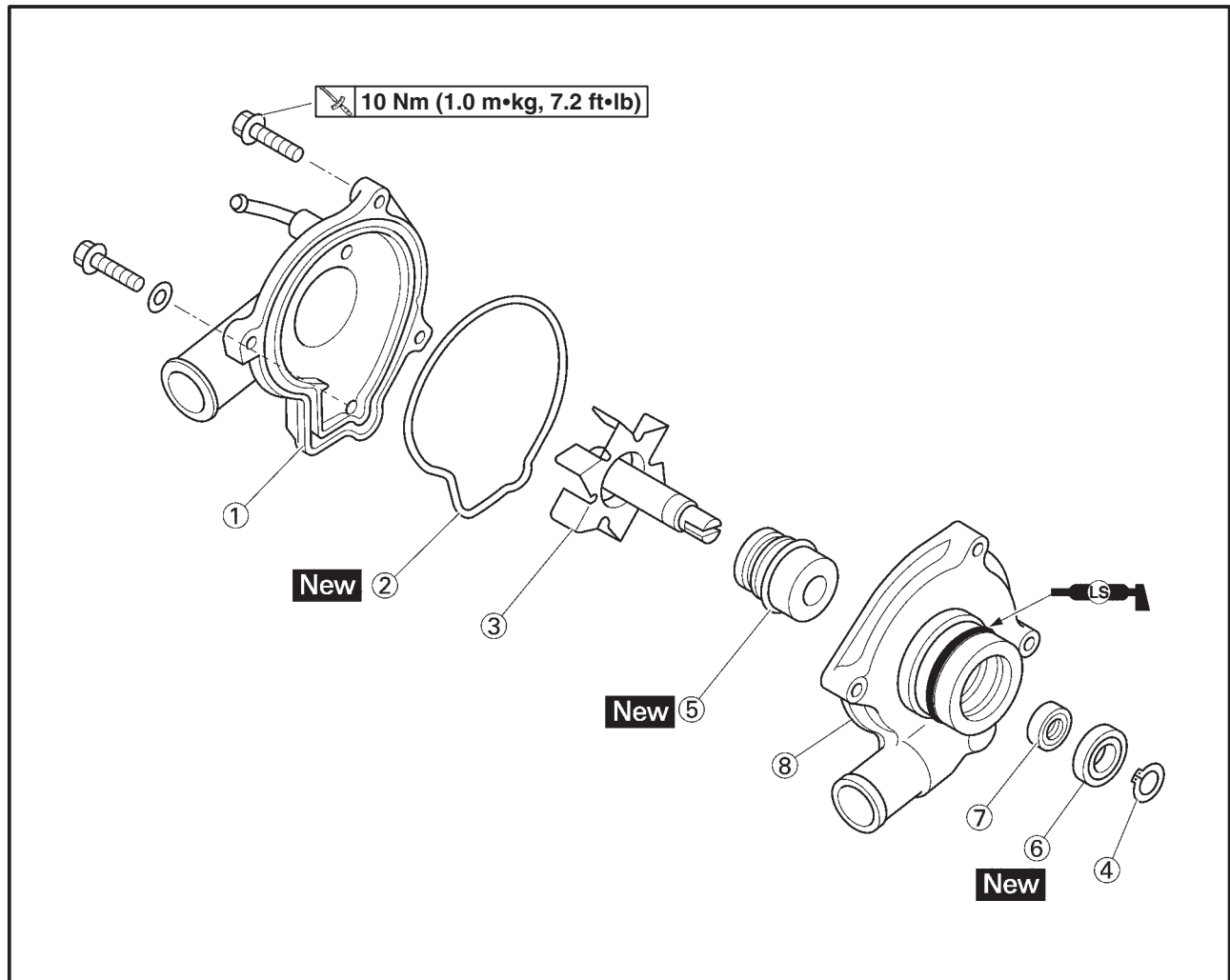
Refer to “CHECKING THE RADIATOR”.

EAS00408

# WATER PUMP



Order	Job/Part	Q'ty	Remarks
	<b>Removing the water pump</b> Bottom cowl Coolant		Remove the parts in the order listed. Refer to "COWLINGS" in chapter 3. Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Water pump inlet hose	1	
2	Water pump outlet hose	1	
3	Water pump hose	1	
4	Clutch cable/holder	1/1	
5	Water pump	1	
			<b>NOTE:</b> _____ It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the water pump</b>		
①	Water pump cover	1	Disassemble the parts in the order listed.
②	O-ring	1	
③	Impeller shaft	1	
④	Circlip	1	
⑤	Water pump seal	1	
⑥	Oil seal	1	
⑦	Bearing	1	
⑧	Water pump housing	1	
			For assembly, reverse the disassembly procedure.

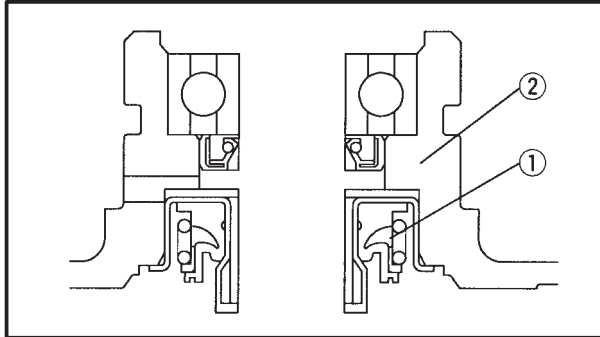


EAS00471

### DISASSEMBLING THE WATER PUMP

#### 1. Remove:

- circlip
- impeller shaft



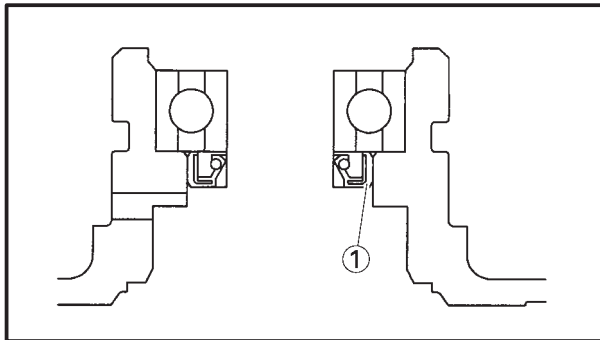
#### 2. Remove:

- water pump seal ①

#### NOTE:

Remove the water pump seal from the outside of the water pump housing.

② Water pump housing

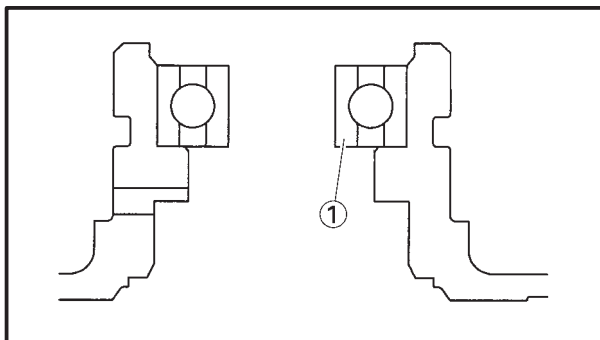


#### 3. Remove:

- oil seal ①  
(with a thin, flat-head screwdriver)

#### NOTE:

Remove the oil seal from the outside of the water pump housing.

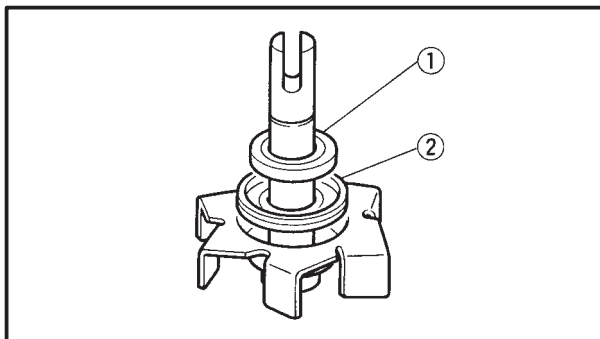


#### 4. Remove:

- bearing ①

#### NOTE:

Remove the bearing from inside of the water pump housing.

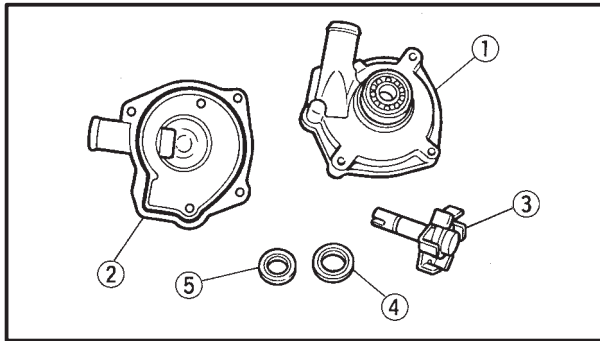


#### 5. Remove:

- rubber damper holder ①
- rubber damper ②  
(from the impeller, with a thin, flat-head screwdriver)

#### NOTE:

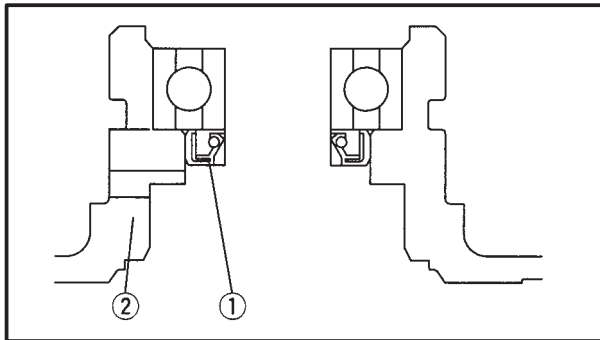
Do not scratch the impeller shaft.



EAS00473

## CHECKING THE WATER PUMP

1. Check:
  - water pump housing (1)
  - water pump cover (2)
  - impeller (3)
  - rubber damper (4)
  - rubber damper holder (5)
  - water pump seals
  - oil seal
 Cracks/damage/wear → Replace.
2. Check:
  - bearing
 Rough movement → Replace.
3. Check:
  - water pump outlet pipe
  - radiator outlet hose
 Cracks/damage/wear → Replace.



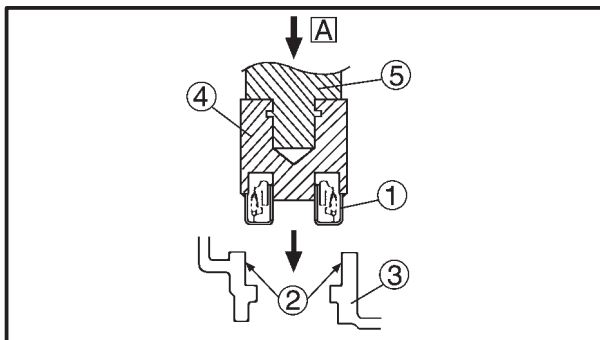
EAS00475

## ASSEMBLING THE WATER PUMP

1. Install:
  - oil seal **New** (1)
 (into the water pump housing (2))

### NOTE:

- Before installing the oil seal, apply tap water or coolant onto its out surface.
- Install the oil seal with a socket that matches its outside diameter.



2. Install:
  - water pump seal **New** (1)

### CAUTION:

**Never lubricate the water pump seal surface with oil or grease.**

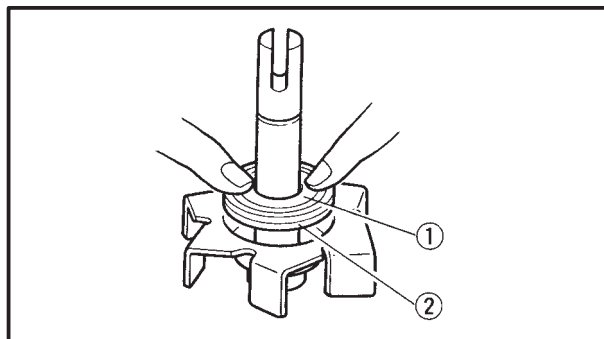
### NOTE:

- Install the water pump seal with the special tools.
- Before installing the water pump seal, apply Yamaha bond No.1215 or Quick Gasket (2) to the water pump housing (3).



**Mechanical seal installer**  
90890-04078, YM-33221 ④  
**Middle driven shaft bearing driver**  
90890-04058, YM-04058 ⑤  
**Quick Gasket**  
ACC-11001-05-01  
**Yamaha bond #1215**  
90890-85505

A Push down.

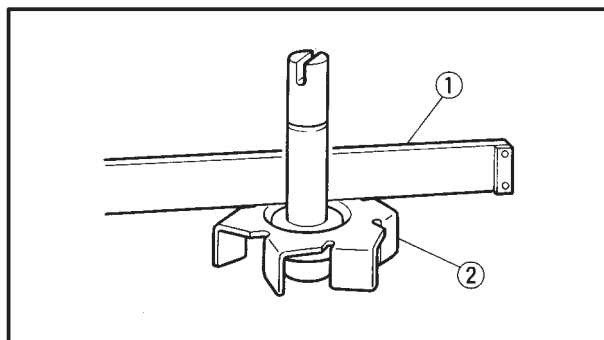


3. Install:

- rubber damper **New** ①
- rubber damper holder **New** ②

**NOTE:**

Before installing the rubber damper, apply tap water or coolant onto its outer surface.



4. Measure:

- impeller shaft tilt  
Out of specification → Repeat steps (3) and (4).

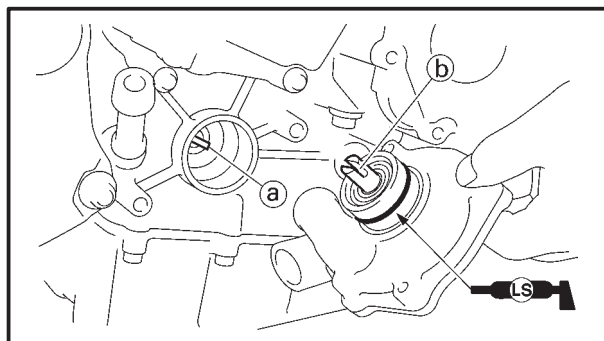
**CAUTION:**

Make sure the rubber damper and rubber damper holder are flush with the impeller.




**Impeller shaft tilt limit**  
0.15 mm (0.006 in)

- ① Straightedge
- ② Impeller

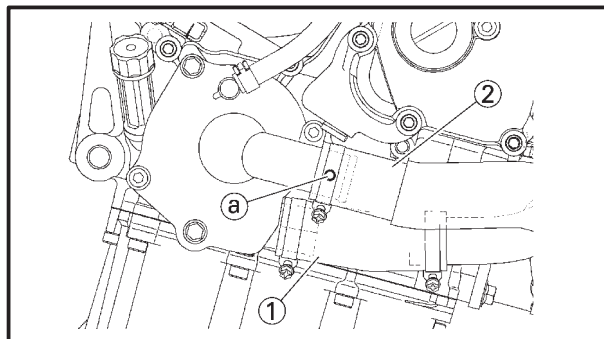
**INSTALLING THE WATER PUMP****1. Install:**

- water pump assembly

 **12 Nm (1.2 m•kg, 8.7 ft•lb)**

**NOTE:**

Align the projection (a) at the oil pump shaft and water pump shaft groove (b).

**2. Install:**

- water pump outlet hose (1)
- water pump inlet hose (2)

**NOTE:**

- Install the inlet hose with yellow (a) mark positioned outside.
- Install the hose clamp with its screw head pointed to the inner side not to contact with the cowling.

**3. Fill:**

- coolant

Refer to “CHANGING THE COOLANT” in chapter 3.

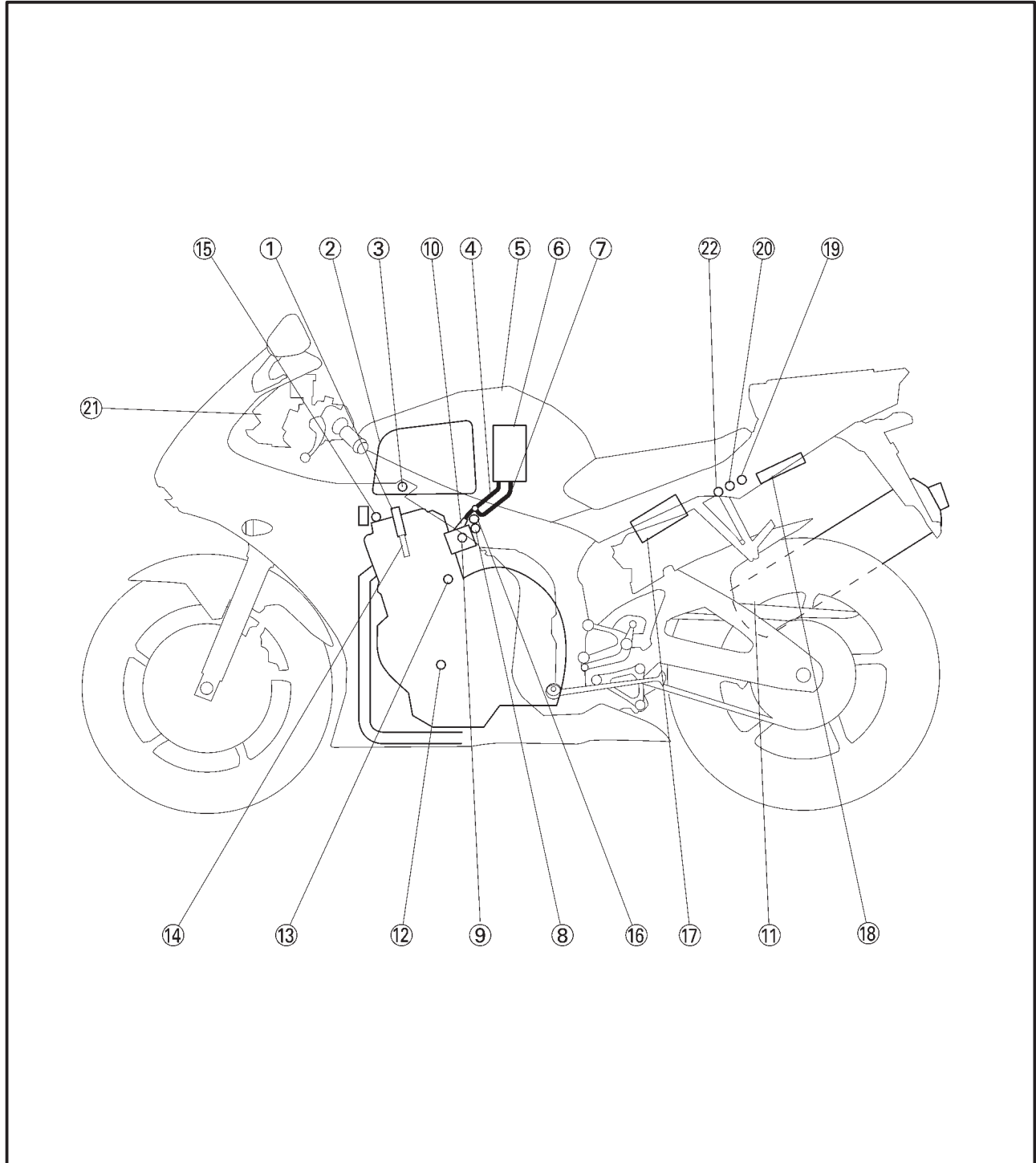




## FUEL INJECTION SYSTEM

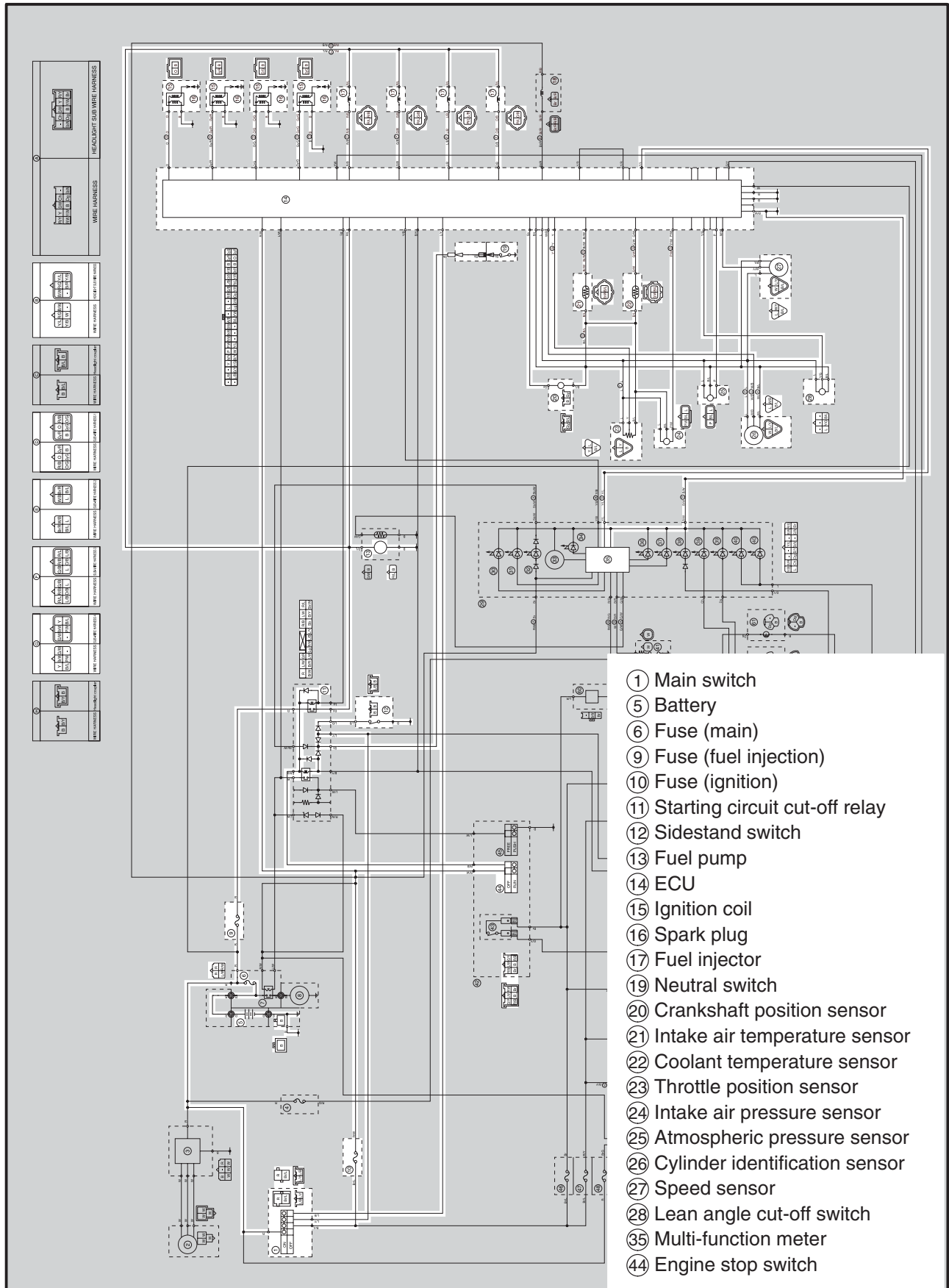
### FUEL INJECTION SYSTEM

- |                             |                              |                                  |                                |
|-----------------------------|------------------------------|----------------------------------|--------------------------------|
| ① Ignition coil             | ⑧ Intake air pressure sensor | ⑬ Coolant temperature sensor     | ⑰ Atmospheric pressure sensor  |
| ② Air filter case           | ⑨ Throttle position sensor   | ⑭ Spark plug                     | ⑱ Fuel injection system relay  |
| ③ Intake temperature sensor | ⑩ Fuel injector              | ⑮ Cylinder identification sensor | ⑲ Engine trouble warning light |
| ④ Fuel delivery hose        | ⑪ Catalytic converter        | ⑯ Pressure regulator             | ⑳ Lean angle cut-off switch    |
| ⑤ Fuel tank                 | ⑫ Crankshaft position sensor | ⑰ Battery                        |                                |
| ⑥ Fuel pump                 |                              | ⑱ ECU                            |                                |
| ⑦ Fuel return hose          |                              |                                  |                                |





## WIRING DIAGRAM





EAS00899

## 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, 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 a engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the clock LCD. 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	Can not be operated
Remains ON	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction.	Can or cannot be operated depending on the fault code

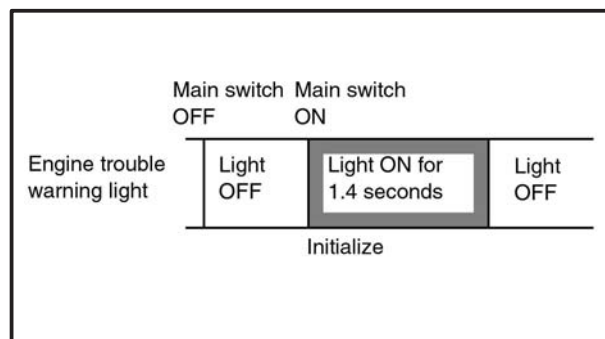
\* The warning light flashes when any one of the conditions listed below is present and the start switch is pushed.

- |  |   |
|--|---|
| 11: Cylinder identification sensor                 | 30: Lean angle cut-off switch (latch up detected)     |
| 12: Crankshaft position sensor                     | 41: Lean angle cut-off switch (open or short circuit) |
| 19: Sidestand switch (open circuit in wire to ECU) | 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.

