



YAMAHA

2012

SERVICE MANUAL

YZF-R1(B)



MOTOMATRIX

1KB-28197-E0

EAS20040

**YZF-R1(B)
SERVICE MANUAL
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First edition, July 2011
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IMPORTANT

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.

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.

TIP

Designs and specifications are subject to change without notice.

EAS20081

IMPORTANT MANUAL INFORMATION

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

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.
TIP	A TIP provides key information to make procedures easier or clearer.

EAS20090

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.

- The manual is divided into chapters and each chapter is divided into sections. The current section title "1" is shown at the top of each page.
- Sub-section titles "2" appear in smaller print than the section title.
- To help identify parts and clarify procedure steps, there are exploded diagrams "3" at the start of each removal and disassembly section.
- Numbers "4" are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step.
- Symbols "5" indicate parts to be lubricated or replaced. Refer to "SYMBOLS".
- A job instruction chart "6" accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
- Jobs "7" requiring more information (such as special tools and technical data) are described sequentially.

1
↓
CLUTCH

EAS20091
CLUTCH
Removing the clutch cover

3

4

5

6

Order	Job/Parts to remove	Q'ty	Remarks
1	Engine oil	1	Drain.
2	Clutch cable	1	Disconnect.
3	Clutch cover	1	
4	Clutch cover gasket	1	
5	Dowel pin	3	
6	Oil filler cap	1	For installation, reverse the removal procedure.

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CLUTCH

TIP
When adjusting the clutch assembly width (by replacing the clutch plate(s)), be sure to replace the clutch plate "1" fast.
After replacing the clutch plate "1", if specifications cannot be met, replace the clutch plate "2".

EAS20126
CHECKING THE CLUTCH HOUSING

1. Check:
• Clutch housing dogs
Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

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

EAS20116
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:
• Clutch spring
Damage → Replace the clutch springs as a set.

2. Measure:
• Clutch spring free length "a"
Out of specification → Replace the clutch springs as a set.

Clutch spring free length
43.80 mm (1.72 in)
Limit
41.61 mm (1.64 in)

EAS20100
CHECKING THE CLUTCH BOSS

1. Check:
• Clutch boss splines
Damage/pitting/wear → Replace the clutch boss.

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

EAS20110
CHECKING THE PRESSURE PLATE

1. Check:
• Pressure plate 1 "1"
• Pressure plate 2 "2"
Cracks/damage → Replace.

5-64

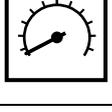
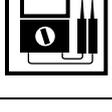
EAS20100

SYMBOLS

The following symbols are used in this manual for easier understanding.

TIP

The following symbols are not relevant to every vehicle.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Serviceable with engine mounted		Gear oil
	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
	Special tool		Wheel bearing grease
	Tightening torque		Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone grease
	Electrical data		Apply locking agent (LOCTITE®).
	Engine oil		Replace the part with a new one.

EAS20110

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IDENTIFICATION

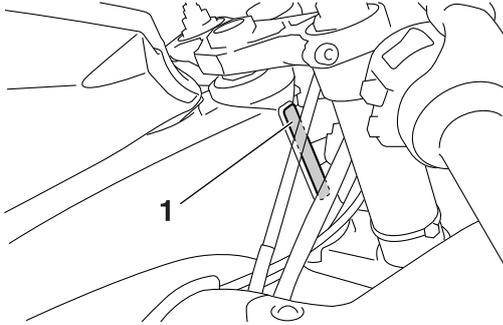
EAS20130

IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

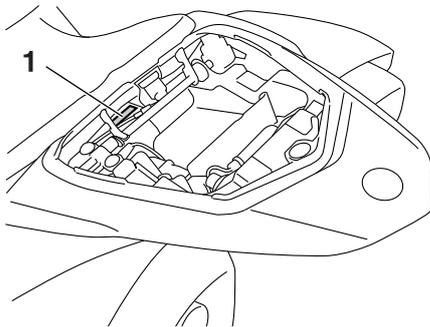
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



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MODEL LABEL

The model label "1" is affixed to the seat rail reinforcement under the passenger seat. This information will be needed to order spare parts.



FEATURES

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FEATURES

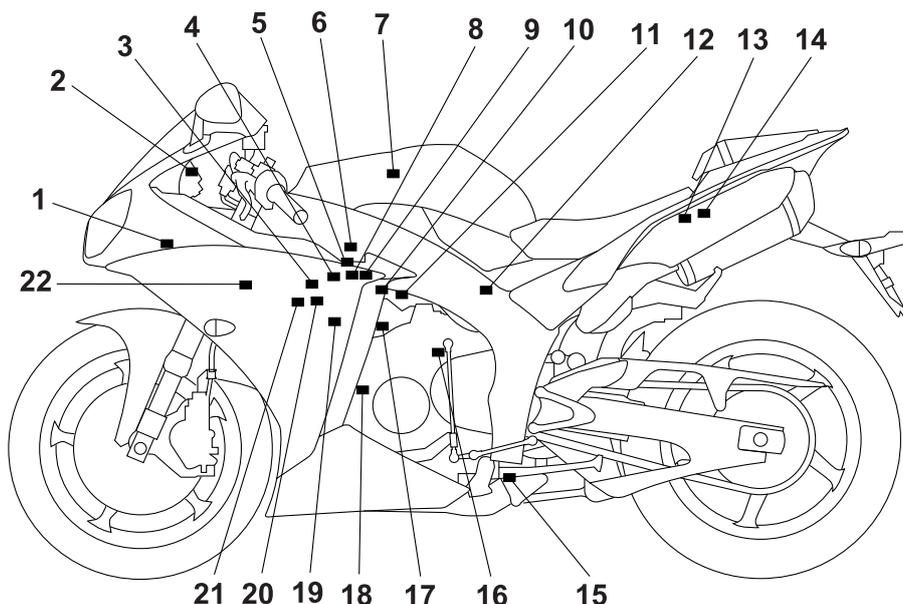
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OUTLINE OF THE FI SYSTEM

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

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

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



- | | |
|----------------------------------|------------------------------------|
| 1. Intake air temperature sensor | 13. Lean angle sensor |
| 2. Engine trouble warning light | 14. Relay unit (fuel pump relay) |
| 3. Air induction system solenoid | 15. O ₂ sensor |
| 4. Atmospheric pressure sensor | 16. Rear speed sensor |
| 5. Intake air pressure sensor | 17. Coolant temperature sensor |
| 6. Intake funnel servo motor | 18. Crankshaft position sensor |
| 7. Secondary injectors | 19. Spark plugs |
| 8. Throttle servo motor | 20. Ignition coils |
| 9. Throttle position sensor | 21. Cylinder identification sensor |
| 10. Accelerator position sensor | 22. ECU (engine control unit) |
| 11. Primary injectors | |
| 12. Fuel pump | |

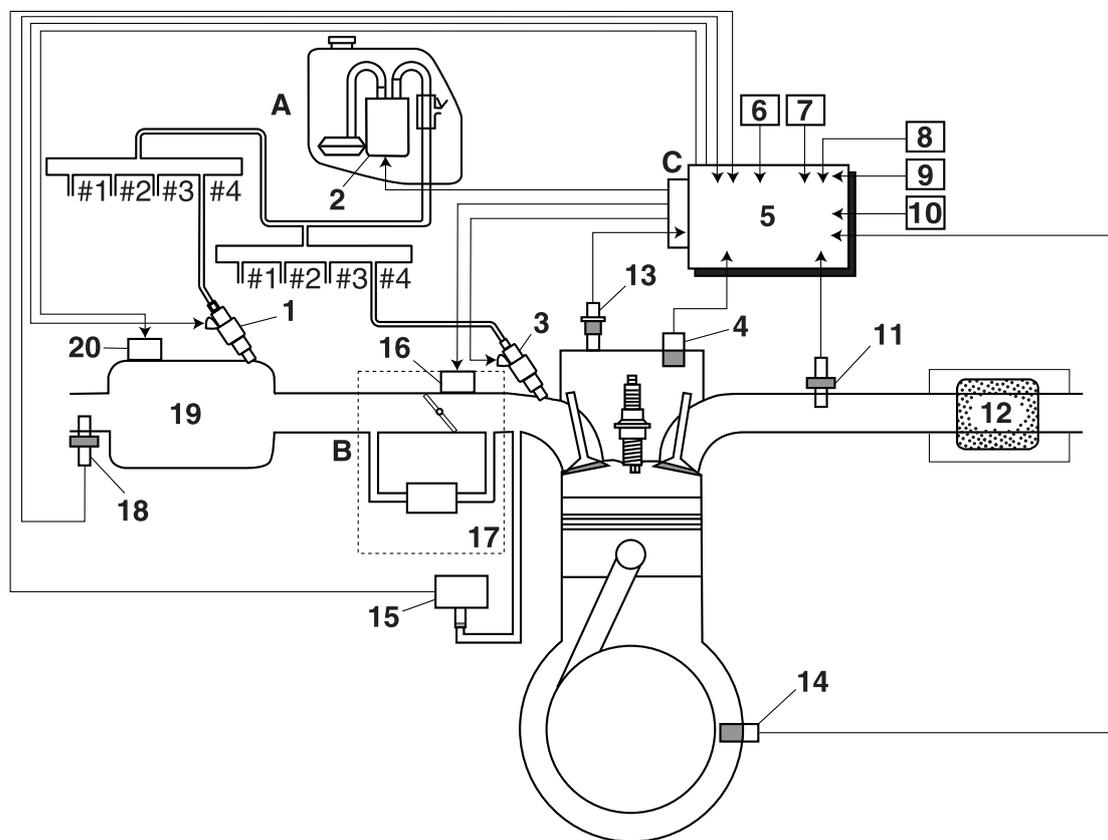
FEATURES

EAS14B1017

FI SYSTEM

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

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, accelerator position sensor, coolant temperature sensor, atmospheric pressure sensor, cylinder identification sensor, lean angle sensor, crankshaft position sensor, intake air pressure sensor, air temperature sensor, rear speed sensor and O₂ sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor and 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.



- | | |
|-----------------------------------|---------------------------------|
| 1. Secondary injector | 13. Coolant temperature sensor |
| 2. Fuel pump | 14. Crankshaft position sensor |
| 3. Primary injector | 15. Intake air pressure sensor |
| 4. Cylinder identification sensor | 16. Throttle servo motor |
| 5. ECU (engine control unit) | 17. Throttle body |
| 6. Throttle position sensor | 18. Atmospheric pressure sensor |
| 7. Accelerator position sensor | 19. Air filter case |
| 8. Rear speed sensor | 20. Intake funnel servo motor |
| 9. Intake air temperature sensor | |
| 10. Lean angle sensor | |
| 11. O ₂ sensor | |
| 12. Catalytic converter | |
- A. Fuel system
 B. Air system
 C. Control system

EAS14B1076

YCC-T (Yamaha Chip Controlled Throttle) YCC-I (Yamaha Chip Controlled Intake)**Mechanism characteristics**

Yamaha developed the YCC-T and YCC-I system employing the most advanced electronic control technologies. Electronic control throttle systems have been used on automobiles, but Yamaha has developed a faster, more compact system specifically for the needs of a sports motorcycle. The Yamaha-developed system has a high-speed calculating capacity that produces computations of running conditions every 1/1000th of a second.

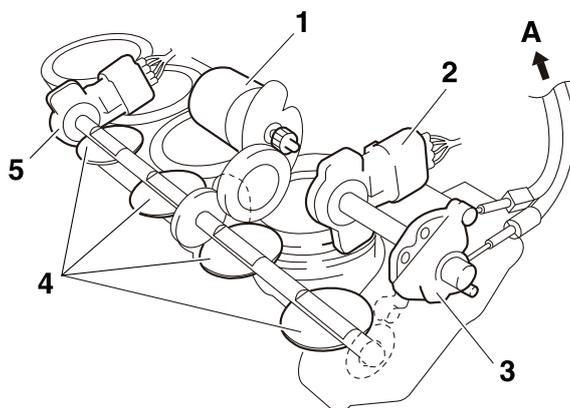
The YCC-T system is designed to respond to the throttle action of the rider by having the ECU instantaneously calculate the ideal throttle valve opening and generate signals to operate the motor-driven throttle valves and thus actively control the intake air volume.

The ECU contains three CPUs with a capacity about five times that of conventional units, making it possible for the system to respond extremely quickly to the slightest adjustments made by the rider. In particular, optimized control of the throttle valve opening provides the optimum volume of intake air for easy-to-use torque, even in a high-revving engine.

The YCC-I system calculates the value from the engine speed and throttle opening rate, activates the intake air funnel with the electronic control motor drive to control the intake pipe length in order to gain the high power output in all revolution ranges from low speeds to high speeds.

Aims and advantages of using YCC-T system

- Increased engine power
By shortening the air intake path, higher engine speed is possible → Increased engine power.
- Improved driveability
Air intake volume is controlled according to the operating conditions → Improved throttle response to meet engine requirement.
Driving force is controlled at the optimal level according to the transmission gear position and engine speed → Improved throttle control.
- Engine braking control
Due to the throttle control, optimal engine braking is made possible.
- Simplified idle speed control (ISC) mechanism
The bypass mechanism and ISC actuator are eliminated → A simple mechanism is used to maintain a steady idle speed.
- Reduced weight
Compared to using a sub-throttle mechanism, weight is reduced.



1. Throttle servo motor
2. Accelerator position sensor
3. Throttle cable pulley with linkage guard
4. Throttle valves
5. Throttle position sensor

A. To throttle grip

FEATURES

Aims and advantages of using YCC-I system

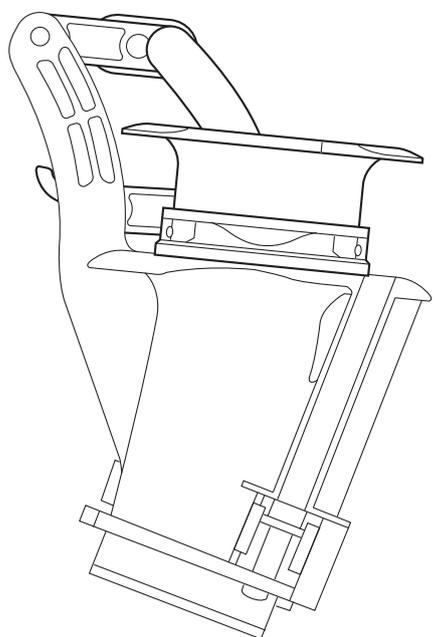
- Improved power band

By using a dual intake funnel system, YCC-I optimizes the effectiveness of the fuel injection system to deliver an incredibly precise air/fuel mixture to the combustion chamber. This degree of intake volume control gives both improved low to mid-range power, as well as improved power in the higher rpm range. In effect, the YCC-I offers higher levels of power across the RPM range.

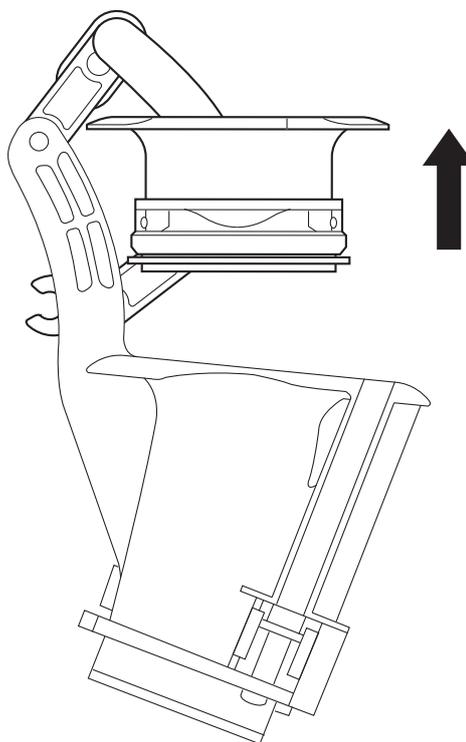
- Electronically controlled intake length

The YCC-I system consists of four lightweight plastic resin funnels, and each of these is divided into an upper and lower portion. Depending upon operating conditions, the funnels can be joined to form a single long funnel, or split to create a short funnel. This change is performed instantaneously by an electrically controlled servo-motor which handles the function so smoothly that the rider is unaware it is happening.

A



B

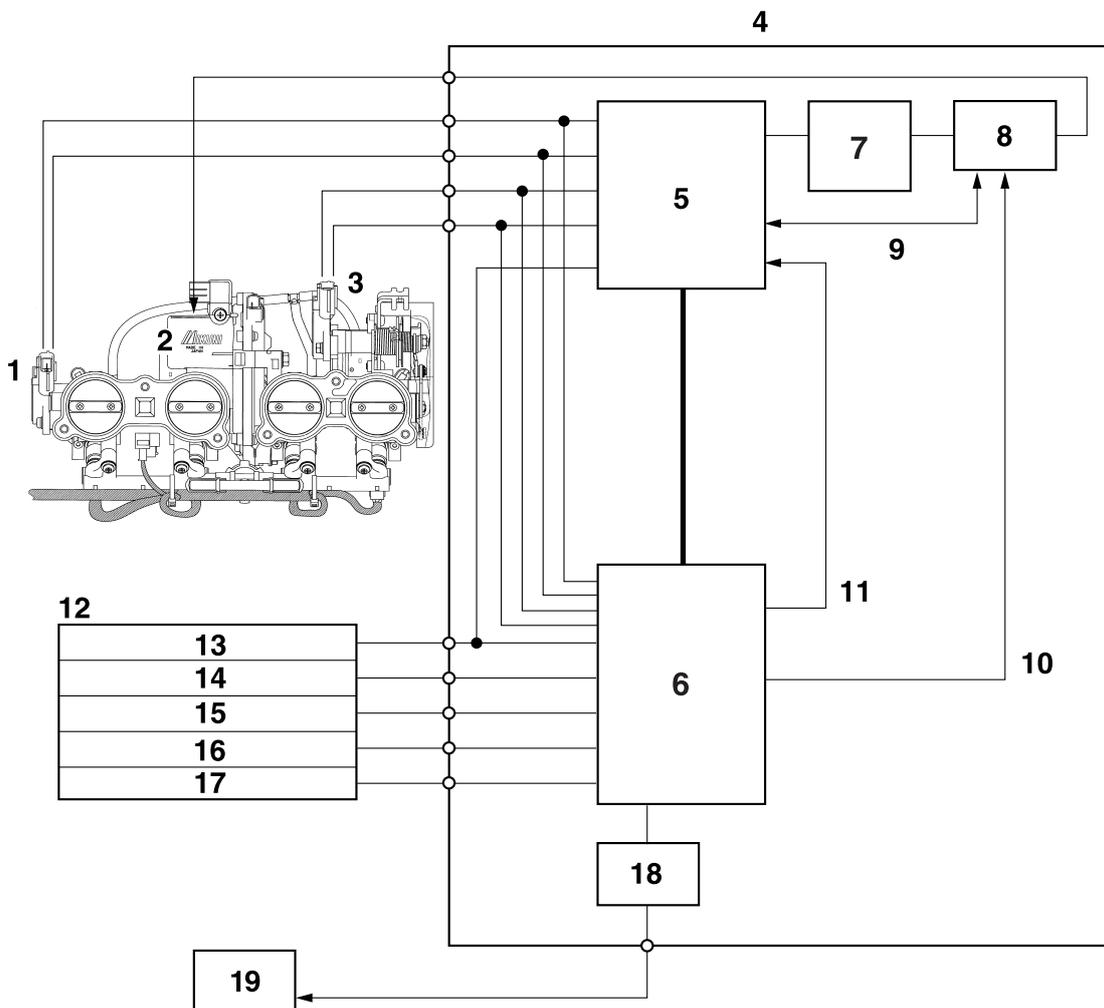


A. Down position (long intake)
(Low rpm to Mid rpm)

B. Up position (short intake)
(High rpm)

FEATURES

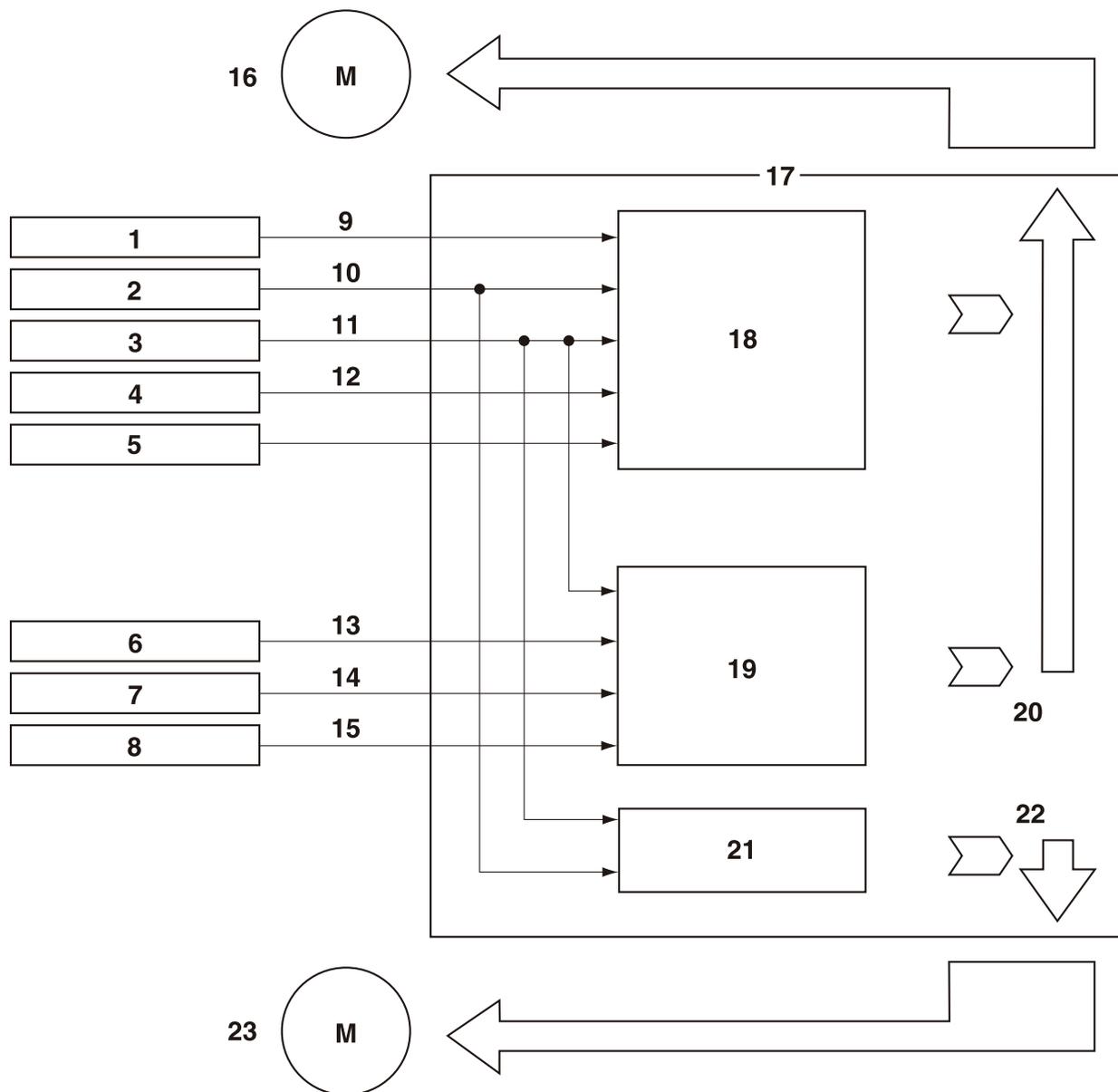
YCC-T/YCC-I system outline



1. Throttle position sensor
2. Throttle servo motor
3. Accelerator position sensor
4. ECU (engine control unit)
5. ETV main CPU (32 bit)
6. FI CPU (32 bit)
7. Throttle servo motor driver
8. Throttle servo motor driver operation sensing/shut off circuit
9. Throttle servo motor driver operation sensing feedback/emergency stop
10. Emergency stop
11. Engine revolution (pulse signal)
12. Sensor input
13. Neutral switch
14. Crankshaft position sensor
15. Rear speed sensor
16. Coolant temperature sensor
17. Atmospheric pressure sensor
18. Intake funnel servo motor driver
19. Intake funnel servo motor

FEATURES

YCC-T/YCC-I control outline



- 1. Accelerator position sensor
- 2. Throttle position sensor
- 3. Crankshaft position sensor
- 4. Rear speed sensor
- 5. D-mode switch
- 6. Coolant temperature sensor
- 7. Neutral switch
- 8. Atmospheric pressure sensor
- 9. Accelerator position (two signals)
- 10. Throttle position (two signals)
- 11. Engine revolution
- 12. Vehicle speed
- 13. Coolant temperature
- 14. Neutral/In gear
- 15. Atmospheric pressure
- 16. Throttle servo motor

- 17. ECU (engine control unit)
- 18. Base map
- 19. Idle speed control
- 20. Calculated throttle valve opening angle
- 21. Base map
- 22. Air funnel position (Calculation value)
- 23. Intake funnel servo motor

FEATURES

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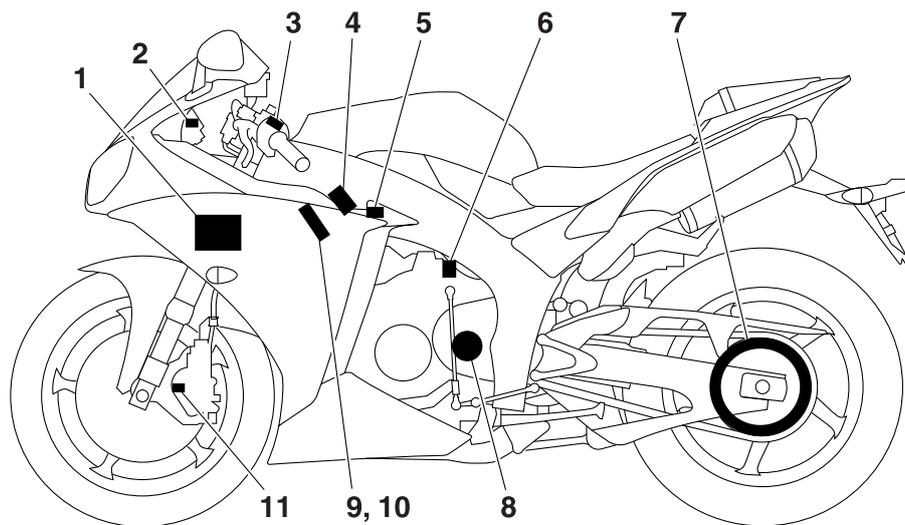
OUTLINE OF THE TCS (Traction Control System)

The traction control system controls excessive spinning (slipping) of the rear wheel when accelerating.

The ECU monitors the front and rear wheel speeds using the signals from the front and rear speed sensors, and detects rear wheel slipping according to the difference between the wheel speeds. If the slipping exceeds the preset value, the ECU controls the slipping using integrated control of the ignition timing, fuel cut-off, and throttle valve opening of the YCC-T system.

The traction control system can be set to one of six traction control system modes and an off mode.

TCS (Traction control system) layout

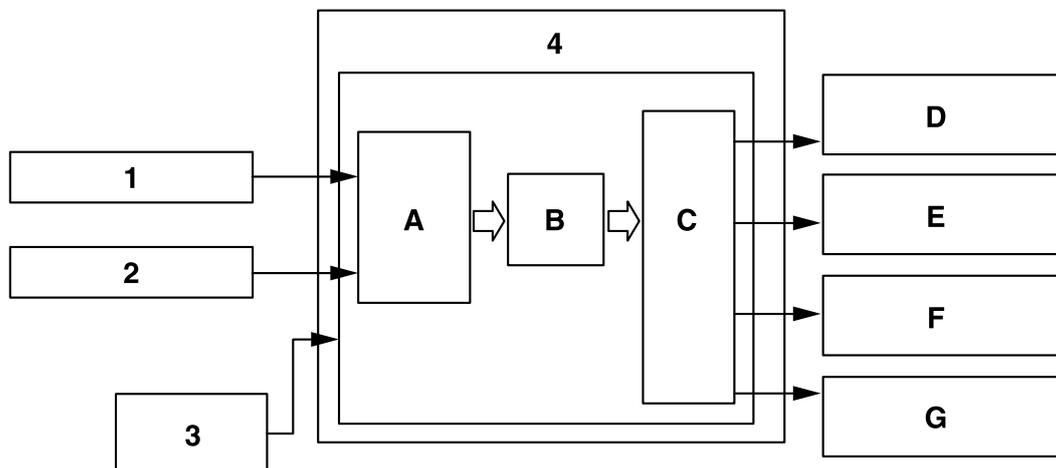


1. ECU (engine control unit)
2. Traction control system indicator/warning light
3. Traction control system switch
4. Throttle servo motor
5. Fuel injector
6. Rear speed sensor
7. Rear wheel sprocket
8. Drive sprocket
9. Ignition coils
10. Spark plugs
11. Front speed sensor

FEATURES

TCS (Traction control system) block diagram

The signals from the front and rear speed sensors are sent to the ECU, and the ECU calculates the amount of slip according to the difference between the detected front and rear wheel speeds. If the amount of slip exceeds the preset value, the ECU controls the ignition timing, fuel cut-off, and throttle valve opening of the YCC-T system so that the amount of slip is less than the preset value. The traction control system indicator/warning light in the meter assembly flashes when the traction control system has activated.



- | | |
|-----------------------------------|--|
| 1. Front speed sensor | C. Actuator control |
| 2. Rear speed sensor | D. Fuel cut-off |
| 3. Traction control system switch | E. Ignition timing (retarded) |
| 4. ECU (engine control unit) | F. Traction control system indicator/warning light (flashes) |
| A. Slip amount calculation | G. YCC-T motor throttle valve opening (decreased) |
| B. Exceeds preset value | |

TCS (Traction control system) function

The traction control system helps maintain traction when accelerating. If sensors detect that the rear wheel is starting to slip (uncontrolled spinning), the traction control system assists by regulating engine power as needed until traction is restored. The traction control system indicator/warning light flashes to let the rider know that traction control has engaged.

EWA23P1039



The traction control system is not a substitute for riding appropriately for the conditions. Traction control cannot prevent loss of traction due to excessive speed when entering turns, when accelerating hard at a sharp lean angle, or while braking, and cannot prevent front wheel slipping. As with any motorcycle, approach surfaces that may be slippery with caution and avoid especially slippery surfaces.

TIP

- The traction control may engage when the vehicle travels over a bump.
- The rider may notice slight changes in engine and exhaust sounds when the traction control system is engaged.

FEATURES

There are six traction control system modes and an off mode.

	Display
OFF	
Mode 1	
Mode 2	
Mode 3	
Mode 4	
Mode 5	
Mode 6	

- “TCS” mode 1 provides for the least traction control system assist.
- “TCS” modes 2 through 6 provide for more traction control system assist. Mode 6 provides the most traction control system assist.
- “TCS OFF” mode turns the traction control system off. The system may also be automatically disabled in some riding conditions.

When the key is turned to “ON”, the traction control system is enabled and the last mode selected displays in the multi-function meter.

All traction control system modes can be selected when the key is in the “ON” position. Modes 1 through 6 can also be selected when the vehicle is moving, however the throttle grip must be completely closed. The traction control system cannot be turned on or off while the vehicle is moving.

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NOTICE

Use only the specified tires. Using different sized tires will prevent the traction control system from controlling tire rotation accurately.

Setting the traction control system

EWA1KB8101

WARNING

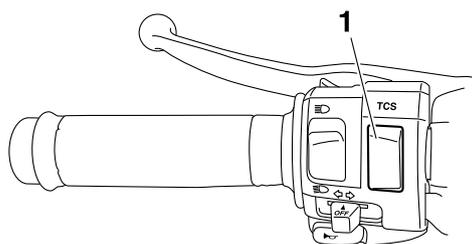
Changing settings while riding can distract the operator. Therefore, take extra precaution when changing modes while riding.

When the vehicle is stopped, push the upper side of the traction control system switch for at least two seconds to turn the traction control system off. Push the lower side of the switch to turn the traction control system on. When the vehicle is stopped or while riding, close the throttle and push the lower side of the switch to change from modes 1 to 6. Close the throttle and push the upper side of the switch to change from modes 6 to 1.

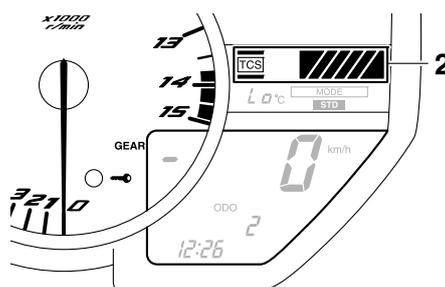
TIP

The vehicle was set to “TCS” mode 6 at the time of manufacture.

FEATURES



1. Traction control system switch



2. Traction control system mode display

Resetting

The traction control system may be disabled in the following conditions:

- Either the front wheel or rear wheel comes off the ground while riding
- Excessive rear wheel spinning

If the traction control system has been disabled, both the traction control system indicator/warning light and the engine trouble warning light come on.

To reset the traction control system:

Turn the key to "OFF". Wait at least one second, then turn the key back to "ON". The traction control system indicator/warning light should go off and the system will be enabled. The engine trouble warning light should go off after the motorcycle reaches at least 20 km/h (12 mi/h). If the traction control system indicator/warning light and/or engine trouble warning light still remain on after resetting, check the fuel injection system (Refer to "FUEL INJECTION SYSTEM" on page 8-33).

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NOTICE

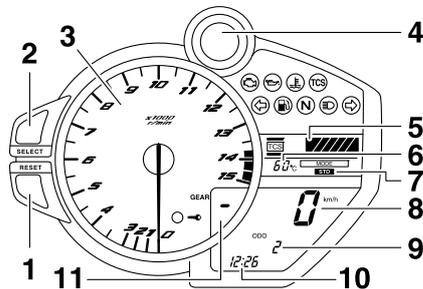
- **Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the front and rear speed sensor or front speed sensor rotor; otherwise, the sensors or rotor may be damaged, resulting in improper performance of the traction control system.**
 - **Be careful not to damage the sensors or rotor.**
-

FEATURES

EAS1KB8102

INSTRUMENT FUNCTIONS

Multi-function meter unit



1. "RESET" button
2. "SELECT" button
3. Tachometer
4. Shift timing indicator light
5. Traction control system mode display
6. Coolant temperature display/air intake temperature display
7. Drive mode display
8. Speedometer
9. Odometer/tripmeter/fuel reserve tripmeter/instantaneous fuel consumption display/average fuel consumption display
10. Clock/stopwatch
11. Transmission gear display

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WARNING

Be sure to stop the vehicle before making any setting changes to the multi-function meter unit. Changing settings while riding can distract the operator and increase the risk of an accident.

The multi-function meter unit is equipped with the following:

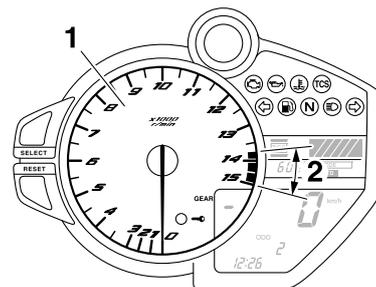
- A speedometer
- A tachometer
- An odometer
- Two tripmeters (which show the distance traveled since they were last set to zero)
- A fuel reserve tripmeter (which shows the distance traveled since the fuel level warning light came on)
- A stopwatch
- A clock
- A coolant temperature display
- An air intake temperature display
- A transmission gear display
- A drive mode display (which shows the selected drive mode)

- A fuel consumption display (instantaneous and average consumption functions)
- A traction control system mode display (which shows the selected traction control system mode)
- A self-diagnosis device
- A display brightness and shift timing indicator light control mode

TIP

- Be sure to turn the key to "ON" before using the "SELECT" and "RESET" buttons, except for setting the display brightness and shift timing indicator light control mode.
- For the U.K. only: To switch the speedometer and odometer/tripmeter/fuel consumption displays between kilometers and miles, press the "SELECT" button for at least one second.

Tachometer



1. Tachometer
2. Tachometer red zone

The electric tachometer allows the rider to monitor the engine speed and keep it within the ideal power range.

When the key is turned to "ON", the tachometer needle sweeps once across the r/min range and then returns to zero r/min in order to test the electrical circuit.

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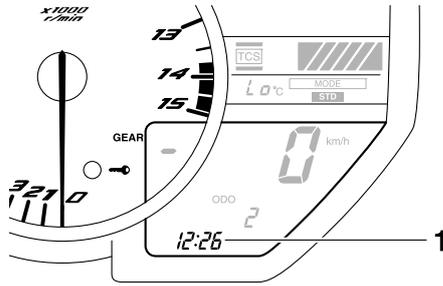
NOTICE

Do not operate the engine in the tachometer red zone.

Red zone: 13750 r/min and above

FEATURES

Clock and stopwatch modes



1. Clock/stopwatch

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 start flashing.
4. Push the “RESET” button to set the minutes.
5. Push the “SELECT” button and then release it to start the clock.

To display the stopwatch

To change the display to the stopwatch mode, push the “SELECT” button and “RESET” button together. To change the display back to the clock mode, push the “SELECT” button and “RESET” button together; however, this is not possible when the stopwatch is counting.

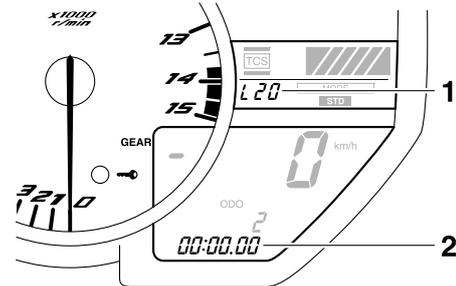
Standard measurement

1. Push the “RESET” button to start the stopwatch.
2. Push the “SELECT” button to stop the stopwatch.
3. Push the “SELECT” button again to reset the stopwatch.

Split time measurement

1. Push the “RESET” button to start the stopwatch.
2. Push the start switch “” or “RESET” button to measure split times. Split times are displayed on the odometer display for five seconds.
3. Push the start switch “” or “RESET” button to display the final split time or push the “SELECT” button to stop the stopwatch and display the final split time.

Split time history



1. Coolant temperature display/air intake temperature display
2. Stopwatch

The split time history displays up to 20 stored split times. The split time history can be displayed either in reverse chronological order or by speed.

1. Push the “SELECT” button for at least one second to select the reverse chronological order mode; “L20” displays on the stopwatch. Push the “SELECT” button again to select the speed mode; “F20” displays on the stopwatch.

TIP

- Reverse chronological order mode: The split times are shown from the latest to earliest (i.e., L1, L2, L3, L4).
- Speed order mode: The split times are shown from the fastest to slowest (i.e., F1, F2, F3, F4).

2. Push the “RESET” button. Depending on the selected split time, “L1” or “F1” displays on the coolant temperature display/air intake temperature display, and its corresponding stored split time displays on the stopwatch.
3. Push the “SELECT” button to switch the displayed split time in ascending order (i.e., 1, 2, 3, 4), and the “RESET” button to switch the displayed split time in descending order (i.e., 20, 19, 18, 17).

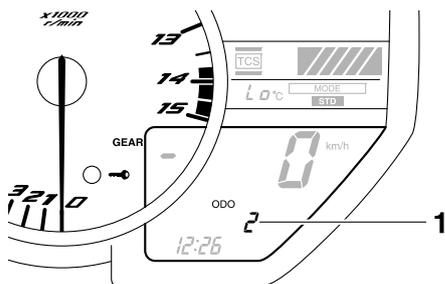
TIP

- To switch between the reverse chronological order mode and the speed mode, push the “SELECT” button for at least one second to cancel the currently selected mode, and then repeat step 1 to select the desired mode.

FEATURES

- To reset all the recorded times for the selected split time history, push the “RESET” button for at least one second.
-
4. Push the “SELECT” button for at least one second to cancel the split time history and return to the time measurement.

Odometer, tripmeter, instantaneous fuel consumption and average fuel consumption modes



1. Odometer/tripmeter/fuel reserve tripmeter/instantaneous fuel consumption display/average fuel consumption display

Push the “SELECT” button to switch the display between the odometer mode “ODO”, the tripmeter modes “TRIP 1” and “TRIP 2”, the instantaneous fuel consumption mode “km/L” or “L/100 km”, and the average fuel consumption mode “AVE_ _ _ km/L” or “AVE_ _ _ L/100 km” in the following order:

ODO → TRIP 1 → TRIP 2 → km/L or L/100 km → AVE_ _ _ km/L or AVE_ _ _ L/100 km → ODO

For the UK only:

Push the “SELECT” button to switch the display between the odometer mode “ODO”, the tripmeter modes “TRIP 1” and “TRIP 2”, the instantaneous fuel consumption mode “km/L”, “L/100 km” or “MPG”, and the average fuel consumption mode “AVE_ _ _ km/L”, “AVE_ _ _ L/100 km” or “AVE_ _ _ MPG” in the following order:

ODO → TRIP 1 → TRIP 2 → km/L, L/100 km or MPG → AVE_ _ _ km/L, AVE_ _ _ L/100 km or AVE_ _ _ MPG → ODO

If the fuel level warning light comes on, the display automatically changes to the fuel reserve tripmeter mode “TRIP F” and starts counting

the distance traveled from that point. In that case, push the “SELECT” button to switch the display between the various tripmeter, odometer, instantaneous fuel consumption and average fuel consumption modes in the following order:

TRIP F → km/L or L/100 km → AVE_ _ _ km/L or AVE_ _ _ L/100 km → ODO → TRIP 1 → TRIP 2 → TRIP F

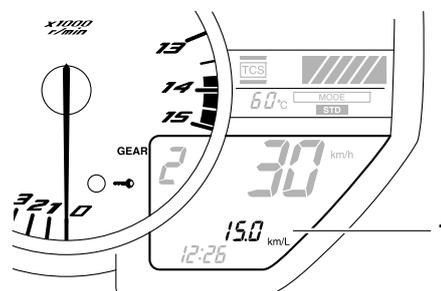
For the UK only:

TRIP F → km/L, L/100 km or MPG → AVE_ _ _ km/L, AVE_ _ _ L/100 km or AVE_ _ _ MPG → ODO → TRIP 1 → TRIP 2 → TRIP F

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 resets itself automatically and the display returns to the prior mode after refueling and traveling 5 km (3 mi).

Instantaneous fuel consumption mode



1. Instantaneous fuel consumption display

The instantaneous fuel consumption display can be set to either “km/L”, “L/100 km” or “MPG” (for the UK only).

- “km/L”: The distance that can be traveled on 1.0 L of fuel under the current riding conditions is shown.
- “L/100 km”: The amount of fuel necessary to travel 100 km under the current riding conditions is shown.
- “MPG” (for the UK only): The distance that can be traveled on 1.0 Imp.gal of fuel under the current riding conditions is shown.

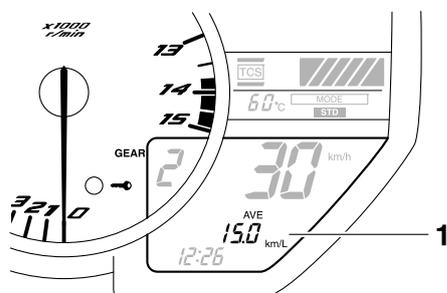
To switch between the instantaneous fuel consumption displays, push the “SELECT” button for one second when one of the displays is shown.

FEATURES

TIP

If traveling at speeds under 10 km/h (6.0 mi/h), “_ _ . _” is displayed.

Average fuel consumption mode



1. Average fuel consumption display

The average fuel consumption display can be set to either “AVE_ _ . _ km/L”, “AVE_ _ . _ L/100 km” or “AVE_ _ . _ MPG” (for the UK only).

This display shows the average fuel consumption since it was last reset.

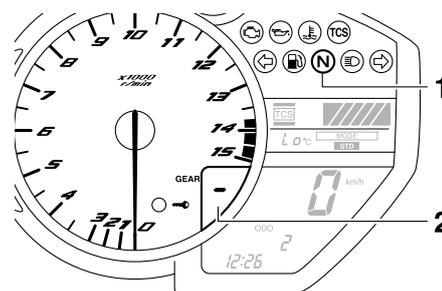
- “AVE_ _ . _ km/L”: The average distance that can be traveled on 1.0 L of fuel is shown.
- “AVE_ _ . _ L/100 km”: The average amount of fuel necessary to travel 100 km is shown.
- “AVE_ _ . _ MPG” (for the UK only): The average distance that can be traveled on 1.0 Imp.gal of fuel is shown.

To switch between the average fuel consumption displays, push the “SELECT” button for one second when one of the displays is shown. To reset the average fuel consumption display, select it by pushing the “SELECT” button, and then push the “RESET” button for at least one second.

TIP

After resetting an average fuel consumption display, “_ _ . _” is shown for that display until the vehicle has traveled 1 km (0.6 mi).

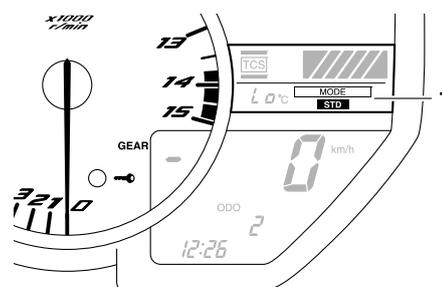
Transmission gear display



1. Neutral indicator light “N”
2. Transmission gear display

This display shows the selected gear. The neutral position is indicated by “N” and by the neutral indicator light.

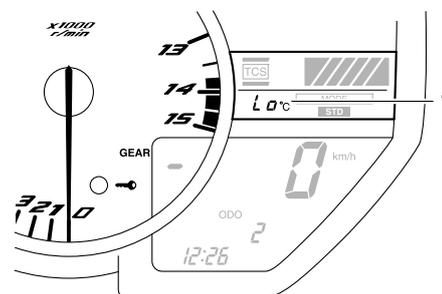
Drive mode display



1. Drive mode display

This display indicates which drive mode has been selected: “STD”, “A” or “B”. For more details on the modes and on how to select them, refer to “D-mode (drive mode)”.

Coolant temperature display



1. Coolant temperature display

The coolant temperature display indicates the temperature of the coolant.

FEATURES

TIP

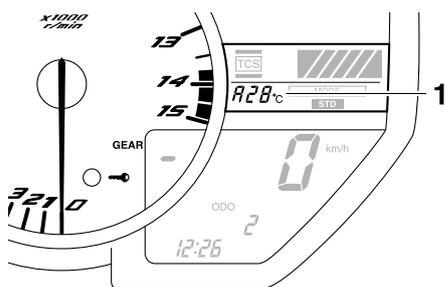
When the coolant temperature display is selected, “C” is displayed for one second, and then the coolant temperature is displayed.

ECA14B1016

NOTICE

Do not continue to operate the engine if it is overheating.

Air intake temperature display



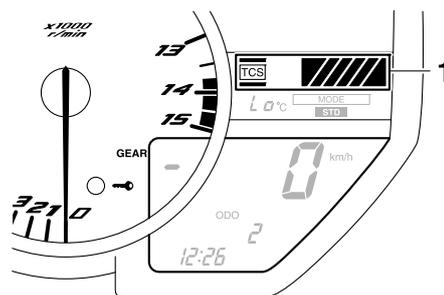
1. Air intake temperature display

The air intake temperature display indicates the temperature of the air drawn into the air filter case. Turn the key to “ON”, and push the “RESET” button to switch the coolant temperature display to the air intake temperature display. Push the “RESET” button again to return to the coolant temperature display.

TIP

- Even if the air intake temperature is set to be displayed, the coolant temperature warning light comes on if the engine overheats.
- When the key is turned to “ON”, the coolant temperature is automatically displayed, even if the air intake temperature was displayed prior to turning the key to “OFF”.
- When the air intake temperature display is selected, “A” is displayed before the temperature.

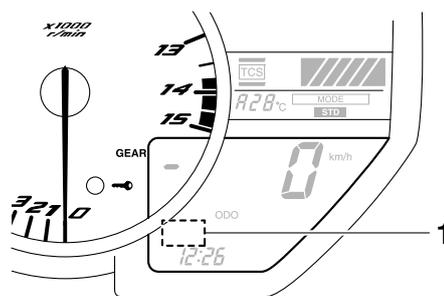
Traction control system mode display



1. Traction control system mode display

This display indicates which traction control system mode has been selected. For more details on the modes and on how to select them, refer to “TCS (Traction control system) function”.

Self-diagnosis device



1. Error code display

This model is equipped with a self-diagnosis device for various electrical circuits. If a problem is detected in the immobilizer system circuits, the immobilizer system indicator light flashes and the display indicates an error code. If a problem is detected in any other circuit, the engine trouble warning light comes on and the display indicates an error code. If the display indicates any error codes, note the code number, and check the fuel injection system (Refer to “FUEL INJECTION SYSTEM” on page 8-33).

TIP

If the display indicates immobilizer system circuit error code 52, this could be caused by transponder interference. If this error code appears, try following the procedure below.

FEATURES

1. Use the code re-registering key to start the engine.

TIP

Make sure there are no other immobilizer keys close to the main switch, and do not keep more than one immobilizer key on the same key ring! Immobilizer system keys may cause signal interference, which may prevent the engine from starting.

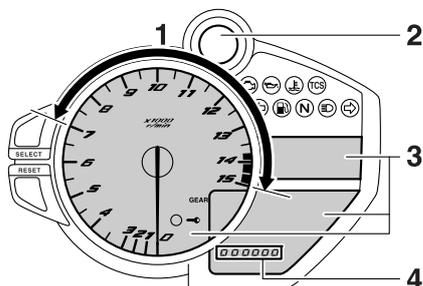
2. If the engine starts, turn it off and try starting the engine with the standard keys.
3. If one or both of the standard keys do not start the engine, check the immobilizer system (Refer to “IMMOBILIZER SYSTEM” on page 8-111).

ECA14B1017

NOTICE

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

Display brightness and shift timing indicator light control mode



1. Shift timing indicator light activation range
2. Shift timing indicator light
3. Brightness adjustable displays
4. Brightness level

This mode allows you to make changes to five settings by performing the following steps.

1. Turn the key to “OFF”.
2. Push and hold the “SELECT” button.
3. Turn the key to “ON”, and then release the “SELECT” button after five seconds. The display brightness function is selected.
4. Push the “SELECT” button to switch the functions in the order below.
 - a. Display brightness: This function allows you to adjust the brightness of the displays and tachometer to suit the outside lighting conditions.

