YAMAHA

YZF-R1P
YZF-R1PC

SERVICE MANUAL

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EAS00000

YZF-R1P/YZF-R1PC
SERVICE MANUAL

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EAS00003

NOTICE

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

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

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

NOTE:

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

EAS00004

IMPORTANT MANUAL INFORMATION

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

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

⚠ WARNING Failure to follow WARNING instructions could result in severe injury or death to the 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.

EAS00007

HOW TO USE THIS MANUAL

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

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

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

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

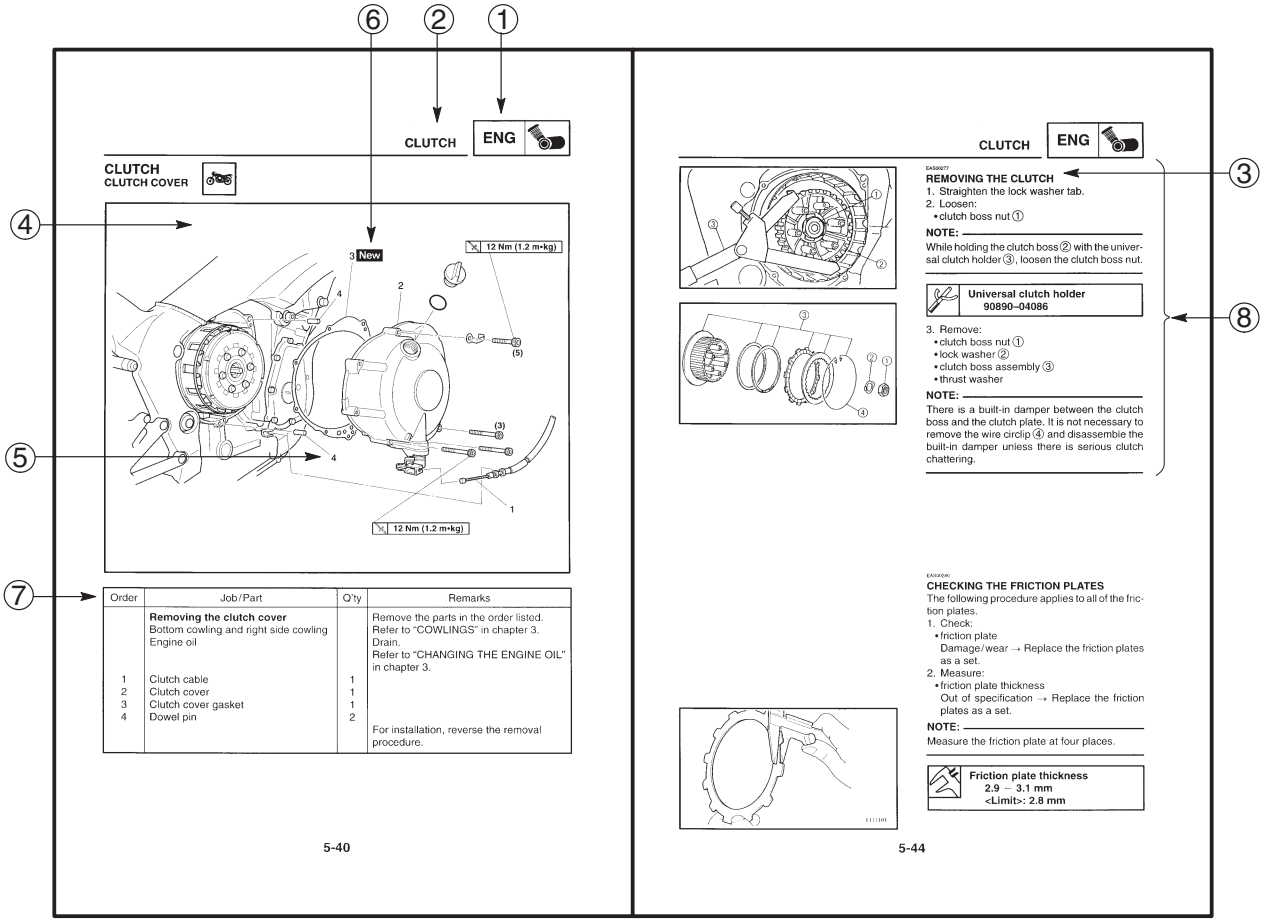
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

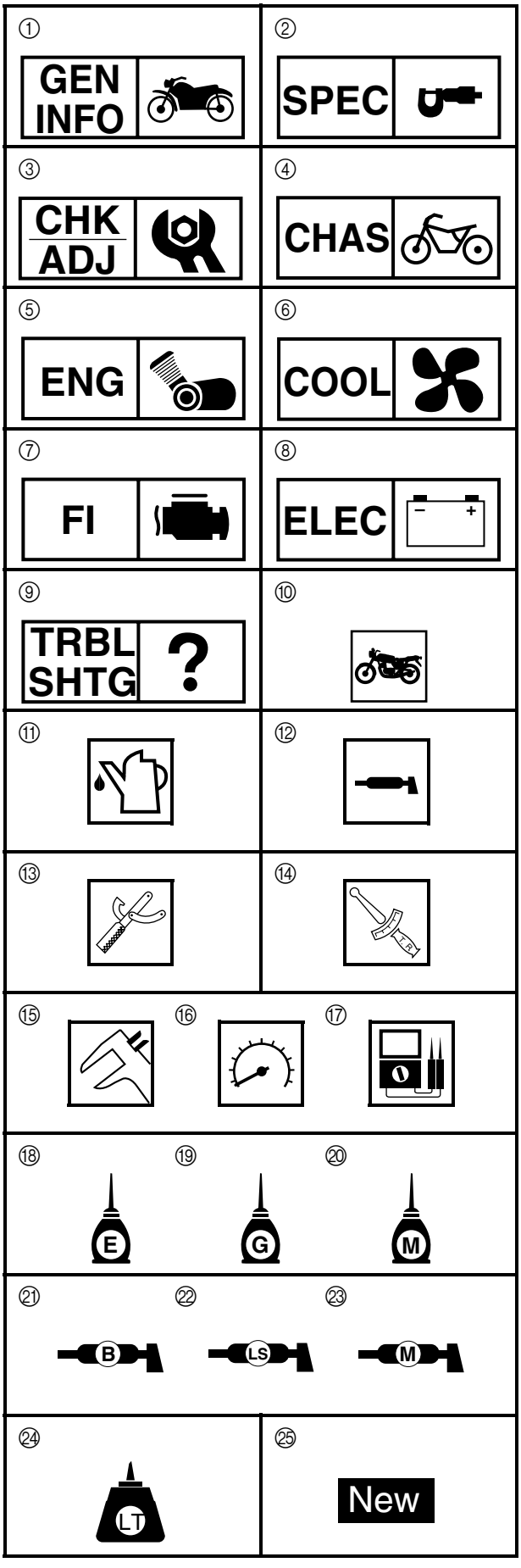
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

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

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

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





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SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

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

Symbols ⑩ to ⑰ indicate the following.

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

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

⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum-disulfide oil
㉑ Wheel-bearing grease
㉒ Lithium-soap-base 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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CHAPTER 8
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CHAPTER 9
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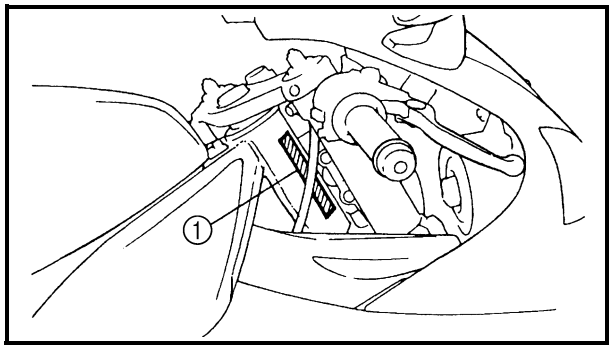

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GENERAL INFORMATION
MOTORCYCLE IDENTIFICATION

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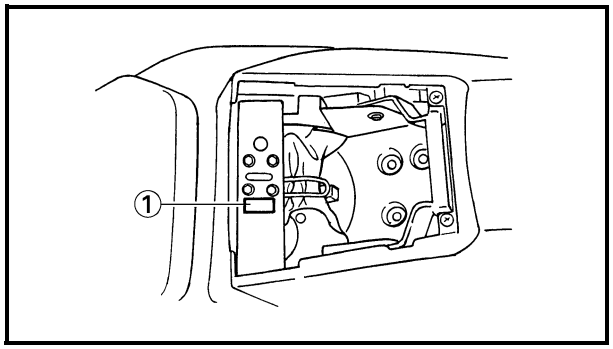
VEHICLE IDENTIFICATION NUMBER
The vehicle identification number ① is stamped into the right side of the steering head pipe.



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

FEATURES

OUTLINE OF FI SYSTEM

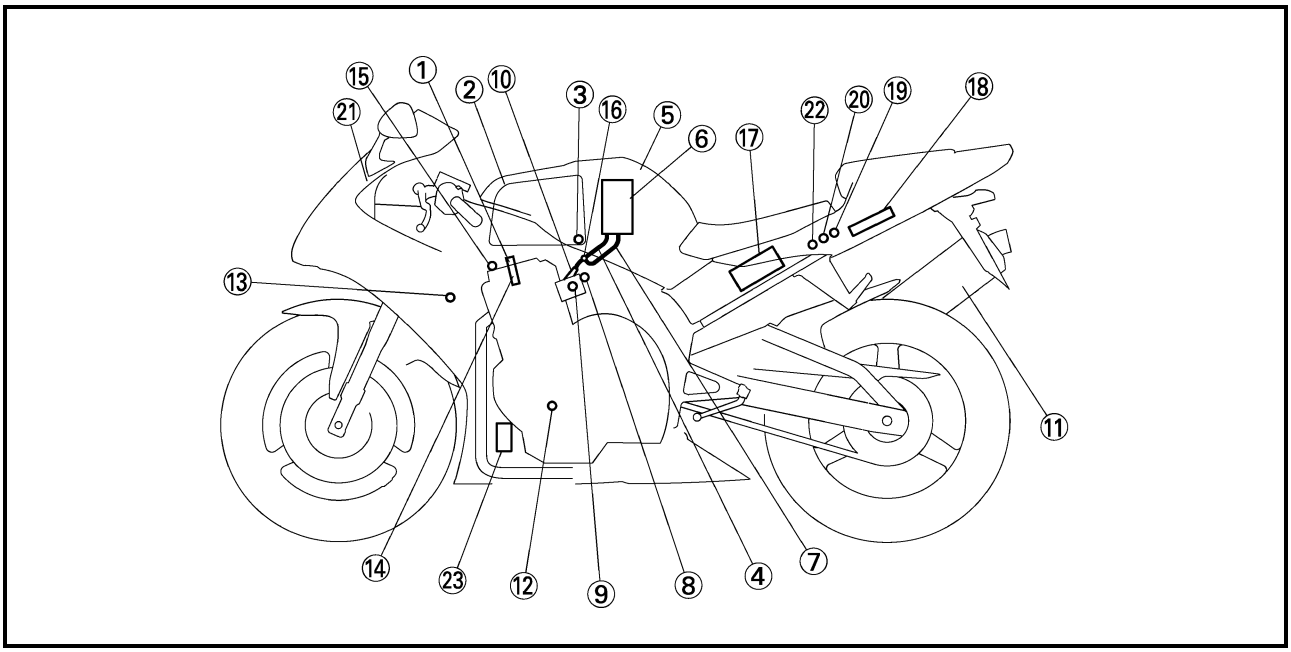
The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating conditions and the atmospheric temperature.

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 that is 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.



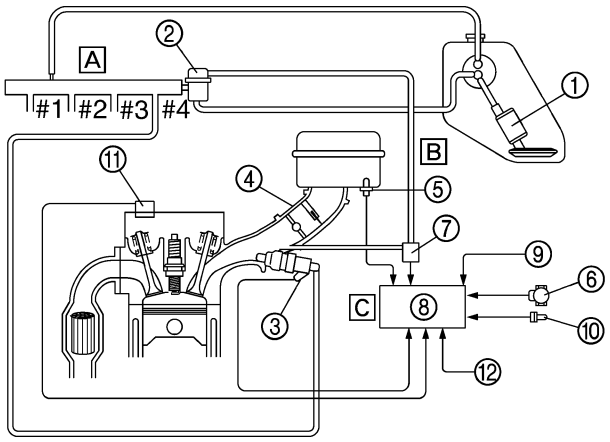
① Ignition coil
② Air filter case
③ Intake temperature sensor
④ Fuel delivery hose
⑤ Fuel tank
⑥ Fuel pump
⑦ Fuel return hose
⑧ Intake air pressure sensor
⑨ Throttle position sensor
⑩ Fuel injector
⑪ Catalytic converter
⑫ Crankshaft position sensor
⑬ Coolant temperature sensor
⑭ Spark plug
⑮ Cylinder identification sensor
⑯ Pressure regulator
⑰ Battery
⑱ ECU
⑲ Atmospheric pressure sensor
⑳ Fuel injection system relay
㉑ Engine trouble warning light
㉒ Lean angle cut-off switch
㉓ Air cut-off valve

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^2, 40.4 psi) 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
② Pressure regulator
③ Fuel injector
④ Throttle body
⑤ Intake temperature sensor
⑥ Throttle position sensor
⑦ Intake air pressure sensor
⑧ ECU
⑨ Atmospheric pressure sensor
⑩ Coolant temperature sensor
⑪ Cylinder identification sensor
⑫ Crankshaft position sensor
A Fuel system
B Air system
C Control system

Fuel control block

The fuel control block consists of the following main components:

	Component	Function
Control block	ECU	Total FI system control
	Throttle body	Air volume control
	Pressure regulator	Fuel pressure detection
Sensor block	Intake air pressure sensor	Intake air pressure detection
	Atmospheric pressure sensor	Atmospheric pressure detection
	Coolant temperature sensor	Coolant temperature detection
	Intake temperature sensor	Intake temperature detection
	Throttle position sensor	Throttle angle detection
	Cylinder identification sensor	Reference position detection
	Crankshaft position sensor	Crankshaft position detection and engine RPM detection
	Speed sensor	Speed detection
Actuator block	Injector	Fuel injection
	Fuel pump	Fuel feed
	Air Induction system, air cut valve	Induction of secondary air

An engine trouble warning light is provided on meter panel.

COMPONENTS

ECU (Electronic Control Unit)

The ECU is mounted underneath the seat. The main functions of the ECU are ignition control, fuel control, self-diagnosis, and load control.

- ECU's internal construction and functions

  The main components and functions of the ECU can be broadly divided into the following four items:

  A. Power supply circuit

  The power supply circuit obtains power from the battery (12 V) to supply the power (5 V) that is required for operating the ECU.

  B. Input interface circuits

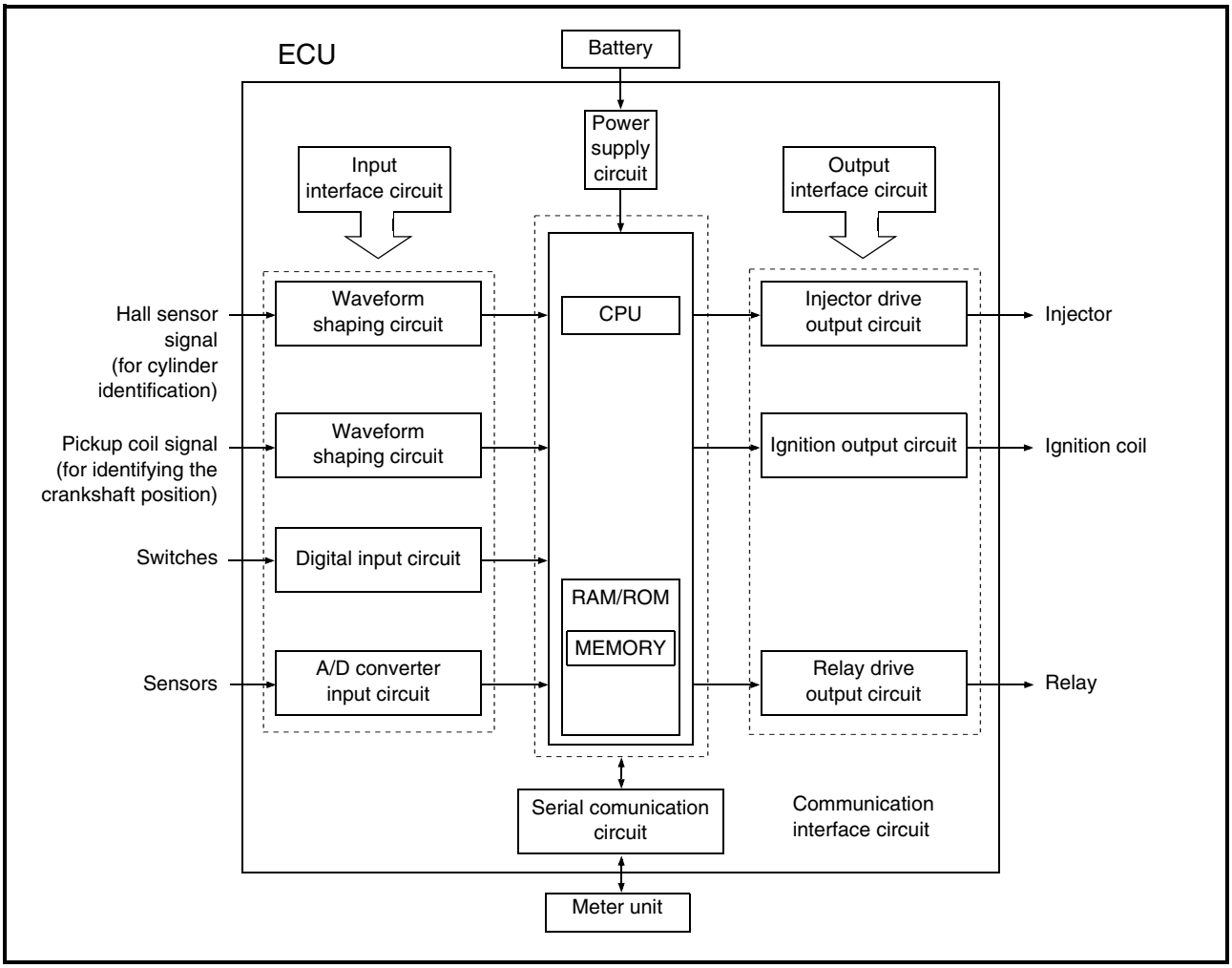
  The input interface circuits convert the signals output by all the sensors into digital signals, which can be processed by the CPU, and input them into the CPU.

  C. CPU (Central Processing Unit)

  The CPU determines the condition of the sensors in accordance with the level of the signal that is output by the respective sensor. Then, the signals are temporarily stored on the RAM in the CPU. Based on those stored signals and the basic processing program on the ROM, the CPU calculates the fuel injection duration, injection timing, and ignition timing, and then sends control commands to the respective output interface circuits.

  D. Output interface circuits

  The output interface circuits convert the control signals output by the CPU into actuating signals for the respective actuators in order to actuate them. They also output commands to the indicator and relay output circuits as needed.



- Ignition control
  The ignition control function of the ECU controls the ignition timing and the duration of ignition energizing. The ignition timing control uses the signals from the throttle position sensor (to detect the angle of the throttle), and the crankshaft position sensor and speed sensor (to detect the speed of the engine). This control establishes an ignition timing that suits the operating condition of the engine through compensations made to the basic ignition timing control map. The ignition energizing duration control establishes the energizing duration to suit the operating conditions by calculating the energizing duration in accordance with the signal received from the crankshaft position sensor and the battery voltage.
- Fuel control
  The fuel control function of the ECU controls the injection timing and injection duration. The injection timing control controls the injection timing during the starting of the engine and the injection timing during the normal operation of the engine, based on the signals received from the crankshaft position sensor and the cylinder identification sensor. The injection duration control determines the duration of injection based on the signals received from the atmospheric pressure sensors, temperature sensors, and the position sensors, to which compensations are made to suit various conditions such as the weather, atmospheric pressure, starting, acceleration, and deceleration.
- Load control
  The ECU effects load control in the following manner:
  1. Stopping the fuel pump and injectors when the motorcycle overturns
     The ECU turns OFF the fuel injection system relay when the lean angle cut-off switch is operated.
  2. Operating the headlight illumination relay
     The ECU controls the headlight relay 2 in accordance with the engine speed as required by the daytime illumination specification.
  3. Operating the radiator fan motor in accordance with the coolant temperature
     The ECU controls the radiator fan motor relay ON/OFF in accordance with the coolant temperature.
  4. Operating the AI system solenoid valve
     The ECU controls the energizing of the solenoid valve in accordance with the driving conditions.
- Self-diagnosis function
  The ECU is equipped with a self-diagnosis function to ensure that the engine control system is operating normally. The ECU mode functions include a diagnosis mode in addition to the normal mode.
  Normal mode
  - To check for any blown bulbs, this mode illuminates a engine trouble warning light while the main switch is turned ON, and while the starter switch is being pressed.
  - If the starting disable warning is activated, this mode alerts the rider by blinking the engine trouble warning light while the start switch is being pressed.
  - If a malfunction occurs in the system, this mode provides an appropriate substitute characteristic operation, and alerts the rider of the malfunction by illuminating an engine trouble warning light. After the engine is stopped, this mode displays a fault code on the clock LCD.

  Diagnosis mode
  - In this mode, a diagnostic code is input into the ECU through the operation of the operating switch on the meter, and the ECU displays the values output by the sensors or actuates the actuators in accordance with the diagnostic code. Whether the system is operating normally can be checked by observing the illumination of the engine trouble warning light, the values displayed on the meter, or the actuating state of the actuators.

Fuel pump

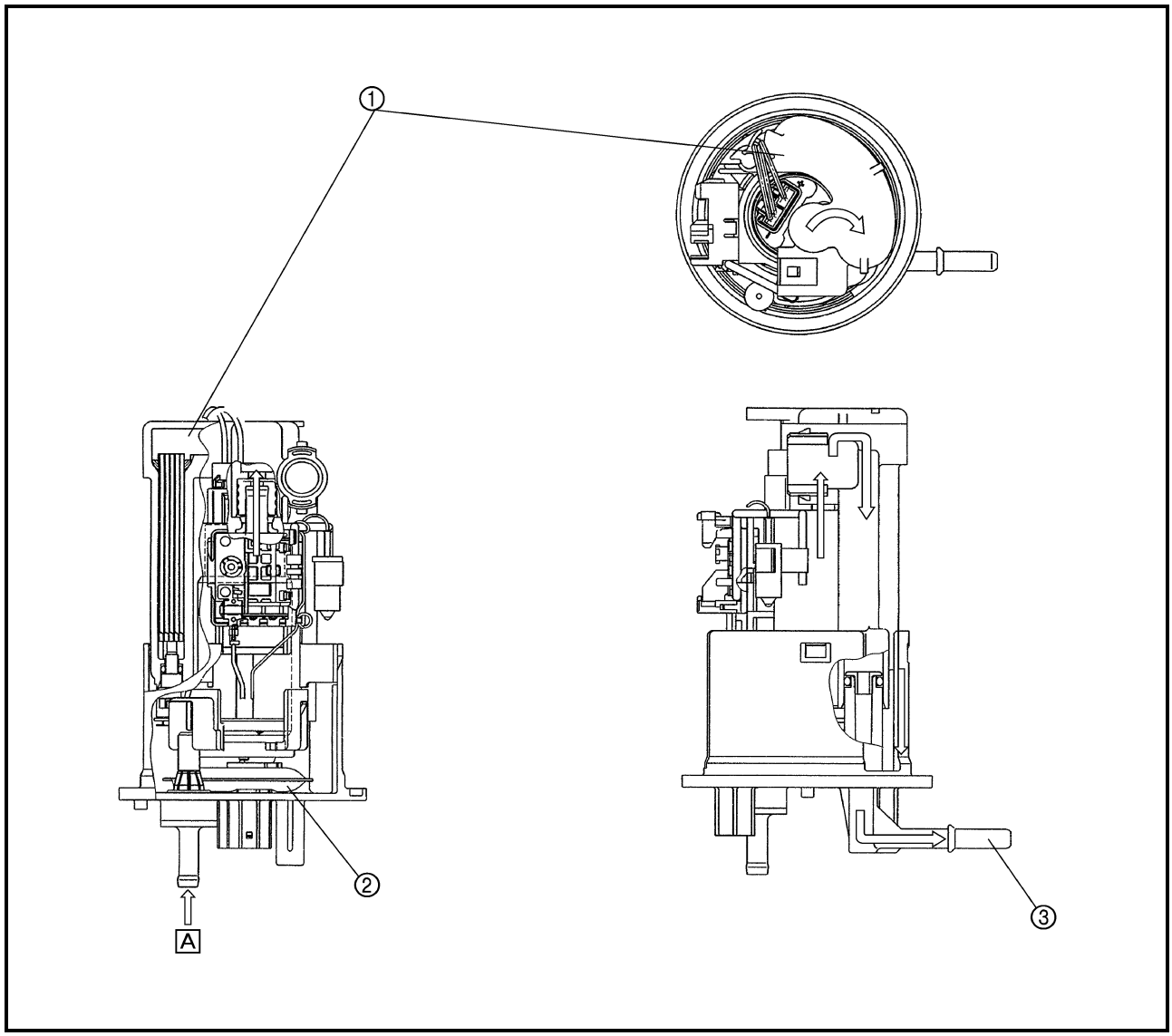
The fuel pump, which is mounted in the fuel tank, draws the fuel directly from the tank and pumps it to the injector.

A filter that is provided in the fuel pump prevents any debris in the fuel tank from entering the fuel system downstream of the pump.

The pump consists of a pump unit, electric motor, filter, and valves.

The pump unit is a Wesco type rotary pump that is connected to the motor shaft.

A relief valve is provided to prevent the fuel pressure from rising abnormally if the fuel hose becomes clogged. This valve opens when the fuel pressure at the discharge outlet reaches between 440 ~ 640 kPa (4.4 ~ 6.4 kg/cm^2, 62.6 ~ 91.0 psi), and returns the fuel to the fuel tank.



① Fuel filter
② Fuel inlet strainer
③ Outlet
A Fuel

Pressure regulator

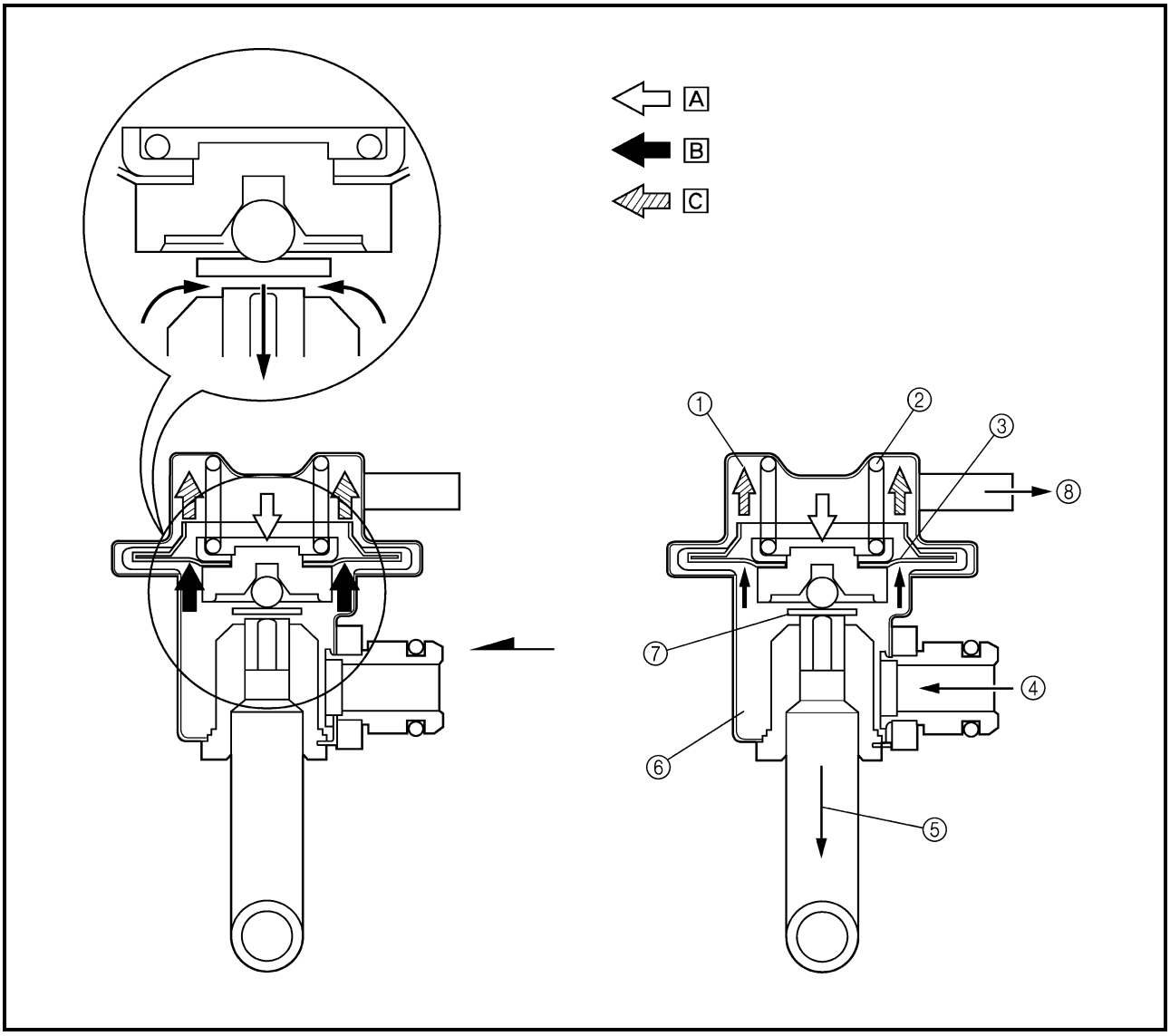
It regulates the fuel pressure that is applied to the injectors that are provided in the cylinders in order to maintain a constant pressure difference with the pressure in the intake manifold.

The fuel that is delivered by the fuel pump fills the fuel chamber through the fuel inlet of the regulator and exerts pressure on the diaphragm in the direction for opening the valve.

A spring that is provided in the spring chamber exerts pressure on the diaphragm in the direction for closing the valve, in contrast to the pressure of the fuel. Thus, the valve cannot open unless the fuel pressure overcomes the spring force.

An intake vacuum is applied to the spring chamber via a pipe. When the pressure of the fuel exceeds the sum of the intake vacuum and the spring force, the valve that is integrated with the diaphragm opens, allowing the fuel to return from the fuel outlet to the fuel tank, via the fuel return hose.

As a result, because the intake vacuum fluctuates in accordance with the changes in the operating conditions in contrast to the constant volume of fuel supplied by the pump, the valve opening/closing pressure also changes to regulate the return fuel volume. Thus, the difference between the fuel pressure and the intake manifold pressure remains constant at a prescribed pressure.

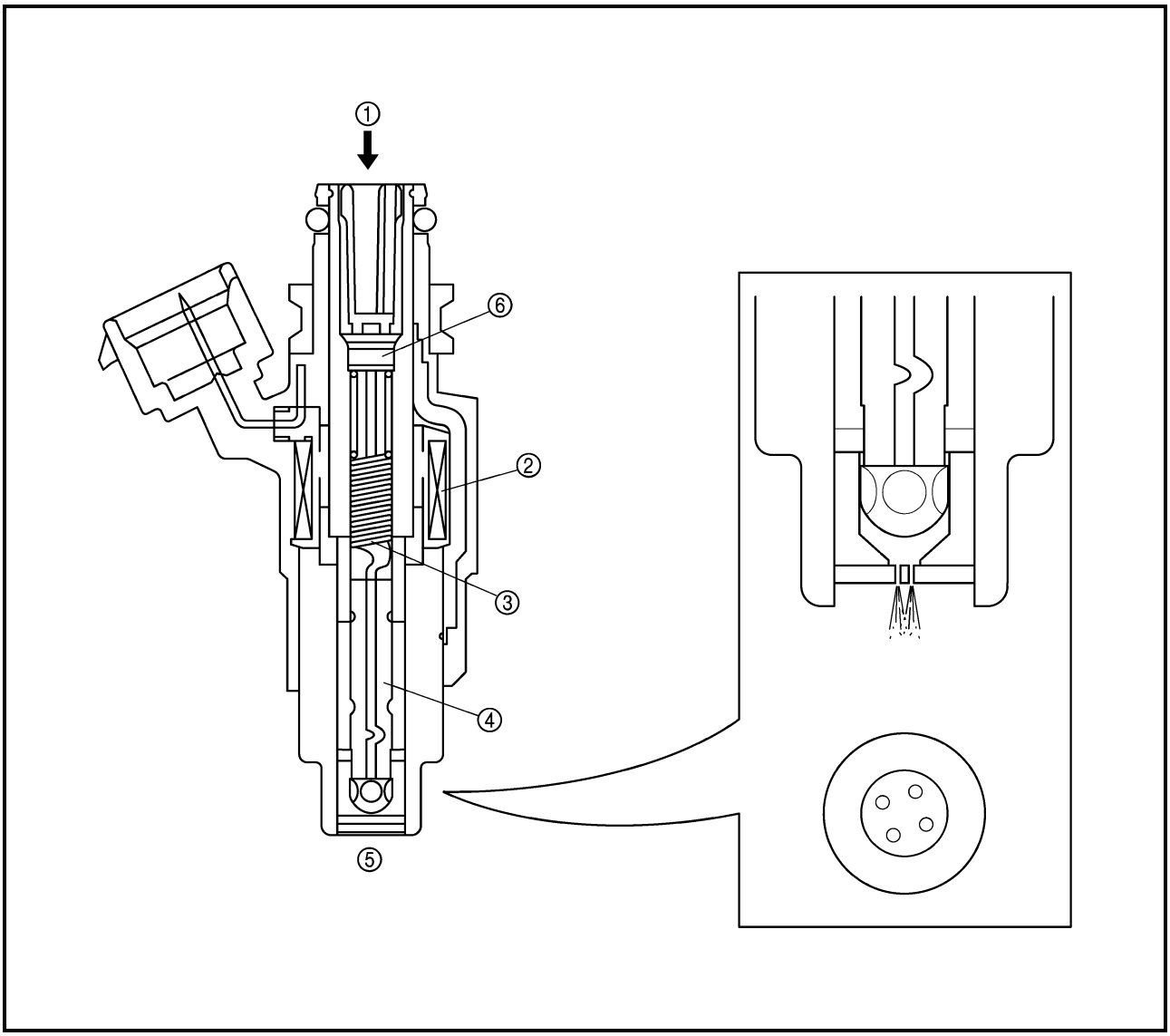


① Spring chamber
② Spring
③ Diaphragm
④ Fuel inlet
⑤ Fuel return
⑥ Fuel chamber
⑦ Valve
⑧ Intake manifold vacuum pressure
A Spring pressure
B Fuel pressure
C Vacuum pressure

Fuel injector

Upon receiving injection signals from the ECU, the fuel injector injects fuel. In the normal state, the core is pressed downward by the force of the spring, as illustrated. The plunger that is integrated with the bottom of the core keeps the fuel passage closed.

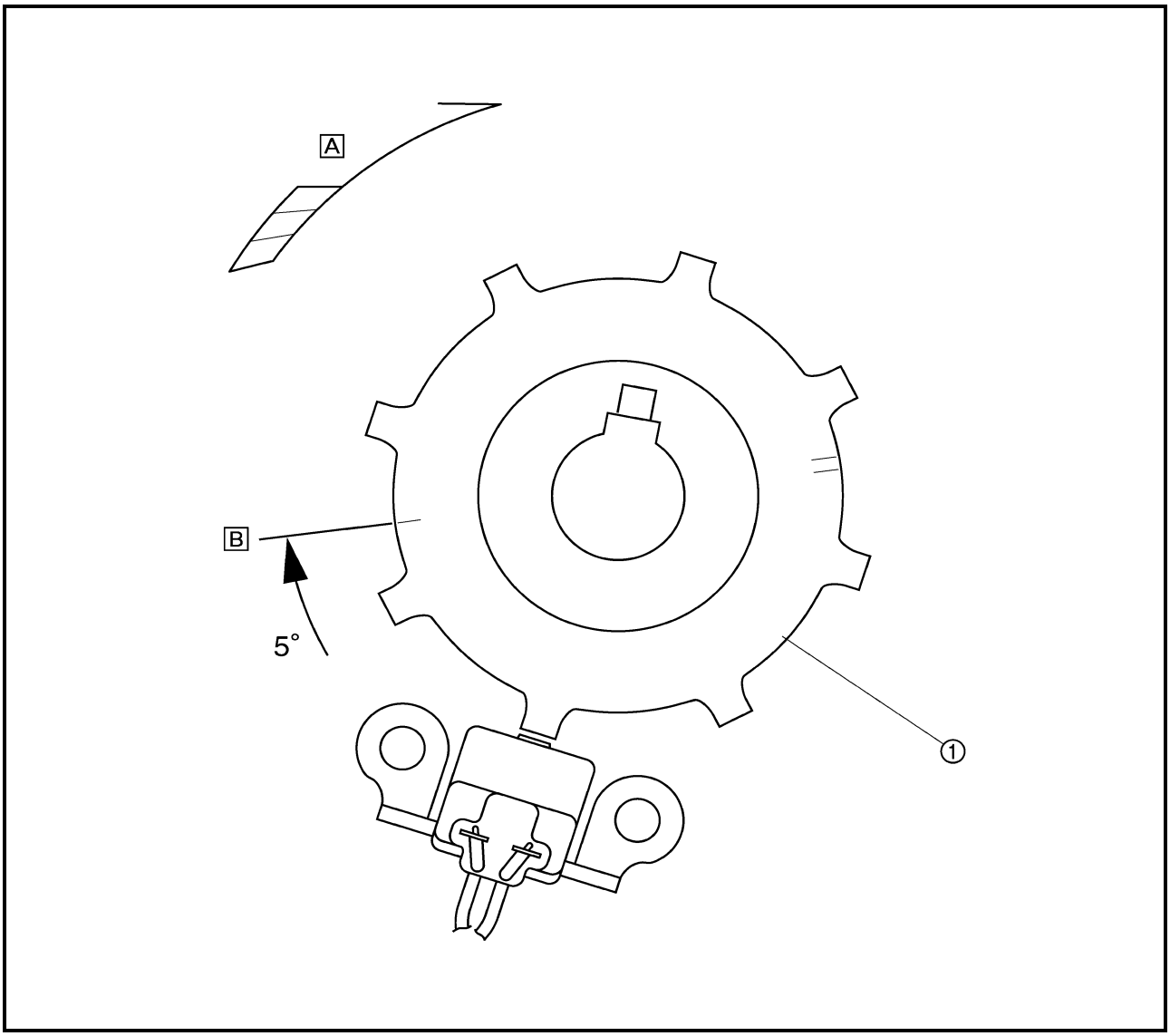
When the current flows to the coil in accordance with the signal from the ECU, the core is drawn upward, allowing the flange that is integrated with the plunger to move to the spacer. Since the distance of the movement of the needle is thus kept constant, the opening area of the fuel passage also becomes constant. Because the pressure difference of the fuel to the intake manifold pressure is kept constant by the pressure regulator, the fuel volume varies in proportion to the length of time the coil is energized. The injector that has been recently adopted has a four-hole type injection orifice that enhances the atomization of fuel and improves combustion efficiency.



① Fuel
② Coil
③ Core
④ Plunger
⑤ Inject
⑥ Flange

Crankshaft position sensor

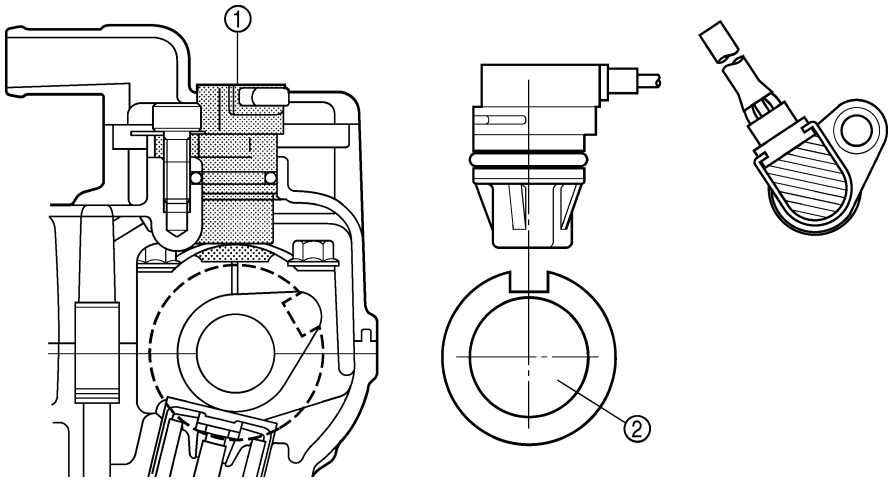
The crankshaft position sensor uses the signals of the pickup coil that is mounted on the right side of the crankshaft. When the rotation of the pickup rotor that is attached to the crankshaft causes the projections on the rotor to pass by the pickup coil, an electromotive force is generated in the coil. The voltage of this force is then input into the ECU, which calculates the position of the crankshaft and the speed of the engine. The ignition timing is then determined in accordance with the calculated data, in order to determine the corresponding injection timing. Based on the changes in the time intervals of the signals generated by the pickup coil, the ECU calculates the ignition timing advance to suit the operating conditions. The injection timing is also advanced in accordance with the ignition timing in order to supply fuel to the engine at an optimal timing.



① Pickup rotor
A Direction of rotation
B #1 cylinder compression stroke, 5° BTDC

Cylinder identification sensor

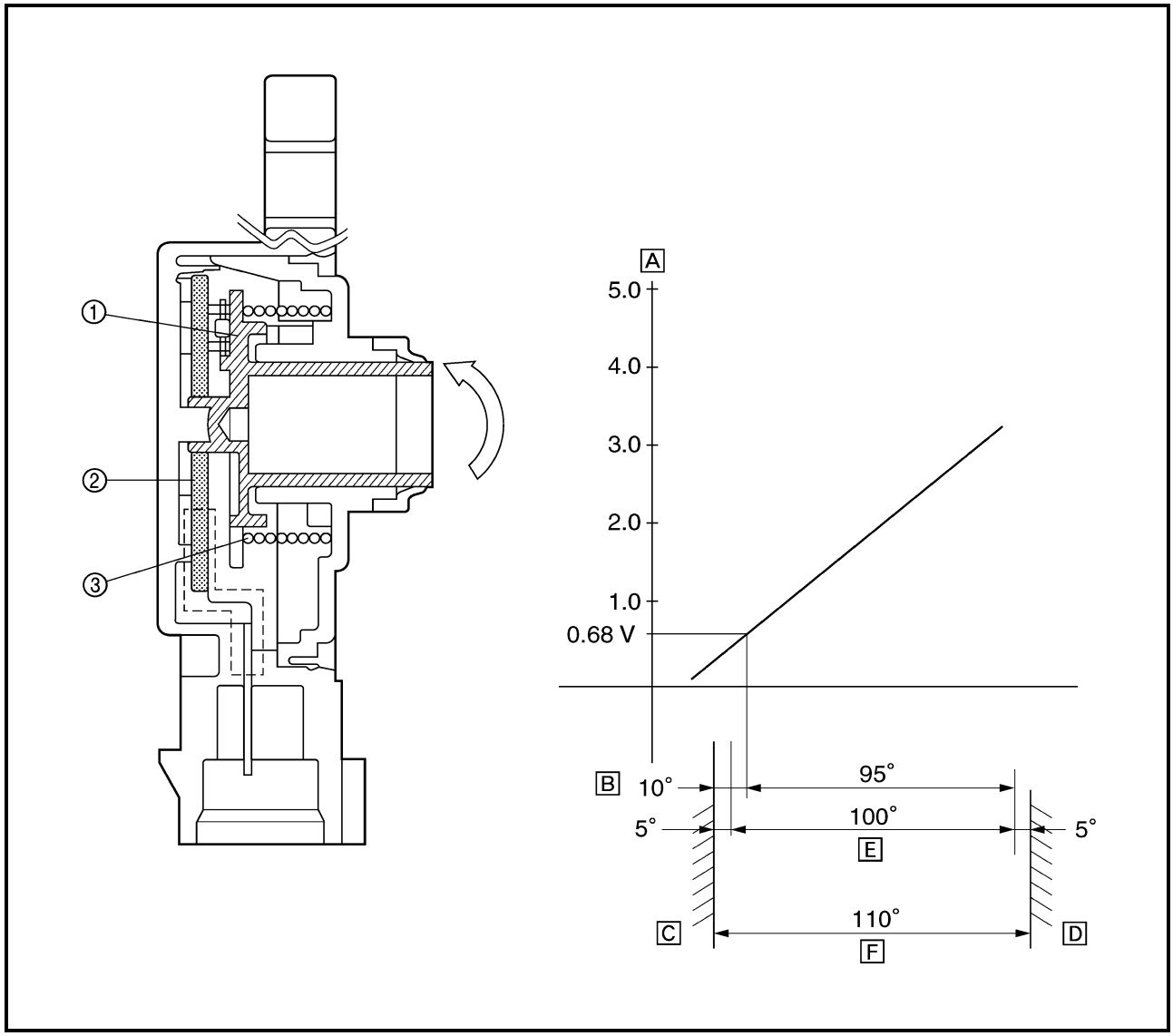
The cylinder identification sensor is mounted on the middle of exhaust side head cover. When the exhaust camshaft rotates, the sensor generates a signal and sends it to the ECU. Based on this signal and the signal from the crankshaft position sensor, the ECU then actuates the injector of the cylinder that is currently in order to supply fuel.



① Cylinder identification sensor
② Camshaft

Throttle position sensor

The throttle position sensor measures the intake air volume by detecting the position of the throttle valve. It detects the mechanical angle of the throttle valve through the positional relationship between the moving contact that moves in unison with the throttle shaft and the resistor board. In actual operation, the ECU supplies 5 V power to both ends of the resistor board and the voltage that is output by the throttle position sensor is used to determine the angle of the throttle valve.

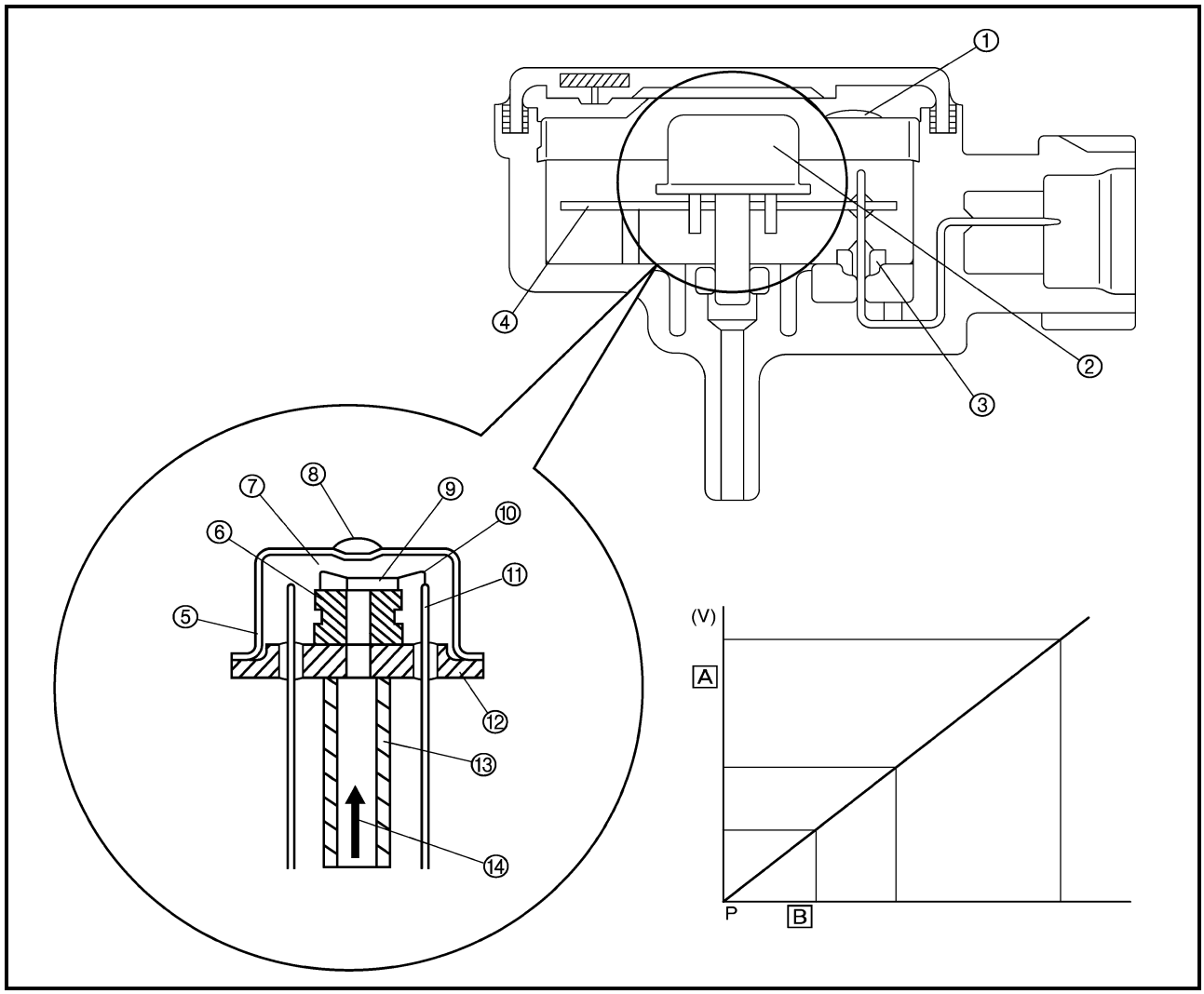


① Moving contact
② Resistor board
③ Spring

A Output voltage
B Idling output position
C Mechanical stopper
D Mechanical stopper
E Effective electrical angle
F Sensor operating angle

Intake air pressure sensor and atmospheric pressure sensor

- Intake air pressure sensor
  The intake air pressure sensor is used for measuring the intake air volume. The intake air volume of every intake stroke is proportionate to the intake air pressure. Therefore, the intake air volume can be measured by measuring the intake air pressure. The intake air pressure sensor converts the measured intake air pressure into electrical signals and sends those signals to the ECU. When the intake air pressure is introduced into the sensor unit, which contains a vacuum chamber on one side of the silicon diaphragm, the silicon chip that is mounted on the silicon diaphragm converts the intake air pressure into electrical signals. Then, an integrated circuit (IC) amplifies and adjusts the signals and makes temperature compensations, in order to generate electrical signals that are proportionate to the pressure.
- Atmospheric pressure sensor
  The atmospheric pressure sensor is used for making compensations to the changes in the air density caused by the changes in the atmospheric pressure (particularly at high altitudes). The operating principle and function of the atmospheric pressure sensor are the same as those of the aforementioned intake air pressure sensor.

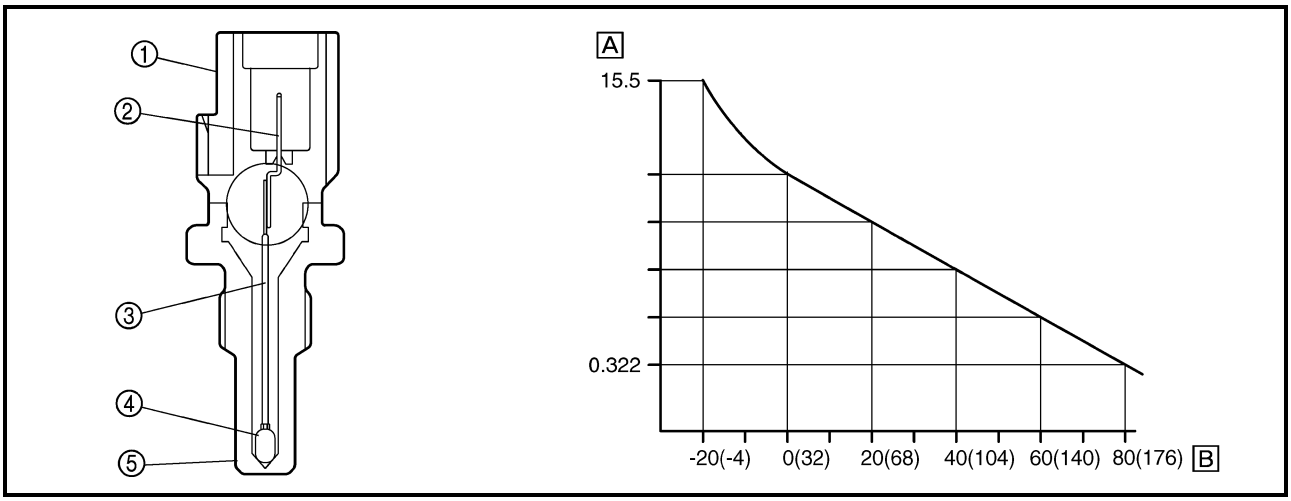


① EMI shield
② Sensor unit
③ Through condenser
④ Hybrid IC
⑤ Cap
⑥ Silicon diaphragm
⑦ Vacuum chamber
⑧ Solder
⑨ Silicon chip
⑩ Gold wire
⑪ Lead pin
⑫ Stem
⑬ Pressure induction pipe
⑭ Atmospheric pressure, intake air pressure
A Output voltage
B Input pressure

Coolant temperature sensor

The signals from the coolant temperature sensor are used primarily for making fuel volume compensations during starting and warm-up. The coolant temperature sensor converts the temperature of the coolant into electrical signals and sends them to the ECU.

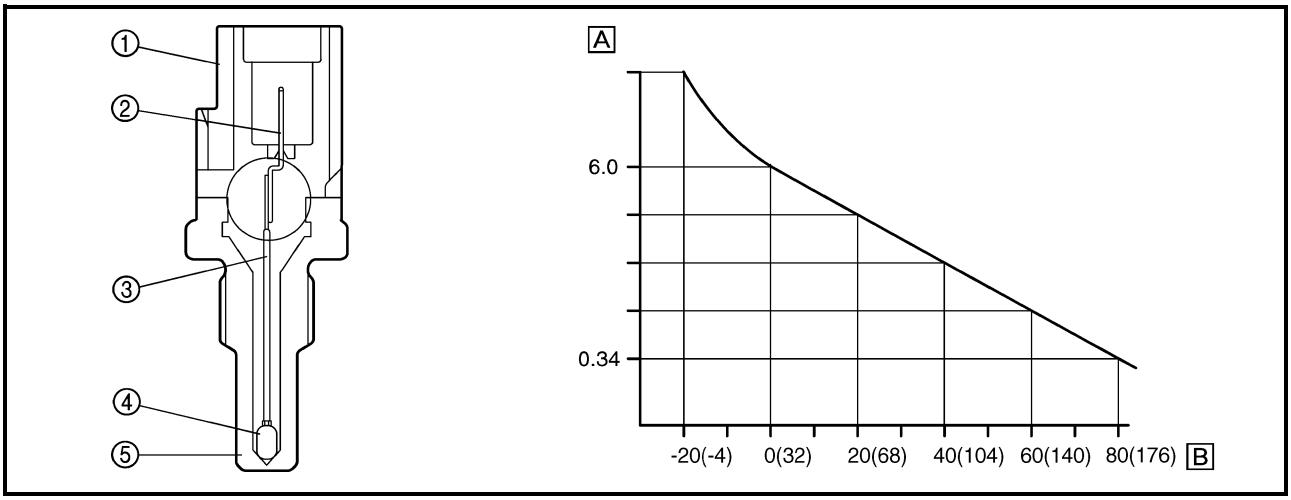
This sensor uses a semi-conductor thermistor that has a large resistance at low temperatures and a small resistance at high temperatures. The thermistor converts the temperature-dependent changes in resistance into electrical resistance values, which are then input into the ECU.



① Connector
② Terminal
③ Tube
④ Thermistor
⑤ Holder
A Resistance kΩ
B Temperature °C (°F)

Intake temperature sensor

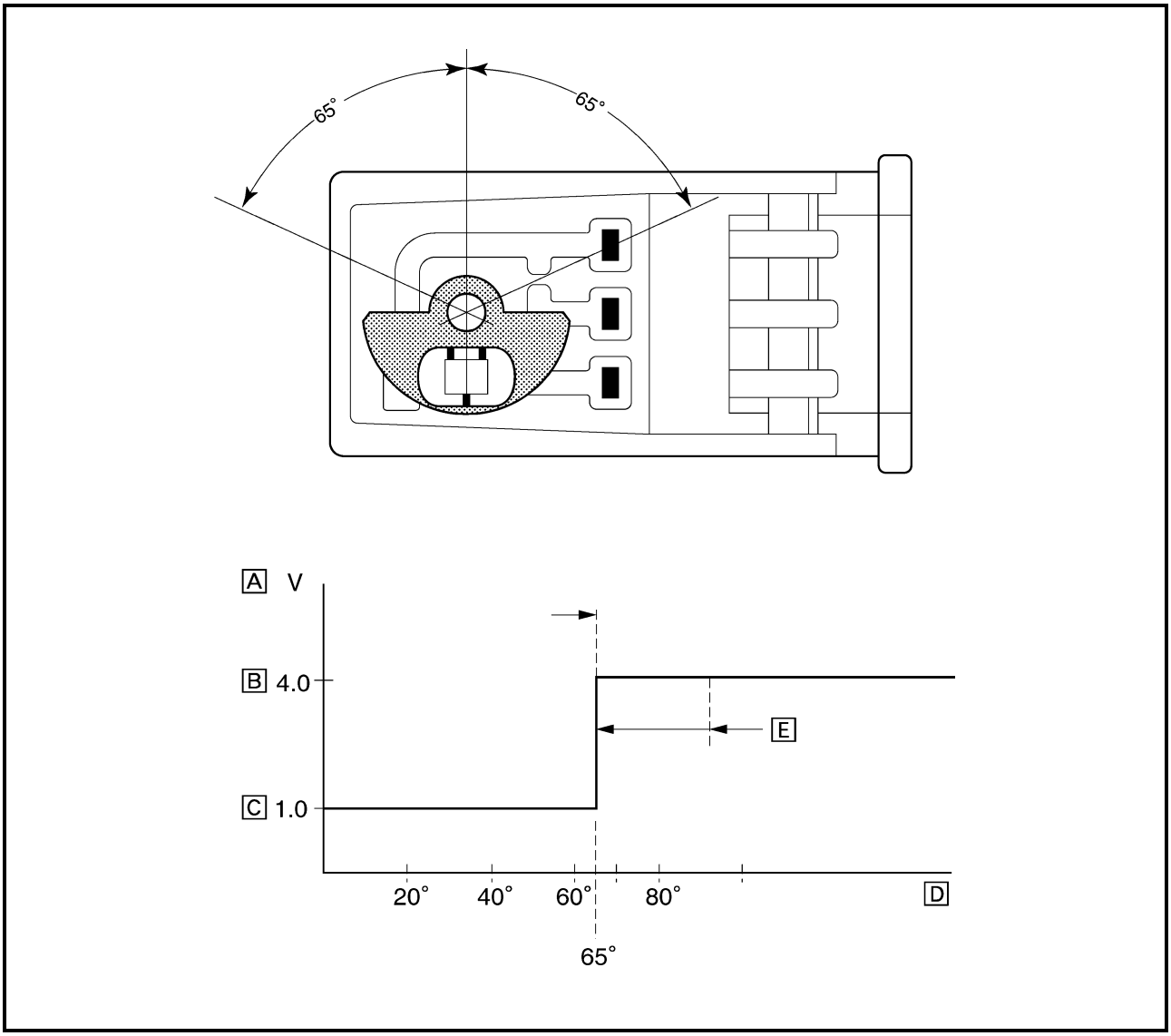
The intake temperature sensor corrects the deviation of the air-fuel mixture that is associated with the changes in the intake air density, which are created by the changes in the intake air temperature that occur due to atmospheric temperatures. This sensor uses a semi-conductor thermistor that has a large resistance at low temperatures and a small resistance at high temperatures. The thermistor converts the temperature-dependent changes in resistance into electrical resistance values, which are then input into the ECU.



① Connector
② Terminal
③ Tube
④ Thermistor
⑤ Holder
A Resistance kΩ
B Temperature °C (°F)

Lean angle cut-off switch

The lean angle cut-off switch stops the supply of fuel to the engine in case the motorcycle overturns. When the motorcycle is in the normal state, the cut-off switch outputs a constant voltage of approximately 1.0 V (low level). When the motorcycle tilts, the float in the switch tilts in proportion to the tilt of the motorcycle. However, the voltage output to the ECU remains unchanged at the low level. When the tilt of the motorcycle exceeds 65 degrees (according to the tilt of the float), the signal from the sensor increases to approximately 4.0 V (high level). When the ECU receives the high-level voltage, it determines that the motorcycle has overturned, and stops the delivery of fuel to the engine by turning OFF the fuel injection system relay that powers the fuel pump and the injectors. Once the cut-off switch is tripped, the ECU maintains this state; therefore, even if the motorcycle has recovered its upright position, this state will not be canceled unless the main switch is turned OFF, and then turned back ON.



A Output voltage
B High level
C Low level
D Cut-off switch tilt angle
E Fuel injection system relay OFF

FUEL INJECTION SYSTEM

Operation and control

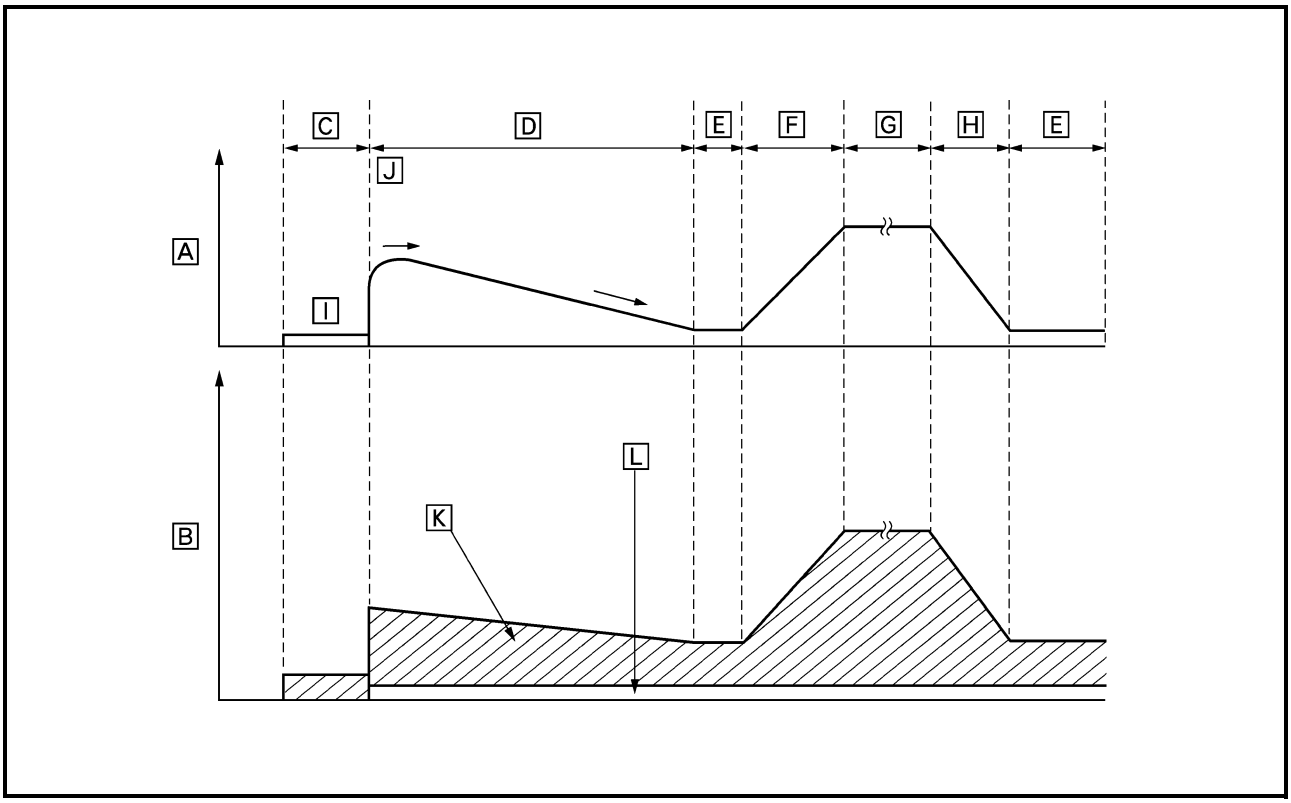
The fuel injection timing, injection duration, ignition timing, and the coil energizing duration are controlled by the ECU. To determine the basic injection timing, the ECU calculates the intake air volume through the signals from the intake air pressure sensor, throttle position sensor, cylinder identification sensor, and crankshaft position sensor.

Furthermore, the ECU calculates the final injection timing by adding the following compensations to the aforementioned basic injection duration: those obtained from the state of acceleration, as well as those based on the signals from various sensors such as the coolant temperature, intake temperature and atmospheric. At the same time, the ECU assesses the crankshaft position through the signals from the cylinder identification sensor and the crankshaft position sensor. Then, when the ECU determines that it is time to inject fuel, it sends an injection command to the injectors. Furthermore, the ECU also controls the length of time the coil is energized by calculating the ignition timing and the coil energizing duration based on the signals from these sensors.

Determining the basic injection duration

The intake air volume determines the basic injection duration. In order to operate the engine in an optional condition, it is necessary to supply fuel at an air-fuel ratio that corresponds appropriately to the volume of intake air that is constantly changing, and to ignite it an appropriate timing. The ECU controls the basic injection duration based on the intake air volume and engine speed data.

Composition of basic injection duration



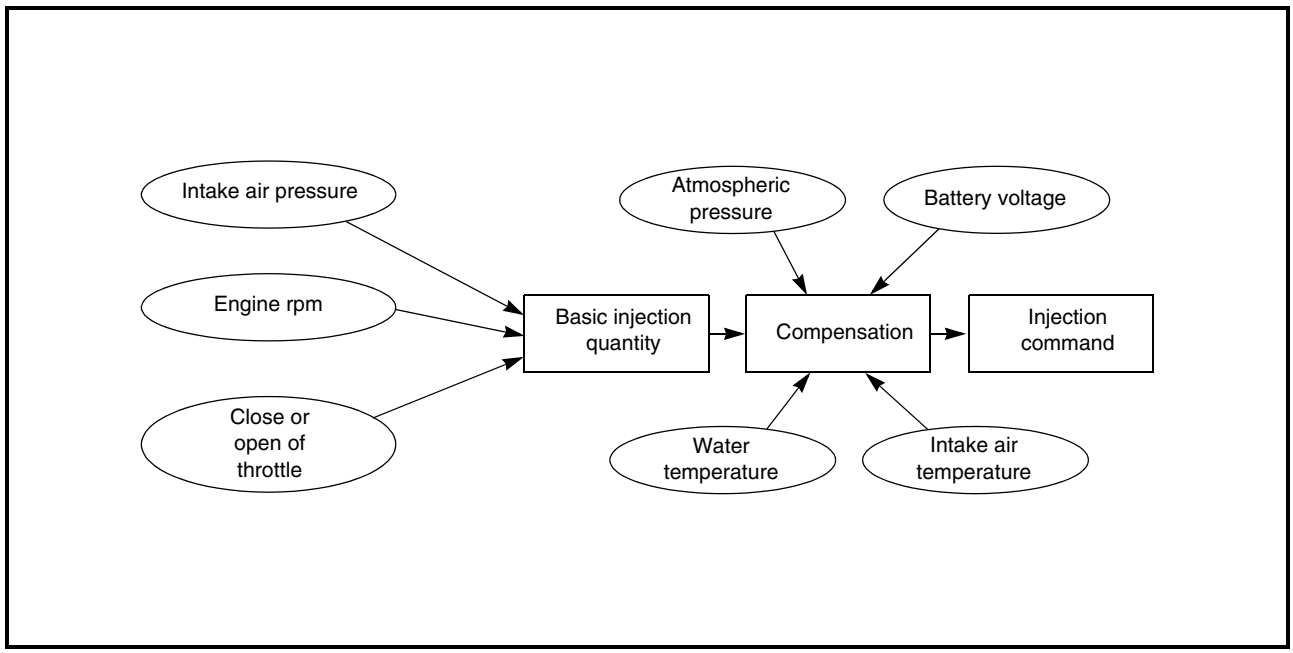
A RPM
B Injection duration
C Cranking
D Warm-up
E Idle
F Acceleration
G Constant
H Deceleration
I Start
J After start
K Basic injection duration
L Voltage compensation duration

Detection of intake air volume

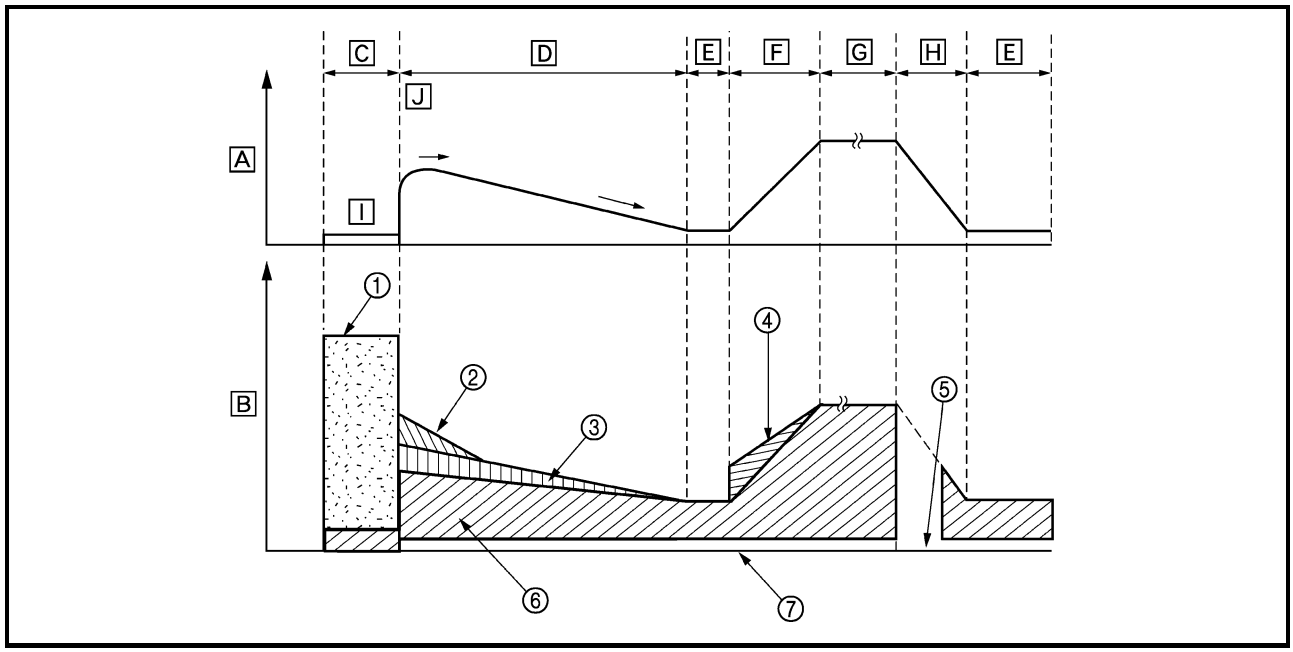
The intake air volume is detected primarily through the signals from the throttle position sensor and the intake air pressure sensor. The intake air volume is determined in accordance with the signals from the atmospheric pressure sensor, intake temperature sensor, and the engine speed data.

Determining the final injection duration

The intake air volume determines the basic injection duration. However, at a given intake air volume, the volume of fuel that is required varies by the engine operating conditions such as acceleration or deceleration, or by weather conditions. This system uses various sensors to precisely check these conditions, applies compensations to the basic injection duration, and determines the final injection duration based on the operating condition of the engine.



Composition of final injection duration



① Injection at start *1
② After-start enrichment *2
③ Warm-up enrichment *3
④ Acceleration compensation *5
⑤ Fuel cut-off
Deceleration compensation *5
⑥ Basic injection duration
⑦ Voltage compensation duration

A RPM
B Injection duration
C Cranking
D Warm-up
E Idle
F Acceleration
G Constant
H Deceleration
I Start
J After start

Reactive injection duration:
A lag is created between the time the ECU outputs a fuel injection signal to the injector and the time the injector actually opens. Therefore, the ECU calculates this lag in advance before sending the actuation signal to the injector. The battery voltage determines the reactive injection duration.
- High voltage → short reactive injection duration
- Low voltage → long reactive injection duration

LIST OF FUEL INJECTION COMPENSATIONS

Compensation item	Check item	Sensor used
Starting injection *1	Coolant temperature	Coolant temperature sensor
After-start injection:		
After-start enrichment *2	Coolant temperature	Coolant temperature sensor
Warm-up enrichment *3	Coolant temperature	Coolant temperature sensor
Intake temperature compensation *4	Intake temperature	Intake temperature sensor
Acceleration compensation/deceleration compensation *5	Intake air pressure	Intake air pressure sensor
	Throttle position	Throttle position sensor
	Coolant temperature	Coolant temperature sensor

- Over-revving control
  This function effects fuel cut-off control when the engine speed becomes greater than the prescribed value. The fuel cut-off control regulates the engine speed by stopping the injection of fuel into two cylinders when the engine speed becomes greater than the specified value. If the engine speed increases further, this control stops the injection of fuel to all the cylinders. Thus, the over-revving control effects fuel cut-off control in two stages.

THREE-WAY CATALYTIC CONVERTER SYSTEM

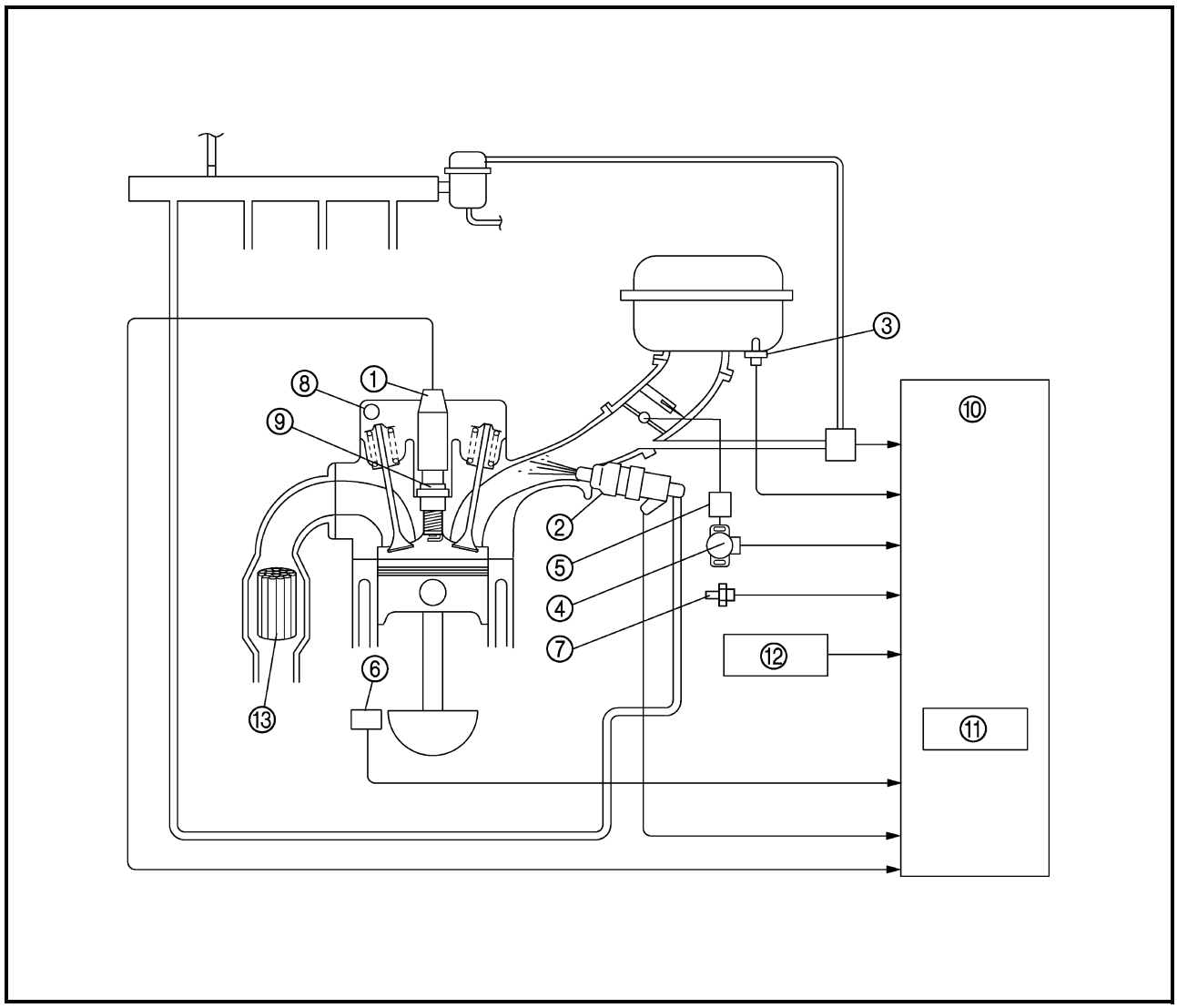
System outline

This is a highly efficient exhaust gas cleaning system that effects air-fuel control through a joint effort by the FI system and the three-way catalytic converter system. By effecting comprehensive control of the air-fuel ratio in this manner, this system reduces the CO, HC, and NOx in the exhaust gases.

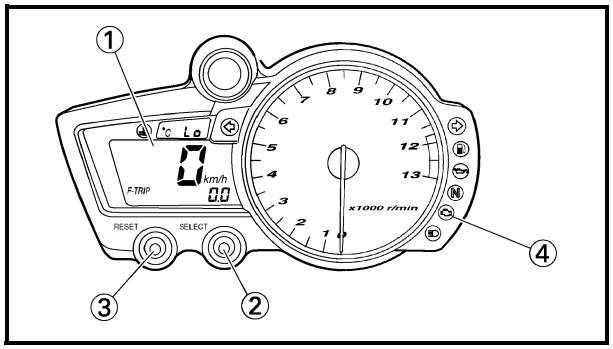
The FI system controls the mixture to an optimal air-fuel ratio (basic air-fuel ratio) that matches the operating condition of the engine in order to realize an ideal combustion.

Through the joint effort of these control systems, the exhaust gas is cleaned in a highly efficient manner without sacrificing engine performance.

Three-way catalytic converter system diagram



① Ignition coil
② Injector
③ Intake temperature sensor
④ Throttle position sensor
⑤ Intake air pressure sensor
⑥ Crankshaft position sensor
⑦ Coolant temperature sensor
⑧ Cylinder identification sensor
⑨ Spark plug
⑩ ECU
⑪ Igniter
⑫ Atmospheric pressure sensor
⑬ Catalytic converter



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 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 A" and "TRIP B" in the following order:

ODO → TRIP A → TRIP B → 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 A → TRIP B → 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.

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.

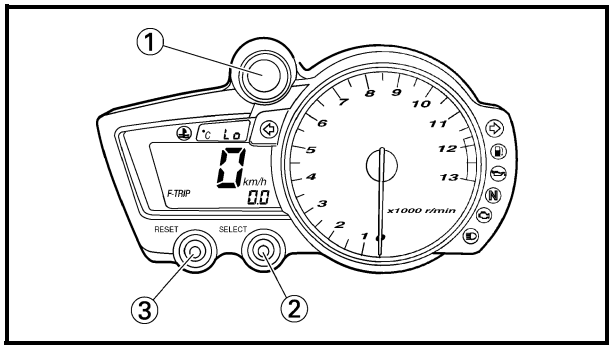
To set the clock:

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.

Self-diagnosis device

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

If any of those circuits are defective, the engine trouble warning light will come on and then, the multi-function display will indicate a two-digit error code (e.g., 11, 12, 13).



① Engine speed indicator light
② "SELECT" button
③ "RESET" button

Display brightness and engine speed 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. Engine speed 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. Engine speed indicator light activation: This function allows you to select the engine speed at which the indicator light will be activated.
4. Engine speed indicator light deactivation: This function allows you to select the engine speed at which the indicator light will be deactivated.
5. Engine speed 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" 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 engine speed 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 engine speed indicator light activity function.

To set the engine speed 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 engine speed indicator light activation function.

To set the engine speed indicator light activation function

NOTE:

The indicator light activation function can be set between 7,000 and 12,000 r/min in increments of 500 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 engine speed indicator light deactivation function.

To set the engine speed indicator light deactivation function

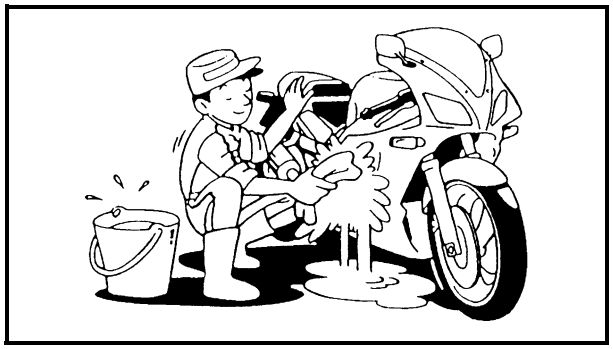
NOTE:

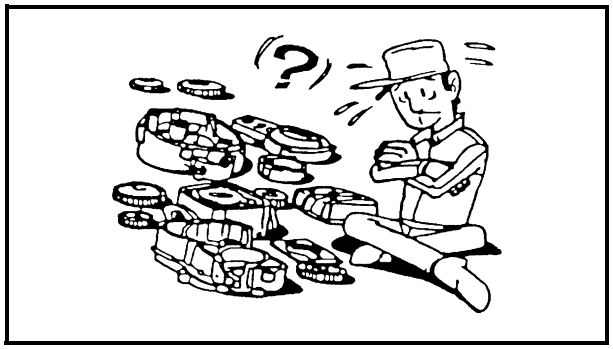
- The indicator light deactivation function can be set between 7,000 and 12,000 r/min in increments of 500 r/min.
- Be sure to set the deactivation function to a higher engine speed than for the activation function, otherwise the engine speed indicator light will remain deactivated.

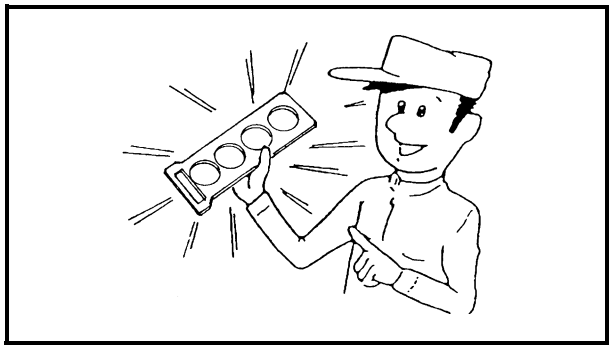
1. Push the “RESET” button to select the desired engine speed for deactivating the indicator light.
2. Push the “SELECT” button to confirm the selected engine speed.
   The control mode changes to the engine speed indicator light brightness function.

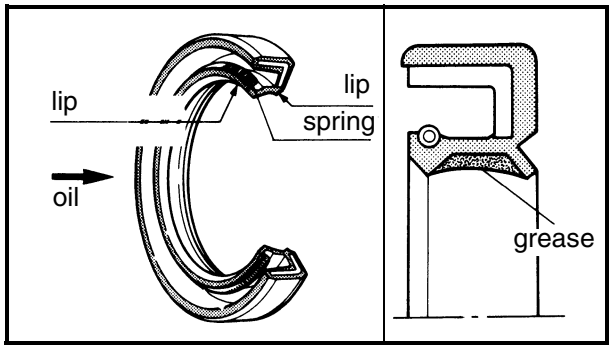
To adjust the engine speed indicator light brightness

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

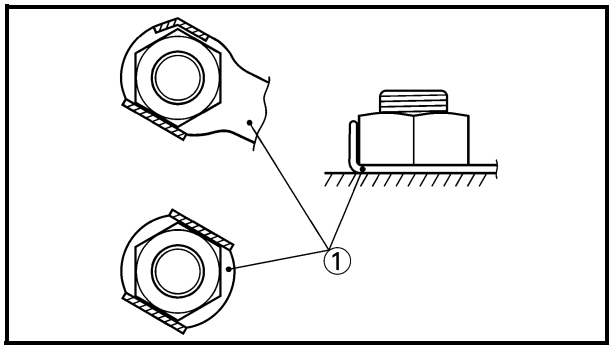
REPLACEMENT PARTS

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

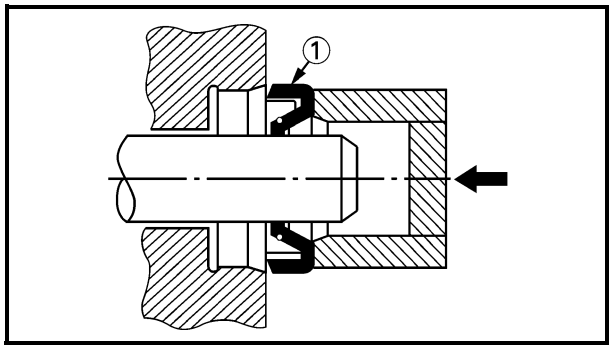
GASKETS, OIL SEALS AND O-RINGS

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.



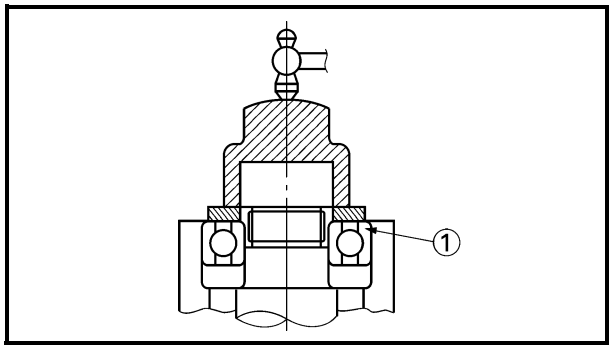
EAS00024
BEARINGS AND OIL SEALS

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.

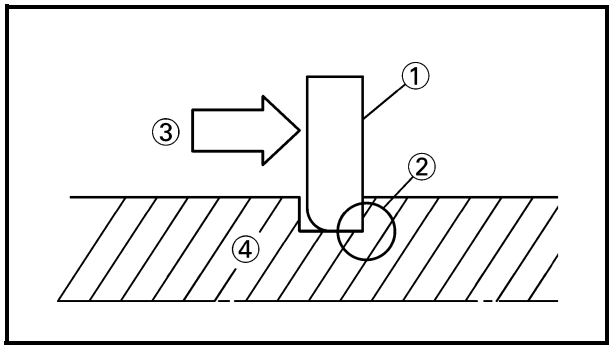
① Oil seal

CAUTION:

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



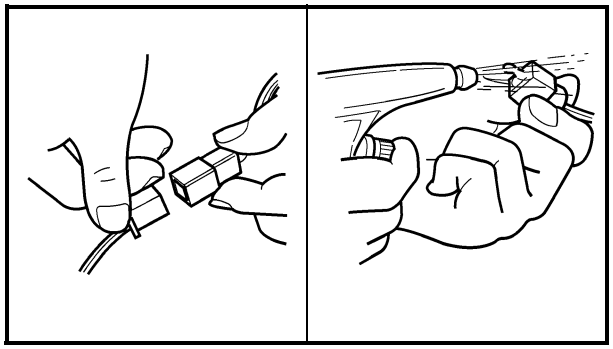
① Bearing

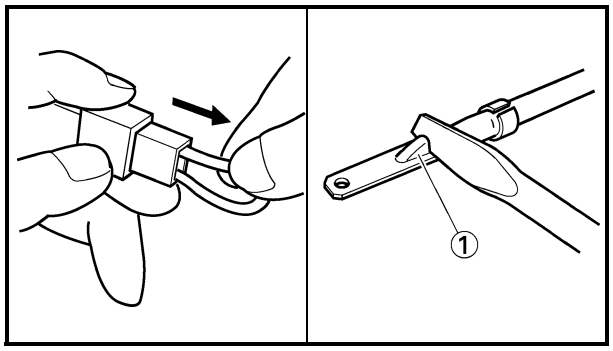


EAS00025
CIRCLIPS

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.

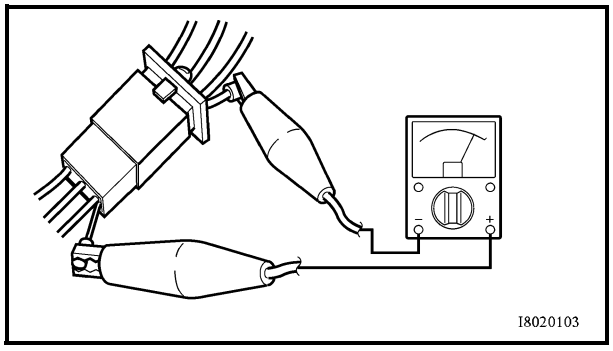
NOTE:

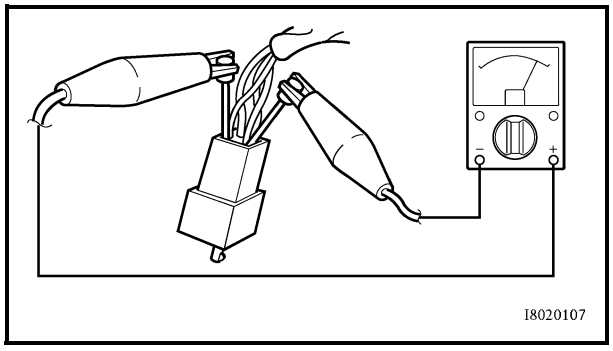
If the pin ① on the terminal is flattened, bend it up.

4. Connect:
   - lead
   - coupler
   - connector

NOTE:

Make sure all connections are tight.





5. Check:
   - continuity

   (with the pocket tester)

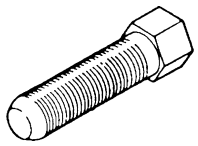
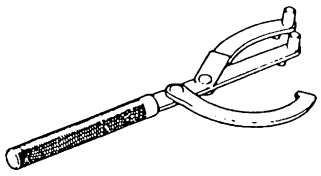
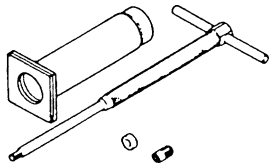
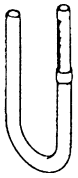
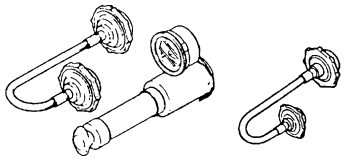
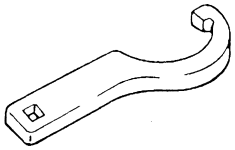
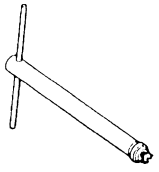
	Pocket tester **YM-03112**

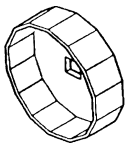
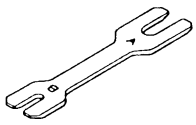
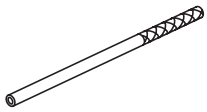
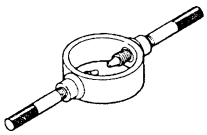
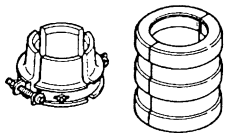
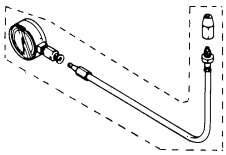
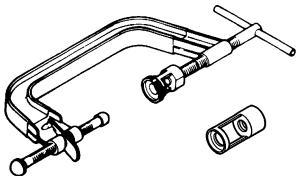
NOTE:

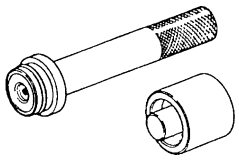
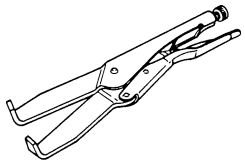
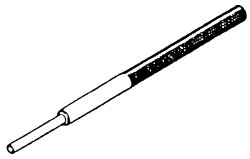
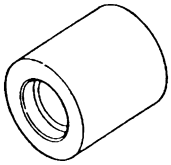
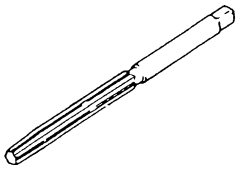
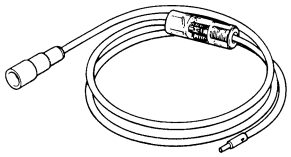
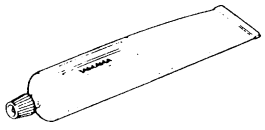
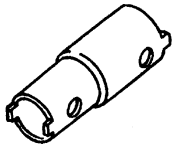
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.

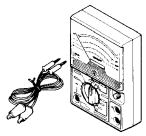
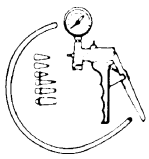
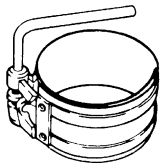
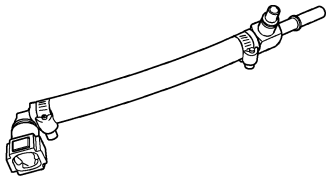
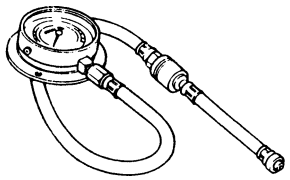
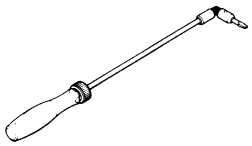
EAS00027
SPECIAL TOOLS

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.

Tool No.	Tool name/Function	Illustration
YM-01080-A	Flywheel puller This tool is used to remove the generator rotor.	
YU-01235	Rotor holding tool This tool is used to hold the generator rotor when removing or installing the generator rotor bolt or pickup coil rotor bolt.	
YU-01304	Piston pin puller This tool is used to remove the piston pins.	
YU-01312-A	Fuel level gauge This tool is used to measure the fuel level in the float chamber.	
Radiator cap tester YU-24460-01 Adapter YU-33984	Radiator cap tester Radiator cap tester adapter These tools are used to check the cooling system.	
YU-33975	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
YM-1423	Damper rod holder This tool is used to hold the damper rod assembly when loosening or tightening the damper rod assembly bolt.	

Tool No.	Tool name/Function	Illustration
YU-38411	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
YM-01434	Rod holder This tool is used to support the damper adjusting rod.	
Rod puller YM-01437	Rod puller These tools are used to pull up the front fork damper rod.	
YM-01441	Fork spring compressor This tool is used to disassemble or assemble the front fork legs.	
YM-01442	Fork seal driver This tool is used to install the front fork's oil seal and dust seal.	
YU-08030	Carburetor synchronizer This guide is used to synchronize the carburetors.	
Compression gauge YU-33223 Adapter YU-33223-3	Compression gauge Compression gauge adapter These tools are used to measure engine compression.	
Valve spring compressor YM-04019 Attachment YM-4108 YM-4114	Valve spring compressor Valve spring compressor attachment These tools are used to remove or install the valve assemblies.	

Tool No.	Tool name/Function	Illustration
Middle driven shaft bearing driver YM-4058-1 Mechanical seal installer YM-33221	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
YM-91042	Universal clutch holder This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
(4 mm, 0.16 in) 90890-04111 (4.5 mm, 0.18 in) YM-4116	Valve guide remover This tool is used to remove or install the valve guides.	
(4 mm, 0.16 in) 90890-04112 (4.5 mm, 0.18 in) YM-4117	Valve guide installer This tool is used to install the valve guides.	
(4 mm, 0.16 in) 90890-04113 (4.5 mm, 0.18 in) YM-4118	Valve guide reamer This tool is used to rebore the new valve guides.	
YM-34487	Dynamic spark tester This tool is used to check the ignition system components.	
ACC-11001-05-01	Quick Gasket® This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	
YM-01471	Pivot shaft wrench This tool is need to loosen or tighten the spacer bolt.	

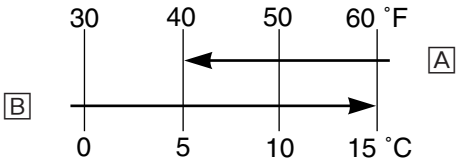
Tool No.	Tool name/Function	Illustration
YM-03112	Pocket tester This instrument is needed for checking the engine oil temperature.	
YB-35956	Mity vac This tool used to measure the vacuum pressure.	
YM-8037	Piston ring compressor This tool is used to compress the piston rings when installing the piston into the cylinder.	
YM-03176	Fuel pressure adapter This tool is needed to measure fuel pressure.	
YU-03153	Pressure gauge This tool used is to measure fuel pressure.	
90890-03158	Carburetor angle driver This tool is used to turn the air screw when synchronizing the throttle bodies.	

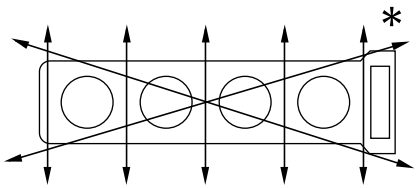
SPECIFICATIONS

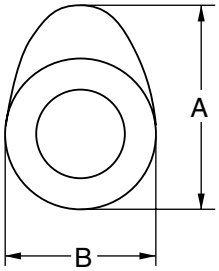
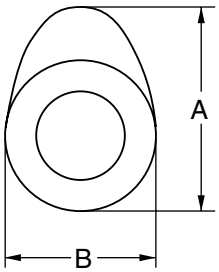
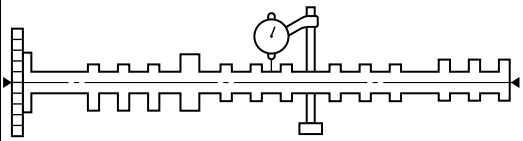
GENERAL SPECIFICATIONS

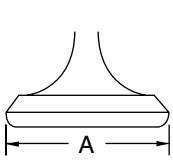
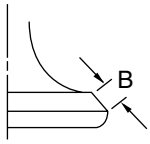
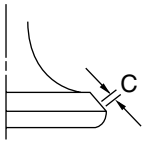
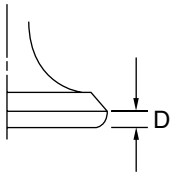
Item	Standard	Limit
Model code	5PW4 USA	----
	5PW5 California	----
	5PW6 Canada	----
Dimensions		
Overall length	2,040 mm (80.3 in)	----
Overall width	705 mm (27.8 in)	----
Overall height	1,105 mm (43.5 in)	----
Seat height	820 mm (32.3 in)	----
Wheelbase	1,395 mm (54.9 in)	----
Minimum ground clearance	140 mm (5.5 in)	----
Minimum turning radius	3,900 mm (153.5 in)	----
Weight		
Wet (with oil and a full fuel tank)	193 kg (426 lb) USA, Canada	----
	194 kg (428 lb) California	----
Maximum load (except motorcycle)	202 kg (445 lb) USA, Canada	----
	201 kg (443 lb) California	----

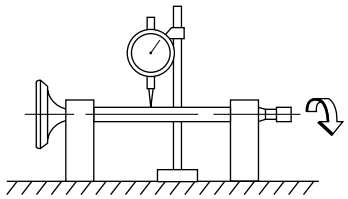
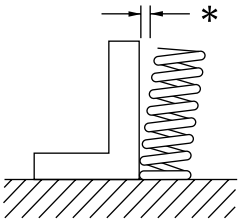
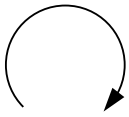
ENGINE SPECIFICATIONS

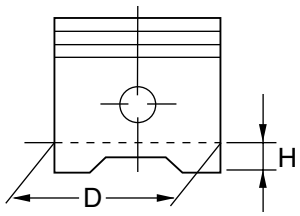
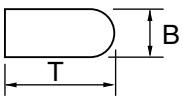
Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 4-stroke, DOHC	----
Displacement	998 cm^3 (60.9 cu.in)	----
Cylinder arrangement	Forward-inclined parallel 4-cylinder	----
Bore × stroke	74 × 58 mm (2.91 × 2.28 in)	----
Compression ratio	11.8 : 1	----
Engine idling speed	1,000 ~ 1,100 r/min	----
Vacuum pressure at engine idling speed	25.3 kPa (190 mmHg, 7.47 inHg)	----
Standard compression pressure (at sea level)	1,450 kPa (14.5 kg/cm^2, 210 psi) at 400 r/min	----
Fuel		
Recommended fuel	Premium unleaded gasoline only	----
Fuel tank capacity		
Total (including reserve)	17 L (3.74 Imp gal, 4.49 US gal)	----
Reserve only	3.3 L (0.73 Imp gal, 0.87 US gal)	----
Engine oil		
Lubrication system	Wet sump	----
Recommended oil		
	Yamalube 4 (20W40) or SAE 20W40 type SE motor oil (5 °C (40 °F) or higher) A Yamalube 4 (10W30) or SAE 10W30 type SE motor oil (15 °C (60 °F) or below) B	---- ----
Quantity		
Total amount	3.8 L (3.34 Imp qt, 4.02 US qt)	----
Without oil filter cartridge replacement	2.9 L (2.55 Imp qt, 3.07 US qt)	----
With oil filter cartridge replacement	3.1 L (2.73 Imp qt, 3.28 US qt)	----
Oil pressure (hot)	45 kPa at 1,100 r/min (0.45 kg/cm^2, 6.5 psi at 1,100 r/min)	----
Relief valve opening pressure	480 ~ 560 kPa (4.8 ~ 5.6 kg/cm^2, 69.6 ~ 81.2 psi)	----

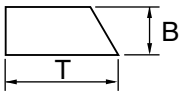
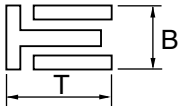
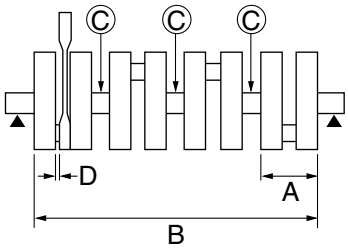
Item	Standard	Limit
Oil filter		
Oil filter type	Cartridge (paper)	----
Bypass valve opening pressure	80 ~ 120 kPa (0.8 ~ 1.2 kg/cm^2, 11.6 ~ 17.4 psi)	----
Oil pump		
Oil pump type	Trochoid	----
Inner-rotor-to-outer-rotor-tip clearance	0.01 ~ 0.10 mm (0.0004 ~ 0.0039 in)	0.18 mm (0.0071 in)
Outer-rotor-to-oil-pump-housing clearance	0.09 ~ 0.15 mm (0.0035 ~ 0.0059 in)	0.22 mm (0.0087 in)
Cooling system		
Radiator capacity	2.45 L (2.16 Imp qt, 2.59 US qt)	----
Radiator cap opening pressure	95 ~ 125 kPa (0.95 ~ 1.25 kg/cm^2, 13.8 ~ 18.1 psi)	----
Radiator core		
Width	340 mm (13.4 in)	----
Height	295.8 mm (11.6 in)	----
Depth	27 mm (1.06 in)	----
Coolant reservoir		
Capacity	0.24 L (0.21 Imp qt, 0.25 US qt)	----
Water pump		
Water pump type	Single suction centrifugal pump	----
Reduction ratio	68/43 × 28/28 (1.581)	----
Max. impeller shaft tilt	----	0.15 mm (0.0059 in)
Starting system type	Electric starter	----
Electric fuel injection		
Type	INP-731/4	----
Manufacturer	NIPPON INJECTOR	----
Spark plugs		
Model (manufacturer) × quantity	CR9EIA 9/IU24D (NGK/DENSO) × 4	----
Spark plug gap	0.8 ~ 0.9 mm (0.032 ~ 0.035 in)	----
Cylinder head		
Volume	13.45 ~ 14.05 cm^3 (0.82 ~ 0.86 cu.in)	----
Max. warpage	----	0.1 mm (0.0039 in)
		

Item	Standard	Limit
Camshafts		
Drive system	Chain drive (right)	----
Camshaft cap inside diameter	24.500 ~ 24.521 mm (0.9646 ~ 0.9654 in)	----
Camshaft journal diameter	24.459 ~ 24.472 mm (0.9630 ~ 0.9635 in)	----
Camshaft-journal-to-camshaft-cap clearance	0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	----
Intake camshaft lobe dimensions		
		
Measurement A	32.5 ~ 32.6 mm (1.2795 ~ 1.2835 in)	32.4 mm (1.2756 in)
Measurement B	24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in)	24.85 mm (0.9783 in)
Exhaust camshaft lobe dimensions		
		
Measurement A	32.95 ~ 33.05 mm (1.2972 ~ 1.3012 in)	32.85 mm (1.2933 in)
Measurement B	24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in)	24.85 mm (0.9783 in)
Max. camshaft runout	----	0.03 mm (0.0012 in)
		

Item	Standard	Limit
Timing chain		
Model/number of links	RH2015/130	----
Tensioning system	Automatic	----
Valves, valve seats, valve guides		
Valve clearance (cold)		
Intake	0.11 ~ 0.20 mm (0.0043 ~ 0.0079 in)	----
Exhaust	0.21 ~ 0.27 mm (0.0083 ~ 0.0106 in)	----
Valve dimensions		
 Head Diameter	 Face Width	 Seat Width	 Margin Thickness
Valve head diameter A		
Intake	22.9 ~ 23.1 mm (0.9016 ~ 0.9094 in)	----
Exhaust	24.4 ~ 24.6 mm (0.9606 ~ 0.9685 in)	----
Valve face width B		
Intake	1.76 ~ 2.90 mm (0.0693 ~ 0.1142 in)	----
Exhaust	1.76 ~ 2.90 mm (0.0693 ~ 0.1142 in)	----
Valve seat width C		
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	----
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	----
Valve margin thickness D		
Intake	0.5 ~ 0.9 mm (0.0197 ~ 0.0354 in)	----
Exhaust	0.5 ~ 0.9 mm (0.0197 ~ 0.0354 in)	----
Valve stem diameter		
Intake	3.975 ~ 3.990 mm (0.1565 ~ 0.1571 in)	3.945 mm (0.1553 in)
Exhaust	4.465 ~ 4.480 mm (0.1758 ~ 0.1764 in)	4.43 mm (0.1744 in)
Valve guide inside diameter		
Intake	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)	4.05 mm (0.1594 in)
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)	4.55 mm (0.1791 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	0.020 ~ 0.047 mm (0.0008 ~ 0.0019 in)	0.10 mm (0.0039 in)

Item	Standard	Limit
Valve stem runout 	----	0.01 mm (0.0004 in)
Valve seat width		
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	----
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	----
Valve springs		
Free length		
Intake	38.9 mm (1.53 in)	37.0 mm (1.46 in)
Exhaust	40.67 mm (1.60 in)	38.6 mm (1.52 in)
Installed length (valve closed)		
Intake	34.5 mm (1.36 in)	----
Exhaust	35 mm (1.38 in)	----
Compressed spring force (installed)		
Intake	82 ~ 96 N (8.2 ~ 9.6 kg, 18.43 ~ 21.58 lb)	----
Exhaust	110 ~ 126 N (11.0 ~ 12.6 kg, 24.73 ~ 28.32 lb)	----
Spring tilt 		
Intake	----	2.5°/1.7 mm (0.067 in)
Exhaust	----	2.5°/1.8 mm (0.071 in)
Winding direction (top view)		
Intake	Clockwise	----
Exhaust	Clockwise 	----

Item	Standard	Limit
Cylinders		
Cylinder arrangement	Forward-inclined, parallel 4-cylinder	----
Bore × stroke	74 × 58 mm (2.91 × 2.28 in)	----
Compression ratio	11.8 : 1	----
Bore	74.00 ~ 74.01 mm (2.9134 ~ 2.9138 in)	----
Max. taper	----	0.05 mm (0.0020 in)
Max. out-of-round	----	0.05 mm (0.0020 in)
Piston		
Piston-to-cylinder clearance	0.010 ~ 0.035 mm (0.0004 ~ 0.0014 in)	0.12 mm (0.0047 in)
Diameter D	73.975 ~ 73.990 mm (2.9124 ~ 2.9130 in)	----
		
Height H	5 mm (0.2 in)	----
Piston pin bore (in the piston)		
Diameter	17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in)	17.043 mm (0.6710 in)
Offset	0.5 mm (0.02 in)	----
Offset direction	Intake side	----
Piston pins		
Outside diameter	16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in)	16.971 mm (0.6681 in)
Piston-pin-to-piston-pin-bore clearance	0.002 ~ 0.022 mm (0.00008 ~ 0.00087 in)	0.072 mm (0.00283 in)
Piston rings		
Top ring		
		
Ring type	Barrel	----
Dimensions (B × T)	0.90 × 2.75 mm (0.04 × 0.11 in)	----
End gap (installed)	0.32 ~ 0.44 mm (0.013 ~ 0.017 in)	0.69 mm (0.027 in)
Ring side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.115 mm (0.0045 in)

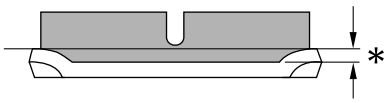
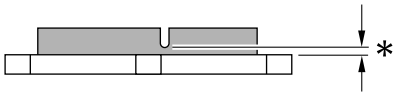
Item	Standard	Limit
2nd ring 		
Ring type	Taper	----
Dimensions (B × T)	0.8 × 2.8 mm (0.03 × 0.11 in)	----
End gap (installed)	0.43 ~ 0.58 mm (0.017 ~ 0.023 in)	0.93 mm (0.037 in)
Ring side clearance	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)	0.115 mm (0.0045 in)
Oil ring 		
Dimensions (B × T)	1.5 × 2.6 mm (0.06 × 0.10 in)	----
End gap (installed)	0.10 ~ 0.35 mm (0.0039 ~ 0.0138 in)	----
Connecting rods		
Crankshaft-pin-to-big-end-bearing clearance	0.031 ~ 0.055 mm (0.0012 ~ 0.0022 in)	----
Bearing color code	–1 = Violet 0 = White 1 = Blue 2 = Black	----
Crankshaft 		
Width A	52.40 ~ 57.25 mm (2.06 ~ 2.25 in)	----
Width B	300.75 ~ 302.65 mm (11.84 ~ 11.92 in)	----
Max. runout C	----	0.03 mm (0.0012 in)
Big end side clearance D	0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in)	----
Crankshaft-journal-to-crankshaft-journal-bearing clearance	0.029 ~ 0.053 mm (0.0011 ~ 0.0021 in)	----
Bearing color code	–1 = Violet 0 = White 1 = Blue 2 = Black 3 = Brown	----

Item	Standard	Limit
Clutch		
Clutch type	Wet, multiple disc	----
Clutch release method	Outer pull, rack and pinion pull	----
Clutch release method operation	Cable operation	----
Operation	Left-hand operation	----
Clutch cable free play (at the end of the clutch lever)	10 ~ 15 mm (0.4 ~ 0.6 in)	----
Friction plates		
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Plate quantity	8	----
Clutch plates		
Thickness	1.9 ~ 2.1 mm (0.075 ~ 0.083 in)	----
Plate quantity	7	----
Max. warpage	----	0.1 mm (0.004 in)
Clutch springs		
Free length	6.5 mm (0.26 in)	----
Spring quantity	1	----
Transmission		
Transmission type	Constant mesh, 6-speed	----
Primary reduction system	Spur gear	----
Primary reduction ratio	68/43 (1.581)	----
Secondary reduction system	Chain drive	----
Secondary reduction ratio	43/16 (2.688)	----
Operation	Left-foot operation	----
Gear ratios		
1st gear	35/14 (2.500)	----
2nd gear	35/19 (1.842)	----
3rd gear	30/20 (1.500)	----
4th gear	28/21 (1.333)	----
5th gear	30/25 (1.200)	----
6th gear	29/26 (1.115)	----
Max. main axle runout	----	0.08 mm (0.0031 in)
Max. drive axle runout	----	0.08 mm (0.0031 in)
Shifting mechanism		
Shift mechanism type	Guide bar	----
Max. shift fork guide bar bending	----	0.1 mm (0.0039 in)

Item	Standard	Limit
Air filter type	Wet element	----
Fuel pump		
Pump type	Electrical	----
Model (manufacturer)	5PW (DENSO)	----
Output pressure	94 kPa (2.94 kg/cm^2, 42.6 psi)	----
Throttle position sensor		
Resistance	4.85 ~ 5.15 kΩ at 20 °C (68 °F)	----
Output voltage (at idle)	Adjusted by tachometer	----
Throttle bodies		
Model (manufacturer) × quantity	40EIS (MIKUNI) × 4	----
Intake vacuum pressure	25.3 kPa (190 mmHg, 7.48 inHg)	----
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm	----
ID mark	5PW1 00 USA, Canada	----
	5PW5 20 California	----
Throttle value size	#100	----
Max. EXUP cable free play (at the EXUP valve pulley)	1.5 mm (0.059 in)	----

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Diamond	----
Caster angle	24°	----
Trail	103 mm (4.06 in)	----
Front wheel		
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)
Rear wheel		
Wheel type	Cast wheel	----
Rim		
Size	17 M/C × MT6.00	----
Material	Aluminum	----
Wheel travel	130 mm (5.12 in)	----
Wheel runout		
Max. radial wheel runout	----	1 mm (0.04 in)
Max. lateral wheel runout	----	0.5 mm (0.02 in)
Front tire		
Tire type	Tubeless	----
Size	120/70 ZR17 (58W)	----
Model (manufacturer)	Pilot SPORT E (MICHELIN)	----
	D208FL (DUNLOP)	----
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kgf/cm^2, 36.3 psi)	----
90 ~ 202 kg	250 kPa (2.5 kgf/cm^2, 36.3 psi)	----
High-speed riding	250 kPa (2.5 kgf/cm^2, 36.3 psi)	----
Min. tire tread depth	----	1.6 mm (0.06 in)
Rear tire		
Tire type	Tubeless	----
Size	190/55 ZR17 M/C (73W)	----
Model (manufacturer)	Pilot SPORT (MICHELIN)	----
	D208L (DUNLOP)	----
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kgf/cm^2, 36.3 psi)	----
90 ~ 202 kg	290 kPa (2.9 kgf/cm^2, 42.1 psi)	----
High-speed riding	250 kPa (2.5 kgf/cm^2, 36.3 psi)	----
Min. tire tread depth	----	1.6 mm (0.06 in)

Item	Standard	Limit
Front brakes		
Brake type	Dual disc brake	----
Operation	Right hand operation	----
Recommended fluid	DOT 4	----
Brake lever free play	2.3 ~ 11.5 mm (0.09 ~ 0.45 in)	----
Brake discs		
Diameter × thickness	298 × 5 mm (11.73 × 0.20 in)	----
Min. thickness	----	4.5 mm (0.18 in)
Max. deflection	----	0.1 mm (0.004 in)
Brake pad lining thickness 	4.5 mm (0.18 in)	0.5 mm (0.02 in)
Master cylinder inside diameter	14 mm (0.55 in)	----
Caliper cylinder inside diameter	30.1 mm and 27 mm (1.19 in and 1.06 in)	----
Rear brake		
Brake type	Single disc brake	----
Operation	Right foot operation	----
Brake pedal position (from the top of the brake pedal to the bottom of the rider footrest bracket)	38 ~ 42 mm (1.50 ~ 1.65 in)	----
Recommended fluid	DOT 4	----
Brake pedal freeplay	4.3 ~ 9.3 mm (0.17 ~ 0.37 in)	----
Brake discs		
Diameter × thickness	220 × 5 mm (8.66 × 0.20 in)	----
Min. thickness	----	4.5 mm (0.18 in)
Max. deflection	----	0.15 mm (0.006 in)
Brake pad lining thickness 	5.1 mm (0.20 in)	0.8 mm (0.03 in)
Master cylinder inside diameter	12.7 mm (0.5 in)	----
Caliper cylinder inside diameter	27 mm and 22.2 mm (1.06 in and 0.87 in)	----

Item	Standard	Limit
Front suspension		
Suspension type	Telescopic fork	----
Front fork type	Coil spring/oil damper	----
Front fork travel	120 mm (4.72 in)	----
Spring		
Free length	251 mm (9.88 in)	246 mm (9.69 in)
Spacer length	74 mm (2.91 in)	----
Installed length	244 mm (9.61 in)	----
Spring rate (K1)	8.34 N/mm (0.83 kg/mm, 47.62 lb/in)	----
Spring stroke (K1)	0 ~ 120 mm (0 ~ 4.72 in)	----
Inner tube outer diameter	43 mm (1.69 in)	----
Inner tube bending limit	----	0.2 mm (0.008 in)
Optional spring available	No	----
Fork oil		
Recommended oil	Suspension oil “01” or equivalent	----
Quantity (each front fork leg)	0.543 L (0.478 Imp qt, 0.574 US qt)	----
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	88 mm (3.46 in)	----
Spring preload adjusting positions		
Minimum	8	----
Standard	6	----
Maximum	1	----
Rebound damping adjusting positions		
Minimum*	26	----
Standard*	13	----
Maximum*	1	----
Compression damping adjusting positions		
Minimum*	20	----
Standard*	13	----
Maximum*	1	----
*from the fully turned-in position		
Steering		
Steering bearing type	Angular bearing	----

Item	Standard	Limit
Rear suspension		
Suspension type	Swingarm (link suspension)	----
Rear shock absorber assembly type	Coil spring/gas-oil damper	----
Rear shock absorber assembly travel	65 mm (2.56 in)	----
Spring		
Free length	176.5 mm (6.95 in)	----
Installed length	162.5 mm (6.4 in)	----
Spring rate (K1)	88.3 N/mm (8.83 kg/mm, 504 lb/in)	----
Spring stroke (K1)	0 ~ 65 mm (0 ~ 2.56 in)	----
Optional spring available	No	----
Standard spring preload gas/air pressure	1,200 kPa (12 kg/cm^2, 174 psi)	----
Spring preload adjusting positions		
Minimum	1	----
Standard	4	----
Maximum	9	----
Rebound damping adjusting positions		
Minimum*	20	----
Standard*	15	----
Maximum*	1	----
Compression damping adjusting positions		
Minimum*	20	----
Standard*	15	----
Maximum*	1	----
*from the fully turned-in position		
Swingarm		
Free play (at the end of the swingarm)		
Radial	----	1.0 mm (0.04 in)
Axial	----	1.0 mm (0.04 in)
Drive chain		
Model (manufacturer)	50VA8 (DAIDO)	----
Link quantity	114	----
Drive chain slack	40 ~ 50 mm (1.57 ~ 1.97 in)	----
Maximum ten-link section	----	150.1 mm (5.91 in)

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	----
Ignition system		
Ignition system type	Transistorized coil ignition (digital)	----
Ignition timing	5° BTDC at 1,050 r/min	----
Crankshaft position sensor resistance/color	248 ~ 372 Ω at 20 °C (68 °F)/Gy-B	----
Transistorized coil ignition unit model (manufacturer)	F8T917 (MITSUBISHI) USA, Canada F8T918 (MITSUBISHI) California	---- ----
Ignition coils		
Model (manufacturer)	F6T558 (MITSUBISHI)	----
Minimum ignition spark gap	6 mm (0.24 in)	----
Primary coil resistance	1.19 ~ 1.61 Ω at 20 °C (68 °F)	----
Secondary coil resistance	8.5 ~ 11.5 kΩ at 20 °C (68 °F)	----
Charging system		
System type	AC magneto	----
Model (manufacturer)	F4T471 (MITSUBISHI)	----
Normal output	14 V/32 A at 5,000 r/min	----
Stator coil resistance/color	0.19 ~ 0.23 Ω at 20 °C (68 °F)/W–W	----
Rectifier/regulator		
Regulator type	Semi conductor short circuit	----
Model (manufacturer)	FH001 (SHINDENGEN)	----
No-load regulated voltage	14.1 ~ 14.9 V	----
Rectifier capacity	35 A	----
Withstand voltage	200 V	----
Battery		
Battery type	GT12B-4	----
Battery voltage/capacity	12 V/10 AH	----
Specific gravity	1.320	----
Manufacturer	GS	----
Ten hour rate amperage	1 A	----
Headlight type	Halogen bulb	----
Bulbs (voltage/wattage × quantity)		
Headlight	12 V 60 W/55 W × 2	----
Auxiliary light	12 V 5 W × 2	----
Tail/brake light	12 V 4 W/0.5 W (LED)	----
Front turn signal light/position light	12 V 21 W/5 W × 2	----
Rear turn signal light	12 V 21 W × 2	----
Licence plate light	12 V 5 W × 1	----
Indicator light (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 indicator light	LED × 1	----
Engine trouble warning light	LED × 1	----
Engine speed indicator light	LED × 1	----

Item	Standard	Limit
Electric starting system		
System type	Constant mesh	----
Starter motor		
Model (manufacturer)	5JJ (YAMAHA)	----
Power output	0.9 kW	----
Brushes		
Overall length	10.8 mm (0.43 in)	3.65 mm (0.14 in)
Spring force	5.28 ~ 7.92 N (528 ~ 792 g, 19.01 ~ 28.51 oz)	----
Armature coil resistance	0.009 ~ 0.011 Ω at 20 °C (68 °F)	----
Commutator diameter	24.5 mm (0.96 in)	23.5 mm (0.93 in)
Mica undercut	1.5 mm (0.06 in)	----
Starter relay		
Model (manufacturer)	2768079-A (JIDECO)	----
Amperage	180 A	----
Coil resistance	4.18 ~ 4.62 Ω at 20 °C (68 °F)	----
Horn		
Horn type	Plain	----
Model (manufacturer) × quantity	YF-12 (NIKKO) × 1	----
Max. amperage	3 A	----
Performance	105 ~ 113 db/2 m (6.6 ft)	----
Coil resistance	1.15 ~ 1.25 Ω at 20 °C (68 °F)	----
EXUP servo motor		
Type (manufacturer)	5PW (YAMAHA)	----
Turn signal relay		
Relay type	Full-transistor	----
Model (manufacturer)	FE218BH (DENSO)	----
Self-cancelling device built-in	No	----
Turn signal blinking frequency	75 ~ 95 cycles/min.	----
Wattage	21 W × 2 + 3.4 W	----
Oil level gauge		
Model (manufacturer)	5PW (DENSO)	----
Fuses (amperage × quantity)		
Main fuse	50 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)	5 A × 1	----
Reserve fuse	20 A, 15 A, 5 A × 1	----

EAS00028
CONVERSION TABLE

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

Ex.

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

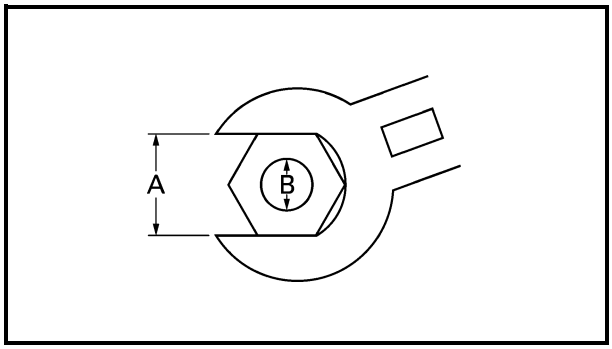
CONVERSION TABLE

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

TIGHTENING TORQUES

EAS00029
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: Width across flats
B: Thread diameter

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

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	2	20 + 121° (50)	2.0 + 121° (5.0)	14 + 121° (36)	E
Cylinder head	Nut	M10	6	20 + 105° (50)	2.0 + 105° (5.0)	14 + 105° (36)	
Cylinder head	Cap nut	M10	2	20 + 140° (65)	2.0 + 140° (65)	14 + 140° (47)	E
Cylinder head	Bolt	M6	2	12	1.2	8.7	
Camshaft caps	Bolt	M6	28	10	1.0	7.2	E
Cylinder head cover	Bolt	M6	6	12	1.2	8.7	
Cylinder head (exhaust pipe)	Stud bolt	M8	8	15	1.5	11	E
Connecting rod caps	Nut	M8	8	20 + 120°	2.0 + 120°	14 + 120°	M
Engine hunger	Screw	M6	4	10	1.0	7.2	L
Generator rotor	Bolt	M10	1	65 + 60°	6.5 + 60°	47 + 60°	E
Crankshaft sprocket	Bolt	M10	1	60	6.0	43	E
Cap bolt (timing chain tensioner)	Bolt	M6	1	7	0.7	5.1	
Camshaft sprocket	Bolt	M7	4	24	2.4	17	
Water pump inlet pipe	Bolt	M6	1	10	1.0	7.2	L
Water pump outlet pipe	Bolt	M6	1	10	1.0	7.2	L
Oil/water pump assembly driven sprocket	Bolt	M6	1	15	1.5	11	L
Oil pump	Bolt	M6	2	12	1.2	8.7	L
Oil cooler	Bolt	M20	1	35	3.5	25	E
Engine oil drain bolt	—	M14	1	43	4.3	31	
Oil strainer housing	Bolt	M6	2	10	1.0	7.2	L
Oil/water pump assembly driven sprocket cover	Bolt	M6	1	12	1.2	8.7	L
Oil delivery pipe	Bolt	M6	1	10	1.0	7.2	L
Oil filter bolt	Bolt	M20	1	70	7.0	51	
Oil filter cartridge	—	M20	1	17	1.7	12	E
Oil strainer cover	Bolt	M6	15	10	1.0	7.2	L
Air cleaner case	Screw	M5	8	4	0.4	2.9	
Frame and air cleaner	Bolt	M6	1	10	1.0	7.2	
Cylinder head and throttle body and air cleaner case	Clamp	M4	8	3.0	0.3	2.2	
Ring nut and cylinder head	Nut	M8	8	20	2.0	14	
Exhaust pipe and muffler	Bolt	M8	1	20	2.0	14	
Emission check bolt	Bolt	M6	4	10	1.0	7.2	
EXUP pulley cover	Bolt	M6	3	10	1.0	7.2	
EXUP cable bracket	Bolt	M6	2	10	1.0	7.2	

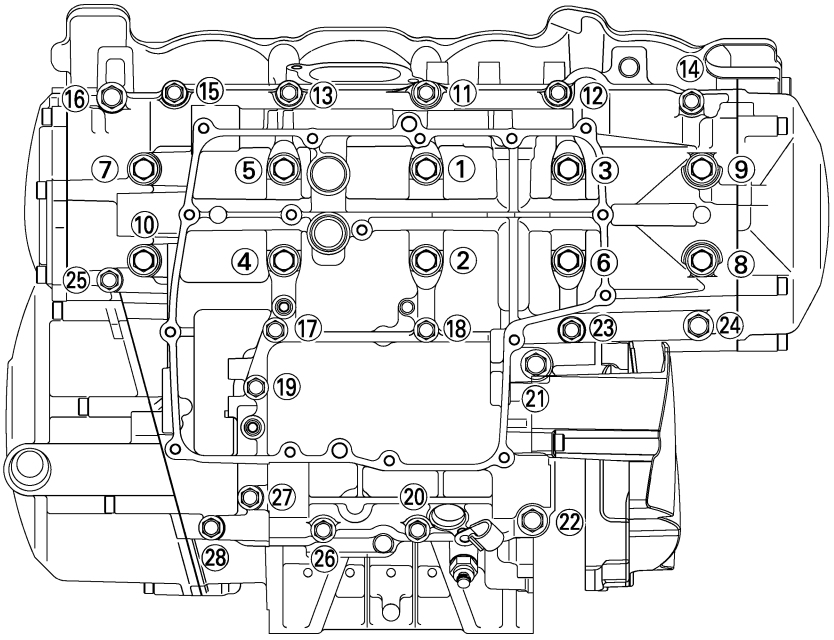
Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Exhaust pipe and exhaust valve	Bolt	M6	4	10	1.0	7.2	
Exhaust valve and housing	Bolt	M6	3	10	1.0	7.2	
EXUP pulley and arm shaft	Bolt	M5	2	5	0.5	3.6	
Exhaust joint	Bolt	M4	4	3	0.3	2.2	
Exhaust valve pipe	Bolt	M8	1	20	2.0	14	
Air induction system pipe	Clamp	—	4	3.5	0.35	2.5	
Crankcase (cylinder head)	Stud bolt	M10	10	10	1.0	7.2	E
Crankcase (upper and lower)	Bolt	M9	10	See NOTE.			E
Crankcase (upper and lower)	Bolt	M6	2	14	1.4	10	E
Crankcase (upper and lower)	Bolt	M6	14	12	1.2	8.7	E
Crankcase (upper and lower)	Bolt	M8	2	24	2.4	17	E
AC magneto cover	Bolt	M6	9	12	1.2	8.7	
Drive sprocket cover	Bolt	M6	2	10	1.0	7.2	
Drive sprocket cover	Bolt	M6	1	10	1.0	7.2	LT
Plate	Bolt	M6	1	10	1.0	7.2	
Clutch cover	Bolt	M6	8	12	1.2	8.7	
Pick up rotor cover	Bolt	M6	8	12	1.2	8.7	
Shift shaft cover	Bolt	M6	5	12	1.2	8.7	
Breather plate	Bolt	M6	5	10	1.0	7.2	LT
Timing mark accessing screw	Bolt	M8	1	15	1.5	11	
Starter clutch idle gear shaft	Bolt	M6	1	10	1.0	7.2	
Starter one-way clutch	Bolt	M6	3	12	1.2	8.7	LT
Clutch boss	Nut	M20	1	105	10.5	76	Use a lock washer. LT
Clutch spring	Bolt	M6	6	8	0.8	5.8	
Drive sprocket	Nut	M22	1	85	8.5	61	Use a lock washer.
Main axle bearing housing	Screw	M6	3	12	1.2	8.7	LT
Shift lever stopper	Bolt	M6	2	10	1.0	7.2	LT
Stopper screw	Screw	M8	1	22	2.2	16	LT
Shift rod	Nut	M6	1	6.5	0.65	4.7	Left thread
Shift rod	Nut	M6	1	6.5	0.65	4.7	
Shift rod joint	Bolt	M6	1	10	1.0	7.2	LT
Shift arm	Bolt	M6	1	10	1.0	7.2	
AC magneto stator coil	Screw	M6	3	14	1.4	10	LT
ECU	Screw	M6	2	7	0.7	5.1	
Neutral switch	—	M10	1	20	2.0	14	
Pick up coil	Bolt	M6	2	10	1.0	7.2	LT
Thermo unit	—	M12	1	18	1.8	13	

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
EXUP servo motor cover	Screw	M5	2	2	0.2	1.4	
Intake air temperature sensor	—	M12	1	18	1.8	13	
Cylinder identification sensor	Bolt	M6	1	10	1.0	7.2	◆
Atmospheric pressure sensor	Screw	M5	2	7	0.7	5.1	
Speed sensor	Bolt	M6	1	10	1.0	7.2	
Stator coil clamp	Bolt	M6	1	10	1.0	7.2	◆

NOTE:

1. First, tighten the bolt to approximately 20 Nm (2.0 m • kg, 14 ft • lb) with a torque wrench.
2. Retighten the bolt to 20 Nm (2.0 m • kg, 14 ft • lb), and tighten another 41 ~ 46° with a angle gauge or 32 Nm (3.2 m • kg, 23 ft • lb) with a torque wrench.