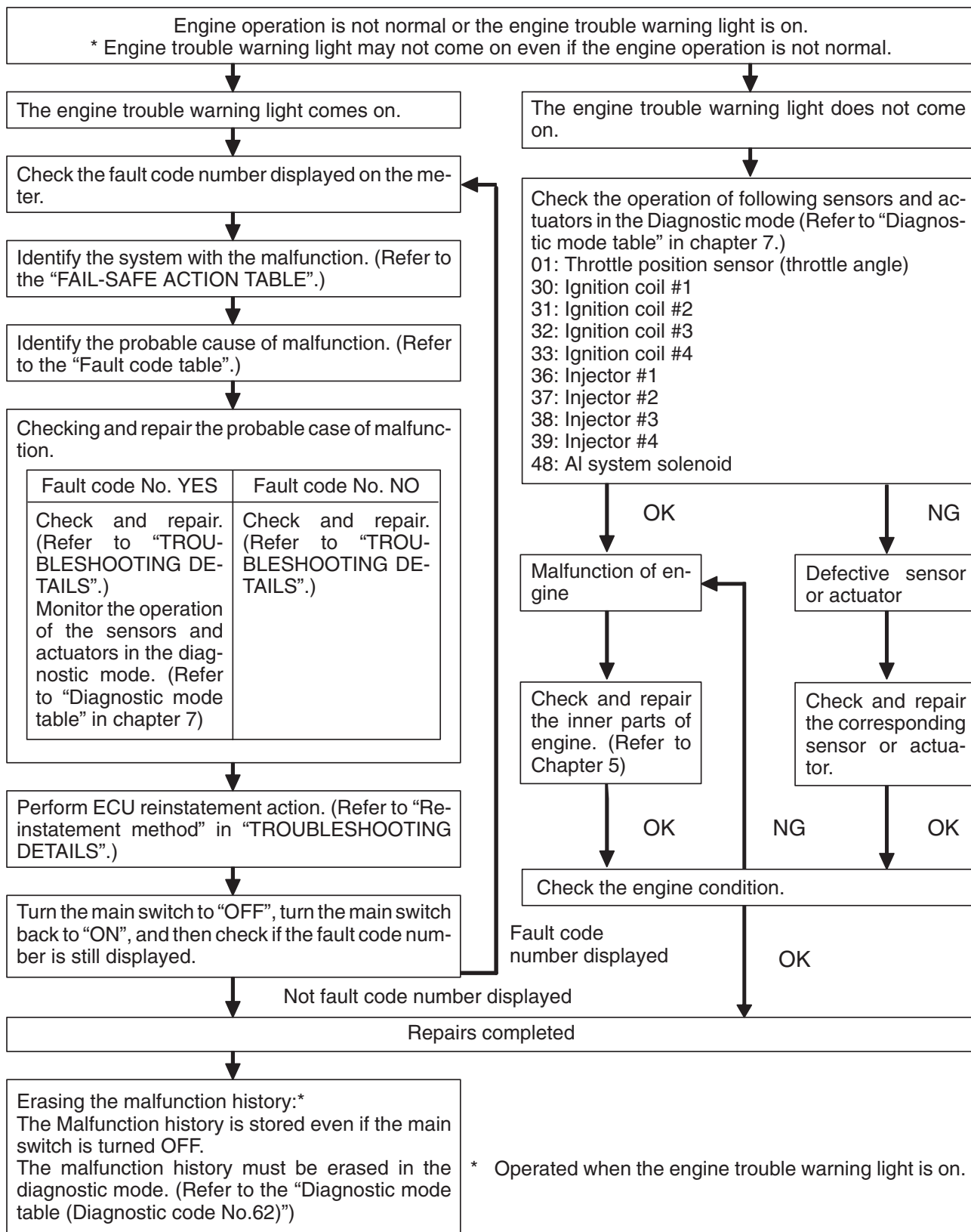
## FAIL-SAFE ACTIONS TABLE

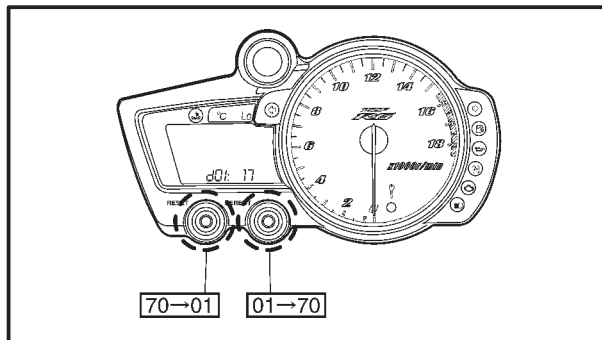
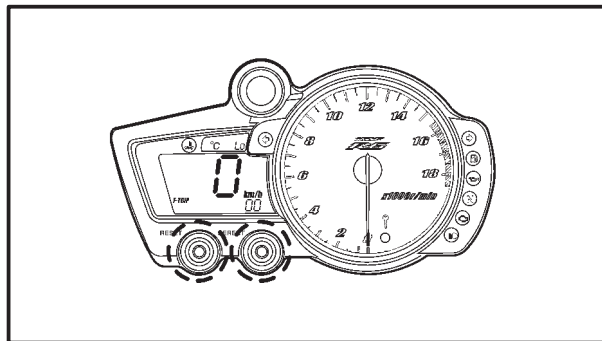
Fault Code No.	Item	Symptom	Fail-safe action	Engine startability	Vehicle drivability
11	Cylinder identification sensor	No normal signals from the cylinder identification sensor are received when the engine is started or while the motor cycle travels.	Continues to operate the engine based on the results of the cylinder identification that existed up to that point.	Unable	Able
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 system.	• Fixes the intake air pressure to 760 mmHg.	Able	Able
15 16	Throttle position sensor (open or short circuit) (stuck)	Throttle position sensor-open or short circuit detected.	• Fixes the throttle position sensor to fully open.	Able	Able
19	Sidestand switch (open circuit in wire to ECU)	Open circuit is detected in the input line from the sidestand switch to the ECU.	-- (No start)	Unable	Unable
20	Intake air pressure sensor or Atmospheric pressure sensor	When the main switch is turned to ON, the atmospheric sensor voltage and intake air pressure sensor voltage differ greatly.	• Fixes the intake air pressure and atmospheric pressure to 760 mmHg.	Able	Able
21	Coolant temperature sensor	Coolant temperature sensor-open or short circuit detected.	• Fixes the coolant temperature to 60°C.	Able	Able
22	Intake temperature sensor	Intake temperature sensor-open or short circuit detected.	• Fixes the intake temperature to 20°C.	Able	Able
23	Atmospheric pressure sensor	Atmospheric pressure sensor-open or short circuit detected.	• Fixes the atmospheric pressure to 760 mmHg.	Able	Able
33 34 35 36	Faulty ignition	Open circuit detected in the primary lead of the ignition coil.	• Cut the injection of other cylinder in the same group with the cylinder that the error is detected. (Example: when the #1 cylinder is defective cut the injection of #1 and #4 cylinders) • Turn on the power to the air induction solenoid to always cut-off the air.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
30 41	Lean angle cut-off switch (latch up detected) (open or short circuit)	The motorcycle has over turned. Lean angle cut-off switch-open or short circuit detected.	• Turns OFF the fuel injection system relay of the fuel system.	Unable	Unable
42	Speed sensor, neutral switch	No normal signals are received from the speed sensor; or, an open or short circuit is detected in the neutral switch.	• Fixes the gear to the top gear.	Able	Able
43	Fuel system voltage (monitor voltage)	Supply power to the injector and fuel pump is not normal.	• Fixes the battery voltage to 12 V.	Depending on the malfunction case.	Depending on the malfunction case.
44	Error in writing the amount of CO adjustment on EEPROM	An error is detected while reading or writing on EEPROM (CO adjustment value).	--	Able	Able
46	Vehicle system power supply (Monitor voltage)	Power supply to the FI system relay is not normal	--	Unable	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.	• Shut down all functions except the communication with the meter.	Unable	Unable
—	Start unable warning	Relay is not turned ON even if the crank signal is input while the start switch is turned ON. When the start switch is turned ON while an error is detected with the fault code of No.11, 12, 19, 30, 33, 43, 41 or 50.	Engine trouble warning light flashes when the start switch is turned ON.	Unable	Unable



EAS00904

## TROUBLESHOOTING CHART





EAS00905

## DIAGNOSTIC MODE

Setting the diagnostic mode

1. Turn the main switch to "OFF" and set the engine stop switch to "ON".
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 clock LCD.

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. Set the engine stop switch to "OFF".
7. 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 clock LCD (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.

8. 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.
9. Turn the main switch to "OFF" to cancel the diagnostic mode.



## Fault code table

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code
11	No normal signals are received from the cylinder identification sensor when the engine is started or while the motor cycle travels. <b>NOTE:</b> _____ This code appears if no normal signals from the start switch is turned ON.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring sub lead.</li> <li>• Open or short circuit in wiring harness.</li> <li>• Defective cylinder identification sensor.</li> <li>• Malfunction in ECU.</li> <li>• Improperly installed sensor.</li> </ul>	—
12	No normal signals are received from the crankshaft position sensor.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring harness.</li> <li>• Defective crankshaft position sensor.</li> <li>• Malfunction in pickup rotor.</li> <li>• Malfunction in ECU.</li> <li>• Improperly installed sensor.</li> </ul>	—
13	Intake air pressure sensor-open or short circuit detected.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring sub lead.</li> <li>• Open or short circuit in wiring harness.</li> <li>• Defective intake air pressure sensor.</li> <li>• Malfunction in ECU.</li> </ul>	03
14	Faulty intake air pressure sensor hose system; a hose is detached, causing constant application of the atmospheric pressure to the sensor; or, the hose is clogged.	<ul style="list-style-type: none"> <li>• Intake air pressure sensor hose is detached, clogged, kinked, or pinched.</li> <li>• Malfunction in ECU.</li> </ul>	03
15	Throttle position sensor-open or short circuit detected.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring sub lead.</li> <li>• Open or short circuit in wiring harness.</li> <li>• Defective throttle position sensor.</li> <li>• Malfunction in ECU.</li> <li>• Improperly installed throttle position sensor.</li> </ul>	01
16	A stuck throttle position sensor is detected.	<ul style="list-style-type: none"> <li>• Stuck throttle position sensor.</li> <li>• Malfunction in ECU.</li> </ul>	01
19	Open circuit in the input line from the sidestand switch to the ECU is detected when the start switch is pressed.	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness.</li> <li>• Malfunction in ECU.</li> </ul>	20
20	When the main switch is turned to "ON", the atmospheric sensor voltage and intake air pressure sensor voltage differ greatly.	<ul style="list-style-type: none"> <li>• Atmospheric pressure sensor hose is clogged.</li> <li>• Intake air pressure sensor hose is clogged, kinked, or pinched.</li> <li>• Malfunction of the atmospheric pressure sensor in the intermediate electrical potential.</li> <li>• Malfunction of the intake air pressure sensor in the intermediate electrical potential.</li> <li>• Malfunction in ECU.</li> </ul>	03 02
21	Coolant temperature sensor-open or short circuit detected.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring harness.</li> <li>• Defective coolant temperature sensor.</li> <li>• Malfunction in ECU.</li> <li>• Improperly installed sensor.</li> </ul>	06
22	Intake temperature sensor-open or short circuit detected.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring harness.</li> <li>• Defective intake temperature sensor.</li> <li>• Malfunction in ECU.</li> <li>• Improperly installed sensor.</li> </ul>	05
23	Atmospheric pressure sensor-open or short circuit detected.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring sub lead.</li> <li>• Defective atmospheric pressure sensor.</li> <li>• Improperly installed sensor.</li> <li>• Malfunction in ECU.</li> </ul>	02
30	The motorcycle has overturned.	<ul style="list-style-type: none"> <li>• Overturned.</li> <li>• Malfunction in ECU.</li> </ul>	08

# FUEL INJECTION SYSTEM

FI



Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code
33	Open circuit is detected in the primary lead of the ignition coil (#1).	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness.</li> <li>• Malfunction in ignition coil.</li> <li>• Malfunction in ECU.</li> <li>• Malfunction in a component of ignition cut-off circuit system.</li> </ul>	30
34	Open circuit is detected in the primary lead of the ignition coil (#2).	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness.</li> <li>• Malfunction in ignition coil.</li> <li>• Malfunction in ECU.</li> <li>• Malfunction in a component of ignition cut-off circuit system.</li> </ul>	31
35	Open circuit is detected in the primary lead of the ignition coil (#3).	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness.</li> <li>• Malfunction in ignition coil.</li> <li>• Malfunction in ECU.</li> <li>• Malfunction in a component of ignition cut-off circuit system.</li> </ul>	32
36	Open circuit is detected in the primary lead of the ignition coil (#4).	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness.</li> <li>• Malfunction in ignition coil.</li> <li>• Malfunction in ECU.</li> <li>• Malfunction in a component of ignition cut-off circuit system.</li> </ul>	33
41	Lean angle cut-off switch-open or short circuit detected.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring harness.</li> <li>• Defective lean angle cut-off switch.</li> <li>• Malfunction in ECU.</li> </ul>	08
42	No normal signals are received from the speed sensor; or, an open or short circuit is detected in the neutral switch.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring harness.</li> <li>• Defective speed sensor.</li> <li>• Malfunction in vehicle speed sensor detected unit.</li> <li>• Defective neutral switch.</li> <li>• Malfunction in the engine side of the neutral switch.</li> <li>• Malfunction in ECU.</li> </ul>	07 21
43	Supply power to the injector and fuel pump is not normal	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness. (red/blue line)</li> <li>• Malfunction in ECU.</li> </ul>	09
44	An error is detected while reading or writing on EEPROM.	<ul style="list-style-type: none"> <li>• Malfunction in ECU. (The CO adjustment value is not properly written on or read from the internal memory).</li> </ul>	60
46	Power supply to the FI system relay is not normal.	<ul style="list-style-type: none"> <li>• Open circuit in wiring harness. (red/white line)</li> <li>• Malfunction in "CHARGING SYSTEM".</li> </ul>	—
50	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	<ul style="list-style-type: none"> <li>• Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.)</li> </ul>	—
Er-1	No signal are received from the ECU.	<ul style="list-style-type: none"> <li>• Open or short circuit in wiring sub lead.</li> <li>• Malfunction in meter.</li> <li>• Malfunction in ECU.</li> </ul>	—
Er-2	No signal are received from the ECU within the specified duration.	<ul style="list-style-type: none"> <li>• Improper connection in wiring sub lead.</li> <li>• Malfunction in meter.</li> <li>• Malfunction in ECU.</li> </ul>	—
Er-3	Data from the ECU cannot be received correctly.	<ul style="list-style-type: none"> <li>• Improper connection in wiring sub lead.</li> <li>• Malfunction in meter.</li> <li>• Malfunction in ECU.</li> </ul>	—
Er-4	Non-registered data has been received from the meter.	<ul style="list-style-type: none"> <li>• Improper connection in wiring sub lead.</li> <li>• Malfunction in meter.</li> <li>• Malfunction in ECU.</li> </ul>	—





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 temperature and coolant temperature as close as possible to the intake temperature sensor and the coolant temperature sensor respectively.
- If it is not possible to check the atmospheric pressure with an atmospheric pressure gauge, determine the atmospheric pressure by using 760 mmHg as the standard.
- If it is not possible to check the intake 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 (15 ~ 17) • Fully open position (97 ~ 100)
02	Atmospheric pressure	Displays the atmospheric pressure. * Use an atmospheric pressure gauge to check the atmospheric pressure.	Compare it to the value displayed on the meter.
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.	10 ~ 200 mmHg
05	Intake 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
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. (When the gear is in a position other than neutral.)	Stand retracted: ON Stand extended: OFF
21	Neutral switch	Displays that the switch is ON or OFF.	Neutral: ON In gear: OFF
30	Ignition coil #1	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates ignition coil #1 for five times every second and illuminates the engine trouble warning light. * Connect an ignition checker. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.
31	Ignition coils #2	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates ignition coil #2 for five times every second and illuminates the engine trouble warning light. * Connect an ignition checker. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.

# FUEL INJECTION SYSTEM

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Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
32	Ignition coil #3	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates ignition coil #3 for five times every second and illuminates the engine trouble warning light. * Connect an ignition checker. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.
33	Ignition coil #4	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates ignition coil #4 for five times every second and illuminates the engine trouble warning light. * Connect an ignition checker. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.
36	Injector #1	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the injector five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the injector five times with engine stop switch ON.
37	Injector #2	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the injector five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the injector five times with engine stop switch ON.
38	Injector #3	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the injector five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the injector five times with engine stop switch ON.
39	Injector #4	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the injector five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the injector five times with engine stop switch ON.
48	AI system solenoid	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the AI system solenoid five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the AI system solenoid 5 times with the engine stop switch ON.
50	Fuel injection system relay	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the fuel injection system relay five times every second and illuminates the engine trouble warning light (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 once, 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	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the radiator fan motor relay five times every 5 seconds and illuminates the engine trouble warning light. (ON 2 seconds, OFF 3 seconds) * If the engine stop switch is ON, turn it OFF once, 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.)

# FUEL INJECTION SYSTEM

FI



Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
52	Headlight relay 1	<p>After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the headlight relay five times every 5 seconds and illuminates the engine trouble warning light. (ON 2 seconds, OFF 3 seconds)</p> <p>* If the engine stop switch is ON, turn it OFF once, and then turn it back ON.</p>	Check the headlight relay operating sound 5 times with the engine stop switch ON. (At that time, the headlight turns ON.)
60	E2PROM fault code display	<ul style="list-style-type: none"> <li>Transmits the abnormal portion of the data in the E2PROM that has been detected as a fault code 44.</li> <li>If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.</li> </ul>	<p>(01 ~ 04) Displays the cylinder number.</p> <p>(00) Displays when there is no malfunction.</p>
61	Malfunction history code display	<ul style="list-style-type: none"> <li>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).</li> <li>If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.</li> </ul>	<p>11 ~ 50</p> <p>(00) Displays when there is no malfunction.</p>
62	Malfunction history code erasure	<ul style="list-style-type: none"> <li>Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history.</li> <li>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.</li> </ul>	<p>00 ~ 21</p> <p>(00) Displays when there is no malfunction.</p>
70	Control number	<ul style="list-style-type: none"> <li>Displays the program control number.</li> </ul>	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 in the “TROUBLESHOOTING CHART”.

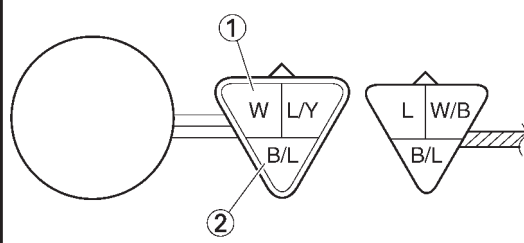

After the check and service of the malfunctioned part has been completed, reset the meter display according to the “Reinstatement method”.

Fault code No.:

Fault code number displayed on the meter when the engine failed to work normally. (Refer to the “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.	11	Symptom	No normal signals are received from the cylinder identification sensor when the engine is started or while the motorcycle travels.	
Used diagnostic code No. --				
Inspection operation item		Operation item and countermeasure		Reinstatement method
Installed condition of sensor		Check the installed area for looseness or pinching.		Reinstated by starting the engine and operating it at idle.
Defective cylinder identification sensor.		<div>Replace if defective.</div> <div>1. Connect the pocket tester (DC 20 V) to the cylinder identification sensor coupler terminal as shown.</div> <div><div>Tester positive probe → white ①</div><div>Tester negative probe → black/blue ②</div><div></div><div>2. Turn the main switch to "ON".</div><div>3. Measure the cylinder identification sensor output voltage.</div><div><div></div><div>Cylinder identification sensor output voltage</div><div>When sensor is on</div><div>4.8 V or more</div><div>When sensor is off</div><div>0.8 V or less</div></div><div>4. Is the cylinder identification sensor OK?</div></div>		
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 Blue – Blue White/Black – White/Black Black/Blue – Black/Blue		
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. Cylinder identification sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler		



Fault code No.   12   Symptom   No normal signals are received from the crankshaft position sensor.		
Used diagnostic code No. --		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by cranking the engine.
Defective crankshaft position sensor.	<p>Replace if defective.</p> <ol style="list-style-type: none"> <li>1. Disconnect the crankshaft position sensor coupler from the wire harness.</li> <li>2. Connect the pocket tester (<math>\Omega \times 100</math>) to the crankshaft position sensor coupler as shown.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><b>Tester positive probe → gray ①</b>  <b>Tester negative probe → black ②</b></p> </div> <div style="text-align: center; margin: 5px 0;"> </div> <ol style="list-style-type: none"> <li>3. Measure the crankshaft position sensor resistance.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <div style="display: flex; align-items: center;"> <div> <p><b>Crankshaft position sensor resistance</b>  <b>248 ~ 372 <math>\Omega</math> at 20°C (68 °F)</b>  <b>(between gray and black)</b></p> </div> </div> </div> <ol style="list-style-type: none"> <li>4. Is the crankshaft position sensor OK?</li> </ol>	
Open or short circuit in wiring harness.	<p>Repair or replace if there is an open or short circuit between the main wiring harnesses.</p> <p>Between sensor coupler and ECU coupler</p> <p>Gray - Gray</p> <p>Black/Blue - Black/Blue</p>	
<p>Connected condition of connector</p> <p>Inspect the coupler for any pins that may have pulled cut.</p> <p>Check the locking condition of the coupler.</p>	<p>If there is a malfunction, repair it and connect it securely.</p> <p>Crankshaft position sensor coupler</p> <p>Main wiring harness ECU coupler</p>	



Fault code No. 13 Symptom Intake air pressure sensor - open or short circuit detected.

Used diagnostic code No. 03 (intake air pressure sensor)

Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective intake air pressure sensor	<p>Replace if defective.</p> <ol style="list-style-type: none"> <li>1. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler terminal as shown.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Tester positive probe → pink/white ①</b>  <b>Tester negative probe → black/blue ②</b></p> </div> <div style="text-align: center; margin: 10px 0;"> </div> <ol style="list-style-type: none"> <li>2. Set the main switch to "ON".</li> <li>3. Measure the intake air pressure sensor output voltage.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <div style="display: flex; align-items: center;"> <div> <p><b>Intake air pressure sensor output voltage</b></p> <p><b>3.75 ~ 4.25 V</b></p> </div> </div> </div> <ol style="list-style-type: none"> <li>4. Is the intake air pressure sensor OK?</li> </ol>	Reinstated by turning the main switch ON.
Open or short circuit in wiring harness and/or sub lead.	<p>Repair or replace if there is an open or short circuit.</p> <p>Between sensor coupler and ECU coupler</p> <p>Black/Blue - Black/Blue</p> <p>Pink/White - Pink/White</p> <p>Blue - Blue</p>	
<p>Connected condition of connector</p> <p>Inspect the coupler for any pins that may have pulled out.</p> <p>Check the locking condition of the coupler.</p>	<p>If there is a malfunction, repair it and connect it securely.</p> <p>Intake air pressure sensor coupler</p> <p>Main wiring harness ECU coupler</p> <p>Sub-wire harness coupler</p>	



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)		
Inspection operation item and probable cause		Operation item and countermeasuer		Reinstatement method
Intake air pressure sensor hose detached, clogged, kinked, or pinched. Intake air pressure sensor malfunction at intermediate electrical potential. Atmospheric 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.
Defective intake air pressure sensor.		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)				
Inspection operation item and probable cause		Operation item and countermeasure		Reinstatement method
Defective throttle position sensor.		Replace if defective. Refer to "THROTTLE BODIES" section.		Reinstated by turning the main switch ON.
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 Blue - Blue		
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 BODIES" section.		
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		

Fault code No.	16	Symptom	Stuck throttle position sensor detected.	
Used diagnostic code		No.01 (throttle position sensor)		
Inspection operation item and probable cause		Operation item and countermeasure		Reinstatement method
Defective throttle position sensor		Replace if defective. Refer to “THROTTLE BODIES” section.		Reinstated by starting the engine, operating it at idle, and then racing it.
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 BODIES” section.		



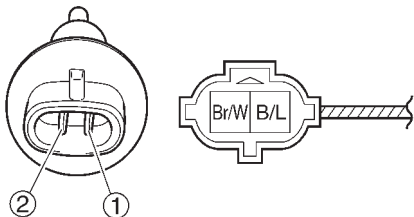

Fault code No.   19   Symptom   Open circuit is detected in the input line from the sidestand switch to the ECU.		
Used diagnostic code No. 20 (sidestand switch)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective sidestand switch	Replace if defective. Refer to "CHECKING THE SWITCHES" in chapter 8.	If the transmission is in gear, it is reinstated by retracting the sidestand. If the transmission is in neutral, it is reinstated by reconnecting the wiring.
Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sidestand switch coupler and starting circuit cut-off relay coupler, starting circuit cut-off relay coupler and ECU coupler Blue/Black – Blue/Black, Blue/Yellow – Blue/Yellow	

Fault code No.   20   Symptom   Faulty atmospheric pressure sensor or intake air pressure sensor.		
Used diagnostic code No. 03 (intake air pressure sensor) 02 (atmospheric pressure sensor)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Intake air pressure sensor hose detached, clogged, kinked, or pinched. Atmospheric pressure sensor hose is clogged.	Repair or replace the sensor hose.	Reinstated by turning the main switch ON.
Defective intake air pressure sensor or atmospheric pressure sensor.	Replace if defective. Refer to "Fault code No.13 or No.23".	

Fault code No.   21   Symptom   Open or short circuit is detected from the coolant temperature sensor.		
Used diagnostic code No. 06 (coolant temperature sensor)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
Defective coolant temperature sensor.	Replace if defective. Refer to "COOLING SYSTEM" in chapter 8.	
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/White - Green/White	
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	





Fault code No.   22   Symptom   Open or short circuit detected from the intake temperature sensor.		
Used diagnostic code No. 05 (intake temperature sensor)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
Defective intake temperature sensor.	<p>Replace if defective.</p> <ol style="list-style-type: none"> <li>1. Remove the intake air temperature sensor from the air filter case.</li> <li>2. Connect the pocket tester (<math>\Omega \times 100</math>) to the intake air temperature sensor terminal as shown.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Tester positive probe → brown/white ①</b>  <b>Tester negative probe → black/blue ②</b></p>  </div> <ol style="list-style-type: none"> <li>3. Measure the intake air temperature sensor resistance.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">  <p><b>Intake air temperature sensor resistance</b>  <b>2.2 ~ 2.7 <math>\Omega</math> at 20°C (68 °F)</b></p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>⚠ WARNING</b></p> <ul style="list-style-type: none"> <li>• Handle the intake air temperature sensor with special care.</li> <li>• Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.</li> </ul> </div> <ol style="list-style-type: none"> <li>4. Is the intake air temperature sensor OK?</li> </ol>	
Open or short circuit in wiring harness and/or sub lead.	<p>Repair or replace if there is an open or short circuit.</p> <p>Between sensor coupler and ECU coupler</p> <p>Black/Blue - Black/Blue</p> <p>Brown/White - Brown/White</p>	
<p>Connected condition of connector</p> <p>Inspect the coupler for any pins that may have pulled out.</p> <p>Check the locking condition of the coupler.</p>	<p>If there is a malfunction, repair it and connect it securely.</p> <p>Intake temperature sensor coupler</p> <p>Main wiring harness ECU coupler</p> <p>Sub-wire harness coupler</p>	



Fault code No. 23   Symptom   Open or short circuit detected from the atmospheric pressure sensor.		
Used diagnostic code No. 02 (atmospheric pressure sensor)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective atmospheric pressure sensor.	<p>Replace if defective.</p> <p>1. Connect the pocket tester (DC 20 V) to the atmospheric pressure sensor coupler terminal as shown.</p> <div> <p><b>Tester positive probe → blue ①</b>  <b>Tester negative probe → black/blue ②</b></p> </div> <p>2. Set the main switch to "ON".</p> <p>3. Measure the atmospheric pressure sensor output voltage.</p> <div> <p><b>Atmospheric pressure sensor output voltage</b>  <b>3.75 ~ 4.25 V</b></p> </div> <p>4. Is the atmospheric pressure sensor OK?</p>	Reinstated by turning the main switch ON.
Open or short circuit in wiring harness.	<p>Repair or replace if there is an open or short circuit.</p> <p>Between sensor coupler and ECU coupler</p> <p>Blue - Blue</p> <p>Black/Blue - Black/Blue</p> <p>Pink - Pink</p>	
Installed condition of atmospheric pressure sensor	Check the installed area for looseness or pinching.	
<p>Connected condition of connector</p> <p>Inspect the coupler for any pins that may have pulled out.</p> <p>Check the locking condition of the coupler.</p>	<p>If there is a malfunction, repair it and connect it securely.</p> <p>Atmospheric pressure sensor coupler</p> <p>Main wiring harness ECU coupler</p>	



Fault code No.   30   Symptom   The motorcycle has overturned.		
Used diagnostic code No. 08 (lean angle cut-off switch)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective lean angle cut-off switch	<p>Replace if defective.</p> <ol style="list-style-type: none"> <li>1. Remove the lean angle cut-off switch from the motorcycle.</li> <li>2. Connect the lean angle cut-off switch coupler to the wireharness.</li> <li>3. Connect the pocket tester (DC 20 V) to the lean angle cut-off switch coupler as shown.</li> </ol> <div> </div> <ol style="list-style-type: none"> <li>4. When turn the lean angle cut-off switch approx. 65°, the voltage reading is 1.0 V to 4.0 V.</li> <li>5. Is the lean angle cut-off switch OK?</li> </ol>	Reinstated by turning the main switch ON (however, the engine cannot be restarted unless the main switch is first turned OFF).
The motorcycle has overturned.	Raise the motorcycle upright.	
Installed condition of the lean angle cut-off switch	Check the installed area for looseness or pinching.	
Connected condition of connector	If there is a malfunction, repair it and connect it securely.	
<p>Inspect the coupler for any pins that may have pulled out.</p> <p>Check the locking condition of the coupler.</p>	<p>Lean angle cut-off switch coupler</p> <p>Main wiring harness ECU coupler</p>	



Fault code No.   33   Symptom   Malfunction detected in the primary lead of the ignition coil (#1).			
Used diagnostic code No. 30 (ignition coil #1)			
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method	
Defective ignition coil (test the primary and secondary coils for continuity).	Replace if defective. Refer to "IGNITION SYSTEM" in chapter 8.	Reinstated by starting the engine and operating it at idle. In case of multiple cylinder open or short circuit in lead, make sure to turn ON and OFF the main switch after each time of cranking.	
Open or short circuit in lead.	Repair or replace if there is an open or short circuit. Between ignition coil coupler (#1) and ECU coupler/main harness Orange – Orange Black – Black		
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		

Fault code No.   34   Symptom   Malfunction detected in the primary lead of the ignition coil (#2).			
Used diagnostic code No. 31 (ignition coil #2)			
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method	
Defective ignition coil (test the primary and secondary coils for continuity).	Replace if defective. Refer to "IGNITION SYSTEM" in chapter 8.	Reinstated by starting the engine and operating it at idle. In case of multiple cylinder open or short circuit in lead, make sure to turn ON and OFF the main switch after each time of cranking.	
Open or short circuit in lead wire.	Repair or replace if there is an open or short circuit. Between ignition coil coupler (#2) and ECU coupler/main harness Gray/Red – Gray/Red Black – Black		
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 - Gray/Red Main wiring harness ECU coupler Sub-wire harness coupler		