- b. Shift timing indicator light activity: This function allows you to choose whether or not the indicator light should be activated and whether it should flash or stay on when activated.
- c. Shift timing indicator light activation: This function allows you to select the engine speed at which the indicator light is activated.
- d. Shift timing indicator light deactivation: This function allows you to select the engine speed at which the indicator light is deactivated.
- e. Shift timing indicator light brightness: This function allows you to adjust the brightness of the indicator light to suit your preference.

TIP

The display shows the current setting for each function, except the shift timing indicator light activity function.

To adjust the brightness of the multifunction meter displays and tachometer

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

To set the shift timing indicator light activity function

1. Push the “RESET” button to select one of the following indicator light activity settings:
 - The indicator light stays on when activated. (This setting is selected when the indicator light stays on.)
 - The indicator light flashes when activated. (This setting is selected when the indicator light flashes four times per second.)
 - The indicator light is deactivated; in other words, it does not come on or flash. (This setting is selected when the indicator light flashes once every two seconds.)

FEATURES

2. Push the "SELECT" button to confirm the selected indicator light activity. The control mode changes to the shift timing indicator light activation function.

To set the shift timing indicator light activation function

TIP

The shift timing indicator light activation function can be set between 7000 r/min and 15000 r/min. From 7000 r/min to 12000 r/min, the indicator light can be set in increments of 500 r/min. From 12000 r/min to 15000 r/min, the indicator light can be set in increments of 200 r/min.

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

To set the shift timing indicator light deactivation function

TIP

- The shift timing indicator light deactivation function can be set between 7000 r/min and 15000 r/min. From 7000 r/min to 12000 r/min, the indicator light can be set in increments of 500 r/min. From 12000 r/min to 15000 r/min, the indicator light can be set in increments of 200 r/min.
- Be sure to set the deactivation function to a higher engine speed than for the activation function, otherwise the shift timing indicator light remains deactivated.

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

To adjust the shift timing indicator light brightness

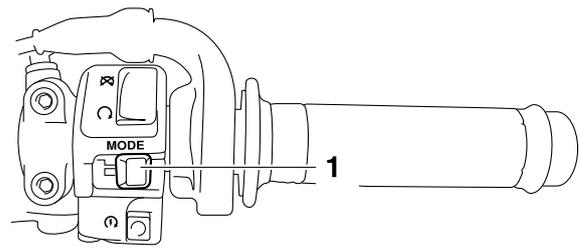
1. Push the "RESET" button to select the desired indicator light brightness level.

2. Push the "SELECT" button to confirm the selected indicator light brightness level. The display returns to the odometer or tripmeter mode.

D-mode (drive mode)

D-mode is an electronically controlled engine performance system with three mode selections ("STD", "A", and "B").

Push the drive mode switch "MODE" to switch between modes.



1. Drive mode switch "MODE"

TIP

Before using D-mode, make sure you understand its operation along with the operation of the drive mode switch.

Mode "STD"

Mode "STD" is suitable for various riding conditions.

This mode allows the rider to enjoy smooth and sporty drivability from the low-speed range to the high-speed range.

Mode "A"

Mode "A" offers a sportier engine response in the low-to mid-speed range compared to mode "STD".

Mode "B"

Mode "B" offers response that is somewhat less sharp compared to mode "STD" for riding situations that require especially sensitive throttle operation.

Drive mode switch "MODE"

EWA14B1025



Do not change the D-mode while the vehicle is moving.

FEATURES

Using this switch changes the drive mode to “STD”, “A”, or “B” in the following order:

STD → A → B → STD

The throttle grip must be completely closed in order to change the drive mode.

TIP _____

- The mode is set to “STD” by default. The “STD” mode resets when the key is turned to “OFF”.
 - The selected mode is shown on the drive mode display.
-

IMPORTANT INFORMATION

EAS20180

IMPORTANT INFORMATION

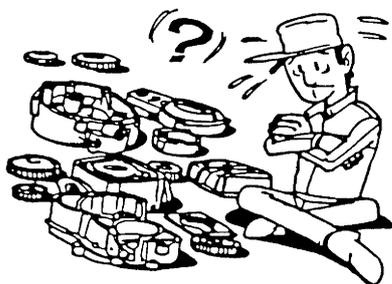
EAS20190

PREPARATION FOR REMOVAL AND DISASSEMBLY

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



2. Use only the proper tools and cleaning equipment. Refer to "SPECIAL TOOLS" on page 1-24.
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.

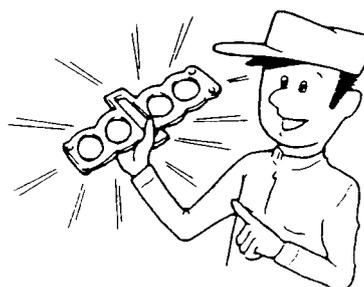


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200

REPLACEMENT PARTS

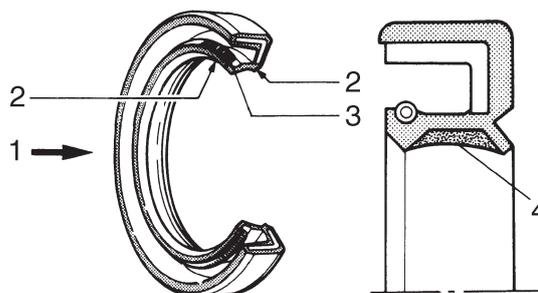
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS20210

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.

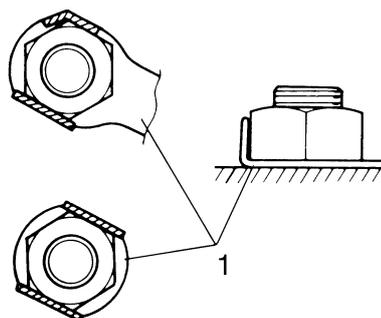


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

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.

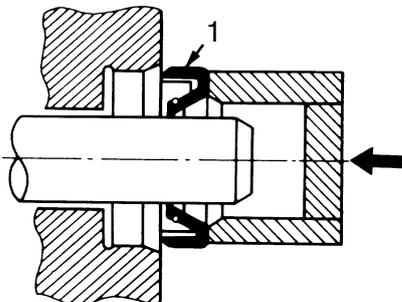


IMPORTANT INFORMATION

EAS20230

BEARINGS AND OIL SEALS

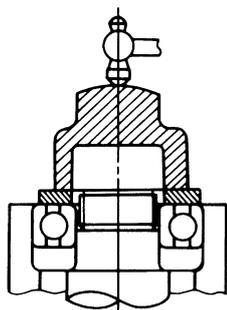
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

NOTICE

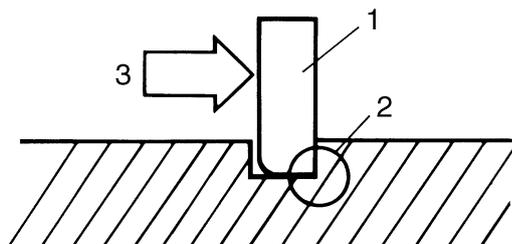
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



EAS20240

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.



CHECKING THE CONNECTIONS

EAS20250

CHECKING THE CONNECTIONS

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

1. Disconnect:

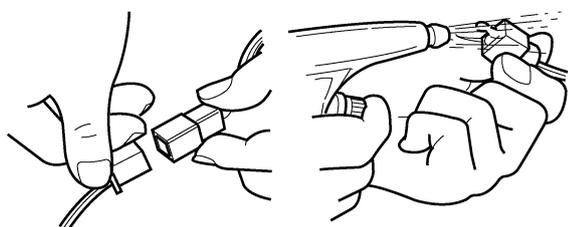
- Lead
- Coupler
- Connector

2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.

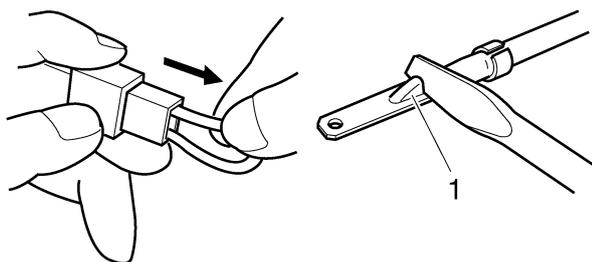


3. Check:

- All connections
- Loose connection → Connect properly.

TIP

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



4. Connect:

- Lead
- Coupler
- Connector

TIP

Make sure all connections are tight.

5. Check:

- Continuity
(with the pocket tester)



Pocket tester

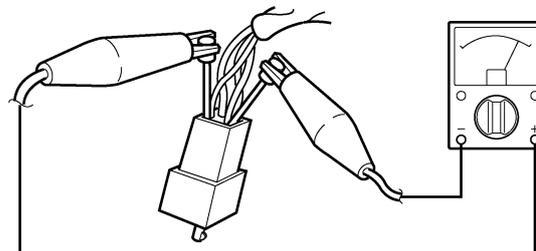
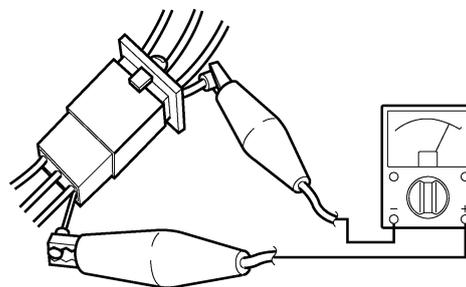
90890-03112

Analog pocket tester

YU-03112-C

TIP

- 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.

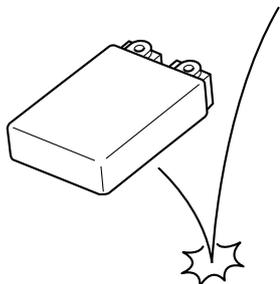


HANDLING THE ELECTRONIC PARTS

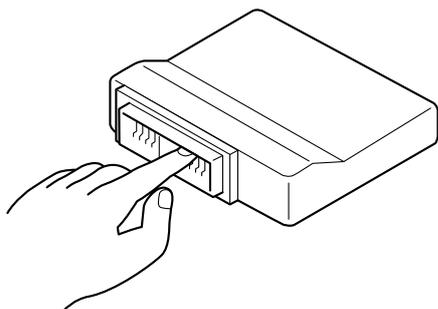
EAS14B1120

HANDLING THE ELECTRONIC PARTS

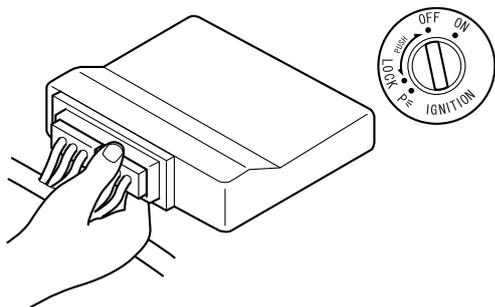
Electronic parts is very sensitive.
Handle with care and do not give impact.



Mankind has static electricity and it's voltage is very high and electronic parts is very sensitive. It has possibility that inside small parts of electronic parts is destroyed by static electricity. Do not touch and do not make it dirty.



When you disconnect electronic parts from wire harness, always turn off main switch. If you disconnect above condition, it may gives damages to electronic parts.



SPECIAL TOOLS

EAS20260

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.

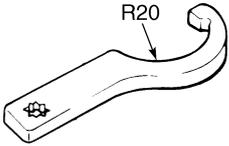
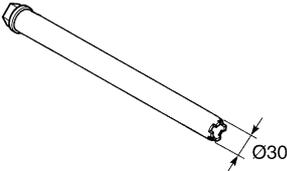
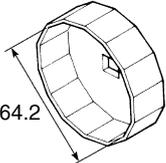
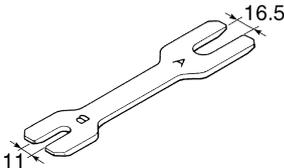
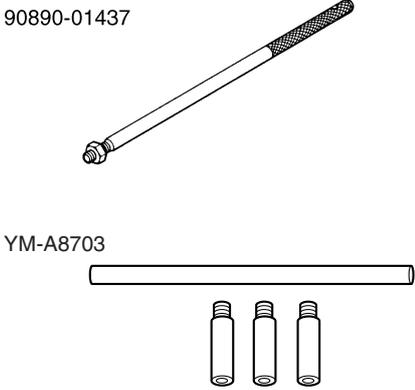
When placing an order, refer to the list provided below to avoid any mistakes.

TIP _____

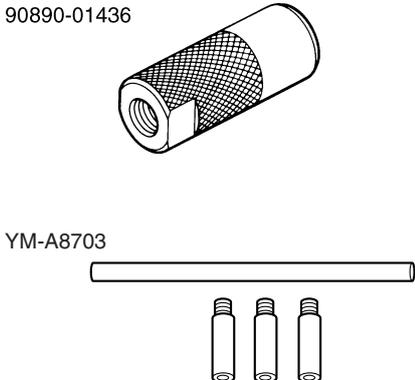
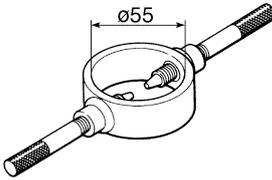
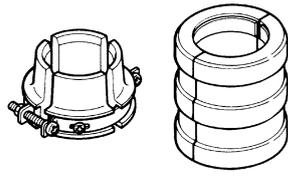
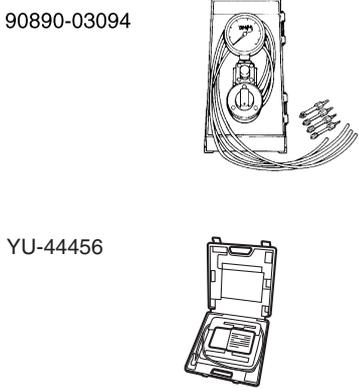
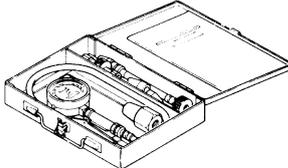
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304		5-75
Radiator cap tester 90890-01325 Radiator pressure tester YU-24460-01		6-3
Radiator cap tester adapter 90890-01352 Radiator pressure tester adapter YU-33984		6-3

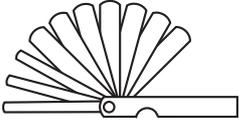
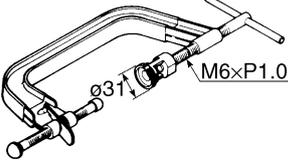
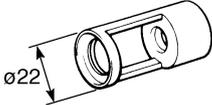
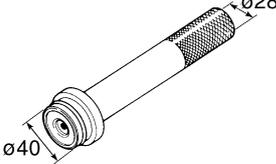
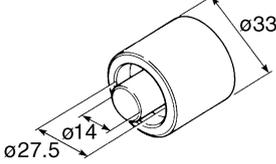
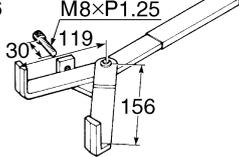
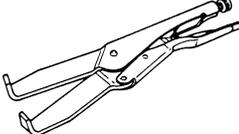
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-23, 4-74
Damper rod holder 90890-01506 YM-01506		4-65, 4-67
Oil filter wrench 90890-01426 YU-38411		3-29
Rod holder 90890-01434 Damper rod holder double ended YM-01434		4-64, 4-69
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703		4-68, 4-69

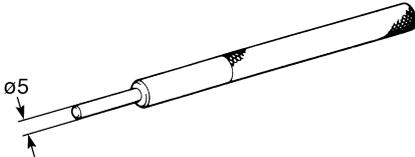
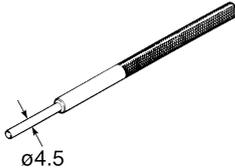
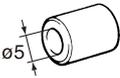
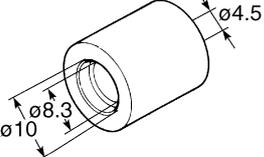
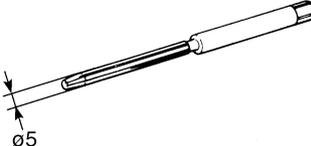
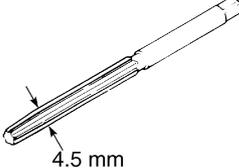
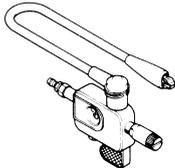
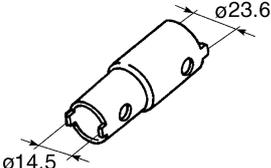
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Rod puller attachment (M10) 90890-01436 Universal damping rod bleeding tool set YM-A8703	 <p>90890-01436</p> <p>YM-A8703</p>	4-68, 4-69
Fork spring compressor 90890-01441 YM-01441	 <p>ø55</p>	4-64, 4-69
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-67, 4-68
Vacuum gauge 90890-03094 Carburetor synchronizer YU-44456	 <p>90890-03094</p> <p>YU-44456</p>	3-10
Compression gauge 90890-03081 Engine compression tester YU-33223		5-1

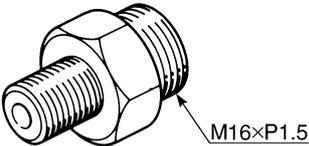
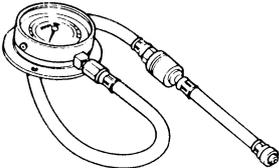
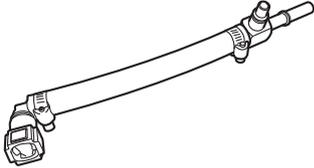
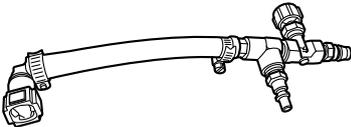
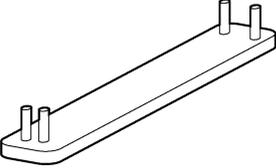
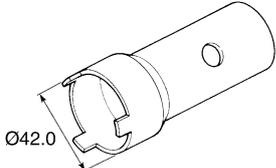
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-7, 3-8, 4-24
Valve spring compressor 90890-04019 YM-04019		5-29, 5-35
Valve spring compressor attachment 90890-04108 Valve spring compressor adapter 22 mm YM-04108		5-29, 5-35
Middle driven shaft bearing driver 90890-04058 Bearing driver 40 mm YM-04058		6-14
Mechanical seal installer 90890-04132 Water pump seal installer YM-33221-A		6-14
Universal clutch holder 90890-04086 YM-91042	 	5-62, 5-66

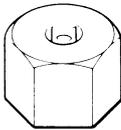
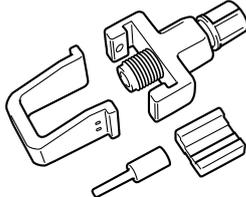
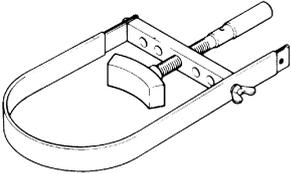
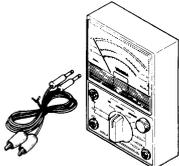
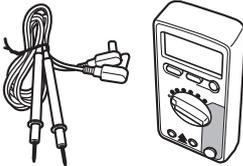
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Valve guide remover (ø5) 90890-04097 Valve guide remover (5.0 mm) YM-04097		5-31
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-31
Valve guide installer (ø5) 90890-04098 Valve guide installer (5.0 mm) YM-04098		5-31
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-31
Valve guide reamer (ø5) 90890-04099 Valve guide reamer (5.0 mm) YM-04099		5-31
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-31
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		8-137
Pivot shaft wrench 90890-01471 Frame spanner socket YM-01471		5-10

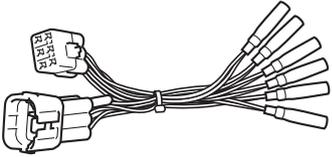
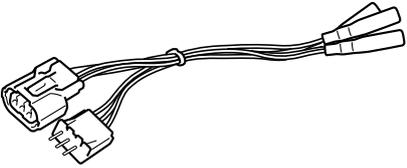
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Pivot shaft wrench adapter 90890-01476		5-10
Valve lapper 90890-04101 Valve lapping tool YM-A8998		3-8
Oil pressure adapter H 90890-03139		3-30
Pressure gauge 90890-03153 YU-03153		3-30, 7-18
Fuel pressure adapter 90890-03176 YM-03176		7-18
Fuel injector pressure adapter 90890-03210 YU-03210		7-18
Camshaft wrench 90890-04143 YM-04143		5-16, 5-20
Ring nut wrench 90890-01507 YM-01507		4-82, 4-84

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Damper rod holder (22 mm) 90890-01365		4-83, 4-84
Drive chain cut & rivet tool 90890-01550 YM-01550		4-86, 4-87
Piston installing tool 90890-04161 YM-04161		5-82
Rotor puller 2K7-85555-00		5-37
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-37, 5-40, 5-41, 5-43
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-22, 8-127, 8-128, 8-129, 8-133, 8-134, 8-135, 8-136, 8-137, 8-138, 8-139, 8-140, 8-141, 8-143, 8-144, 8-146, 8-147, 8-148
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		5-47, 8-139, 8-144, 8-145, 8-146

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Test harness-speed sensor (3P) 90890-03208 YU-03208		8-141, 8-146
Test harness-lean angle sensor (6P) 90890-03209 YU-03209		8-138
Test harness S-pressure sensor (3P) 90890-03207 YU-03207		8-145, 8-146
Yamaha bond No. 1215 (Three bond No. 1215®) 90890-85505		5-23, 5-38, 5-44, 5-72

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GENERAL SPECIFICATIONS

EAS20280

GENERAL SPECIFICATIONS

Model

Model	1KB8, 1KBJ (AUT, BEL, CHE, CZE, DEU, DNK, ESP, FIN, GBR, GRC, HUN, IRL, ITA, NLD, NOR, POL, PRT, SVN, SWE, ZAF) 1KB9, 1KBK (BEL, FRA) 1KBH, 1KBP (AUS)
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Dimensions

Overall length	2070 mm (81.5 in)
Overall width	715 mm (28.1 in)
Overall height	1130 mm (44.5 in)
Seat height	835 mm (32.9 in)
Wheelbase	1415 mm (55.7 in)
Ground clearance	135 mm (5.31 in)
Minimum turning radius	3500 mm (137.8 in)

Weight

With oil and fuel	206 kg (454 lb)
Maximum load	189 kg (417 lb)

ENGINE SPECIFICATIONS

EAS20290

ENGINE SPECIFICATIONS**Engine**

Engine type	Liquid cooled 4-stroke, DOHC
Displacement	998.0 cm ³
Cylinder arrangement	Inline 4-cylinder
Bore × stroke	78.0 × 52.2 mm (3.07 × 2.06 in)
Compression ratio	12.70 : 1
Standard compression pressure (at sea level)	1480 kPa/350 r/min (14.8 kgf/cm ² /350 r/min, 210.5 psi/350 r/min)
Minimum–Maximum	1290–1660 kPa/350 r/min (12.9–16.6 kgf/cm ² /350 r/min, 183.5–236.1 psi/350 r/min)
Starting system	Electric starter

Fuel

Recommended fuel	Premium unleaded gasoline only
Fuel tank capacity	18.0 L (4.76 US gal, 3.96 Imp.gal)
Fuel reserve amount	3.1 L (0.82 US gal, 0.68 Imp.gal)

Engine oil

Recommended brand	YAMALUBE
Type	SAE 10W-40, 10W-50, 15W-40, 20W-40 or 20W-50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Lubrication system	Wet sump
Engine oil quantity	
Total amount	4.58 L (4.84 US qt, 4.03 Imp.qt)
Without oil filter cartridge replacement	3.73 L (3.94 US qt, 3.28 Imp.qt)
With oil filter cartridge replacement	3.93 L (4.15 US qt, 3.46 Imp.qt)

Oil filter

Oil filter type	Cartridge
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Oil pump

Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	Less than 0.12 mm (0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.090–0.190 mm (0.0035–0.0075 in)
Limit	0.260 mm (0.0102 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.06–0.13 mm (0.0024–0.0051 in)
Limit	0.200 mm (0.0079 in)
Oil pressure	320 kPa/5000 r/min (3.20 kgf/cm ² /5000 r/min, 45.5 psi/5000 r/min) at 75–85 °C (167–185 °F)
Bypass valve opening pressure	80.0–120.0 kPa (0.80–1.20 kgf/cm ² , 11.6–17.4 psi)
Relief valve operating pressure	700.0–820.0 kPa (7.00–8.20 kgf/cm ² , 101.5–118.9 psi)

Cooling system

Radiator capacity (including all routes)	2.73 L (2.89 US qt, 2.40 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)	0.25 L (0.26 US qt, 0.22 Imp.qt)
Radiator cap opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm ² , 15.6–19.9 psi)

ENGINE SPECIFICATIONS

Thermostat

Valve opening temperature	71 °C (159.8 °F)
Valve full open temperature	85 °C (185.0 °F)
Valve lift (full open)	More than 8 mm (0.31 in)

Radiator core

Width	383.0 mm (15.08 in)
Height	250.6 mm (9.87 in)
Depth	24.0 mm (0.94 in)

Water pump

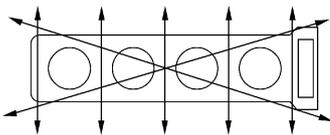
Water pump type	Single suction centrifugal pump
Reduction ratio	65/43 × 28/36 (1.176)
Impeller shaft tilt limit	0.15 mm (0.006 in)

Spark plug(s)

Manufacturer/model	NGK/LMAR9E-J
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)

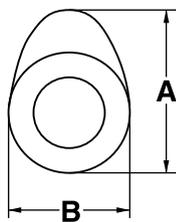
Cylinder head

Volume	14.43–15.23 cm ³ (0.88–0.93 cu.in)
Warpage limit	0.10 mm (0.0039 in)

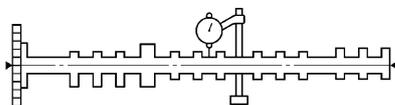


Camshaft

Drive system	Chain drive (right)
Camshaft cap inside diameter	25.500–25.521 mm (1.0039–1.0048 in)
Camshaft journal diameter	25.459–25.472 mm (1.0023–1.0028 in)
Camshaft-journal-to-camshaft-cap clearance	0.028–0.062 mm (0.0011–0.0024 in)
Camshaft lobe dimensions	
Intake A	37.350–37.450 mm (1.4705–1.4744 in)
Limit	37.250 mm (1.4665 in)
Intake B	28.034–28.134 mm (1.1037–1.1076 in)
Limit	27.934 mm (1.0998 in)
Exhaust A	36.450–36.550 mm (1.4350–1.4390 in)
Limit	36.350 mm (1.4311 in)
Exhaust B	28.006–28.106 mm (1.1026–1.1065 in)
Limit	27.906 mm (1.0987 in)



Camshaft runout limit	0.030 mm (0.0012 in)
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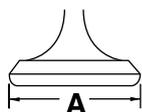
ENGINE SPECIFICATIONS

Timing chain

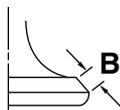
Tensioning system Automatic

Valve, valve seat, valve guide

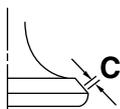
Valve clearance (cold)	
Intake	0.11–0.20 mm (0.0043–0.0079 in)
Exhaust	0.23–0.27 mm (0.0091–0.0106 in)
Valve dimensions	
Valve head diameter A (intake)	30.90–31.10 mm (1.2165–1.2244 in)
Valve head diameter A (exhaust)	24.90–25.10 mm (0.9803–0.9882 in)



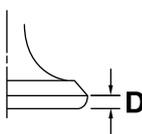
Valve face width B (intake)	1.200–2.475 mm (0.0472–0.0974 in)
Valve face width B (exhaust)	1.625–2.900 mm (0.0640–0.1142 in)



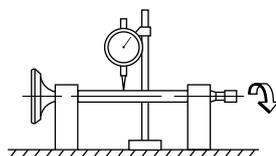
Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.60 mm (0.06 in)
Valve seat width C (exhaust)	1.10–1.30 mm (0.0433–0.0512 in)
Limit	1.80 mm (0.07 in)



Valve margin thickness D (intake)	1.35–1.75 mm (0.0532–0.0689 in)
Valve margin thickness D (exhaust)	0.50–0.90 mm (0.0197–0.0354 in)



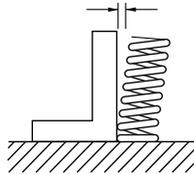
Valve stem diameter (intake)	4.975–4.990 mm (0.1959–0.1965 in)
Limit	4.960 mm (0.1953 in)
Valve stem diameter (exhaust)	4.460–4.475 mm (0.1756–0.1762 in)
Limit	4.425 mm (0.1742 in)
Valve guide inside diameter (intake)	5.000–5.012 mm (0.1969–0.1973 in)
Limit	5.050 mm (0.1988 in)
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 in)
Limit	4.550 mm (0.1791 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout limit	0.010 mm (0.0004 in)



ENGINE SPECIFICATIONS

Valve spring

Inner spring	
Free length (intake)	39.33 mm (1.55 in)
Limit	37.36 mm (1.47 in)
Free length (exhaust)	37.96 mm (1.49 in)
Limit	36.06 mm (1.42 in)
Installed length (intake)	34.50 mm (1.36 in)
Installed length (exhaust)	33.00 mm (1.30 in)
Spring rate K1 (intake)	41.57 N/mm (4.24 kgf/mm, 237.36 lbf/in)
Spring rate K2 (intake)	55.62 N/mm (5.67 kgf/mm, 317.59 lbf/in)
Spring rate K1 (exhaust)	40.10 N/mm (4.09 kgf/mm, 228.97 lbf/in)
Spring rate K2 (exhaust)	59.31 N/mm (6.05 kgf/mm, 338.66 lbf/in)
Installed compression spring force (intake)	187.00–215.00 N (19.07–21.92 kgf, 42.04–48.33 lbf)
Installed compression spring force (exhaust)	185.00–213.00 N (18.86–21.72 kgf, 41.59–47.88 lbf)
Spring tilt limit (intake)	2.5°/1.7 mm (0.067 in)
Spring tilt limit (exhaust)	2.5°/1.7 mm (0.067 in)



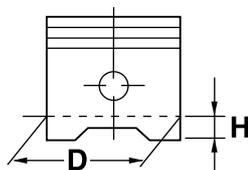
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise

Cylinder

Bore	78.000–78.010 mm (3.0709–3.0713 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)

Piston

Piston-to-cylinder clearance	0.010–0.035 mm (0.0004–0.0014 in)
Limit	0.150 mm (0.0059 in)
Piston diameter	77.975–77.990 mm (3.0699–3.0705 in)
Height H	12.0 mm (0.47 in)

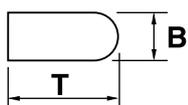


Offset	0.00 mm (0.0000 in)
Piston pin bore inside diameter	17.002–17.013 mm (0.6694–0.6698 in)
Limit	17.043 mm (0.6710 in)
Piston pin outside diameter	16.991–17.000 mm (0.6689–0.6693 in)
Limit	16.971 mm (0.6682 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)
Limit	0.072 mm (0.0028 in)

Piston ring

Top ring	
Ring type	Barrel
Dimensions (B × T)	0.90 × 2.75 mm (0.04 × 0.11 in)

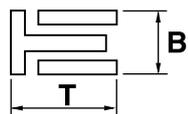
ENGINE SPECIFICATIONS



End gap (installed)	0.15–0.25 mm (0.0059–0.0098 in)
Limit	0.50 mm (0.0197 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Limit	0.115 mm (0.0045 in)
2nd ring	
Ring type	Taper
Dimensions (B × T)	0.80 × 2.75 mm (0.03 × 0.11 in)



End gap (installed)	0.30–0.45 mm (0.0118–0.0177 in)
Limit	0.80 mm (0.0315 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Limit	0.115 mm (0.0045 in)
Oil ring	
Dimensions (B × T)	1.50 × 2.25 mm (0.06 × 0.09 in)



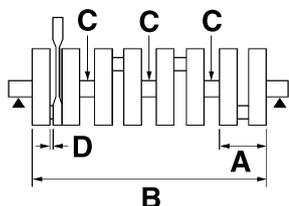
End gap (installed)	0.10–0.40 mm (0.0039–0.0157 in)
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Connecting rod

Crankshaft-pin-to-big-end-bearing clearance	0.034–0.058 mm (0.0013–0.0023 in)
Limit	0.09 mm (0.0035 in)
Bearing color code	1.Blue 2.Black 3.Brown 4.Green

Crankshaft

Width A	59.40–60.10 mm (2.339–2.366 in)
Width B	301.80–303.00 mm (11.88–11.93 in)
Runout limit C	0.030 mm (0.0012 in)
Big end side clearance D	0.160–0.262 mm (0.0063–0.0103 in)



Journal oil clearance	0.004–0.039 mm (0.0002–0.0015 in)
Bearing color code	1.Blue 2.Black 3.Brown 4.Green 5.Yellow

Balancer shaft

Balancer shaft runout limit	0.030 mm (0.0012 in)
Journal oil clearance	0.012–0.043 mm (0.0005–0.0017 in)
Bearing color code	0.White 1.Blue 2.Black 3.Brown 4.Green 5.Yellow 6.Pink

ENGINE SPECIFICATIONS**Clutch**

Clutch type	Wet, multiple-disc
Clutch release method	Outer pull, rack and pinion pull
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Wear limit	2.82 mm (0.111 in)
Plate quantity	9 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Warpage limit	0.10 mm (0.0039 in)
Plate quantity	8 pcs
Clutch spring free length	43.80 mm (1.72 in)
Limit	41.61 mm (1.64 in)
Spring quantity	6 pcs

Transmission

Transmission type	Constant mesh 6-speed
Primary reduction ratio	1.512 (65/43)
Secondary reduction ratio	2.765 (47/17)
Final drive	Chain
Operation	Left foot operation
Gear ratio	
1st	2.533 (38/15)
2nd	2.063 (33/16)
3rd	1.762 (37/21)
4th	1.522 (35/23)
5th	1.364 (30/22)
6th	1.269 (33/26)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

Shifting mechanism

Shift mechanism type	Shift drum and guide bar
Shift fork guide bar bending limit	0.100 mm (0.0039 in)
Shift fork-L thickness	5.795–5.868 mm (0.2281–0.2310 in)
Shift fork-C thickness	5.795–5.868 mm (0.2281–0.2310 in)
Shift fork-R thickness	5.760–5.890 mm (0.2268–0.2319 in)

Air filter

Air filter element	Oil-coated paper element
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Fuel pump

Pump type	Electrical
Maximum consumption amperage	6.0 A

Fuel injector

Model/quantity	297500–1450/4 (Pri), 297500–1640/4 (2nd)
Fuel injector resistance (Primary injector/Secondary injector)	12.0 Ω at 20 °C (68 °F)

Throttle body

Type/quantity	45EIDW/1
ID mark	1KB8 00
Fuel line pressure (at idle)	300.0–390.0 kPa (3.00–3.90 kgf/cm ² , 43.5–56.6 psi)

ENGINE SPECIFICATIONS

Throttle position sensor

Throttle position sensor resistance	1.2–2.8 k Ω
Accelerator position sensor resistance	1.2–2.8 k Ω
Output voltage (at idle)	0.63–0.73 V

Fuel injection sensor

Crankshaft position sensor resistance	248–372 Ω at 20 °C (68 °F)
Cylinder identification sensor output voltage (ON)	More than 4.8 V
Cylinder identification sensor output voltage (OFF)	Less than 0.8 V
Atmospheric pressure sensor output voltage	3.57–3.71 V at 101.32 kPa
Intake air pressure sensor output voltage	3.57–3.71 V at 101.32 kPa
Intake air temperature sensor resistance	5.4–6.6 k Ω at 0 °C (32 °F) 290–390 Ω at 80 °C (176 °F)

Air induction system

Reed valve bending limit	0.4 mm (0.016 in)
Solenoid resistance	18–22 Ω at 20 °C (68 °F)

Idling condition

Engine idling speed	1150–1250 r/min
CO% (at exhaust pipe)	3.0–4.0 %
Water temperature	90–110 °C (194–230 °F)
Oil temperature	75–95 °C (167–203 °F)
Throttle cable free play	3.0–5.0 mm (0.12–0.20 in)

CHASSIS SPECIFICATIONS

EAS20300

CHASSIS SPECIFICATIONS**Chassis**

Frame type	Diamond
Caster angle	24.0°
Trail	102.0 mm (4.02 in)

Front wheel

Wheel type	Cast wheel
Rim size	17M/C × MT3.50
Rim material	Aluminum
Wheel travel	120.0 mm (4.72 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)

Rear wheel

Wheel type	Cast wheel
Rim size	17M/C × MT6.00
Rim material	Aluminum
Wheel travel	120.0 mm (4.72 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)

Front tire

Type	Tubeless
Size	120/70 ZR17M/C (58W)
Manufacturer/model	MICHELIN/POWER PURE A (1KB8, 1KB9, 1KBJ, 1KBK) DUNLOP/Qualifier II (1KB8, 1KBH, 1KBJ, 1KBP)
Wear limit (front)	1.6 mm (0.06 in) (Europe) 1.0 mm (0.04 in) (AUS)

Rear tire

Type	Tubeless
Size	190/55 ZR17M/C (75W)
Manufacturer/model	MICHELIN/POWER PURE (1KB8, 1KB9, 1KBJ, 1KBK) DUNLOP/Qualifier II (1KB8, 1KBH, 1KBJ, 1KBP)
Wear limit (rear)	1.6 mm (0.06 in) (Europe) 1.0 mm (0.04 in) (AUS)

Tire air pressure (measured on cold tires)

Loading condition	0–90 kg (0–198 lb)
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	290 kPa (2.90 kgf/cm ² , 42 psi)
Loading condition	90–189 kg (198–417 lb)
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	290 kPa (2.90 kgf/cm ² , 42 psi)
High-speed riding	
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	290 kPa (2.90 kgf/cm ² , 42 psi)

Front brake

Type	Dual disc brake
Operation	Right hand operation

CHASSIS SPECIFICATIONS**Front disc brake**

Disc outside diameter × thickness	310.0 × 5.0 mm (12.20 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc deflection limit	0.10 mm (0.0039 in)
Brake pad lining thickness (inner)	4.5 mm (0.18 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	4.5 mm (0.18 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	16.00 mm (0.63 in)
Caliper cylinder inside diameter	24.05 mm × 3 (0.95 in × 3)
Recommended fluid	DOT 4

Rear brake

Type	Single disc brake
Operation	Right foot operation
Brake pedal position	12–18 mm (0.47–0.71 in)
Rear disc brake	
Disc outside diameter × thickness	220.0 × 5.0 mm (8.66 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	6.0 mm (0.24 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	6.0 mm (0.24 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	38.18 mm (1.50 in)
Recommended fluid	DOT 4

Steering

Steering bearing type	Angular bearing
Center to lock angle (left)	27.0°
Center to lock angle (right)	27.0°

Front suspension

Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	120.0 mm (4.72 in)
Fork spring free length	271.5 mm (10.69 in)
Limit	266.1 mm (10.48 in)
Collar length	118.4 mm (4.66 in)
Installed length	262.0 mm (10.31 in)
Spring rate K1	9.06 N/mm (0.92 kgf/mm, 51.73 lb/in)
Spring stroke K1	0.0–120.0 mm (0.00–4.72 in)
Inner tube outer diameter	43.0 mm (1.69 in)
Inner tube bending limit	0.2 mm (0.01 in)
Optional spring available	No
Recommended oil	Suspension oil M1 or equivalent
Quantity	528.0 cm ³ (17.85 US oz, 18.62 Imp.oz)
Level	117.0 mm (4.61 in)
Spring preload adjusting positions	
Minimum	0
Standard	2
Maximum	5
Rebound damping adjusting positions	
Minimum	25
Standard	12
Maximum	1

CHASSIS SPECIFICATIONS

Compression damping adjusting positions	
Minimum	25
Standard	20
Maximum	1

Rear suspension

Type	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	60.0 mm (2.36 in)
Spring free length	161.0 mm (6.34 in)
Installed length	147.5 mm (5.81 in)
Spring rate K1	93.20 N/mm (9.50 kgf/mm, 532.17 lb/in)
Spring stroke K1	0.0–60.0 mm (0.00–2.36 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	1200 kPa (12.0 kgf/cm ² , 174.0 psi)
Spring preload adjusting positions	
Minimum	16
Standard	8
Maximum	0
Rebound damping adjusting positions	
Minimum	20
Standard	15
Maximum	3
Compression damping setting (for fast compression damping)	
Minimum	4
Standard	3
Maximum	0
Compression damping setting (for slow compression damping)	
Minimum	20
Standard	9
Maximum	1

Swingarm

Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	1.0 mm (0.04 in)

Drive chain

Type/manufacturer	50VAZ/DAIDO
Number of links	120
Drive chain slack (when adjusting the drive chain)	25.0–35.0 mm (0.98–1.38 in)
Drive chain slack (when replacing the drive chain and sprocket)	20.0–30.0 mm (0.79–1.18 in)
15-link length limit	239.3 mm (9.42 in)

Shift pedal

Installed shift rod length	262.5–264.5 mm (10.33–10.41 in)
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ELECTRICAL SPECIFICATIONS

EAS20310

ELECTRICAL SPECIFICATIONS**Voltage**

System voltage 12 V

Ignition systemIgnition system TCI
Ignition timing (B.T.D.C.) 5.0°/1200 r/min**Engine control unit**Model/manufacture TBDFE9/DENSO (1KB8, 1KBH, 1KBJ, 1KBP)
TBDFE0/DENSO (1KB9, 1KBK)**Ignition coil**Minimum ignition spark gap 6.0 mm (0.24 in)
Primary coil resistance 0.85–1.15 Ω
Secondary coil resistance 8.50–11.50 kΩ**AC magneto**Standard output 14.0 V, 33.0 A at 5000 r/min
Stator coil resistance 0.112–0.168 Ω at 20 °C (68 °F)**Rectifier/regulator**Regulator type Semi conductor-short circuit
Rectifier/regulator output voltage 14.2–14.8 V
Rectifier/regulator input voltage above 14 V at 5000 r/min
Rectifier capacity 50.0 A**Lean angle sensor**Lean angle sensor output voltage
Less than 45° 0.4–1.4 V
More than 45° 3.7–4.4 V**Battery**Model YTZ10S
Voltage, capacity 12 V, 8.6 Ah
Specific gravity 1.31
Manufacturer GS YUASA
Ten hour rate amperage 0.90 A**Headlight**

Bulb type Halogen bulb

Bulb voltage, wattage × quantityHeadlight 12 V, 55 W × 2
Auxiliary light LED
Tail/brake light LED
Front turn signal light 12 V, 10.0 W × 2
Rear turn signal light 12 V, 10.0 W × 2
License plate light 12 V, 5.0 W × 1
Meter lighting LED**Indicator light**Neutral indicator light LED
Turn signal indicator light LED
Oil level warning light LED
High beam indicator light LED

ELECTRICAL SPECIFICATIONS

Fuel level warning light	LED
Coolant temperature warning light	LED
Engine trouble warning light	LED
Immobilizer system indicator light	LED
Shift timing indicator light	LED
Traction control system indicator/warning light	LED
Electric starting system	
System type	Constant mesh
Starter motor	
Power output	0.90 kW
Armature coil	
Commutator resistance	0.0090–0.0110 Ω at 20 °C (68 °F)
Insulation resistance	Above 1 M Ω at 20 °C (68 °F)
Brush overall length	10.8 mm (0.43 in)
Limit	7.19 mm (0.28 in)
Brush spring force	5.28–7.92 N (538–808 gf, 19.01–28.51 oz)
Commutator diameter	24.5 mm (0.96 in)
Limit	23.5 mm (0.93 in)
Mica undercut (depth)	1.50 mm (0.06 in)
Starter relay	
Amperage	180.0 A
Coil resistance	4.18–4.62 Ω
Horn	
Horn type	Plane
Quantity	1 pcs
Maximum amperage	3.0 A
Coil resistance	1.07–1.11 Ω at 20 °C (68 °F)
Turn signal/hazard relay	
Relay type	Full transistor
Built-in, self-canceling device	No
Oil level switch	
Maximum level position resistance	484–536 Ω
Minimum level position resistance	114–126 Ω
Rear speed sensor	
Output voltage reading cycle	0.6 V to 4.8 V to 0.6 V to 4.8 V
Coolant temperature sensor	
Resistance at 0 °C (32 °F)	5.21–6.37 k Ω
Resistance at 20 °C (68 °F)	2.45 k Ω
Resistance at 80 °C (176 °F)	290–354 Ω
Throttle servo motor	
Throttle servo motor resistance	1.23–1.67 Ω
Steering damper solenoid	
Steering damper solenoid resistance	49.82–56.18 Ω at 20 °C (68 °F)
Fuses	
Main fuse	50.0 A
Headlight fuse	20.0 A
Signaling system fuse	7.5 A

ELECTRICAL SPECIFICATIONS

Ignition fuse	15.0 A
Radiator fan fuse	10.0 A × 2
Turn signal light fuse	7.5 A
Fuel injection system fuse	15.0 A
Steering damper fuse	7.5 A
Backup fuse	7.5 A
ETV (Electronic Throttle Valve) fuse	7.5 A
Spare fuse	20.0 A
Spare fuse	15.0 A × 2
Spare fuse	10.0 A
Spare fuse	7.5 A

TIGHTENING TORQUES

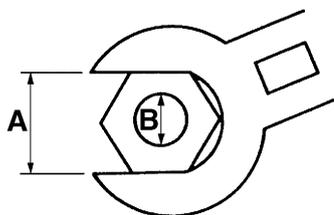
EAS20320

TIGHTENING TORQUES

EAS20330

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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



- A. Distance between flats
- B. Outside thread diameter

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

TIGHTENING TORQUES

EAS20340

ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Spark plugs	M10	4	13 Nm (1.3 m.kgf, 9.4 ft.lbf)	
Cylinder head nut	M10	2	See TIP.	
Cylinder head nut	M10	8	See TIP.	
Cylinder head bolt	M6	2	12 Nm (1.2 m.kgf, 8.7 ft.lbf)	
Camshaft cap bolt	M6	20	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Cylinder head cover bolt	M6	6	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Cylinder head stud bolt (exhaust pipe)	M8	8	15 Nm (1.5 m.kgf, 11 ft.lbf)	
Read valve cover bolt (air induction system)	M6	4	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Camshaft sprocket bolt	M7	4	24 Nm (2.4 m.kgf, 17 ft.lbf)	
Throttle body joint bolt	M6	7	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil checking bolt	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Connecting rod bolt	M8	8	See TIP.	
Generator rotor bolt	M12	1	70 Nm (7.0 m.kgf, 50 ft.lbf)	
Pickup rotor bolt	M10	1	60 Nm (6.0 m.kgf, 43 ft.lbf)	
Timing chain tensioner bolt	M6	2	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Water pump outlet pipe bolt	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Radiator inlet pipe bolt	M6	2	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Water pump inlet pipe bolt (water pump side)	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Water pump inlet pipe bolt (front side)	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Water hose clamp	—	6	2 Nm (0.2 m.kgf, 1.4 ft.lbf)	
Oil/water pump driven sprocket bolt	M6	1	15 Nm (1.5 m.kgf, 11 ft.lbf)	
Oil/water pump assembly bolt	M6	2	12 Nm (1.2 m.kgf, 8.7 ft.lbf)	
Thermostat housing cover nut	M6	2	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Thermostat inlet pipe bolt	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil cooler union bolt	M20	1	63 Nm (6.3 m.kgf, 45 ft.lbf)	
Engine oil drain bolt	M14	1	43 Nm (4.3 m.kgf, 31 ft.lbf)	
Oil pipe bolt	M6	2	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil strainer bolt	M6	3	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil/water pump assembly drive chain guide bolt	M6	2	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil delivery pipe 1 bolt	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil delivery pipe 2 bolt	M6	1	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Oil filter union bolt	M20	1	70 Nm (7.0 m.kgf, 51 ft.lbf)	
Oil filter cartridge	M20	1	17 Nm (1.7 m.kgf, 12 ft.lbf)	
Oil pan bolt	M6	13	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Relief valve assembly bolt	M6	2	10 Nm (1.0 m.kgf, 7.2 ft.lbf)	
Throttle cable adjusting bolt	M6	2	5 Nm (0.5 m.kgf, 3.6 ft.lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Throttle body and throttle body joint clamp	M5	4	3 Nm (0.3 m·kgf, 2.2 ft·lbf)	
Throttle position sensor screw	M5	2	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Accelerator position sensor screw	M5	2	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Secondary injector assembly bolt	M5	7	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Fuel rail screw	—	4	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Intake funnel joint bolt	M6	6	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Air filter case screw	M5	10	2 Nm (0.2 m·kgf, 1.4 ft·lbf)	
Exhaust pipe nut	M8	8	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust chamber and muffler clamp bolt	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust pipe and exhaust stay bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust chamber bracket bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust chamber bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust pipe and exhaust chamber clamp bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Muffler and frame bolt	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Muffler cover bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Exhaust chamber protector bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Muffler pipe cover bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Crankcase stud bolt	M10	10	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Crankcase bolt (main journal)	M9	10	See TIP.	l=100 mm (3.94 in) 
Crankcase bolt	M8	8	24 Nm (2.4 m·kgf, 17 ft·lbf)	l=60 mm (2.36 in) 
Crankcase bolt	M8	2	24 Nm (2.4 m·kgf, 17 ft·lbf)	l=60 mm (2.36 in) 
Crankcase bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l=65 mm (2.56 in) 
Crankcase bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l=70 mm (2.76 in)  
Crankcase bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l=60 mm (2.36 in) 
Crankcase bolt	M6	7	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l=50 mm (1.97 in) 
Crankcase bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l=40 mm (1.57 in) 

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Generator rotor cover bolt	M6	8	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Clutch cover bolt	M6	8	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Clutch cover bolt	M6	1	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Pickup rotor cover 2 bolt	M6	6	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Crankcase breather case bolt	M6	6	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil baffle plate bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Crankcase breather cover bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Pull lever shaft protector bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Engine oil filler cap	M20	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Main gallery plug 1	M16	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Main gallery plug 2	M20	1	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Clutch cable holder bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Main gallery plug (oil return)	M12	1	24 Nm (2.4 m·kgf, 17 ft·lbf)	
Stator coil lead holder bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Stator coil assembly bolt	M6	3	14 Nm (1.4 m·kgf, 10 ft·lbf)	
Crankcase baffle plate bolt	M6	10	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Pickup rotor cover 1 bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Right side cowling inner panel bracket bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Idler gear bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Starter clutch holder bolt	M6	3	14 Nm (1.4 m·kgf, 10 ft·lbf)	
Clutch boss nut	M20	1	115 Nm (11.5 m·kgf, 85 ft·lbf)	Stake 
Clutch spring bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Drive sprocket nut	M22	1	85 Nm (8.5 m·kgf, 61 ft·lbf)	Stake 
Bearing housing bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Shift drum retainer bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Stopper screw	M8	1	22 Nm (2.2 m·kgf, 16 ft·lbf)	
Shift rod nut	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	Left thread
Shift rod nut	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Joint rod bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Shift arm bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
ECU (engine control unit) screw	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Gear position sensor bolt	M5	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Coolant temperature sensor	M12	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Cylinder identification sensor bolt	M6	1	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Atmospheric pressure sensor bolt	M5	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Intake air pressure sensor screw	M5	1	3.5 Nm (0.35 m·kgf, 1.1 ft·lbf)	
Crankshaft position sensor bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil level switch bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

TIGHTENING TORQUES

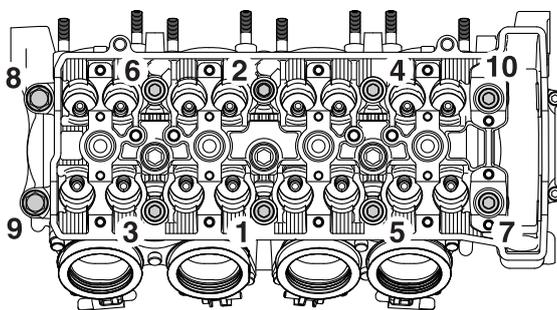
Item	Thread size	Q'ty	Tightening torque	Remarks
Starter motor bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Rear speed sensor bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

TIP

Cylinder head nut

Use new nuts and washers.