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	
Steering stem nut	M28	115	11.5	83	
Handlebar and front fork	M6	13	1.3	9.4	
Handlebar and upper bracket	M6	13	1.3	9.4	
Lower ring nut	M30	9	0.9	6.5	See NOTE
Lower bracket pinch bolt	M8	23	2.3	17	
Main switch and handle crown	M8	26	2.6	19	
Brake fluid reservoir 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	9	0.9	6.5	
Meter and cowling stay	M5	1	0.1	0.7	
Headlight and cowling stay	M5	1	0.1	0.7	
Upper cowling and headlight	M5	1	0.1	0.7	
Side, bottom cowling and frame, engine	M6	5	0.5	3.6	
Wind screen and upper cowling	M5	0.4	0.04	0.3	
Side cowling and console panel	M5	1	0.1	0.7	
Side cowling and inner panel	M5	1	0.1	0.7	
Grip end and handlebar	M6	4	0.4	2.9	
Brake hose holder and under bracket	M6	7	0.7	5.1	
Engine mounting					
Front mounting bolts	M10	45	4.5	33	
Rear mounting bolts (upper and lower)	M10	50	5.0	36	
Pinch bolts (front)	M8	24	2.4	17	
Engine mount adjust bolt (rear)	M16	7	0.7	5.1	
Exhaust pipe bracket and frame	M8	34	3.4	25	
Clutch cable adjuster lock nut (engine side)	M8	7	0.7	5.1	
Main frame and rear frame	M10	40	4.0	29	
Throttle cable adjuster lock nut (engine side)	M6	5	0.5	3.6	
Pivot shaft nut	M18	105	10.5	76	
Pivot shaft adjust bolt	M25	5	0.5	3.6	
Connecting arm and frame	M10	45	4.5	33	
Relay arm and connecting rod	M10	45	4.5	33	
Relay arm and swingarm	M10	45	4.5	33	
Rear shock absorber and relay arm	M10	45	4.5	33	
Rear shock absorber and frame	M10	45	4.5	33	
Drive chain guard	M6	7	0.7	5.1	
Fuel tank and fuel pump	M5	4	0.4	2.9	
Fuel tank stay and frame (front)	M6	7	0.7	5.1	
Fuel tank and stay (rear)	M6	10	1.0	7.2	
Fuel tank and fuel tank side cover	M5	4	0.4	2.9	
Rider seat and frame	M6	7	0.7	5.1	

Item	Thread size	Tightening			Remarks
		Nm	m·kg	ft·lb	
Coolant reservoir and radiator	M6	5	0.5	3.6	
Tail cowling and frame	M5	4	0.4	2.9	
Battery box and frame	M6	7	0.7	5.1	
Taillight and battery box	M5	3	0.3	2.2	
ECU and battery box	M6	1	0.1	0.7	
Passenger seat lock and battery box	M6	3	0.3	2.2	
Atmospheric pressure sensor and battery box	M5	0.7	0.07	0.5	
Lean angle cut-off switch sensor and battery box	M4	2	0.2	1.4	
Rider footrest bracket and frame	M8	28	2.8	20	
Passenger footrest bracket and frame	M8	28	2.8	20	
Rear master cylinder	M6	18	1.8	13	
Rear brake hose union bolts	M10	30	3.0	22	
Sidestand	M10	63	6.3	46	
Front wheel axle and bolt	M14	90	9.0	65	
Rear wheel axle nut	M24	150	15.0	108	
Front brake caliper and front fork	M10	40	4.0	29	
Brake disc and wheel	M6	18	1.8	13	
Rear wheel sprocket and rear wheel drive hub	M10	100	10	72	
Brake caliper and bleed screw	M8	6	0.6	4.3	
Pinch bolt (front wheel axle)	M8	18	1.8	13	

NOTE:

1.First, tighten the ring nut to approximately 50 Nm (5.0 m • kg, 36 ft • lb) with a torque wrench, then loosen the ring nut completely.

2.Retighten the lower ring nut to specification.

EAS00031
LUBRICATION POINTS AND LUBRICANT TYPES
ENGINE

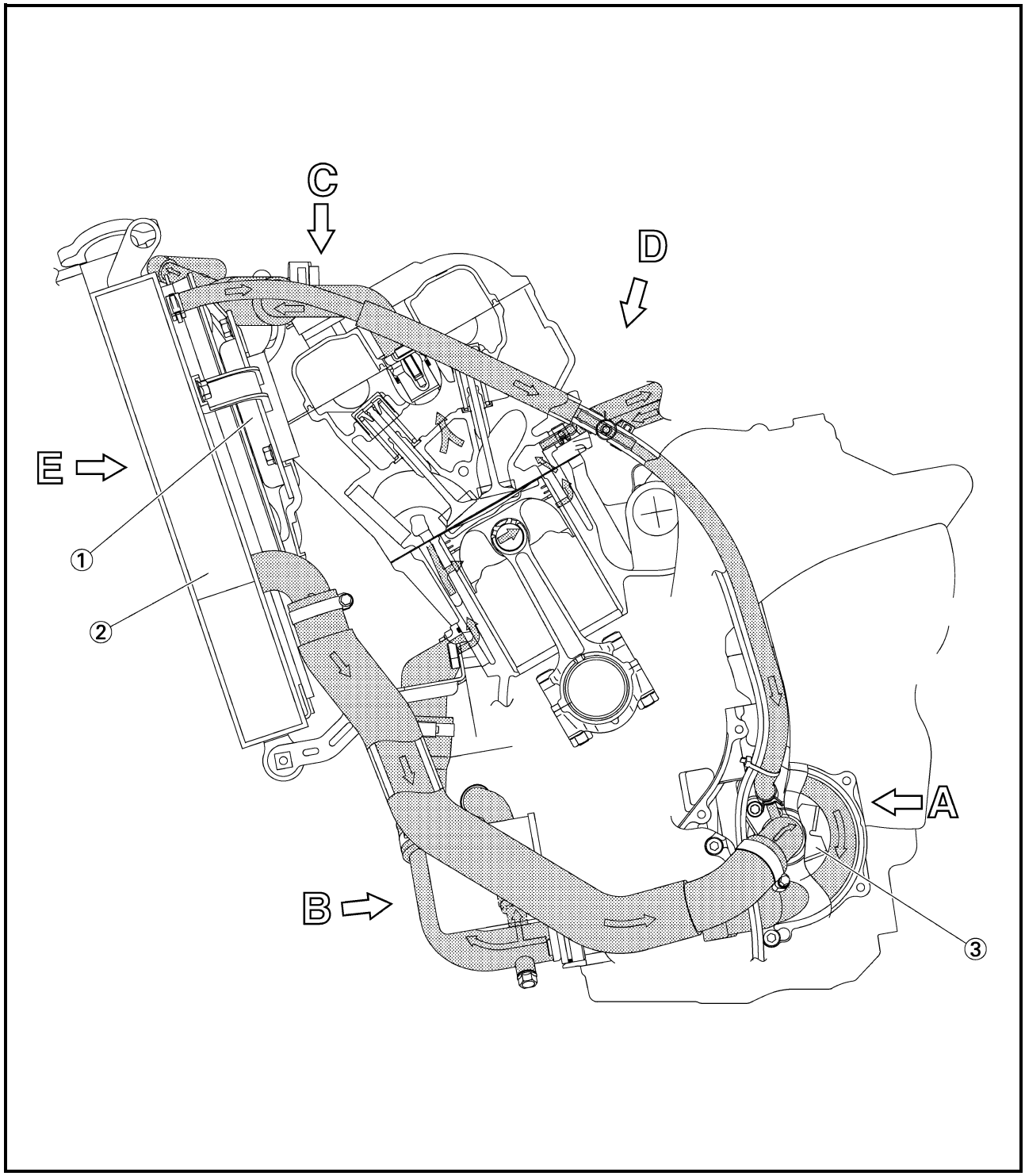
Lubrication point	Lubricant
Oil seal lips	LS
O-rings	LS
Bearings	E
Crankshaft pins	E
Piston surfaces	E
Piston pins	E
Connecting rod bolts and nuts	M
Crankshaft journals	E
Camshaft lobes	M
Camshaft journals	M
Valve stems (intake and exhaust)	M
Valve stem ends (intake and exhaust)	E
Water pump impeller shaft	E
Oil pump rotors (inner and outer)	E
Oil pump housing	E
Oil strainer	E
Clutch (pull rod)	LS
Oil/water pump drive sprocket and washer	E
Clutch (thrust plate)	E
Starter clutch idle gear inner surface	E
Starter clutch assembly	E
Primary driven gear	E
Transmission gears (wheel and pinion)	M
Main axle and drive axle	M
Shift drum	E
Shift forks and shift fork guide bars	E
Shift shaft	E
Shift shaft boss	E
Cylinder head cover mating surface	Yamaha bond No. 1215
Crankcase mating surface	Yamaha bond No. 1215
Clutch cover (crankcase mating surface)	Yamaha bond No. 1215
Generator rotor cover (crankcase mating surface)	Yamaha bond No. 1215
Pickup rotor cover	Yamaha bond No. 1215

EAS00032
CHASSIS

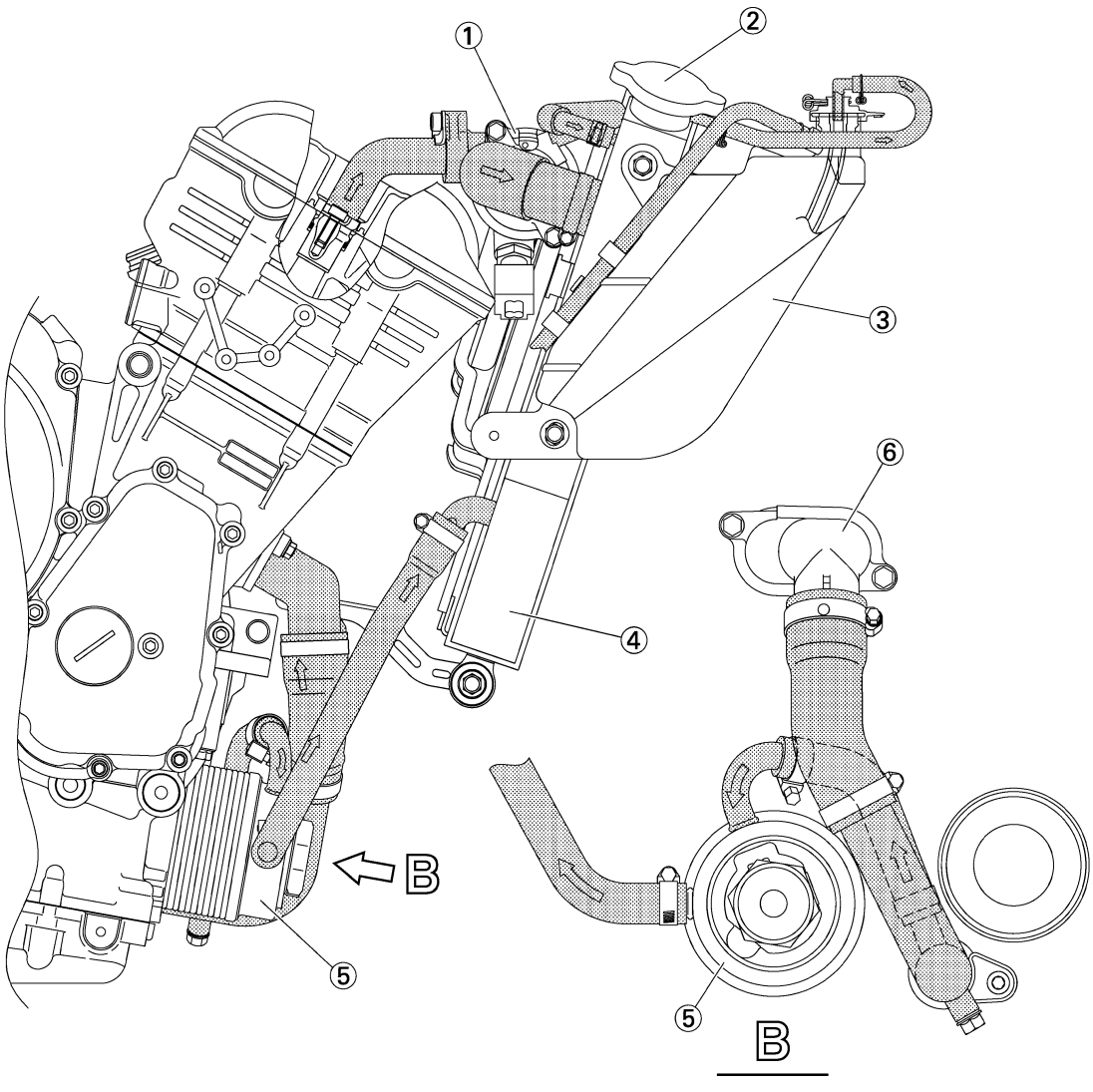
Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	LS
Front wheel oil seal (right and left)	LS
Rear wheel oil seal	LS
Rear wheel drive hub oil seal	LS
Rear wheel drive hub mating surface	LS
Rear brake pedal shaft	LS
Sidestand pivoting point and metal-to-metal moving parts	LS
Throttle grip inner surface	LS
Brake lever pivoting point and metal-to-metal moving parts	LS
Clutch lever pivoting point and metal-to-metal moving parts	LS
Relay arm, connecting rod and rear shock absorber collar	LS
Pivot shaft	LS
Swing arm pivot bush	LS
Swing arm head pipe end and oil seal	LS
Oil seal (relay arm and connecting arm)	LS

EAS00033
COOLING SYSTEM DIAGRAMS

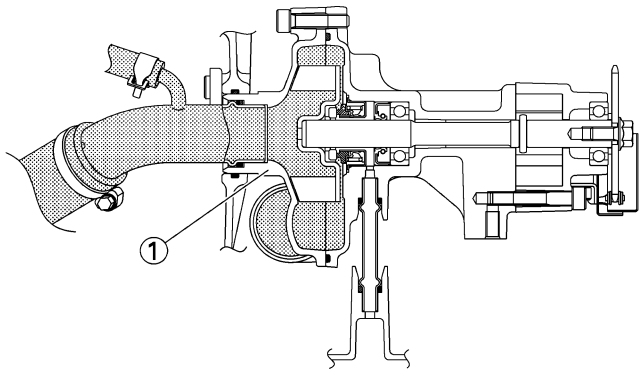
① Radiator fan
② Radiator
③ Water pump



① Thermostat
② Radiator cap
③ Coolant reservoir
④ Radiator
⑤ Oil cooler
⑥ Water jacket joint



① Water pump
② Radiator cap
③ Thermostat
④ Thermostat housing



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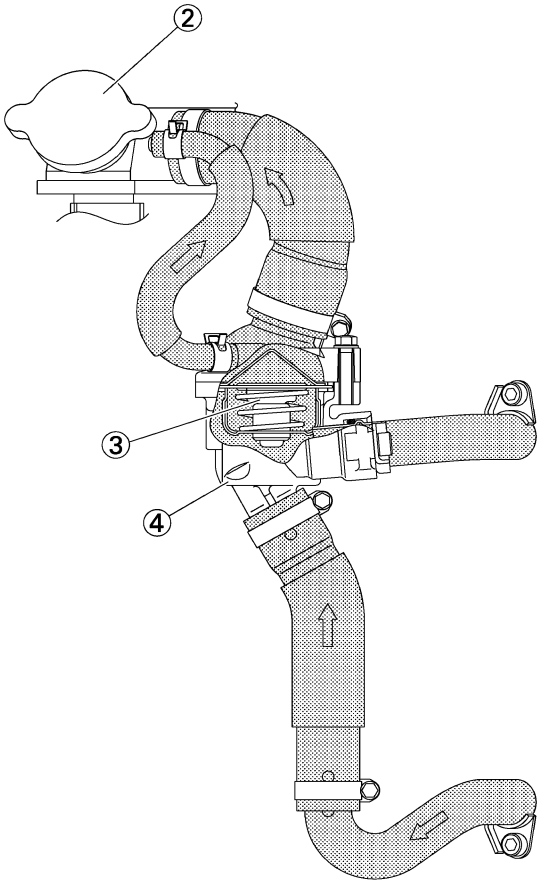

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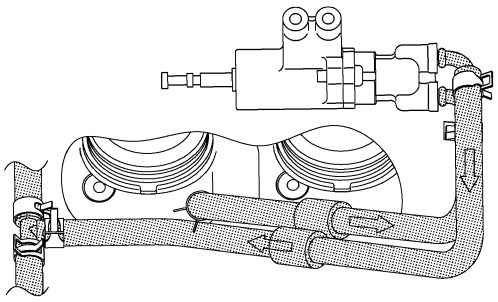
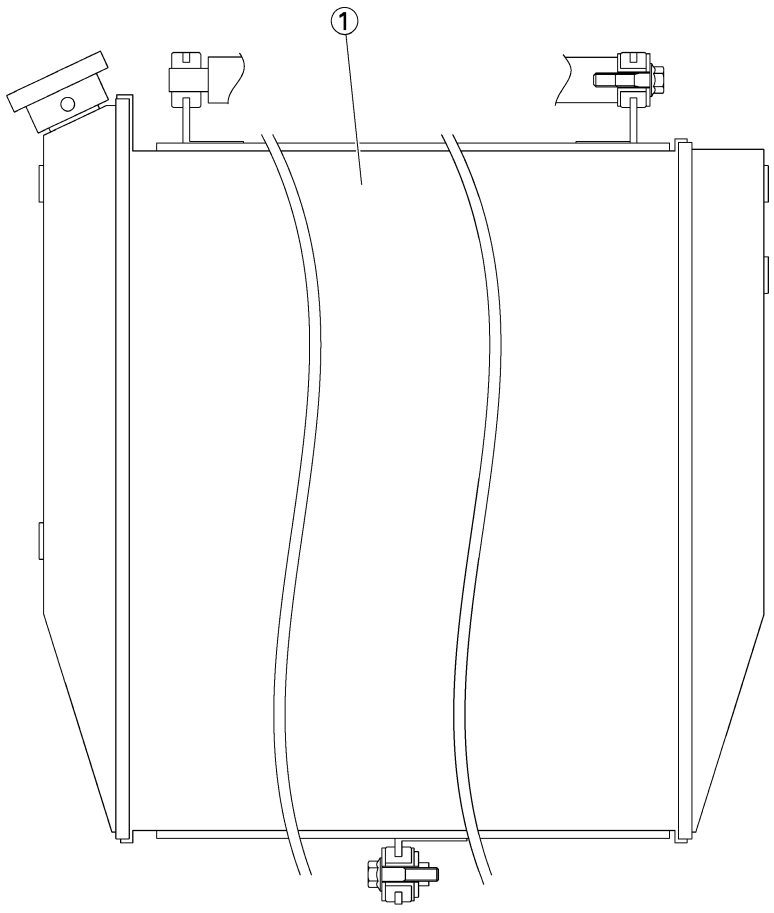
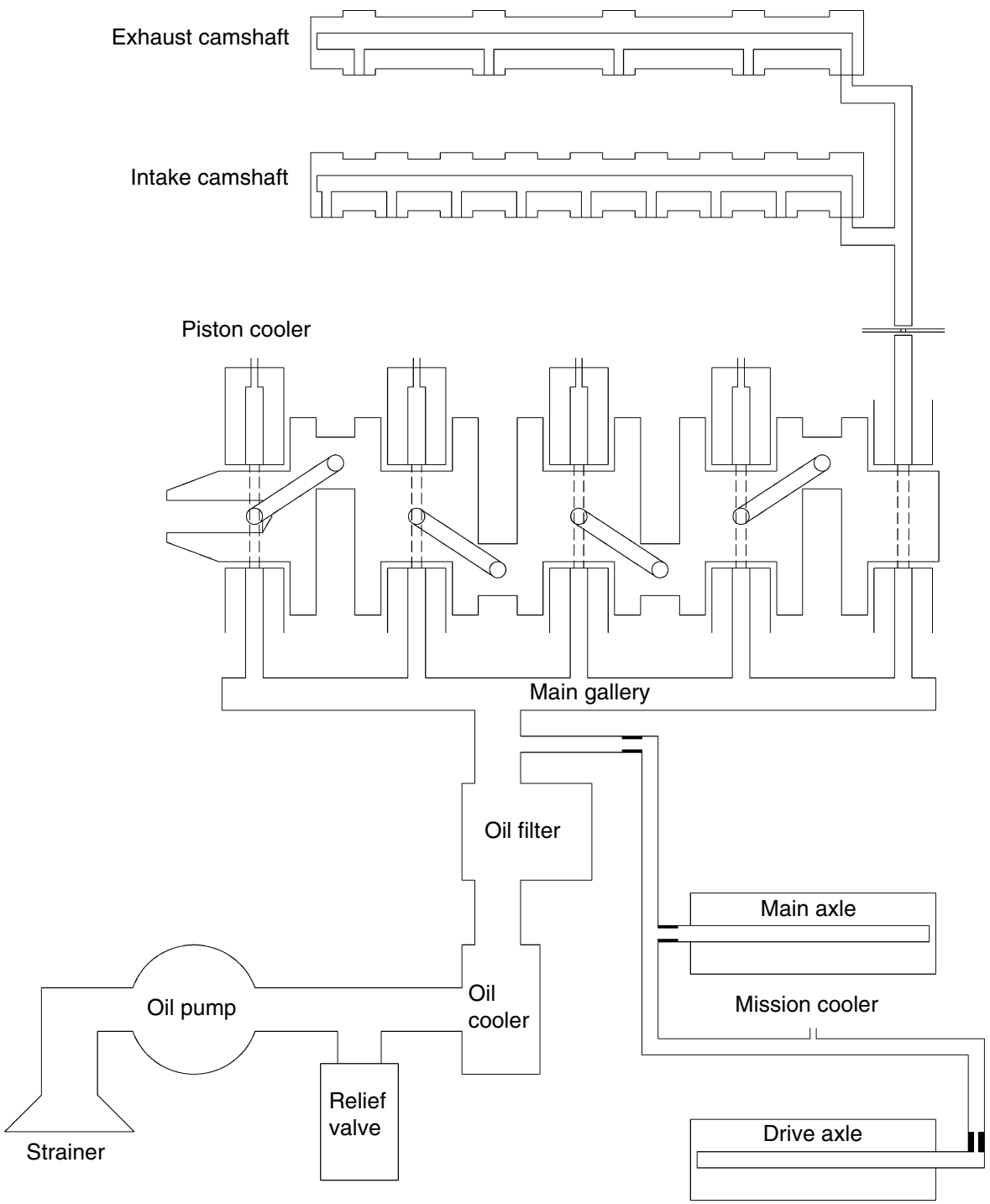


D

① Radiator

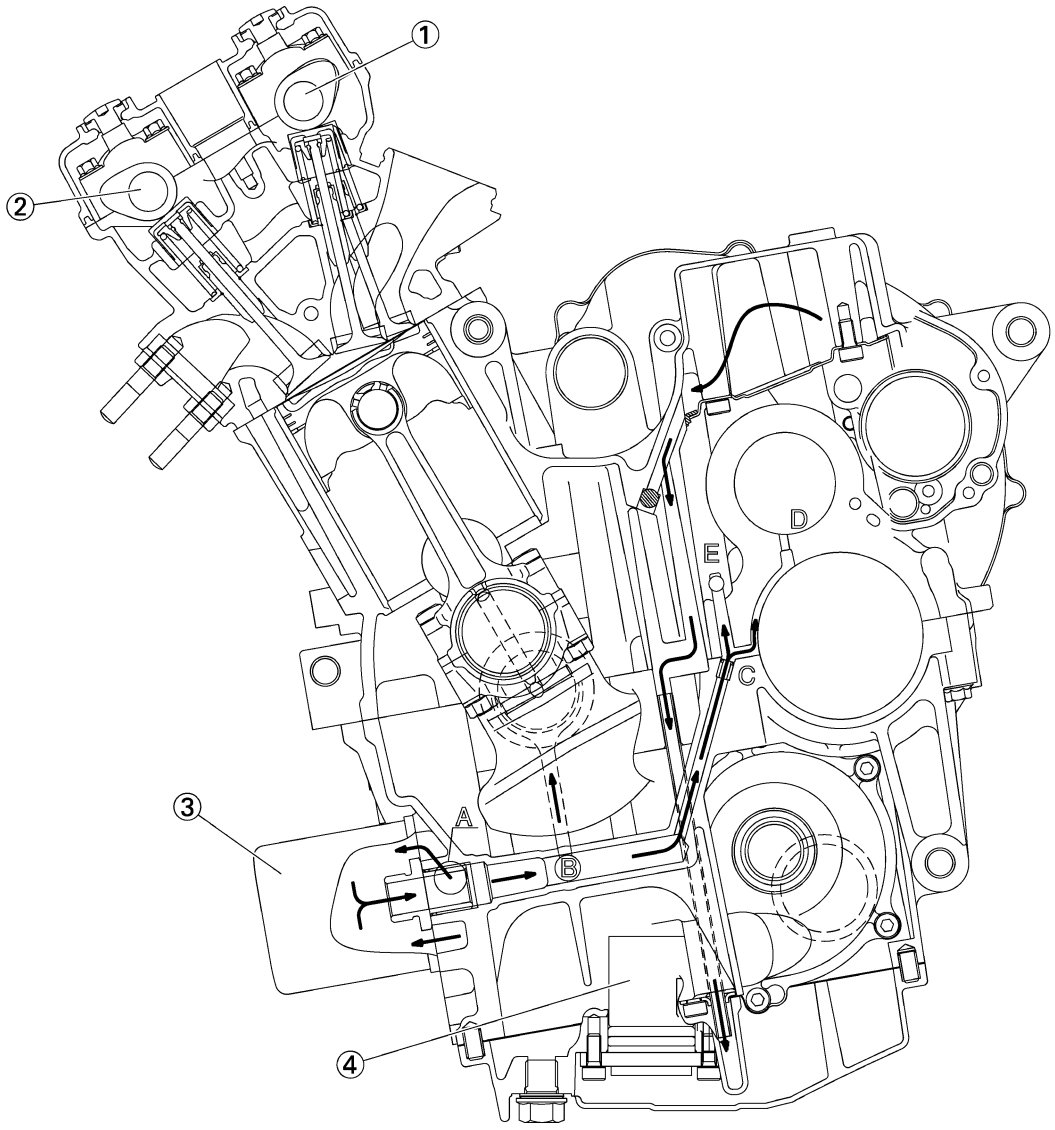


ENGINE OIL LUBRICATION CHART

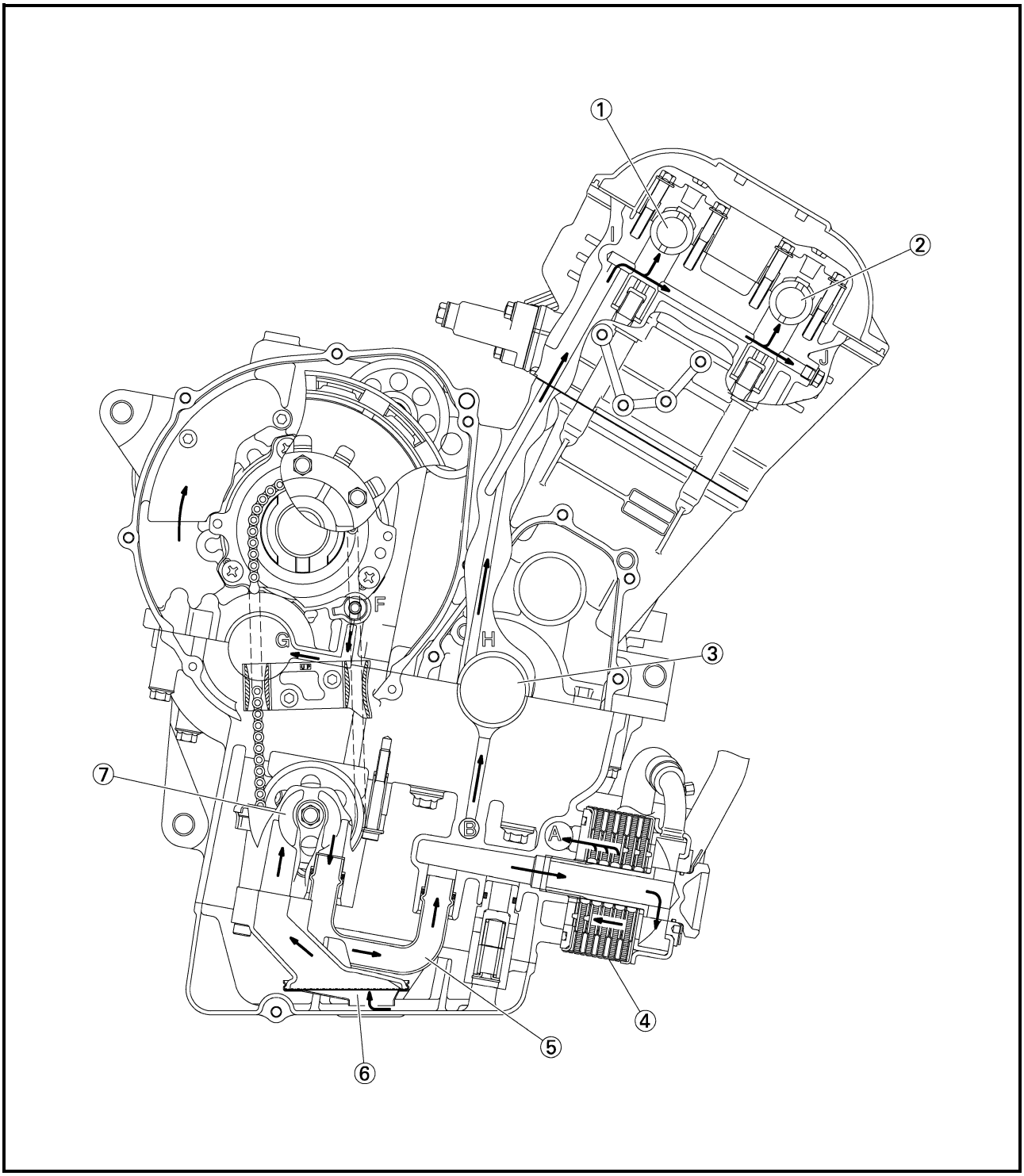


EAS00034
LUBRICATION DIAGRAMS

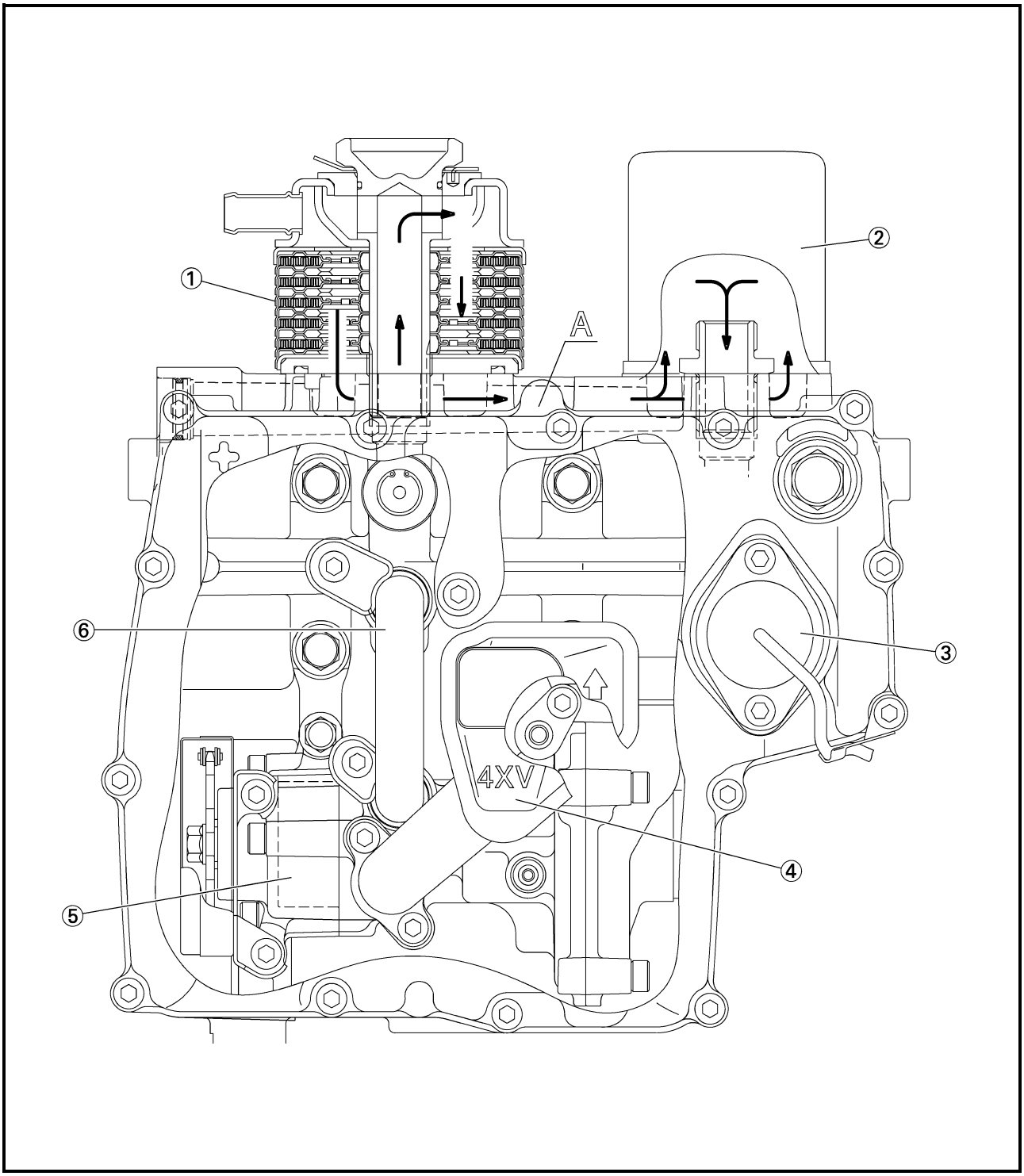
① Intake camshaft
② Exhaust camshaft
③ Oil filter cartridge
④ Oil level switch



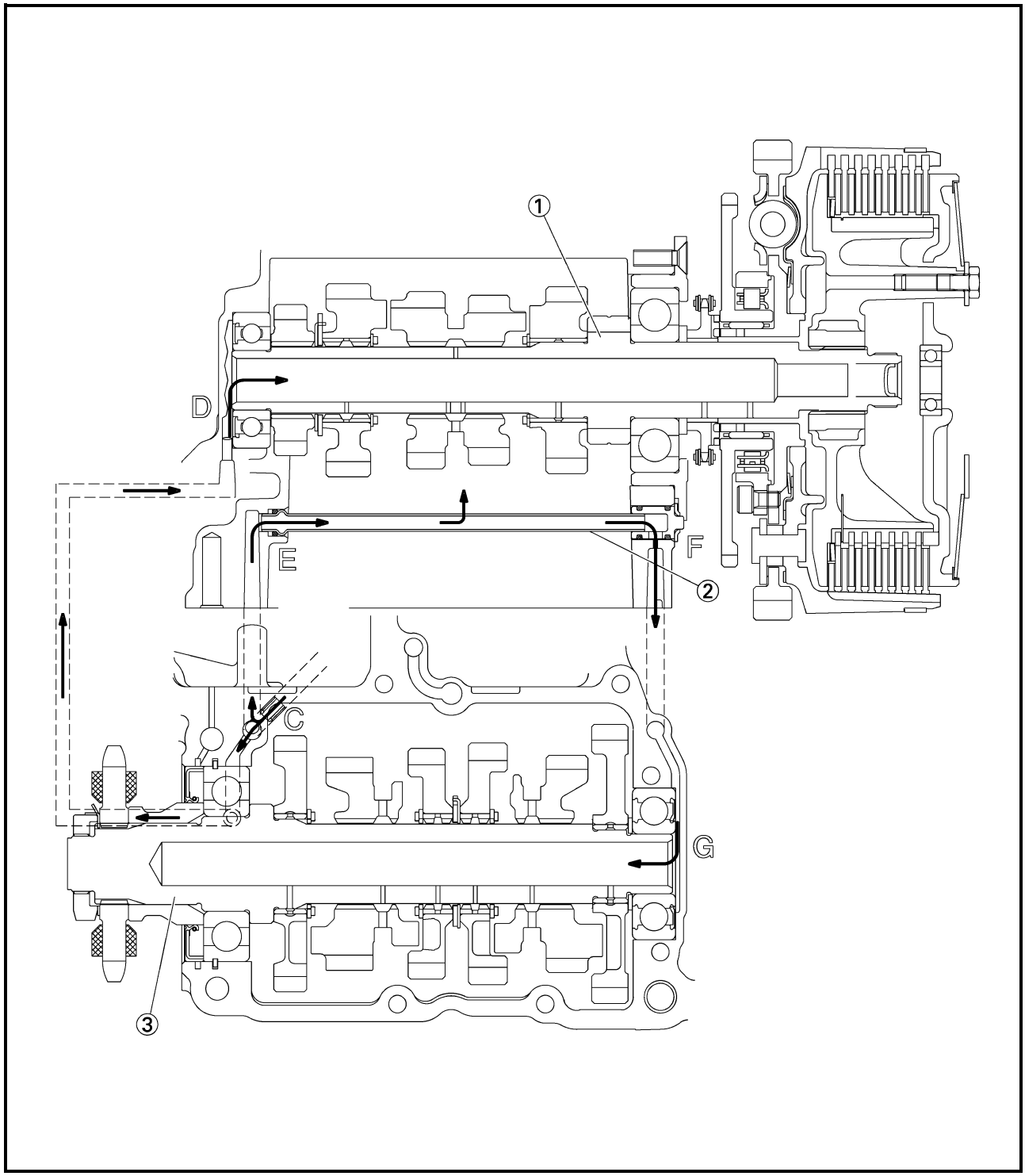
① Intake camshaft
② Exhaust camshaft
③ Crankshaft
④ Oil cooler
⑤ Oil pipe
⑥ Oil strainer
⑦ Oil pump



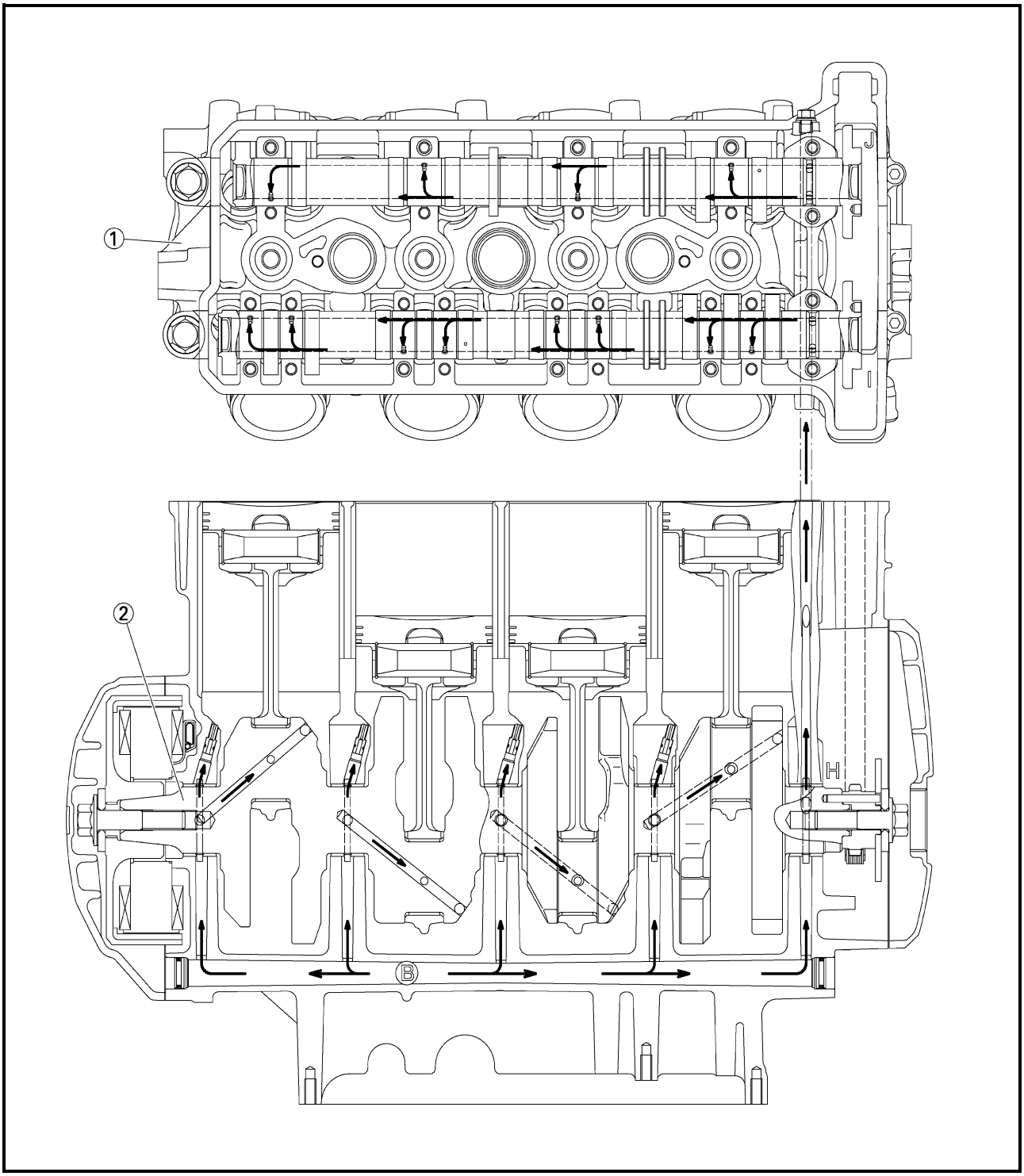
① Oil cooler
② Oil filter cartridge
③ Oil level switch
④ Oil strainer
⑤ Oil pump
⑥ Oil pipe



① Main axle
② Oil delivery pipe
③ Drive axle



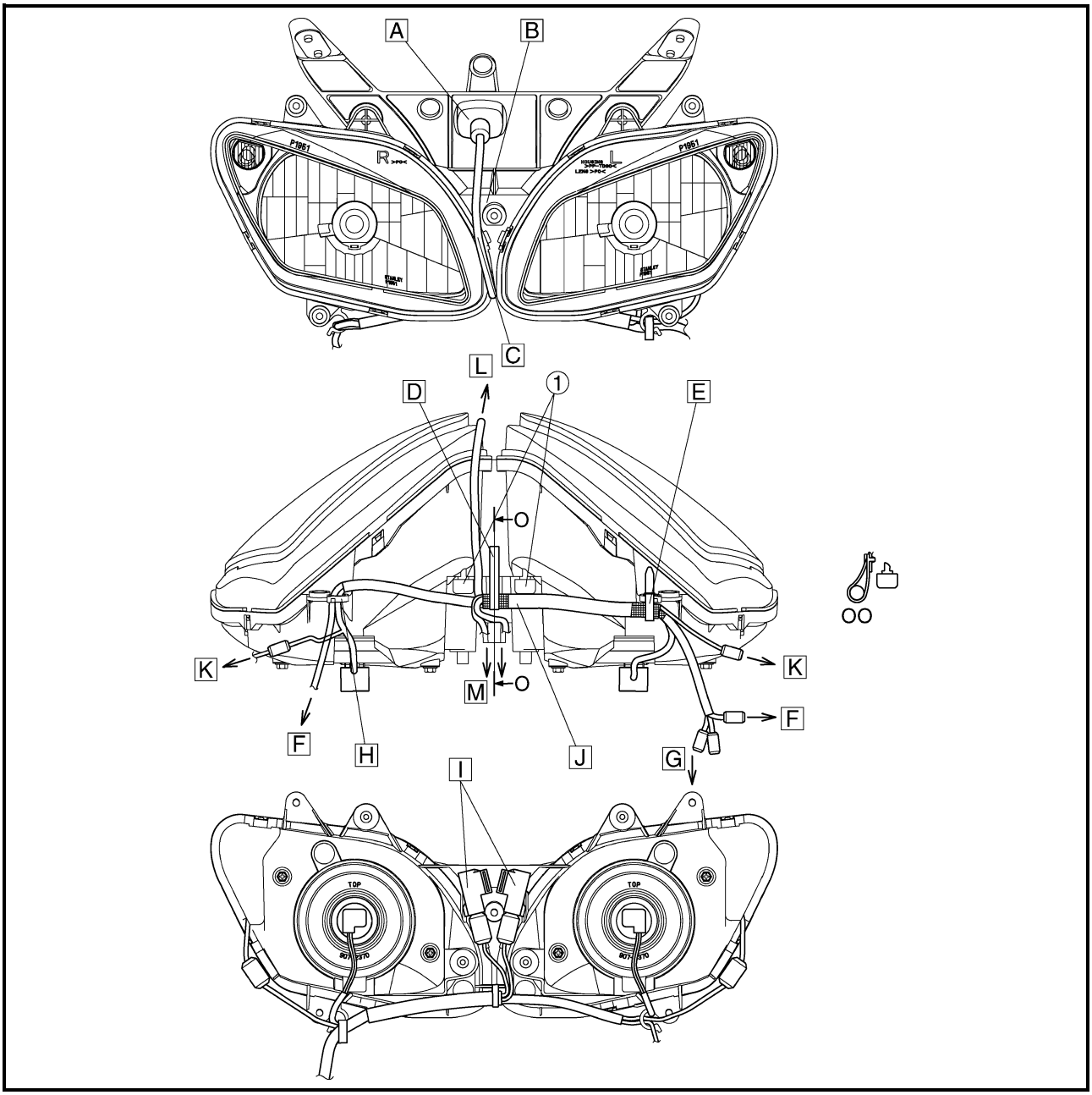
① Cylinder head
② Crankshaft



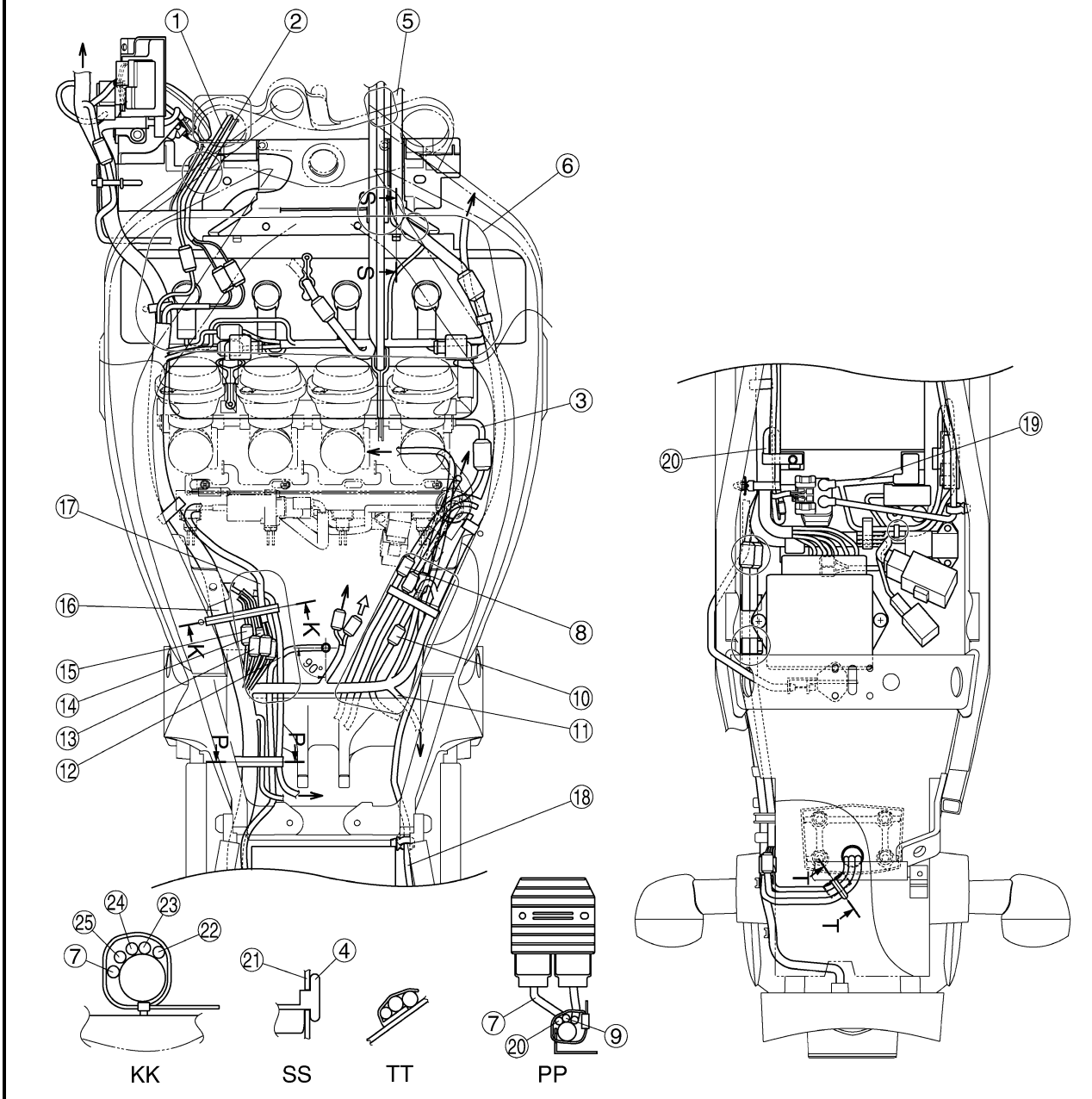
EAS00035
CABLE ROUTING

① Headlight drain plug

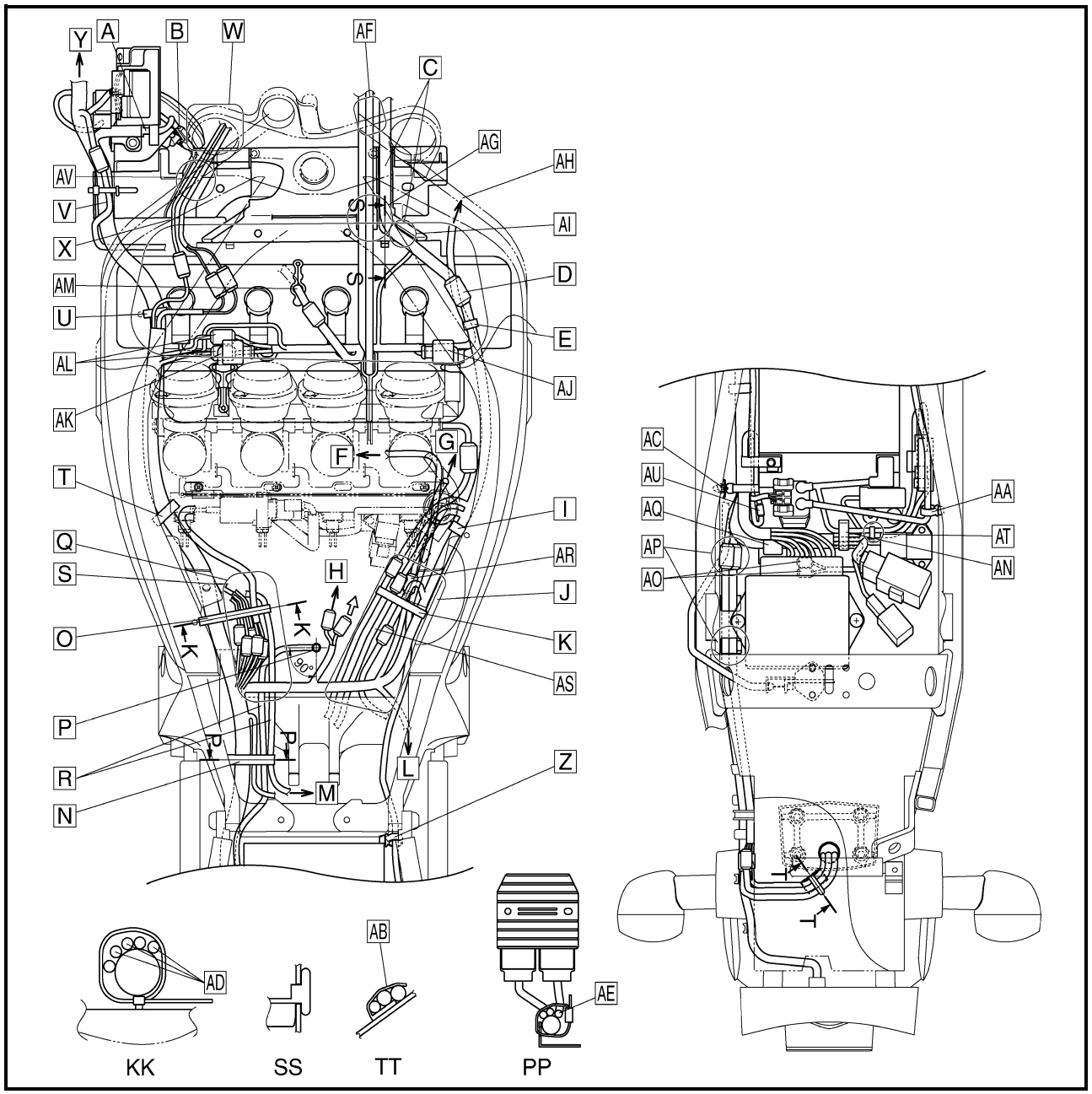
A Make sure to securely insert the coupler and boot.
B The headlight lead can be routed by either of the headlight or the boss. Do not catch the headlight lead when assembling the front cowling.
C Do not make the lead stretch too much.
D Secure the junction of the cord headlight at the place of white tape.
E Secure the junction of headlight lead (including the headlight leads and position lamp leads) at the place of white tape with the clamp behind the pawl of headlight body.
F To turn signal light
G To main harness
H Route the junction of the headlight, position lamp and turn signal light leads through the pawl on the headlight body. (Pay attention to the direction.)
I Insert the headlight relay to the rib of the headlight body. (No special roder is specified for right and left.)
J Route the headlight lead behind the cap of headlight breather hole. (It can be routed below, but should not be in front of the cap.)
K To the auxiliary light lead
L To meter assembly
M To headlight relay



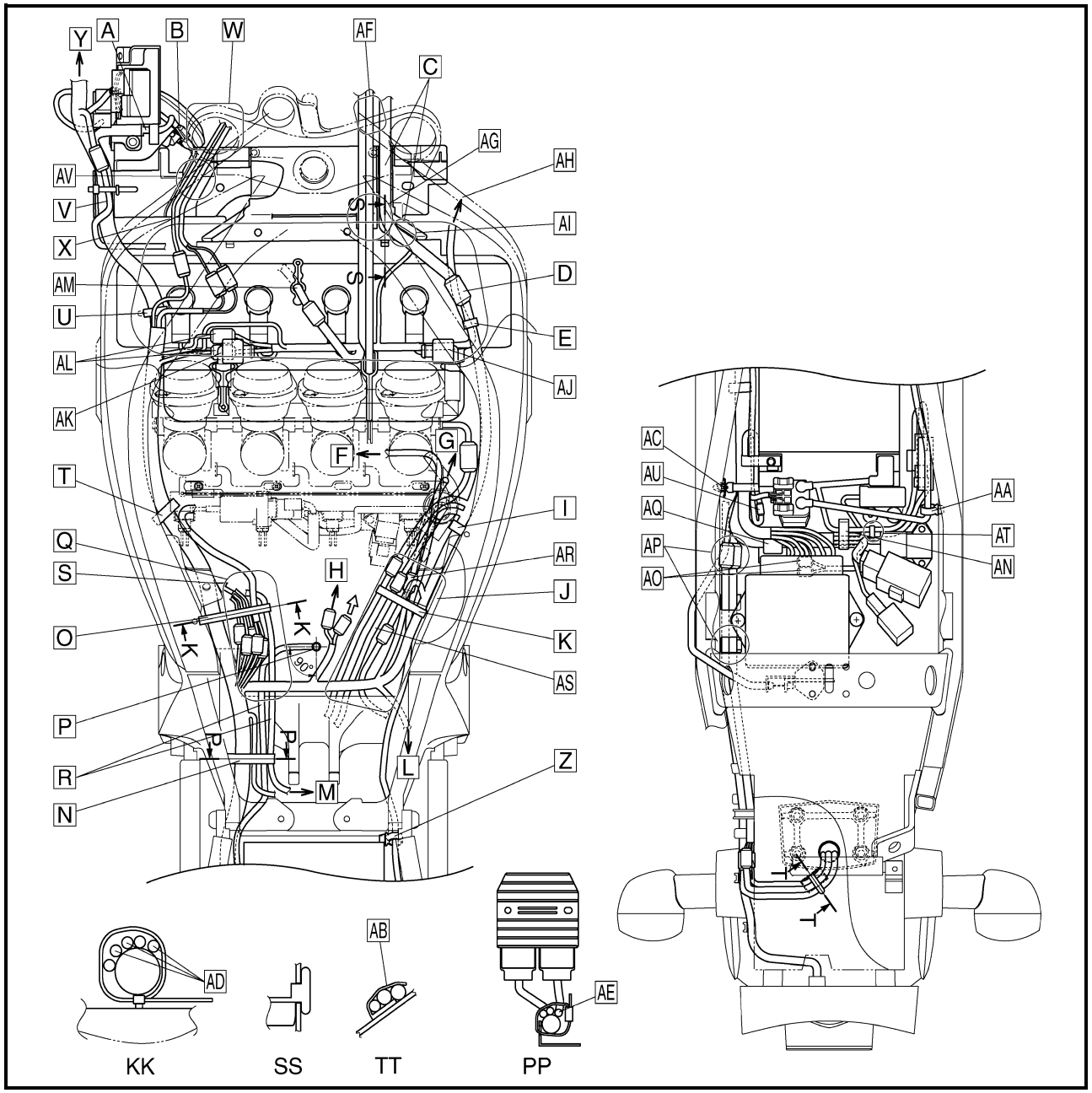
① Handlebar switch (left)
② Main switch
③ Throttle position sensor lead
④ Guide-air
⑤ Handlebar switch (right)
⑥ Wiring section 1
⑦ AC magneto lead
⑧ Speed sensor lead
⑨ (–) lead
⑩ Rear brake switch lead
⑪ EXUP servo motor lead
⑫ AC magneto lead
⑬ AI system lead
⑭ Oil level switch lead
⑮ Sidestand switch lead
⑯ Wire harness assembly
⑰ Injector sub lead
⑱ Starter lead
⑲ (+) lead
⑳ (–) lead
㉑ Cover 1
㉒ Injector sub lead
㉓ AI system lead
㉔ Oil level switch lead
㉕ Sidestand switch lead



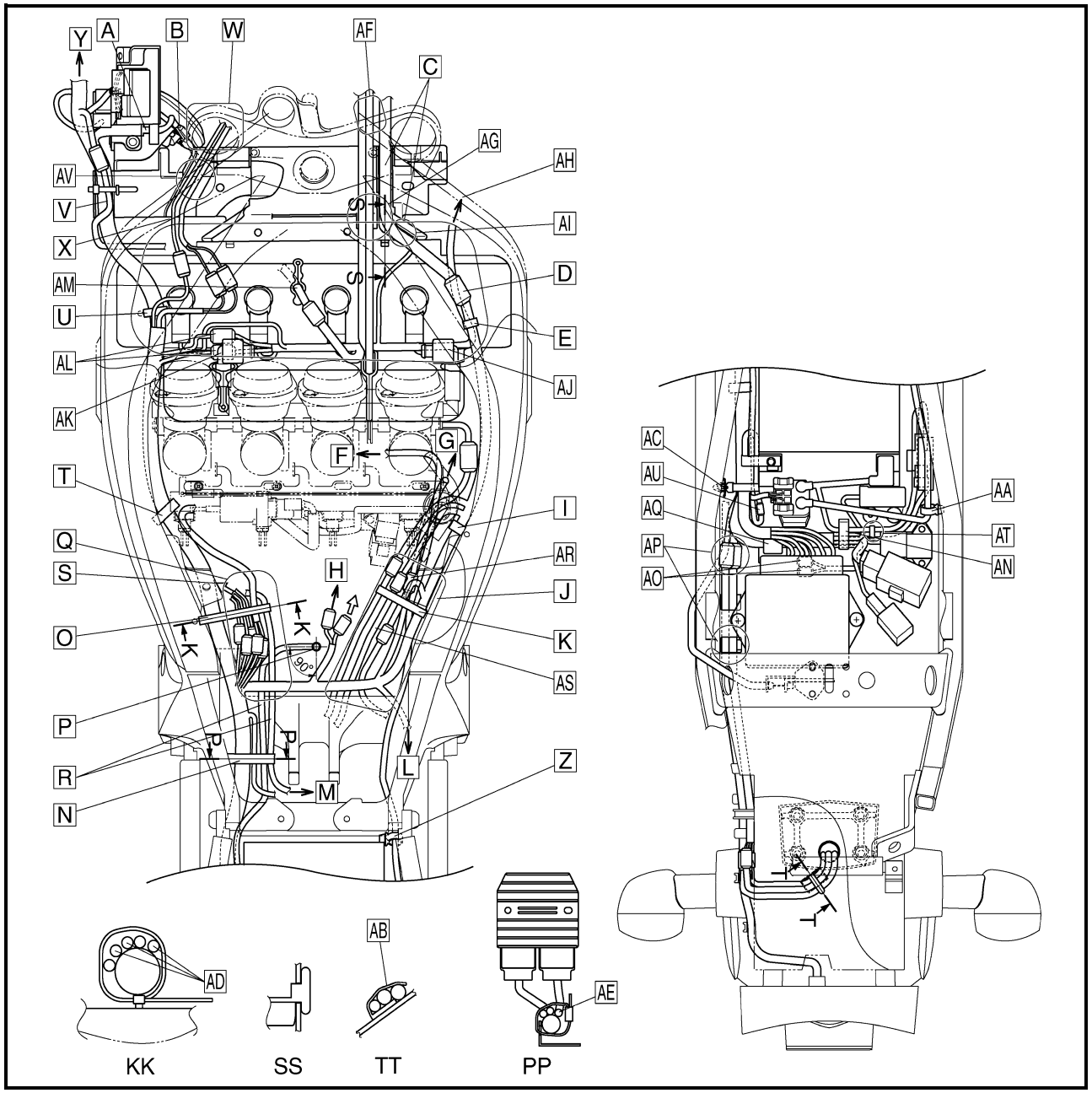
[A] Route the horn lead under the rib of bracket horn positioning the stepped part of protector outside the rib.
[B] Make the horn lead face the outside.
[C] Route the handlebar switch lead along the groove of the guide-air.
[D] Handlebar switch (right) lead coupler.
[E] Fasten the wire harness and coolant temperature sensor lead with the clamp inserted to the frame. Point the clamp tip downward.
[F] To starter motor
[G] To pick-up coil
[H] To fuel pump
[I] Insert the holding clamp of the wire harness to the frame. Route the starter motor lead and crankshaft position sensor lead under the throttle body.
[J] Wiring section [3]
[K] Connect the leads behind the clamp. (without crankshaft position sensor lead)
Fasten the wire harness, speed sensor, neutral switch, rear brake switch, pick-up coil and starter leads with the clamp inserted to the frame.
[L] EXUP servo motor
[M] To rectifier regulator
[N] Fasten the wire harness, (–) lead, AC magneto lead and rectifier regulator lead junction with the clamp inserted to the box battery.
[O] Fasten the wire harness, AI system lead, AC magneto lead, oil level gauge lead, sidestand switch lead and injector sub lead with the clamp inserted to the frame.
[P] Pay attention to the direction of installation.
[Q] Connect the leads between the clamp and the junction.
[R] Route the (–) and AC magneto leads under the wire harness.



[S] Route under the wire harness to the assembling point [1].
[T] Insert the holding clamp of the wire harness to the frame.
[U] Fasten the wire harness with the clamp inserted to the frame.
[V] Route the radiator fan motor lead above the wire harness.
[W] Assembling point [3]
Beneath the under bracket
[X] Route the handlebar switch lead and main switch leads along the groove of the guide-air.
[Y] To cord headlight
[Z] Route the starter motor lead through the clamp inserted to the box battery.
[A A] Route the starter motor lead through the clamp inserted to the box battery.
[A B] Clamp the lead as being in parallel along the fender. Make sure to clamp three leads.
[A C] Fasten the wire harness with the clamp inserted to the hole of the box battery.
[A D] Routing position of each lead except the wire harness is not regulated in the clamp.
[A E] Branch from the main harness
[A F] Assembling point [4]
Beneath the under bracket, below the cover steering
[A G] Throttle cable should not be placed on the rib of guide-air.
[A H] To coolant temperature sensor
[A I] Do not pinch the handlebar switch lead when assembling the ignition coil plate.
[A J] Pass the filter of throttle body through the notch of the rubber baffle and release it under the ignition coil plate.

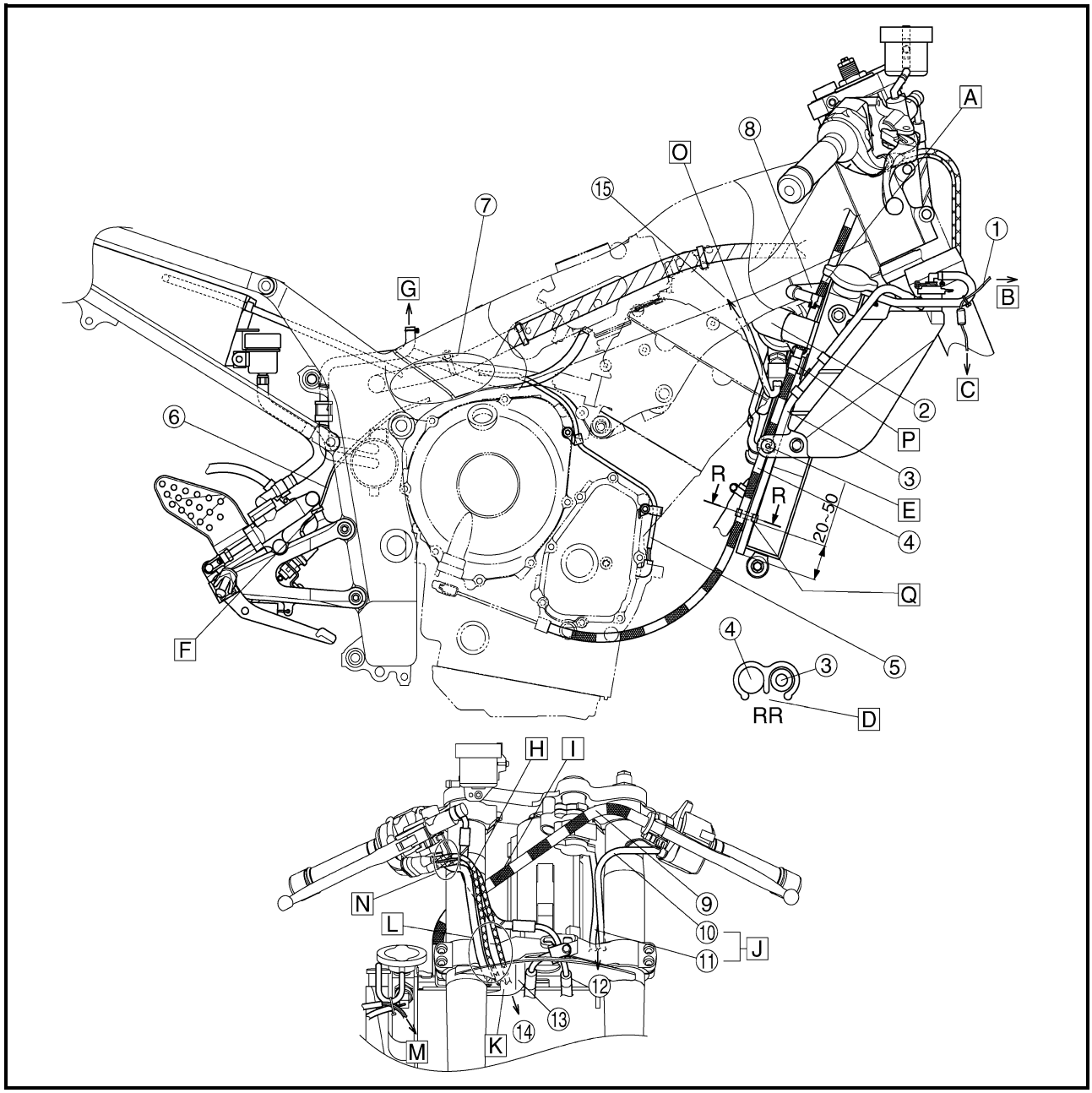


[AK] Pass the filter of throttle body through the hole of rubber baffle and release it under the ignition coil plate.
[AL] Route the sub lead coupler behind the ignition coil.
[AM] Pass the camshaft position sensor lead through the hole of COVER 1 and connect it.
[AN] After branching the harness, clamp each lead of the (+) lead junction, starting circuit cut-off relay, atmosphere pressure sensor, lean angle cut-off switch flasher relay in the lump. Do not clamp the ALARM coupler lead.
[AO] Press the lead of the coupler for ALARM in under the coupler of ECU.
[AP] Pay attention not to allow the lead to slack and get caught after wiring when assembling the side cover.
[AQ] Make sure to hook the harness on the hook of battery box.
[AR] Pick-up coil lead
(Should be wired in front of the clamp.)
[AS] Neutral switch lead
(Should be wired in front of the clamp.)
[AT] Fasten the (+) lead junction lead by hooking on the pawl of the box battery.
[AU] Push the (–) lead coupler into the down side of wire harness clamp.
[AV] Pull in the lead to the position inside the frame until the different color tape attached to the lead is invisible outside the frame bottom edge.

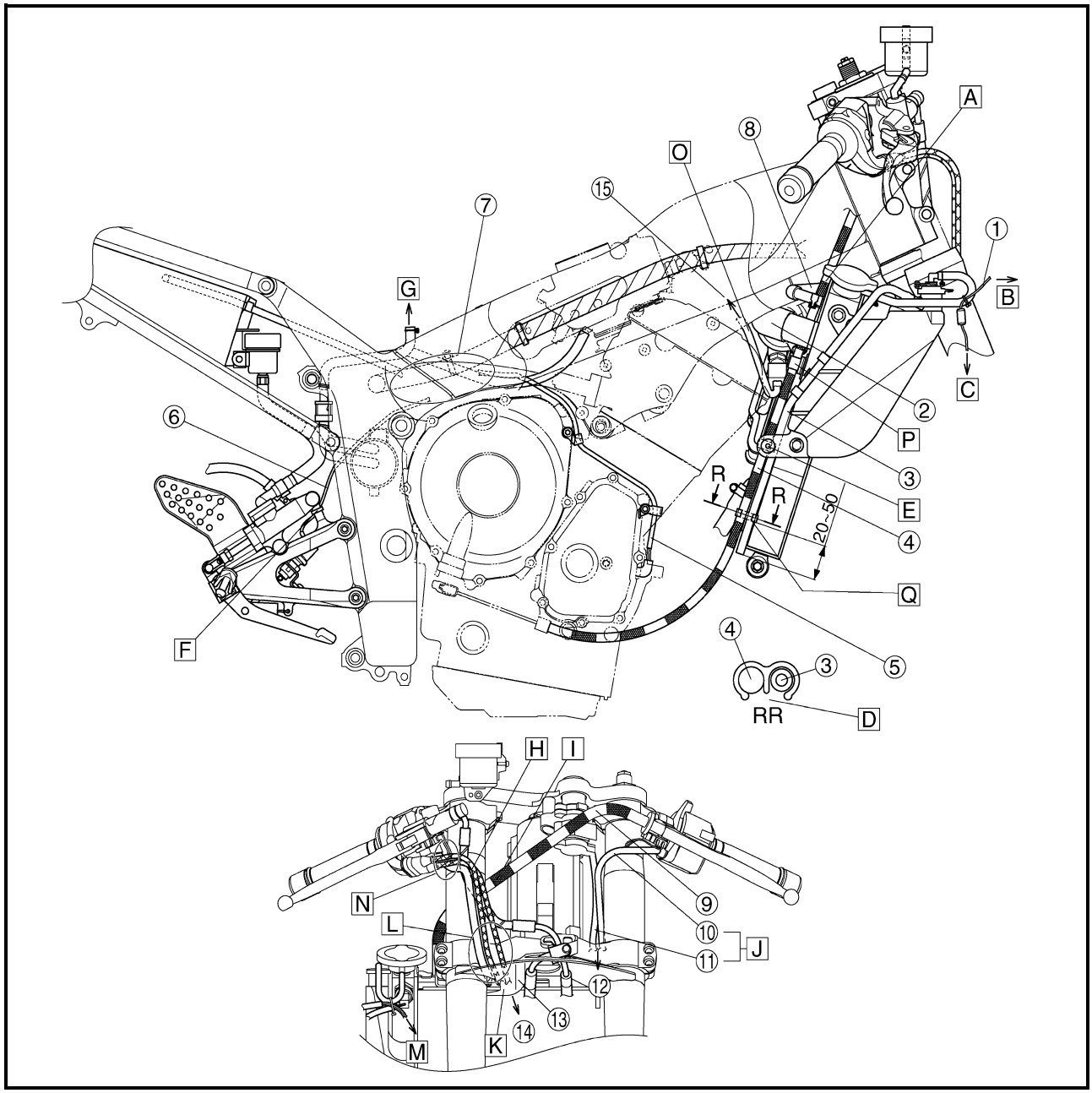


① Turn signal light lead
② Radiator hose
③ Reservoir tank breather hose (L = 440)
④ Clutch cable
⑤ Crankshaft position sensor lead
⑥ Rear brake switch lead
⑦ Wiring section [3]
⑧ Coolant breather hose
⑨ Clutch cable
⑩ Handlebar switch lead
⑪ Main switch lead
⑫ Assembling point [3]
⑬ Cover steering
⑭ Assembling point [4]
⑮ Wiring section [1]

[A] Route the clutch cable through the backward of radiator bracket and inside of coolant breather hose.
[B] To cord headlight
[C] To turn signal light
[D] Point the open side to the vehicle outside.
[E] Fasten the clutch cable with the clamp to the inside of the coolant reservoir tank.
[F] Fasten the sidestand switch lead behind the bracket and cut the tip.
[G] To fuel tank
[H] Pass the throttle cable in front of the brake hose.
[I] Pass the clutch cable behind the front fork.
[J] Pass the handlebar switch lead and main switch lead between the steering stopper and front fork outer tube.
[K] Pass the throttle cable, handlebar switch lead between the under bracket and the cover steering. There should be no twist and crossing of the cable.
[L] In this area, the handlebar switch lead (right side) should not be in front of the throttle cable. It should not cross the throttle cable around the guide-air.

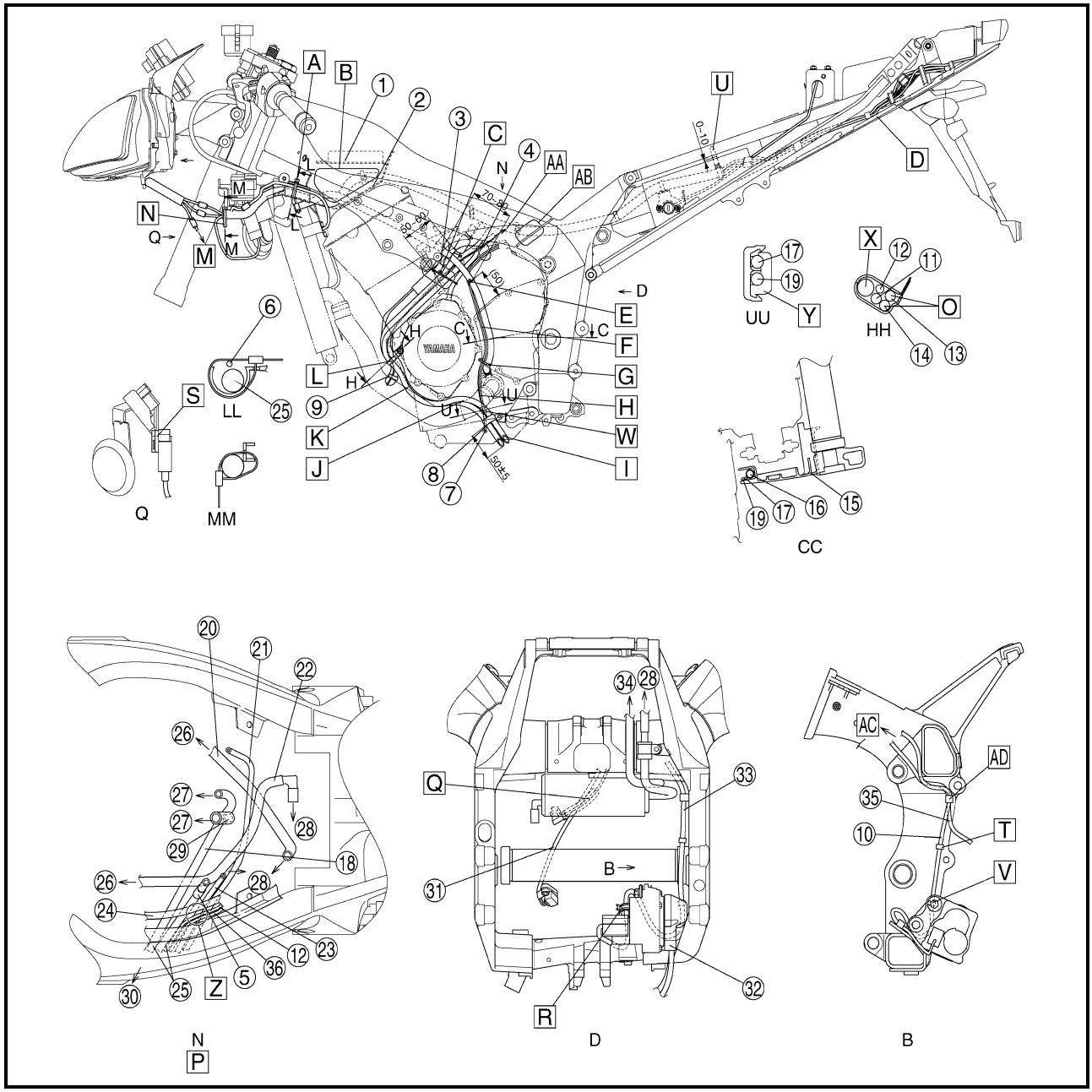


M To turn signal light
N In this area, pass the handlebar switch (right) lead behind of the throttle cable.
O Route the coolant temperature sensor lead between the engine and the radiator hose.
P Route the clutch cable through the inside of radiator hose and fasten it with the clamp to the radiator.
Q Fasten the clutch cable and coolant reservoir tank breather hose with the clamp.



① Ignition coil plate
② Rubber baffle
③ Assembling point 2
④ Assembling point 1
⑤ To wiring section 2
⑥ To wiring sections 2, 3
⑦ Oil level switch lead
⑧ Sidestand switch lead
⑨ Clamp
⑩ EXUP servo motor lead
⑪ Air cleaner drain hose
⑫ AI system lead
⑬ Fuel tank breather hose
⑭ Fuel tank drain hose (No special order is required.)
⑮ Drive sprocket cover
⑯ Radiator hose
⑰ Oil level gauge lead
⑱ AI system hose
⑲ Sidestand switch lead
⑳ Fuel return hose
㉑ Fuel tank breather hose
㉒ Fuel feeder hose
㉓ Fuel tank drain hose
㉔ Injector sub lead
㉕ Wire harness
㉖ To throttle body
㉗ To air cleaner
㉘ To fuel tank
㉙ Crankcase breather hose
㉚ Assembling point 2
㉛ Speed sensor lead
㉜ EXUP servo motor
㉝ EXUP servo motor lead
㉞ To throttle body
㉟ Rear brake switch lead
㊱ AC magneto lead

A Route the wire harness and radiator fan motor lead through the hole of the guide-air and fasten them.
B Wiring section 1
Above rubber buffle
Under ignition coil plate



[C] Clamp the air cleaner drain hose, fuel tank breather hose, drain hose, AI system hose, AI system lead and AC magneto. Route the air cleaner drain hose, fuel tank breather hose and drain hose outside the AI system hose, AI system lead and AC magneto lead. Route the fuel tank reserve hose and fuel tank drain hose underneath AC magneto lead and AI system lead and then to the outside.

[D] House all the leads in the rib of the box battery.

[E] Clamp the oil level gauge, side stand switch lead and radiator hose.

[F] Place the oil level gauge, side stand switch lead and radiator hose in the drive sprocket cover.

[G] Do not pinch the hose.

[H] Pass the oil level gauge lead and sidestand switch lead by the inner side of the coolant hose.

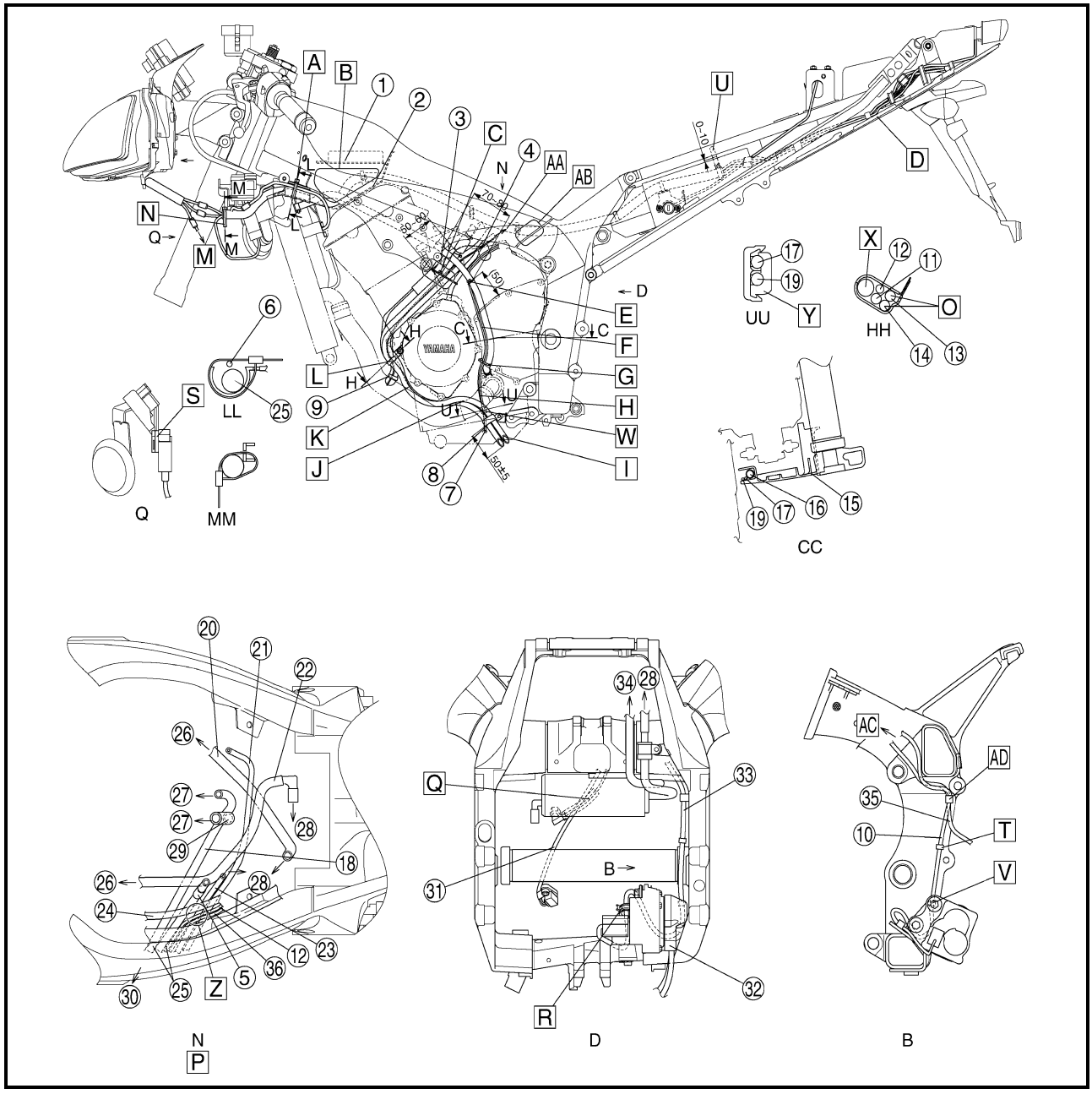
[I] Route the fuel tank breather hose and fuel tank drain hoses through the clamp and pass by the outside of the bottom cowling. Make the end length of hoses even.

[J] Pass the fuel tank breather hose and fuel tank drain hose by the inner side of the coolant hose. Do not pinch each hose in the bottom cowling cowl mounting section.

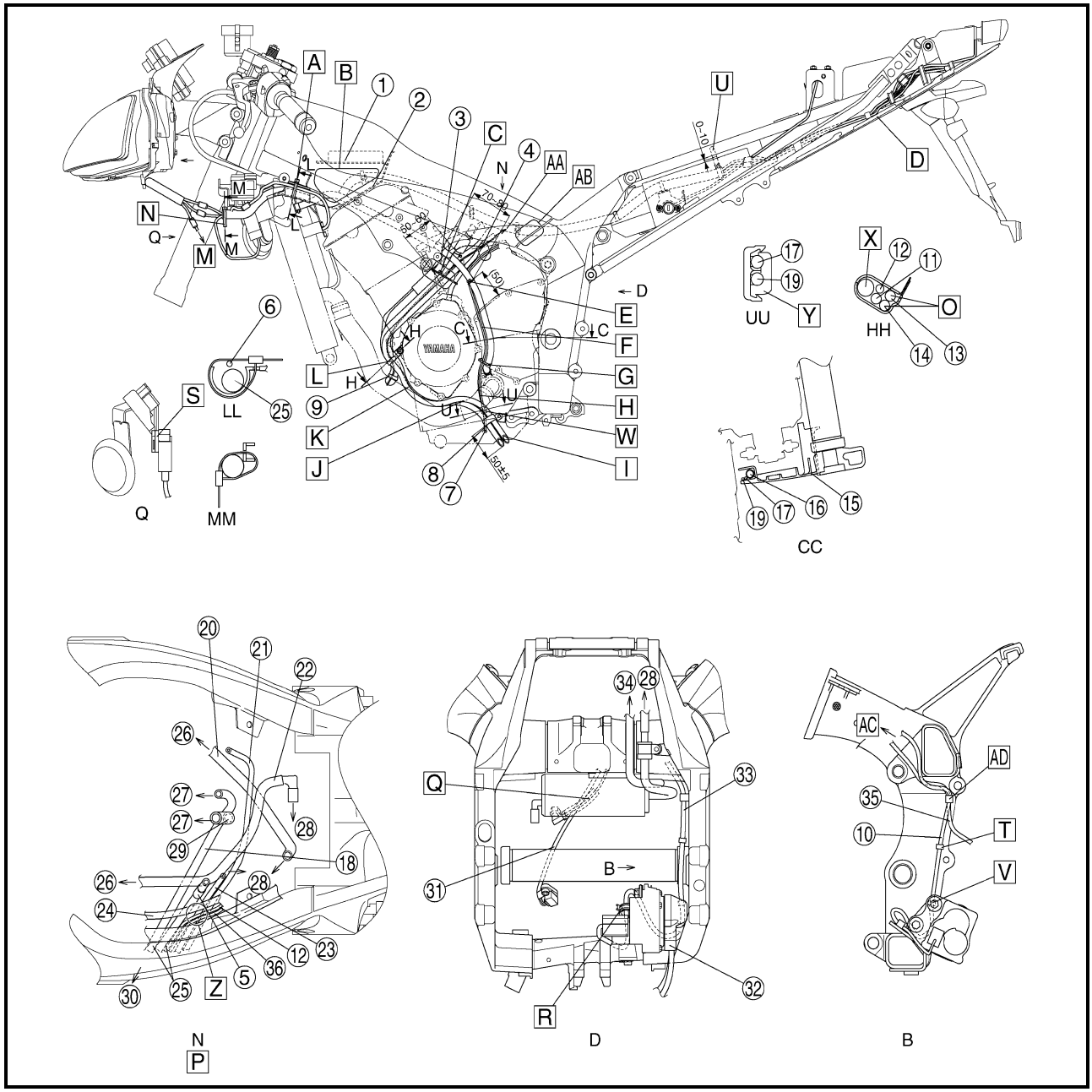
[K] Pass the air cleaner drain by the inner side of the coolant hose and release under the coolant hose. However, do not place out side of the bottom cowling.

[L] Route the air cleaner drain hose, fuel tank breather hose, fuel tank drain hose, AI system hose and AI system lead through the clamp.

[M] To turn signal light



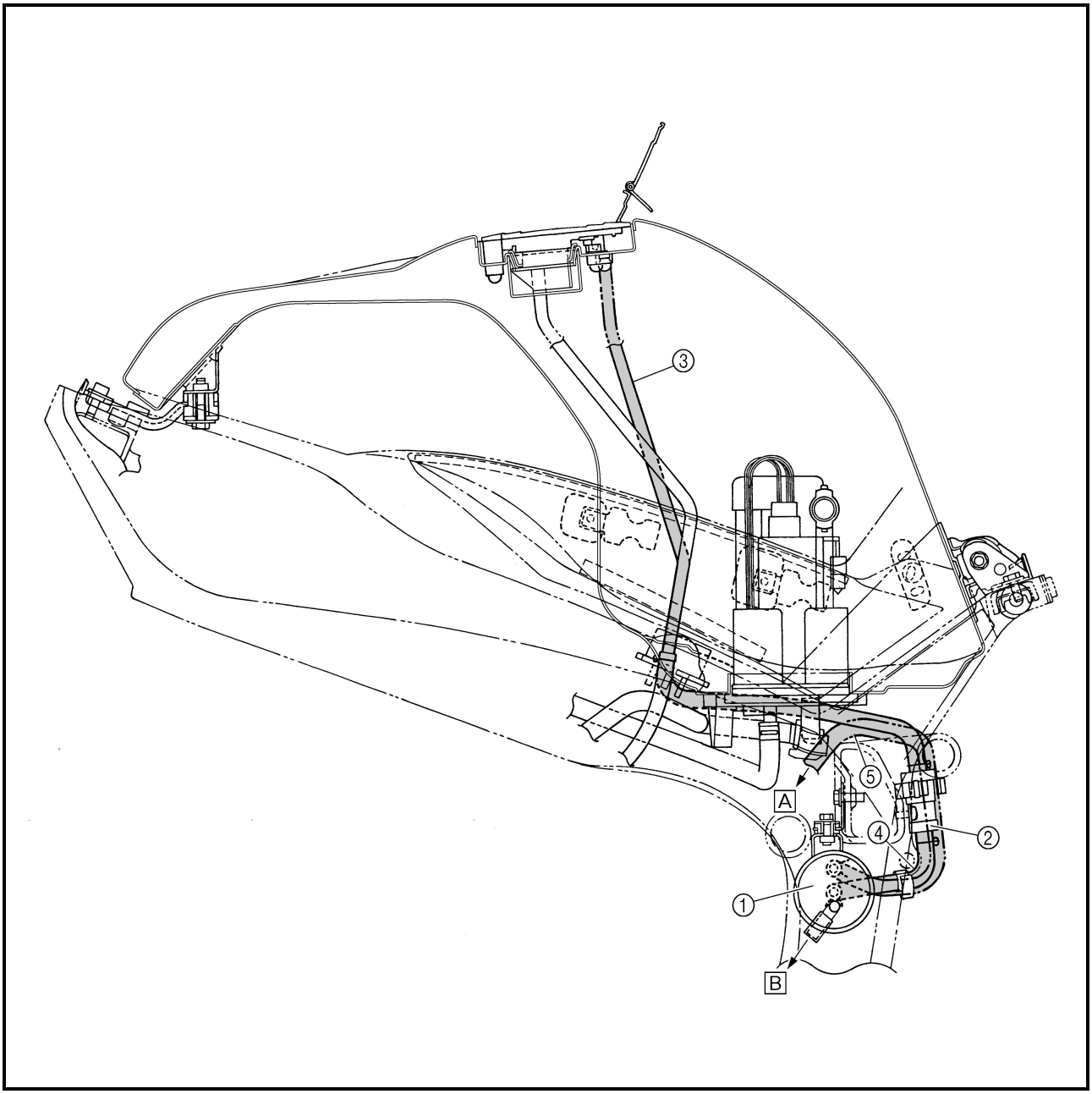
[N] Point the tip of the band to the inner side.
[O] Routing position of each hose except the AI system hose is not regulated in the clamp.
[P] Pass all the hoses under the injector sub lead and wire harness.
[Q] Neutral switch lead:
Fasten the EXUP servo motor lead and rear brake switch lead with the clamp inserted to the frame.
[R] Clamp the lead making slack so that the harness routes to the coupler from the downside of the EXUP serve motor.
[S] Pay attention to the inserting direction of the relay.
[T] Fasten the EXUP servo motor lead with the clamp inserted to the frame.
[U] Fasten the wire harness with the clamp inserted to the hole of battery box. Point the tip of clamp upward. Cut the tip according to the illustration.
[V] Fasten the EXUP servo motor lead with the clamp inserted to the frame.
[W] Clamp the oil level gauge and sidestand switch lead.
[X] AI system hose
(Route by the most inner side.)
[Y] Position the clamp between the clamp of oil level switch lead and the radiator coolant hose. The direction of clamp is not regulated.
[Z] Route the hoses of fuel tank drain and breather underneath the wire harness, injector sub lead, AI system lead and AC magneto lead.



for California

① Canister
② Roll over valve assembly
③ Hose (fuel tank breather – canister)
④ Hose (canister – roll over valve)
⑤ Hose (roll over valve – throttle body)

[A] To throttle body
[B] To atomosphere



EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

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

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1,000 km) or 1 month	4,000 mi (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 3-9.)**	• Check and adjust valve clearance when engine is cold.	**Every 26,600 mi (42,000 km)**					
2	*	**Spark plugs (See page 3-19.)**	• Check condition. • Adjust gap and clean. • Replace every 8,000 mi (13,000 km) or 12 months.		√	**Replace.**	√	**Replace.**	√
3	*	**Crankcase ventilation system (See page 3-29.)**	• Check ventilation hose for cracks or damage. • Replace if necessary.		√	√	√	√	√
4	*	**Fuel line (See page 3-29.)**	• Check fuel hoses and vacuum hose for cracks or damage. • Replace if necessary.		√	√	√	√	√
5	*	**Exhaust system (See page 3-30.)**	• Check for leakage. • Retighten if necessary. • Replace gasket(s) if necessary.		√	√	√	√	√
6	*	**Electronic fuel injection (See page 3-14.)**	• Check and adjust engine idle speed and synchronization.	√	√	√	√	√	√
7	*	**Evaporative emission control system (for California only)**	• Check control system for damage. • Replace if necessary.				√		√
8	*	**Air induction system (See page 7-39.)**	• Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged parts if necessary.		√	√	√	√	√

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

GENERAL MAINTENANCE AND LUBRICATION CHART

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1,000 km) or 1 month	4,000 mi (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 3-23.)**	• Replace (warm engine before draining). (See NOTE on page 3-2.)	√	√	√	√	√	√
2	*	**Engine oil filter cartridge (See page 3-24.)**	• 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 3-28.)**	• Check condition. • Replace if necessary.		√	√	√	√	√
4	*	**Cooling system (See page 3-32.)**	• Check hoses for cracks or damage. • Replace if necessary.		√	√	√	√	√
			• Replace with ethylene glycol antifreeze coolant every 24 months.					**Replace.**	
5	*	**Brake system (See page 3-37.)**	• Check operation, pad wear, and fluid leakage. (See NOTE on page 3-2.) • Correct if necessary.	√	√	√	√	√	√
6	*	**Clutch (See page 3-26.)**	• Check operation. • Adjust or replace cable.	√	√	√	√	√	√

GENERAL MAINTENANCE AND LUBRICATION CHART

CHK ADJ

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1,000 km) or 1 month	4,000 mi (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 3-57.)**	• Apply Yamaha chain and cable lube or engine oil SAE 10W-30 thoroughly.	√	√	√	√	√	√
8	*	**Swingarm pivot bearing (See page 4-71.)**	• Check bearing assembly for looseness. • Moderately repack with lithium-soap-based grease every 16,000 mi (25,000 km) or 24 months.			√		√ **Replace.**	
9	*	**Rear suspension link pivots (See page 4-71.)**	• Check operation. • Correct if necessary.			√		√	
10	*	**Shock absorber assembly (See page 4-68.)**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
11	*	**Front fork (See page 3-48.)**	• Check operation and for oil leakage. • Repair if necessary.		√	√	√	√	√
12	*	**Steering bearings (See page 3-45.)**	• Check bearing assembly for looseness. • Moderately repack with lithium-soap-based grease every 16,000 mi (25,000 km) or 24 months.		√	√	√	√ **Replace.**	√
13		**Brake and clutch lever pivot shafts (See page 3-57.)**	• Apply chain lube or lithium-soap-based grease lightly.	√	√	√	√	√	√
14		**Brake pedal (See page 3-57.)**	• Apply chain lube or lithium-soap-based grease lightly.		√	√	√	√	√
15	*	**Drive chain (See page 3-43.)**	• Check chain slack/alignment condition. • Adjust and lubricate chain with Yamaha chain and cable lube or engine oil SAE 10W-30 thoroughly.	**Every 600 mi (1,000 km) or after washing the motorcycle or riding in the rain.**					
16	*	**Wheel bearings (See page 4-3.)**	• Check bearings for smooth operation.		√	√	√	√	√
17	*	**Sidestand pivot (See page 3-57.)**	• Check operation. • Apply chain lube or lithium-soap-based grease lightly.		√	√	√	√	√
18	*	**Sidestand switch (See page 8-4.)**	• Check and clean or replace if necessary.	√	√	√	√	√	√
19	*	**Chassis fasteners (See page 2-21.)**	• Check all chassis fittings and fasteners. • 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) or 36 months, repeat the maintenance intervals starting from 4,000 mi (7,000 km) or 6 months.

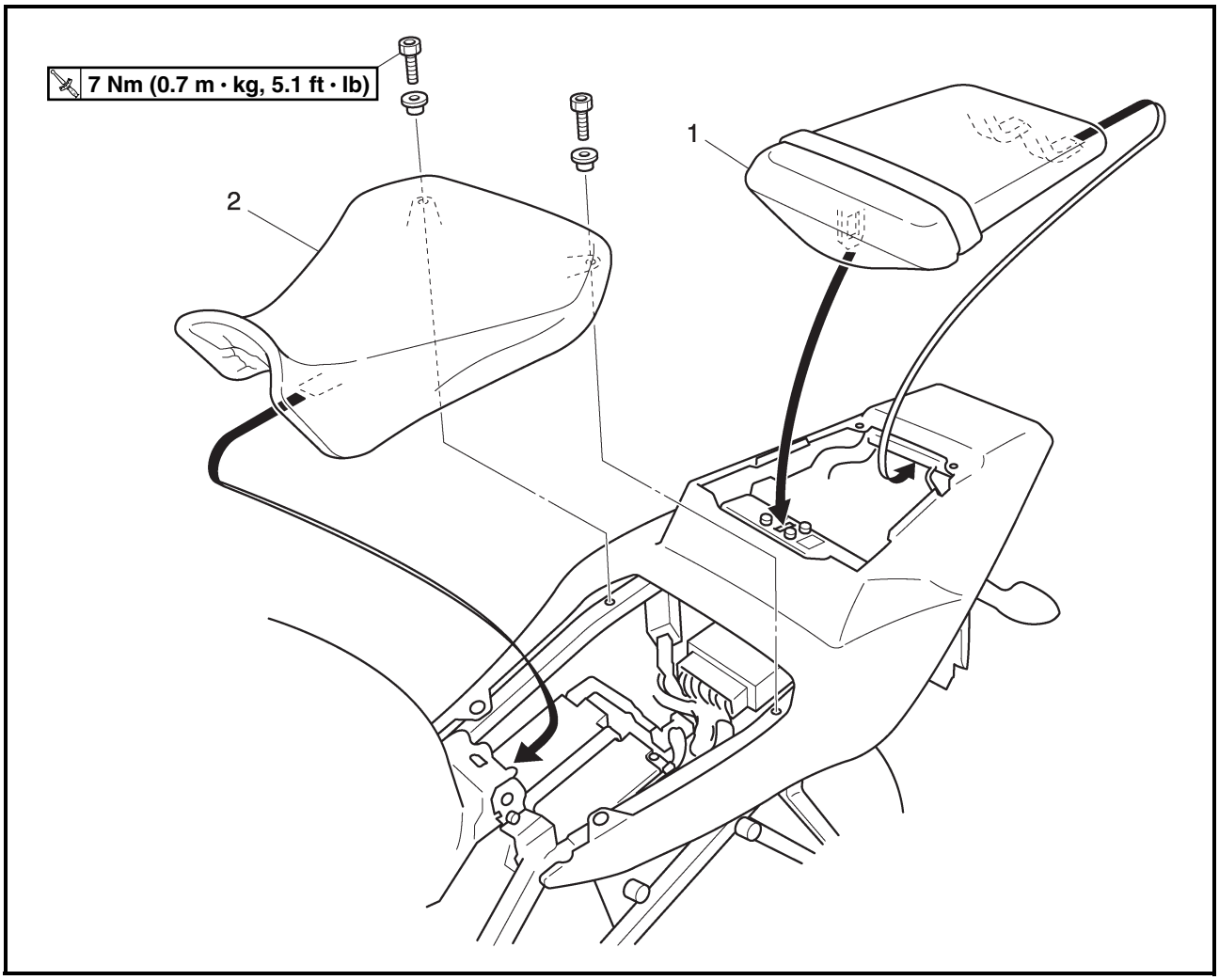
NOTE:

● Air filter
- This model's air filter is equipped with a disposable oil-coated paper element, which must not be cleaned with compressed air to avoid damaging it.
- The air filter element needs to be replaced more frequently when 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.

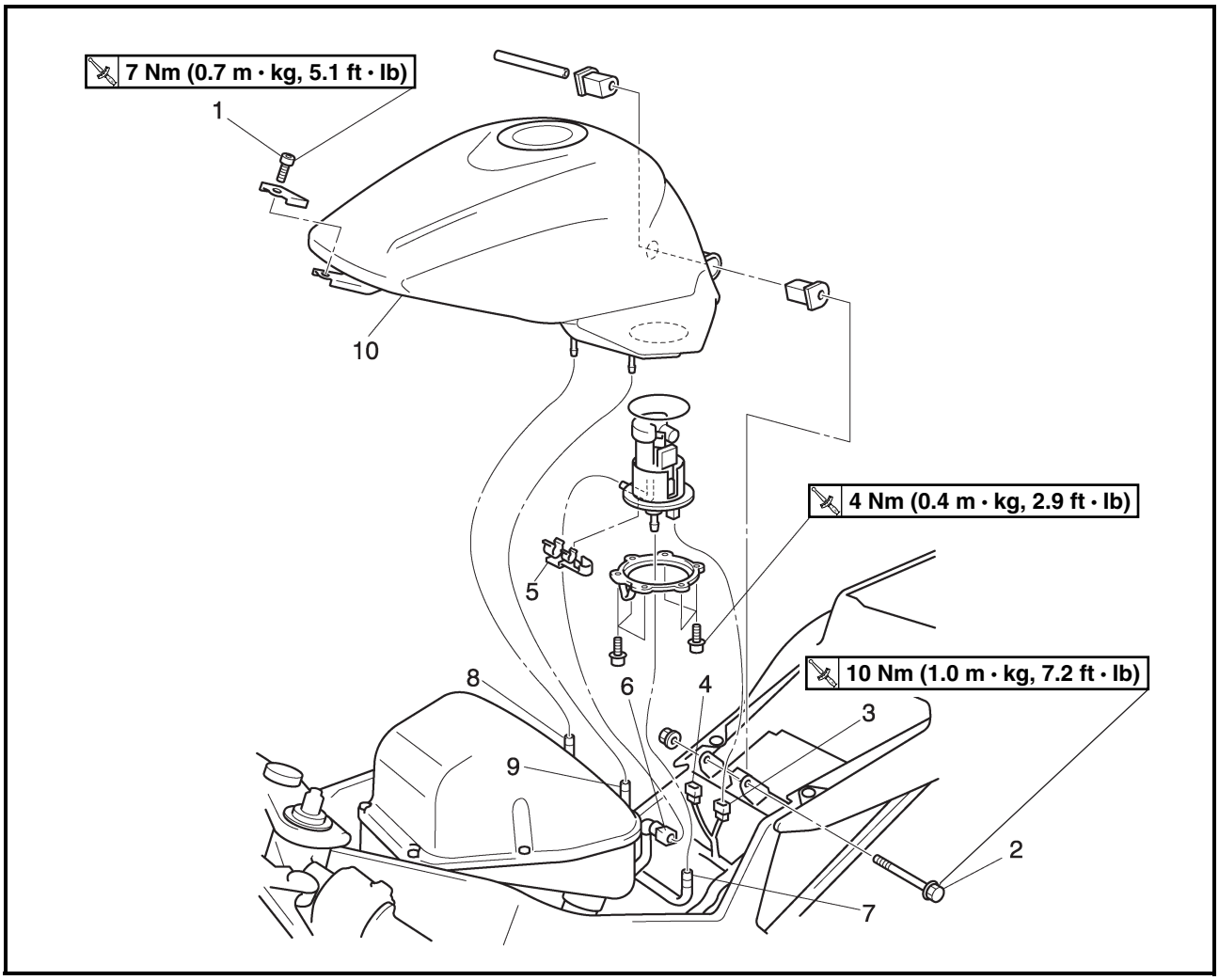
● Engine oil type
- Yamalube 4 (20W-40) or engine oil SAE 20W-40 (API SE) for temperatures of 5 °C (40 °F) or above.
- Yamalube 4 (10W-30) or engine oil SAE 10W-30 (API SE) for temperatures of 15 °C (60 °F) or below.

EAS00039
SEATS



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

EAS00040
FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS".
1	Bolt	1	
2	Bolt	1	
3	Fuel sender coupler	1	Disconnect.
4	Fuel pump coupler	1	Disconnect.
5	Fuel hose connector cover	1	
6	Fuel hose	1	
7	Fuel return hose	1	
8	Fuel tank overflow hose	1	
9	Fuel tank breather hose	1	
10	Fuel tank	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:

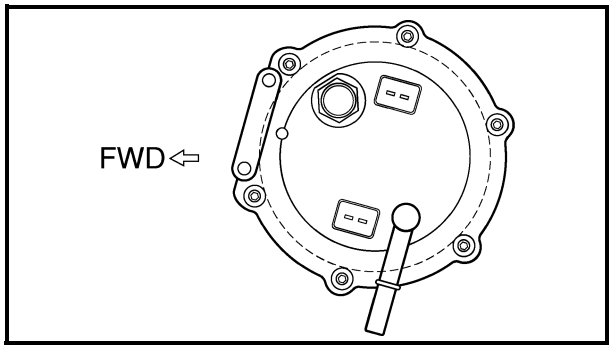
Do not set the fuel tank down so that the installation surface of the fuel pump is directly under the tank. Be sure to lean the fuel tank in an upright position.

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 crisscross pattern and to the specified torque.

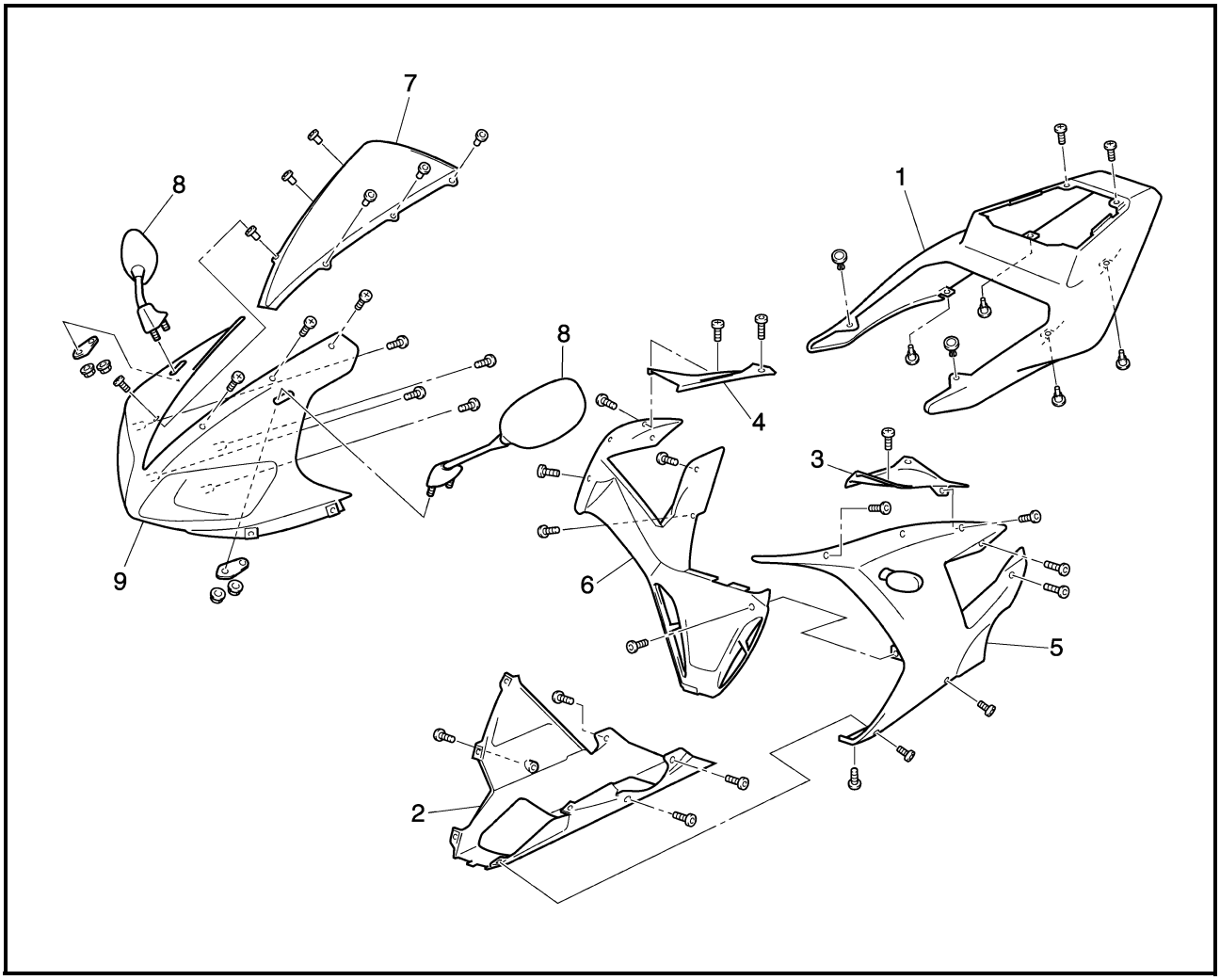
INSTALLING THE FUEL HOSE

1. Install:
   - fuel hose
   - fuel hose holders

CAUTION:

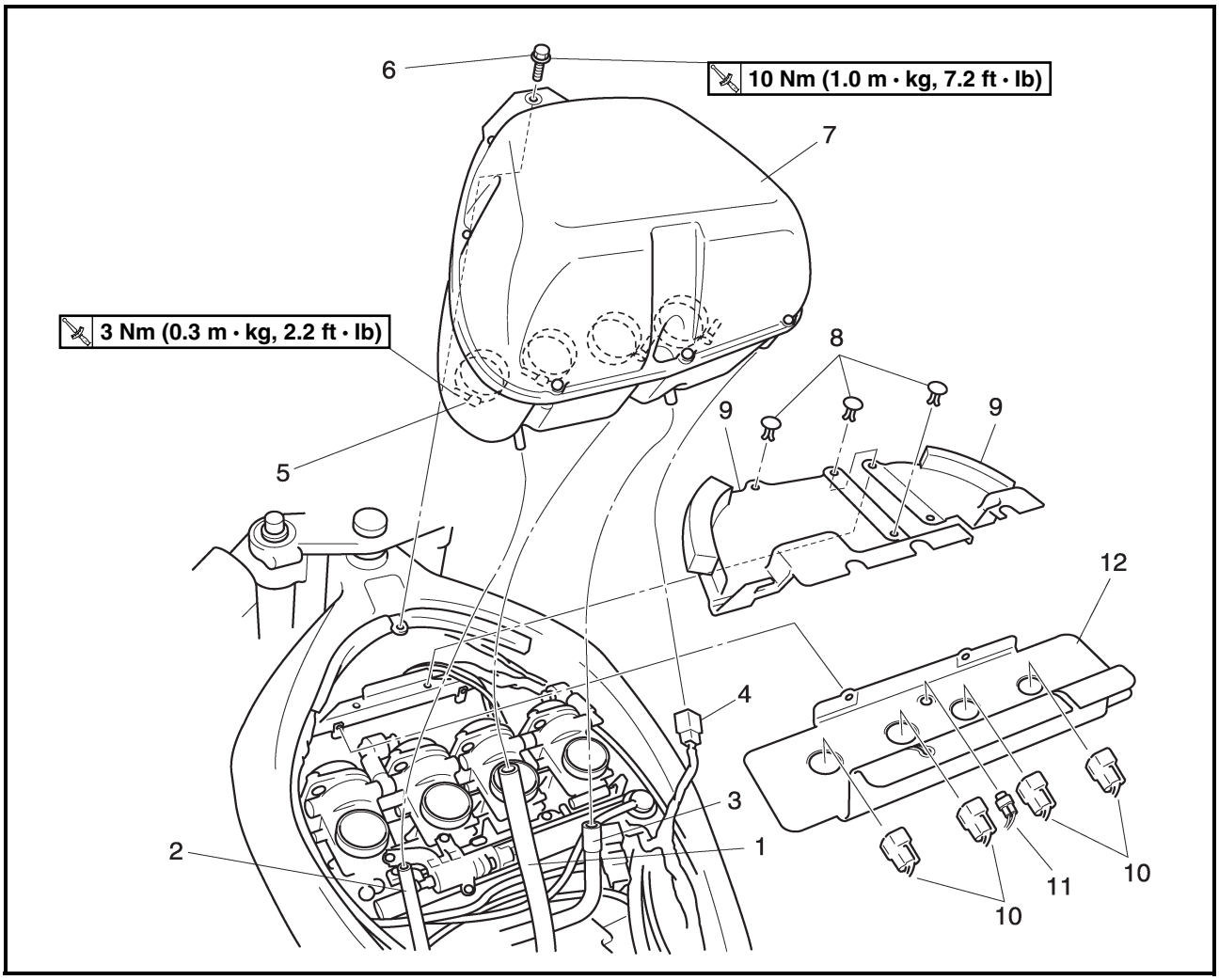
When installing the fuel hose, make sure that it is securely connected, and that the fuel hose holders are in the correct position, otherwise the fuel hose will not be properly installed.

EAS00042
COWLINGS



Order	Job/Part	Q'ty	Remarks
	Removing the cowlings		Remove the parts in the order listed.
	Rider and passenger seats		Refer to "SEATS".
1	Tail cowling	1	
2	Bottom cowling	1	
3	Front cowling inner panel (left)	1	
4	Front cowling inner panel (right)	1	
5	Left side cowling	1	
6	Right side cowling	1	
7	Windshield	1	
8	Rear view mirror	2	
9	Upper cowling	1	
			For installation, reverse the removal procedure.

EAS00043
AIR FILTER CASE

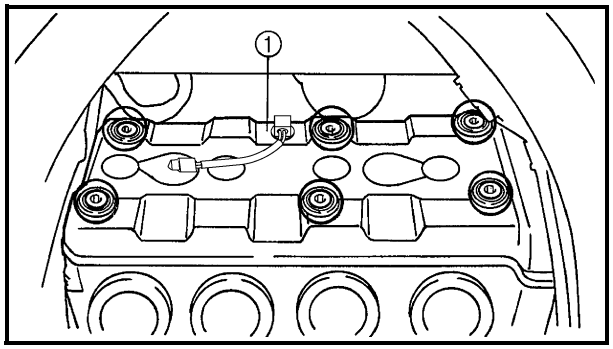


Order	Job/Part	Q'ty	Remarks
	Removing the air filter case		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK".
1	Crankcase breather hose	1	
2	Air filter case breather hose	1	
3	AI system hose	1	
4	Intake temperature sensor coupler	1	
5	Clamp screw	4	Loosen.
6	Bolt	1	
7	Air filter case	1	
8	Quick fastener	3	
9	Ignition coil plate	2	
10	Ignition coil coupler	4	Disconnect.
11	Cylinder identification sensor coupler	1	
12	Rubber baffle	1	
			For installation, reverse the removal procedure.

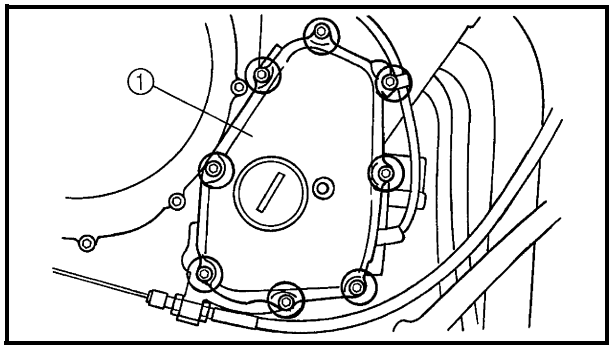
EAS00045
ENGINE
ADJUSTING THE VALVE CLEARANCE
The following procedure applies to all of the valves.

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
   - fuel tank
     Refer to “SEATS” and “FUEL TANK”.
   - air filter case
   - ignition coil plate
     Refer to “AIR FILTER CASE”.
   - bottom cowling
   - side cowlings
     Refer to “COWLINGS”.
   - throttle body
     Refer to “THROTTLE BODIES” in chapter 7.
   - radiator
   - thermostat
     Refer to “RADIATOR” and “THERMOSTAT” in chapter 6.



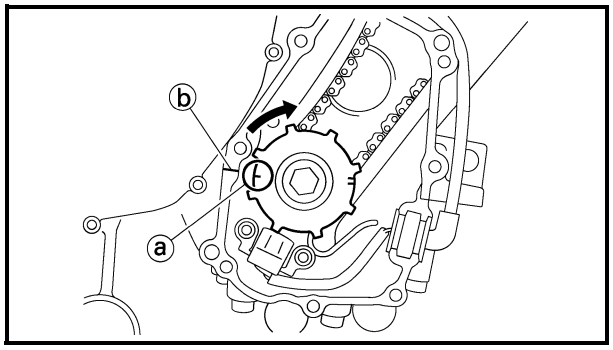
2. Remove:
   - spark plugs
   - cylinder head cover ①
   - cylinder head cover gasket



3. Remove:
   - pickup coil rotor cover ①

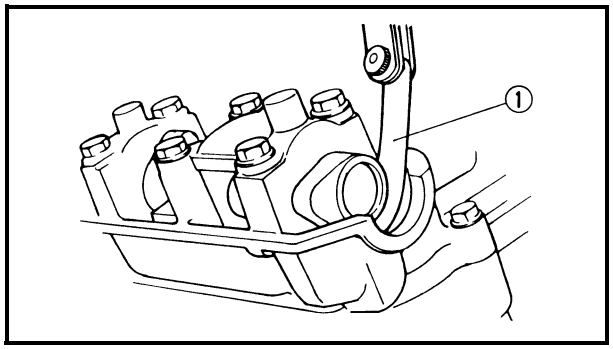
4. Measure:
   • valve clearance
   Out of specification → Adjust.

Valve clearance (cold)
Intake valve
0.11 ~ 0.20 mm
(0.0043 ~ 0.0079 in)
Exhaust valve
0.21 ~ 0.27 mm
(0.0083 ~ 0.0106 in)



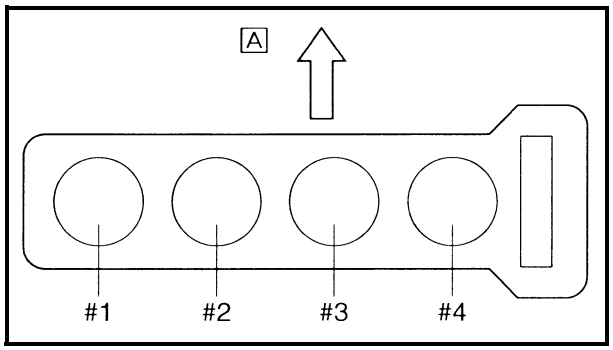
a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC on the compression stroke, align the TDC mark ⓐ on the pickup rotor with the crankcase mating surface ⓑ.

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



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

NOTE:
• If the valve clearance is incorrect, record the measured reading.
• Measure the valve clearance in the following sequence.

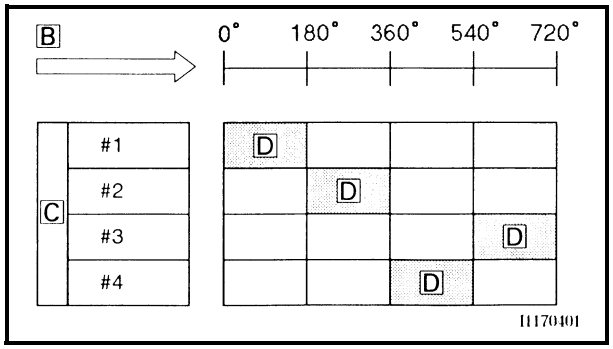


Valve clearance measuring sequence
Cylinder #1 → #2 → #4 → #3

A Front

d. To measure the valve clearances of the other cylinders, starting with cylinder #1 at TDC, turn the crankshaft clockwise as specified in the following table.

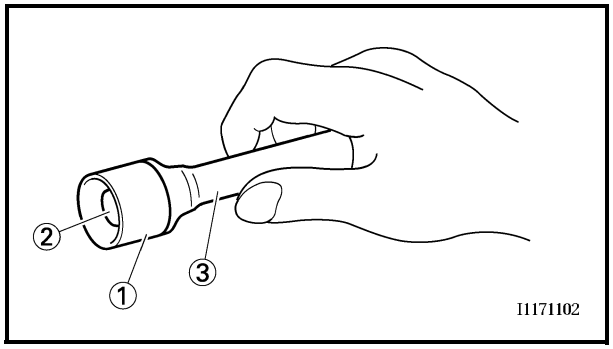
B Degrees that the crankshaft is turned counterclockwise
C Cylinder
D Combustion cycle



Cylinder #2	**180°**
Cylinder #4	**360°**
Cylinder #3	**540°**

5. Remove:
   • camshaft

NOTE:
- Refer to "DISASSEMBLING THE ENGINE—CAMSHAFT AND CYLINDER HEAD" in chapter 5.
- When removing the timing chain and camshafts, fasten the timing chain with a wire to retrieve it if it falls into the crankcase.

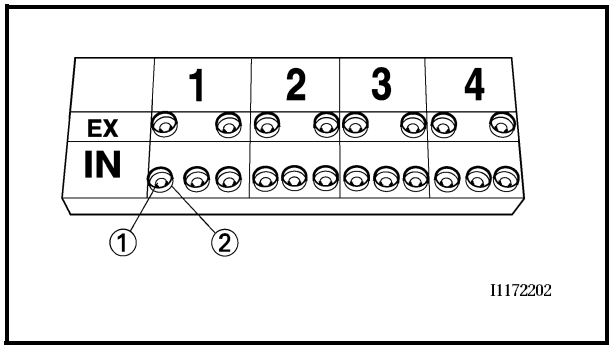


6. Adjust:
   • valve clearance

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

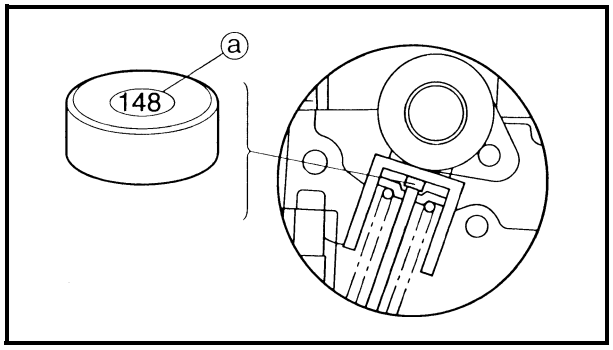
NOTE:
- Cover the timing chain opening with a rag to prevent the valve pad from falling into the crankcase.
- Make a note of the position of each valve lifter ① and valve pad ② so that they can be installed in the correct place.



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

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

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



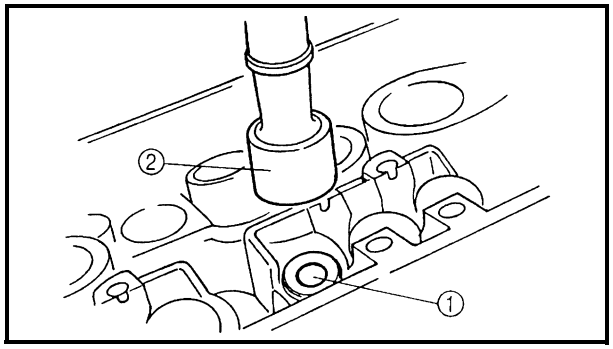
c. Round off the original valve pad number according to the following table.

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

EXAMPLE:
Original valve pad number
= 148 (thickness =1.48 mm)
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)

VALVE PAD SELECTION TABLE

INTAKE

exa	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
	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 ~ 0.10		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
	0.11 ~ 0.20	Specification																								
→	0.21 ~ 0.22	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
	0.23 ~ 0.27	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
	0.28 ~ 0.32	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
	0.33 ~ 0.37	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
	0.38 ~ 0.42	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
	0.43 ~ 0.47	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
	0.48 ~ 0.52	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
	0.53 ~ 0.57	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
	0.58 ~ 0.62	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
	0.63 ~ 0.67	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
	0.68 ~ 0.72	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
	0.73 ~ 0.77	180	185	190	195	200	205	210	215	220	225	230	235	240												
	0.78 ~ 0.82	185	190	195	200	205	210	215	220	225	230	235	240													
	0.83 ~ 0.87	190	195	200	205	210	215	220	225	230	235	240														
	0.88 ~ 0.92	195	200	205	210	215	220	225	230	235	240															
	0.93 ~ 0.97	200	205	210	215	220	225	230	235	240																
	0.98 ~ 1.02	205	210	215	220	225	230	235	240																	
	1.03 ~ 1.07	210	215	220	225	230	235	240																		
	1.08 ~ 1.12	215	220	225	230	235	240																			
	1.13 ~ 1.17	220	225	230	235	240																				
	1.18 ~ 1.22	225	230	235	240																					
	1.23 ~ 1.27	230	235	240																						
	1.28 ~ 1.32	235	240																							
	1.33 ~ 1.37	240																								

EXAMPLE:
VALVE CLEARANCE: 0.11 ~ 0.20 mm
Installed is 150
Measured clearance is 0.25 mm
Replace 150 pad with 160 pad

EXHAUST

exa	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 ~ 0.20		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
	0.21 ~ 0.27	Specification																								
→	0.28 ~ 0.32	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
	0.33 ~ 0.37	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
	0.38 ~ 0.42	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
	0.43 ~ 0.47	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
	0.48 ~ 0.52	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
	0.53 ~ 0.57	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
	0.58 ~ 0.62	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
	0.63 ~ 0.67	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
	0.68 ~ 0.72	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
	0.73 ~ 0.77	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
	0.78 ~ 0.82	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
	0.83 ~ 0.87	180	185	190	195	200	205	210	215	220	225	230	235	240												
	0.88 ~ 0.92	185	190	195	200	205	210	215	220	225	230	235	240													
	0.93 ~ 0.97	190	195	200	205	210	215	220	225	230	235	240														
	0.98 ~ 1.02	195	200	205	210	215	220	225	230	235	240															
	1.03 ~ 1.07	200	205	210	215	220	225	230	235	240																
	1.08 ~ 1.12	205	210	215	220	225	230	235	240																	
	1.13 ~ 1.17	210	215	220	225	230	235	240																		
	1.18 ~ 1.22	215	220	225	230	235	240																			
	1.23 ~ 1.27	220	225	230	235	240																				
	1.28 ~ 1.32	225	230	235	240																					
	1.33 ~ 1.37	230	235	240																						
	1.38 ~ 1.42	235	240																							
	1.43 ~ 1.47	240																								

EXAMPLE:
VALVE CLEARANCE: 0.21 ~ 0.27 mm
Installed is 175
Measured clearance is 0.35 mm
Replace 175 pad with 185 pad

NOTE:
- Refer to "ASSEMBLING AND ADJUSTING THE ENGINE—CYLINDER HEAD AND CAMSHAFT" 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.

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7. Install:
   - all removed parts

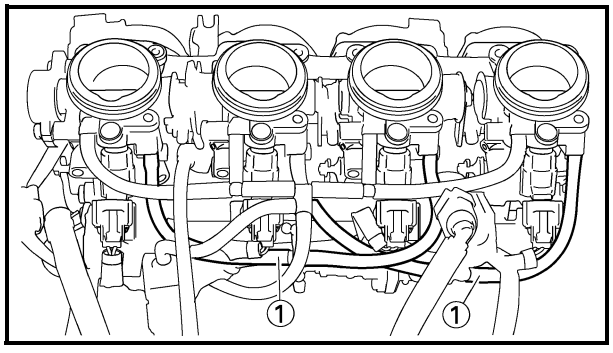
NOTE:
For installation, reverse the removal procedure.

SYNCHRONIZING THE THROTTLE BODIES

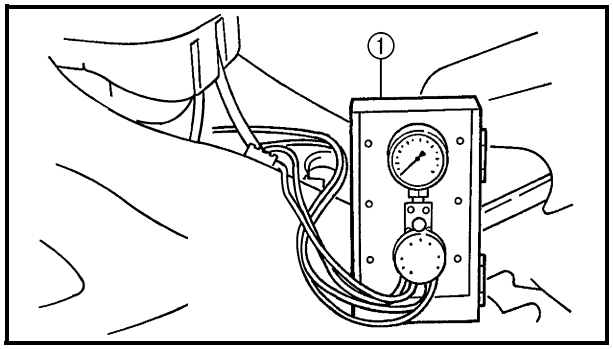
NOTE:
Prior to synchronizing the throttle bodies, the valve clearance and the engine idling speed should be properly adjusted and the ignition timing should be checked.

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

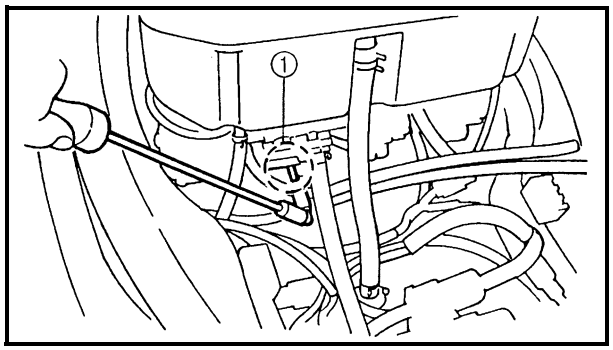


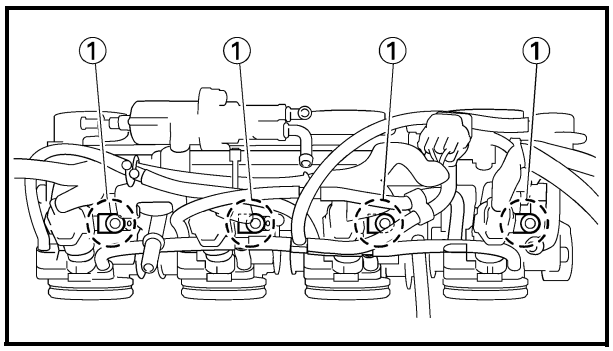
4. Install:
   - carburetor syncronizer ①
     (onto the synchronizing hose)
   - digital tachometer
     (near the spark plug)

	Carburetor synchronizer **YU-08030**

5. Install:
   - fuel tank
     Refer to "FUEL TANK".
6. Start the engine and let it warm up for several minutes.
7. Measure:
   - engine idling speed
     Out of specification → Adjust.
     Refer to "ADJUSTING THE ENGINE IDLING SPEED".