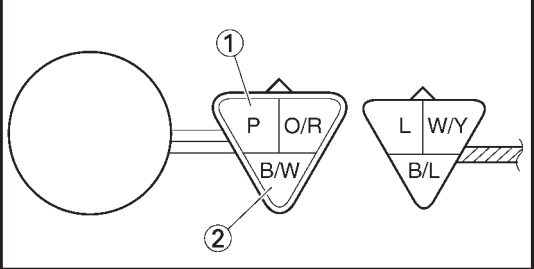

Fault code No.   35   Symptom   Malfunction detected in the primary lead of the ignition coil (#3).			
Used diagnostic code No. 32 (ignition coil #3)			
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method	
Defective ignition coil (test the primary and secondary coils for continuity).	Replace if defective. Refer to "IGNITION SYSTEM" in chapter 8.	Reinstated by starting the engine and operating it at idle. In case of multiple cylinder open or short circuit in lead, make sure to turn ON and OFF the main switch after each time of cranking.	
Open or short circuit in lead wire.	Repair or replace if there is an open or short circuit. Between ignition coil coupler (#3) and ECU coupler/main harness Orange/Green – Orange/Green Black – Black		
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/ Green Main wiring harness ECU coupler Sub-wire harness coupler		



Fault code No.   36   Symptom   Malfunction detected in the primary lead of the ignition coil (#4).		
Used diagnostic code No. 33 (ignition coil #4)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective ignition coil (test the primary and secondary coils for continuity).	Replace if defective. Refer to "IGNITION SYSTEM" in chapter 8.	Reinstated by starting the engine and operating it at idle. In case of multiple cylinder open or short circuit in lead, make sure to turn ON and OFF the main switch after each time of cranking.
Open or short circuit in lead wire.	Repair or replace if there is an open or short circuit. Between ignition coil coupler (#4) and ECU coupler/main harness Gray/Green – Gray/Green Black – Black	
Connected state 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 - Gray/Green Main wiring harness ECU coupler Sub-wire harness coupler	

Fault code No.   41   Symptom   Open or short circuit detected in the lean angle cut-off switch.		
Used diagnostic code No. 08 (lean angle cut-off switch)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective lean angle cut-off switch	Replace if defective. Refer to Fault code No. 30.	Reinstated by turning the main switch ON.
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	
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	



Fault code No.	42	Symptom	1 No normal signals are received from the speed sensor. 2 Open or short circuit is detected in the neutral switch.
Used diagnostic code	No. 07 (speed sensor) No. 21 (neutral switch)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method	
Defective speed sensor	<p>Replace if defective.</p> <p>1. Measure the speed sensor output voltage.</p> <p>2. Connect the pocket tester (DC 20 V) to the speed sensor coupler terminal as shown.</p> <div><p><b>Tester positive probe → pink ①</b> <b>Tester negative probe → black/white ②</b></p></div> <p>3. Measure the speed sensor output voltage.</p> <div><p><b>Speed sensor output voltage</b> <b>When sensor is on</b> <b>DC 4.8 V or more</b> <b>When sensor is off</b> <b>DC 0.6 V or less</b></p></div> <p>4. Is the speed sensor OK?</p>	Reinstated by starting the engine, and inputting the vehicle speed signals by operating the motorcycle at a low speed of 20 to 30 km/h.	
Open or short circuit in speed sensor lead.	<p>Repair or replace if there is an open or short circuit.</p> <p>Between sensor coupler and ECU coupler.</p> <p>Blue - Blue White/Yellow - White/Yellow Black/Blue - Black/Blue</p>		
Gear for detecting vehicle speed has broken.	<p>Replace if defective.</p> <p>Refer to “TRANSMISSION” in chapter 5.</p>		
Connected condition of speed sensor connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	<p>If there is a malfunction, repair it and connect it securely.</p> <p>Speed sensor coupler Main wiring harness ECU coupler</p>		
Defective neutral switch	<p>Replace if defective.</p> <p>Refer to “CHECKING THE SWITCHES” in chapter 8.</p>		
Faulty shift drum (neutral detection area)	<p>Replace if defective.</p> <p>Refer to “TRANSMISSION” in chapter 5.</p>		
Open or short circuit in neutral switch lead.	<p>Repair or replace if there is an open or short circuit.</p> <p>Between switch connector and ECU coupler</p> <p>Sky blue - Black/Yellow</p>		
Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	<p>If there is a malfunction, repair it and connect it securely.</p> <p>Neutral switch connector Main wiring harness ECU coupler</p>		



<b>Fault code No.</b> 43   <b>Symptom</b> The ECU is unable to monitor the battery voltage.		
Used diagnostic code No. 09 (fuel system voltage)		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Malfunction in ECU	Fuel injection system relay is on.	Reinstated by starting the engine and operating it at idle.
Open or short circuit in the wiring harness.	Repair or replace if there is an open or short circuit. Between starting circuit cut-off relay (fuel injection system relay), fuel pump, injector (#1 ~ #4) Red/Blue – Red /Blue	
Malfunction or open circuit in fuel injection system relay	Replace if defective. 1. Disconnect the starting circuit cut-off relay from the wire harness. 2. Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the starting circuit cut-off relay terminals as shown. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>Battery positive terminal → red/black ①</b>  <b>Battery positive terminal → light green ②</b> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>Tester positive probe → red ③</b>  <b>Tester negative probe → red/blue ④</b> </div> <div style="text-align: center; margin: 10px 0;"> </div> 3. Does the starting circuit cut-off relay have continuity between red and red/blue?	
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. Starting circuit cut-off relay coupler (fuel injection system relay) Fuel pump coupler Injector coupler ECU coupler	



Fault code No.	44	Symptom	Error is detected while reading or writing on EEPROM (CO adjustment value).
Used diagnostic No. 60 (EEP-ROM improper cylinder indication)			
Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
Malfunction in ECU	Execute diagnostic code 60 * Check the faulty cylinder. (If there are multiple cylinders, the number of the faulty cylinders appear alternately at 2-second intervals.) * Readjust the CO of the displayed cylinder. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" in chapter 3. 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. --			
Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
Faulty battery	Replace or change the battery Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.		Reinstated by starting the engine and operating it at idle.
Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit. <ul style="list-style-type: none"><li>Between battery and main switch Red – Red</li><li>Between main switch and Fuse (ignition) Brown/blue – Brown/blue</li><li>Between Fuse (ignition) and ECU Red/white – Red/white</li></ul>		
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.		

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. --			
Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
Malfunction in ECU	Replace the ECU.		Reinstated by turning the main switch ON.





Fault code No.   Er-1   Symptom   No signal are received from the ECU.		
Used diagnostic code No. --		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
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 Yellow/Blue - Yellow/Blue Black/White - Black/White	Reinstated by turning the main switch ON.
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. Cylinder identification sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
Malfunction in meter	Replace the meter.	
Malfunction in ECU	Replace the ECU.	

Fault code No.   Er-2   Symptom   No signal are received from the ECU within the specified duration.		
Used diagnostic code No. --		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
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 Yellow/Blue - Yellow/Blue Black/White - Black/White	Reinstated by turning the main switch ON.
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. Cylinder identification sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
Malfunction in meter	Replace the meter.	
Malfunction in ECU	Replace the ECU.	

Fault code No.   Er-3   Symptom   Data from the ECU cannot be received correctly.		
Used diagnostic code No. --		
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
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 Yellow/Blue - Yellow/Blue Black/White - Black/White	Reinstated by turning the main switch ON.
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. Cylinder identification sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
Malfunction in meter	Replace the meter.	
Malfunction in ECU	Replace the ECU.	

## FUEL INJECTION SYSTEM

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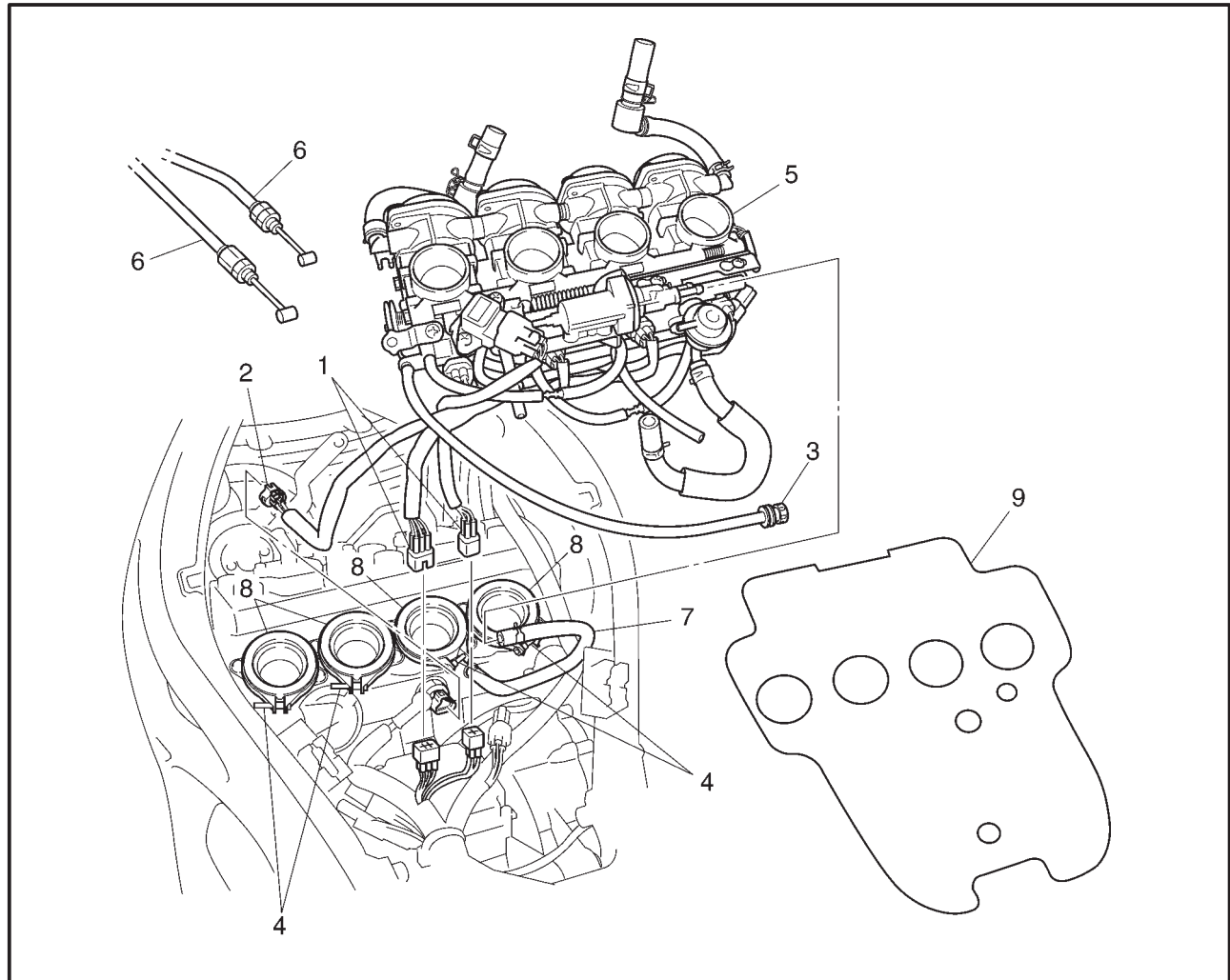
Fault code No. | Er-4 | Symptom | Non-registered data has been received from the meter.

Used diagnostic code No. --

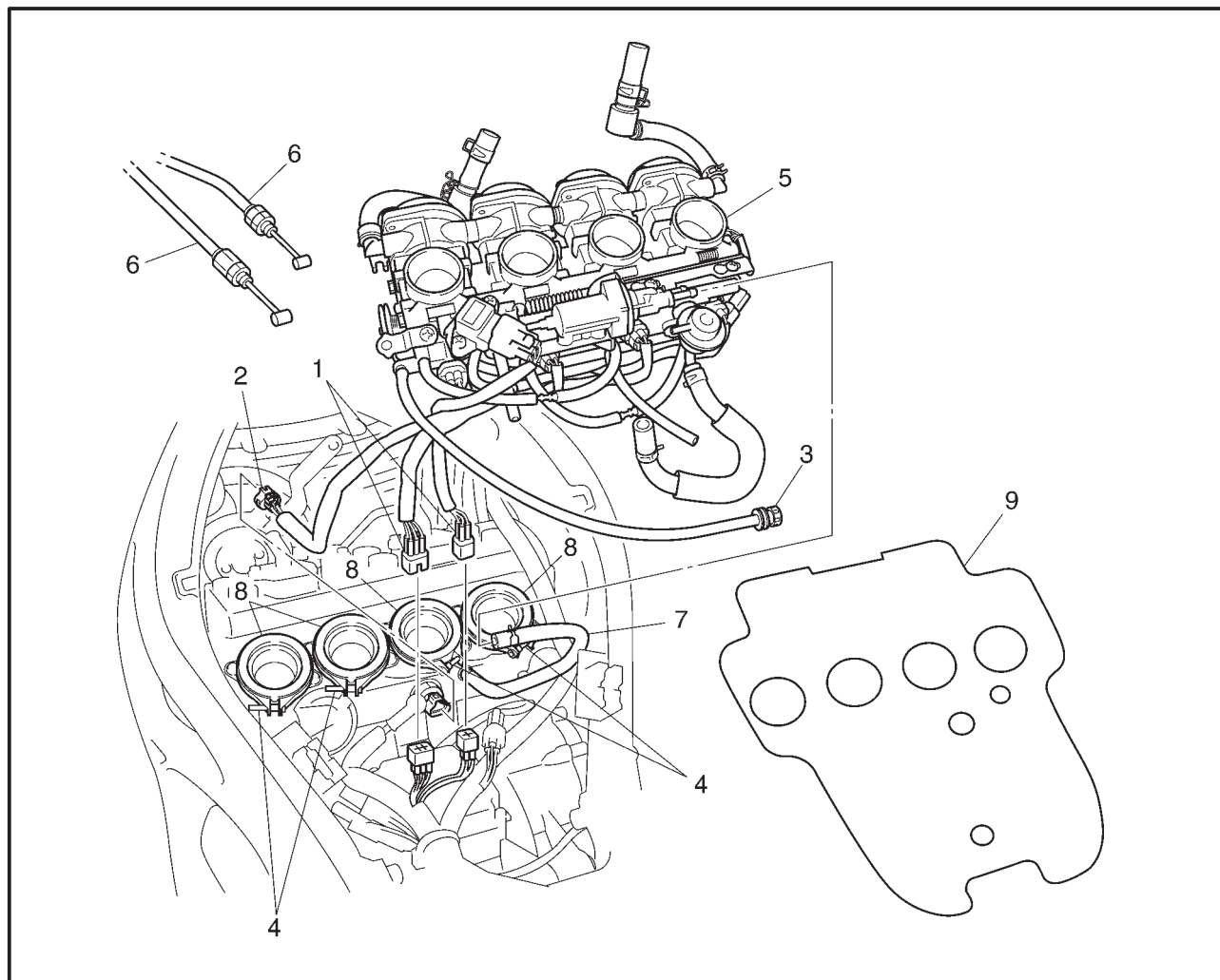
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler Yellow/Blue - Yellow/Blue Black/White - Black/White	Reinstated by turning the main switch ON.
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. Cylinder identification sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
Malfunction in meter	Replace the meter.	
Malfunction in ECU	Replace the ECU.	



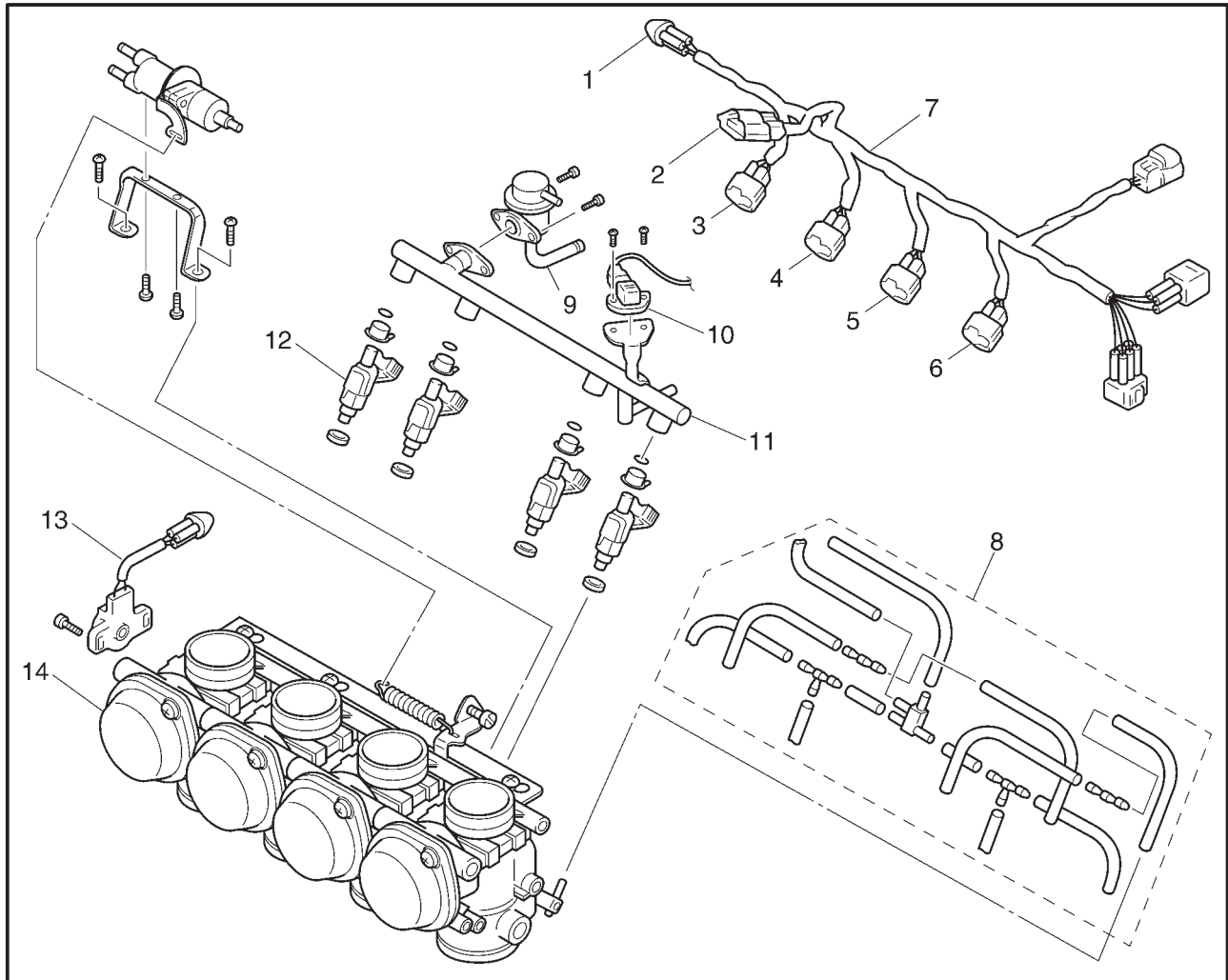
## THROTTLE BODIES



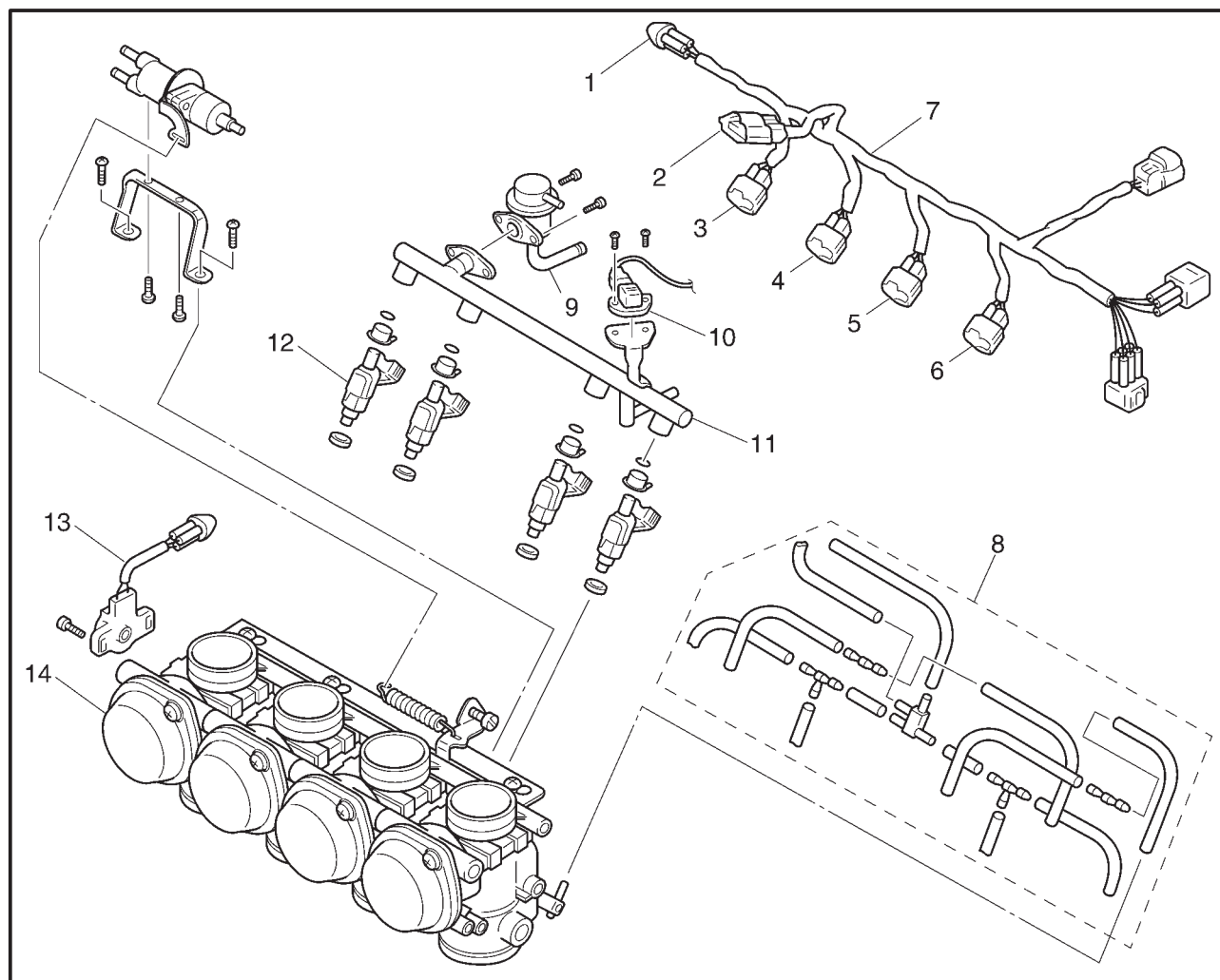
Order	Job/Part	Q'ty	Remarks
	<b>Removing the throttle bodies</b>		
	Seats/fuel tank/rubber sheet		Remove the parts in the order listed. Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Sub-wire harness coupler	2	Disconnect.
2	Coolant temp sensor coupler	1	
3	Throttle stop screw	1	Loosen.
4	Throttle body joint clamp screw	4	
5	Throttle bodies	1	



Order	Job/Part	Q'ty	Remarks
6	Throttle cable	2	Disconnect.
7	Plunger control unit hose	2	Disconnect.
8	Throttle body joint	4	
9	Heat protector	1	
			For installation, reverse the removal procedure.

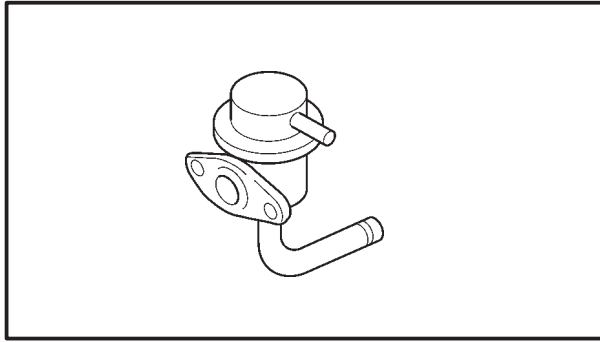


Order	Job/Part	Q'ty	Remarks
	<b>Removing the injector</b>		
1	Throttle position sensor coupler	1	Remove the parts in the order listed.
2	Intake air pressure sensor	1	Disconnect.
3	Cylinder #1-injector coupler	1	Disconnect.
4	Cylinder #2-injector coupler	1	Disconnect.
5	Cylinder #3-injector coupler	1	Disconnect.
6	Cylinder #4-injector coupler	1	Disconnect.
7	Sub wire harness 2	1	
8	Negative pressure hose	1	Disconnect.
9	Pressure regulator	1	



Order	Job/Part	Q'ty	Remarks
10	Intake air pressure sensor	1	For installation, reverse the removal procedure.
11	Fuel distributor	1	
12	Injector	4	
13	Throttle position sensor	1	
14	Throttle body assembly	1	





### CHECKING THE PRESSURE REGULATOR

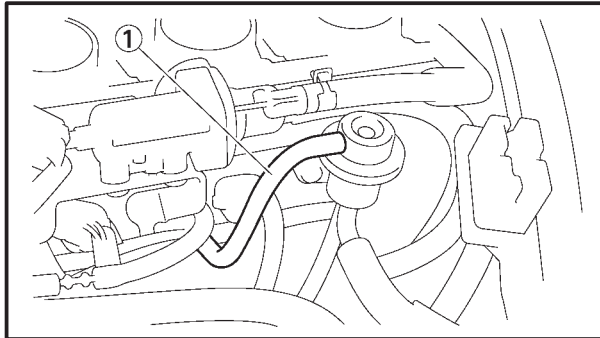
1. Check:
  - pressure regulator
 Damage → Replace.

### CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OPERATION

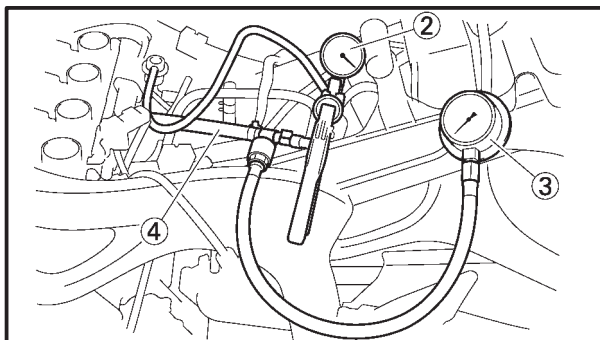
1. Check:
  - pressure regulator operation



- a. Remove the fuel tank.  
Refer to “FUEL TANK” in chapter 3.
- b. Disconnect the negative pressure hose ① from the pressure regulator at the joint.
- c. Connect the vacuum/pressure pump gauge set ② onto the negative pressure hose from the pressure regulator.
- d. Connect the pressure gauge ③ and adapter ④ onto the fuel injection pipe.



**Vacuum/pressure pump gauge set**  
 90890-06756, YB-35956  
**Pressure gauge**  
 90890-03153, YU-03153  
**Adapter**  
 90890-03176, YM-03176



- e. Install the fuel tank.  
Refer to “FUEL TANK” in chapter 3.
- f. Start the engine.
- g. Measure the fuel pressure.



**Fuel pressure**  
 284 kPa (2.84 kg/cm<sup>2</sup>, 40.4 psi)

- h. Use the vacuum pressure pump gauge set to adjust the fuel pressure in relation to the vacuum pressure as described below.

#### NOTE:

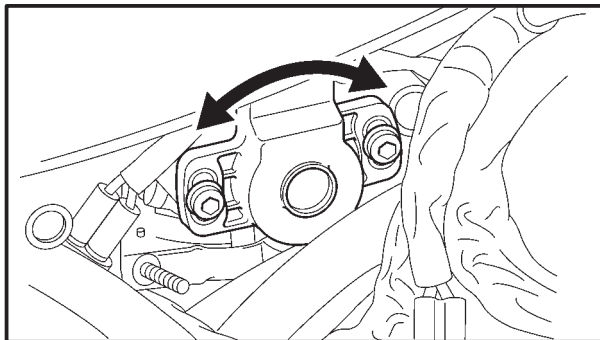
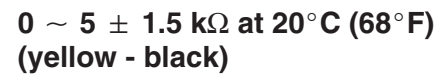
The vacuum pressure should not exceed 100 kPa (760 mmHg, 29.9 inHg).





- The slot is worn or broken → Replace the throttle position sensor.

Check mainly that the resistance changes gradually when turning the throttle, since the readings (from closed to wide-open throttle) may differ slightly from those specified.

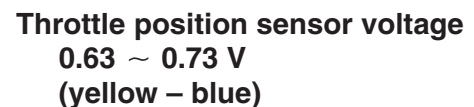


- Connect the throttle position sensor coupler to the wire harness.
- Connect the digital circuit tester to the throttle position sensor.

**Tester positive probe → blue terminal ①**  
**Tester negative probe → yellow terminal ②**



- c. Measure the throttle position sensor voltage.
- d. Adjust the throttle position sensor angle so the measured voltage is within the specified range.



- g. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.



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 (1112 to 1292°F).