1. Apply engine oil to nut thread, mating surface and washer.
2. Tighten the nut to 40 Nm (4.0 m·kgf, 29 ft·lbf).
3. Loosen all the nut one by one following the tightening order and then tighten the nuts 1–7 and 10 to 20 Nm (2.0 m·kgf, 14 ft·lbf) and nuts 8 and 9 to 25 Nm (2.5 m·kgf, 18 ft·lbf) again.
4. Tighten the nut to 120°.



TIP

Connecting rod cap bolt

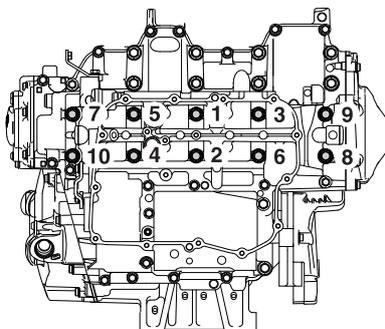
Use new bolts.

1. Apply Molybdenum-disulfide oil to bolt thread and cap/nut mating surface.
2. Tighten the bolt to 20 Nm (2.0 m·kgf, 14 ft·lbf).
3. Retighten the bolt further to reach the specified angle of 145°–155°.

TIP

Crankcase bolt (main journal)

1. Lubricate the bolts thread, mating surfaces and washers with engine oil.
2. First, tighten the bolts to approximately 30 Nm (3.0 m·kgf, 22 ft·lbf) with a torque wrench.
3. Loosen all the bolts one by one following the tightening order and then tighten them to 18 Nm (1.8 m·kgf, 13 ft·lbf) again.
4. Retighten the bolts further to reach the specified angle of 60°.



TIGHTENING TORQUES

EAS20350

CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine mounting bolt (front side)	M12	2	70 Nm (7.0 m·kgf, 50 ft·lbf)	
Engine mounting nut (rear side)	M10	2	51 Nm (5.1 m·kgf, 37 ft·lbf)	
Engine mount adjusting bolt	M18	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch cable locknut (engine side)	M8	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch lever holder bolt	M6	1	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Main frame and rear frame bolt	M10	4	41 Nm (4.1 m·kgf, 30 ft·lbf)	
Battery cover bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Upper tail cover bracket bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Swingarm pivot shaft	M30	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Swingarm pivot shaft ring nut	M30	1	65 Nm (6.5 m·kgf, 47 ft·lbf)	
Swingarm pivot shaft nut	M20	1	105 Nm (10.5 m·kgf, 75 ft·lbf)	
Relay arm and frame nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Relay arm and connecting arm nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Connecting arm and swingarm nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly lower nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly and bracket nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly bracket and frame nut	M16	1	92 Nm (9.2 m·kgf, 66 ft·lbf)	
Drive chain guide bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive chain guard bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Locknut (drive chain adjusting nut)	M8	2	16 Nm (1.6 m·kgf, 11 ft·lbf)	
Upper bracket pinch bolt	M8	2	26 Nm (2.6 m·kgf, 19 ft·lbf)	
Steering stem nut	M28	1	113 Nm (11.3 m·kgf, 82 ft·lbf)	
Handlebar pinch bolt	M8	2	16 Nm (1.6 m·kgf, 11 ft·lbf)	
Handlebar bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Lower bracket ring nut	M30	2	See TIP.	
Lower bracket pinch bolt	M8	4	23 Nm (2.3 m·kgf, 17 ft·lbf)	See TIP.
Main switch bolt	M8	2	—	Bolt head to be cut off.
Damper rod assembly	M34	2	75 Nm (7.5 m·kgf, 54 ft·lbf)	
Cap bolt	M47	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Brake master cylinder reservoir cap stopper screw	M4	1	1.2 Nm (0.12 m·kgf, 0.9 ft·lbf)	
Front brake hose union bolt	M10	3	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Front brake hose holder bolt	M6	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Front brake master cylinder holder bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Handlebar end grip bolt	M6	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Front brake hose joint bracket bolt	M6	2	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Coolant reservoir bolt	M6	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Air chamber bracket bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Left lower cowling bracket bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Left lower cowling bracket and radiator outlet pipe bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Right lower cowling bracket bolt	M6	1	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Left side cowling inner panel bolt	M6	1	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Right side cowling inner panel bolt	M6	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Meter bracket bolt	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Meter bracket ground lead bolt	M5	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Rear view mirror nut	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump bracket bolt	M5	6	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Hose joint bolt	M5	1	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Front fuel tank bracket bolt	M6	2	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Fuel tank and front fuel tank bracket bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear fuel tank bracket and rear frame bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank and rear fuel tank bracket bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank upper cover and frame bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank upper cover and fuel tank bolt (rear)	M5	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Fuel tank upper cover and fuel tank bolt (side)	M5	2	0.4 Nm (0.04 m·kgf, 0.29 ft·lbf)	
Fuel tank side cover screw	M5	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Rider seat bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Seat lock plate bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front wheel axle bolt	M14	1	91 Nm (9.1 m·kgf, 66 ft·lbf)	
Rear wheel axle nut	M24	1	150 Nm (15 m·kgf, 110 ft·lbf)	
Front brake caliper bolt	M10	4	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Rear brake caliper bolt (front side)	M12	1	27 Nm (2.7 m·kgf, 19 ft·lbf)	
Rear brake caliper bolt (rear side)	M8	1	22 Nm (2.2 m·kgf, 16 ft·lbf)	 
Front brake disc bolt	M6	10	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Rear brake disc bolt	M8	5	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Front speed sensor bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear wheel sprocket self-locking nut	M10	6	100 Nm (10 m·kgf, 72 ft·lbf)	
Bleed screw (caliper)	M8	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Bleed screw (master cylinder)	M8	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Front wheel axle pinch bolt	M8	4	21 Nm (2.1 m·kgf, 15 ft·lbf)	See TIP.
Rider footrest bolt	M8	4	28 Nm (2.8 m·kgf, 20 ft·lbf)	
Passenger footrest bolt	M8	4	28 Nm (2.8 m·kgf, 20 ft·lbf)	
Rear frame lower reinforcement and passenger footrest bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Rear brake master cylinder bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Rear brake hose union bolt	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Rear brake hose holder bolt	M6	1	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Sidestand bracket bolt	M10	2	63 Nm (6.3 m·kgf, 45 ft·lbf)	
Battery box bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Lean angle sensor bolt	M4	2	2 Nm (0.2 m·kgf, 1.4 ft·lbf)	
License plate/turn signal light stay bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
License plate/turn signal light bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Exhaust chamber cover bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	

TIP

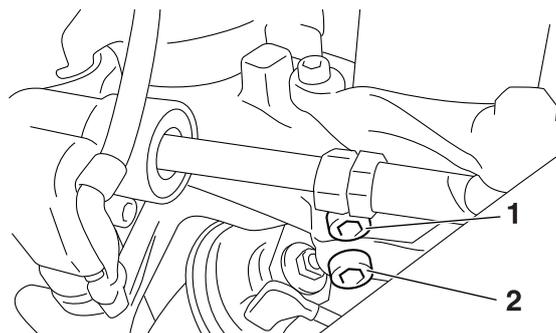
Lower ring nut

1. First, tighten the lower ring nut approximately 52 Nm (5.2 m·kgf, 37 ft·lbf) by using the torque wrench, then loosen the ring nut completely.
2. Retighten the lower ring nut 18 Nm (1.8 m·kgf, 13 ft·lbf).

TIP

Lower bracket pinch bolt

Tighten each bolt to 23 Nm (2.3 m·kgf, 17 ft·lbf) in the order pinch bolt "1" → pinch bolt "2" → pinch bolt "1" → pinch bolt "2".



TIP

Front wheel axle pinch bolt

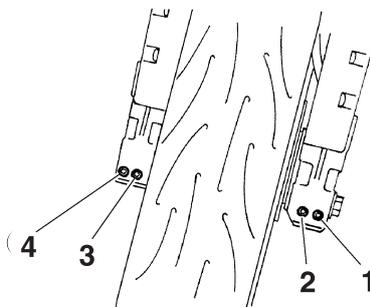
1. Insert the front wheel axle from the right side and tighten it with the flange bolt from the left side to 91 Nm (9.1 m·kgf, 66 ft·lbf).
2. In the order from the pinch bolt "2" → pinch bolt "1" → pinch bolt "2", tighten each bolt to 21 Nm (2.1 m·kgf, 15 ft·lbf) without performing temporary tightening.
3. Check that the end face of the axle head and the end face of the fork side are flush-mounted. If they are out of alignment, make sure to fit them by adding the external force by hand or with a plastic hammer, etc.

TIGHTENING TORQUES

If the end face of the axle is not parallel to the end face of the fork, align them so that one point of the axle circumference is positioned on the end face of the fork.

At this stage, it can be accepted if the end face of the axle becomes partially concave to the end face of the fork.

4. In the order from the pinch bolt "4" → pinch bolt "3" → pinch bolt "4", tighten each bolt to 21 Nm (2.1 m·kgf, 15 ft·lbf) without performing temporary tightening.
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LUBRICATION POINTS AND LUBRICANT TYPES

EAS20360

LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370

ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Coolant hose insertion part	Silicon fluid
Bearings	
Camshaft lobes and journals (intake and exhaust)	
Valve stem seal (installed on valve guide)	Silicon fluid
Valve lifter outer surface (intake and exhaust)	
Valve stems and stem ends (intake and exhaust)	
Connecting rod big end bearings and connecting rod big end thrust surface	
Piston surfaces	
Piston pins	
Connecting rod bolts	
Crankshaft journals	
Balancer journals	
Generator rotor bolt thread and washer	
Crankshaft sprocket bolt thread	
Balancer gear press fitting surface	
O-rings (coolant pipe)	
Oil pump rotors (inner and outer)	Shell Alvania EP Grease®
Oil cooler bolt thread and washer	
Oil filter union bolt	
O-ring (oil nozzle)	
O-ring (main gallery plug)	
Idler gear and idler gear shaft	
Starter clutch assembly	
Starter clutch gear thrust surface	
Primary driven gear	
Clutch boss nut thread and bearing surface	
Pull rod	
Oil/water pump assembly drive sprocket inner surface	
Oil/water pump assembly drive sprocket collar and washer	
Clutch housing thrust washer	
Transmission gears (wheel and pinion)	
Main axle and drive axle	
Shift forks and shift fork guide bars	
Cylinder head cover mating surface	Three bond No.1541C®

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Cylinder head cover semicircular	Yamaha bond No.1215 (Three bond No.1215®)
Crankcase mating surface	Yamaha bond No.1215 (Three bond No.1215®)
Crankcase cover (lead grommet)	Yamaha bond No.1215 (Three bond No.1215®)

LUBRICATION POINTS AND LUBRICANT TYPES

EAS20380
CHASSIS

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	
Throttle grip inner surface and throttle cable end	
Brake lever pivoting point and metal-to-metal moving parts	
Clutch lever pivoting point and metal-to-metal moving parts	
Clutch cable end	
Engine mounting bolts (rear upper and lower side)	
Relay arm, connecting arm and rear shock absorber spacer	
Swingarm pivot shaft	
Swingarm pivot shaft bearings	
Swingarm dust cover lips	
Relay arm, connecting arm and rear shock absorber oil seal lips	
Seat lock lever pivoting point	
Sidestand pivoting point and metal-to-metal moving parts	
Sidestand switch striker and sidestand switch contact point	
Sidestand hook and spring	
Sidestand bracket and sidestand bolt	
Shift shaft joint	
Front wheel oil seal lips	
Front axle shaft	
Rear wheel oil seal lips	
Rear wheel drive hub oil seal lips	
Rear wheel drive hub mating surface	

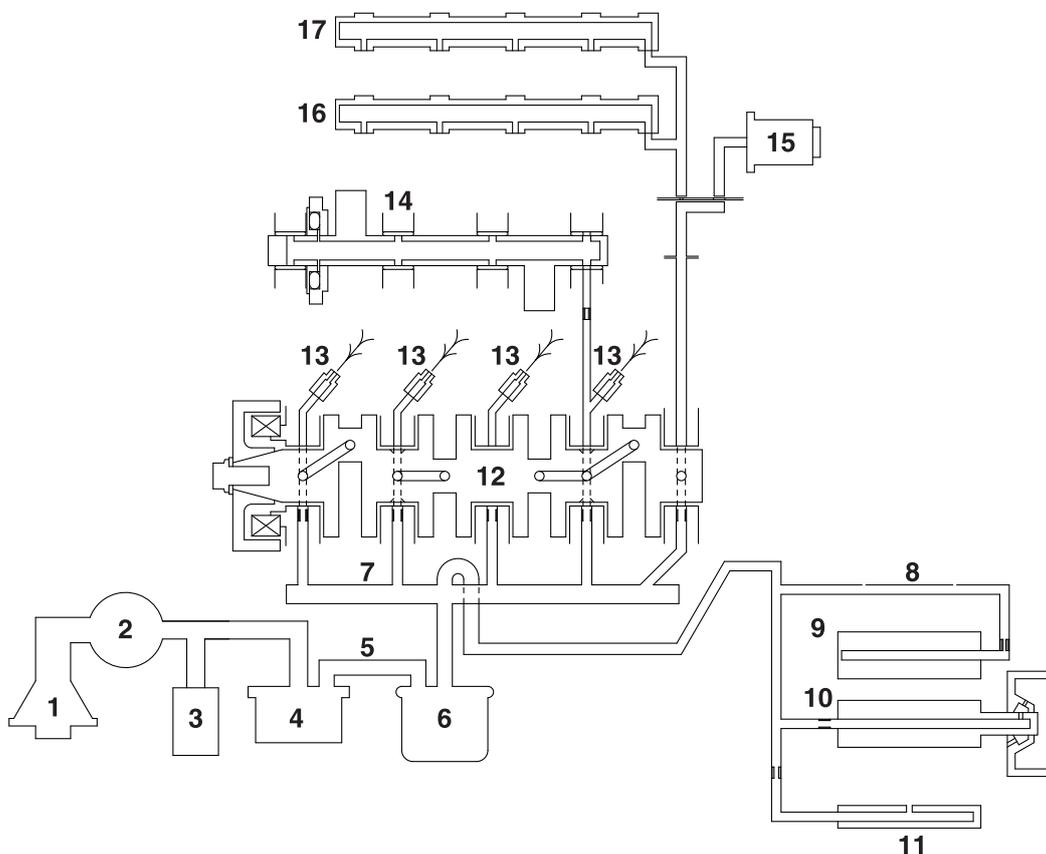
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20390

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400

ENGINE OIL LUBRICATION CHART



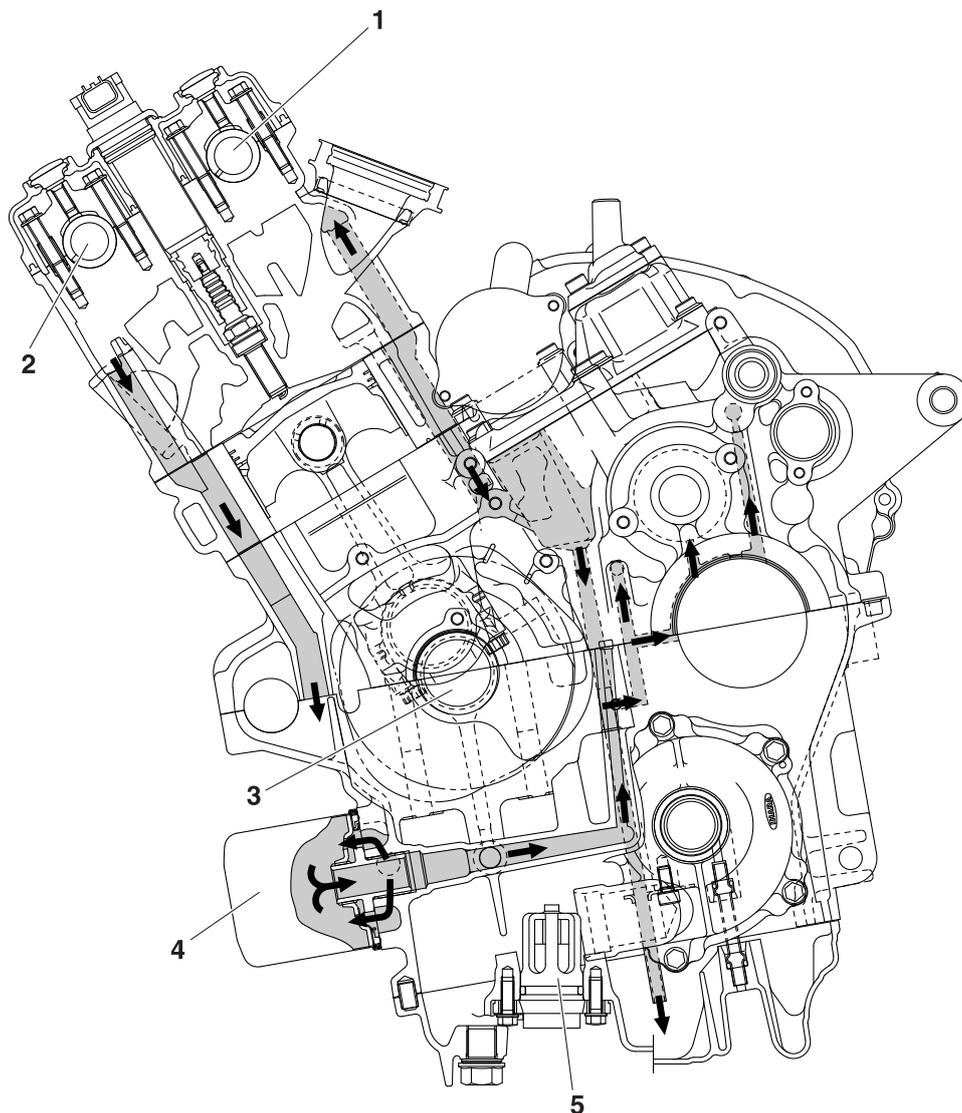
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil strainer
2. Oil pump
3. Relief valve
4. Oil cooler
5. Sub gallery
6. Oil filter cartridge
7. Main gallery
8. Mission shower
9. Drive axle
10. Main axle
11. Shift fork (upper)
12. Crankshaft
13. Oil nozzle
14. Balancer shaft
15. Timing chain tensioner
16. Intake camshaft
17. Exhaust camshaft

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20410

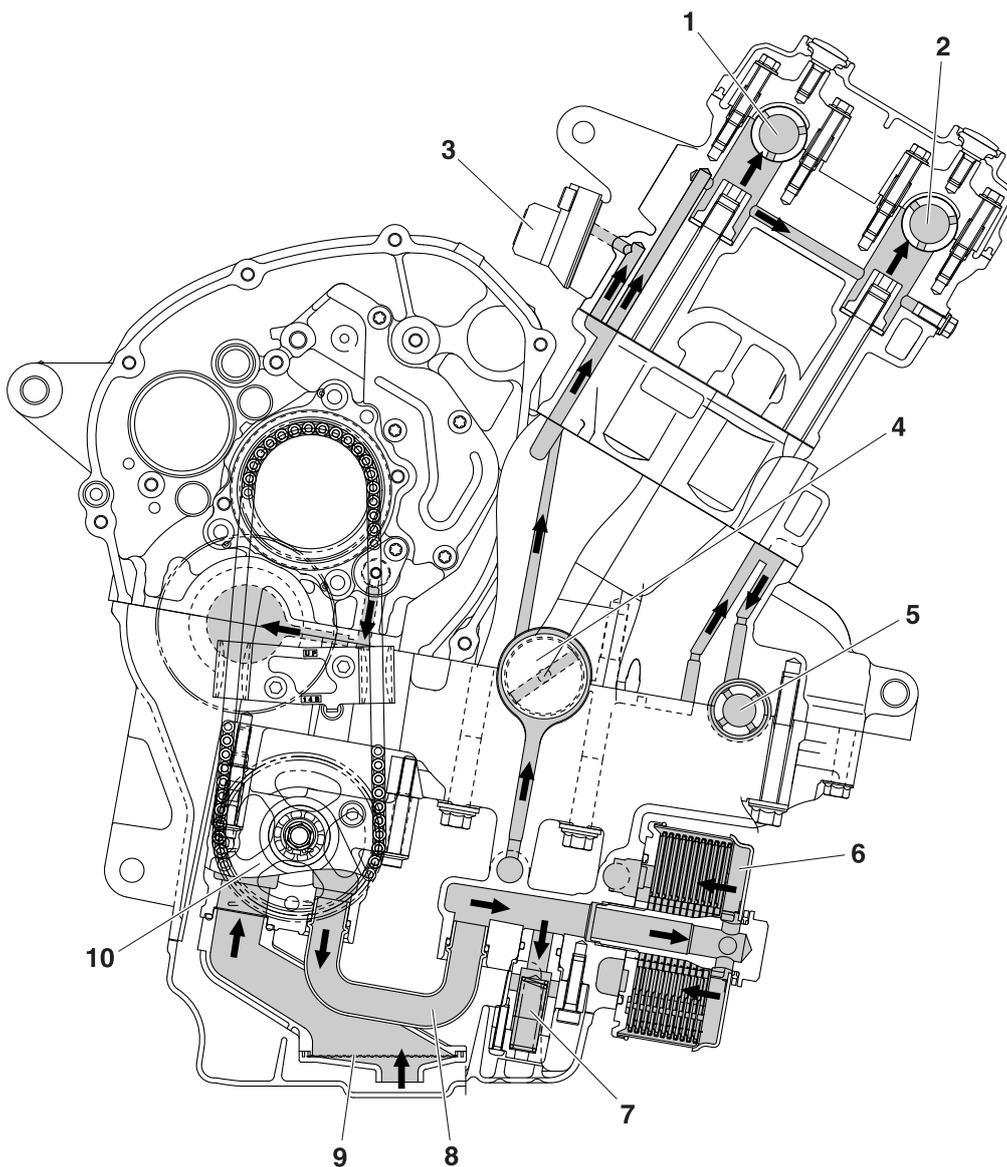
LUBRICATION DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

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

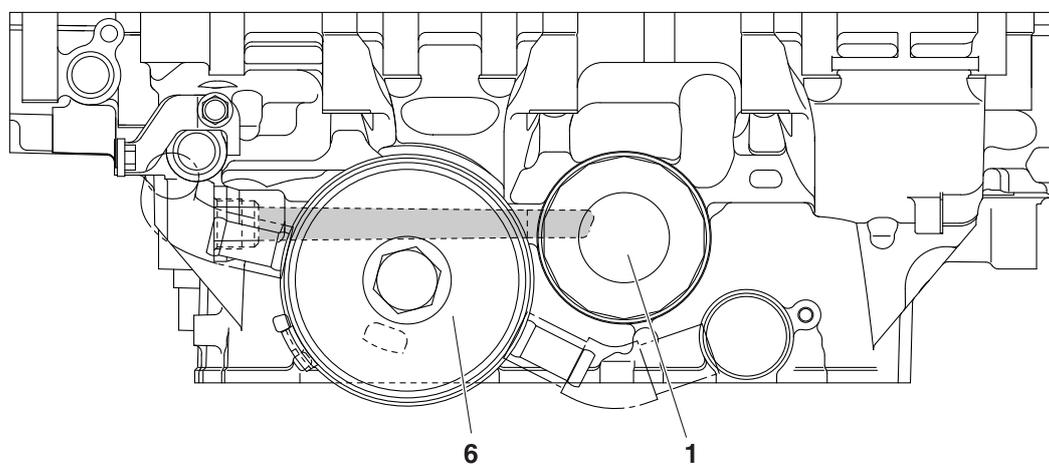
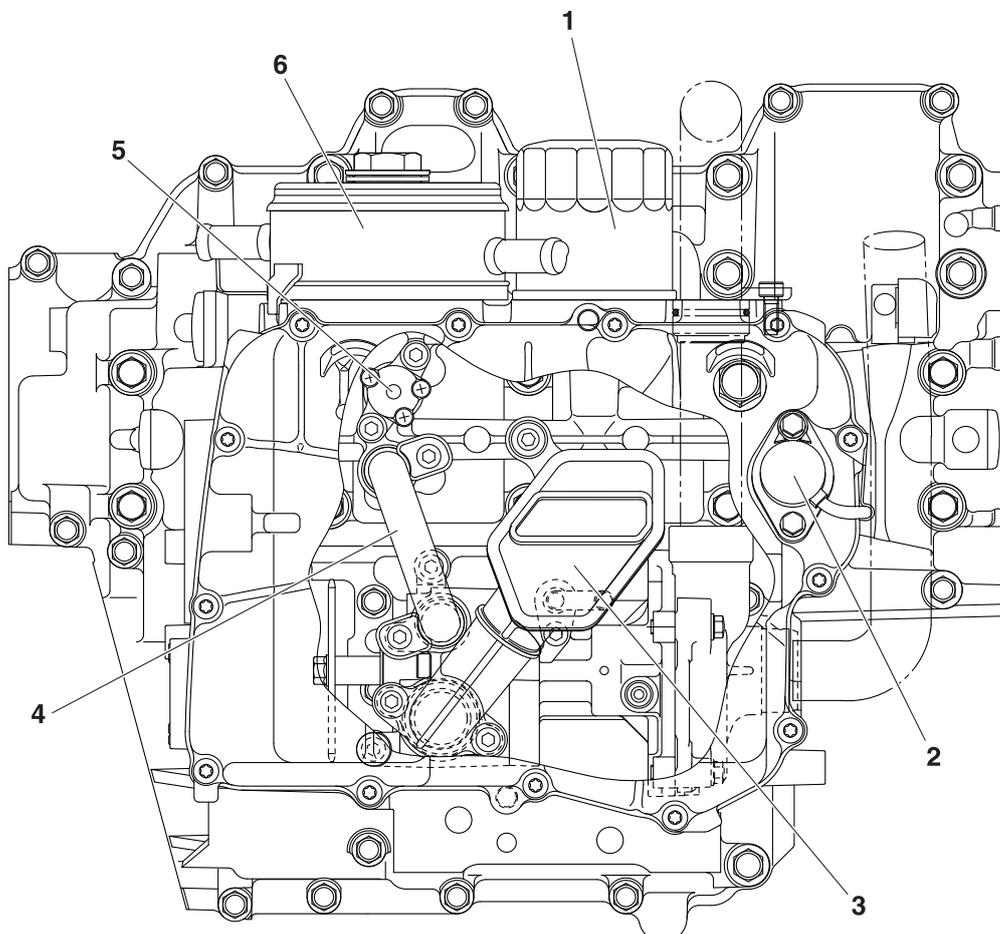
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Intake camshaft
2. Exhaust camshaft
3. Timing chain tensioner
4. Crankshaft
5. Balancer shaft
6. Oil cooler
7. Relief valve
8. Oil pipe
9. Oil strainer
10. Oil/water pump assembly

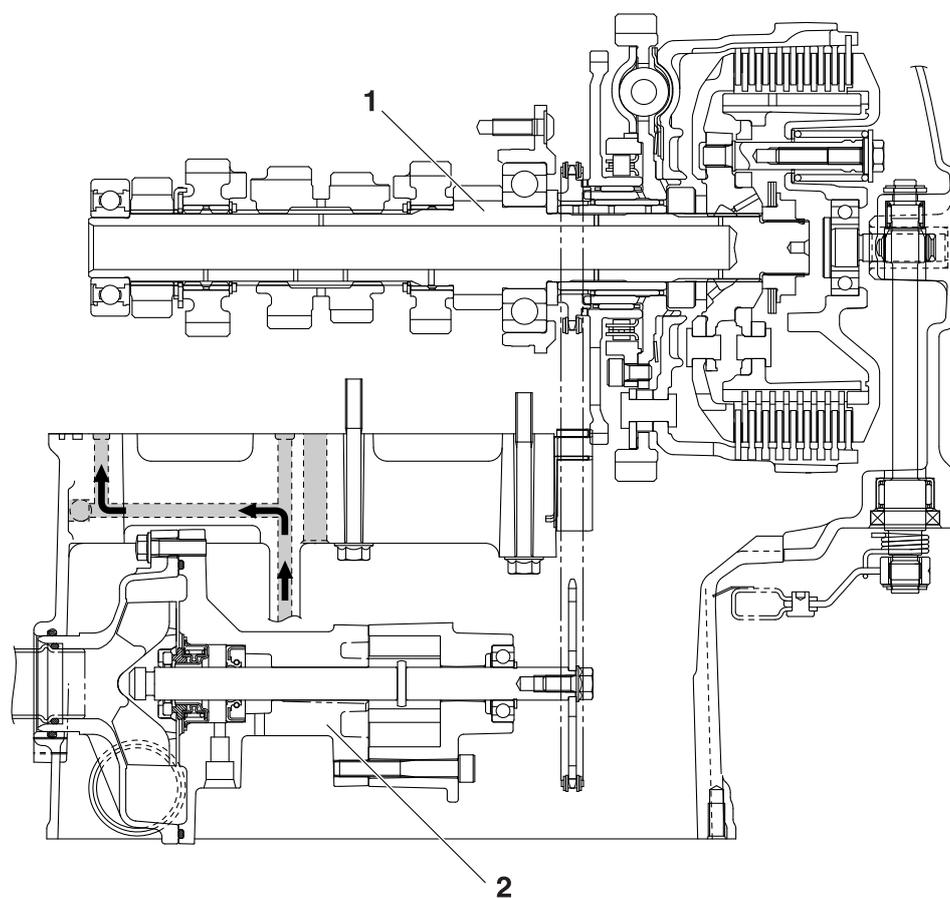
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil filter cartridge
2. Oil level switch
3. Oil strainer
4. Oil pipe
5. Relief valve
6. Oil cooler

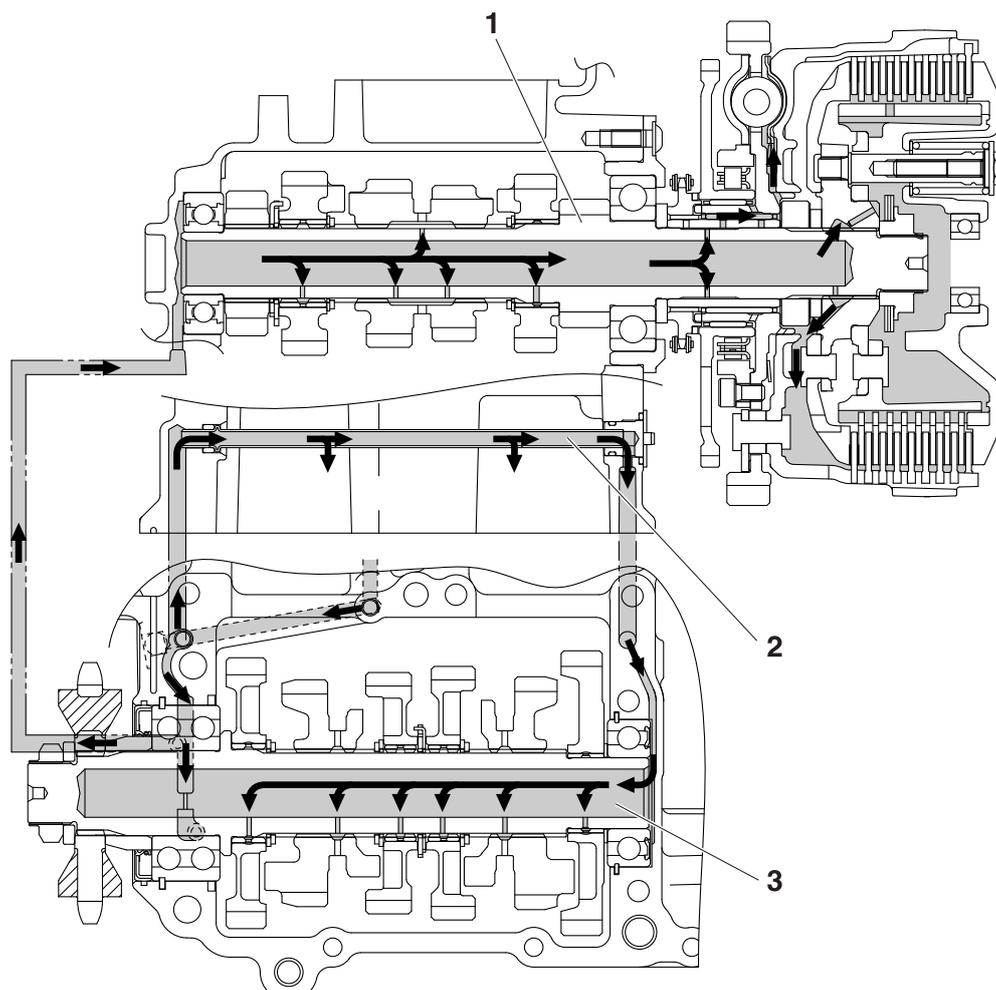
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Main axle
2. Oil/water pump assembly

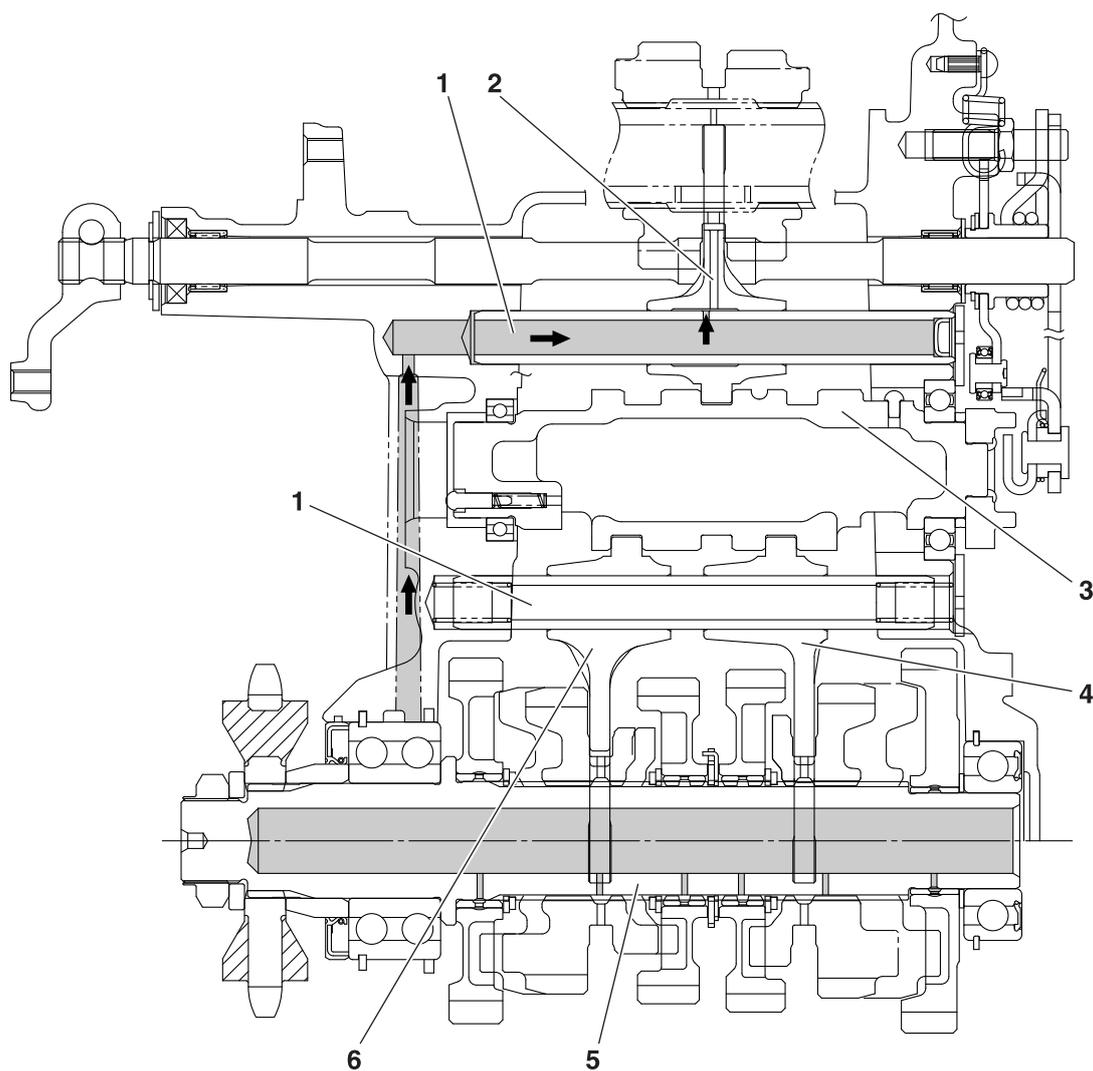
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Main axle
2. Oil delivery pipe 2
3. Drive axle

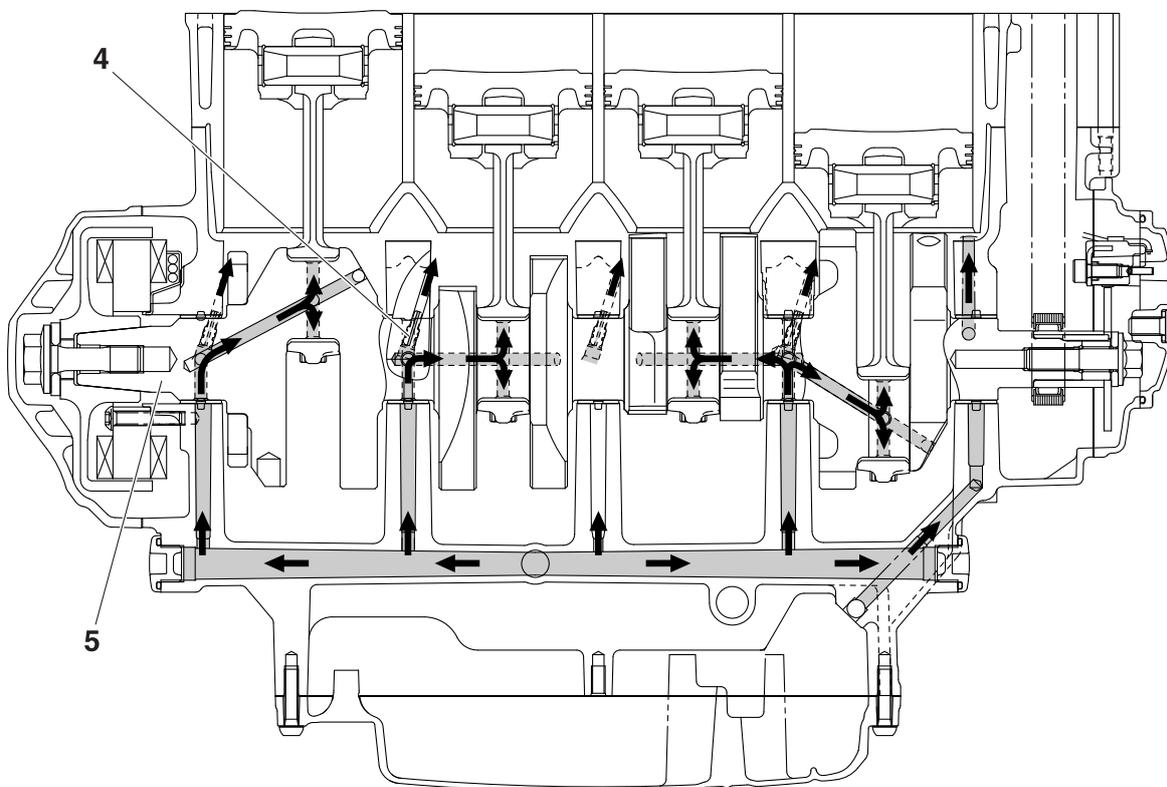
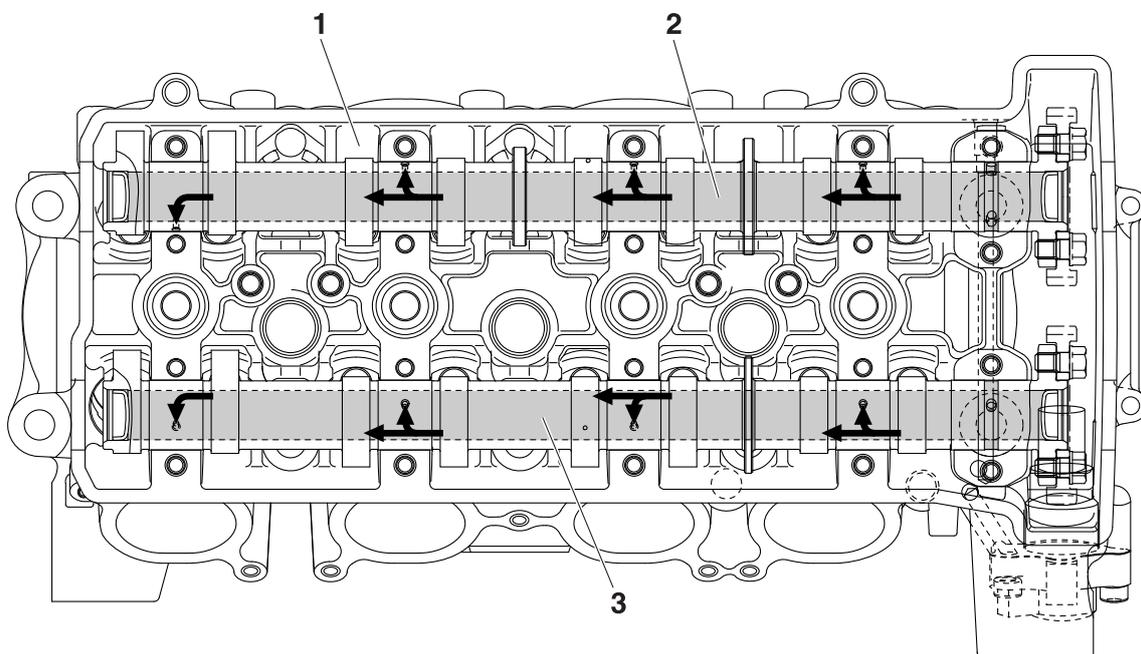
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Shift fork guide bar
2. Shift fork-C
3. Shift drum assembly
4. Shift fork-R
5. Drive axle
6. Shift fork-L

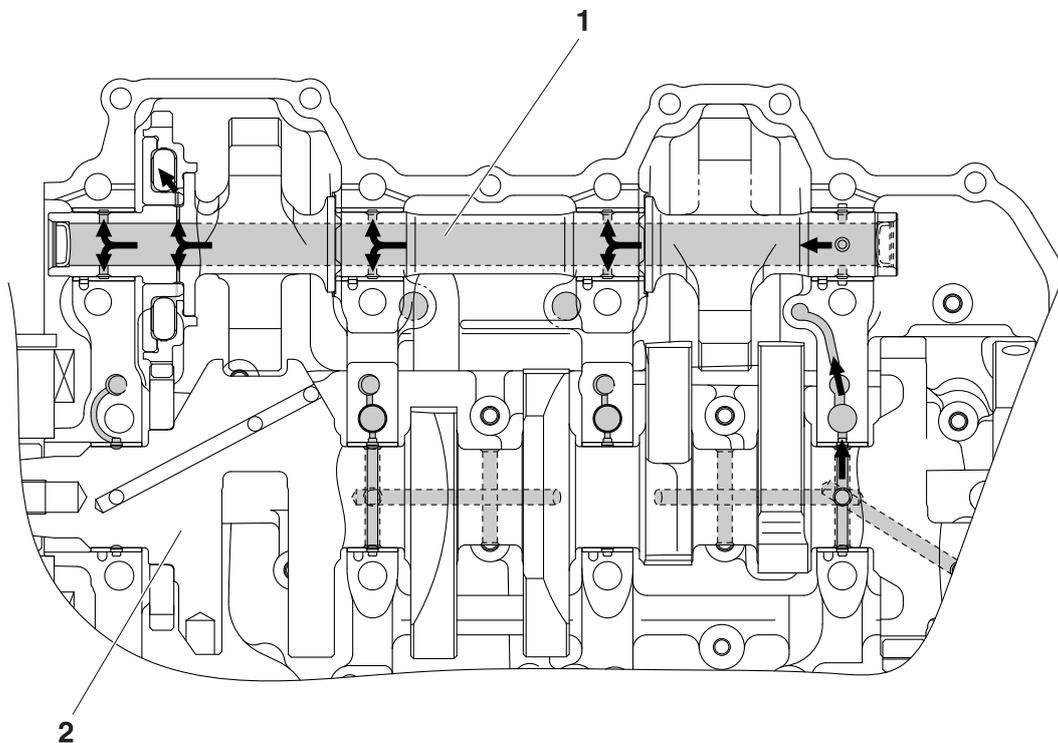
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Cylinder head
2. Exhaust camshaft
3. Intake camshaft
4. Oil nozzle
5. Crankshaft

LUBRICATION SYSTEM CHART AND DIAGRAMS



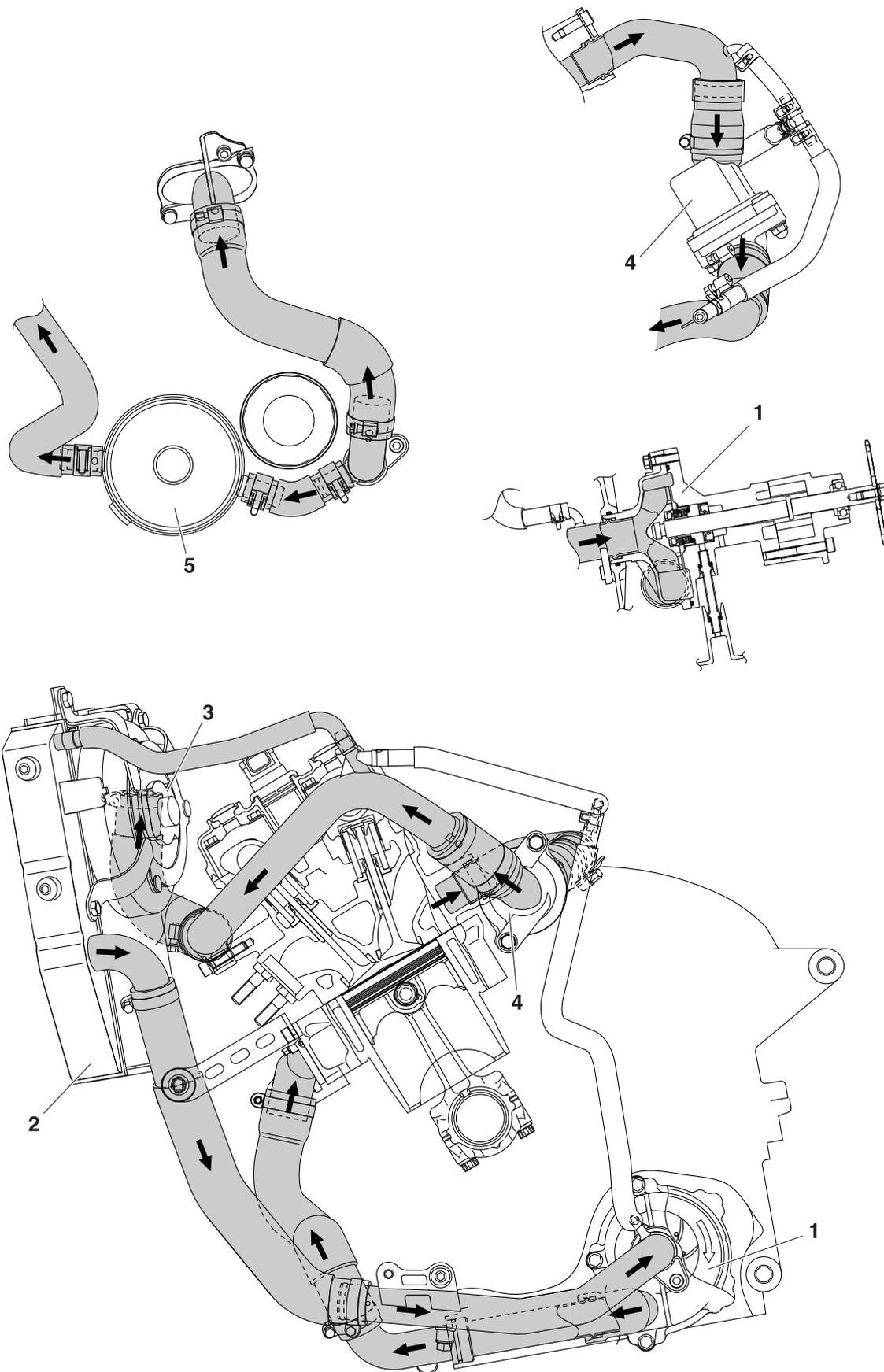
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Balancer shaft
2. Crankshaft