	Engine idling speed **1,000 ~ 1,100 r/min**





8. Adjust:
   - throttle body synchronization

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a. With throttle body #3 as standard, adjust throttle bodies #1, #2, and #4 using the air screw ①.

NOTE:

- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If the air screw is removed, turn the screw 3/4 turn in and be sure to synchronize the throttle body.

CAUTION:

Do not use the throttle valve adjusting screws to adjust the throttle body synchronization.

	Carburetor angle driver **90890-03158**
	Vacuum pressure at engine idling speed **25.3 kPa** **(190 mmHg, 7.48 inHg)**

NOTE:
The difference in vacuum pressure between two throttle bodies should not exceed 1.33 kPa (10 mmHg, 0.39 inHg).

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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)
3 ~ 5 mm (0.12 ~ 0.20 in)

12. Remove:
    - digital tachometer
    - carburetor syncronizer
13. Remove:
    - fuel tank
14. Install:
    - fuel tank
      Refer to "FUEL TANK".
    - rider seat
      Refer to "SEATS".

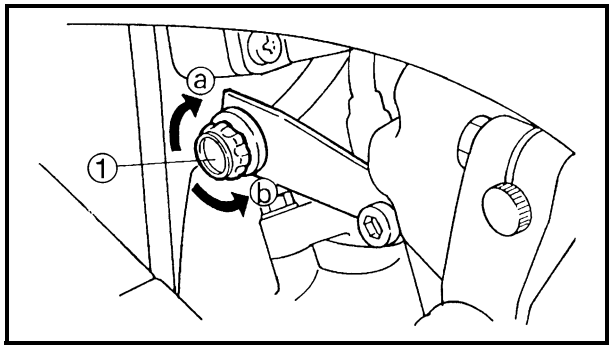
EAS00052
ADJUSTING THE ENGINE IDLING SPEED

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
   (onto the spark plug lead of cylinder #1)
3. Check:
   • engine idling speed
   Out of specification → Adjust.

	Engine idling speed **1,000 ~ 1,100 r/min**



4. Adjust:
   • engine idling speed

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a. Turn the throttle stop screw ① in direction ⓐ or ⓑ until the specified engine idling speed is obtained.

Direction ⓐ	**Engine idling speed is increased.**
Direction ⓑ	**Engine idling speed is decreased.**

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5. Adjust:
   • throttle cable free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY".

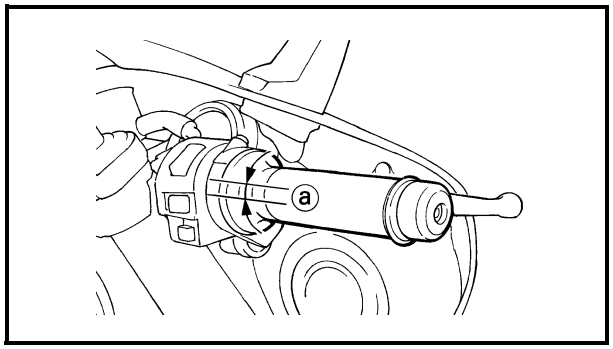
	Throttle cable free play (at the flange of the throttle grip) **3 ~ 5 mm (0.12 ~ 0.20 in)**

EAS00056

ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE:

Prior to adjusting the throttle cable free play, the engine idling speed should be adjusted properly.



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

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

2. Remove:
   - rider seat
     Refer to “SEATS”.
   - fuel tank
     Refer to “FUEL TANK”.
   - air filter case
     Refer to “AIR FILTER CASE”.
3. Adjust:
   - throttle cable free play

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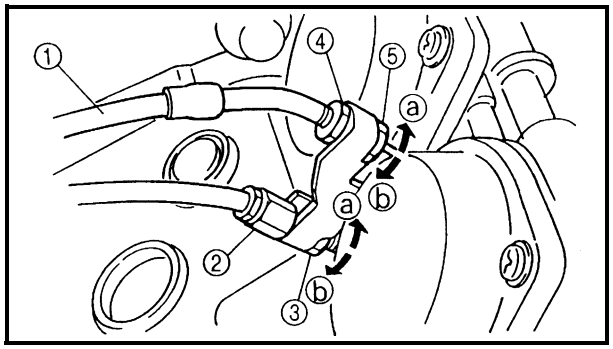
NOTE:

When the throttle is opened, the accelerator cable ① is pulled.



Carburetor side

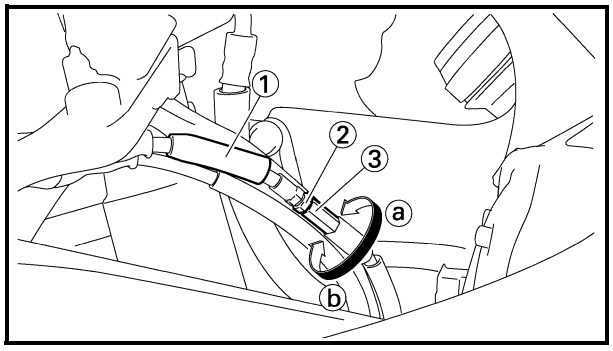
a. Loosen the locknut ② on the decelerator cable.
b. Turn the adjusting nut ③ in direction ⓐ or ⓑ to take up any slack on the decelerator cable.
c. Loosen the locknut ④ on the accelerator cable.
d. Turn the adjusting nut ⑤ in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.

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

e. Tighten the locknuts.

NOTE:

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



Handlebar side

a. Slide back the rubber cover ①.
b. Loosen the locknut ②.
c. Turn the adjusting nut ③ in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.

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

d. Tighten the locknut.

⚠ WARNING

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

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4. Install:
   - 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.

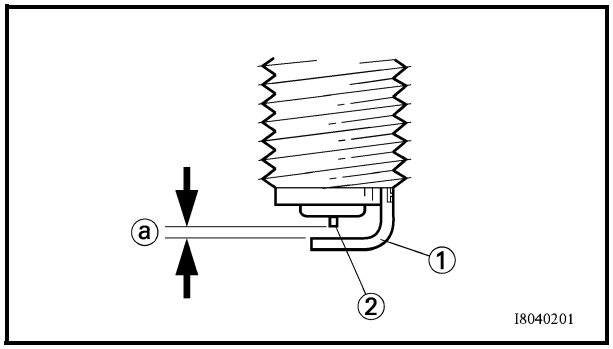
1. Remove:
   - rider seat
     Refer to “SEATS”.
   - fuel tank
     Refer to “FUEL TANK”.
   - air filter case
   - ignition coil plates
   - rubber baffle
     Refer to “AIR FILTER CASE”.
2. Remove:
   - ignition coil
   - spark plug

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)
CR9EIA 9 (NGK)
IU27D (DENSO)



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 ⓐ
     (with a wire thickness gauge)
     Out of specification → Regap.

Spark plug gap
0.8 ~ 0.9 mm (0.032 ~ 0.035 in)

7. Install:
   - spark plug — **13 Nm (1.3 m · kg, 9.4 ft · lb)**
   - ignition coil

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

8. Install:
   - rubber baffle
   - ignition coil plates
   - air filter case
     Refer to “AIR FILTER CASE”.
   - fuel tank
     Refer to “FUEL TANK”.
   - rider seat
     Refer to “SEATS”.

EAS00065
MEASURING THE COMPRESSION PRESSURE

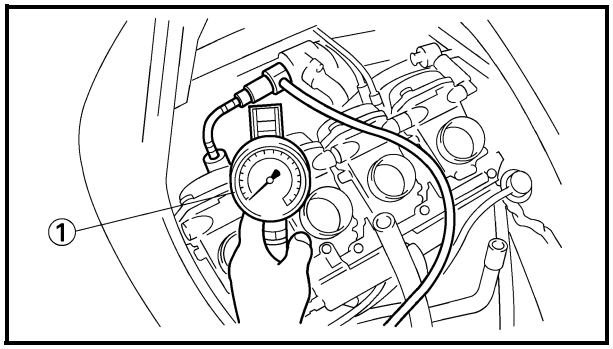
The following procedure applies to all of the cylinders.

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
   • ignition coil plates
   • rubber baffle
   Refer to “AIR FILTER CASE”.
4. Remove:
   • spark plug
   • ignition coil

CAUTION:

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



5. Install:
   • compression gauge ①

Compression gauge
YU-33223
Adapter
YU-33223-3

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

Compression pressure
(at sea level)
Minimum
1,350 kPa
(13.5 kg/cm², 192 psi)
Standard
1,450 kPa
(14.5 kg/cm², 206 psi)
Maximum
1,500 kPa
(15.0 kg/cm², 213 psi)

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

⚠ WARNING

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

NOTE:
The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm², 1 bar).

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

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

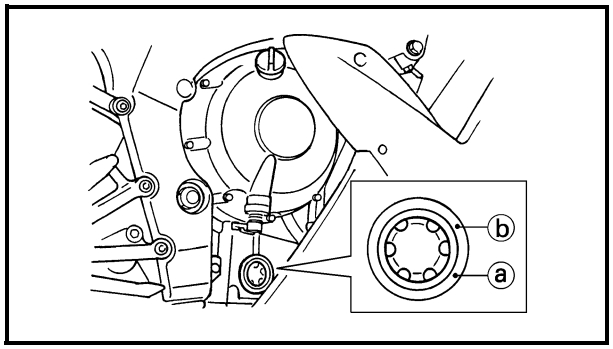
7. Install:
   - spark plug — **13 Nm (1.3 m · kg, 9.4 ft · lb)**
   - ignition coil
8. Install:
   - rubber baffle
   - ignition coil plates
   - air filter case
     Refer to “AIR FILTER CASE”.
   - fuel tank
     Refer to “FUEL TANK”.
   - rider seat
     Refer to “SEATS”.

EAS00069
CHECKING THE ENGINE OIL LEVEL

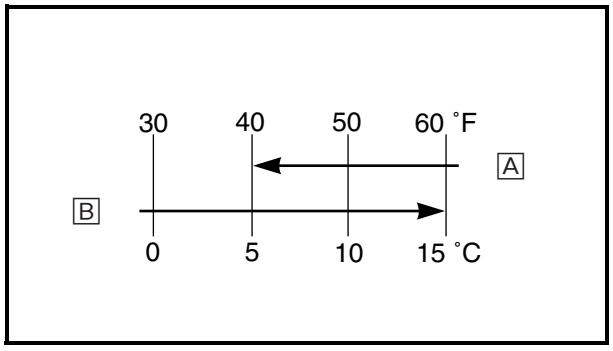
1. Stand the motorcycle on a level surface.

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

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



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



Recommended oil
At 5 °C (40 °F) or higher 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

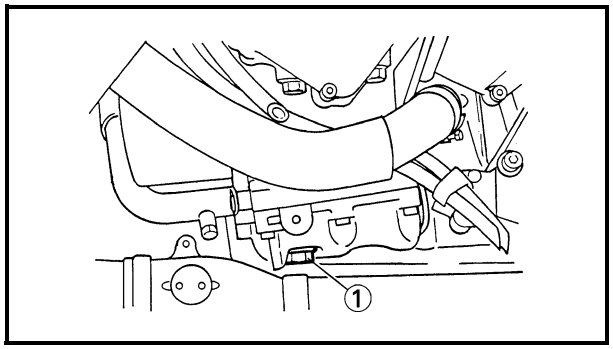
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

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

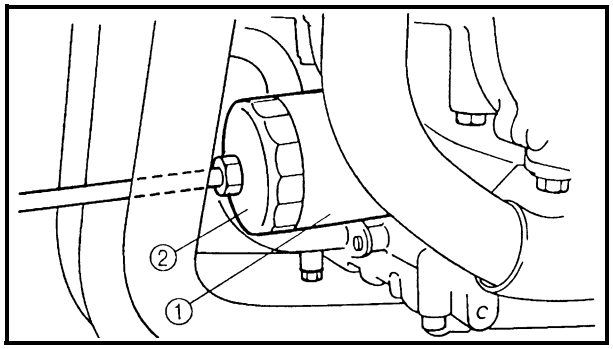
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

EAS00073
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”.
   - engine oil filler cap
   - engine oil drain bolt ①
     (along with the gasket)
4. Drain:
   - engine oil
     (completely from the crankcase)



5. If the oil filter cartridge is also to be replaced, perform the following procedure.

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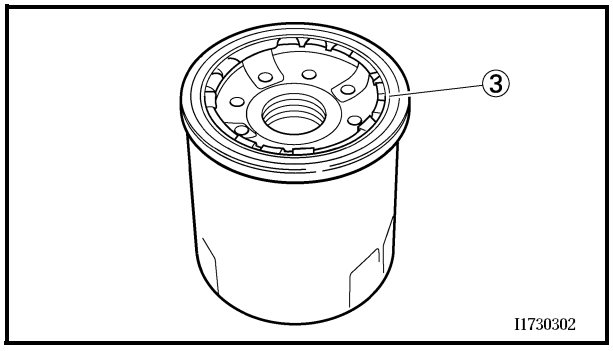
a. Remove the oil filter cartridge ① with an oil filter wrench ②.

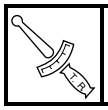
	**Oil filter wrench** **YU-38411**



b. Lubricate the O-ring ③ of the new oil filter cartridge with a thin coat of engine oil.

CAUTION:
Make sure the O-ring ③ is positioned correctly in the groove of the oil filter cartridge.

c. Tighten the new oil filter cartridge to specification with an oil filter wrench.



Oil filter cartridge
17 Nm (1.7 m · kg, 12 ft · lb)

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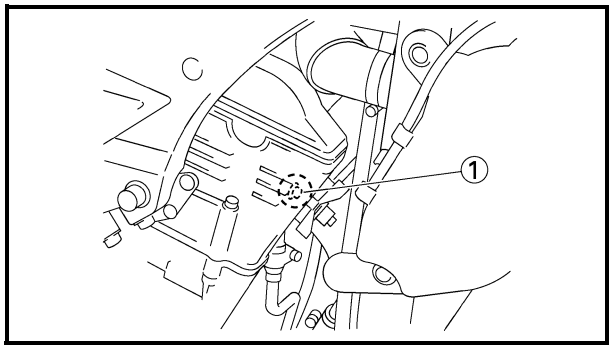
6. Check:
   - engine oil drain bolt gasket
     Damage → Replace.
7. Install:
   - engine oil drain bolt
     (along with the gasket New)

43 Nm (4.3 m · kg, 31 ft · lb)

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

Quantity
Total amount
3.8 L (3.34 Imp qt, 4.02 US qt)
Without oil filter cartridge replacement
2.9 L (2.55 Imp qt, 3.07 US qt)
With oil filter cartridge replacement
3.1 L (2.73 Imp qt, 3.28 US qt)

9. Install:
   - engine oil filler cap
   - bottom cowling
     Refer to “COWLINGS”.
10. Start the engine, warm it up for several minutes, and then turn it off.
11. Check:
    - engine
      (for engine oil leaks)
12. Check:
    - engine oil level
      Refer to “CHECKING THE ENGINE OIL LEVEL”.



13.Check:
- engine oil pressure

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

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

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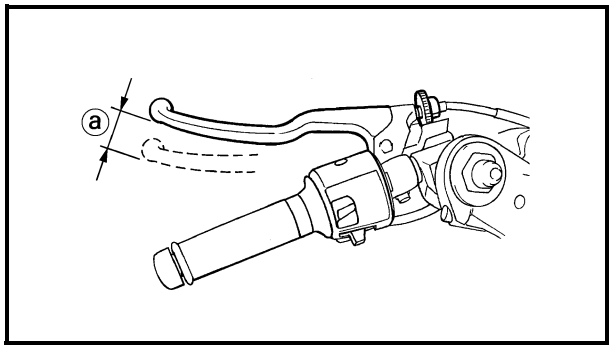
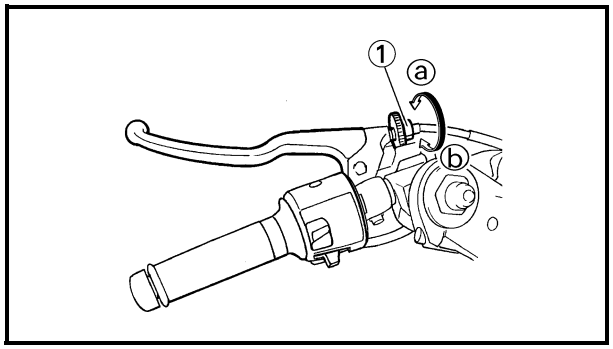


EAS00079
ADJUSTING THE CLUTCH CABLE FREE PLAY

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

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



2. Adjust:
   • clutch cable free play

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Handlebar side

a. Turn the adjusting dial ① in direction ⓐ or ⓑ until the specified clutch cable free play is obtained.

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

NOTE:

If the specified clutch cable free play cannot be obtained as described above, perform the mechanism adjustment procedure described below.

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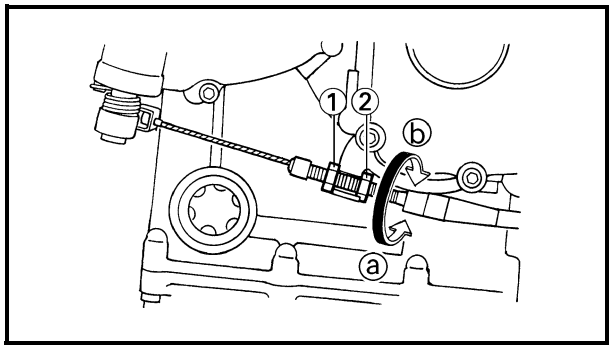
3. Remove:
   • bottom cowling
   Refer to “COWLINGS”.



4. Adjust:
   • clutch mechanism

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Engine side

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

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

c. Tighten the locknut.
d. Check the clutch cable free play again and adjust it if necessary.

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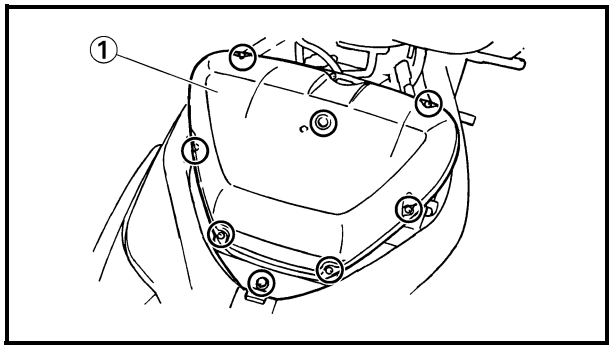
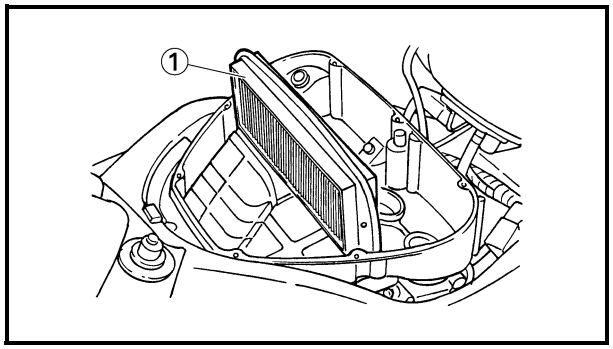




EAS00086
REPLACING THE AIR FILTER ELEMENT

1. Remove:
   - rider seat
     Refer to “SEATS”.
   - fuel tank
     Refer to “FUEL TANK”.
2. Remove:
   - air filter case cover ①

3. Check:
   - air filter element ①
     Damage → Replace.

NOTE:
Replace the air filter element at periodic intervals of 40,000 km travel.
The air filter needs more frequent service if you are riding in unusuallu wet or dusty areas.

4. Install:
   - 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 carburetor tuning, leading to poor engine performance and possible overheating.

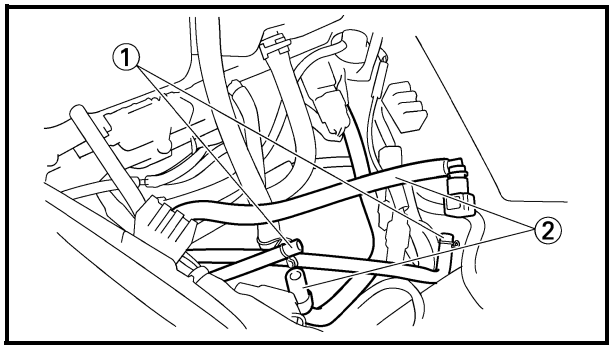
NOTE:
When installing the air filter element into the air filter case cover, make sure their sealing surfaces are aligned to prevent any air leaks.

5. 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 hose ①
   - fuel hose ②
     Cracks/damage → Replace.
     Loose connection → Connect properly.

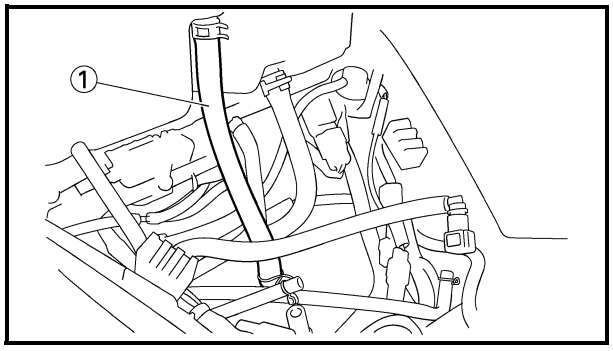
NOTE:

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:

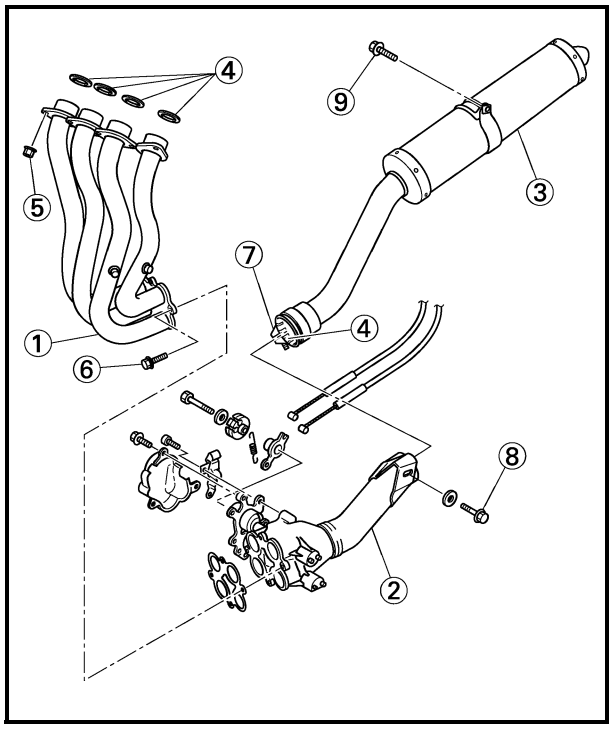
Make sure the crankcase breather hose is routed correctly.

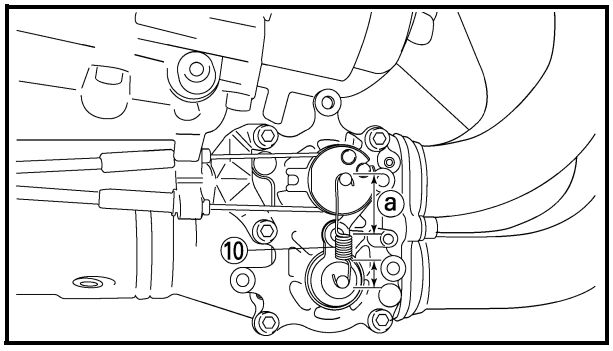
3. Install:
   - fuel tank
     Refer to “FUEL TANK”.
   - rider seat
     Refer to “SEATS”.

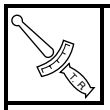
EAS00099
CHECKING THE EXHAUST SYSTEM

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

1. Remove:
   - radiator
     Refer to “RADIATOR” in chapter 6.
2. Check:
   - exhaust pipe ①
   - exhaust valve pipe ②
   - muffler ③
     Cracks/damage → Replace.
   - gasket ④
     Exhaust gas leaks → Replace.
3. Check:
   - tightening torque



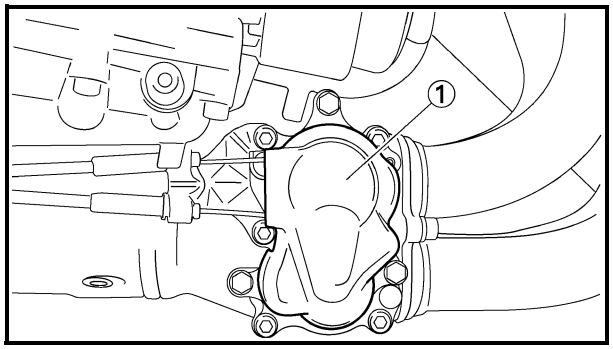




Exhaust pipe nut ⑤
20 Nm (2.0 m · kg, 14 ft · lb)
Exhaust pipe and exhaust valve pipe bolt ⑥
10 Nm (1.0 m · kg, 7.2 ft · lb)
Exhaust pipe and muffler bolt ⑦
20 Nm (2.0 m · kg, 14 ft · lb)
Exhaust valve pipe bracket bolt ⑧
20 Nm (2.0 m · kg, 14 ft · lb)
Muffler and muffler bracket bolt ⑨
38 Nm (3.8 m · kg, 27 ft · lb)

NOTE:
- Install the spring ⑩ with its longer part ⓐ positioned upward.
- Upper part “2” of the EXUP cable is attached with the rubber boot cover.
- Install the EXUP cable in parallel without twisting its upper and lower sides.

4. Install:
   - radiator
     Refer to “RADIATOR” in chapter 6.



EAS00101
ADJUSTING THE EXUP CABLES

1. Remove:
   - bottom cowling
     Refer to “COWLINGS”.
2. Remove:
   - EXUP valve pulley cover ①

3. Check:
   - EXUP system operation

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a. Turn the main switch ON.
b. Check that the EXUP valve operates properly.

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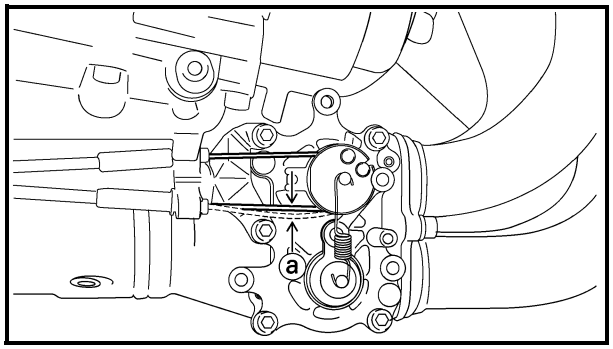
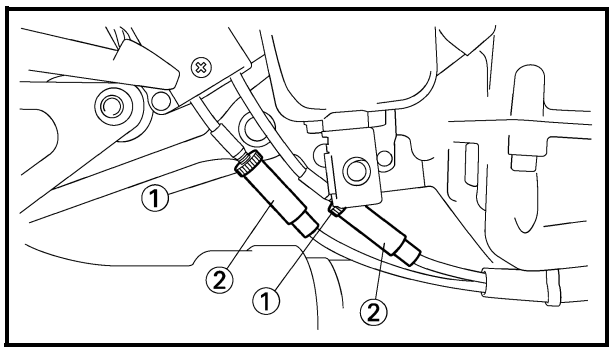


4. Check:
   - EXUP cable free play (at the EXUP valve pulley) ⓐ

Maximum EXUP cable free play (at the EXUP valve pulley)
1.5 mm (0.059 in)



5. Adjust:
   - EXUP cable free play

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a. Loosen both locknuts ①.
b. Insert a 4-mm long pin through the notch in the EXUP valve pulley and into the hole in the EXUP valve cover.
c. Turn both adjusting bolts ② counterclockwise until there is no EXUP cable free play.
d. Turn both adjusting bolts 1/2 of a turn clockwise.
e. Tighten both locknuts and then remove the pin.

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6. Install:
   - EXUP valve pulley cover

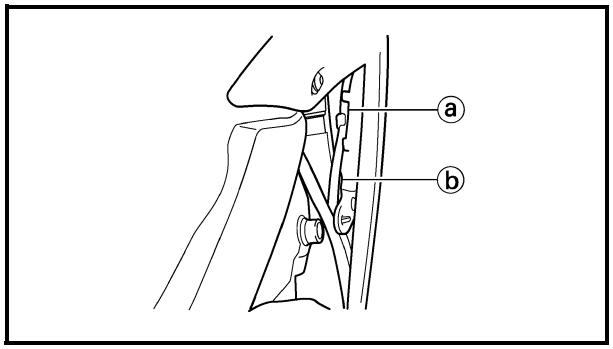
EXUP valve pulley cover bolt
10 Nm (1.0 m · kg, 7.2 ft · lb)

7. Install:
   • bottom cowling
   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.

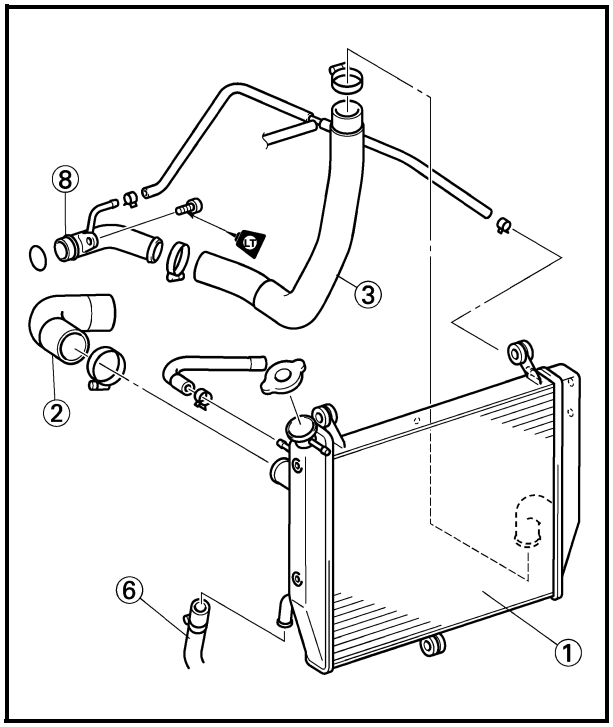


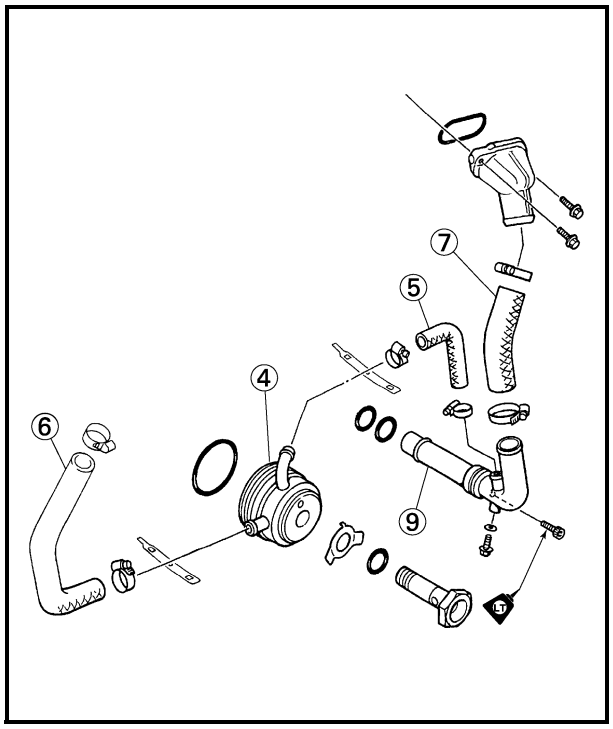
2. Check:
   • coolant level
   The coolant level should be between the maximum level mark ⓐ and minimum level mark ⓑ.
   Below the minimum level mark → Add the recommended coolant to the proper level.

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

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

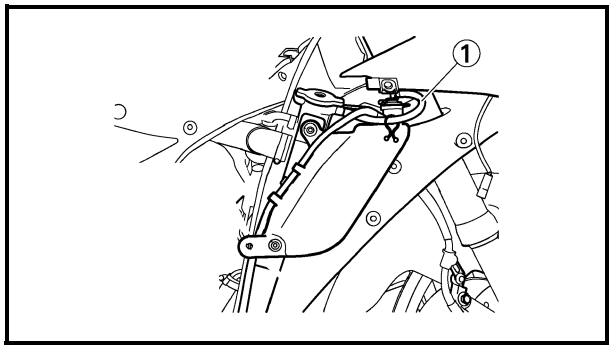
NOTE:
Before checking the coolant level, wait a few minutes until it settles.

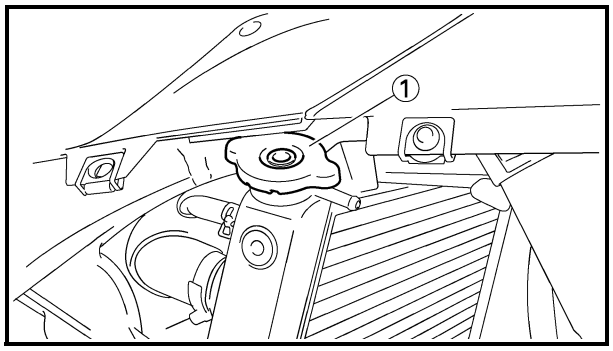




EAS00104
CHECKING THE COOLING SYSTEM

1. Remove:
   - bottom cowling
   - 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 joint inlet hose ⑦
   - water pump inlet pipe ⑧
   - water pump outlet pipe ⑨
   Cracks/damage → Replace.
   Refer to “COOLING SYSTEM” in chapter 6.
3. Install:
   - side cowlings
   - bottom cowling
   Refer to “COWLINGS”.





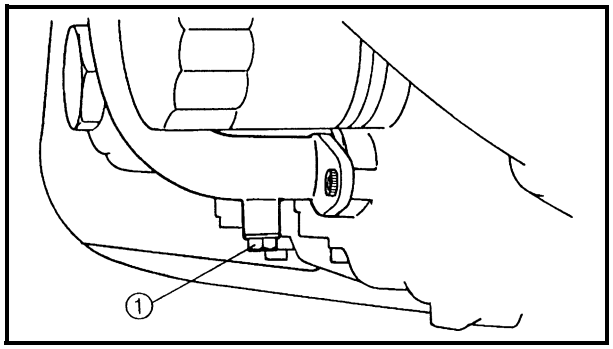
EAS00105
CHANGING THE COOLANT

1. Remove:
   - side cowling
   - bottom cowling
   Refer to “COWLINGS”.
2. Disconnect:
   - coolant reservoir hose ①
3. Drain:
   - coolant
   (from the coolant reservoir)
4. Remove:
   - radiator cap ①

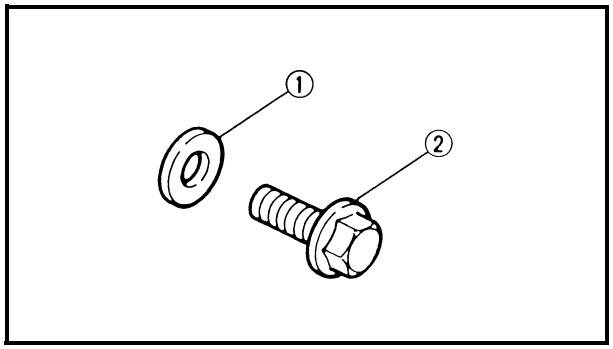
⚠ WARNING

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

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

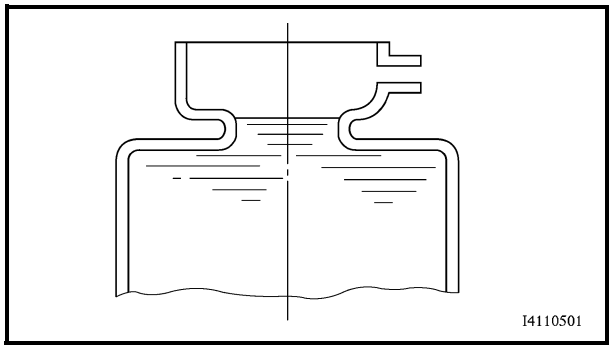


5. Remove:
   - coolant drain bolt ①
   (along with the copper washer)
6. Drain:
   - coolant



7. Check:
   - copper washer ①
   - coolant drain bolt ②
   Damage → Replace.
8. Install:
   - coolant drain bolt

   10 Nm (1.0 m · kg, 7.2 ft · lb)
9. Connect:
   - coolant reservoir hose



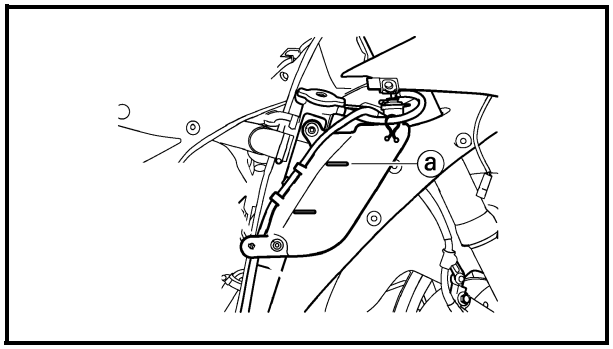
10.Fill:
- cooling system
  (with the specified amount of the recommended coolant)

Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Quantity
Total amount
2.45 L
(2.16 Imp qt, 2.59 US qt)
Coolant reservoir capacity
0.24 L
(0.21 Imp qt, 0.25 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.**
- **Use only distilled water. However, if distilled water is not available, soft water may be used.**
- **If coolant comes into contact with painted surfaces, immediately wash them with water.**
- **Do not mix different types of antifreeze.**



11.Install:
- radiator cap

12.Fill:
- coolant reservoir
  (with the recommended coolant to the maximum level mark ⓐ)

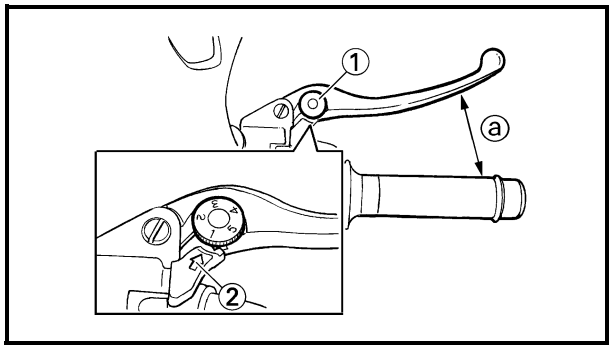
13.Install:
- coolant reservoir cap

14.Start the engine, warm it up for several minutes, and then stop it.

15.Check:
- coolant level
  Refer to “CHECKING THE COOLANT LEVEL”.

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

16.Install:
- side cowling
- bottom cowling
  Refer to “COWLINGS”.



EAS00107
CHASSIS
ADJUSTING THE FRONT BRAKE

1. Adjust:
   - brake lever position
     (distance ⓐ 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.

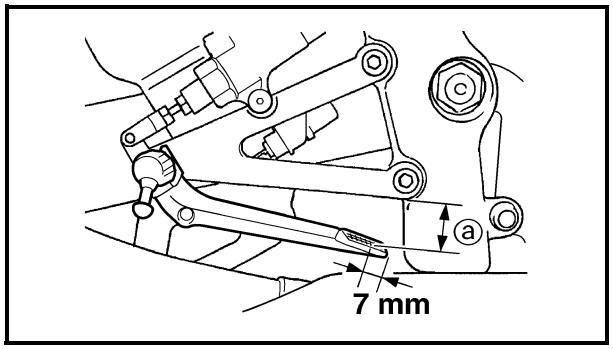
Position #1	**Distance ⓐ is the largest.**
Position #5	**Distance ⓐ is the smallest.**

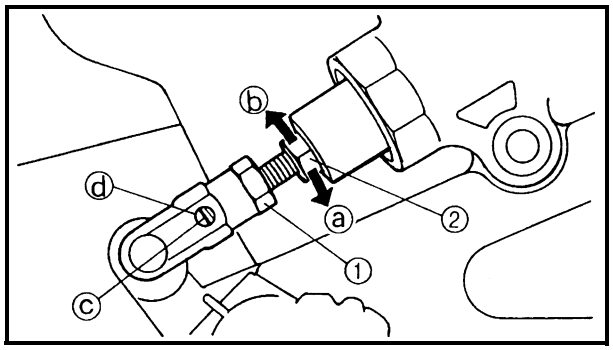
⚠ WARNING

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.





EAS00110
ADJUSTING THE REAR BRAKE

1. Check:
   - brake pedal position
     (distance ⓐ from the top of the brake pedal to the bottom of the rider footrest bracket)
     Out of specification → Adjust.

Brake pedal position (from the top of the brake pedal to the bottom of the rider footrest bracket)
38 ~ 42 mm (1.50 ~ 1.65 in)

2. Adjust:
   - brake pedal position

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a. Loosen the locknut ①.
b. Turn the adjusting bolt ② in direction ⓐ or ⓑ until the specified brake pedal position is obtained.

Direction ⓐ	**Brake pedal is raised.**
Direction ⓑ	**Brake pedal is lowered.**

⚠ WARNING

After adjusting the brake pedal position, check that the end of the adjusting bolt ⓒ is visible through the hole ⓓ.

c. Tighten the locknut ① to specification.

Locknut
16 Nm (1.6 m · kg, 12 ft · lb)

⚠ WARNING

A soft or spongy feeling in the brake pedal 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 braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.

CAUTION:

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

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3. Adjust:
   • rear brake light switch
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH".

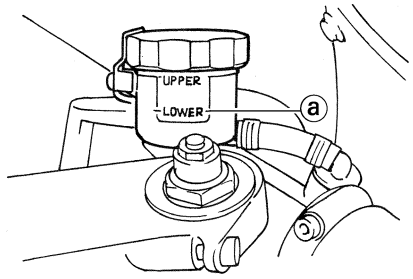
EAS00115

CHECKING THE BRAKE FLUID LEVEL

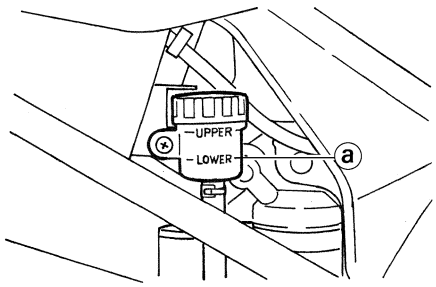
1. Stand the motorcycle on a level surface.

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

A



B



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

Recommended brake fluid
DOT 4

A Front brake
B Rear brake

⚠ WARNING

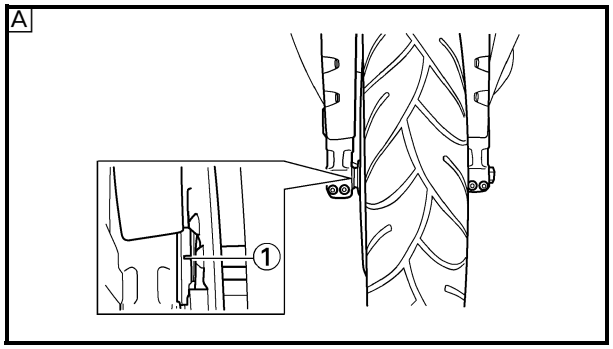
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor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

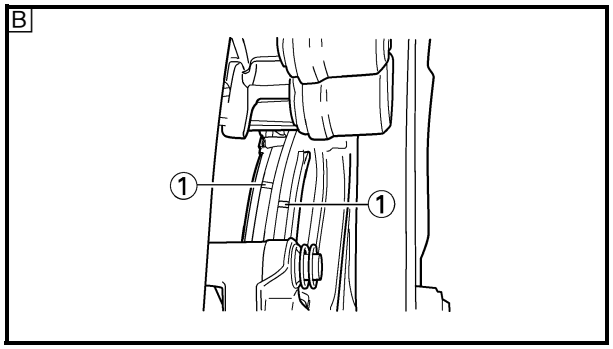
CAUTION:

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

NOTE:

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





EAS00122
CHECKING THE FRONT AND REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
   - front brake pad
   - rear brake pad

   Wear indicator groove ① almost disappeared → Replace the brake pads as a set. Refer to "REPLACING THE FRONT BRAKE PADS" and "REPLACING THE REAR BRAKE PADS" in chapter 4.

Ⓐ Front brake
Ⓑ Rear brake

EAS00128
ADJUSTING THE REAR BRAKE LIGHT SWITCH

NOTE:

The rear brake light switch is operated by movement of the brake pedal. The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.

1. Check:
   - rear brake light operation timing

   Incorrect → Adjust.
2. Adjust:
   - rear brake light operation timing

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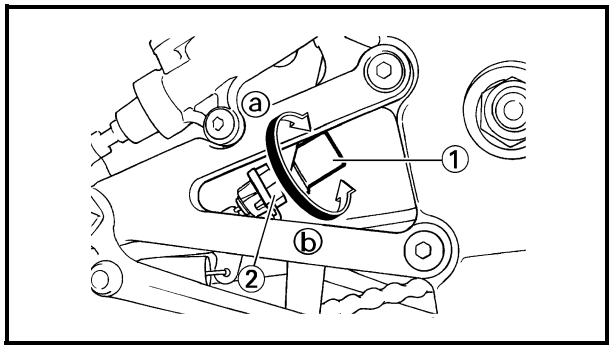
a. Hold the main body ① of the rear brake light switch so that it does not rotate and turn the adjusting nut ② in direction ⓐ or ⓑ until the rear brake light comes on at the proper time.



Direction ⓐ	**Brake light comes on sooner.**
Direction ⓑ	**Brake light comes on later.**

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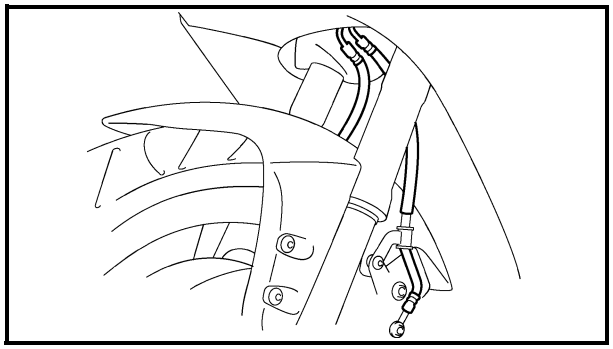
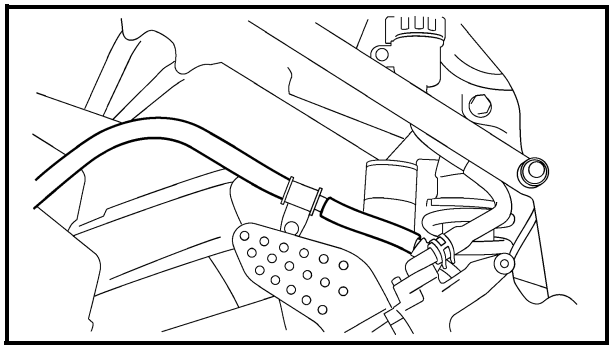




EAS00131
CHECKING THE FRONT AND REAR BRAKE HOSES

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

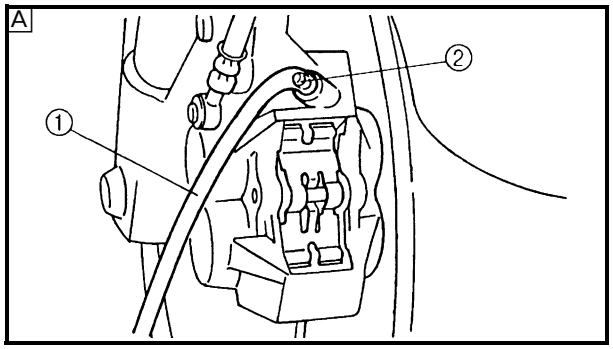
1. Check:
   - brake hose
     Cracks/damage/wear → Replace.
2. Check:
   - brake hose clamp
     Loose → Tighten the clamp bolt.
3. Hold the motorcycle upright and apply the brake several times.
4. Check:
   - brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to “FRONT AND REAR BRAKES” in chapter 4.

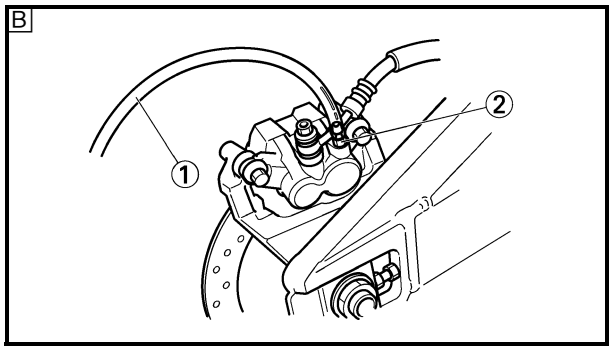
EAS00135
BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠ WARNING

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

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





1. Bleed:
   - hydraulic brake system

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

A Front
B Rear

d. Place the other end of the hose into a container.
e. Slowly apply the brake several times.
f. Fully pull the brake lever or fully press down the brake pedal and hold it in position.
g. Loosen the bleed screw.

NOTE:

Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip or the brake pedal to fully extend.

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

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

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

⚠ WARNING

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

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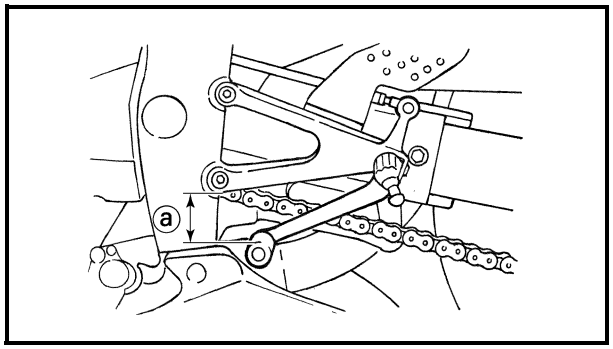

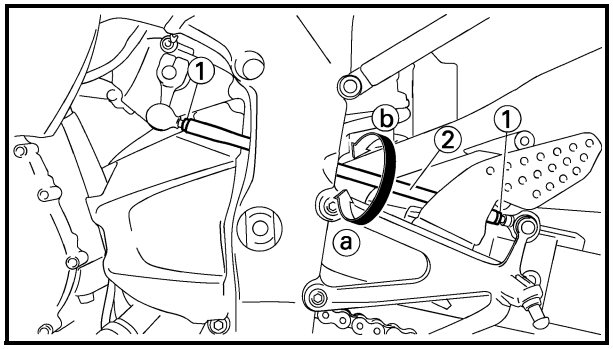

EAS00136
ADJUSTING THE SHIFT PEDAL

1. Check:
   - shift pedal position
     (distance ⓐ from the bottom of the rider footrest bracket to the top of the shift pedal)
     Out of specification→ Adjust.

Shift pedal position (below the top of the rider footrest)
38 ~ 43 mm (1.50 ~ 1.69 in)

2. Adjust:
   - shift pedal position

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a. Loosen both locknuts ①.
b. Turn the shift rod ② in direction ⓐ or ⓑ to obtain the correct shift pedal position.

Direction ⓐ	**Shift pedal is raised.**
Direction ⓑ	**Shift pedal is lowered.**

c. Tighten both locknuts.

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EAS00140
ADJUSTING THE DRIVE CHAIN SLACK

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

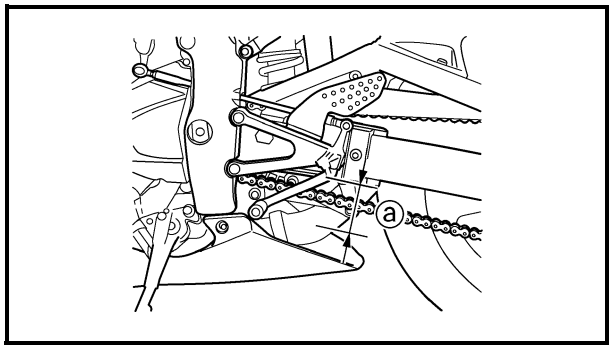
CAUTION:
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the motorcycle on a level surface.

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

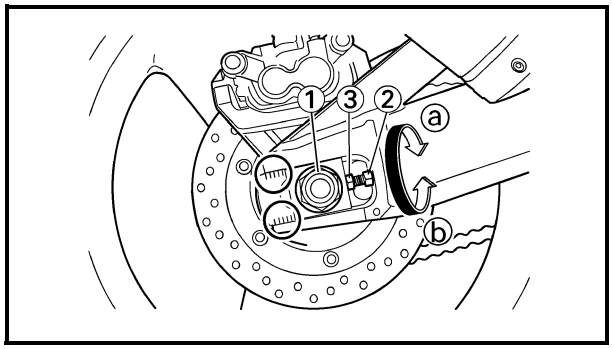
NOTE:
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

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



3. Check:
   • drive chain slack ⓐ
   Out of specification → Adjust.

	Drive chain slack **40 ~ 50 mm (1.57 ~ 1.97 in)**



4. Adjust:
   • drive chain slack

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

Direction ⓐ	**Drive chain is tightened.**
Direction ⓑ	**Drive chain is loosened.**

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

d. Tighten both locknuts to specification.

	Locknut **16 Nm (1.6 m · kg, 12 ft · lb)**

e. Tighten the wheel axle nut to specification.

	Wheel axle nut **150 Nm (15 m · kg, 108 ft · lb)**

CAUTION:
Do not loosen the wheel axle nut after tightening it to the specified torque. If the groove in the wheel axle nut is not aligned with the cotter pin hole in the wheel axle, tighten the nut further until they are aligned.

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.

Recommended lubricant
Engine oil or chain lubricant suitable for O-ring chains

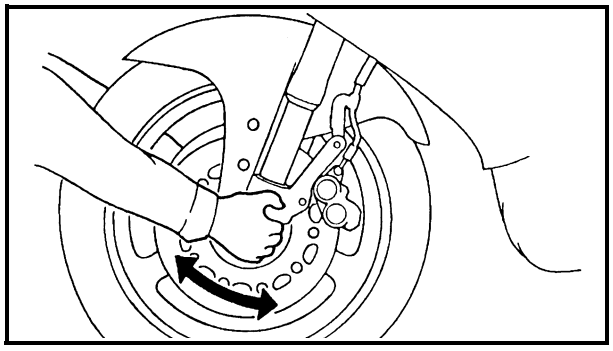
EAS00146
CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the motorcycle on a level surface.

⚠ WARNING

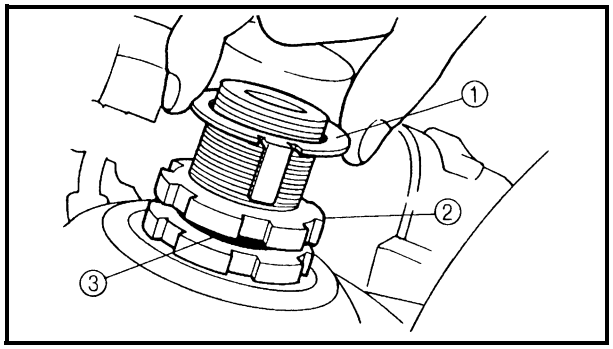
Securely support the motorcycle so that there is no danger of it falling over.

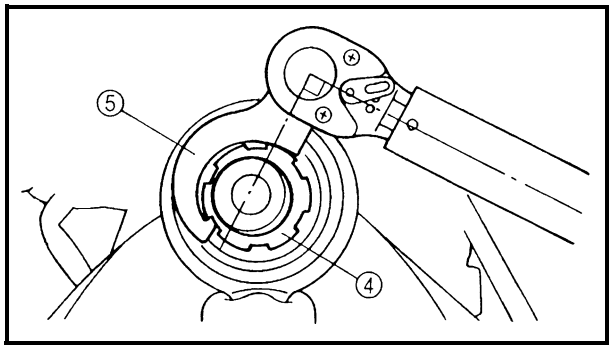
NOTE:
Place the motorcycle on a suitable stand so that the front wheel is elevated.



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 “HANDLEBARS” and “STTERLING HEAD” in chapter 4.





4. Adjust:
   • steering head

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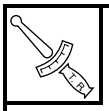
a. Remove the lock washer ①, the upper ring nut ②, and the rubber washer ③.
b. Loosen the lower ring nut ④ and then tighten it to specification with a steering nut wrench ⑤.

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

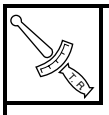
	**Steering nut wrench** **YU-33975**

	**Lower ring nut (initial tightening torque)** **50 Nm (5.0 m · kg, 36.2 ft · lb)**

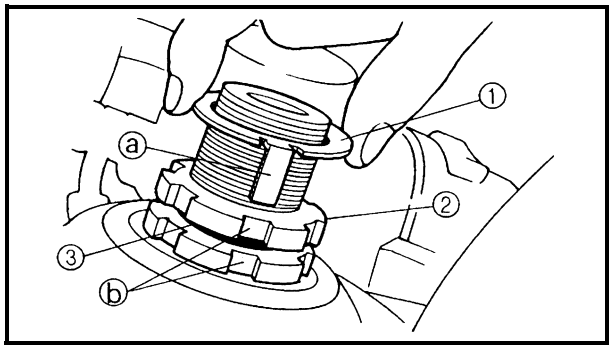
c. Loosen the lower ring nut completely, then tighten it to specification.

⚠ WARNING

Do not overtighten the lower ring nut.

	**Lower ring nut (final tightening torque)** **9 Nm (0.9 m·kg, 6.5 ft · lb)**

d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
   Refer to “STEERING HEAD” in chapter 4.



e. Install the rubber washer 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 ⓐ sit correctly in the ring nut slots ⓑ.

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5. Install:
   - upper bracket
   - steering stem nut

     115 Nm (11.5 m · kg, 83 ft · lb)
   - upper bracket bolt

     13 Nm (1.3 m · kg, 9.4 ft · lb)
   - handlebar pinch bolt

     13 Nm (1.3 m · kg, 9.4 ft · lb)
   - upper bracket pinch bolt

     26 Nm (2.6 m · kg, 19 ft · lb)
6. Measure:
   - steering head tension

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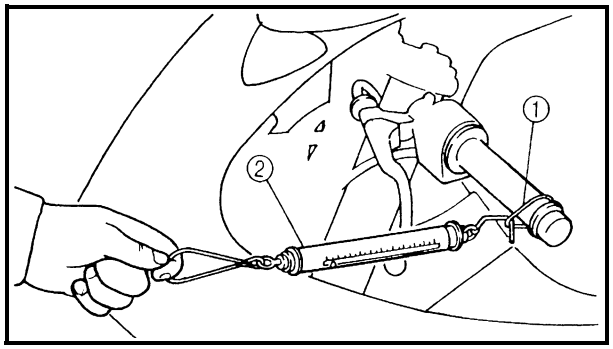
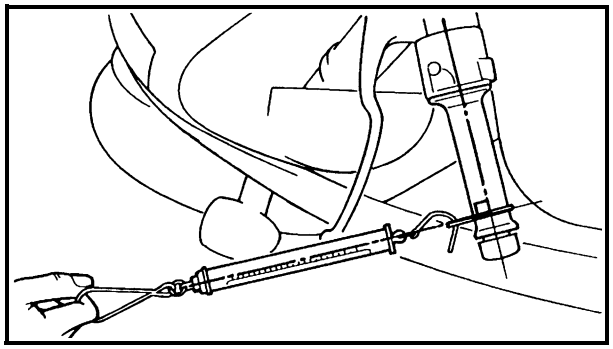
NOTE:
Make sure all of the cables and wires are properly routed.





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 (7.05 ~ 17.64 oz)

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.

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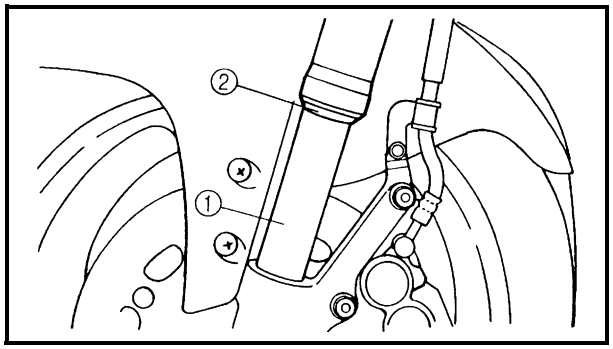
EAS00150
CHECKING THE FRONT FORK

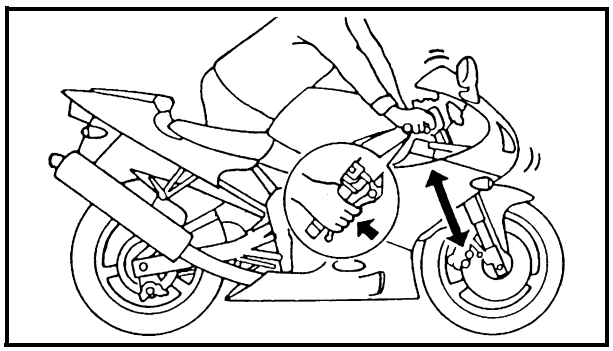
1. Stand the motorcycle on a level surface.

⚠ 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.

EAS00155
ADJUSTING THE FRONT FORK LEGS

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

⚠ WARNING

- **Always adjust both front fork legs evenly. Uneven adjustment can result in poor handling and loss of stability.**
- **Securely support the motorcycle so that there is no danger of it falling over.**

Spring preload

CAUTION:

- **Grooves are provided to indicate the adjustment position.**
- **Never go beyond the maximum or minimum adjustment positions.**

1. Adjust:
   - spring preload

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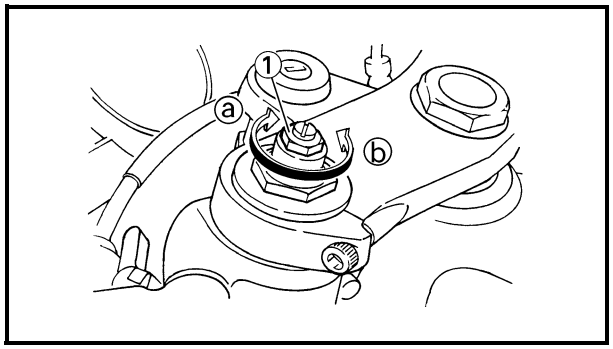
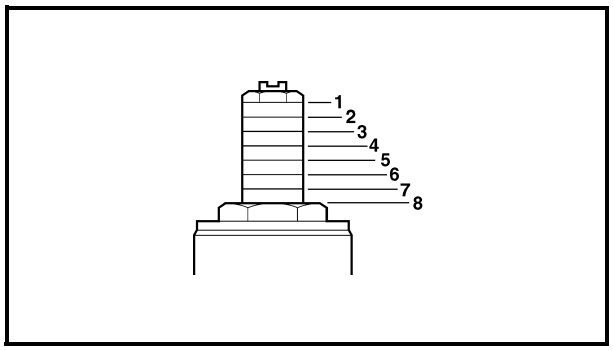
a. Turn the adjusting bolt ① in direction ⓐ or ⓑ.



Direction ⓐ	**Spring preload is increased (suspension is harder).**
Direction ⓑ	**Spring preload is decreased (suspension is softer).**



Adjusting positions
Minimum: 8
Standard: 6
Maximum: 1

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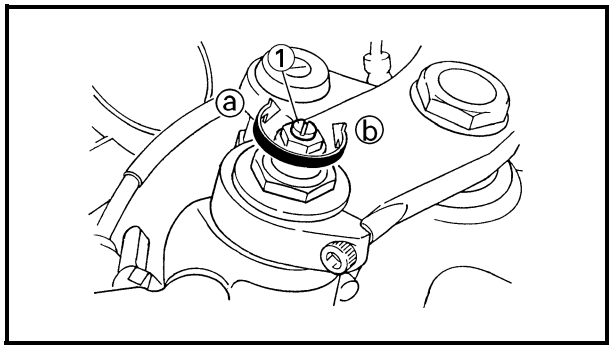
Rebound damping

CAUTION:

Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   - rebound damping

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

Direction ⓐ	**Rebound damping is increased (suspension is harder).**
Direction ⓑ	**Rebound damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 26 clicks in direction ⓑ *
Standard: 13 clicks in direction ⓑ *
Maximum: 1 click in direction ⓑ *
*** with the adjusting screw fully turned-in direction ⓐ**

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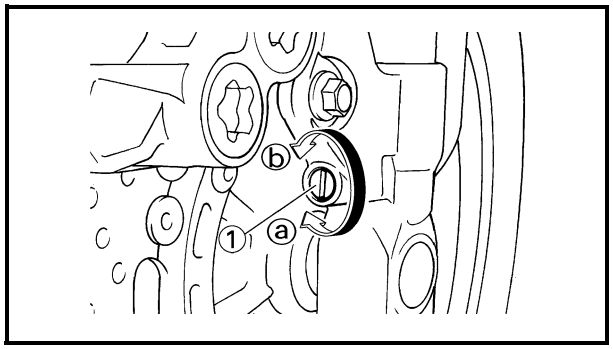
Compression damping

CAUTION:

Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   - compression damping

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

Direction ⓐ	**Compression damping is increased (suspension is harder).**
Direction ⓑ	**Compression damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 20 clicks in direction ⓑ *
Standard: 13 clicks in direction ⓑ *
Maximum: 1 click in direction ⓑ *
*** with the adjusting screw fully turned-in direction ⓐ**

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EAS00158

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

⚠ WARNING

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

Spring preload

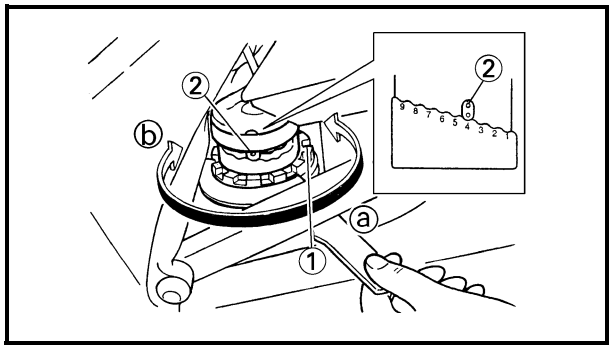
CAUTION:

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
   • spring preload

NOTE:

Adjust the spring preload with the special wrench and extension bar included in the owner's tool kit.



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a. Turn the adjusting ring ① in direction ⓐ or ⓑ.
b. Align the desired position on the adjusting ring with the stopper ②.

Direction ⓐ	**Spring preload is increased (suspension is harder).**
Direction ⓑ	**Spring preload is decreased (suspension is softer).**

Adjusting positions
Minimum: 1
Standard: 4
Maximum: 9

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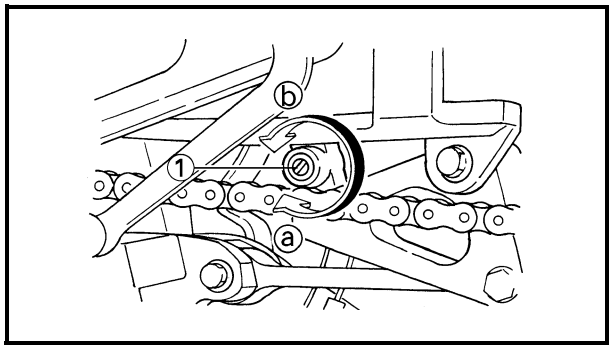
Rebound damping

CAUTION:

Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   • rebound damping

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

Direction ⓐ	**Rebound damping is increased (suspension is harder).**
Direction ⓑ	**Rebound damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 20 clicks in direction ⓑ *
Standard: 15 clicks in direction ⓑ *
Maximum: 1 click in direction ⓑ *
*** with the adjusting screw fully turned-in direction ⓐ**

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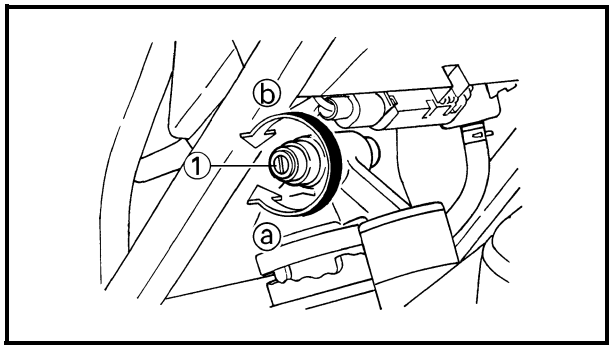
Compression damping

CAUTION:

Never go beyond the maximum or minimum adjustment positions.



1. Adjust:
   • compression damping

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

Direction ⓐ	**Compression damping is increased (suspension is harder).**
Direction ⓑ	**Compression damping is decreased (suspension is softer).**

Adjusting positions
Minimum: 20 clicks in direction ⓑ *
Standard: 15 clicks in direction ⓑ *
Maximum: 1 click in direction ⓑ *
*** with the adjusting screw fully turned-in direction ⓐ**

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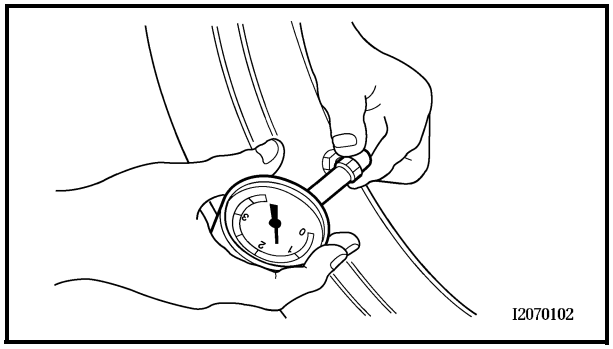


EAS00162
CHECKING THE TIRES

The following procedure applies to both of the tires.

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

⚠ WARNING

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

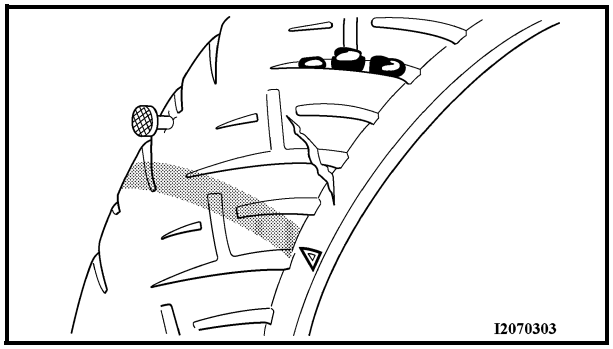
NEVER OVERLOAD THE MOTORCYCLE.

Basic weight (with oil and a full fuel tank)	**For USA, Canada 193 kg (426 lb) For California 194 kg (428 lb)**	
Maximum load*	**For USA, Canada 202 kg (445 lb) For California 201 kg (443 lb)**	
Cold tire pressure	**Front**	**Rear**
Up to 90 kg (198 lb) load*	**250 kPa (2.5 kgf/cm², 36.3 psi)**	**250 kPa (2.5 kgf/cm², 36.3 psi)**
90 kg (198 lb) ~ maximum load*	**250 kPa (2.5 kgf/cm², 36.3 psi)**	**290 kPa (2.9 kgf/cm², 42.1 psi)**
High-speed riding	**250 kPa (2.5 kgf/cm², 36.3 psi)**	**250 kPa (2.5 kgf/cm², 36.3 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.

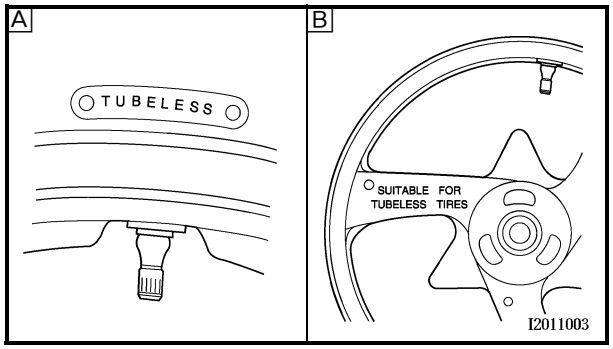


2. Check:
   - tire surfaces
     Damage/wear → Replace the tire.

	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

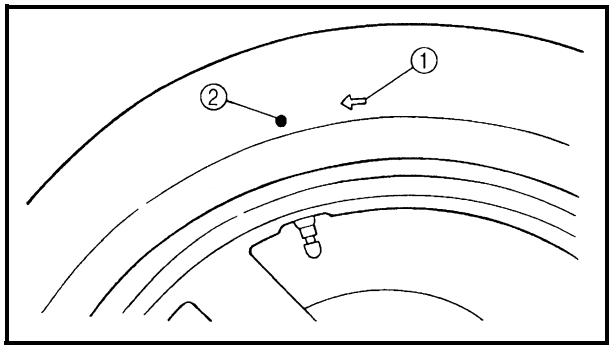
Manufacturer	Size	Model
DUNLOP	120/70ZR 17M/C (58W)	D208FL
MICHELIN	120/70ZR 17M/C (58W)	Pilot SPORT E

Rear tire

Manufacturer	Size	Model
DUNLOP	190/50ZR 17M/C (73W)	D208L
MICHELIN	190/50ZR 17M/C (73W)	Pilot SPORT

⚠ 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 base grease

EAS00172
LUBRICATING THE SIDESTAND

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

Recommended lubricant
Lithium soap base grease

EAS00174
LUBRICATING THE REAR SUSPENSION

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

Recommended lubricant
Lithium soap base 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

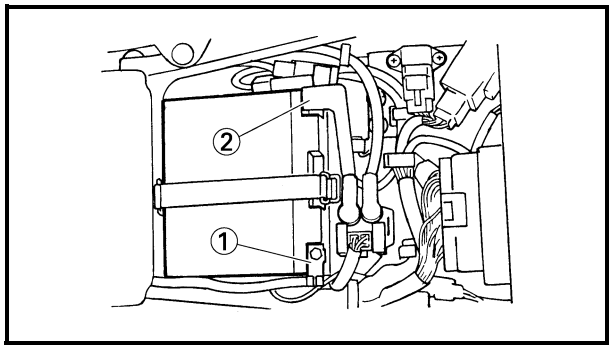
- **Skin — Wash with water.**
- **Eyes — Flush with water for 15 minutes and get immediate medical attention.**

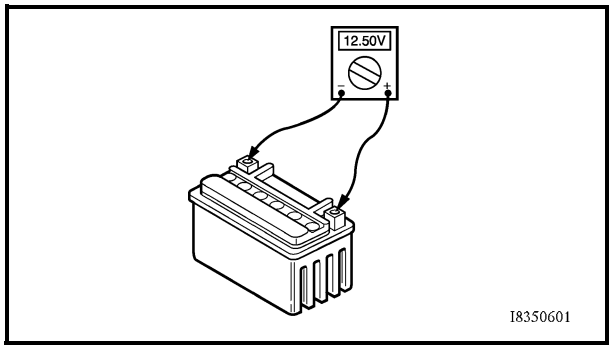
INTERNAL

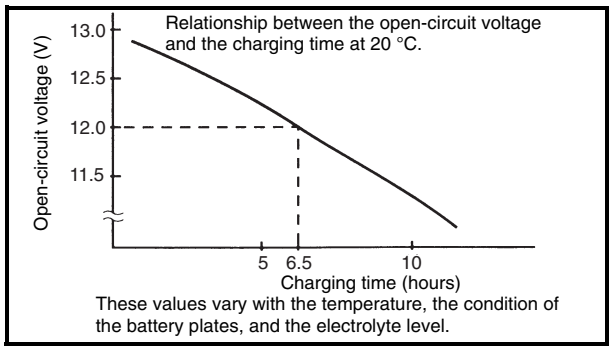
- **Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.**

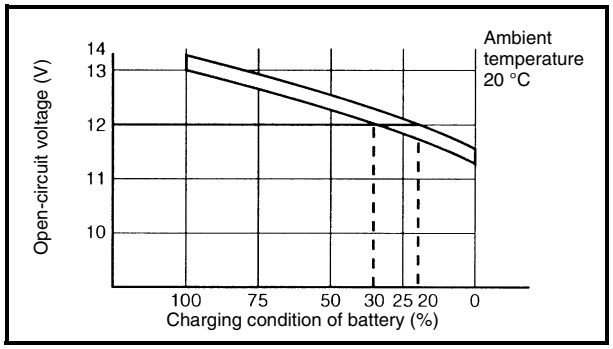
CAUTION:

- **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.**









NOTE:

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

1. Remove:
   - rider seat
     Refer to "SEATS"
2. Disconnect:
   - battery leads
     (from the battery terminals)

CAUTION:

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

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

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a. Connect a pocket tester to the battery terminals.

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

NOTE:

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

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

Example

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

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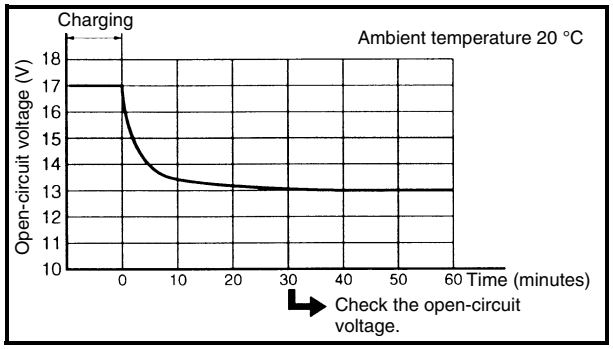


5. Charge:
   • battery
   (refer to the appropriate charging method illustration)

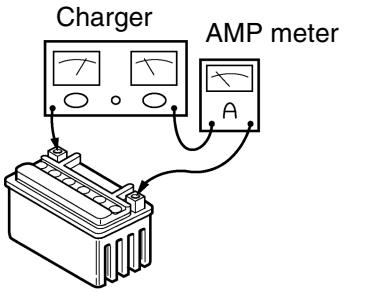
⚠ WARNING

Do not quick charge a battery.

CAUTION:

- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.**
- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **When charging a battery, be sure to remove it from the 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



I8350101

Measure the open-circuit voltage prior to charging.

Connect a charger and AMP meter to the battery and start charging.

Make sure that the current is higher than the standard charging current written on the battery.

YES

NO

By turning the charging voltage adjust dial, set the charging at 20 ~ 24 V.

Monitor the amperage for 3 ~ 5 minutes to check if the standard charging current is reached.

YES

Adjust the voltage so that the current is at the standard charging level.

NO

Set the time according to the charging time suitable for the open-circuit voltage.
Refer to “Battery condition checking steps”.

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

If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.

Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

NOTE:
Set the charging voltage at 16 ~ 17 V. (If the setting lower, charging will be insufficient. If too high, the battery will be over-charged.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charger and AMP meter to the battery and start charging.

Make sure that the current is higher than the standard charging current written on the battery.

YES

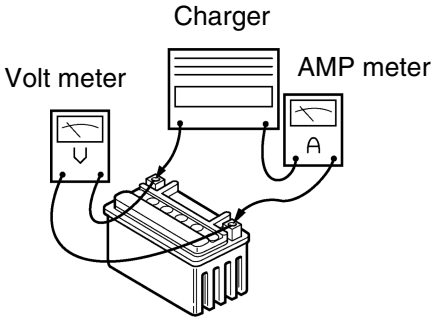
Charge the battery until the battery's charging voltage is 15 V.

NOTE:
Set the charging time at 20 hours (maximum).

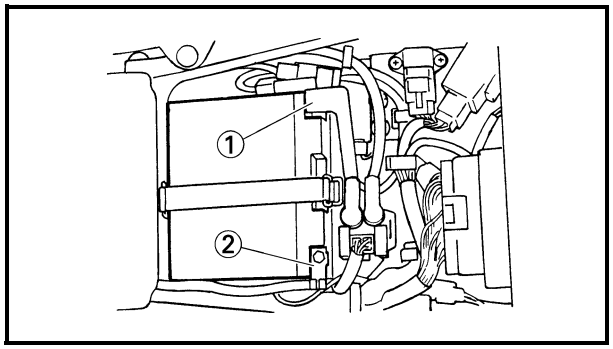
Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

NO

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



I8350102



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

CAUTION:

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

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

	Recommended lubricant **Dielectric grease**

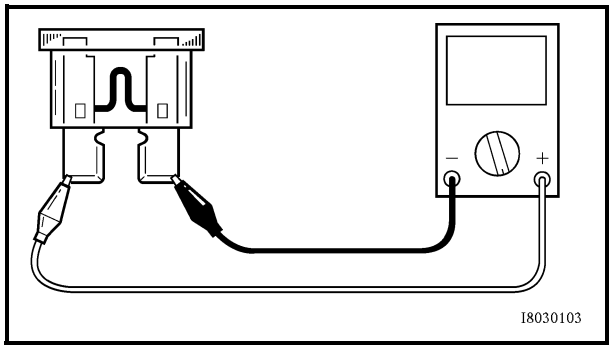
10. Install:
    • rider seat
      Refer to “SEATS”.

EAS00181
CHECKING THE FUSES

The following procedure applies to all of the fuses.

CAUTION:

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



1. Remove:
   • rider seat
     Refer to “SEATS”.
   • front cowling inner panel (left)
     Refer to “COWLINGS”.
2. Check:
   • fuse

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

NOTE:

Set the pocket tester selector to “Ω × 1”.

	Pocket tester **YM-03112**

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

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3. Replace:
   • blown fuse

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

Fuses	Amperage rating	Q’ty
Main	50 A	1
Fuel injection system	15 A	1
Headlight	20 A	1
Signaling system	15 A	1
Ignition	15 A	1
Back up (odometer and clock)	5 A	1
Radiator fan motor	15 A	1
Reserve	20 A	1
Reserve	15 A	1
Reserve	5 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.

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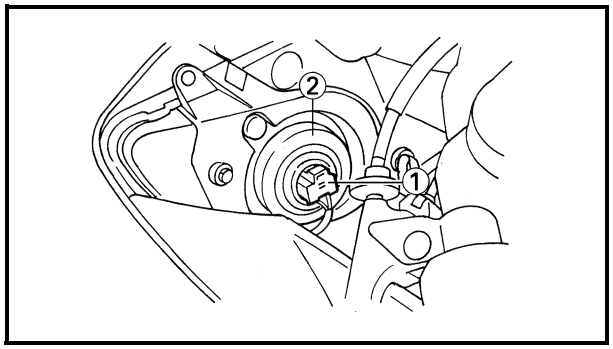
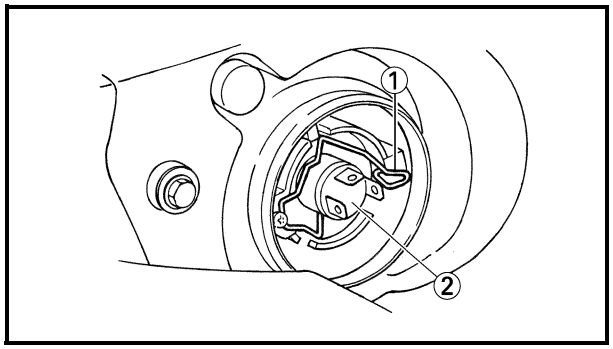
4. Install:
   • front cowling inner panel (left)
   Refer to “COWLINGS”.
   • rider seat
   Refer to “SEATS”.





EAS00183
REPLACING THE HEADLIGHT BULBS

The following procedure applies to both of the headlight bulbs.

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

⚠ WARNING

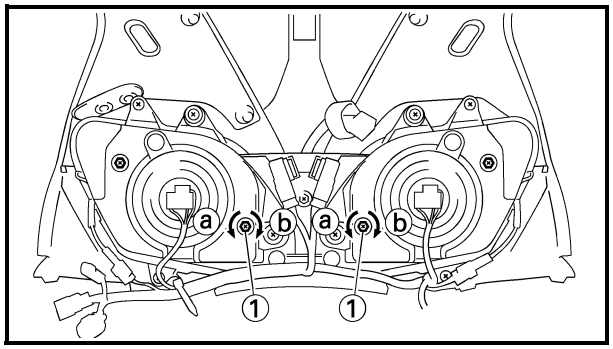
Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

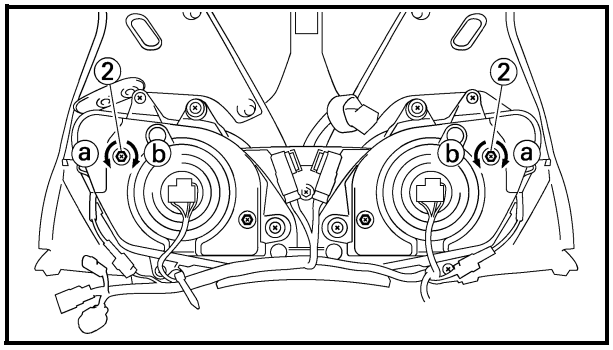
4. Install:
   - headlight bulb New
     Secure the new headlight bulb with the headlight bulb holder.

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





EAS00184
ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
   • headlight beam (vertically)

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

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

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2. Adjust:
   • headlight beam (horizontally)

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a. Turn the adjusting screw ② in direction ⓐ or ⓑ.

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

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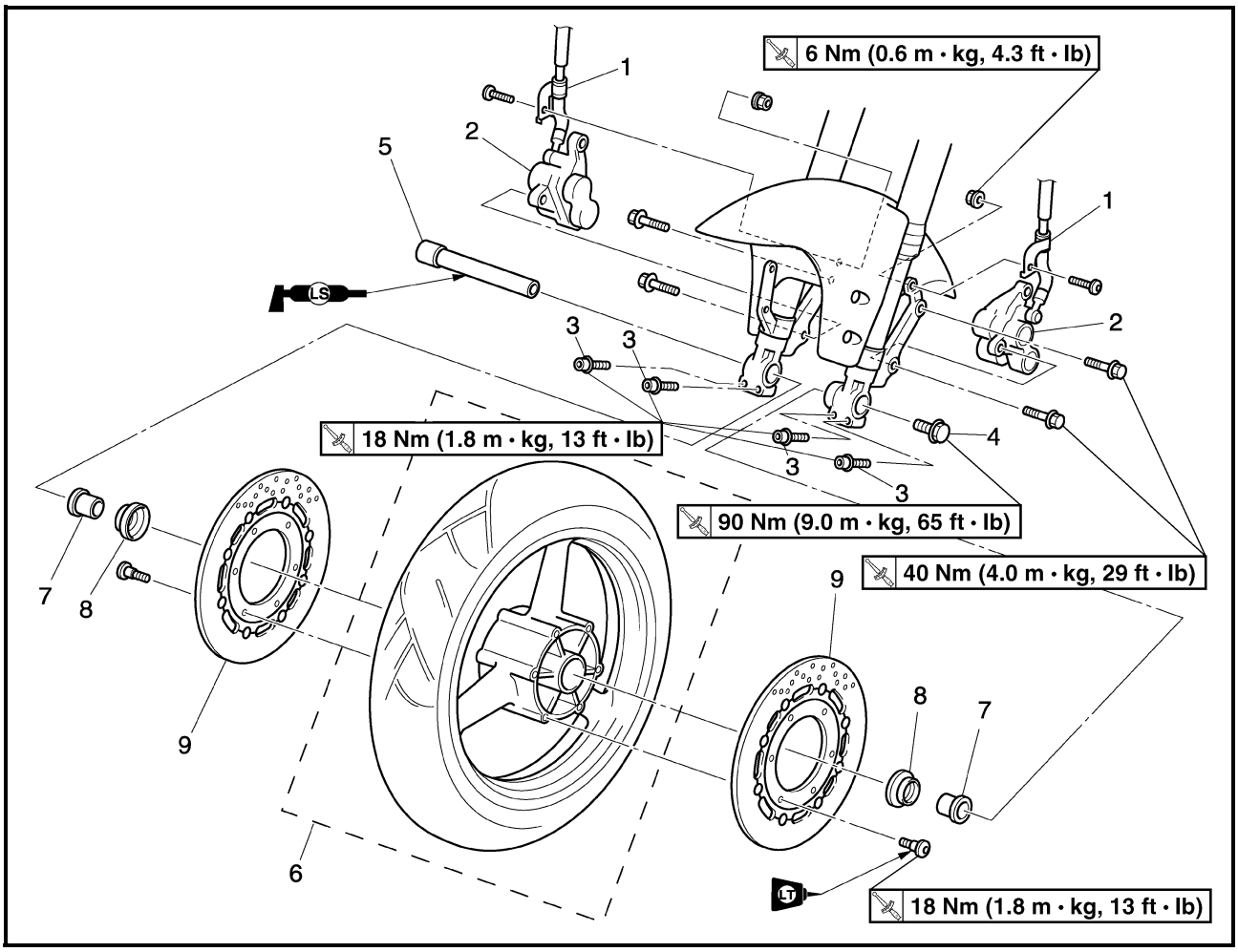
EAS00514

CHASSIS

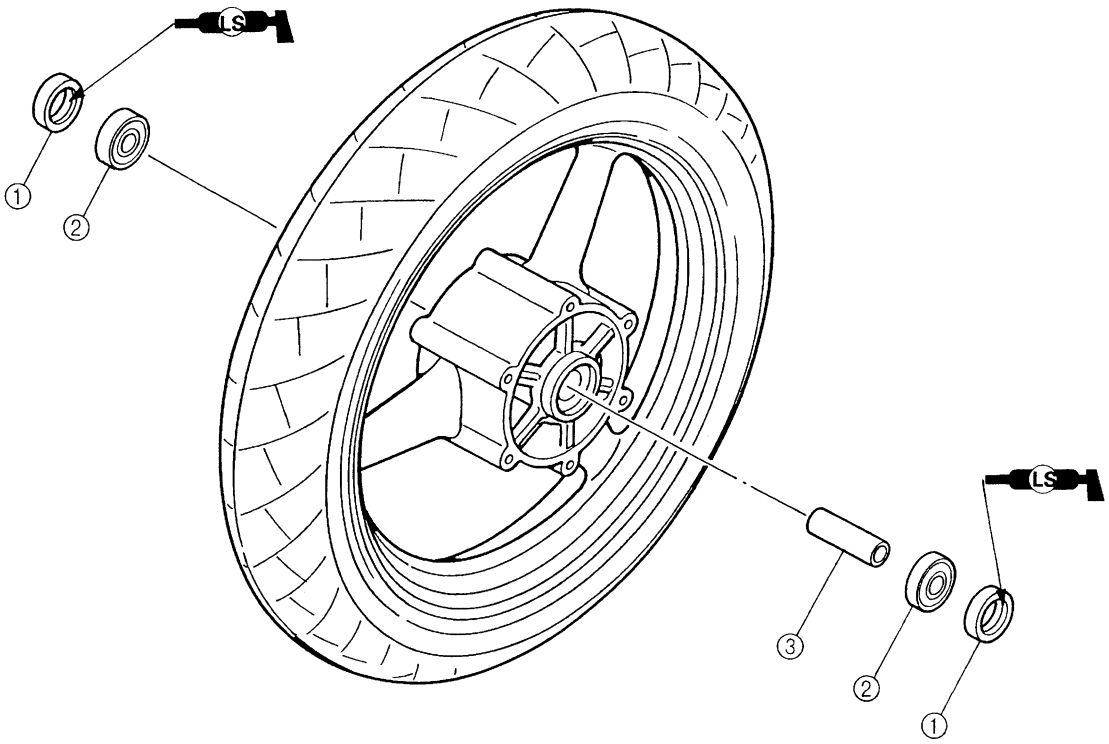
FRONT WHEEL AND BRAKE DISCS



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

EAS00518

FRONT WHEEL



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Remove the parts in the order listed.
①	Oil seal (left and right)	2	
②	Wheel bearing (left and right)	2	
③	Spacer	1	
			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

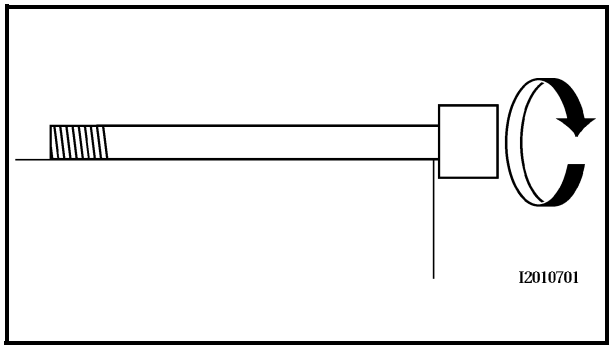
NOTE:

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.



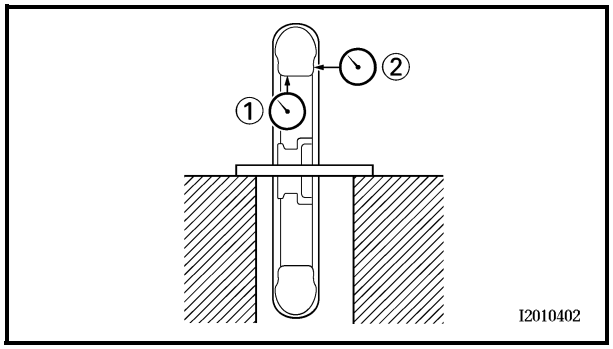
EAS00525
CHECKING THE FRONT WHEEL

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

⚠ WARNING

Do not attempt to straighten a bent wheel axle.

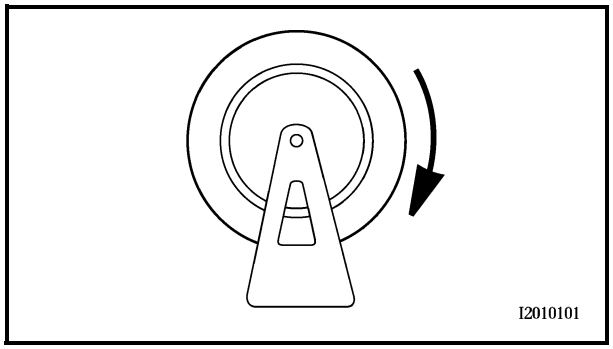
2. Check:
   - tire
   - front wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.



3. Measure:
   - radial wheel runout ①
   - lateral wheel runout ②

   Over the specified limits → Replace.

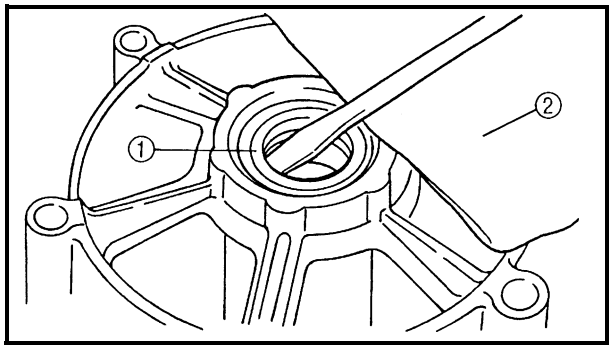
Radial wheel runout limit
1.0 mm (0.04 in)
Lateral wheel runout limit
0.5 mm (0.02 in)



4. Check:
   - wheel bearings

     Front wheel turns roughly or is loose → Replace the wheel bearings.
   - oil seals

     Damage/wear → Replace.



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

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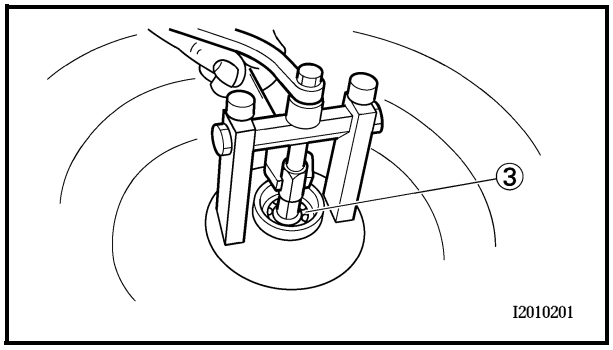
a. Clean the outside of the front wheel hub.
b. Remove the oil seals ① with a flat-head screwdriver.

NOTE:

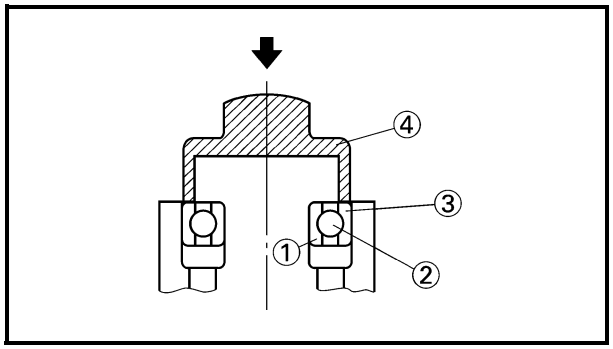
To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.



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

CAUTION:

Do not contact the wheel bearing inner race ① or balls ②. Contact should be made only with the outer race ③.



NOTE:

Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

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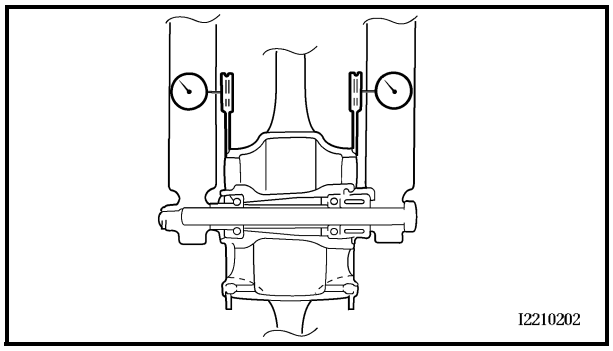
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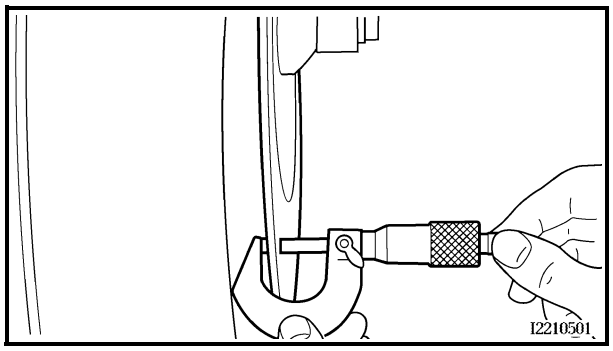
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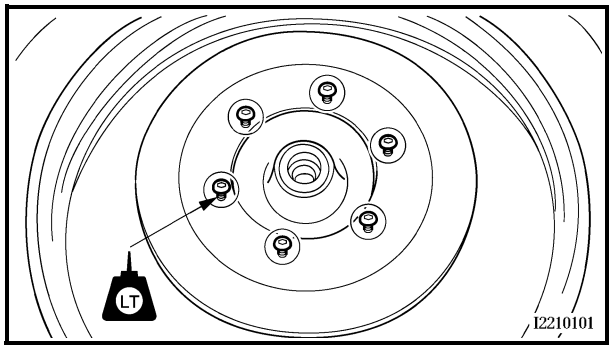

I2210101

EAS00533
CHECKING THE BRAKE DISCS

The following procedure applies to all of the brake discs.

1. Check:
   - brake disc
     Damage/galling → Replace.
2. Measure:
   - brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.

Brake disc deflection limit (maximum)
Front: 0.1 mm (0.04 in)
Rear: 0.15 mm (0.06 in)

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

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

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

4. Adjust:
   - brake disc deflection

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

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

Brake disc bolt
18 Nm (1.8 m · kg, 13 ft · lb)
LOCTITE®

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

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EAS00545
INSTALLING THE FRONT WHEEL

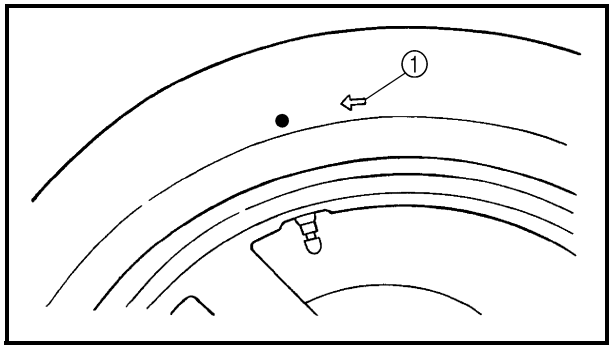
The following procedure applies to both brake discs.

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.



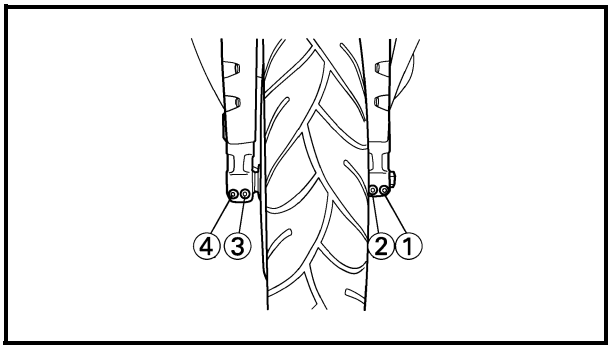
4. Lower the front wheel so that it is on the ground.
5. Install the brake calipers by installing the bolts, and then tightening them to the specified torque.

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
90 Nm (9.0 m · kg, 65 ft · lb)



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

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

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

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

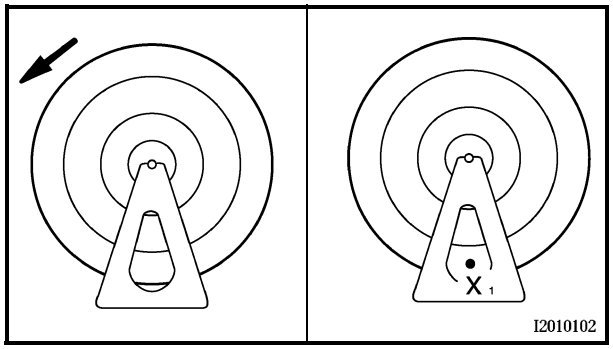
11. While applying the front brake, push down hard on the handlebar several times to check for proper fork operation.

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.



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

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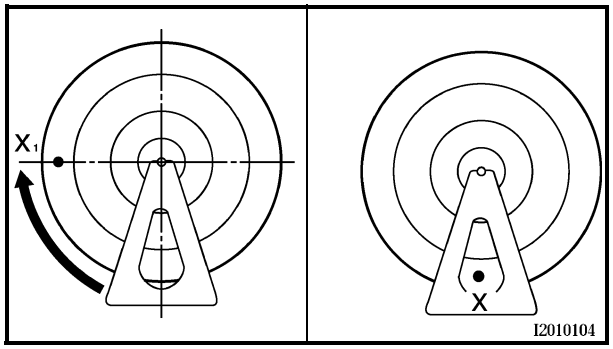

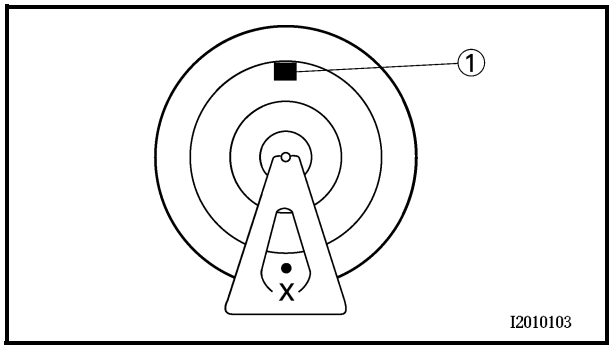

3. Adjust:
   • front wheel static balance

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

NOTE:
Start with the lightest weight.

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

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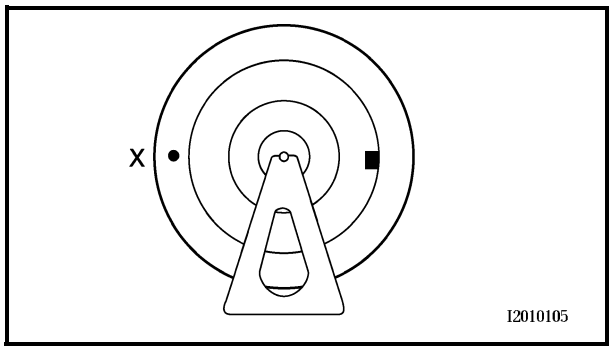

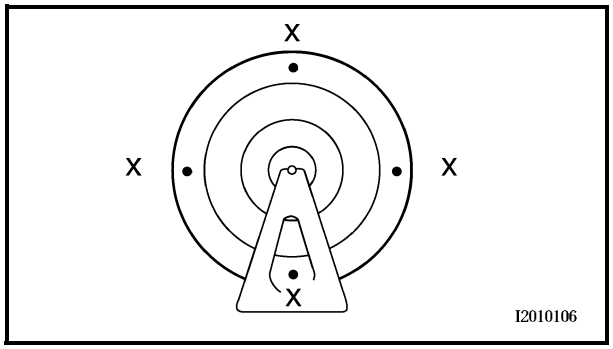

4. Check:
   • front wheel static balance

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

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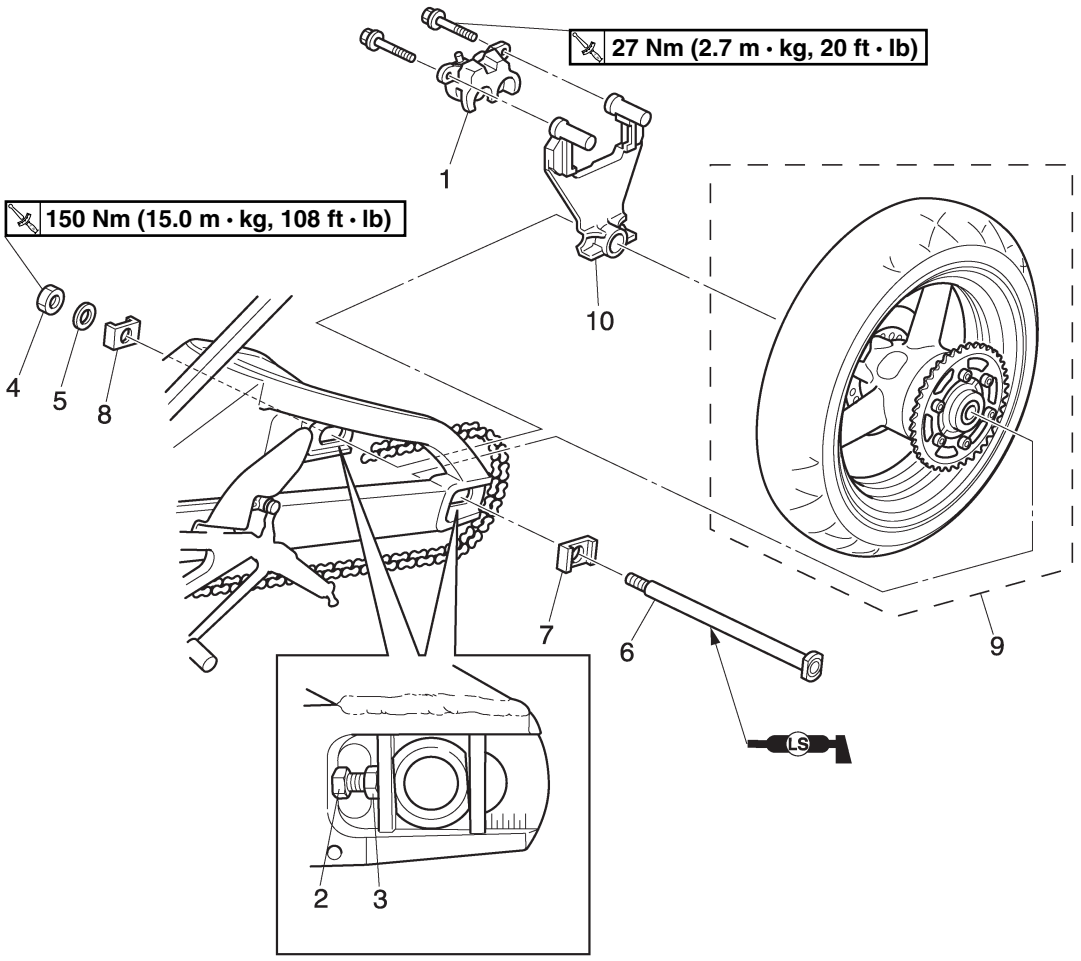
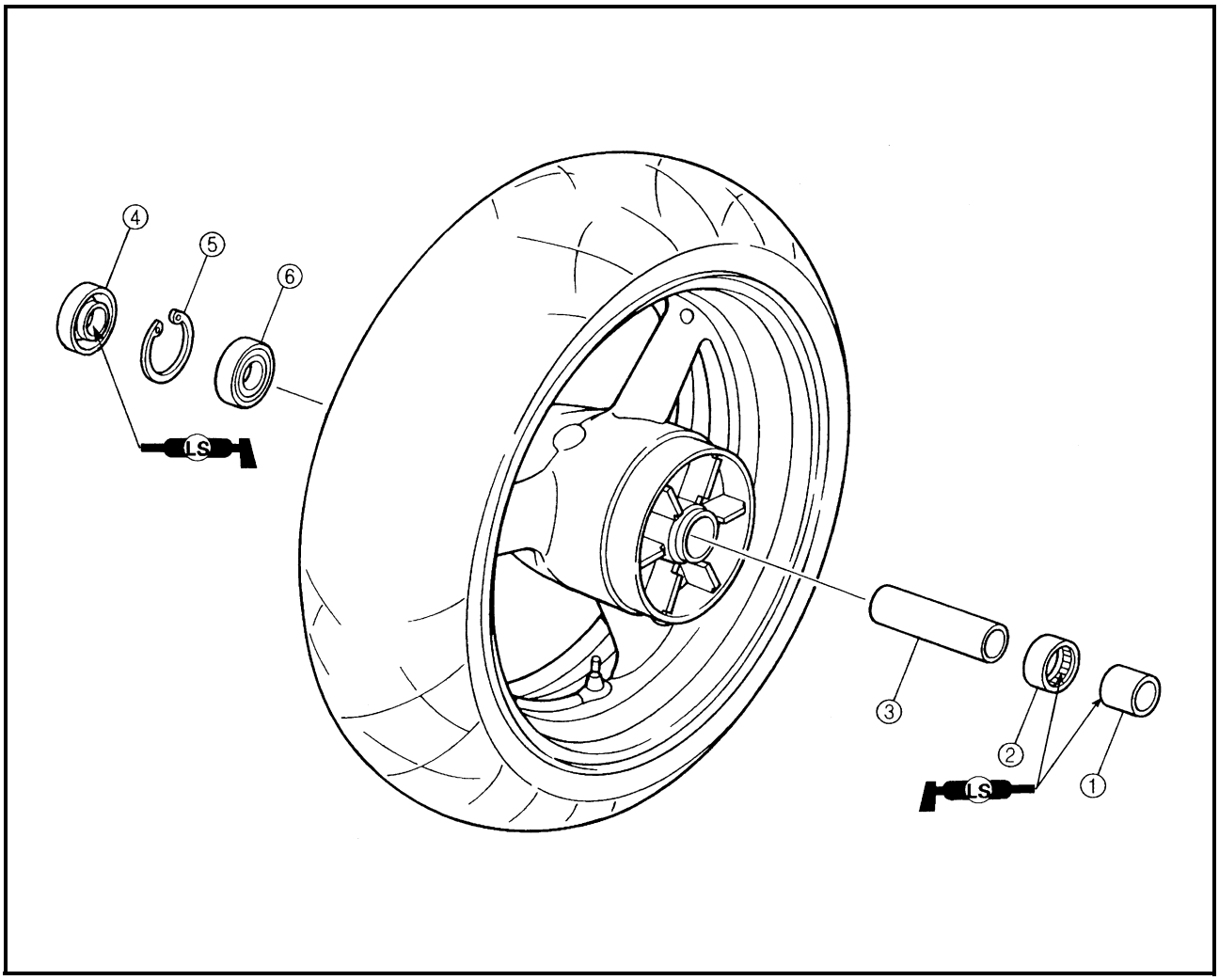
EAS00551
REAR WHEEL AND BRAKE DISC



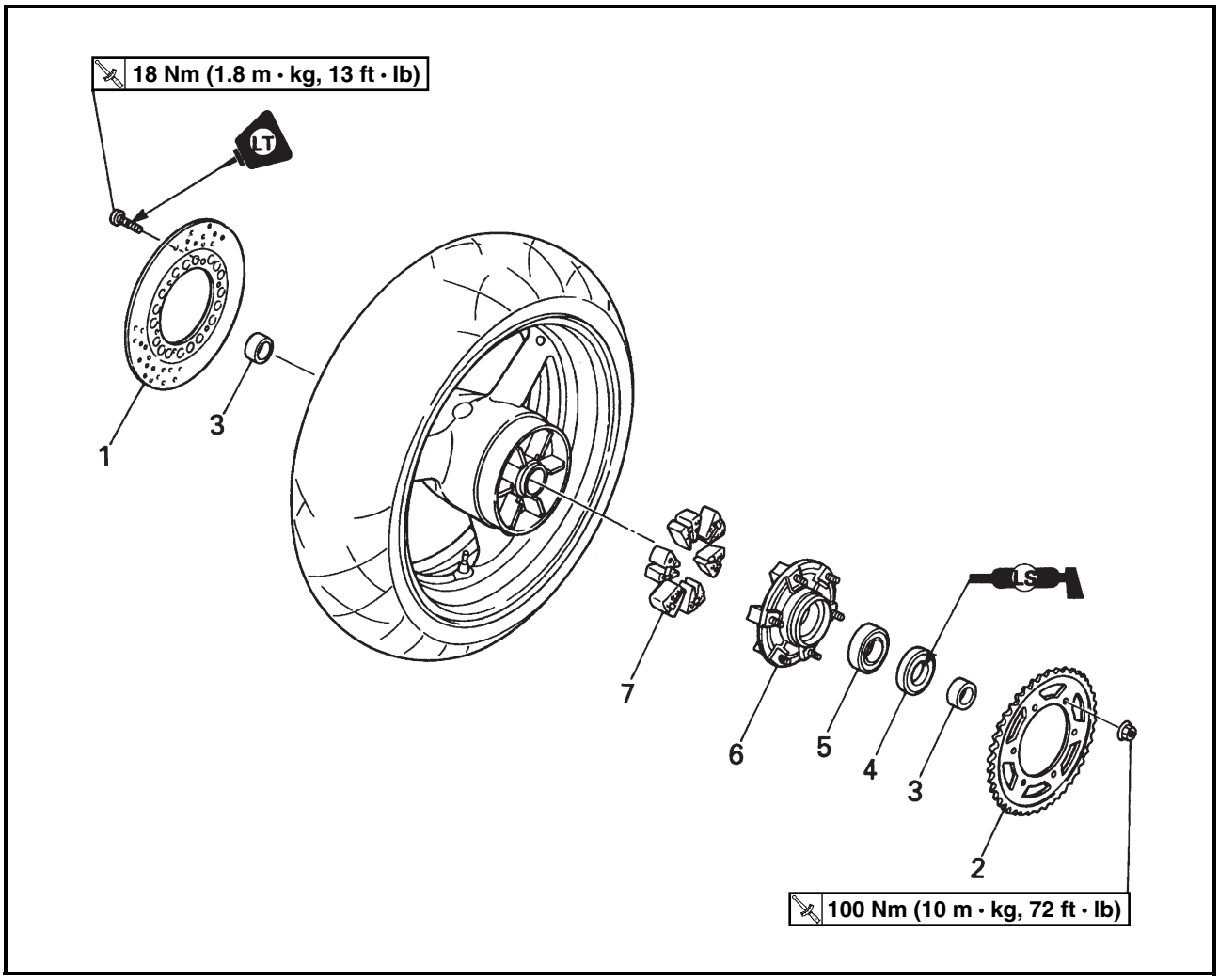
Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Brake caliper	1	
2	Locknut (left and right)	2	Loosen.
3	Adjusting bolt (left and right)	2	Loosen.
4	Wheel axle nut	2	
5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

EAS00560

REAR WHEEL



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



Order	Job/Part	Q'ty	Remarks
	Remove the brake disc and rear wheel sprocket		Remove the parts in the order listed.
1	Brake disc	1	
2	Rear wheel sprocket	1	
3	Collar (left and right)	2	
4	Oil seal	1	
5	Bearing	1	
6	Rear wheel drive hub	1	
7	Rear wheel drive hub damper	6	
			For installation, reverse the removal procedure.

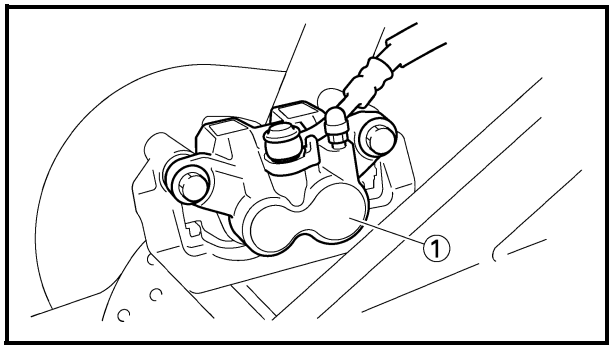
EAS00561
REMOVING THE REAR WHEEL

1. Stand the motorcycle on a level surface.

⚠ WARNING

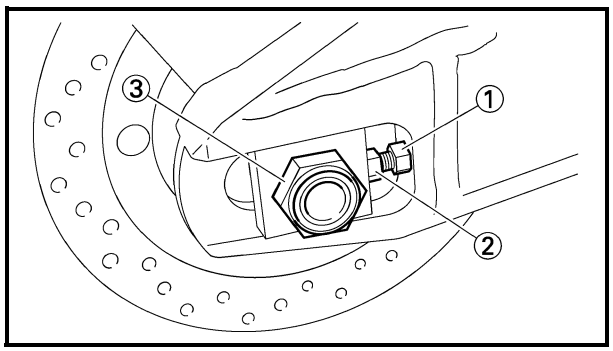
Securely support the motorcycle so that there is no danger of it falling over.

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



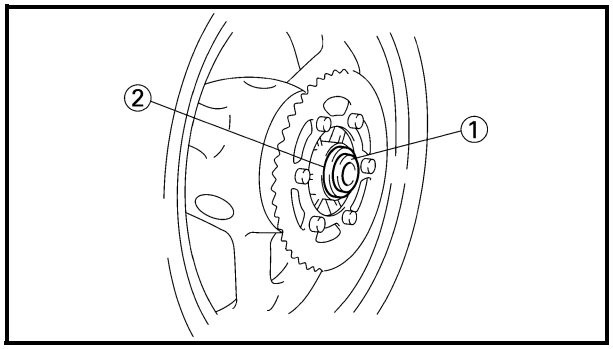
2. Remove:
   - brake caliper ①

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



3. Loosen:
   - locknut ①
   - adjusting bolt ②
4. Remove:
   - wheel axle nut ③
   - wheel axle
   - 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

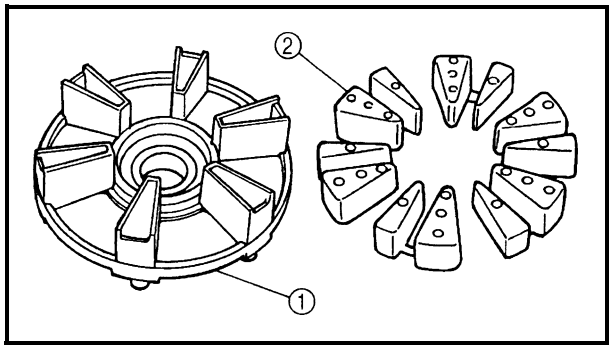
1. Check:
   - wheel axle
   - rear wheel
   - wheel bearings
   - oil seals

   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”.

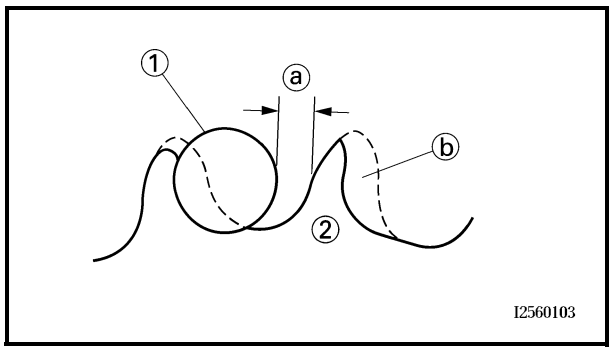


EAS00567
CHECKING THE REAR WHEEL DRIVE HUB

1. Check:
   - rear wheel drive hub ①

     Cracks/damage → Replace.
   - rear wheel drive hub dampers ②

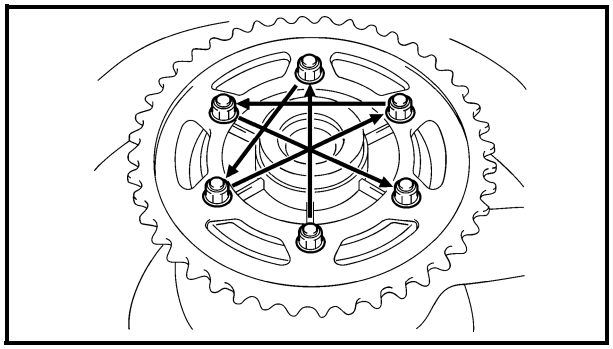
     Damage/wear → Replace.



EAS00568
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

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

ⓑ Correct
① Drive chain roller
② Rear wheel sprocket



2. Replace:
   - rear wheel sprocket

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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.

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EAS00571
INSTALLING THE REAR WHEEL

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

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

2. Adjust:
   • drive chain slack

Drive chain slack
40 ~ 50 mm (1.57 ~ 1.97 in)

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

3. Tighten:
   • wheel axle nut

150 Nm (15 m · kg, 108 ft · lb)

   • brake caliper bolts

27 Nm (2.7 m · kg, 20 ft · lb)

⚠ WARNING

Make sure the brake hose is routed properly.

CAUTION:

Do not loosen the wheel axle nut after tightening it to the specified torque. If the groove in the wheel axle nut is not aligned with the cotter pin hole in the wheel axle, tighten the nut further until they are aligned.

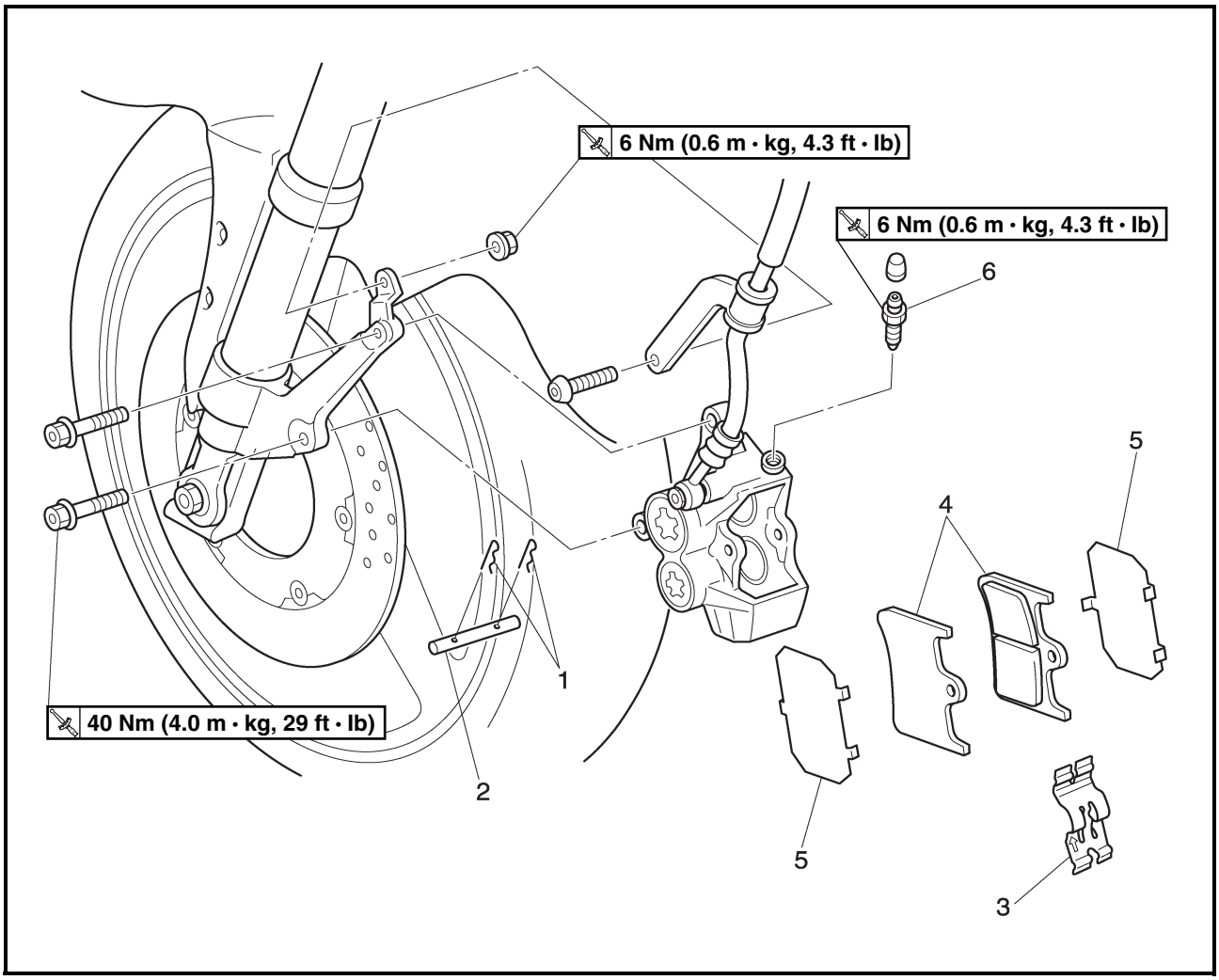
EAS00575
ADJUSTING THE REAR WHEEL STATIC BALANCE

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.

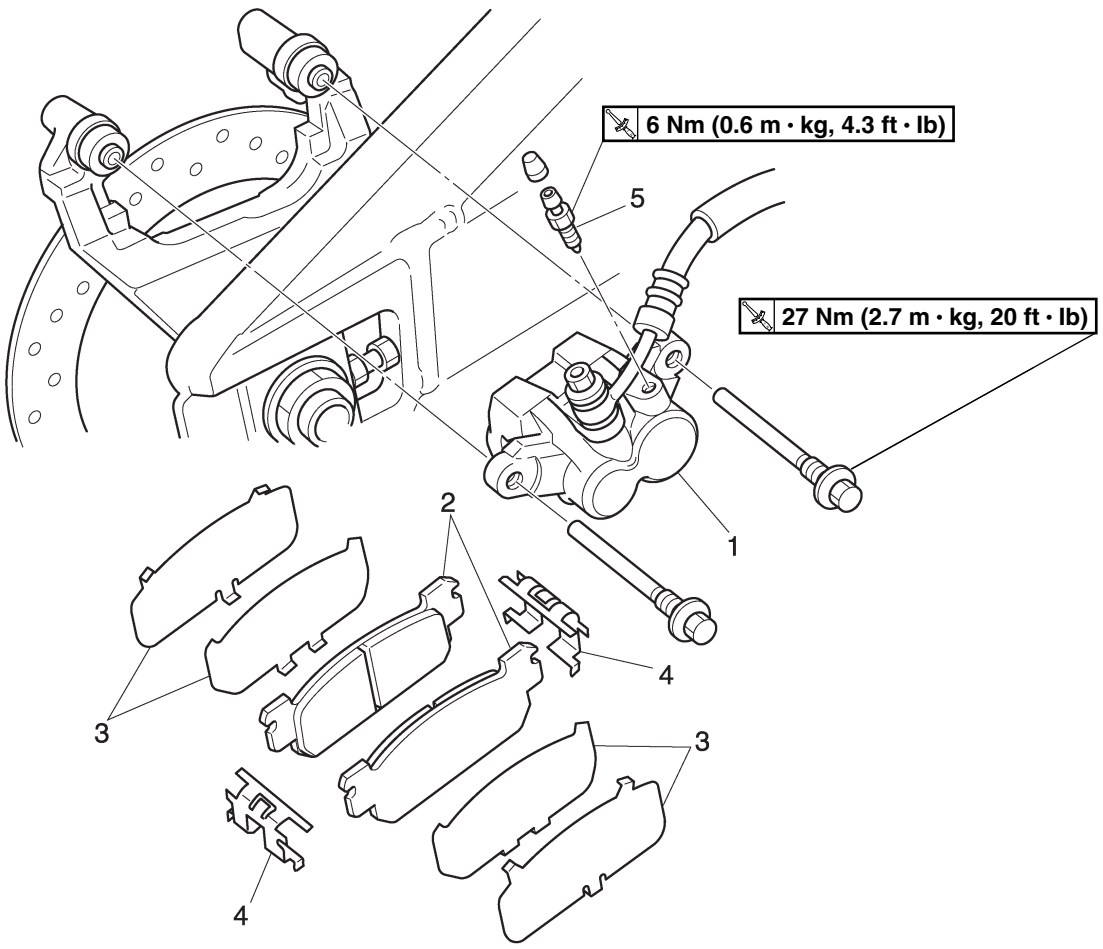
1. Adjust:
   • rear wheel static balance
   Refer to “ADJUSTING THE FRONT WHEEL STATIC BALANCE”.

EAS00577
FRONT AND REAR BRAKES
FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed. 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 pad shim	2	
6	Bleed screw	1	
			For installation, reverse the removal procedure.

REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		Remove the parts in the order listed.
1	Brake caliper	1	
2	Brake pad	2	
3	Brake pad shim	2/2	
4	Brake pad spring	2	
5	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.**

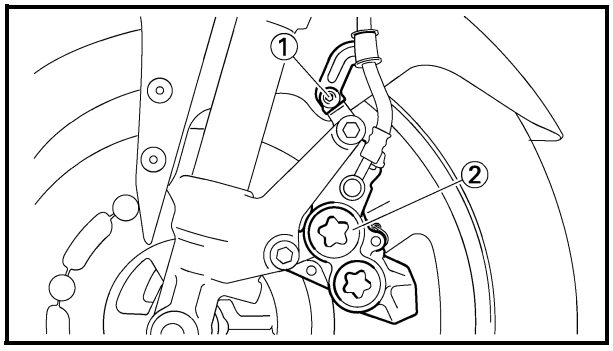
EAS00582

REPLACING THE FRONT BRAKE PADS

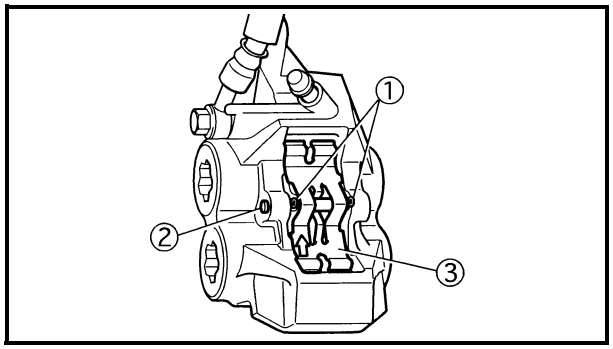
The following procedure applies to both brake calipers.