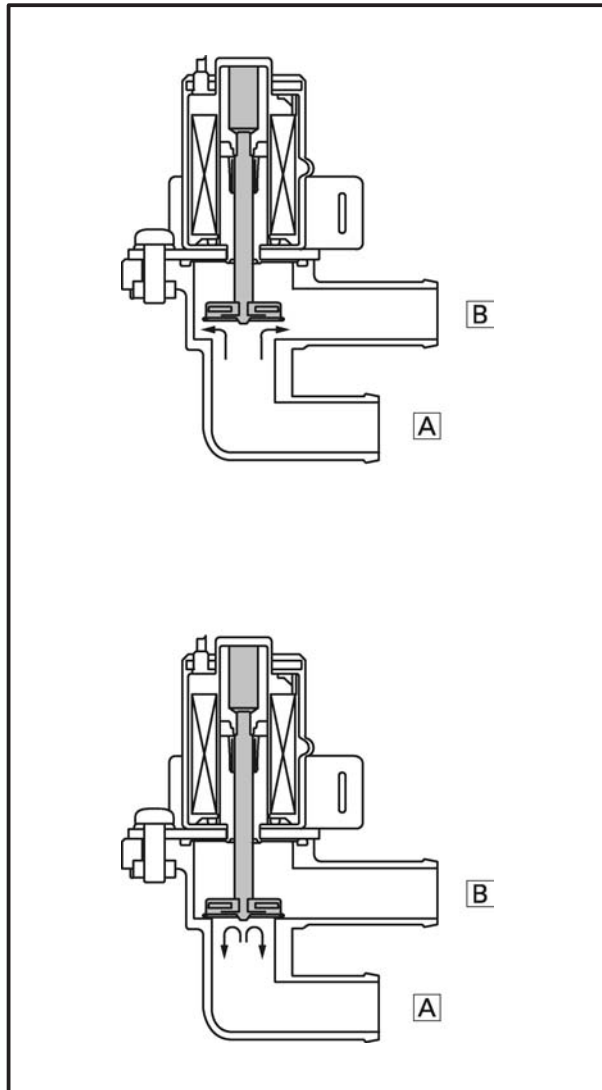
EAS0097

**AIR CUT-OFF VALVE**

The air cut-off valve is controlled by the signals from the ECU in accordance with the combustion conditions. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the motorcycle is being driven. However, if the coolant temperature is below the specified value, the air cut-off valve remains open and allows the air to flow into the exhaust pipe until the temperature becomes higher than the specified value.

**A** From the air cleaner

**B** To the cylinder head

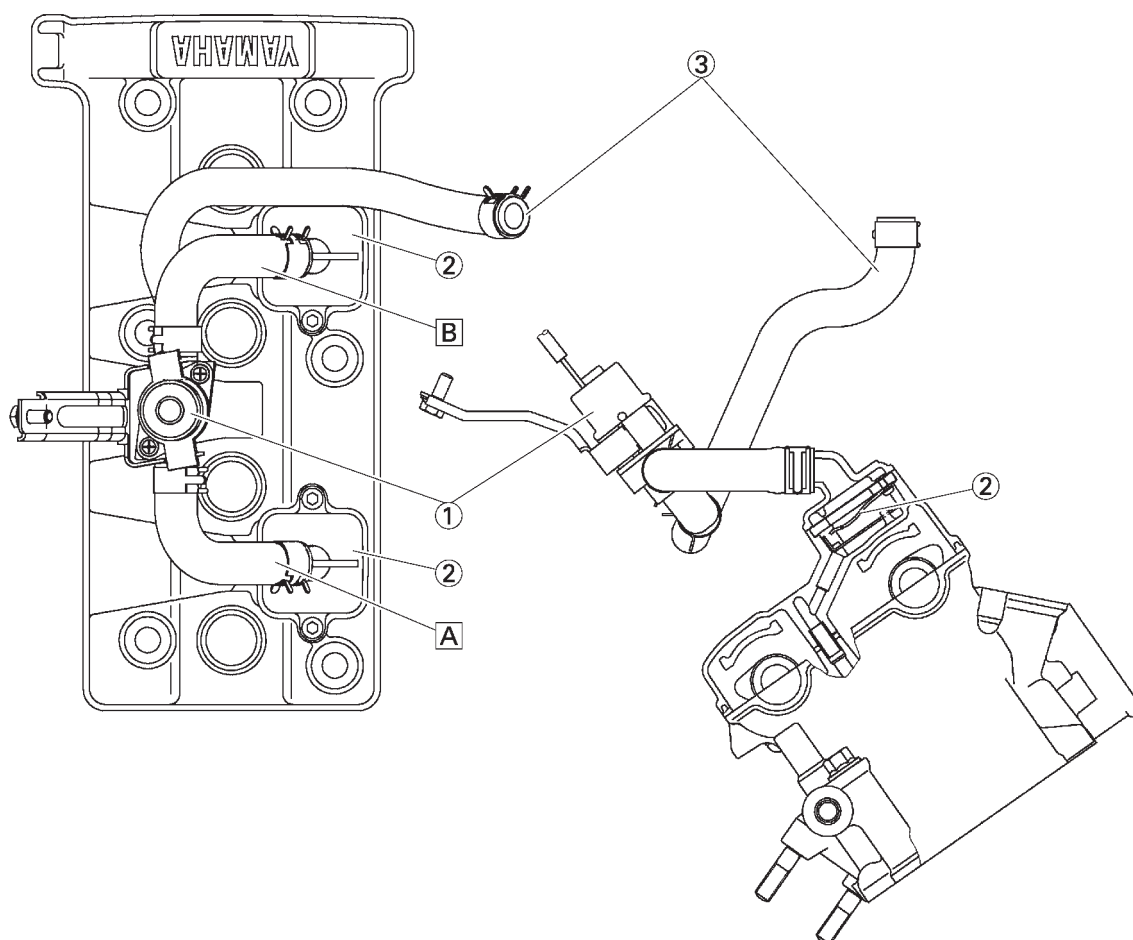




EAS00509

## AIR INDUCTION SYSTEM DIAGRAMS

- |                      |                                |
|----------------------|--------------------------------|
| ① Air cut-off valve  | <b>A</b> To cylinder #1 and #2 |
| ② Reed valve         | <b>B</b> To cylinder #3 and #4 |
| ③ To air filter case |                                |



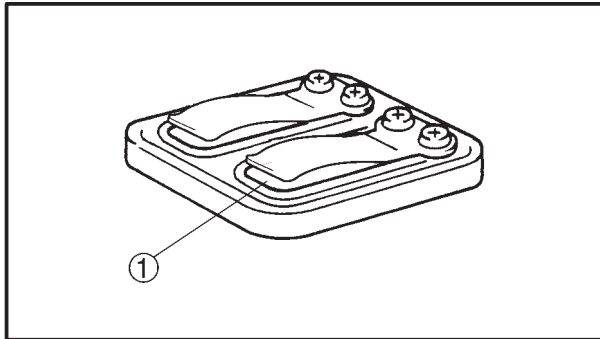


EAS00510

## CHECKING THE AIR INDUCTION SYSTEM

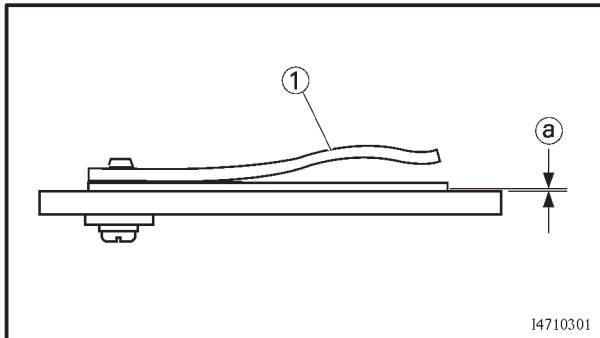
### 1. Check:

- hoses  
Loose connection → Connect properly.  
Cracks/damage → Replace.
- pipes  
Cracks/damage → Replace.



### 2. Check:

- reed valve ①
- reed valve stopper
- reed valve seat  
Cracks/damage → Replace the reed valve.



### 3. Measure:

- reed valve bending limit (a)  
Out of specification → Replace the reed valve.

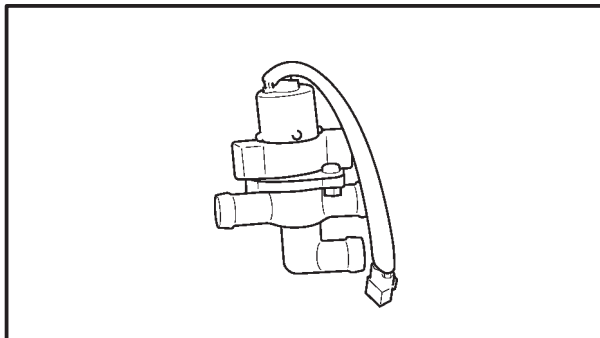


**Reed valve bending limit  
0.4 mm (0.016 in)**

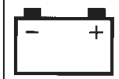
- ① Surface plate

### 4. Check:

- air cut-off valve  
Cracks/damage → Replace.





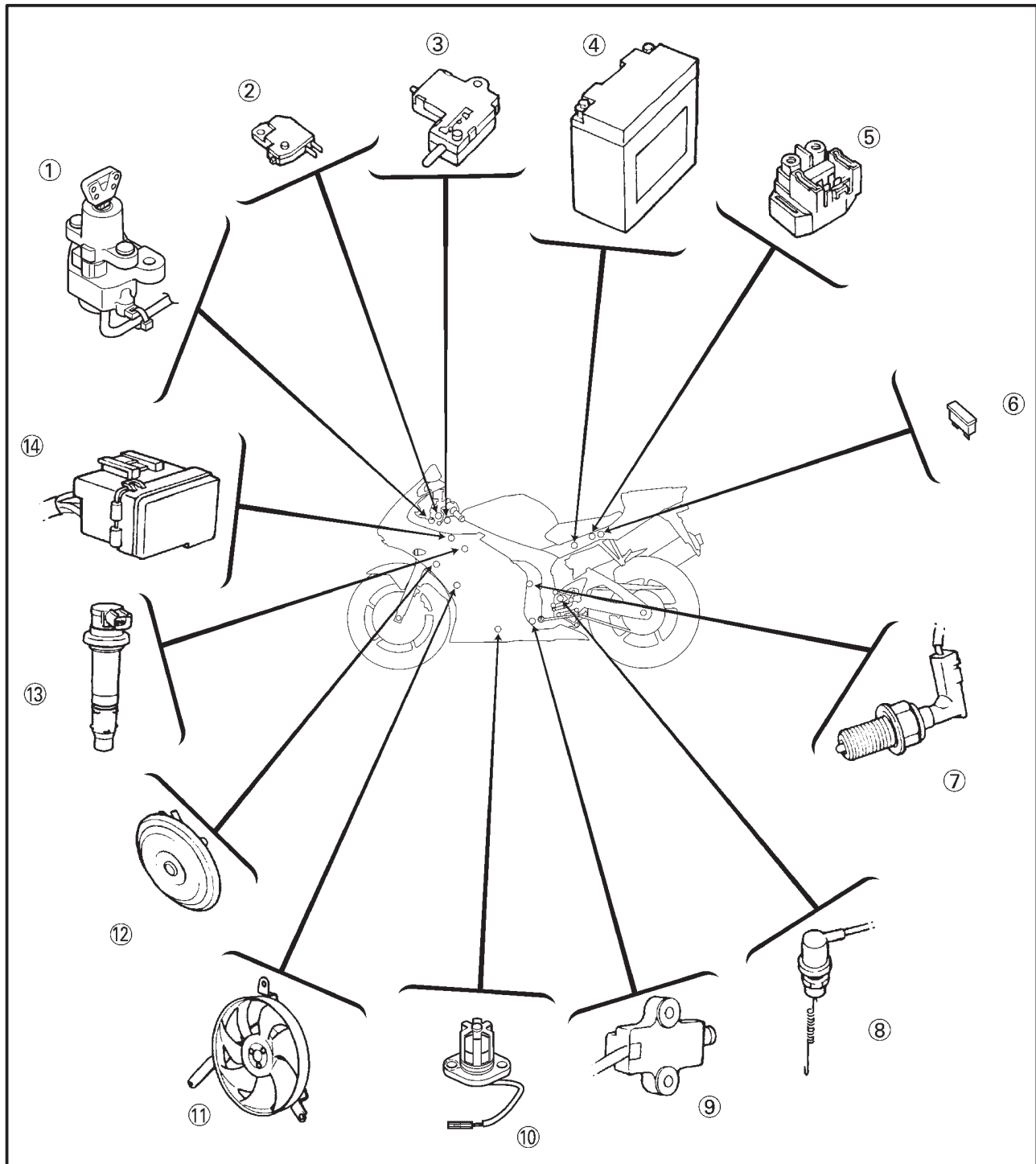


EAS00729

## ELECTRICAL

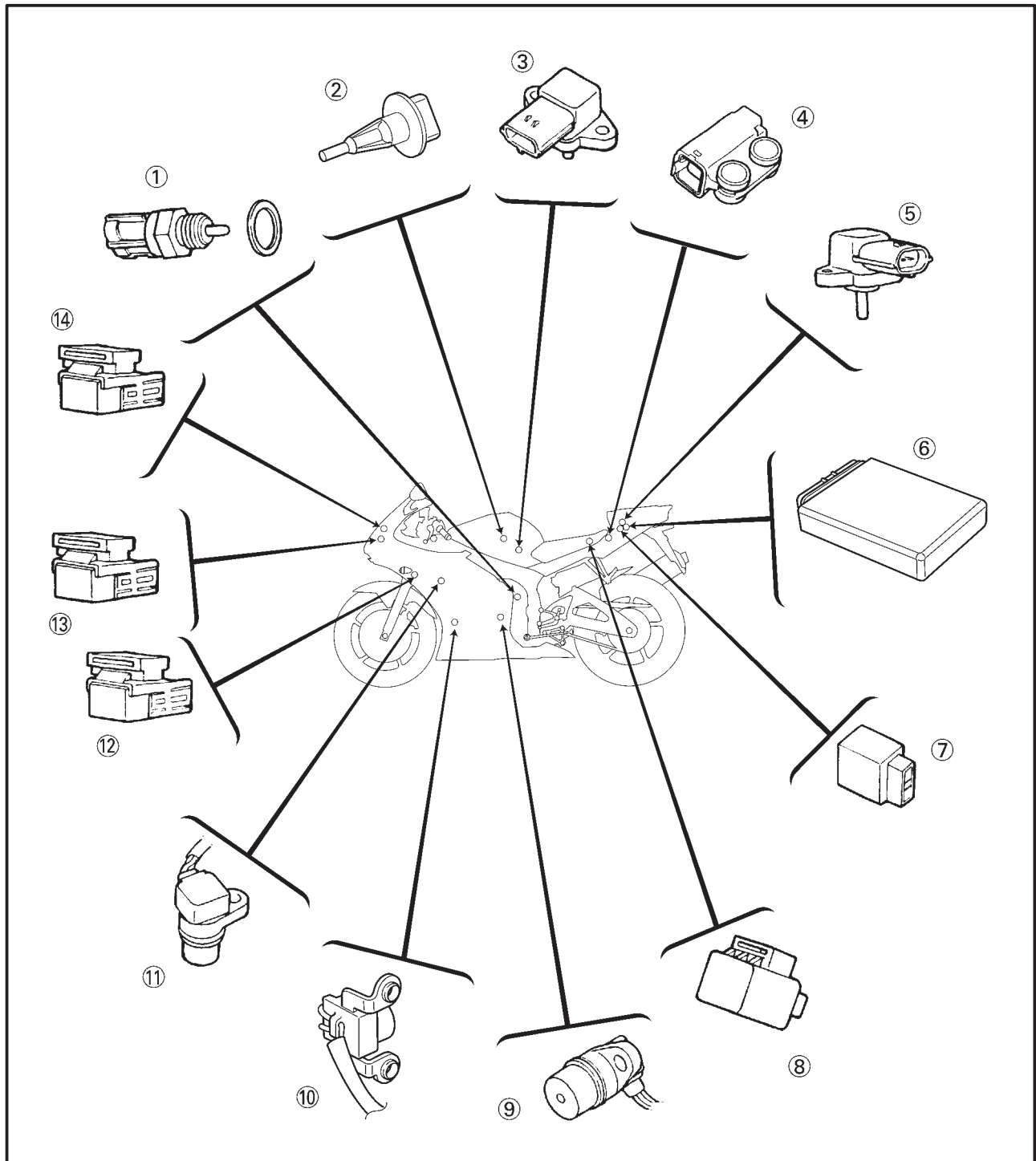
## ELECTRICAL COMPONENTS

- |                            |                      |
|----------------------------|----------------------|
| ① Main switch              | ⑨ Sidestand switch   |
| ② Front brake light switch | ⑩ Oil level switch   |
| ③ Clutch switch            | ⑪ Radiator fan motor |
| ④ Battery                  | ⑫ Horn               |
| ⑤ Starter relay            | ⑬ Ignition coil      |
| ⑥ Fuse (main)              | ⑭ Fuse box           |
| ⑦ Neutral switch           |                      |
| ⑧ Rear brake light switch  |                      |





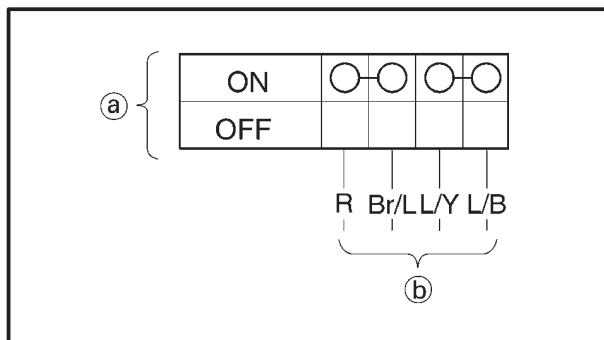
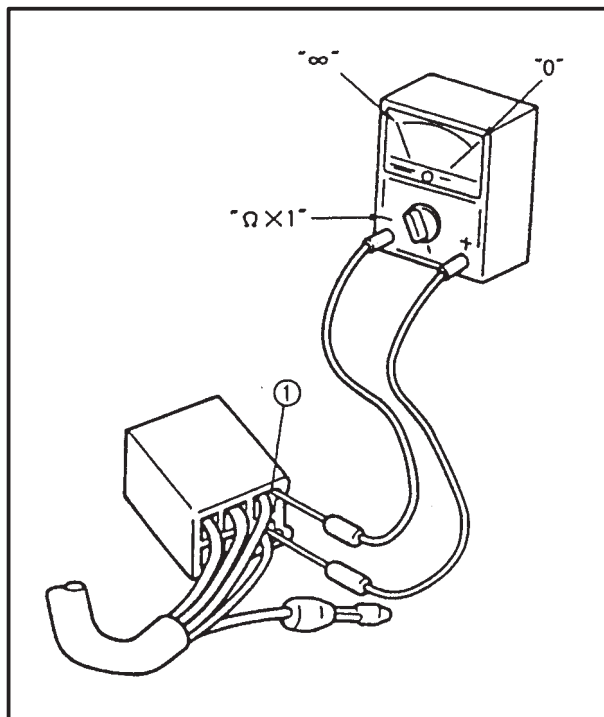
- ① Coolant temperature sensor
- ② Intake air temperature sensor
- ③ Intake air pressure sensor
- ④ Lean angle cut-off switch
- ⑤ Atmospheric pressure sensor
- ⑥ ECU
- ⑦ Starting circuit cut-off relay
- ⑧ Turn signal relay
- ⑨ Speed sensor
- ⑩ Crankshaft position sensor
- ⑪ Cylinder identification sensor
- ⑫ Radiator fan motor relay
- ⑬ Headlight relay (on/off)
- ⑭ Headlight relay (dimmer)







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 ① taking care not to loosen or damage the leads.

**Pocket tester****90890-03112, YU-3112****NOTE:**

- Before checking for continuity, set the pocket tester to “0” and to the “ $\Omega \times 1$ ” 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 ① are shown in the far left column and the switch lead colors ② 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 when the switch is set to “ON”.



EAS00731

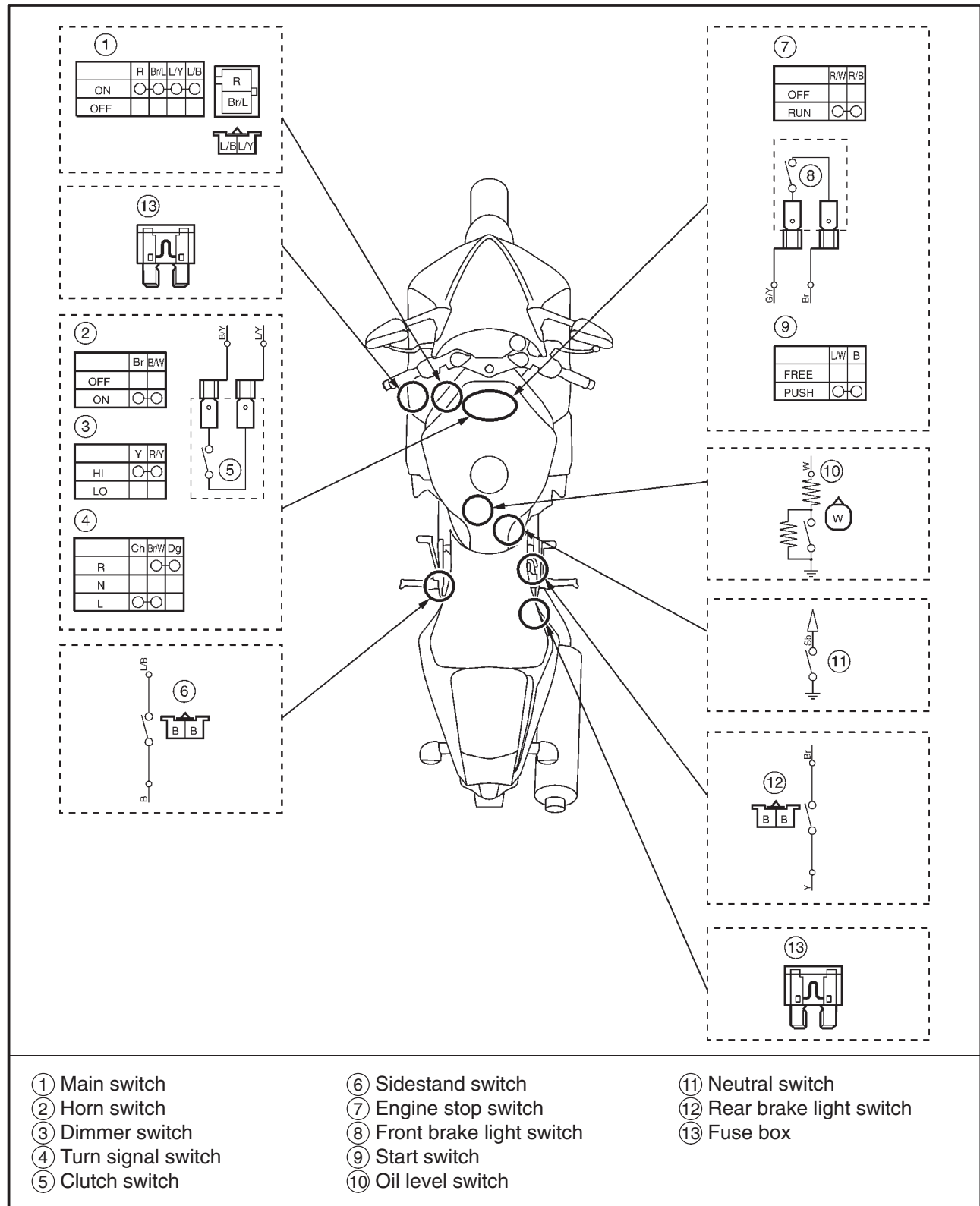
## CHECKING THE SWITCHES

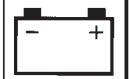
Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to "CHECKING SWITCH CONTINUITY".

Damage/wear → Repair or replace.

Improperly connected → Properly connect.

Incorrect continuity reading → Replace the switch.





EAS00732

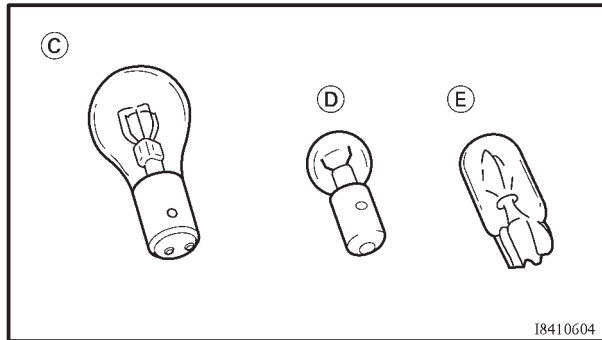
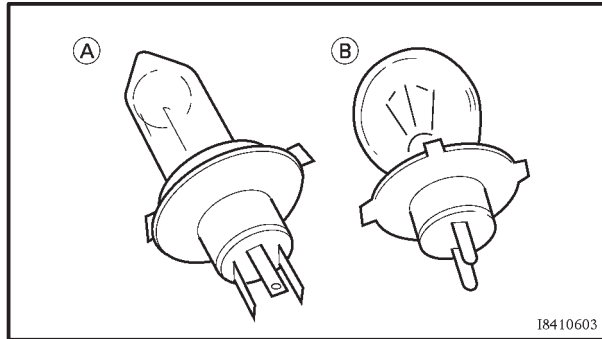
## CHECKING THE BULBS AND BULB SOCKETS

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 motorcycle are shown in the illustration on the left.

- Bulbs **A** and **B** 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.
- Bulbs **C** is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs **D** and **E** are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

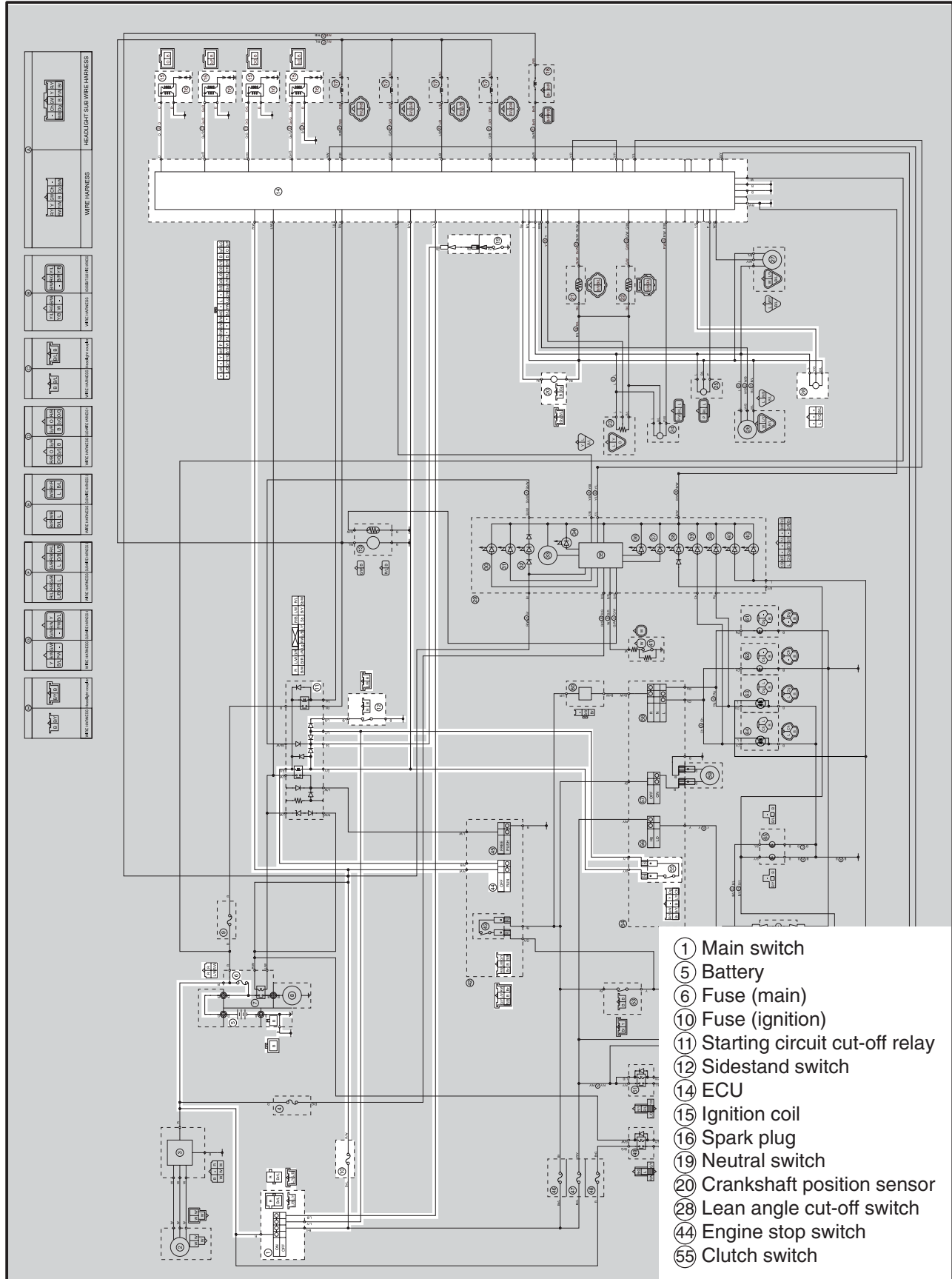






EAS00735

## IGNITION SYSTEM CIRCUIT DIAGRAM





EAS00737

### TROUBLESHOOTING

**The ignition system fails to operate (no spark or intermittent spark).**

Check:

1. main and ignition fuses
2. battery
3. spark plugs
4. ignition spark gap
5. ignition coil resistance
6. crankshaft position sensor
7. main switch
8. engine stop switch
9. neutral switch
10. sidestand switch
11. clutch switch
12. starting circuit cut-off relay
13. lean angle cut-off switch
14. wiring connections  
(of the entire ignition system)

#### NOTE:

- Before troubleshooting, remove the following part(s):
  1. seat
  2. fuel tank
  3. air filter case
  4. bottom cowl
  5. side cowlings
- Troubleshoot with the following special tool(s).