COOLING SYSTEM DIAGRAMS

EAS20420

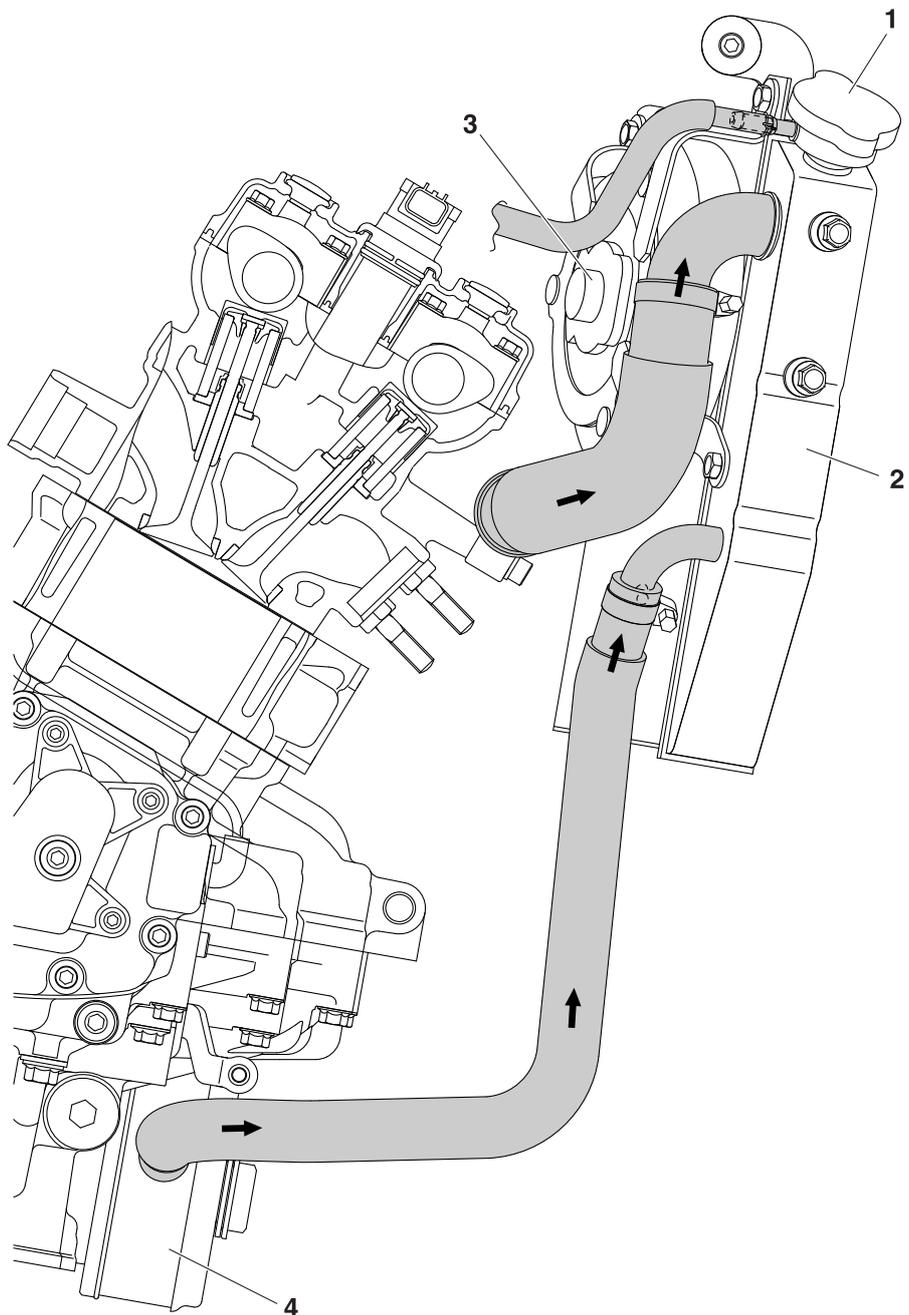
COOLING SYSTEM DIAGRAMS



COOLING SYSTEM DIAGRAMS

1. Oil/water pump assembly
2. Radiator
3. Radiator fan
4. Thermostat
5. Oil cooler

COOLING SYSTEM DIAGRAMS



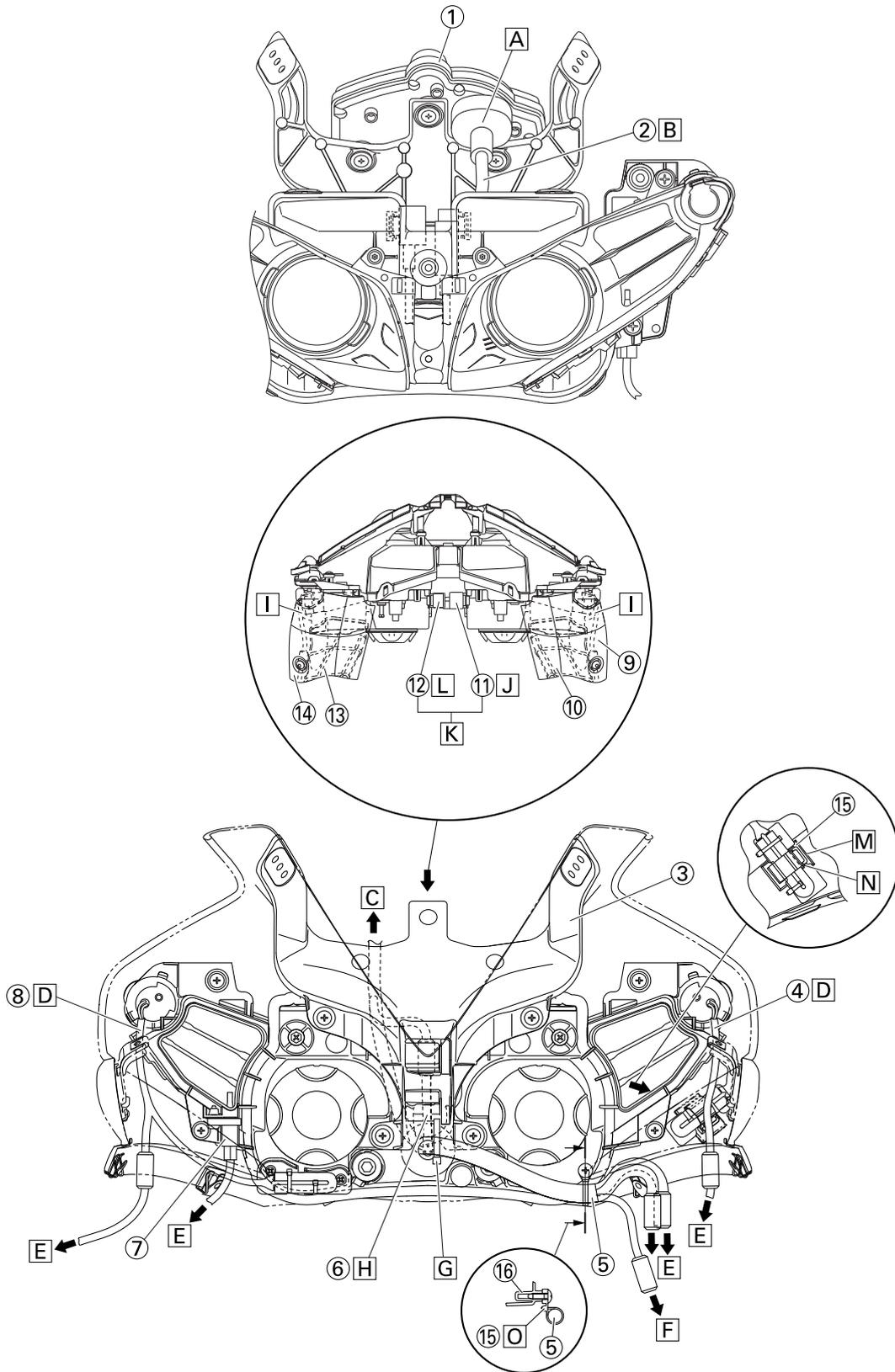
COOLING SYSTEM DIAGRAMS

1. Radiator cap
2. Radiator
3. Radiator fan
4. Oil cooler

CABLE ROUTING

EAS20430

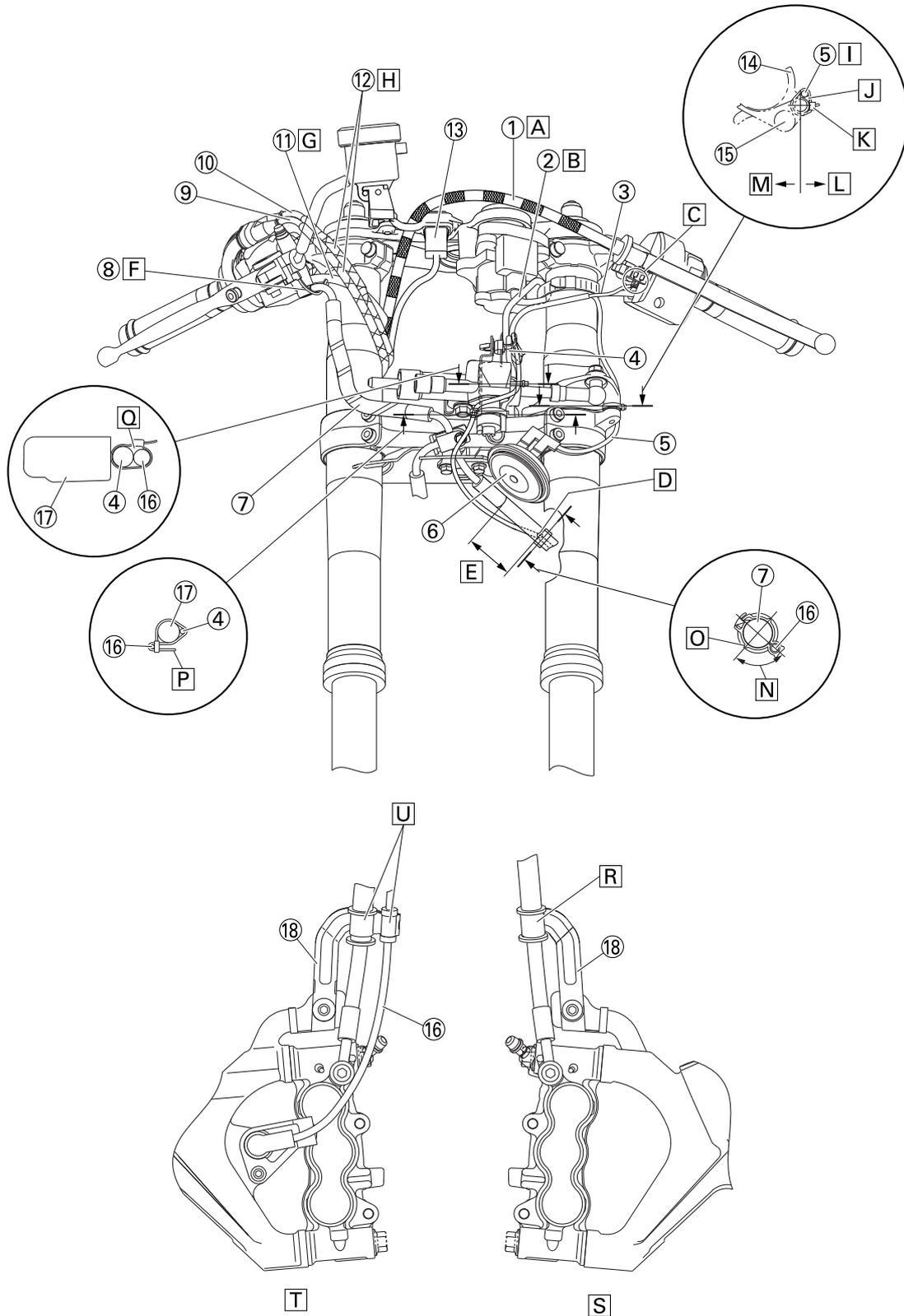
CABLE ROUTING



CABLE ROUTING

1. Meter assembly
 2. Meter lead
 3. Meter bracket
 4. Right auxiliary light lead
 5. Headlight sub-wire harness
 6. Headlight lead
 7. Intake air temperature sensor
 8. Left auxiliary light lead
 9. Right air intake air duct cover
 10. Right front intake air duct
 11. Turn signal relay
 12. Headlight relay
 13. Left front intake air duct
 14. Left air intake air duct cover
 15. Wire harness holder
 16. Headlight assembly
-
- A. Make sure to insert the coupler and boots into the meter. Edge of the boots should not turn inward/outward.
 - B. The meter lead should not protrude out.
 - C. To the meter assembly
 - D. Route the auxiliary light lead under the front intake air duct and connect.
 - E. To the main harness
 - F. To the turn signal
 - G. Avoid the purple tape when fastening the headlight sub-wire harness. When fastening the headlight sub-wire harness, it should not be sagged. Face the end of the clamp to front.
 - H. Route the headlight lead toward the front of the meter bracket and connect.
 - I. The auxiliary light lead should not be pinched when installing the air intake air duct cover, and should be placed within the air intake air duct cover.
 - J. Secure the turn signal relay by inserting it all the way in to the headlight right rib.
 - K. The turn signal relay and headlight relay can be installed either right/left.
 - L. Secure the headlight relay by inserting it all the way in to the headlight left rib.
 - M. Fasten the wire harness holder along the guide line on the front cowling with the wire harness holder opening facing rear of the vehicle.
 - N. Fasten the wire harness so that the notch faces rear of the vehicle (The wire harness should be directed as shown in the illustration).
 - O. Cut off the end of the clamp.

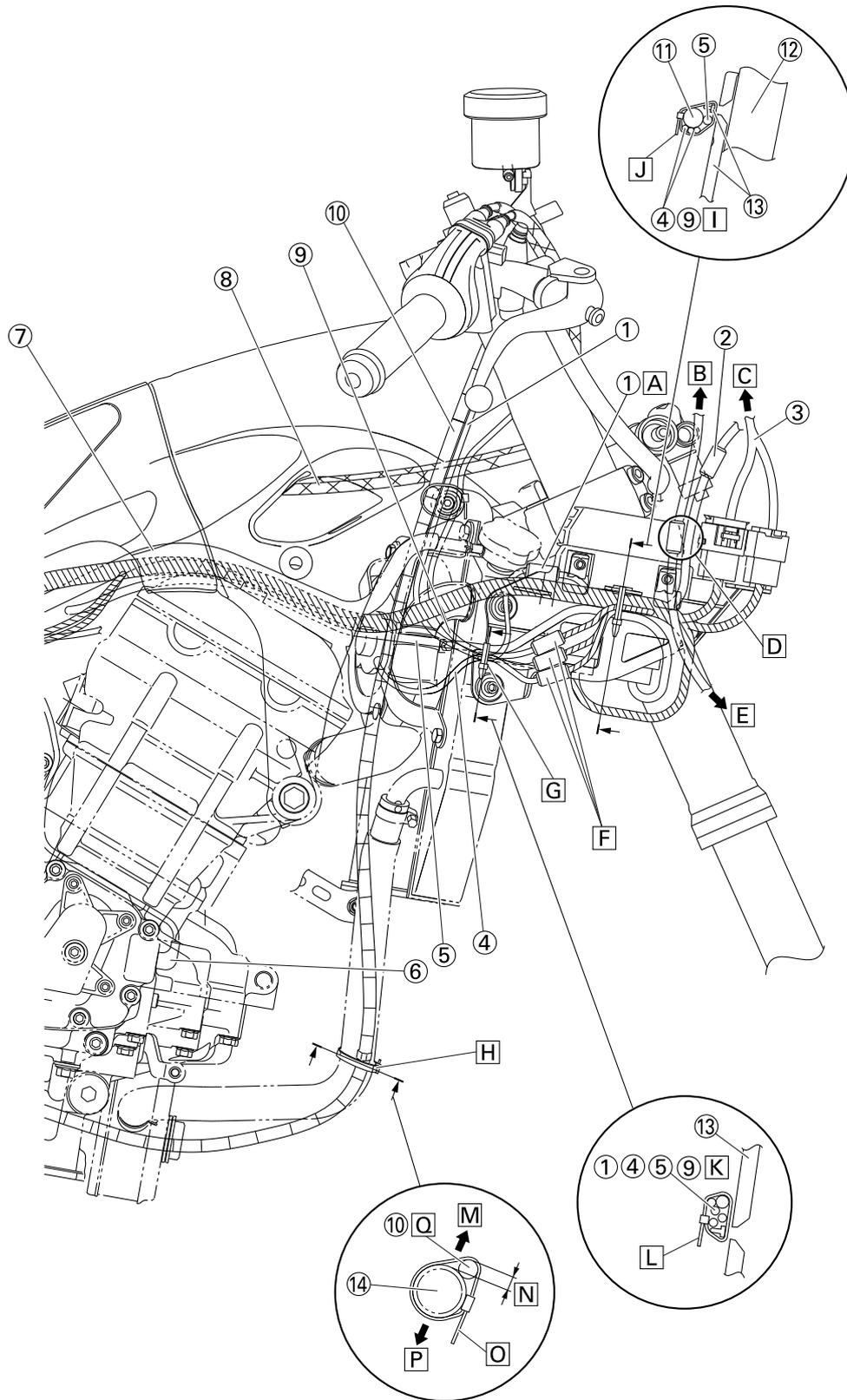
CABLE ROUTING



CABLE ROUTING

1. Clutch cable
 2. Main switch lead
 3. Left handlebar switch lead
 4. Steering damper lead
 5. Horn lead
 6. Horn
 7. Brake hose
 8. Front brake light switch lead
 9. Throttle cable (decelerator cable)
 10. Throttle cable (accelerator cable)
 11. Right handlebar switch lead
 12. Throttle cable
 13. Hazard switch
 14. Lower bracket
 15. Steering damper bracket
 16. Front speed sensor lead
 17. Steering damper
 18. Brake hose holder
- A. After passing the clutch cable through the clutch cable guide, route it along and front of the main switch.
- B. Make sure the main switch lead is not tight when turning the handle to the right of the stopper.
- C. Route the clutch switch lead outside of the left handlebar switch lead.
- D. Fasten the brake hose at a position actual measurement of 50 mm (1.97 in) away from the brake hose clasp, and the front speed sensor lead on the white tape.
- E. 50 mm (1.97 in)
- F. Route the front brake light switch lead under the brake hose.
- G. Route the right handlebar switch lead above the metal fitting on the brake hose.
- H. Route the throttle cable above the lower bracket, inside of the front fork and under the brake fluid reservoir hose. Throttle cable (accelerator cable) and throttle cable (decelerator cable) should not be twisted together.
- I. Fasten the horn lead back and inside of the steering damper bracket projection.
- J. Steering damper bracket projection
- K. Face the end of the plastic locking tie to the left and cut off the excess end leaving 2–4 mm (0.08–0.16 in).
- L. Outside of the vehicle.
- M. Inside of the vehicle.
- N. Fasten the front speed sensor lead within the area (90°) indicated by the arrows shown in the illustration.
- O. Fasten the front speed sensor lead behind the brake hose.
- P. Fasten the front wheel sensor lead on the white tape. Face the end of the plastic band to rear and to inside of the vehicle, and cut off the excess end leaving 5–10 mm (0.20–0.39 in).
- Q. Fasten the front speed sensor lead on the white tape either in front of or beside the steering damper motor. Face the end of the plastic locking tie to outside of the vehicle and cut off the excess end leaving 2–4 mm (0.08–0.16 in).
- R. Fasten the brake hose with the brake hose holder.
- S. Right side.
- T. Left side.
- U. Fasten the brake hose and front speed sensor lead with the brake hose holder.

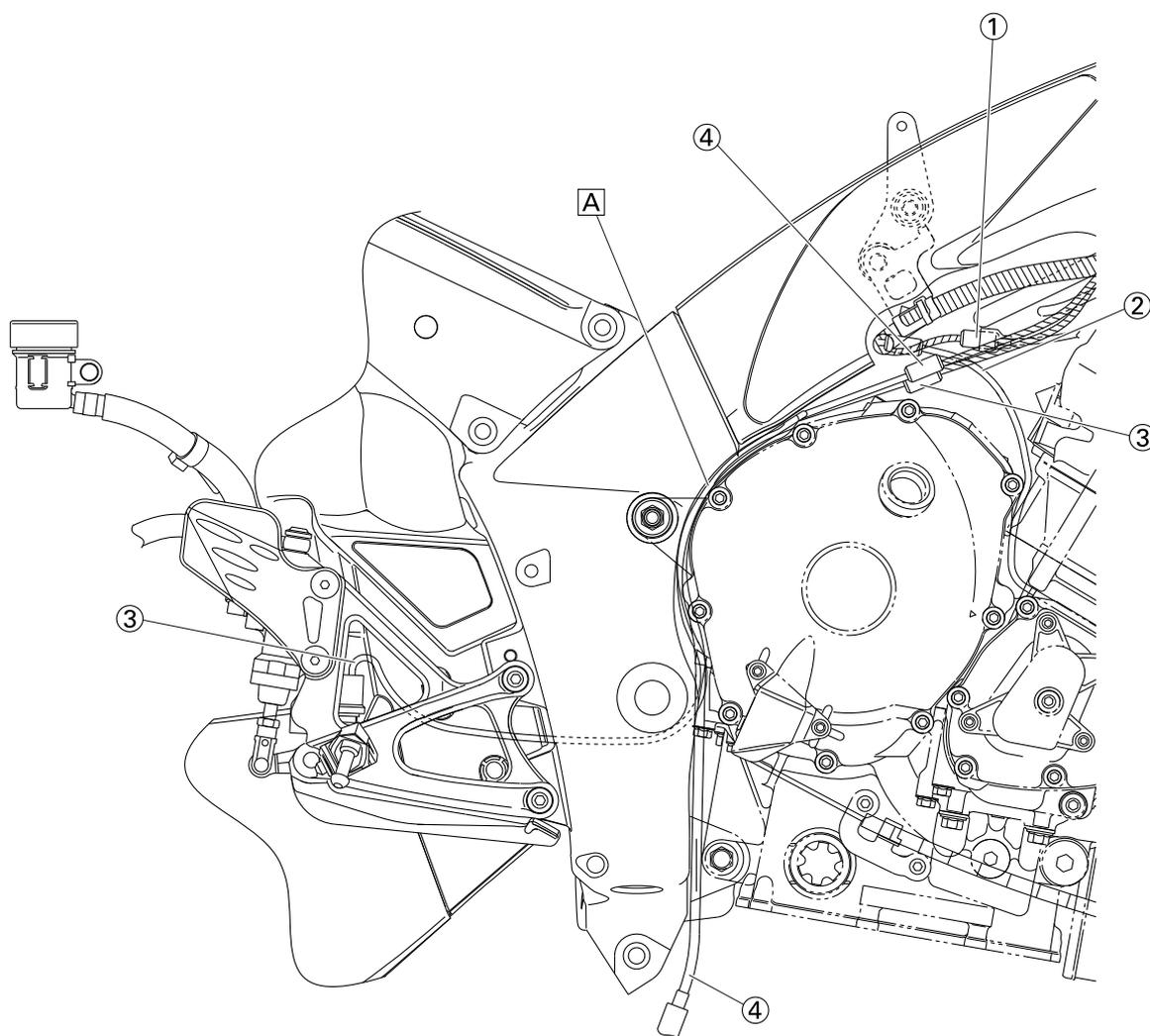
CABLE ROUTING



CABLE ROUTING

1. Hazard switch lead
 2. Right auxiliary light lead
 3. Headlight sub-wire harness
 4. Right radiator fan motor lead
 5. AC magneto lead
 6. Crankshaft position sensor
 7. Coolant reservoir hose
 8. Throttle cable
 9. Right handlebar switch lead
 10. Clutch cable
 11. Main harness
 12. Rectifier/regulator
 13. Rectifier/regulator bracket
 14. Oil cooler outlet hose
- A. Place the hazard switch lead coupler above the main harness. Make sure that the claw of the coupler is not in contact with any parts around the coupler.
- B. To the headlight sub-wire harness
- C. To the headlight
- D. Order insignificant-the right auxiliary light lead and front turn signal light coupler.
- E. To the turn signal
- F. Order insignificant-right radiator fan motor lead and right handlebar switch lead. Make sure the right radiator fan motor lead coupler and two right handlebar switch lead couplers do not overlap in the horizontal direction.
- G. Out of the two slits at the root of the rectifier/regulator bracket rib, clamp at the back of the slit.
- H. Clamp the clutch cable and oil cooler outlet hose at the protector rivet ring of the clutch cable.
- I. Order insignificant-the right radiator fan motor lead and right handlebar switch lead.
- J. Fasten the right radiator fan motor lead, right handlebar switch lead, main harness and AC magneto lead under the rectifier/regulator bracket rib and face the end of the clamp down.
- K. Order insignificant-hazard switch lead, right radiator fan motor lead, right handlebar switch lead and AC magneto lead. Either on top of or bottom of the rectifier/regulator bracket rib.
- L. Fasten the hazard switch lead, right radiator fan motor lead, right handlebar switch lead and AC magneto lead to the rectifier/regulator bracket. Face the end of the clamp to the bottom of the vehicle.
- M. Outside of the vehicle.
- N. Outermost part of the clutch cable should be outward than outermost part of the oil cooler outlet hose.
- O. Face the end of the clamp to inside.
- P. Inside of the vehicle.
- Q. Fasten the clutch cable in front of the oil cooler outlet hose.

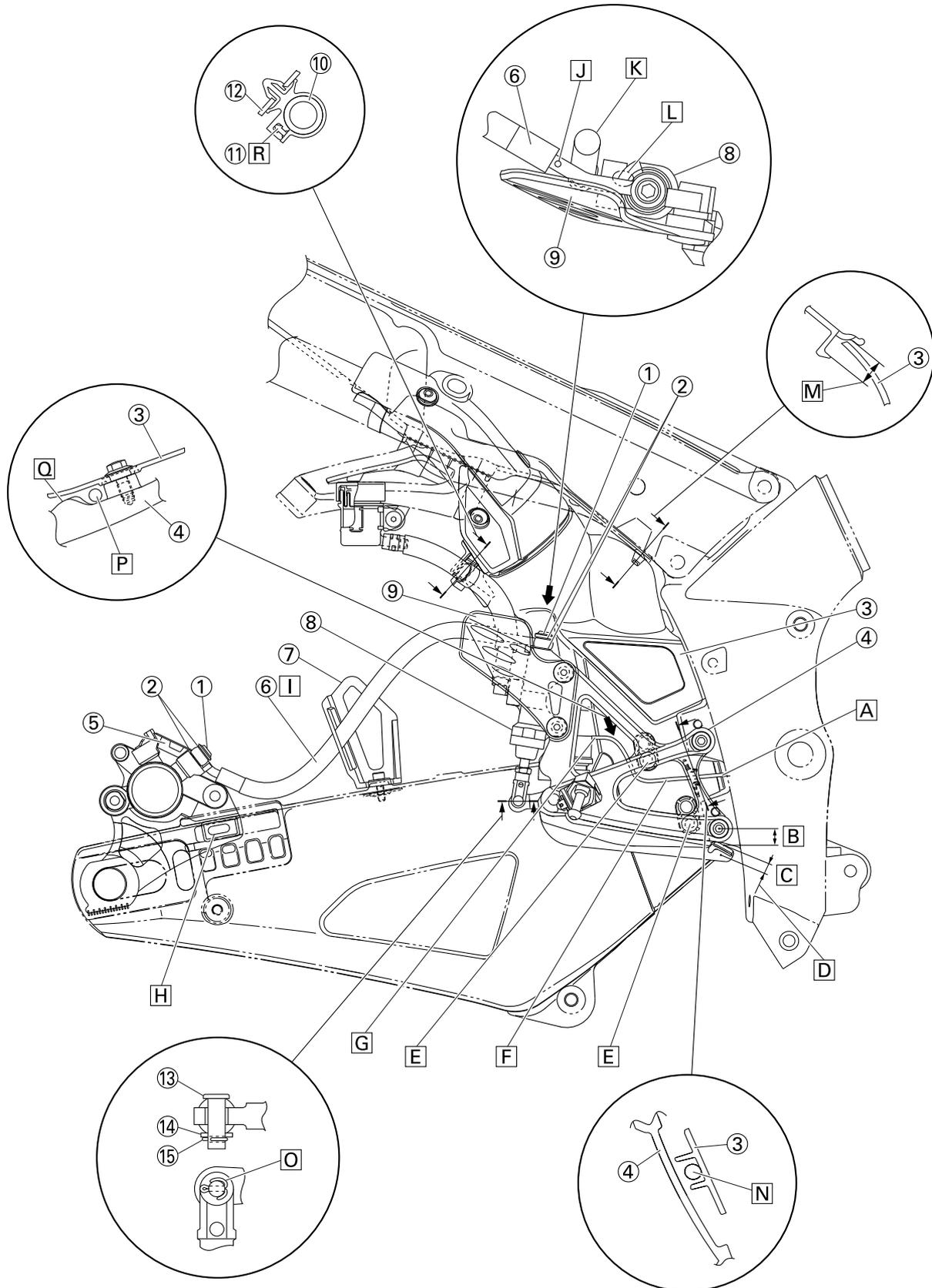
CABLE ROUTING



CABLE ROUTING

1. Ignition coil lead
 2. Crankshaft position sensor lead
 3. Rear brake light switch lead
 4. O₂ sensor lead
- A. Route the rear brake light switch lead outside of the O₂ sensor lead and push it to the occluding surface of the clutch cover.

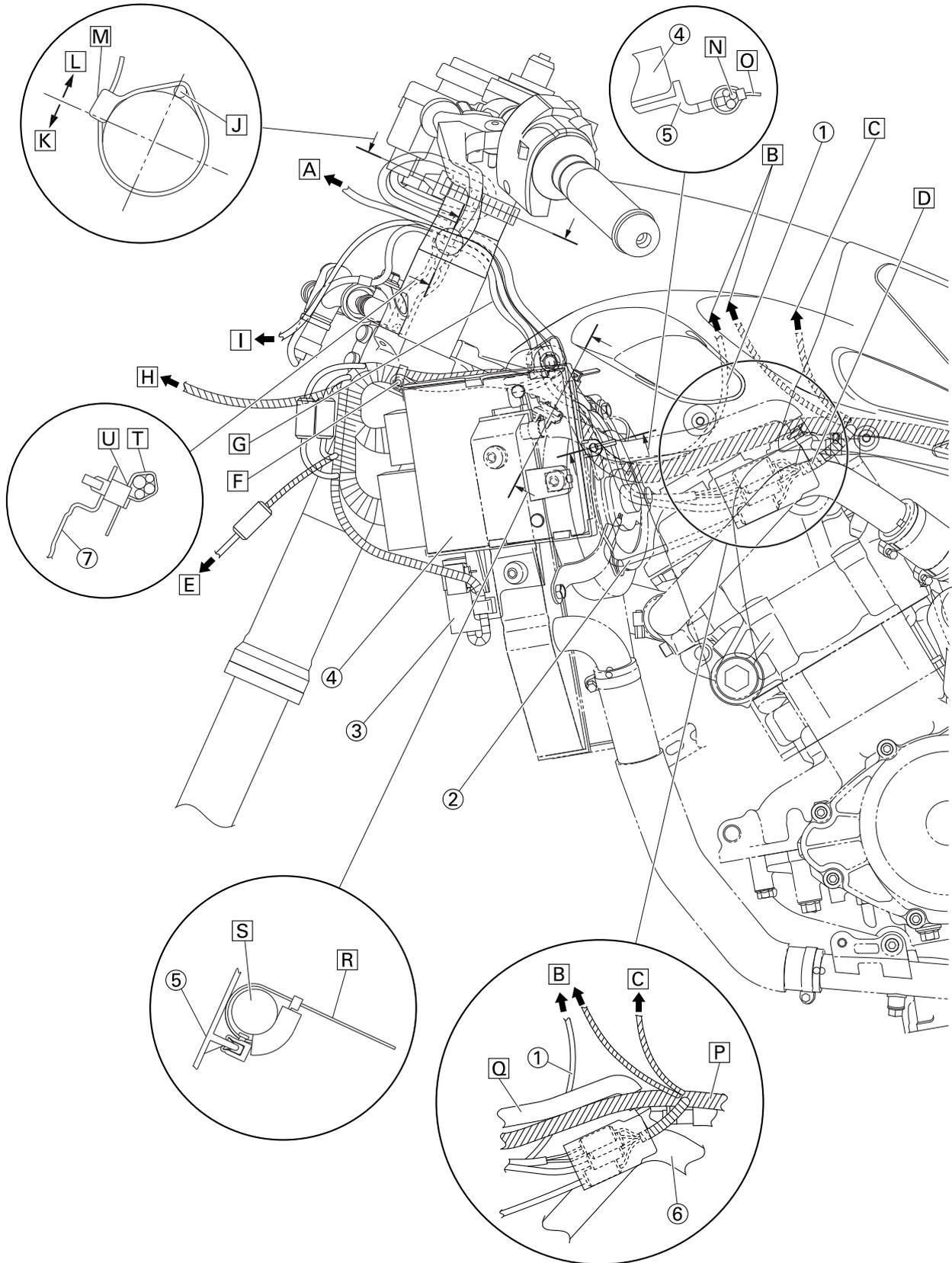
CABLE ROUTING



CABLE ROUTING

1. Union bolt
 2. Washer
 3. Exhaust chamber cover
 4. Right footrest assembly
 5. Brake caliper
 6. Brake hose
 7. Brake hose holder
 8. Brake master cylinder
 9. Footrest plate
 10. Brake fluid reservoir hose
 11. Clamp
 12. Right muffler pipe cover
 13. Pin
 14. Washer
 15. Cotter pin
- A. Route the rear brake light switch lead between the top and bottom frame bosses for installing the right footrest assembly and to inside of the frame.
- B. 12–18 mm (0.47–0.71 in)
- C. 6–12 mm (0.24–0.47 in)
- D. Fit the lightening point of the brake light within 6–12 mm (0.24–0.47 in) by adjusting the adjusting nut of the rear brake light switch.
- E. Install the exhaust chamber cover to the right footrest assembly by aligning it to the bottom hole of the exhaust chamber cover.
- F. Adjust the sag of the rear brake light switch lead so that it is not outside of the right footrest assembly.
- G. The rear brake light switch lead should be directed as shown in the illustration.
- H. When installing the rear brake caliper bracket, make sure to fit the torque receptor convex of the rear brake caliper bracket and torque receptor groove of the swingarm.
- I. Make sure to pass the brake hose through the brake hose holder.
- J. Install the brake hose with its paint mark facing the brake master cylinder and upward.
- K. Route the brake fluid reservoir hose inside of the brake hose.
- L. Install the brake hose by contacting it against the stopper.
- M. Install the end of the exhaust chamber cover within the area shown in the illustration.
- N. Route the rear brake light switch lead between the ribs of the exhaust chamber cover.
- O. Make sure to bend the cotter pin. It can be bent in the same direction.
- P. When installing the exhaust chamber cover, route the rear brake light switch lead in front of the projection of the right footrest assembly.
- Q. Projection of the right footrest assembly
- R. Face the clamp in the direction shown in the illustration.

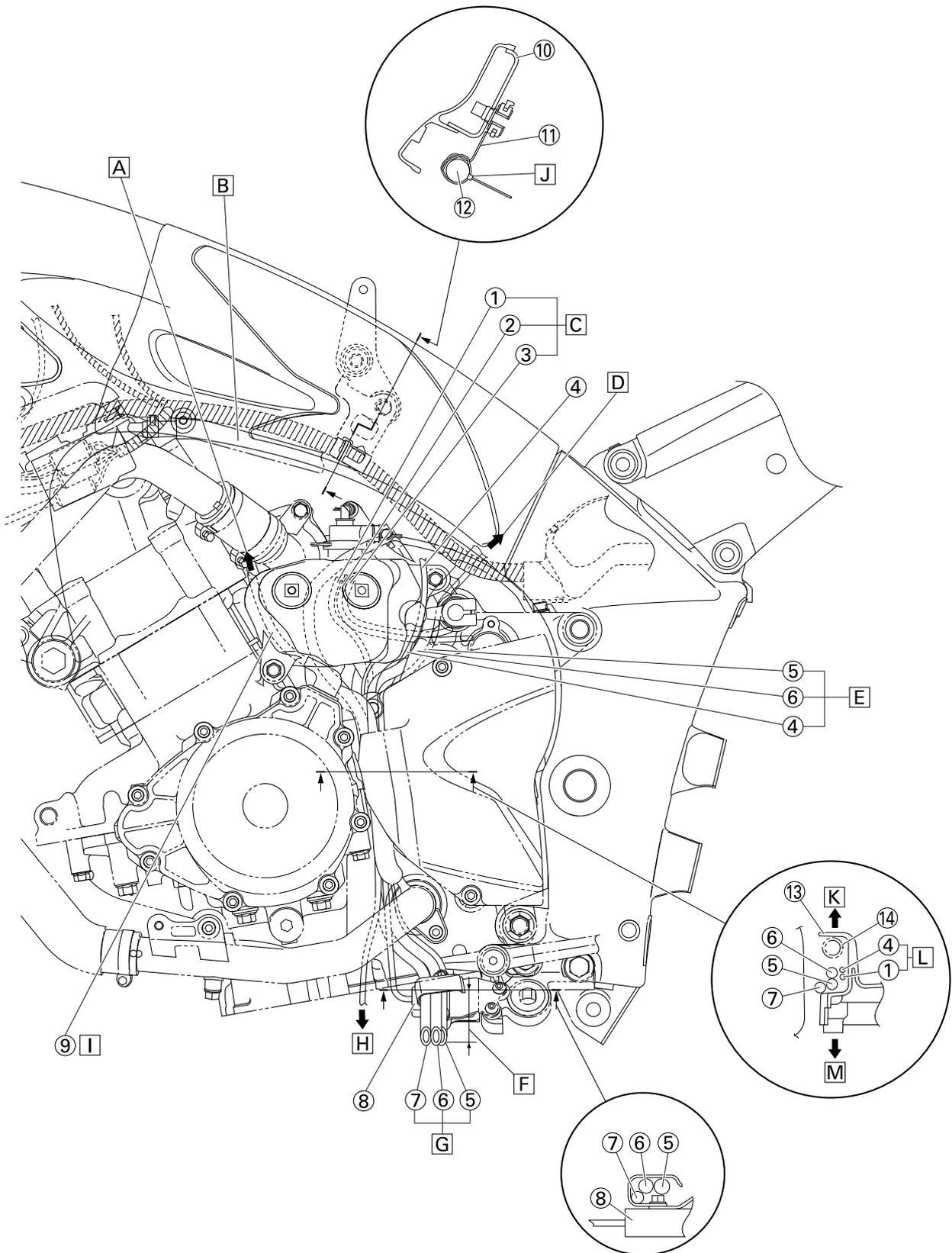
CABLE ROUTING



CABLE ROUTING

1. Immobilizer unit lead
 2. Left radiator fan motor lead
 3. Radiator fan motor relay
 4. ECU (engine control unit)
 5. ECU (engine control unit) bracket
 6. Radiator inlet pipe
 7. Cable guide
-
- A. To the handlebar switch
 - B. To the main harness branch lead, throttle body
 - C. To the throttle position sensor (for throttle valves)
 - D. Connect the main switch lead, steering damper lead and left radiator fan motor lead and put the connector cover.
 - E. To the turn signal
 - F. Insert the clamp winding the main harness into the ECU (engine control unit) bracket hole.
 - G. The leads should not be twisted together between the clamps.
 - H. To the intake air temperature sensor and headlight
 - I. To the front speed sensor
 - J. Align the main switch lead (white) to the tape and clamp it inside of the front fork. Route the lead from the switch to the connector (bottom to up).
 - K. Outside of the vehicle.
 - L. Inside of the vehicle.
 - M. Face the end of the clamp to front and inside of the vehicle.
 - N. Order insignificant-main switch lead, steering damper lead and immobilizer unit lead.
 - O. Face the end of the clamp to rear of the vehicle.
 - P. Route the main harness outside of the radiator inlet pipe.
 - Q. Route the immobilizer unit lead under the thermostat bypass hose 3 and to inside of the vehicle.
 - R. Face the end of the band to inside of the vehicle and then below the main switch lead, handlebar switch lead and steering damper lead and also between radiator fan stay.
 - S. Fasten the main harness above the rib located at the back of the ECU (engine control unit) bracket.
 - T. Align the main switch lead (white), left handlebar switch lead (at the positioning tape), steering damper lead (white) and front speed sensor lead (white) to the tapes and clamp them inside of the front fork.
 - U. Face the end of the clamp to bottom of the vehicle and insert it into the cable guide.

CABLE ROUTING



CABLE ROUTING

1. Oil level switch lead
 2. Gear position sensor lead
 3. Rear speed sensor lead
 4. Sidestand switch lead
 5. Fuel tank overflow hose
 6. Fuel tank breather hose
 7. Coolant reservoir breather hose
 8. Sidestand switch
 9. AC magneto lead
 10. Frame
 11. Main harness holder
 12. Main harness
 13. Drive sprocket cover
 14. Water pump bypass hose
-
- A. To the rectifier/regulator
 - B. Route the thermostat bypass hose 2 under the main harness.
 - C. Route the oil level switch lead, gear position sensor lead and rear speed sensor lead through inner side of the coolant reservoir tank and to main harness.
 - D. To the fuel tank
 - E. Push the fuel tank breather hose, fuel tank overflow hose and sidestand switch lead inside of the flange of the drive sprocket cover.
 - F. 30–50 mm (1.18–1.97 in)
 - G. Route the fuel tank breather hose, fuel tank overflow hose and coolant reservoir breather hose inner side of the water pump bypass hose, then through the binding clamp on the sidestand switch and to the outside of the under cover. End of the hoses can face in any direction.
 - H. To the oil level switch
 - I. Route the AC magneto lead through inner side of the coolant reservoir tank and front and under the thermostat housing and to right side of the vehicle.
 - J. Fasten the main harness and route it through the hole on the side of the main harness holder. Align it to the main harness tape (purple). Do not cut the end and face it inside of the vehicle (same for right & left).
 - K. Outside of the vehicle.
 - L. Order insignificant-oil level switch lead, sidestand switch lead.
 - M. Inside of the vehicle.

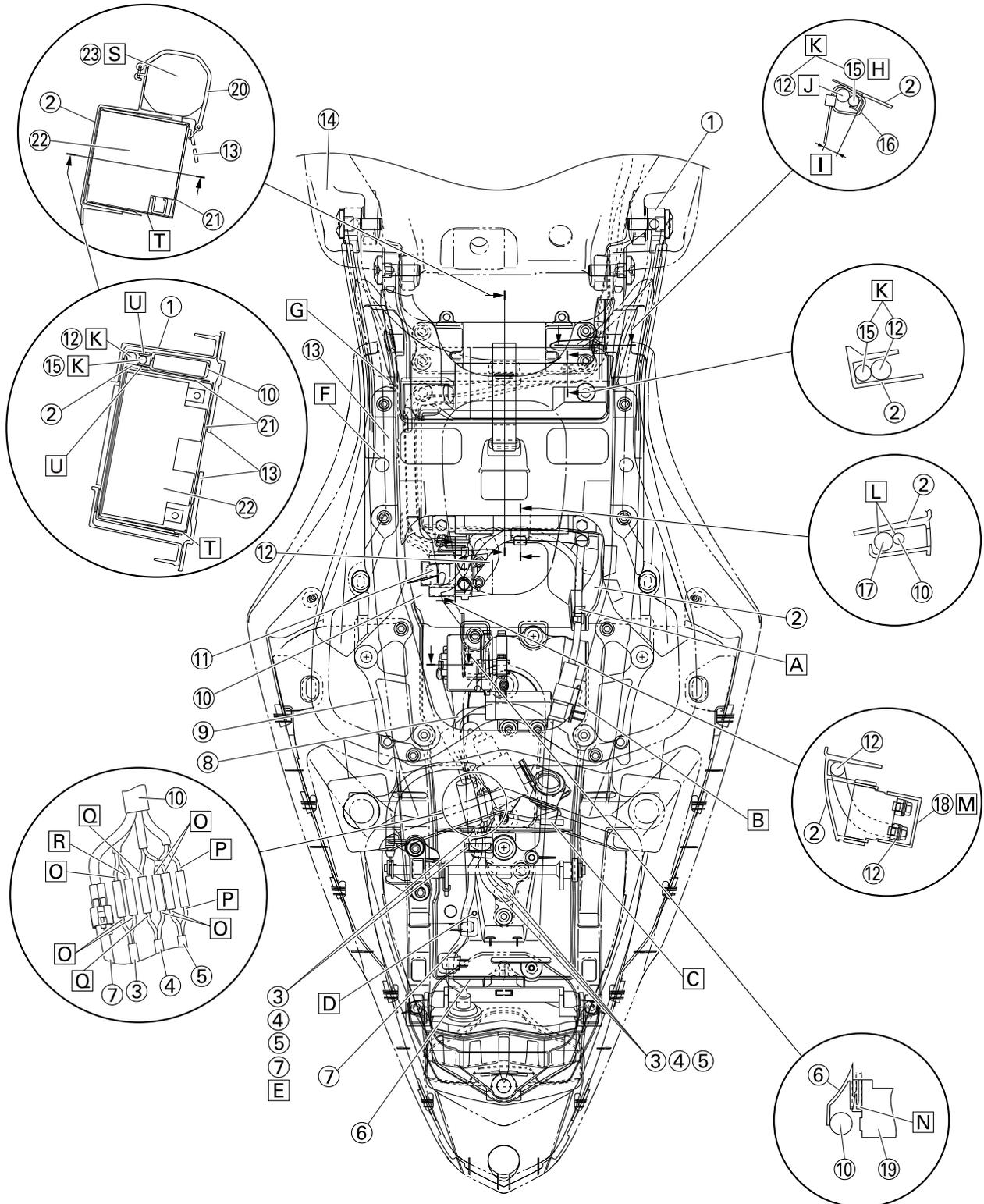
CABLE ROUTING

1. Right handlebar switch lead
 2. Headlight sub-wire harness
 3. Right radiator fan motor lead
 4. AC magneto lead
 5. Atmospheric pressure sensor
 6. Throttle position sensor (for throttle cable pulley)
 7. Throttle servo motor
 8. O₂ sensor lead
 9. Rear brake light switch lead
 10. Ignition coil lead
 11. Crankshaft position sensor lead
 12. Joint coupler
 13. Coolant reservoir hose
 14. Starter motor lead
 15. Battery negative lead
 16. Fuel hose
 17. Sidestand switch lead
 18. Oil level switch lead
 19. Gear position sensor lead
 20. Rear speed sensor lead
 21. Secondary injector sub-wire harness
 22. Throttle sub-wire harness
 23. Intake funnel servo motor lead
 24. Throttle position sensor (for throttle valves)
 25. Left handlebar switch lead
 26. Front speed sensor lead
 27. Intake air pressure sensor
 28. Immobilizer unit lead
 29. Radiator stay
 30. Frame boss
 31. Clutch cable
 32. Hazard switch lead
 33. Stay 1
 34. Main harness
 35. Main switch lead
 36. Steering damper lead
- A. Fasten the clutch cable, right handlebar switch lead and hazard switch lead to inside of the radiator stay with the clamp aligning to their white tape marks.
 - B. After connecting the main harness and headlight sub-wire harness, insert them into the rectifier/regulator bracket stay.
 - C. To the radiator
 - D. Route the coolant reservoir hose, main harness and AC magneto lead in this order from the top. Each of them can either be right or left.
 - E. Route the crankshaft position sensor lead through the heat protector hole and to right of the engine.
 - F. Route the coolant reservoir hose in front of the crankcase breather hose and to the coolant reservoir tank. Route it as shown in the illustration and it should not touch the air bleed hose clip.
 - G. Fasten the main harness and fuel hose between the breather hose and the main harness (such as the ground lead). Route the fuel hose on the side of the main harness facing toward rear of the vehicle.
 - H. Route the main harness behind the crankcase breather hose.
 - I. Fasten the starter motor lead and fuel pump lead at the right of the vehicle. Do not cut off the end and face it to back of the vehicle.
 - J. Route the starter motor lead below the fuel tank breather hose and fuel tank overflow hose, back of the fuel hose and above the ground lead and battery negative lead.
 - K. Install with the ground lead at the bottom and the battery negative lead on the top. Install the rivet of the each lead facing up. Angle of installing each lead is shown in the illustration.
 - L. Route the fuel pump lead through front of the fuel tank breather hose.
 - M. Route the sidestand switch lead outside of the installation dotted line at the back of the coolant reservoir tank.
 - N. Connect the oil level switch lead, gear position sensor lead, rear speed sensor lead and sidestand switch lead (order insignificant) and put the connector cover on.
 - O. To the AC magneto
 - P. To the coolant reservoir tank
 - Q. The intake funnel servo motor lead can either be on top or bottom of the branched secondary injector sub-wire harness and throttle sub-wire harness.
 - R. To the throttle body
 - S. To the air filter case
 - T. To the intake funnel servo motor
 - U. Fasten the front speed sensor lead, left handlebar switch lead and main harness within the range shown in the illustration (between the ECU (engine control unit) bracket rib and radiator core).
 - V. Route the left handlebar switch lead and front speed sensor lead along the main harness, making sure there is no slack in the leads.
 - W. Align the main switch lead (white), left handlebar switch lead (at the positioning tape) and steering damper lead (white) to the tapes and clamp them inside of the radiator stay.
 - X. End of the clamp should be at front and facing down.
 - Y. Route the hazard switch lead on the side of the clutch cable facing toward front of the vehicle.

CABLE ROUTING

- Z. After connecting the main harness coupler and immobilizer unit coupler, insert them into the stay 1.
- AA. Main harness side
- AB. Fasten the secondary injector sub-wire harness and throttle sub-wire harness at the protector. Face the end of the clamp downward.
- AC. Fasten the coolant reservoir hose and water pump bypass hose.
- AD. Install the coolant reservoir hose with the clamp opening facing up.
- AE. Fit the connector cover including the oil level switch lead, gear position sensor lead, rear speed sensor lead and side-stand switch lead (order insignificant) between the thermostat bypass hose 2 and main harness.
- AF. Install the water pump bypass hose with its clamp opening facing right of the vehicle.
- AG. Face the end of the plastic locking tie inside of the vehicle.
- AH. Route the front speed sensor lead on the side of the main switch lead facing toward front of the vehicle.