NOTE:

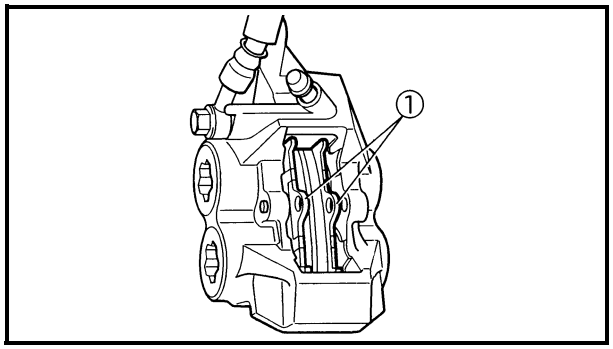
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



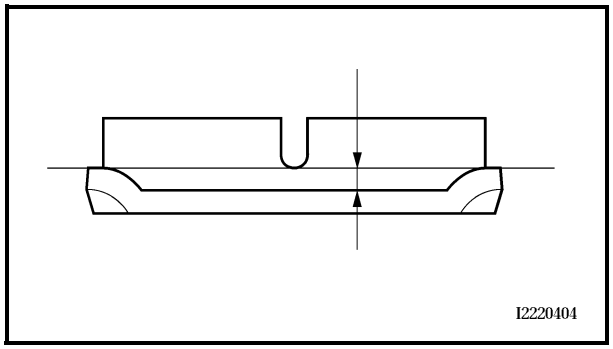
1. Remove:
   - brake hose holder ①
   - brake caliper ②



2. Remove:
   - brake pad clips ①
   - brake pad pins ②
   - brake pad spring ③



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

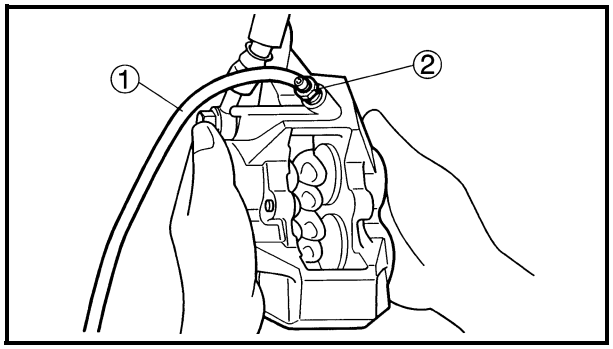


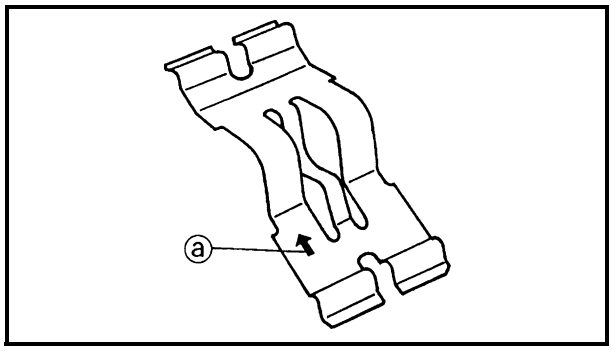
4. Measure:
   - brake pad wear limit
     Out of specification → Replace the brake pads as a set.

	Brake pad wear limit **0.5 mm (0.02 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.





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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 onto each new brake pad.
e. Install new brake pads and a new brake pad spring.

NOTE:

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

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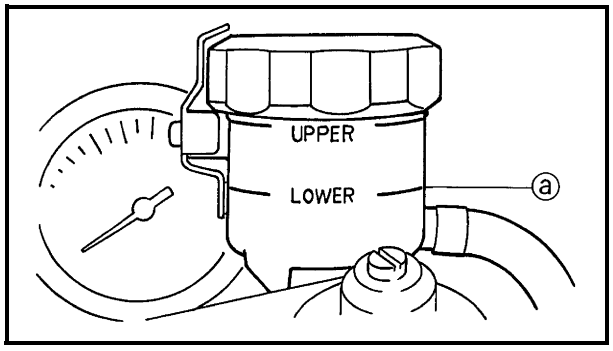
6. Install:
   - brake pad pins
   - brake pad clips
   - brake caliper **40 Nm (4.0 m · kg, 29 ft · lb)**



7. Check:
   - brake fluid level

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

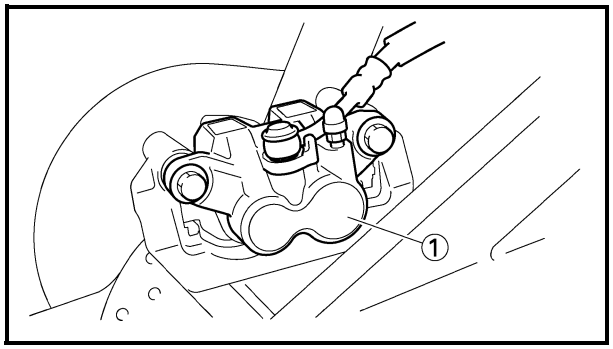
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
8. Check:
   - brake lever operation

     Soft or spongy feeling → Bleed the brake system.

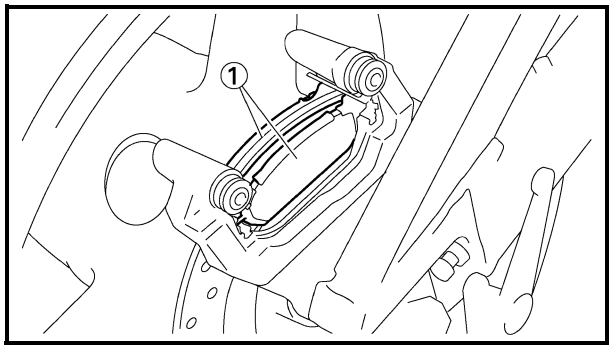
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

EAS00583
REPLACING THE REAR BRAKE PADS

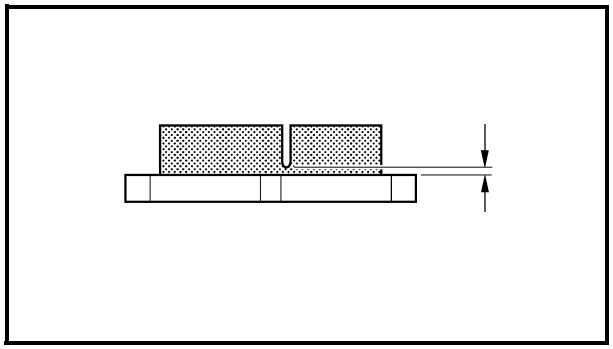
NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



1. Remove:
   • brake caliper ①



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

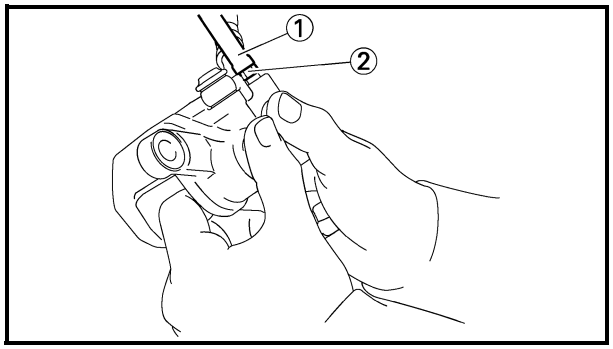


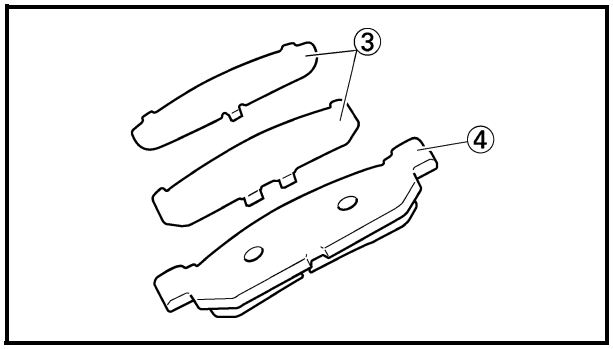
3. Measure:
   • brake pad wear limit
   Out of specification → Replace the brake pads as a set.

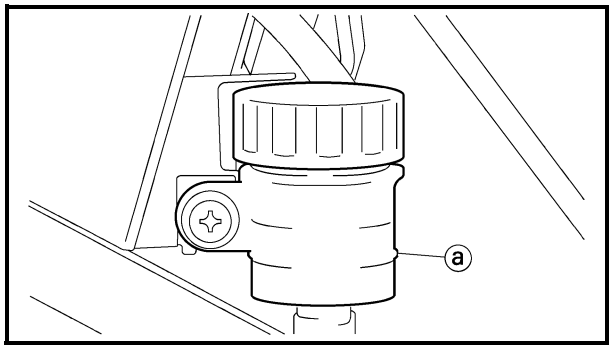
Brake pad wear limit
0.8 mm (0.03 in)

4. Install:
   • brake pad shims
   (onto the brake pads)
   • brake pads

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







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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.

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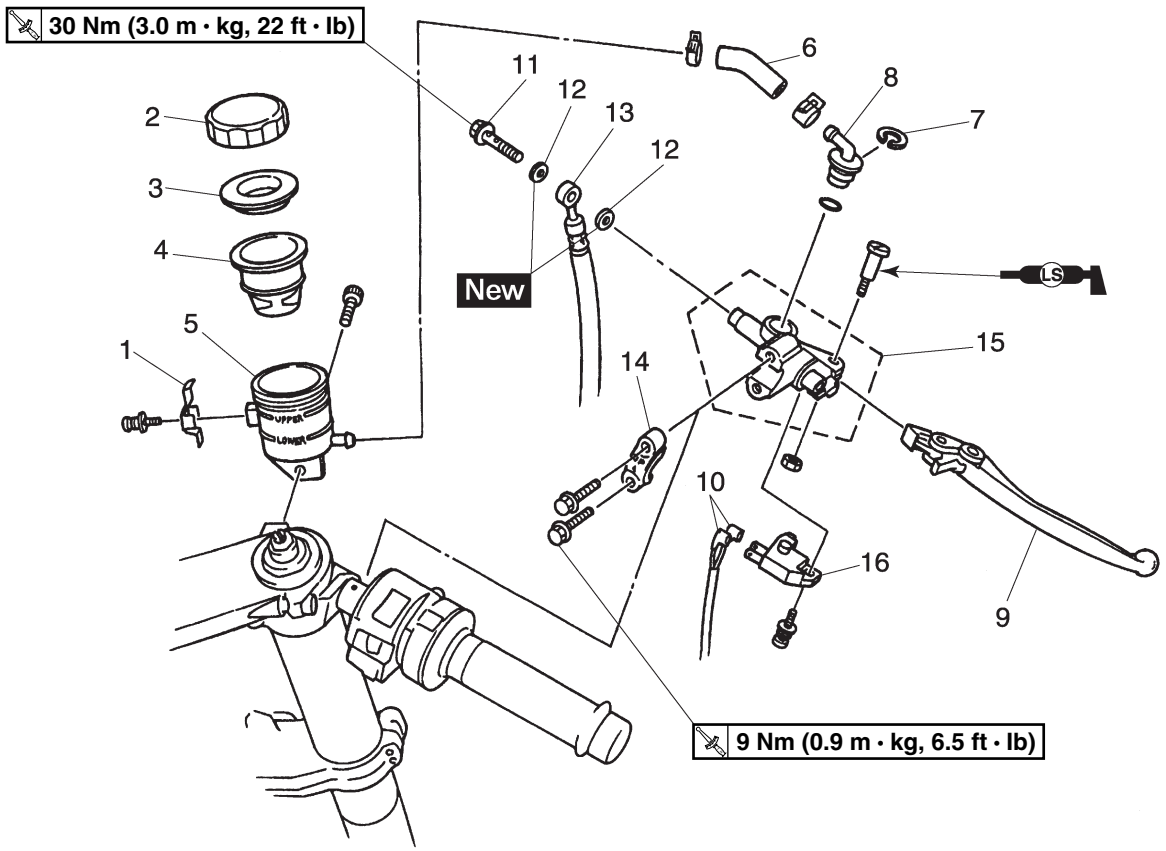
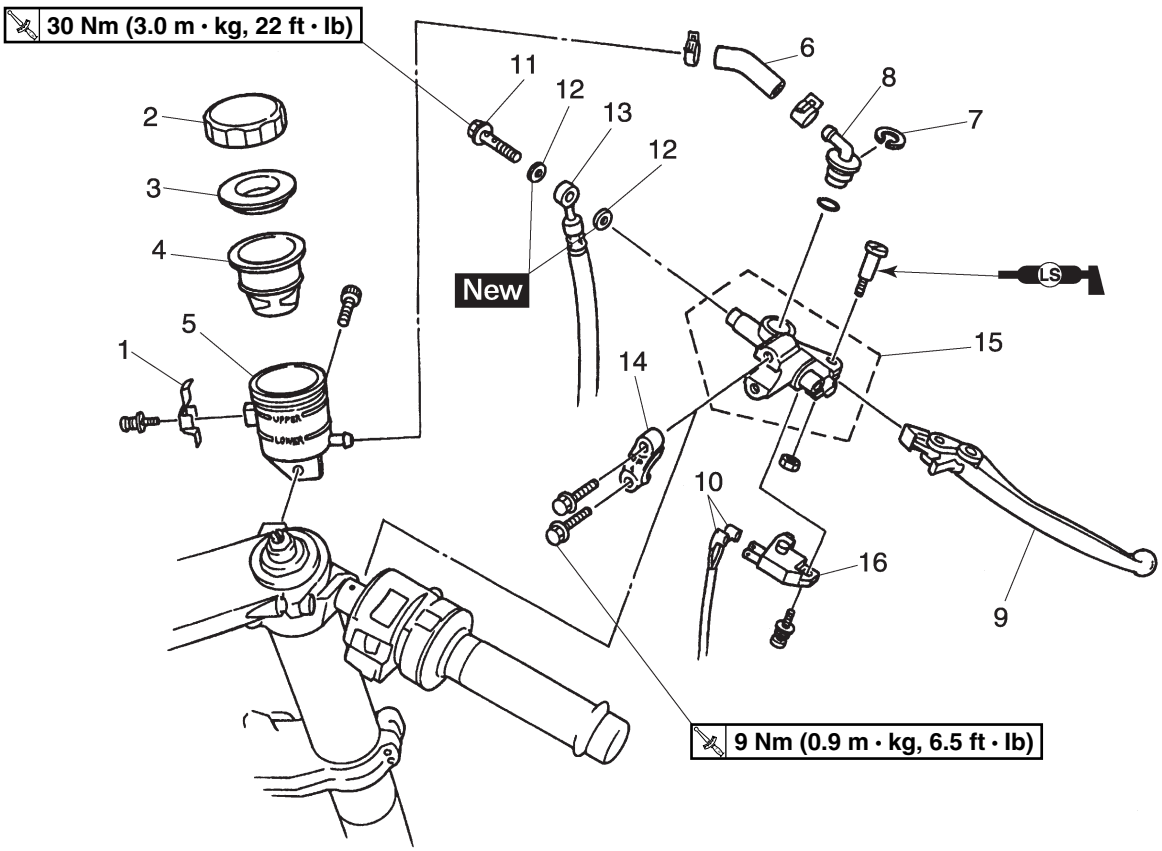
5. Install:
   • brake caliper **27 Nm (2.7 m · kg, 20 ft · lb)**
6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
7. Check:
   • brake pedal operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

EAS00584

FRONT BRAKE MASTER CYLINDER

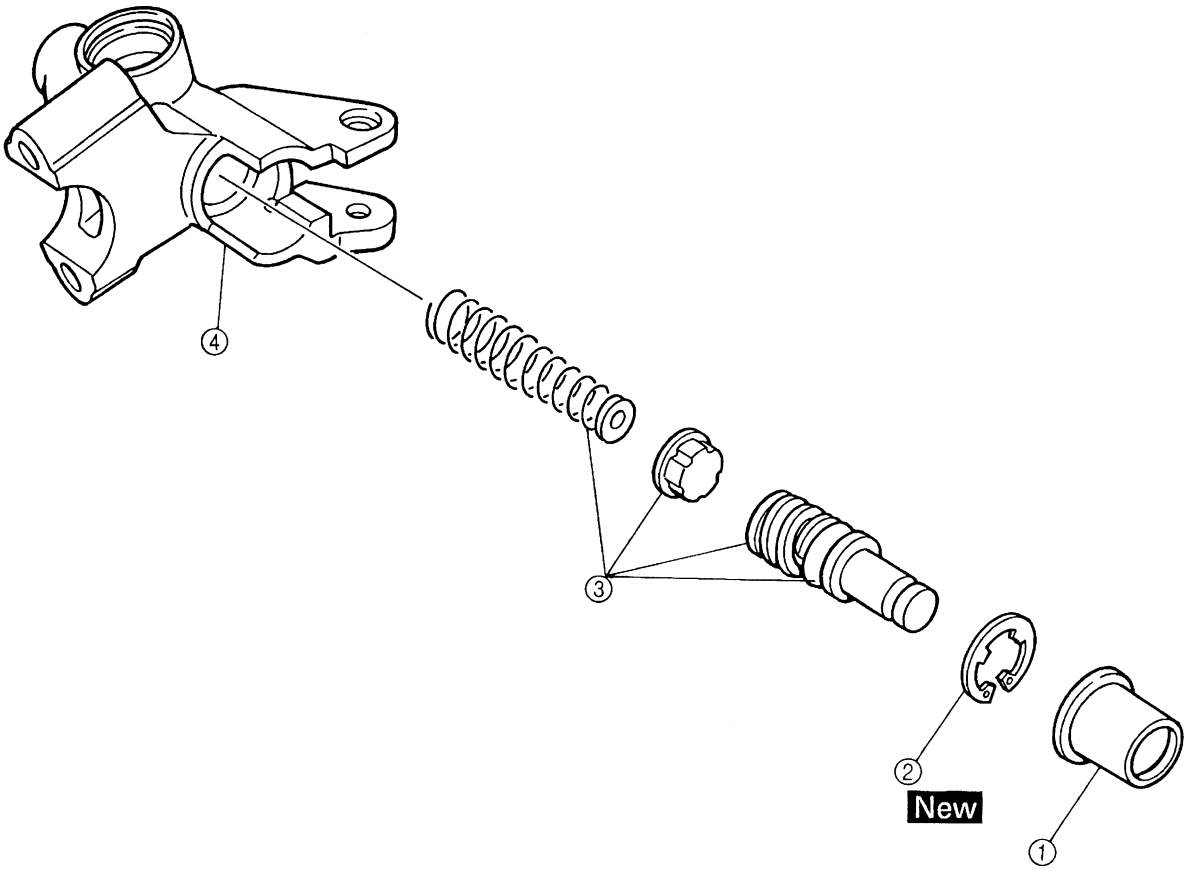


Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake fluid reservoir cap stopper	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Circlip	1	
8	Hose joint	1	
9	Brake lever	1	
10	Front brake switch connector	2	Disconnect.
11	Union bolt	1	
12	Copper washer	2	



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

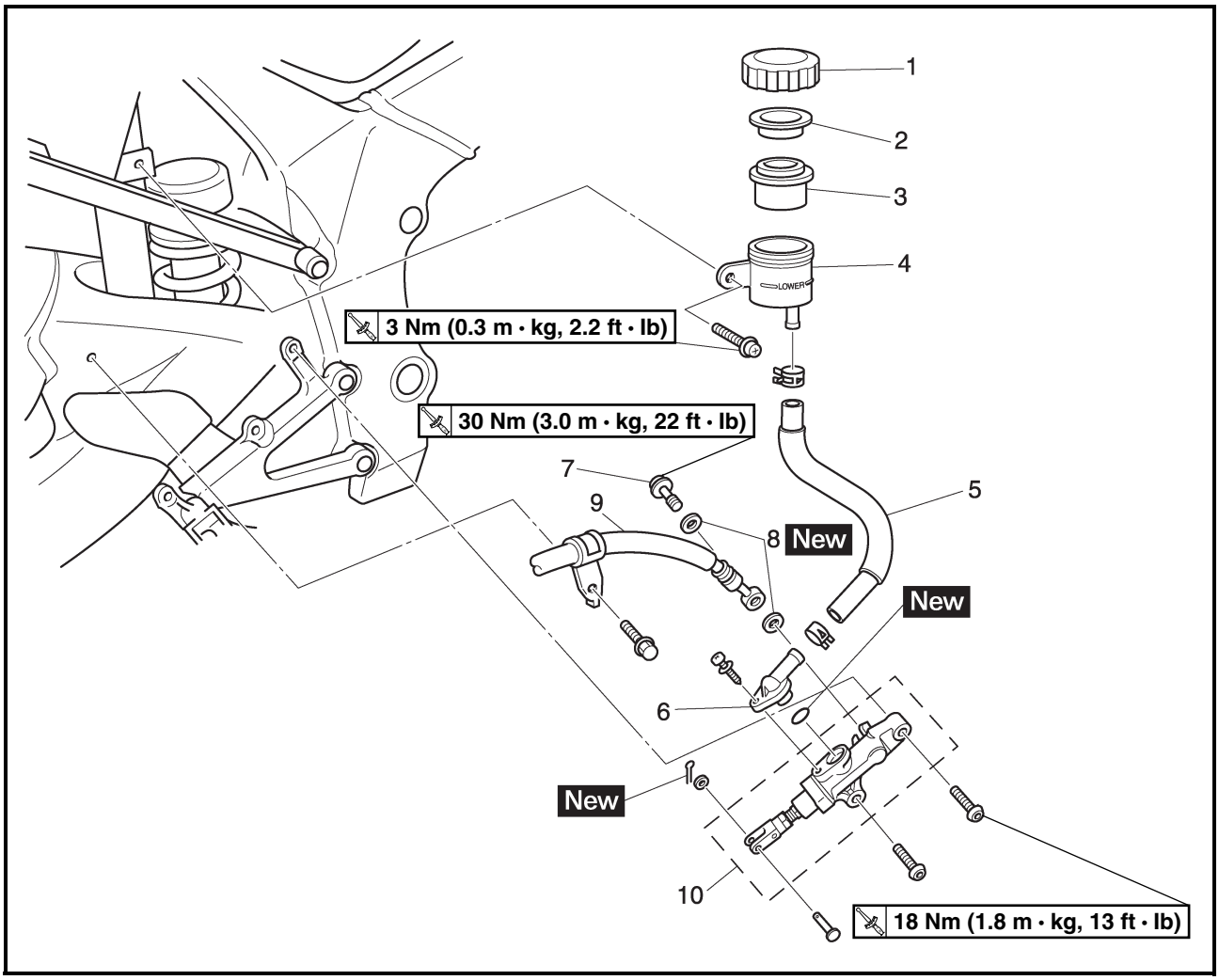
EAS00585



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

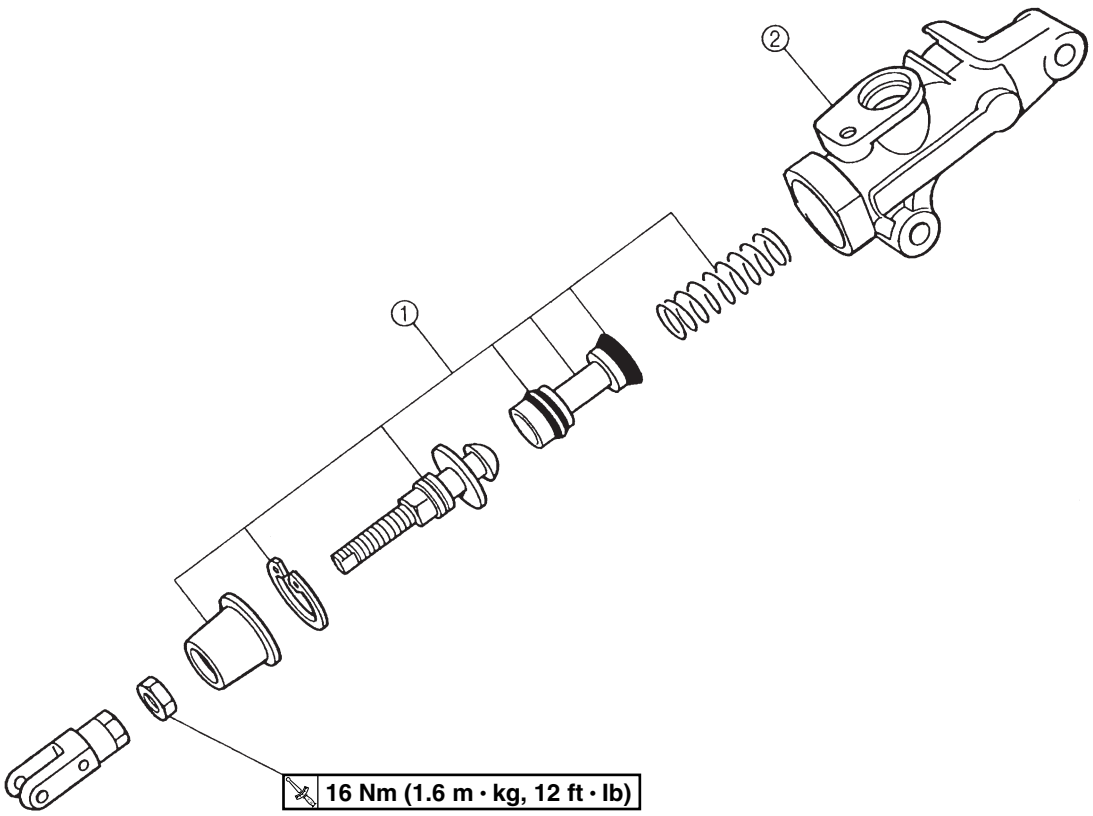
EAS00586

REAR BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm holder	1	
3	Brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir	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.

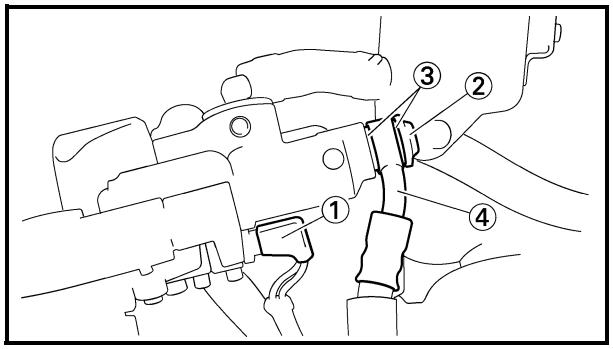
EAS00587



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

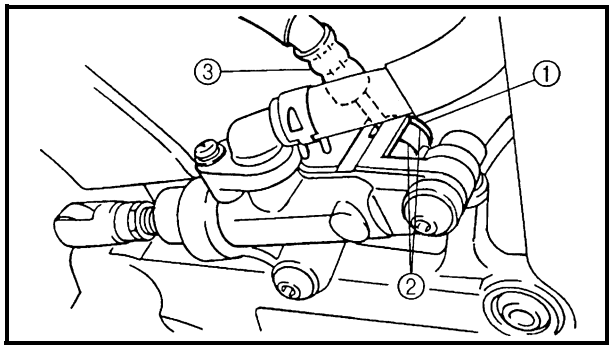
EAS00588
DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

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



1. Disconnect:
   - brake switch coupler ①
     (from the brake switch)
2. Remove:
   - union bolt ②
   - copper washers ③
   - brake hoses ④

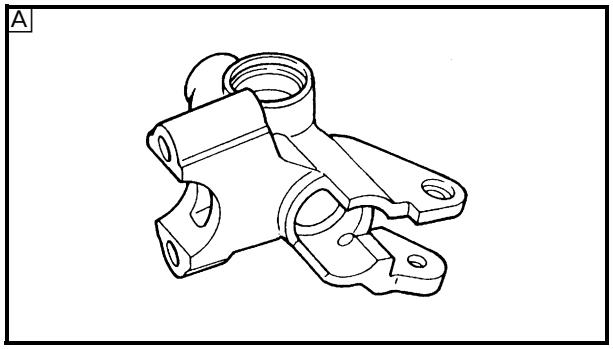
NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

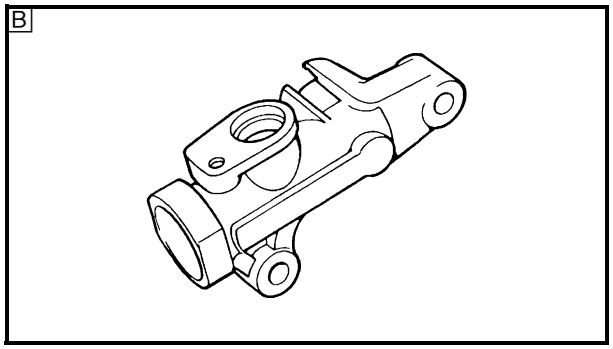


EAS00589
DISASSEMBLING THE REAR BRAKE MASTER CYLINDER

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.



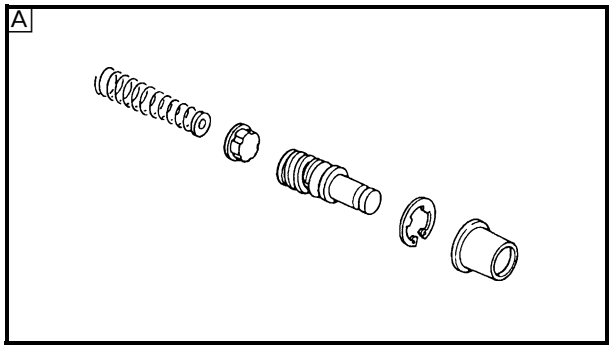


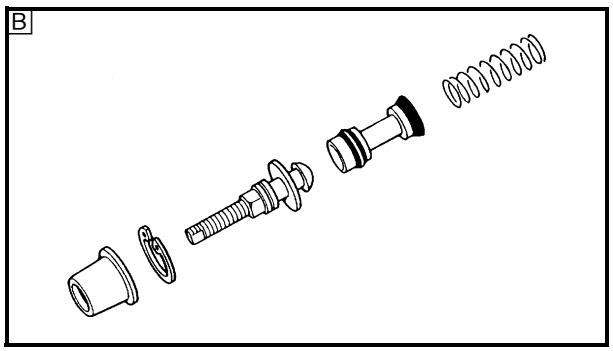
EAS00593
CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

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.

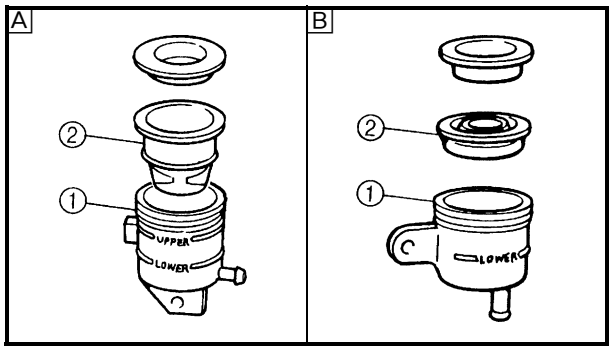
A Front
B Rear





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.

A Front
B Rear

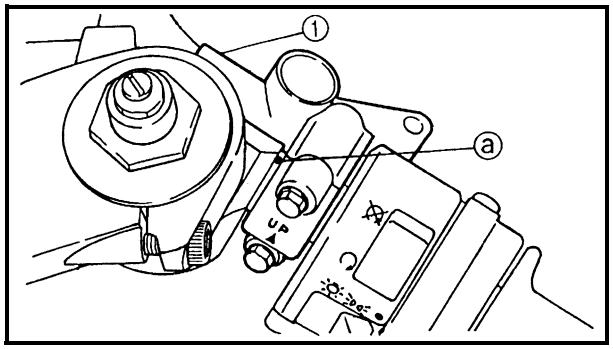
4. Check:
   - brake hoses
     Cracks/damage/wear → Replace.

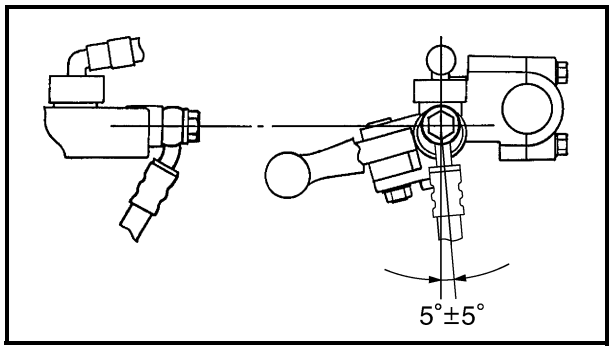
EAS00607
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

⚠ 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 ①

9 Nm (0.9 m · kg, 6.5 ft · lb)

NOTE:

- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark ⓐ on the right handlebar.
- First, tighten the upper bolt, then the lower bolt.

2. Install:
   - copper washers New
   - brake hose
   - union bolt

30 Nm (3.0 m · kg, 22 ft · lb)

⚠ WARNING

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

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.

3. Fill:
   • brake fluid reservoir
   (with the specified amount of the recommended brake fluid)

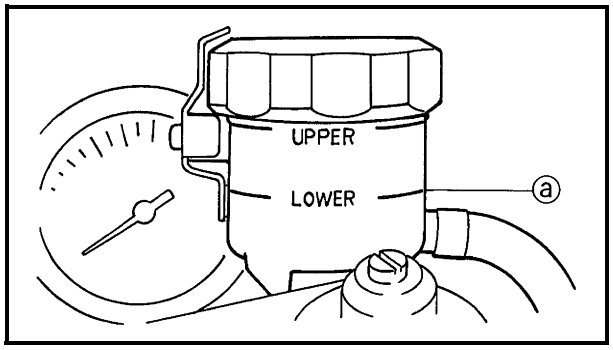
	Recommended brake fluid **DOT 4**

⚠ WARNING

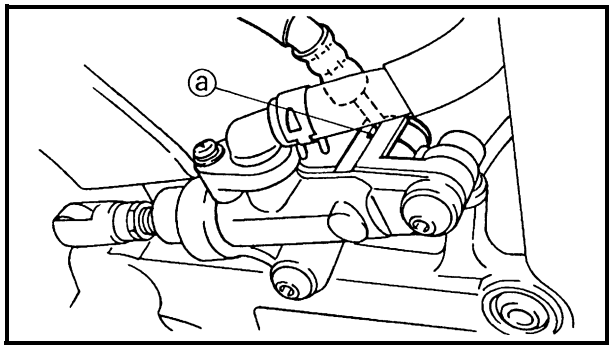
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor 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 ⓐ → 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.



EAS00610
ASSEMBLING THE REAR BRAKE MASTER CYLINDER

1. Install:
   - copper washers **New**
   - brake hose
   - union bolt

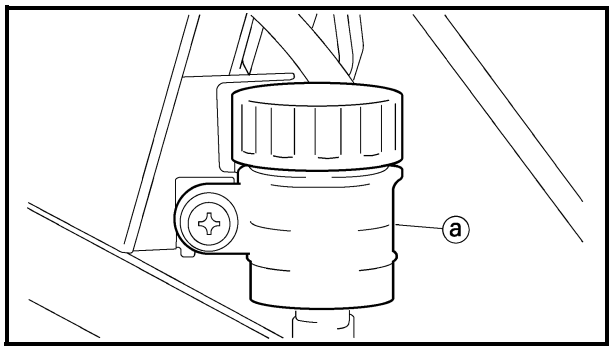
30 Nm (3.0 m · kg, 22 ft · lb)

CAUTION:

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

⚠ WARNING

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



2. Fill:
   - brake fluid reservoir
     (to the maximum level mark ⓐ)

Recommended brake fluid
DOT 4

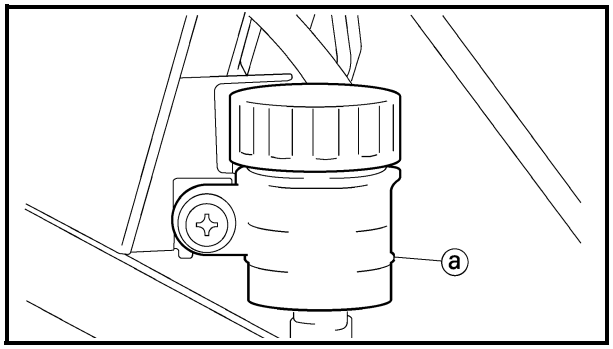
⚠ WARNING

- **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.**

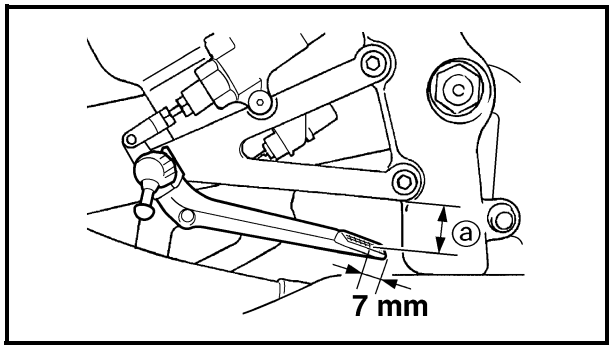
CAUTION:

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

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



4. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.



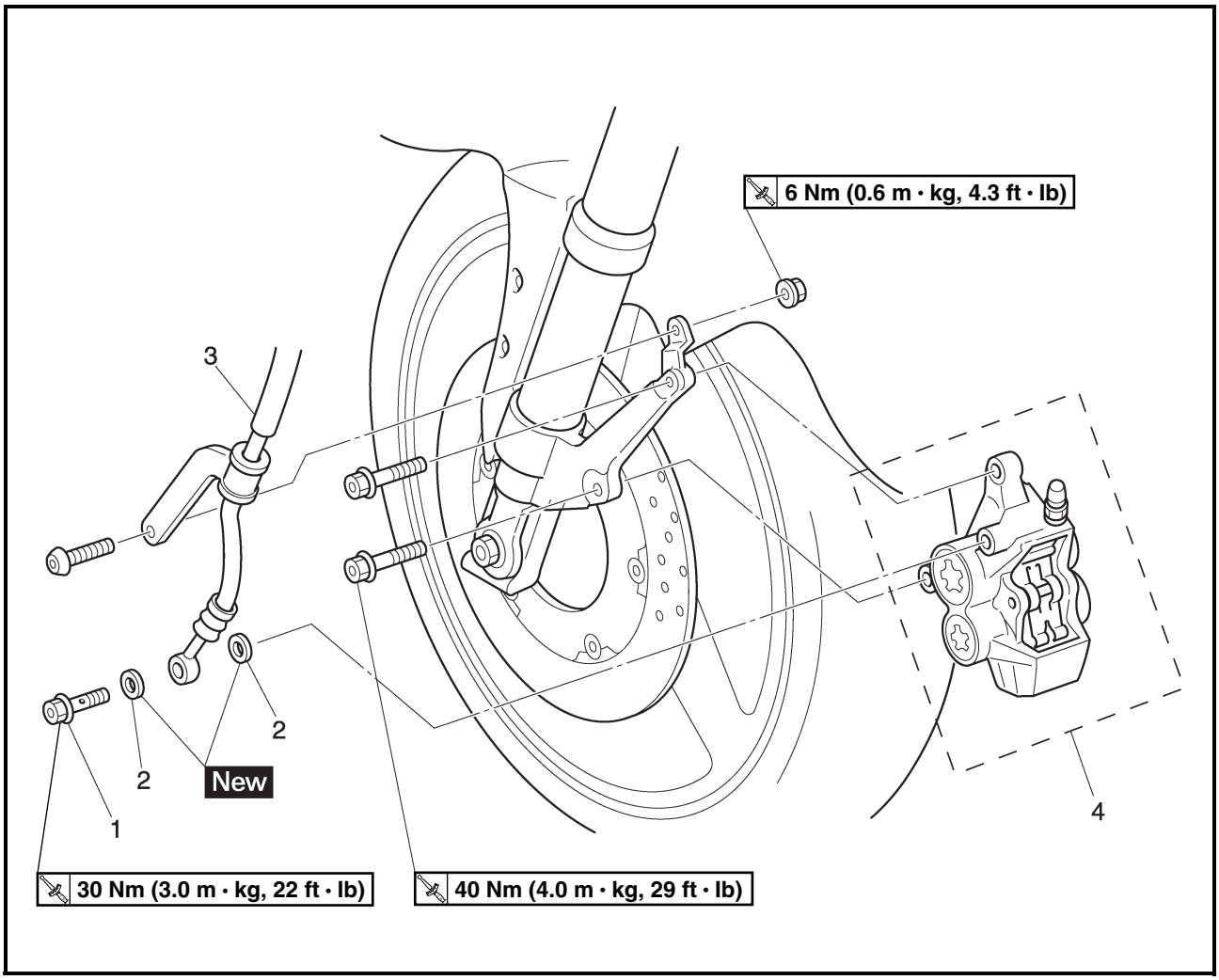
5. Adjust:
   • brake pedal position ⓐ
   Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.

Brake pedal position
(from the top of the brake pedal to the bottom of the rider footrest bracket)
38 ~ 42 mm (1.50 ~ 1.65 in)

6. Adjust:
   • rear brake light operation timing
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" in chapter 3.

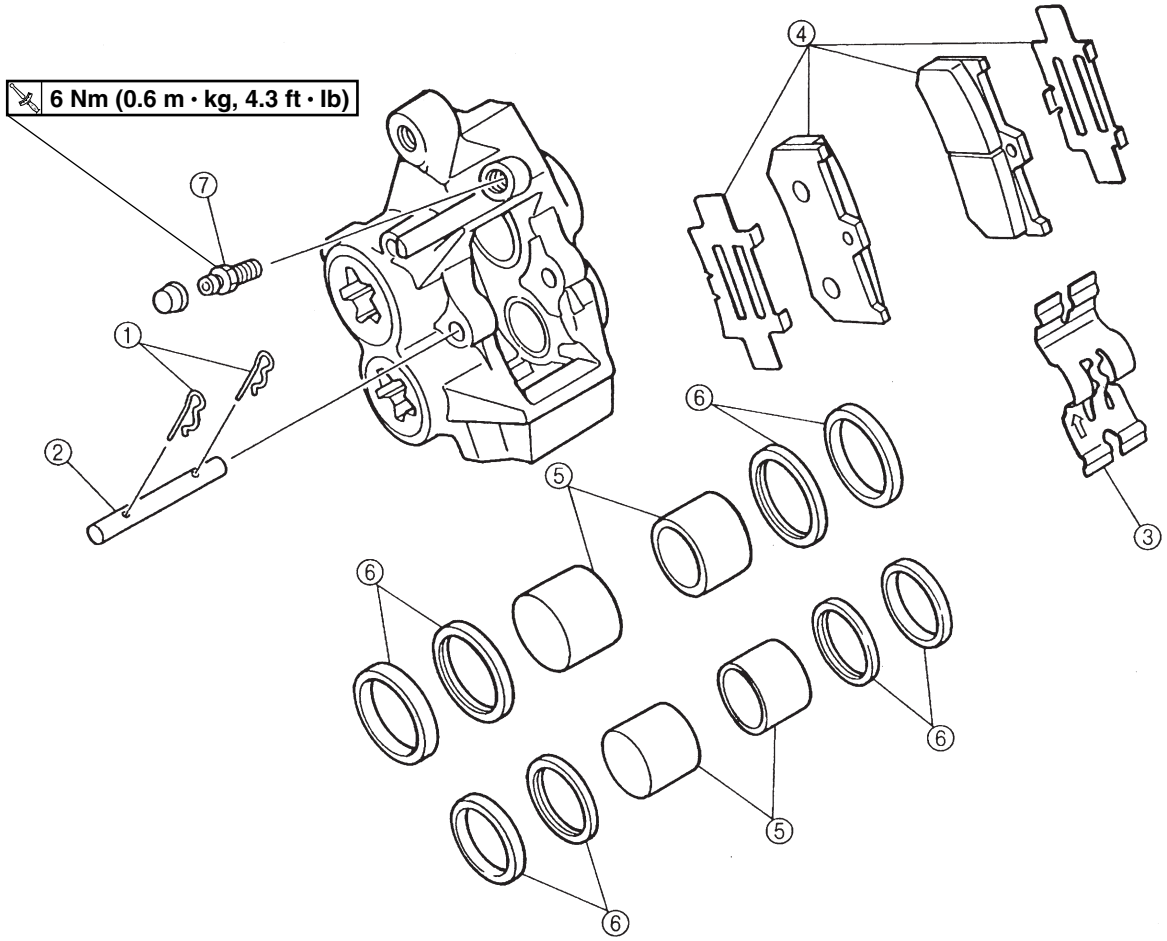
EAS00613

FRONT BRAKE CALIPERS



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

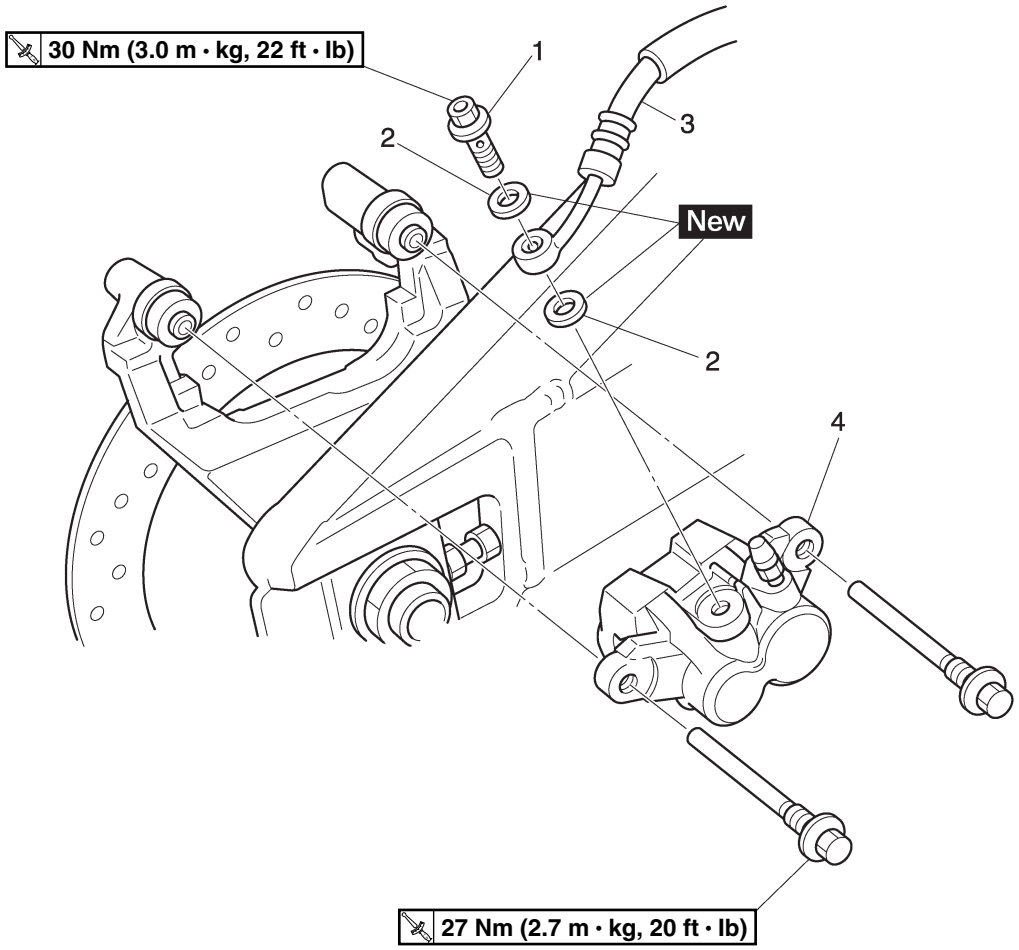
EAS00615



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Remove the parts in the order listed. 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.

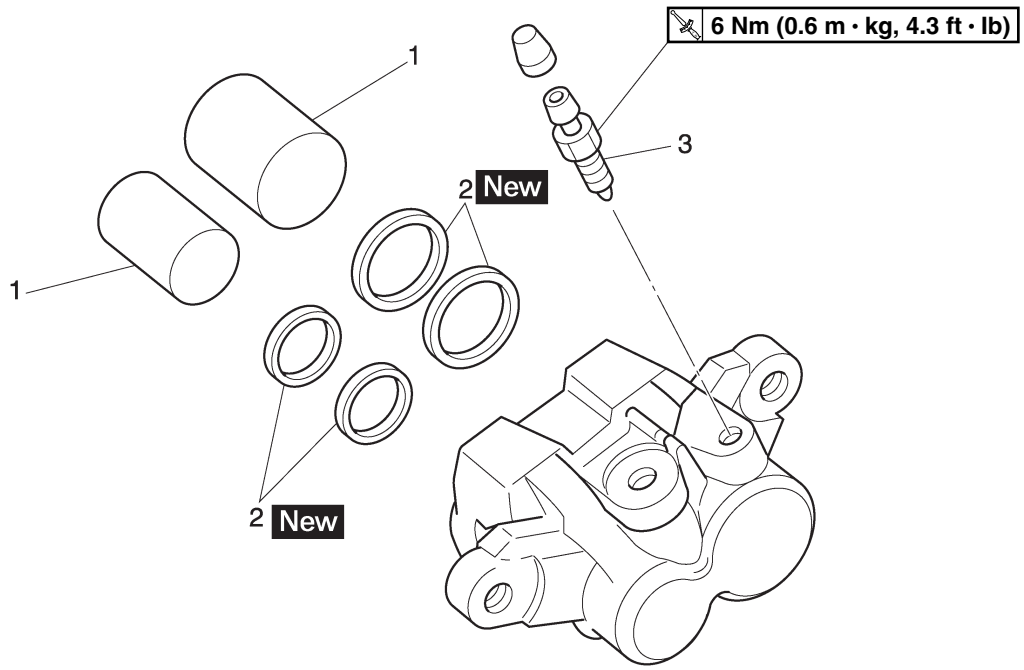
EAS00616

REAR BRAKE CALIPER



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

EAS00617

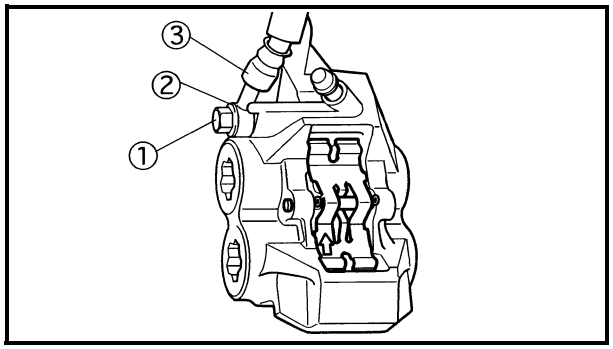


Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Remove the parts in the order listed.
1	Brake caliper piston	2	
2	Brake caliper piston seal	4	
3	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS00625
DISASSEMBLING THE FRONT BRAKE CALIPERS

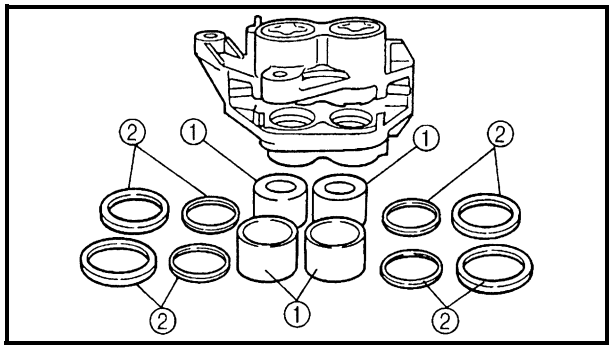
The following procedure applies to both of the brake calipers.

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

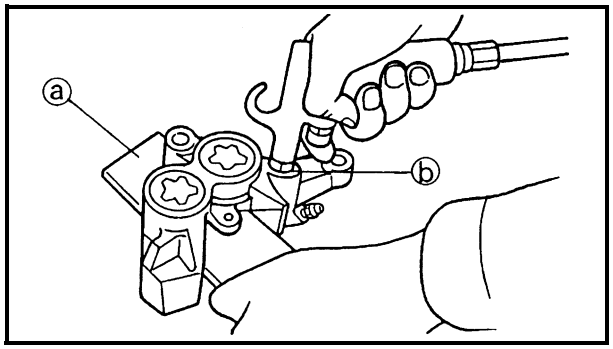


1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

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



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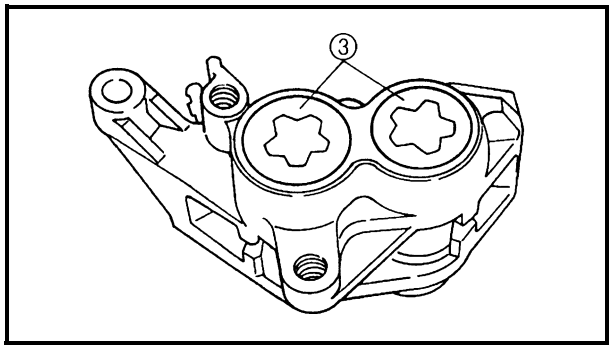
a. Secure the right side brake caliper pistons with a piece of wood ⓐ.
b. Blow compressed air into the brake hose joint opening ⓑ to force out the left side pistons from the brake caliper.



⚠ WARNING

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

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

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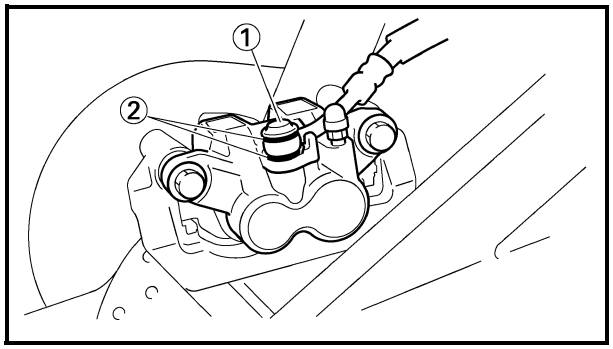
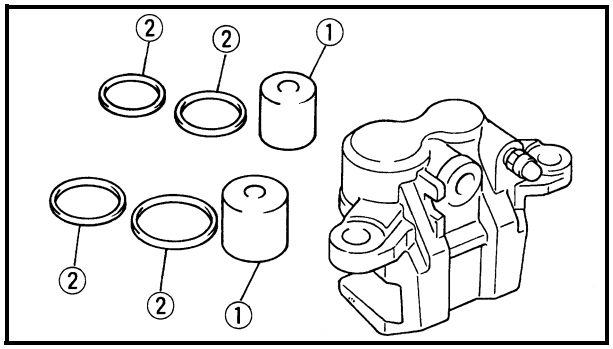
EAS00627
DISASSEMBLING THE REAR BRAKE CALIPER

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

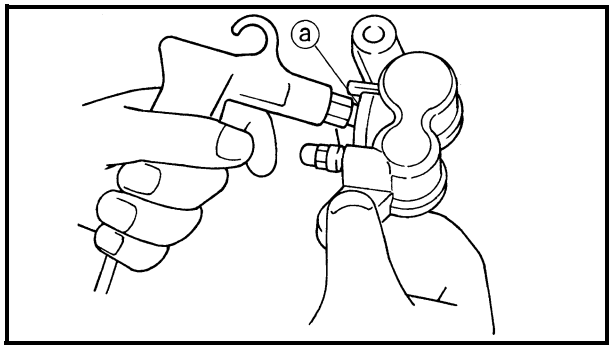


1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose

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



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

⚠ WARNING

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

b. Remove the brake caliper piston seals.

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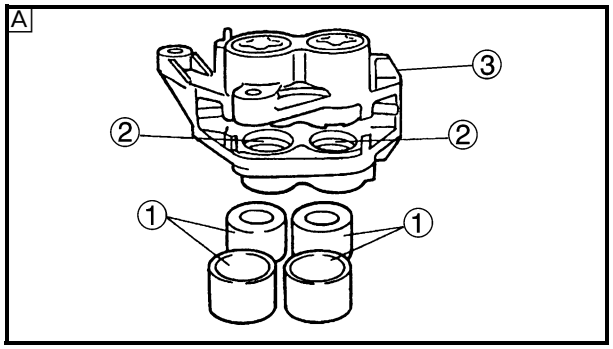
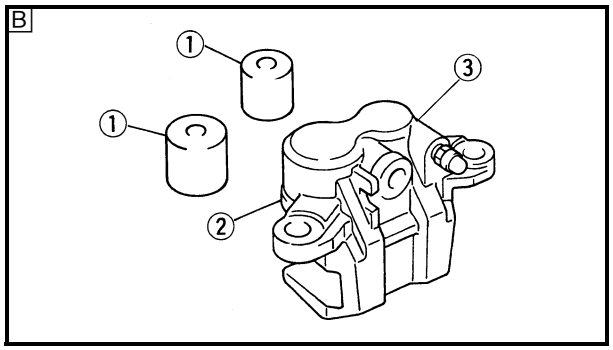
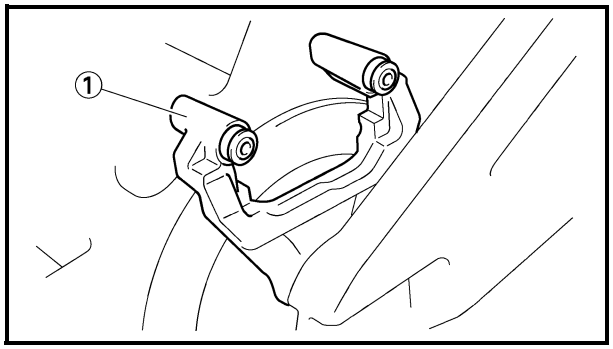
EAS00633
CHECKING THE FRONT AND REAR BRAKE CALIPERS

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

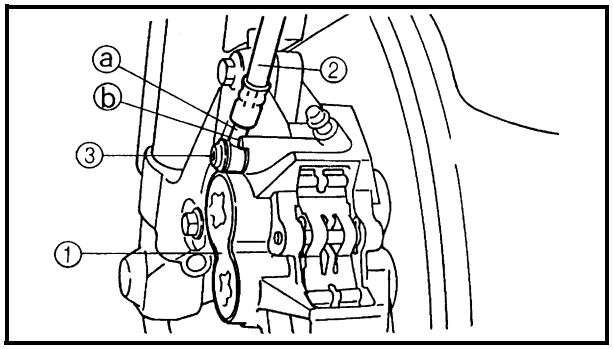
EAS00640
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

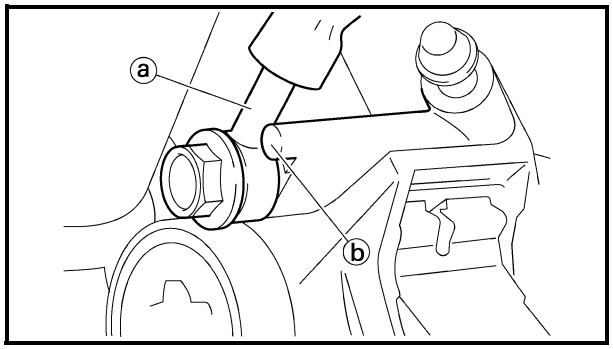
The following procedure applies to both of the brake calipers.

⚠ 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 caliper ① (temporarily)
   - 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" in chapter 2.

CAUTION:

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

2. Remove:
   - brake caliper
3. Install:
   - brake pads
   - brake pad spring
   - brake caliper **40 Nm (4.0 m · kg, 29 ft · lb)**
   - brake hose holder **6 Nm (0.6 m · kg, 4.3 ft · lb)**

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

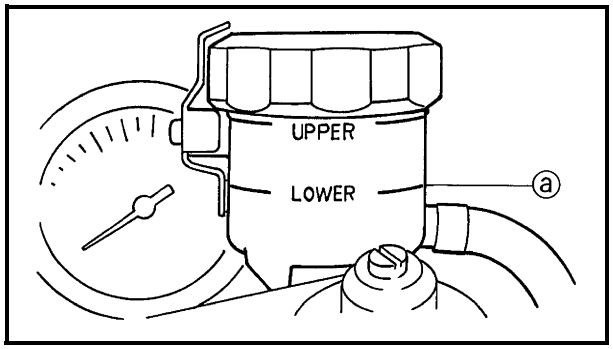
	Recommended brake fluid **DOT 4**

⚠ 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.



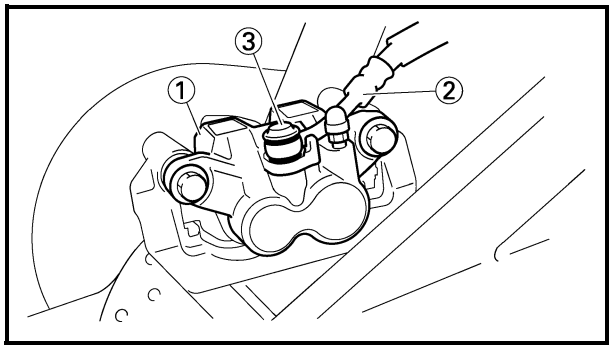
5. Bleed:
   • brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
7. Check:
   • brake lever operation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

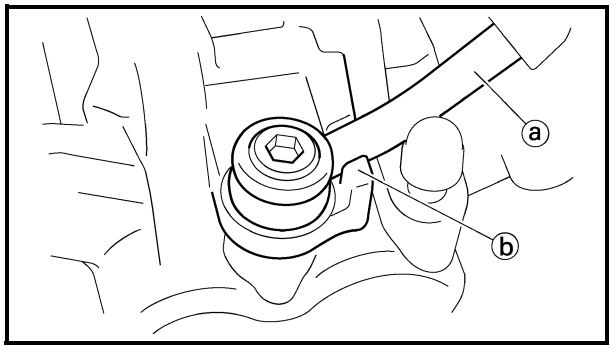
ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

⚠ 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 (temporarily)
   - 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" in chapter 2.

CAUTION:

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

2. Remove:
   - brake caliper
3. Install:
   - brake pads
   - brake pad springs
   - brake caliper **27 Nm (2.7 m · kg, 20 ft · lb)**
   - brake hose holder **7 Nm (0.7 m · kg, 5.1 ft · lb)**

   Refer to "REPLACING THE REAR BRAKE PADS".

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

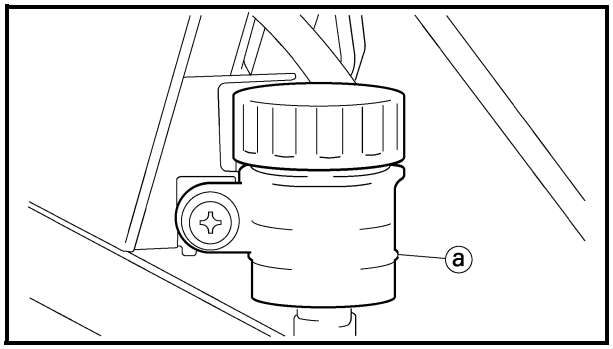
Recommended brake fluid
DOT 4

⚠ 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.**

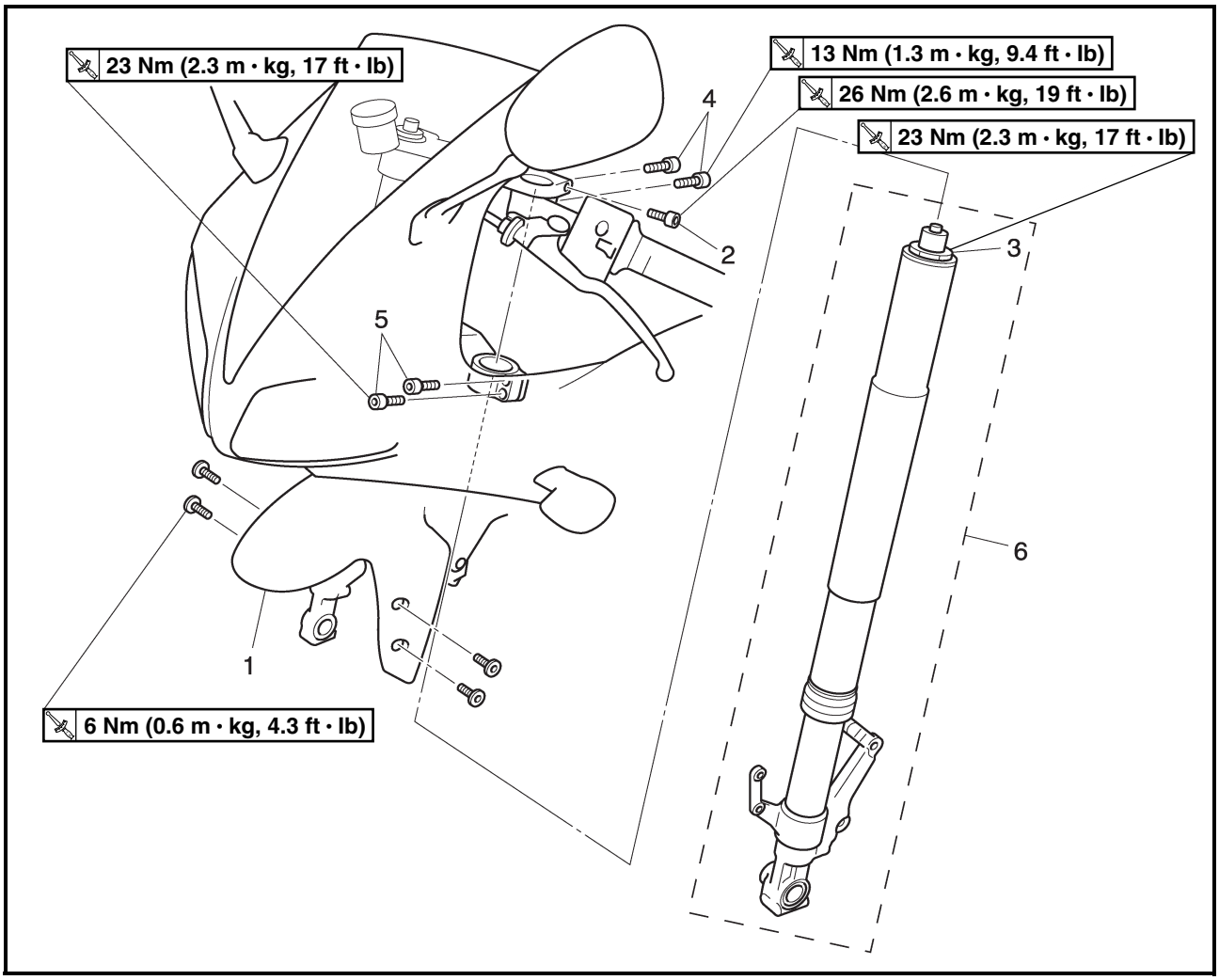
CAUTION:

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



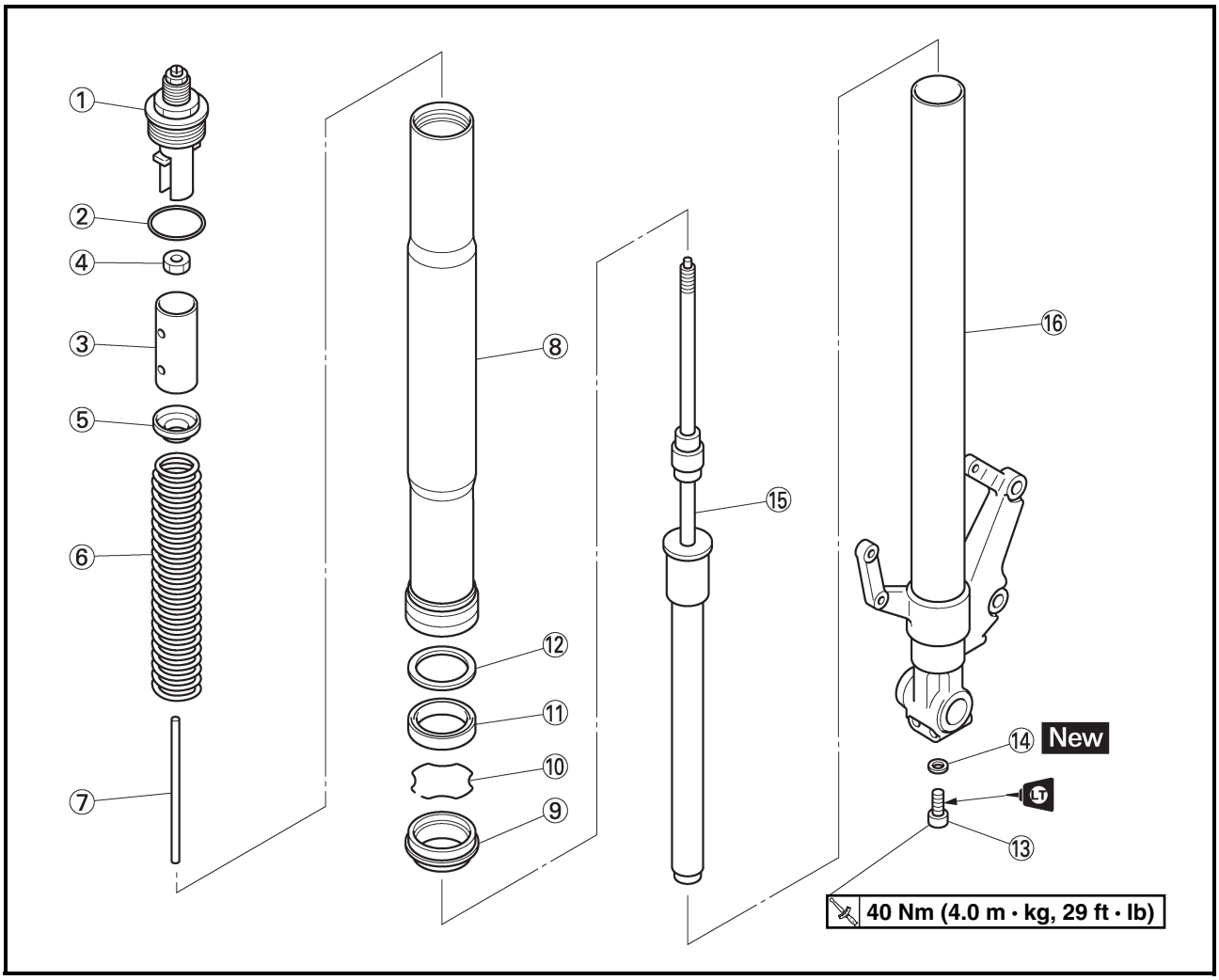
5. Bleed:
   • brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
7. Check:
   • brake pedal operation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

EAS00647
FRONT FORK

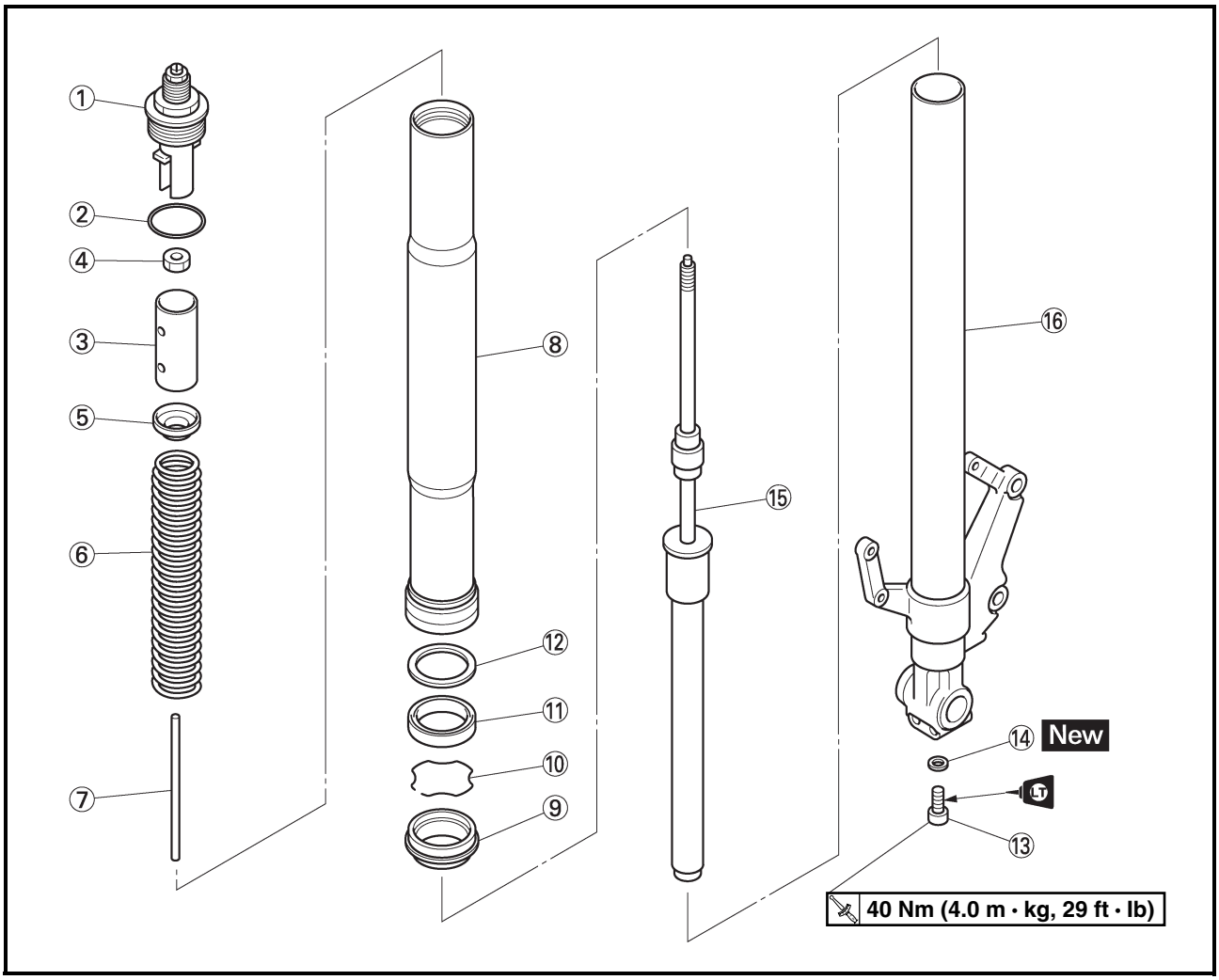


Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front cowling inner panels		Refer to "COWLINGS" in chapter 3.
1	Front fender	1	
2	Upper bracket pinch bolt	1	Loosen.
3	Cap bolt	1	Loosen.
4	Handlebar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

EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork legs		Remove the parts in the order listed.
①	Cap bolt	1	
②	O-ring	1	
③	Spacer	1	
④	Nut	1	
⑤	Spring seat	1	
⑥	Fork spring	1	
⑦	Damper adjusting rod	1	
⑧	Outer tube	1	
⑨	Dust seal	1	
⑩	Oil seal clip	1	
⑪	Oil seal	1	
⑫	Washer	1	



Order	Job/Part	Q'ty	Remarks
⑬	Damper rod assembly bolt	1	
⑭	Copper washer	1	
⑮	Damper rod assembly	1	
⑯	Inner tube	1	
			For assembly, reverse the disassembly procedure.

EAS00649
REMOVING THE FRONT FORK LEGS

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

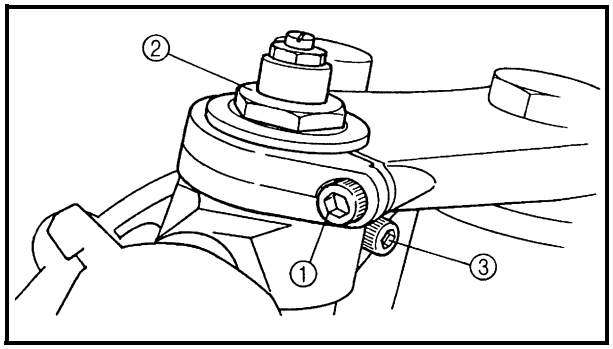
1. Stand the motorcycle on a level surface.

⚠ 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. Loosen:
   - upper bracket pinch bolt ①
   - cap bolt ②
   - handlebar boss pinch bolt ③
   - lower bracket pinch bolt

⚠ WARNING

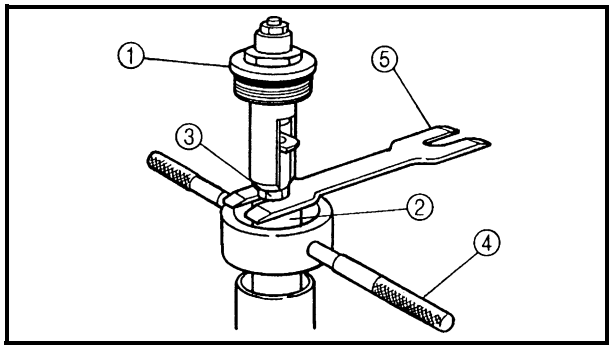
Before loosening the upper and lower bracket pinch bolts, support the front fork leg.

3. Remove:
   - front fork leg

EAS00652
DISASSEMBLING THE FRONT FORK LEGS

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

1. Remove:
   - cap bolt ①
     (from the damper adjusting rod)
   - spacer ②
   - nut ③



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a. Press down on the spacer with the fork spring compressor ④.
b. Install the rod holder ⑤ between the nut ③ and the spacer ②.

Fork spring compressor
YM-01441
Rod holder
YM-01434

NOTE:
Use the side of the rod holder that is marked "B".

c. Loosen the nut.
d. Remove the cap bolt.
e. Remove the rod holder and fork spring compressor.

⚠ WARNING

The fork spring is compressed.

f. Remove the spacer and nut.

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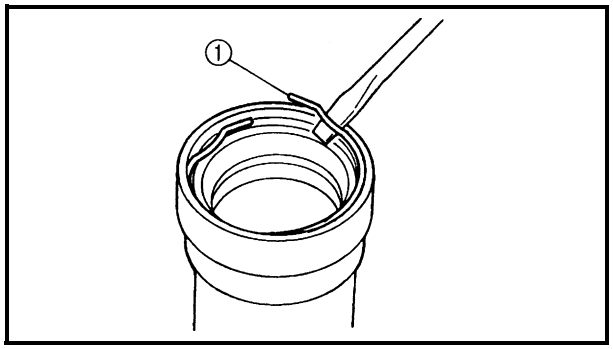
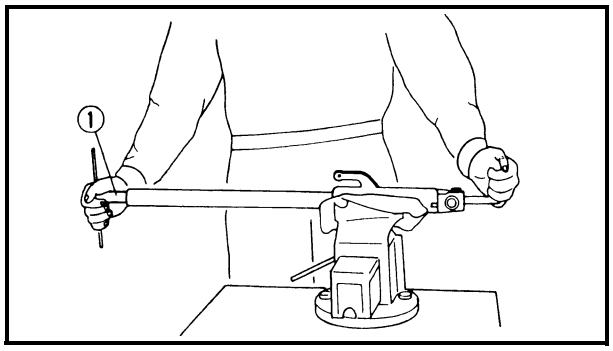


2. Remove:
- dust seal
- oil seal clip ①
- oil seal
- washer
(with a flat-head screwdriver)

CAUTION:

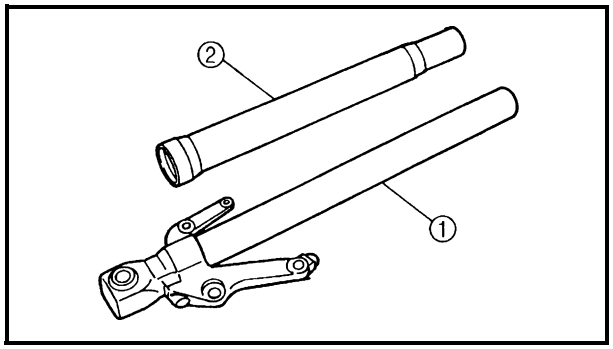
Do not scratch the inner tube.

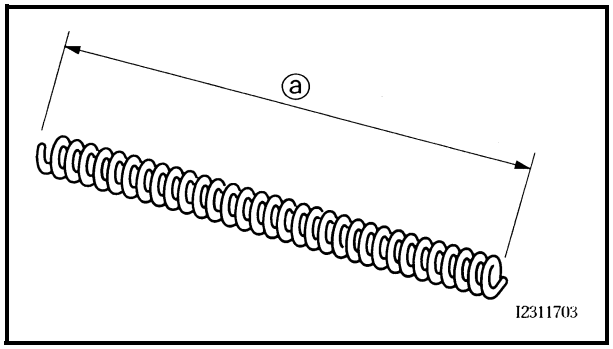


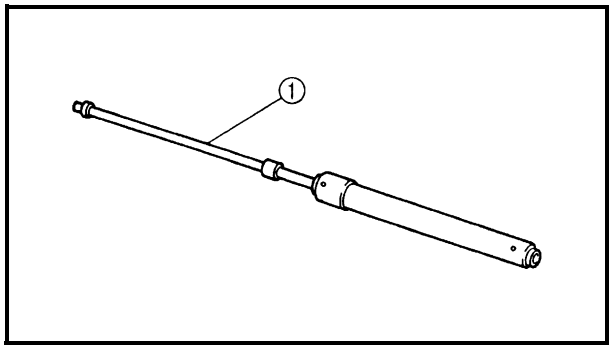
3. Remove:
- damper rod assembly bolt

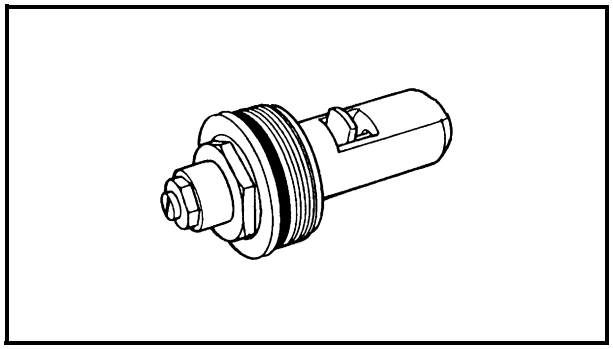
NOTE:
While holding the damper rod assembly with the damper rod holder ①, loosen the damper rod assembly bolt.

Damper rod holder
YM-1423









EAS00656
CHECKING THE FRONT FORK LEGS

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

1. Check:
   - inner tube ①
   - outer tube ②

   Bends/damage/scratches → Replace.

⚠ WARNING

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

2. Measure:
   - spring free length ⓐ

   Out of specification → Replace.

Spring free length
246 mm (9.69 in)

3. Check:
   - damper rod ①

   Damage/wear → Replace.
   - obstruction → Blow out all of the oil passages with compressed air.

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.

EAS00659
ASSEMBLING THE FRONT FORK LEGS

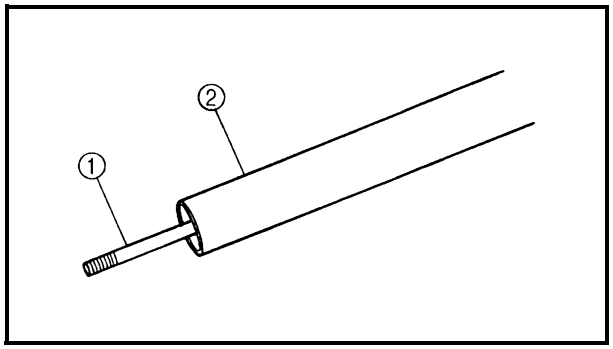
The following procedure applies to both of the front fork legs.

⚠ WARNING

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

NOTE:

- When assembling the front fork leg, be sure to replace the following parts:
  - oil seal
  - dust seal
- Before assembling the front fork leg, make sure all of the components are clean.



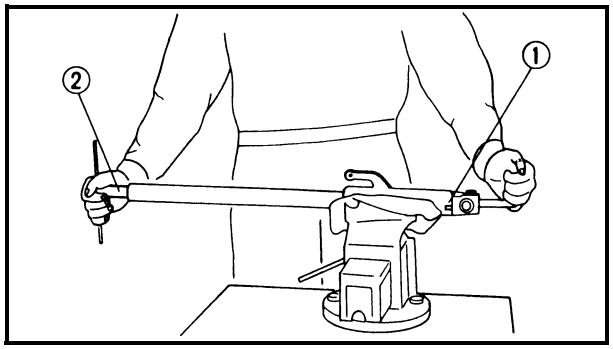
1. Install:
   - damper rod assembly ①

CAUTION:

Allow the damper rod assembly to slide slowly down the inner tube ② 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**



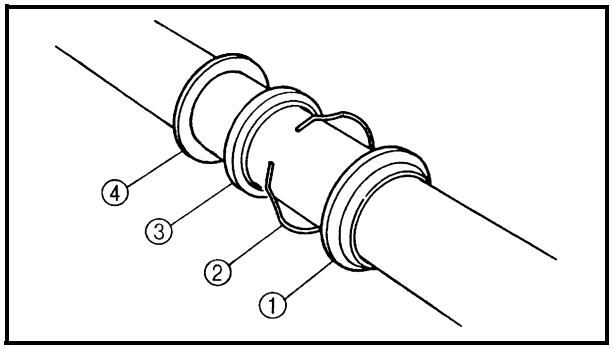
3. Tighten:
   - damper rod assembly bolt ①

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.

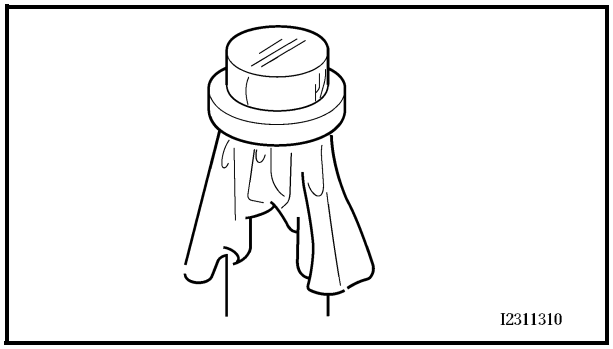
	Damper rod holder **YM-1423**



4. Install:
   - dust seal ①
   - oil seal clip ②
   - oil seal ③
   - washer ④

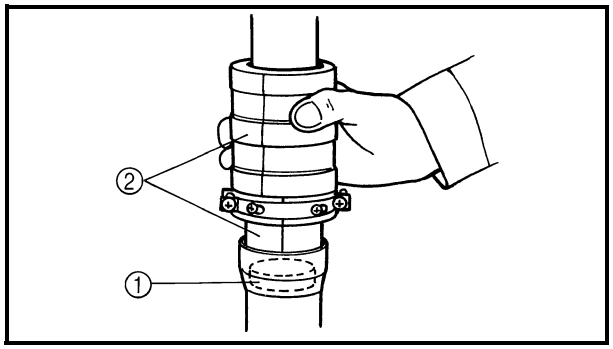
CAUTION:

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



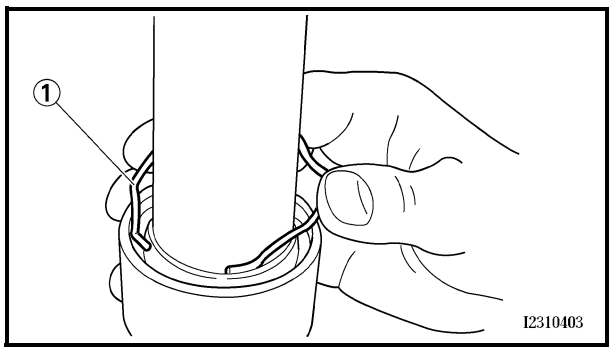
NOTE:

- 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 to protect the oil seal during installation.



5. Install:
   - oil seal ①
     (with the fork seal driver ②)

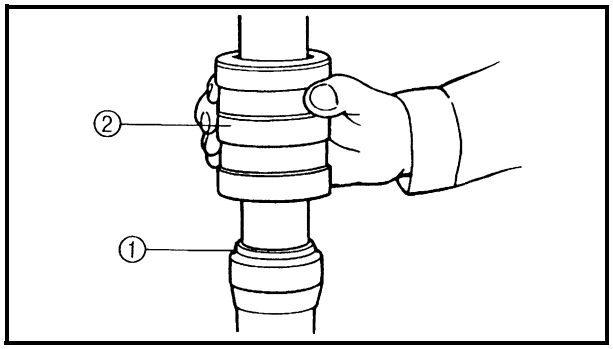
	Fork seal driver **YM-01442**



6. Install:
   - oil seal clip ①

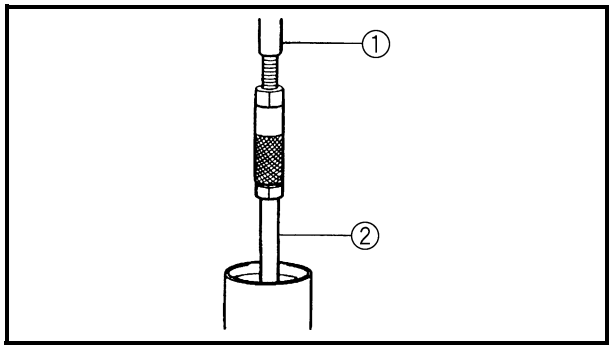
NOTE:

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 ②)

	Fork seal driver **YM-01442**



8. Install:
   • rod puller ①
   (onto the damper rod ②)

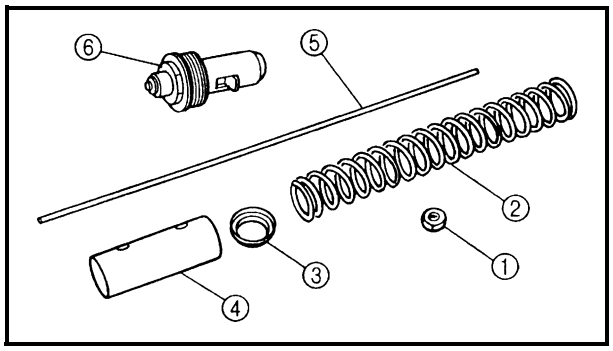
	Rod puller **YM-01437**

9. Fill:
   • front fork leg
   (with the specified amount of the recommended fork oil)

	Quantity (each front fork leg) **0.543 L** **(0.478 Imp qt, 0.574 US qt)** **Recommended oil** **Suspension oil "01" or equivalent**

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

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



10. Install:
   • nut ①
   • fork spring ②
   • spring seat ③
   • spacer ④
   • damper adjusting rod ⑤
   • cap bolt ⑥

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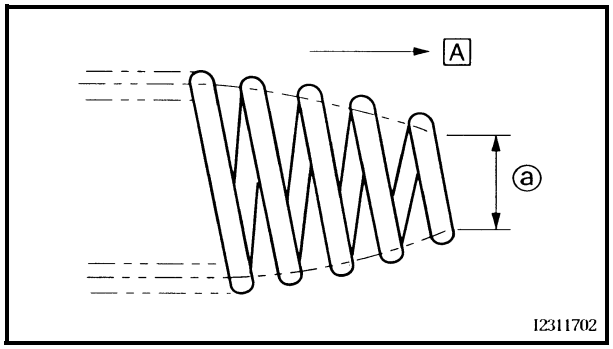
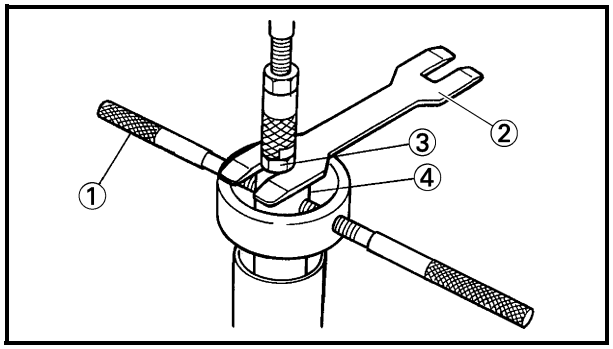
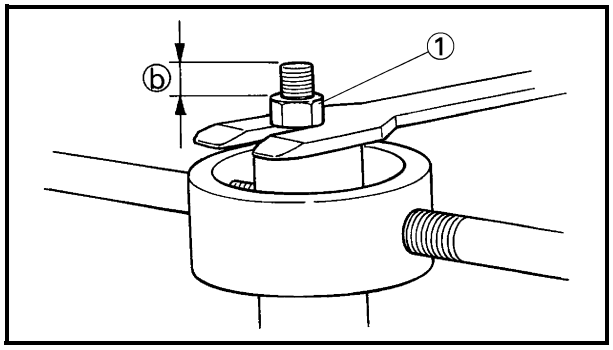
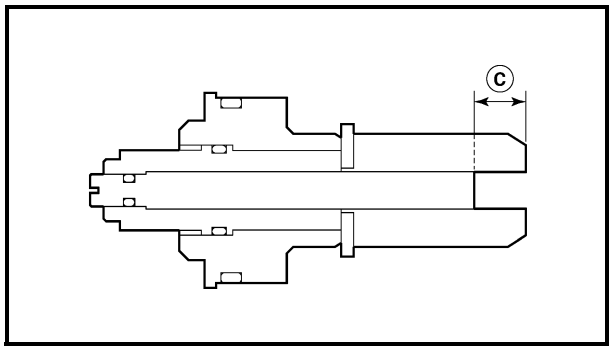
a. Remove the rod puller and adapter.
b. Install the nut.
c. Install the fork spring, spring seat, and spacer.

NOTE:
Install the spring with the smaller pitch ⓐ facing up Ⓐ.









d. Press down on the spacer with the fork spring compressor ①.
e. Pull up the rod puller and install the rod holder ② between the nut ③ and the spacer ④.

NOTE:
Use the side of the rod holder that is marked "B".

Fork spring compressor
YM-01441
Rod holder
YM-01434

f. Remove the rod puller and adapter.
g. Install the nut ① and position it as specified ⓑ.

Distance ⓑ
11 mm (0.43 in)

h. Set the cap bolt distance ⓒ to specification.

Distance ⓒ
13 mm (0.51 in)

i. Install the damper adjusting rod and cap bolt, and then finger tighten the cap bolt.
j. Hold the cap bolt and tighten the nut to specification.

Nut
15 Nm (1.5 m · kg, 11 ft · lb)

k. Remove the rod holder and fork spring compressor.

⚠ WARNING
- **The fork spring is compressed.**
- **Always use a new cap bolt O-ring.**

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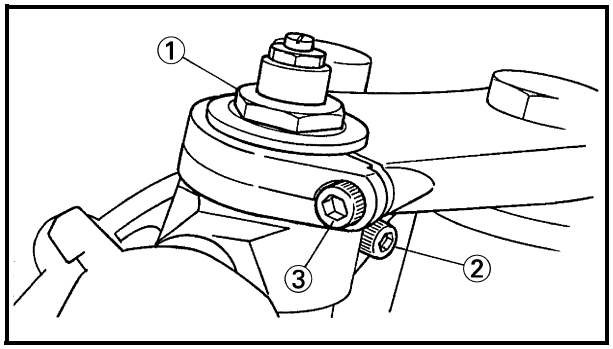
EAS00662
INSTALLING THE FRONT FORK LEGS

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

1. Install:
   - front fork leg
     Temporarily tighten the upper and lower bracket pinch bolts.

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



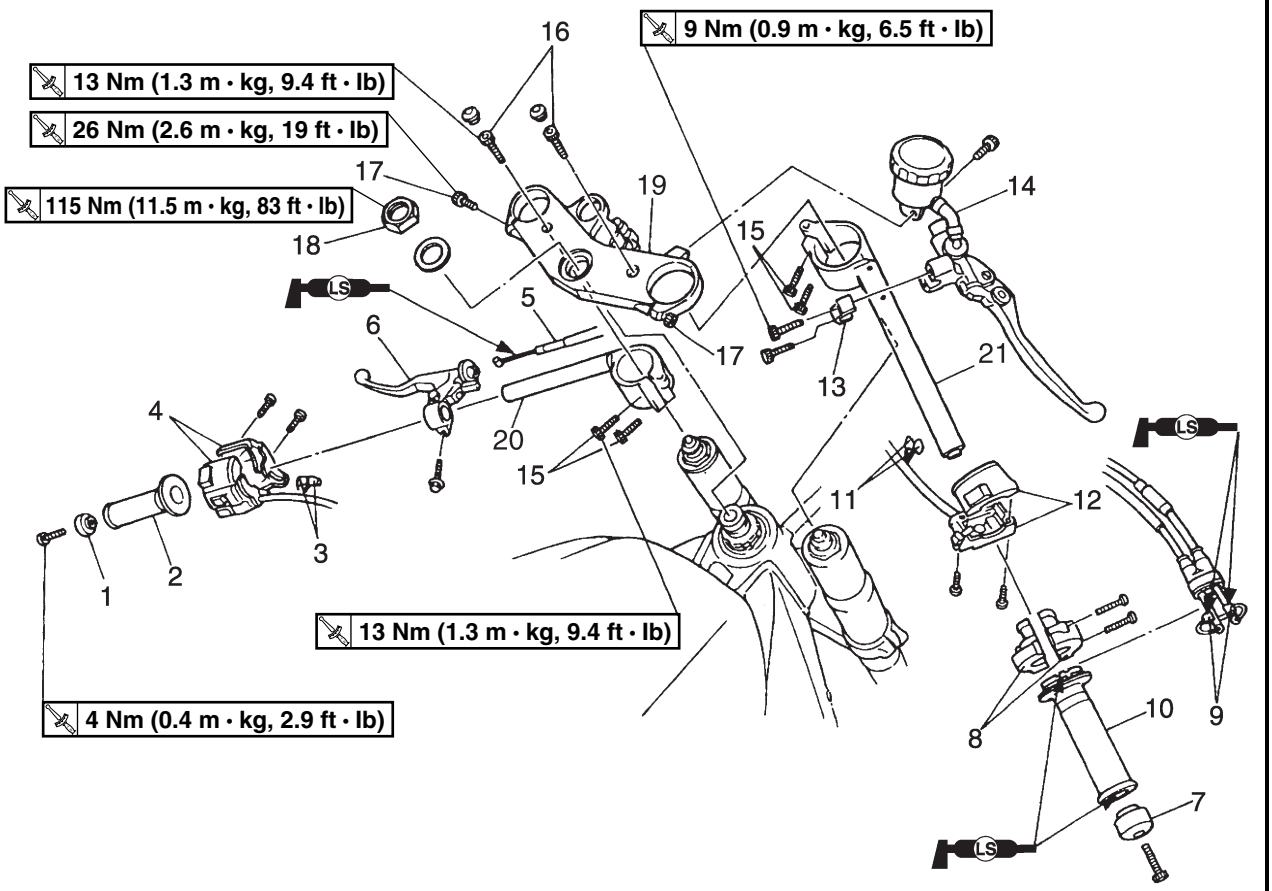
2. Tighten:
   - lower bracket pinch bolt
     23 Nm (2.3 m · kg, 17 ft · lb)
   - cap bolt ①
     23 Nm (2.3 m · kg, 17 ft · lb)
   - handlebar boss pinch bolt ②
     13 Nm (1.3 m · kg, 9.4 ft · lb)
   - upper bracket pinch bolt ③
     26 Nm (2.6 m · kg, 19 ft · lb)

⚠ WARNING

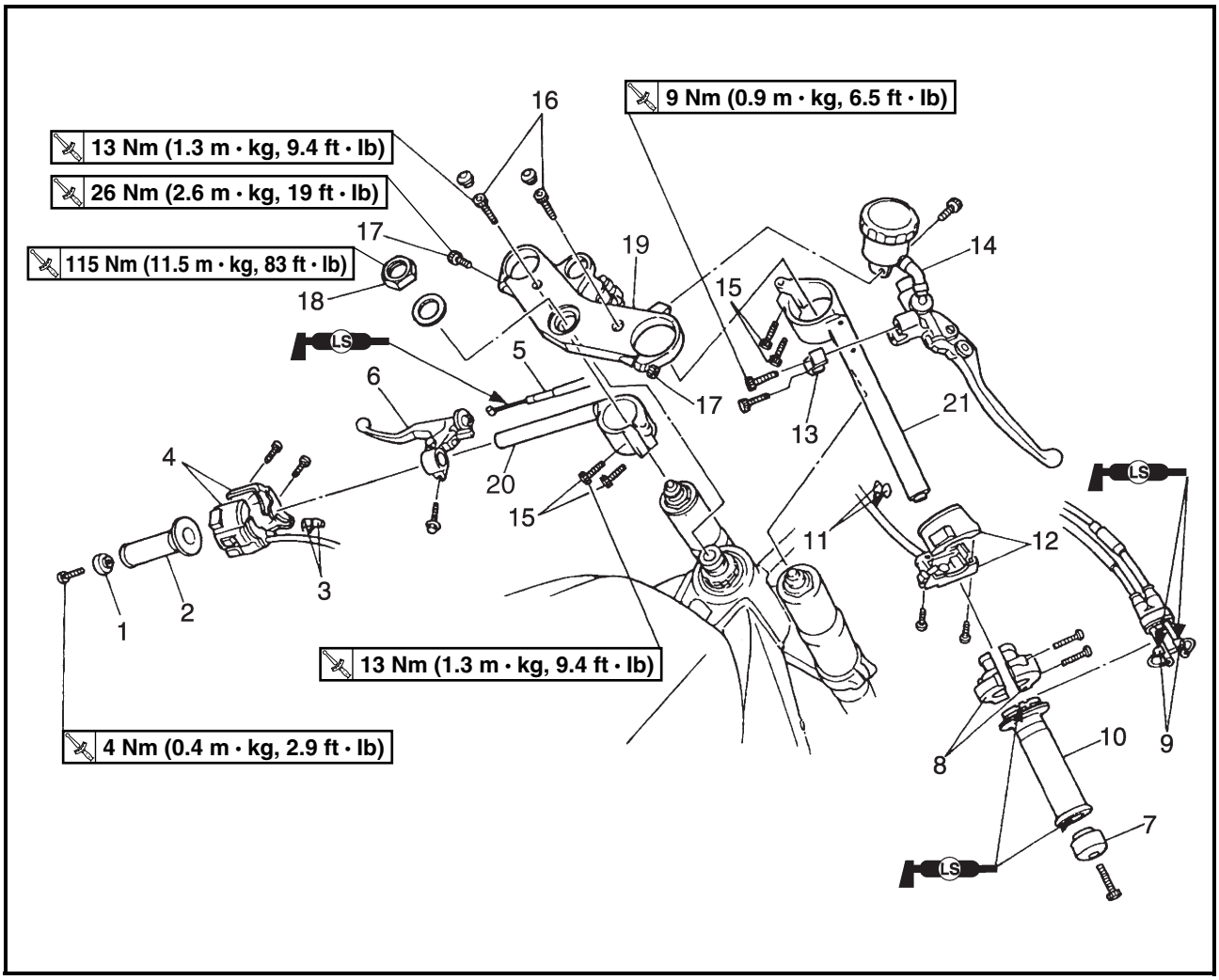
Make sure the brake hoses are routed properly.

3. 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
	Removing the handlebars		Remove the parts in the order listed.
1	Left grip end	1	
2	Handlebar grip	1	
3	Clutch switch connector	2	Disconnect.
4	Left handlebar switch	1	
5	Clutch cable	1	
6	Clutch lever	1	Disconnect.
7	Right grip end	1	
8	Throttle cable housing	1	
9	Throttle cable	2	
10	Throttle grip	1	



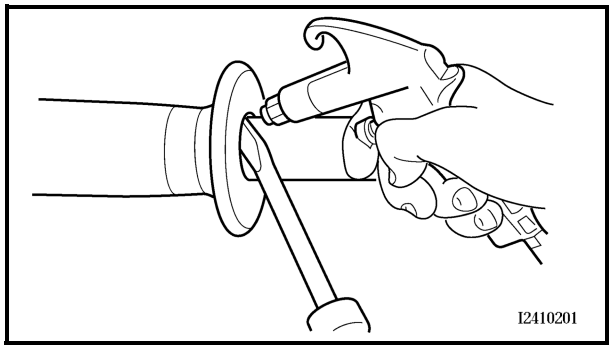
Order	Job/Part	Q'ty	Remarks
11	Front brake switch connector	2	Disconnect.
12	Right handlebar switch	1	
13	Brake master cylinder bracket	1	
14	Brake master cylinder	1	
15	Handlebar pinch bolt	4	
16	Upper bracket bolt	2	
17	Upper bracket pinch bolt	2	
18	Steering stem nut	1	
19	Upper bracket	1	
20	Left handlebar	1	
21	Right handlebar	1	
			For installation, reverse the removal procedure.

EAS00667
REMOVING THE HANDLEBARS

1. Stand the motorcycle on a level surface.

⚠ WARNING

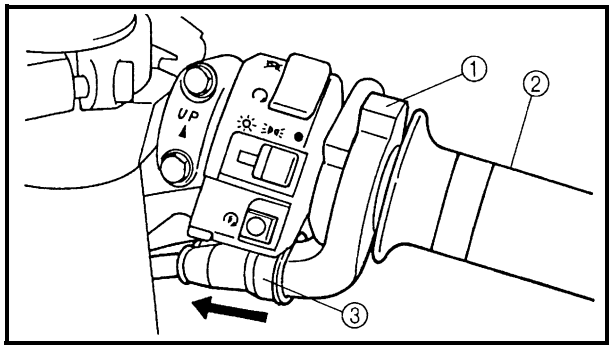
Securely support the motorcycle so that there is no danger of it falling over.



2. Remove:
   - handlebar grip

NOTE:

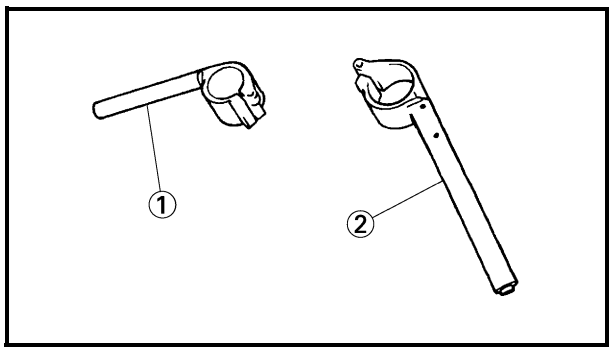
Blow compressed air between the left handlebar and the handlebar grip, and gradually push the grip off the handlebar.



3. Remove:
   - throttle cable housing ①
   - throttle grip ②

NOTE:

While removing the throttle cable housing, pull back the rubber cover ③.



EAS00669
CHECKING THE HANDLEBARS

1. Check:
   - left handlebar ①
   - right handlebar ②

   Bends/cracks/damage → Replace.

⚠ WARNING

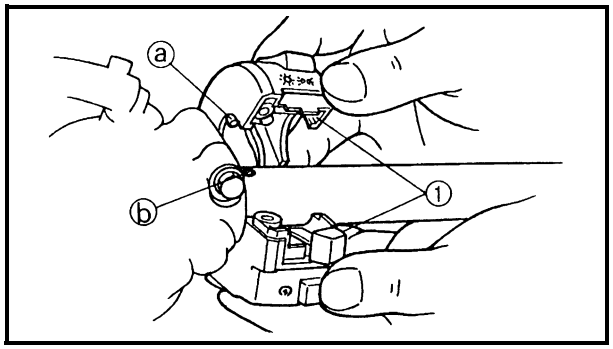
Do not attempt to straighten bent handlebars as this may dangerously weaken them.

EAS00674
INSTALLING THE HANDLEBARS

1. Stand the motorcycle on a level surface.

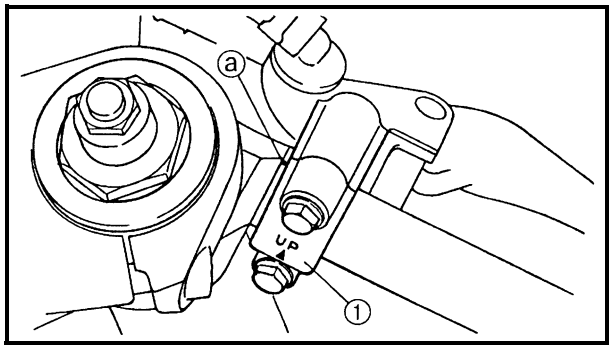
⚠ WARNING

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



2. Install:
   • right handlebar switch ①

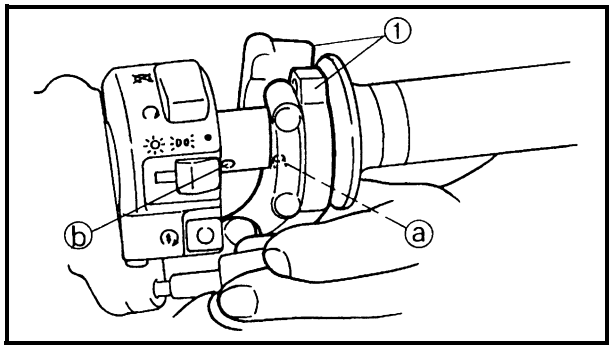
NOTE:
Align the projection ⓐ on the right handlebar switch with the hole ⓑ in the right handlebar.



3. Install:
   • brake master cylinder holder ①

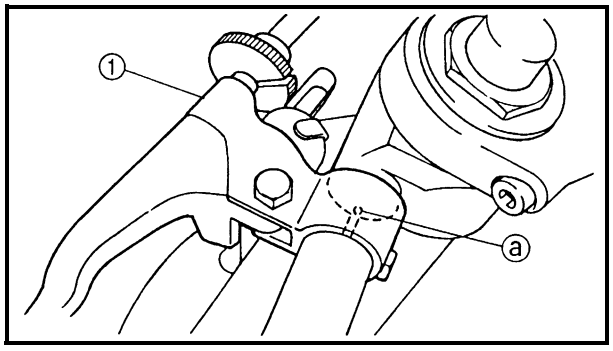
CAUTION:
- **Install the brake master cylinder holder with the "UP" mark facing up.**
- **First, tighten the upper bolt, then the lower bolt.**

NOTE:
- Align the mating surfaces of the brake master cylinder holder with the punch mark ⓐ in the right handlebar.
- There should be 2 mm of clearance between the right handlebar switch and the brake master cylinder holder.



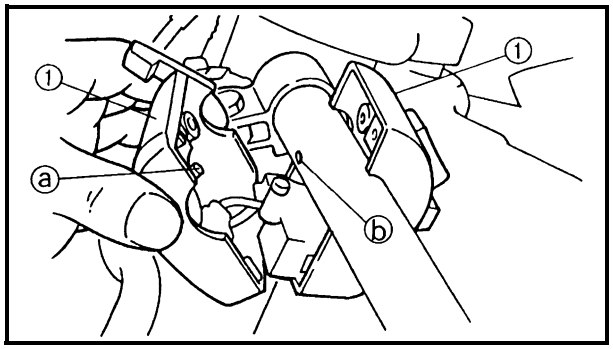
4. Install:
   • throttle grip
   • throttle cable housing ①
   • throttle cables

NOTE:
Align the projection ⓐ on the throttle cable housing with the hole ⓑ in the right handlebar.



5. Install:
   • clutch lever holder ①

NOTE:
Align the slit in the clutch lever holder with the punch mark ⓐ in the left handlebar.



6. Install:
   • left handlebar switch ①

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

7. Install:
   • handlebar grip

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

⚠ WARNING

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

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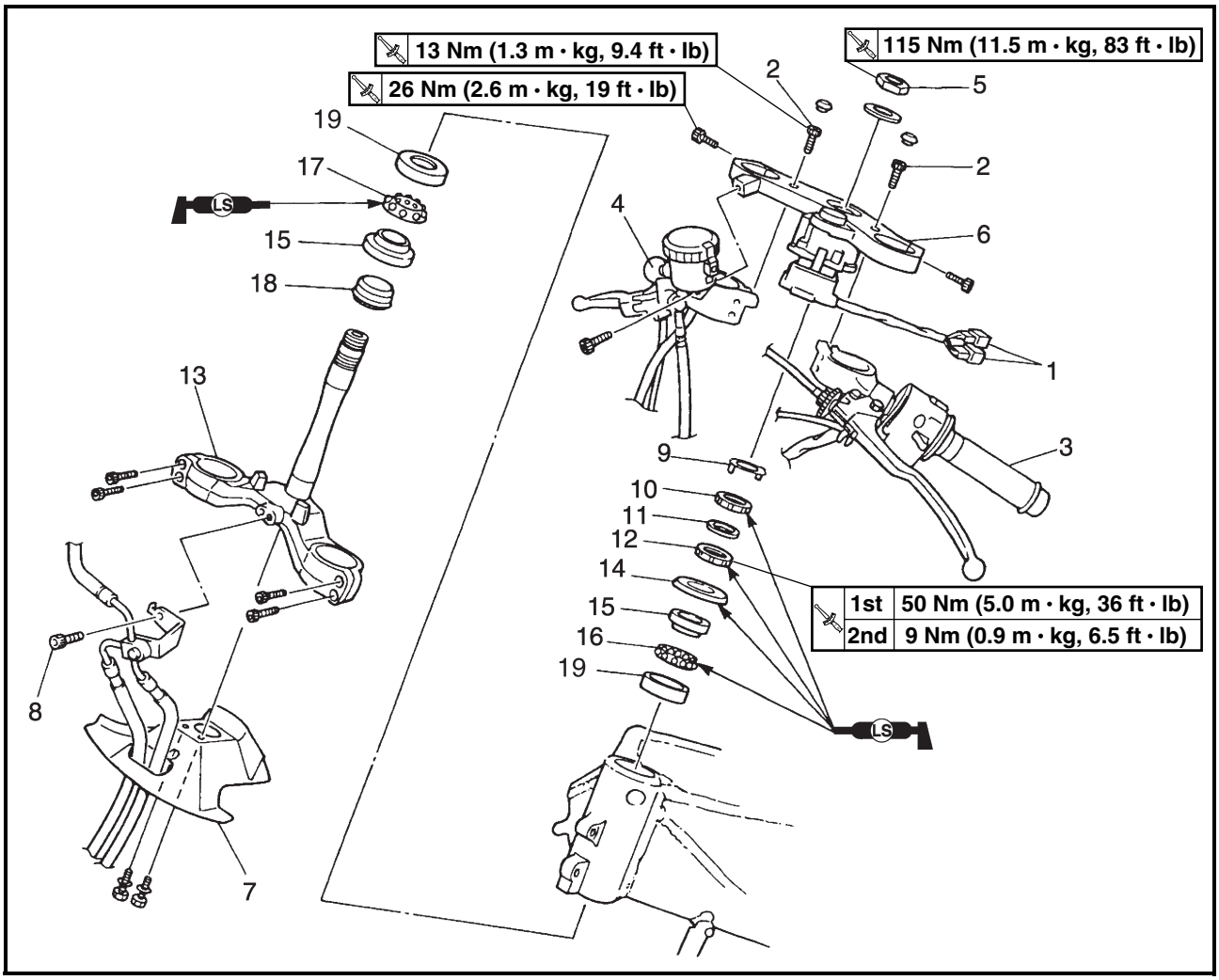
8. Adjust:
   • clutch cable free play
   Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.

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

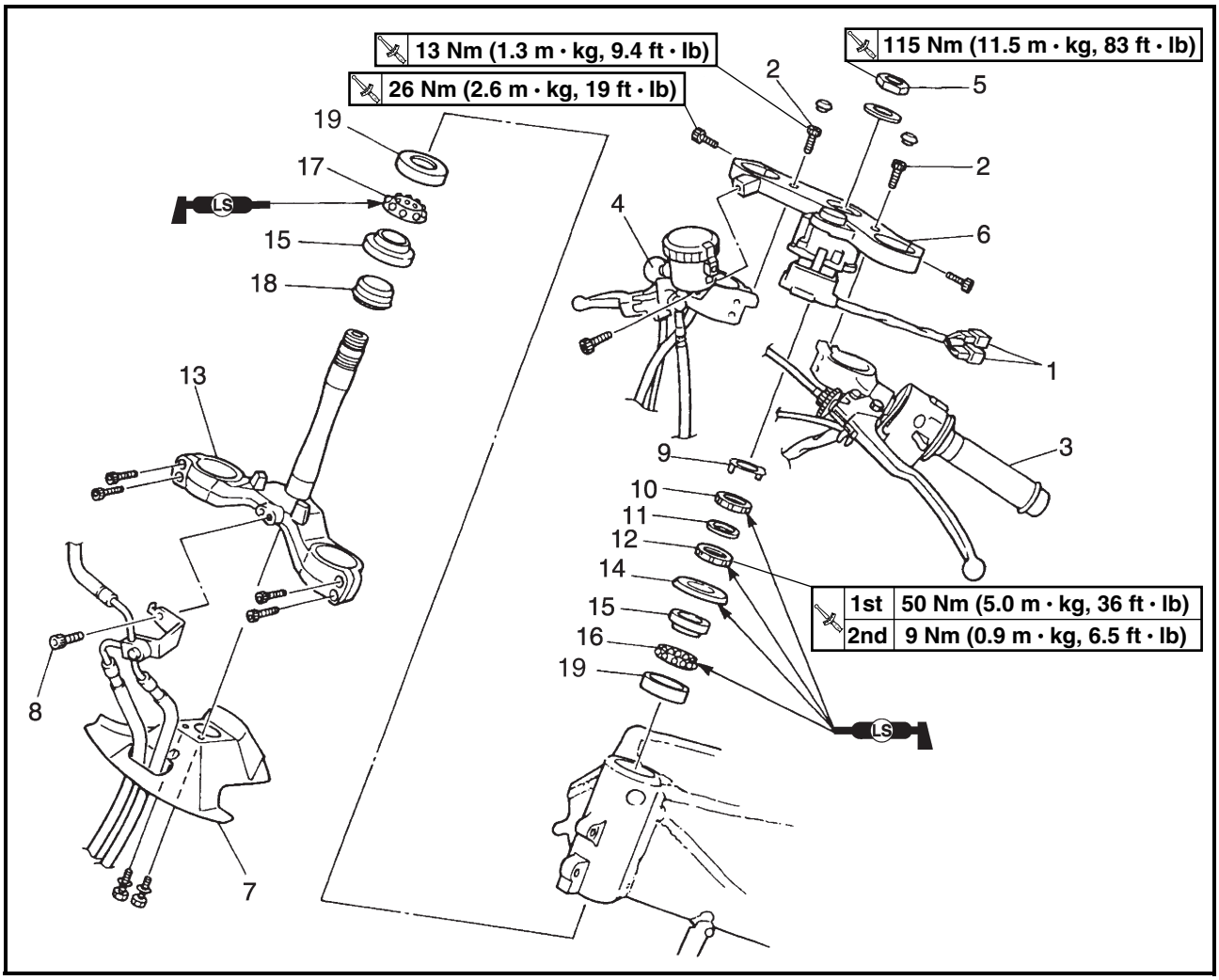
9. Adjust:
   • throttle cable free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

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

EAS00676
STEERING HEAD



Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front fork legs		Refer to "FRONT FORK".
1	Main switch coupler	2	Disconnect.
2	Upper bracket bolt	2	
3	Left handlebar assembly	1	
4	Right handlebar assembly	1	
5	Steering stem nut	1	
6	Upper bracket	1	
7	Lower bracket panel	1	
8	Brake hose holder bolt	1	
9	Lock washer	1	
10	Upper ring nut	1	
11	Rubber washer	1	



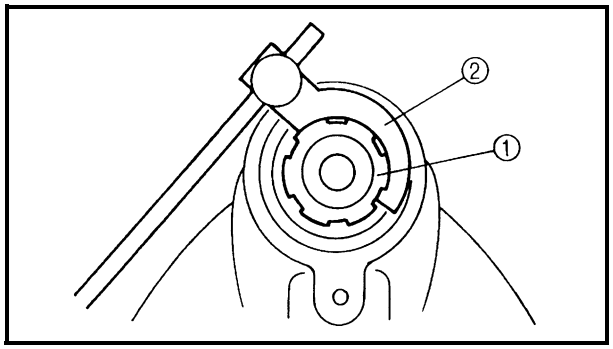
Order	Job/Part	Q'ty	Remarks
12	Lower ring nut	1	
13	Lower bracket	1	
14	Bearing cover	1	
15	Bearing inner race	2	
16	Upper bearing	1	
17	Lower bearing	1	
18	Dust seal	1	
19	Bearing outer race	2	
			For installation, reverse the removal procedure.

EAS00677
REMOVING THE LOWER 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:
   - ring nut ①
     (with the steering nut wrench ②)

	Steering nut wrench **YU-33975**

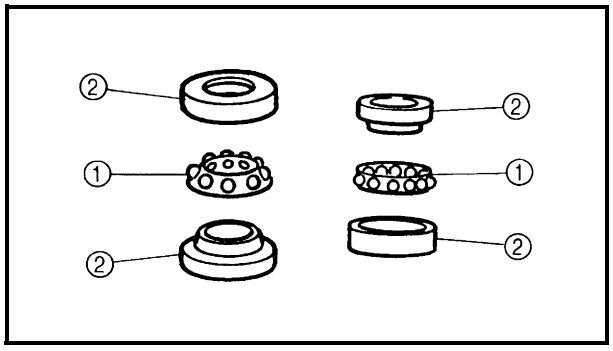
⚠ WARNING

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

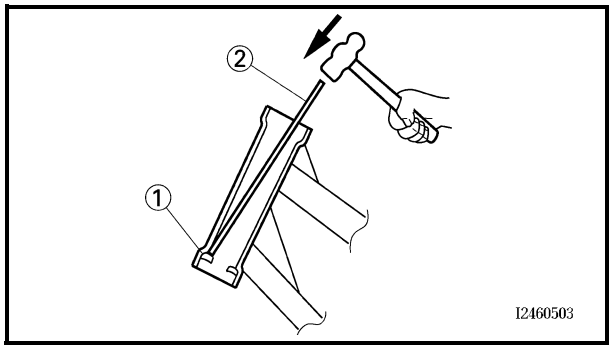
EAS00681
CHECKING THE STEERING HEAD

1. Wash:
   - bearings
   - bearing races

	Recommended cleaning solvent **Kerosene**



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



3. Replace:
   - bearings
   - bearing races

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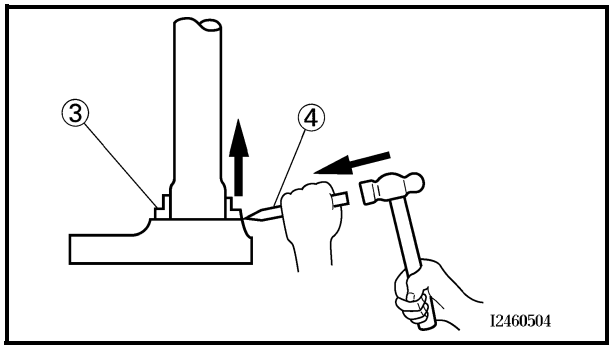
a. Remove the bearing races ① from the steering head pipe with a long rod ② and hammer.



b. Remove the bearing race ③ from the lower bracket with a floor chisel ④ and hammer.
c. Install a new rubber seal and new bearing races.

CAUTION:

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

NOTE:

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

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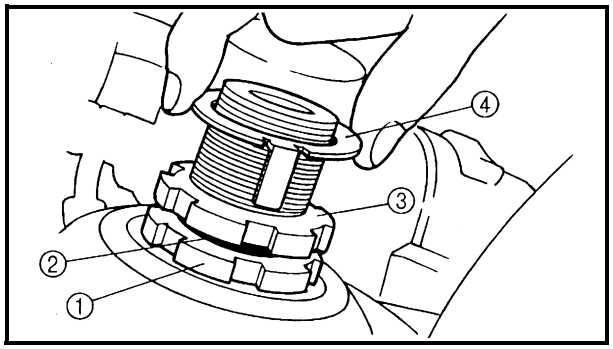
4. Check:
   - upper bracket
   - lower bracket
   (along with the steering stem)
   Bends/cracks/damage → Replace.

EAS00683

INSTALLING THE STEERING HEAD

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

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



2. Install:
   - lower ring nut ①
   - rubber washer ②
   - upper ring nut ③
   - lock washer ④
   Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" in chapter 3.
3. Install:
   - upper bracket
   - steering stem nut

NOTE:

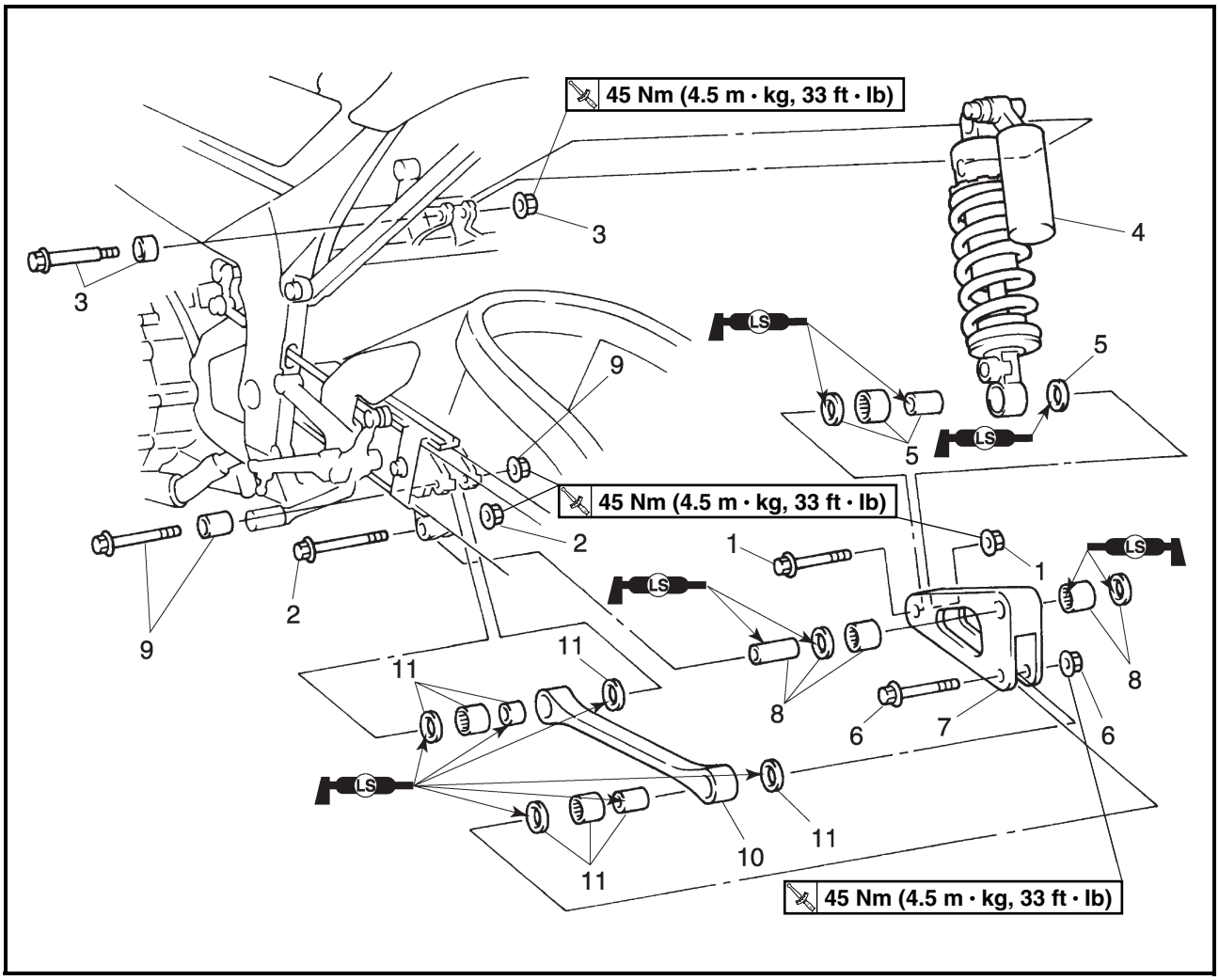
Temporarily tighten the steering stem nut.

4. Install:
   - front fork legs
   Refer to "INSTALLING THE FRONT FORK LEGS".

NOTE:

Temporarily tighten the upper and lower bracket pinch bolts.

EAS00685
REAR SHOCK ABSORBER ASSEMBLY



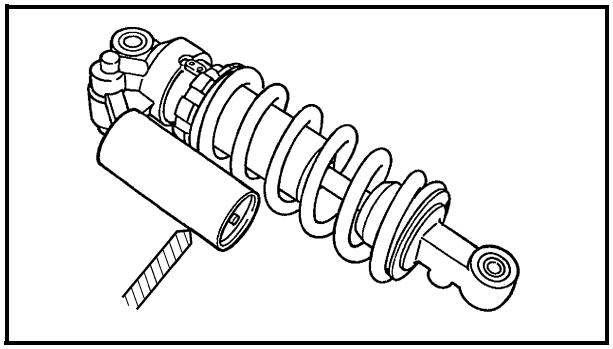
Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assembly		Remove the parts in the order listed.
1	Self-locking nut/bolt	1/1	
2	Self-locking nut/bolt	1/1	
3	Self-locking nut/bolt/spacer	1/1/1	
4	Rear shock absorber assembly	1	
5	Collar/oil seal/bearing	1/2/1	
6	Self-locking nut/bolt	1/1	
7	Relay arm	1	
8	Collar/oil seal/bearing	1/2/2	
9	Self-locking nut/bolt/collar	1/1/1	
10	Connecting arm	1	
11	Collar/oil seal/bearing	2/4/2	
			For installation, reverse the removal procedure.

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.

EAS00690
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

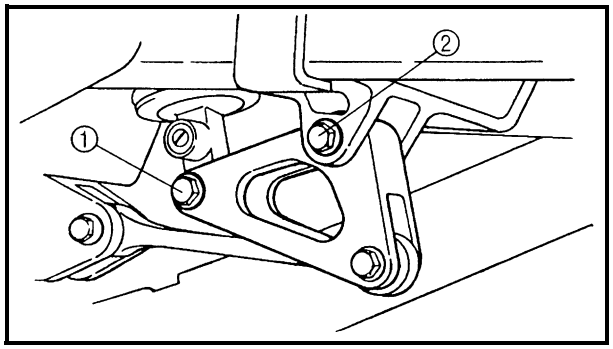
1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

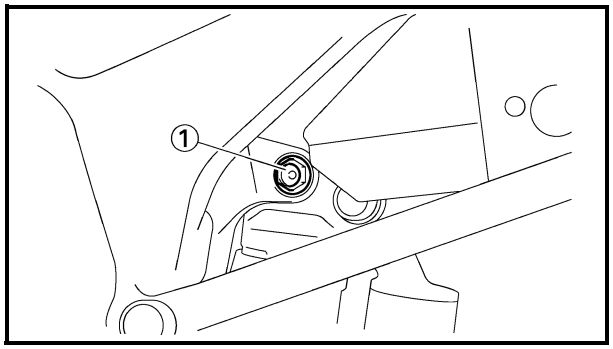
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



2. Remove:
   - rear shock absorber assembly lower bolt ①
   - relay arm-to-swingarm bolt ②

NOTE:

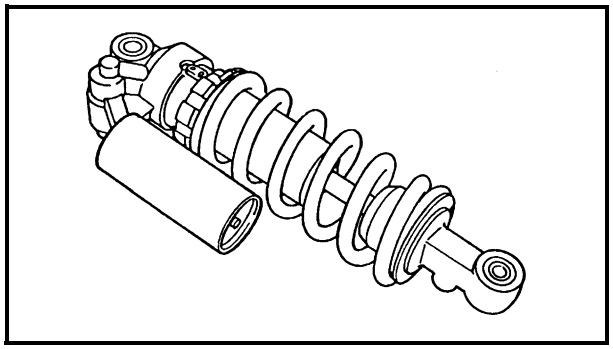
While removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



3. Remove:
   - rear shock absorber assembly upper bolt ①
   - rear shock absorber assembly

NOTE:

Raise the swingarm and then remove the rear shock absorber assembly from between the swingarm.