**Dynamic spark tester**  
**YM-34487**  
**Pocket tester**  
**90890-03112, YU-3112**

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.

EAS00741

#### 3. Spark plugs

The following procedure applies to all of the spark plugs.

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.  
Refer to "CHECKING THE SPARK PLUGS" in chapter 3.



**Standard spark plug**  
**CR9EK or CR10EK (NGK)**  
**Spark plug gap**  
**0.6 ~ 0.7 mm (0.0236 ~ 0.0276 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.

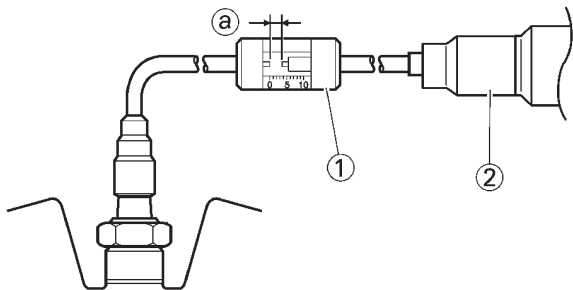


EAS00743

4. Ignition spark gap

The following procedure applies to all of the spark plugs.

- Disconnect the ignition coil from the spark plug.
- Connect the dynamic spark tester ① and ignition coil ② as shown.
- Turn the main switch to “ON”.
- Measure the ignition spark gap ③.
- Crank the engine by pushing the starter 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?



NO



YES

The ignition system  
is OK.

EAS00747

5. Ignition coil resistance

The following procedure applies to all of the ignition coils.

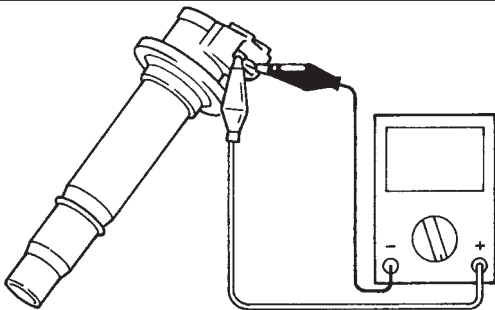
- Disconnect the ignition coil leads from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) to the ignition coil as shown.

**Positive tester probe** →

**ignition coil terminal**

**Negative tester probe** →

**ignition coil terminal**



- Measure the primary coil resistance.



**Primary coil resistance**  
**0.17 ~ 0.23  $\Omega$  at 20°C (68°F)**

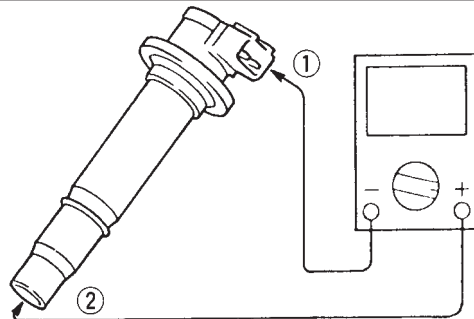
- Connect the pocket tester ( $\Omega \times 1k$ ) to the ignition coil as shown.

**Negative tester probe** →

**ignition coil terminal ①**

**Positive tester probe** →

**spark plug terminal ②**



- Measure the secondary coil resistance.



**Secondary coil resistance**  
**4.8 ~ 7.2 k $\Omega$  at 20°C (68°F)**

- Is the ignition coil OK?



YES



NO

Replace the ignition  
coil.



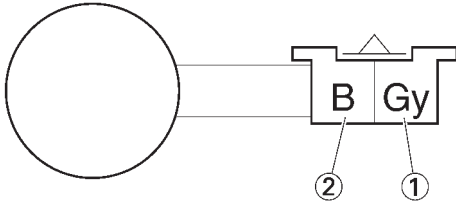


EAS00748

### 6. Crankshaft position sensor resistance

- Disconnect the crankshaft position sensor coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 100$ ) to the crankshaft position sensor coupler as shown.

**Positive tester probe** → gray ①  
**Negative tester probe** → black ②



- Measure the crankshaft position sensor resistance.



**Crankshaft position sensor resistance**  
**248 ~ 372 $\Omega$  at 20°C (68°F)**  
**(between gray and black)**

- Is the crankshaft position sensor OK?

↓ YES

↓ NO

Replace the crankshaft position sensor.

EAS00749

### 7. 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

### 8. 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

### 9. Neutral switch

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

↓ YES

↓ NO

Replace the neutral 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 side-stand switch.

EAS00763

### 11. Clutch switch

- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?

↓ YES

↓ NO

Replace the clutch switch.





YES



NO

Replace the lean  
angle cut-off switch.

EAS00754

14. Wiring

- Check the entire ignition system's wiring.  
Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?



YES



NO

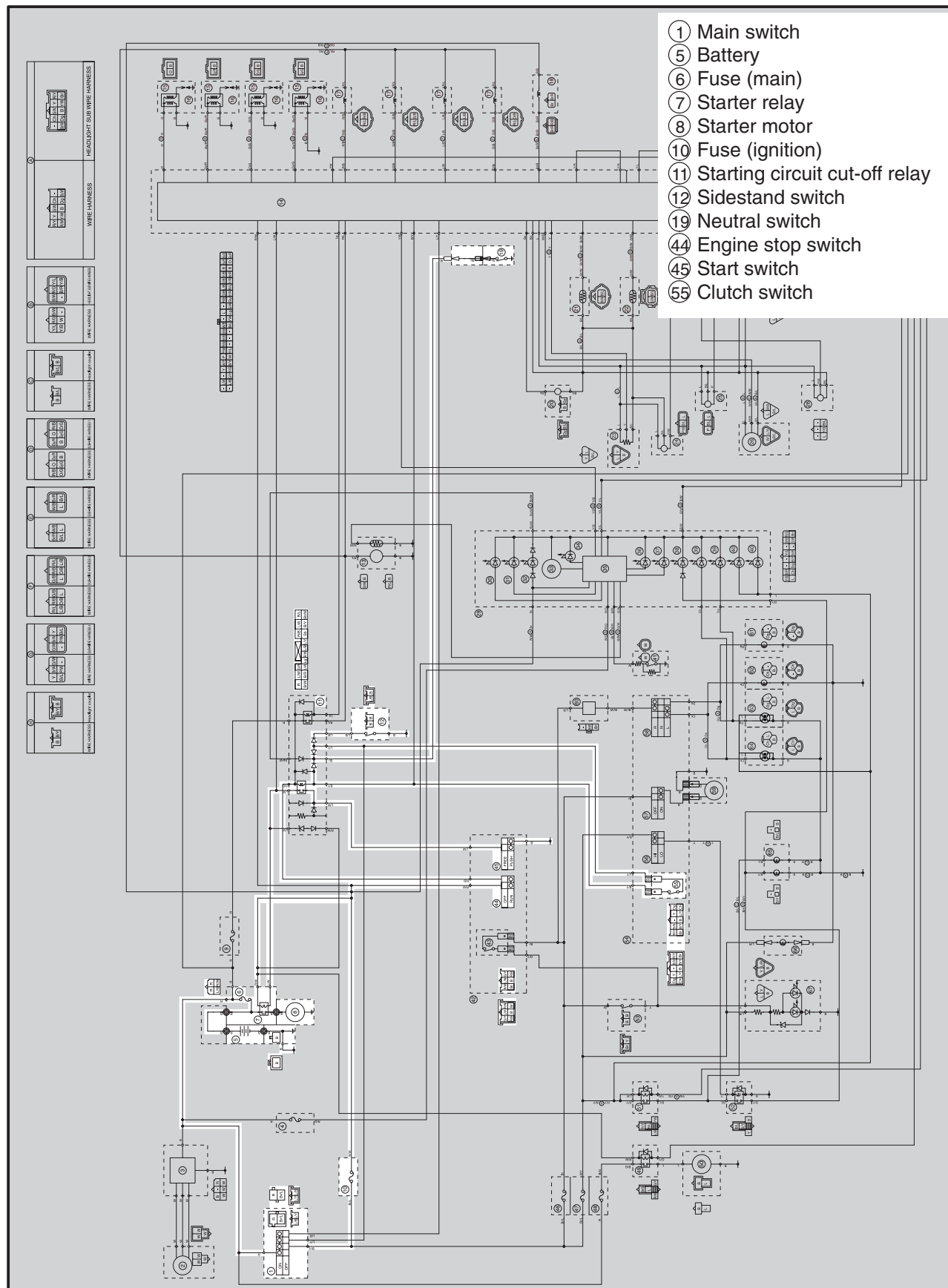
Replace the ignitor  
unit.

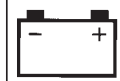
Properly connect or  
repair the ignition  
system's wiring.



EAS00755

# ELECTRIC STARTING SYSTEM CIRCUIT DIAGRAM





EAS00756

### STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

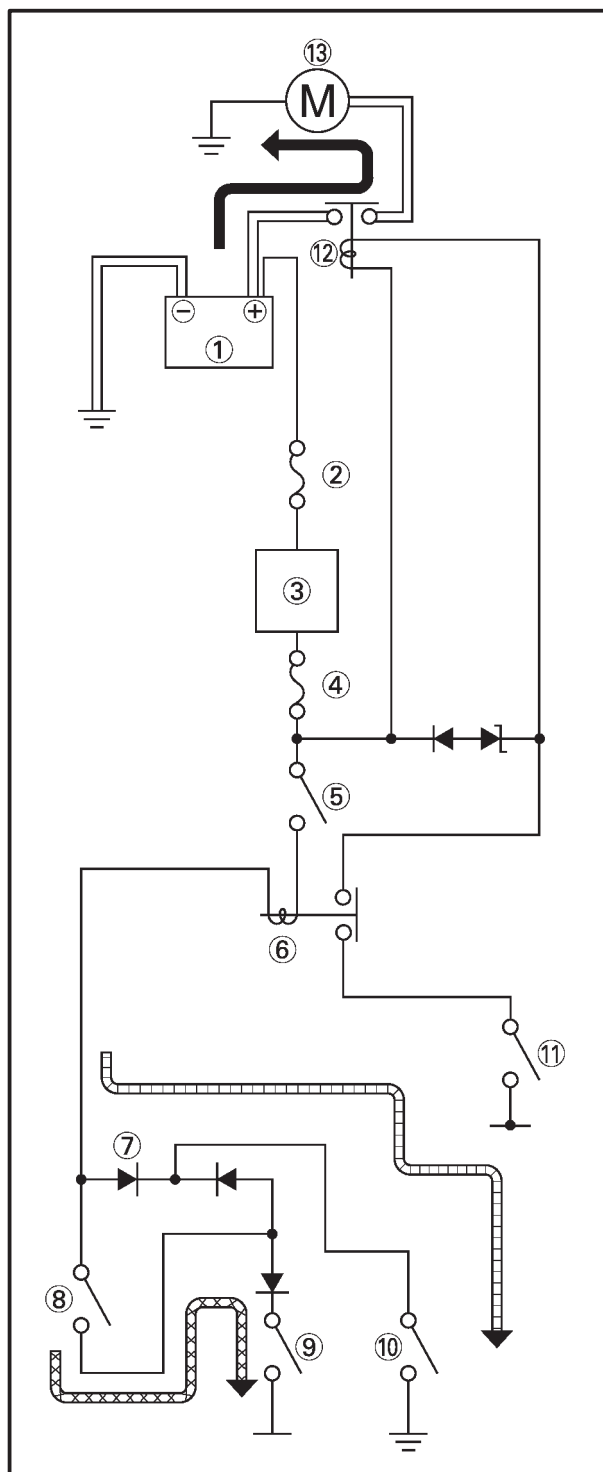
If the engine stop switch is set to “⌚” and the main switch is set to “ON” (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cut-off relay is closed and the engine can be started by pressing the starter switch.

← WHEN THE TRANSMISSION IS IN NEUTRAL

← WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR



- ① Battery
- ② Main fuse
- ③ Main switch
- ④ Ignition fuse
- ⑤ Engine stop switch
- ⑥ Starting circuit cut-off relay
- ⑦ Diode
- ⑧ Clutch switch
- ⑨ Sidestand switch
- ⑩ Neutral switch
- ⑪ Start switch
- ⑫ Starter relay
- ⑬ Starter motor



EAS00757

## TROUBLESHOOTING

**The starter motor fails to turn.**

Check:

1. main and ignition fuses
2. Battery
3. starter motor
4. starting circuit cut-off relay
5. starter relay
6. main switch
7. engine stop switch
8. neutral switch
9. sidestand switch
10. clutch switch
11. start switch
12. wiring connections  
(of the entire starting system)

**NOTE:**

- Before troubleshooting, remove the following part(s):
  1. seat
  2. fuel tank
  3. left side cowling
- Troubleshoot with the following special tool(s).



**Pocket tester**  
90890-03112, YU-3112

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



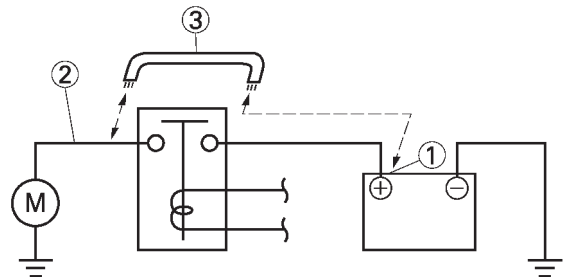
NO

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00758

## 3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



18210801

**! 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?

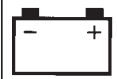


YES



NO

Repair or replace the starter motor.



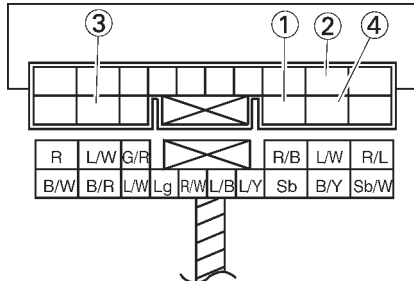
EAS00759

## 4. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the starting circuit cut-off relay coupler as shown.

**Positive battery terminal** → red/black ①  
**Negative battery terminal** → black/yellow ②

**Positive tester probe** → blue/white ③  
**Negative tester probe** → blue/white ④



- Does the starting circuit cut-off relay have continuity between blue/white and blue/white?

↓ YES

↓ NO

Replace the starting circuit cut-off relay.

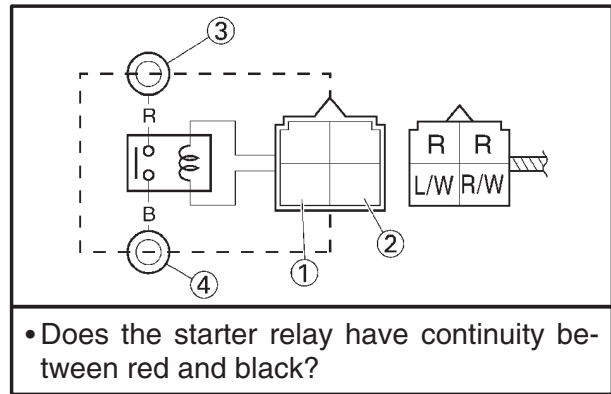
EAS00761

## 5. Starter relay

- Disconnect the starter relay coupler from the coupler.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the starter relay coupler as shown.

**Positive battery terminal** → red/white ①  
**Negative battery terminal** → blue/white ②

**Positive tester probe** → red ③  
**Negative tester probe** → black ④



- Does the starter relay have continuity between red 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. Neutral switch

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

↓ YES

↓ NO

Replace the neutral switch.



EAS00752

**9. Sidestand switch**

- Check the sidestand switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the sidestand switch OK?



YES



NO

Replace the side-stand switch.

EAS00766

**12. 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.

EAS00763

**10. Clutch switch**

- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?



YES



NO

Replace the clutch switch.

EAS00764

**11. Start switch**

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?



YES



NO

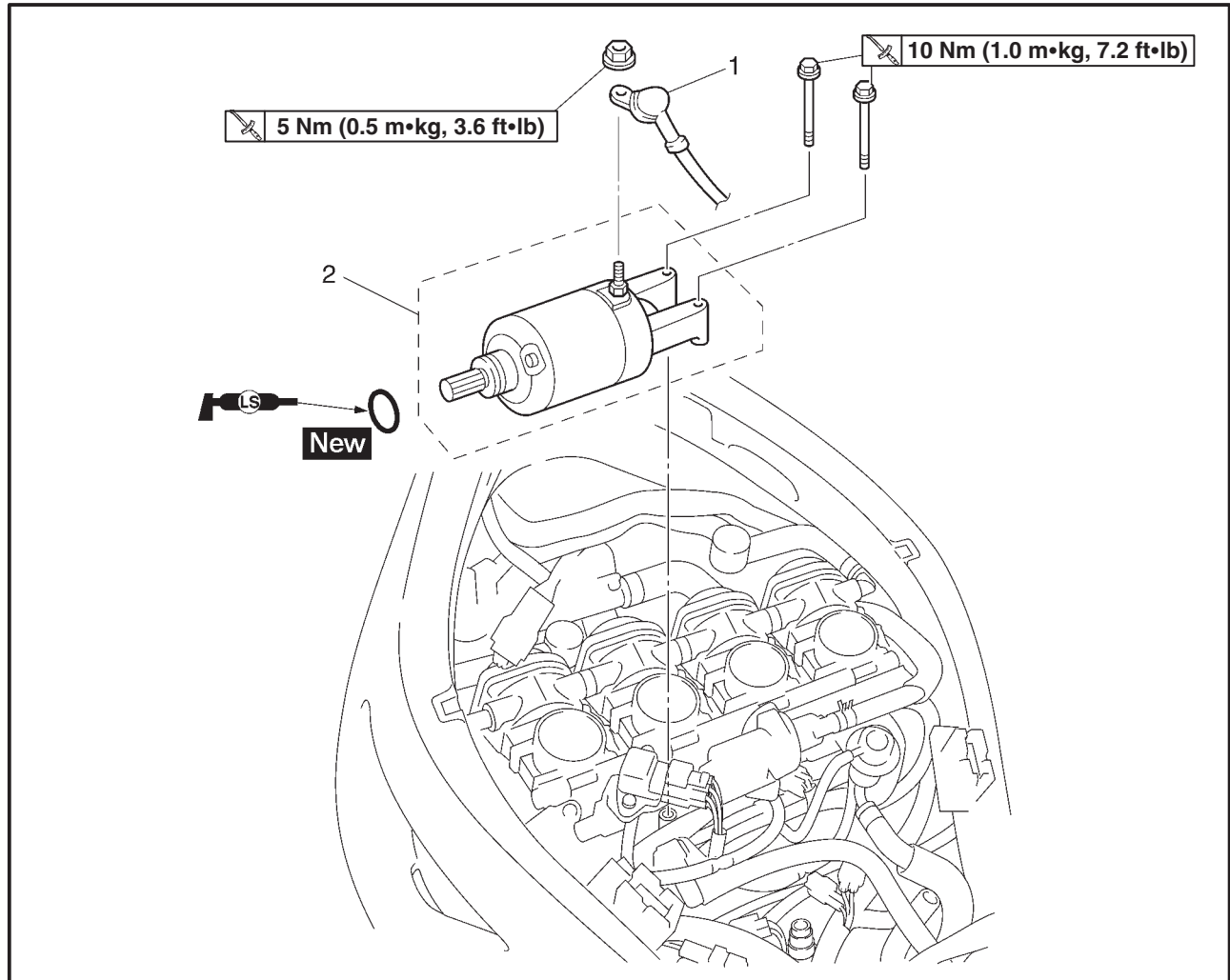
Replace the right handlebar switch.





EAS00767

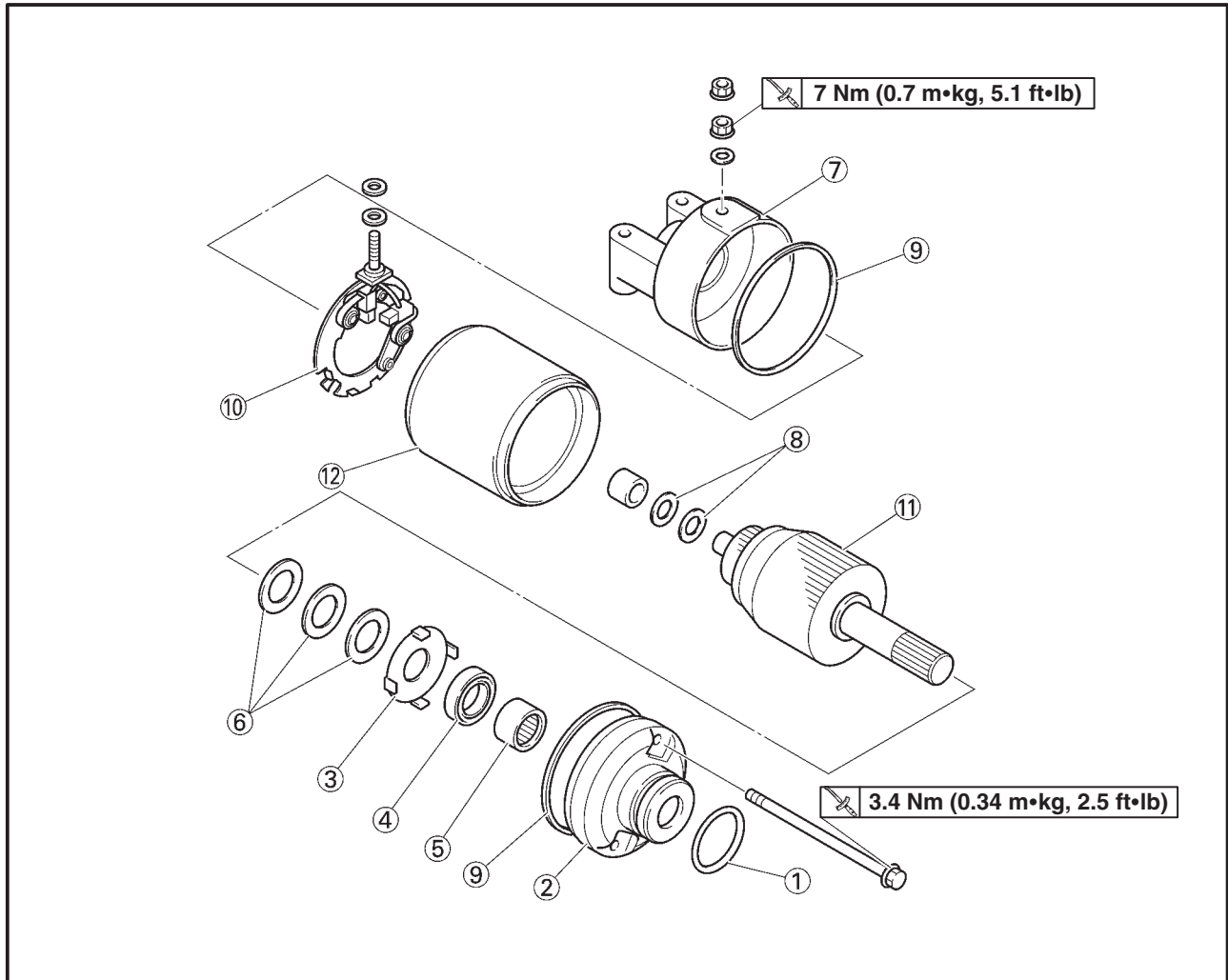
## STARTER MOTOR



Order	Job/Part	Q'ty	Remarks
	<b>Removing the starter motor</b>		
1	Rider seat	1	Remove the parts in the order listed.
	Fuel tank		Refer to "SEATS" in chapter 3.
	Left side cowling		Refer to "FUEL TANK" in chapter 3.
	Starter motor lead		Refer to "COWLINGS" in chapter 3.
2	Starter motor	1	
			For installation, reverse the removal procedure.

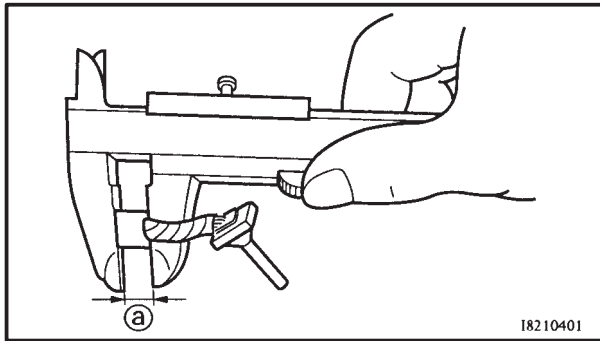


EAS00768



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the starter motor</b>		Disassembly the parts in the order listed.
①	O-ring	1	
②	Front cover	1	
③	Lock washer	1	
④	Oil seal	1	
⑤	Bearing	1	
⑥	Washer set	1	
⑦	Rear cover	1	
⑧	Washer set	1	
⑨	O-ring	2	
⑩	Brush holder	1	
⑪	Armature assembly	1	
⑫	Starter motor yoke	1	
			For assembly, reverse the disassembly procedure.





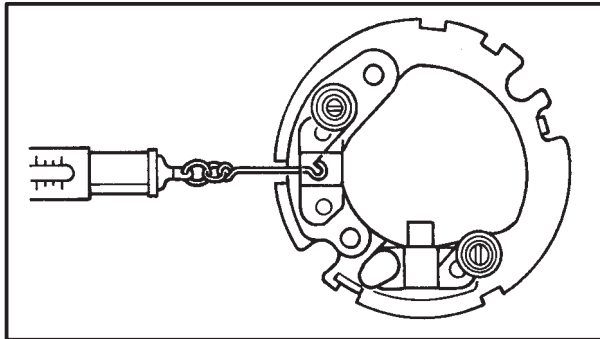
5. Measure:

- brush length ①.

Out of specification → Replace the brushes as a set.



**Brush length wear limit**  
3.5 mm (0.14 in)



6. Measure:

- brush spring force

Out of specification → Replace the brush springs as a set.



**Brush spring force**  
7.16 ~ 9.52 N  
(730 ~ 971 gf, 25.77 ~ 34.27 oz)

7. Check:

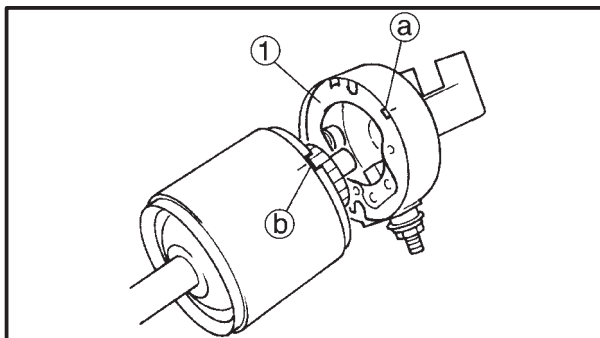
- gear teeth

Damage/wear → Replace the gear.

8. Check:

- bearing
- oil seal

Damage/wear → Replace the defective part(s).