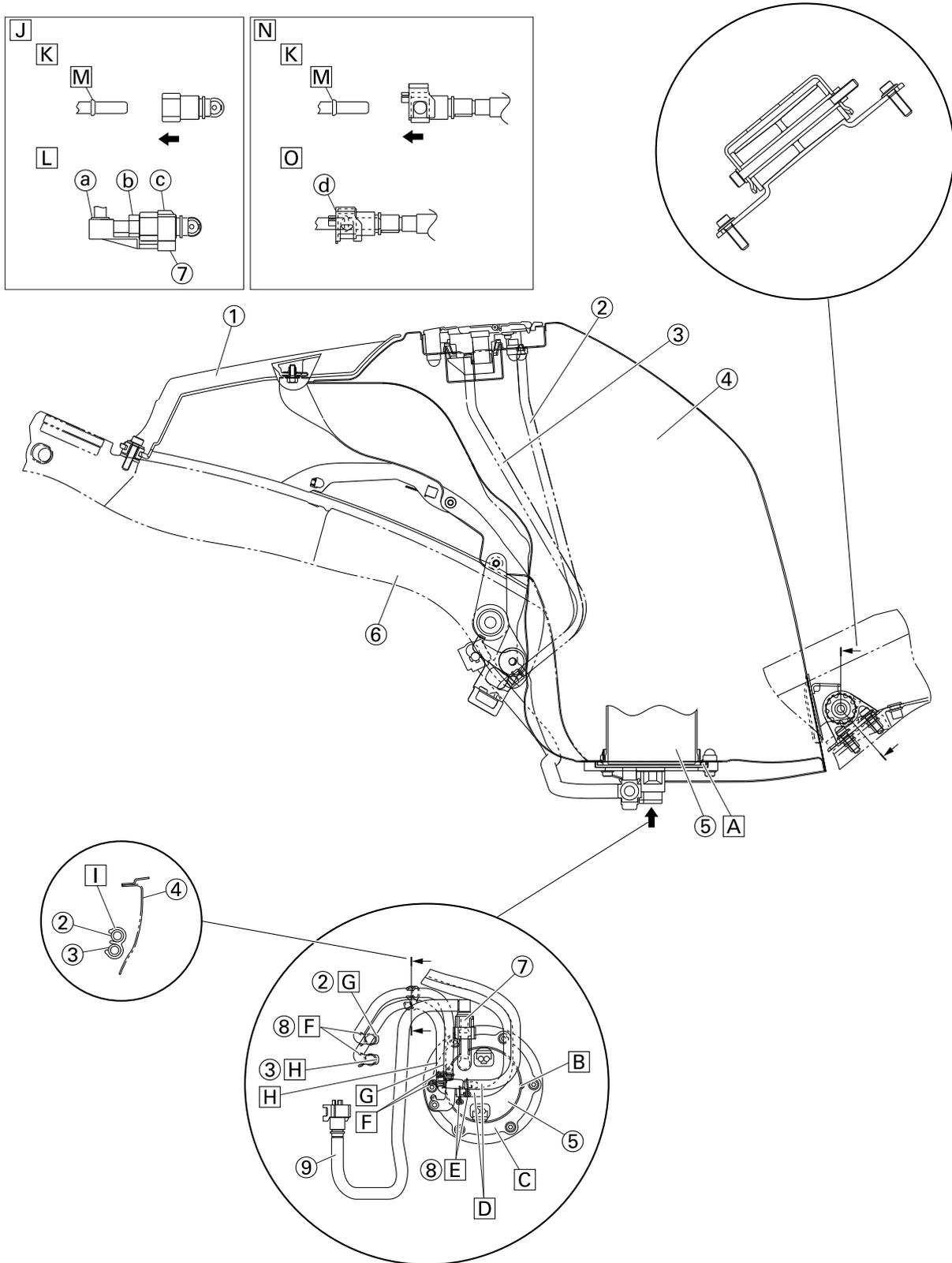
CABLE ROUTING



CABLE ROUTING

1. Rear frame
 2. Battery box 1
 3. License plate light lead
 4. Left turn signal light lead
 5. Right turn signal light lead
 6. Battery box 2
 7. Tail/brake light lead
 8. Lean angle sensor lead
 9. Lower tail cover bracket
 10. Main harness
 11. Starter relay
 12. Starter motor lead
 13. Battery cover
 14. Front frame
 15. Battery negative lead
 16. Plastic band
 17. Battery positive lead
 18. Lead cover
 19. Fuse box
 20. Tool band
 21. Battery seat
 22. Battery
 23. Tool
-
- A. Pass the main fuse lead through the guide of the battery box 1.
 - B. Insert the main fuse until it is completely over the tab projection of the battery box 2.
 - C. Put the anti-theft alarm lead coupler in front of the dividing rib of the battery box 2 for Australia.
 - D. Route the tail/brake light lead through the left of the battery box 2 boss.
 - E. After passing the tail/brake light lead, license plate light lead, right turn signal light lead and left turn signal light lead through the guide of the battery box 2, route them between the ribs.
 - F. When installing the seal, align it to the push pin trace mark of the rear frame (both left & right).
 - G. Slip the seal in between the rear frame and the battery cover (both left & right).
 - H. Align the positioning tape of the battery negative lead to the clamp.
 - I. Face the excess end of the plastic band to inside and the end should not be above the tool reception bearing surface of the battery box 1.
 - J. Align the positioning tape of the starter motor lead to the clamp.
 - K. Up/down position of the battery negative lead and starter motor lead is shown in the illustration.
 - L. Install the battery positive lead (red) on top.
 - M. Put the lead cover on after connecting the starter motor lead to the starter relay.
 - N. Insert the fuse box until back of the tab of the battery box 2.
 - O. Black
 - P. Green
 - Q. Brown
 - R. Blue
 - S. Installing direction of the tool is insignificant.
 - T. Bend the battery seat inward.
 - U. Install the main harness with its tab fitted inside of the battery box 1.

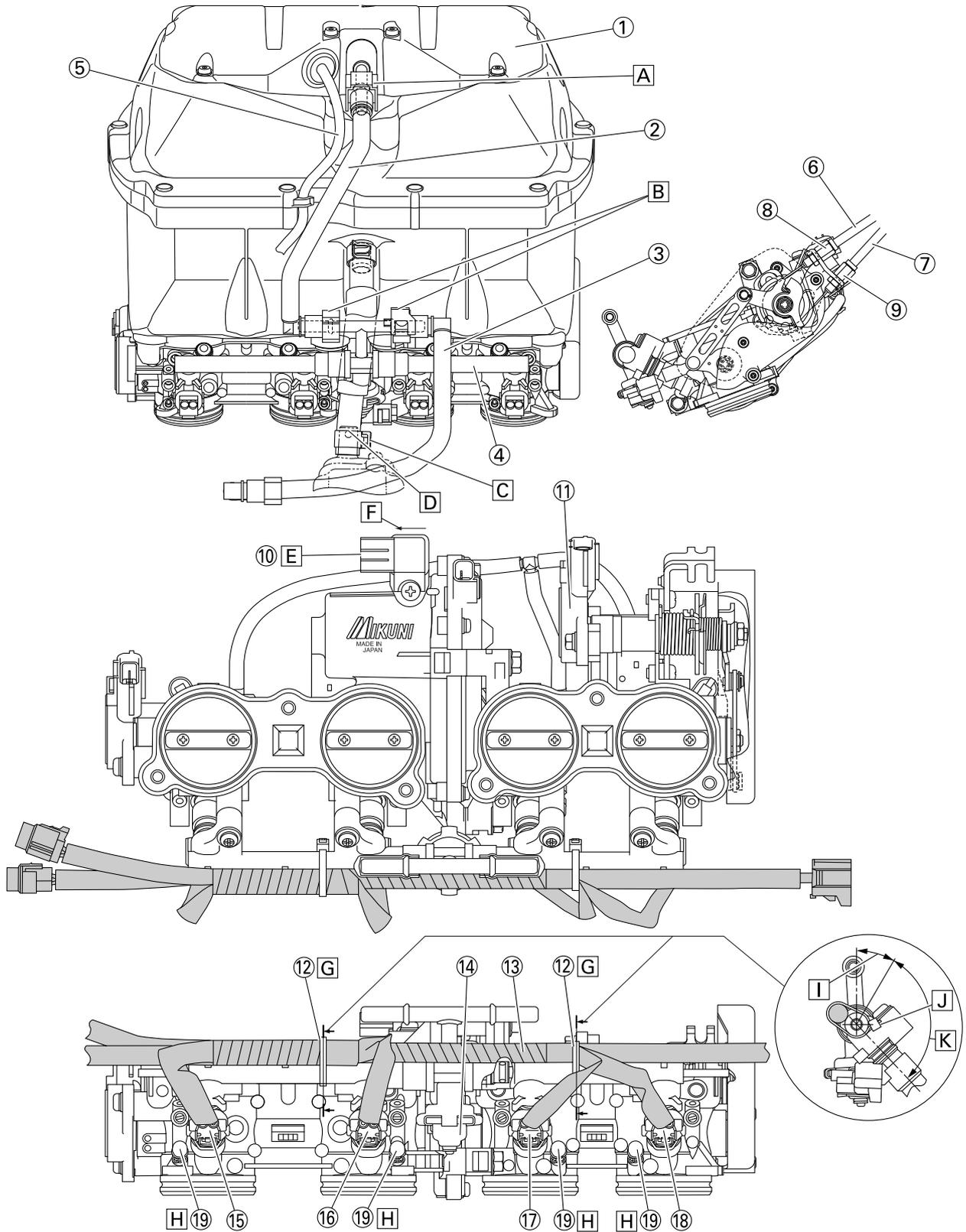
CABLE ROUTING



CABLE ROUTING

1. Fuel tank upper cover
 2. Fuel tank breather hose
 3. Fuel tank overflow hose
 4. Fuel tank
 5. Fuel pump
 6. Frame
 7. Fuel hose connector cover
 8. Clip
 9. Fuel hose
-
- A. Install the lip on the fuel pump gasket upward.
 - B. Pump positioning punch mark
 - C. Install the fuel pump with the pump positioning punch mark and fuel pump bracket concave part at the same position.
 - D. Install the fuel tank overflow hose and fuel tank breather hose with the white paint mark on each hose facing right of the vehicle.
 - E. Align the clip knob to the paint mark on each hose and face it to right of the vehicle.
 - F. Align the clip knob to the paint mark on each hose and face it to front of the vehicle.
 - G. Install the fuel tank breather hose with its white paint facing front of the vehicle.
 - H. Install the fuel tank overflow hose with its yellow paint facing front of the vehicle.
 - I. Install the fuel tank overflow hose and fuel tank breather hose with the clamp opening facing down.
 - J. Fuel pump side
 - K. Insert the connector until the click sound is heard and check that the connector does not come off. Make sure that no foreign matter is caught in the sealing section. (It is prohibited to wear the cotton work gloves or equivalent coverings.)
 - L. After item "K" mentioned above is finished, check that the clamp is inserted from the down side "a", "b" and "c" sections are perfectly equipped.
 - M. This part works as a dropout stopper
 - N. Engine side
 - O. After Step "K" as above is finished, check that the connector is completely attached by sliding the double lock (orange part) "d" on the connector as shown in the illustration and seeing if it touches firmly or not.

CABLE ROUTING

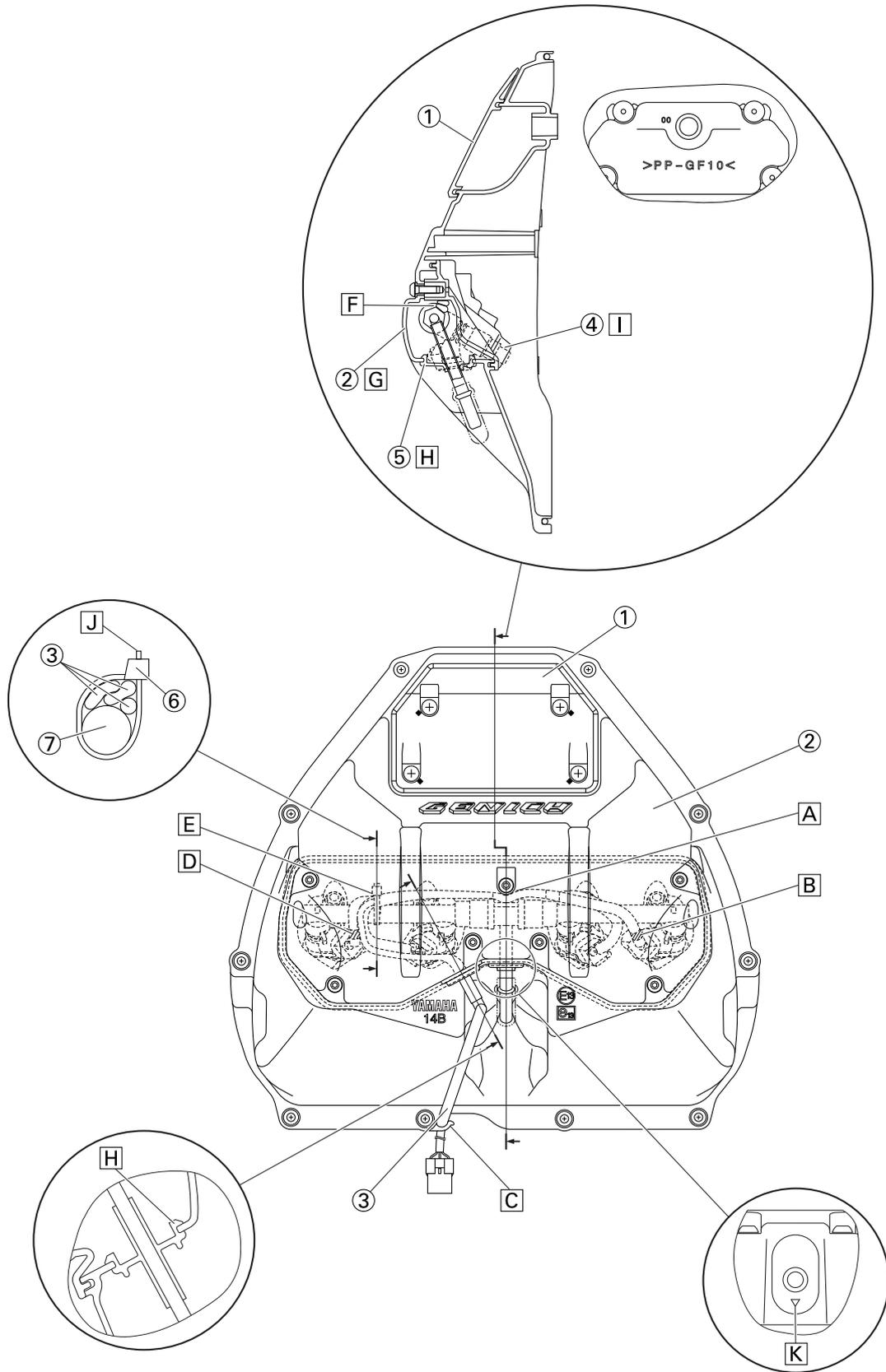


CABLE ROUTING

1. Upper air filter case
2. Fuel hose (secondary injector fuel rail side)
3. Fuel hose (primary injector fuel rail side)
4. Primary injector fuel rail
5. Secondary injector sub-wire harness
6. Throttle cable (pull side)
7. Throttle cable (return side)
8. Black coating
9. White coating
10. Intake air pressure sensor
11. Accelerator position sensor
12. Plastic locking tie
13. Primary injector sub-wire harness
14. Fuel damper
15. Primary injector #1 coupler
16. Primary injector #2 coupler
17. Primary injector #3 coupler
18. Primary injector #4 coupler
19. Cap

- A. Checker color: orange
- B. Checker color: black
- C. Rotate the clip to the right of the vehicle.
- D. Adjust top edge of the clip to top edge of the paint.
- E. Make sure the intake air pressure sensor is touching against the stopper and install it horizontally.
- F. After installing the intake air pressure sensor, do not press it to the direction of the arrow.
- G. Fasten the primary injector sub-wire harness at the position shown in the illustration.
- H. A cap for synchronization
- I. 30°
- J. Mass of plastic locking ties
- K. Mass of plastic locking ties should be within this range.

CABLE ROUTING



CABLE ROUTING

1. Cap case
 2. Upper air filter case
 3. Sub-wire harness
 4. Secondary injector holder
 5. Grommet
 6. Plastic locking tie
 7. Fuel rail
-
- A. Sub-wire harness should not be pinched under the bearing surface of the bolt.
 - B. #4 purple tape
 - C. Pinch the sub-wire harness with the hook. When pinching, make sure not to change the shape of the hook.
 - D. #1 white tape
 - E. Fasten the plastic locking tie at the branch root of the sub-wire harness. Position the plastic locking tie as shown in the illustration.
 - F. Position the sub-wire harness under the bearing surface of the bolt so that it is not pinched.
 - G. When installing the air filter case, the sub-wire harness should not be pinched.
 - H. Make sure the grommet is not pinched.
 - I. When installing the cap case assembly, the sub-wire harness should not be pinched.
 - J. Face the end of the plastic locking tie to front of the vehicle and cut off the excess end leaving 2–4 mm (0.08–0.16 in).
 - K. Install with the \triangle mark facing down.

CABLE ROUTING

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PERIODIC MAINTENANCE

EAS20450

PERIODIC MAINTENANCE

EAS20460

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.

EAS14B1033

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

TIP

- **The annual checks must be performed every year, except if a kilometer-based maintenance, or for the UK, a mileage-based maintenance, is performed instead.**
- From 50000 km (30000 mi), repeat the maintenance intervals starting from 10000 km (6000 mi).
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK	
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)		
1	*	Fuel line		√	√	√	√	√	
2	*	Spark plugs	• Check condition.	√		√			
			• Clean and regap.						
		• Replace.			√		√		
3	*	Valves	Every 40000 km (24000 mi)						
		• Check valve clearance.							
		• Adjust.							
4	*	Fuel injection system		√	√	√	√	√	
		• Adjust synchronization.							
5	*	Mufflers and exhaust pipes	√	√	√	√	√		
		• Check the screw clamps for looseness.							
6	*	Air induction system	• Check the air cut-off valve, reed valve, and hose for damage.		√	√	√	√	√
			• Replace any damaged parts if necessary.						

PERIODIC MAINTENANCE

EAS14B1034

GENERAL MAINTENANCE AND LUBRICATION CHART

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
1	* Air filter element	• Replace.					√	
2	Clutch	• Check operation. • Adjust.	√	√	√	√	√	
3	* Front brake	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
		• Replace brake pads.	Whenever worn to the limit					
4	* Rear brake	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
		• Replace brake pads.	Whenever worn to the limit					
5	* Brake hoses	• Check for cracks or damage. • Check for correct routing and clamping.		√	√	√	√	√
		• Replace.	Every 4 years					
6	* Wheels	• Check runout and for damage.		√	√	√	√	
7	* Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
8	* Wheel bearings	• Check bearing for looseness or damage.		√	√	√	√	
9	* Swingarm	• Check operation and for excessive play.		√	√	√	√	
		• Lubricate with lithium-soap-based grease.	Every 50000 km (30000 mi)					
10	Drive chain	• Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 800 km (500 mi) and after washing the motorcycle, riding in the rain or riding in wet areas					
11	* Steering bearings	• Check bearing play and steering for roughness.	√	√	√	√	√	
		• Lubricate with lithium-soap-based grease.	Every 20000 km (12000 mi)					
12	* Steering damper	• Check operation and for oil leakage.		√	√	√	√	
13	* Chassis fasteners	• Make sure that all nuts, bolts and screws are properly tightened.		√	√	√	√	√
14	Brake lever pivot shaft	• Lubricate with silicone grease.		√	√	√	√	√
15	Brake pedal pivot shaft	• Lubricate with lithium-soap-based grease.		√	√	√	√	√
16	Clutch lever pivot shaft	• Lubricate with lithium-soap-based grease.		√	√	√	√	√
17	Shift pedal pivot shaft	• Lubricate with lithium-soap-based grease.		√	√	√	√	√
18	Sidestand	• Check operation. • Lubricate with lithium-soap-based grease.		√	√	√	√	√
19	* Sidestand switch	• Check operation.	√	√	√	√	√	√
20	* Front fork	• Check operation and for oil leakage.		√	√	√	√	
21	* Shock absorber assembly	• Check operation and shock absorber for oil leakage.		√	√	√	√	

PERIODIC MAINTENANCE

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
22	* Rear suspension relay arm and connecting arm pivoting points	<ul style="list-style-type: none"> Check operation. 		√	√	√	√	
23	Engine oil	<ul style="list-style-type: none"> Change. Check oil level and vehicle for oil leakage. 	√	√	√	√	√	√
24	Engine oil filter cartridge	<ul style="list-style-type: none"> Replace. 	√		√		√	
25	* Cooling system	<ul style="list-style-type: none"> Check coolant level and vehicle for coolant leakage. 		√	√	√	√	√
		<ul style="list-style-type: none"> Change with ethylene glycol antifreeze coolant. 	Every 3 years					
26	* Front and rear brake switches	<ul style="list-style-type: none"> Check operation. 	√	√	√	√	√	√
27	Moving parts and cables	<ul style="list-style-type: none"> Lubricate. 		√	√	√	√	√
28	* Throttle grip	<ul style="list-style-type: none"> Check operation. Check throttle grip free play, and adjust if necessary. Lubricate cable and grip housing. 		√	√	√	√	√
29	* Lights, signals and switches	<ul style="list-style-type: none"> Check operation. Adjust headlight beam. 	√	√	√	√	√	√

TIP

- 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
 - Regularly check and, if necessary, correct the brake fluid level.
 - 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.

PERIODIC MAINTENANCE

EAS21030

CHECKING THE FUEL LINE (Primary injector)

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

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-5.
3. Check:
 - Fuel hose "1"
 - Vacuum hoses "2"
 - Breather hose "3"
 - Over flow hose "4"

Cracks/damage → Replace.
Loose connection → Connect properly.

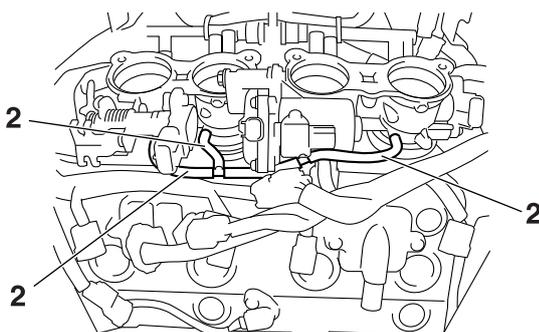
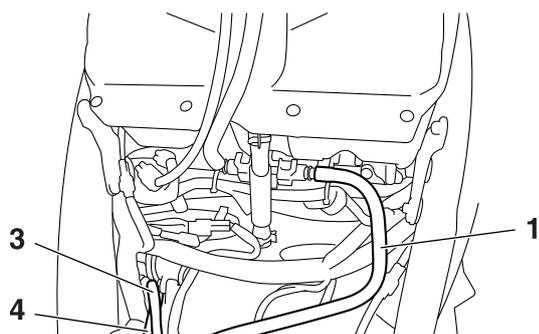
TIP

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

ECA14940

NOTICE

Make sure the fuel tank breather hose is routed correctly.



4. Install:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
5. Install:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS14B1114

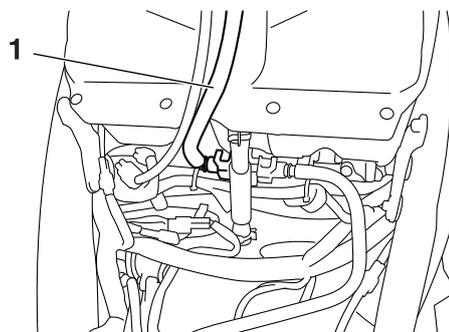
CHECKING THE FUEL LINE (Secondary injector)

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
3. Check:
 - Fuel hose "1"

Cracks/damage → Replace.
Loose connection → Connect properly.

TIP

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



4. Install:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
5. Install:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS20680

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:
 - Side cowlings
 - Lower cowlings
Refer to "GENERAL CHASSIS" on page 4-1.

PERIODIC MAINTENANCE

2. Remove:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
3. Remove:
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-5.
4. Disconnect:
 - Ignition coil
5. Remove:
 - Spark plug

ECA13320

NOTICE

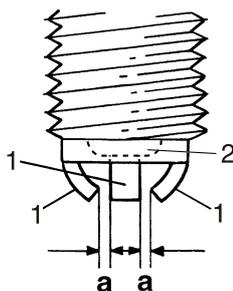
Before removing the spark plugs, blow away any dirt accumulated in the spark plug wells with compressed air to prevent it from falling into the cylinders.

6. Check:
 - Spark plug type
Incorrect → Change.

	Manufacturer/model NGK/LMAR9E-J
--	--

7. Check:
 - Electrode "1"
Damage/wear → Replace the spark plug.
 - Insulator "2"
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.
8. Clean:
 - Spark plug
(with a spark plug cleaner or wire brush)
9. Measure:
 - Spark plug gap "a"
(with a wire thickness gauge)
Out of specification → Regap.

	Spark plug gap 0.6–0.7 mm (0.024–0.028 in)
---	---



10. Install:
 - Spark plug

	Spark plug 13 Nm (1.3 m·kgf, 9.4 ft·lbf)
---	---

TIP

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

11. Install:
 - Ignition coil
12. Install:
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-5.
13. Install:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
14. Install:
 - Lower cowlings
 - Side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.

EAS20490

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

TIP

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

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-5.
 - Lower cowlings
 - Side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.
 - Throttle body assembly
Refer to "THROTTLE BODIES" on page 7-12.

PERIODIC MAINTENANCE

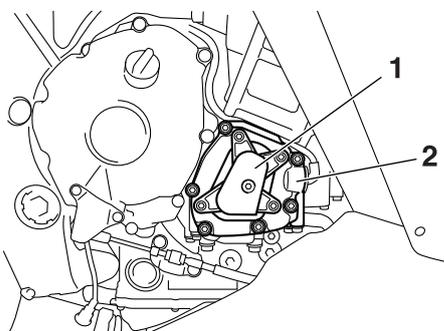
- Air cut-off valve
Refer to "AIR INDUCTION SYSTEM" on page 7-21.
- Radiator
- Radiator fan motor
Refer to "RADIATOR" on page 6-1.

2. Remove:

- Ignition coils
- Spark plugs
- Cylinder head cover
- Cylinder head cover gasket
Refer to "CAMSHAFTS" on page 5-13.

3. Remove:

- Pickup rotor cover 1 "1"
- Pickup rotor cover 2 "2"



4. Measure:

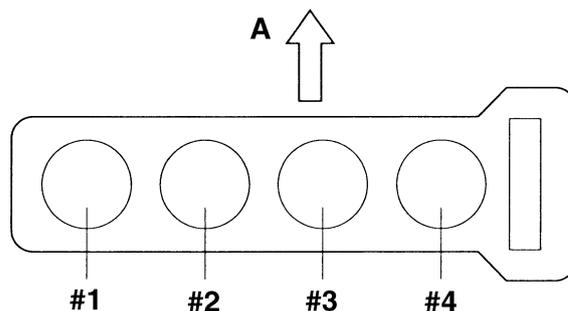
- Valve clearance
Out of specification → Adjust.

	Valve clearance (cold)
	Intake
	0.11–0.20 mm (0.0043–0.0079 in)
	Exhaust
	0.23–0.27 mm (0.0091–0.0106 in)

TIP

- If the valve clearance is incorrect, record the measured reading.
- Measure the valve clearance in the following sequence.

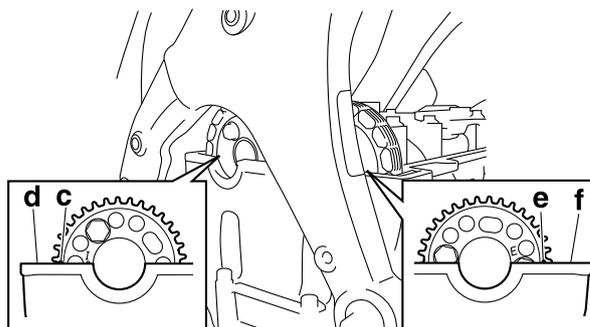
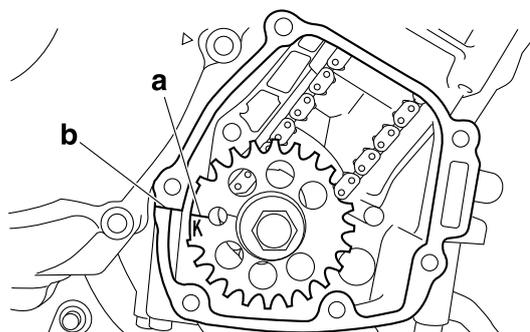
Valve clearance measuring sequence
Cylinder #1 → #3 → #2 → #4



A. Front

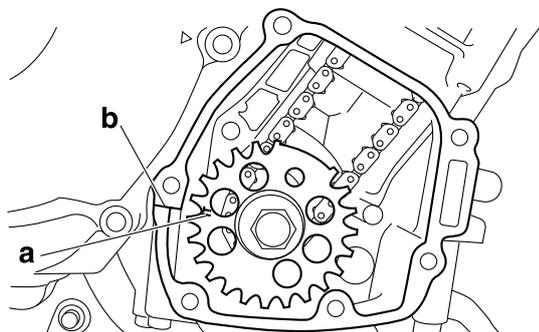


- a. Turn the crankshaft clockwise and align the pickup rotor K mark "a" and crankcase occluding surface "b".
(At this time, make sure the intake camshaft sprocket punch mark "c" and cylinder head occluding surface "d", and exhaust camshaft sprocket punch mark "e" and cylinder head occluding surface "f" are aligned. If not, repeat until they are aligned.)



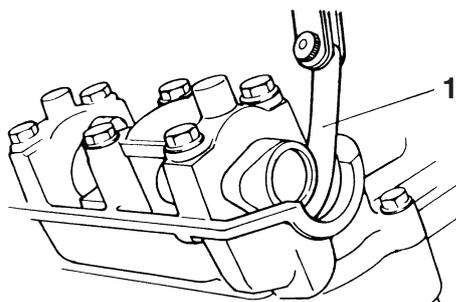
PERIODIC MAINTENANCE

- b. Turn the crankshaft 105 degrees in clockwise and align the pickup rotor T mark "a" and crankcase mating surface "b".

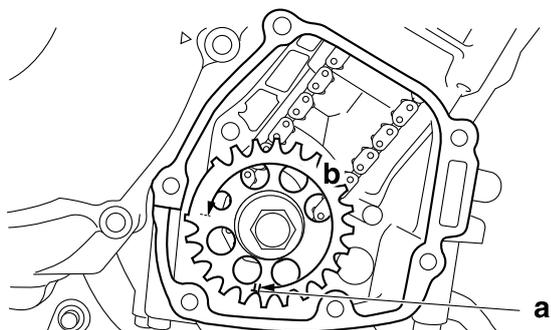


- c. Measure the valve clearance #1 with a thickness gauge "1".

	<p>Thickness gauge 90890-03180 Feeler gauge set YU-26900-9</p>
---	---



- d. Turn the crankshaft 270 degrees in clockwise and position the pickup rotor I mark "a" downward.

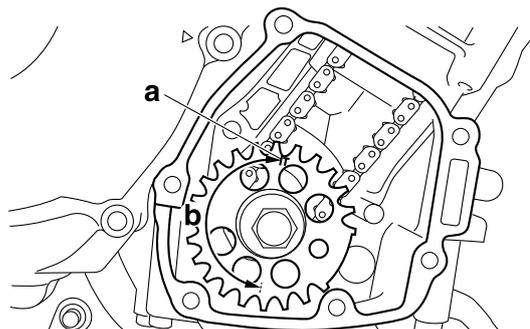


b. 270°

- e. Measure the valve clearance #3 with a thickness gauge.

	<p>Thickness gauge 90890-03180 Feeler gauge set YU-26900-9</p>
---	---

- f. Turn the crankshaft 180 degrees in clockwise and position the pickup rotor T mark "a" upward.

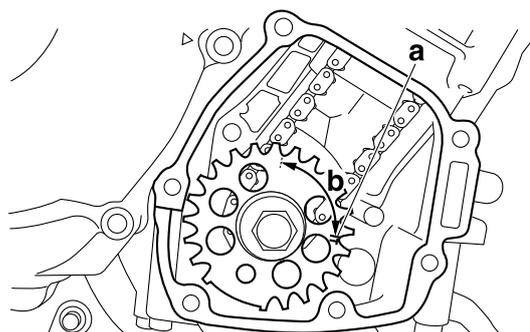


b. 180°

- g. Measure the valve clearance #2 with a thickness gauge.

	<p>Thickness gauge 90890-03180 Feeler gauge set YU-26900-9</p>
---	---

- h. Turn the crankshaft 90 degrees in clockwise and position the pickup rotor T mark "a" opposite side of TDC.



b. 90°

- i. Measure the valve clearance #4 with a thickness gauge.

PERIODIC MAINTENANCE



Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9



5. Remove:
- Camshafts

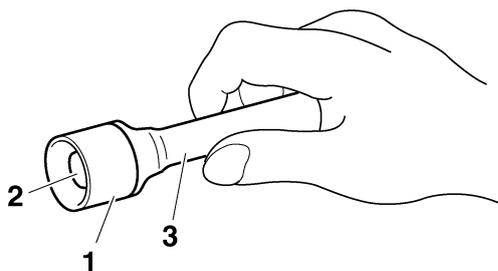
TIP

- Refer to "CAMSHAFTS" on page 5-13.
- 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



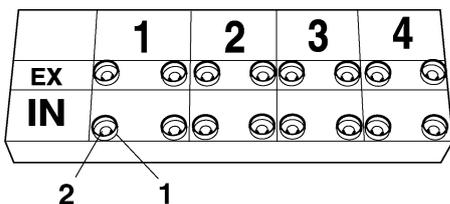
- a. Remove the valve lifter "1" and the valve pad "2" with a valve lapper "3".



Valve lapper
90890-04101
Valve lapping tool
YM-A8998

TIP

- 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. Calculate the difference between the specified valve clearance and the measured valve clearance.

Example:

Specified valve clearance = 0.11–0.20 mm (0.0043–0.0079 in)

Measured valve clearance = 0.23 mm (0.0091 in)

$0.23 \text{ mm (0.0091 in)} - 0.20 \text{ mm (0.0079 in)} = 0.03 \text{ mm (0.0012 in)}$

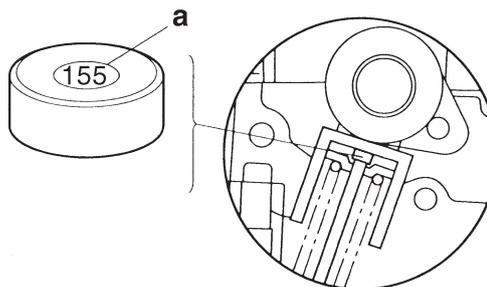
- c. Check the thickness of the current valve pad.

TIP

The thickness "a" of each valve pad is marked in hundredths of millimeters on the side that touches the valve lifter.

Example:

If the valve pad is marked "155", the pad thickness is 1.55 mm (0.0610 in).



- d. Calculate the sum of the values obtained in steps (b) and (c) to determine the required valve pad thickness and the valve pad number.

Example:

$1.55 \text{ mm (0.0610 in)} + 0.03 \text{ mm (0.0012 in)} = 1.58 \text{ mm (0.0622 in)}$

The valve pad number is 158.

- e. Round off the valve pad number according to the following table, and then select the suitable valve pad.

Last digit	Rounded value
0, 1, 2	0
3, 4, 5, 6	5
7, 8, 9	10

TIP

Refer to the following table for the available valve pads.

PERIODIC MAINTENANCE

Valve pad range	No. 160–240
Valve pad thickness	1.60–2.40 mm (0.0630–0.0945 in)
Available valve pads	17 thicknesses in 0.05 mm (0.0022 in) increments

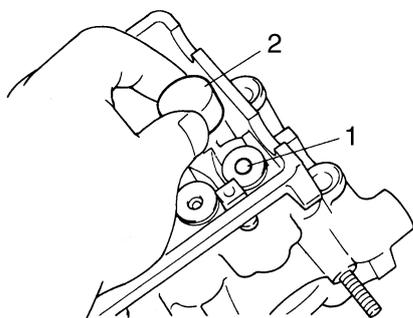
Example:

Valve pad number = 158

Rounded value = 160

New valve pad number = 160

- f. Install the new valve pad “1” and the valve lifter “2”.



TIP

- Lubricate the valve pad with molybdenum disulfide oil.
- Lubricate the valve lifter with engine oil.
- The valve lifter must turn smoothly when rotated by finger.
- Install the valve lifter and the valve pad in the correct place.

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

	<p>Camshaft cap bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)</p>
---	---

TIP

- Refer to “CAMSHAFTS” on page 5-13.
- Lubricate the camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft sprocket marks with the camshaft cylinder head surface.
- Turn the crankshaft counterclockwise several full turns to seat the parts.

- h. Measure the valve clearance again.

- i. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.



7. Install:

- All removed parts

TIP

For installation, reverse the removal procedure.

EAS20571

SYNCHRONIZING THE THROTTLE BODIES

TIP

Before synchronizing the throttle bodies, check the following items:

- Valve clearance
- Spark plugs
- Air filter element
- Throttle body joints
- Fuel hoses
- Air induction system
- Exhaust system
- Breather hoses
- Vacuum hose

Checking the throttle body synchronization

1. Stand the vehicle on a level surface.

TIP

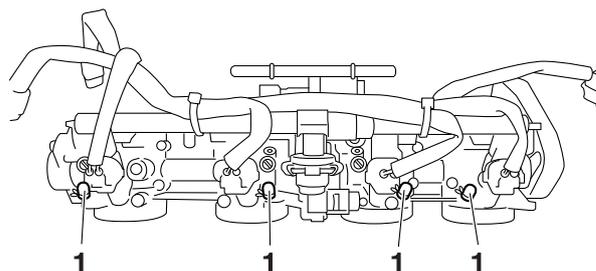
Place the vehicle on a suitable stand.

2. Remove:

- Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.
- Fuel tank
Refer to “FUEL TANK” on page 7-1.
- Air filter case
Refer to “AIR FILTER CASE” on page 7-5.

3. Remove:

- Caps “1”



PERIODIC MAINTENANCE

3. Adjust:
 - Throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-34.



Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

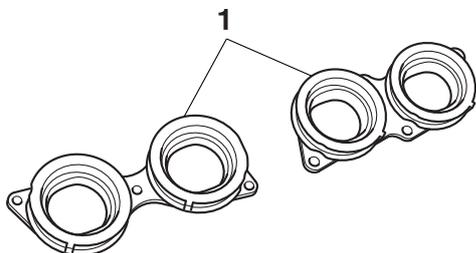
4. Install:
 - Fuel tank
 - Fuel tank side cover
Refer to "FUEL TANK" on page 7-1.
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21010

CHECKING THE THROTTLE BODY JOINTS

The following procedure applies to all of the throttle body joints and intake manifolds.

1. Remove:
 - Throttle bodies
Refer to "THROTTLE BODIES" on page 7-12.
2. Check:
 - Throttle body joints "1"
Cracks/damage → Replace.



3. Install:
 - Throttle bodies
Refer to "THROTTLE BODIES" on page 7-12.

EAS21070

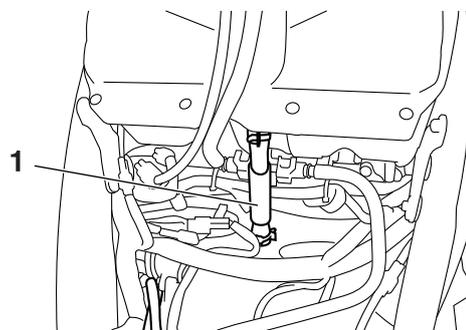
CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
3. Check:
 - Crankcase breather hose "1"
Cracks/damage → Replace.
Loose connection → Connect properly.

ECA13450

NOTICE

Make sure the crankcase breather hose is routed correctly.



4. Install:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
5. Install:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

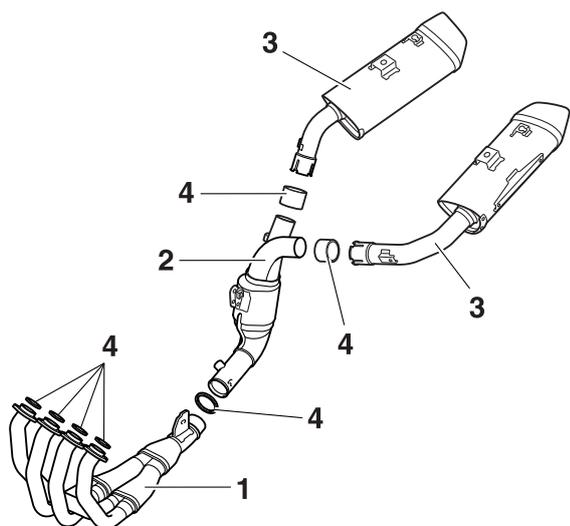
EAS21080

CHECKING THE EXHAUST SYSTEM

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

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
 - Passenger seat
Refer to "GENERAL CHASSIS" on page 4-1.
3. Remove:
 - Side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.
4. Remove:
 - Rear brake master cylinder
Refer to "REAR BRAKE" on page 4-44.
5. Remove:
 - Radiator lower bracket
Refer to "RADIATOR" on page 6-1.
6. Check:
 - Exhaust pipe "1"
 - Exhaust chamber "2"
 - Mufflers "3"
Cracks/damage → Replace.
 - Gaskets "4"
Exhaust gas leaks → Replace.

PERIODIC MAINTENANCE



7. Check:
- Tightening torque

	<p>Exhaust pipe nut 20 Nm (2.0 m·kgf, 14 ft·lbf)</p> <p>Exhaust pipe and exhaust chamber clamp bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)</p> <p>Exhaust pipe and exhaust pipe stay bolt 20 Nm (2.0 m·kgf, 14 ft·lbf)</p> <p>Exhaust chamber bracket bolt 20 Nm (2.0 m·kgf, 14 ft·lbf)</p> <p>Exhaust chamber bolt 20 Nm (2.0 m·kgf, 14 ft·lbf)</p> <p>Exhaust chamber and left muffler bolt 20 Nm (2.0 m·kgf, 14 ft·lbf)</p> <p>Exhaust chamber and right muffler bolt 20 Nm (2.0 m·kgf, 14 ft·lbf)</p> <p>Left muffler and frame bolt 23 Nm (2.3 m·kgf, 17 ft·lbf)</p> <p>Right muffler and frame bolt 23 Nm (2.3 m·kgf, 17 ft·lbf)</p>
---	--

8. Install:
- Radiator lower bracket
Refer to "RADIATOR" on page 6-1.
9. Install:
- Rear brake master cylinder
Refer to "REAR BRAKE" on page 4-44.
10. Install:
- Side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.

11. Install:
- Passenger seat
Refer to "GENERAL CHASSIS" on page 4-1.
12. Install:
- Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS20600

ADJUSTING THE EXHAUST GAS VOLUME

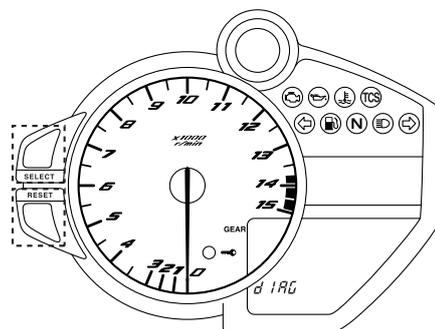
TIP

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

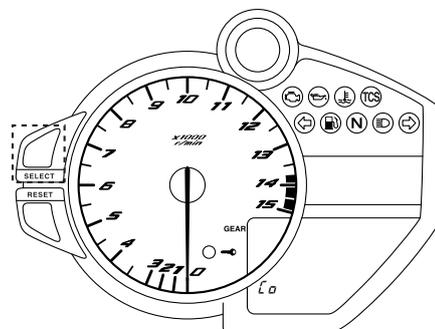
1. Turn the main switch to "OFF" and set the engine stop switch to "ON".
2. Simultaneously press and hold the "SELECT" and "RESET" buttons, turn the main switch to "ON", and continue to press the buttons for 8 seconds or more.

TIP

"DIAG" appears on the odometer, tripmeter and fuel reserve trip LCD.



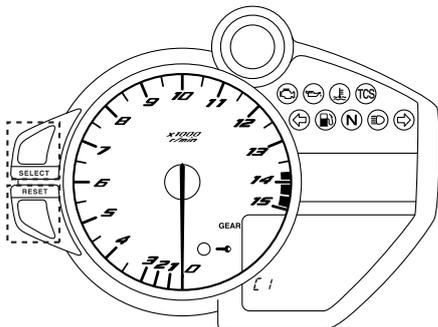
3. Press the "SELECT" button to select the CO adjustment mode "CO" or the diagnostic mode "DIAG".



4. After selecting "CO", simultaneously press the "SELECT" and "RESET" buttons for 2 seconds or more to execute the selection.

PERIODIC MAINTENANCE

- Press the "SELECT" and "RESET" buttons to select a cylinder.



TIP

The selected cylinder number appears on the odometer, tripmeter and fuel reserve trip LCD.

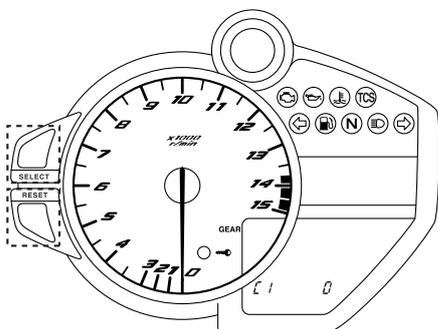
- To decrease the selected cylinder number, press the "RESET" button.
- To increase the selected cylinder number, press the "SELECT" button.

- After selecting the cylinder, simultaneously press the "SELECT" and "RESET" buttons for 2 seconds or more to execute the selection.
- Change the CO adjustment volume by pressing the "SELECT" and "RESET" buttons.

TIP

The CO adjustment volume appears on the odometer, tripmeter and fuel reserve trip LCD.

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



- Release the button to execute the selection.
- Simultaneously press the "SELECT" and "RESET" buttons to return to the cylinder selection (step 5).

- Turn the main switch to "OFF" to cancel the CO adjustment mode.

EAS14B1099

CHECKING THE AIR INDUCTION SYSTEM

Refer to "CHECKING THE AIR INDUCTION SYSTEM" on page 7-25.

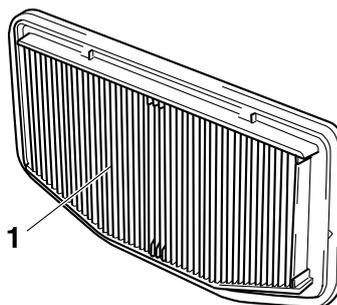
EAS20961

REPLACING THE AIR FILTER ELEMENT

- Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
- Remove:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Remove:
 - Air filter case cover
Refer to "AIR FILTER CASE" on page 7-5.
- Check:
 - Air filter element "1"
 - Air filter seal
Damage → Replace.

TIP

- Replace the air filter element every 40000 km (24000 mi) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

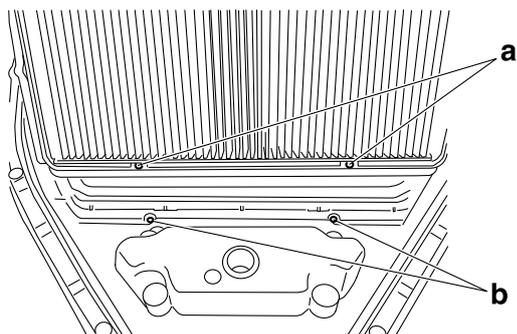


- Install:
 - Air filter element

TIP

Align projection "a" of the air filter element to the groove "b" of the air filter case cover and install.

PERIODIC MAINTENANCE



6. Install:
- Air filter case cover
- Refer to "AIR FILTER CASE" on page 7-5.

ECA14401

NOTICE

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

TIP

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

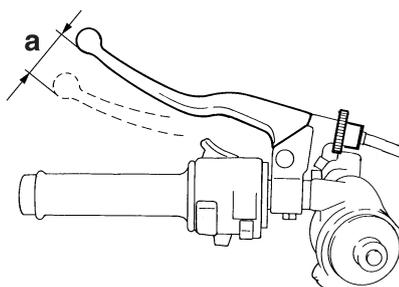
7. Install:
- Fuel tank
- Refer to "FUEL TANK" on page 7-1.
8. Install:
- Rider seat
- Refer to "GENERAL CHASSIS" on page 4-1.

EAS20870

ADJUSTING THE CLUTCH CABLE FREE PLAY

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

	<p>Clutch lever free play 10.0–15.0 mm (0.39–0.59 in)</p>
--	--



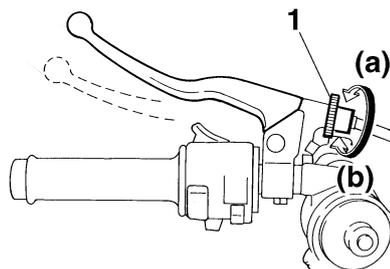
2. Adjust:
- Clutch cable free play



Handlebar side

- a. Turn the adjusting bolt "1" in direction "a" or "b" until the specified clutch lever free play is obtained.