EAS00695
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

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.
   - bushings
     Damage/wear → Replace.
   - dust seals
     Damage/wear → Replace.
   - bolts
     Bends/damage/wear → Replace.

EAS00698
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   - spacers
   - bearings

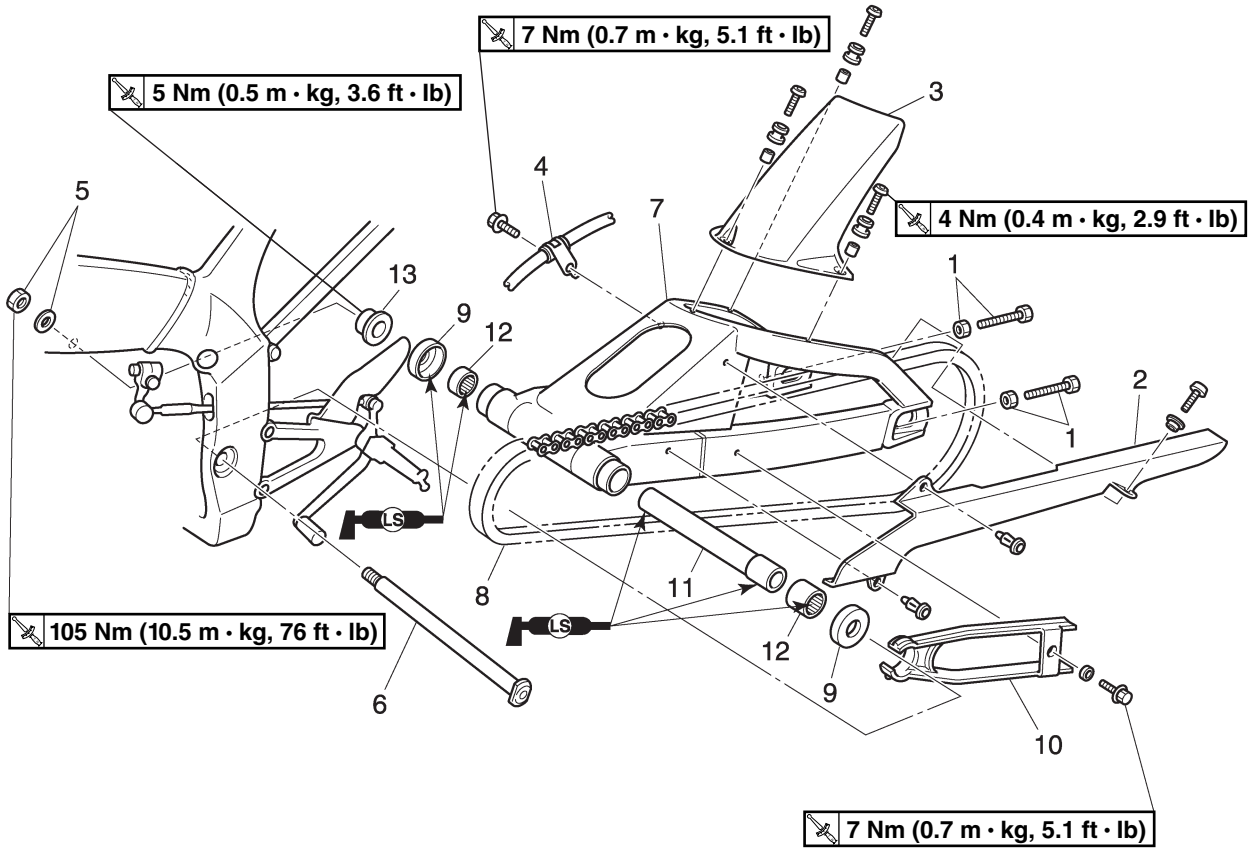
	Recommended lubricant **Lithium-soap base grease**

2. Install:
   - rear shock absorber assembly

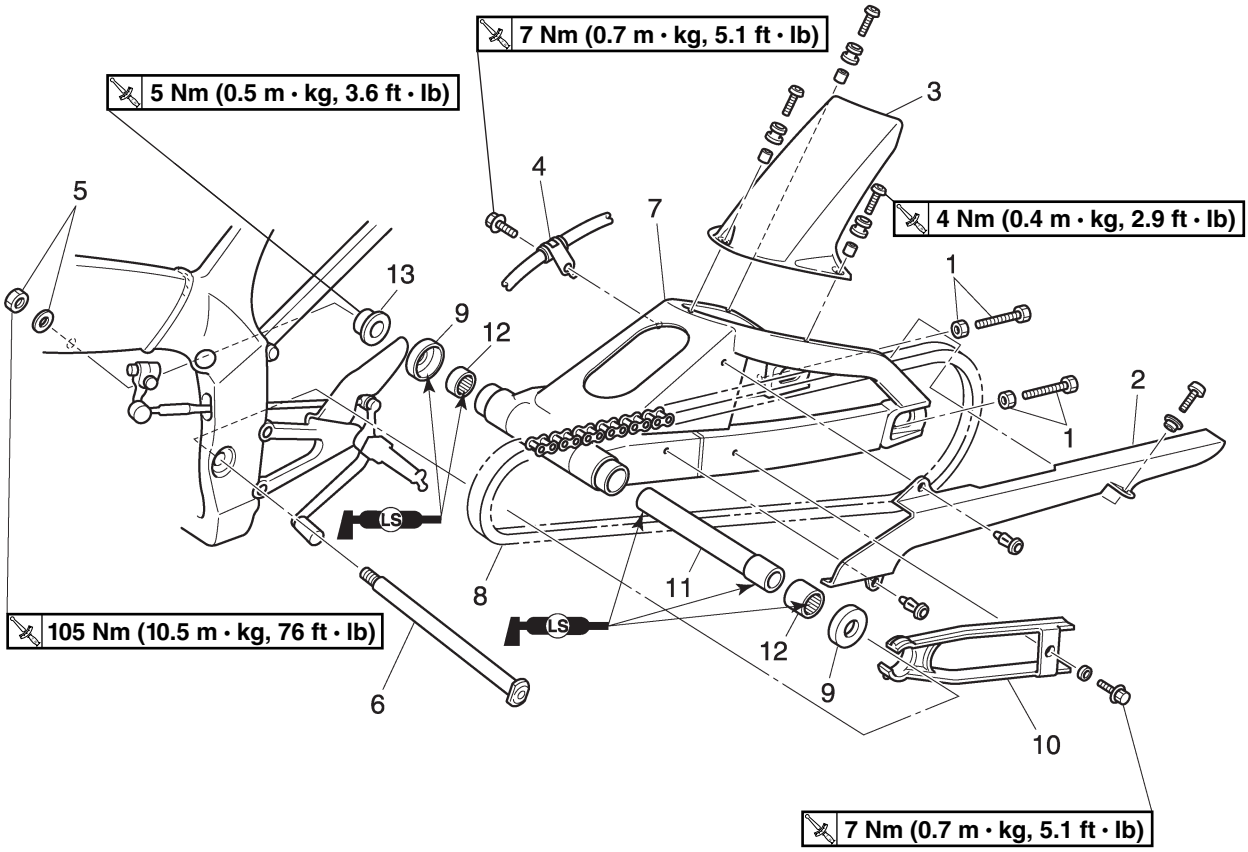
NOTE:
- When installing the rear shock absorber assembly, lift up the swingarm.
- Install the connecting arm front bolt from the right.

3. Tighten:
   - rear shock absorber assembly upper nut
     45 Nm (4.5 m · kg, 33 ft · lb)
   - rear shock absorber assembly lower nut
     45 Nm (4.5 m · kg, 33 ft · lb)
   - relay arm-to swingarm nut
     45 Nm (4.5 m · kg, 33 ft · lb)

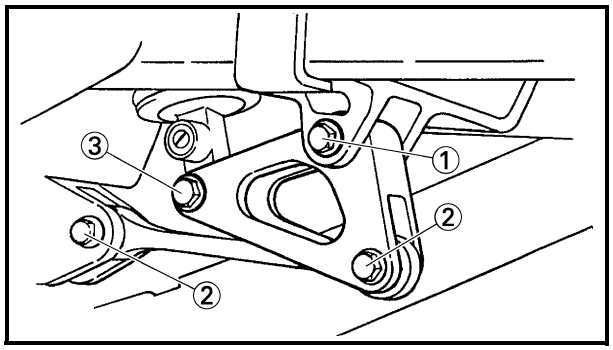
EAS00700
SWINGARM AND DRIVE CHAIN

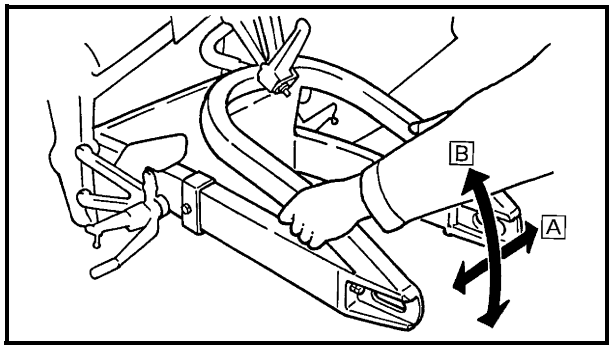


Order	Job/Part	Q'ty	Remarks
	Removing the swingarm and drive chain		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL AND BRAKE DISC".
	Rear shock absorber		Refer to "REAR SHOCK ABSORBER ASSEMBLY".
	Drive sprocket		Refer to "ENGINE" in chapter 5.
1	Adjusting bolt/locknut	2/2	
2	Drive chain guard	1	
3	Rear fender	1	
4	Brake hose holder	1	
5	Pivot shaft nut/washer	1/1	
6	Pivot shaft	1	
7	Swingarm	1	



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





EAS00703
REMOVING THE SWINGARM

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:
   - relay arm-to-swingarm bolt ①
   - connecting arm bolt ②
   - rear shock absorber assembly lower bolt ③

NOTE:

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

3. Measure:
   - swingarm side play
   - swingarm vertical movement

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a. Measure the tightening torque of the pivot shaft nut.

Pivot shaft nut
105 Nm (10.5 m · kg, 76 ft · lb)

b. Measure the swingarm side play [A] by moving the swingarm from side to side.
c. If the swingarm side play is out of specification, check the spacers, bearings, washers, and dust covers.

Swingarm side play
(at the end of the swingarm)
1.0 mm (0.039 in)

d. Check the swingarm vertical movement [B] by moving the swingarm up and down.
   If swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, washers, and dust covers.

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EAS00704
REMOVING THE DRIVE CHAIN
1. Stand the motorcycle on a level surface.

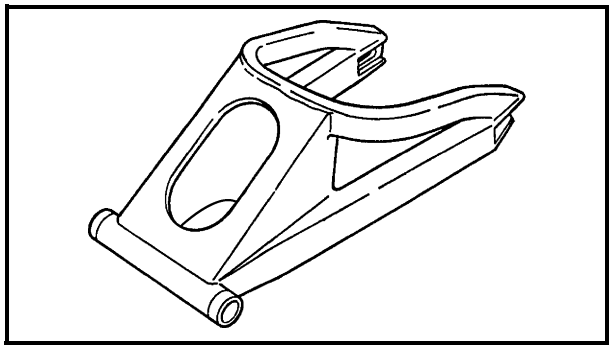
⚠ WARNING

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

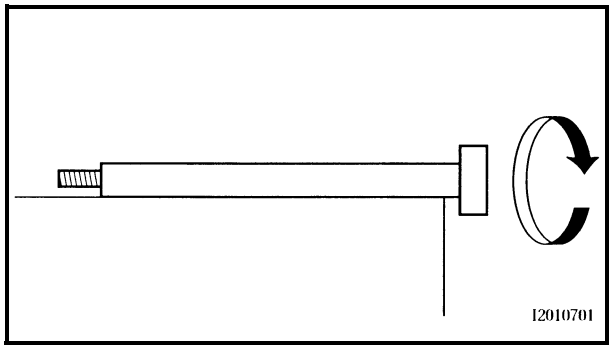
NOTE:
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - drive chain
     (with the drive chain cutter)

NOTE:
Only cut the drive chain if it or the swingarm is to be replaced.



EAS00707
CHECKING THE SWINGARM
1. Check:
   - swingarm
     Bends/cracks/damage → Replace.



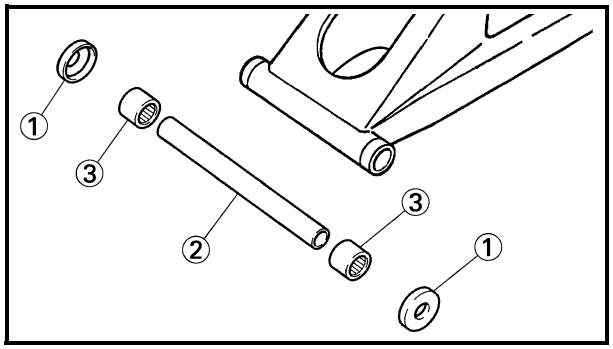
2. Check:
   - pivot shaft
     Roll the pivot shaft on a flat surface.
     Bends → Replace.

⚠ WARNING

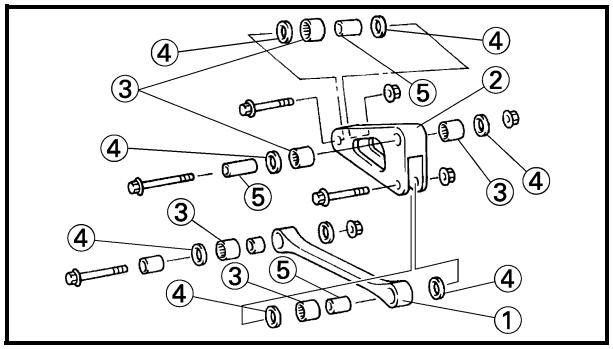
Do not attempt to straighten a bent pivot shaft.

3. Wash:
   - pivot shaft
   - dust covers
   - spacer
   - washers
   - bearings

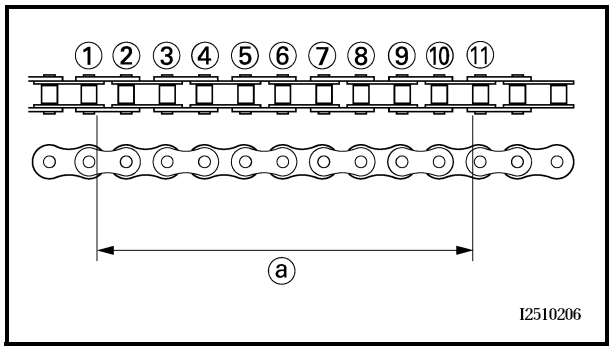
Recommended cleaning solvent
Kerosene



4. Check:
   - dust covers ①
   - spacer ②
     Damage/wear → Replace.
   - bearings ③
     Damage/pitting → Replace.



5. Check:
   - connecting arms ①
   - relay arm ②
     Damage/wear → Replace.
6. Check:
   - bearings ③
   - oil seals ④
     Damage/pitting → Replace.
7. Check:
   - collars ⑤
     Damage/scratches → Replace.

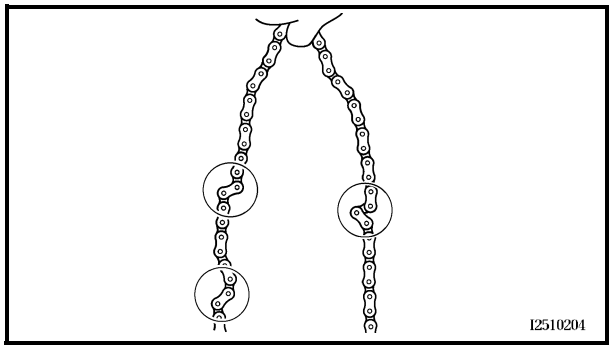


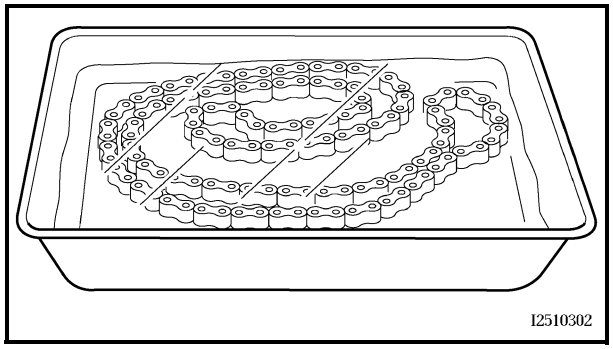
EAS00709
CHECKING THE DRIVE CHAIN

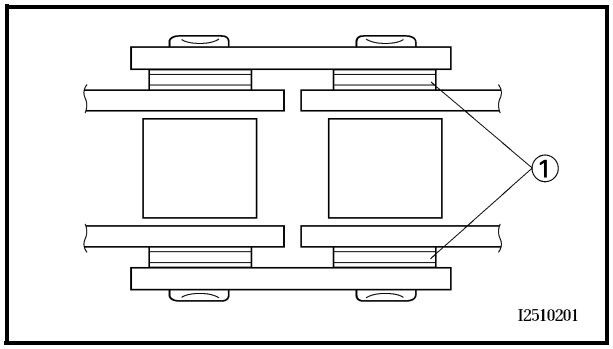
1. Measure:
   - ten-link section ⓐ of the drive chain
     Out of specification → Replace the drive chain.

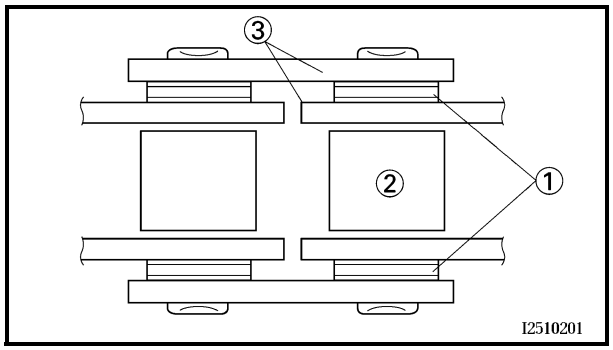
Ten-link drive chain section limit (maximum)
150.1 mm (5.91 in)

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

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a. Wipe the drive chain with a clean cloth.
b. Put the drive chain in kerosene and remove any remaining dirt.
c. 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 kerosine more them ten minutes. O-ring is damage by kerosine.

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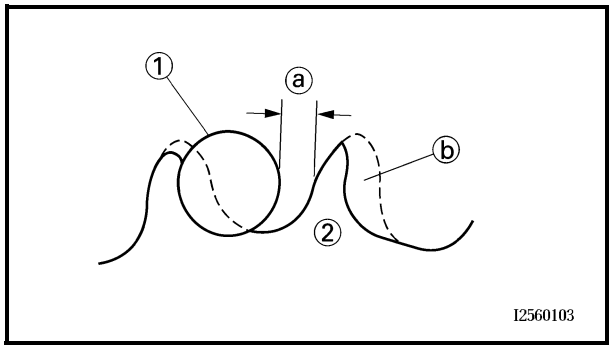
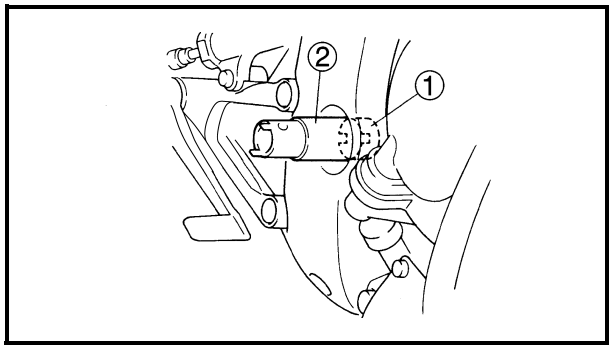
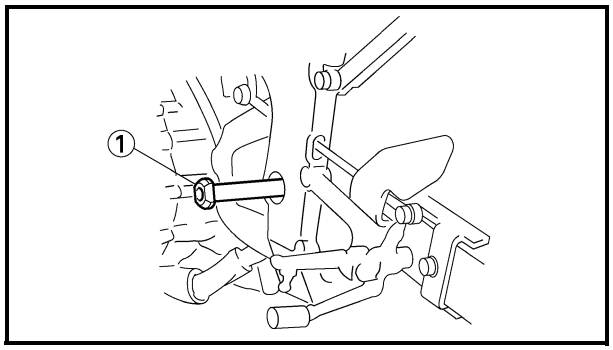
4. Check:
   • O-rings ①
   Damage → Replace the drive chain.
   • drive chain rollers ②
   Damage/wear → Replace the drive chain.
   • drive chain side plates ③
   Damage/wear → Replace the drive chain.
   Cracks → Replace the drive chain and make sure the battery breather hose is properly routed away 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 ⓐ wear → Replace the drive chain sprockets as a set.

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

ⓑ Correct
① Drive chain roller
② Drive chain sprocket

EAS00711
INSTALLING THE SWINGARM

1. Lubricate:
   - bearings
   - spacers
   - dust covers
   - pivot shaft adjust bolt ①
   - pivot shaft

NOTE:
Use the pivot shaft wrench ② to tighten the pivot adjust bolt to specification torque.

	**Pivot shaft wrench** **YM-01471**
	**Pivot shaft adjusting bolt** **5 Nm (0.5 m · kg, 3.6 ft · lb)**

2. Install:
   - relay arm — **45 Nm (4.5 m · kg, 33 ft · lb)**
   - connecting arms — **45 Nm (4.5 m · kg, 33 ft · lb)**

NOTE:
Install the connecting arm front bolt ① from the left.

3. Install:
   - rear shock absorber assembly
   - rear wheel

   Refer to “INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY” and “INSTALLING THE REAR WHEEL”.
4. Adjust:
   - drive chain slack

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

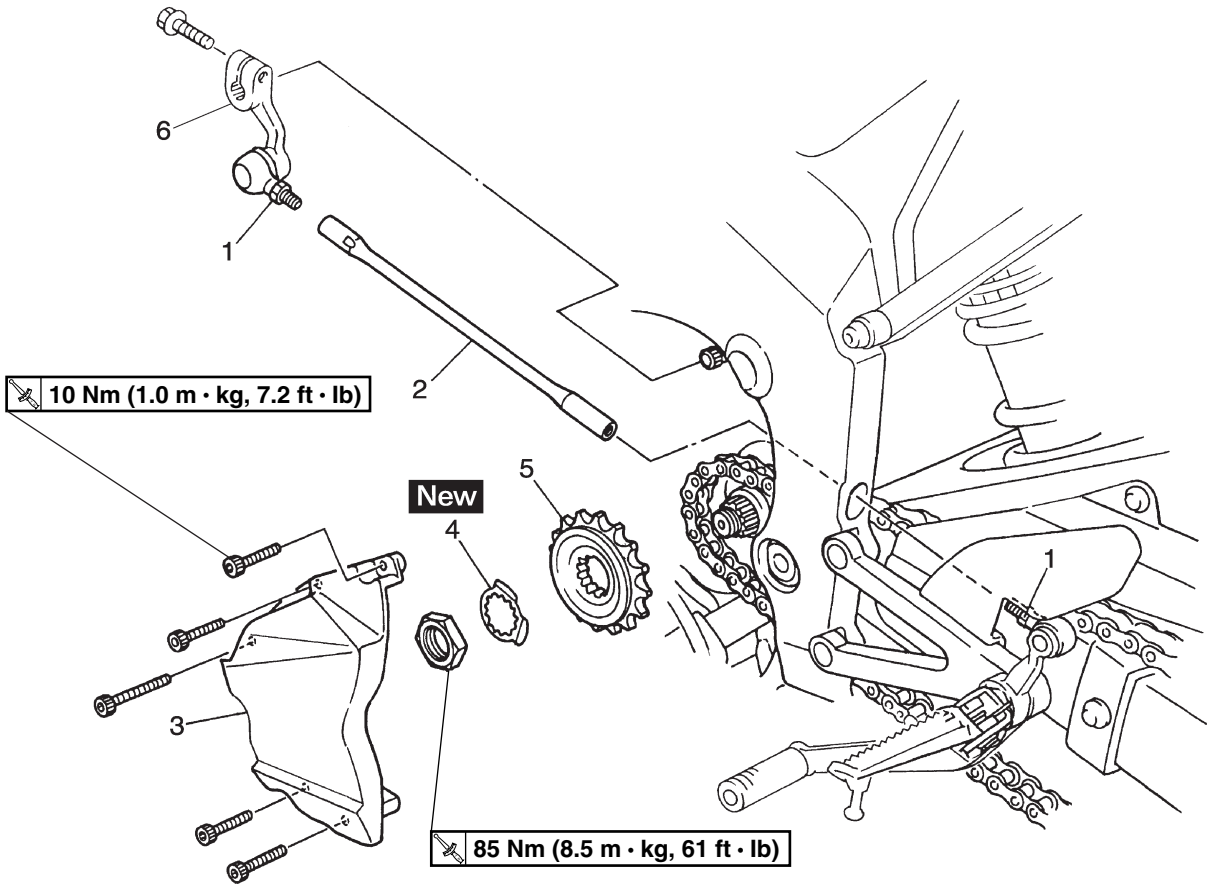
	**Drive chain slack** **40 ~ 50 mm (1.57 ~ 1.97 in)**

EAS00188

OVERHAULING THE ENGINE

ENGINE

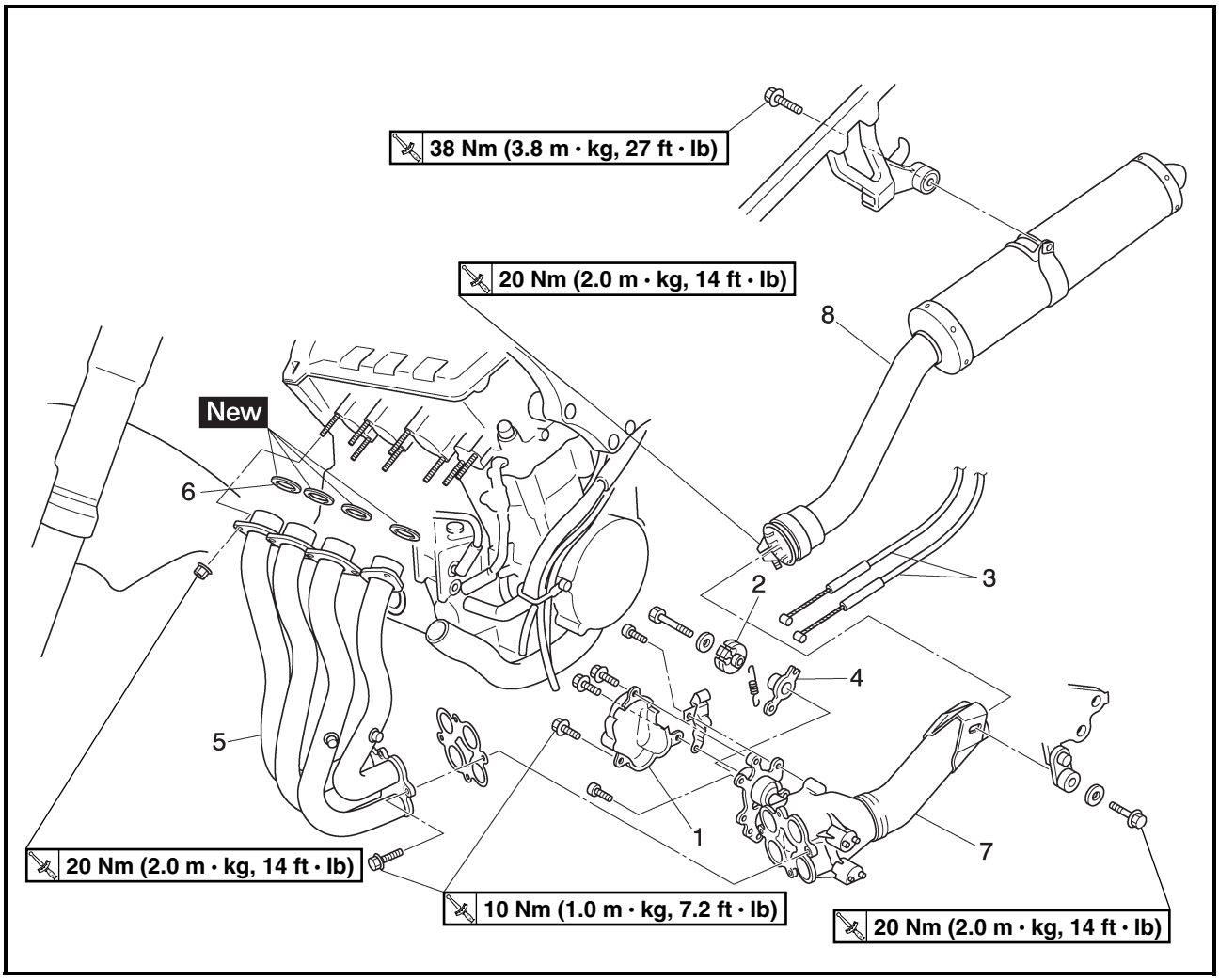
DRIVE SPROCKET



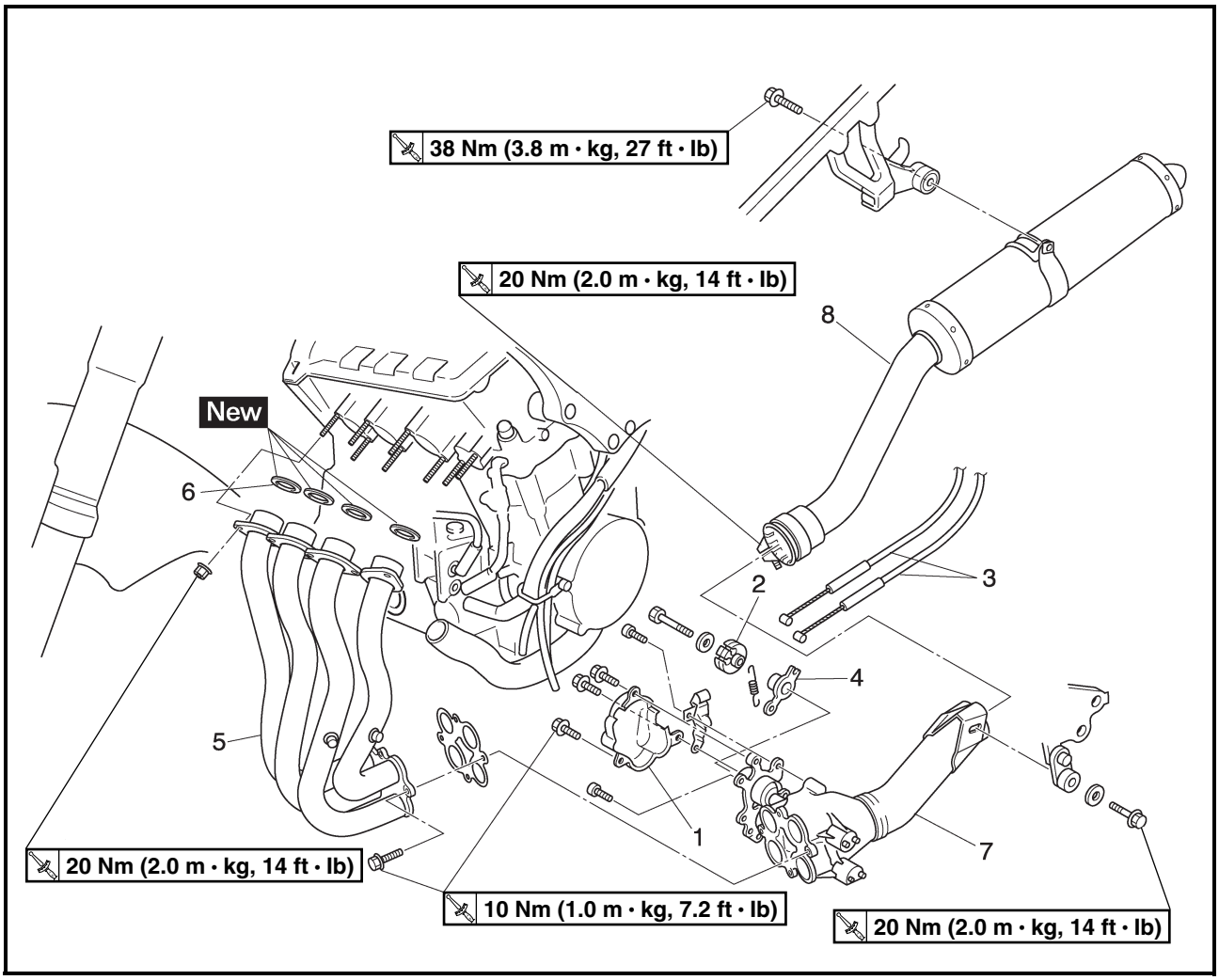
Order	Job/Part	Q'ty	Remarks
	Removing the drive sprocket		Remove the parts in the order listed.
1	Locknut	2	
2	Shift rod	1	
3	Drive sprocket cover	1	
4	Lock washer	1	
5	Drive sprocket	1	
6	Shift arm	1	
			For installation, reverse the removal procedure.

EAS00189

EXHAUST PIPE

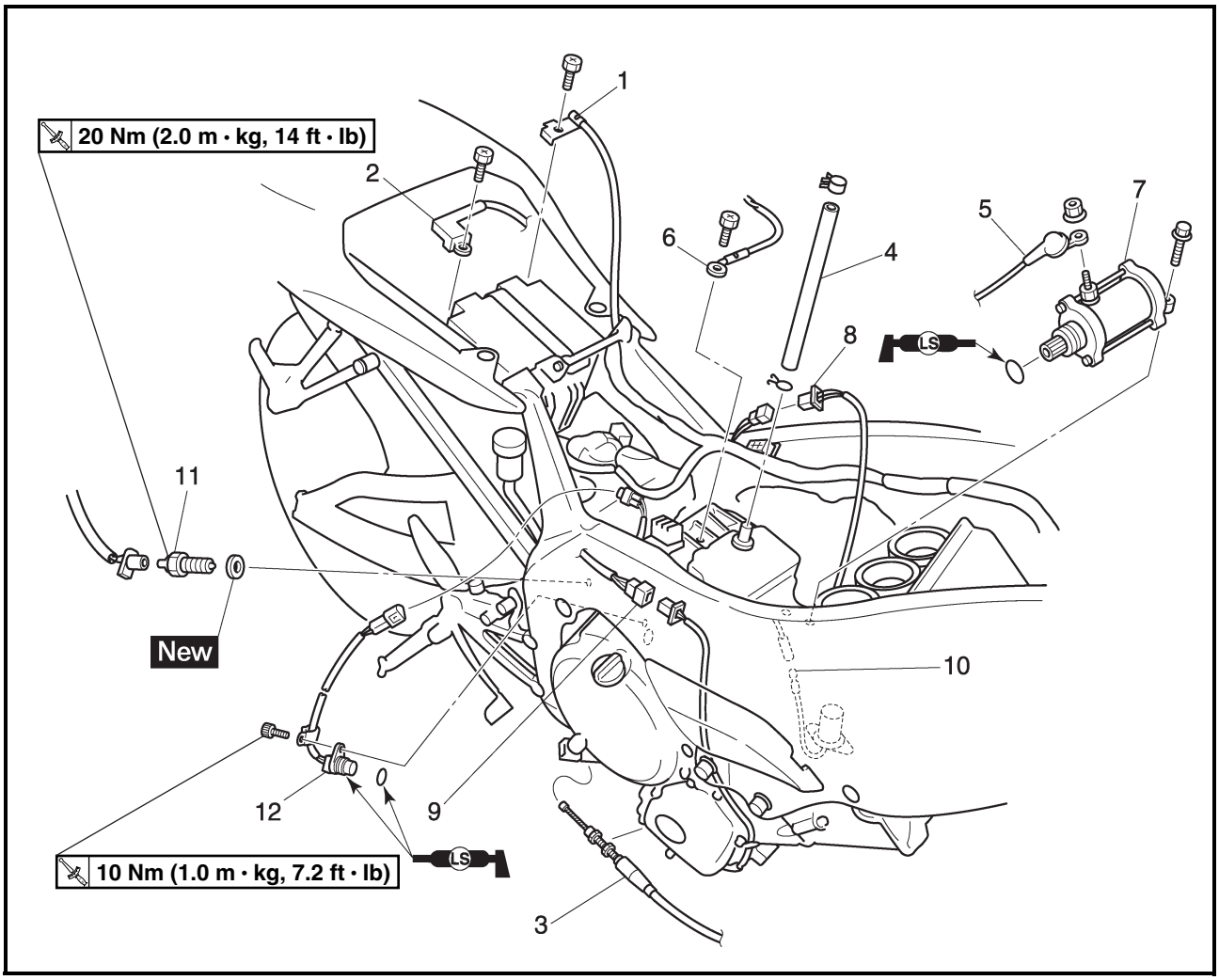


Order	Job/Part	Q'ty	Remarks
	Removing the exhaust pipe		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Bottom cowling and side cowlings		Refer to "COWLINGS" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Radiator assembly		Refer to "RADIATOR" in chapter 6.
1	EXUP valve pulley cover	1	
2	EXUP valve pulley	1	
3	EXUP cable	2	
4	EXUP valve linkage	1	
5	Exhaust pipe assembly	1	
6	Exhaust pipe gasket	4	

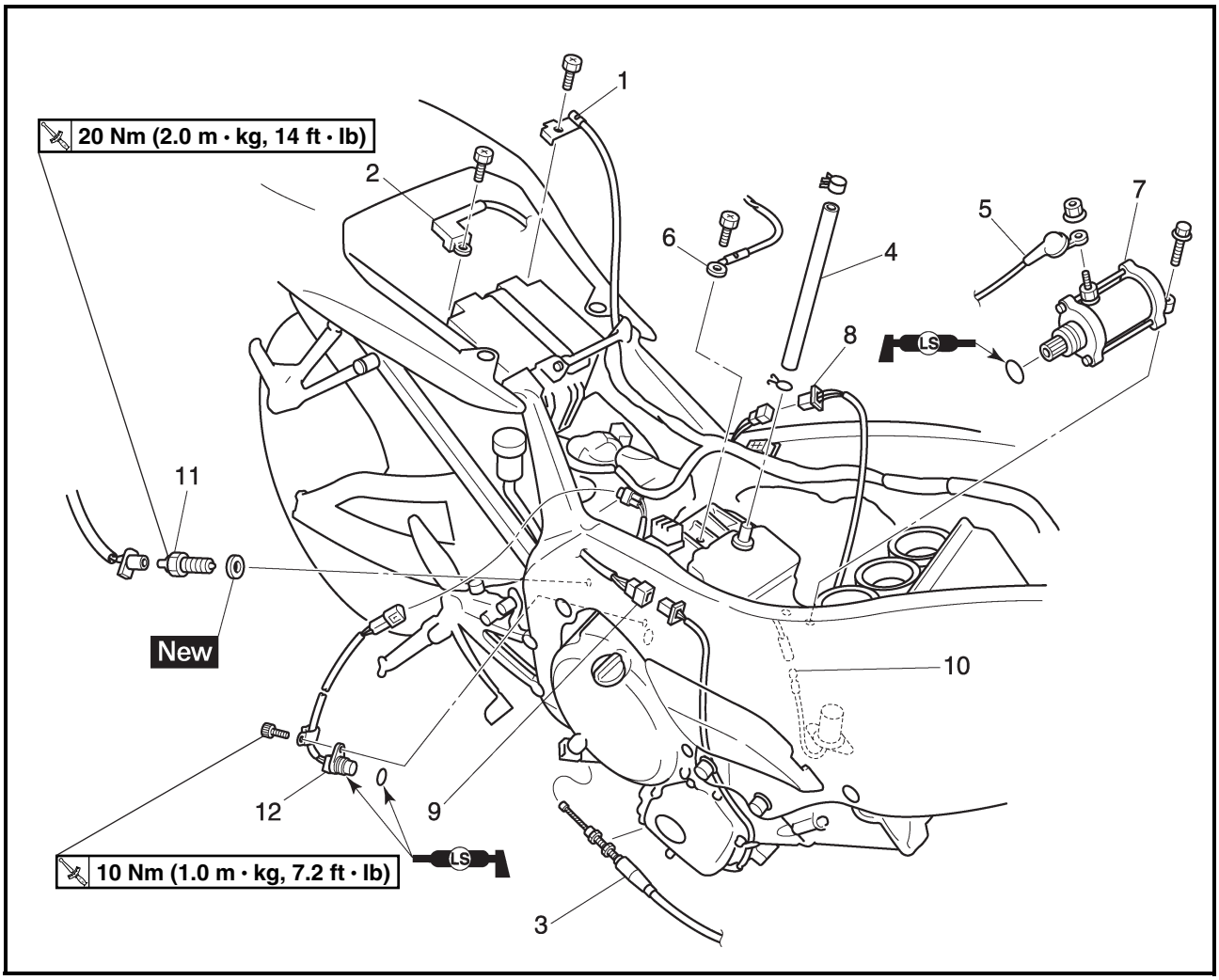


Order	Job/Part	Q'ty	Remarks
7	Exhaust valve pipe	1	
8	Muffler	1	
			For installation, reverse the removal procedure.

LEADS AND HOSES



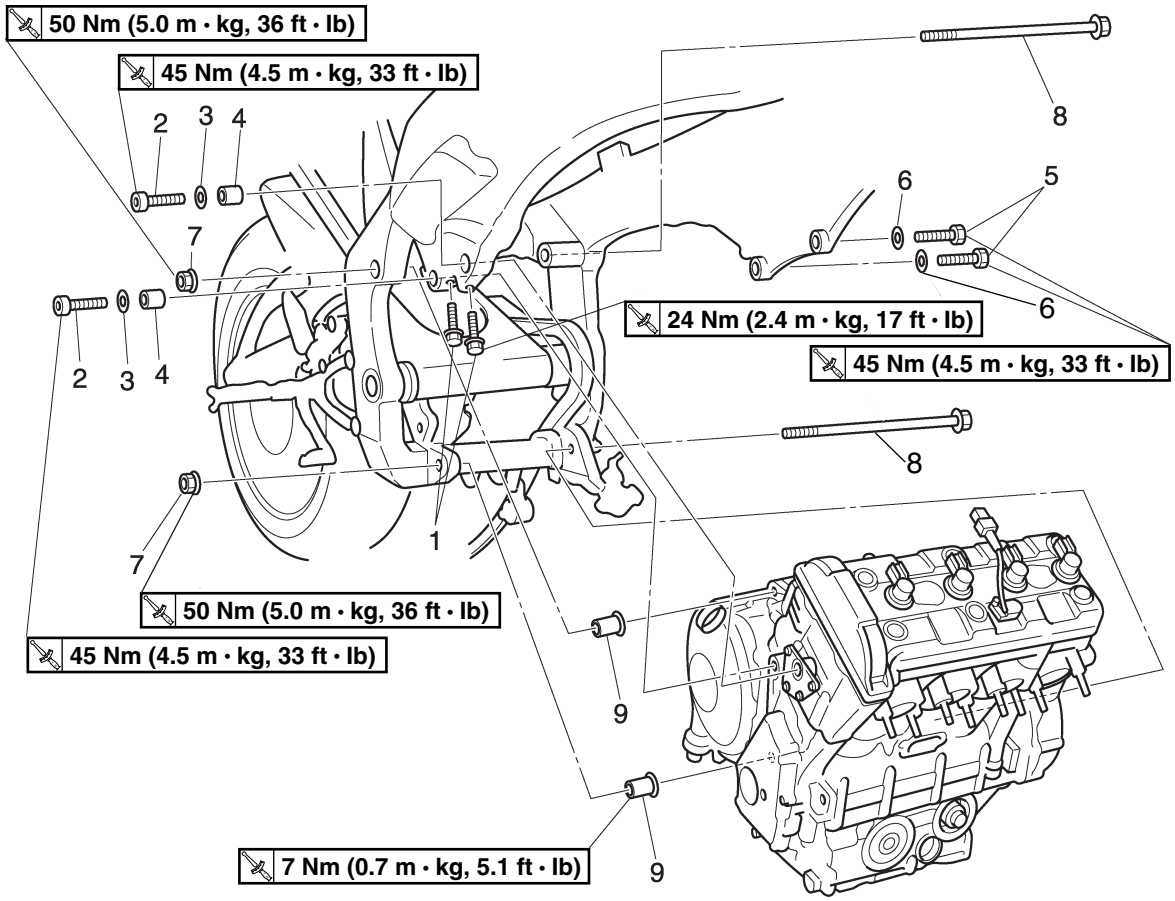
Order	Job/Part	Q'ty	Remarks
	Disconnecting the leads and hoses		Disconnect the parts in the order listed.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Throttle body assembly		Refer to "THROTTLE BODIES" in chapter 7.
	Engine oil and oil filter cartridge		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Oil cooler and thermostat assembly		Refer to "OIL COOLER" and "THERMOSTAT" in chapter 6.
1	Battery negative lead	1	**CAUTION:** **First, disconnect the negative lead, then the positive lead.**
2	Battery positive lead	1	



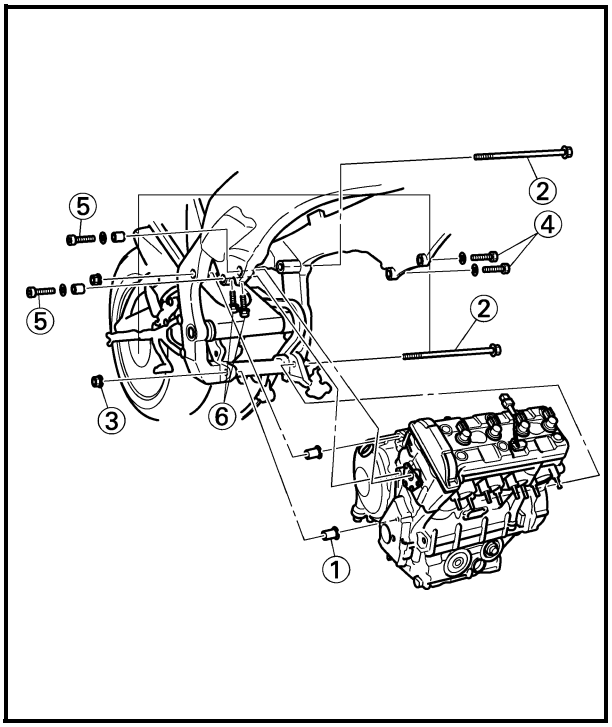
Order	Job/Part	Q'ty	Remarks
3	Clutch cable	1	
4	Crankcase breather hose	1	
5	Starter motor lead	1	Disconnect.
6	Ground lead	1	Disconnect.
7	Starter motor	1	
8	Stator coil assembly coupler	1	Disconnect.
9	Pickup coil coupler	1	Disconnect.
10	Oil level switch connector	1	Disconnect.
11	Neutral switch	1	
12	Speed sensor	1	
			For connecting, reverse the disconnection procedure.

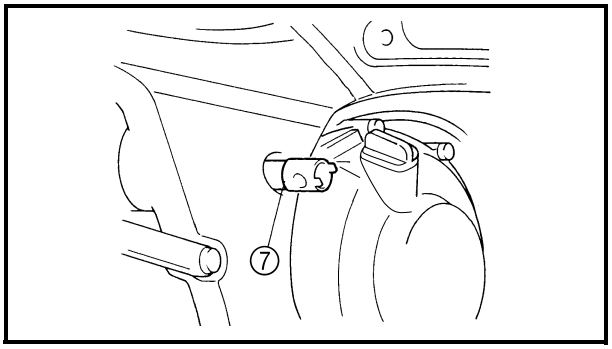
EAS00191

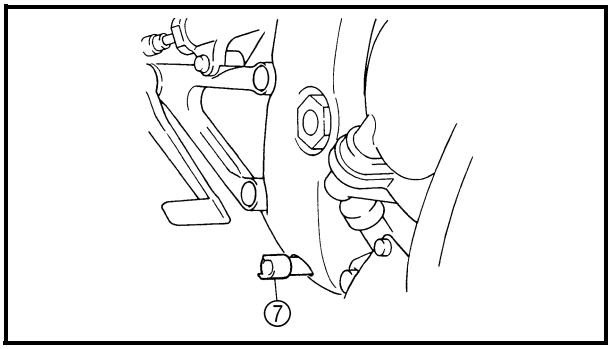
ENGINE

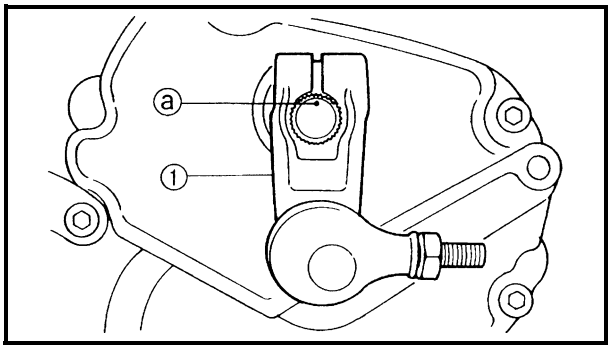


Order	Job/Part	Q'ty	Remarks
	Removing the engine		Remove the parts in the order listed. **NOTE:** Place a suitable stand under the frame and engine.
1	Pinch bolt	2	Loosen.
2	Right front mounting bolt	1	
3	Washer	1	
4	Spacer	1	
5	Left front mounting bolt	2	
6	Washer	2	
7	Self-locking nut	2	
8	Rear mounting bolt	2	
9	Engine mounting adjust bolt	2	
			For installation, reverse the removal procedure.









EAS00192
INSTALLING THE ENGINE

1. Install:
   - engine mounting adjust bolts ①
   - rear mounting bolts ②
   - self-locking nuts ③
   - left front mounting bolt ④
   - right front mounting bolt ⑤
   - pinch bolt ⑥

NOTE:
- Lubricate the rear mounting bolt threads with lithium soap base grease.
- Do not fully tighten the bolts.

NOTE:
Use the pivot shaft wrench ⑦ to tighten the engine mounting adjust bolt.

	Pivot shaft wrench **YM-01471**

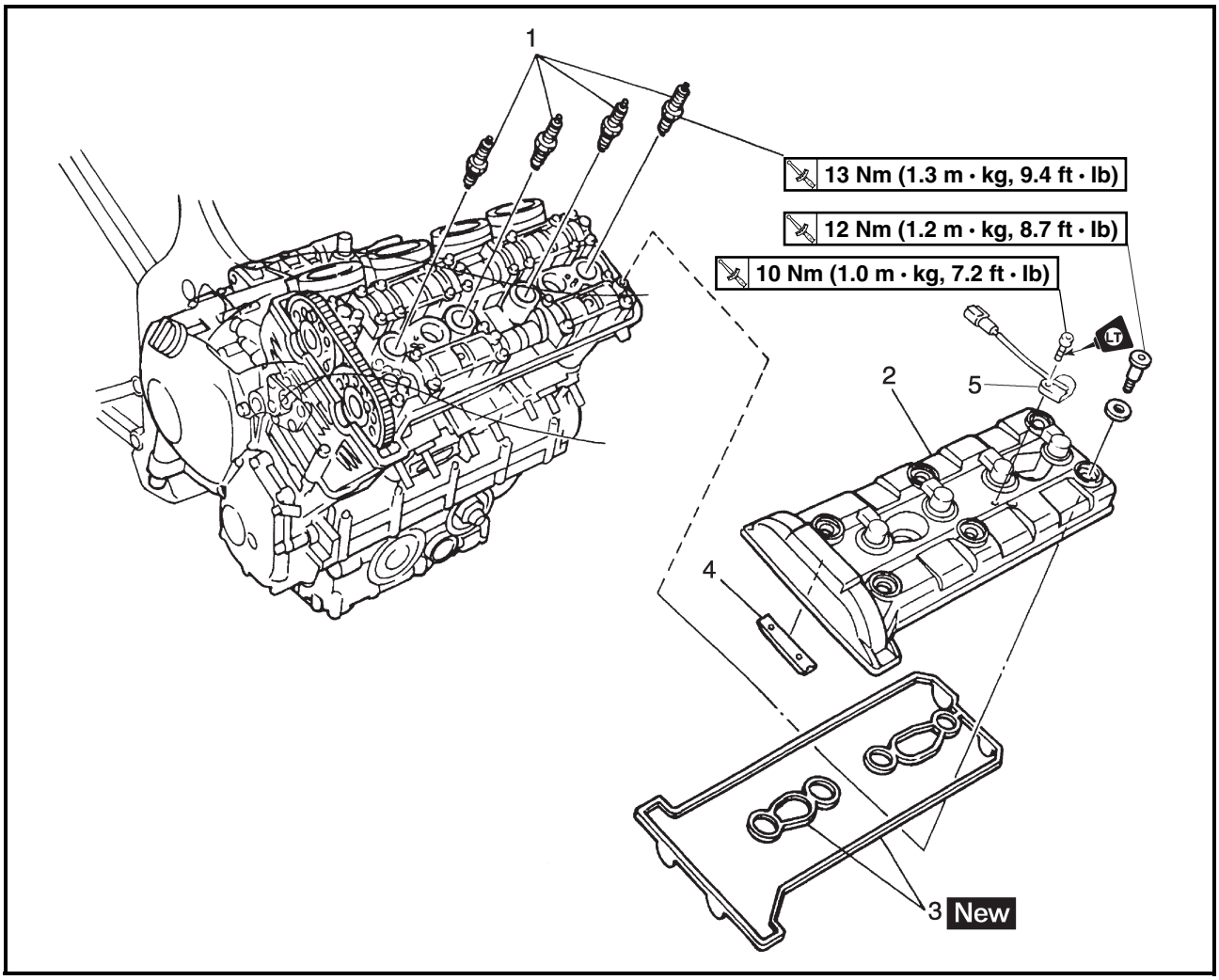
2. Tighten the bolts in the following order.

	Engine mounting adjust bolt ① **7 Nm (0.7 m · kg, 5.1 ft · lb)** **Self-locking nut ③** **50 Nm (5.0 m · kg, 36 ft · lb)** **Left front mounting bolt ④** **45 Nm (4.5 m · kg, 33 ft · lb)** **Right front mounting bolt ⑤** **45 Nm (4.5 m · kg, 33 ft · lb)** **Pinch bolt ⑥** **24 Nm (2.4 m · kg, 17 ft · lb)**

3. Install:
   - shift arm ① — **10 Nm (1.0 m · kg, 7.2 ft · lb)**

NOTE:
- Align the punch mark ⓐ 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.

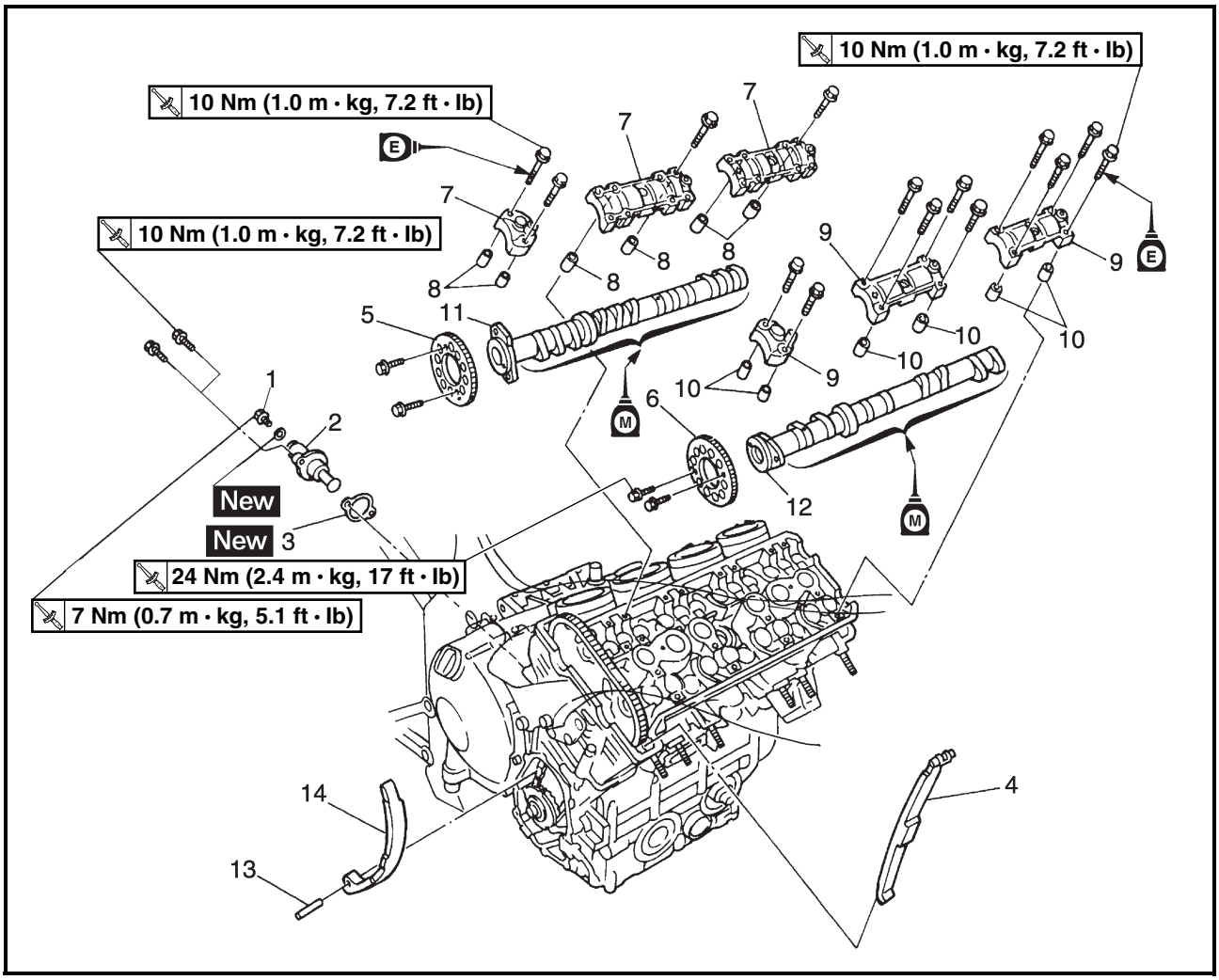
EAS00194
CAMSHAFT
CYLINDER HEAD COVERS



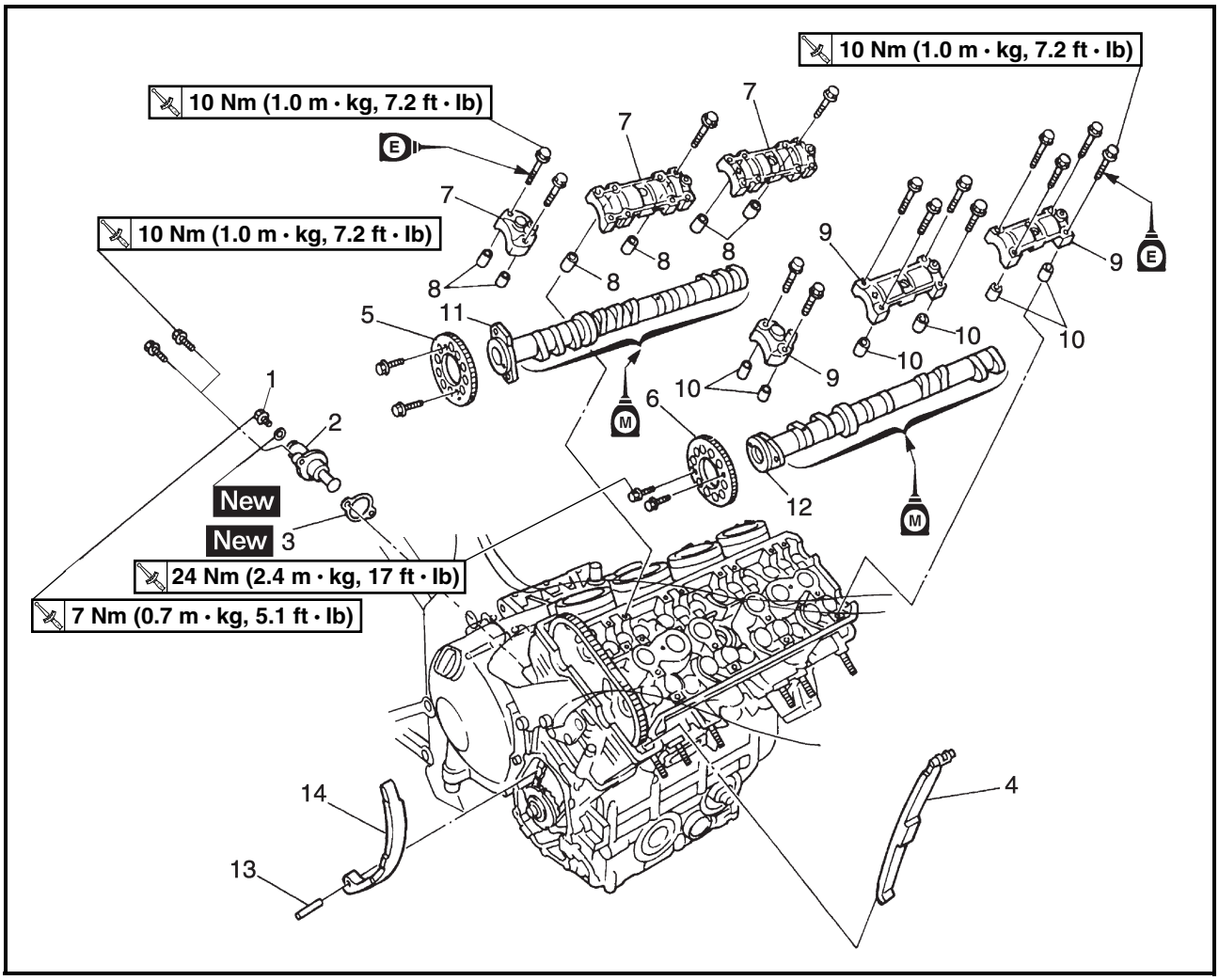
Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head covers		Remove the parts in the order listed.
	Throttle body assembly		Refer to "THROTTLE BODIES" in chapter 7.
	Radiator assembly and thermostat assembly		Refer to "RADIATOR" and "THERMOSTAT" in chapter 6.
1	Spark plug	4	
2	Cylinder head cover	1	
3	Cylinder head cover gasket	1	
4	Timing chain guide (top side)	1	
5	Cylinder identification sensor	1	
			For installation, reverse the removal procedure.

EAS00196

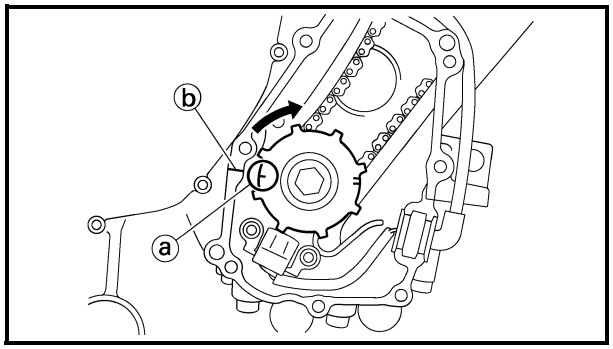
CAMSHAFTS



Order	Job/Part	Q'ty	Remarks
	Removing the camshafts		Remove the parts in the order listed.
	Pickup coil rotor cover		Refer to "PICKUP COIL".
1	Timing chain tensioner cap bolt	1	
2	Timing chain tensioner	1	
3	Timing chain tensioner gasket	1	
4	Timing chain guide (exhaust side)	1	
5	Intake camshaft sprocket	1	**NOTE:** During removal, the dowel pins may still be connected to the camshaft caps.
6	Exhaust camshaft sprocket	1	
7	Intake camshaft cap	3	
8	Dowel pin	6	
9	Exhaust camshaft cap	3	
10	Dowel pin	6	
11	Intake camshaft	1	
12	Exhaust camshaft	1	



Order	Job/Part	Q'ty	Remarks
13	Pin	1	
14	Timing chain guide (intake side)	1	
			For installation, reverse the removal procedure.



EAS00198
REMOVING THE CAMSHAFTS

1. Align:
   - TDC mark on the pickup coil rotor (with the crankcase mating surface)

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a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC on the compression stroke, align the TDC mark ⓐ on the pickup coil rotor with the crankcase mating surface ⓑ.

NOTE:

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

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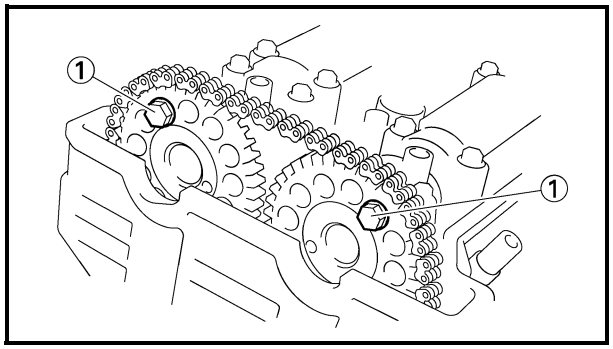
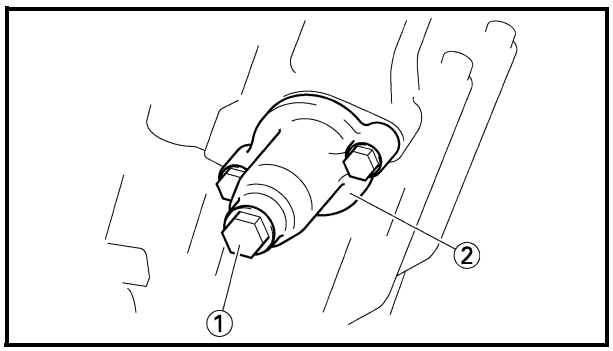
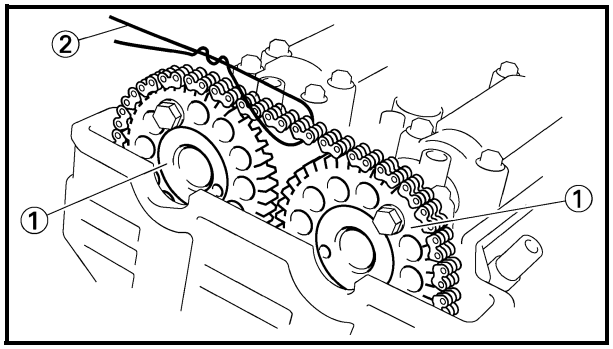


2. Loosen:
   - camshaft sprocket bolts ①



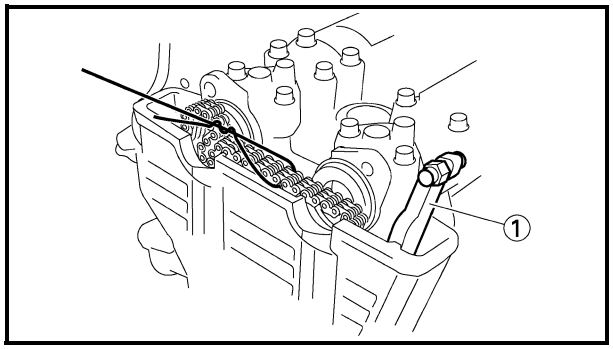
3. Loosen:
   - cap bolt ①
4. Remove:
   - timing chain tensioner ②
   - gasket



5. Remove:
   - camshaft sprockets ①

NOTE:

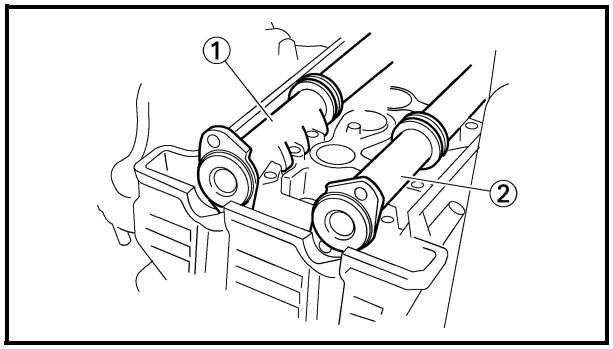
To prevent the timing chain from falling into the crankcase, fasten it with a wire ②.



6. Remove:
   - timing chain guide (exhaust side) ①
   - camshaft caps
   - 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.

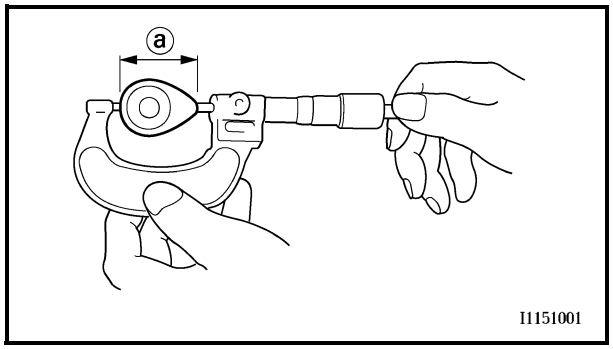


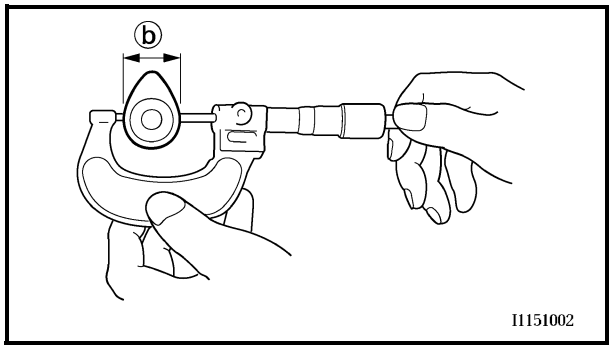
7. Remove:
   - intake camshaft ①
   - exhaust camshaft ②

EAS00204

CHECKING THE CAMSHAFTS

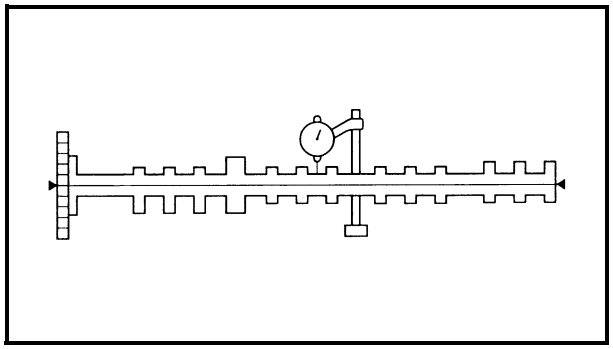
1. Check:
   - camshaft lobes
     Blue discoloration/pitting/scratches → Replace the camshaft.





2. Measure:
   - camshaft lobe dimensions ⓐ and ⓑ
     Out of specification → Replace the camshaft.

Camshaft lobe dimension limit
Intake camshaft
ⓐ 32.4 mm (1.2756 in)
ⓑ 24.85 mm (0.9783 in)
Exhaust camshaft
ⓐ 32.85 mm (1.2933 in)
ⓑ 24.85 mm (0.9783 in)

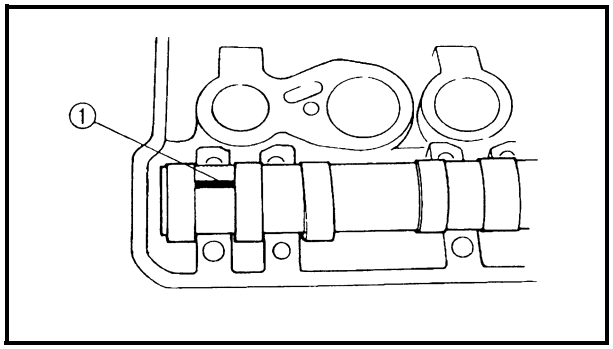


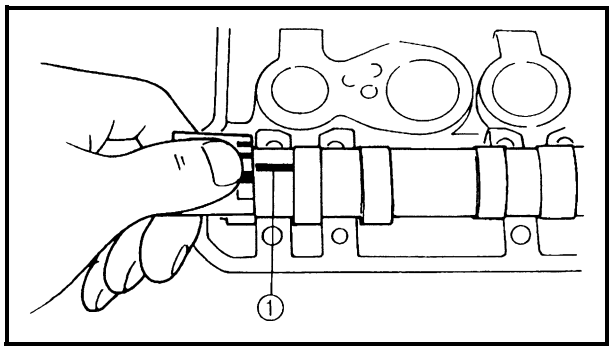
3. Measure:
   • camshaft runout
   Out of specification → Replace.

	Camshaft runout limit **0.03 mm (0.0012 in)**

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

	Camshaft-journal-to-camshaft-cap clearance **0.028 ~ 0.062 mm** **(0.0011 ~ 0.0024 in)**





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

NOTE:

- Tighten the camshaft cap bolts in stages and in a crisscross pattern, working from the inner caps out.
- Do not turn the camshaft when measuring the camshaft journal-to-camshaft cap clearance with the Plastigauge®.

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

d. Remove the camshaft caps and then measure the width of the Plastigauge® ①.

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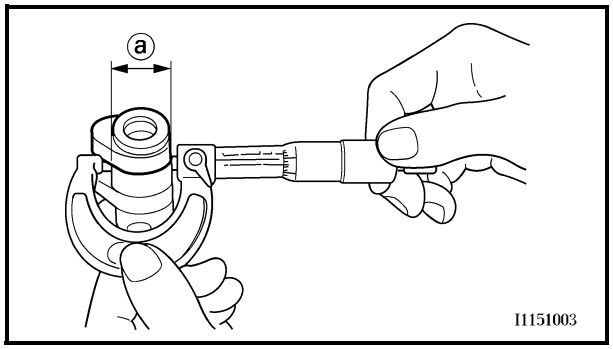
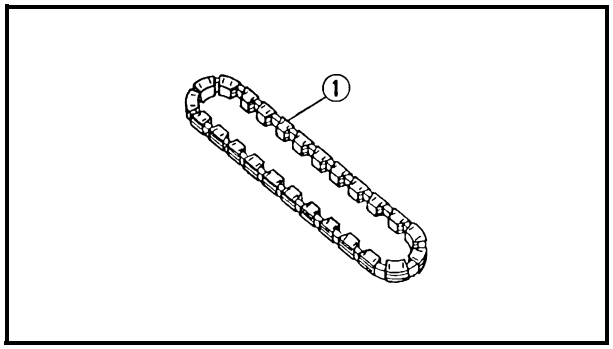


5. Measure:
   • camshaft journal diameter ⓐ
   Out of specification → Replace the camshaft.
   Within specification → Replace the cylinder head and the camshaft caps as a set.

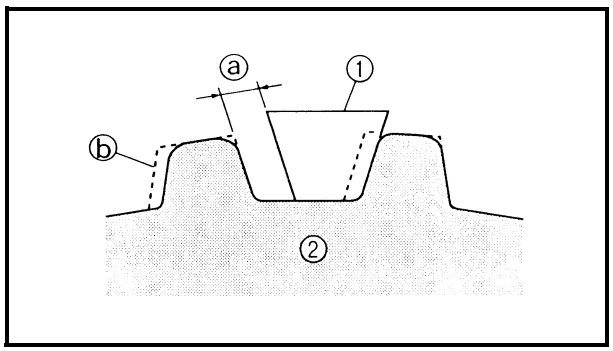
Camshaft journal diameter
24.459 ~ 24.472 mm
(0.9630 ~ 0.9635 in)



EAS00208
CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKETS, AND TIMING CHAIN GUIDES

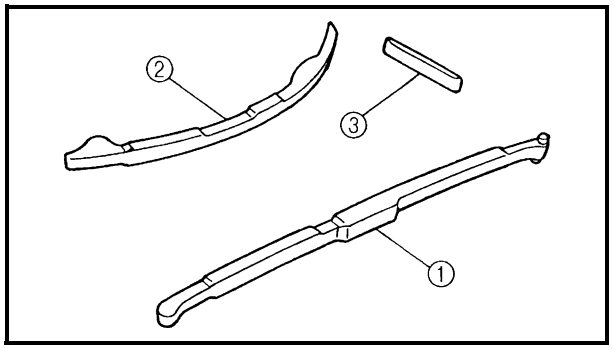
The following procedure applies to all of the camshaft sprockets and timing chain guides.

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

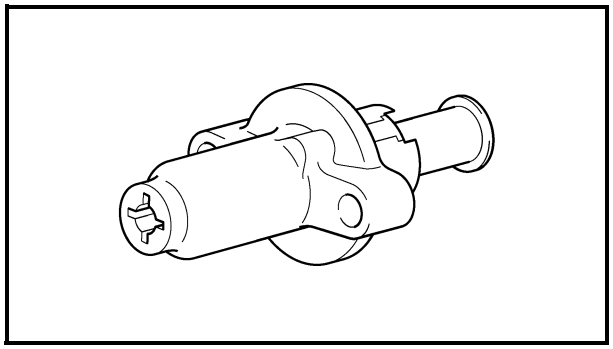


2. Check:
   • camshaft sprocket
   More than 1/4 tooth wear ⓐ → Replace the camshaft sprockets and the timing chain as a set.

ⓐ 1/4 tooth
ⓑ Correct
① Timing chain roller
② Camshaft sprocket



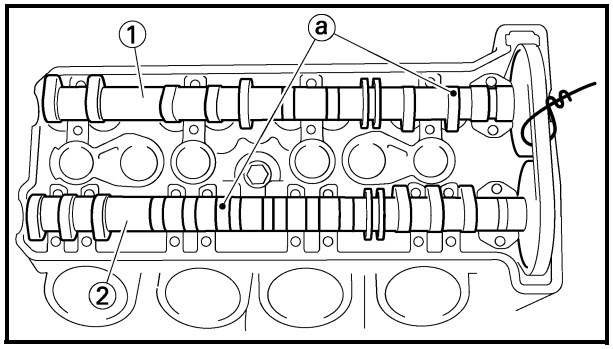
3. Check:
   • timing chain guide (exhaust side)①
   • timing chain guide (intake side)②
   • timing chain guide (top side)③
   Damage/wear → Replace the defective part(s).



EAS00210
CHECKING THE TIMING CHAIN TENSIONER

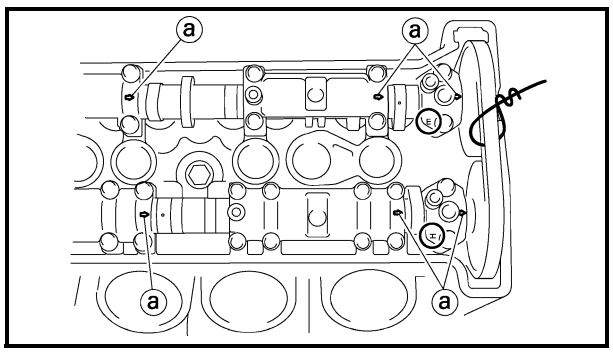
1. Check:
   - timing chain tensioner
     Cracks/damage → Replace.
2. Check:
   - one-way cam operation
     Rough movement → Replace the timing chain tensioner housing.
3. Check:
   - cap bolt
   - copper washer
   - spring
   - one-way cam
   - gasket
   - timing chain tensioner rod
     Damage/wear → Replace the defective part(s).

EAS00214
INSTALLING THE CAMSHAFTS



1. Install:
   - exhaust camshaft ①
   - intake camshaft ②
     (with the camshaft sprockets temporarily tightened)

NOTE:
Make sure the punch mark ⓐ faces up.



2. Install:
   - dowel pins
   - intake camshaft caps
   - exhaust camshaft caps

NOTE:
- Make sure each camshaft cap is installed in its original place. Refer to the identification marks as follows:

"I": Intake
"E": Exhaust

- Make sure the arrow mark ⓐ on each camshaft cap points towards the right side of the engine.

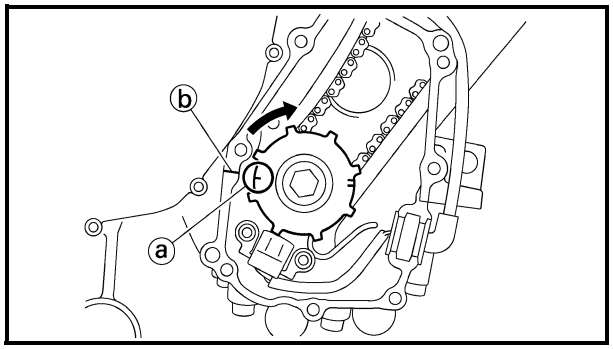
3. Install:
   - camshaft cap bolts

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.

CAUTION:

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



4. Install:
   - intake camshaft sprocket
   - exhaust camshaft sprocket

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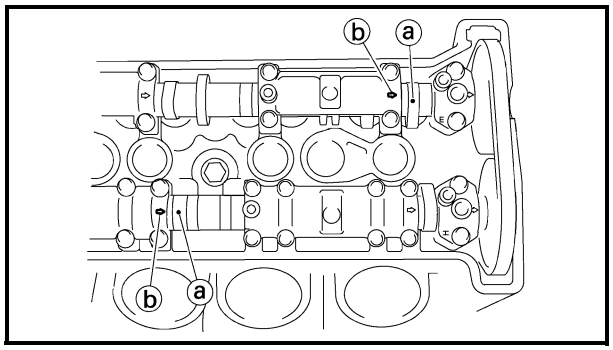
a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC on the compression stroke, align the TDC mark ⓐ with the crankshaft mating surface ⓑ.
c. Install the timing chain onto both camshaft sprockets and then install the camshaft sprockets onto the camshafts.

NOTE:

When installing the camshaft sprockets, start with the exhaust camshaft and be sure to keep the timing chain as tight as possible on the exhaust side.

CAUTION:

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



d. Turn both camshafts opposite each other so that the punch mark ⓐ on the camshaft is aligned with the arrow mark ⓑ in the camshaft cap as shown.
e. While holding the camshafts, temporarily tighten the camshaft sprocket bolts.

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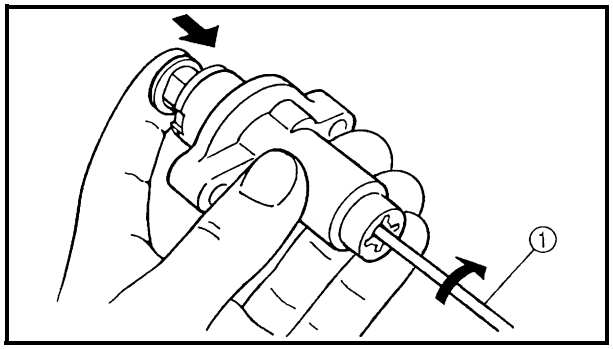
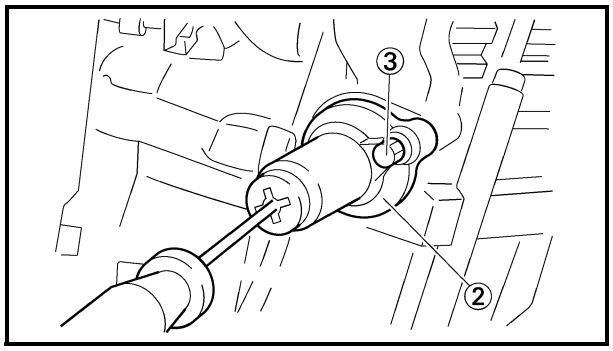
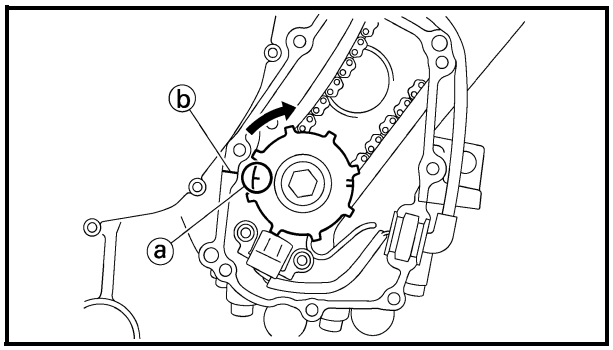
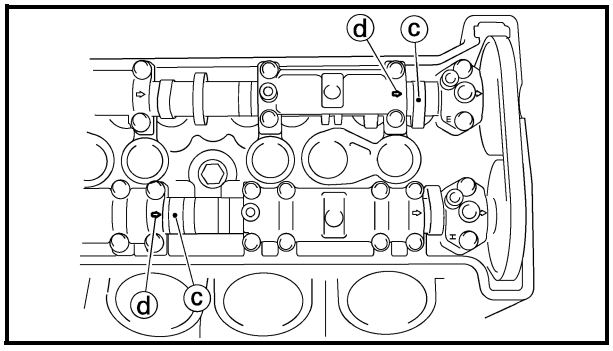
5. Install:
   - timing chain guide (exhaust side)









6. Install:
   • timing chain tensioner

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

NOTE:
The "UP" mark on the timing chain tensioner should face UP.

⚠ WARNING

Always use a new gasket.

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

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

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

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

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7. Turn:
   • crankshaft
   (several turns clockwise)
8. Check:
   • TDC mark ⓐ
   Make sure the TDC mark ⓐ is aligned with the crankcase mating surface ⓑ.

   • camshaft punch mark ⓒ
   Make sure the punch mark ⓒ on the camshaft is aligned with the camshaft cap arrow mark ⓓ.
   Out of alignment → Adjust.
   Refer to the installation steps above.

9. Tighten:
   • camshaft sprocket bolts

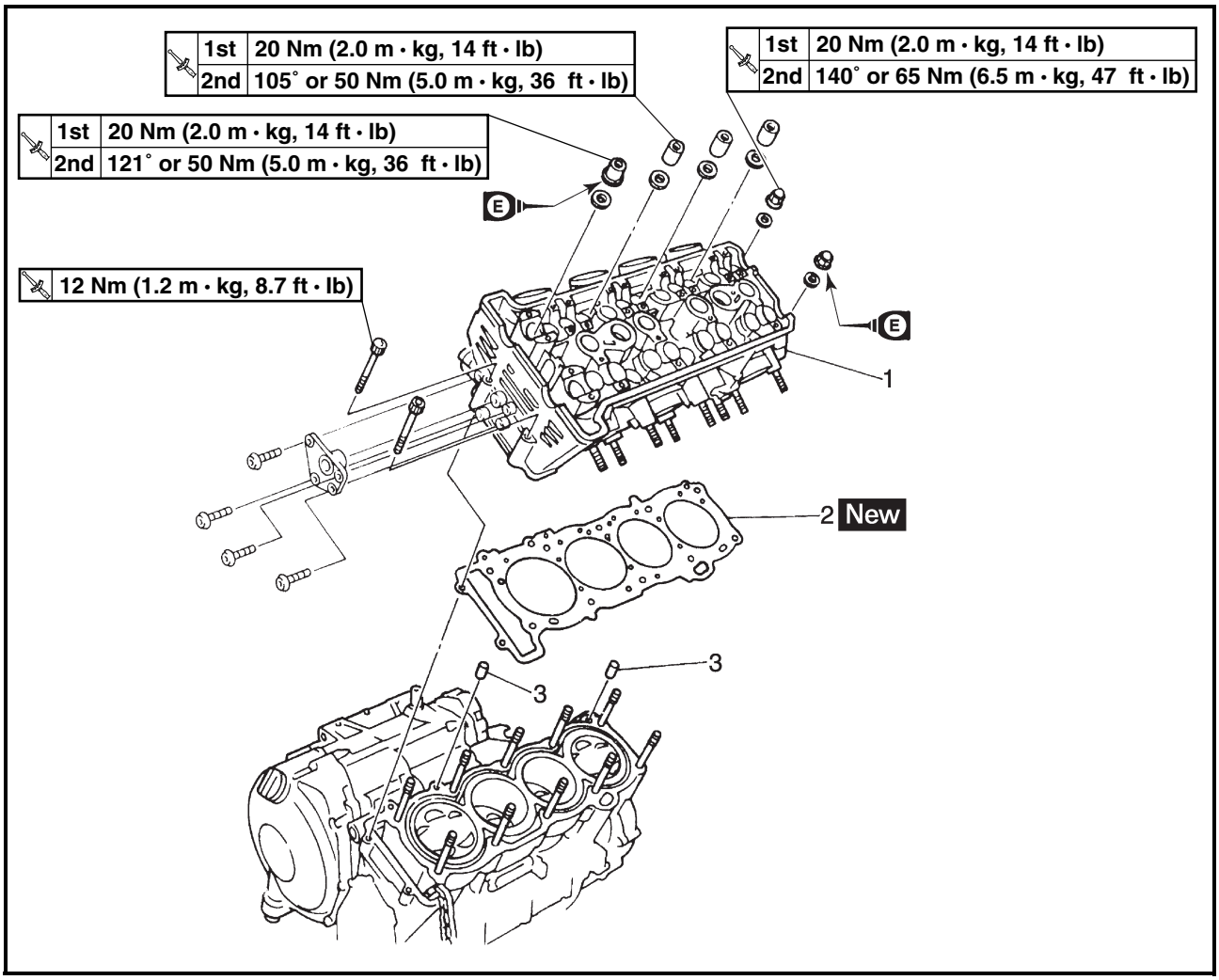
24 Nm (2.4 m · kg, 17 ft · lb)

CAUTION:

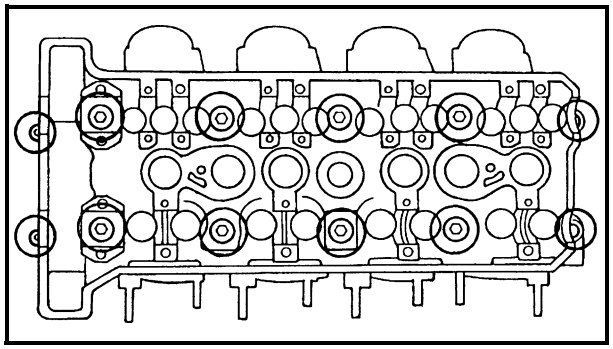
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

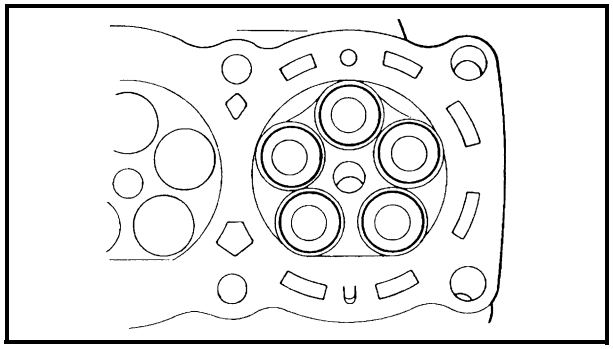
10. Install:
    • timing chain guide (top side)
11. Measure:
    • valve clearance
      Out of specification → Adjust.
      Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3.
12. Install:
    • timing plate cover

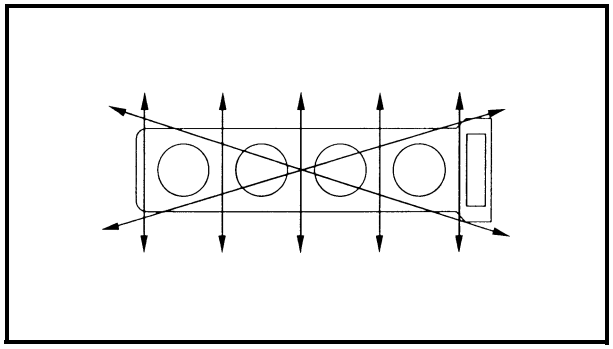
EAS00221
CYLINDER HEAD

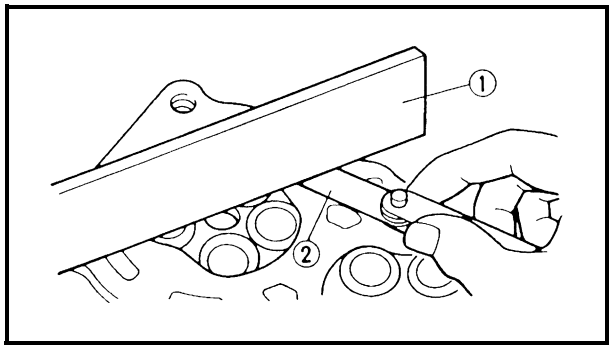


Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head		Remove the parts in the order listed.
	Engine		Refer to "ENGINE".
	Intake and exhaust camshafts		Refer to "CAMSHAFTS".
1	Cylinder head	1	
2	Cylinder head gasket	1	
3	Dowel pin	2	
			For installation, reverse the removal procedure.









EAS00222
REMOVING THE CYLINDER HEAD

1. Remove:
   - cylinder head nuts
   - cylinder head bolts

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

EAS00227
CHECKING THE CYLINDER HEAD

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

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

2. Check:
   - cylinder head
     Damage/scratches → Replace.
3. Measure:
   - cylinder head warpage
     Out of specification → Resurface the cylinder head.

Maximum cylinder head warpage
0.1 mm (0.0039 in)

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

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

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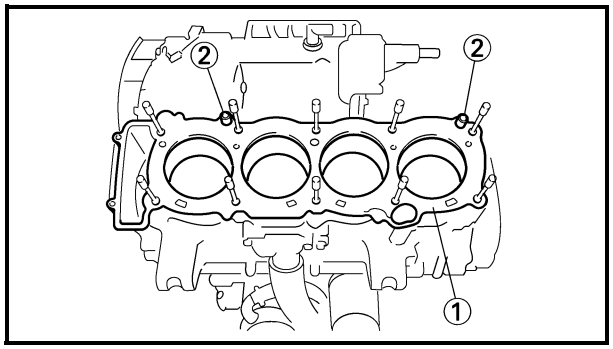
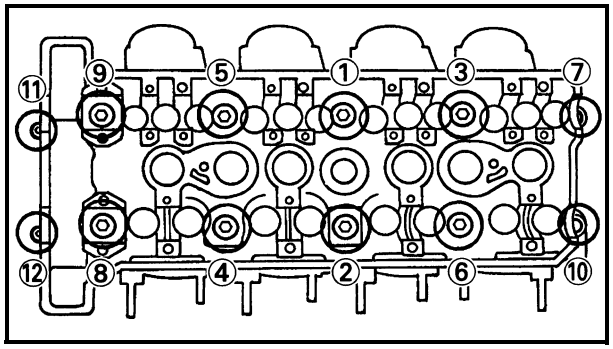




EAS00233
INSTALLING THE CYLINDER HEAD

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

NOTE:
Pass the timing chain through the timing chain cavity.

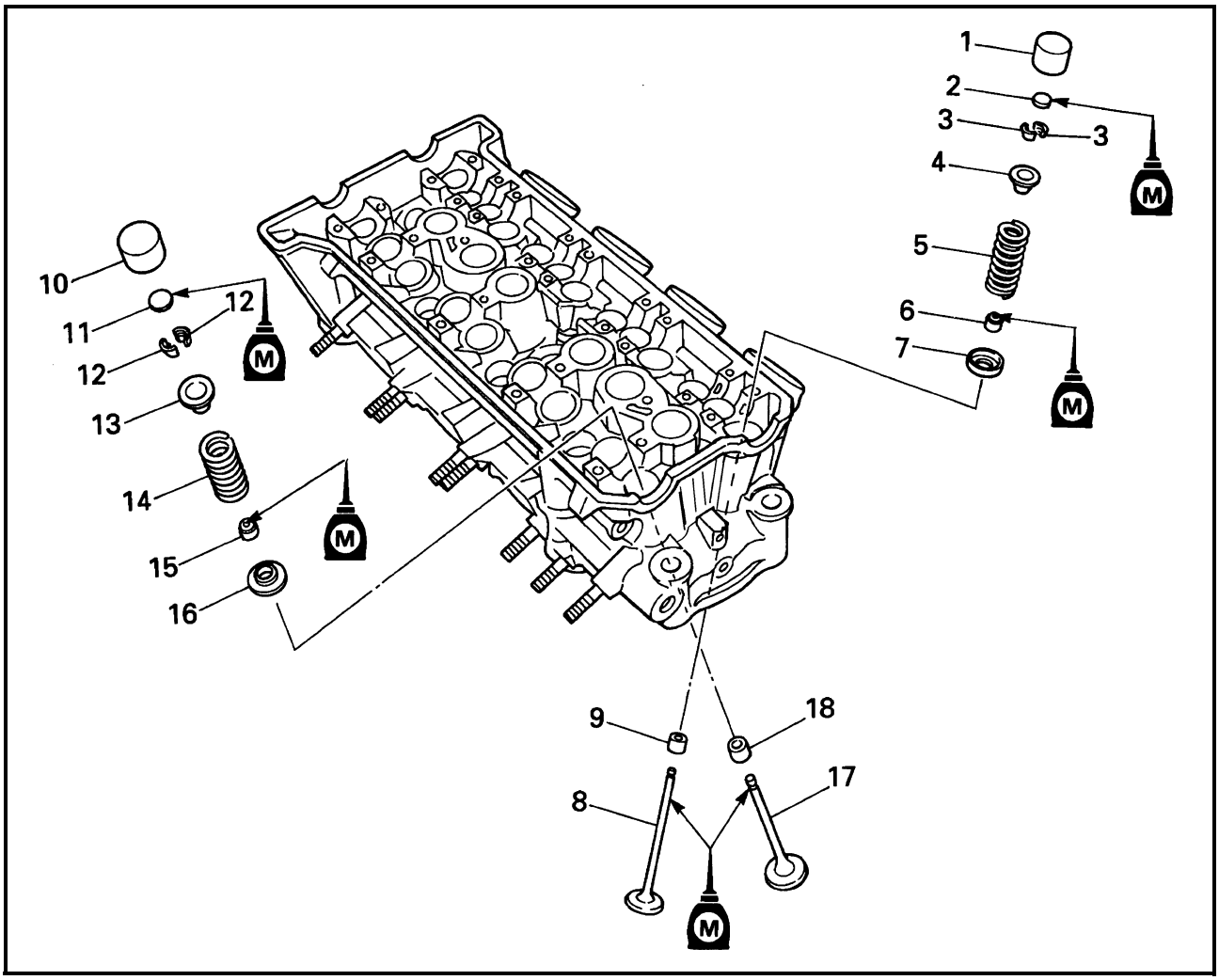
3. Tighten:
   - cylinder head nuts ① ~ ⑥
     1st **20 Nm (2.0 m · kg, 14 ft · lb)**
     2nd **105° or 50 Nm (5.0 m · kg, 36 ft · lb)**
   - cylinder head nuts ⑦, ⑩
     1st **20 Nm (2.0 m · kg, 14 ft · lb)**
     2nd **140° or 65 Nm (6.5 m · kg, 47 ft · lb)**
   - cylinder head nuts ⑧, ⑨
     1st **20 Nm (2.0 m · kg, 14 ft · lb)**
     2nd **121° or 50 Nm (5.0 m · kg, 36 ft · lb)**
   - cylinder head bolt ⑪, ⑫
     12 Nm (1.2 m · kg, 8.7 ft · lb)

NOTE:
- First, tighten the nuts ① ~ ⑩ to approximately 20 Nm (2.0 m · kg, 14 ft · lb) with a torque wrench.
- Retighten the nuts to specification torque.

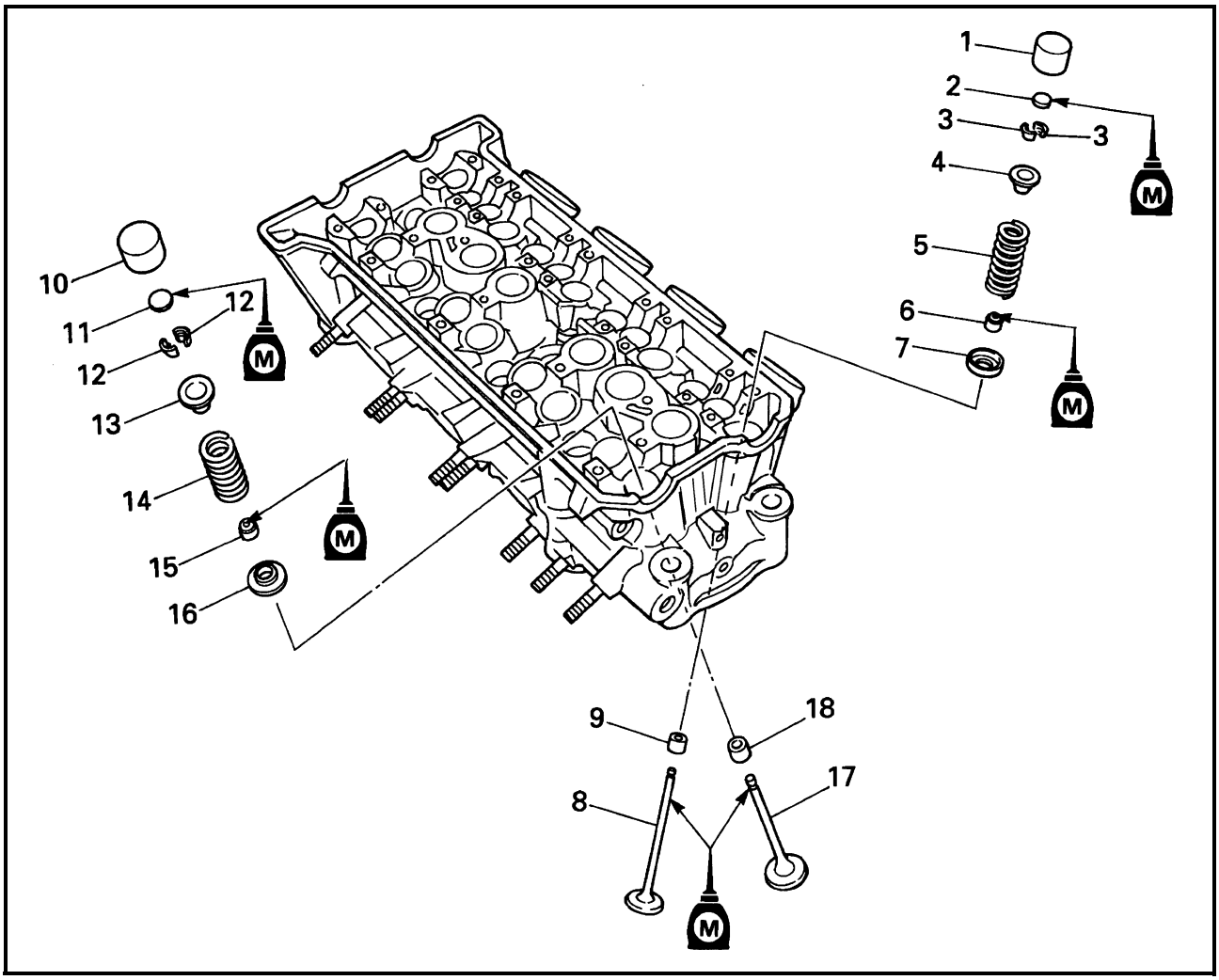
NOTE:
- Lubricate the cylinder head nuts with engine oil.
- Tighten the cylinder head nuts in the proper tightening sequence as shown and torque them in two stages.

4. Install:
   - exhaust camshaft
   - intake camshaft
     Refer to “INSTALLING THE CAMSHAFTS”.

EAS00236
VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Intake valve lifter	12	
2	Intake valve pad	12	
3	Intake valve cotter	24	
4	Intake valve upper spring seat	12	
5	Intake valve spring	12	
6	Intake valve oil seal	12	
7	Intake valve lower spring seat	12	
8	Intake valve	12	
9	Intake valve guide	12	



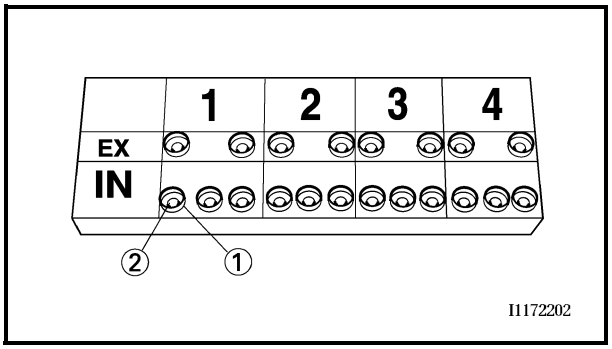
Order	Job/Part	Q'ty	Remarks
10	Exhaust valve lifter	8	
11	Exhaust valve pad	8	
12	Exhaust valve cotter	16	
13	Exhaust valve upper spring seat	8	
14	Exhaust valve spring	8	
15	Exhaust valve oil seal	8	
16	Exhaust valve lower spring seat	8	
17	Exhaust valve	8	
18	Exhaust valve guide	8	
			For installation, reverse the removal procedure.

EAS00237
REMOVING THE VALVES

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

NOTE:

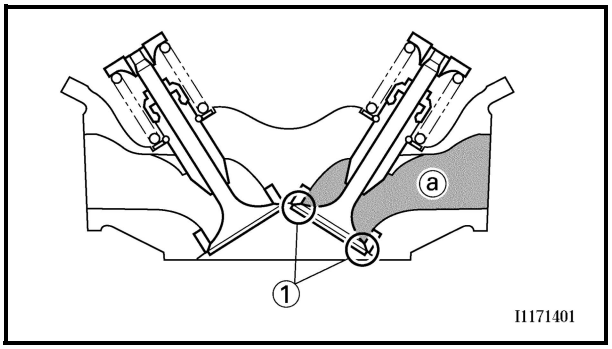
Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.



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

NOTE:

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



2. Check:
   - valve sealing

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

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

NOTE:

There should be no leakage at the valve seat ①.

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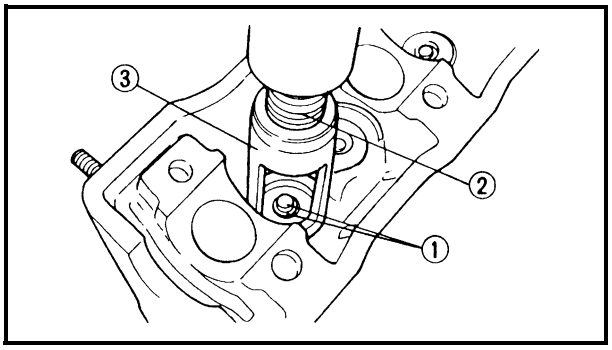
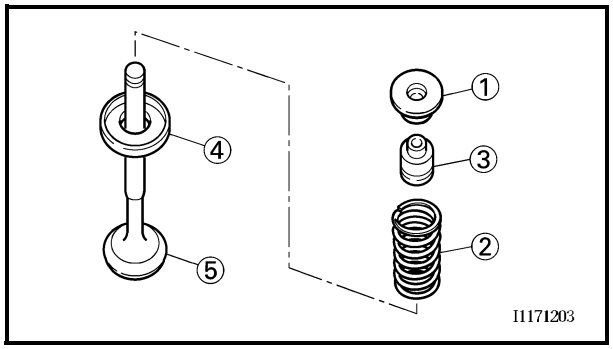


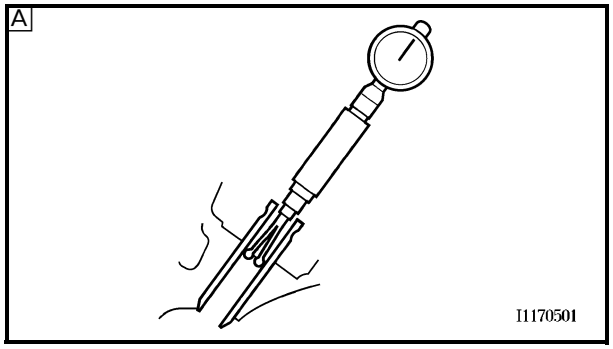
3. Remove:
   - valve cotters ①

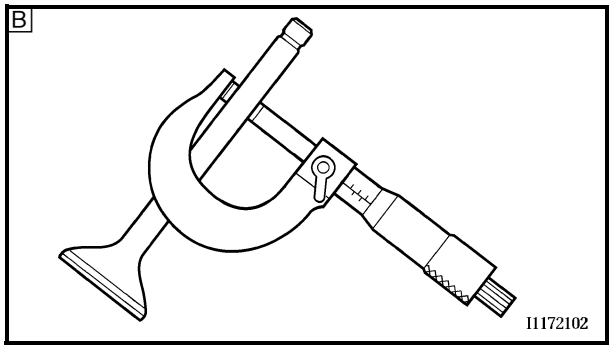
NOTE:

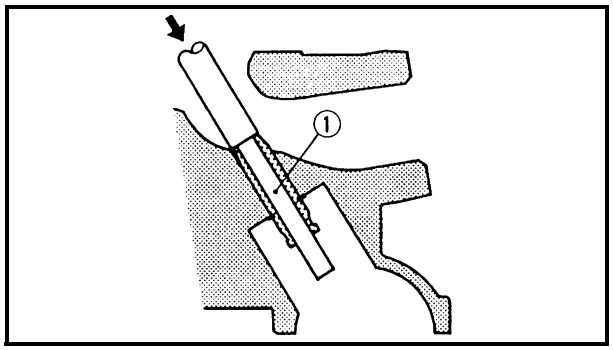
Remove the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.

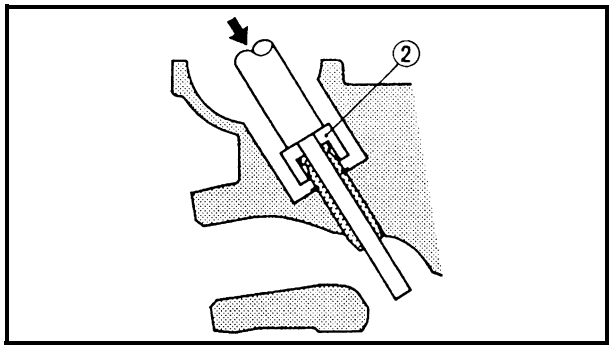
Valve spring compressor
YM-04019
Valve spring compressor attachment
Intake valve
YM-4114
Exhaust valve
YM-4108











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

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

EAS00239
CHECKING THE VALVES AND VALVE GUIDES

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

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

Valve-stem-to-valve-guide clearance =
Valve guide inside diameter A –
Valve stem diameter B

Out of specification → Replace the valve guide.

Valve-stem-to-valve-guide clearance
Intake
0.0010 ~ 0.0037 mm
(0.0004 ~ 0.0015 in)
<Limit>: 0.08 mm (0.0031 in)
Exhaust
0.020 ~ 0.047 mm
(0.0008 ~ 0.0019 in)
<Limit>: 0.10 mm (0.0039 in)

2. Replace:
   - valve guide

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

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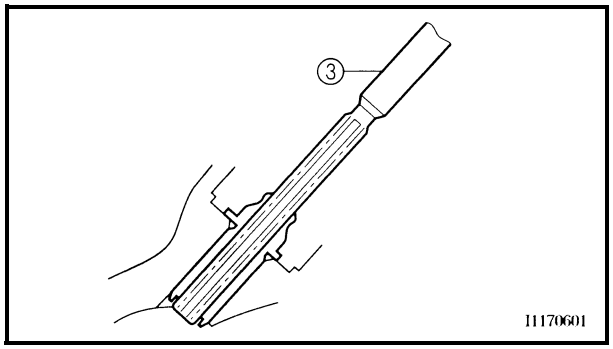
a. Remove the valve guide with the valve guide remover ①.
b. Install the new valve guide with the valve guide installer ② and valve guide remover ①.
c. After installing the valve guide, bore the valve guide with the valve guide reamer ③ to obtain the proper valve-stem-to-valve-guide clearance.

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



Valve guide remover
Intake (4.0 mm, 0.16 in)
90890-04111
Exhaust (4.5 mm, 0.18 in)
YM-4116
Valve guide installer
Intake (4.0 mm, 0.16 in)
90890-04112
Exhaust (4.5 mm, 0.18 in)
YM-4117
Valve guide reamer
Intake (4.0 mm, 0.16 in)
90890-04113
Exhaust (4.5 mm, 0.18 in)
YM-4118

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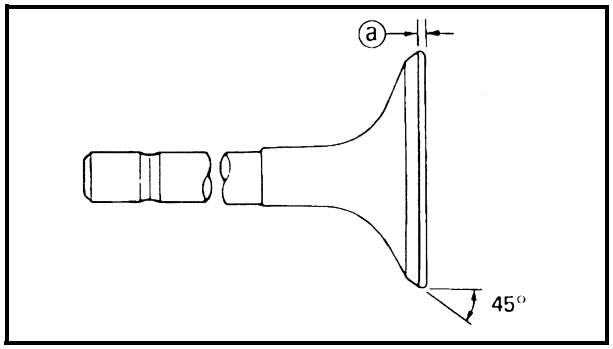
3. Eliminate:
   - carbon deposits
     (from the valve face and valve seat)
4. Check:
   - valve face
     Pitting/wear → Grind the valve face.
   - valve stem end
     Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.

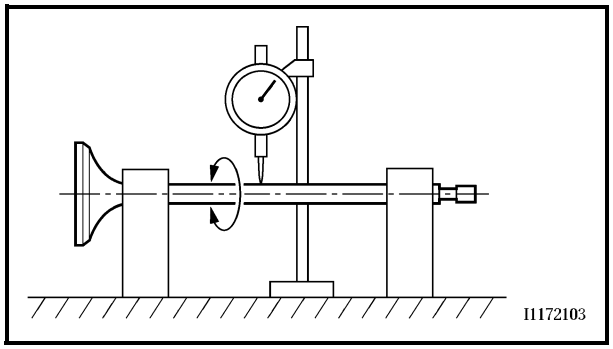


5. Measure:
   - valve margin thickness ⓐ
     Out of specification → Replace the valve.

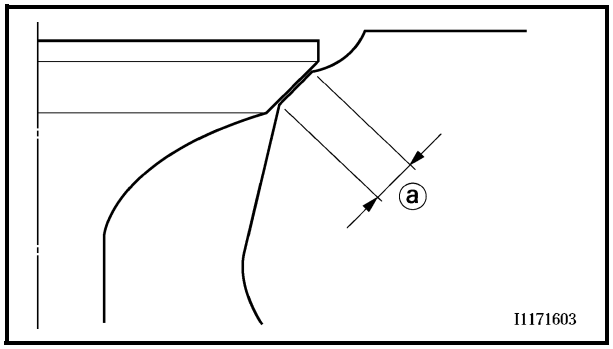
Valve margin thickness
0.5 ~ 0.9 mm (0.0197 ~ 0.0354 in)

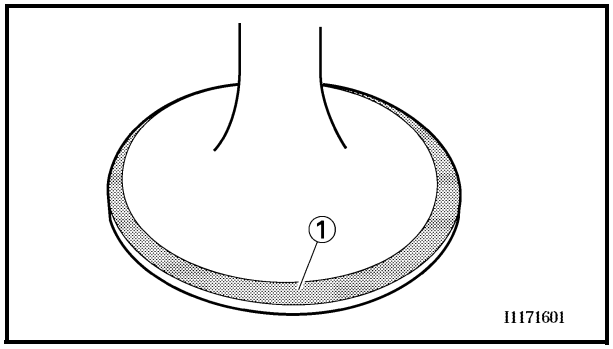
6. Measure:
   - valve stem runout
     Out of specification → Replace the valve.

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



Valve stem runout
0.01 mm (0.0004 in)





EAS00240
CHECKING THE VALVE SEATS

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

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

Valve seat width
Intake: 0.9 ~ 1.1 mm
(0.0354 ~ 0.0433 in)
Exhaust: 0.9 ~ 1.1 mm
(0.0354 ~ 0.0433 in)
<Limit: 1.6 mm> (0.063 in)

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a. Apply Mechanic's blueing dye (Dykem) ① onto the valve face.
b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
d. Measure the valve seat width.

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

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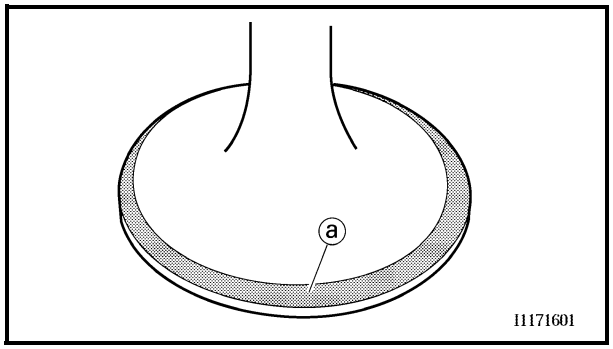
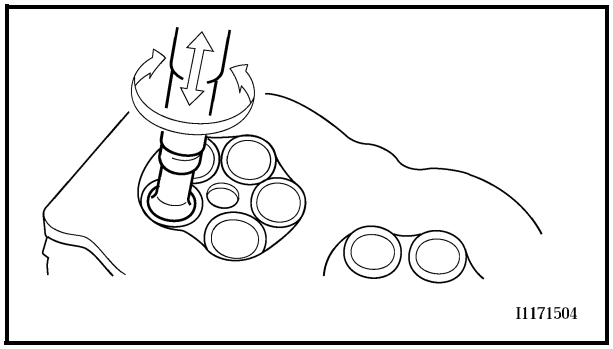
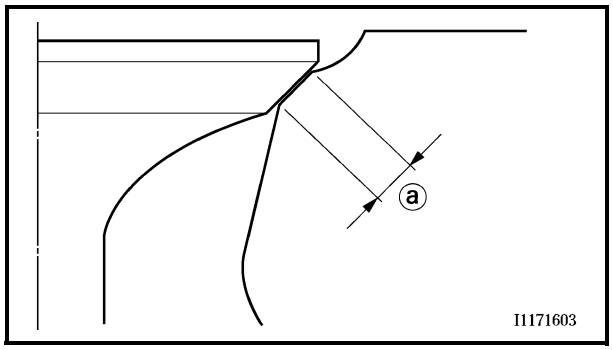
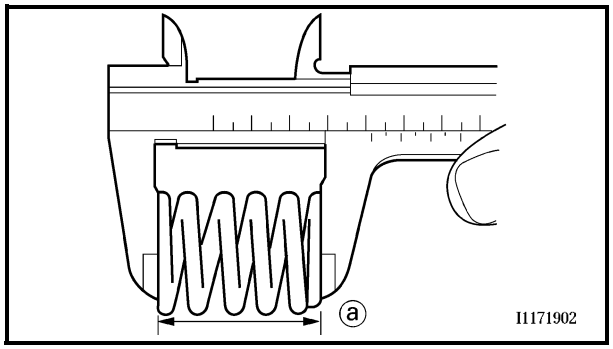
4. Lap:
   - valve face
   - valve seat

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









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

CAUTION:

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

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

NOTE:

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

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

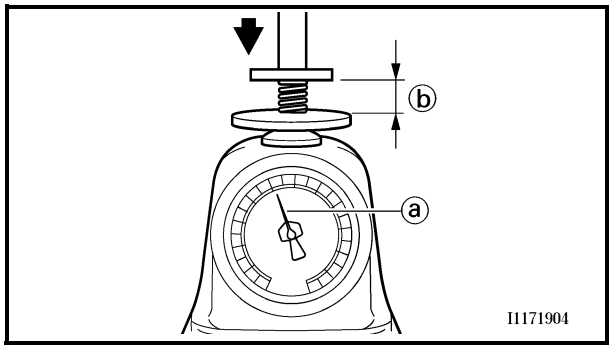
EAS00241

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

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

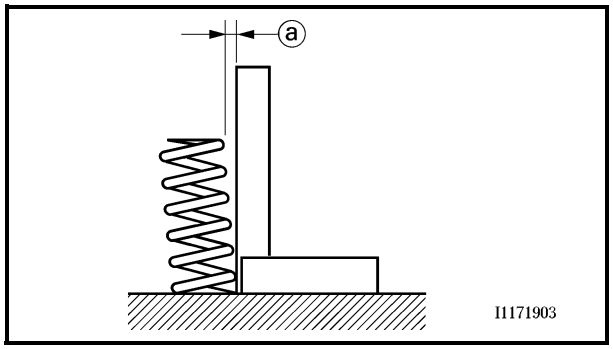
Valve spring free length
Intake valve spring
38.9 mm (1.53 in)
<Limit: 37.0 mm (1.46 in)>
Exhaust valve spring
40.67 mm (1.60 in)
<Limit: 38.6 mm (1.52 in)>



2. Measure:
   • compressed valve spring force ⓐ
     Out of specification → Replace the valve spring.

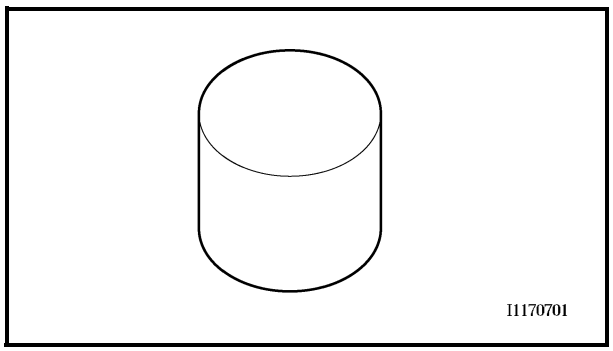
ⓑ Installed length

Compressed valve spring force (installed)
Intake valve spring
82 ~ 96 N
(8.2 ~ 9.6 kg, 18.43 ~ 21.58 lb)
at 34.5 mm (1.36 in)
Exhaust valve spring
110 ~ 126 N
(11.0 ~ 12.6 kg, 24.73 ~ 28.32 lb)
at 35 mm (1.38 in)



3. Measure:
   • valve spring tilt ⓐ
     Out of specification → Replace the valve spring.

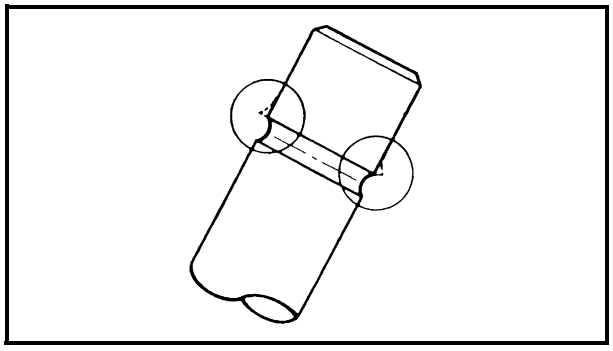
Spring tilt limit
Intake valve spring
1.7 mm (0.067 in)
Exhaust valve spring
1.8 mm (0.071 in)



EAS00242
CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

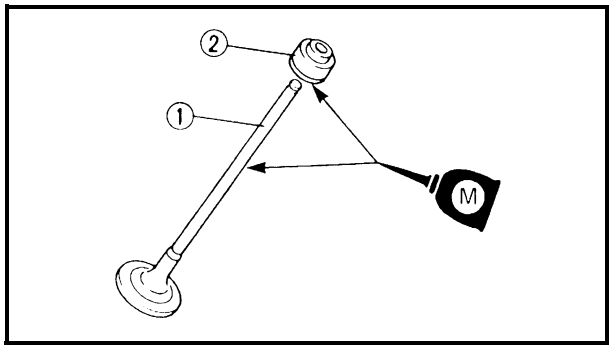
1. Check:
   • valve lifter
     Damage/scratches → Replace the valve lifters and cylinder head.



EAS00245
INSTALLING THE VALVES

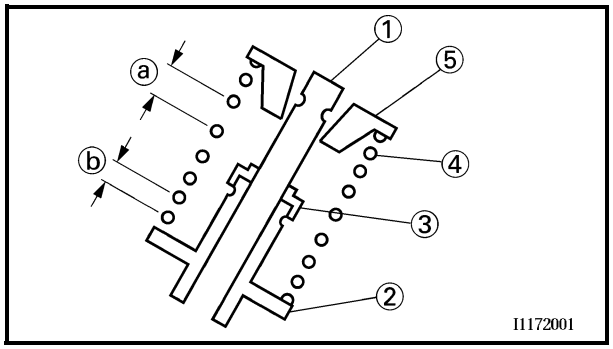
The following procedure applies to all of the valves and related components.

1. Deburr:
   • valve stem end
     (with an oil stone)



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

	Recommended lubricant **Molybdenum disulfide oil**

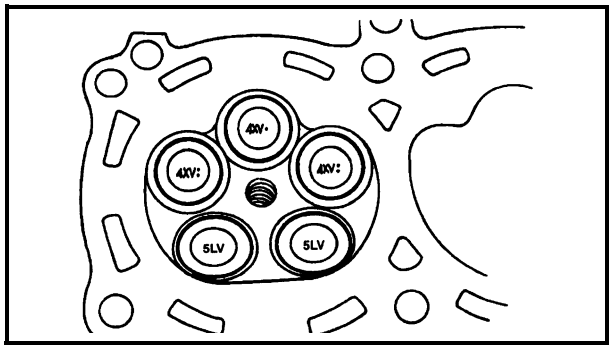


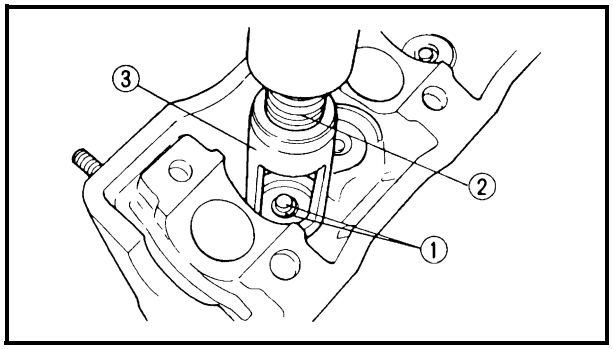
3. Install:
   - valve ①
   - lower spring seat ②
   - valve stem seal ③
   - valve spring ④
   - upper spring seat ⑤
     (into the cylinder head)

NOTE:
Install the valve spring with the larger pitch ⓐ facing up.

ⓑ Smaller pitch

NOTE:
Make sure that each valve is installed in its original place. Refer to the following embossed marks.
Right and left intake valve(-s): “4XV:”
Middle intake valve(-s): “4XV.”
Exhaust valve(-s): “5LV”

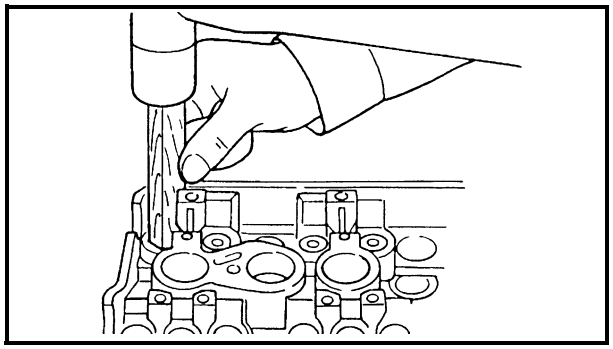




4. Install:
   - valve cotters ①

NOTE:
Install the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.

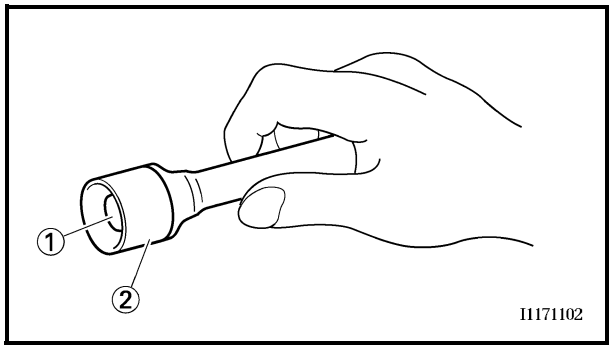
	Valve spring compressor **YM-04019** **Valve spring compressor attachment** **Intake valve** **YM-4114** **Exhaust valve** **YM-4108**



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.

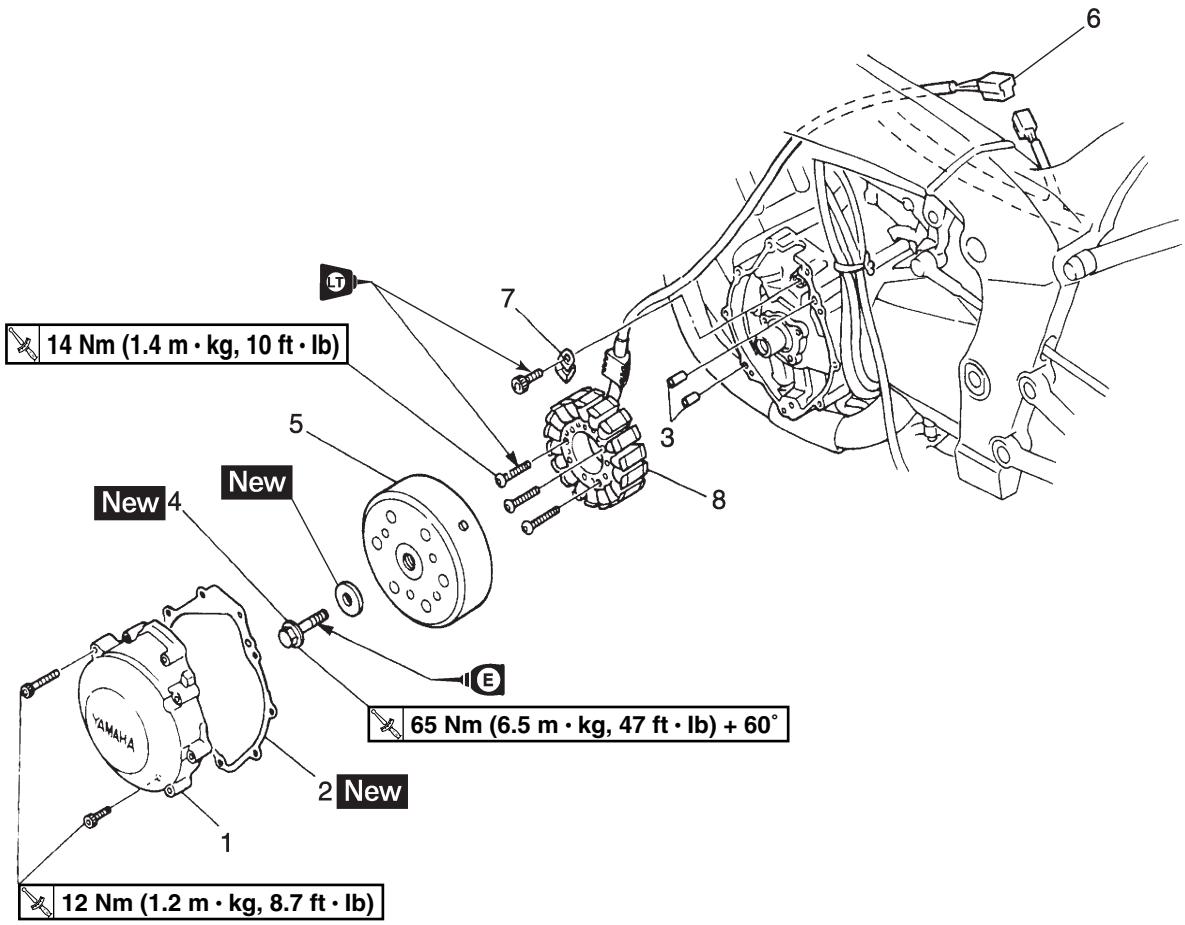


6. Install:
   - valve pad ①
   - valve lifter ②

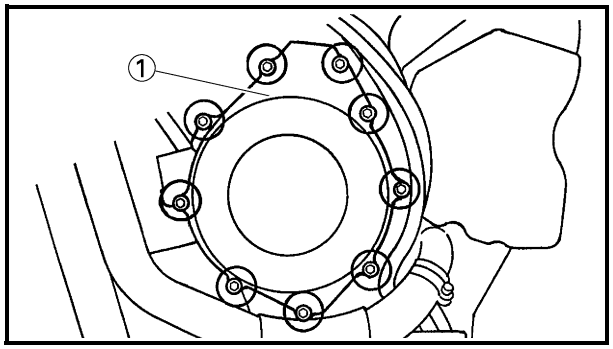
NOTE:

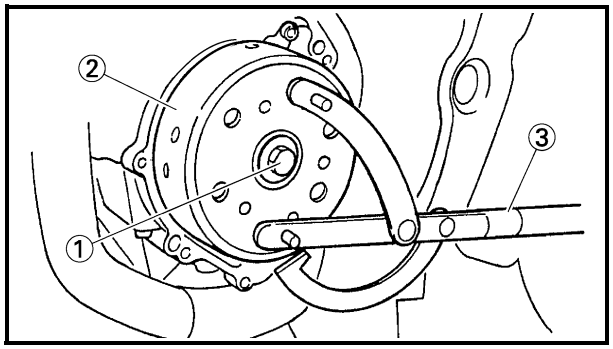
- Lubricate the valve lifter and valve pad with molybdenum disulfide oil.
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.