EAS00772

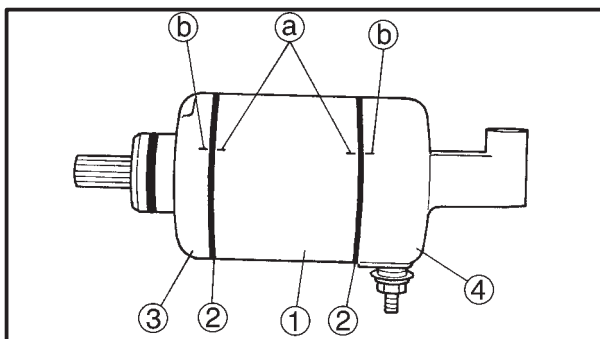
## ASSEMBLING THE STARTER MOTOR

1. Install:

- brush seat ①

**NOTE:**

Align the tab ① on the brush seat with the slot ② in the starter motor rear cover.



2. Install:

- starter motor yoke ①
- O-ring ② **New**
- front cover ③
- rear cover ④

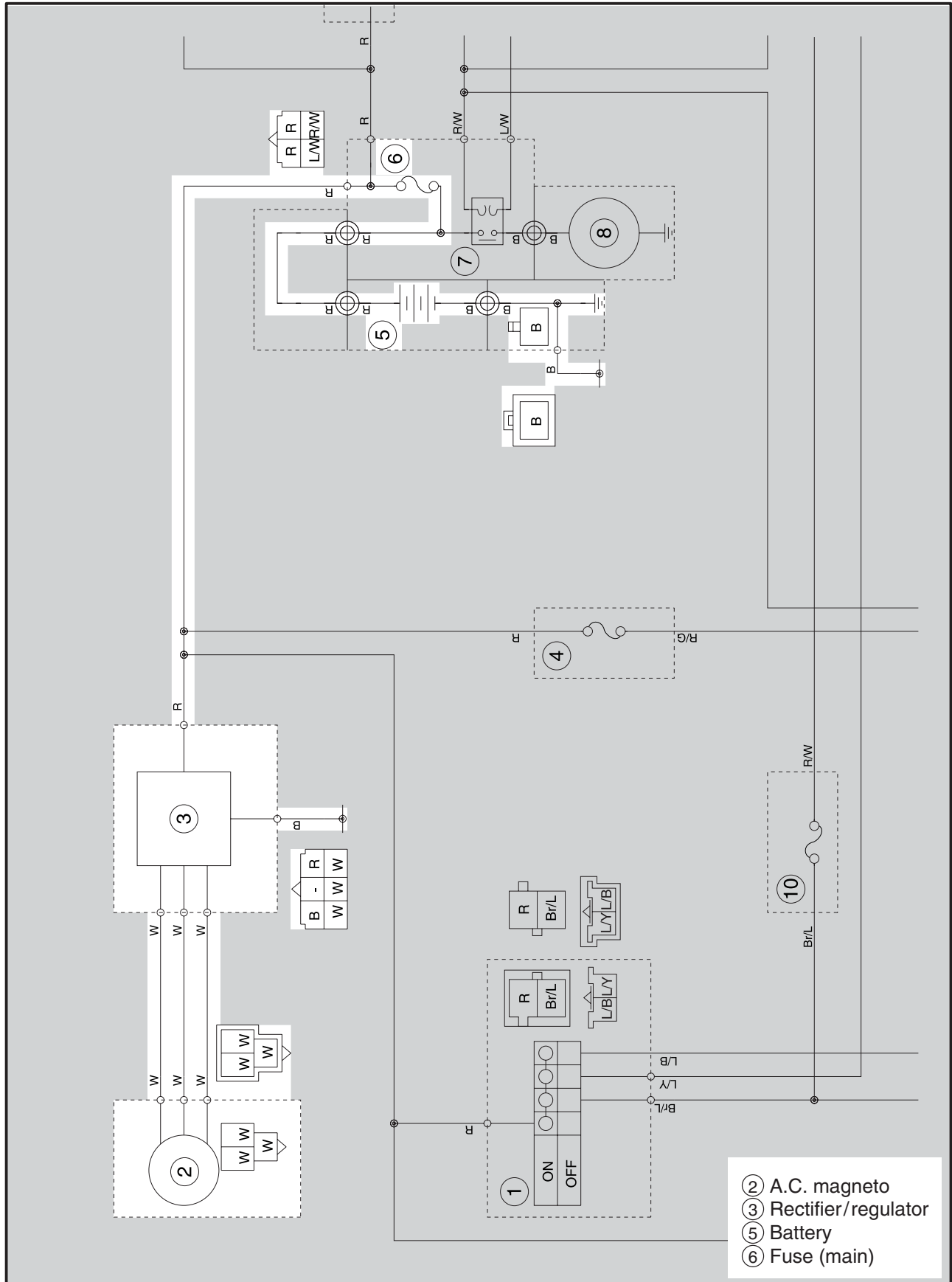
**NOTE:**

Align the match marks ① on the starter motor yoke with the match marks ② on the front and starter motor rear covers.



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 1
5. stator coil resistance 2
6. wiring connections  
(of the entire charging system)

**NOTE:**

- Before troubleshooting, remove the following part(s):
  1. seat
  2. fuel tank
  3. bottom cowling
- Troubleshoot with the following special tool(s).



**Pocket tester**  
90890-03112, YU-3112

EAS00738

## 1. Main fuse

- Check the main fuse for continuity.  
Refer to "CHECKING THE FUSES" in chapter 3.
- Are 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

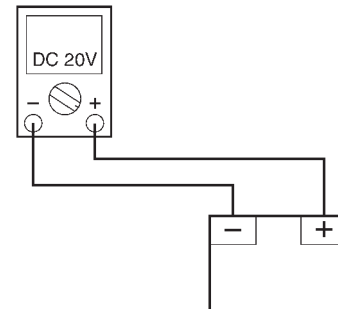
- Set the engine tachometer to the ignition coil of cylinder #1.
- Connect the pocket tester (DC 20 V) to the battery as shown.

**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.



## 4. Stator coil resistance 1

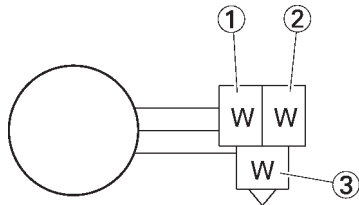
- Disconnect stator coil lead coupler.
- Connect the pocket tester ( $\Omega \times 1$ ) to the stator coil lead coupler as shown.

Positive tester probe → white ①  
Negative tester probe → ground

Positive tester probe → white ②  
Negative tester probe → ground

Positive tester probe → white ③  
Negative tester probe → ground

No  
continuity



- Are the tester readings correct?

↓ YES

↓ NO

Replace the stator coil assembly.

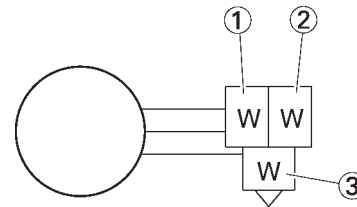
EAS00776

## 5. Stator coil resistance 2

- Remove the generator cover.
- Connect the pocket tester ( $\Omega \times 1$ ) to the stator coils 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

0.18 ~ 0.26  $\Omega$  at 20°C (68°F)

- Is the stator coil OK?

↓ YES

↓ NO

Replace the stator coil assembly.

EAS00779

## 6. 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

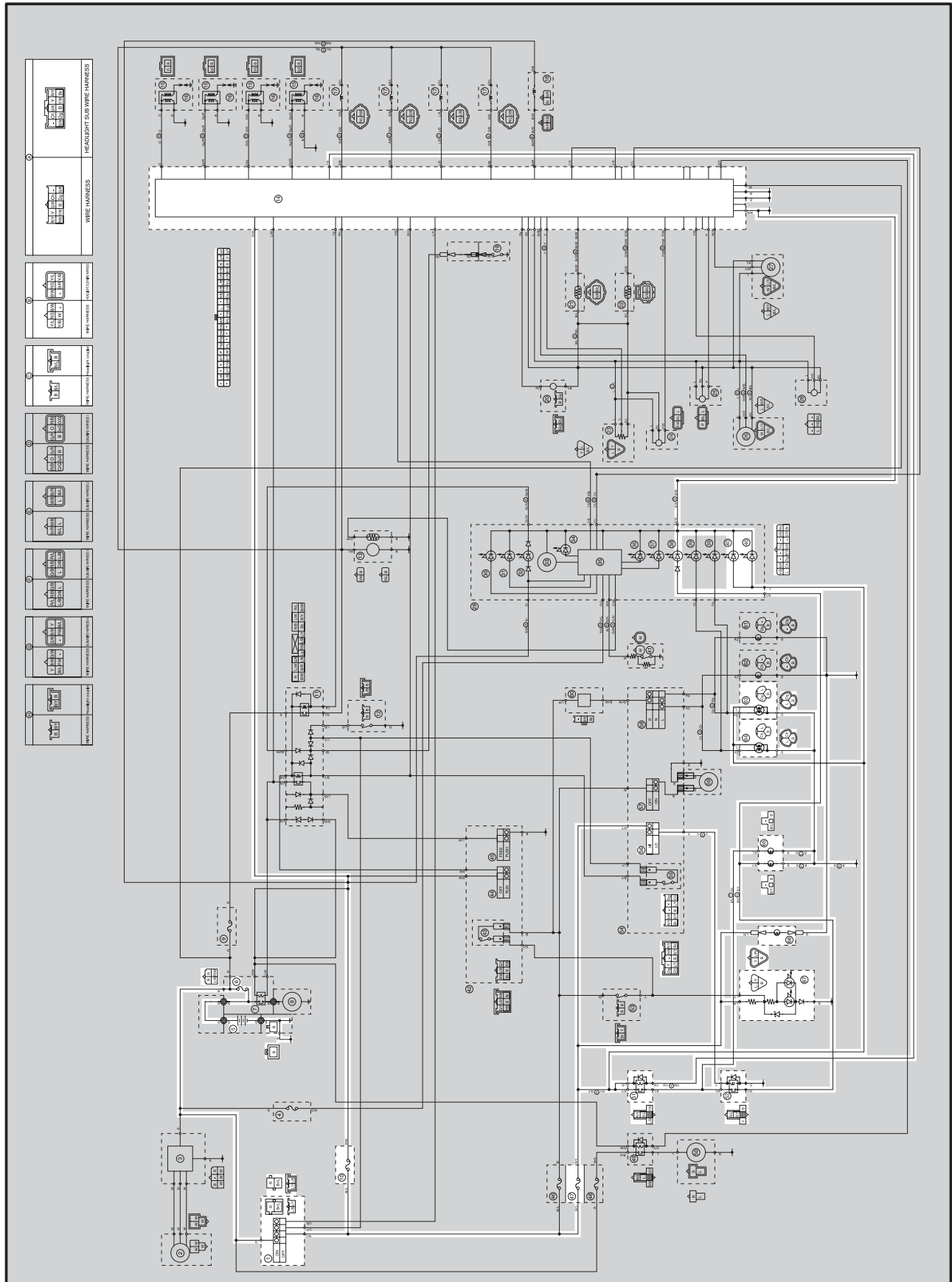
Replace the rectifier/regulator.

Properly connect or repair the charging system's wiring.

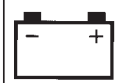


EAS00780

# LIGHTING SYSTEM CIRCUIT DIAGRAM







- ① Main switch
- ⑤ Battery
- ⑥ Fuse (main)
- ⑩ Fuse (ignition)
- ⑭ ECU
- ③⑧ High beam indicator light
- ④⑩ Meter light
- ④⑦ Fuse (headlight)
- ⑤① Headlight relay (on/off)
- ⑤② Headlight relay (dimmer)
- ⑤⑥ Dimmer switch
- ⑥③ Front turn signal/position light (right)
- ⑥④ Front turn signal/position light (left)
- ⑥⑤ Headlight
- ⑥⑥ License light
- ⑥⑦ Tail/brake light



EAS00781

### TROUBLESHOOTING

**Any of the following fail to light: headlight, high beam indicator light, taillight, licence light or meter light.**

Check:

1. main, ignition and headlight fuses
2. battery
3. main switch
4. dimmer switch
5. headlight relay (on/off)
6. headlight relay (dimmer)
7. wiring connections  
(of the entire lighting system)

#### NOTE:

- Before troubleshooting, remove the following part(s):
  1. seat
  2. fuel tank
  3. side cowlings
  4. rear cowlings
- Troubleshoot with the following special tool(s).



**Pocket tester**  
**90890-03112, YU-3112**

EAS00738

#### 1. Main, ignition and headlight fuses

- Check the main, ignition and headlight fuses for continuity. Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main, ignition and headlight 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.

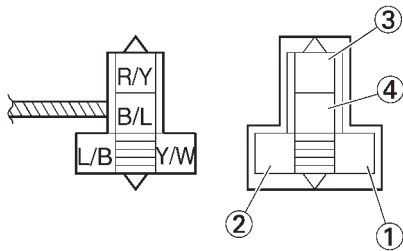


### 5. Headlight relay (on/off)

- Disconnect the headlight relay (on/off) from the coupler.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the headlight relay (on/off) coupler as shown.

**Positive battery lead** → blue/black ①  
**Negative battery lead** → yellow/white ②

**Positive tester probe** → red/yellow ③  
**Negative tester probe** → black/blue ④



- Does the headlight relay (on/off) have continuity between red/yellow and black/blue?

YES

NO

Replace the headlight relay (on/off).

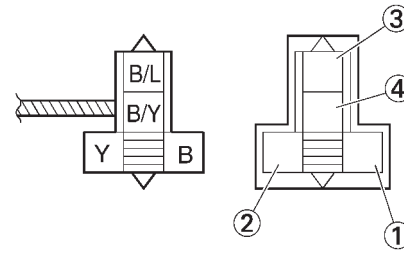
### 6. Headlight relay (dimmer)

- Disconnect the headlight relay (dimmer) from the coupler.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the headlight relay (dimmer) coupler as shown.

**High beam**

**Positive battery lead** → yellow ①  
**Negative battery lead** → black ②

**Positive tester probe** → black/blue ③  
**Negative tester probe** → black/yellow ④



- Does the headlight relay (dimmer) have continuity?

YES

NO

Replace the headlight relay (dimmer).

EAS00787

### 7. Wiring

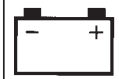
- Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?

YES

NO

Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".

Properly connect or repair the lighting system's wiring.



EAS00788

### CHECKING THE LIGHTING SYSTEM

1. The headlight 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



NO

Replace the headlight bulb, socket or both.

#### 2. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and meter assembly couplers as shown.

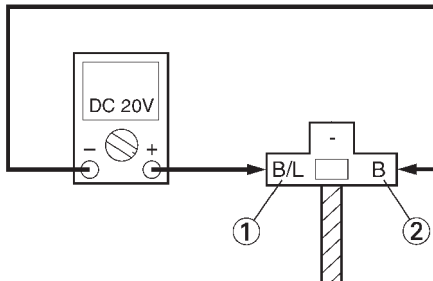
- A When the dimmer switch is set to "☹" (Low beam)
- B When the dimmer switch is set to "☹☹" (High beam)

#### Headlight

- Positive tester probe → black/blue ①
- Negative tester probe → black ②

#### Headlight coupler (wire harness side)

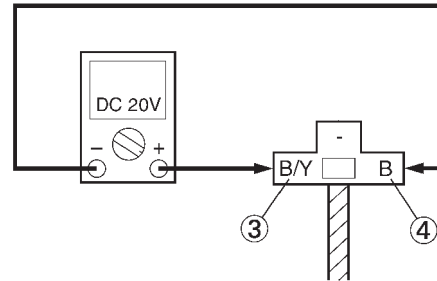
- A Low beam



#### Headlight

- Positive tester probe → black/yellow ③
- Negative tester probe → black ④

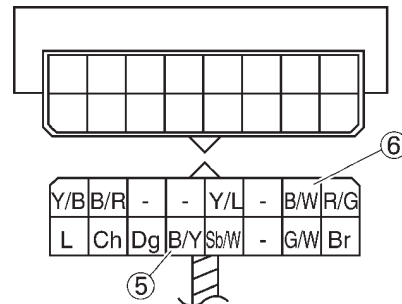
- B High beam



#### High beam indicator light (LEDs)

- Positive tester probe → black/yellow ⑤
- Negative tester probe → black/white ⑥

#### Meter assembly coupler (wire harness side)



- Turn the main switch to "ON".
- Start the engine.
- Set the dimmer switch to "☹" or "☹☹".
- Measure the voltage (DC 12 V) of black/blue ① or black/yellow ③ on the headlight coupler (wire harness side).
- Is the voltage within specification?



YES



NO

This circuit is OK.

The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.



EAS00789

2. The meter light fails to come on.

### 1. Meter light (LEDs)

- Check the meter light for continuity. Refer to “CHECKING THE LEDs”
- Are the meter light OK?



Replace the meter assembly.

EAS00790

3. The tail/brake light fails to come on.

### 1. Tail/brake light (LEDs)

- Check the tail/brake light for continuity. Refer to “CHECKING THE LEDs”
- Are the tail/brake light OK?



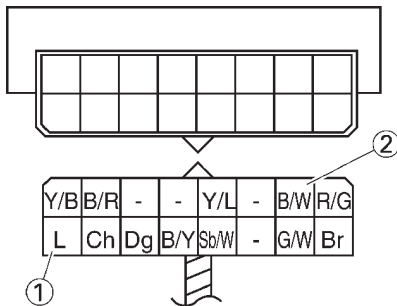
Replace the tail/brake light assembly.

### 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/white ②**



- Turn 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?



This circuit is OK.

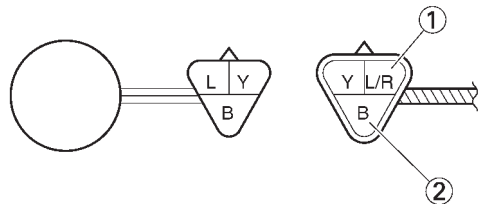
The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

### 2. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

**Positive tester probe → blue/red ①**

**Negative tester probe → black ②**



- Turn the main switch to “ON”.
- Measure the voltage (DC 12 V) of blue/red ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

Wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.



EAS00792

### 4. The license light fails to come on.

#### 1. License light bulb and socket

- Check the license light bulb and socket for continuity.  
Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the license light bulb and socket OK?



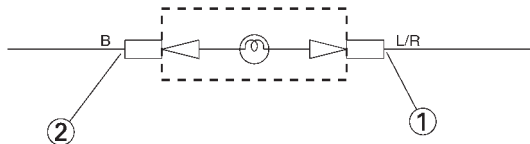
Replace the license light bulb, socket or both.

#### 2. Voltage

- Connect the pocket tester (DC 20 V) to the license light coupler (wire harness light side) as shown.

**Positive tester probe** → blue/red ①

**Negative tester probe** → black ②



- Turn the main switch to “ON”.
- Measure the voltage (DC 12 V) of blue/red ① on the license light coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit from the main switch to the license light coupler is faulty and must be repaired.

### 5. The turn signal/position light fails to come on.

#### 1. Turn signal/position light bulb and socket

- Check the turn signal/position light bulb and socket for continuity.  
Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the turn signal/position light bulb and socket OK?



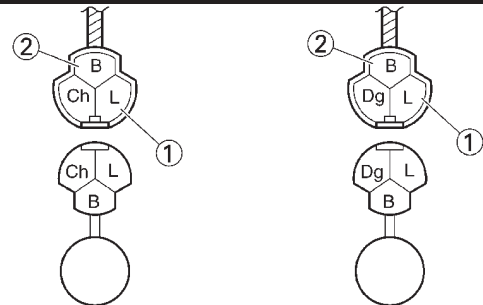
Replace the turn signal/position light bulb, socket or both.

#### 2. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal/position light couplers (wire harness side) as shown.

**Tester positive probe** → blue ①

**Tester negative probe** → black ②



- Turn the main switch to “ON”.
- Measure the voltage (12 V) of blue ① on the turn signal/position light couplers (wire harness side).
- Is the voltage within specification?



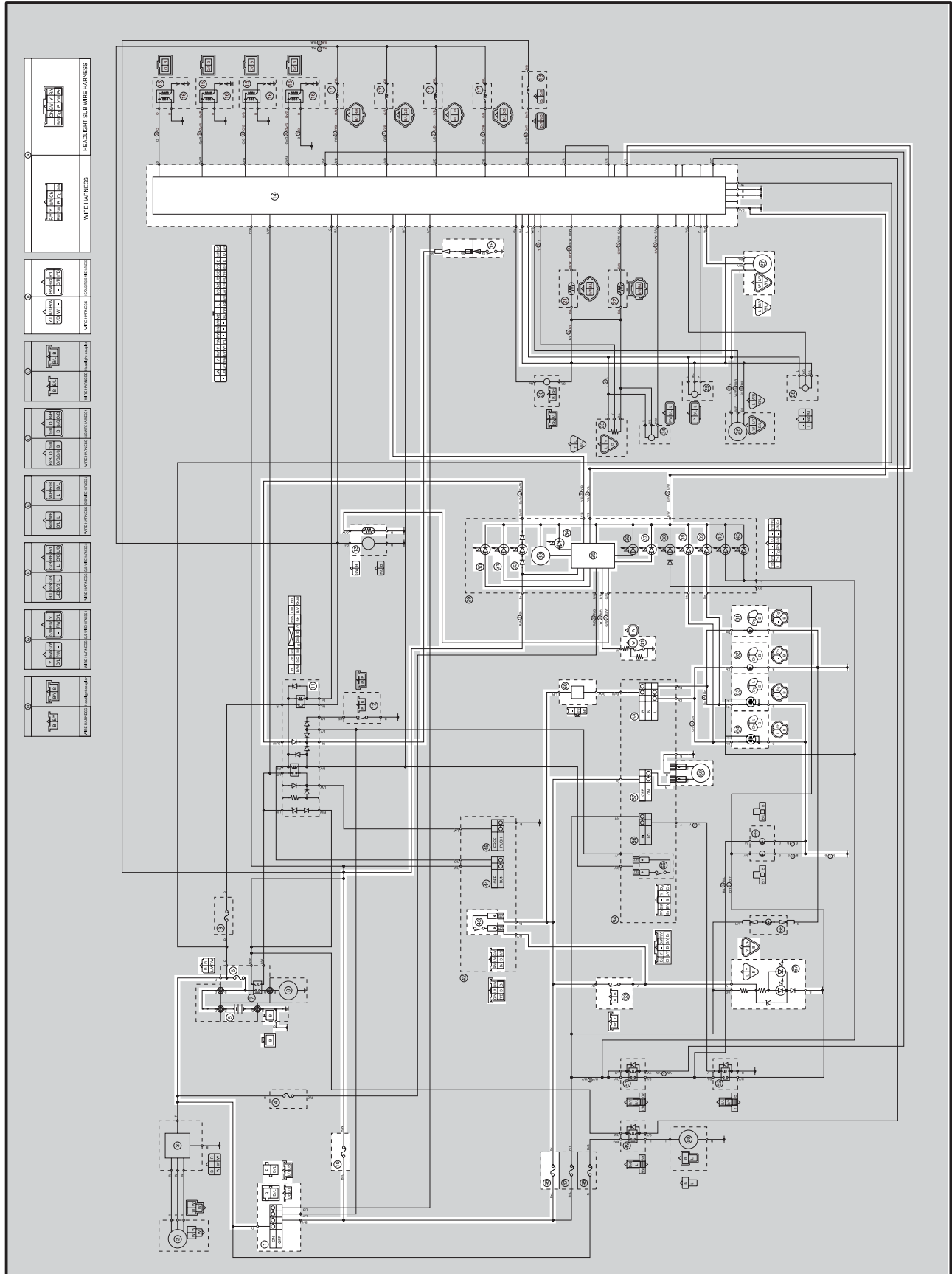
This circuit is OK.

The wiring circuit from the main switch to the turn signal/position light connectors is faulty and must be repaired.



EAS00793

# SIGNALING SYSTEM CIRCUIT DIAGRAM





- ① Main switch
- ⑤ Battery
- ⑥ Fuse (main)
- ⑩ Fuse (ignition)
- ⑪ Starting circuit cut-off relay
- ⑬ Fuel pump
- ⑭ ECU
- ⑲ Neutral switch
- ⑳ Speed sensor
- ③① Fuel level warning light
- ③① Oil level warning light
- ③② Neutral indicator light
- ③③ Tachometer
- ③④ Shift timing indicator light
- ③⑤ Multi-function meter
- ③⑦ Coolant temperature indicator light
- ③⑨ Turn signal indicator light
- ④① Oil level switch
- ④③ Front brake light switch
- ④⑥ Fuse (signal)
- ⑤③ Rear brake light switch
- ⑤⑦ Horn switch
- ⑤⑧ Turn signal switch
- ⑤⑨ Horn
- ⑥① Turn signal relay
- ⑥① Rear turn signal light (right)
- ⑥② Rear turn signal light (left)
- ⑥③ Front turn signal/position light (right)
- ⑥④ Front turn signal/position light (left)
- ⑥⑦ Tail/brake light





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 and signaling fuses
2. battery
3. main switch
4. wiring connections  
(of the entire signaling system)

#### NOTE:

- Before troubleshooting, remove the following part(s):
  1. seat
  2. fuel tank
  3. bottom cowling
  4. side cowlings
  5. rear cowling
- Troubleshoot with the following special tool(s).



**Pocket tester**  
**90890-03112, YU-3112**

EAS00738

#### 1. Main, ignition and signaling fuses

- Check the main, ignition and signaling fuses for continuity.  
Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, ignition and signaling 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.

#### 4. Wiring

- Check the entire signaling system's wiring.  
Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?



YES



NO

Check the condition of each of the signaling system's circuits.  
Refer to "CHECKING THE LIGHTING SYSTEM".

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

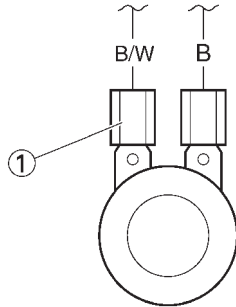
Replace the left handlebar switch.



### 2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

**Positive tester probe → black/white ①**  
**Negative tester probe → ground**



- Turn the main switch to "ON".
- Push the horn switch.
- Measure the voltage (DC 12 V) of black/white at the horn terminal.
- Is the voltage within specification?

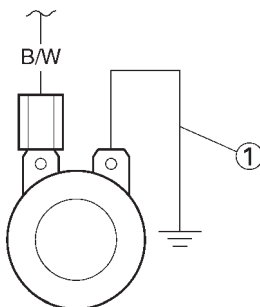
↓ YES

↓ NO

The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

### 3. Horn

- Disconnect the black connector at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Turn the main switch to "ON".
- Push the horn switch.
- Does the horn sound?



↓ YES

↓ NO

The horn is OK.

Replace the horn.

EAS00797

### 2. The tail/brake light fails to come on.

#### 1. Tail/brake light (LEDs)

- Check the tail/brake light for continuity. Refer to "CHECKING THE LEDs"
- Are the tail/brake light 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

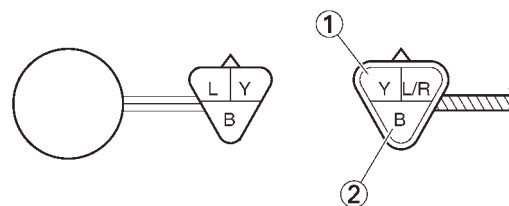
↓ NO

Replace the brake light switch.