<p>Direction "a" Clutch cable free play is increased.</p> <p>Direction "b" Clutch cable free play is decreased.</p>



TIP

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



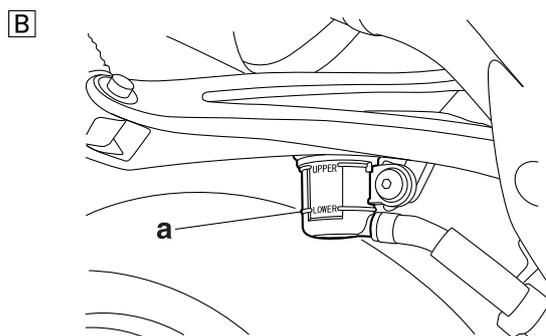
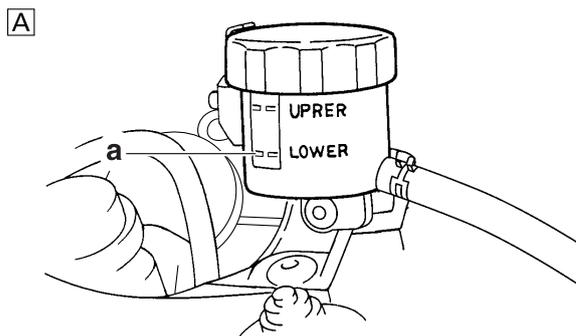
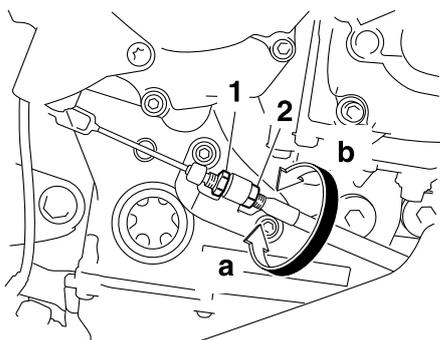
Engine side

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

<p>Direction "a" Clutch cable free play is increased.</p> <p>Direction "b" Clutch cable free play is decreased.</p>

PERIODIC MAINTENANCE

c. Tighten the locknuts "1".



A. Front brake
B. Rear brake

EAS14B1088

CHECKING THE BRAKE OPERATION

1. Check:

- Brake operation
Brake not working properly → Check the brake system.
Refer to "FRONT BRAKE" on page 4-31 and "REAR BRAKE" on page 4-44.

TIP

Drive on the dry road, operate the front and rear brakes separately and check to see if the brakes are operating properly.

EAS21240

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

TIP

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

2. Check:

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



EWA13090

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.

ECA13540

NOTICE

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

TIP

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

PERIODIC MAINTENANCE

EAS21160

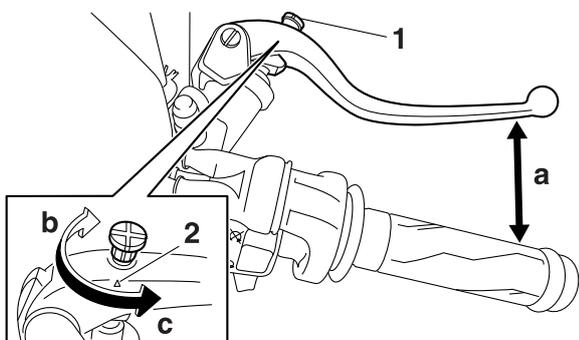
ADJUSTING THE FRONT DISC BRAKE

1. Adjust:
 - Brake lever position
(distance "a" from the throttle grip to the brake lever)

TIP

- While pushing the brake lever forward, turn the adjusting dial "1" until the brake lever is in the desired position.
- Adjust the groove of the adjusting dial to the \triangle mark "2" at preferable position.

Direction "b"
 Brake lever distance "a" is increased.
Direction "c"
 Brake lever distance "a" is decreased.



EWA13060

WARNING

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

ECA13490

NOTICE

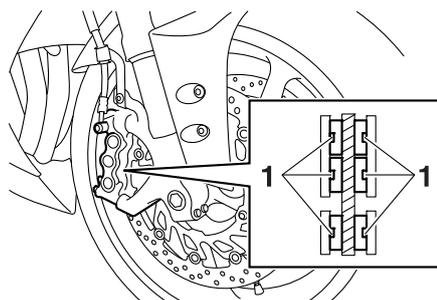
After adjusting the brake lever position, make sure there is no brake drag.

EAS21250

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
 - Front brake pad
Wear indicators "1" almost touch the brake disc → Replace the brake pads as a set.
Refer to "FRONT BRAKE" on page 4-31.

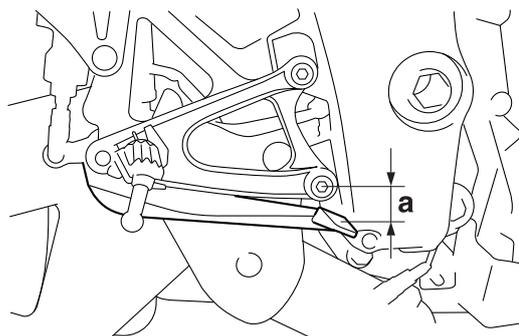


EAS21190

ADJUSTING THE REAR DISC BRAKE

1. Check:
 - Brake pedal position
(distance "a" from the center of the foot-rest bracket bolt to the center of the brake pedal)
Out of specification → Adjust.

Brake pedal position
 12–18 mm (0.47–0.71 in)



2. Adjust:
 - Brake pedal position

- a. Loosen the locknut "1".

PERIODIC MAINTENANCE

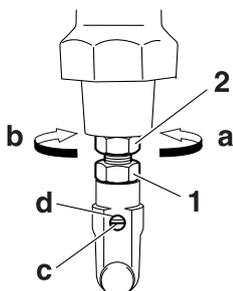
- b. Turn the adjusting bolt "2" in direction "a" or "b" until the specified brake pedal position is obtained.

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

EWA13070

WARNING

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



- c. Tighten the locknut "1" to specification.



Locknut
 16 Nm (1.6 m·kgf, 11 ft·lbf)

EWA13050

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 braking performance.

ECA13510

NOTICE

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



3. Adjust:
- Rear brake light switch
 Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-33.

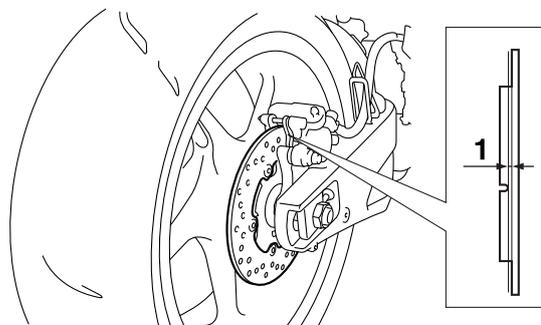
EAS21260

CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.

2. Check:
- Rear brake pad
 Wear indicators "1" almost touch the brake disc → Replace the brake pads as a set.
 Refer to "REAR BRAKE" on page 4-44.



EAS21360

BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100

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.

TIP

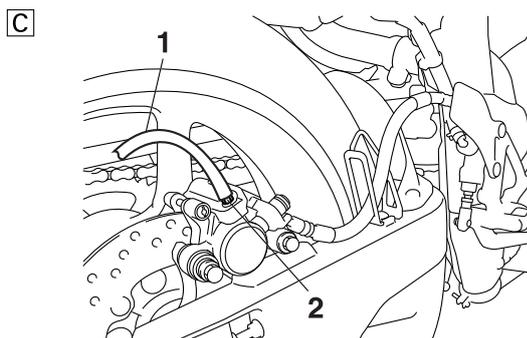
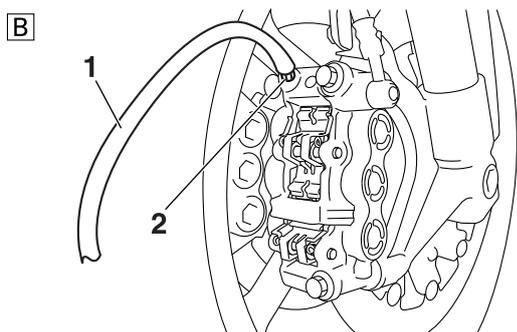
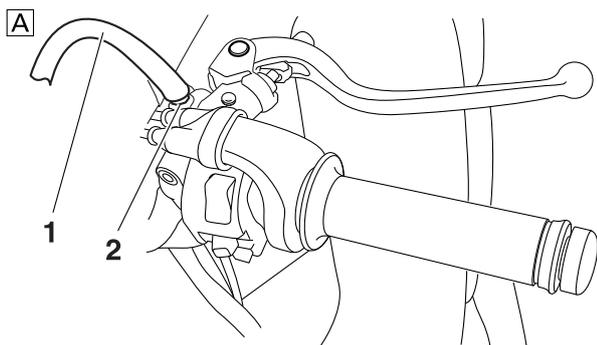
- Be careful not to spill any brake fluid or allow the brake fluid reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening 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



- 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".

PERIODIC MAINTENANCE



- A. Front brake master cylinder
- B. Front brake caliper
- C. Rear brake caliper

TIP

Bleeding order of the front hydraulic brake system is the following order:

- Front brake master cylinder
- Front brake calipers

- 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.

TIP

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.

	<p>Brake caliper bleed screw 5 Nm (0.5 m·kgf, 3.6 ft·lbf)</p> <p>Master cylinder bleed screw 6 Nm (0.6 m·kgf, 4.3 ft·lbf)</p>
---	---

- k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.

EWA13110

⚠ WARNING

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

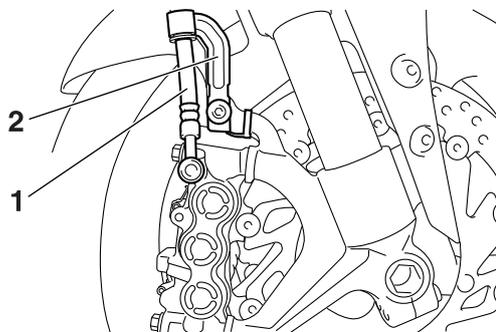


EAS21280

CHECKING THE FRONT BRAKE HOSES

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

- 1. Check:
 - Brake hose "1"
 - Cracks/damage/wear → Replace.
- 2. Check:
 - Brake hose clamp "2"
 - Loose → Tighten the clamp bolt.



- 3. Hold the vehicle upright and apply the brake several times.

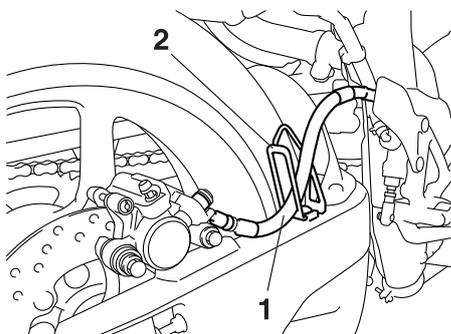
PERIODIC MAINTENANCE

4. Check:
 - Brake hose
Brake fluid leakage → Replace the damaged hose.
Refer to "FRONT BRAKE" on page 4-31.

EAS21290

CHECKING THE REAR BRAKE HOSE

1. Check:
 - Brake hose "1"
Cracks/damage/wear → Replace.
2. Check:
 - Brake hose clamp "2"
Loose Connection → Tighten the clamp bolt.



3. Hold the vehicle upright and apply rear brake several times.
4. Check:
 - Brake hose
Brake fluid leakage → Replace the damaged hose.
Refer to "REAR BRAKE" on page 4-44.

EAS21670

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

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

EWA13260

⚠ WARNING

Never attempt to make any repairs to the wheel.

TIP

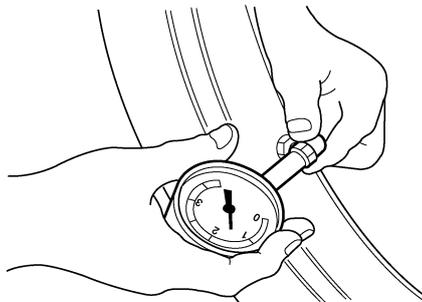
After a tire or wheel has been changed or replaced, always balance the wheel.

EAS21650

CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
 - Tire pressure
Out of specification → Regulate.



EWA13180

⚠ 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 vehicle could cause tire damage, an accident or an injury.

NEVER OVERLOAD THE VEHICLE.

PERIODIC MAINTENANCE



Tire air pressure (measured on cold tires)

Loading condition

0–90 kg (0–198 lb)

Front

250 kPa (2.50 kgf/cm², 36 psi)

Rear

290 kPa (2.90 kgf/cm², 42 psi)

Loading condition

90–189 kg (198–417 lb)

Front

250 kPa (2.50 kgf/cm², 36 psi)

Rear

290 kPa (2.90 kgf/cm², 42 psi)

High-speed riding

Front

250 kPa (2.50 kgf/cm², 36 psi)

Rear

290 kPa (2.90 kgf/cm², 42 psi)

Maximum load

189 kg (417 lb)

* Total weight of rider, passenger, cargo and accessories

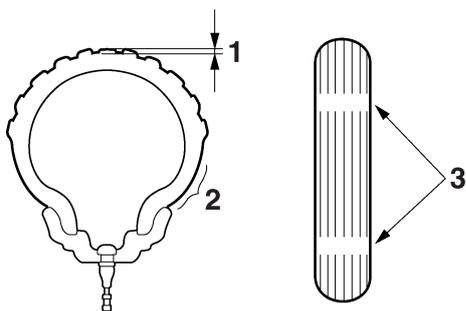
2. Check:

- Tire surfaces
- Damage/wear → Replace the tire.

EWA13190



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



1. Tire tread depth
2. Side wall
3. Wear indicator



Wear limit (front)

1.6 mm (0.06 in) (Europe)

1.0 mm (0.04 in) (AUS)

Wear limit (rear)

1.6 mm (0.06 in) (Europe)

1.0 mm (0.04 in) (AUS)

EWA14090



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 vehicle.



Front tire

Size

120/70 ZR17M/C (58W)

Manufacturer/model

MICHELIN/POWER PURE A (1KB8, 1KB9, 1KBJ, 1KBK)

Manufacturer/model

DUNLOP/Qualifier II (1KB8, 1KBH, 1KBJ, 1KBP)



Rear tire

Size

190/55 ZR17M/C (75W)

Manufacturer/model

MICHELIN/POWER PURE (1KB8, 1KB9, 1KBJ, 1KBK)

Manufacturer/model

DUNLOP/Qualifier II (1KB8, 1KBH, 1KBJ, 1KBP)

EWA13210



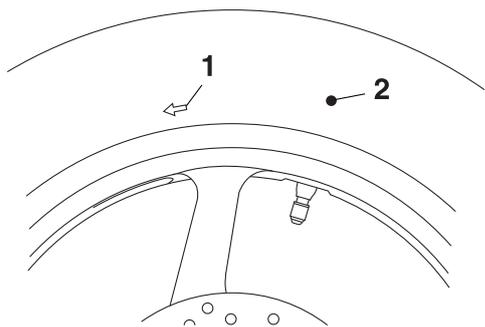
New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

TIP

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.

PERIODIC MAINTENANCE



EAS14B1089

CHECKING THE WHEEL BEARINGS

The following procedure applies to all of the wheel bearings.

1. Check:
 - Wheel bearings
Refer to "CHECKING THE FRONT WHEEL" on page 4-19 and "CHECKING THE REAR WHEEL" on page 4-28.

EAS14B1090

CHECKING THE SWINGARM OPERATION

1. Check:
 - Swingarm operation
Swingarm not working properly → Check the swingarm.
Refer to "SWINGARM" on page 4-80.
2. Check:
 - Swingarm excessive play
Refer to "SWINGARM" on page 4-80.

EAS21390

ADJUSTING THE DRIVE CHAIN SLACK

TIP

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

ECA13550

NOTICE

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 vehicle on a level surface.

EWA13120

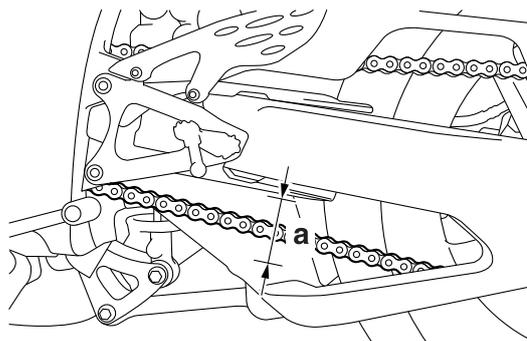
WARNING

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

TIP

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

2. Move the rear wheel several times and find the tightest position of drive chain.
3. Check:
 - Drive chain slack "a"
Out of specification → Adjust.



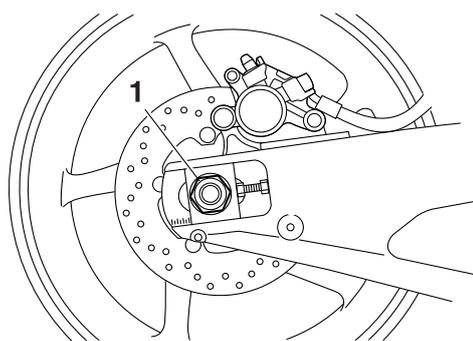
Drive chain slack (when adjusting the drive chain)

25.0–35.0 mm (0.98–1.38 in)

Drive chain slack (when replacing the drive chain and sprocket)

20.0–30.0 mm (0.79–1.18 in)

4. Loosen:
 - Wheel axle nut "1"



5. Adjust:
 - Drive chain slack



- a. Loosen both locknuts "1".
- b. Turn both adjusting bolts "2" in direction "a" or "b" until the specified drive chain slack is obtained.

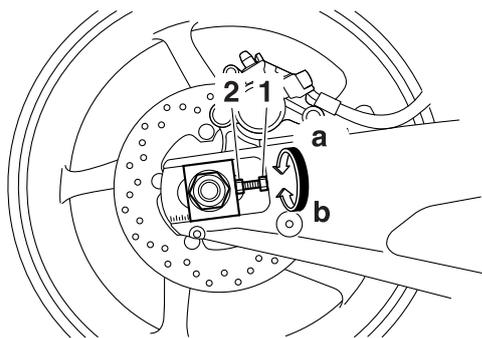
Direction "a"

Drive chain is tightened.

Direction "b"

Drive chain is loosened.

PERIODIC MAINTENANCE



TIP

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

c. Tighten the wheel axle nut to specification.

	Wheel axle nut 150 Nm (15 m·kgf, 110 ft·lbf)
---	---

d. Tighten the locknuts to specification.

	Locknut 16 Nm (1.6 m·kgf, 11 ft·lbf)
--	---

EAS21440

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 vehicle is used in dusty areas.

This vehicle 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 Chain lubricant suitable for O-ring chains
---	---

EAS21500

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

TIP

Place the vehicle 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.

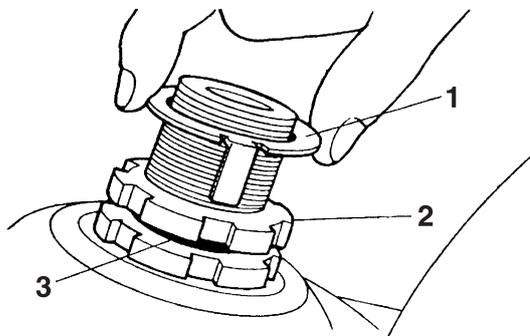
3. Remove:

- Upper bracket
Refer to "HANDLEBARS" on page 4-56 and "STEERING HEAD" on page 4-72.

4. Adjust:

- Steering head

a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".

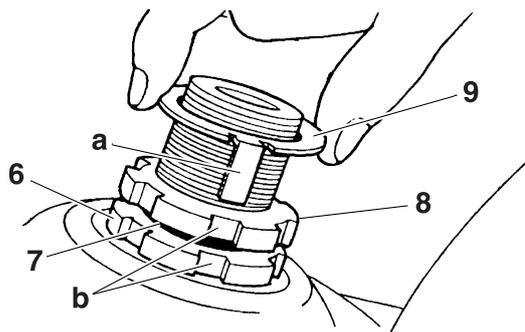
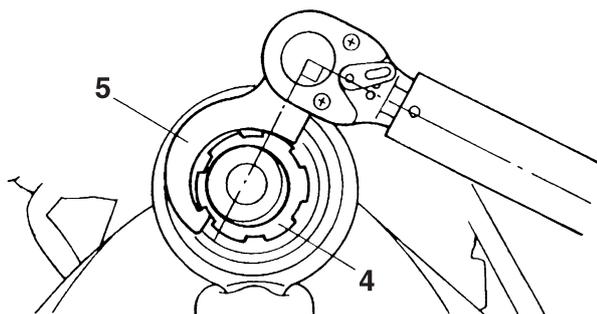


b. Loosen the lower ring nut "4" and then tighten it to specification with a steering nut wrench "5".

TIP

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

PERIODIC MAINTENANCE



	<p>Steering nut wrench 90890-01403</p> <p>Exhaust flange nut wrench YU-A9472</p>
---	--

	<p>Lower ring nut (initial tightening torque) 52 Nm (5.2 m·kgf, 37 ft·lbf)</p>
---	---

c. Loosen the lower ring nut "6" completely, then tighten it to specification.

EWA13140

⚠ WARNING

Do not overtighten the lower ring nut.

	<p>Lower ring nut (final tightening torque) 18 Nm (1.8 m·kgf, 13 ft·lbf)</p>
---	---

- 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" on page 4-72.
- e. Install the rubber washer "7".
- f. Install the upper ring nut "8".
- g. Finger tighten the upper ring nut, 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 "9".

TIP

Make sure the lock washer tabs "a" sit correctly in the ring nut slots "b".



5. Install:
- Upper bracket
 Refer to "HANDLEBARS" on page 4-56.

EAS14B1092

CHECKING THE STEERING DAMPER

Refer to "CHECKING THE STEERING DAMPER" on page 4-75.

EAS14B1093

CHECKING THE CHASSIS FASTENERS

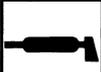
Make sure that all nuts, bolts, and screws are properly tightened.

Refer to "CHASSIS TIGHTENING TORQUES" on page 2-20.

EAS21700

LUBRICATING THE BRAKE LEVER

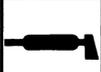
Lubricate the pivoting point and metal-to-metal moving parts of the levers.

	<p>Recommended lubricant Silicone grease</p>
---	---

EAS14B1100

LUBRICATING THE CLUTCH LEVER

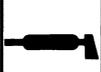
Lubricate the pivoting point and metal-to-metal moving parts of the levers.

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

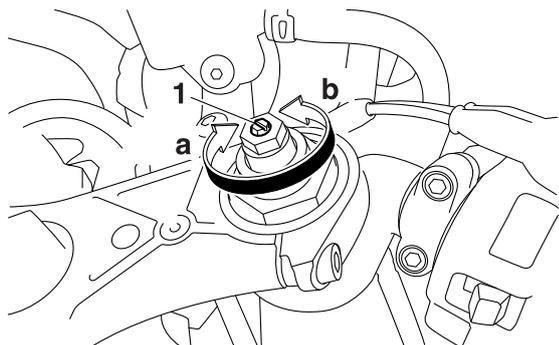
EAS21710

LUBRICATING THE PEDAL

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

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

PERIODIC MAINTENANCE



Compression damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
 - Compression damping (left side)



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

Direction "a"

Compression damping is increased (suspension is harder).

Direction "b"

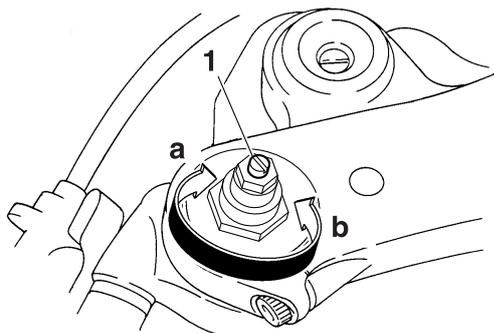
Compression damping is decreased (suspension is softer).



Compression damping adjusting positions

- Minimum
25 click(s) out*
- Standard
20 click(s) out*
- Maximum
1 click(s) out*

* With the adjusting screw fully turned in



EAS14B1096

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-77.

EAS21610

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

EWA13120

WARNING

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

Spring preload

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
 - Spring preload



- a. Adjust the spring preload with a spring preload adjusting bolt.
- b. Turn the spring preload adjusting bolt "1" in direction "a" or "b".

Direction "a"

Spring preload is increased (suspension is harder).

Direction "b"

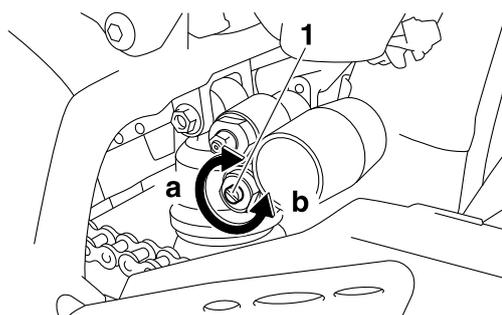
Spring preload is decreased (suspension is softer).



Spring preload adjusting positions

- Minimum
16 turn(s) out*
- Standard
8 turn(s) out*
- Maximum
0 turn(s) out*

* With the adjusting screw fully turned in



PERIODIC MAINTENANCE



Rebound damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

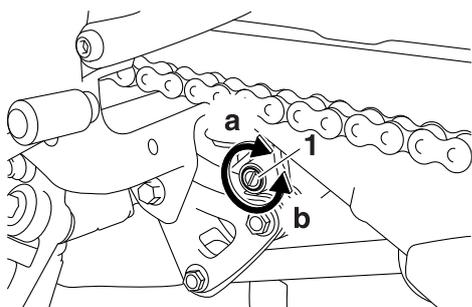
1. Adjust:
 - Rebound damping



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

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

Rebound damping adjusting positions
Minimum
 20 click(s) out*
Standard
 15 click(s) out*
Maximum
 3 click(s) out*
 * With the adjusting screw fully turned in



Compression damping (for fast compression damping)

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

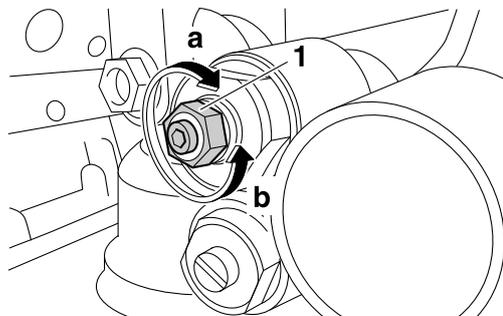
1. Adjust:
 - Compression damping (for fast compression damping)



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

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

Minimum
 4 turn(s) out*
Standard
 3 turn(s) out*
Maximum
 0 turn(s) out*
 * With the adjusting screw fully turned in



Compression damping (for slow compression damping)

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
 - Compression damping (for slow compression damping)

PERIODIC MAINTENANCE



Engine oil quantity

Total amount

4.58 L (4.84 US qt, 4.03 Imp.qt)

Without oil filter cartridge replacement

3.73 L (3.94 US qt, 3.28 Imp.qt)

With oil filter cartridge replacement

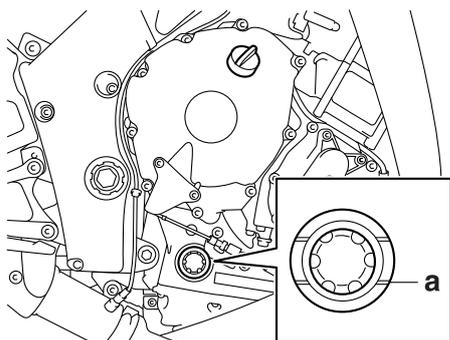
3.93 L (4.15 US qt, 3.46 Imp.qt)

9. Install:
 - Engine oil filler cap
10. Start the engine, warm it up for several minutes, and then turn it off.
11. Check:
 - Engine (for engine oil leaks)
12. Install:
 - Lower cowlings
Refer to "GENERAL CHASSIS" on page 4-1.
13. Check:
 - Engine oil level
Refer to "CHECKING THE ENGINE OIL LEVEL" on page 3-28.

EAS20820

MEASURING THE ENGINE OIL PRESSURE

1. Check:
 - Engine oil level
Below the minimum level mark "a" → Add the recommended engine oil to the proper level.



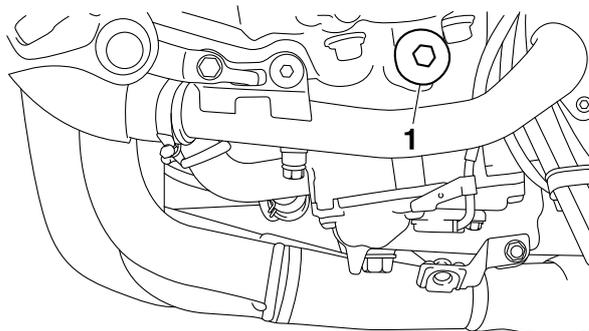
2. Start the engine, warm it up for several minutes, and then turn it off.

ECA13410

NOTICE

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

3. Remove:
 - Main gallery bolt "1"



EWA12980

WARNING

The engine, muffler and engine oil are extremely hot.

4. Install:
 - Oil pressure gauge "1"
 - Oil pressure adapter H "2"



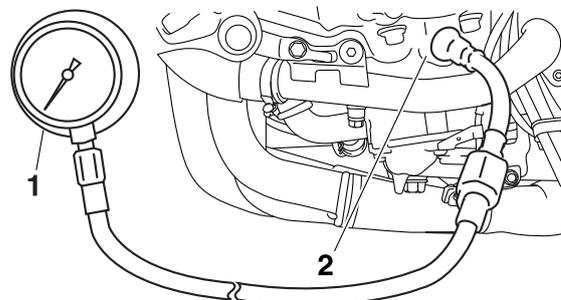
Pressure gauge

90890-03153

YU-03153

Oil pressure adapter H

90890-03139



5. Measure:
 - Engine oil pressure (at the following conditions)



Oil pressure

320 kPa/5000 r/min (3.20 kgf/cm²/5000 r/min, 45.5 psi/5000 r/min) at 75–85 °C (167–185 °F)

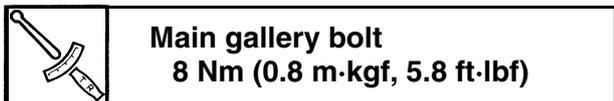
Out of specification → Check.

Engine oil pressure	Possible causes
Below specification	<ul style="list-style-type: none"> • Faulty oil pump • Clogged oil filter • Leaking oil passage • Broken or damaged oil seal

PERIODIC MAINTENANCE

Engine oil pressure	Possible causes
Above specification	<ul style="list-style-type: none"> Leaking oil passage Faulty oil filter Oil viscosity too high

6. Install:
- Main gallery bolt



EAS21110
CHECKING THE COOLANT LEVEL

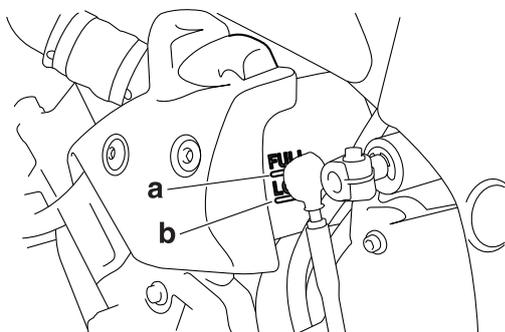
1. Stand the vehicle on a level surface.

TIP

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

2. Check:

- Coolant level
The coolant level should be between the maximum level mark "a" and minimum level mark "b".
Below the minimum level mark → Add the recommended coolant to the proper level.



ECA13470

NOTICE

- 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

TIP

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

EAS21120

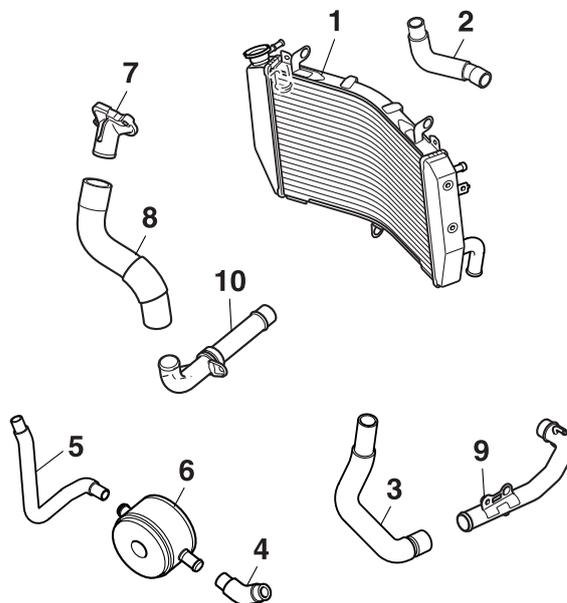
CHECKING THE COOLING SYSTEM

1. Remove:

- Side cowlings
- Lower cowlings
Refer to "GENERAL CHASSIS" on page 4-1.

2. Check:

- Radiator "1"
- Radiator inlet hose "2"
- Radiator outlet hose "3"
- Oil cooler inlet hose "4"
- Oil cooler outlet hose "5"
- Oil cooler "6"
- Water jacket joint "7"
- Water jacket joint hose "8"
- Water pump inlet pipe "9"
- Water pump outlet pipe "10"
Cracks/damage → Replace.
Refer to "RADIATOR" on page 6-1 and "OIL COOLER" on page 6-5.



3. Install:

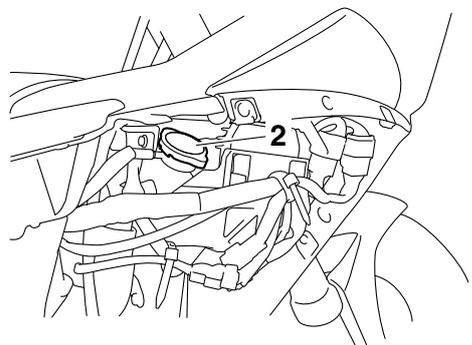
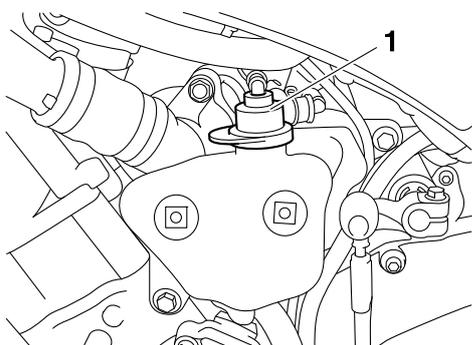
- Lower cowlings
- Side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.

PERIODIC MAINTENANCE

EAS21130

CHANGING THE COOLANT

1. Remove:
 - Lower cowlings
 - Side cowlings
 Refer to "GENERAL CHASSIS" on page 4-1.
2. Disconnect:
 - Coolant reservoir cap "1"
3. Drain:
 - Coolant (from the coolant reservoir)
4. Remove:
 - Radiator cap "2"



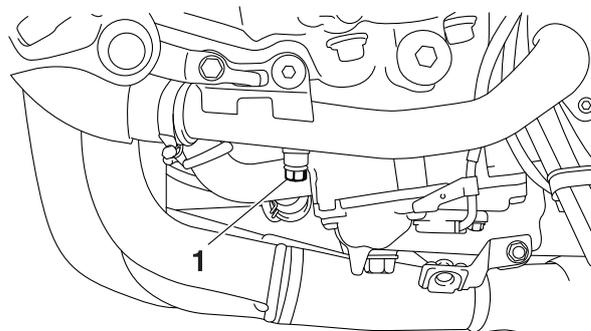
EWA13030

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 (engine) "1" (along with the copper washer)



6. Drain:
 - Coolant (from the engine and radiator)
7. Install:
 - Coolant drain bolt (with the copper washer **New**)



Coolant drain bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

8. Install:
 - Coolant reservoir
9. Fill:
 - Cooling system (with the specified amount of the recommended coolant)



Recommended antifreeze
High-quality ethylene glycol anti-freeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Radiator capacity (including all routes)
2.73 L (2.89 US qt, 2.40 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)
0.25 L (0.26 US qt, 0.22 Imp.qt)

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

EWA13040

WARNING

- If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.

PERIODIC MAINTENANCE

EAS21690

CHECKING AND LUBRICATING THE CABLES

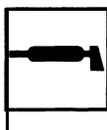
The following procedure applies to all of the inner and outer cables.

EWA13270

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
---	--

TIP

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

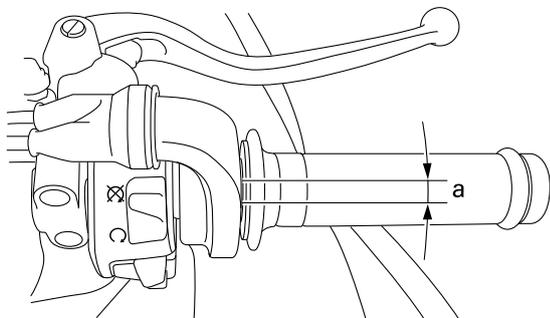
EAS20630

ADJUSTING THE THROTTLE CABLE FREE PLAY

TIP

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

1. Check:
 - Throttle cable free play “a”
Out of specification → Adjust.



	Throttle cable free play 3.0–5.0 mm (0.12–0.20 in)
---	--

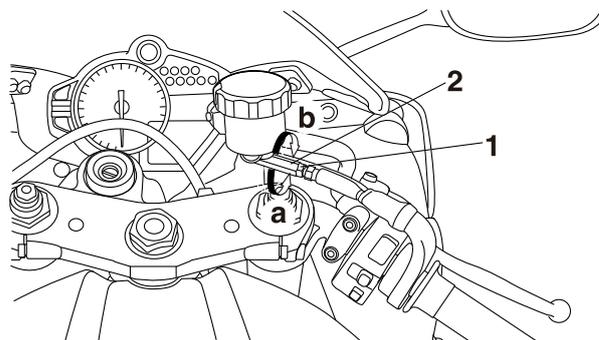
2. Adjust:
 - Throttle cable free play



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

Direction “a” Throttle cable free play is increased. Direction “b” Throttle cable free play is decreased.
--

- c. Tighten the locknut “1”.



EWA14B1016

WARNING

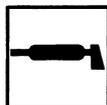
After adjusting the throttle cable free play, start the engine and turn the handlebars to the right and to the left to ensure that this does not cause the engine idling speed to change.



EAS21740

LUBRICATING THE REAR SUSPENSION

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

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

EAS21760

CHECKING AND CHARGING THE BATTERY

Refer to “ELECTRICAL COMPONENTS” on page 8-121.

EAS21770

CHECKING THE FUSES

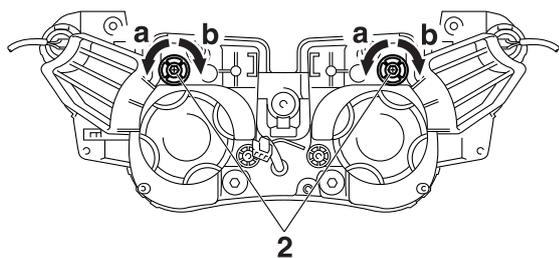
Refer to “ELECTRICAL COMPONENTS” on page 8-121.

PERIODIC MAINTENANCE

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

Right headlight

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



PERIODIC MAINTENANCE

CHASSIS

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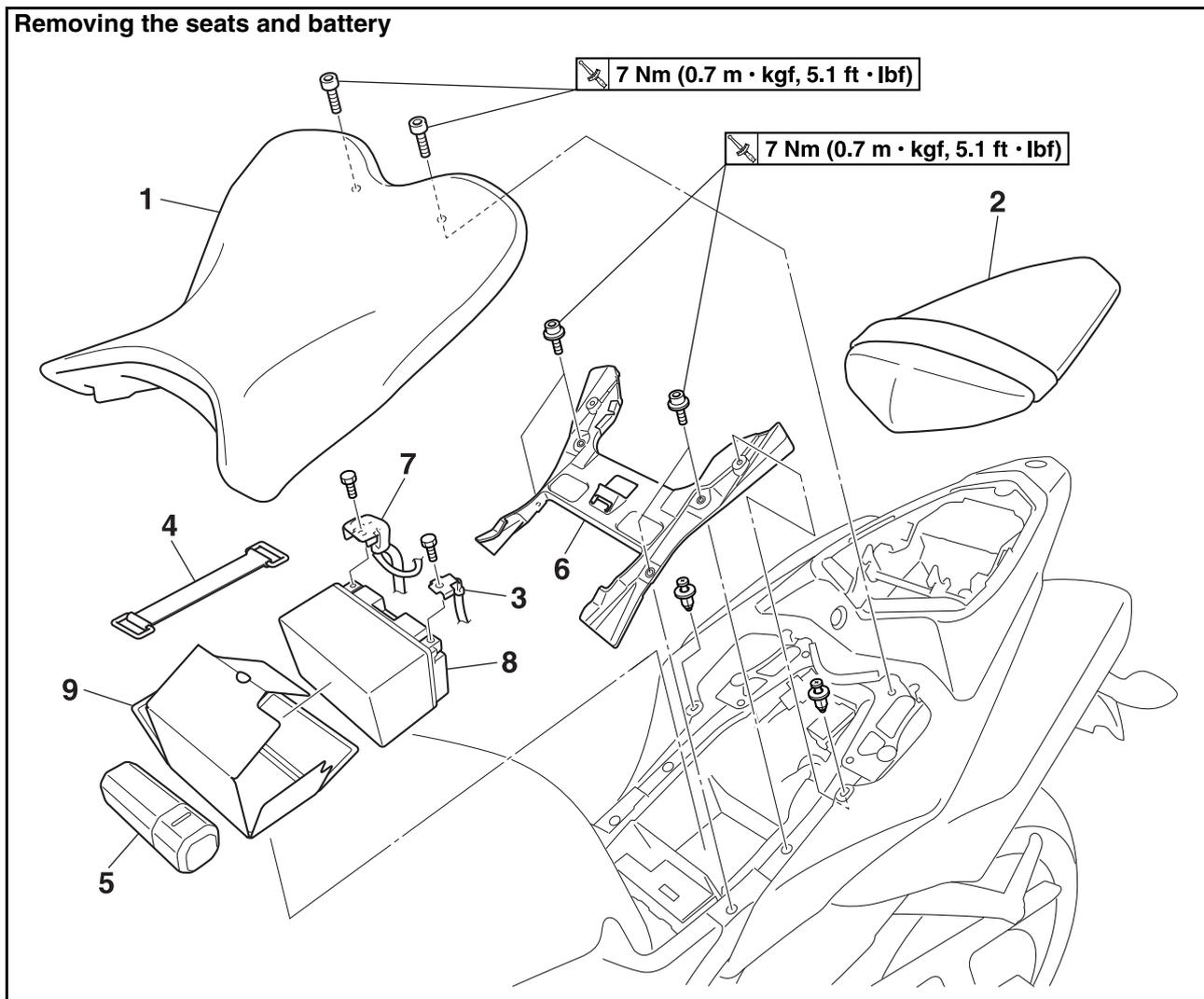
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GENERAL CHASSIS

EAS21830

GENERAL CHASSIS

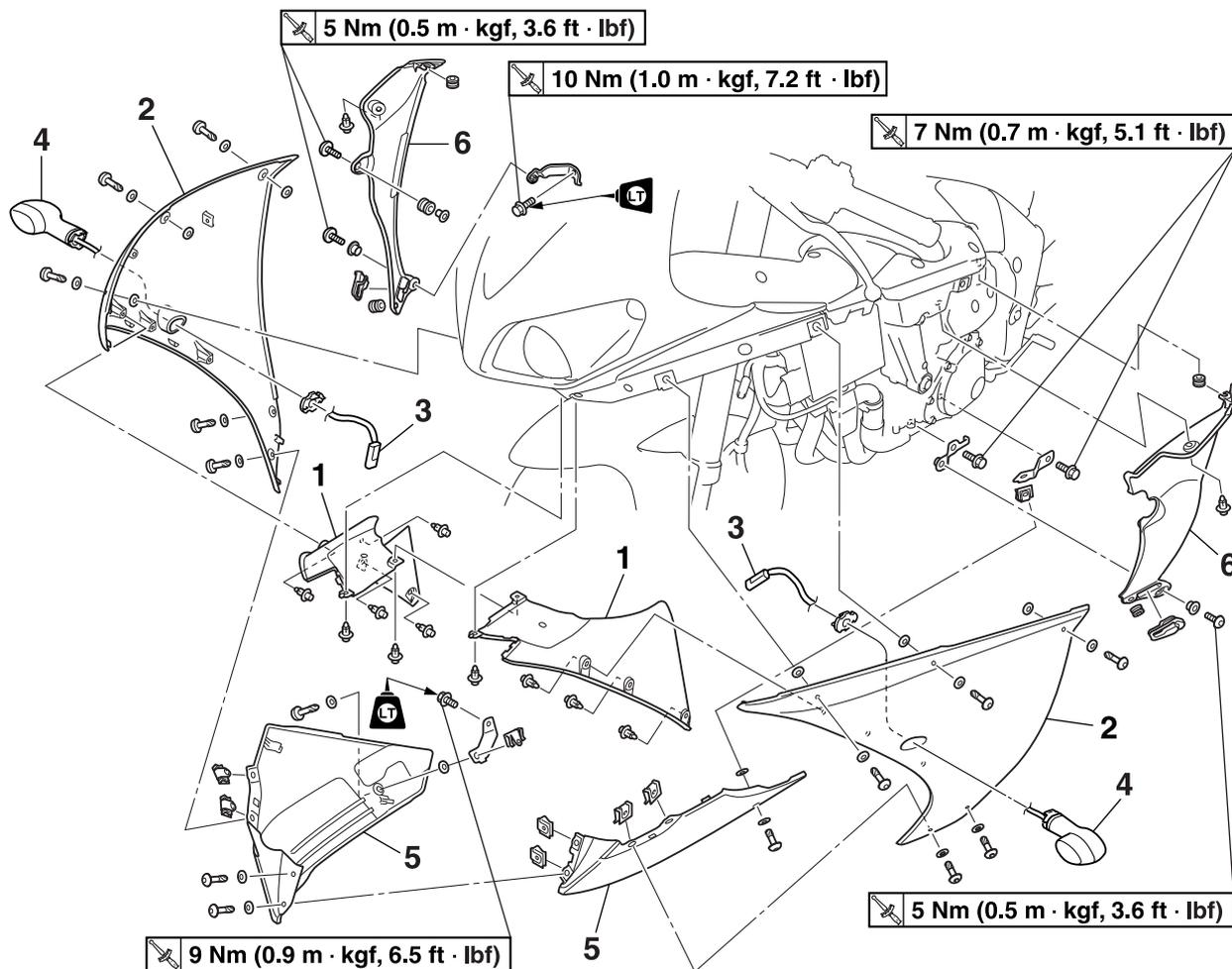
Removing the seats and battery



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank side cover		Refer to "FUEL TANK" on page 7-1.
1	Rider seat	1	
2	Passenger seat	1	
3	Battery negative lead	1	Disconnect.
4	Tool band	1	
5	Tool	1	
6	Battery cover	1	
7	Battery positive lead	1	Disconnect.
8	Battery	1	
9	Battery seat	1	
			For installation, reverse the removal procedure.

GENERAL CHASSIS

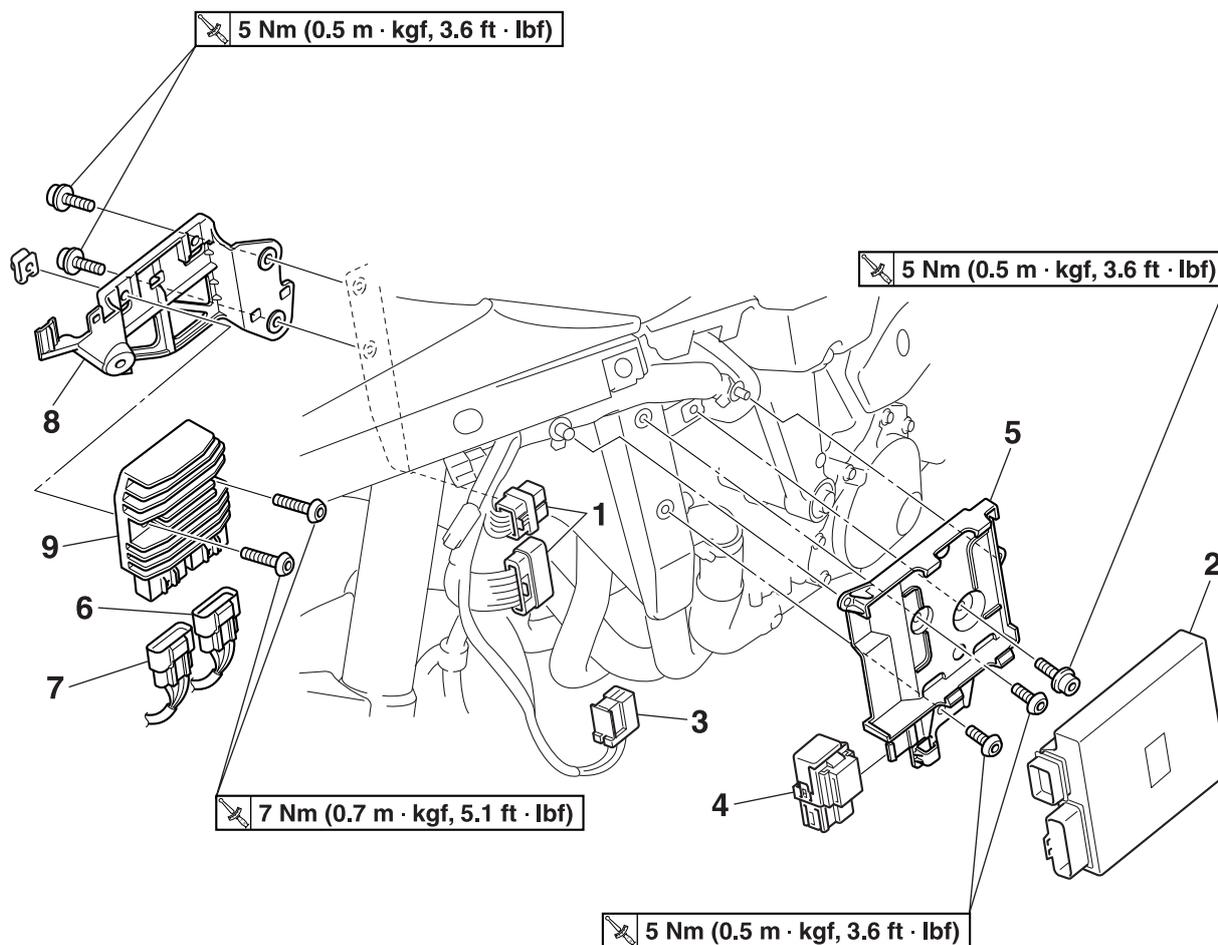
Removing the side cowlings



Order	Job/Parts to remove	Q'ty	Remarks
1	Front cowling inner panel	2	
2	Side cowling	2	
3	Front turn signal light coupler	2	Disconnect.
4	Front turn signal light	2	
5	Lower cowling	2	
6	Side cowling inner panel	2	
			For installation, reverse the removal procedure.