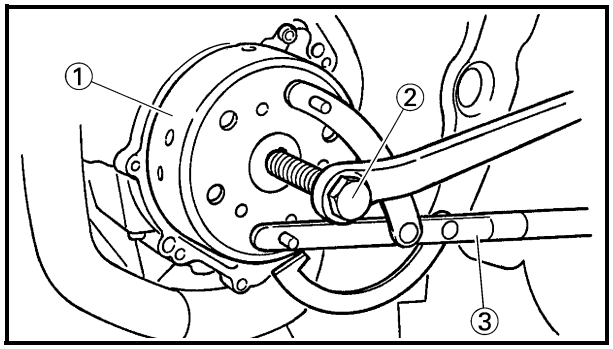
GENERATOR

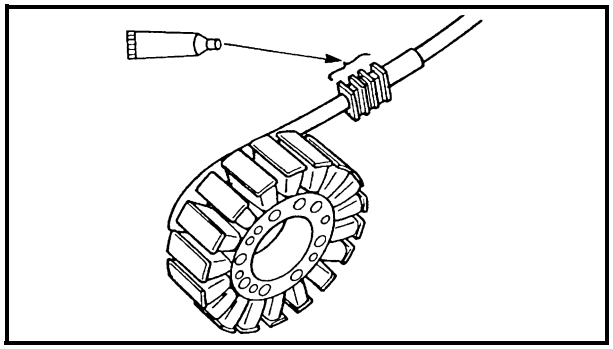


Order	Job/Part	Q'ty	Remarks
	Removing the stator coil assembly		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Bottom cowling		Refer to "COWLINGS" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Generator rotor cover	1	
2	Generator rotor cover gasket	1	
3	Dowel pin	2	
4	Generator rotor bolt	1	
5	Generator rotor	1	
6	Stator coil assembly coupler	1	Disconnect.
7	Stator coil assembly lead holder	1	
8	Stator coil assembly	1	
			For installation, reverse the removal procedure.









REMOVING THE GENERATOR

1. Remove:
   - generator rotor cover ①

NOTE:

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
After all of the bolts are fully loosened, remove them.

2. Remove:
   - generator rotor bolt ①
   - washer

NOTE:

While holding the generator rotor ② with the rotor holding tool ③, loosen the generator rotor bolt.

	Rotor holding tool **YU-01235**

3. Remove:
   - generator rotor ①
     (with the flywheel puller ② and rotor holding tool ③)

	Flywheel puller **YM-01080-A**

INSTALLING THE GENERATOR

1. Apply:
   - sealant
     (onto the stator coil assembly lead grommet)

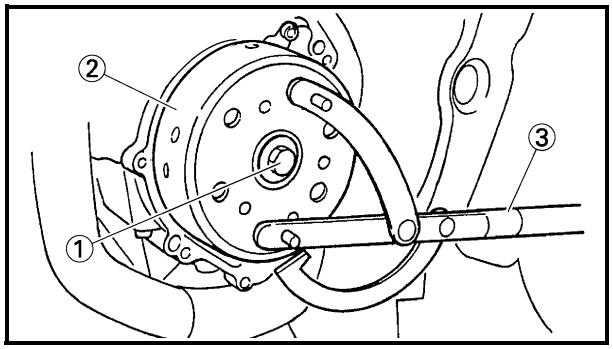
	Quick Gasket® **ACC-11001-05-01**

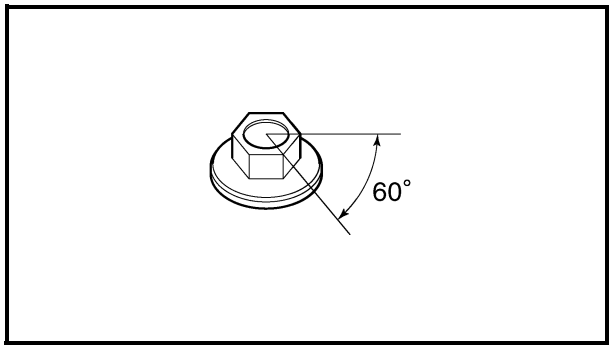
2. Install:
   - generator rotor
   - washer
   - generator rotor bolt

⚠ WARNING

Always use a new generator rotor bolt.

CAUTION:
- **Clean the tapered portion of the crankshaft and the generator rotor hub with lacquer thinner.**
- **Lubricate the generator rotor bolt threads with engine oil.**





3. Tighten:
   - generator rotor bolt ① New

65 Nm (6.5 m · kg, 47 ft · lb) + 60°

NOTE:
While holding the generator rotor ② with the rotor holding tool ③, tighten the generator rotor bolt.

Rotor holding tool
YU-01235

⚠ WARNING
- **Replace the rotor bolt and washer with new ones.**
- **Clean the rotor bolt.**

NOTE:
The tightening procedure of rotor bolt is angle controlled, therefore tighten the nuts using the following procedure.

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a. Tighten the connecting rod nuts to the specified torque.

Rotor bolt
1st
65 Nm (6.5 m · kg, 47 ft · lb)

b. Tighten the rotor bolt further to reach the specified angle (60°).

Rotor bolt
Final
Specified angle 60°

⚠ WARNING

When the bolt are tightened more than the specified angle, do not loosen the bolt 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 bolt to the specified angle.**
- **Tighten the bolt until it is at the specified angle.**

NOTE:

When using a hexagon bolt, note that the angle from one corner to another is 60°.

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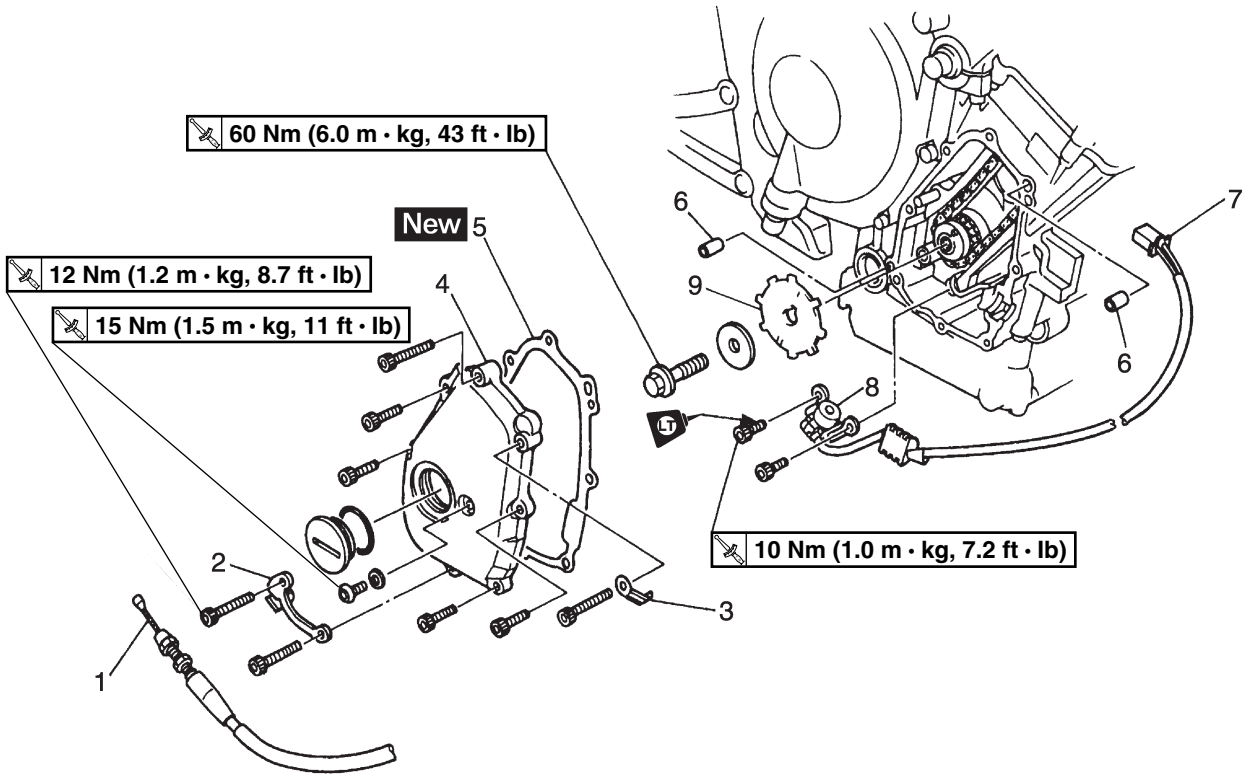
4. Install:
   - generator rotor cover

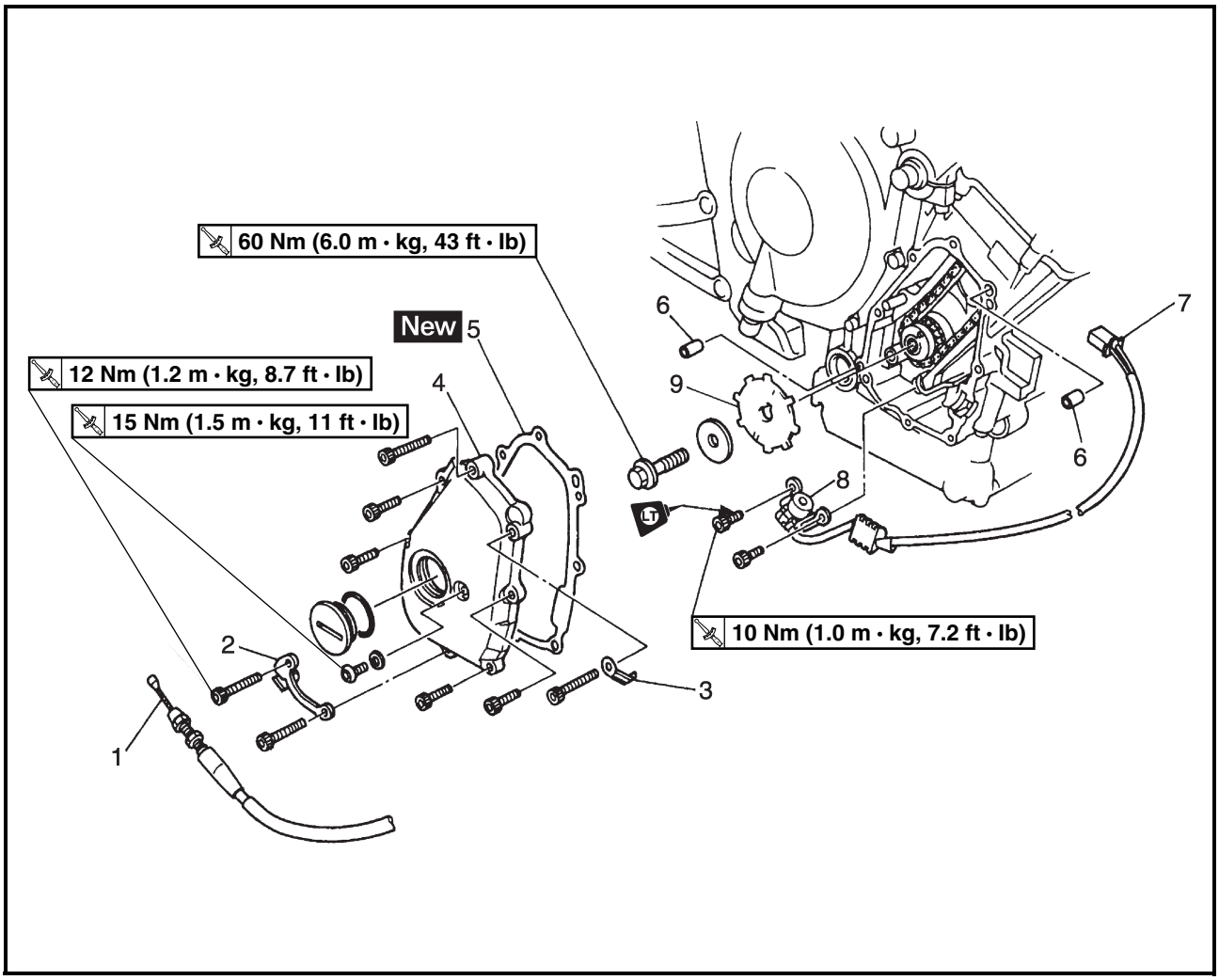
NOTE:

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

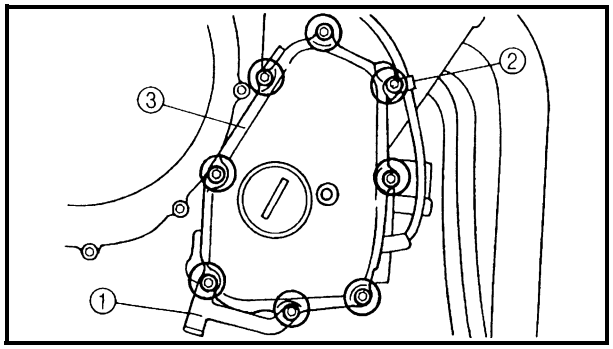
PICKUP COIL



Order	Job/Part	Q'ty	Remarks
	Removing the pickup coil and pickup coil rotor		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Bottom cowling and right side cowling		Refer to "COWLINGS" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Generator rotor cover		Refer to "GENERATOR".
1	Clutch cable	1	
2	Clutch cable holder	1	
3	Pickup coil lead holder	1	
4	Pickup coil rotor cover	1	
5	Pickup coil rotor cover gasket	1	
6	Dowel pin	2	



Order	Job/Part	Q'ty	Remarks
7	Crankshaft position sensor coupler	1	Disconnect.
8	Crankshaft position sensor	1	
9	Pickup coil rotor	1	
			For installation, reverse the removal procedure.

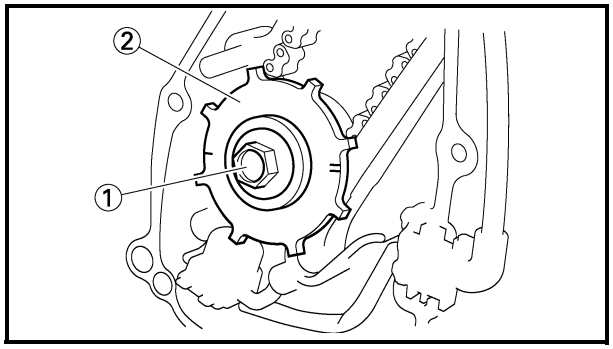


REMOVING THE PICKUP COIL ROTOR

1. Remove:
   - clutch cable holder ①
   - pickup coil lead holder ②
   - pickup coil rotor cover ③

NOTE:

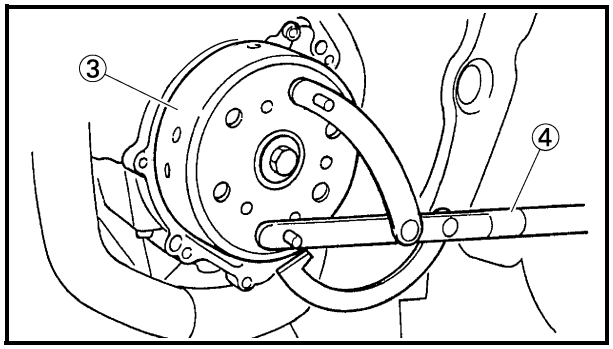
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
After all of the bolts are fully loosened, remove them.



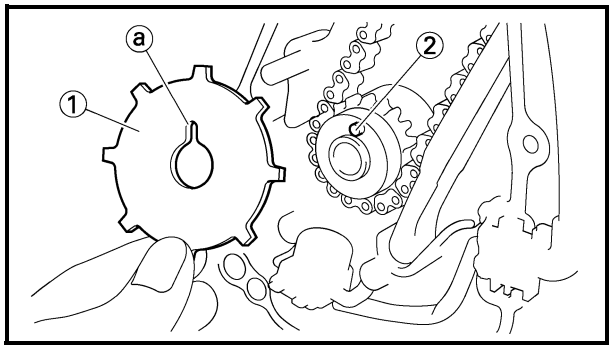
2. Remove:
   - pickup coil rotor bolt ①
   - washer
   - pickup coil rotor ②

NOTE:

While holding the generator rotor ③ with the rotor holding tool ④, loosen the pickup coil rotor bolt.



Rotor holding tool
YU-01235

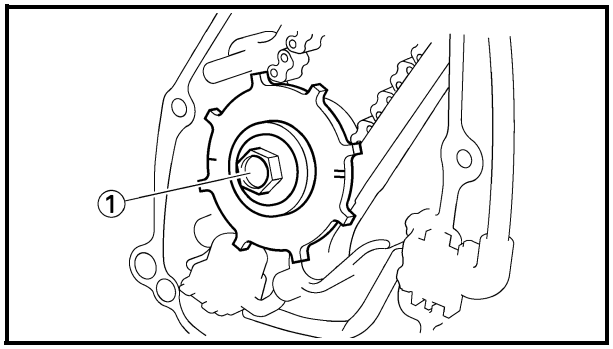


INSTALLING THE PICKUP COIL ROTOR

1. Install:
   - pickup coil rotor ①
   - washer
   - pickup coil rotor bolt

NOTE:

When installing the pickup coil rotor, align the pin ② in the crankshaft sprocket with the groove ⓐ in the pickup coil rotor.

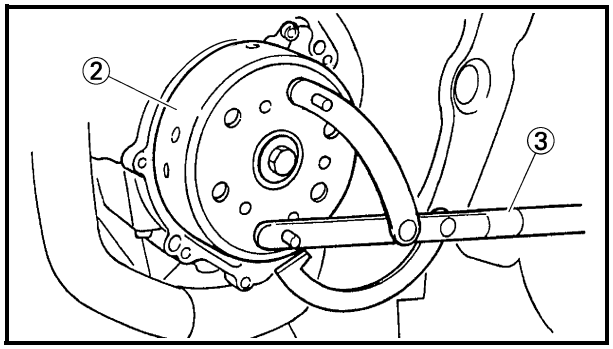


2. Tighten:
   - pickup coil rotor bolt ①

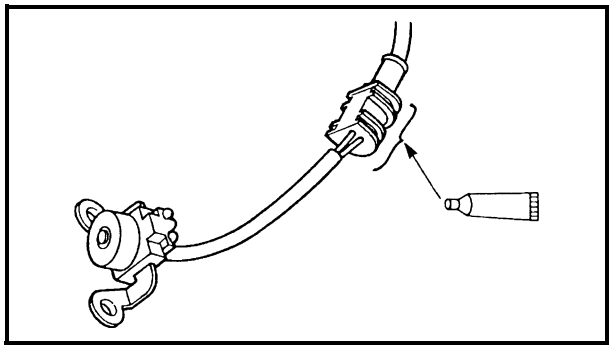
60 Nm (6.0 m · kg, 43 ft · lb)

NOTE:

While holding the generator rotor ② with the rotor holding tool ③, tighten the pickup coil rotor bolt.

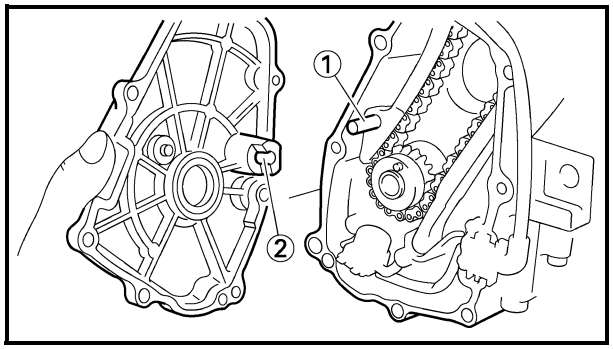


Rotor holding tool
YU-01235



3. Apply:
   - sealant
     (onto the crankshaft position sensor lead grommet)

Quick Gasket®
ACC-11001-05-01

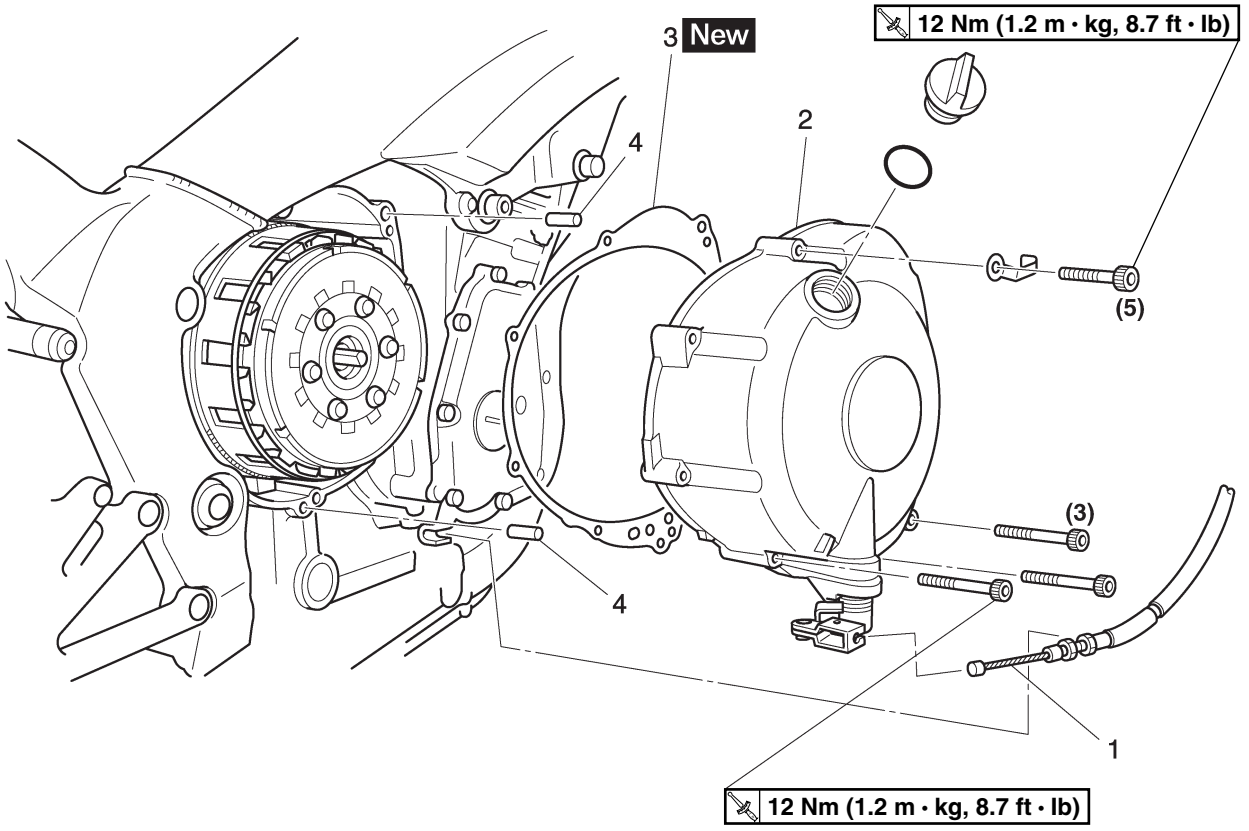


4. Install:
   - pickup coil rotor cover
   - pickup coil lead holder
   - clutch cable holder

NOTE:

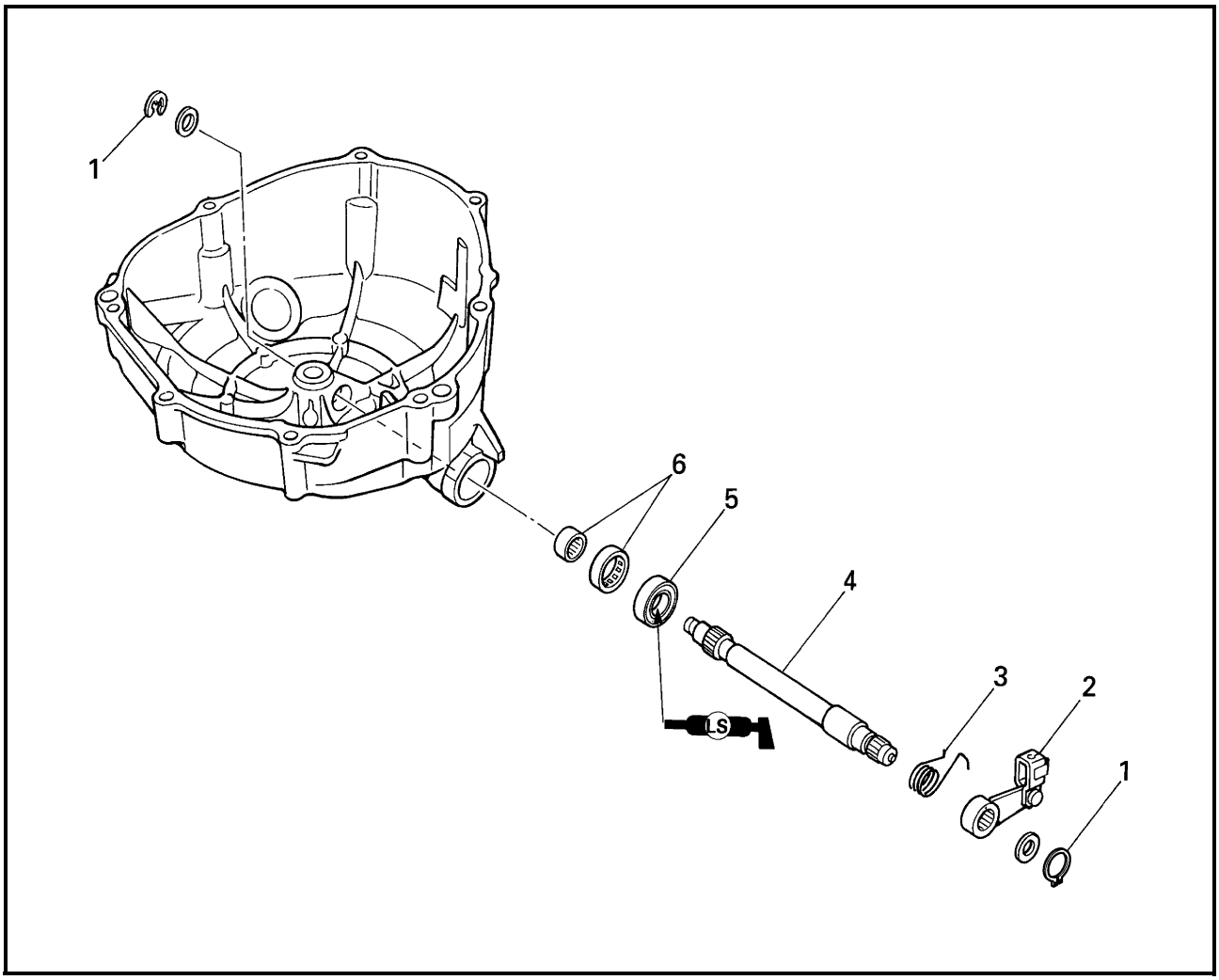
- When installing the pickup coil rotor cover, align the timing chain guide (intake side) pin ① of the with the hole ② in the pickup coil rotor cover.
- Tighten the pickup coil rotor cover bolts in stages and in a crisscross pattern.

CLUTCH
CLUTCH COVER



Order	Job/Part	Q'ty	Remarks
	Removing the clutch cover		Remove the parts in the order listed.
	Bottom cowling and right side cowling		Refer to "COWLINGS" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Clutch cable	1	
2	Clutch cover	1	
3	Clutch cover gasket	1	
4	Dowel pin	2	
			For installation, reverse the removal procedure.

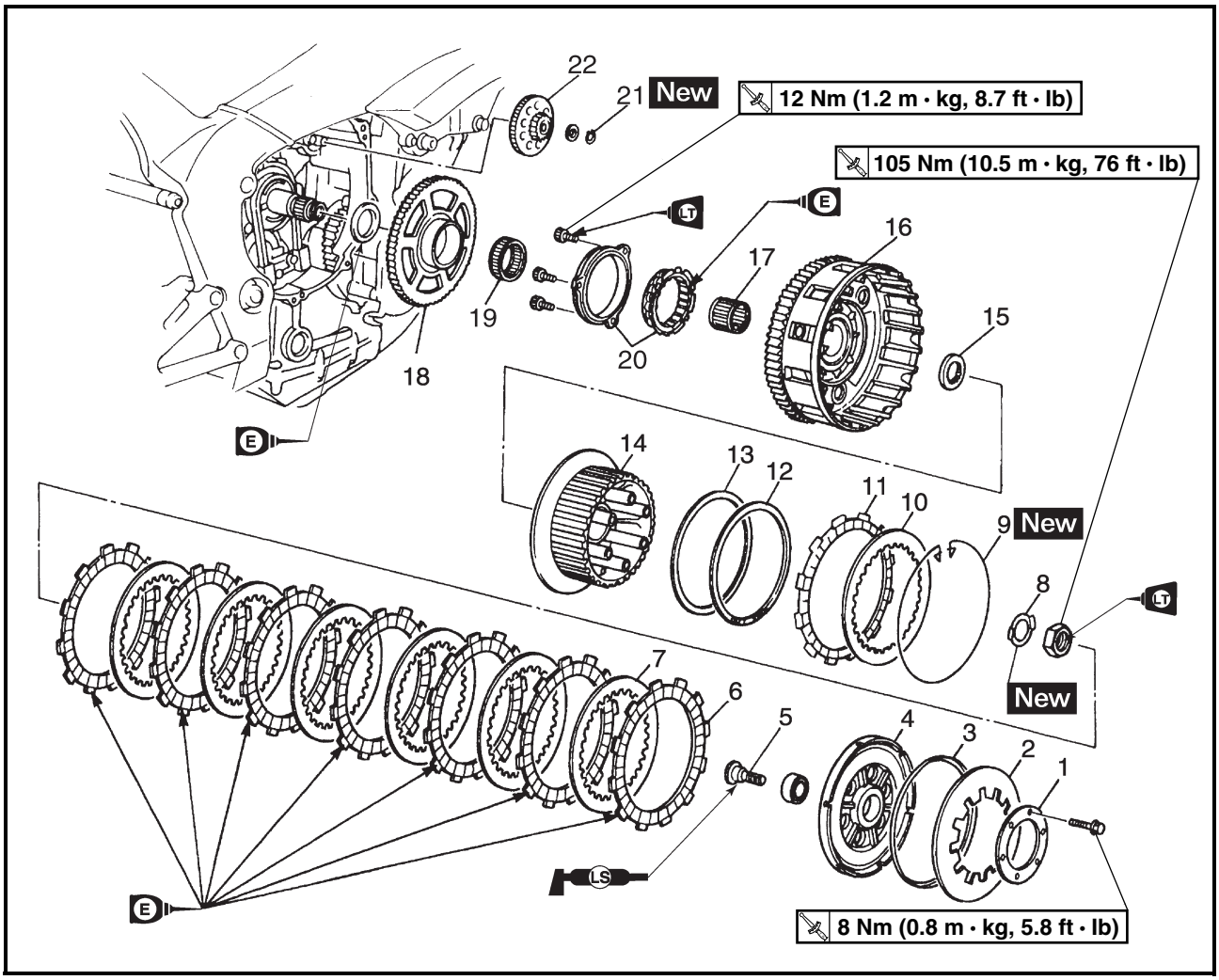
PULL LEVER SHAFT



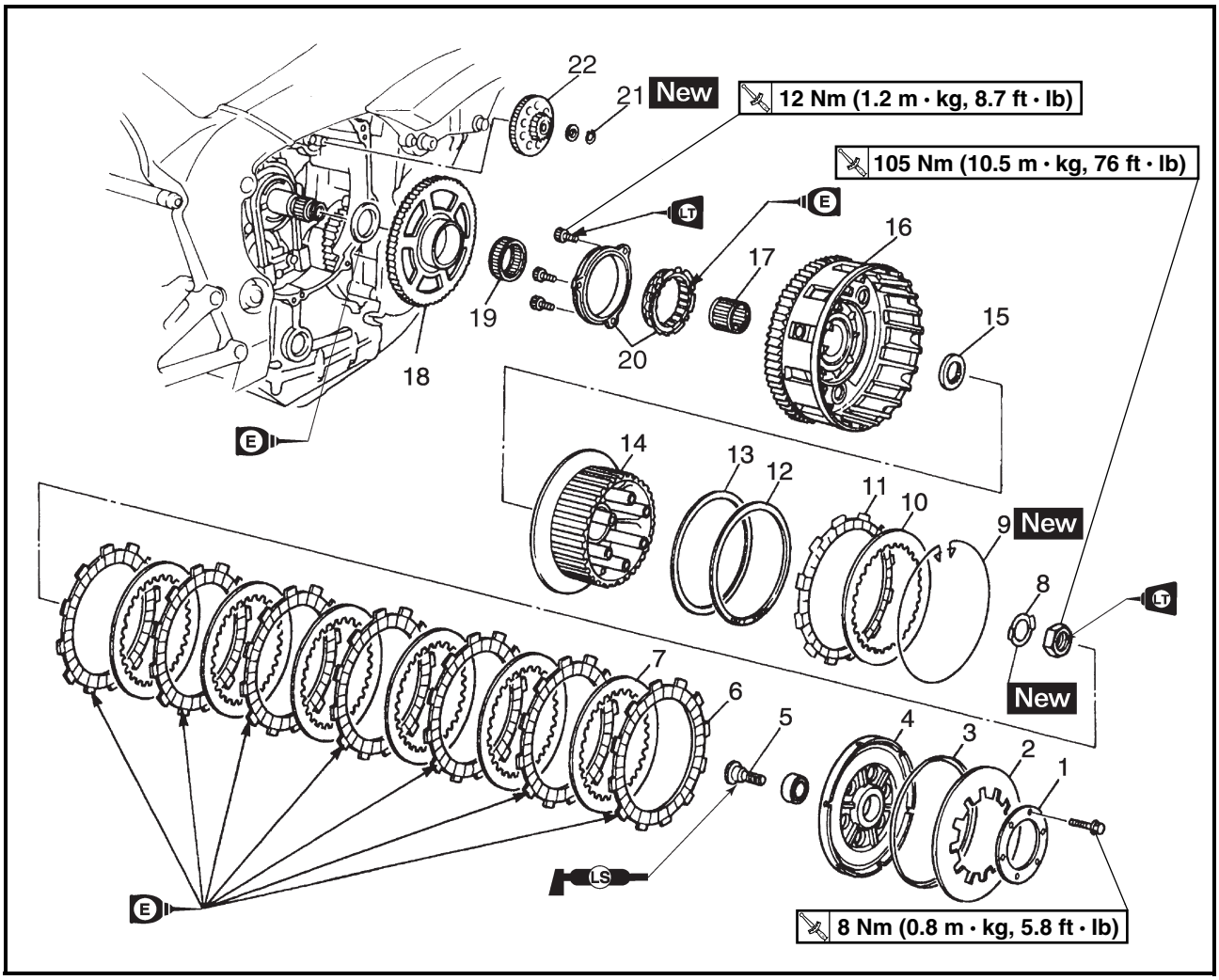
Order	Job/Part	Q'ty	Remarks
	Removing the pull lever shaft		Remove the parts in the order listed.
1	Circlip	2	
2	Pull lever	1	
3	Pull lever spring	1	
4	Pull lever shaft	1	
5	Oil seal	1	
6	Bearing	2	
			For installation, reverse the removal procedure.

EAS00274

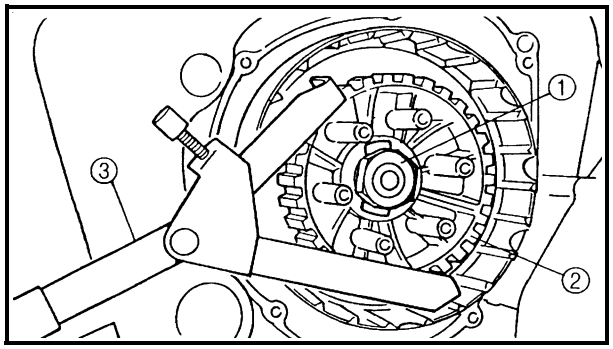
CLUTCH



Order	Job/Part	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
1	Clutch spring plate retainer	1	
2	Clutch spring plate	1	
3	Clutch spring plate seat	1	
4	Pressure plate	1	
5	Pull rod	1	
6	Friction plate	7	Inside diameter = 124 mm
7	Clutch plate	6	
8	Lock washer	1	
9	Wire circlip	1	
10	Clutch plate	1	
11	Friction plate	1	Inside diameter = 135 mm
12	Clutch damper spring	1	
13	Clutch damper spring seat	1	
14	Clutch boss	1	



Order	Job/Part	Q'ty	Remarks
15	Thrust washer	1	
16	Clutch housing	1	
17	Bearing	1	
18	Starter clutch gear	1	
19	Bearing	1	
20	Starter clutch assembly	1	
21	Circlip	1	
22	Starter clutch idle gear	1	
			For installation, reverse the removal procedure.

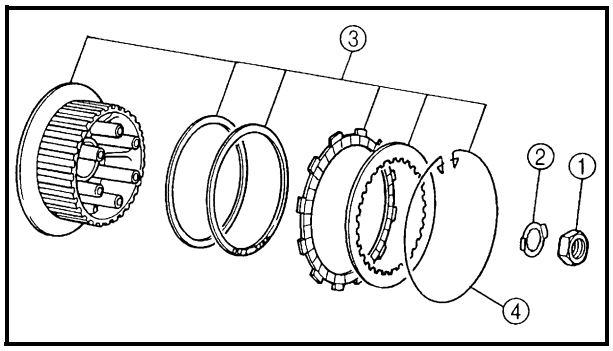


EAS00277
REMOVING THE CLUTCH

1. Straighten the lock washer tab.
2. Loosen:
   - clutch boss nut ①

NOTE:

While holding the clutch boss ② with the universal clutch holder ③, loosen the clutch boss nut.



Universal clutch holder
YM-91042

3. Remove:
   - clutch boss nut ①
   - lock washer ②
   - clutch boss assembly ③
   - thrust washer

NOTE:

There is a built-in damper between the clutch boss and the clutch plate. It is not necessary to remove the wire circlip ④ and disassemble the built-in damper unless there is serious clutch chattering.

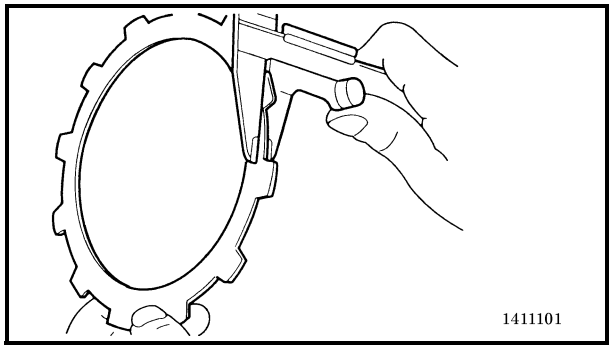
EAS00280
CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:
   - friction plate
     Damage/wear → Replace the friction plates as a set.
2. Measure:
   - friction plate thickness
     Out of specification → Replace the friction plates as a set.

NOTE:

Measure the friction plate at four places.

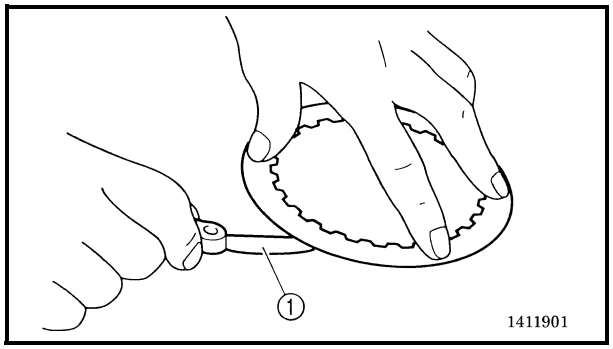


Friction plate thickness
2.9 ~ 3.1 mm
(0.114 ~ 0.122 in)
<Limit>: 2.8 mm (0.110 in)

EAS00281
CHECKING THE CLUTCH PLATES

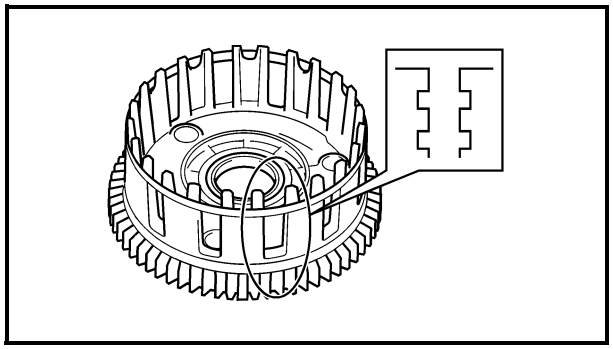
The following procedure applies to all of the clutch plates.

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.

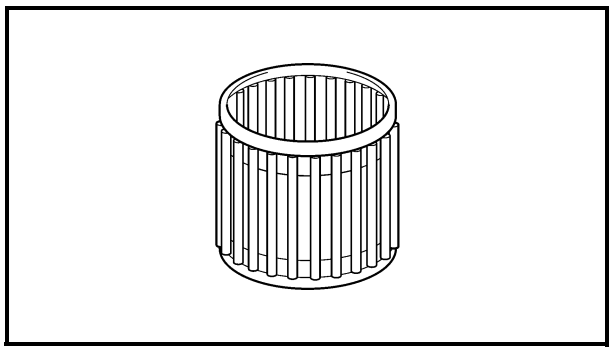
Clutch plate warpage limit
0.1 mm (0.004 in)



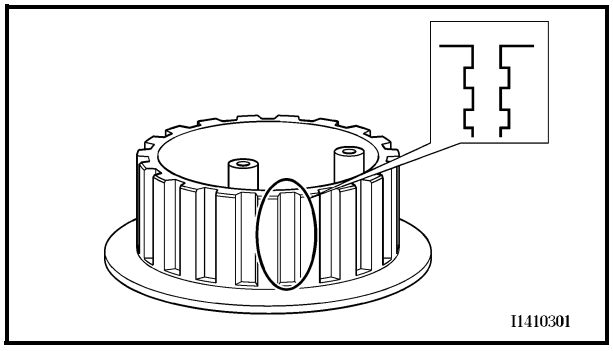
EAS00284
CHECKING THE CLUTCH HOUSING

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.



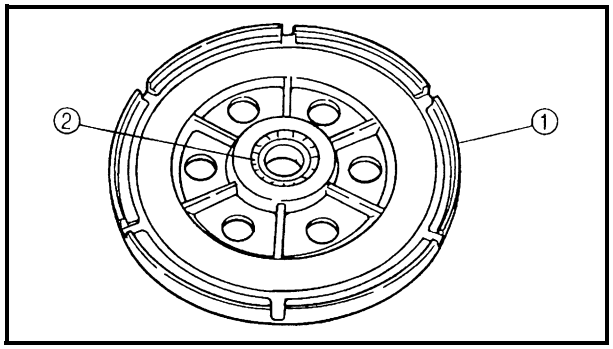
2. Check:
   - bearing
     Damage/wear → Replace the bearing and clutch housing.



EAS00285
CHECKING THE CLUTCH BOSS

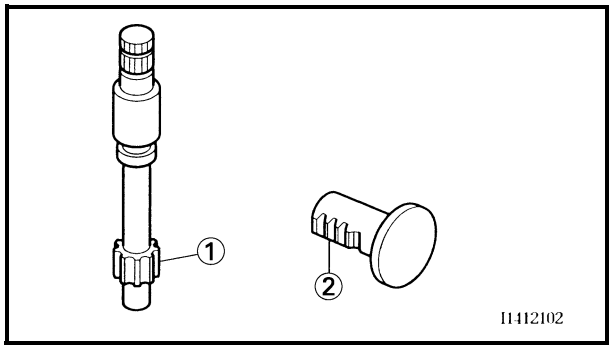
1. Check:
   - clutch boss splines
     Damage/pitting/wear → Replace the clutch boss.

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



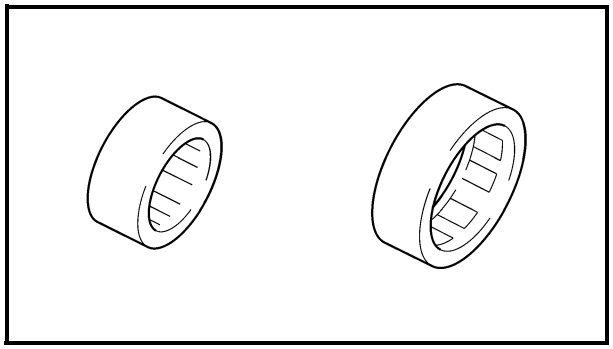
EAS00286
CHECKING THE PRESSURE PLATE

1. Check:
   - pressure plate ①
     Cracks/damage → Replace.
   - bearing ②
     Damage/wear → Replace.

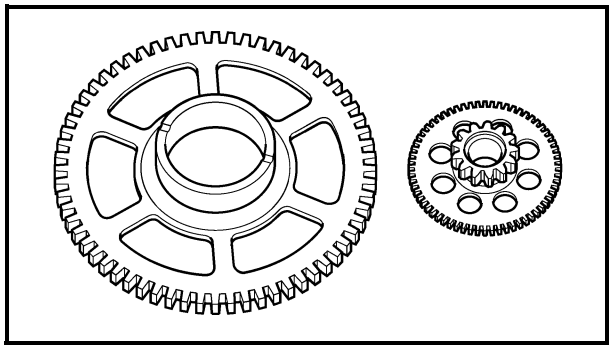


EAS00287
CHECKING THE PULL LEVER SHAFT AND PULL ROD

1. Check:
   - pull lever shaft pinion gear teeth ①
   - pull rod teeth ②
     Damage/wear → Replace the pull rod and pull lever shaft pinion gear as a set.

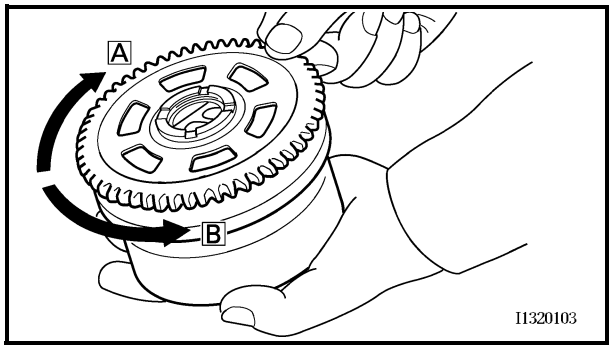


2. Check:
   - pull rod bearing
     Damage/wear → Replace.



EAS00348
CHECKING THE STARTER CLUTCH

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



2. Check:
   • starter clutch operation

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a. Install the starter clutch drive gear onto the starter clutch and hold the starter clutch.
b. When turning the starter clutch drive gear clockwise [A], the starter clutch and the starter clutch drive gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter clutch drive gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.

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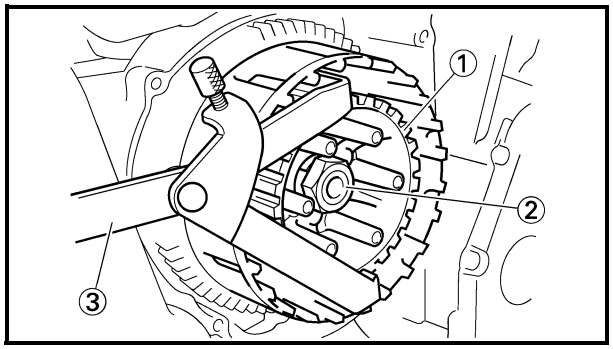


EAS00299
INSTALLING THE CLUTCH

1. Install:
   • clutch boss ①
   • lock washer New
   • clutch boss nut ②
2. Tighten:
   • clutch boss nut

   105 Nm (10.5 m · kg, 76 ft · lb) **LOCTITE®**

NOTE:

While holding the clutch boss with the universal clutch holder ③, tighten the clutch boss nut.

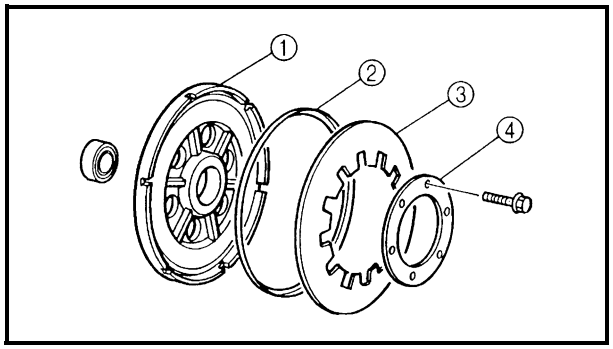
	**Universal clutch holder** **YM-91042**

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**

5. Install:
   - friction plates
   - clutch plates

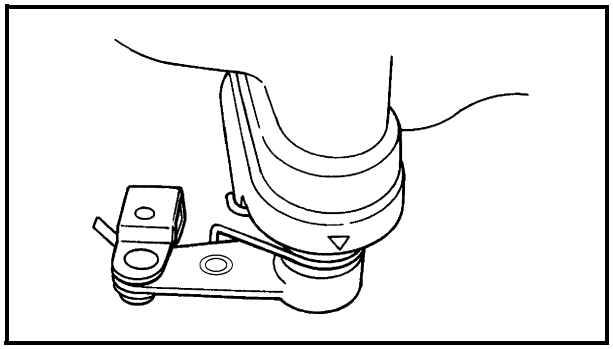
NOTE:
First, install a friction plate and then alternate between a clutch plate and a friction plate.



6. Install:
   - pressure plate ①
   - clutch spring plate seat ②
   - clutch spring plate ③
   - clutch spring plate retainer ④

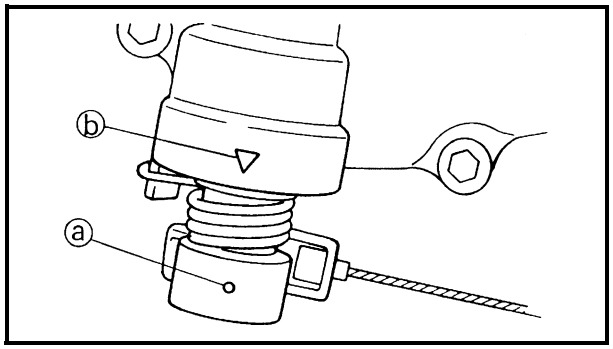
8 Nm (0.8 m · kg, 5.8 ft · lb)

NOTE:
Tighten the clutch spring plate retainer bolts in stages and in a crisscross pattern.



7. Install:
   - pull lever

NOTE:
Install the pull lever with the "⬭" mark facing towards the clutch cover.

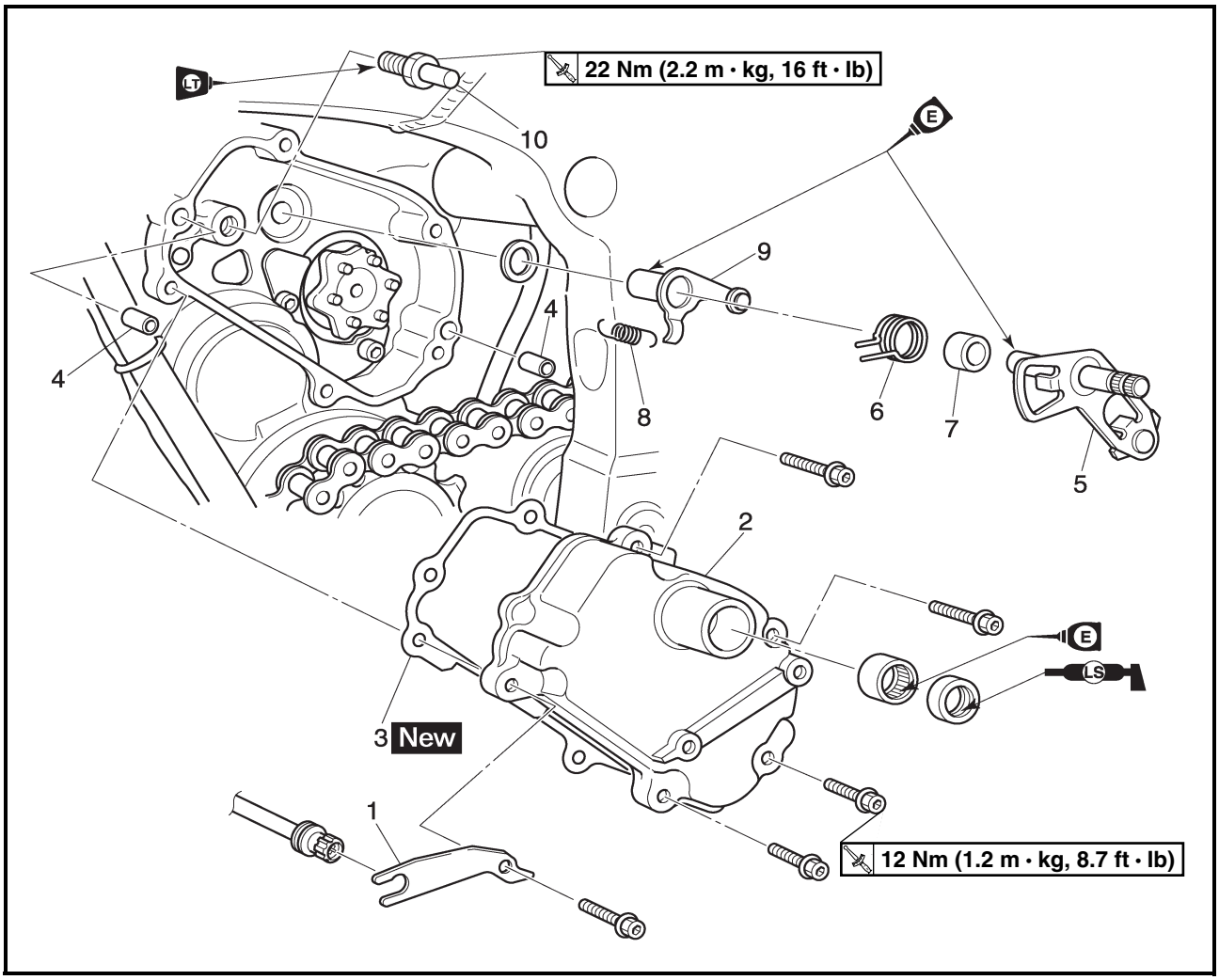


8. Install:
   - clutch cover

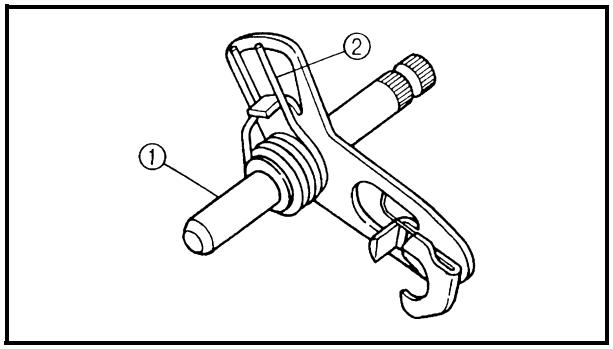
12 Nm (1.2 m · kg, 8.7 ft · lb)

NOTE:
- When installing the clutch cover, push the pull lever and check that the punch mark ⓐ on the pull lever aligns with the mark ⓑ 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.

EAS00327
SHIFT SHAFT
SHIFT SHAFT AND STOPPER LEVER

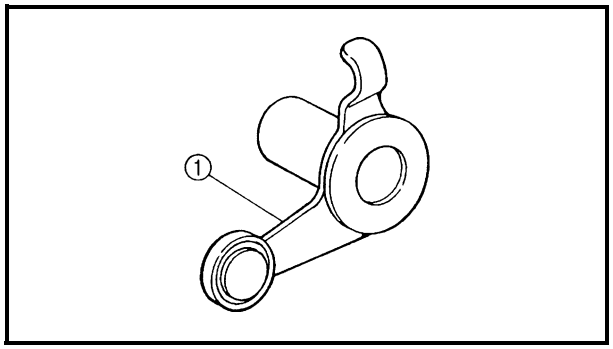


Order	Job/Part	Q'ty	Remarks
	Removing the shift shaft and stopper lever		Remove the parts in the order listed.
	Drive sprocket cover		Refer to "ENGINE".
1	Throttle stop screw holder	1	
2	Shift shaft cover	1	
3	Shift shaft cover gasket	1	
4	Dowel pin	2	
5	Shift shaft	1	
6	Shift shaft spring	1	
7	Spacer	1	
8	Stopper lever spring	1	
9	Stopper lever	1	
10	Shift shaft spring stopper	1	
			For installation, reverse the removal procedure.



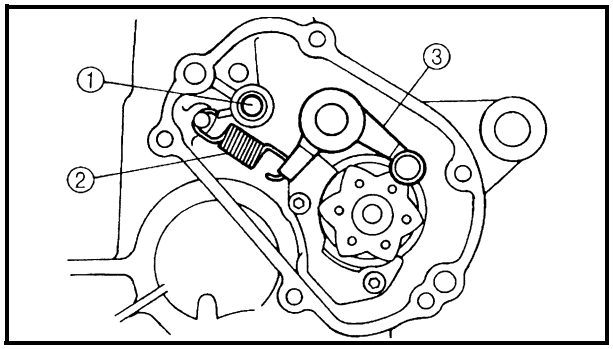
CHECKING THE SHIFT SHAFT

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



CHECKING THE STOPPER LEVER

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



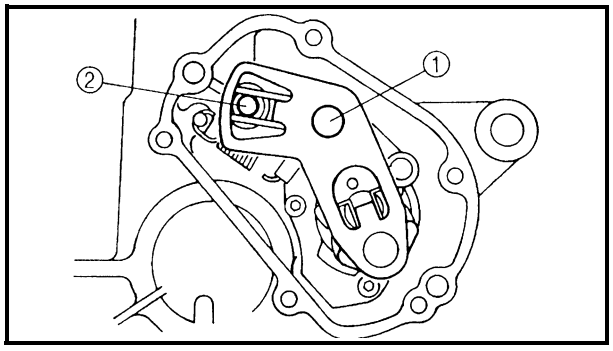
INSTALLING THE SHIFT SHAFT

1. Install:
   - shift shaft spring stopper ①

     22 Nm (2.2m · kg, 16 ft · lb)
   - stopper lever spring ②
   - stopper lever ③

NOTE:

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

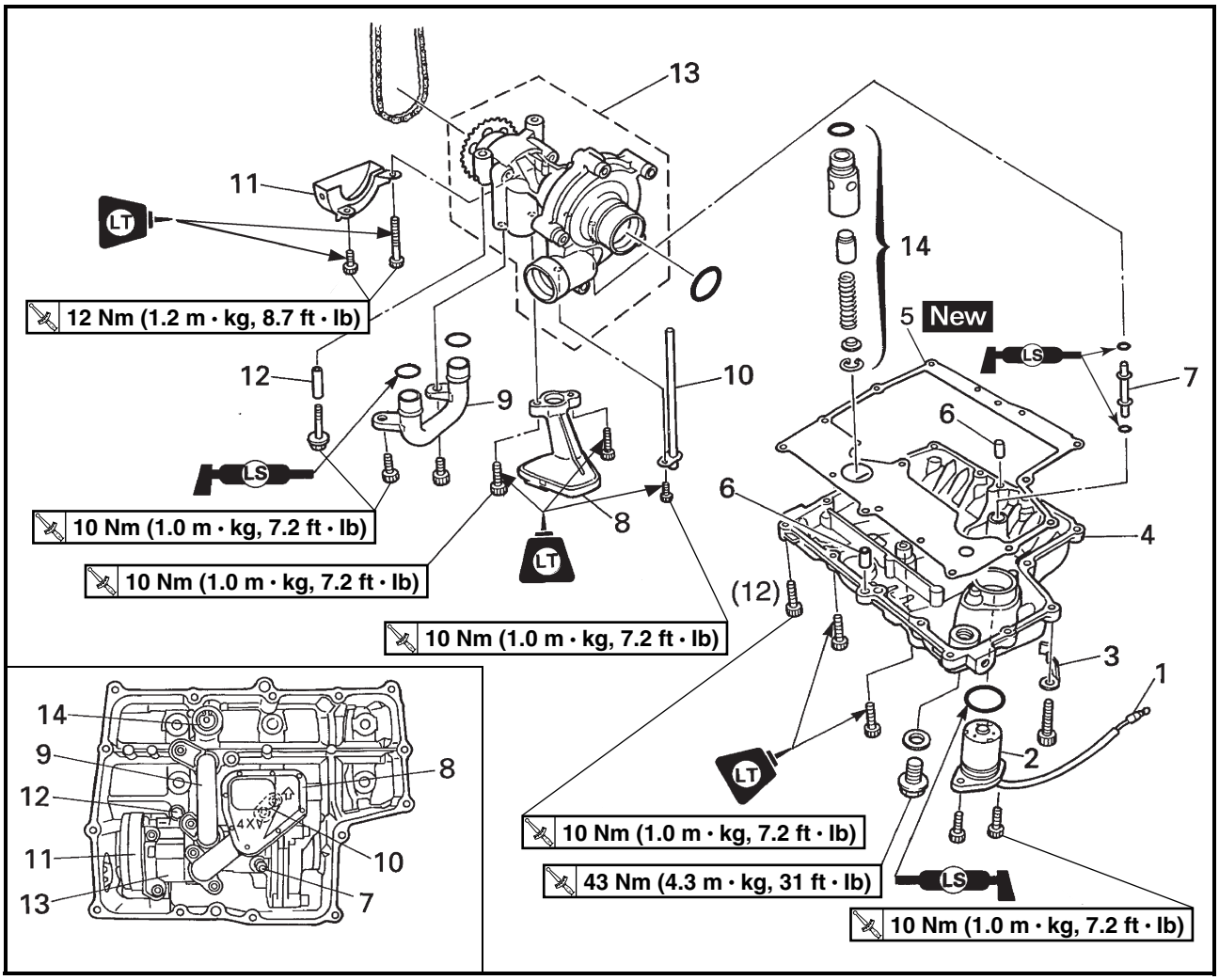


2. Install:
   - shift shaft ①
   - spacer

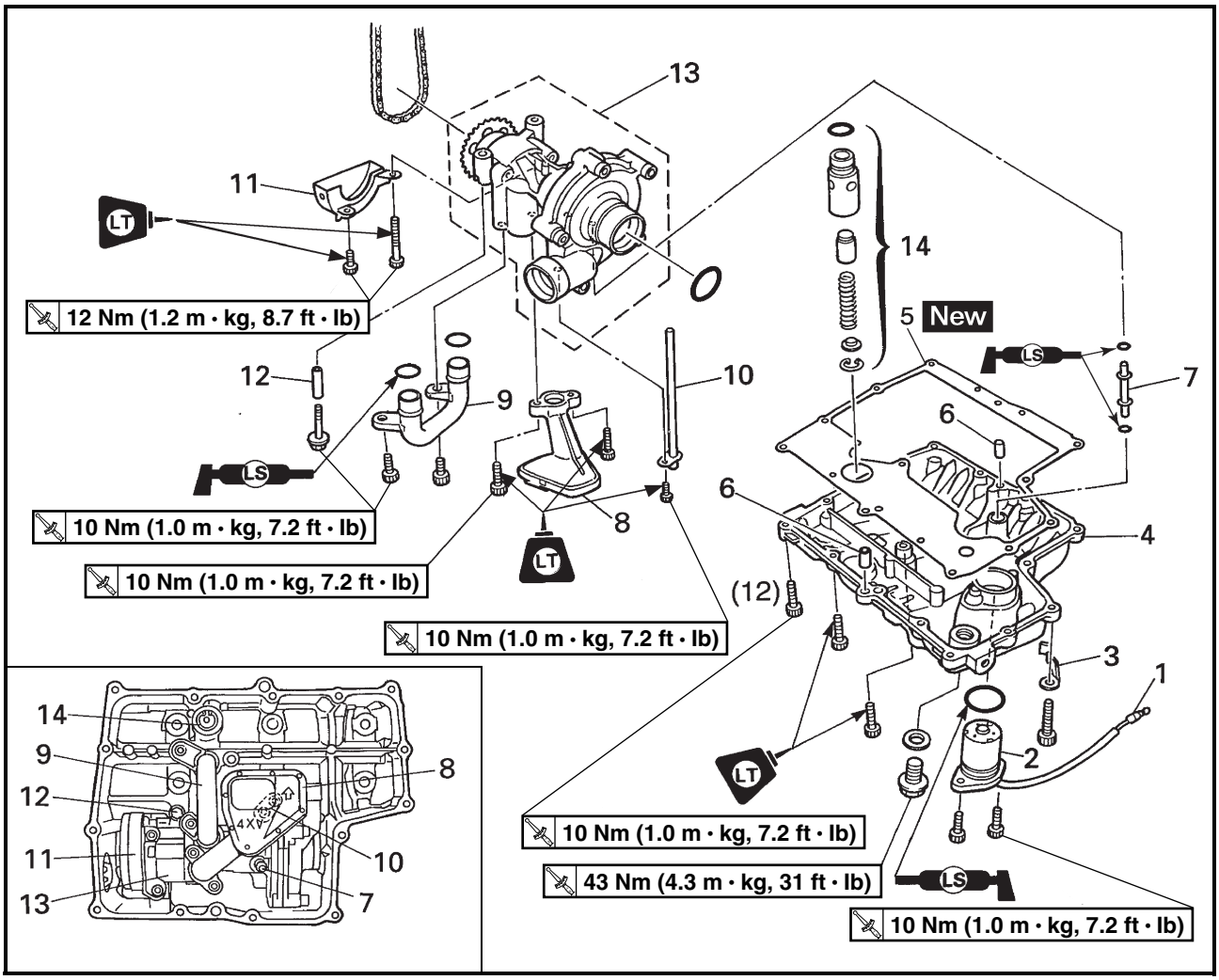
NOTE:

- Lubricate the oil seal lips with lithium soap base grease.
- Install the end of the shift shaft spring onto the shift shaft spring stopper ②.

EAS00356
OIL PAN AND OIL PUMP



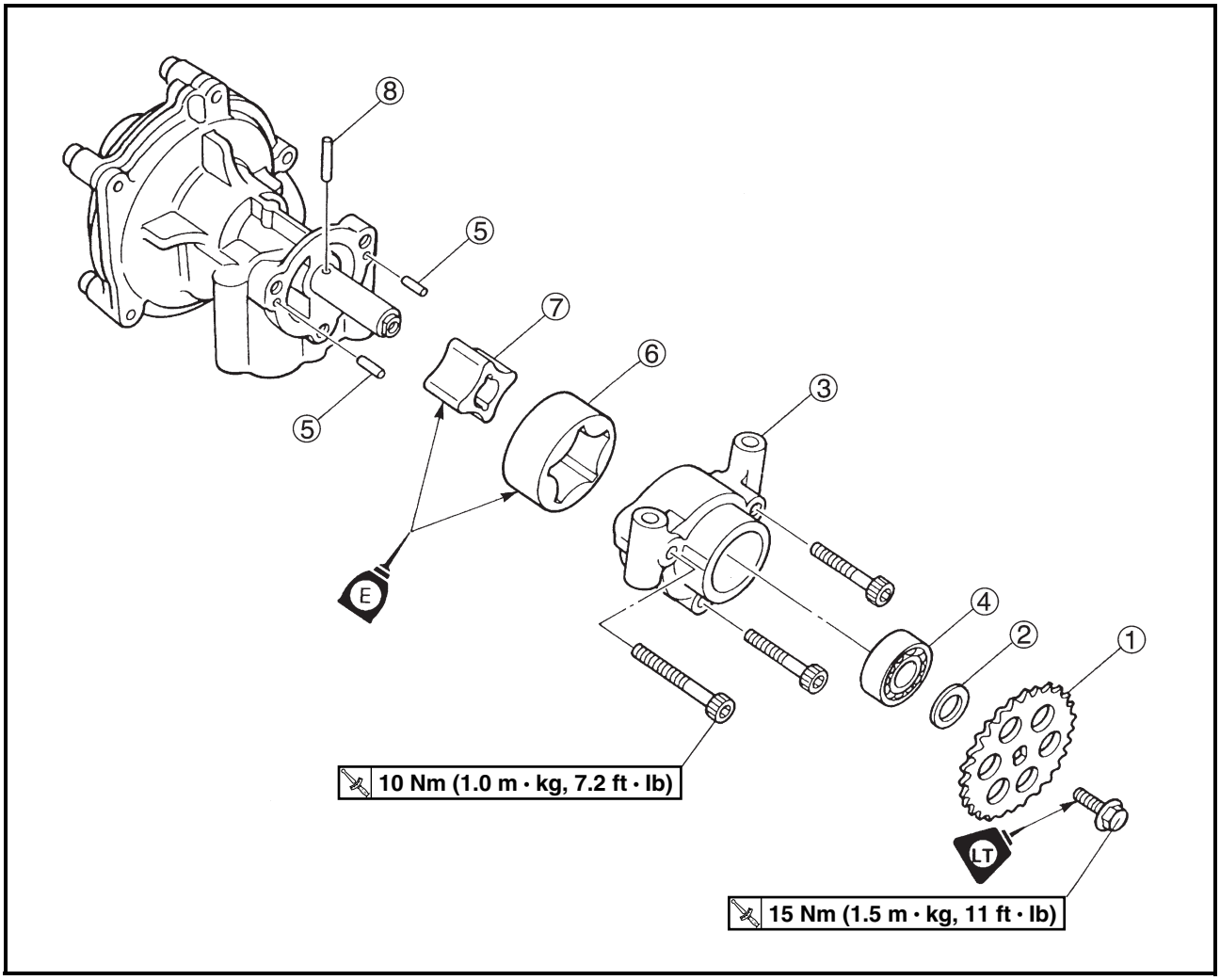
Order	Job/Part	Q'ty	Remarks
	Removing the oil pan and oil pump		Remove the parts in the order listed.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Radiator assembly and water pump outlet pipe		Refer to "RADIATOR" and "OIL COOLER" in chapter 6.
	Exhaust pipe assembly		Refer to "ENGINE".
1	Oil level switch connector	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	



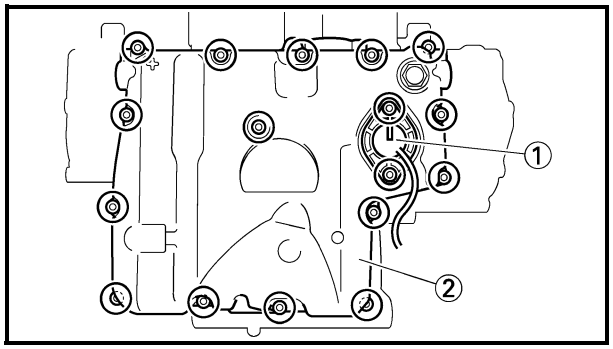
Order	Job/Part	Q'ty	Remarks
7	Drain pipe	1	
8	Oil strainer	1	
9	Oil pipe	1	
10	Oil delivery pipe	1	
11	Oil/water pump assembly drive sprocket cover	1	
12	Dowel pin	1	
13	Oil/water pump assembly	1	
14	Relief valve assembly	1	
			For installation, reverse the removal procedure.

EAS00360

OIL PUMP



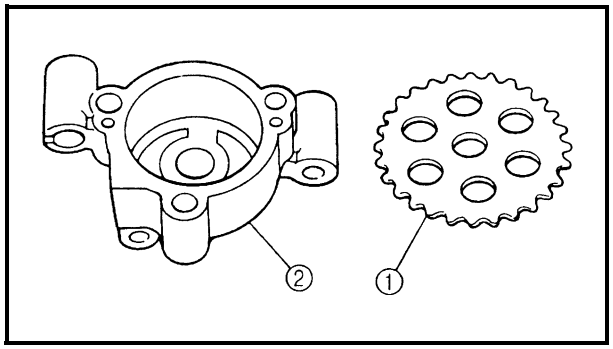
Order	Job/Part	Q'ty	Remarks
	Disassembling the oil pump		Remove the parts in the order listed.
①	Oil/water pump assembly driven sprocket	1	
②	Washer	1	
③	Oil pump housing	1	
④	Bearing	1	
⑤	Pin	2	
⑥	Oil pump outer rotor	1	
⑦	Oil pump inner rotor	1	
⑧	Pin	1	
			For assembly, reverse the disassembly procedure.

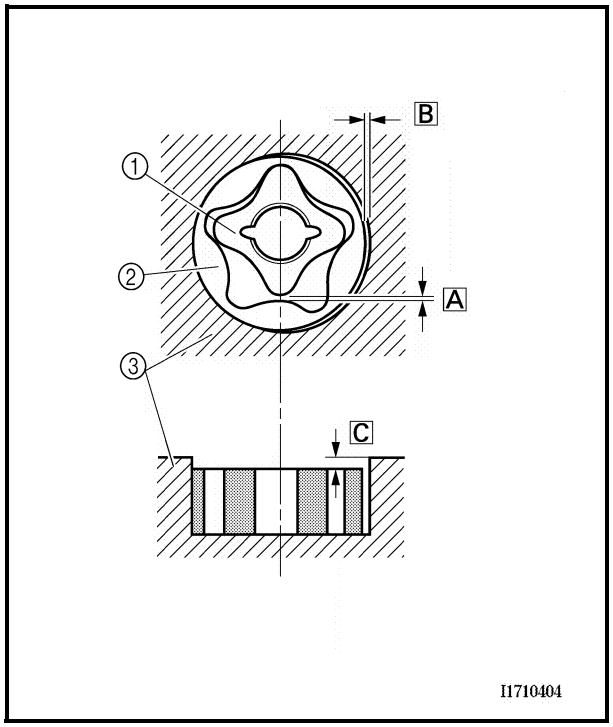


EAS00362
REMOVING THE OIL PAN

1. Remove:
   - oil level switch ①
   - oil pan ②
   - 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.



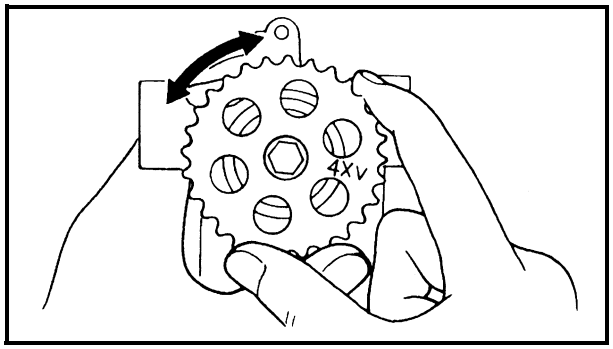


EAS00364
CHECKING THE OIL PUMP

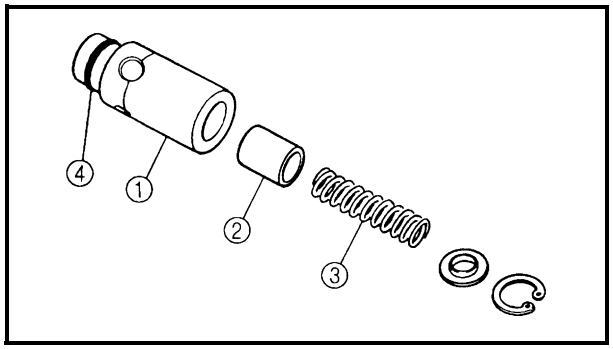
1. Check:
   - oil pump driven gear ①
   - oil pump housing ②
     Cracks/damage/wear → Replace the defective part(s).
2. Measure:
   - inner-rotor-to-outer-rotor-tip clearance [A]
   - outer-rotor-to-oil-pump-housing clearance [B]
   - oil-pump-housing-to-inner-rotor-and-outer-rotor clearance [C]
     Out of specification → Replace the oil pump.

① Inner rotor
② Outer rotor
③ Oil pump housing

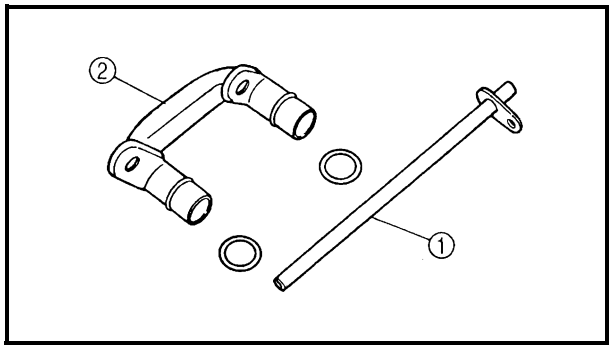
Inner-rotor-to-outer-rotor-tip clearance
0.01 ~ 0.10 mm
(0.0004 ~ 0.0039 in)
<Limit: 0.18 mm (0.0071 in)>
Outer-rotor-to-oil-pump-housing clearance
0.09 ~ 0.15 mm
(0.0035 ~ 0.0059 in)
<Limit: 0.22 mm (0.0087 in)>
Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance
0.06 ~ 0.11 mm
(0.0024 ~ 0.0043 in)
<Limit: 0.18 mm (0.0071 in)>



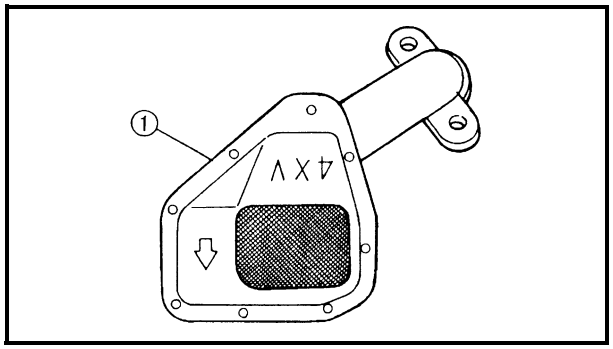
3. Check:
   • oil pump operation
   Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



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 PIPES
The following procedure applies to all of the oil delivery pipes.
1. Check:
   • oil delivery pipe ①
   • oil pipe ②
   Damage → Replace.
   Obstruction → Wash and blow out with compressed air.

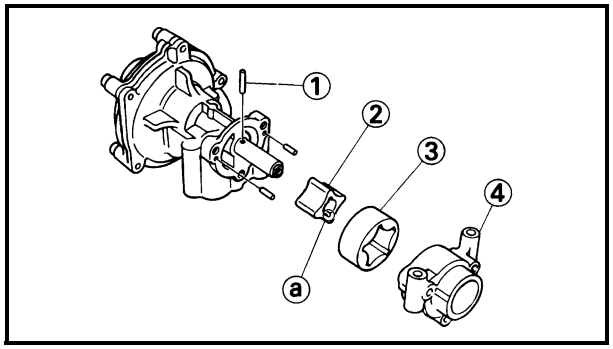


EAS00368
CHECKING THE OIL STRAINER
1. Check:
   • oil strainer ①
   Damage → Replace.
   Contaminants → Clean with solvent.

EAS00374
ASSEMBLING THE OIL PUMP

1. Lubricate:
   - inner rotor
   - outer rotor
   - oil pump shaft
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

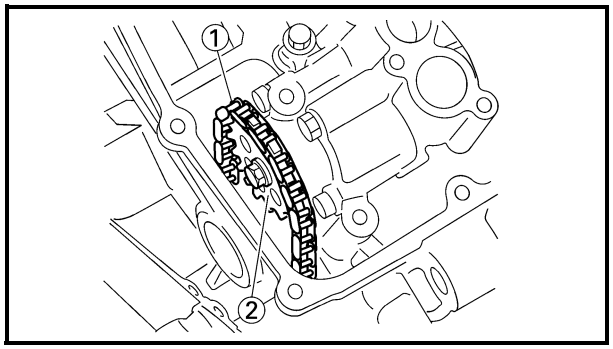


2. Install:
   - pin ①
   - inner rotor ②
   - outer rotor ③
   - oil pump housing ④
   - oil pump housing screw

10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:
When installing the inner rotor, align the pin ① in the oil pump shaft with the groove ⓐ in the inner rotor ②.

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

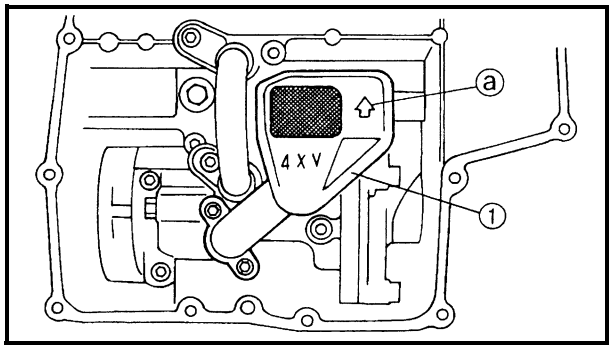


EAS00376
INSTALLING THE OIL PUMP

1. Install:
   - oil pump

15 Nm (1.5 m · kg, 11 ft · lb)

NOTE:
Install the oil/water pump drive chain ① onto the oil/water pump driven sprocket ②.



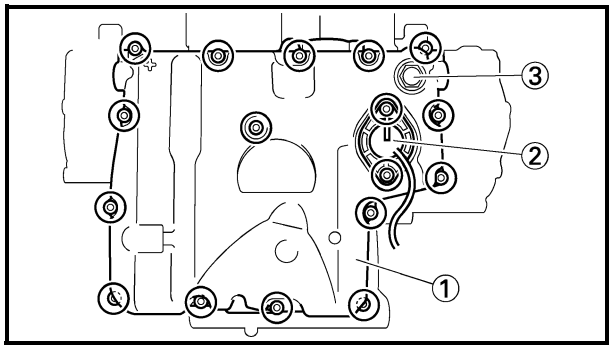
EAS00378
INSTALLING THE OIL STRAINER

1. Install:
   - oil strainer housing ①

10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:

The arrow mark ⓐ on the oil strainer housing must point towards the front of the engine.



EAS00380
INSTALLING THE OIL PAN

1. Install:
   - dowel pins
   - gasket New
   - oil pan ① **10 Nm (1.0 m · kg, 7.2 ft · lb)**
   - oil level switch ② **10 Nm (1.0 m · kg, 7.2 ft · lb)**
   - engine oil drain bolt ③ **43 Nm (4.3 m · kg, 31 ft · lb)**

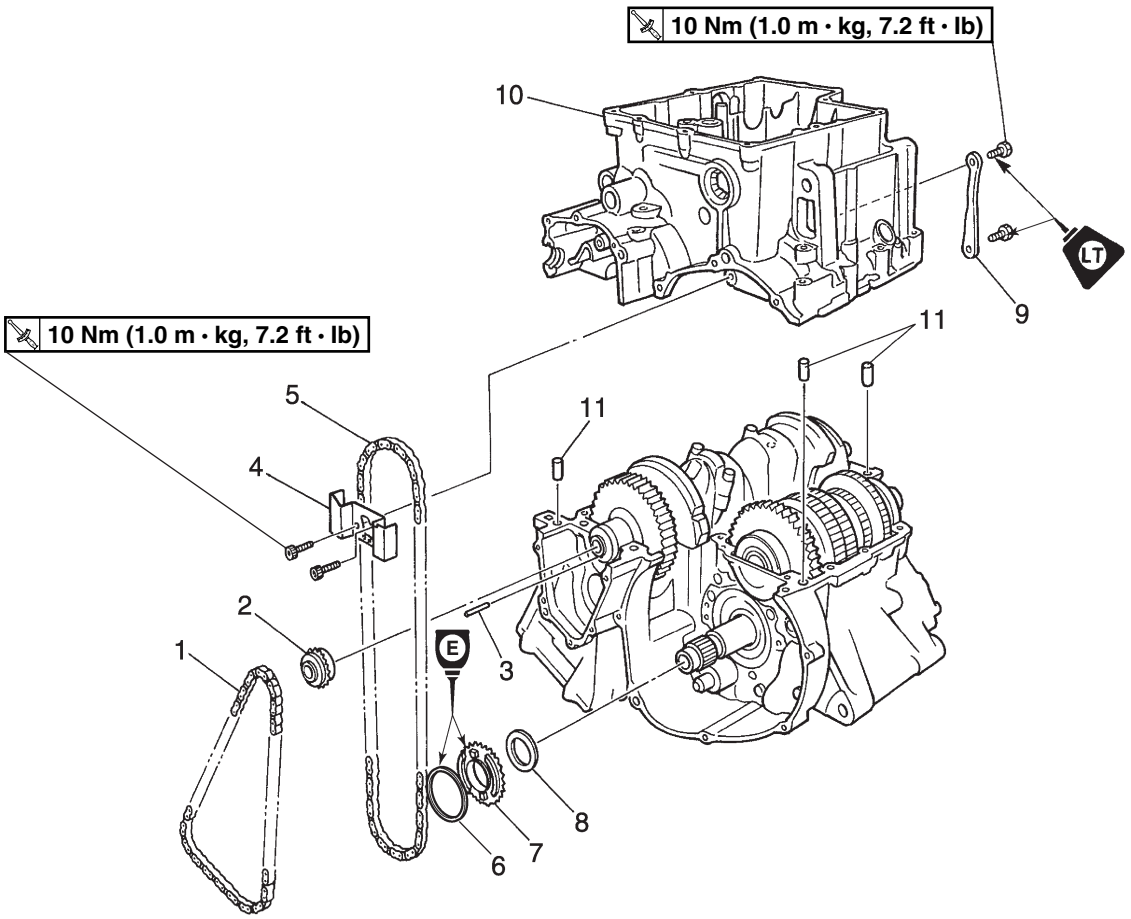
⚠ WARNING

Always use new copper washers.

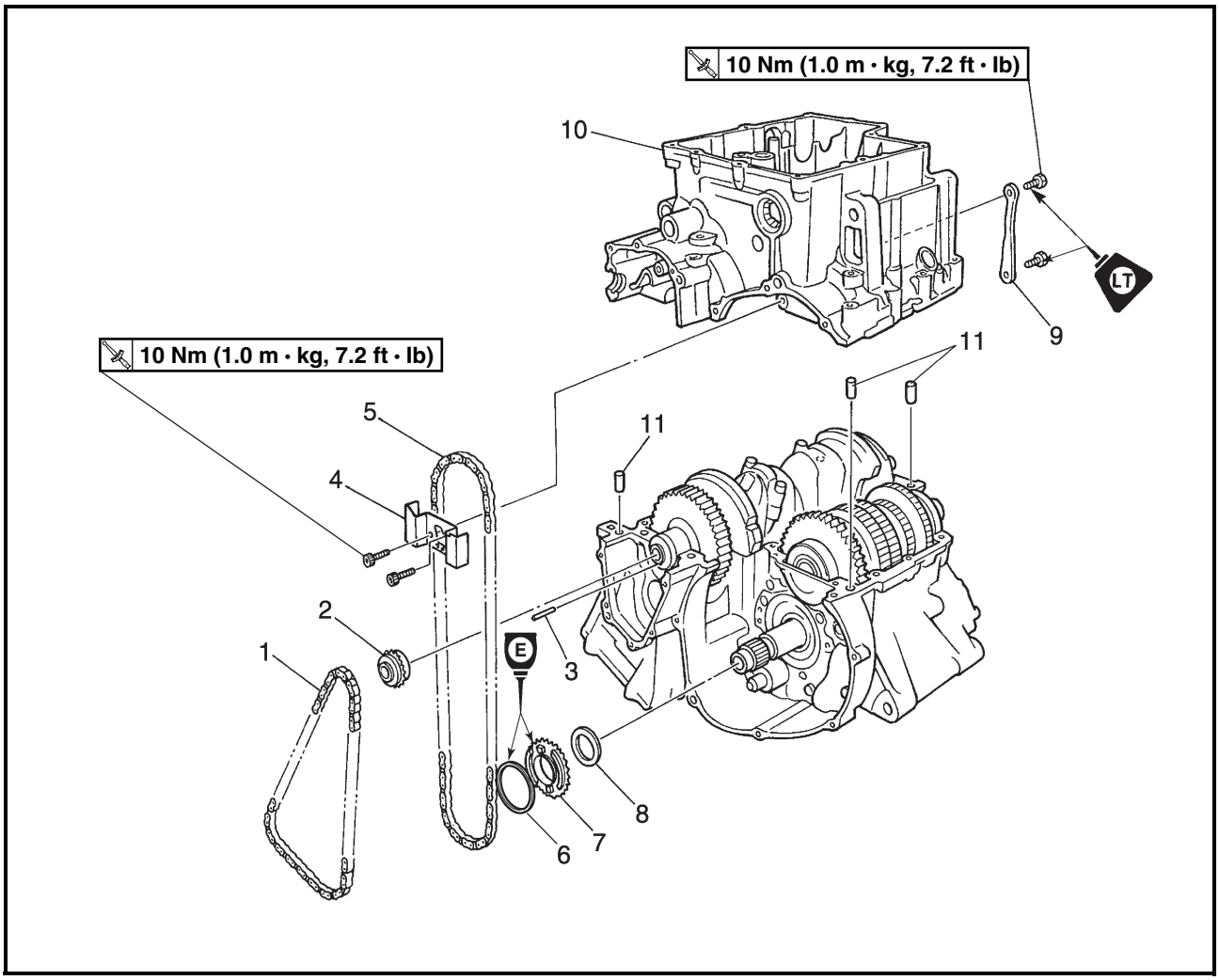
NOTE:

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

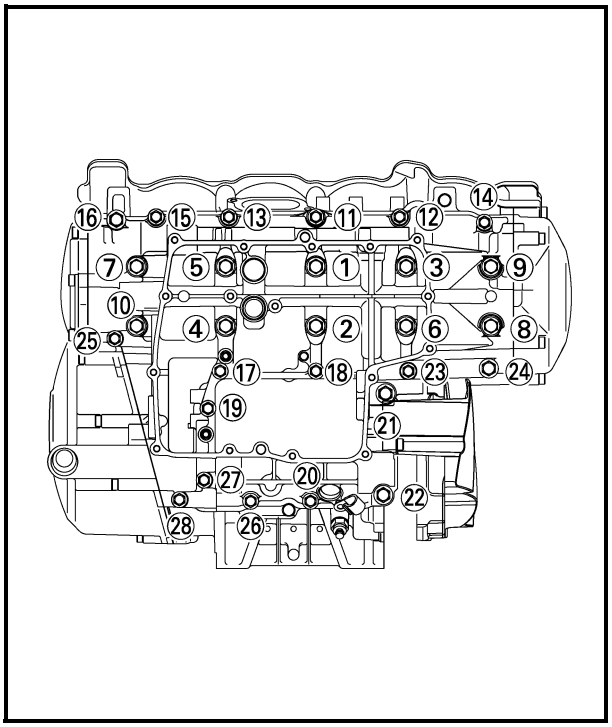
EAS00381
CRANKCASE



Order	Job/Part	Q'ty	Remarks
	Removing the crankcase		Remove the parts in the order listed.
	Engine		Refer to "ENGINE".
	Cylinder head		Refer to "CYLINDER HEAD".
	Pickup coil and pickup coil rotor		Refer to "PICKUP COIL".
	Stator coil assembly		Refer to "GENERATOR".
	Clutch housing and starter clutch idle gear		Refer to "CLUTCH".
	Oil/water pump assembly		Refer to "OIL PAN AND OIL PUMP".
1	Timing chain	1	
2	Crankshaft sprocket	1	
3	Pin	1	
4	Oil/water pump assembly drive chain guide	1	
5	Oil/water pump assembly drive chain	1	



Order	Job/Part	Q'ty	Remarks
6	Washer	1	
7	Oil/water pump assembly drive sprocket	1	
8	Washer	1	
9	Plate	1	
10	Lower crankcase	1	
11	Dowel pin	3	
			For installation, reverse the removal procedure.



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.

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.

M9 × 105 mm bolts: ① ~ ⑩
M8 × 50 mm bolt: ㉒
M8 × 60 mm bolt: ㉑
M6 × 45 mm bolts: ⑳, ㉖, ㉘
M6 × 50 mm bolt: ⑱
M6 × 55 mm bolts: ⑪ ~ ⑮
M6 × 60 mm bolt: ㉓
M6 × 65 mm bolt: ㉗
M6 × 65 mm bolts: ⑯, ㉔
M6 × 70 mm bolts: ⑰, ⑲, ㉕

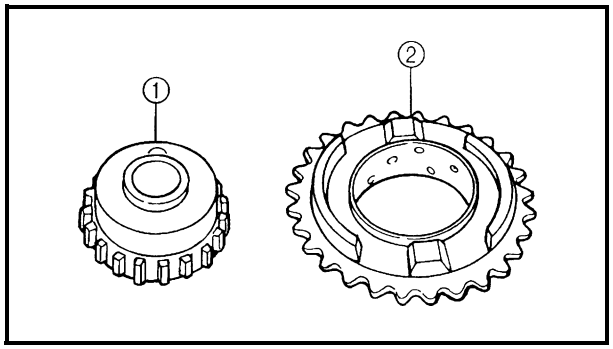
4. Remove:
   - dowel pins
   - O-ring
5. Remove:
   - crankshaft journal lower bearing (from the lower crankcase)

NOTE:

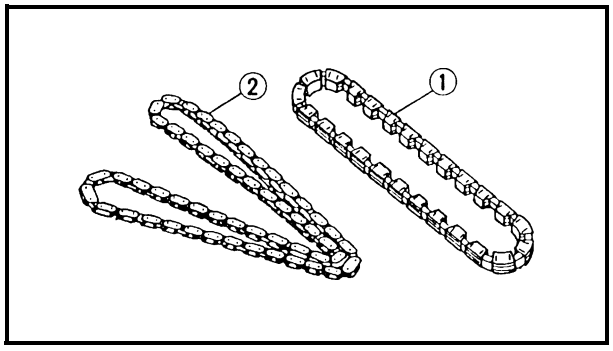
Identify the position of each crankshaft journal lower bearing so that it can be reinstalled in its original place.

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 SPROCKET AND CHAINS
1. Check:
   - crankshaft sprocket ①
   - oil/water pump assembly drive sprocket ②
     Cracks/damage/wear → Replace the defective part(-s).

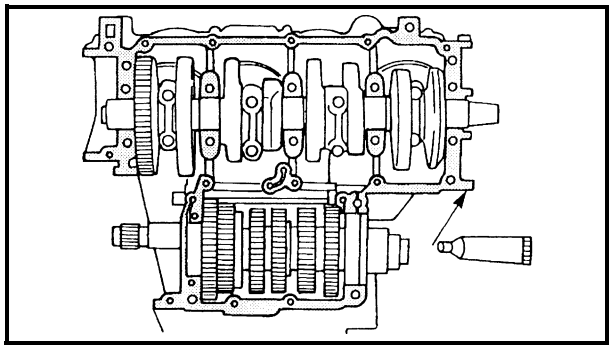


2. Check:
   - timing chain ①
     Damage/stiffness → Replace the timing chain and crankshaft sprocket as a set.
   - oil/water pump assembly drive chain ②
     Damage/stiffness → Replace the oil/water pump assembly drive chain and oil/water pump assembly drive sprocket as a set.

EAS00414
ASSEMBLING THE CRANKCASE

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

	Recommended lubricant **Engine oil**

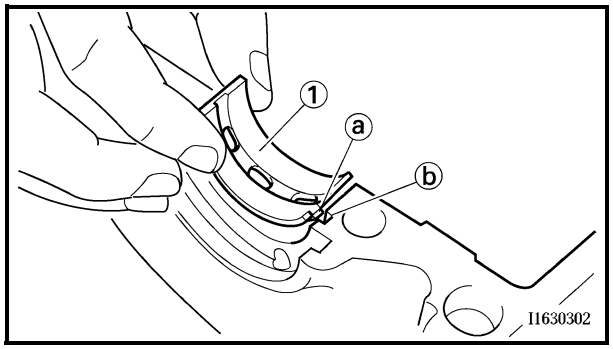


2. Apply:
   • sealant
   (onto the crankcase mating surfaces)

	Quick Gasket® **ACC-11001-05-01**

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.

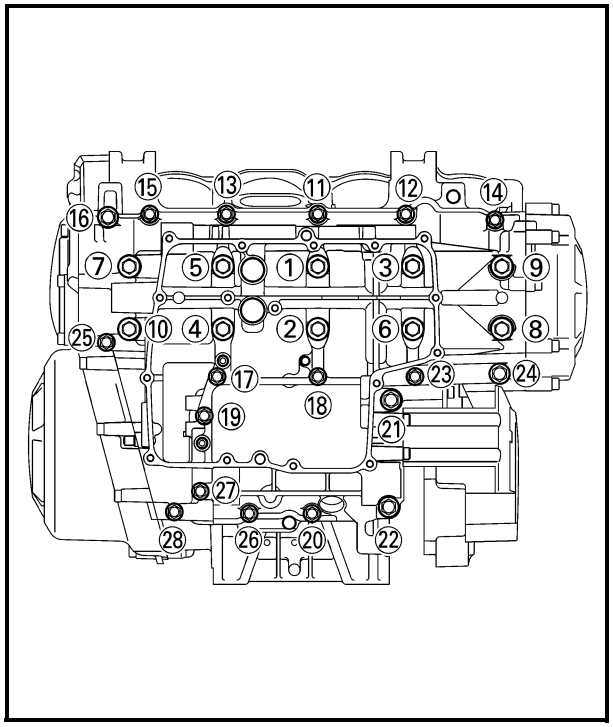
3. Install:
   • dowel pin



4. Install:
   • crankshaft journal lower bearings ①
   (into the lower crankcase)

NOTE:
- Align the projections ⓐ on the crankshaft journal lower bearings with the notches ⓑ in the lower crankcase.
- Install each crankshaft journal lower bearing in its original place.

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



6. Install:
   • lower crankcase ①
   (onto the upper crankcase ②)

CAUTION:

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

7. Install:
   • crankcase bolts

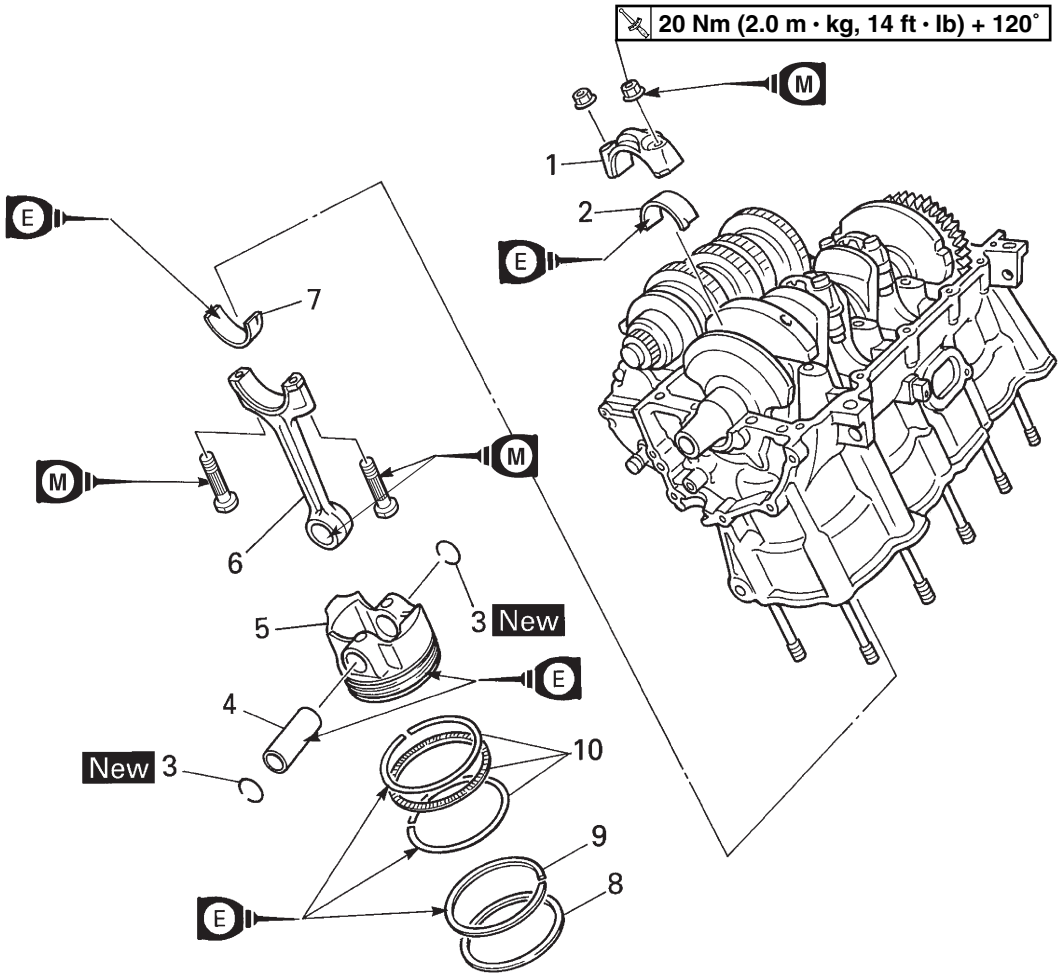
NOTE:

- Lubricate the bolt threads with engine oil.
- Tighten the bolts in increasing numerical order.
- Install washers on bolts ① ~ ⑩.

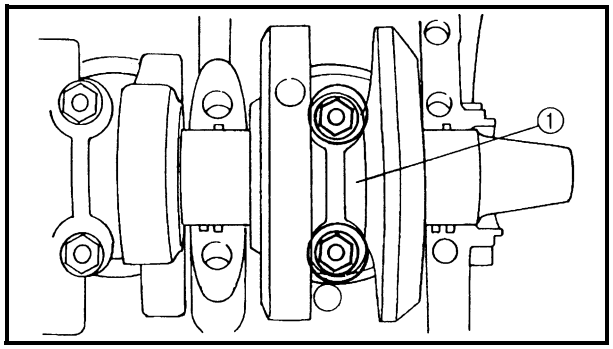
M9 × 105 mm bolts: ① ~ ⑩
M8 × 50 mm bolt: ㉒
M8 × 60 mm bolt: ㉑
M6 × 45 mm bolts: ⑳, ㉖, ㉘
M6 × 50 mm bolt: ⑱
M6 × 55 mm bolts: ⑪ ~ ⑮
M6 × 60 mm bolt: ㉓
M6 × 65 mm bolt: ㉗
M6 × 65 mm bolts: ⑯, ㉔
M6 × 70 mm bolts: ⑰, ⑲, ㉕

Crankcase bolt
Bolt ① ~ ⑩
1st: 20 Nm
(2.0 m · kg, 14 ft · lb)
2nd: 20 Nm
(2.0 m · kg, 14 ft · lb) +
41 ~ 46° or 32 Nm
(3.2 m · kg, 23 ft · lb)
Bolt ⑪ ~ ⑮, ⑰ ~ ⑳, ㉓, ㉕ ~ ㉘
12 Nm (1.2 m · kg, 8.7 ft · lb)
Bolt ⑯, ㉔
14 Nm (1.4 m · kg, 10 ft · lb)
Bolt ㉑ ~ ㉒
24 Nm (2.4 m · kg, 17 ft · lb)

EAS00382
CONNECTING RODS AND PISTONS



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



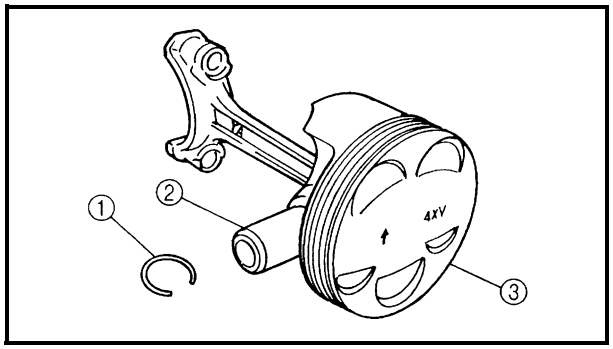
EAS00393
REMOVING THE CONNECTING RODS AND PISTONS

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

1. Remove:
   - connecting rod ①
   - big end bearings

NOTE:

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



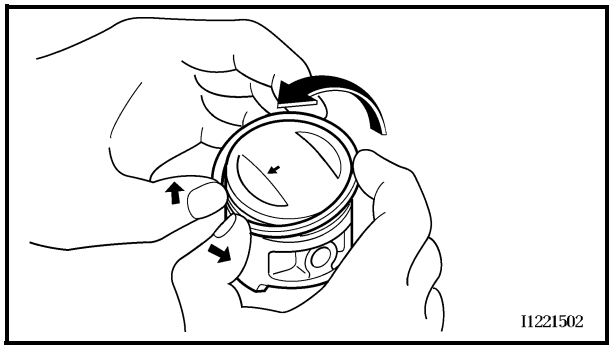
2. Remove:
   - piston pin clips ①
   - piston pin ②
   - piston ③

CAUTION:

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

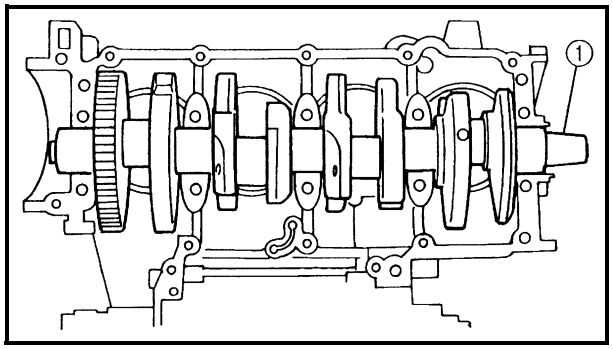
NOTE:

- 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.



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.



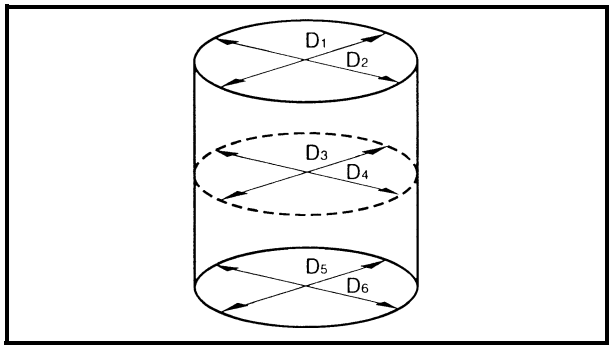
EAS00387
REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
   - crankshaft assembly ①
   - crankshaft journal upper bearings (from the upper crankcase)

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 PISTONS

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

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a. Measure cylinder bore “C” with the cylinder bore gauge.

NOTE:
Measure cylinder bore “C” by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

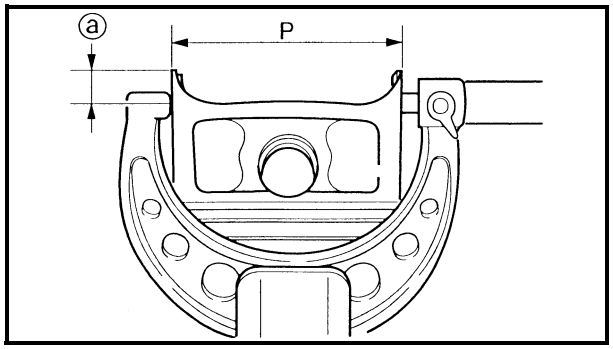
Cylinder bore "C"	**74.00 ~ 74.01 mm (2.9134 ~ 2.9138 in)**
Wear limit	**74.06 mm (2.9157 in)**
Taper limit "T"	**0.05 mm (0.002 in)**
Out of round "R"	**0.05 mm (0.002 in)**

"C" = maximum of D_1 ~ D_6

"T" = maximum of D_1 or D_2 – maximum of D_5 or D_6

"R" = maximum of D_1 D_3 or D_5 – minimum of D_2 D_4 or D_6

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.
ⓐ 5 mm from the bottom edge of the piston

Piston size "P"
73.975 ~ 73.990 mm (2.9124 ~ 2.9130 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>: 0.12 mm (0.0047 in)

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

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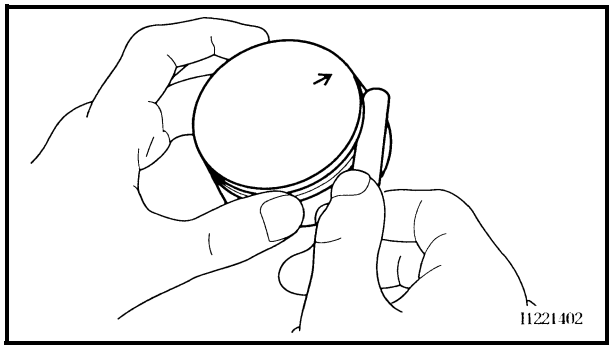
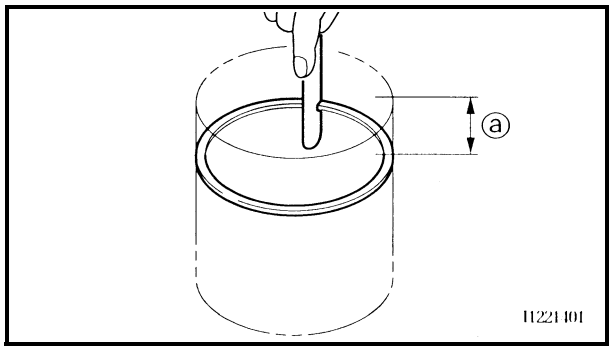


EAS00263
CHECKING THE PISTON RINGS

1. Measure:
   - piston ring side clearance
     Out of specification → Replace the piston and piston rings as a set.

NOTE:
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Piston ring side clearance
Top ring
0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)
<Limit>: 0.115 mm (0.0045 in)
2nd ring
0.020 ~ 0.055 mm
(0.0008 ~ 0.0022 in)
<Limit>: 0.115 mm (0.0045 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.

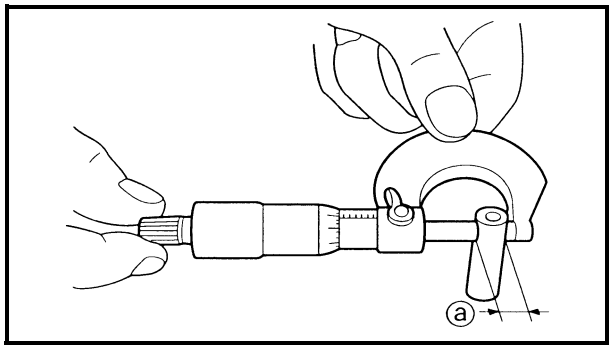
NOTE:
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring end gap
Top ring
0.32 ~ 0.44 mm
(0.013 ~ 0.017 in)
<Limit>: 0.69 mm (0.027 in)
2nd ring
0.43 ~ 0.58 mm
(0.017 ~ 0.023 in)
<Limit>: 0.93 mm (0.037 in)
Oil ring
0.10 ~ 0.35 mm
(0.0039 ~ 0.0138 in)

CHECKING THE PISTON PINS

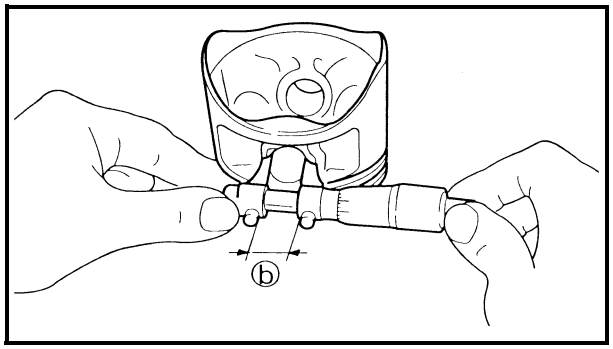
The following procedure applies to all of the piston pins.

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



2. Measure:
   - piston pin outside diameter ⓐ
     Out of specification → Replace the piston pin.

Piston pin outside diameter
16.991 ~ 17.000 mm
(0.6689 ~ 0.6693 in)
<Limit: 16.971 mm (0.6681 in)>



3. Measure:
   - piston pin bore inside diameter ⓑ
     Out of specification → Replace the piston.

Piston pin bore inside diameter
17.002 ~ 17.013 mm
(0.6694 ~ 0.6698 in)
<Limit: 17.043 mm (0.6710 in)>

4. Calculate:
   - piston-pin-to-piston clearance
     Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston clearance =
Piston pin bore size –
Piston pin outside diameter
Piston-pin-to-piston clearance
0.002 ~ 0.022 mm
(0.00008 ~ 0.00087 in)
<Limit: 0.072 mm (0.00238 in)>

CHECKING THE BIG END BEARINGS

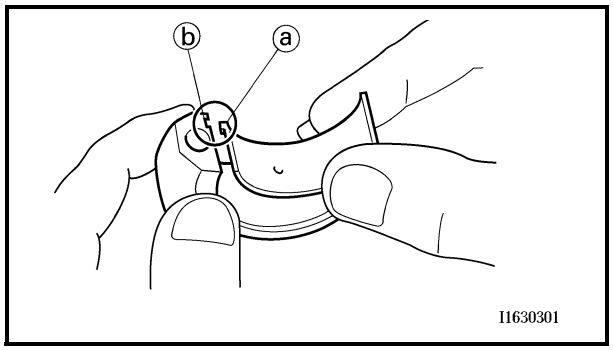
1. Measure:
   - crankshaft-pin-to-big-end-bearing clearance
     Out of specification → Replace the big end bearings.

Crankshaft-pin-to-big-end-bearing clearance
0.031 ~ 0.055 mm
(0.0012 ~ 0.0022 in)

The following procedure applies to all of the connecting rods.

CAUTION:

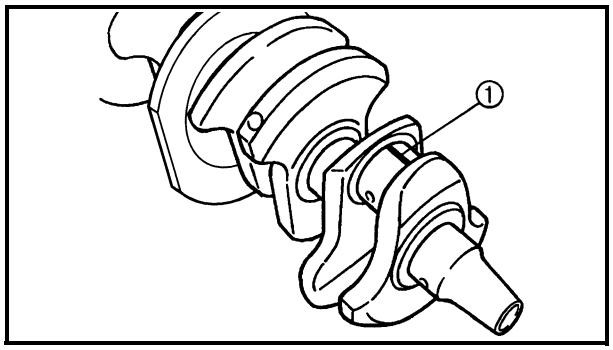
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.



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

NOTE:

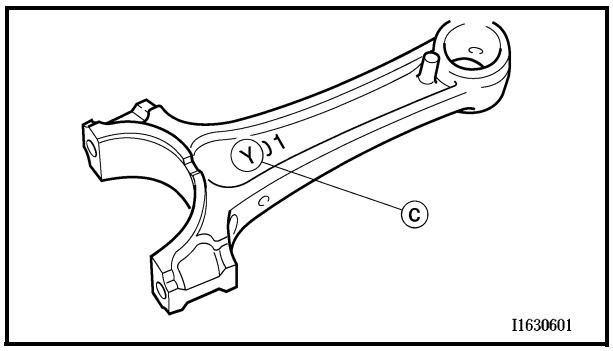
Align the projections ⓐ on the big end bearings with the notches ⓑ in the connecting rod and connecting rod cap.

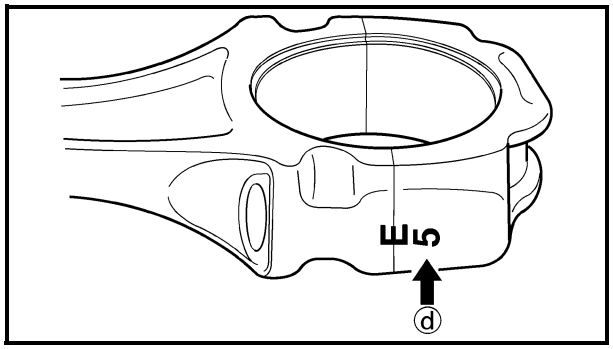


c. Put a piece of Plastigauge® ① on the crankshaft pin.
d. Assemble the connecting rod halves.

NOTE:

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





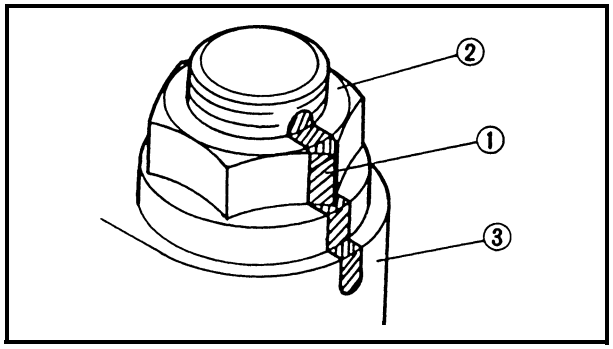
e. Tighten the connecting rod nuts.

	Connecting rod nut **20 Nm (2.0 m · kg, 14 ft · lb) + 120°**

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

CAUTION:

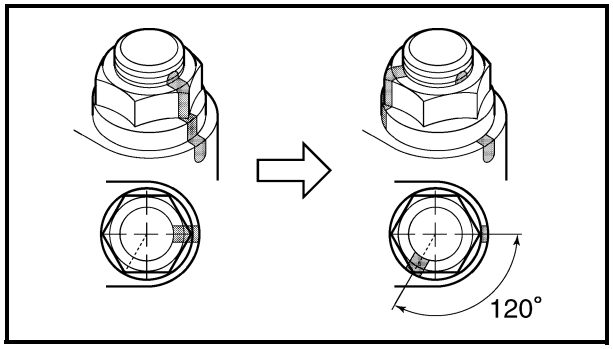
Tighten the connecting rod bolts using the plastic-region tightening angle method.
Always install new bolts and nuts.



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 nuts further to reach the specified angle (120°).

⚠ 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°

k. Remove the connecting rod and big end bearings.
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.

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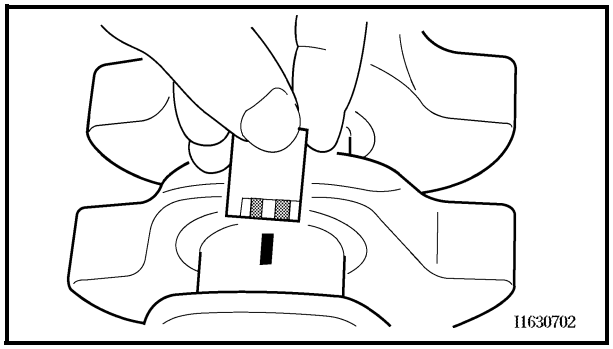
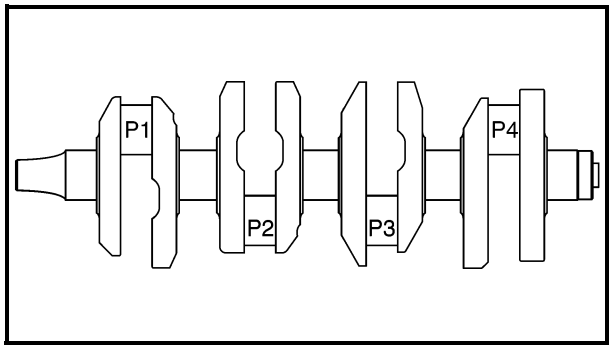
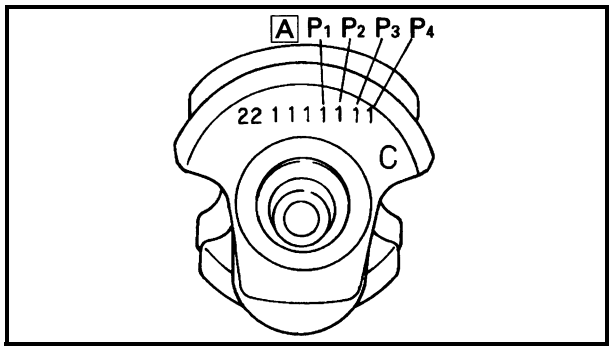
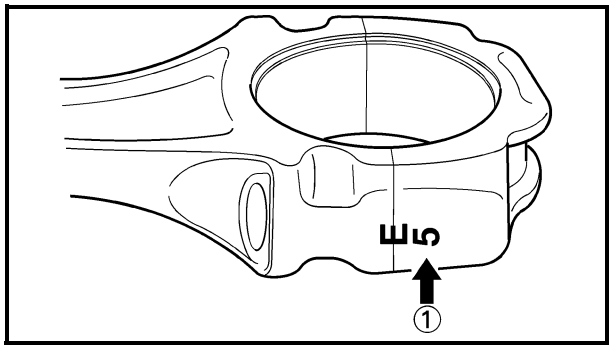
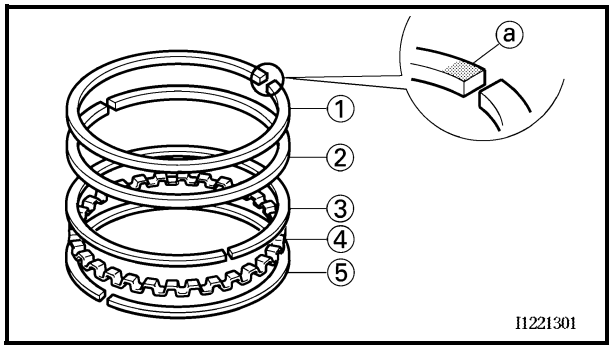










2. Select:
   - big end bearings (P1 ~ P4)

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_1" and the crankshaft web "P_1" numbers are "4" and "1" respectively, then the bearing size for "P1" is:

"P_1" (connecting rod) –
"P_1" (crankshaft) – 2 =
5 – 1 – 2 = 2 (black)

BIG END BEARING COLOR CODE	
–1	violet
0	white
1	blue
2	black

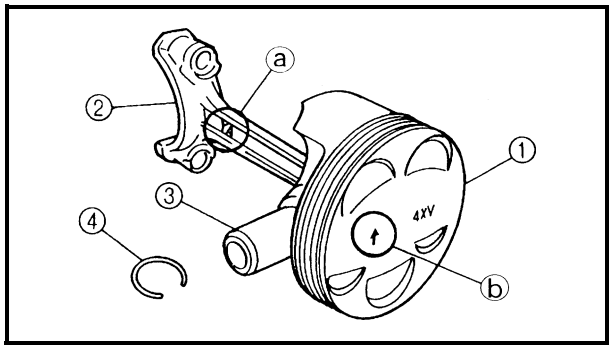
INSTALLING THE CONNECTING ROD AND PISTON

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 ⓐ face up.

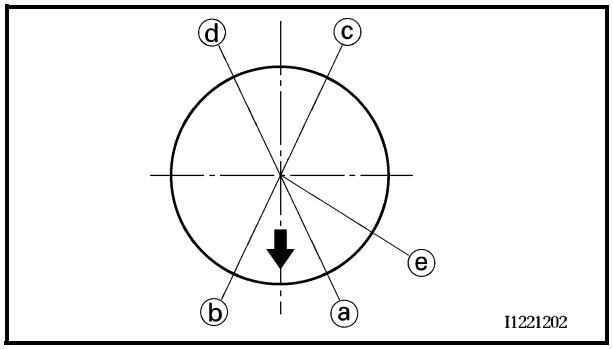


2. Install:
   - piston ①
     (onto the respective connecting rod ②)
   - piston pin ③
   - piston pin clip New ④

NOTE:
- Apply engine oil onto the piston pin.
- Make sure that the "Y" mark ⓐ on the connecting rod faces left when the arrow mark ⓑ 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

ⓐ Top ring
ⓑ Lower oil ring rail
ⓒ Upper oil ring rail
ⓓ 2nd ring
ⓔ Oil ring expander

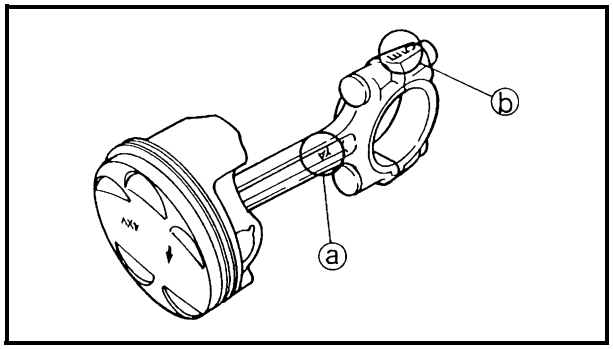
5. Lubricate:
   - crankshaft pins
   - big end bearings
   - connecting rod big end inner surface
     (with the recommended lubricant)

	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 ⓐ on the connecting rods face towards the left side of the crankshaft.
- Make sure that the characters ⓑ 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

	20 Nm (2.0m · kg, 14 ft · lb) + 120°

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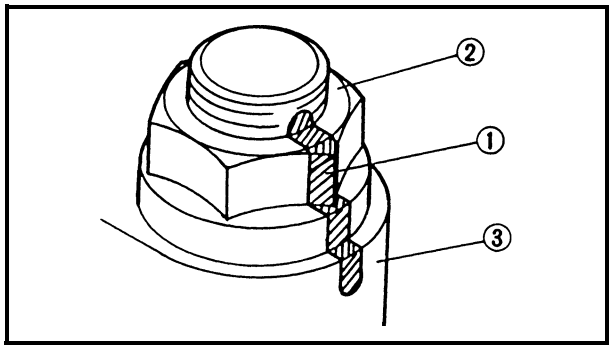
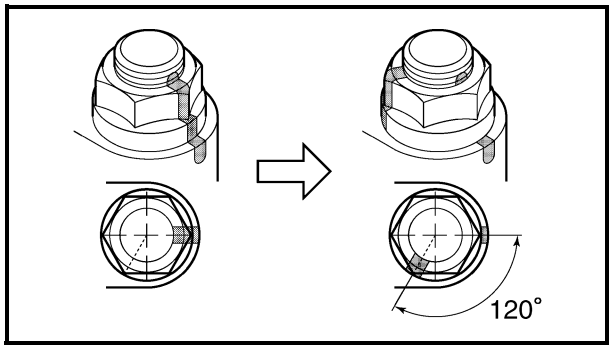
a. Replace the connecting rod bolts and nuts with new ones.

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 (120°).

⚠ 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.

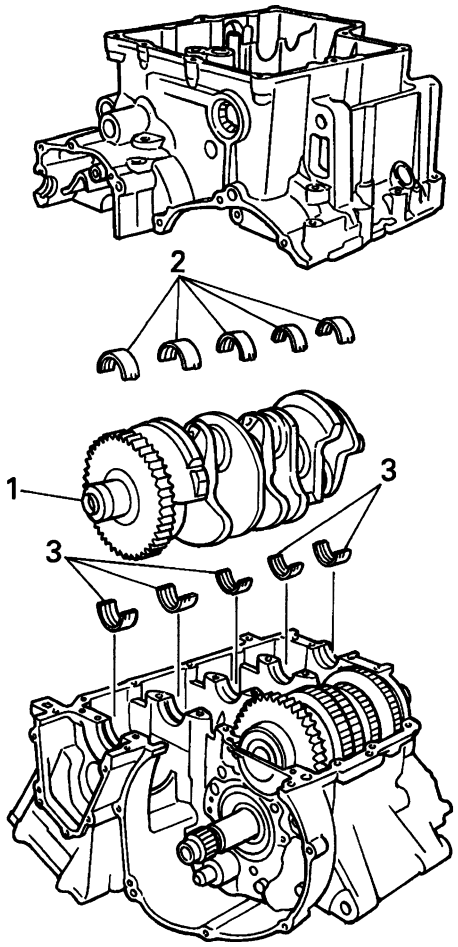
CAUTION:

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

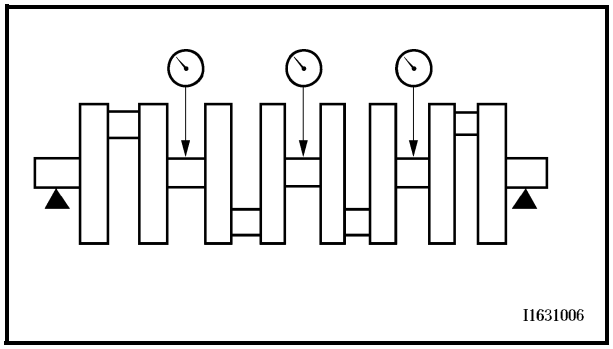
NOTE:

When using a hexagonal nut, note that the angle from one corner to another is 60°.

CRANKSHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft assembly		Remove the parts in the order listed.
	Crankcase		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
0.029 ~ 0.053 mm
(0.0011 ~ 0.0021 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.

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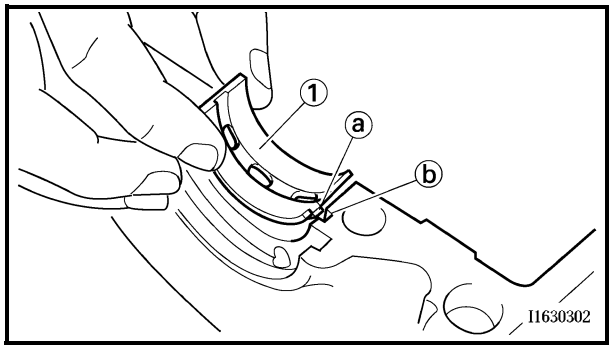
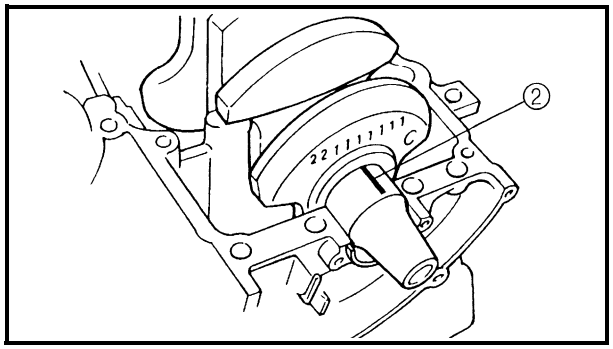
a. Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
b. Place the upper crankcase upside down on a bench.



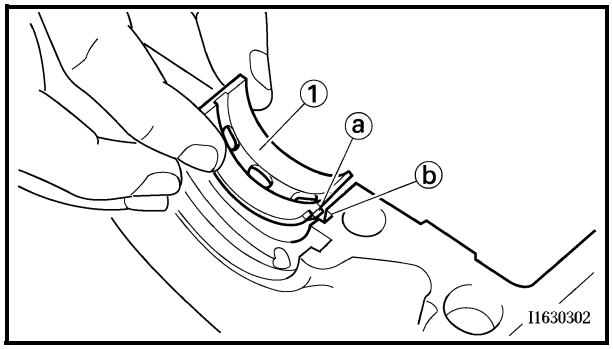
c. Install the crankshaft journal upper bearings ① and the crankshaft into the upper crankcase.

NOTE:
Align the projections ⓐ on the crankshaft journal upper bearings with the notches ⓑ in the upper crankcase.