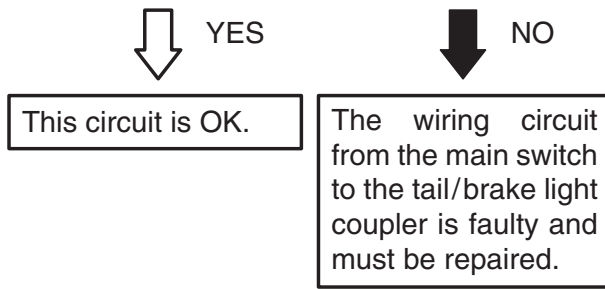
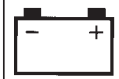
### 3. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

**Positive tester probe → yellow ①**  
**Negative tester probe → black ②**

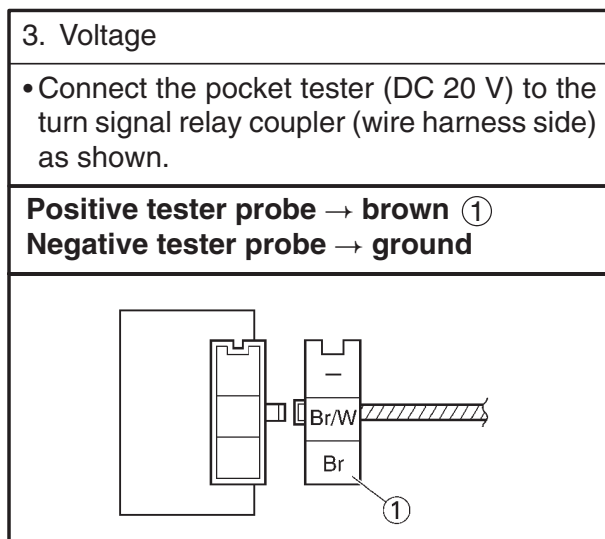
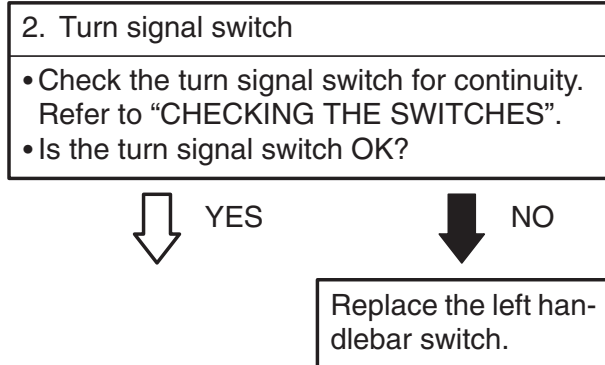
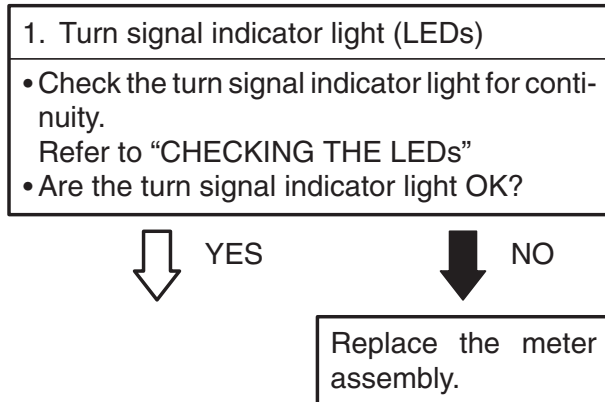


- Turn the main switch to "ON".
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (DC 12 V) of yellow ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?



EAS00799

3. The turn signal/position light, turn signal indicator light or both fail to blink.

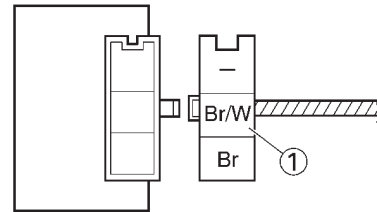


- Turn the main switch to “ON”.
- Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?



The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

4. 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**

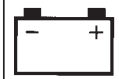


- Turn the main switch to “ON”.
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?



The turn signal relay is faulty and must be replaced.

5. Voltage
- Connect the pocket tester (DC 20 V) to the turn signal/position light connector or meter assembly coupler (wire harness side) as shown.
- A** Front turn signal/position light  
**B** Rear turn signal light  
**C** Turn signal indicator light



### Left turn signal light

**Positive tester probe → chocolate ①**

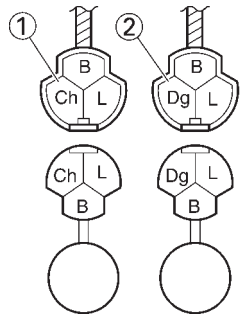
**Negative tester probe → ground**

### Right turn signal light

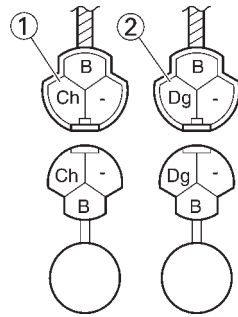
**Positive tester probe → dark green ②**

**Negative tester probe → ground**

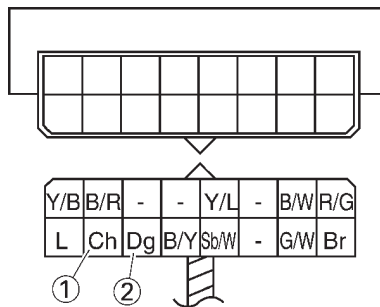
A



B



C



- Turn 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 turn signal light connector (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.

### 2. Neutral switch

- Check the neutral switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the neutral switch OK?

YES

NO

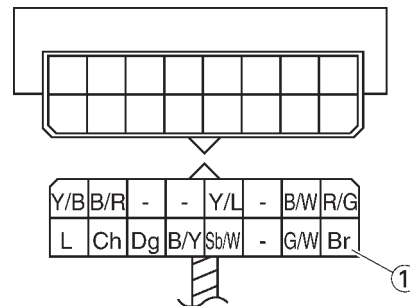
Replace the neutral switch.

### 3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

**Positive tester probe → brown ①**

**Negative tester probe → ground**



- Turn the main switch to “ON”.
- Measure the voltage (DC 12 V) of brown at the meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES

NO

This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EAS00801

### 4. The neutral indicator light fails to come on.

#### 1. Neutral indicator light (LEDs)

- Check the neutral indicator light for continuity. Refer to “CHECKING THE LEDs”
- Are the neutral indicator light OK?



EAS00802

### 5. The oil level warning light fails to come on.

#### 1. Oil level warning light (LEDs)

- Check the oil level warning light for continuity. Refer to “CHECKING THE LEDs”
- Are the oil level warning light OK?



YES



NO

Replace the meter assembly.

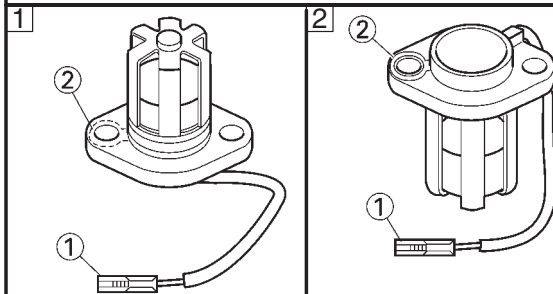
#### 2. Oil level switch

- Drain the engine oil and remove the oil level switch from the oil pan.
- Connect the pocket tester ( $\Omega \times 100$ ) to the oil level switch as shown.

**Positive tester probe** →

**Connector ① (white)**

**Negative tester probe** → **Body earth ②**



- Measure the oil level switch resistance.



#### Oil level switch resistance

① 484 ~ 536  $\Omega$  at 20°C (68°F)

② 114 ~ 126  $\Omega$  at 20°C (68°F)

- Is the oil level switch OK?



YES



NO

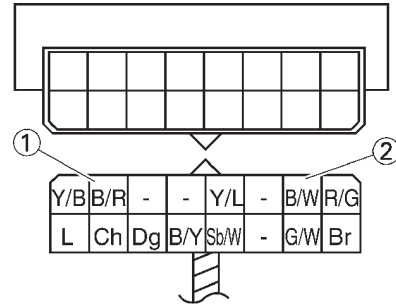
Replace the oil level switch.

#### 3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

**Positive tester probe** → **black/red ①**

**Negative tester probe** → **black/white ②**



- Turn the main switch to “ON”.
- Measure the voltage (DC 12 V) of black/red ① and black/white ② at the meter assembly coupler.
- Is the voltage within specification?



YES



NO

This circuit is OK.

The wiring circuit from the main switch to the meter assembly is faulty and must be repaired.

EAS00803

### 6. The fuel level warning light fails to come on.

#### 1. Fuel level warning light (LEDs)

- Check the fuel level warning light for continuity. Refer to “CHECKING THE LEDs”
- Are the fuel level warning light OK?

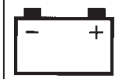


YES



NO

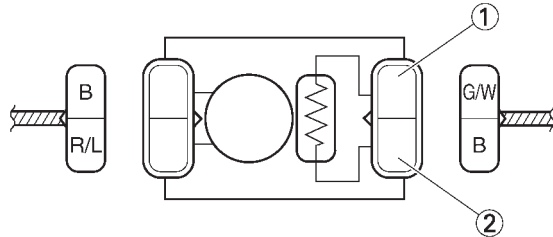
Replace the meter assembly.



### 2. Fuel sender

- Drain the fuel from the fuel tank and remove the fuel pump from the fuel tank.
- Disconnect the fuel sender coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) to the fuel sender as shown.

**Positive tester probe** → green/white ①  
**Negative tester probe** → black ②



- Check the fuel sender for continuity.
- Is the fuel sender OK?

YES

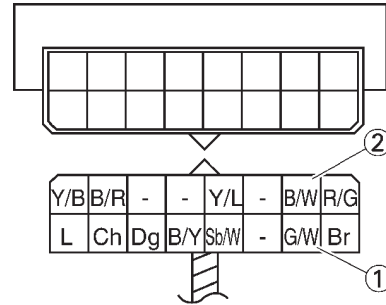
NO

Replace the fuel pump assembly.

### 3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

**Positive tester probe** → green/white ①  
**Negative tester probe** → black/white ②



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) of green/white ① and black/white ② at the meter assembly coupler.
- Is the voltage within specification?

YES

NO

This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EAS00806

### 7. The speedometer fails to operate.

#### 1. Multi-function meter LEDs

- Check the multi-function meter LEDs for continuity. Refer to "CHECKING THE LEDs".
- Is the multi-function meter LEDs OK?

YES

NO

Replace the meter assembly.

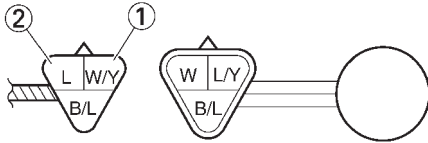


### 2. Speed sensor

- Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.

**Positive tester probe** → white/yellow ①

**Negative tester probe** → blue ②



- Turn the main switch to "ON".
- Elevate the rear wheel and slowly rotate it.
- Measure the voltage (DC 5 V) of blue and white/yellow. With each full rotation of the rear 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

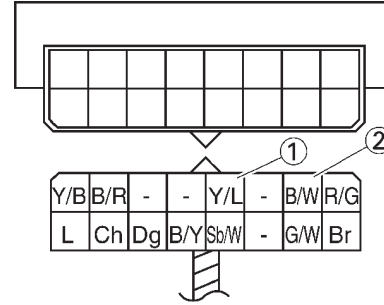
Replace the speed sensor.

### 3. 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/white ②



- Turn the main switch to "ON".
- Elevate the rear wheel and slowly rotate it.
- Measure the voltage (DC 5 V) of yellow/blue ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

↓ NO

↓ YES

This circuit is OK.

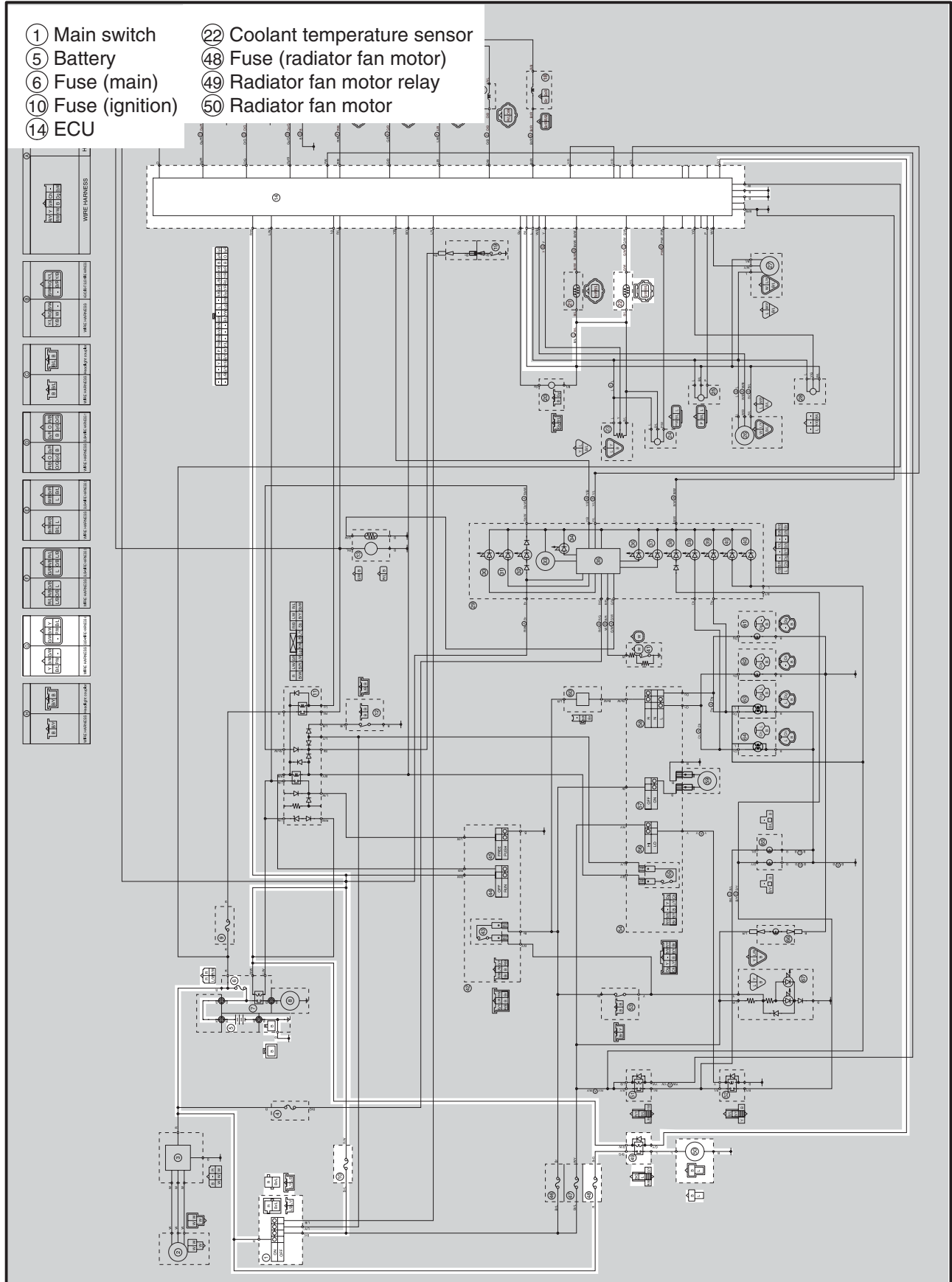
Replace the meter assembly.



EAS00807

# COOLING SYSTEM CIRCUIT DIAGRAM

- |                   |                               |
|-------------------|-------------------------------|
| ① Main switch     | ②② Coolant temperature sensor |
| ⑤ Battery         | ④⑧ Fuse (radiator fan motor)  |
| ⑥ Fuse (main)     | ④⑨ Radiator fan motor relay   |
| ⑩ Fuse (ignition) | ⑤⑩ Radiator fan motor         |
| ⑭ ECU             |                               |







EAS00808

## TROUBLESHOOTING

- The radiator fan motor fails to turn.
- The coolant temperature indicator light fails to light when the engine is warm.

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. seat
  2. fuel tank
  3. bottom cowl
  4. side cowlings
- Troubleshoot with the following special tool(s).



**Pocket tester**  
90890-03112, YU-3112

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

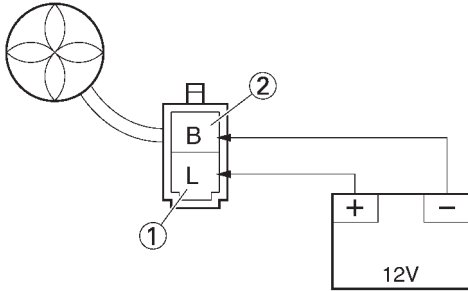
Replace the main switch.



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

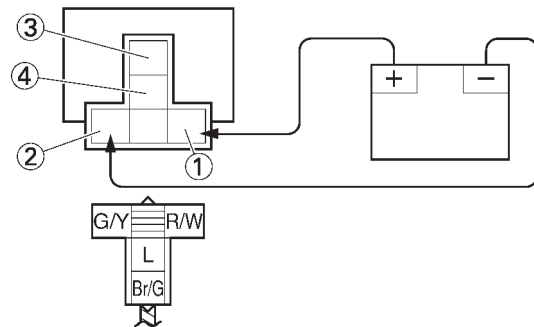
- Disconnect the radiator fan motor relay from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the radiator fan motor terminal as shown.
- Check the radiator fan motor of continuity.

Battery positive terminal → red/white ①

Battery negative terminal → green/yellow ②

Tester positive probe → brown/green ③

Tester negative probe → blue ④

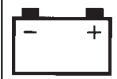


- Does the radiator fan motor relay have continuity between brown/green and blue?

↓ YES

↓ NO

Replace the radiator fan motor relay.



EAS00812

## 6. Coolant temperature sensor

- Remove the coolant temperature sensor.
- Connect the pocket tester ( $\Omega \times 1k$ ) 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 in the table.



### Coolant temperature sensor resistance

0°C (32°F): 5.21 ~ 6.37 k $\Omega$

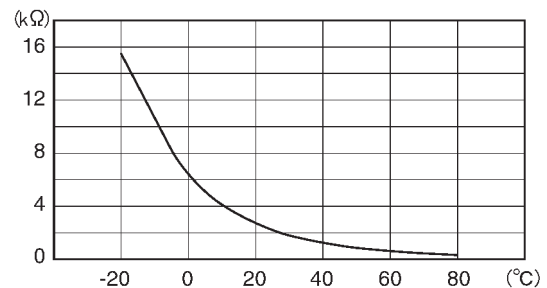
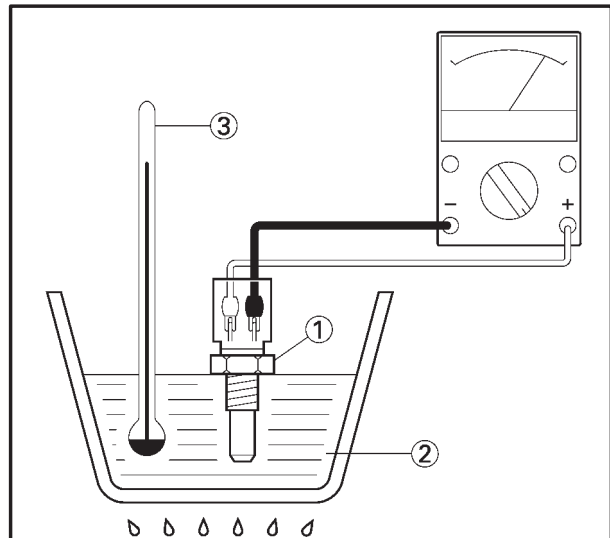
80°C (176°F): 0.29 ~ 0.35 k $\Omega$

### ⚠ 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  
20 Nm (2.0 m•kg, 14 ft•lb)  
Three bond sealock®10



- 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

↓ NO

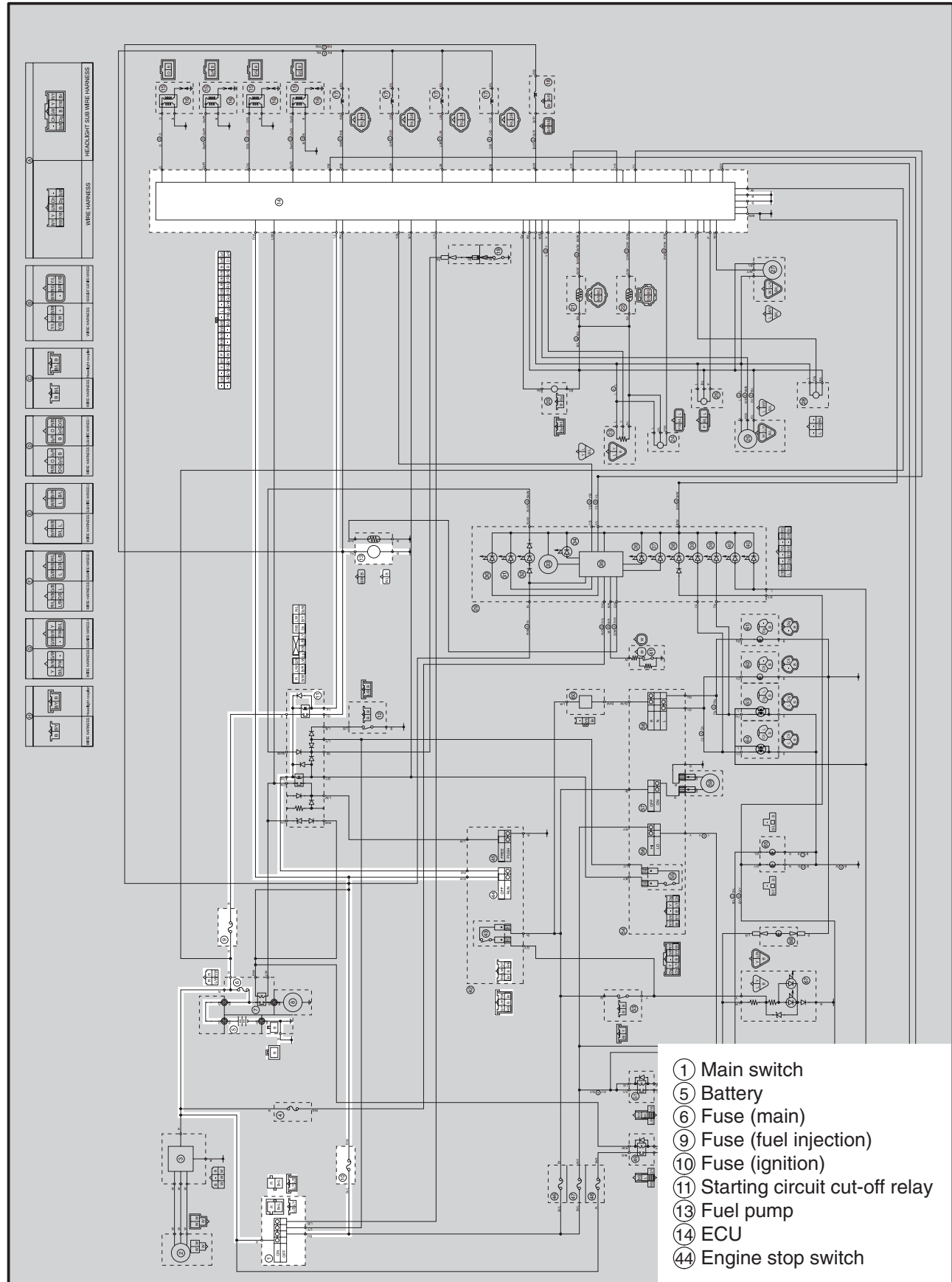
This circuit is OK.

Properly connect or repair the cooling system's wiring.



EAS00814

# FUEL PUMP SYSTEM CIRCUIT DIAGRAM



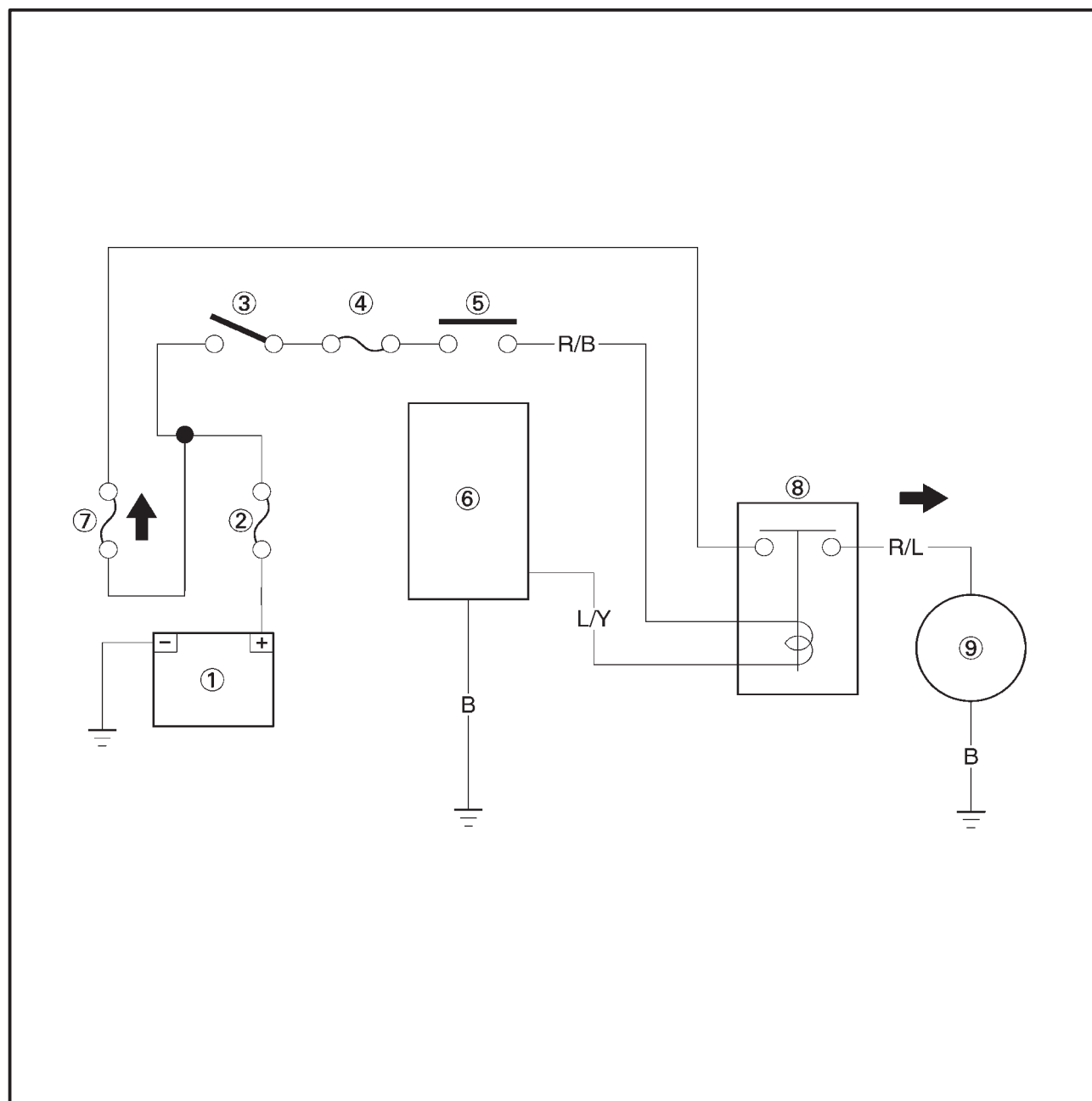


EAS00815

### FUEL PUMP SYSTEM

The ECU includes the control unit for the fuel pump.

- ① Battery
- ② Fuse (main)
- ③ Main switch
- ④ Fuse (ignition)
- ⑤ Engine stop switch
- ⑥ ECU
- ⑦ Fuse (fuel injection)
- ⑧ Starting circuit cut-off relay (fuel pump injection system relay)
- ⑨ Fuel pump





EAS00816

### TROUBLESHOOTING

If the fuel pump fails to operate.

Check:

1. Main, ignition and fuel injection fuses
2. Battery
3. Main switch
4. Engine stop switch
5. Starting circuit cut-off relay  
(the fuel pump injection system relay)
6. Fuel pump
7. Wiring connections  
(the entire fuel system)

#### NOTE:

- Before troubleshooting, remove the following part(s):

1. Seat
2. Fuel tank

Troubleshoot with the following special tool(s).



**Pocket tester**  
**90890-03112, YU-3112**

EAS00738

#### 1. Main, ignition and fuel injection fuses

- Check the main, ignition and fuel injection fuses for continuity. Refer to "CHECKING THE FUSES" in chapter 3.

- Are the main ignition and fuel injection fuses OK?



YES



NO

Replace the fuse(s).

EAS00739

#### 2. Battery

- Check the condition of the battery  
Refer to "CHECKING 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.

EAS00750

#### 4. 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.



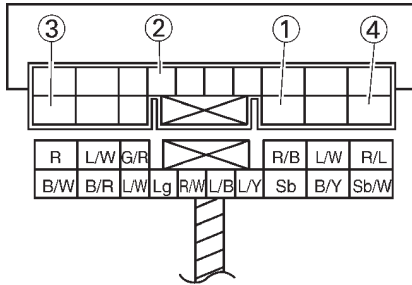
EAS00759

### 5. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12V) to the starting circuit cut-off relay coupler as shown.

**Positive battery lead** → red/black ①  
**Negative battery lead** → light green ②

**Positive tester probe** → red ③  
**Negative tester probe** → red/blue ④



- Does the starting circuit cut-off relay have continuity between red and red/blue?

↓ YES

↓ NO

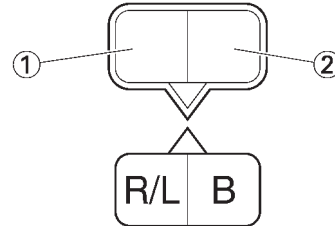
Replace the starting circuit cut-off relay.

EAS00817

### 6. Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) to the fuel pump coupler as shown.

**Positive tester probe** → red/blue ①  
**Negative tester probe** → black ②



- Measure the fuel pump resistance.