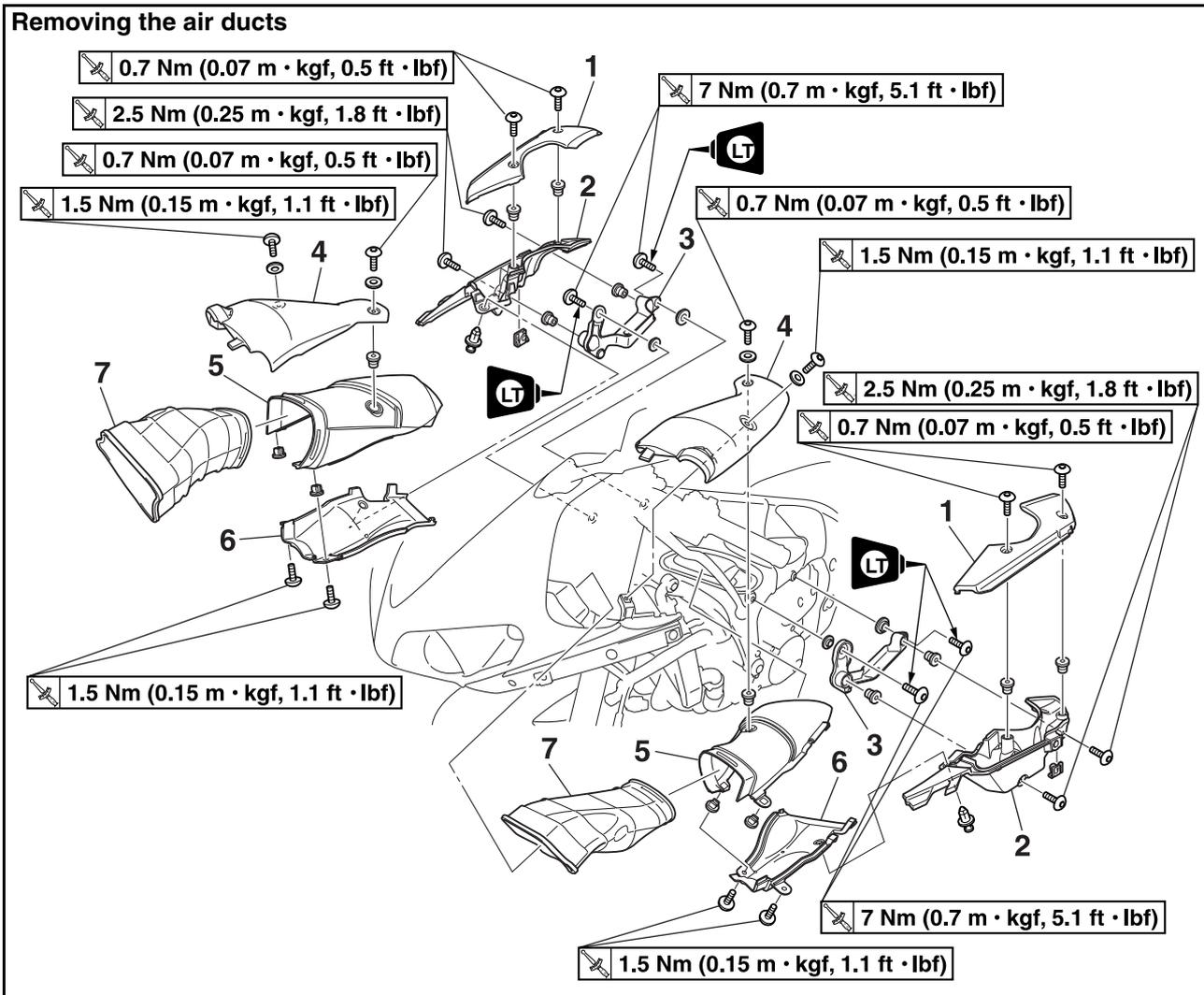
GENERAL CHASSIS

Removing the ECU and rectifier/regulator



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
1	ECU coupler	2	Disconnect.
2	ECU	1	
3	Radiator fan motor relay coupler	1	Disconnect.
4	Radiator fan motor relay	1	
5	ECU bracket	1	
6	Rectifier/regulator coupler	1	Disconnect.
7	Stator coil lead coupler	1	Disconnect.
8	Rectifier/regulator bracket	1	
9	Rectifier/regulator	1	
			For installation, reverse the removal procedure.

GENERAL CHASSIS

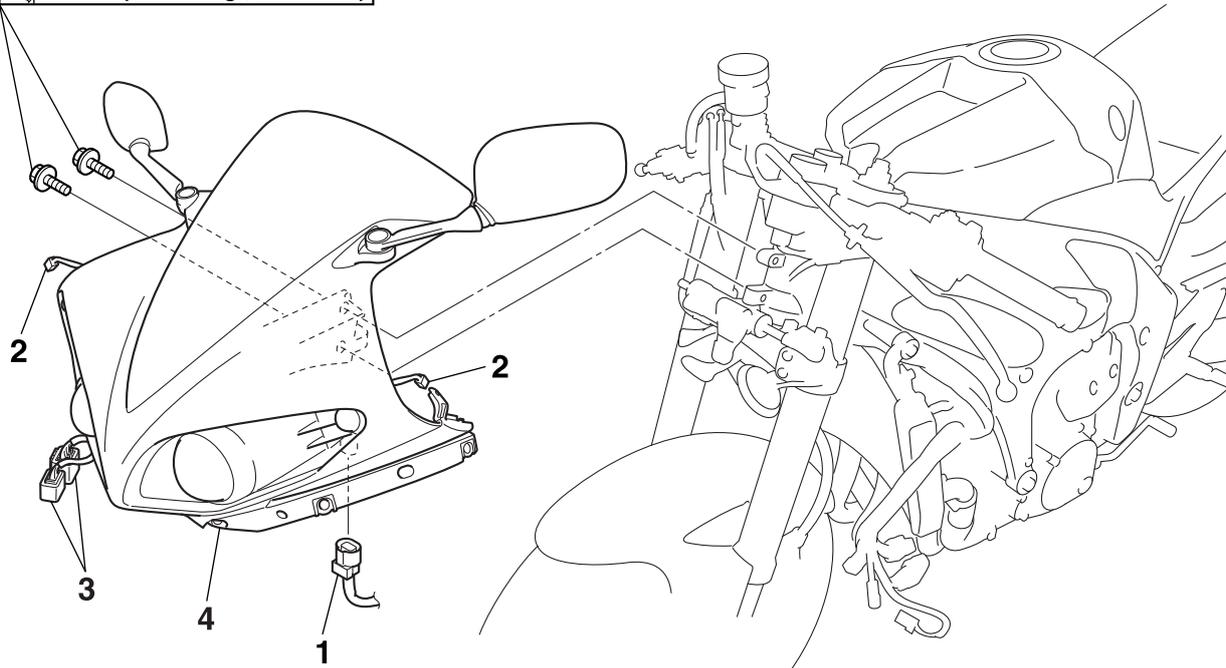


Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
1	Air chamber cover	2	
2	Air chamber	2	
3	Air chamber bracket	2	
4	Air intake air duct cover	2	
5	Rear intake air duct upper	2	
6	Rear intake air duct lower	2	
7	Front intake air duct	2	
			For installation, reverse the removal procedure.

GENERAL CHASSIS

Removing the front cowling assembly

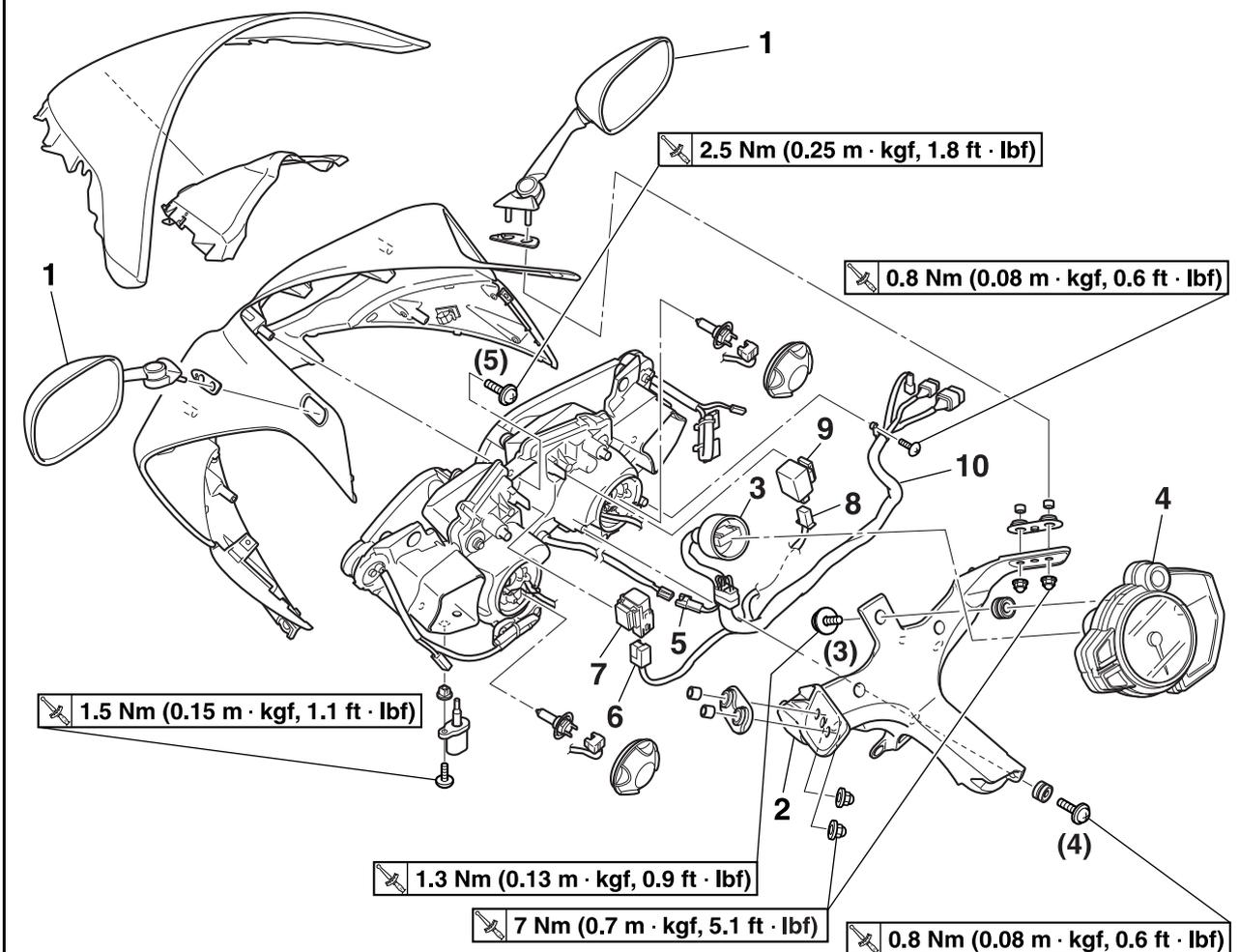
 23 Nm (2.3 m · kgf, 17 ft · lbf)



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Air duct		Refer to "GENERAL CHASSIS" on page 4-1.
1	Intake air temperature sensor coupler	1	Disconnect.
2	Auxiliary light coupler	2	Disconnect.
3	Headlight sub-wire harness coupler	2	Disconnect.
4	Front cowling assembly	1	
			For installation, reverse the removal procedure.

GENERAL CHASSIS

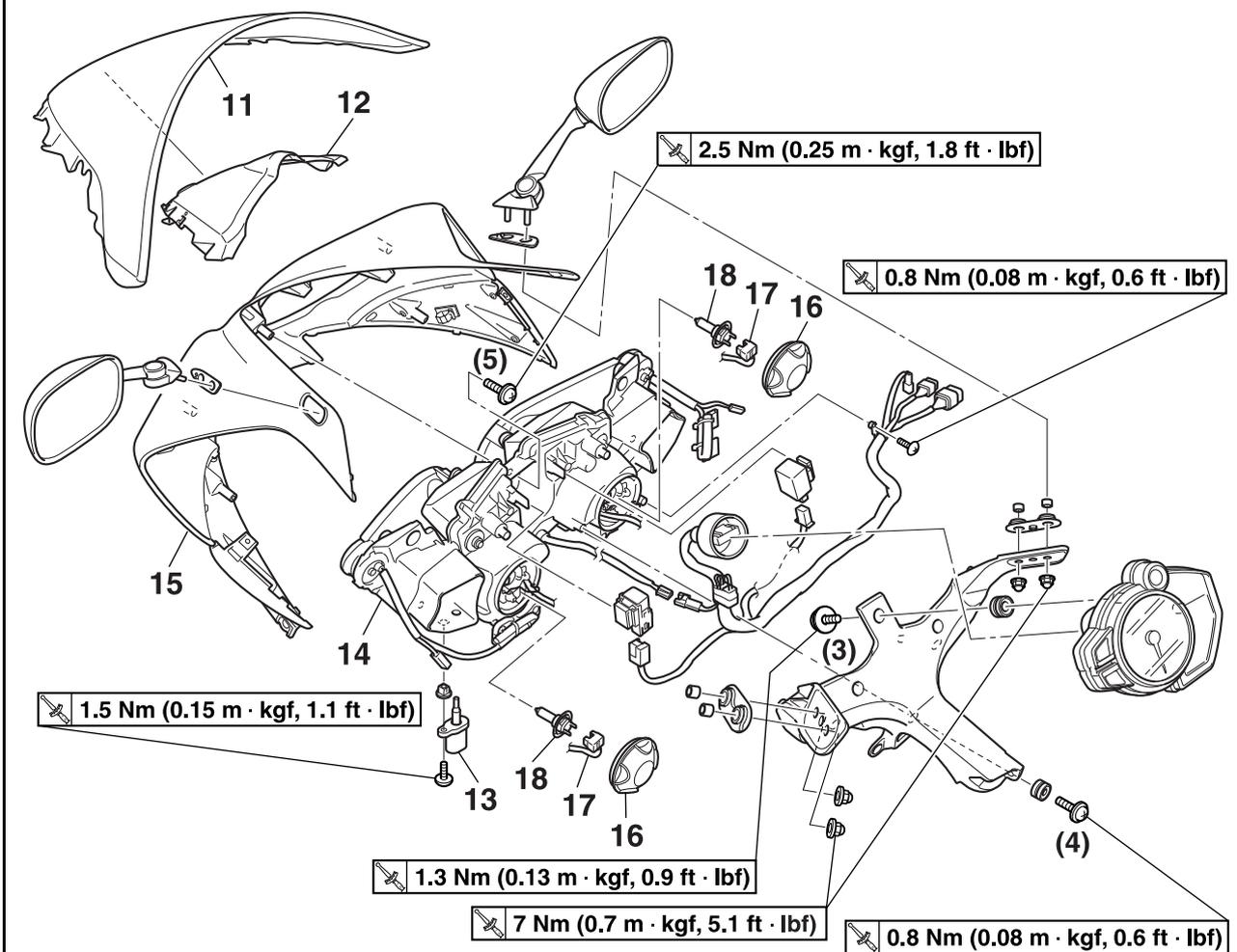
Removing the meter and headlight



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Air duct		Refer to "GENERAL CHASSIS" on page 4-1.
	Front cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
1	Rear view mirror	2	
2	Meter bracket	1	
3	Meter coupler	1	Disconnect.
4	Meter assembly	1	
5	Headlight coupler	1	Disconnect.
6	Headlight relay coupler	1	Disconnect.
7	Headlight relay	1	
8	Turn signal relay coupler	1	Disconnect.
9	Turn signal relay	1	
10	Headlight sub-wire harness	1	

GENERAL CHASSIS

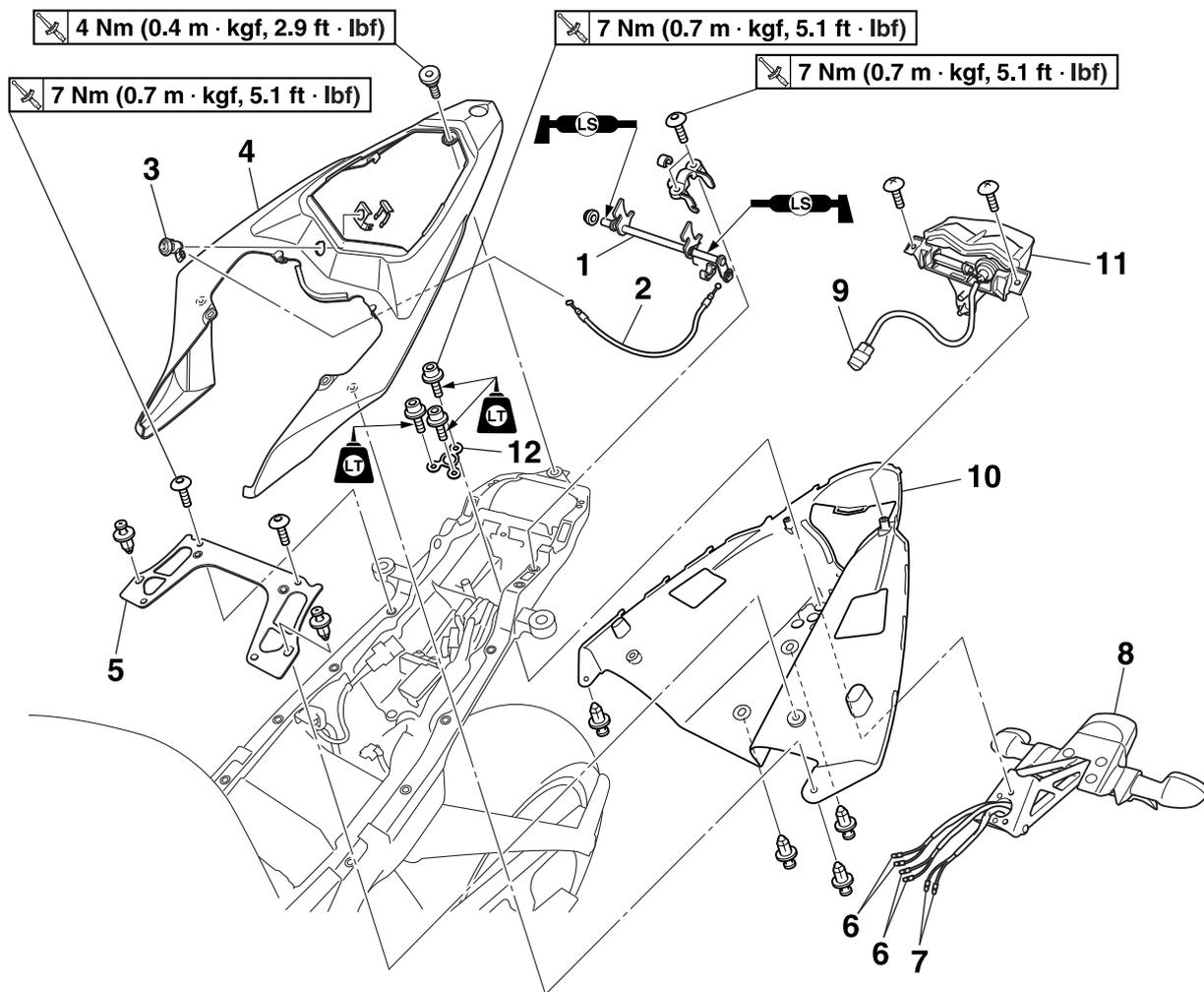
Removing the meter and headlight



Order	Job/Parts to remove	Q'ty	Remarks
11	Windshield	1	
12	Windshield inner panel	1	
13	Intake air temperature sensor	1	
14	Headlight assembly	1	
15	Front cowling	1	
16	Headlight bulb cover	2	
17	Headlight bulb coupler	2	Disconnect.
18	Headlight bulb	2	
			For installation, reverse the removal procedure.

GENERAL CHASSIS

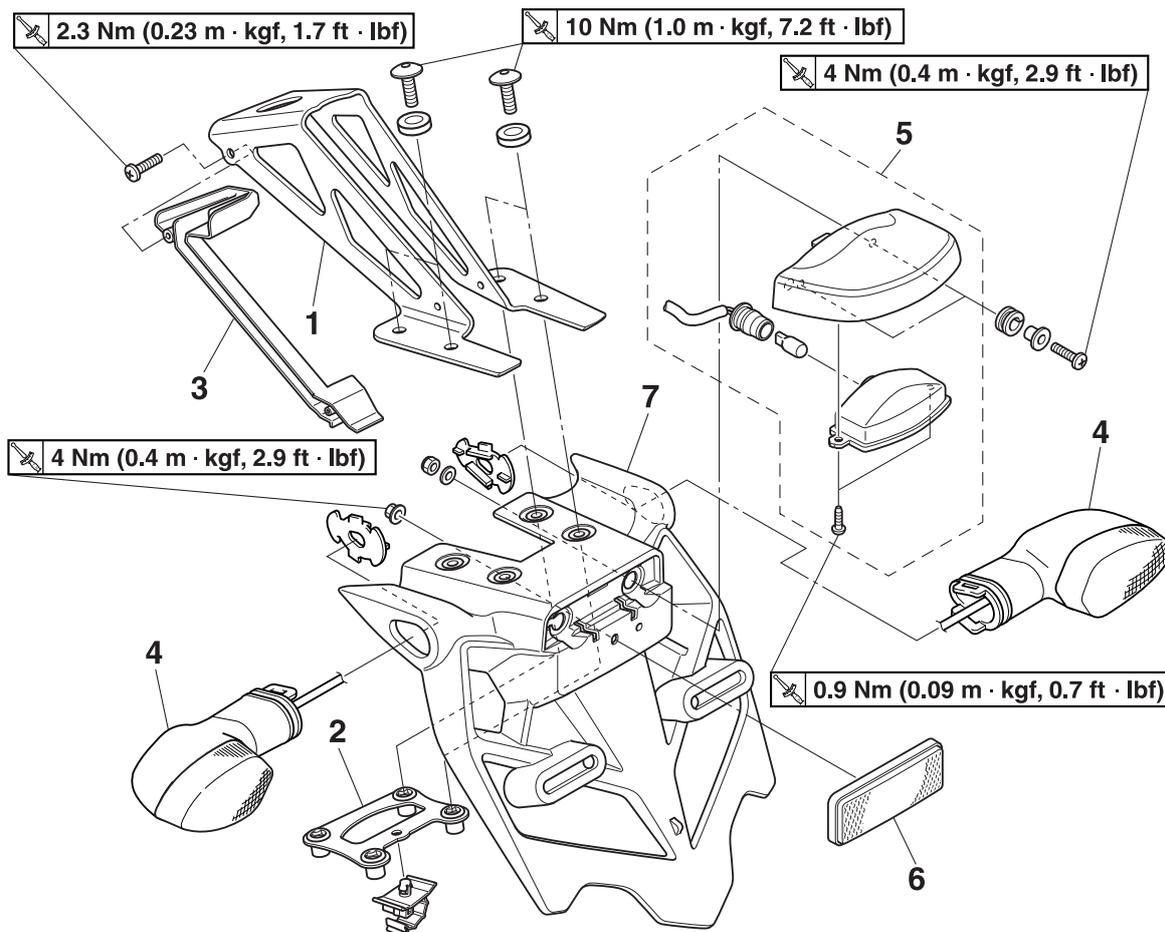
Removing the rear fender



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Passenger seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-3.
1	Passenger seat lock assembly	1	
2	Passenger seat lock cable	1	
3	Passenger seat lock key cylinder	1	
4	Upper tail cover	1	
5	Lower tail cover bracket	1	
6	Rear turn signal light lead connector	4	Disconnect.
7	License plate light lead connector	2	Disconnect.
8	License plate/turn signal light assembly	1	
9	Tail/brake light lead coupler	1	Disconnect.
10	Lower tail cover	1	
11	Tail/brake light	1	
12	Tail/brake light plate	1	
			For installation, reverse the removal procedure.

GENERAL CHASSIS

Disassembling the license plate/turn signal light assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	License plate/turn signal light stay	1	
2	License plate/turn signal light stay plate	1	
3	Cover	1	
4	Rear turn signal light	2	
5	License plate light	1	
6	Rear reflector	1	
7	Mudguard	1	
			For installation, reverse the removal procedure.

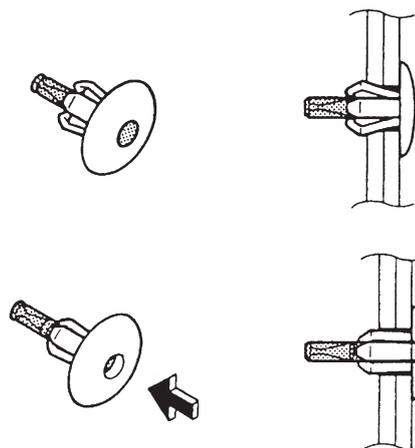
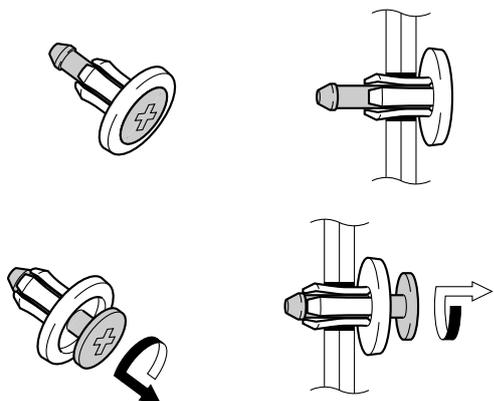
GENERAL CHASSIS

EAS14B1029

REMOVING THE QUICK FASTENER (SCREW TYPE)

TIP _____

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

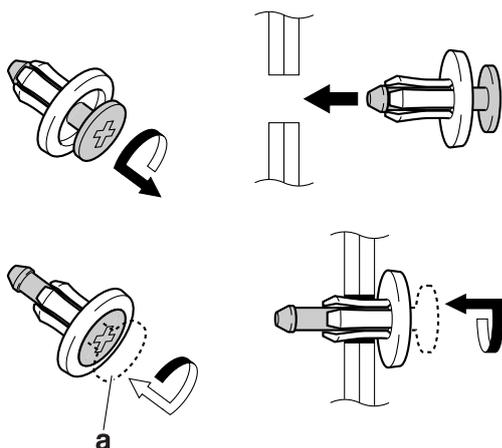


EAS14B1030

INSTALLING THE QUICK FASTENER (SCREW TYPE)

TIP _____

To install the quick fastener, turn its screw counterclockwise so that it protrudes from the fastener head, then insert the fastener into the cover and turn the screw "a" clockwise in with a screwdriver. Make sure that the screw is flush with the fastener's head.

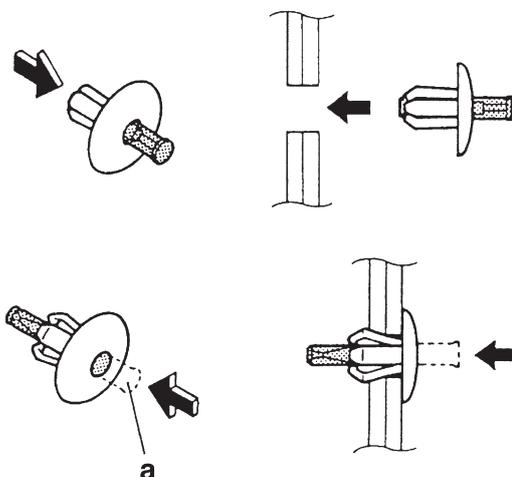


EAS14B1032

INSTALLING THE QUICK FASTENER (PUSH TYPE)

TIP _____

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



EAS14B1031

REMOVING THE QUICK FASTENER (PUSH TYPE)

TIP _____

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

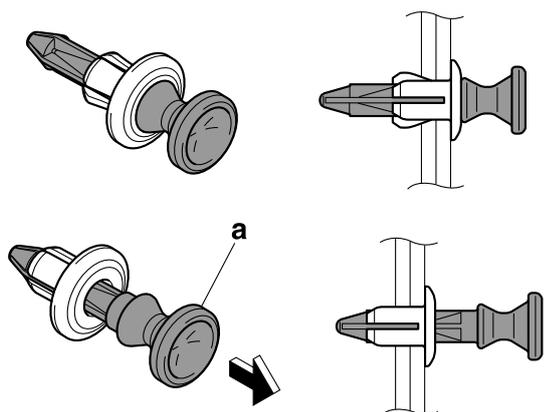
EAS14B1103

REMOVING THE QUICK FASTENER (PULL TYPE)

TIP _____

To remove the quick fastener, pull the pin "a", then pull the fastener out.

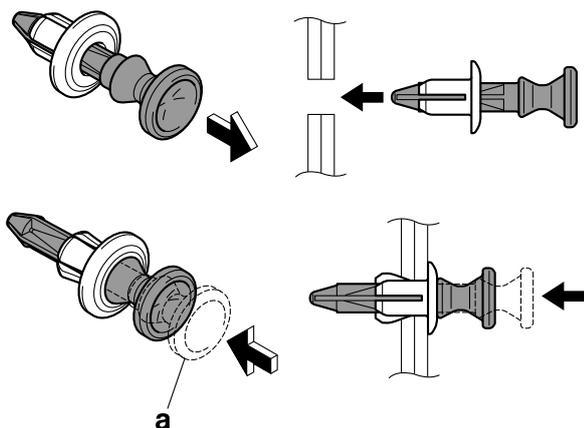
GENERAL CHASSIS



EAS14B1104
INSTALLING THE QUICK FASTENER (PULL TYPE)

TIP

To install the quick fastener, pull the pin, then insert the fastener into the cover and push the pin "a". Make sure to insert the fastener until it is locked.

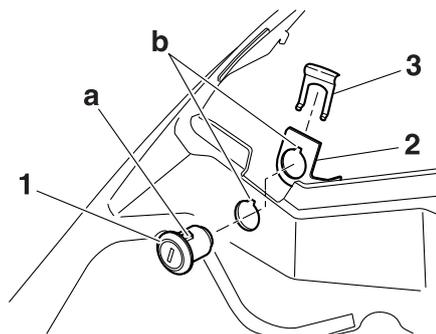


EAS14B1037
INSTALLING THE PASSENGER SEAT LOCK CYLINDER

1. Install:
 - Seat lock key cylinder "1"
 - Lock stay "2"
 - Lock spring "3"

TIP

Align the projection "a" of the passenger seat lock key cylinder "1" to the grooves "b" of the lower tail cover and lock stay "2" and install.

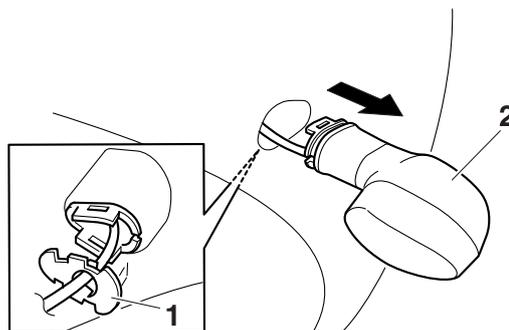


EAS14B1038
REMOVING THE FRONT TURN SIGNAL LIGHTS

1. Remove:
 - Stay "1"
 - Front turn signal light "2"

TIP

Remove the stay "1" first and then remove the front turn signal light "2" from the side cowling.

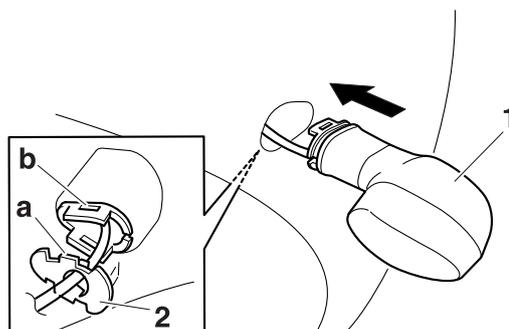


EAS14B1039
INSTALLING THE FRONT TURN SIGNAL LIGHTS

1. Install:
 - Front turn signal light "1"
 - Stay "2"

TIP

Insert the flasher stay tabs "a" into the front turn signal light grooves "b".



GENERAL CHASSIS

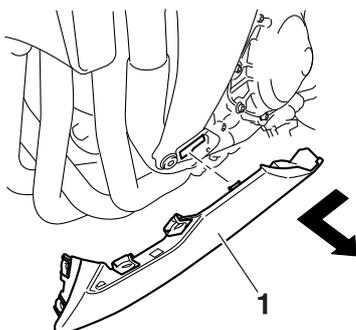
EAS14B1040

REMOVING THE LOWER COWLINGS

1. Remove:
 - Lower cowling "1"

TIP

Slide the lower cowling to the forward and remove.



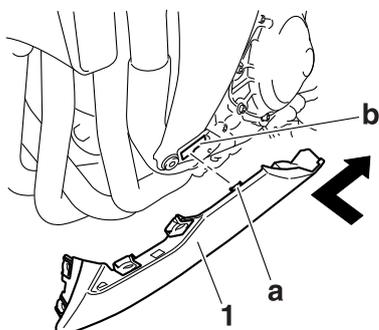
EAS14B1041

INSTALLING THE LOWER COWLINGS

1. Install:
 - Lower cowling "1"

TIP

Insert the lower cowling tab "a" into the inner panel hole "b" and slide back.



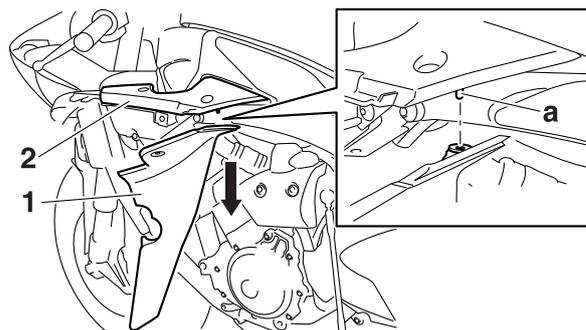
EAS14B1042

REMOVING THE SIDE COWLING INNER PANELS

1. Remove:
 - Side cowling inner panel "1"

TIP

When removing the side cowling inner panel downward, pull out the side cowling inner panel hole from the projection "a" of the air chamber cover "2".



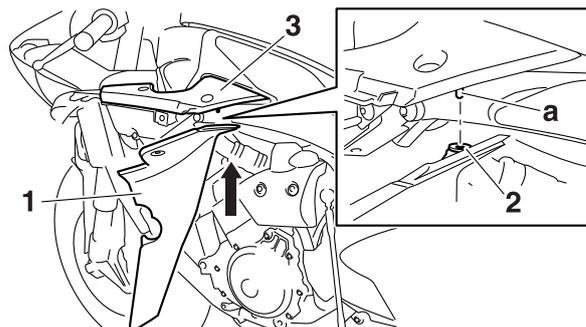
EAS14B1043

INSTALLING THE SIDE COWLING INNER PANELS

1. Install:
 - Side cowling inner panel "1"

TIP

Install the grommet "2" to the side cowling inner panel and insert them into the projection "a" of the air chamber cover "3".



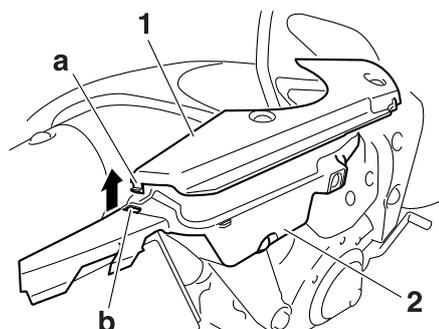
EAS14B1044

REMOVING THE AIR CHAMBER COVERS

1. Remove:
 - Air chamber cover "1"

TIP

Pull out the air chamber cover tab "a" upward from the hole "b" of the air chamber "2".



GENERAL CHASSIS

EAS14B1045

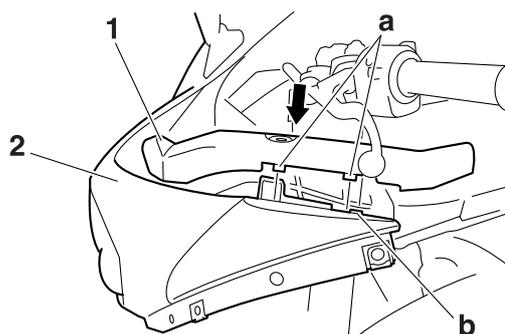
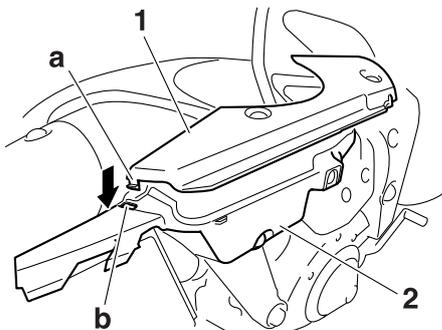
INSTALLING THE AIR CHAMBER COVERS

1. Install:

- Air chamber cover "1"

TIP

Insert the air chamber cover tab "a" downward into the hole "b" of the air chamber "2".



EAS14B1048

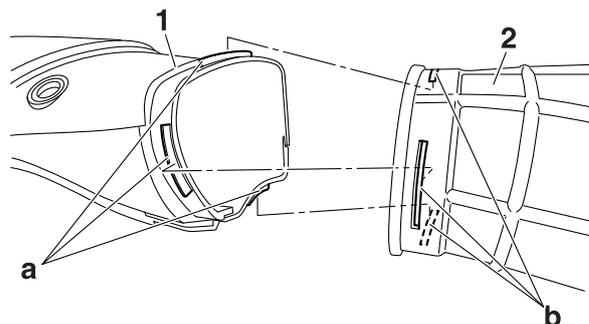
INSTALLING THE AIR INTAKE DUCTS

1. Install:

- Rear air intake duct "1"
(to front air intake duct "2")

TIP

Insert the rear air intake duct tabs "a" into the front air intake duct grooves "b".



EAS14B1046

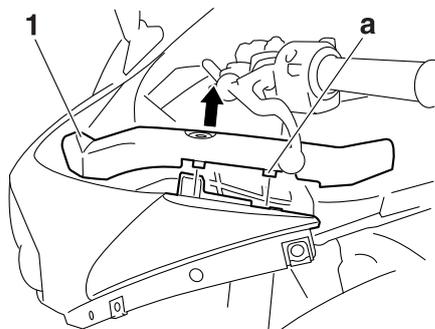
REMOVING THE INTAKE AIR DUCT COVERS

1. Remove:

- Intake air duct cover "1"

TIP

Press the upper surface of the intake air duct cover tab "a" to inside of the vehicle and remove the intake air duct cover upward.



EAS14B1013

INSTALLING THE REAR VIEW MIRRORS

1. Install:

- Rear view mirror "1"
(along with the mirror base "2")

	<p>Rear view mirror nut 7 Nm (0.7 m·kgf, 5.1 ft·lbf)</p>
---	---

TIP

Install the mirror base to the rear view mirror first, then install the rear view mirror to the front cowling.

EAS14B1047

INSTALLING THE INTAKE AIR DUCT COVERS

1. Install:

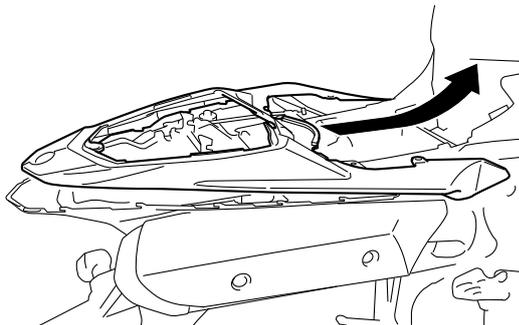
- Intake air duct cover "1"

TIP

Align the intake air duct cover tabs "a" and the tab "b" of the front cowling "2" as shown in the illustration and install.

GENERAL CHASSIS

- d. Slide the upper tail cover forward and remove.



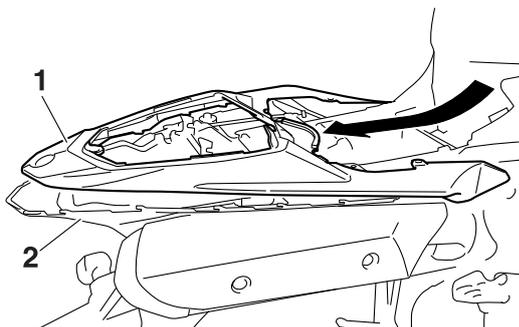
EAS14B1002

INSTALLING THE UPPER TAIL COVER

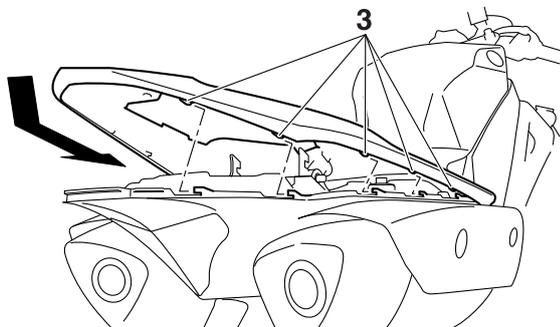
1. Install:
- Upper tail cover "1"



- a. Install the upper tail cover from the front of the lower tail cover "2" and slide to the back.



- b. Put the upper tail cover down, align the tabs "3" of the upper tail cover to the lower tail cover tabs, and then slide the upper tail cover forward.



- c. Install the quick fasteners on the upper tail cover.
 d. Install the bolt on the upper tail cover.



2. Install:
- Passenger seat
Refer to "GENERAL CHASSIS" on page 4-1.
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

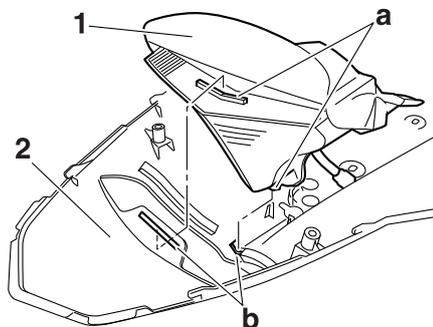
EAS14B1054

INSTALLING THE TAIL/BRAKE LIGHT

1. Install:
- Tail/brake light "1"

TIP

Fit the tail/brake light tabs "a" into the holes "b" of the lower tail cover "2".



EAS14B1056

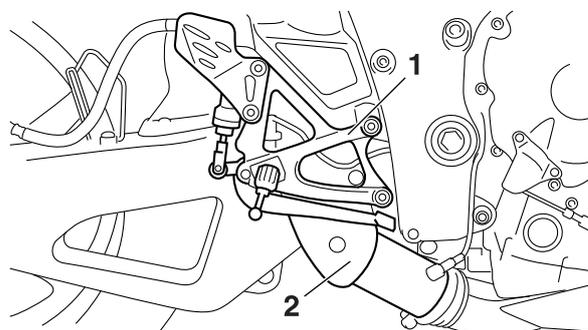
ADJUSTING THE RIDER FOOTRESTS

1. Remove:
- Rider footrest (right and left)

EWA14B1018

⚠ WARNING

When removing the right rider footrest "1", be careful not to burn with the exhaust chamber "2".



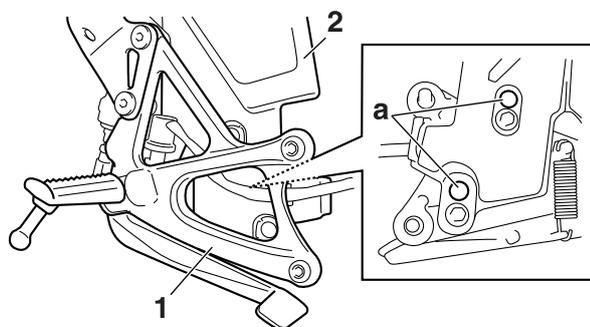
2. Adjust:
- Rider footrest position (right and left)



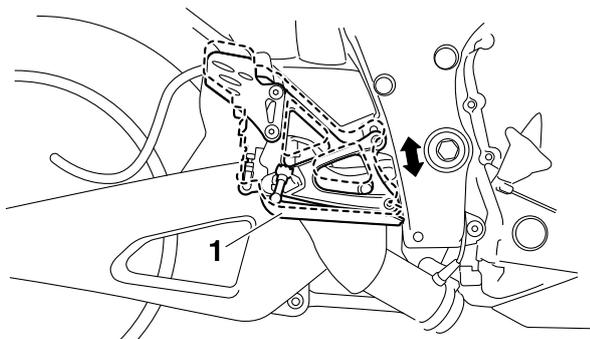
- a. Remove the rider footrest "1" bolts.

GENERAL CHASSIS

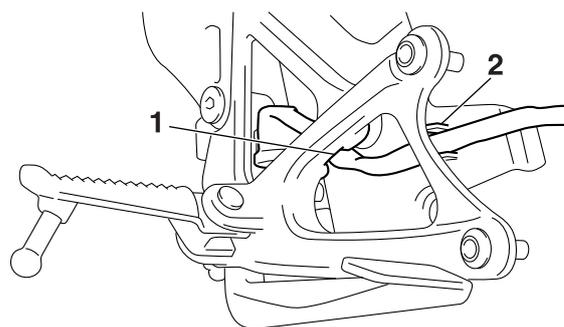
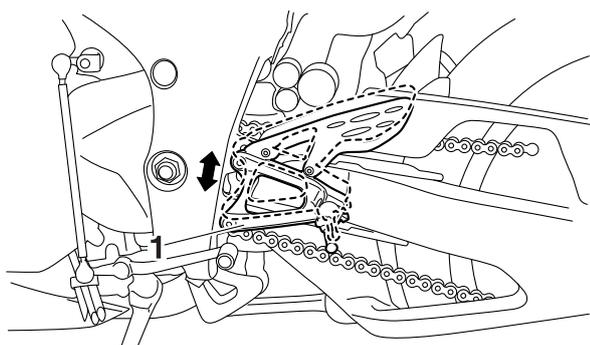
- b. When adjusting the right rider footrest, change the position of the hole "a" of the exhaust chamber cover "2".



- c. Adjusting the right rider footrest "1".



- d. Adjusting the left rider footrest "1".

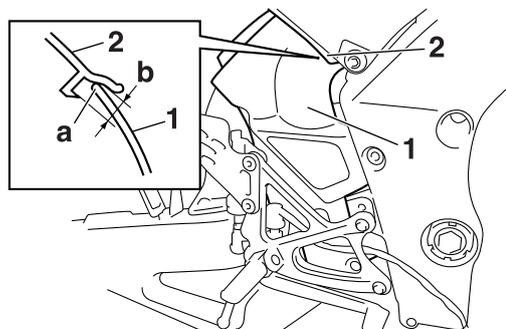


- e. Install the rider footrest bolts.



TIP

- Install the end "a" of the exhaust chamber cover "1" within the range "b" of the exhaust chamber upper cover "2" as shown in the illustration.
- After adjusting the right rider footrest, adjust the rear brake pedal and rear brake light switch.
Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-16 and "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-33.



ECA14B1024

NOTICE

Route the rear brake light switch lead through the groove "1" of the right rider footrest and groove "2" of the exhaust chamber cover.

TIP

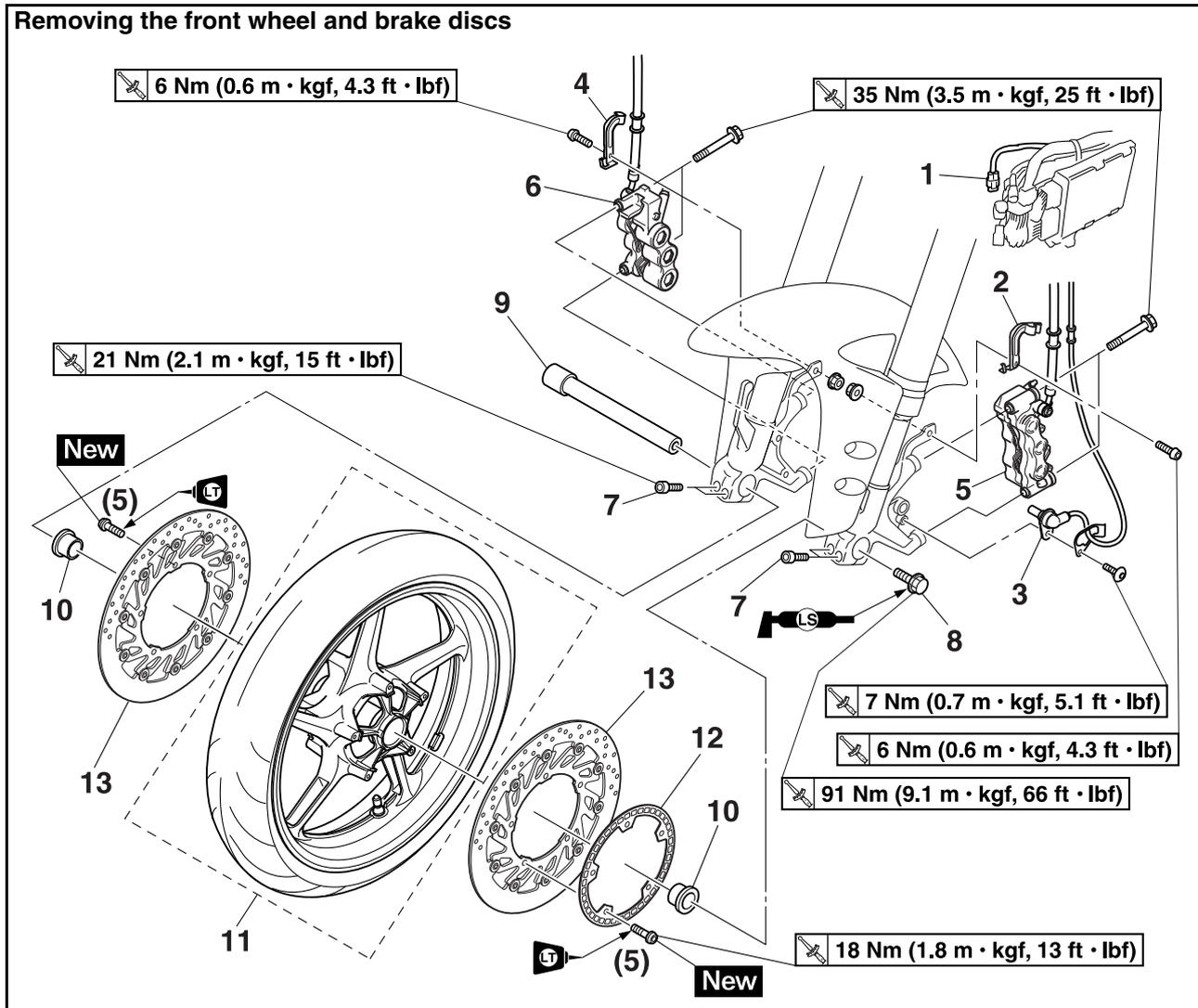
When adjusting the left and right rider footrest, be sure to set them on the same level.