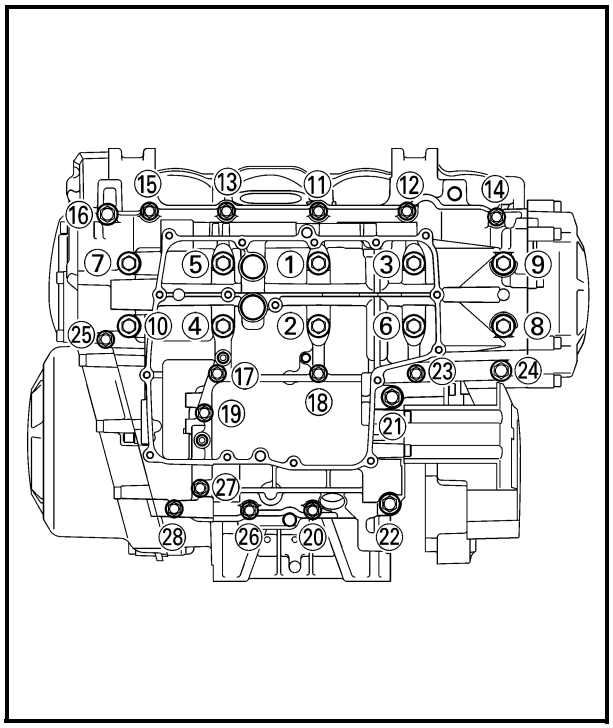
d. Put a piece of Plastigauge® ② on each crankshaft journal.

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.

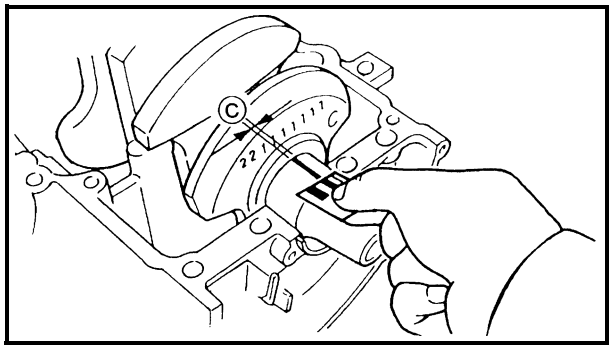
NOTE:
- Align the projections ⓐ of the crankshaft journal lower bearings with the notches ⓑ in the lower crankcase.
- Do not move the crankshaft until the clearance measurement has been completed.

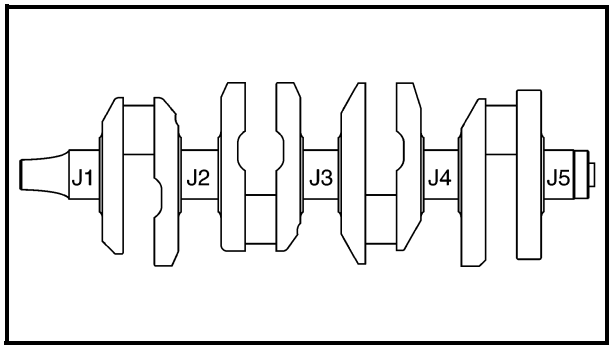


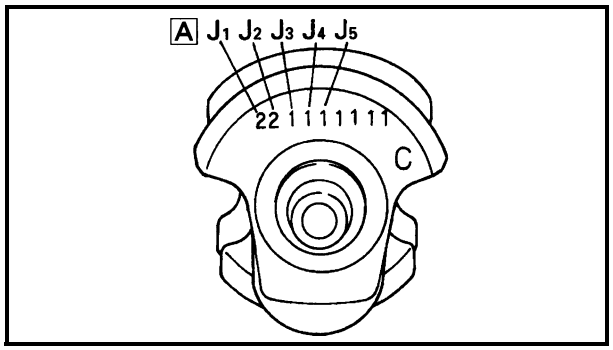
f. Tighten the bolts to specification in the tightening sequence cast on the crankcase.

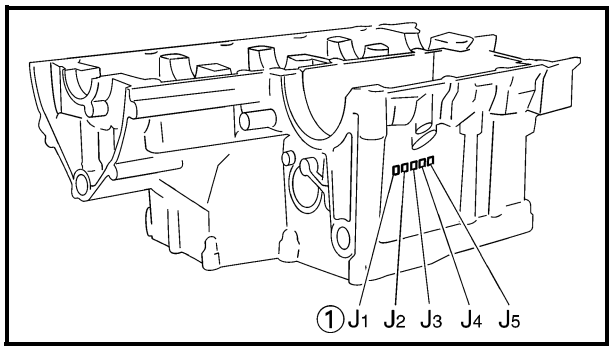
Crankcase bolt
Bolt ① ~ ⑩
1st: 20 Nm
(2.0 m · kg, 14 ft · lb)
2nd: 20 Nm
(2.0 m · kg, 14 ft · lb) +
41 ~ 46° or 32 Nm
(3.2 m · kg, 23 ft · lb)
Bolt ⑪ ~ ⑮, ⑰ ~ ⑳, ㉓, ㉕ ~ ㉘
12 Nm (1.2 m · kg, 8.7 ft · lb)
Bolt ⑯, ㉔
14 Nm (1.4 m · kg, 10 ft · lb)
Bolt ㉑ ~ ㉒
24 Nm (2.4 m · kg, 17 ft · lb)

NOTE:
Lubricate the crankcase bolt threads with engine oil.









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

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

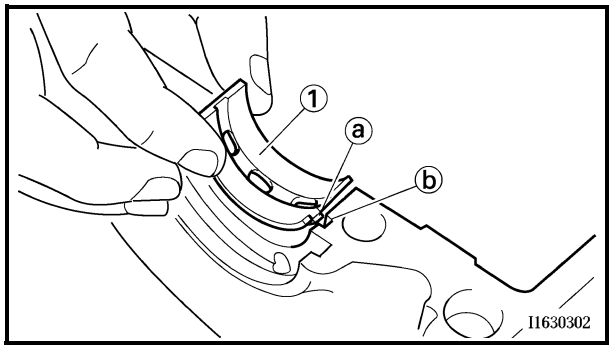
NOTE:

- The numbers Ⓐ 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_1 to J_5" one digit for that size is indicated. (Crankcase side only)

For example, if the crankcase "J_1" and crankshaft web "J_1" numbers are "6" and "2" respectively, then the bearing size for "J1" is:

"J_1" (crankcase) – "J_1" (crankshaft web) – 2 = 6 – 2 – 2 = 2 (black)

CRANKSHAFT JOURNAL BEARING COLOR CODE	
–1	violet
0	white
1	blue
2	black
3	brown



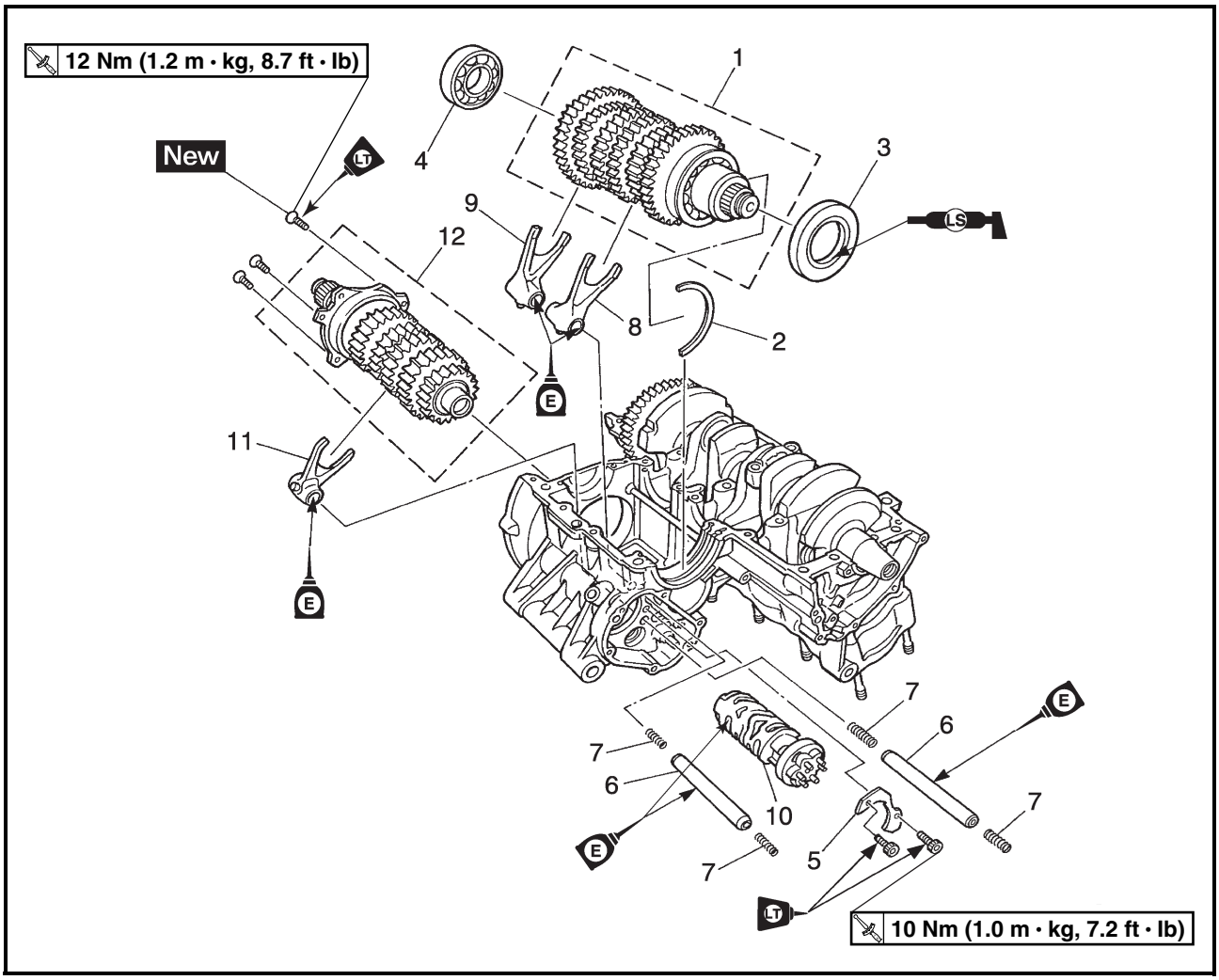
EAS00407
INSTALLING THE CRANKSHAFT

1. Install:
   - crankshaft journal upper bearings ①
     (into the upper crankcase)

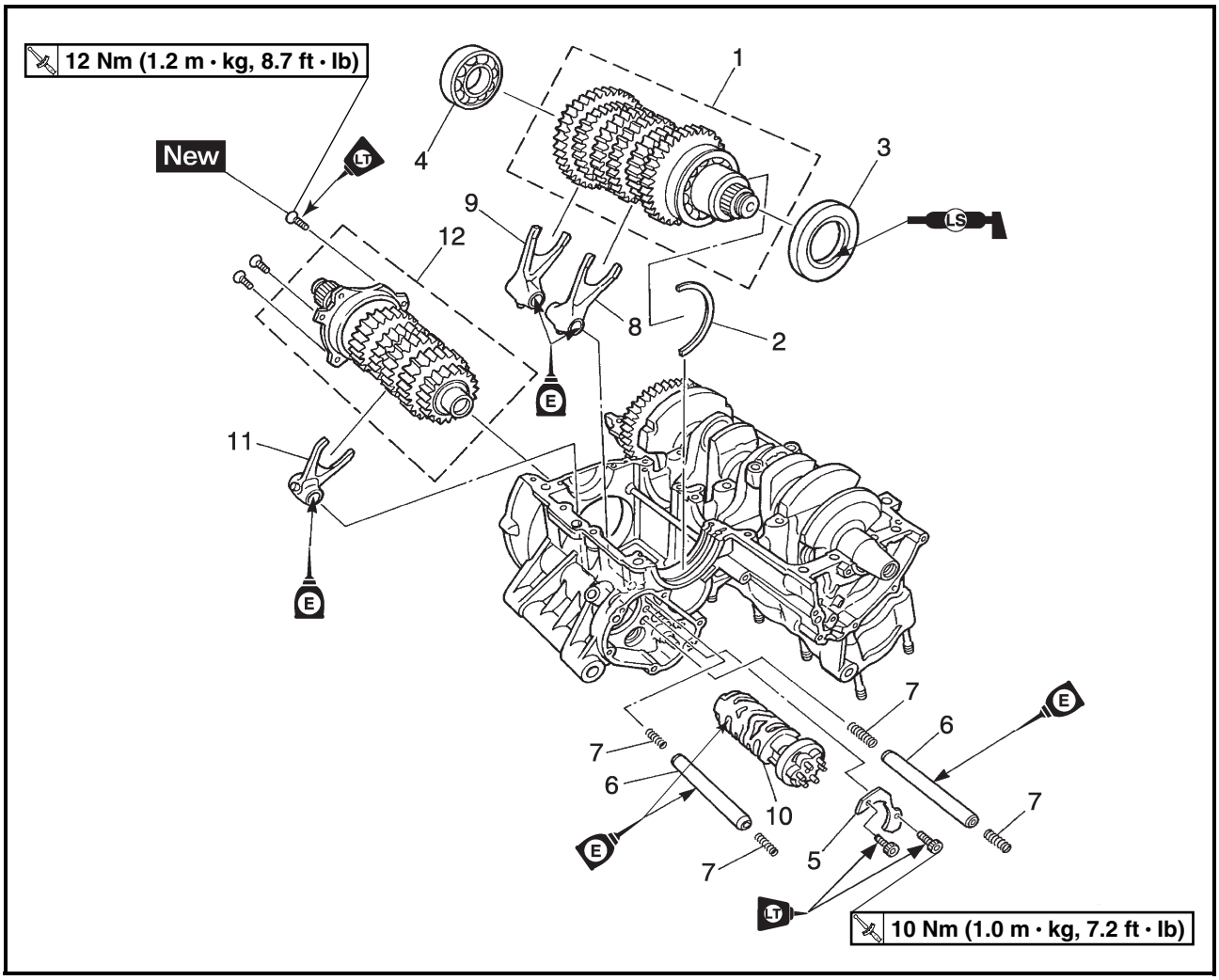
NOTE:
- Align the projections ⓐ on the crankshaft journal upper bearings with the notches ⓑ in the upper crankcase.
- Be sure to install each crankshaft journal upper bearing in its original place.

2. Install:
   - crankshaft

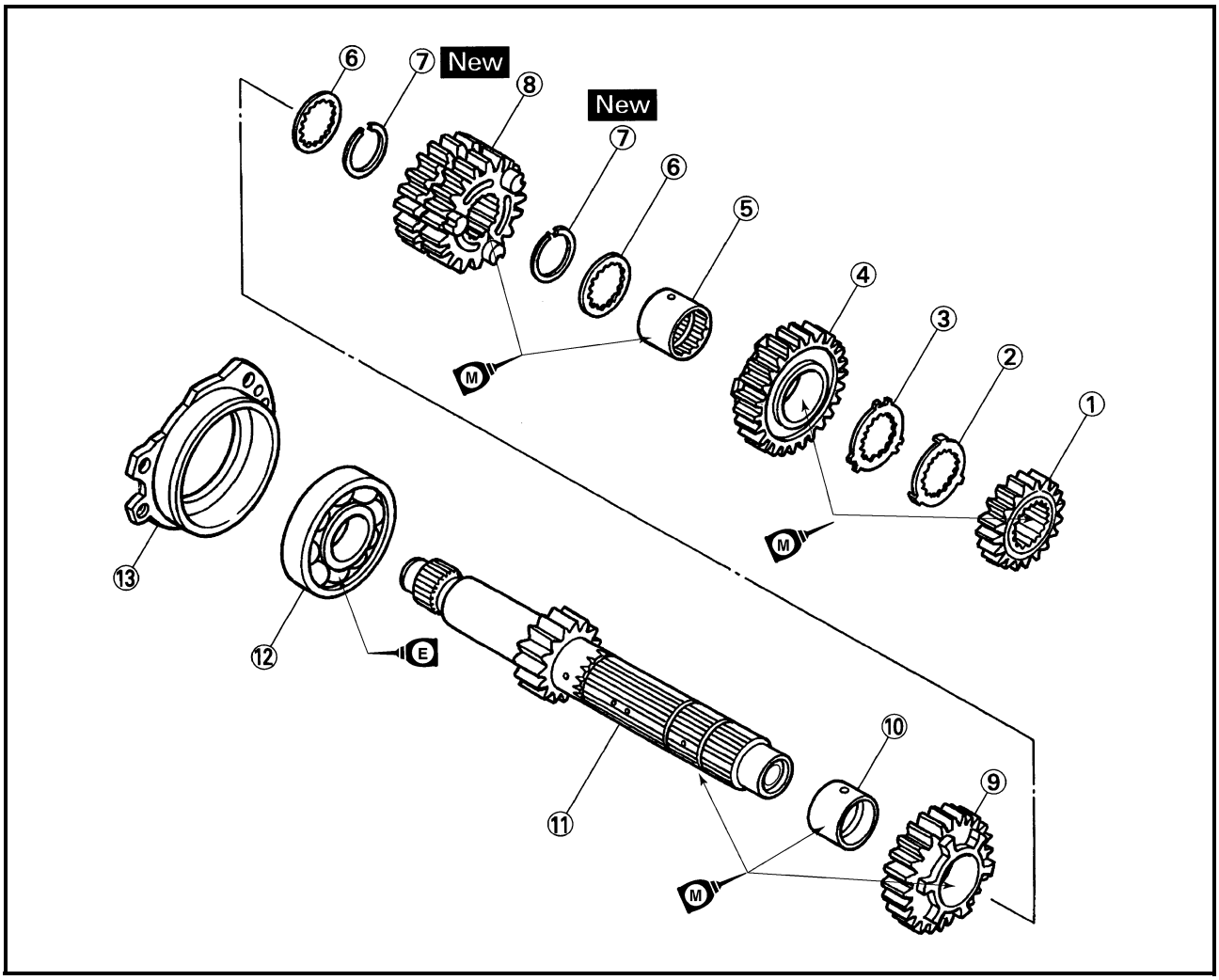
EAS00419
TRANSMISSION



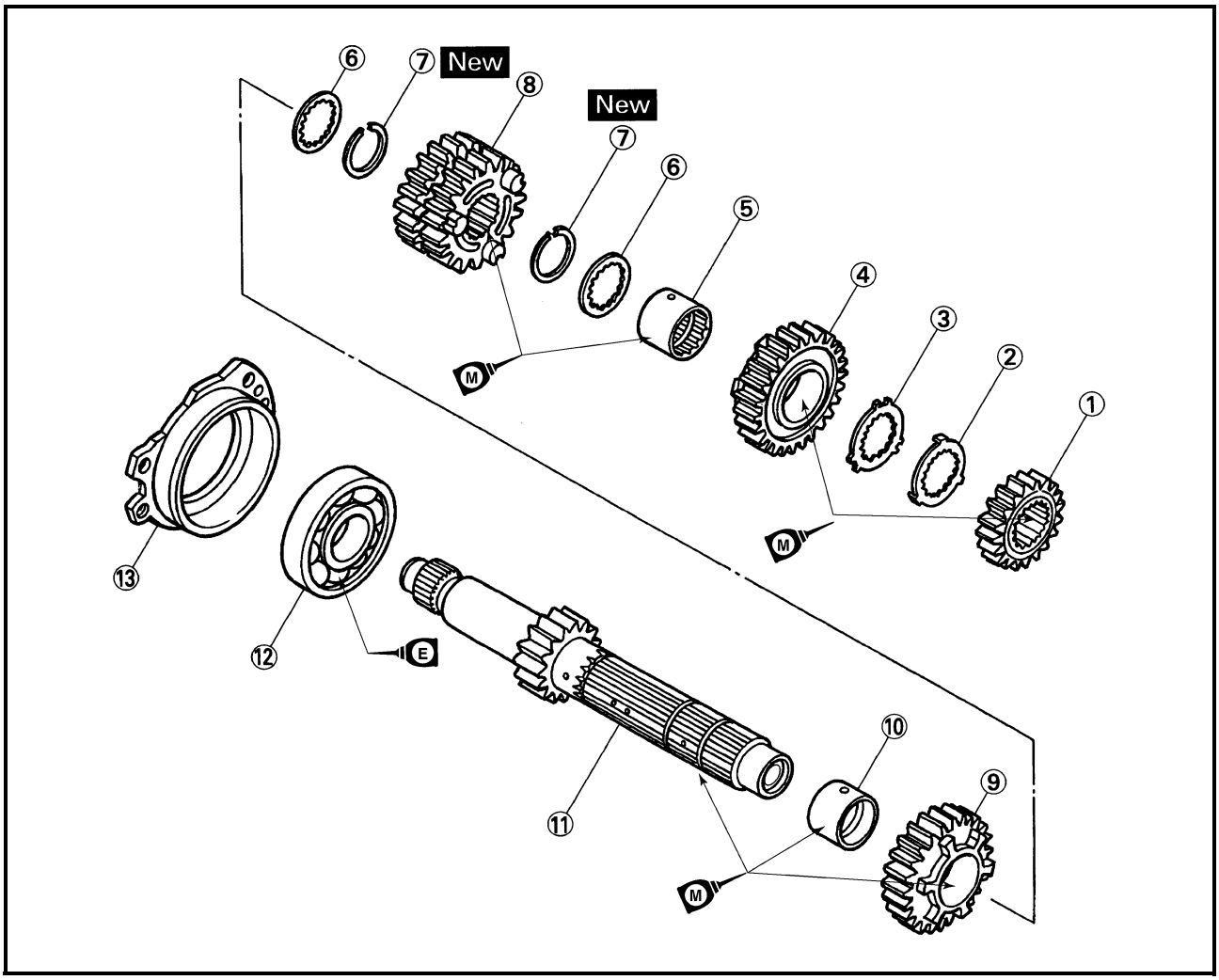
Order	Job/Part	Q'ty	Remarks
	Removing the transmission, shift drum assembly, and shift forks		Remove the parts in the order listed.
	Crankcase		Separate. Refer to "CRANKCASE".
	Stopper lever		Refer to "SHIFT SHAFT".
1	Drive axle assembly	1	
2	Circlip	1	
3	Oil seal	1	
4	Bearing	1	
5	Shift drum retainer	1	
6	Shift fork guide bar	2	
7	Spring	4	
8	Shift fork "L"	1	
9	Shift fork "R"	1	



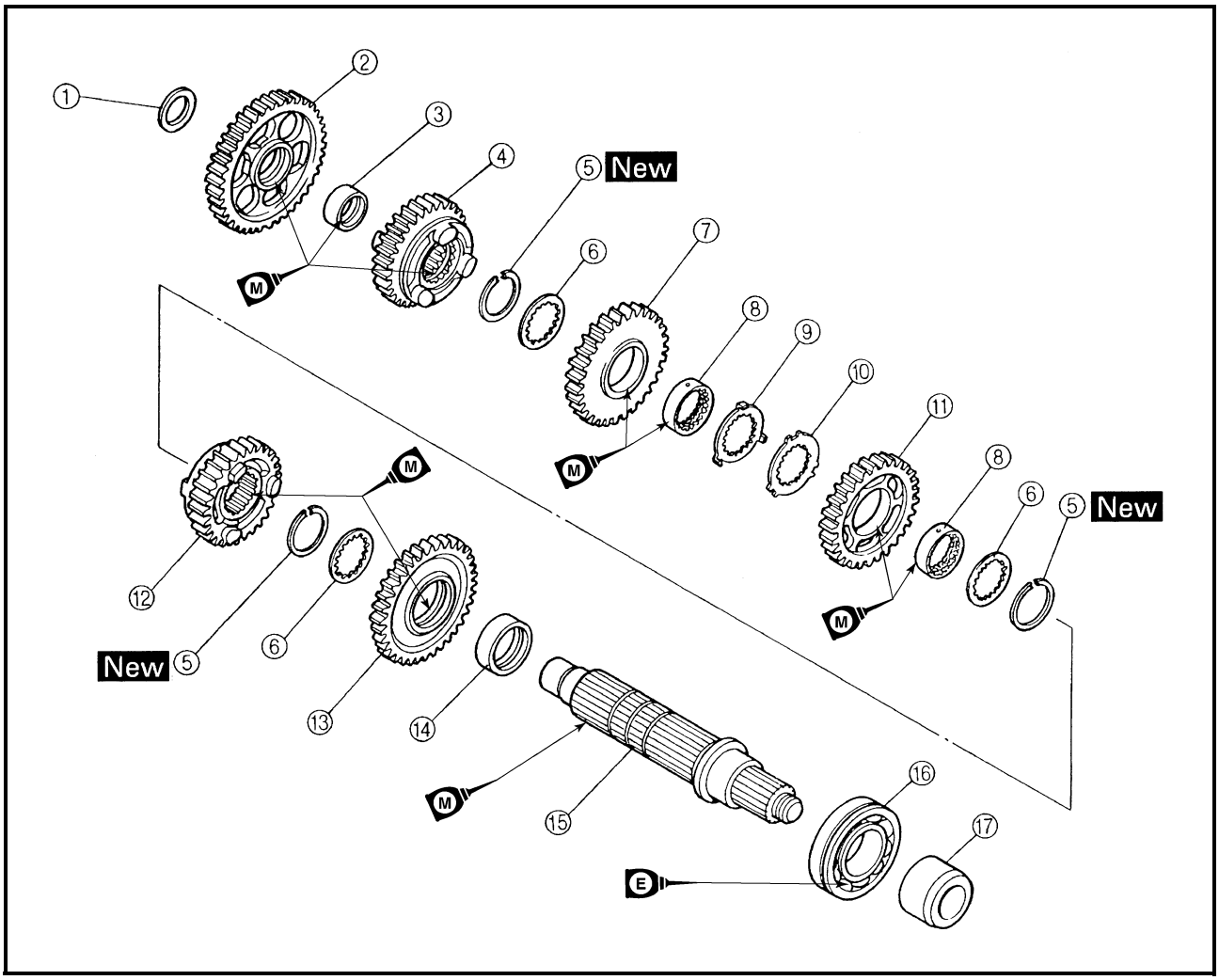
Order	Job/Part	Q'ty	Remarks
10	Shift drum assembly	1	
11	Shift fork "C"	1	
12	Main axle assembly	1	
			For installation, reverse the removal procedure.



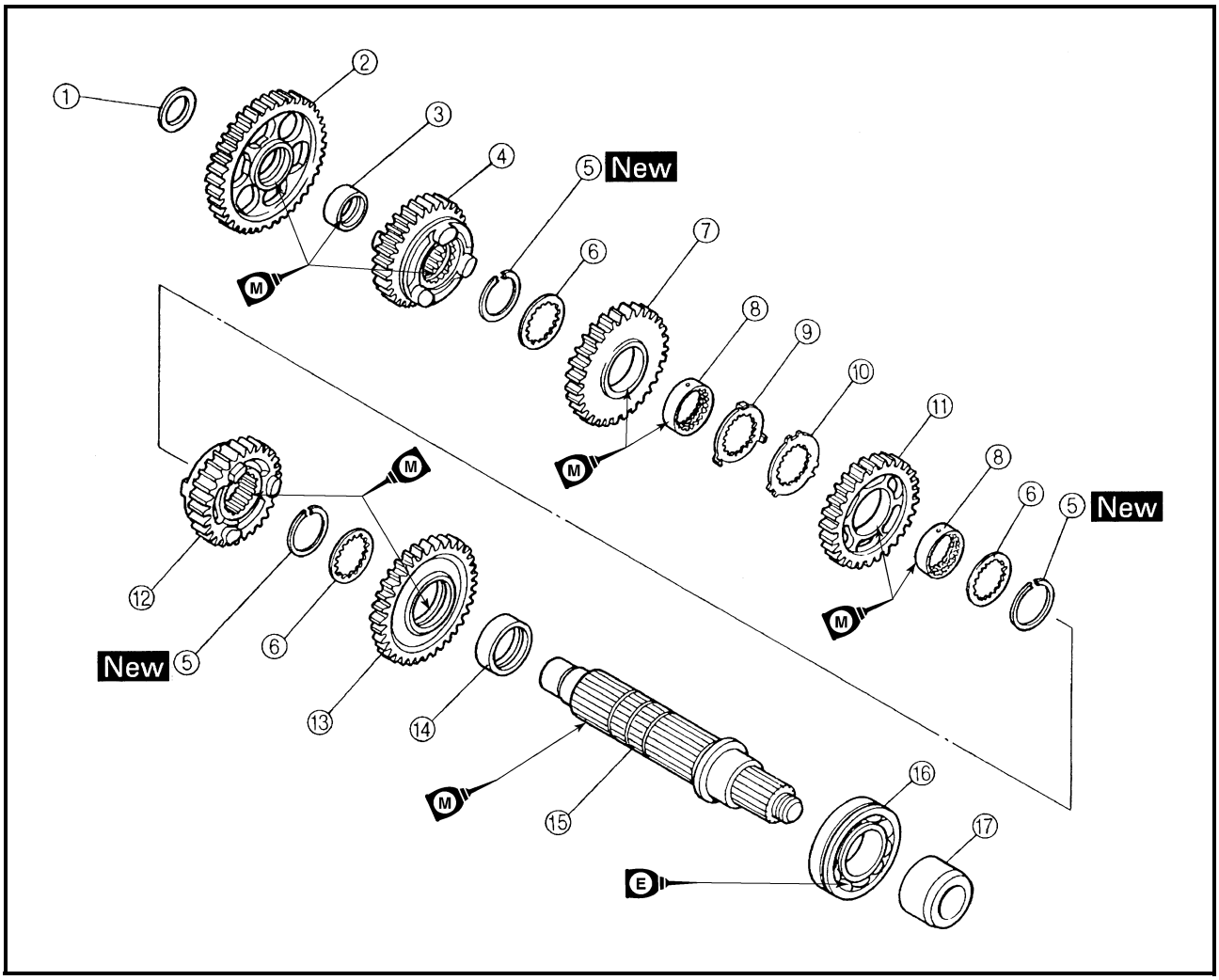
Order	Job/Part	Q'ty	Remarks
	Disassembling the main axle assembly		Disassembly the parts in the order listed.
①	2nd pinion gear	1	
②	Toothed lock washer	1	
③	Toothed lock washer retainer	1	
④	6th pinion gear	1	
⑤	Toothed spacer	1	
⑥	Toothed washer	2	
⑦	Circlip	2	
⑧	3rd/4th pinion gears	1	
⑨	5th pinion gear	1	
⑩	Collar	1	



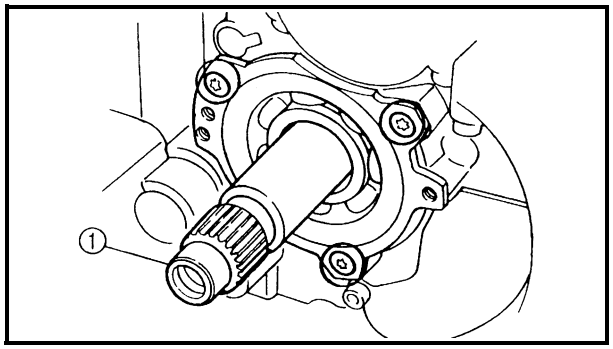
Order	Job/Part	Q'ty	Remarks
⑪	Main axle/1st pinion gear	1	
⑫	Bearing	1	
⑬	Main axle bearing housing	1	
			For assembly, reverse the disassembly procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the drive axle assembly		Disassembly the parts in the order listed.
①	Washer	1	
②	1st wheel gear	1	
③	Spacer	1	
④	5th wheel gear	1	
⑤	Circlip	3	
⑥	Washer	3	
⑦	3rd wheel gear	1	
⑧	Toothed spacer	2	
⑨	Toothed lock washer	1	
⑩	Toothed lock washer retainer	1	



Order	Job/Part	Q'ty	Remarks
⑪	4th wheel gear	1	
⑫	6th wheel gear	1	
⑬	2nd wheel gear	1	
⑭	Spacer	1	
⑮	Drive axle	1	
⑯	Bearing	1	
⑰	Spacer	1	
			For assembly, reverse the disassembly procedure.



EAS00420
REMOVING THE TRANSMISSION

1. Remove:
   - main axle assembly ①
     (with the Torx® wrench T30)

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

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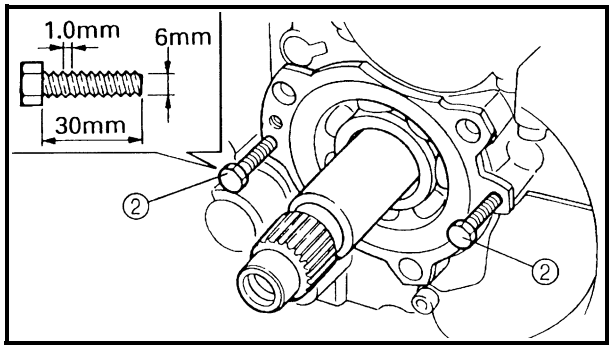
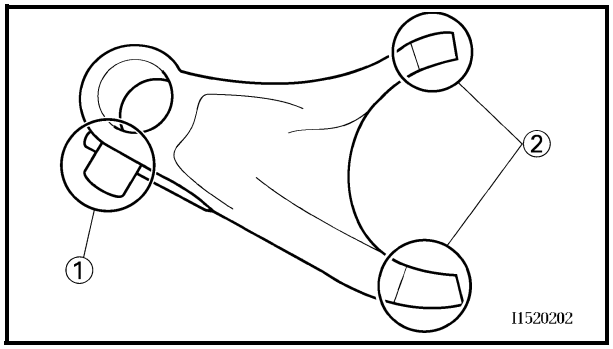
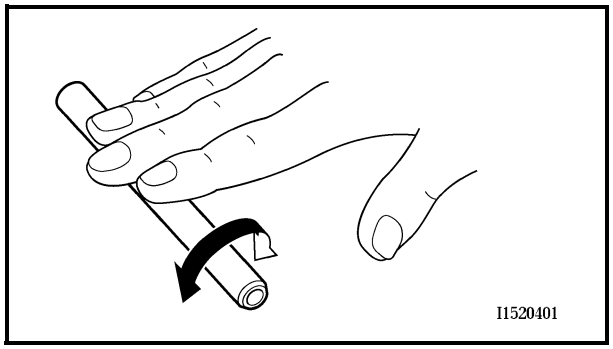




EAS00421
CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

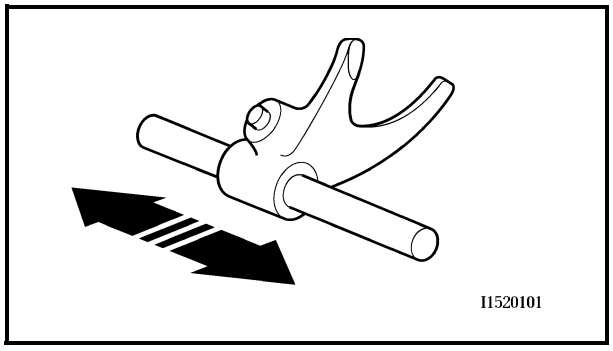
1. Check:
   - shift fork cam follower ①
   - shift fork pawl ②
     Bends/damage/scoring/wear → Replace the shift fork.



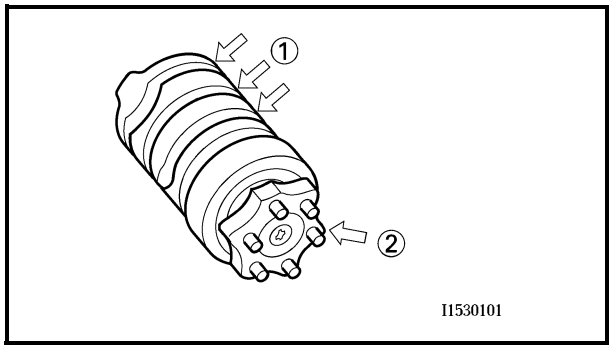
2. Check:
   - shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

⚠ WARNING

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

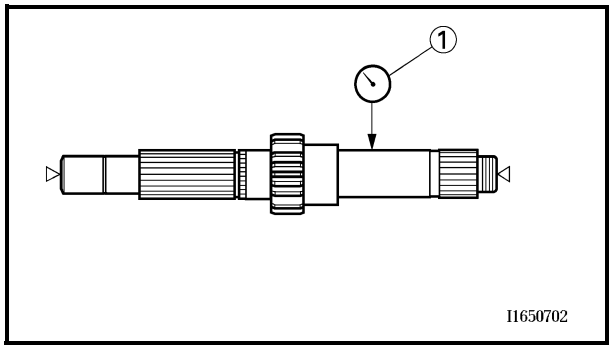


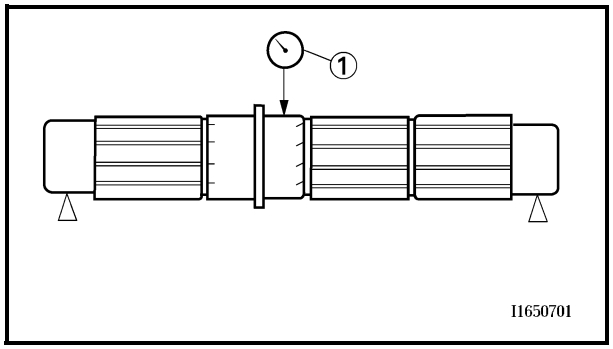
3. Check:
   - shift fork movement
     (along the shift fork guide bar)
     Rough movement → Replace the shift forks and shift fork guide bar as a set.

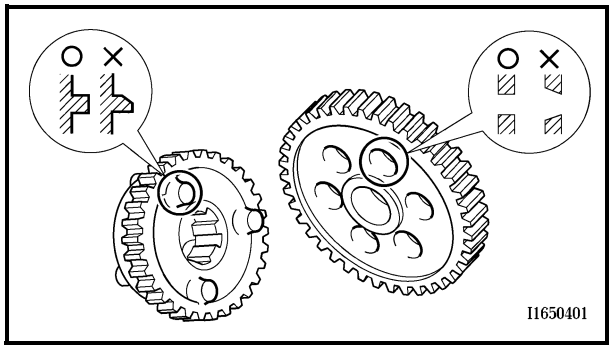


EAS00422
CHECKING THE SHIFT DRUM ASSEMBLY

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.







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 **0.08 mm (0.0031 in)**

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

	Drive axle runout limit **0.08 mm (0.0031 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.

EAS00428
INSTALLING THE TRANSMISSION

1. Install:
   • main axle assembly
   • shift fork “C”
   • shift drum assembly
   • shift fork “R”
   • shift fork “L”
   • springs
   • shift fork guide bars
   • drive axle assembly

NOTE:
- 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.
- 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 is inserted into the grooves in the upper crankcase.

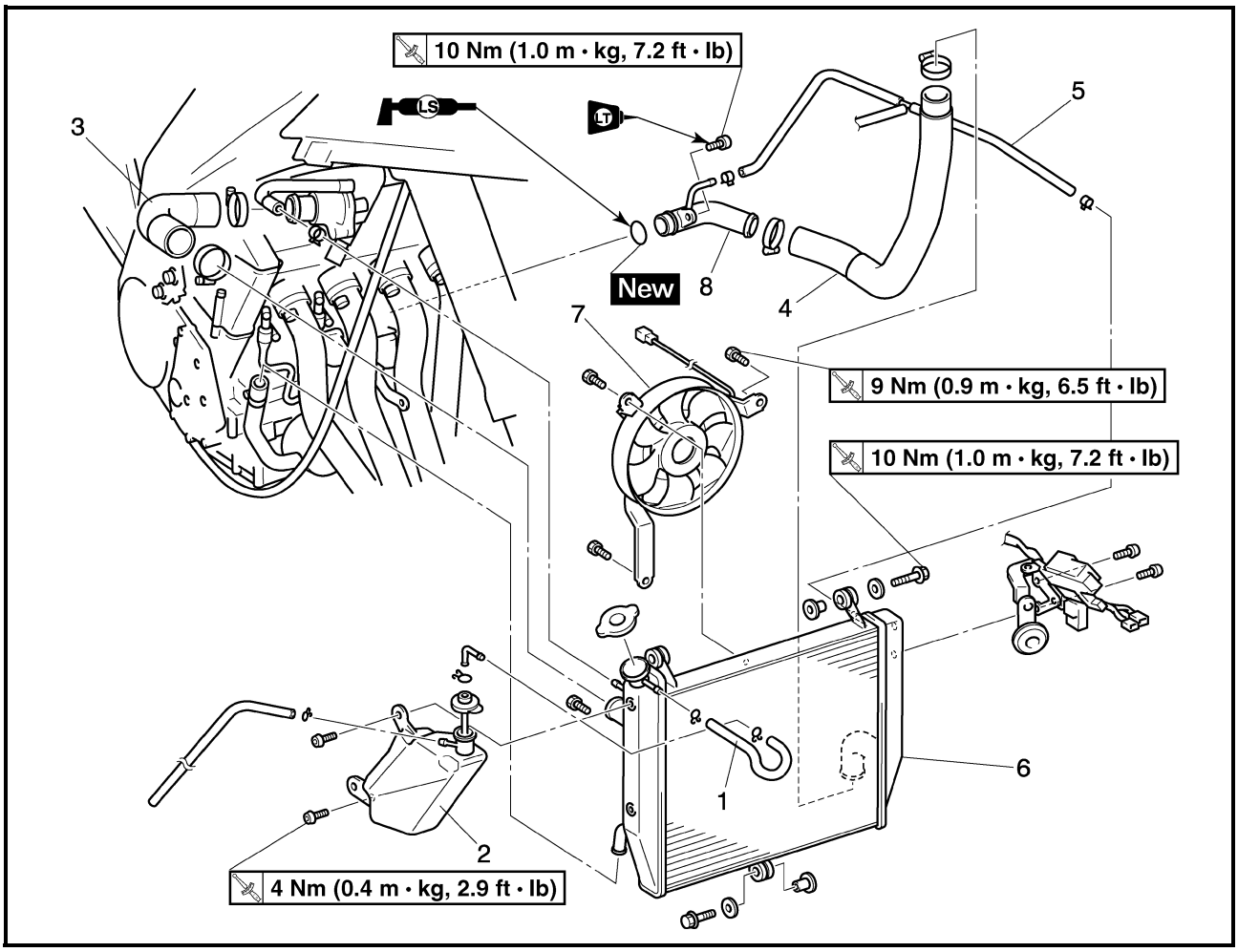
2. Check:
   • transmission
   Rough movement → Repair.

NOTE:
Oil each gear, shaft, and bearing thoroughly.

EAS00454

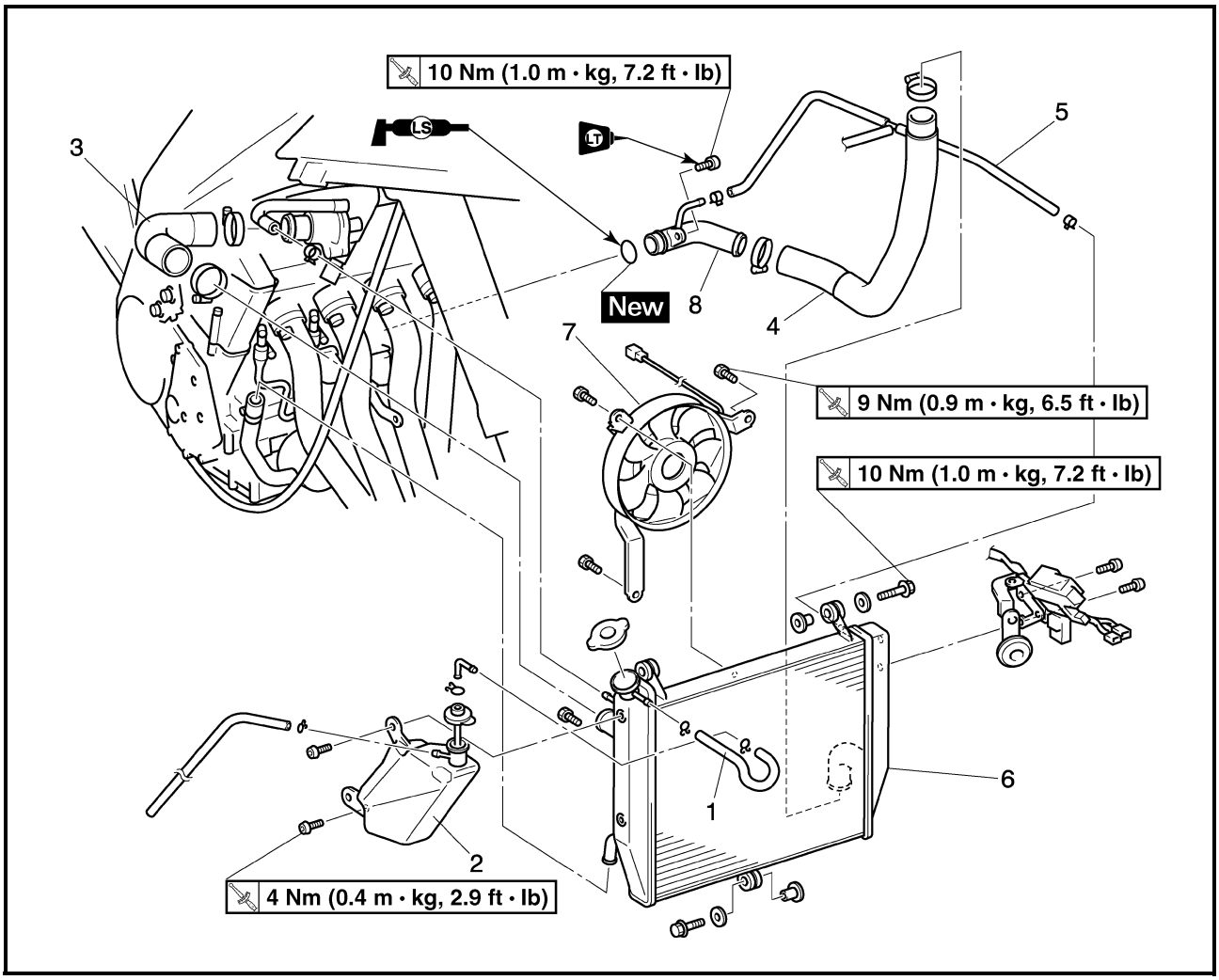
COOLING SYSTEM

RADIATOR

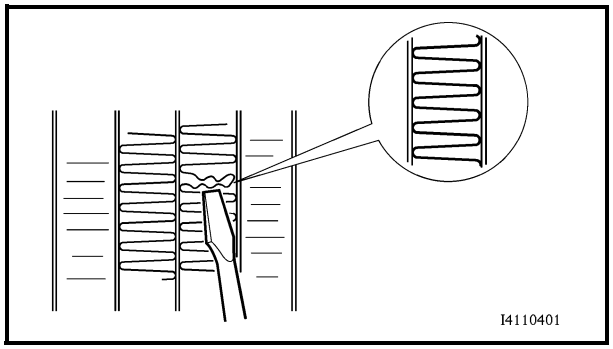


Order	Job/Part	Q'ty	Remarks
	Removing the radiator		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Air filter case and rubber cover		Refer to "AIR FILTER CASE" in chapter 3.
	Bottom cowling and side cowlings		Refer to "COWLINGS" in chapter 3.
	Drive sprocket cover		Refer to "ENGINE" in chapter 5.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Coolant reservoir hose	1	
2	Coolant reservoir	1	

6



Order	Job/Part	Q'ty	Remarks
3	Radiator inlet hose	1	
4	Radiator outlet hose	1	
5	Water pump breather hose	1	
6	Radiator	1	
7	Radiator fan	1	
8	Water pump inlet pipe	1	
			For installation, reverse the removal procedure.

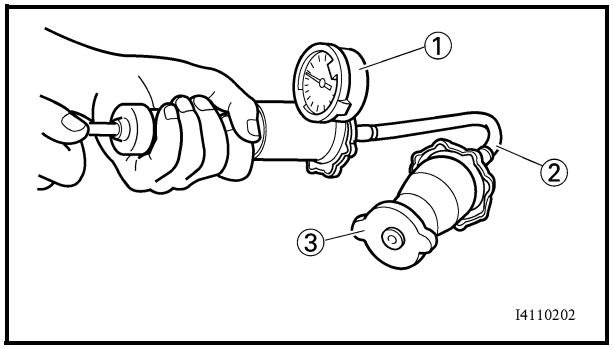


EAS00455
CHECKING THE RADIATOR

1. Check:
   - radiator fins
     Obstruction → Clean.
     Apply compressed air to the rear of the radiator.
     Damage → Repair or replace.

NOTE:
Straighten any flattened fins with a thin, flat-head screwdriver.

2. Check:
   - radiator hoses
   - radiator pipes
     Cracks/damage → Replace.



3. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.

Radiator cap opening pressure
95 ~ 125 kPa
(0.95 ~ 1.25 kg/cm², 13.8 ~ 18.1 psi)

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a. Install the radiator cap tester ① and radiator cap tester adapter ② to the radiator cap ③.

Radiator cap tester
YU-24460-01
Radiator cap tester adapter
YU-33984

b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.

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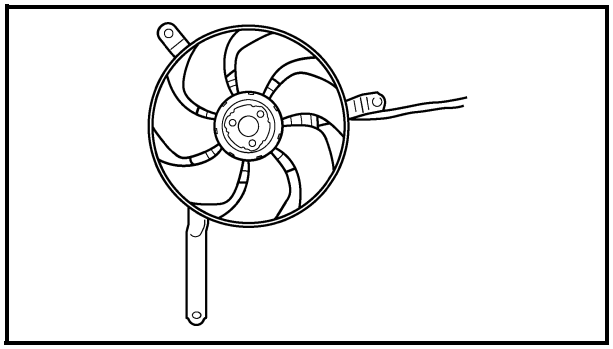
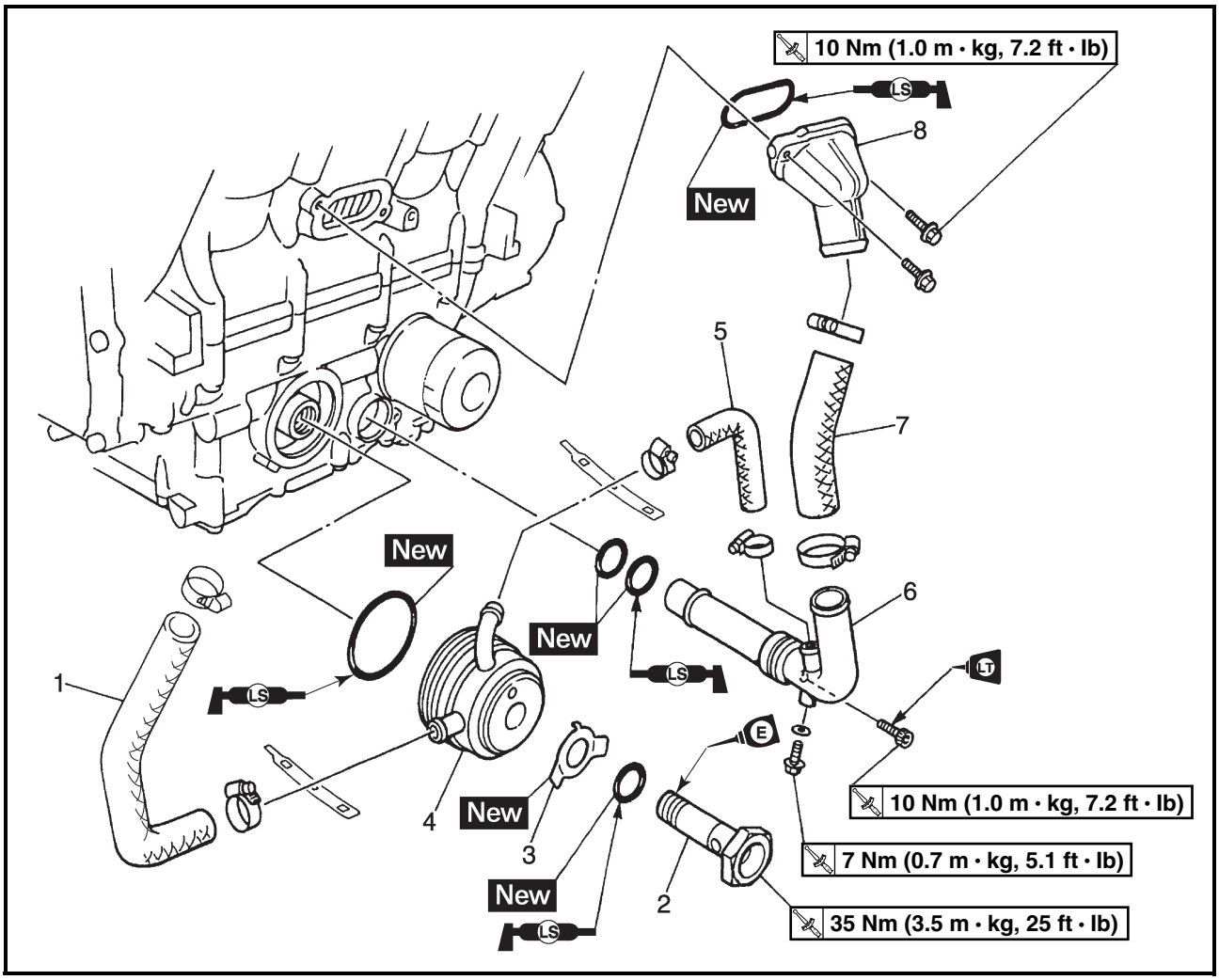


4. Check:
   - radiator fan
     Damage → Replace.
     Malfunction → Check and repair.
     Refer to “COOLING SYSTEM” in chapter 8.

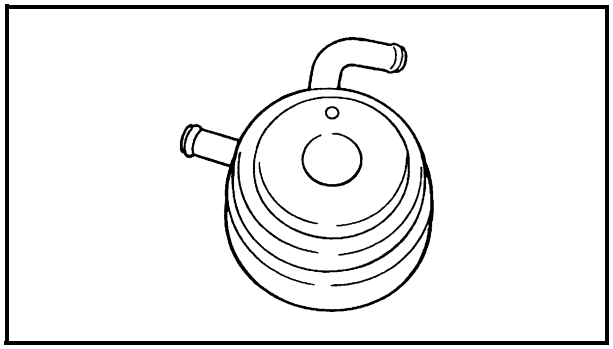
EAS00456
INSTALLING THE RADIATOR

1. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
2. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
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
	Removing the oil cooler		Remove the parts in the order listed.
	Radiator assembly		Refer to "RADIATOR".
	Exhaust pipe assembly		Refer to "ENGINE" in chapter 5.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Oil cooler outlet hose	1	
2	Bolt	1	
3	Lock washer	1	
4	Oil cooler	1	
5	Oil cooler inlet hose	1	
6	Water pump outlet pipe	1	
7	Water jacket joint inlet hose	1	
8	Water jacket joint	1	
			For installation, reverse the removal procedure.

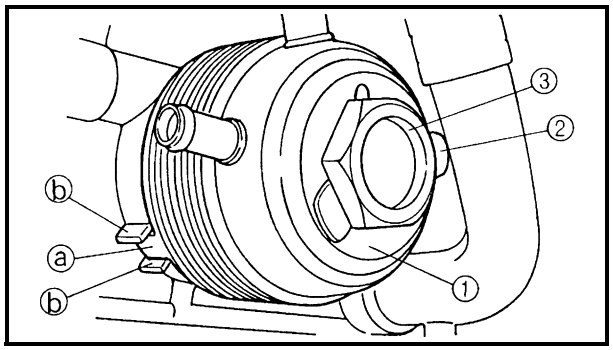


EAS00458
CHECKING THE OIL COOLER

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

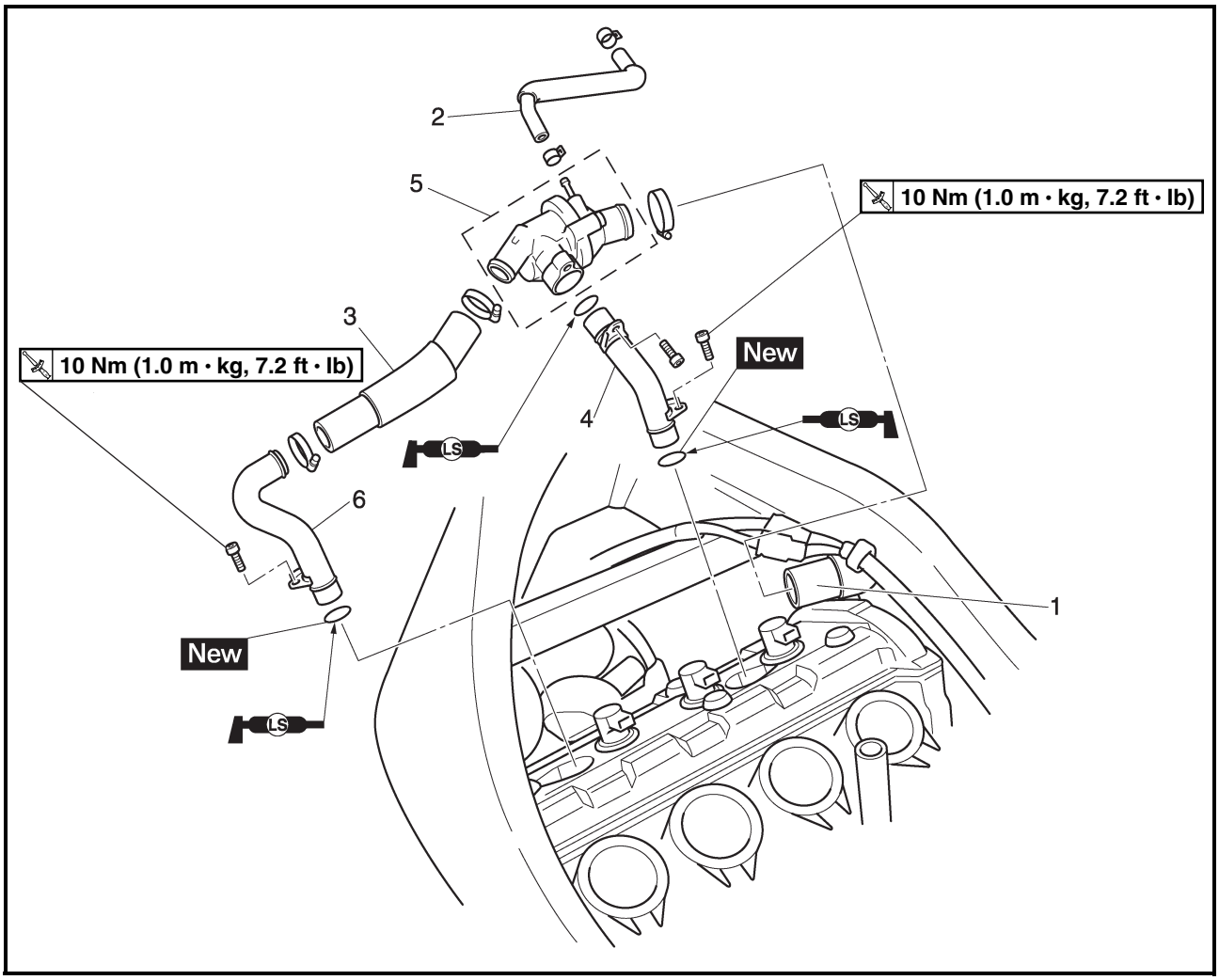
1. Clean:
   - mating surfaces of the oil cooler and the crankcase
     (with a cloth dampened with lacquer thinner)
2. Install:
   - O-ring New
   - oil cooler ①
   - lock washer ② New
   - bolt ③



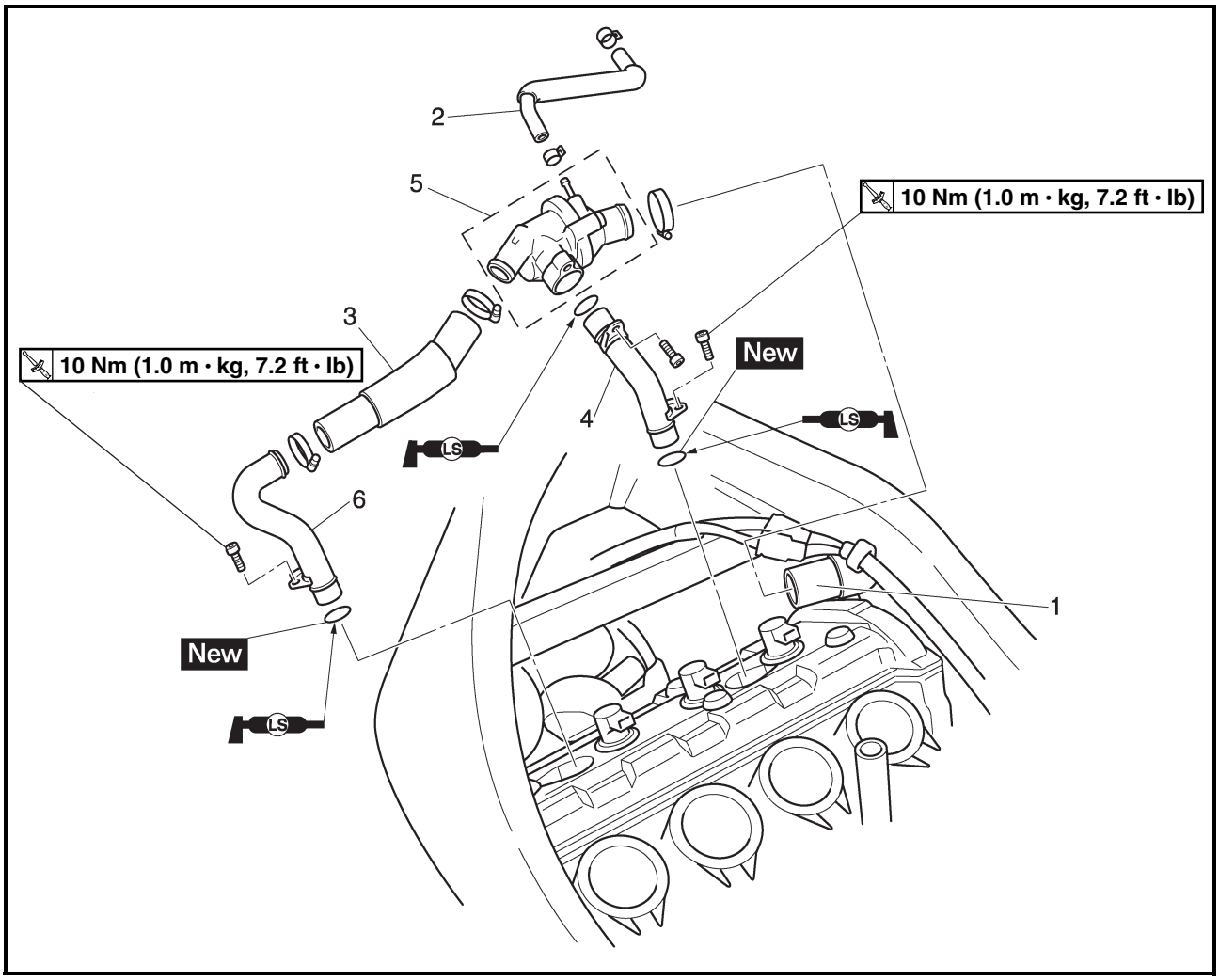
NOTE:
- Before installing the oil cooler, lubricate the oil cooler bolt and O-ring with a thin coat of engine oil.
- Make sure the O-ring is positioned properly.
- Align the projection ⓐ on the oil cooler with the slot ⓑ in the crankcase.

3. Bend the lock washer tab along a flat side of the bolt.
4. 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.
5. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
6. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR”.

EAS00460
THERMOSTAT

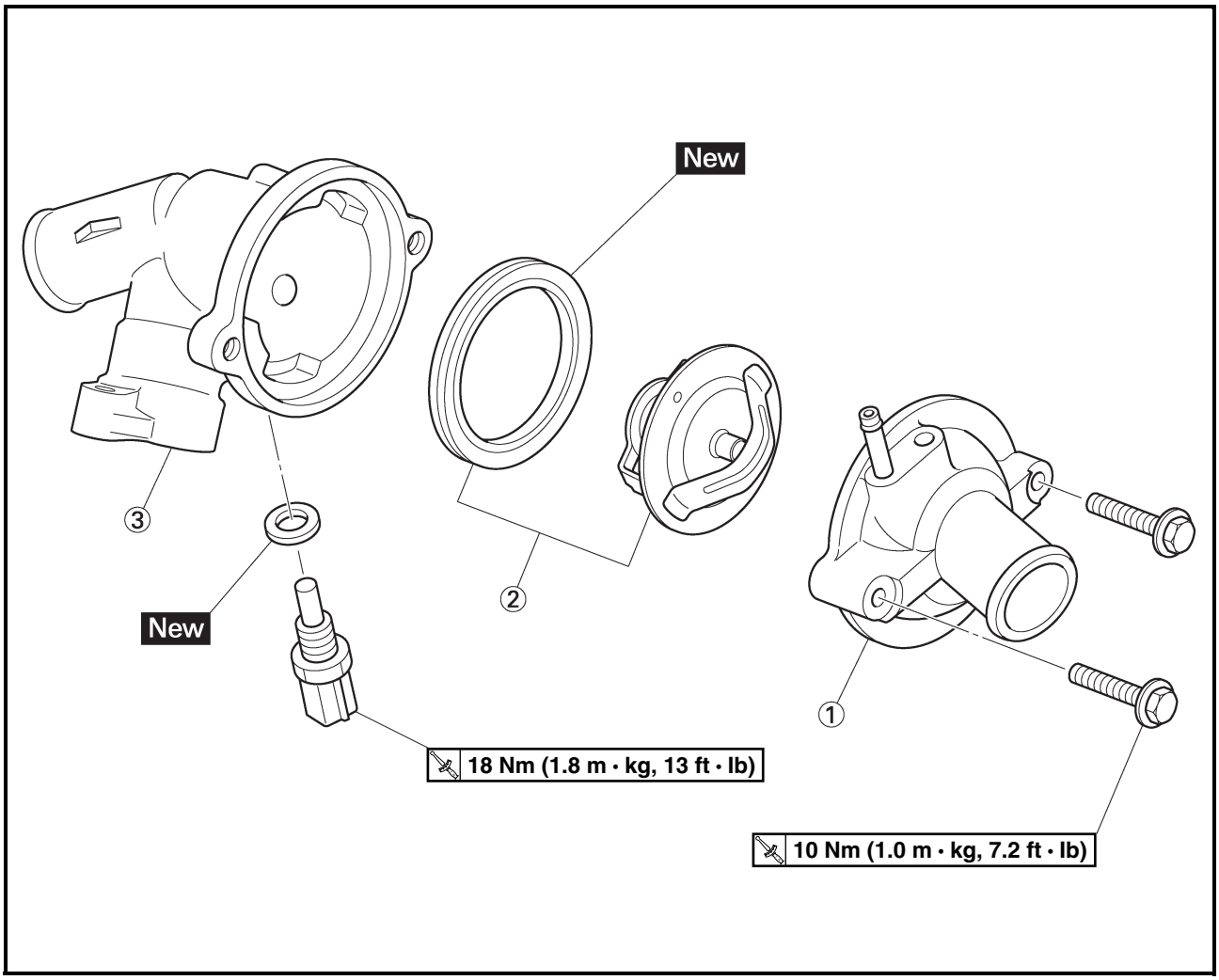


Order	Job/Part	Q'ty	Remarks
	Removing the thermostat assembly		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Air filter case and rubber cover		Refer to "AIR FILTER CASE" in chapter 3.
	Throttle body assembly		Refer to "THROTTLE BODIES" in chapter 7.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator inlet hose	1	
2	Thermostat assembly breather hose	1	
3	Thermostat assembly inlet hose (left)	1	
4	Thermostat assembly inlet pipe (right)	1	

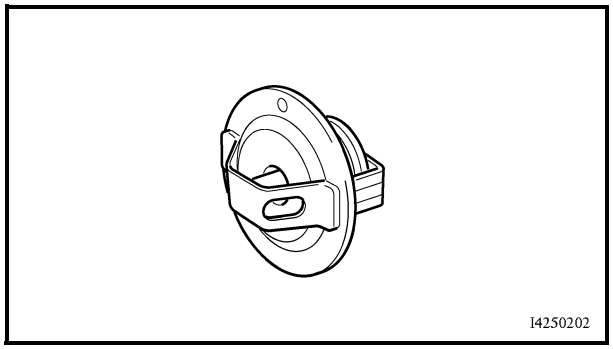


Order	Job/Part	Q'ty	Remarks
5	Thermostat assembly	1	
6	Thermostat assembly inlet pipe (left)	1	For installation, reverse the removal procedure.

EAS00461



Order	Job/Part	Q'ty	Remarks
	Disassembling the thermostat housing		Remove the parts in the order listed.
①	Thermostat housing cover	1	
②	Thermostat	1	
③	Thermostat housing	1	
			For assembly, reverse the disassembly procedure.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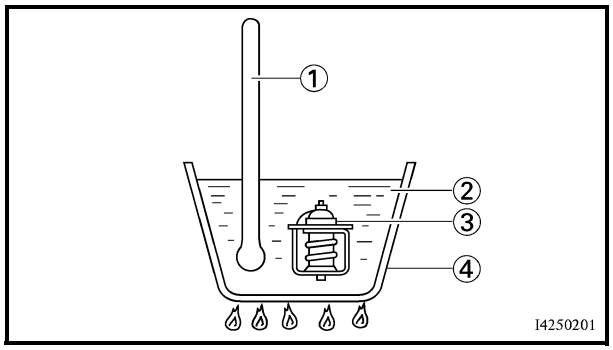

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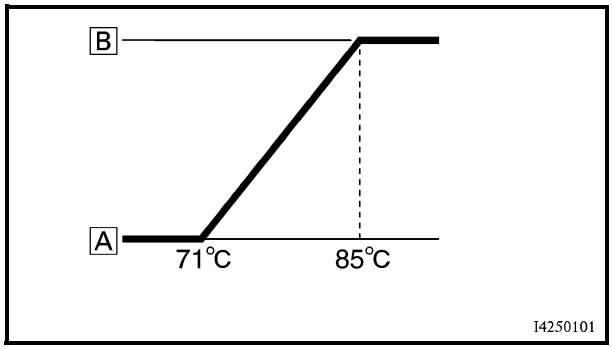

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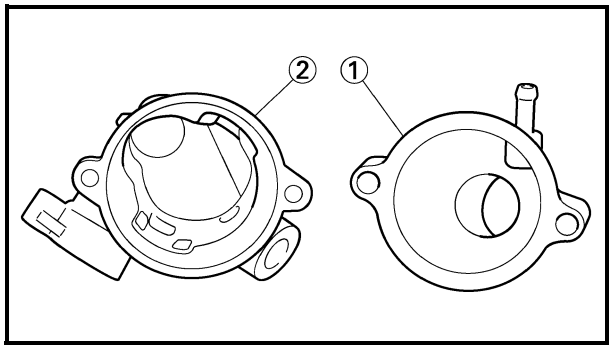

EAS00462
CHECKING THE THERMOSTAT

1. Check:
   - thermostat
     Does not open at 71 ~ 85 °C (160 ~ 185 °F)
     → Replace.

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a. Suspend the thermostat in a container filled with water.
b. Slowly heat the water.
c. Place a thermometer in the water.
d. While stirring the water, observe the thermostat and thermometer's indicated temperature.

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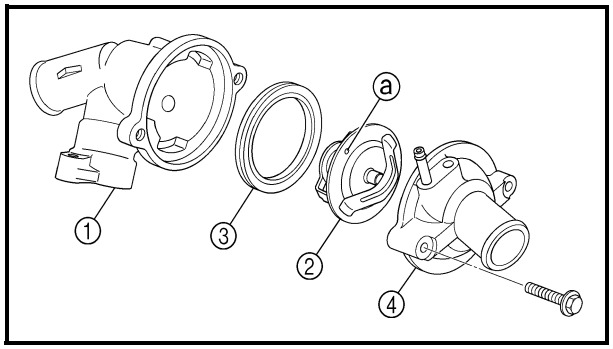
① Thermometer
② Water
③ Thermostat
④ Container
A Fully closed
B Fully open

NOTE:

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

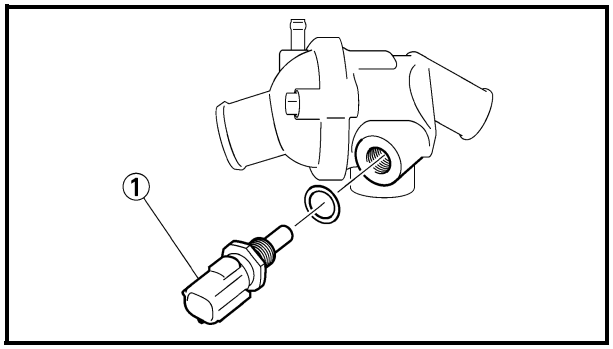
2. Check:
   - thermostat housing cover ①
   - thermostat housing ②
     Cracks/damage → Replace.



EAS00464
ASSEMBLING THE THERMOSTAT ASSEMBLY

1. Install:
   - thermostat housing ①
   - thermostat ②
   - O-ring New ③
   - thermostat housing cover ④

NOTE:
Install the thermostat with its breather hole ⓐ facing up.



2. Install:
   - coolant temperature sensor ①

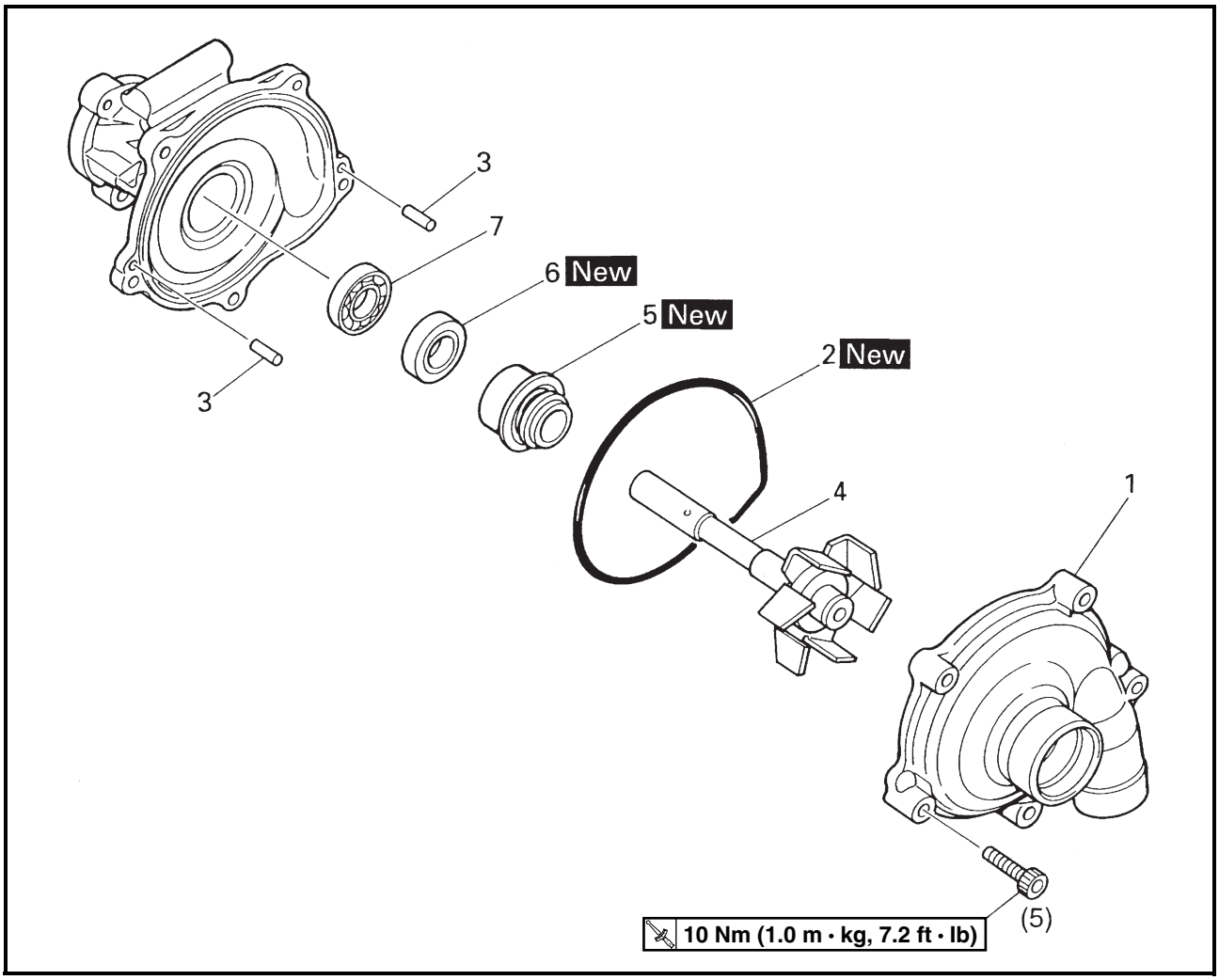
18 Nm (1.8 m · kg, 13 ft · lb)

CAUTION:
Use extreme care when handling the thermo switch and temperature sender. Replace any part that was dropped or subjected to a strong impact.

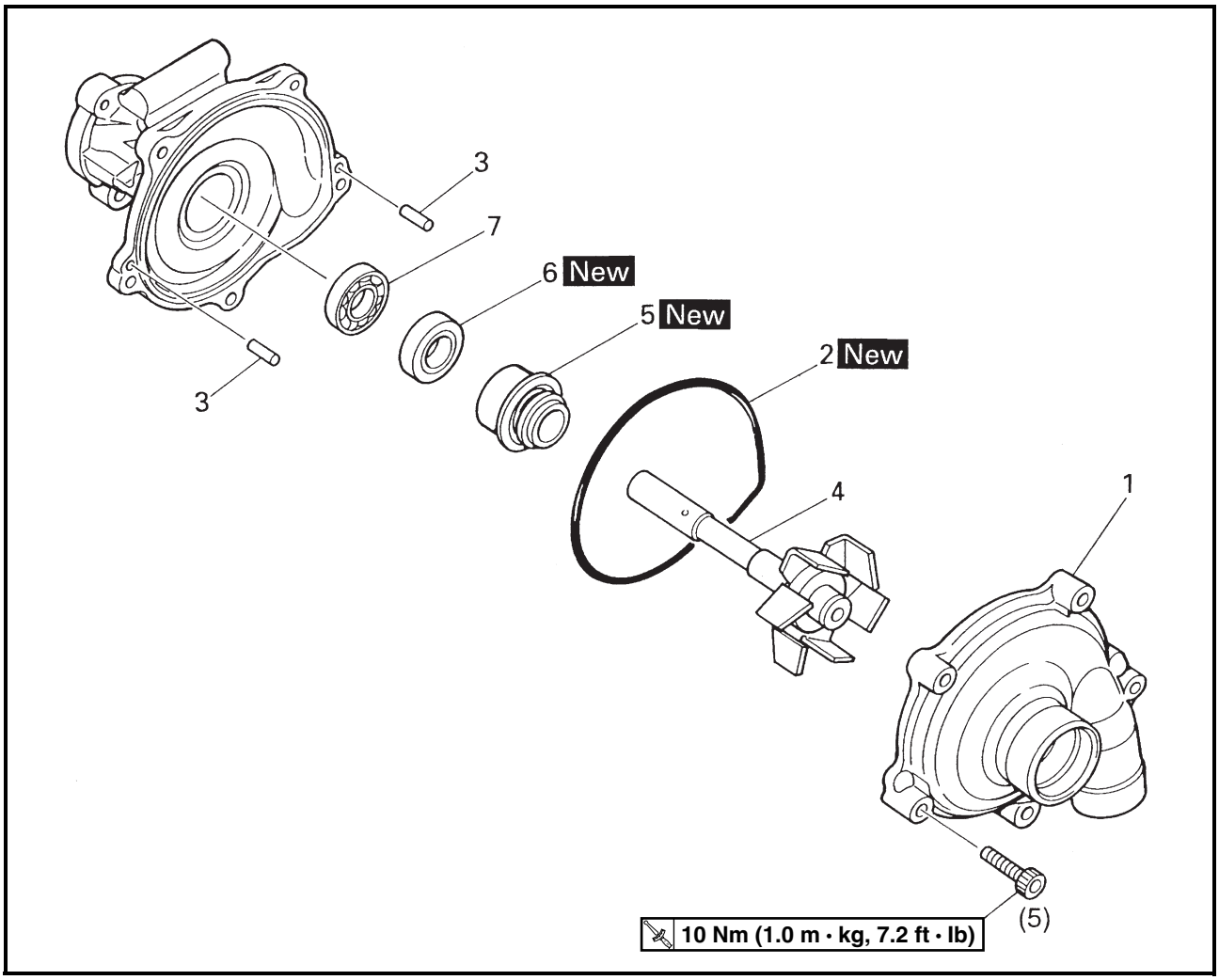
EAS00466
INSTALLING THE THERMOSTAT ASSEMBLY

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".

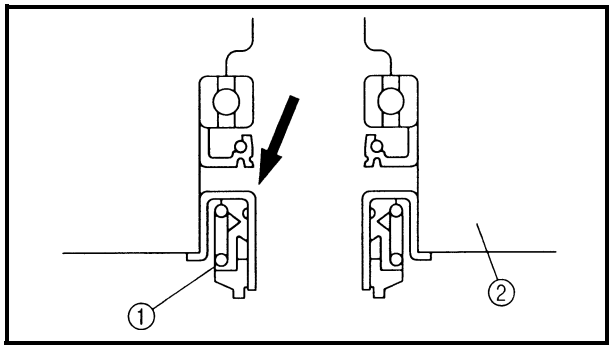
EAS00468
WATER PUMP



Order	Job/Part	Q'ty	Remarks
	Removing the impeller shaft		Remove the parts in the order listed. **NOTE:** • The water pump and oil pump are combined into one unit (oil/water pump assembly). • It is not necessary to remove the impeller shaft unless the coolant level is extremely low or coolant leaks from the oil pan.
	Oil/water pump assembly and oil pump rotor		Refer to "OIL PAN AND OIL PUMP" in chapter 5.
1	Water pump cover	1	
2	O-ring	1	
3	Pin	2	
4	Impeller shaft (along with the impeller)	1	



Order	Job/Part	Q'ty	Remarks
5	Water pump seal	1	
6	Oil seal	1	
7	Bearing	1	
			For installation, reverse the removal procedure.

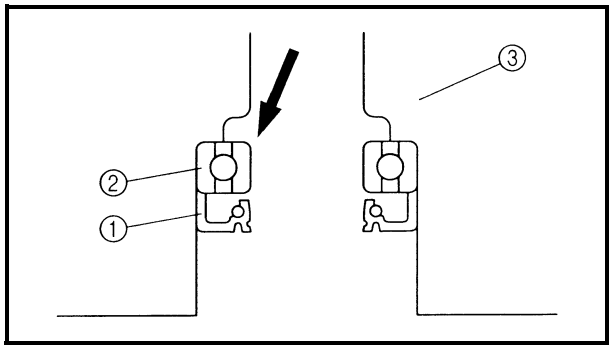


EAS00471
DISASSEMBLING THE WATER PUMP

1. Remove:
   • water pump seal ①

NOTE:
Tap out the water pump seal from the inside of the water pump housing.

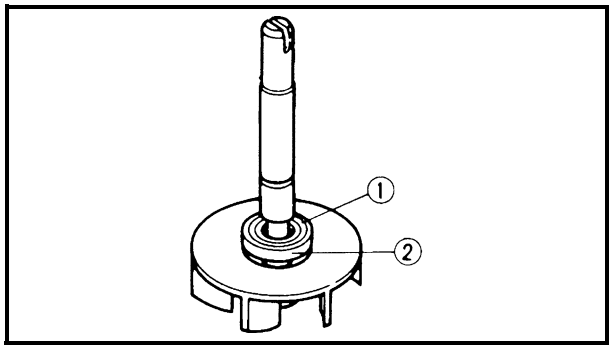
② Water pump housing



2. Remove:
   • oil seal ①
   • bearing ②

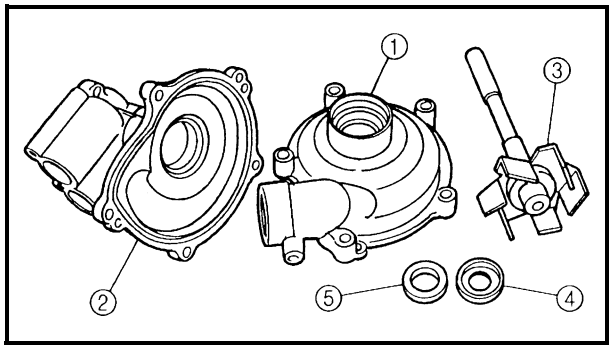
NOTE:
Tap out the bearing and oil seal from the outside of the water pump housing.

③ Water pump housing



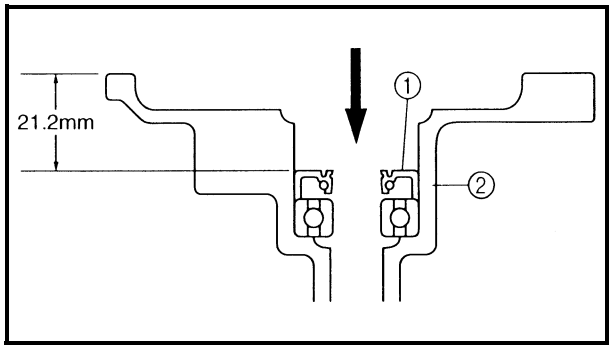
3. Remove:
   • rubber damper holder ①
   • rubber damper ②
     (from the impeller, with a thin, flat-head screwdriver)

NOTE:
Do not scratch the impeller shaft.



EAS00473
CHECKING THE WATER PUMP

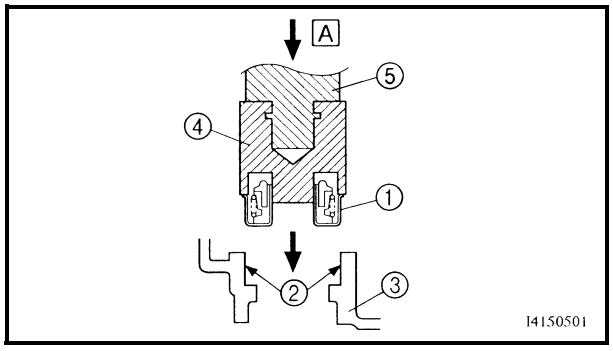
1. Check:
   • water pump housing cover ①
   • water pump housing ②
   • impeller ③
   • rubber damper ④
   • rubber damper holder ⑤
   • water pump seals
   • oil seal
     Cracks/damage/wear → Replace.
2. Check:
   • bearing
     Rough movement → Replace.
3. Check:
   • water pump outlet pipe
     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

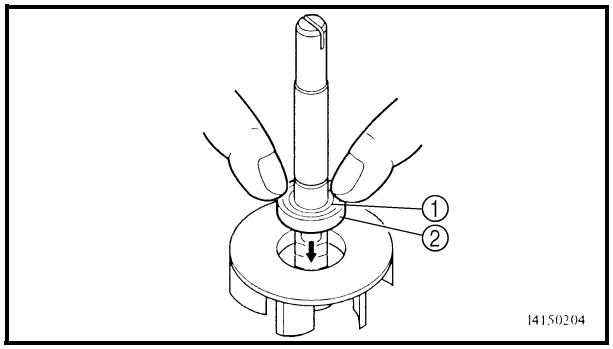
CAUTION:

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.

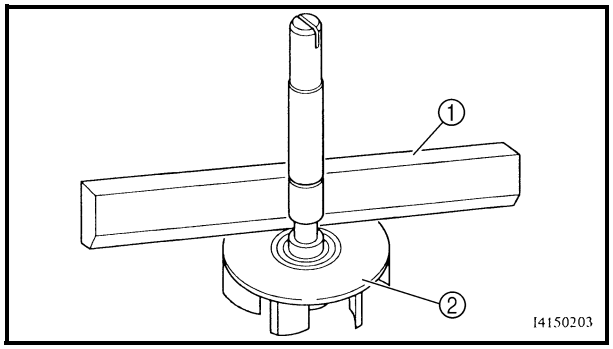
Mechanical seal installer ④
YM-33221
Middle driven shaft bearing driver ⑤
YM-4058-1
Quick Gasket®
ACC-11001-05-01

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.

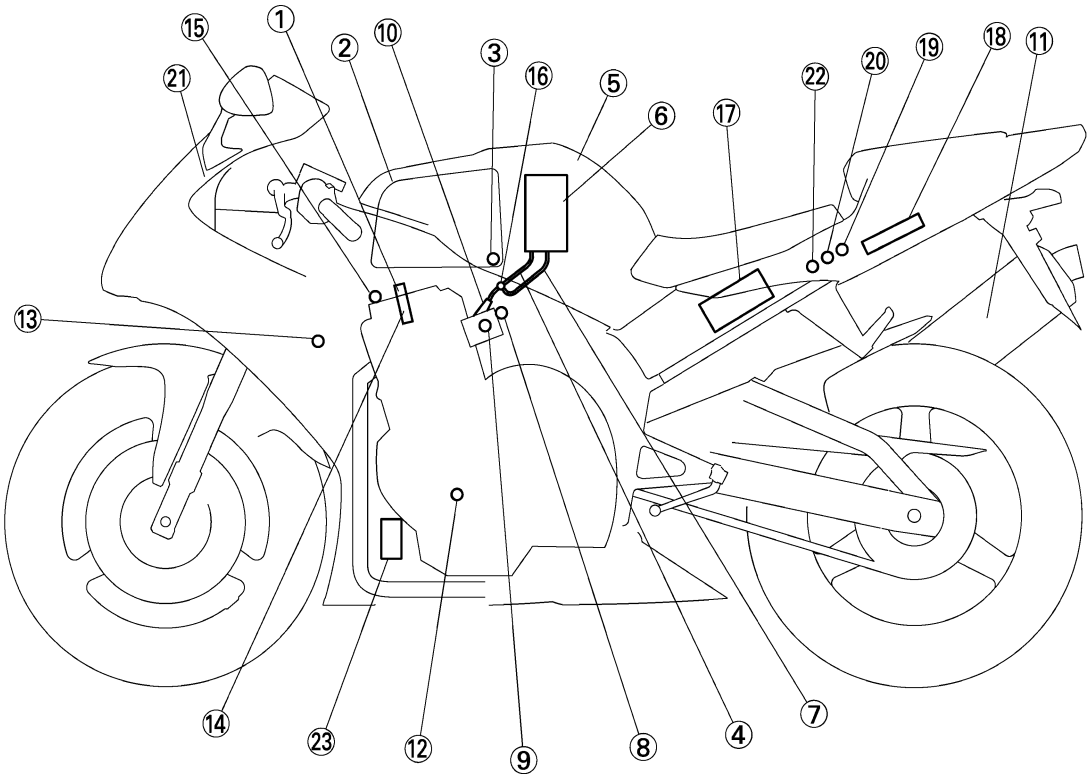
Impeller shaft tilt limit
0.15 mm (0.0059 in)

① Straightedge
② Impeller

FUEL INJECTION SYSTEM

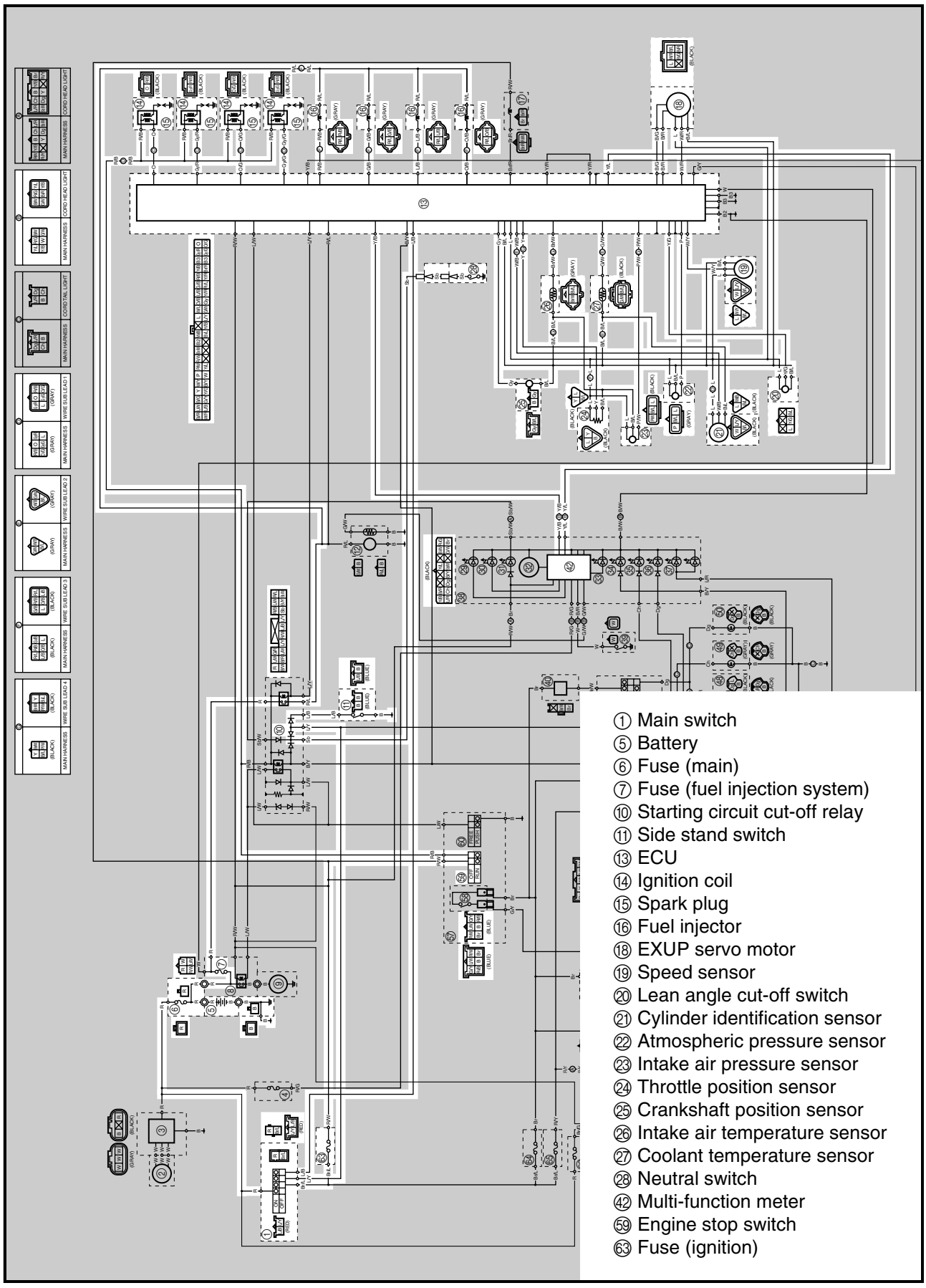
FUEL INJECTION SYSTEM

① Ignition coil
② Air filter case
③ Intake temperature sensor
④ Fuel delivery hose
⑤ Fuel tank
⑥ Fuel pump
⑦ Fuel return hose
⑧ Intake air pressure sensor
⑨ Throttle position sensor
⑩ Fuel injector
⑪ Catalytic converter
⑫ Crankshaft position sensor
⑬ Coolant temperature sensor
⑭ Spark plug
⑮ Cylinder identification sensor
⑯ Pressure regulator
⑰ Battery
⑱ ECU
⑲ Atmospheric pressure sensor
⑳ Fuel injection system relay
㉑ Engine trouble warning light
㉒ Lean angle cut-off switch
㉓ Air cut-off valve



7

WIRING DIAGRAM



① Main switch
⑤ Battery
⑥ Fuse (main)
⑦ Fuse (fuel injection system)
⑩ Starting circuit cut-off relay
⑪ Side stand switch
⑬ ECU
⑭ Ignition coil
⑮ Spark plug
⑯ Fuel injector
⑱ EXUP servo motor
⑲ Speed sensor
⑳ Lean angle cut-off switch
㉑ Cylinder identification sensor
㉒ Atmospheric pressure sensor
㉓ Intake air pressure sensor
㉔ Throttle position sensor
㉕ Crankshaft position sensor
㉖ Intake air temperature sensor
㉗ Coolant temperature sensor
㉘ Neutral switch
㊷ Multi-function meter
㊾ Engine stop switch
㊸ Fuse (ignition)

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, it becomes stored in the ECU memory in the form of a fault code.

- To inform the rider that the fuel injection stop function is active, the engine trouble warning light blinks while the start switch is being pressed to start the engine.
- If a malfunction in the system is detected 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, digital numbers representing the self-diagnostic fault codes appear on the clock LCD. Once a self-diagnostic fault code has been displayed, it remains stored in the ECU memory until a deletion operation is performed.

Engine trouble warning light indication and FI system operating conditions

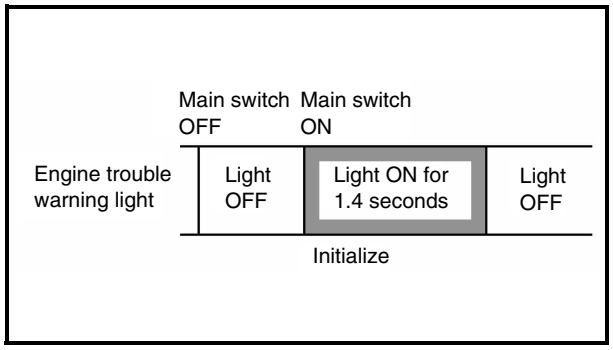
Warning light indication	ECU's operating condition	FI operating condition	Starting and driving
Blinking *	Warning control when unable to start engine	Operation stopped	Unable
Continuous ON	Detecting malfunction	Gives driving instructions with substitute characteristics in accordance with the description of the malfunction.	Able/Unable depending on self-diagnostic fault code

* This control is effected when any one of the conditions listed below is present and the starter switch is turned ON:

11: Cylinder identification sensor
12: Crankshaft position sensor
19: Sidestand switch (open circuit in wire to ECU)
30: Lean angle cut-off switch (latch up detected)
41: Lean angle cut-off switch (open or short circuit)
50: ECU internal malfunction (memory check error)

Function to check for blown engine trouble warning light bulb

The engine trouble warning light illuminates for 1.4 seconds after the main switch has been turned "ON" and while the starter switch is being pressed. If the warning light does not illuminate under these conditions, a problem may have possibly occurred, such as a blown warning light bulb.



SUBSTITUTE CHARACTERISTICS OPERATION CONTROL (FAIL-SAFE ACTION)

If the ECU detects an abnormal signal from a sensor while the motorcycle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with substitute characteristic operation instructions that are appropriate for the type of the malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for every sensor, in order to provide the engine with substitute characteristics operation instructions that enable the engine to continue to operate (or to stop its operation, depending on circumstances).

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	Able/unable to start	Able/unable to drive
11	Cylinder identification sensor	No normal signals are received from the cylinder identification sensor.	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
17	EXUP servo motor (open or short circuit)	EXUP servo motor-open or short circuit detected.	• Turn the EXUP servo motor toward the open side for 3 seconds and then stop it.	Able	Able
18	EXUP servo motor (lock)	A lock EXUP servo motor is detected.	• Perform the preventive control against motor locking. (Preform the lock release operation twice every 100 seconds.)	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 temperature Atmospheric pressure	Defective values are detected due to the internal malfunction	• 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.	• Fuel is cut off only to the cylinder in which a malfunction is detected.	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)	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)	The ECU is unable to monitor the battery voltage (an open circuit in the line to the ECU).	• Fixes the battery voltage to 12 V.	Able	Able
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
50	ECU internal malfunction (memory check error)	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	–	Unable	Unable

TROUBLESHOORING CHART

"Engine runs irregularly." or "Engine trouble warning light is illuminated."
* Engine trouble warning light may not be illuminated even if the engine runs irregularly.

When the engine trouble warning light is illuminated

Checking the self-diagnostic fault code number:
Check the self-diagnostic fault code number displayed on the meter.

Specifying the malfunctioned system:
Specify the malfunctioned system by referring to the Fail-safe actions table.

Presuming the cause:
Presume the malfunction cause by referring to the Diagnostic monitoring code table.

Checking and repaining the presumed place of malfunction.

Diagnostic Monitoring code No. YES	Diagnostic Monitoring code No. NONE
Check and repair in accordance with the "Troubleshooting details", monitoring the operation of sensor and actuator in the Diagnostic monitoring mode (Refer to "Diagnostic mode table" in chapter 7.).	Check and repair in accordance with the trouble shooting details.

ECU reinstatement action:
Perform ECU reinstatement action referring to the reinstatement method in the troubleshooting details.

Checking the meter display:
Check whether the self-diagnostic fault code number is shown after turning the main switch OFF once, and then turning it back ON.

Displayed again. → Checking and repaining the presumed place of malfunction.

Not displayed

Erasing the malfunction history:*
Malfunction history will be stored even if the main switch is turned OFF. To erase the malfunction history, it is required to operate to erase the malfunction history in the Diagnostic monitoring mode. (Refer to Diagnostic mode table (Diagnostic code No.62))

When the engine trouble warning light is not illuminated

Inspecting the sensor actuator: Check the operation of following sensors and actuators in the Diagnostic monitoring mode (Refer to "Diagnostic mode table" in chapter 7.)
01: Throttle position sensor (throttle angle)
30: Ignition coil #1
31: Ignition coil #2
32: Ignition coil #3
33: Ignition coil #4
36: Injector #1
37: Injector #2
38: Injector #3
39: Injector #4
48: AI system solenoid

OK → Malfunction of engine unit → Check and repair the inner parts of engine referring to the engine edition of chapter 5. → OK → Checking the engine condition.

NG → Defective sensor or actuator → Check and repair the corresponding sensor or actuator. → OK → Checking the engine condition.

NG → Malfunction of engine unit

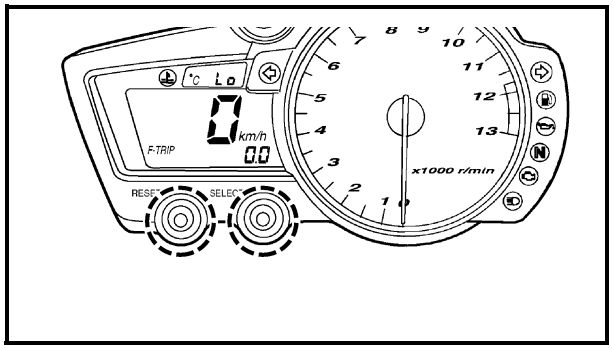
Checking the engine condition. → OK → Repair Completion

Repair Completion

* Operation when the engine trouble warning light is illuminated.

DIAGNOSTIC MODE

- In this mode, diagnostic codes are input into the ECU in accordance with the number of times the start switch has been operated.
- In accordance with the diagnostic codes, the ECU displays the values received from the sensors and actuates the actuators.
- Whether or not the system is operating normally is determined by a human operator through the observations of the values indicated by the engine trouble warning light or the actuating conditions of the actuators.



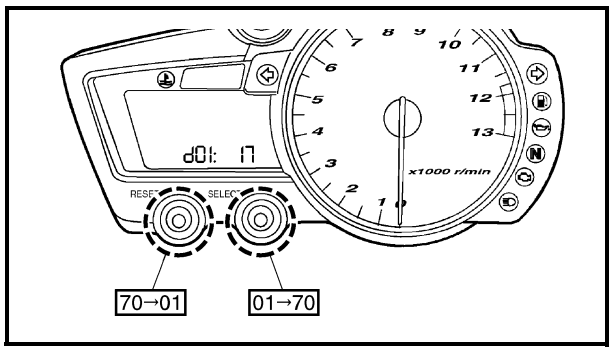
How to set the diagnostic mode

1. Turn the main switch to “OFF” and engine stop switch “ON”.
2. While keeping the “SELECT” and “RESET” buttons pressed simultaneously, turn “ON” the main switch (keep them pressed for 8 seconds or more).

NOTE:

- All indications on the meter disappear except the clock and trip indications.
- Letters “dIAG” appear on the clock LCD.

3. Using the “SELECT” button, select either the CO adjustment mode (which appears as “CO”) or the diagnosis mode (which appears as “dIAG”).
4. After “dIAG” appears as a result of pressing the “SELECT” button, simultaneously press the “SELECT” and “RESET” buttons for 2 seconds or more to execute the selection.
5. Disconnect the wiring harness coupler from the fuel pump.
6. Turn the engine stop switch “OFF”.
   Turn the engine stop switch “ON” if diagnostic code numbers 03 and 09 are shown.
7. Select the diagnostic code number that applies to the item that was verified with the self-diagnostic fault code number, and enter it on the meter by operating the “SELECT” or “RESET” button.



NOTE:

- “RESET” button
  Decrement (press 1 second or longer → auto) “SELECT” button
  Increment (press 1 second or longer → auto)
- Diagnostic code number appears on clock LCD (01 ~ 70)

8. Turn the main switch to “OFF”. The diagnosis mode will be cancelled.

Diagnostic fault code table

Fault Code No.	Symptom	Probable cause of malfunction	Code of diagnostic mode
11	No normal signals are received from the cylinder identification sensor. **NOTE:** This code number appears if the condition continued for 10 seconds in which the starter motor does not run even if the starter switch has been pressed.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective cylinder identification sensor. • Malfunction in ECU. • Improperly installed sensor.	—
12	No normal signals are received from the crankshaft position sensor.	• Open or short circuit in wiring harness. • Defective crankshaft position sensor. • Malfunction in pickup rotor. • Malfunction in ECU. • Improperly installed sensor.	—
13	Intake air pressure sensor-open or short circuit detected.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective intake air pressure sensor. • Malfunction in ECU.	03
14	Faulty intake air pressure sensor hose system; a hose is detached, causing constant application of the atmospheric pressure to the sensor; or, the hose is clogged.	• Intake air pressure sensor hose is detached, clogged, kinked, or pinched. • Malfunction in ECU.	03
15	Throttle position sensor-open or short circuit detected.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective throttle position sensor. • Malfunction in ECU. • Improperly installed throttle position sensor.	01
16	A stuck throttle position sensor is detected.	• Stuck throttle position sensor. • Malfunction in ECU.	01
17	EXUP servo motor potention circuit-open or short circuit detected.	• Open or short circuit in wiring sub lead. • Detected EXUP servo motor (potention circuit).	53
18	EXUP servo motor is stuck.	• Open or short circuit in wiring sub lead. • Stuck EXUP servo motor (mechanism). • Stuck EXUP servo motor (motor).	53
19	Open circuit in the input line from the sidestand switch to the ECU is detected when the start switch is pressed.	• Open or short circuit in wiring harness. • Malfunction in ECU.	20
20	When the main switch is turned to ON, the atmospheric sensor voltage and intake air pressure sensor voltage differ greatly.	• Atmospheric pressure sensor hose is clogged. • Intake air pressure sensor hose is clogged, kinked, or pinched. • Malfunction of the atmospheric pressure sensor in the intermediate electrical potential. • Malfunction of the intake air pressure sensor in the intermediate electrical potential. • Malfunction in ECU.	03 02
21	Coolant temperature sensor - open or short circuit detected.	• Open or short circuit in wiring harness. • Defective coolant temperature sensor. • Malfunction in ECU. • Improperly installed sensor.	06
22	Intake temperature sensor - open or short circuit detected.	• Open or short circuit in wiring harness. • Defective intake temperature sensor. • Malfunction in ECU. • Improperly installed sensor.	05
23	Atmospheric pressure sensor - open or short circuit detected.	• Open or short circuit in wiring sub lead. • Defective atmospheric pressure sensor. • Improperly installed sensor. • Malfunction in ECU.	02
30	The motorcycle has overturned.	• Overturned. • Malfunction in ECU.	08

Fault Code No.	Symptom	Probable cause of malfunction	Code of diagnostic mode
33	Open circuit is detected in the primary lead of the ignition coil (#1).	• Open or short circuit in wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	30
34	Open circuit is detected in the primary lead of the ignition coil (#2).	• Open or short circuit in wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	31
35	Open circuit is detected in the primary lead of the ignition coil (#3).	• Open or short circuit wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	32
36	Open circuit is detected in the primary lead of the ignition coil (#4).	• Open or short circuit in wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	33
41	Lean angle cut-off switch - open or short circuit detected.	• Open or short circuit in wiring harness. • Defective lean angle cut-off switch. • Malfunction in ECU.	08
42	No normal signals are received from the speed sensor; or, an open or short circuit is detected in the neutral switch.	• Open or short circuit in wiring harness. • Defective speed sensor. • Malfunction in vehicle speed sensor detected unit. • Defective neutral switch. • Malfunction in the engine side of the neutral switch. • Malfunction in ECU.	07 21
43	The ECU is unable to monitor the battery voltage (an open circuit in the monitor line to the ECU).	• Open circuit in wiring harness. • Malfunction in ECU.	09
44	An error is detected while reading or writing on EEPROM.	• Malfunction in ECU.	60
50	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	• Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.)	—
Er-1	No signal are received from the ECU.	• Open or short circuit in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-2	No signal are received from the ECU within the specified duration.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-3	Date from the ECU cannot be received correctly.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-4	Non-registered date has been received from the meter.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—

Diagnostic mode table

Set the meter display from the regular mode to the diagnosis mode. For the setting method, refer to "DIAGNOSTIC MODE".

NOTE:

- Check the intake temperature and coolant temperature as close as possible to the area in which the respective sensor is mounted.
- If it is not possible to check it with an atmospheric pressure gauge, judge it by using 760 mmHg (29.9 inHg) as the standard.
- If it is not possible to check the intake temperature, use the ambient temperature as reference (use the compared values for 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.

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.)

Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
52	Headlight relay 1	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) * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the headlight relay operating sound 5 times with the engine stop switch ON. (At that time, the headlight turns ON.)
53	EXUP servo motor	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the servo motor turns to open side at 3 seconds and to close side at 3 seconds. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Turn on the engine trouble warning light while servo motor is operated.
60	E2PROM fault code display	• Transmits the abnormal portion of the data in the E2PROM that has been detected as a self-diagnostic fault code 44. • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.	(01 ~ 04) Displays the cylinder number. (00) Displays when there is no malfunction.
61	Malfunction history code display	• Displays the codes of the history of the self-diagnosis malfunctions (i.e., a code of a malfunction that occurred once and which has been corrected). • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.	11 ~ 50 (00) Displays when there is no malfunction.
62	Malfunction history code erasure	• Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history. • Erases only the history codes when the engine stop switch is turned from OFF to ON. If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	00 ~ 21 (00) Displays when there is no malfunction.
70	Control number	• Displays the program control number.	00 ~ 255

TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the meter.Carry out check and maintenance on items or components that could be a cause of malfunction in accordance with the order.

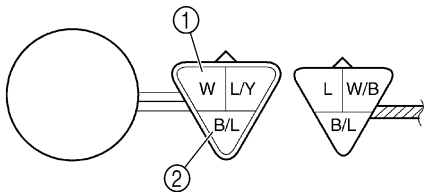
When the check and maintenance of malfunctioned part is completed, restore the meter display according to the “Restore method”.

Fault code No.:

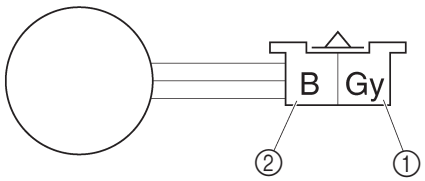
Fault code number displayed on the meter when the engine failed to work normally. (Refer to “Diagnostic fault code table”.)

Diagnostic code No.:

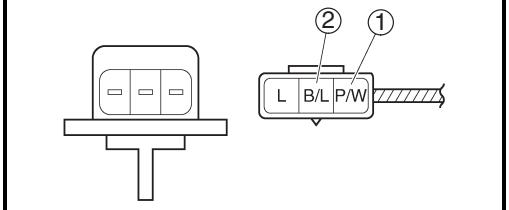
Code number to be used when the diagnostic monitoring mode is operated. (Refer to “DIAGNOSTIC MODE”.)

Fault code No.	11	Symptom	No normal signals are received from the cylinder identification sensor.	
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.			Replace if defective. 1. Connect the pocket tester (DC 20 V) to the cylinder identification sensor coupler terminal as shown. **Tester positive probe → white ①** **Tester negative probe → black/blue ②**  2. Set the main switch to “ON”. 3. Measure the cylinder identification sensor output voltage.  **Cylinder identification sensor output voltage** **When sensor is on** **4.8 V or more** **When sensor is off** **0.8 V or less** 4. Is the cylinder identification sensor OK?	
Defective starter motor.			Replace if defective. Refer to “ELECTRIC STARTING 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 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.	Replace if defective. 1. Disconnect the crankshaft position sensor coupler from the wire harness. 2. Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown. **Tester positive probe → gray ①** **Tester negative probe → black ②**  3. Measure the crankshaft position sensor resistance. **Crankshaft position sensor resistance** **248 ~ 372 Ω at 20 °C (68 °F)** **(between gray and black)** 4. Is the crankshaft position sensor OK?	
Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit between the main wiring harnesses. Between sensor coupler and ECU coupler Gray - Gray 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. Crankshaft position sensor coupler Main wiring harness ECU coupler	

Fault code No.	13	Symptom	Intake air pressure sensor - open or short circuit detected.
Used diagnostic code No. 03 (intake air pressure sensor)			

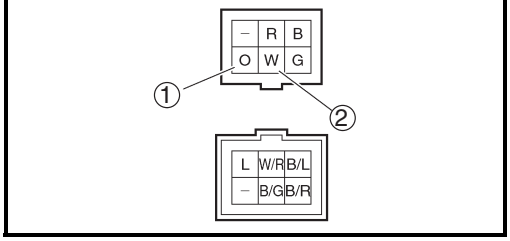
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective intake air pressure sensor	Replace if defective. 1. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler terminal as shown. **Tester positive probe → pink/white ①** **Tester negative probe → black/blue ②**  2. Set the main switch to “ON”. 3. Measure the intake air pressure sensor output voltage. **Intake air pressure sensor output voltage** **3.75 ~ 4.25 V** 4. Is the intake air pressure sensor OK?	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 Pink/White - Pink/White Blue - Blue	
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. Intake air pressure sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	

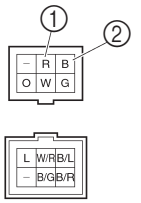
Fault code No.	14	Symptom	Intake air pressure sensor - hose system malfunction (clogged or detached hose).
Used diagnostic code No. 03 (intake air pressure sensor)			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Intake air pressure sensor hose detached, 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.	17	Symptom	EXUP servo motor potention circuit - open or short circuit detected.
Used diagnostic code 53			

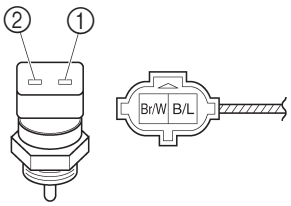
Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
Defective EXUP servo motor potention circuit.	Replace if defective. 1. Disconnect the EXUP servomotor coupler from the wire harness. 2. Connect the pocket tester ($\Omega \times 1k$) to the EXUP servomotor coupler. **Positive tester terminal → orange ①** **Negative tester probe → white ②**  3. While slowly turning the EXUP servomotor pulley, measure the EXUP servomotor resistance.  **EXUP servomotor resistance (when the pulley is turned once)** **0 ~ approximately 7.5 kΩ (blue - white/red)** 4. Is the EXUP servomotor OK?	Reinstated by turning the main switch ON.
Open or short circuit in wire harness.	Repair or replace if there is an open or short circuit. Between motor coupler and ECU coupler Blue - Blue White/Red - White/Red 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. EXUP servo motor coupler Main wire harness ECU coupler	

Fault code No.	18	Symptom	EXUP servo motor is stuck.	
Used diagnostic code 53				
Inspection operation item and probable cause		Operation item and countermeasure		Reinstatement method
Defective EXUP servo motor.		Replace if defective. 1. Disconnect the EXUP cables from the EXUP servomotor pulley. 2. Disconnect the EXUP servomotor coupler from the wire harness. 3. Connect the battery leads to the EXUP servomotor coupler as shown. **Positive battery terminal → red ①** **Negative battery lead → black ②**  4. Check that the EXUP servomotor pulley rotates several times. **CAUTION:** **To prevent damaging the EXUP servomotor, perform this test within a few seconds of connecting the battery.** 5. Does the EXUP servomotor pulley turn?	Reinstated by turning the main switch ON. It takes 120 seconds at the maximum before the original state returns.
Open or short circuit in wire harness.		Repair or replace if there is an open or short circuit. Between motor coupler and ECU coupler. Black/Green - Black/Green Black/Red - Black/Red		
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. EXUP servo motor coupler Main wire harness ECU coupler.		

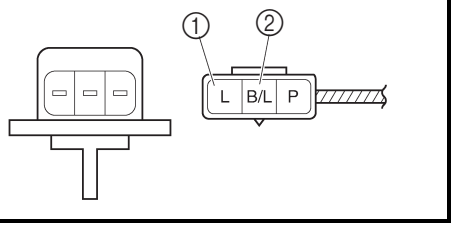
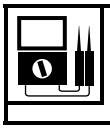
Fault code No.	19	Symptom	Open circuit is detected in the input line from the sidestand switch to the ECU.
Used diagnostic code No. 20 (sidestand switch)			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Defective sidestand switch		Replace if defective. 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 ECU coupler Blue/Black - Black	

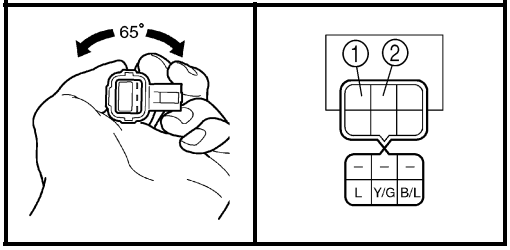
Fault code No.	20	Symptom	Faulty atmospheric pressure sensor or intake air pressure sensor.
Used diagnostic code No.03 (intake air pressure sensor) 02 (atmospheric pressure sensor)			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Intake air pressure 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.			Replace if defective. 1. Remove the intake air temperature sensor from the air filter case. 2. Connect the pocket tester ($\Omega \times 100$) to the intake air temperature sensor terminal as shown. **Tester positive probe → brown/white ①** **Tester negative probe → black/blue ②**  3. Measure the intake air temperature sensor resistance. **Intake air temperature sensor resistance** **450 ~ 550 Ω at 20 °C** **⚠ WARNING** **• Handle the intake air temperature sensor with special care.** **• Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.** **Intake air temperature sensor** **25 Nm (2.5 m · kg, 18 ft · lb)** 4. Is the intake air temperature sensor OK?	
Open or short circuit in wiring harness and/or sub lead.			Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler Black/Blue - Black/Blue Brown/White - Brown/White	
Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.			If there is a malfunction, repair it and connect it securely. Intake temperature sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	

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.	Replace if defective. 1. Connect the pocket tester (DC 20 V) to the atmospheric pressure sensor coupler terminal as shown. **Tester positive probe → blue ①** **Tester negative probe → black/blue ②**  2. Set the main switch to “ON”. 3. Measure the atmospheric pressure sensor output voltage.  **Atmospheric pressure sensor output voltage** **3.75 ~ 4.25 V** 4. Is the atmospheric air pressure sensor OK?	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 sensor coupler and ECU coupler Blue - Blue Black/Blue - Black/Blue Pink - Pink	
Installed condition of atmospheric pressure sensor	Check the installed area for looseness or pinching.	
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. Atmospheric pressure sensor coupler Main wiring harness ECU coupler	

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		Replace if defective. 1. Remove the emergency stop switch from the motorcycle. 2. Connect the lean angle cut-off switch coupler to the wire harness. 3. Connect the pocket tester (DC 20 V) to the emergency stop switch coupler as shown. **Tester positive probe → blue** ① **Tester negative probe → yellow/green** ②  4. When turn the lean angle cut-off switch approx. 65°, the voltage reading is 1.0 V to 4.0 V. 5. Is the emergency stop switch OK?	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 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.	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 Red/Black - Red/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	

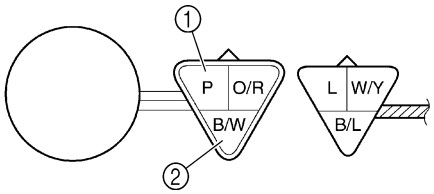
Fault code No.	34	Symptom	Malfunction detected in the primary lead of the ignition coil (#2).
Used diagnostic code No. 31 (ignition coil #2)			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Defective ignition coil (test the primary and secondary 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 Red/Black - Red/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	

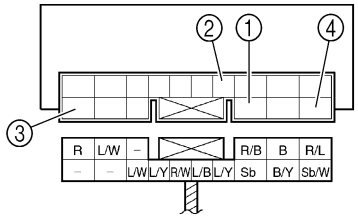
Fault code No.	35	Symptom	Malfunction detected in the primary lead of the ignition coil (#3).
Used diagnostic code No. 32 (ignition coil #3)			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Defective ignition coil (test the primary and secondary 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 Red/Black - Red/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	

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 Red/Black - Red/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	

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	Replace if defective. 1. Measure the speed sensor output voltage. 2. Connect the pocket tester (DC 20 V) to the speed sensor coupler terminal as shown. **Tester positive probe → pink ①** **Tester negative probe → black/white ②**  3. Measure the speed sensor output voltage. **Speed sensor output voltage** **When sensor is on** **DC 4.8 V or more** **When sensor is off** **DC 0.6 V or less** 4. Is the speed sensor OK?	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. (12 to 19 mi/h)
Open or short circuit in speed sensor lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler. Blue - Blue White/Yellow - White/Yellow Black/Blue - Black/Blue	
Gear for detecting vehicle speed has broken.	Replace if defective. Refer to “TRANSMISSION” in chapter 5.	
Connected condition of speed sensor connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Speed sensor coupler Main wiring harness ECU coupler	
Defective neutral switch	Replace if defective. Refer to “CHECKING THE SWITCHES” in chapter 8.	
Faulty shift drum (neutral detection area)	Replace if defective. Refer to “TRANSMISSION” in chapter 5.	
Open or short circuit in neutral switch lead.	Repair or replace if there is an open or short circuit. Between switch connector and ECU coupler Sky blue - Black/Yellow	
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. Neutral switch connector Main wiring harness ECU coupler	

Fault code No.	43	Symptom	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 battery terminal and ECU coupler. Red - White Red - Blue/Yellow (Main switch and engine stop switch are on.) Red - Red/Blue (Fuel injection system relay is on.)		
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. **Battery positive terminal → red/black** ① **Battery positive terminal → blue/yellow** ② **Tester positive probe → red** ③ **Tester negative probe → red/blue** ④  3. Does the starting circuit cut-off relay have continuity between blue/white and 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. Starting circuit cut-off relay coupler (fuel injection system relay) ECU coupler		

Fault code No.	44	Symptom	Error is detected while reading or writing on EEP-ROM.
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.) Replace ECU if defective.	Reinstated by turning the main switch ON.

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.

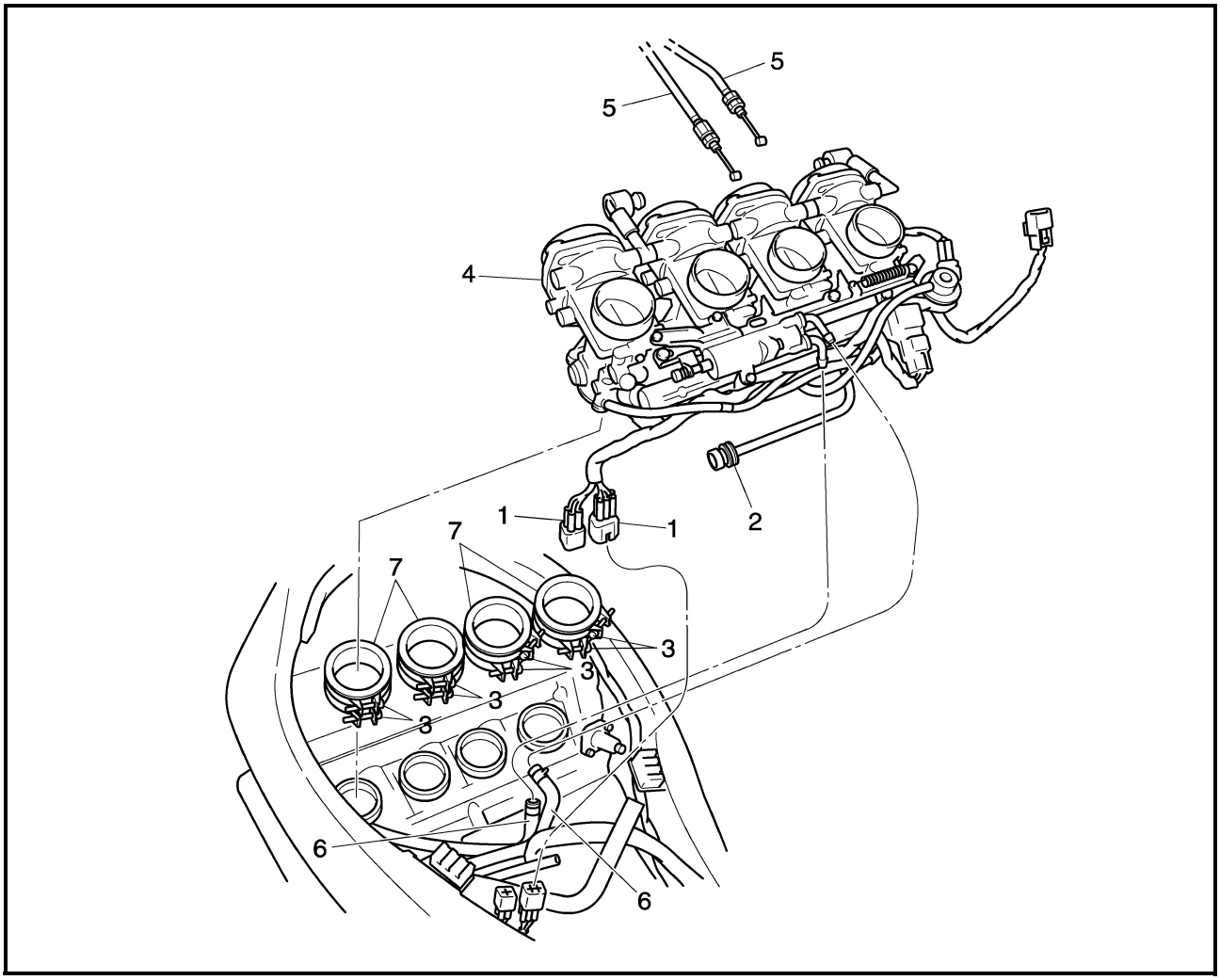
Fault code No.	Er-1	Symptom	No signal are received from the ECU.
Used diagnostic code No. --			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler Yellow/Red - Yellow/Red 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/Red - Yellow/Red 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.	

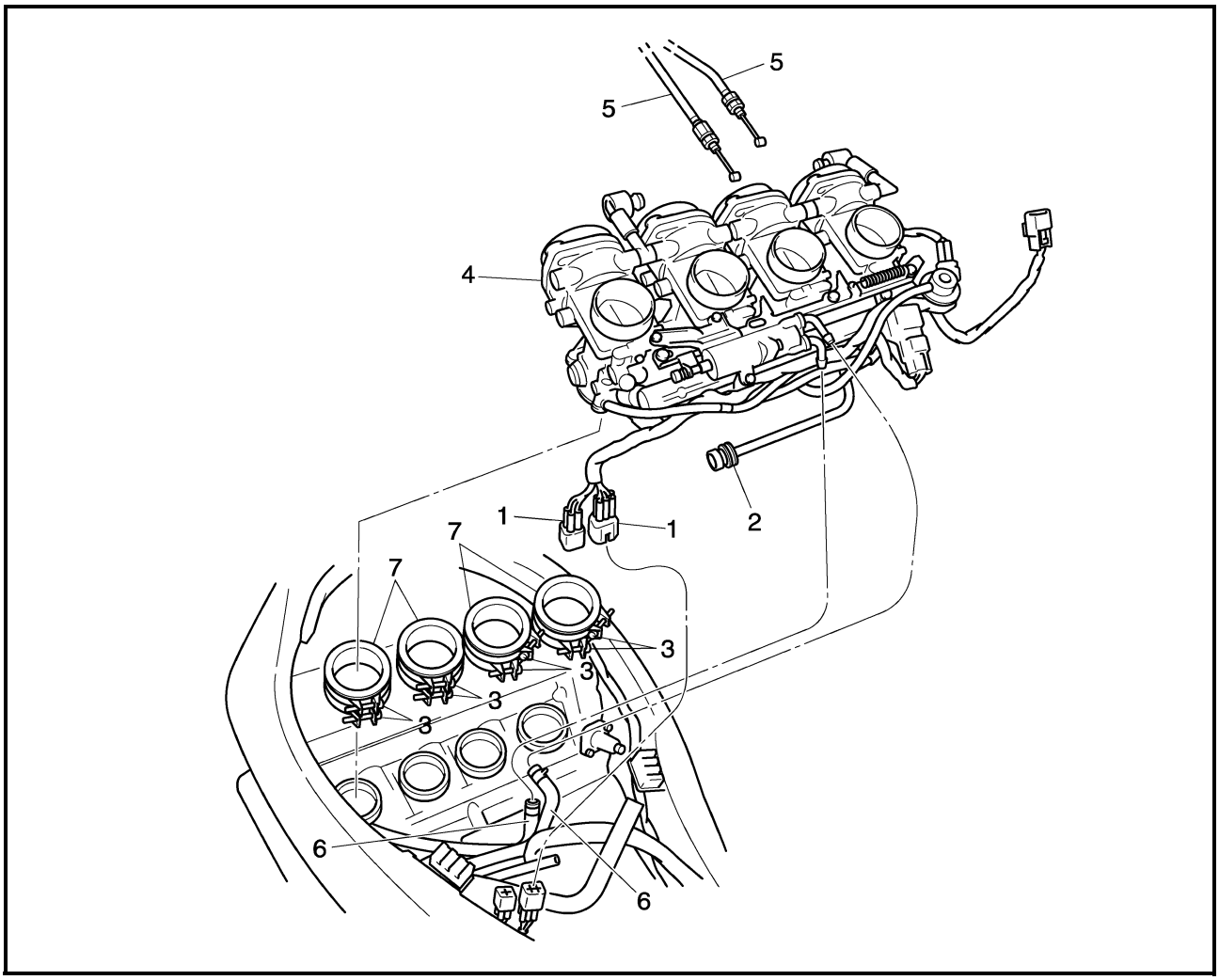
Fault code No.	Er-3	Symptom	Data from the ECU cannot be received correctly.
Used diagnostic code No. --			
Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler Yellow/Red - Yellow/Red 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-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/Red - Yellow/Red 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.	