**Fuel pump resistance**  
**0.2 ~ 3.0  $\Omega$  at 20°C (68°F)**

- Is the fuel pump OK?

↓ YES

↓ NO

Replace the fuel pump.

EAS00818

### 7. Wiring

- Check the entire fuel pump system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the fuel system's wiring properly connected and without defects?

↓ YES

↓ NO

Replace the ECU.

Properly connect or repair the fuel system's wiring.



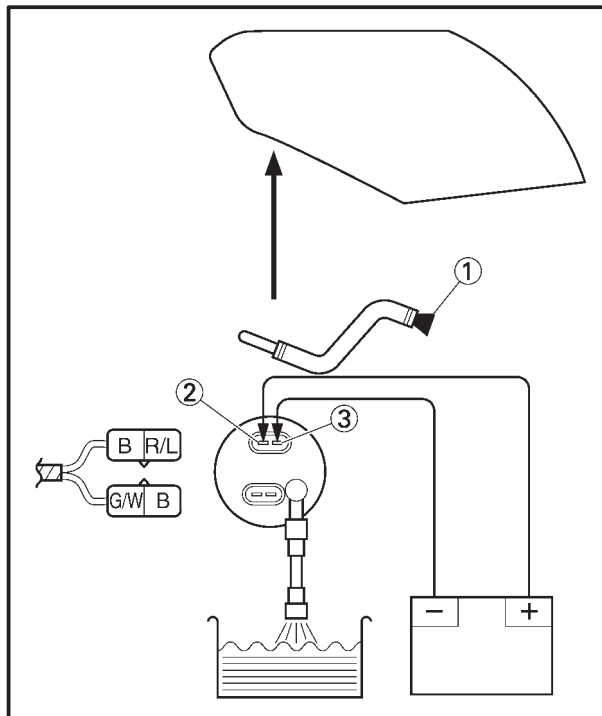
EAS00819

## CHECKING THE FUEL PUMP

**⚠ WARNING**

**Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or fire. Be extremely careful and note the following points:**

- **Stop the engine before refueling.**
- **Do not smoke, and keep away from open flames, sparks, or any other source of fire.**
- **If you do accidentally spill gasoline, wipe it up immediately with dry rags.**
- **If gasoline touches the engine when it is hot, a fire may occur. Therefore, make sure the engine is completely cool before performing the following test.**



1. Check:
  - Fuel pump operation

[illegible]

- Insert the plug ① to fuel return hose end.
- Fill the fuel tank.
- Put the end of the fuel hose into an open container.
- Connect the battery (DC 12 V) to the fuel pump coupler as shown.

**Positive battery lead → red/blue ②**

**Negative battery lead → black ③**

- e. If fuel flows out of the fuel hose, the fuel pump is OK. If fuel does not flow, replace the fuel pump.

[illegible]



SELF-DIAGNOSIS

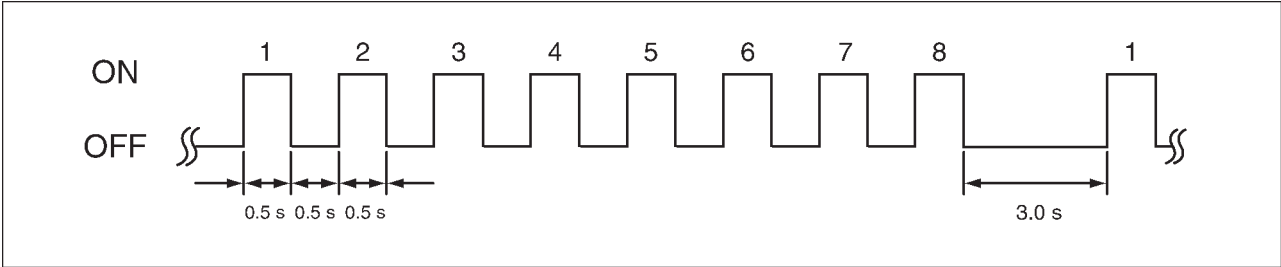
The YZF-R6 features a self-diagnosing system for the following circuit(-s):

- Fuel sender
- Oil level switch

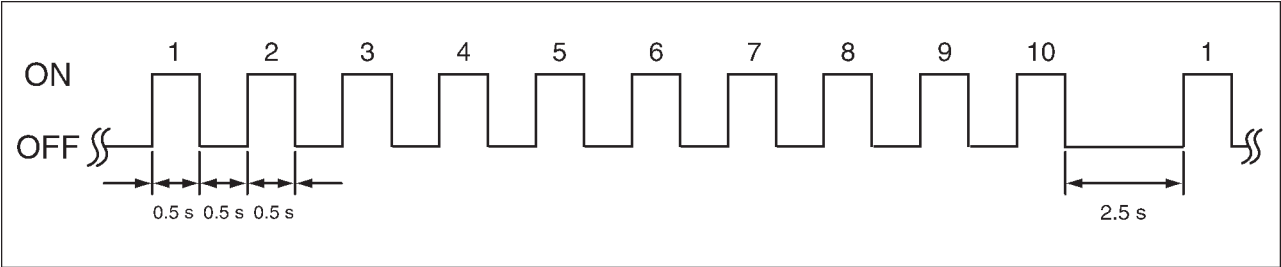
If any of these circuits are defective, their respective condition codes will be displayed on the warning light when the main switch is turn to “ON” (irrespective of whether the engine is running or not)

Circuit	Defect(-s)	System response	Condition code
Fuel sender	<ul style="list-style-type: none"><li>• Open-circuit</li><li>• Short-circuit</li></ul>	<ul style="list-style-type: none"><li>• The fuel warning light indicate the condition code.</li></ul>	Refer to *1
Oil level switch	<ul style="list-style-type: none"><li>• Open-circuit</li><li>• Short-circuit</li></ul>	<ul style="list-style-type: none"><li>• The oil level warning light indicate the condition code.</li></ul>	Refer to *2

\*1 Condition code  
Fuel warning light



\*2 Condition code  
Oil level warning light





### TROUBLESHOOTING

**The warning light starts to indicate the self-diagnosis sequence.**

Check:

1. Fuel sender
2. Oil level switch

#### NOTE:

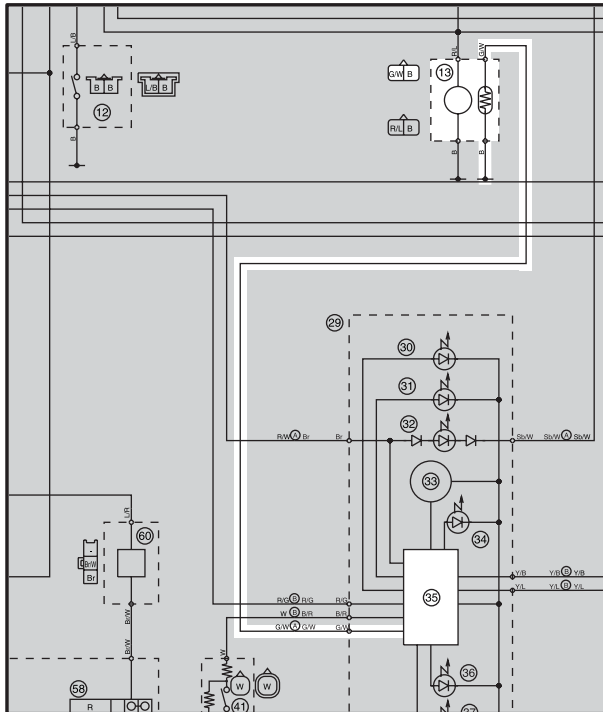
- Before troubleshooting, remove the following part(-s):
  - 1) Seats
  - 2) Fuel tank
  - 3) Lower cowling
- Troubleshoot with the following special tool(-s).



**Pocket tester**  
90890-03112, YU-3112

#### 1. Fuel sender

#### CIRCUIT DIAGRAM



- ⑬ Fuel pump  
⑳ Multi-function meter

#### 1. Wire harness

- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- Is the wire harness OK?



YES



NO

Repair or replace the wire harness.

#### 2. Fuel sender

- Check the fuel sender for continuity. Refer to "The fuel level indicator light fails to come on".
- Is the fuel sender OK?



YES



NO

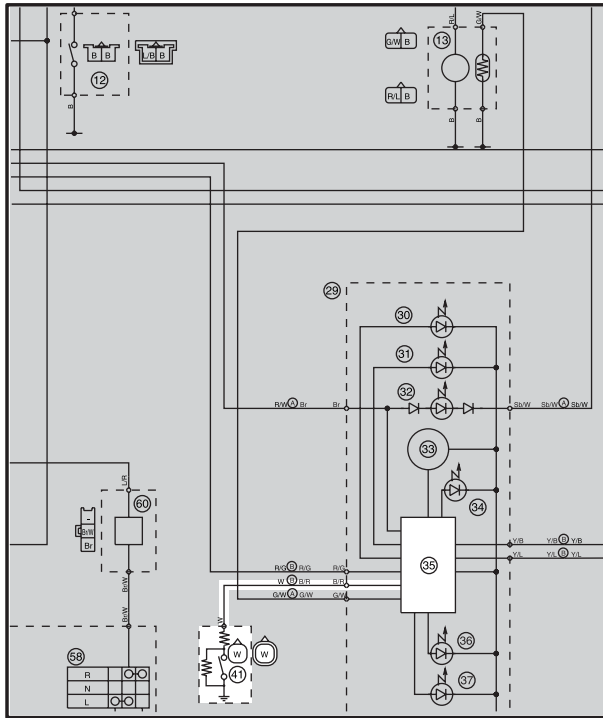
Replace the multi-function meter.

Replace the fuel pump.



## 2. Oil level switch

### CIRCUIT DIAGRAM



③⑤ Multi-function meter

④① Oil level switch

## 1. Wire harness

- Check the wire harness for continuity. Refer to “CIRCUIT DIAGRAM”.
- Is the wire harness OK?

YES

NO

Repair or replace the wire harness.

## 2. Oil level switch

- Check the oil level switch for continuity. Refer to “The oil level warning light fails to come on”.
- Is the oil level switch OK?

YES

NO

Replace the multi-function meter.

Replace the oil level switch.

## 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 FAILURES

### ENGINE

#### Cylinder(s) and cylinder head(s)

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head 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(s) 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 filter
- Clogged fuel tank drain hose
- Clogged rollover valve
- Clogged rollover valve hose
- Deteriorated or contaminated fuel

#### Fuel pump

- Faulty fuel pump
- Faulty fuel pump relay

#### Throttle body (-ies)

- 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(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator

### Ignition coil(s)

- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils

### Ignition system

- Faulty ECU
- Faulty crankshaft position sensor
- Faulty cylinder identification sensor

**Switches and wiring**

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch
- Improperly grounded circuit
- Loose connections

**Starting system**

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

EAS00846

**INCORRECT ENGINE IDLING SPEED  
ENGINE**

**Cylinder(s) and cylinder head(s)**

- Incorrect valve clearance
- Damaged valve train components

**Air filter**

- Clogged air filter element

**FUEL SYSTEM**

**Throttle body (-ies)**

- Damaged or loose throttle body joint
- Improperly synchronized throttle bodies
- Improperly adjusted engine idling speed (throttle stop screw)
- Improper throttle cable free play
- Flooded throttle body
- Faulty air induction system

**ELECTRICAL SYSTEMS**

**Battery**

- Discharged battery
- Faulty battery

**Spark plug(s)**

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator

**Ignition coil(s)**

- Broken or shorted primary or secondary coils
- Cracked or broken ignition coil

**Ignition system**

- Faulty ECU
- Faulty crankshaft position sensor
- Faulty cylinder identification sensor

EAS00848

**POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE**

Refer to "STARTING FAILURES".

**ENGINE**

**Air filter**

- Clogged air filter element

**FUEL SYSTEM**

**Fuel pump**

- Faulty fuel pump

EAS00850

**FAULTY GEAR SHIFTING****SHIFTING IS DIFFICULT**

Refer to "CLUTCH DRAGS".

**SHIFT PEDAL DOES NOT MOVE****Shift shaft**

- Improperly adjusted shift rod
- Bent shift shaft.

**Shift drum and shift forks**

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

**Transmission**

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

**JUMPS OUT OF GEAR****Shift shaft**

- Incorrect shift pedal position
- Improperly returned stopper lever

**Shift forks**

- Worn shift fork

**Shift drum**

- Incorrect axial play
- Worn shift drum groove

**Transmission**

- Worn gear dog

EAS00851

**FAULTY CLUTCH****CLUTCH SLIPS****Clutch**

- Improperly assembled clutch
- Improperly adjusted clutch cable
- Loose or fatigued clutch spring
- Worn friction plate
- Worn clutch plate

**Engine oil**

- Incorrect oil level
- Incorrect oil viscosity (low)
- Deteriorated oil

**CLUTCH DRAGS****Clutch**

- Unevenly tensioned clutch springs
- Warped pressure plate
- Bent clutch plate
- Swollen friction plate
- Bent clutch push rod
- Broken clutch boss
- Burnt primary driven gear bushing
- Match marks not aligned

**Engine oil**

- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

EAS00855

## **OVERHEATING**

### **ENGINE**

#### **Cylinder head(s) and piston(s)**

- 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
- Clogged or damaged oil cooler
- Hose(s) and pipe(s)
- Damaged hose
- Improperly connected hose
- Damaged pipe
- Improperly connected pipe

### **FUEL SYSTEM**

#### **Throttle body (-ies)**

- Damaged or loose throttle body joint

#### **Air filter**

- Clogged air filter element

### **CHASSIS**

#### **Brake(s)**

- Dragging brake

### **ELECTRICAL SYSTEMS**

#### **Spark plug(s)**

- Incorrect spark plug gap
- Incorrect spark plug heat range

#### **Ignition system**

- Faulty ignitor unit

#### **Cooling 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

EAS00863

**UNSTABLE HANDLING****Handlebars**

- Bent or improperly installed right handlebar
- Bent or improperly installed left handlebar

**Steering head components**

- Improperly installed upper bracket
- Improperly installed lower bracket  
(improperly tightened 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

**Swingarm**

- Worn bearing or bushing
- Bent or damaged swingarm

**Rear shock absorber assembly(-ies)**

- Faulty rear shock absorber spring
- Leaking oil or gas

**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 rear brake light switch

#### 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

# YZF-R6R/YZF-R6SR/YZF-R6RC/YZF-R6SRC WIRING DIAGRAM

- ① Main switch
- ② A.C. magneto
- ③ Rectifier/regulator
- ④ Fuse (backup)
- ⑤ Battery
- ⑥ Fuse (main)
- ⑦ Starter relay
- ⑧ Starter motor
- ⑨ Fuse (fuel injection)
- ⑩ Fuse (ignition)
- ⑪ Starting circuit cut-off relay
- ⑫ Sidestand switch
- ⑬ Fuel pump
- ⑭ ECU
- ⑮ Ignition coil
- ⑯ Spark plug
- ⑰ Fuel injector
- ⑱ Air induction system solenoid
- ⑲ Neutral switch
- ⑳ Crankshaft position sensor
- ㉑ Intake air temperature sensor
- ㉒ Coolant temperature sensor
- ㉓ Throttle position sensor
- ㉔ Intake air pressure sensor
- ㉕ Atmospheric pressure sensor
- ㉖ Cylinder identification sensor
- ㉗ Speed sensor
- ㉘ Lean angle cut-off switch
- ㉙ Meter assembly
- ㉚ Fuel level warning light
- ㉛ Oil level warning light
- ㉜ Neutral indicator light
- ㉝ Tachometer
- ㉞ Shift timing indicator light
- ㉟ Multi-function meter
- ㊱ Engine trouble warning light
- ㊲ Coolant temperature indicator light
- ㊳ High beam indicator light
- ㊴ Turn signal indicator light
- ㊵ Meter light
- ㊶ Oil level switch
- ㊷ Right handlebar switch
- ㊸ Front brake light switch
- ㊹ Engine stop switch
- ㊺ Start switch
- ㊻ Fuse (signal)
- ㊼ Fuse (headlight)
- ㊽ Fuse (radiator fan motor)
- ㊾ Radiator fan motor relay
- ㊿ Radiator fan motor
- 1 Headlight relay (on/off)
- 2 Headlight relay (dimmer)
- 3 Rear brake light switch
- 4 Left handlebar switch
- 5 Clutch switch
- 6 Dimmer switch
- 7 Horn switch
- 8 Turn signal switch
- 9 Horn
- 0 Turn signal relay

- 61 Rear turn signal light (right)
- 62 Rear turn signal light (left)
- 63 Front turn signal/position light (right)
- 64 Front turn signal/position light (left)
- 65 Headlight
- 66 License light
- 67 Tail/brake light

## COLOR CODE

B	.....	Black
Br	.....	Brown
Ch	.....	Chocolate
Dg	.....	Dark green
G	.....	Green
Gy	.....	Gray
L	.....	Blue
Lg	.....	Light green
O	.....	Orange
P	.....	Pink
R	.....	Red
Sb	.....	Sky blue
W	.....	White
Y	.....	Yellow
B/L	.....	Black/Blue
B/R	....	Black/Red
B/W	....	Black/White
B/Y	....	Black/Yellow
Br/G	...	Brown/Green
Br/L	....	Brown/Blue
Br/R	....	Brown/Red
Br/W	...	Brown/White
Br/Y	....	Brown/Yellow
G/B	....	Green/Black
G/W	....	Green/White
G/Y	....	Green/Yellow
Gy/G	...	Gray/Green
Gy/R	...	Gray/Red
L/B	.....	Blue/Black
L/R	....	Blue/Red
L/W	....	Blue/White
L/Y	.....	Blue/Yellow
O/B	....	Orange/Black
O/G	....	Orange/Green
P/W	....	Pink/White
R/B	....	Red/Black
R/G	....	Red/Green
R/L	....	Red/Blue
R/W	....	Red White
R/Y	....	Red/Yellow
Sb/W	...	Sky blue/White
W/B	....	White/Black
W/Y	....	White/Yellow
Y/B	....	Yellow/Black
Y/G	....	Yellow/Green
Y/L	.....	Yellow/Blue
Y/W	....	Yellow/White

## YZF-R6R/YZF-R6SR/YZF-R6RC/YZF-R6SRC WIRING DIAGRAM

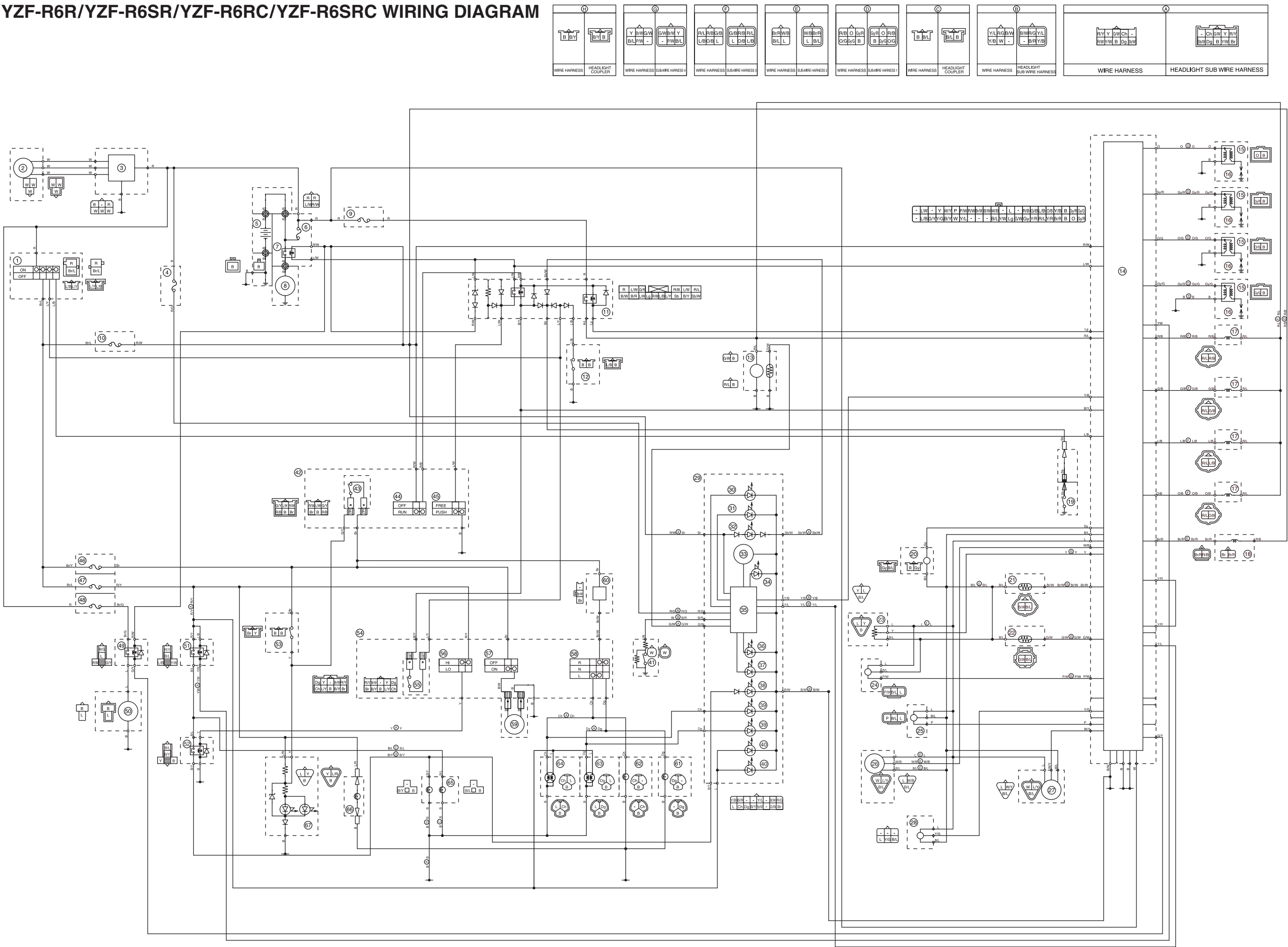
- |                                       |   |
|---------------------------------------|---|
| ① Main switch                         | ⑥1 Rear turn signal light (right)           |
| ② A.C. magneto                        | ⑥2 Rear turn signal light (left)            |
| ③ Rectifier/regulator                 | ⑥3 Front turn signal/position light (right) |
| ④ Fuse (backup)                       | ⑥4 Front turn signal/position light (left)  |
| ⑤ Battery                             | ⑥5 Headlight                                |
| ⑥ Fuse (main)                         | ⑥6 License light                            |
| ⑦ Starter relay                       | ⑥7 Tail/brake light                         |
| ⑧ Starter motor                       |   |
| ⑨ Fuse (fuel injection)               |   |
| ⑩ Fuse (ignition)                     |   |
| ⑪ Starting circuit cut-off relay      |   |
| ⑫ Sidestand switch                    |   |
| ⑬ Fuel pump                           |   |
| ⑭ ECU                                 |   |
| ⑮ Ignition coil                       |   |
| ⑯ Spark plug                          |   |
| ⑰ Fuel injector                       |   |
| ⑱ Air induction system solenoid       |   |
| ⑲ Neutral switch                      |   |
| ⑳ Crankshaft position sensor          |   |
| ㉑ Intake air temperature sensor       |   |
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| ㉞ Shift timing indicator light        |   |
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| ㊶ Oil level switch                    |   |
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| ㊹ Engine stop switch                  |   |
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| ㊽ Fuse (radiator fan motor)           |   |
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| 2 Headlight relay (dimmer)            |   |
| 3 Rear brake light switch             |   |
| 4 Left handlebar switch               |   |
| 5 Clutch switch                       |   |
| 6 Dimmer switch                       |   |
| 7 Horn switch                         |   |
| 8 Turn signal switch                  |   |
| 9 Horn                                |   |
| 0 Turn signal relay                   |   |



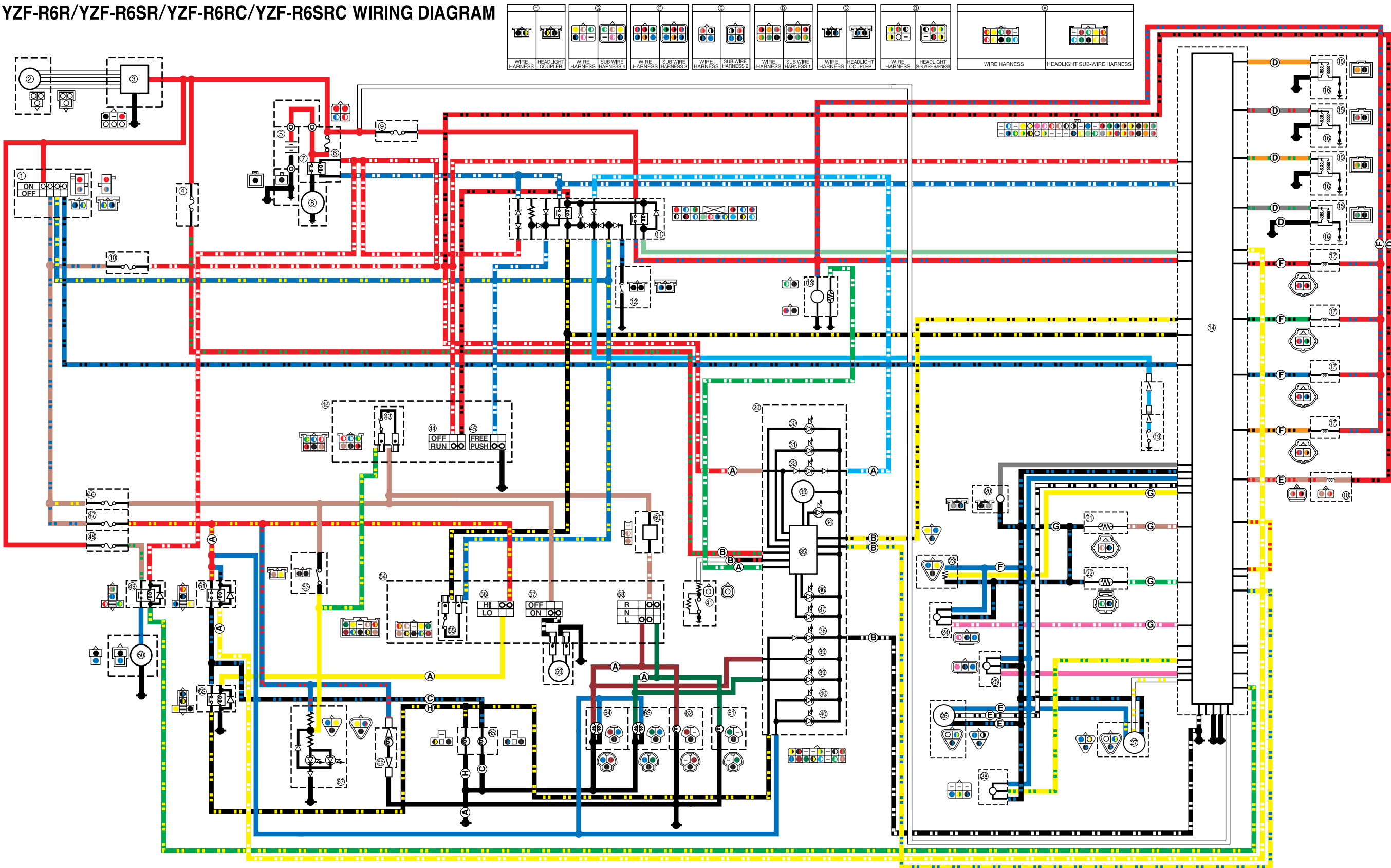
YAMAHA MOTOR CO., LTD.  
2500 SHINGAI IWATA SHIZUOKA JAPAN

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# YZF-R6R/YZF-R6SR/YZF-R6RC/YZF-R6SRC WIRING DIAGRAM



YZF-R6R/YZF-R6SR/YZF-R6RC/YZF-R6SRC WIRING DIAGRAM



COLOR CODE

Black	Gray	Orange	White	Black/White	Brown/Red	Green/White	Blue/Black	Orange/Black	Red/Green	Sky blue/White	Yellow/Blue
Brown	Green	Pink	Yellow	Black/Yellow	Brown/White	Green/Yellow	Blue/Red	Orange/Green	Red/Blue	White/Black	Yellow/Green
Chocolate	Blue	Red	Black/Blue	Brown/Blue	Brown/Yellow	Gray/Green	Blue/White	Pink/White	Red/White	White/Yellow	Yellow/White
Dark green	Light green	Sky blue	Black/Red	Brown/Green	Green/Black	Gray/Red	Blue/Yellow	Red/Black	Red/Yellow	Yellow/Black	