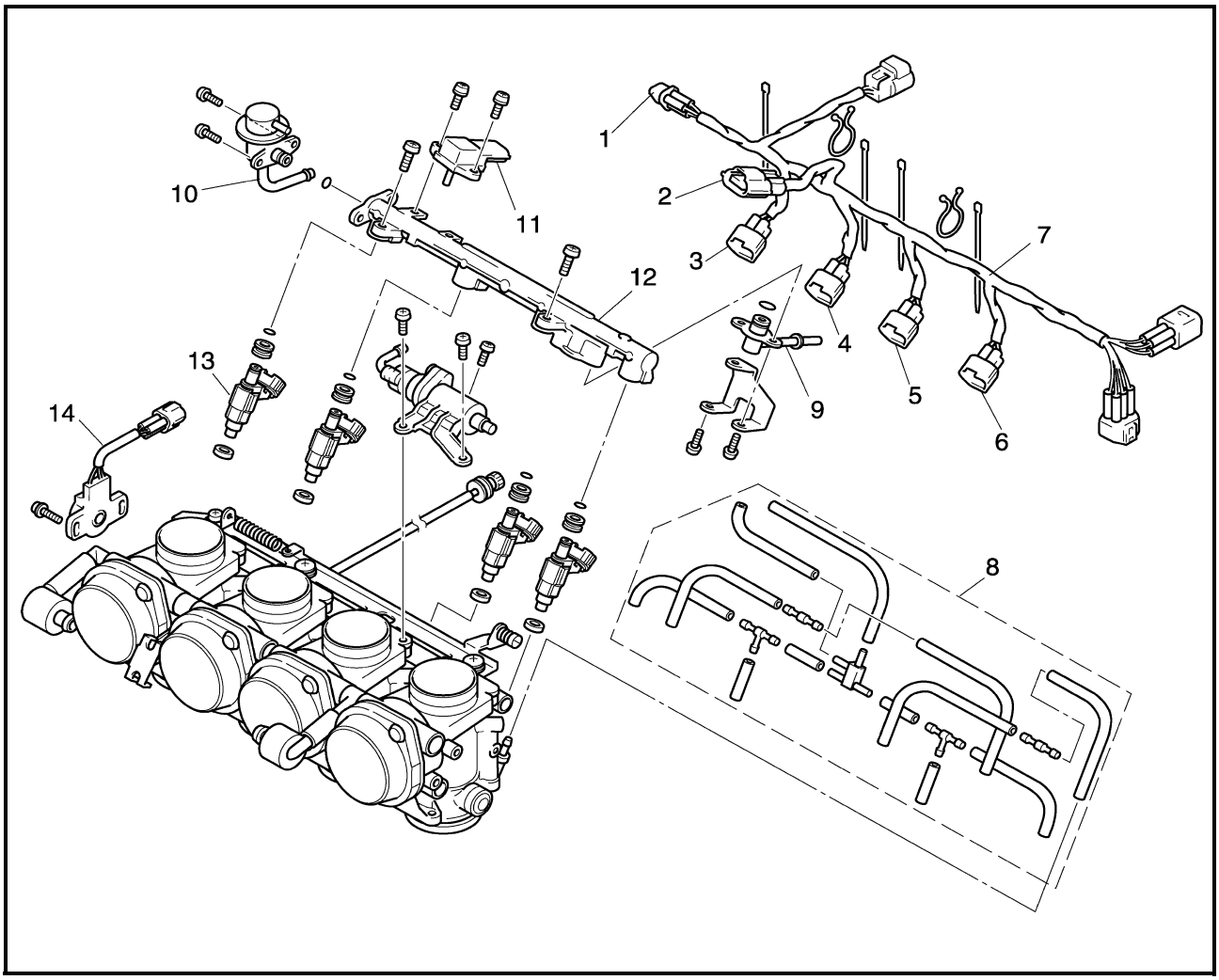
THROTTLE BODIES



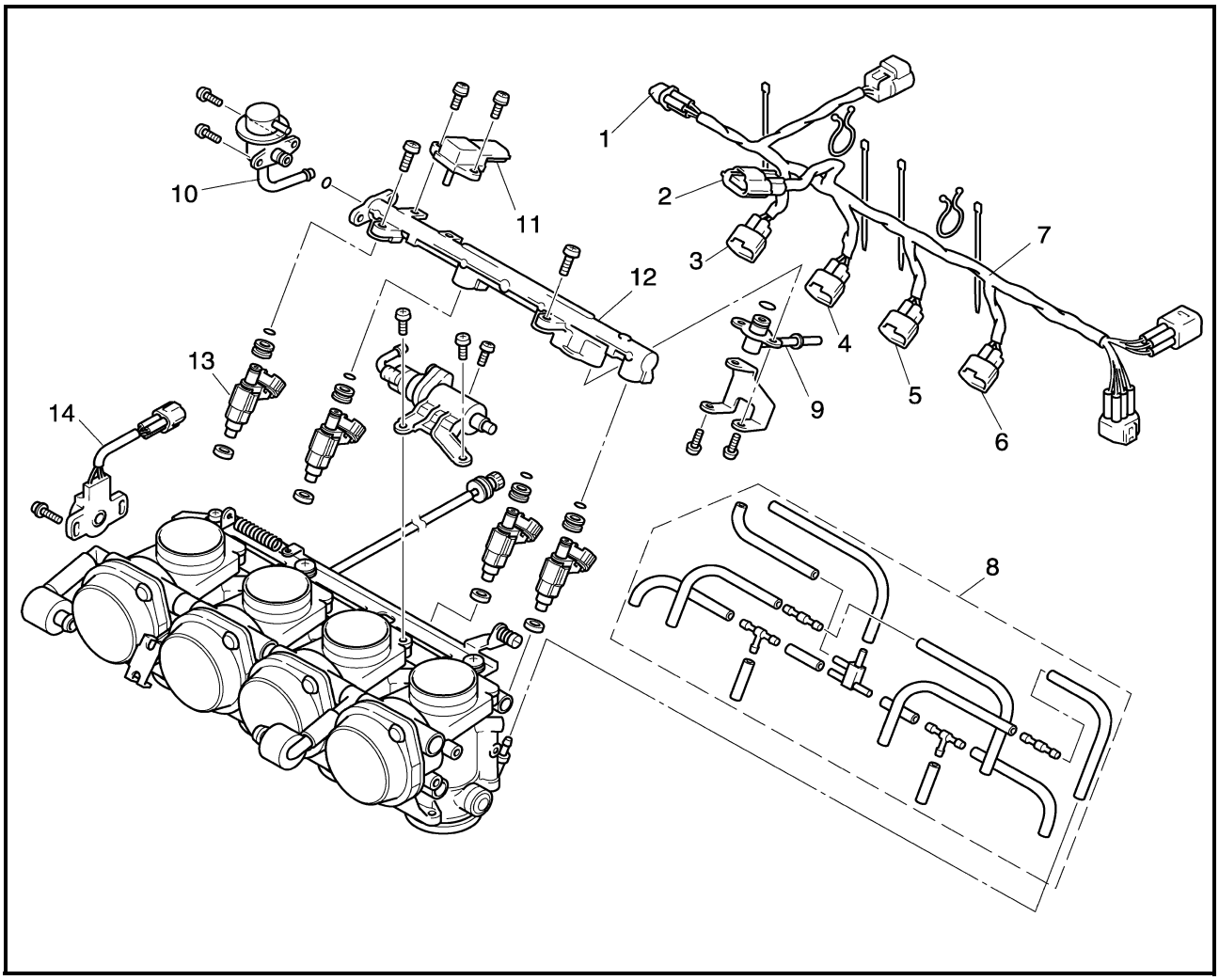
Order	Job/Part	Q'ty	Remarks
	Removing the throttle bodies		Remove the parts in the order listed.
	Seats/fuel tank/rubber sheet		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Sub-wire harness 2 coupler	3	Disconnect.
2	Throttle stop screw	1	
3	Throttle body joint clamp screw	8	Loosen.
4	Throttle bodies	1	



Order	Job/Part	Q'ty	Remarks
5	Throttle cable	2	Disconnect.
6	Plunger control unit hose	2	Disconnect.
7	Throttle body joint	4	For installation, reverse the removal procedure.

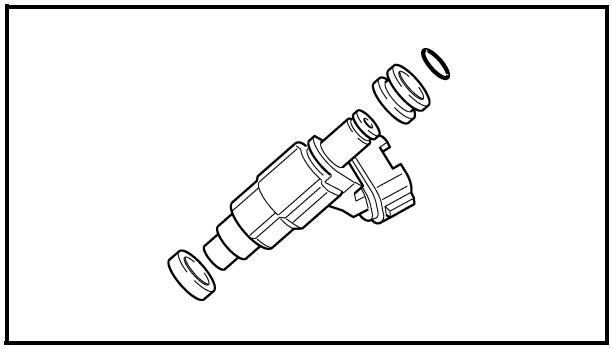


Order	Job/Part	Q'ty	Remarks
	Removing the injector		Remove the parts in the order listed.
1	Throttle position sensor coupler	1	Disconnect.
2	Intake air pressure sensor	1	Disconnect.
3	Cylinder #1-injector coupler	1	Disconnect.
4	Cylinder #2-injector coupler	1	Disconnect.
5	Cylinder #3-injector coupler	1	Disconnect.
6	Cylinder #4-injector coupler	1	Disconnect.
7	Sub-wire harness 2	1	
8	Negative pressure hose	1	Disconnect.
9	Fuel injection pipe	1	
10	Pressure regulator	1	



Order	Job/Part	Q'ty	Remarks
11	Intake air pressure sensor	1	
12	Fuel distributor	1	
13	Injector	4	
14	Throttle position sensor	1	
			For installation, reverse the removal procedure.

CAUTION:
The throttle bodies should not be disassembled unnecessarily.



CHECKING THE INJECTOR
1. Check:
   • injector
   Damage → Replace.

CHECKING THE THROTTLE BODY
1. Check:
   • throttle body
   Cracks/damage → Replace the throttle bodies.

2. Check:
   • fuel passages
   Obstruction → Clean.

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a. Wash the throttle body in a petroleum-based solvent.
   Do not use any caustic carburetor cleaning solution.
b. Blow out all of passages with compressed air.
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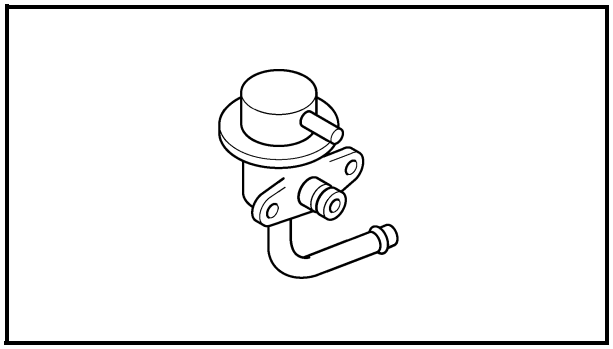

CHECKING THE PRESSURE REGULATOR

1. Check:
   - pressure regulator
     Damage → Replace.

CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OPERATION

1. Check:
   - pressure regulator operation

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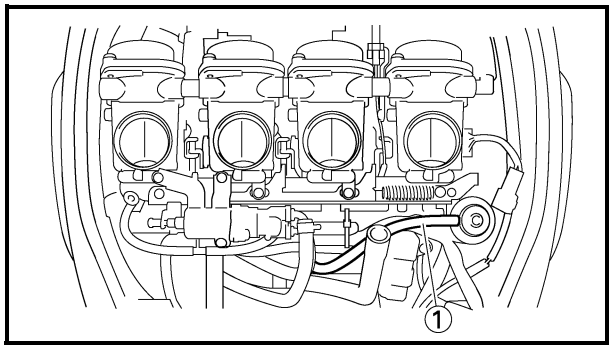
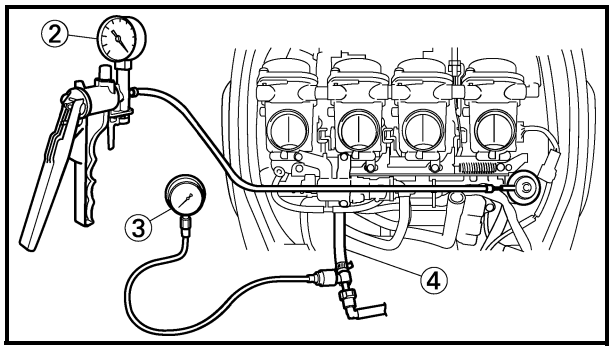
a. Remove the fuel tank.
   Refer to "SEATS" and "FUEL TANK" in chapter 3.
b. Disconnect the negative pressure hose ① from the pressure regulator at the joint.
c. Connect the mity vac ② onto the negative pressure hose from the pressure regulator.
d. Connect the pressure gauge ③ and adapter ④ onto the fuel injection pipe.



Mity vac
YB-35956
Pressure gauge
YU-03153
Adapter
YM-03176



e. Install the fuel tank.
   Refer to "SEATS" and "FUEL TANK" in chapter 3.
f. Start the engine.
g. Measure the fuel pressure.

Fuel pressure
284 kPa (2.84 kg/cm², 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).

Increase the vacuum pressure → Fuel pressure is decreased
Decrease the vacuum pressure → Fuel pressure is increased

Faulty → Replace the pressure regulator.

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EAS00500

CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR

NOTE:

Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

1. Check:
   - throttle position sensor

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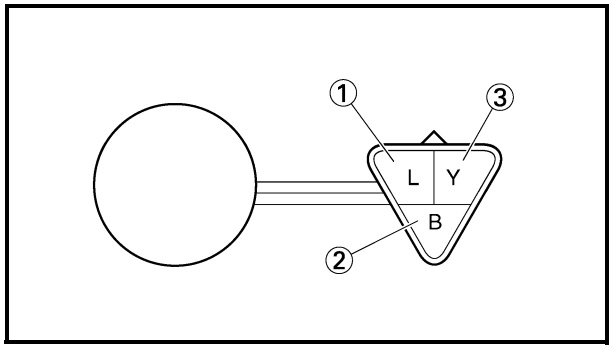
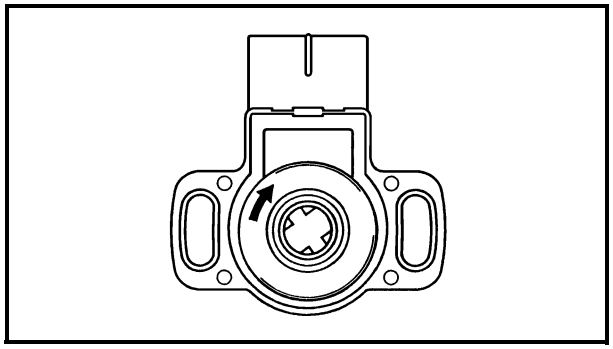
a. Disconnect the throttle position sensor coupler.
b. Remove the throttle position sensor from the throttle body.
c. Connect the pocket tester (Ω × 1k) to the throttle position sensor.



Positive tester probe → blue terminal ①
Negative tester probe → black terminal ②

d. Measure the maximum throttle position sensor resistance.
   Out of specification → Replace the throttle position sensor.



Maximum throttle position sensor resistance
3.5 ~ 6.5 kΩ at 20 °C (68 °F)
(blue - black)

e. Connect the pocket tester (Ω × 1K) to the throttle position sensor.

Positive tester probe → yellow terminal ③
Negative tester probe → black terminal ②

f. While slowly opening the throttle, check that the throttle position sensor resistance is within the specified range.
   The resistance does not change or it changes abruptly → Replace the throttle position sensor.
   The slot is worn or broken → Replace the throttle position sensor.

NOTE:
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.

Throttle position sensor resistance
0 ~ 5 ± 1.5 kΩ at 20 °C (68 °F)
(yellow - black)

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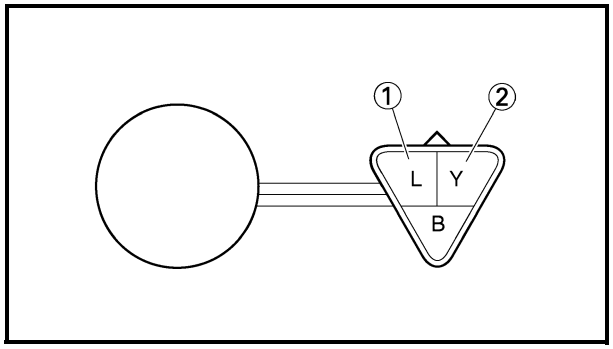

2. Adjust:
   • throttle position sensor angle

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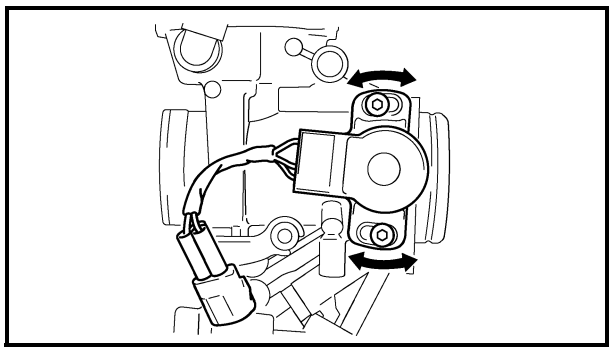
a. Connect the throttle position sensor coupler to the wire harness.
b. Connect the digital circuit tester to the throttle position sensor.

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.

Throttle position sensor voltage
0.63 ~ 0.73 V
(yellow - blue)

e. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.

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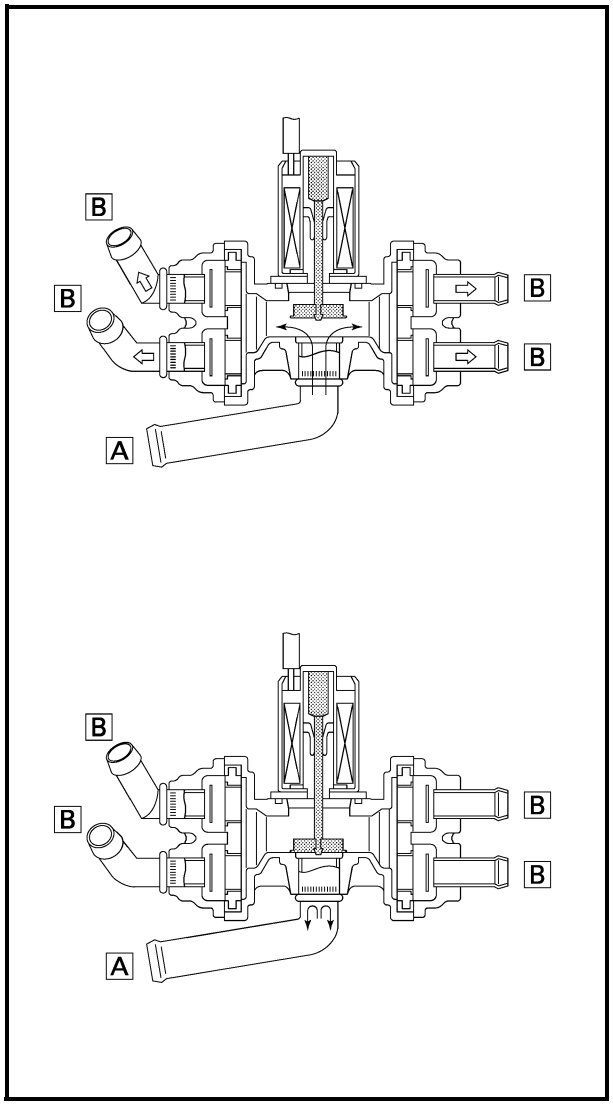
EAS00507
AIR INDUCTION SYSTEM
AIR INDUCTION
The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons.
When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700 °C (1,100 to 1,300 °F).

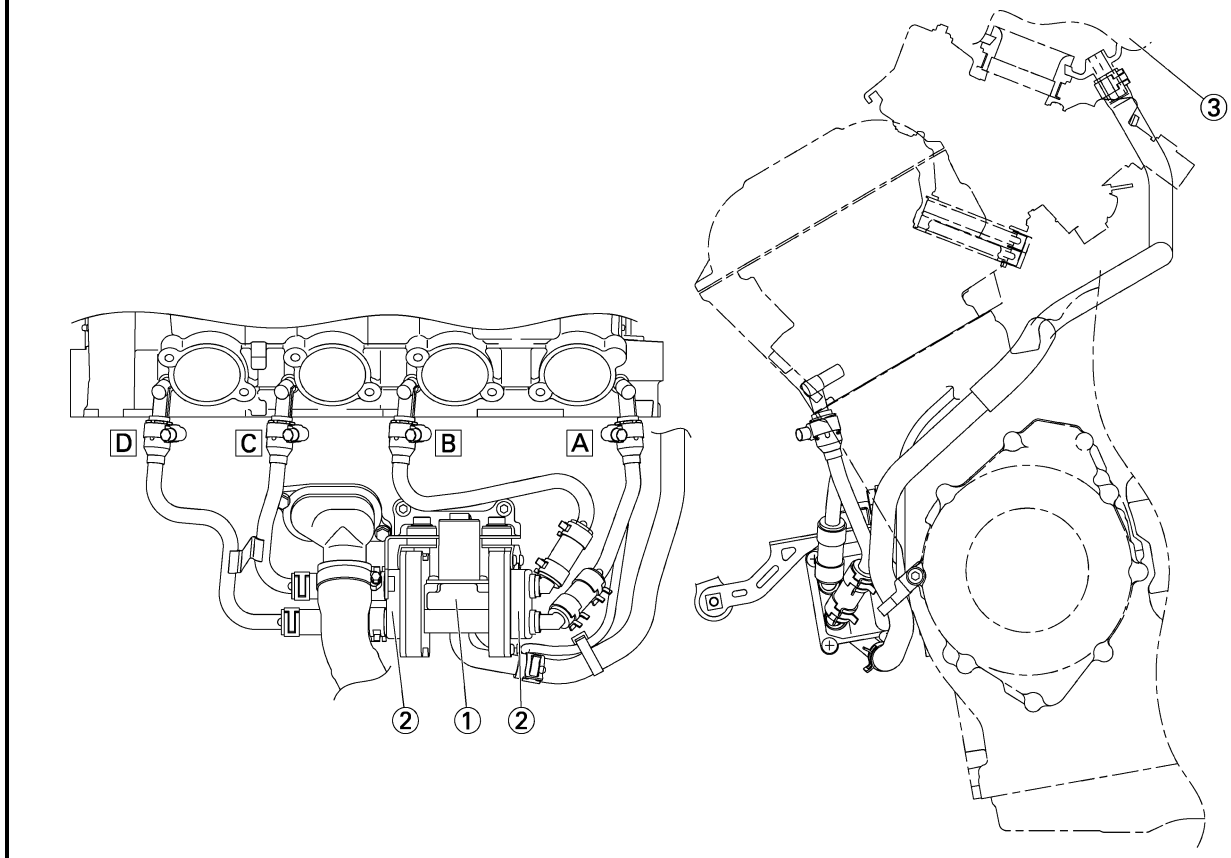


EAS00508
AIR CUT-OFF VALVE
The air cut-off valve is controlled by the signals from the ECU in accordance with the combustion conditions. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the motorcycle is being driven. However, if the coolant 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

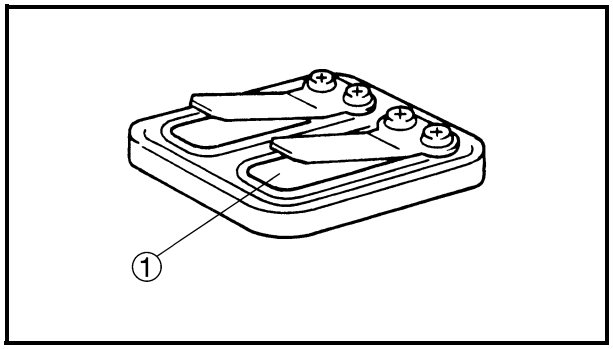
① Air cut-off valve
② Reed valve
③ Air cleaner

A To cylinder #1
B To cylinder #2
C To cylinder #3
D To cylinder #4

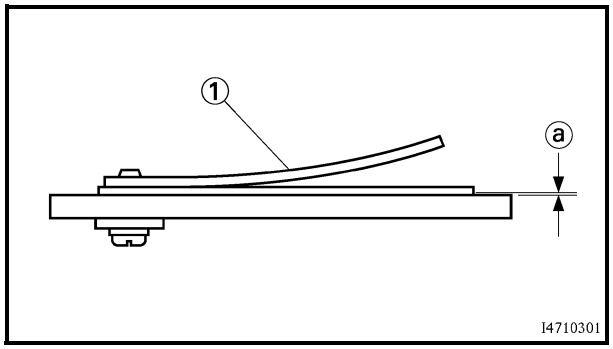


EAS00510
CHECKING THE AIR INDUCTION SYSTEM

1. Check:
   - hoses
     Loose connection → Connect properly.
     Cracks/damage → Replace.
   - pipes
     Cracks/damage → Replace.



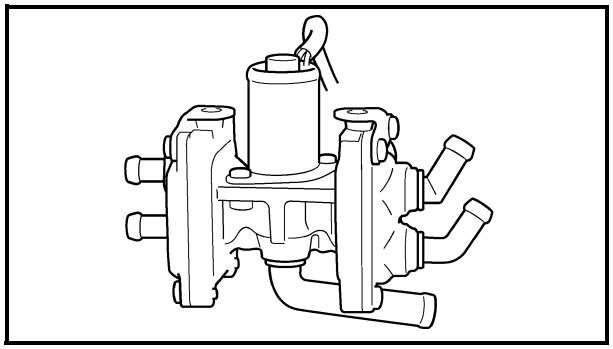
2. Check:
   - reed valve ①
   - reed valve stopper
   - reed valve seat
     Cracks/damage → Replace the reed valve.



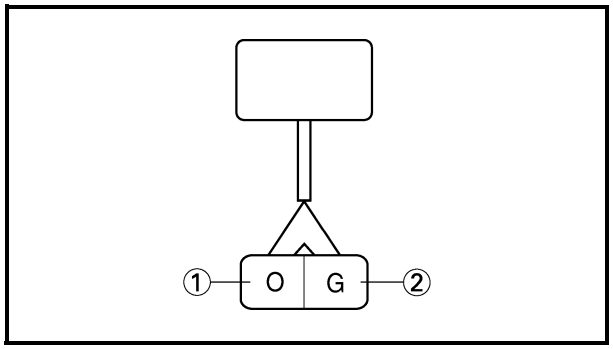
3. Measure:
   - reed valve bending limit ⓐ
     Out of specification → Replace the reed valve.

	Reed valve bending limit **0.4 mm (0.016 in)**

① Surface plate



4. Check:
   - air cut-off valve
     Cracks/damage → Replace.



5. Check
   - AI system solenoid

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a. Remove the AI system solenoid coupler from the wire harness.
b. Connect the pocket tester (Ω × 1) to the AI system solenoid terminal as shown.

Tester positive probe → orange ①
Tester negative probe → green ②

c. Measure the AI system solenoid resistance.

AI system solenoid resistance
18 ~ 22 Ω at 20 °C (68 °F)

d. Out of specification → Replace.

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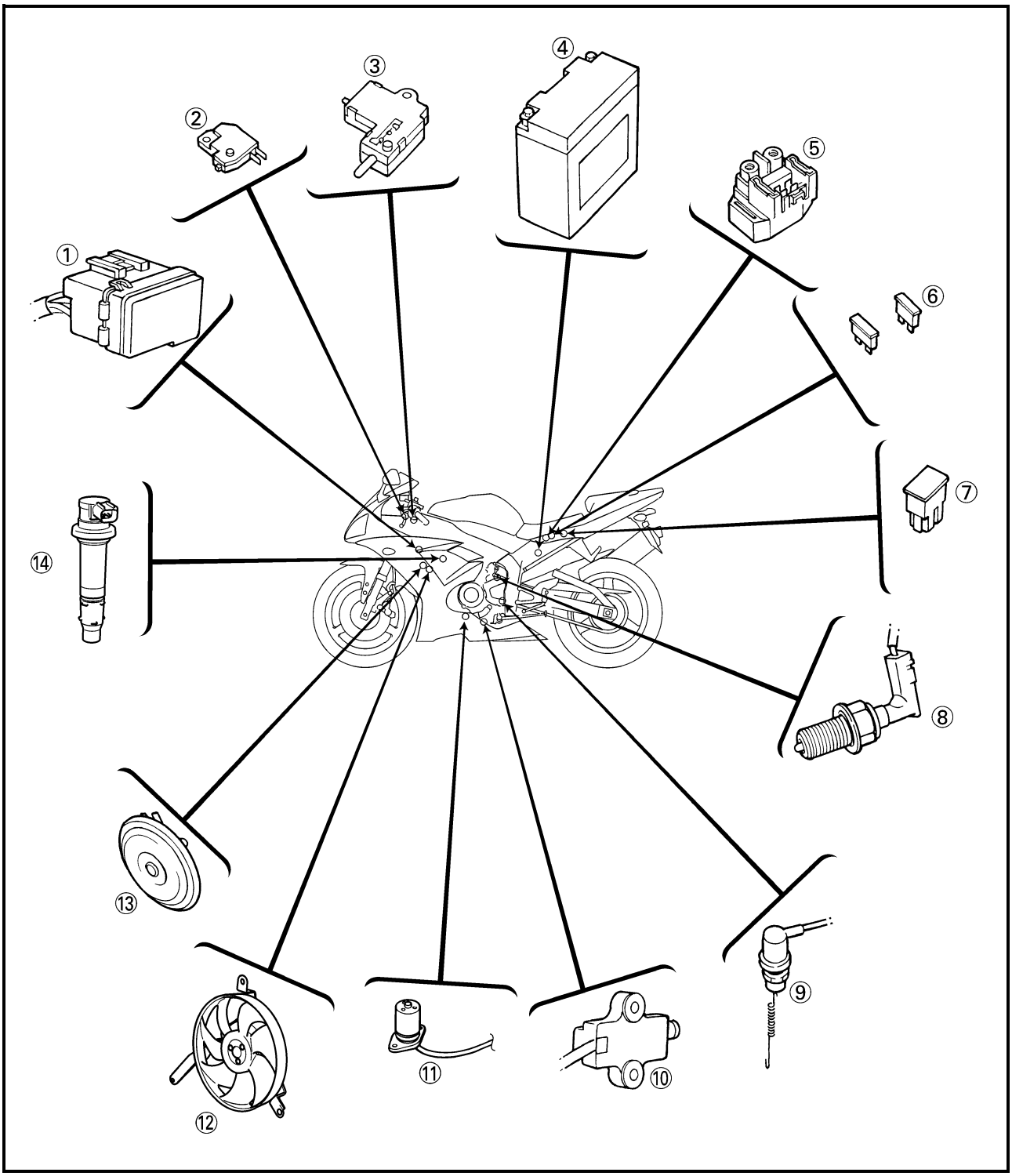
EAS00729

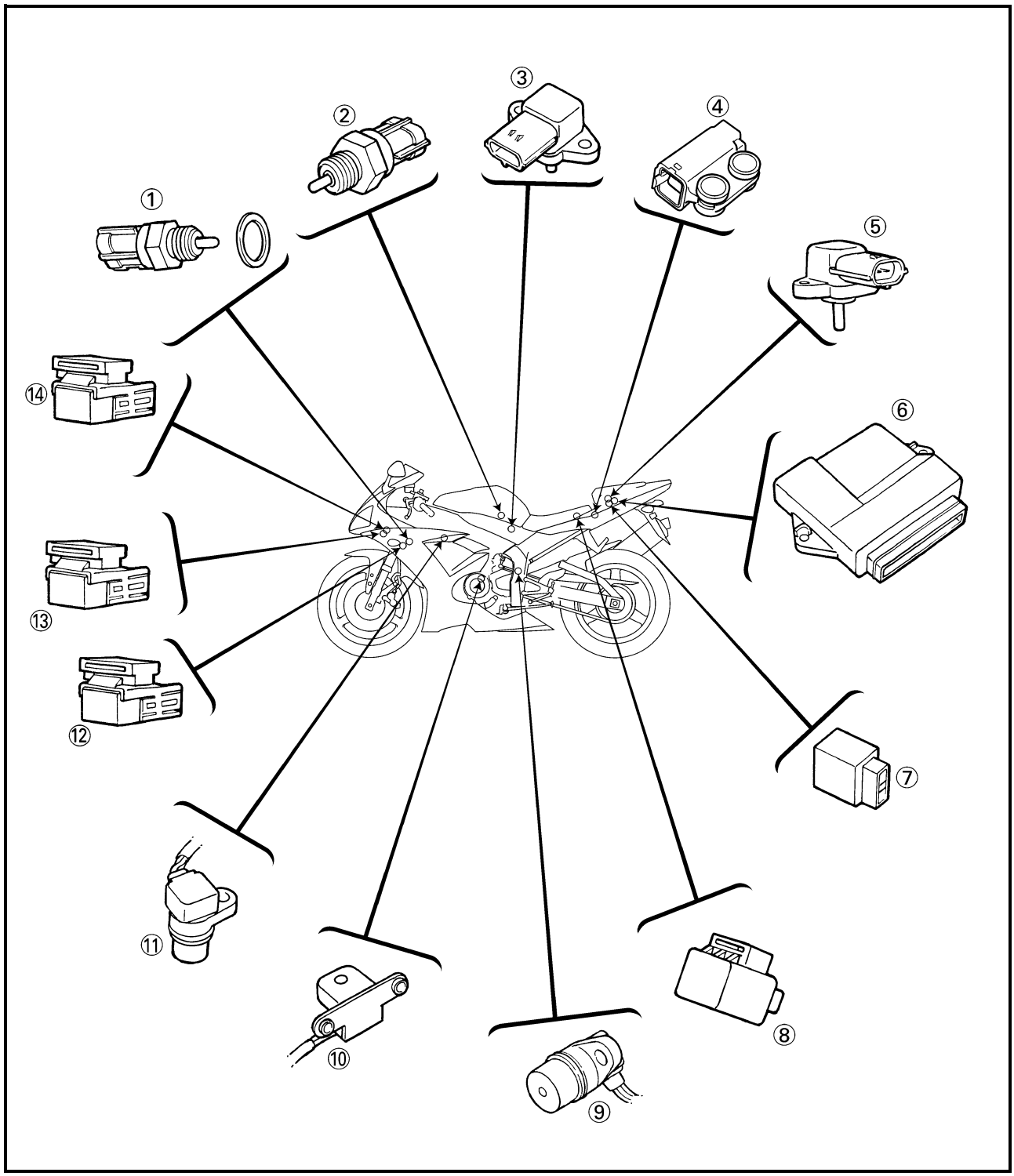
ELECTRICAL

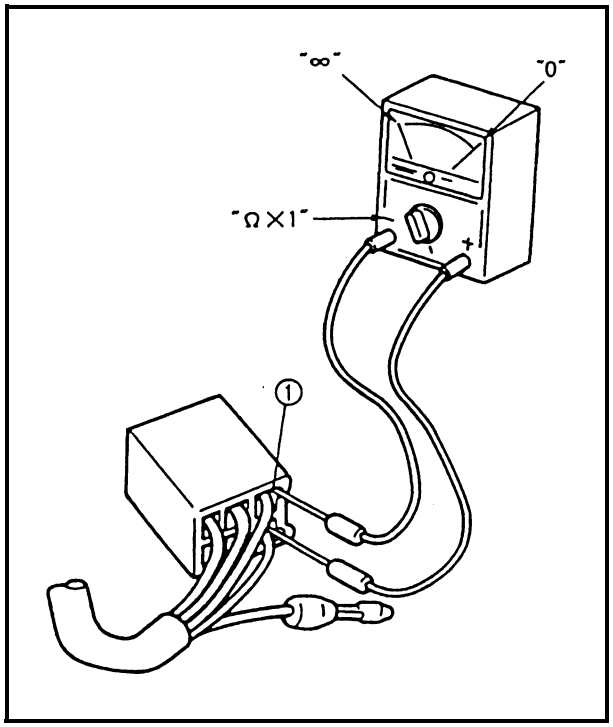
ELECTRICAL COMPONENTS

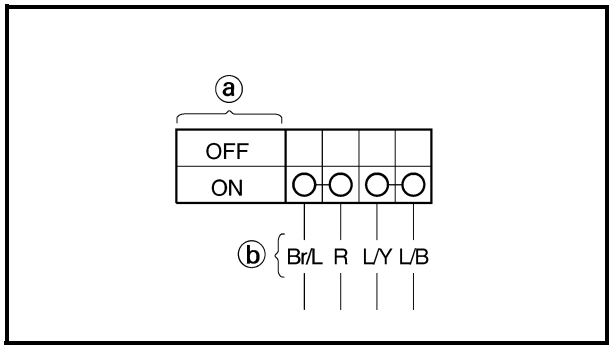
① Fuse box
② Front brake switch
③ Clutch switch
④ Battery
⑤ Starter relay
⑥ Fuel injection system fuse
⑦ Main fuse
⑧ Neutral switch
⑨ Rear brake switch
⑩ Sidestand switch
⑪ Oil level switch
⑫ Radiator fan motor
⑬ Horn
⑭ Ignition coil



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 1
⑭ Headlight relay 2







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 ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

Pocket tester
YM-03112

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:

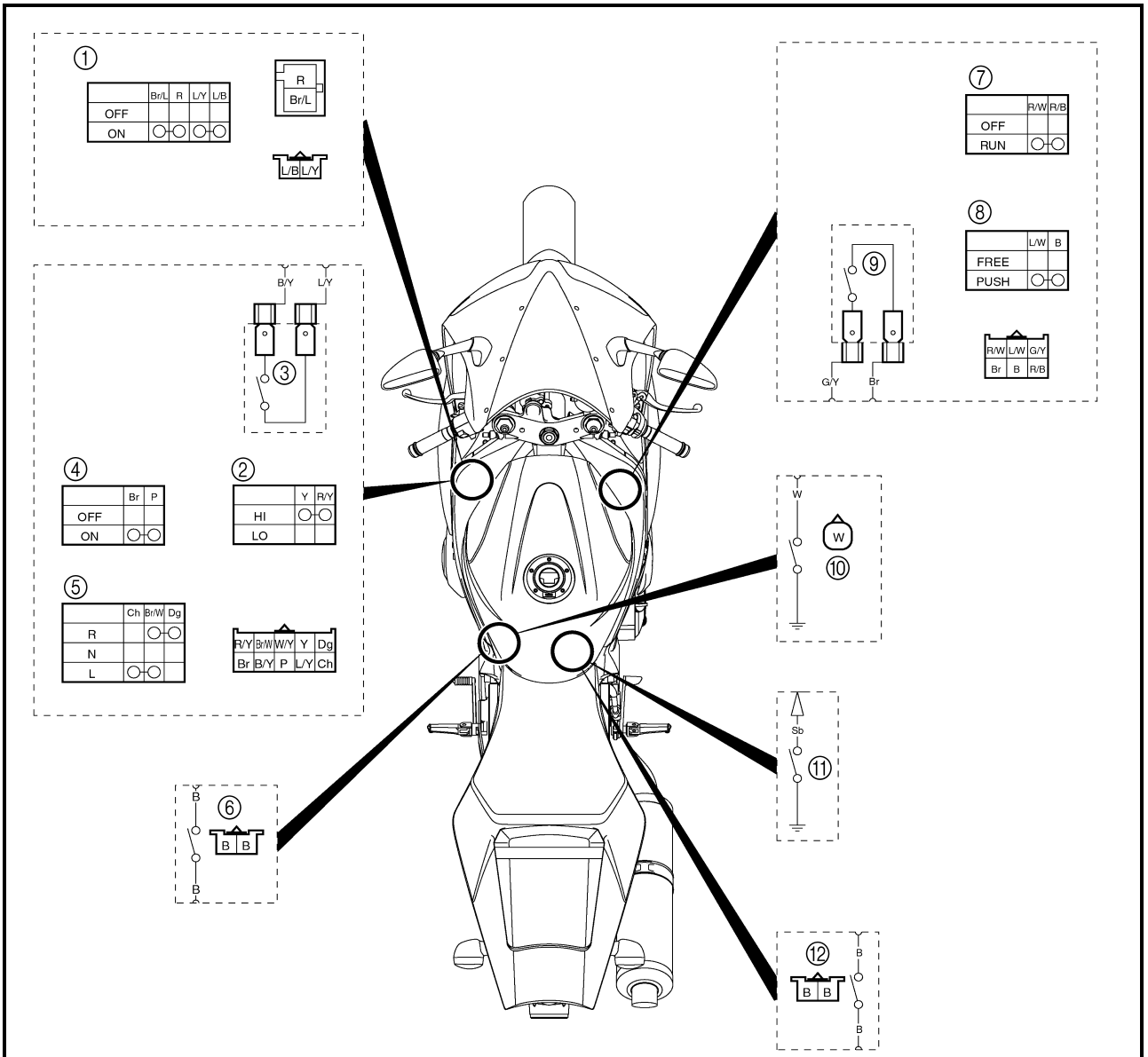
"○——○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:

There is continuity between brown/blue and red when the switch is set to "ON".

EAS00731
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.
Damage/wear → Repair or replace.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.



① Main switch
② Dimmer switch
③ Clutch switch
④ Horn switch
⑤ Turn signal switch
⑥ Sidestand switch
⑦ Engine stop switch
⑧ Start switch
⑨ Front brake light switch
⑩ Oil level gauge
⑪ Neutral switch
⑫ Rear brake light switch

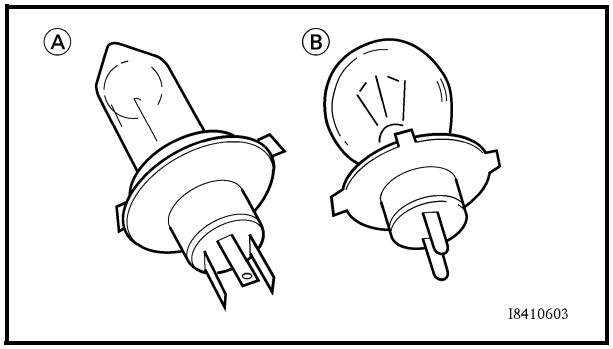
EAS00732
CHECKING THE BULBS AND BULB SOCKETS

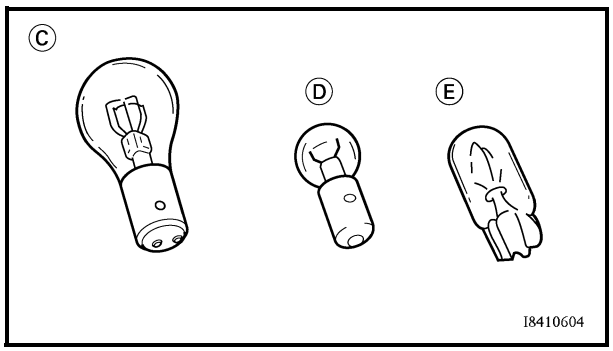
Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

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 Ⓐ and Ⓑ are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulbs Ⓒ is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs Ⓓ and Ⓔ are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

1. Remove:
   • bulb

⚠ WARNING

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

CAUTION:

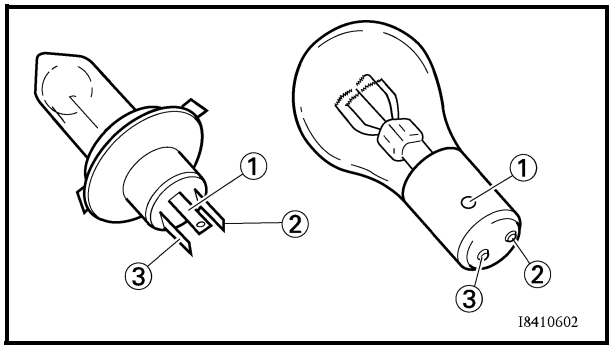
- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**

2. Check:
   • bulb (for continuity)
   (with the pocket tester)
   No continuity → Replace.

	**Pocket tester** **YM-03112**

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.



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a. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ②, and check the continuity.
b. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ③, and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

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CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

1. Check:
   - bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

	Pocket tester **YM-03112**

NOTE:

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

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a. Install a good bulb into the bulb socket.
b. Connect the pocket tester probes to the respective leads of the bulb socket.
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

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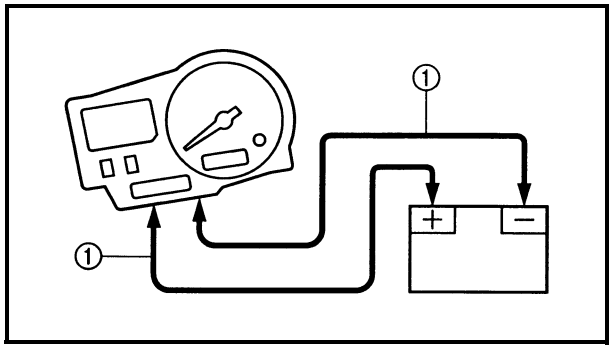
CHECKING THE LEDs

The following procedures applies to all of the LEDs.

1. Check:
   - LED (for proper operation)
     Improper operation → Replace.



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a. Disconnect the meter assembly coupler (meter assembly side).
b. Connect two jumper leads ① from the battery terminals to the respective coupler terminal as shown.

⚠ WARNING

- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.**

c. When the jumper leads are connected to the terminals the respective LED should illuminate.
   Does not light → Replace the meter assembly.

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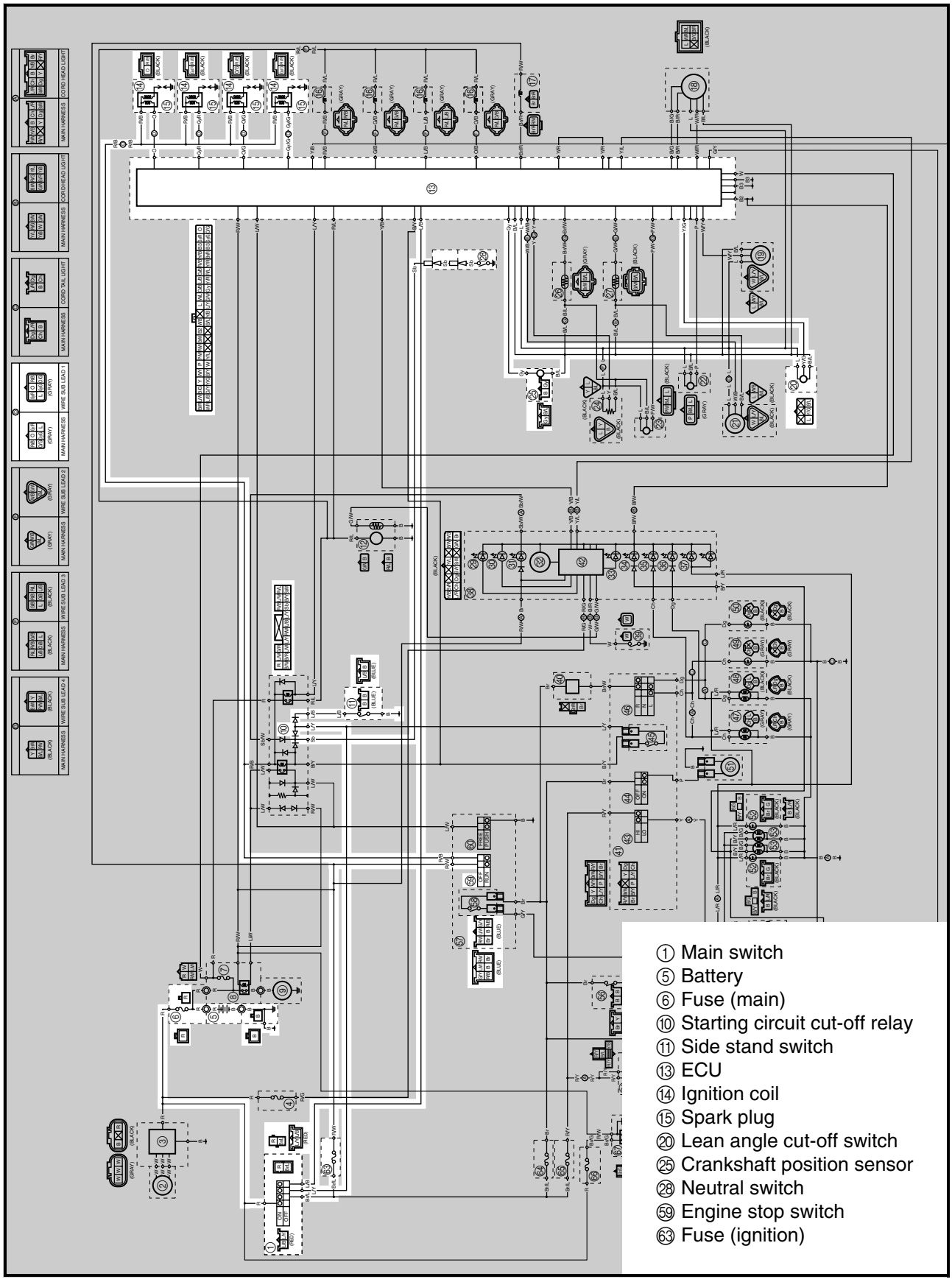
EAS00735

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 resistance
7. main switch
8. engine stop switch
9. neutral switch
10. sidestand switch
11. starting circuit cut-off relay
12. 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 cowling
5. right side cowling

- Troubleshoot with the following special tool(s).

Dynamic spark tester
YM-34487
Pocket tester
YM-03112

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
CR9EIA 9 (NGK)
IU27D (DENSO)
Spark plug gap
0.8 ~ 0.9 mm (0.032 ~ 0.035 in)

- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?

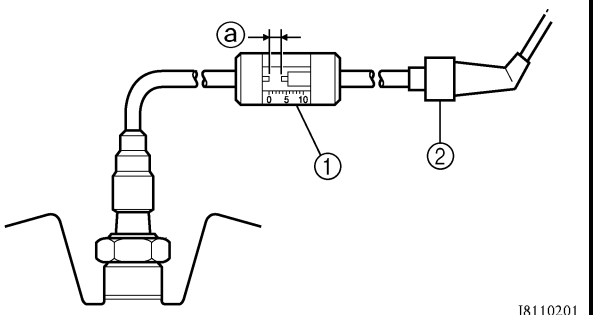
YES → NO

Re-gap or replace the spark plug.

EAS00743

4. Ignition spark gap

The following procedure applies to all of the spark plugs.
- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
  ② Ignition coil
- Set the main switch to "ON".
- Measure the ignition spark gap ⓐ.
- 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

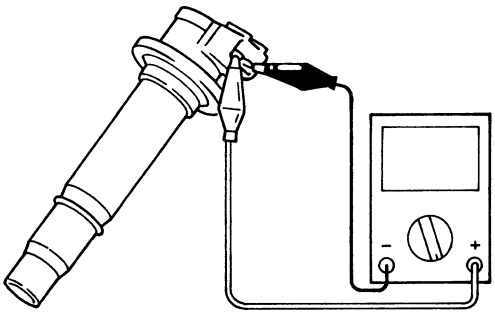
The ignition system is OK.

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 (Ω × 1) to the ignition coil as shown.

Positive tester probe →
ignition coil terminal
Negative tester probe →
ignition coil terminal

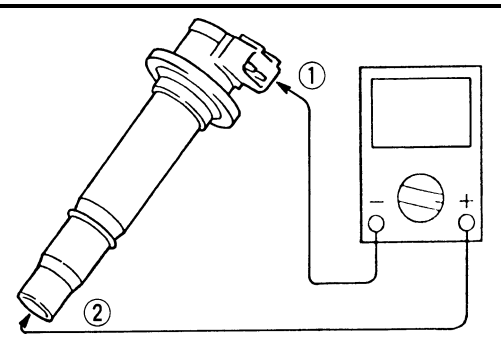


- Measure the primary coil resistance.

Primary coil resistance
1.19 ~ 1.61 Ω at 20 °C (68 °F)

- Connect the pocket tester (Ω × 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
8.5 ~ 11.5 kΩ at 20 °C (68 °F)

- Is the ignition coil OK?

YES

NO

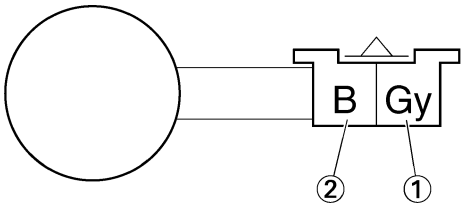
Replace the ignition coil.

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 Ω 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

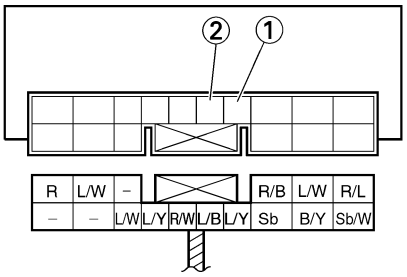
Replace the sidestand switch.

EAS00753

11.Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the starting circuit cut-off relay coupler as shown.
- Check the starting circuit cut-off relay for continuity.

Positive tester probe → blue/yellow ① Negative tester probe → blue/black ②	**Continuity**
Positive tester probe → blue/black ② Negative tester probe → blue/yellow ①	**No continuity**



NOTE:
When you switch the positive and negative tester probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES → NO

Replace the starting circuit cut-off relay.

EAS00754

12.Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

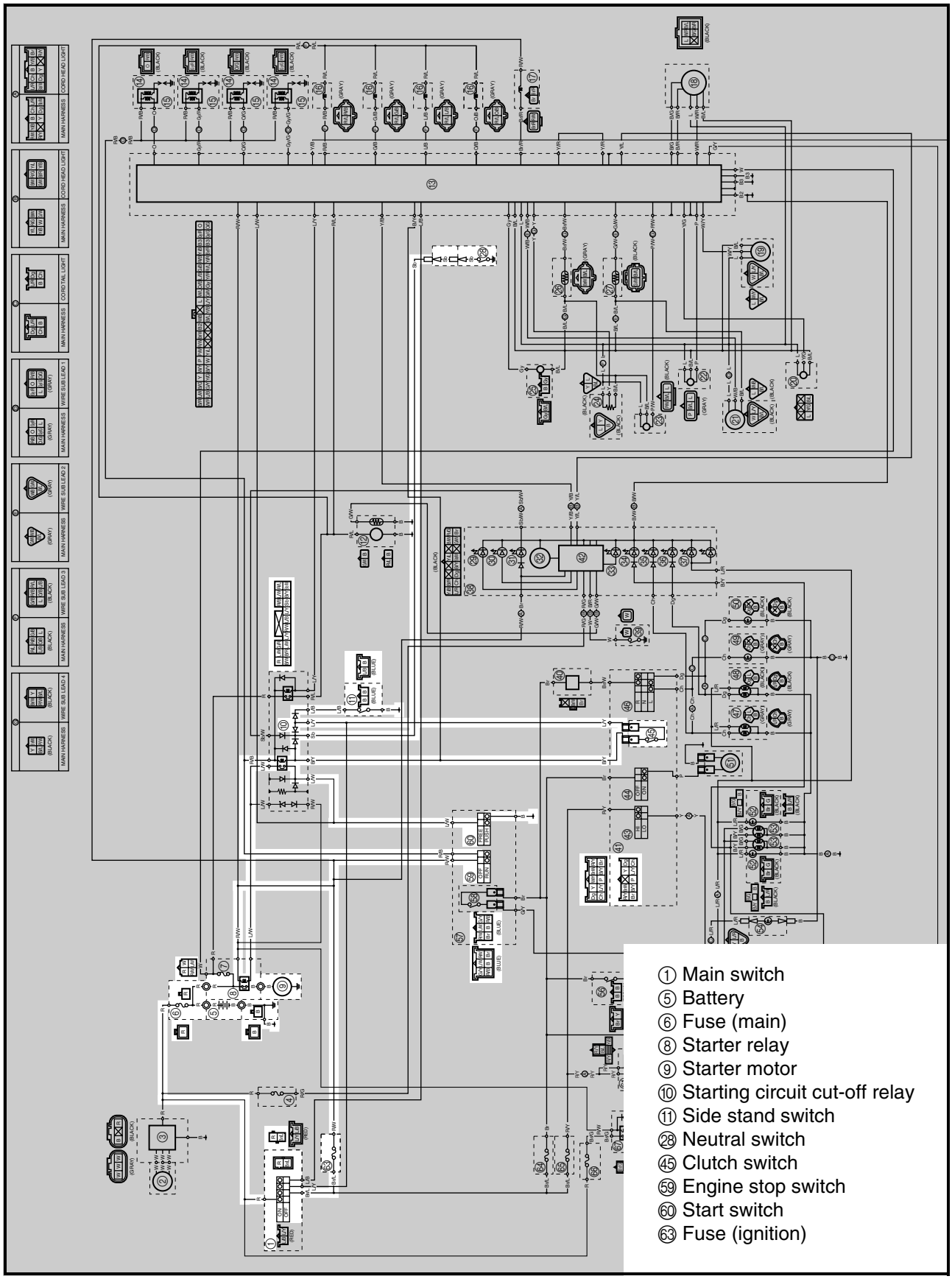
YES → Replace the ignitor unit.

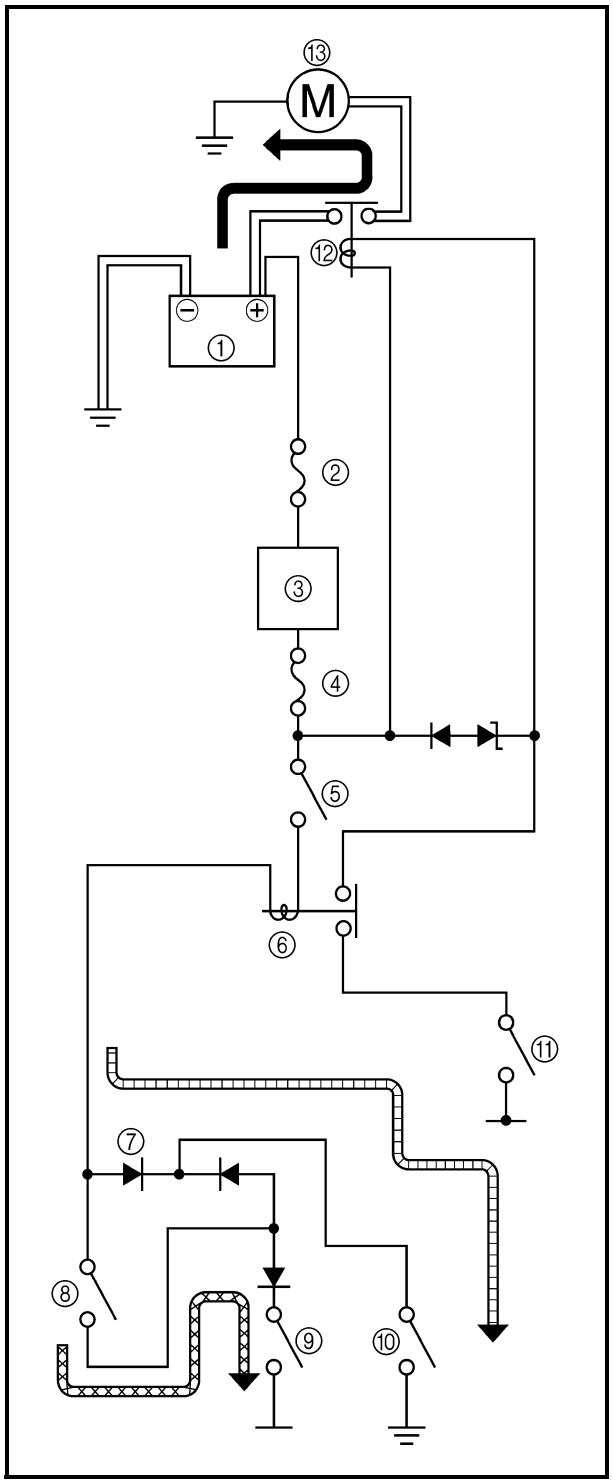
NO → Properly connect or repair the ignition system's wiring.

EAS00755

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM





EAS00756

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to " ◯ " and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if 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
YM-03112

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?

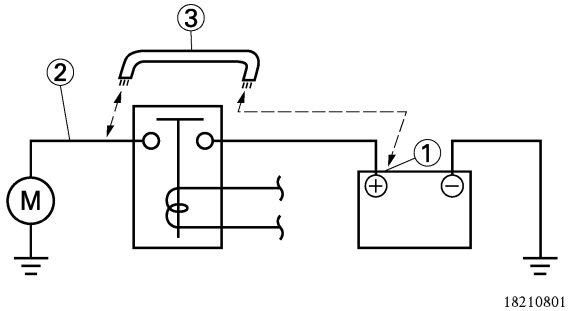
YES

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.



⚠ 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.

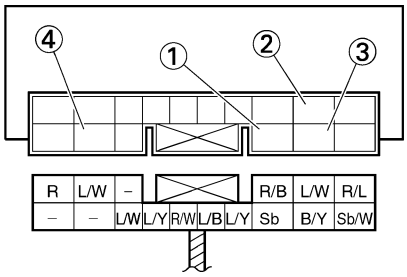
EAS00759

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 black and blue/white?

YES → NO

Replace the starting circuit cut-off relay.

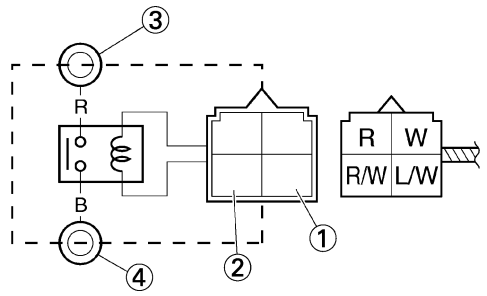
EAS00761

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.

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.

EAS00766

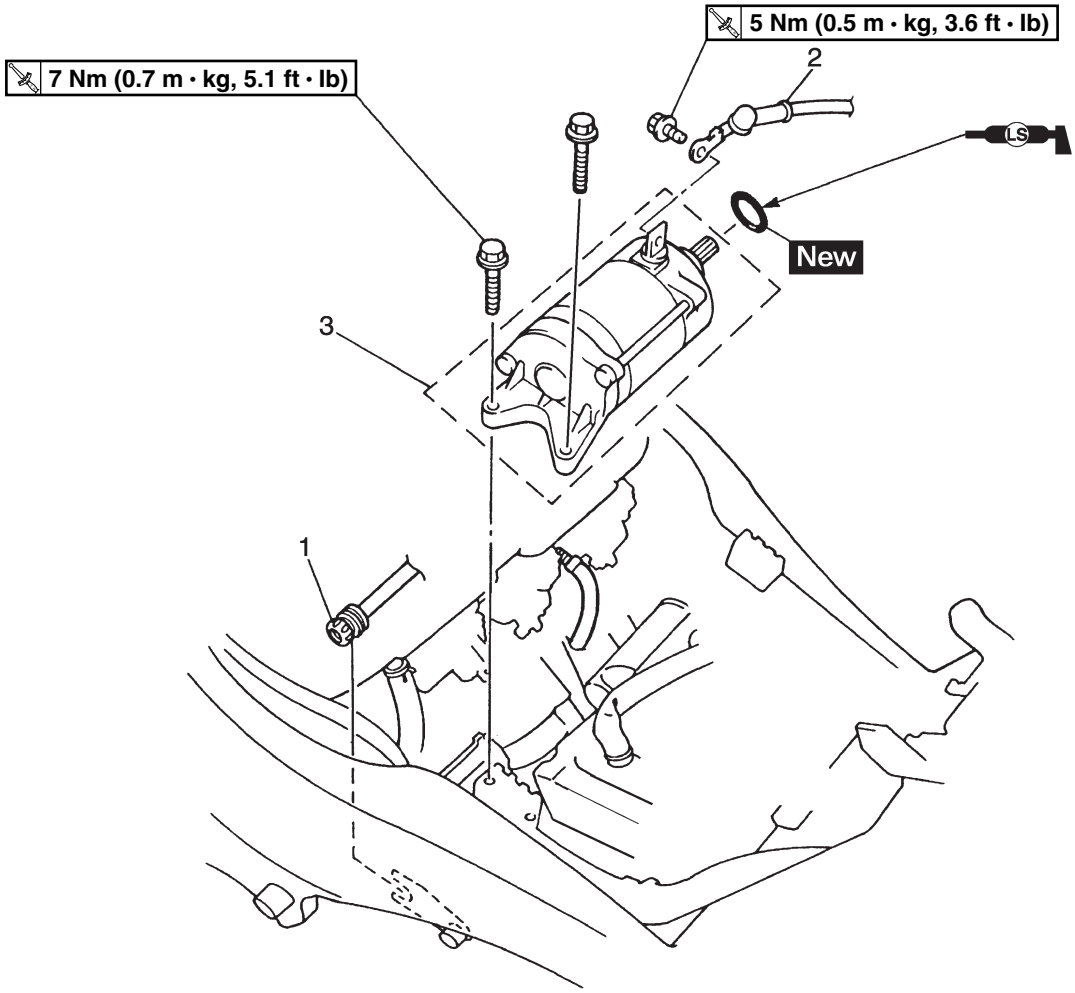
12.Wiring
- Check the entire starting system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the starting system’s wiring properly connected and without defects?

YES → The starting system circuit is OK.

NO → Properly connect or repair the starting system’s wiring.

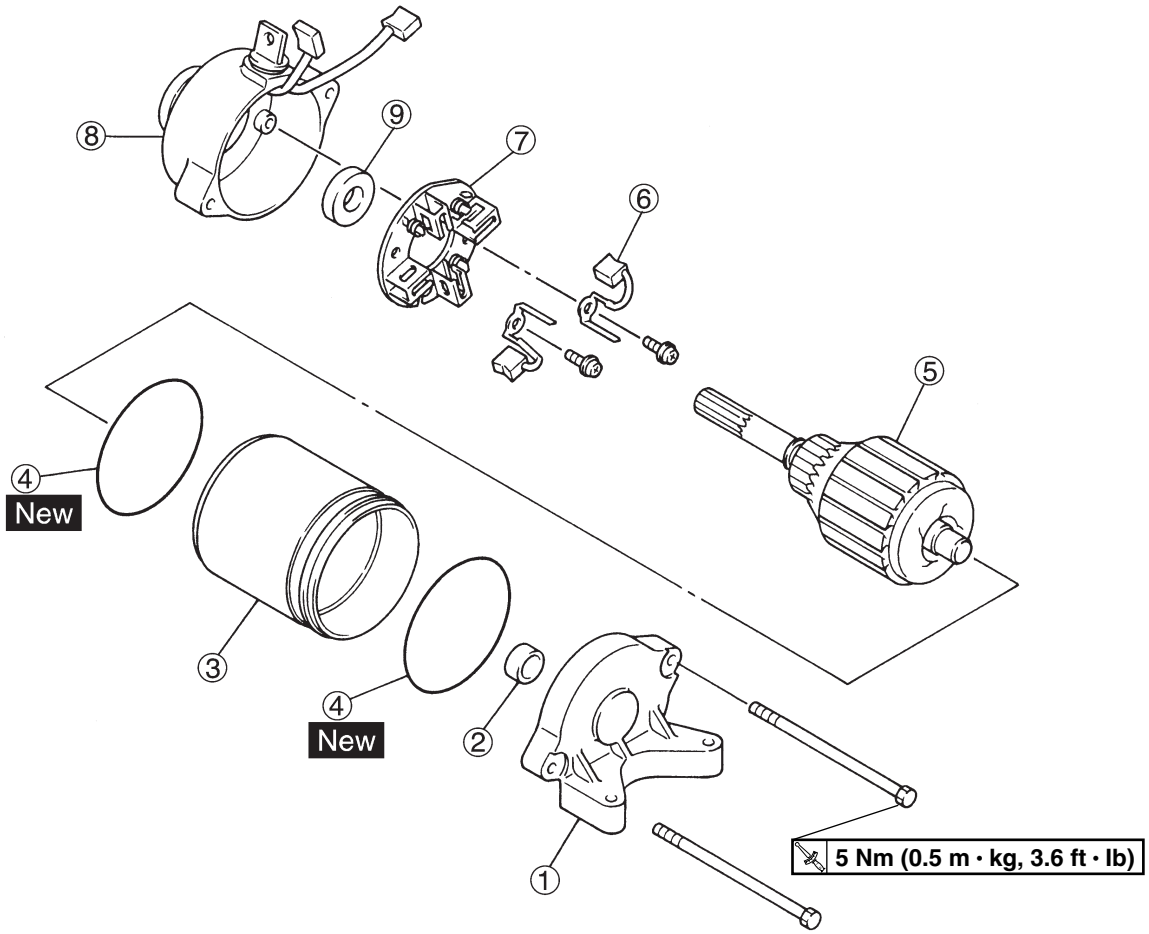
EAS00767

STARTER MOTOR

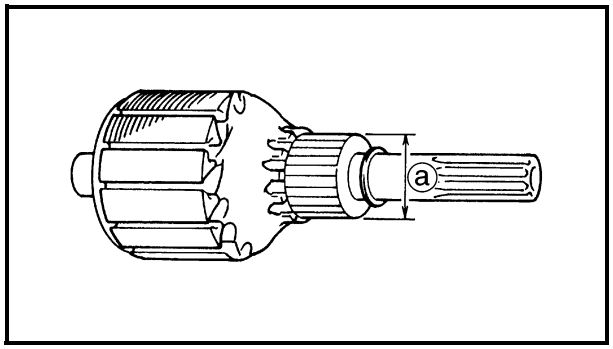


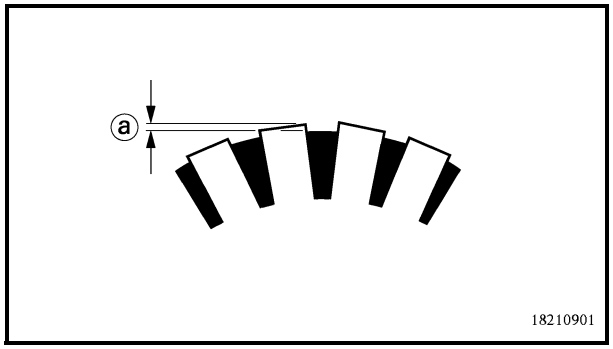
Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Left side cowling		Refer to "COWLINGS" in chapter 3.
1	Throttle stop screw	1	
2	Starter motor lead	1	
3	Starter motor assembly	1	
			For installation, reverse the removal procedure.

EAS00768



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Disassembly the parts in the order listed.
①	Starter motor rear cover	1	
②	Bearing	1	
③	Starter motor yoke	1	
④	O-ring	2	
⑤	Armature assembly	1	
⑥	Brush	2	
⑦	Brush holder	1	
⑧	Starter motor front cover	1	
⑨	Bearing	1	
			For assembly, reverse the disassembly procedure.





EAS00769
CHECKING THE STARTER MOTOR

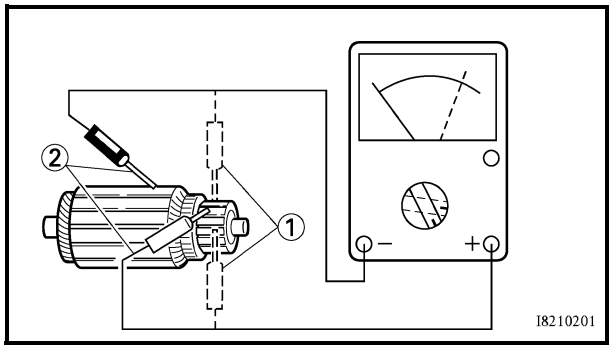
1. Check:
   - commutator
     Dirt → Clean with 600-grit sandpaper.
2. Measure:
   - commutator diameter ⓐ
     Out of specification → Replace the starter motor.

Commutator wear limit
23.5 mm (0.93 in)

3. Measure:
   - mica undercut ⓐ
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut
1.5 mm (0.059 in)

NOTE:
The mica of the commutator must be undercut to ensure proper operation of the commutator.



4. Measure:
   - armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

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a. Measure the armature assembly resistances with the pocket tester.

Pocket tester
YM-03112

Armature coil
Commutator resistance ①
0.009 ~ 0.011 Ω at 20 °C (68 °F)
Insulation resistance ②
Above 1 MΩ at 20°C (68 °F)

b. If any resistance is out of specification, replace the starter motor.

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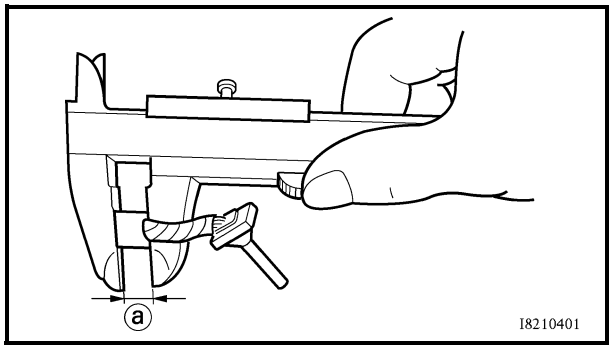
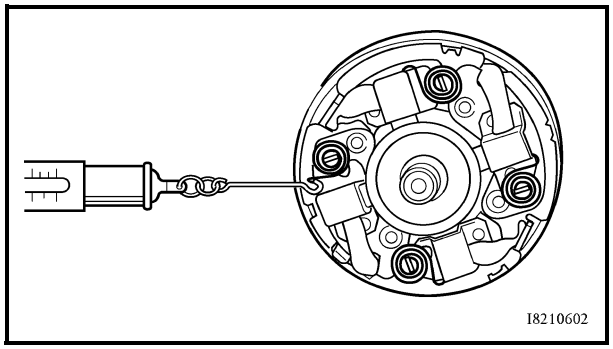


5. Measure:
   • brush length ⓐ
   Out of specification → Replace the brushes as a set.

Brush length wear limit
3.65 mm (0.14 in)

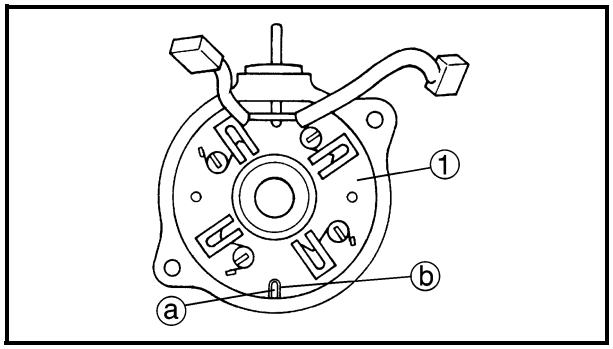


6. Measure:
   • brush spring force
   Out of specification → Replace the brush springs as a set.

Brush spring force
5.28 ~ 7.92 N
(528 ~ 792 g, 19.01 ~ 28.51 oz)

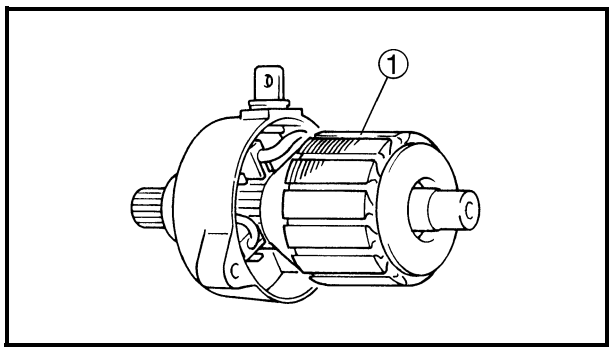
7. Check:
   • gear teeth
   Damage/wear → Replace the gear.

EAS00772
ASSEMBLING THE STARTER MOTOR

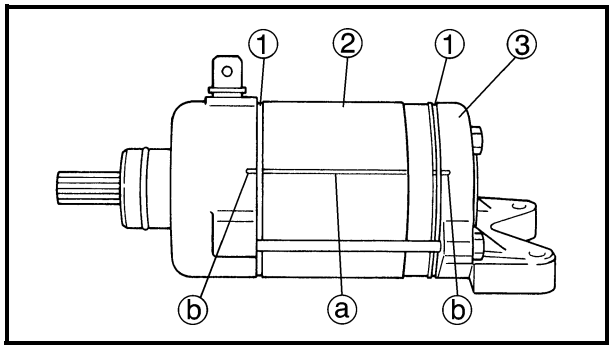


1. Install:
   • brush seat ①

NOTE:
Align the tab ⓐ on the brush seat with the slot ⓑ in the starter motor rear cover.



2. Install:
   • armature ①



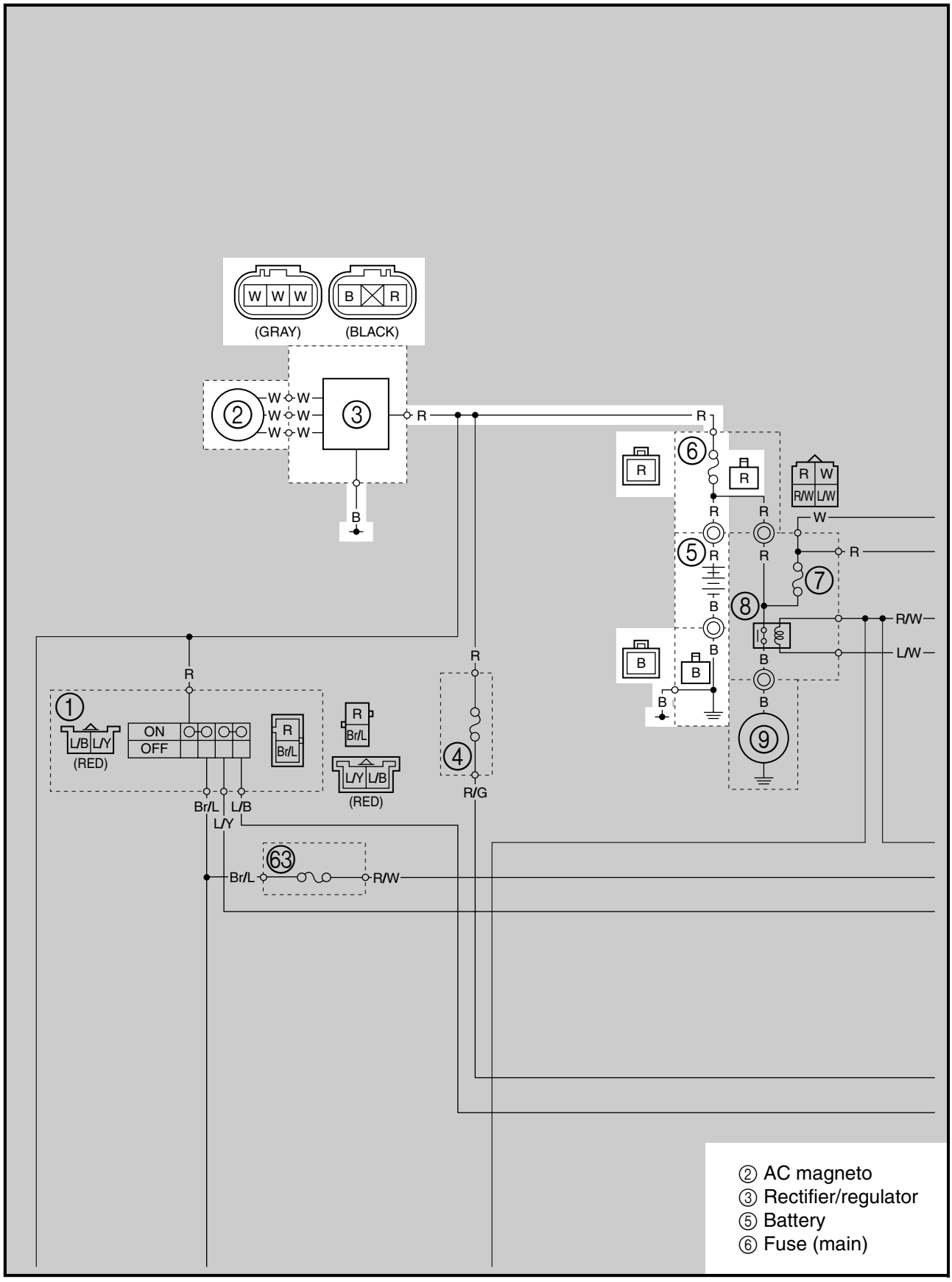
3. Install:
   • starter motor yoke ②
   • O-rings ① New
   • starter motor rear cover ③
   • bolts **5 Nm (0.5 m · kg, 3.6 ft· lb)**

NOTE:
Align the match marks ⓐ on the starter motor yoke with the match marks ⓑ on the front and 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
5. 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
YM-03112

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

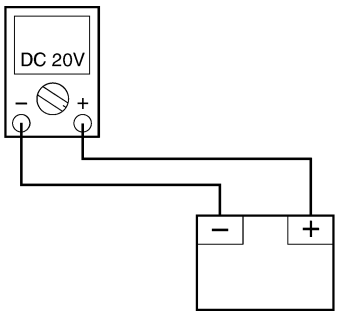
NO →
- Clean the battery terminals.
- Recharge or replace the battery.

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.

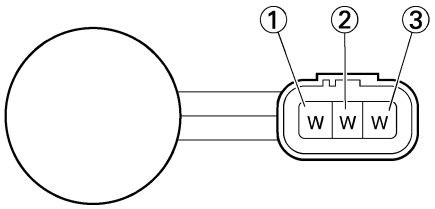
EAS00776

4. Stator coil resistance

- 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
0.19 ~ 0.23 Ω at 20°C (68°F)

- Is the stator coil OK?

YES → NO

Replace the stator coil assembly.

EAS00779

5. Wiring

- Check the wiring connections of the entire charging system.
  Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

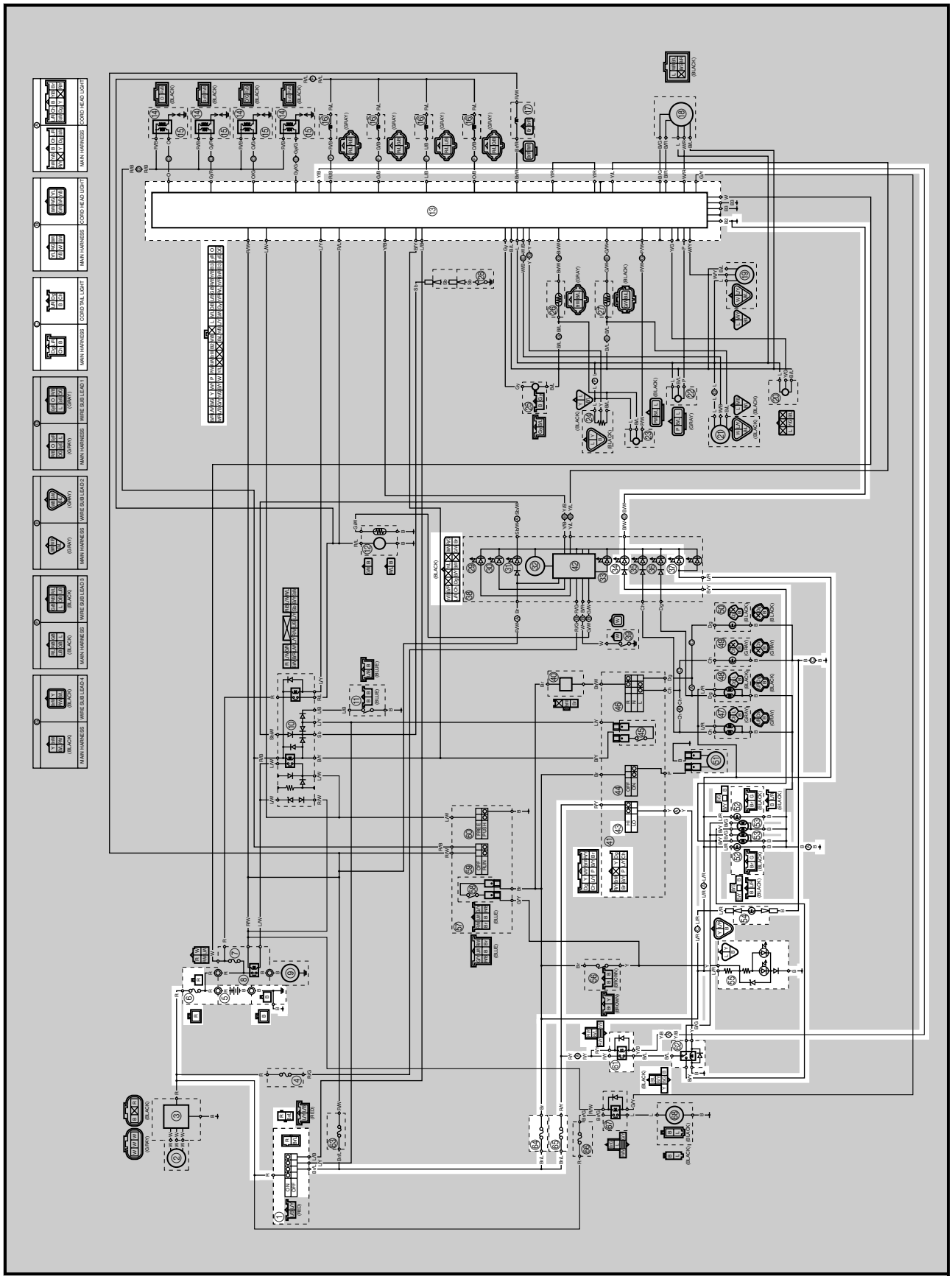
YES → Replace the rectifier/ regulator.

NO → Properly connect or repair the charging system's wiring.

EAS00780

LIGHTING SYSTEM

CIRCUIT DIAGRAM



① Main switch
⑤ Battery
⑥ Fuse (main)
⑬ ECU
㉞ Hi beam indicator light
㊲ Meter light
㊸ Dimmer switch
㊷ Auxiliary light
㊸ Headlight
㊹ License light
㊺ Taillight
㊶ Headlight relay (on/off)
㊷ Headlight relay (dimmer)
㊹ Fuse (signal)
㊺ Fuse (headlight)

EAS00781
TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, auxiliary light or meter light.

Check:
1. main, signal 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. tail cowling

- Troubleshoot with the following special tool(s).

Pocket tester
YM-03112

EAS00738

1. Main, signal and headlight fuses

- Check the main, signal and headlight fuses for continuity.
  Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main, signal and headlight fuses OK?

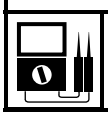
YES

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

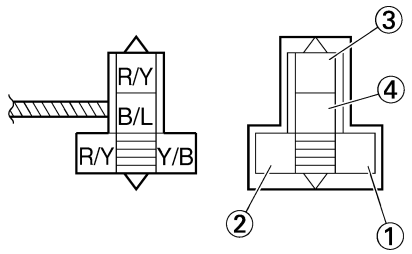
NO → The dimmer switch is faulty. Replace the left handlebar switch.

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 → red/yellow ①
Negative battery lead → yellow/black 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?

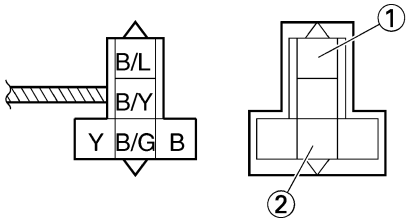
YES

NO → Replace the headlight relay (on/off).

6. Headlight relay (dimmer)

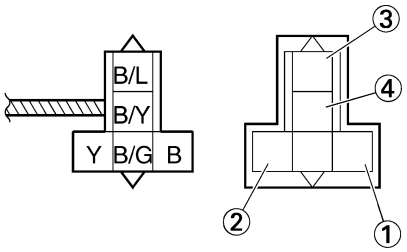
- Disconnect the headlight relay (dimmer) from the coupler.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the headlight relay (dimmer) coupler as shown.

Low-beam
Positive tester probe → black/blue ①
Negative tester probe → black/green ②



Hi-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 → Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".

NO → Properly connect or repair the lighting system's wiring.

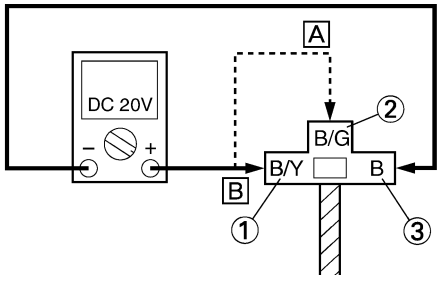
EAS00788
CHECKING THE LIGHTING SYSTEM

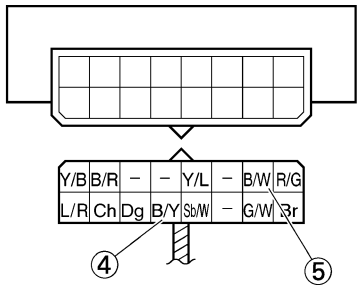
1. The headlight and the high beam indicator light fail to come on.

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 high beam indicator light coupler as shown.
A When the dimmer switch is set to " ≣D " B When the dimmer switch is set to " ≣D "
Headlight coupler (wire harness side) 
Headlight **Positive tester probe →** **black/yellow ① or black/green ②** **Negative tester probe → black ③**

High beam indicator light **Positive tester probe → black/yellow ④** **Negative tester probe → black/white ⑤**
Meter light coupler (wire harness side) 
• Set the main switch to "ON". • Start the engine and headlight to ON. • Set the dimmer switch to " ≣D " or " ≣D ". • Measure the voltage (DC 12 V) of green ② on the headlight coupler (wire harness side). • Is the voltage within specification?

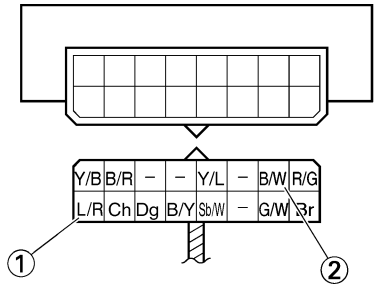
YES → This circuit is OK.

NO → The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

EAS00789
2. The meter light fails to come on.

1. Meter light bulb and socket
• Check the meter light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS” • Are the meter light bulb and socket OK?

YES → NO → Replace the meter light bulb, socket or both.

2. Voltage
• Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.
Positive tester probe → blue/red ① **Negative tester probe → black/white ②**

• Set the main switch to “ON”. • Measure the voltage (DC 12 V) of blue ① on the meter light coupler (wire harness side). • Is the voltage within specification?

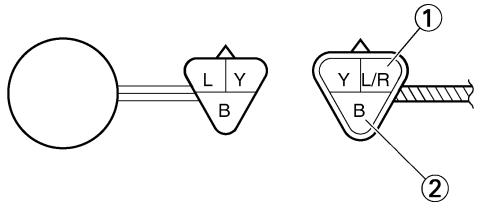
YES → This circuit is OK.

NO → The wiring circuit from the main switch to the meter light coupler is faulty and must be repaired.

EAS00790
3. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket
• Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS” • Are the tail/brake light bulb and socket OK?

YES → NO → Replace the tail/brake light bulb, socket or both.

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**

• Set the main switch to “ON”. • Measure the voltage (DC 12 V) of blue/red ① on the tail/brake light coupler (tail/brake light side). • Is the voltage within specification?

YES → This circuit is OK.

NO → Wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00791
4. The auxiliary light fails to come on.

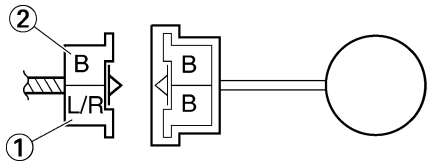
1. Auxiliary light bulb and socket
- Check the auxiliary light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND SOCKETS"
- Are the auxiliary light bulb and socket OK?

YES / NO

Replace the auxiliary light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the auxiliary light connectors (auxiliary light side) as shown.

Positive tester probe → blue/red ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of blue/red ① on the auxiliary light connectors (auxiliary light side).
- Is the voltage within specification?

YES / NO

This circuit is OK.

The wiring circuit from the main switch to the auxiliary light connectors is faulty and must be repaired.

EAS00792
5. The license plate light fails to come on.

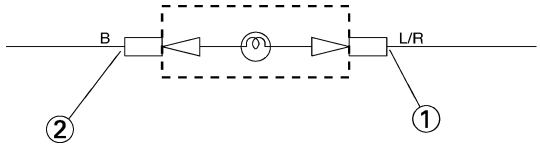
1. License plate light bulb and socket
- Check the license plate light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the license plate light bulb and socket OK?

YES / NO

Replace the license plate light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the license plate light coupler (license plate light side) as shown.

Positive tester probe → blue/red ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of blue/red ① on the license plate light coupler (license plate light side).
- Is the voltage within specification?

YES / NO

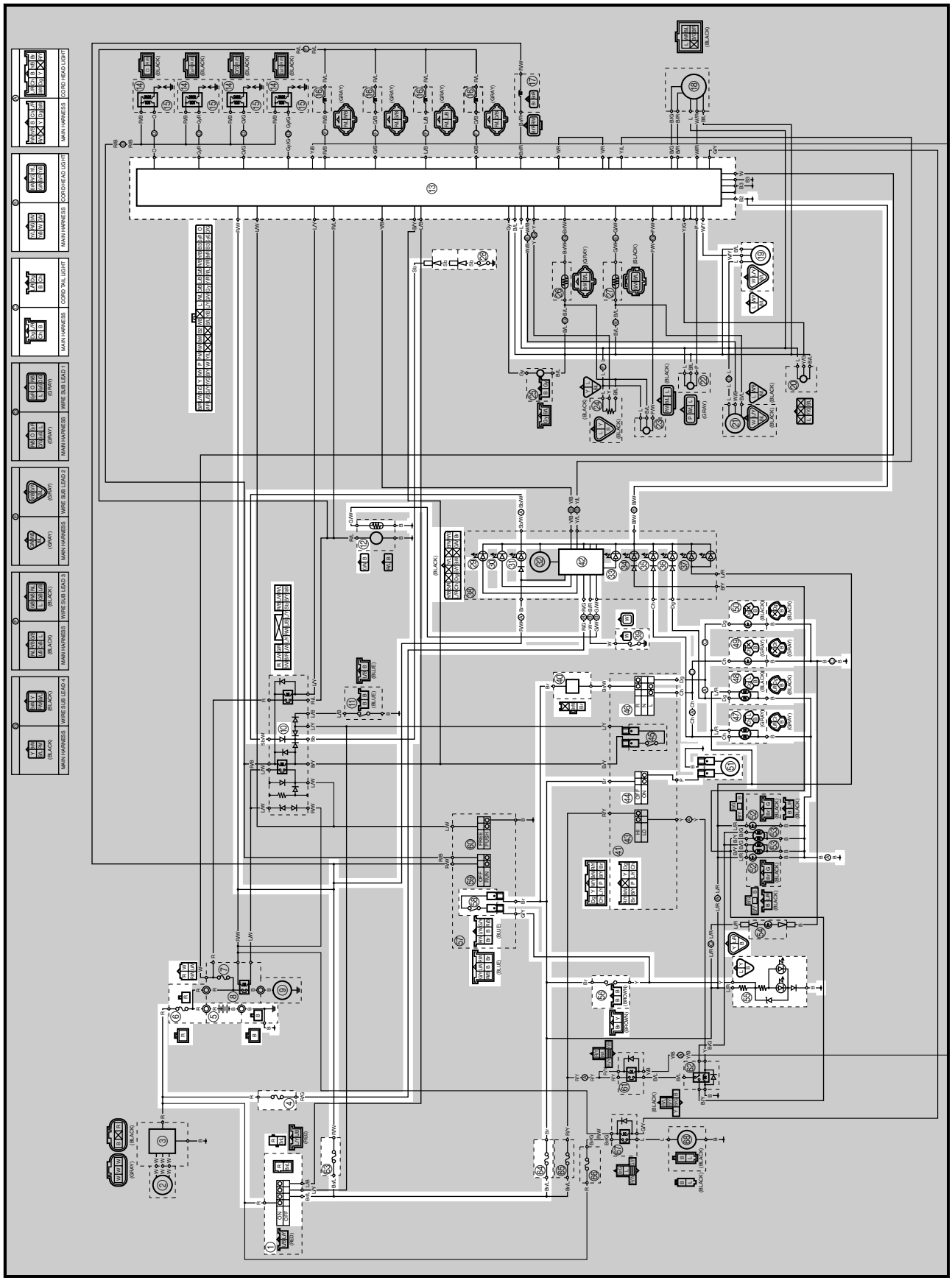
This circuit is OK.

The wiring circuit from the main switch to the license plate light coupler is faulty and must be repaired.

EAS00793

SIGNALING SYSTEM

CIRCUIT DIAGRAM



① Main switch
④ Fuse (back up)
⑤ Battery
⑥ Fuse (main)
⑩ Starting circuit cut-off relay
⑫ Fuel pump
⑬ ECU
⑲ Speed sensor
㉘ Neutral switch
㉙ Fuel level warning light
㉚ Oil level warning light
㉛ Neutral indicator light
㉝ Coolant temperature indicator light
㉟ Turn signal indicator light (L)
㊱ Turn signal indicator light (R)
㊴ Oil level gauge
㊵ Flasher relay
㊷ Multi-function meter
㊹ Horn switch
㊻ Turn signal switch
㊼ Front flasher light (L)
㊽ Front flasher light (R)
㊾ Rear flasher light (L)
㊿ Rear flasher light (R)
(51) Horn
(56) Tail/brake light
(57) Rear brake switch
(58) Front brake switch
(63) Fuse (ignition)
(64) Fuse (signal)

EAS00794
TROUBLESHOOTING

- **Any of the following fail to light: turn signal light, brake light or an indicator light.**
- **The horn fails to sound.**

Check:
1. main, ignition, signaling and back up 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. tail cowling

- Troubleshoot with the following special tool(s).

Pocket tester
YM-03112

EAS00738

1. Main, ignition, signaling and back up fuses

- Check the main, ignition, signaling and back up fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, ignition, signaling and back up 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.

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?

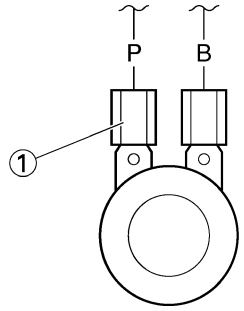
YES

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 → pink ①
Negative tester probe → ground



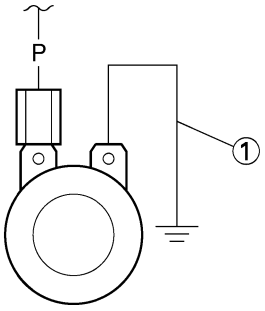
- Set the main switch to "ON".
- Push the horn switch.
- Measure the voltage (DC 12 V) of pink at the horn terminal.
- Is the voltage within specification?

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.
- Set the main switch to "ON".
- Push the horn switch.
- Does the horn sound?



NO → Replace the horn.

YES → The horn is OK.

EAS00797

2. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the tail/brake light bulb and socket OK?

YES

NO → Replace the tail/brake light bulb, socket or both.

2. Brake light switches

- Check the brake light switches for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the brake light switch OK?

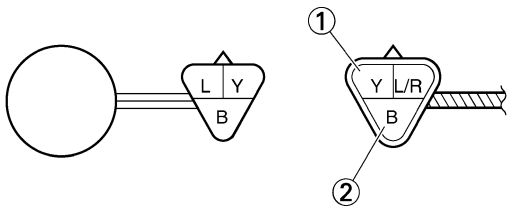
YES

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



- Set 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?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00799

3. The turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal indicator light bulb and socket

- Check the turn signal light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the turn signal light bulb and socket OK?

YES

NO

Replace the turn signal light bulb, socket or both.

2. Turn signal switch

- Check the turn signal switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the turn signal switch OK?

YES

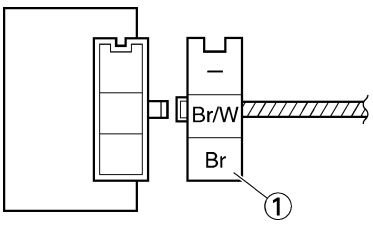
NO

Replace the left handlebar switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → ground



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

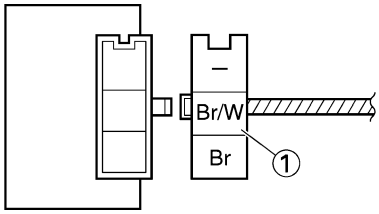
NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

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



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

NO

The turn signal relay is faulty and must be replaced.

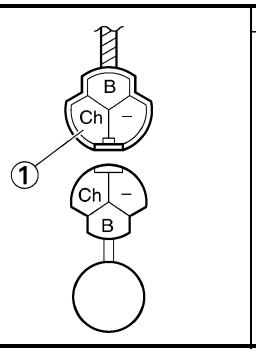
5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connector or meter assembly coupler (wire harness side) as shown.

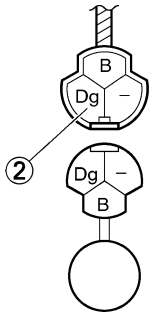
Ⓐ Front turn signal light
Ⓑ Rear turn signal light
Ⓒ Turn signal indicator light

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

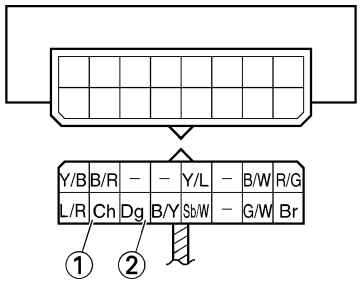
A



B



C



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (DC 12 V) of the chocolate ① or dark green ② at the 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.

EAS00801

4. The neutral indicator light fails to come on.

1. Neutral indicator light bulb and socket

- Check the neutral indicator light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the neutral indicator light bulb and socket OK?

YES

NO

Replace the neutral indicator light bulb, socket or both.

2. Neutral switch

- Check the neutral switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

YES

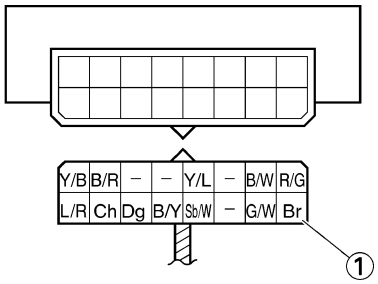
NO

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



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown at the meter light bulb coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the meter light bulb coupler is faulty and must be repaired.

EAS00802
5. The oil level warning light fails to come on.

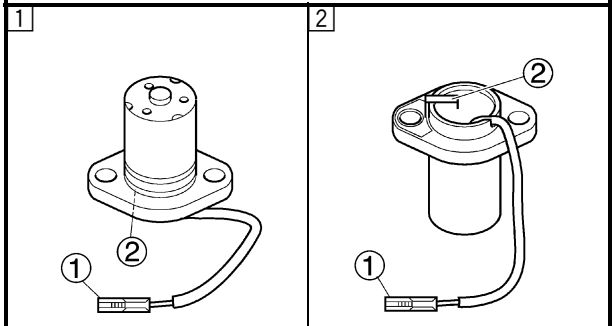
1. Oil level warning light bulb and socket
- Check the oil level warning light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the oil level warning light bulb and socket OK?

YES → 2. Engine oil level gauge

NO → Replace the oil level warning light bulb, socket or both.

2. Engine oil level gauge
- Drain the engine oil and remove the engine oil level switch from the oil pan.
- Connect the pocket tester (Ω × 100) to the engine oil level gauge as shown.

Positive tester probe →
Connector ① (white)
Negative tester probe → Body earth ②



- Measure the engine oil level gauge resistanse.

Oil level gauge resistance
1 108 ~ 132 Ω at 20 °C
2 526 ~ 624 Ω at 20 °C

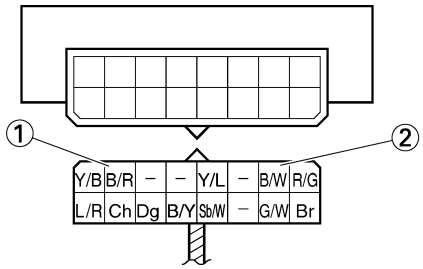
- Is the engine oil level gauge OK?

YES → 3. Voltage

NO → Replace the engine oil level gauge

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



- Set 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 → This circuit is OK.

NO → The wiring circuit from the main switch to the meter assembly is faulty and must be repaired.

EAS00803
6. The fuel level indicator light fails to come on.

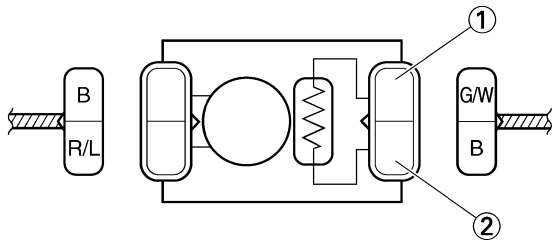
1. Fuel level indicator light bulb and socket
- Check the fuel level indicator light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the fuel level indicator light bulb and socket OK?

YES → NO → Replace the fuel level indicator light bulb, socket or both.

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 (Ω × 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?

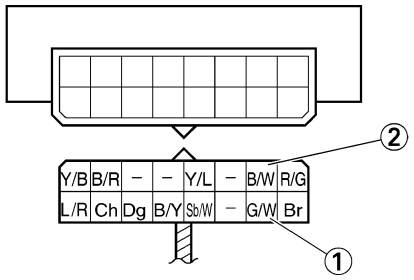
YES

NO → Replace the fuel sender.

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



- Set 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 → This circuit is OK.

NO → The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EAS00806

7. The speedometer fails to come on.

1. Multi-function meter bulb socket

- Check the multi-function meter bulb socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Is the multi-function meter bulb socket OK?

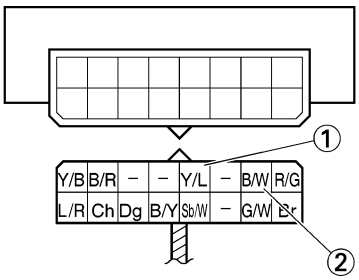
YES

NO → Replace the multi-function meter.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → yellow/blue ①
Negative tester probe → black/white ②



- Set 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

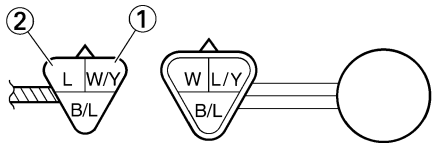
Replace the multi-function meter.

YES

3. 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



- Set the main switch to "ON".
- Elevate the rear wheel and slowly rotate it.
- Measure the voltage (DC 5 V) of yellow and black/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

This circuit is OK.

NO

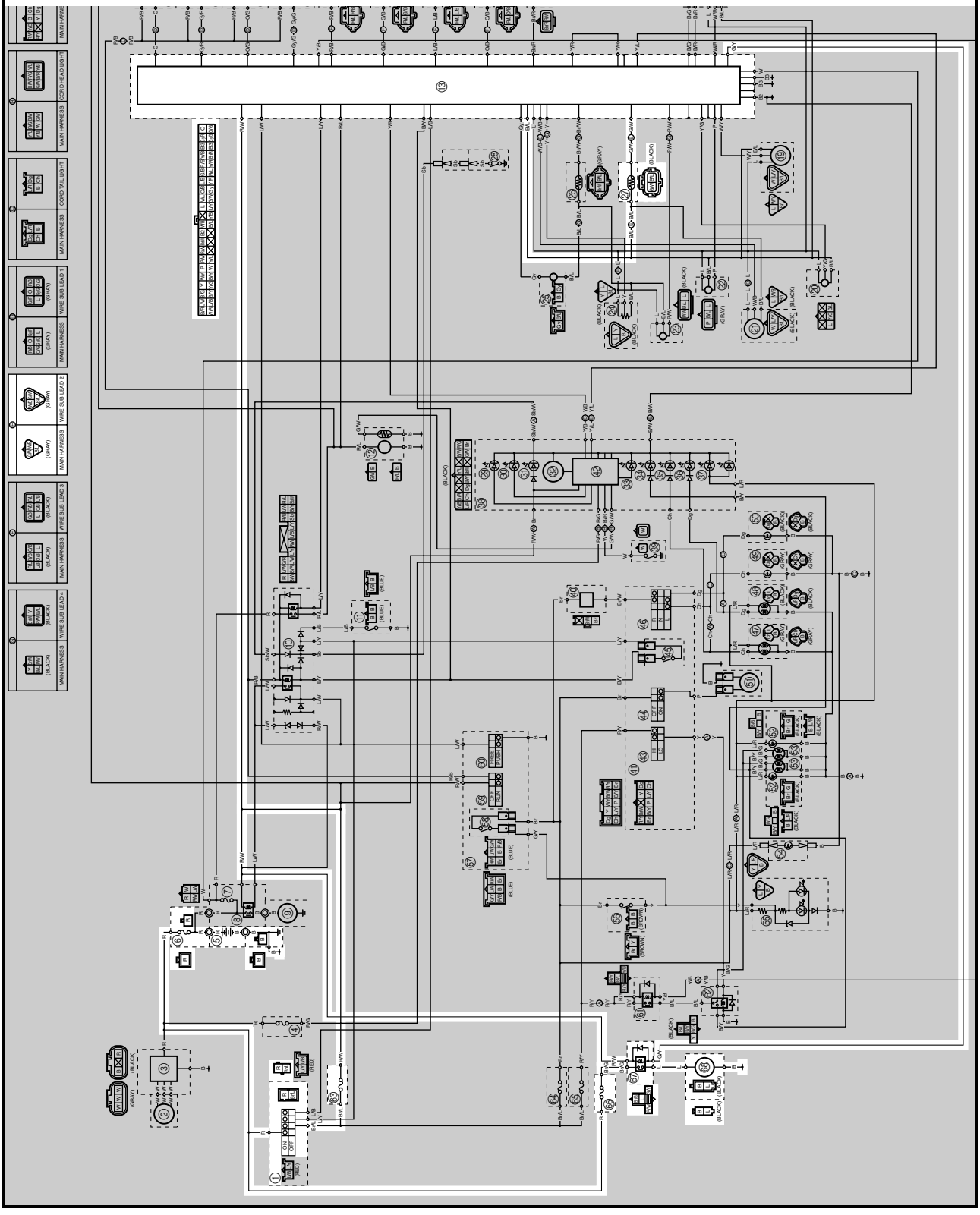
Replace the speed sensor.

EAS00807

COOLING SYSTEM

CIRCUIT DIAGRAM

① Main switch
⑤ Battery
⑥ Fuse (main)
⑬ ECU
㉗ Coolant temperature sensor
㊸ Fuse (ignition)
㊻ Fuse (fan motor)
㊼ Fan motor relay
㊽ Fan motor



EAS00808
TROUBLESHOOTING

• The radiator fan motor fails to turn. **• The coolant temperature meter (meter assembly) fails to indicate 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 cowling
4. side cowlings

- Troubleshoot with the following special tool(s).

	**Pocket tester** **YM-03112**

EAS00738

1. Main, ignition and fan motor 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.

EAS00749

3. Main switch
• Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”. • Is the main switch OK?

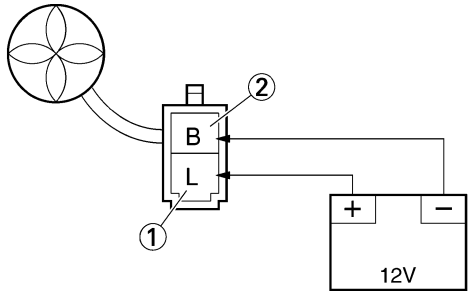
YES

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

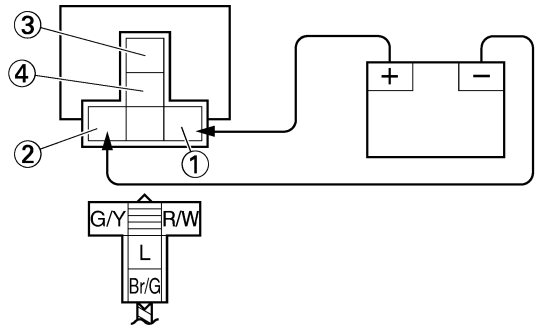
NO → The radiator fan motor is faulty and must be replaced.

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.

Positive battery terminal → red/white ①
Negative battery terminal → green/yellow ②

Tester positive probe → brown/green ③
Tester negative probe → blue ④



- Does the radiator fan motor have continuity between brown/black and blue?

YES

NO → Replace the radiator fan motor.

EAS00812

6. Coolant temperature sensor

- Remove the coolant temperature sensor from the thermostat housing.
- Connect the pocket tester (Ω × 1k) to the coolant temperature sensor ① as shown.
- Immerse the coolant temperature sensor in a container filled with coolant ②.

NOTE:
Make sure the coolant temperature sensor terminals do not get wet.

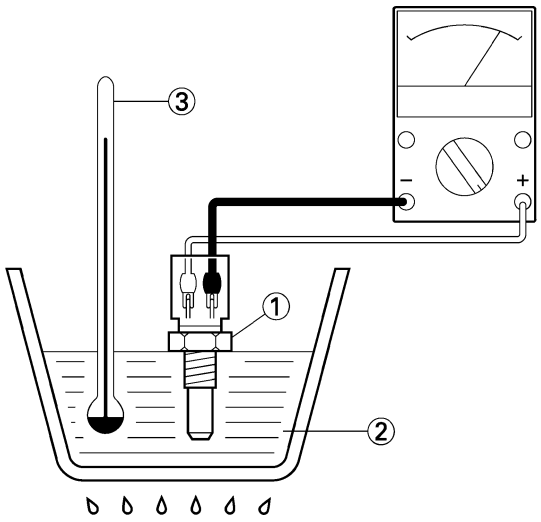
- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.
- Check the coolant temperature sensor for continuity at the temperatures indicated in the table.

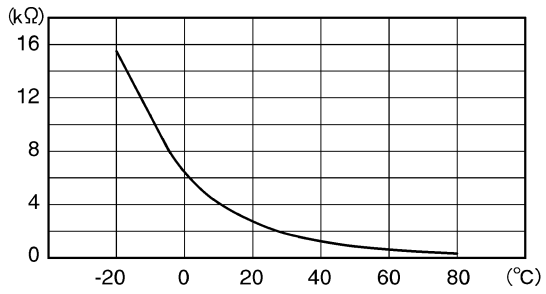
Coolant temperature sensor resistance
0 °C (32 °F): 5.21 ~ 6.37 kΩ
80 °C (176 °F): 0.29 ~ 0.35 kΩ

⚠ WARNING

- **Handle the coolant temperature sensor with special care.**
- **Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.**

Coolant temperature sensor
20 Nm (2.0 m · kg, 14 ft · lb)
Three bond sealock®10





- Does the coolant temperature sensor operate properly?

YES → This circuit is OK.

NO → Replace the coolant temperature sensor.

EAS00813

7. Wiring

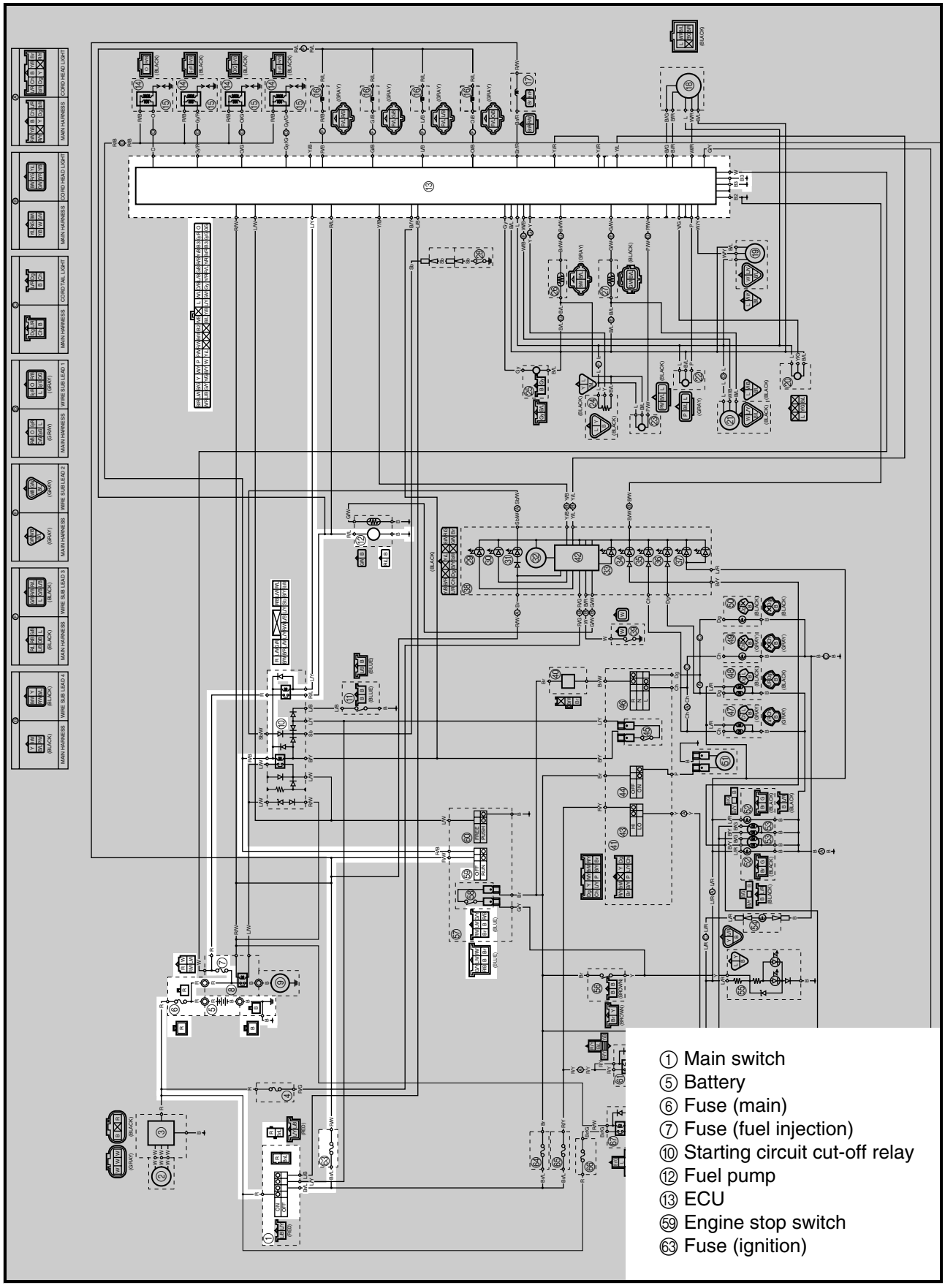
- Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the cooling system's wiring properly connected and without defects?

YES → This circuit is OK.

NO → Properly connect or repair the cooling system's wiring.

FUEL PUMP SYSTEM

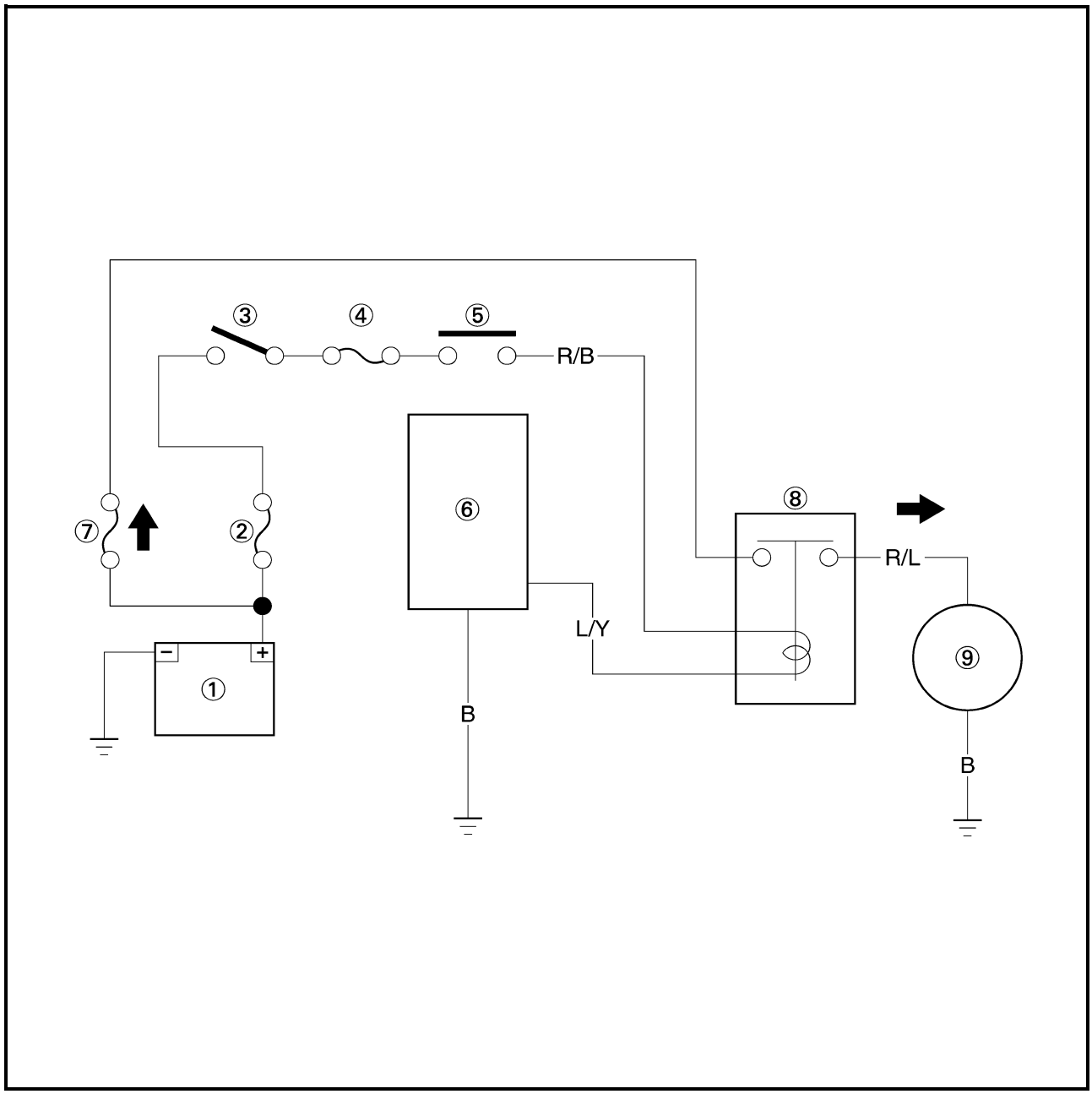
CIRCUIT DIAGRAM



EAS00815
FUEL PUMP SYSTEM

The ECU includes the control unit for the fuel pump.

① Battery
② Main fuse
③ Main switch
④ Ignition fuse
⑤ Engine stop switch
⑥ ECU
⑦ Fuel injection system fuse
⑧ Fuel injection system relay
⑨ Fuel pump



EAS00816
TROUBLESHOOTING

If the fuel pump fails to operate.

Check:
1. Main and fuel injection system fuses
2. Battery
3. Main switch
4. Engine stop switch
5. Starting circuit cut-off relay (the fuel 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
YM-03112

EAS00738

1. Main and fuel injection system 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 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.

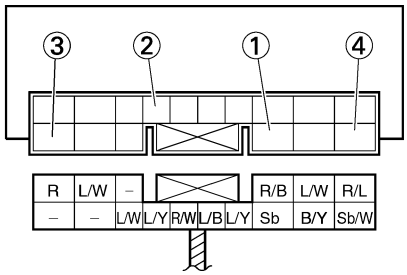
EAS00759

5. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cut-off relay coupler as shown.

Positive battery lead → red/black ①
Negative battery lead → blue/yellow 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 → Replace the starting circuit cut-off relay.

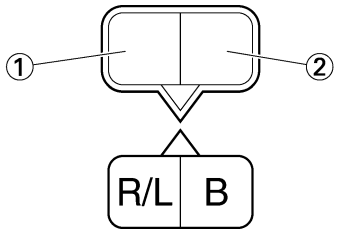
NO

EAS00817

6. Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester (Ω × 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 Ω 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?

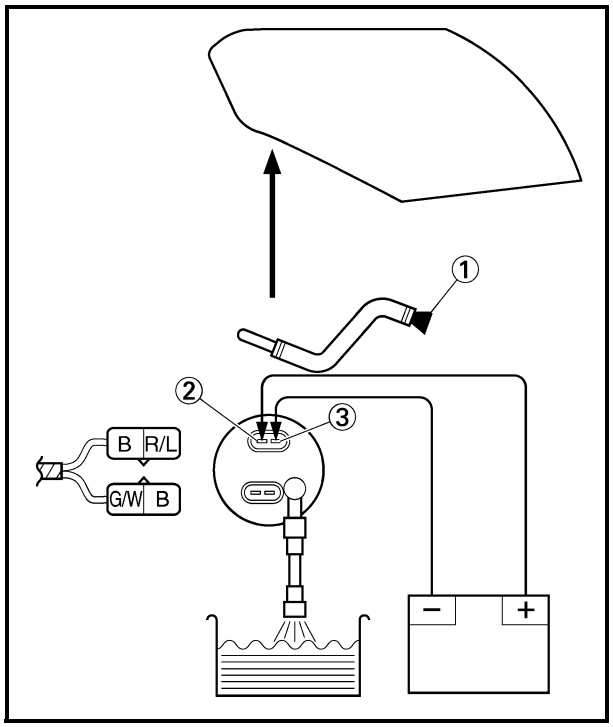
YES → Replace the ECU.

NO → 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

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Insert the plug ① to fuel return hose end.
b. Fill the fuel tank.
c. Put the end of the fuel hose into an open container.
d. 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.

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EAS00844

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
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Piston(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 strainer
- 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
- Faulty spark plug lead

Ignition system
- Faulty ECU
- Faulty crankshaft position sensor
- Broken generator rotor woodruff key

Switches and wiring
- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty 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
- Broken generator rotor woodruff key

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

Clogged coolant passages
- 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)
- Incorrect main jet setting
- Incorrect fuel level
- 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

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

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

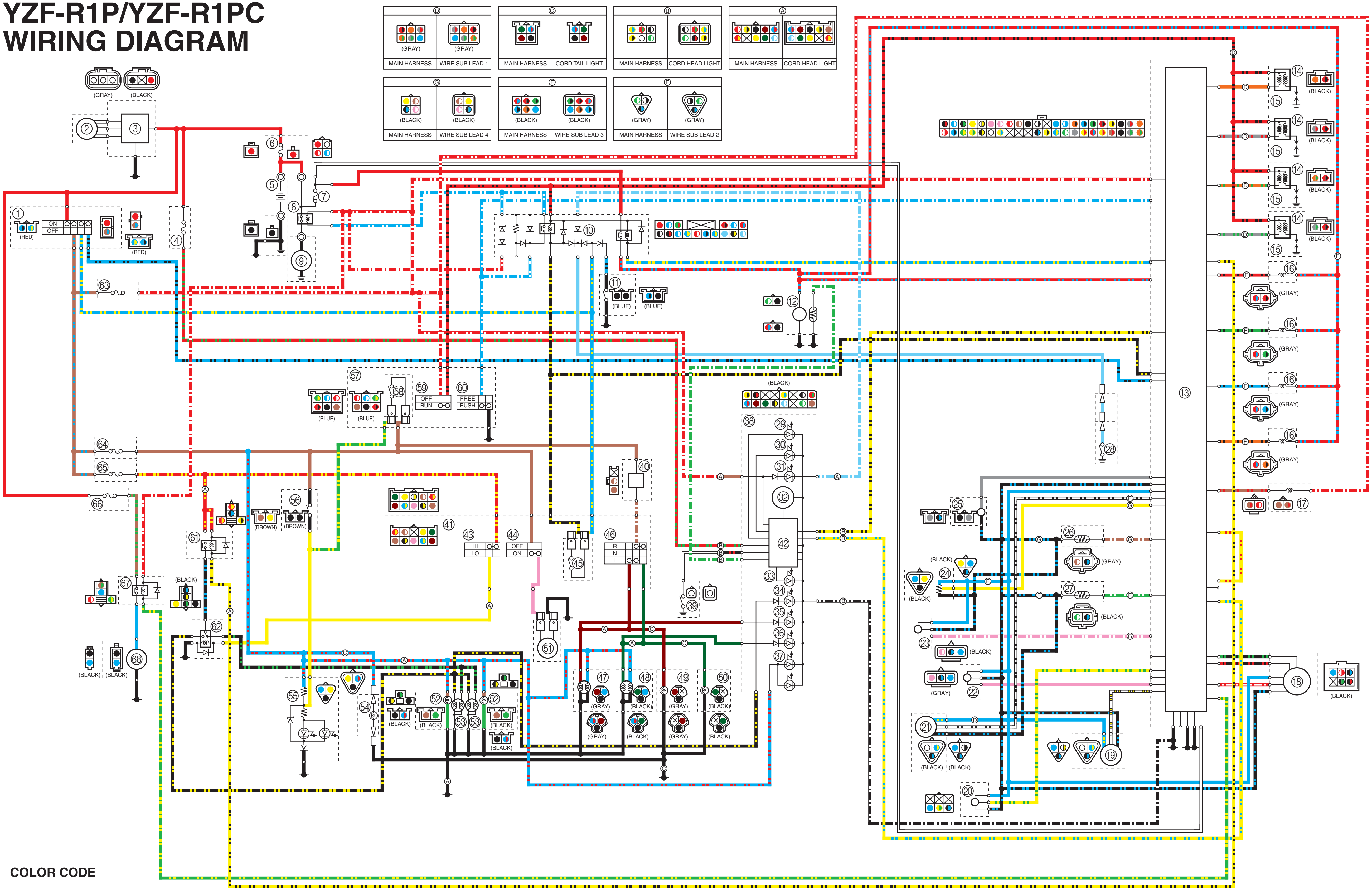
TURN SIGNAL BLINKS QUICKLY
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

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-R1P/YZF-R1PC WIRING DIAGRAM

① Main switch
② AC magneto
③ Rectifier/regulator
④ Fuse (back up)
⑤ Battery
⑥ Fuse (main)
⑦ Fuse (fuel injection system)
⑧ Starter relay
⑨ Starter motor
⑩ Starting circuit cut-off relay
⑪ Sidestand switch
⑫ Fuel pump
⑬ ECU
⑭ Ignition coil
⑮ Spark plug
⑯ Fuel injector
⑰ AI system solenoid
⑱ EXUP servo motor
⑲ Speed sensor
⑳ Lean angle cut-off switch
㉑ Cylinder identification sensor
㉒ Atmospheric pressure sensor
㉓ Intake air pressure sensor
㉔ Throttle position sensor
㉕ Crankshaft position sensor
㉖ Intake air temperature sensor
㉗ Coolant temperature sensor
㉘ Neutral switch
㉙ Fuel level warning light
㉚ Oil level warning light
㉛ Neutral indicator light
㉜ Tachometer
㉝ Coolant temperature indicator light
㉞ High beam indicator light
㉟ Turn signal indicator light (L)
㊱ Turn signal indicator light (R)
㊲ Meter light
㊳ Meter assembly
㊴ Oil level gauge
㊵ Turn signal relay
㊶ Left handlebar switch
㊷ Multi-function meter
㊸ Dimmer switch
㊹ Horn switch
㊺ Clutch switch
㊻ Turn signal switch
㊼ Front turn signal light (L)
㊽ Front turn signal light (R)
㊾ Rear turn signal light (L)
㊿ Rear turn signal light (R)
(51) Horn
(52) Auxiliary light
(53) Headlight
(54) License light
(55) Tail/brake light
(56) Rear brake switch
(57) Right handlebar switch
(58) Front brake switch
(59) Engine stop switch
(60) Start switch
(61) Headlight relay (on/off)
(62) Headlight relay (dimmer)
(63) Fuse (ignition)
(64) Fuse (signal)
(65) Fuse (headlight)
(66) Fuse (fan motor)
(67) Fan motor relay
(68) Fan motor

YZF-R1P/YZF-R1PC WIRING DIAGRAM



COLOR CODE

Black	Dark green	Pink	Yellow	Black/White	Blue/White	Brown/White	Green/White	Orange/Black	Red/Green	Sky blue/White	Yellow/Black
Blue	Green	Red	Black/Green	Black/Yellow	Blue/Yellow	Brown/Green	Green/Yellow	Orange/Green	Red/Blue	White/Black	Yellow/Green
Brown	Gray	Sky blue	Black/Blue	Blue/Black	Brown/Blue	Green/Black	Gray/Green	Pink/White	Red/White	White/Red	Yellow/Blue
Chocolate	Orange	White	Black/Red	Blue/Red	Brown/Red	Green/Red	Gray/Red	Red/Black	Red/Yellow	White/Yellow	Yellow/Red

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