FRONT WHEEL

EAS21870

FRONT WHEEL

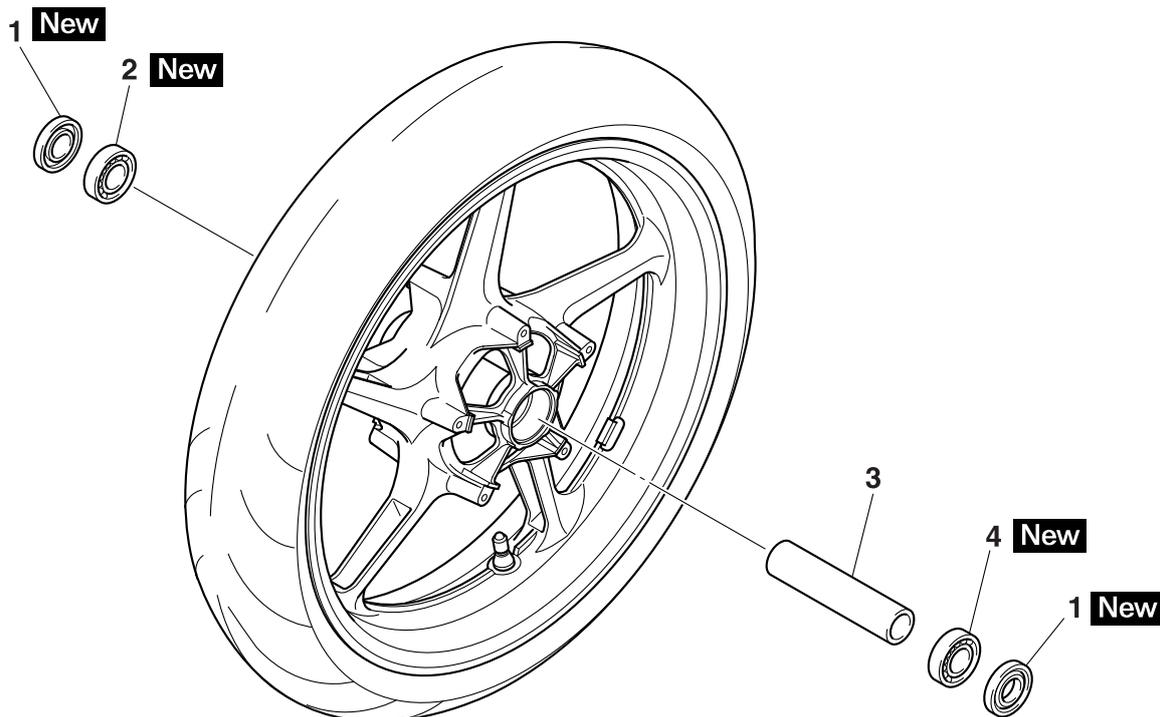
Removing the front wheel and brake discs



Order	Job/Parts to remove	Q'ty	Remarks
	Front cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
1	Front speed sensor coupler	1	Disconnect.
2	Left brake hose holder	1	
3	Front speed sensor	1	
4	Right brake hose holder	1	
5	Left front brake caliper	1	
6	Right front brake caliper	1	
7	Front wheel axle pinch bolt	4	Loosen.
8	Front wheel axle bolt	1	
9	Front wheel axle	1	
10	Collar (left and right)	2	
11	Front wheel	1	
12	Front speed sensor rotor	1	
13	Front brake disc (left and right)	2	
			For installation, reverse the removal procedure.

FRONT WHEEL

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal (left and right)	2	
2	Wheel bearing	1	
3	Spacer	1	
4	Wheel bearing	1	
			For assembly, reverse the disassembly procedure.

FRONT WHEEL

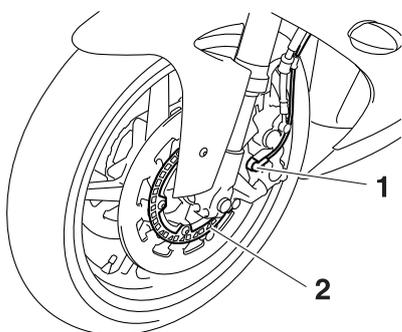
EAS21900

REMOVING THE FRONT WHEEL

ECA1KB8401

NOTICE

- Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the front speed sensor "1" or front speed sensor rotor "2"; otherwise, the sensor or rotor may be damaged, resulting in improper performance of the traction control system.
- Do not drop the front speed sensor rotor or subject it to shocks.
- If any solvent gets on the front speed sensor rotor, wipe it off immediately.



1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

2. Remove:
 - Front speed sensor
 - Left brake caliper
 - Right brake caliper

TIP

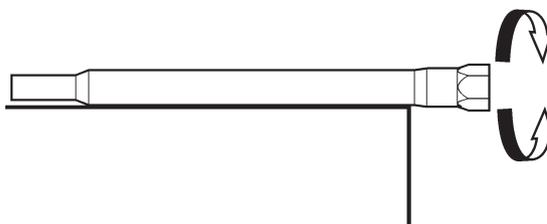
- Remove the front speed sensor first to prevent damage to the front speed sensor.
- Do not apply the brake lever when removing the brake calipers.

3. Loosen:
 - Front wheel axle pinch bolt
4. Remove:
 - Front wheel axle bolt
 - Front wheel axle
 - Front wheel

EAS21920

CHECKING THE FRONT WHEEL

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

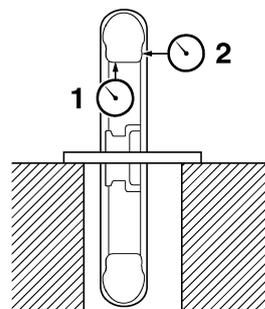


EWA13460

WARNING

Do not attempt to straighten a bent wheel axle.

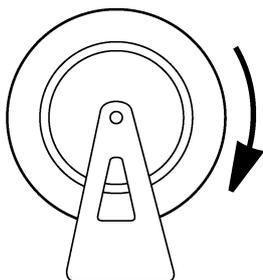
2. Check:
 - Tire
 - Front wheel
 - Damage/wear → Replace.
 - Refer to "CHECKING THE TIRES" on page 3-19 and "CHECKING THE WHEELS" on page 3-19.
3. Measure:
 - Radial wheel runout "1"
 - Lateral wheel runout "2"
 - Over the specified limits → Replace.



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.

FRONT WHEEL



5. Replace:

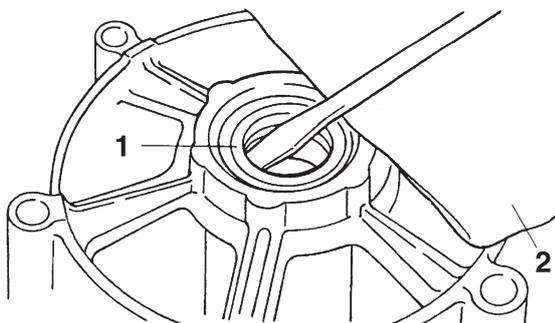
- Wheel bearings **New**
- Oil seals **New**



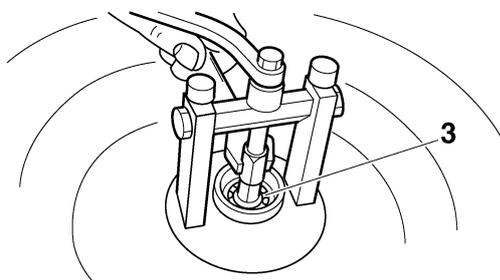
- Clean the outside of the front wheel hub.
- Remove the oil seals "1" with a flat-head screwdriver.

TIP

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



- Remove the wheel bearings "3" with a general bearing puller.



- Install the new wheel bearing (left side).

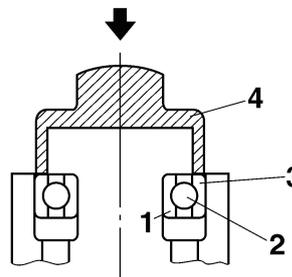
ECA2S31011

NOTICE

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

TIP

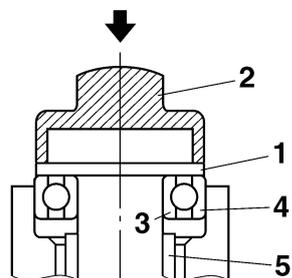
Use a socket "4" that matches the diameter of the wheel bearing outer race.



- Install the spacer.
- Install the new wheel bearing (right side).

TIP

Place a suitable washer "1" between the socket "2" and the bearing so that both the inner race "3" and outer race "4" are pressed at the same time, and then press the bearing until the inner race makes contact with the spacer "5".



- Install the new oil seals.



EAS1KB8401

MAINTENANCE OF THE FRONT SPEED SENSOR AND SENSOR ROTOR

ECA1KB8402

NOTICE

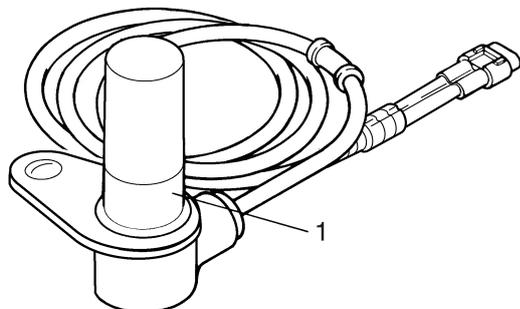
- Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the front speed sensor or front speed sensor rotor.
- Do not drop or shock the front speed sensor or the front speed sensor rotor.
- If any solvent gets on the front speed sensor rotor, wipe it off immediately.

FRONT WHEEL

- The front speed sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.

1. Check:

- Front speed sensor "1"
Cracks/bends/distortion → Replace.
Iron powder/dust → Clean.



2. Check:

- Front speed sensor rotor
Cracks/damage/scratches → Replace.
Iron powder/dust/solvent → Clean.

TIP

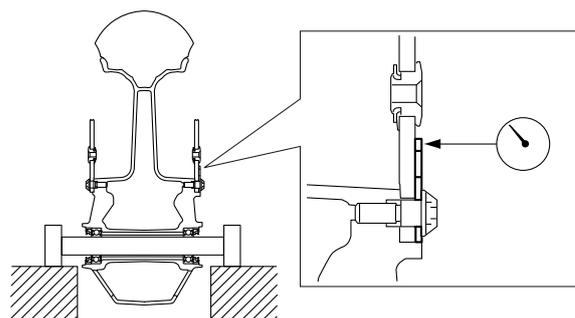
When cleaning the front speed sensor rotor, be careful not to damage the surface of the rotor.

3. Measure:

- Front speed sensor rotor deflection
Out of specification → Clean the installation surface of the front speed sensor rotor and correct the front speed sensor rotor deflection, or replace the front speed sensor rotor.

	Front speed sensor rotor deflection limit 0.25 mm (0.0098 in)
--	--

- Hold the dial gauge at a right angle against the front speed sensor rotor surface.
- Measure the front speed sensor rotor deflection 2.0 mm (0.08 in) below the edge of the front speed sensor rotor.



4. Adjust:

- Front speed sensor rotor deflection

- Remove the front speed sensor rotor.
- Rotate the front speed sensor rotor by 2 or 3 bolt hole.
- Install the front speed sensor rotor.

ECA1CW1401

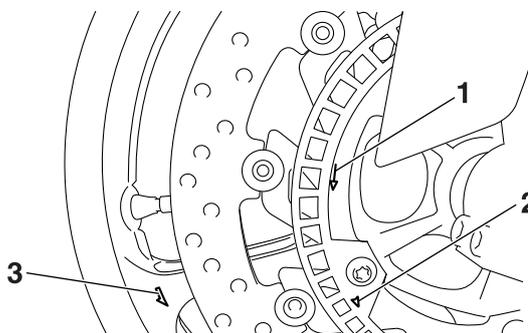
NOTICE

Replace the brake disc bolts with new ones.

TIP

- When installing the brake disc and front speed sensor rotor, align the arrow "1" on the brake disc, arrow "2" on the front speed sensor rotor and arrow "3" on the front wheel in the direction of wheel rotation.
- Tighten the brake disc bolts in stages and in a crisscross pattern.

	Brake disc bolt 18 Nm (1.8 m.kgf, 13 ft.lbf) LOCTITE®
--	--



- Measure the front speed sensor rotor deflection.
- If out of specification, repeat the adjustment steps (a) through (d) until the front speed sensor rotor deflection is within specification.

FRONT WHEEL

- f. If the front speed sensor rotor deflection cannot be brought within specification, replace the front speed sensor rotor.



EAS21970

ADJUSTING THE FRONT WHEEL STATIC BALANCE

TIP

- 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 and the front speed sensor rotor installed.

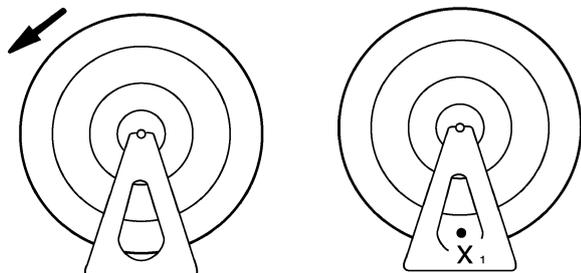
1. Remove:
 - Balancing weight(s)
2. Find:
 - Front wheel's heavy spot

TIP

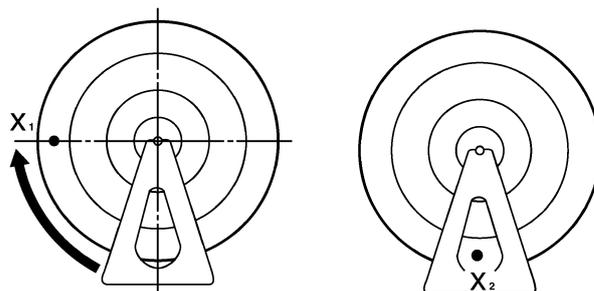
Place the front wheel on a suitable balancing stand.



- a. Spin the front wheel.
- b. When the front wheel stops, put an "X₁" mark at the bottom of the wheel.



- c. Turn the front wheel 90° so that the "X₁" mark is positioned as shown.
- d. Release the front wheel.
- e. When the wheel stops, put an "X₂" mark at the bottom of the wheel.



- f. Repeat steps (b) through (e) 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".



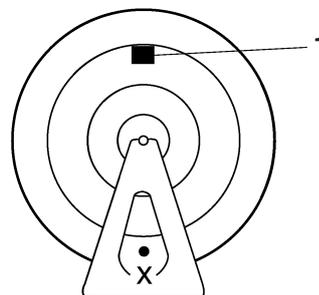
3. Adjust:
 - Front wheel static balance



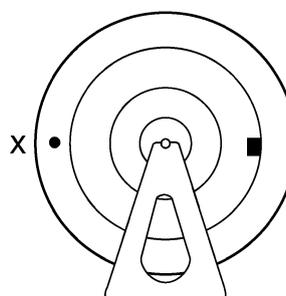
- a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".

TIP

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.



FRONT WHEEL

6. Lower the front wheel so that it is on the ground.
7. Tighten:
 - Front wheel axle bolt

	Front wheel axle bolt 91 Nm (9.1 m·kgf, 66 ft·lbf)
---	---

- Front wheel axle pinch bolt
Refer to “CHASSIS TIGHTENING TORQUES” on page 2-20.

	Front wheel axle pinch bolt 21 Nm (2.1 m·kgf, 15 ft·lbf)
---	---

ECA14B1002

NOTICE

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

8. Install:
 - Front speed sensor

	Front speed sensor bolt 7 Nm (0.7 m·kgf, 5.1 ft·lbf)
---	---

ECA1KB8404

NOTICE

Make sure there are no foreign materials in the front speed sensor rotor and front speed sensor. Foreign materials cause damage to the front speed sensor rotor and front speed sensor.

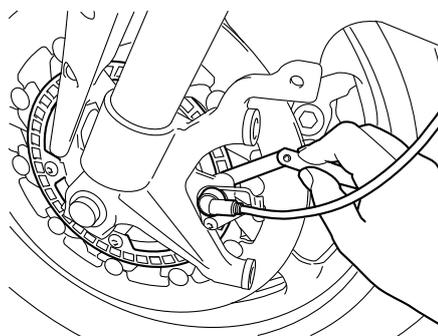
9. Measure:
 - Distance
(between the front speed sensor rotor and front speed sensor)
Out of specification → Check the wheel bearing for looseness, and the front speed sensor and sensor rotor installation conditions (warpage caused by over-torque, wrong installation direction, rotor decentering, LOCTITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.

	Distance (between the front speed sensor rotor and front speed sensor) 1.0–2.2 mm (0.04–0.09 in)
---	---

TIP

- Before measuring the distance between the front speed sensor rotor and front speed sensor, remove the brake caliper.
- Measure the distance between the front speed sensor rotor and front speed sensor in several places in one rotation of the front wheel. Do not turn the front wheel while the thickness gauge is installed. This may damage the front speed sensor rotor and the front speed sensor.

	Thickness gauge 90890-03180 Feeler gauge set YU-26900-9
---	--



10. Install:
 - Front brake calipers
 - Front brake hose holders

	Front brake caliper bolt 35 Nm (3.5 m·kgf, 25 ft·lbf) Front brake hose holder bolt 6 Nm (0.6 m·kgf, 4.3 ft·lbf)
---	--

EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-49.

ECA1KB8403

NOTICE

To route the front speed sensor lead, refer to “CABLE ROUTING” on page 2-49.

TIP

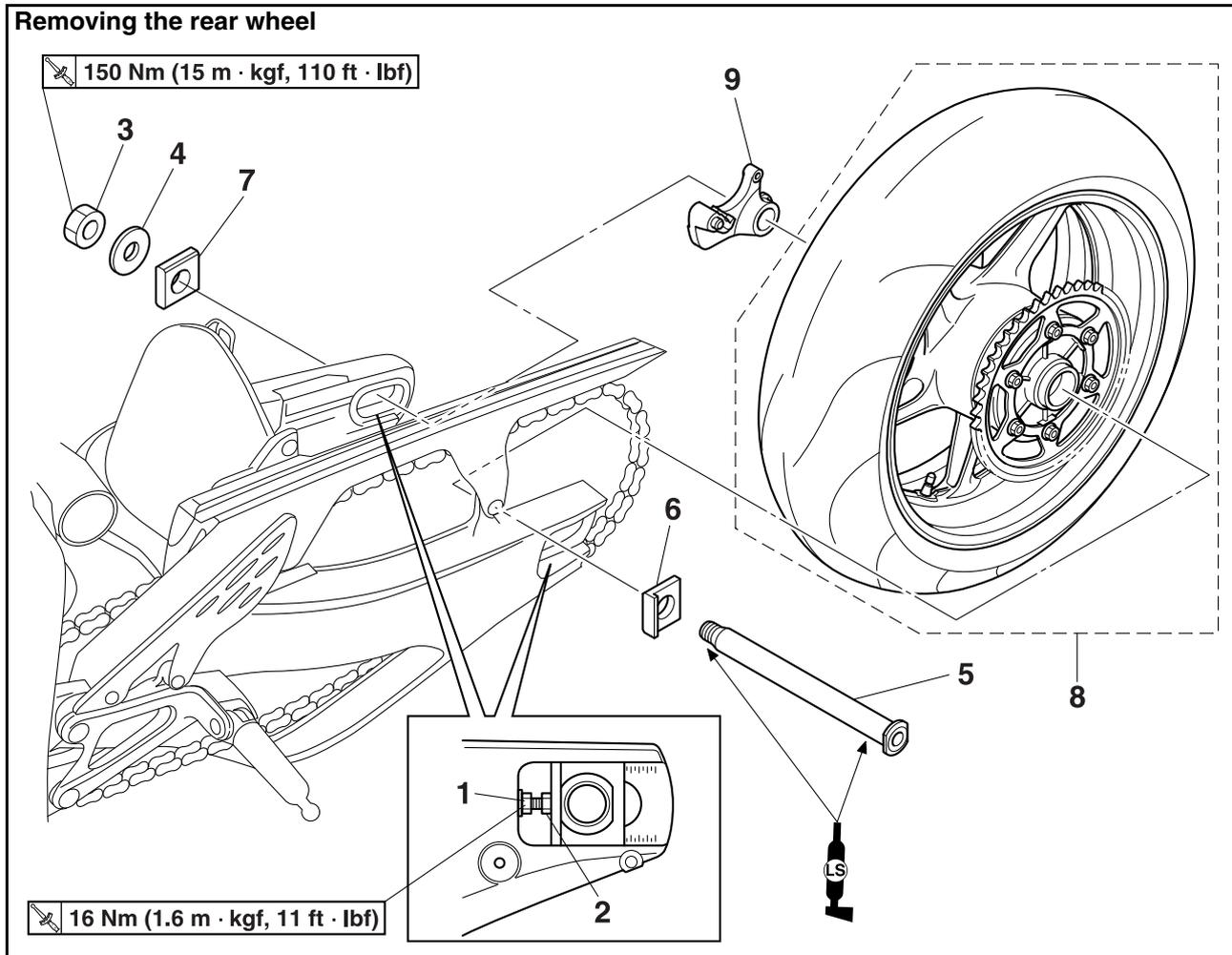
Make sure that there is enough space between the brake pads before installing the brake calipers on to the brake discs.

REAR WHEEL

EAS22020

REAR WHEEL

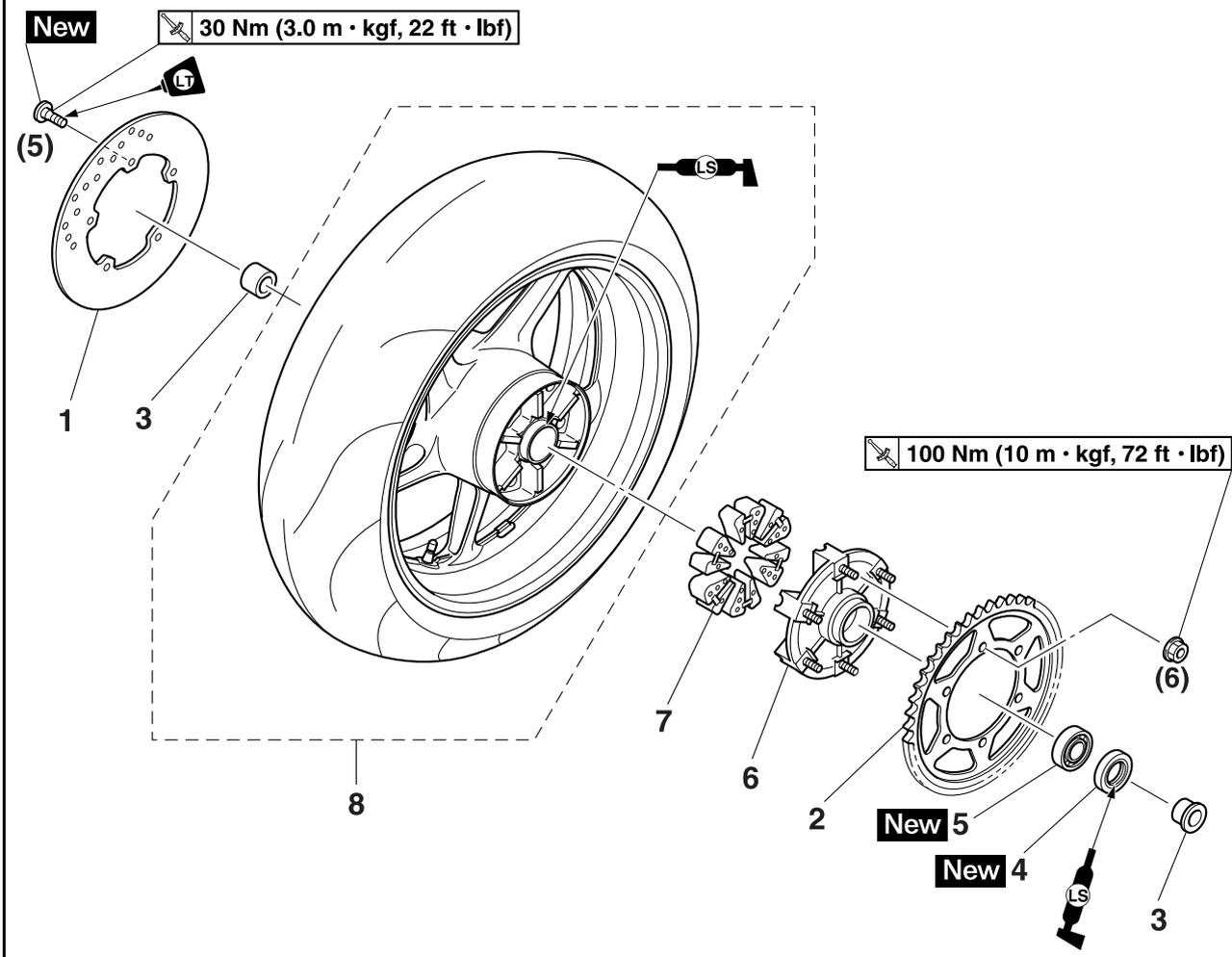
Removing the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-44.
1	Locknut (left and right)	2	Loosen.
2	Adjusting bolt (left and right)	2	Loosen.
3	Rear wheel axle nut	1	
4	Washer	1	
5	Rear wheel axle	1	
6	Adjusting block (left)	1	
7	Adjusting block (right)	1	
8	Rear wheel	1	
9	Rear brake caliper bracket	1	
			For installation, reverse the removal procedure.

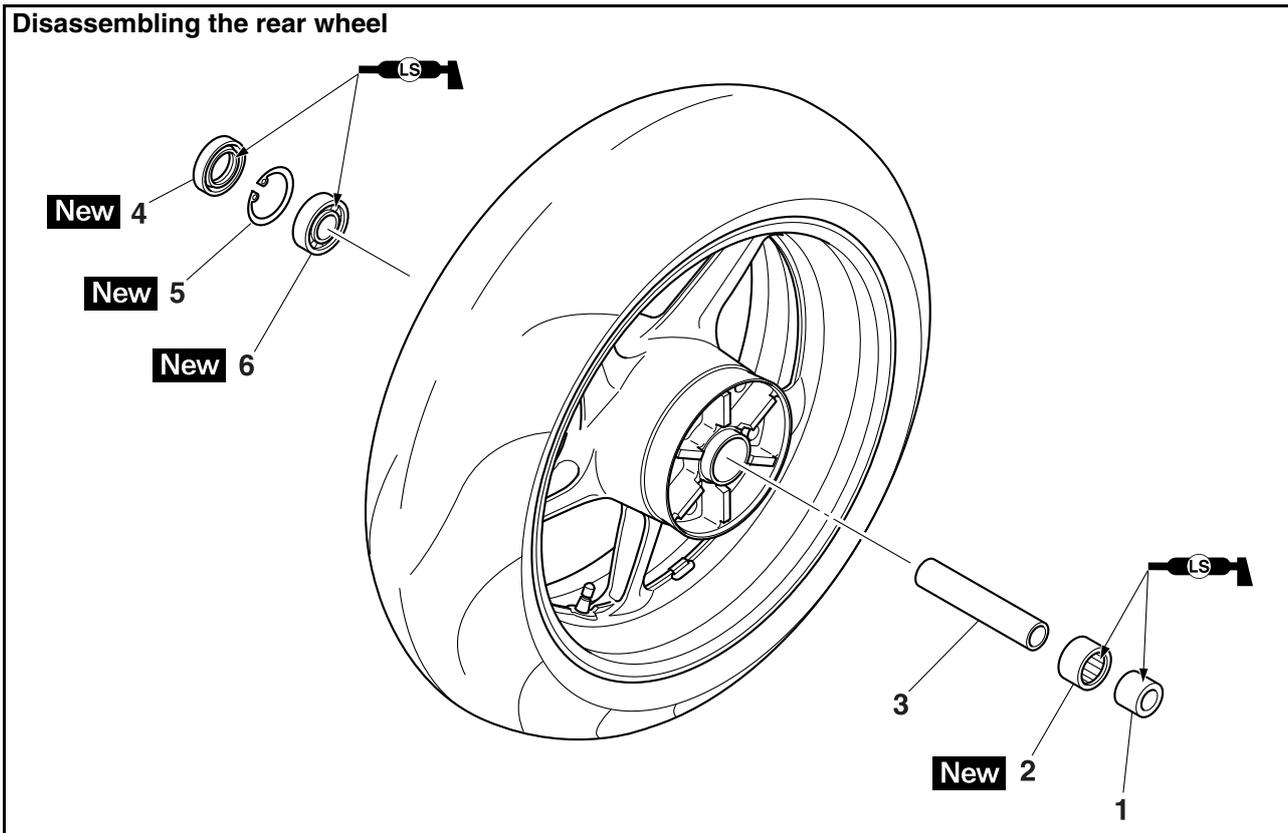
REAR WHEEL

Removing the brake disc and rear wheel sprocket



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake disc	1	
2	Rear wheel sprocket	1	
3	Collar	2	
4	Oil seal	1	
5	Bearing	1	
6	Rear wheel drive hub	1	
7	Rear wheel drive hub damper	6	
8	Rear wheel	1	
			For installation, reverse the removal procedure.

REAR WHEEL



Order	Job/Parts to remove	Q'ty	Remarks
1	Collar	1	
2	Bearing	1	
3	Spacer	1	
4	Oil seal	1	
5	Circlip	1	
6	Bearing	1	
			For assembly, reverse the disassembly procedure.

REAR WHEEL

EAS22040

REMOVING THE REAR WHEEL

1. Stand the vehicle on a level surface.

EWA13120

WARNING

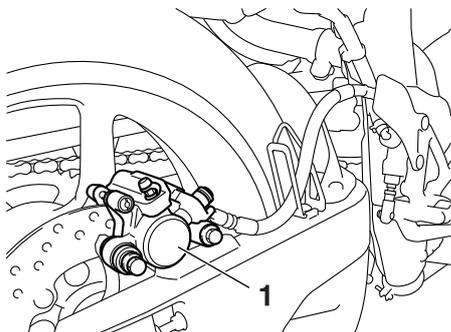
Securely support the vehicle so that there is no danger of it falling over.

TIP

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

2. Remove:

- Brake caliper "1"

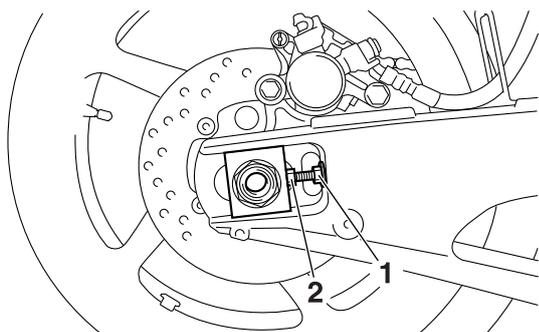


TIP

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

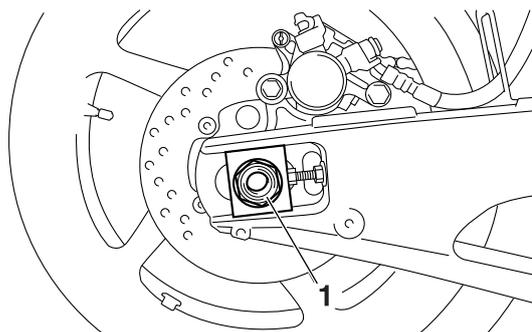
3. Loosen:

- Locknuts "1"
- Adjusting bolts "2"



4. Remove:

- Wheel axle nut "1"
- Wheel axle
- Rear wheel

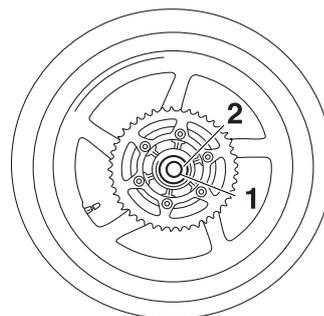


TIP

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



EAS22090

CHECKING THE REAR WHEEL

1. Check:

- Wheel axle
- Rear wheel
- Wheel bearings
- Oil seals

Refer to "CHECKING THE FRONT WHEEL" on page 4-19.

2. Check:

- Tire
- Rear wheel

Damage/wear → Replace.

Refer to "CHECKING THE TIRES" on page 3-19 and "CHECKING THE WHEELS" on page 3-19.

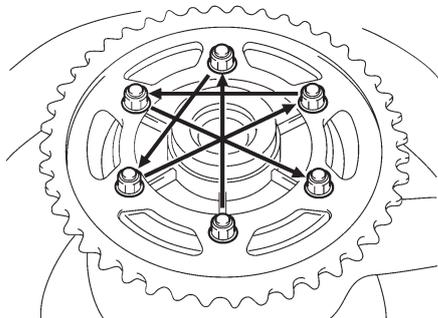
3. Measure:

- Radial wheel runout
- Lateral wheel runout

Refer to "CHECKING THE FRONT WHEEL" on page 4-19.

REAR WHEEL

TIP
Tighten the self-locking nuts in stages and in a crisscross pattern.



EAS22150
ADJUSTING THE REAR WHEEL STATIC BALANCE

TIP

- 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" on page 4-22.

EAS22160
INSTALLING THE REAR WHEEL

1. Lubricate:
 - Wheel axle
 - Wheel bearings
 - Oil seal lips

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

2. Adjust:
 - Drive chain slack
Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-21.

	Drive chain slack (when adjusting the drive chain) 25.0–35.0 mm (0.98–1.38 in) Drive chain slack (when replacing the drive chain and sprocket) 20.0–30.0 mm (0.79–1.18 in)
---	---

3. Tighten:
 - Rear wheel axle nut
 - Rear brake caliper bolts

	Rear wheel axle nut 150 Nm (15 m.kgf, 110 ft.lbf) Rear brake caliper bolt (front side) 27 Nm (2.7 m.kgf, 19 ft.lbf) Rear brake caliper bolt (rear side) 22 Nm (2.2 m.kgf, 16 ft.lbf)
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EWA13530

WARNING

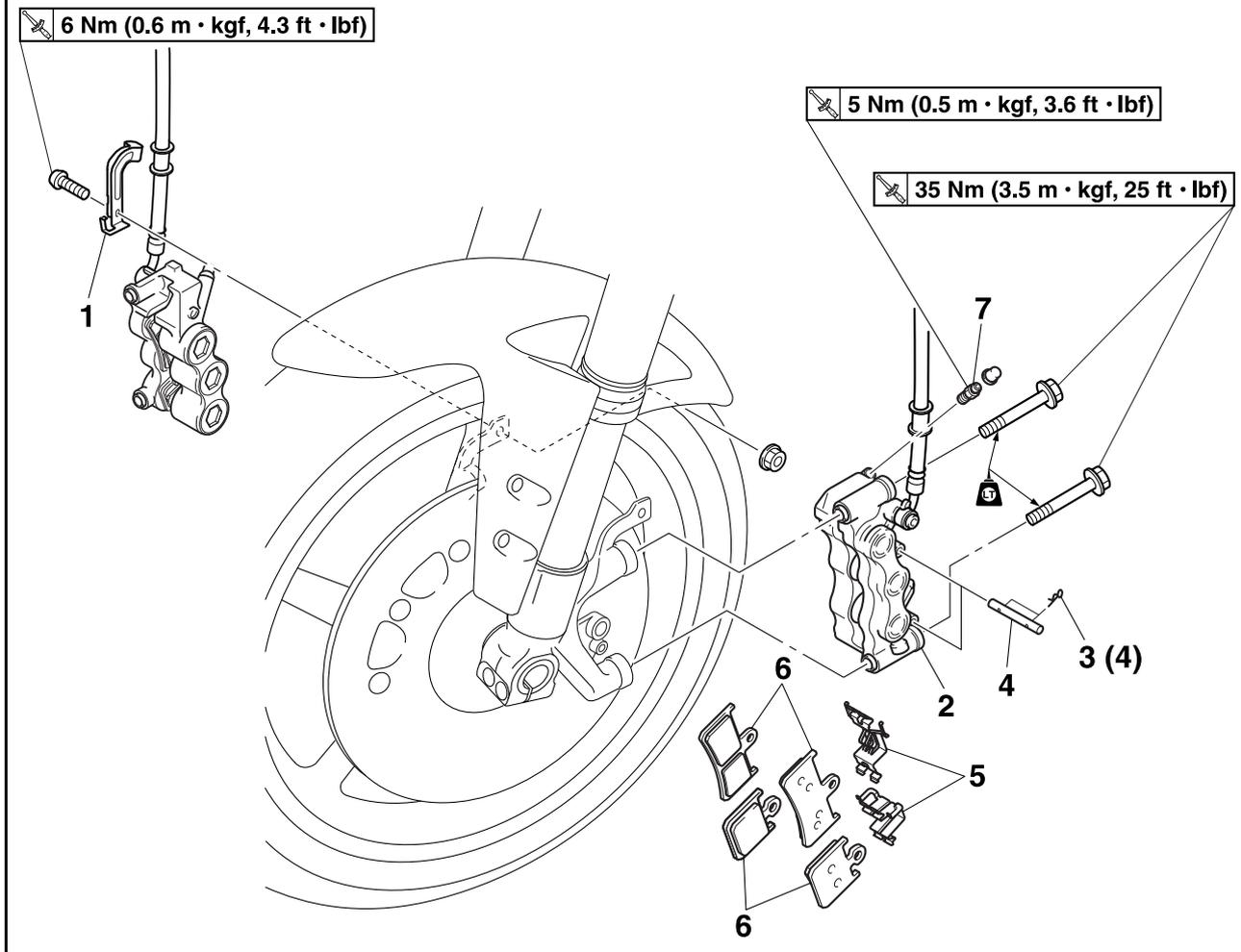
Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-49.

FRONT BRAKE

EAS22210

FRONT BRAKE

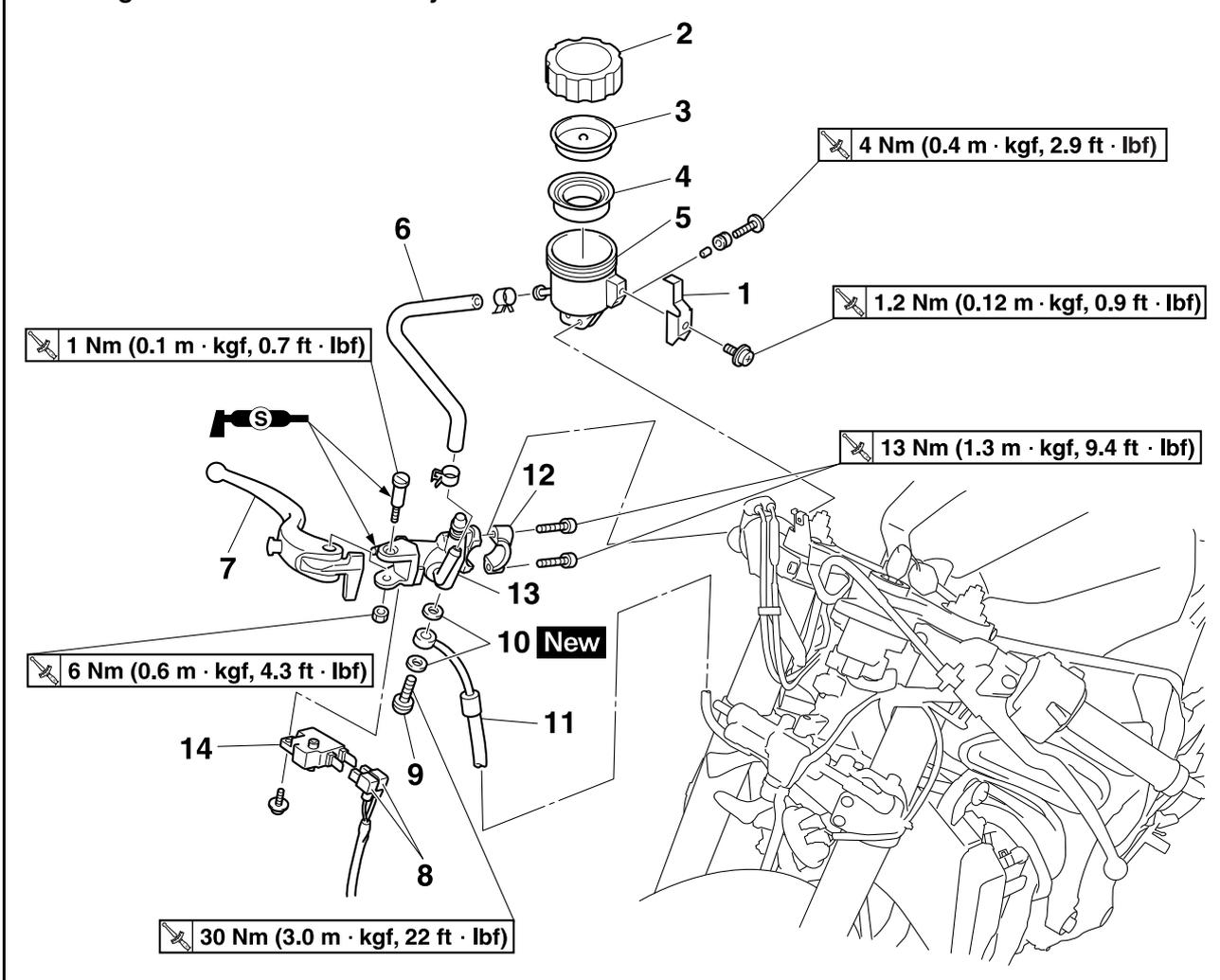
Removing the front brake pads



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
	Front speed sensor		Refer to "FRONT WHEEL" on page 4-17.
1	Brake hose holder	1	Right side
2	Front brake caliper	1	
3	Brake pad clip	4	
4	Brake pad pin	2	
5	Brake pad spring	2	
6	Brake pad kit	1	
7	Bleed screw	1	
			For installation, reverse the removal procedure.

FRONT BRAKE

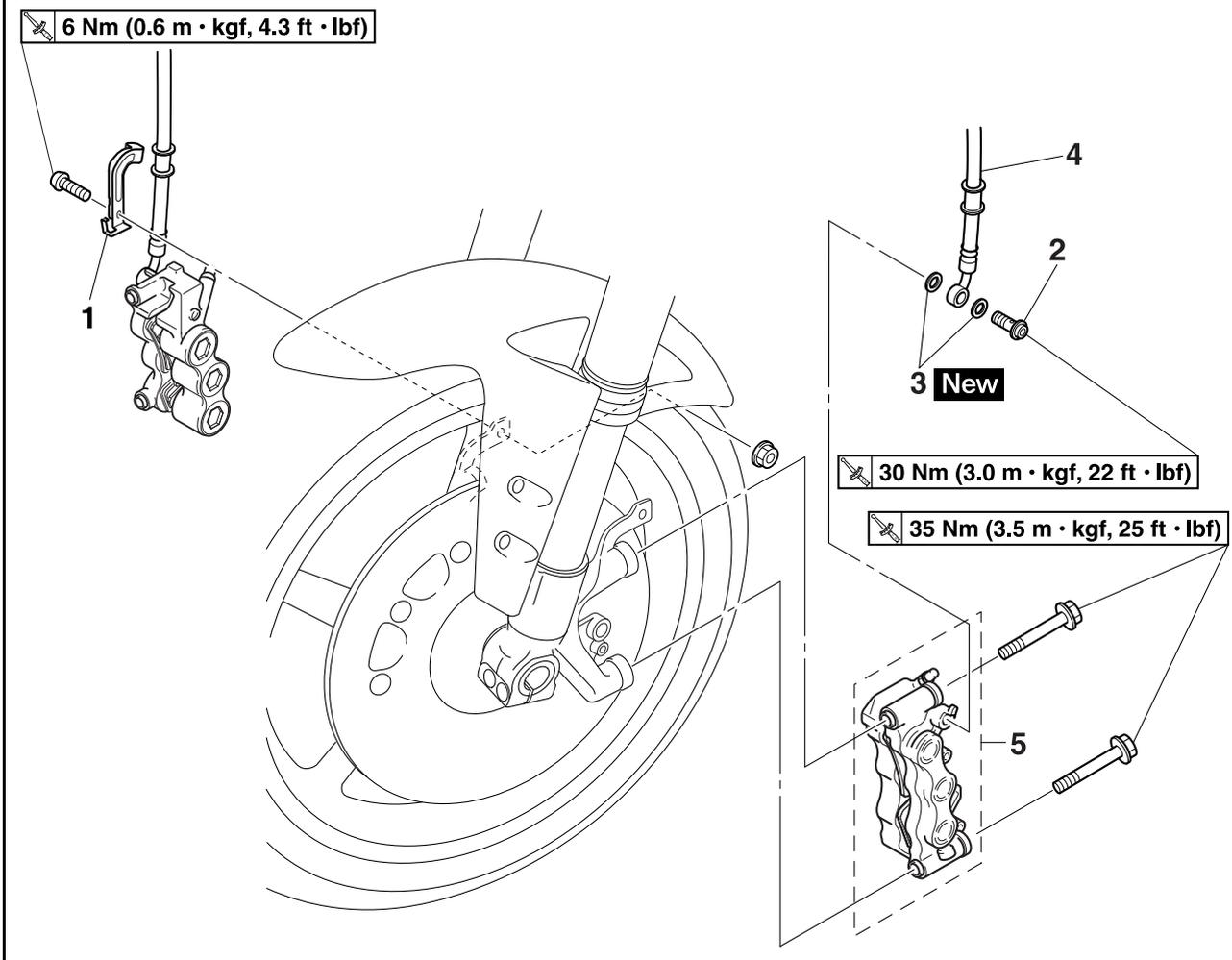
Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-17.
1	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 tank	1	
6	Brake fluid reservoir hose	1	
7	Brake lever	1	
8	Front brake light switch connector	2	Disconnect.
9	Union bolt	1	
10	Washer	2	
11	Brake hose	1	
12	Brake master cylinder holder	1	
13	Brake master cylinder	1	
14	Front brake light switch	1	
			For installation, reverse the removal procedure.

FRONT BRAKE

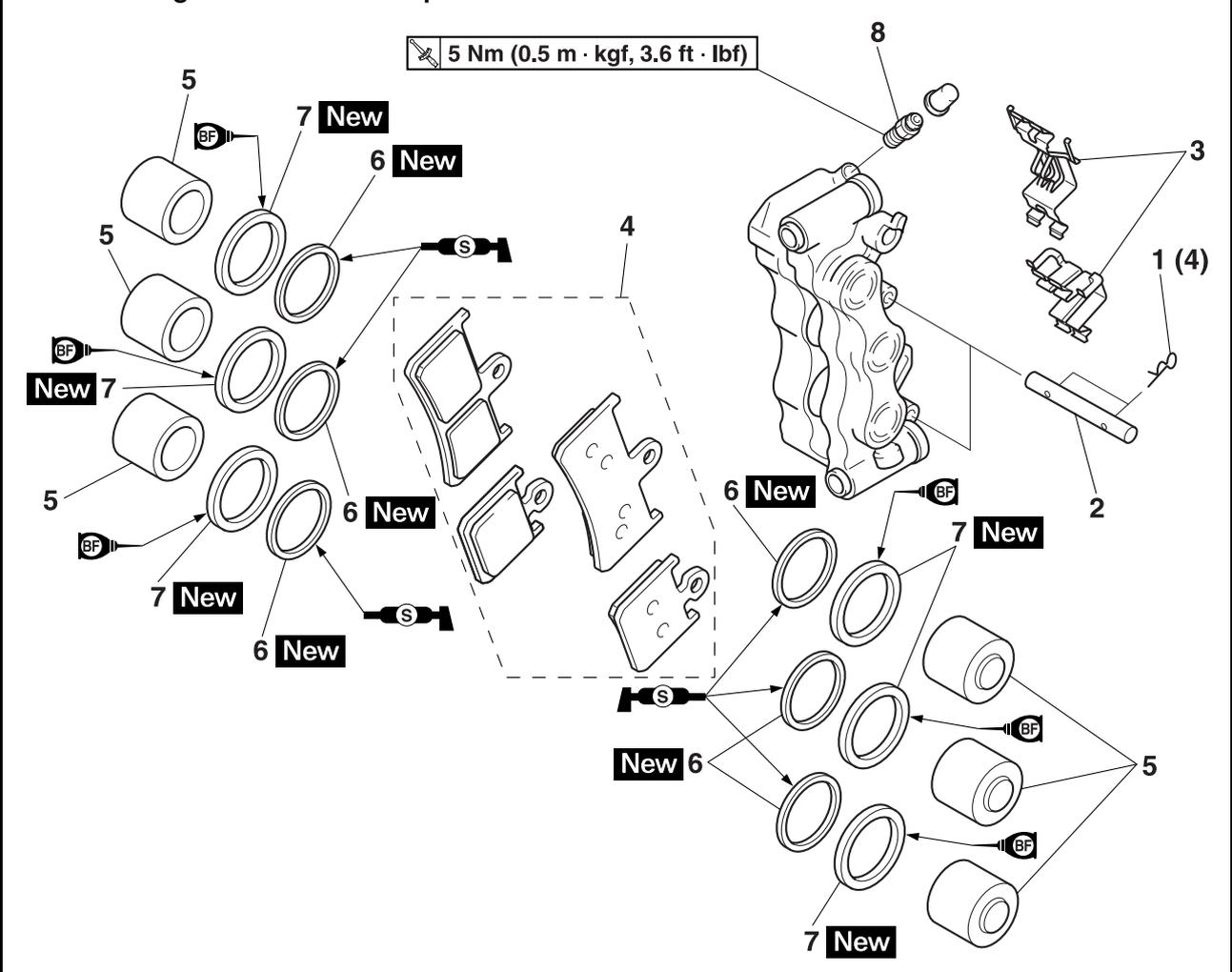
Removing the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
	Front speed sensor		Refer to "FRONT WHEEL" on page 4-17.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-17.
1	Brake hose holder	1	Right side
2	Union bolt	1	
3	Washer	2	
4	Brake hose	1	
5	Brake caliper	1	
			For installation, reverse the removal procedure.

FRONT BRAKE

Disassembling the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad clip	4	
2	Brake pad pin	2	
3	Brake pad spring	2	
4	Brake pad kit	1	
5	Brake caliper piston	6	
6	Brake caliper piston dust seal	6	
7	Brake caliper piston seal	6	
8	Bleed screw	1	
			For installation, reverse the removal procedure.

FRONT BRAKE

ECA1CW1401

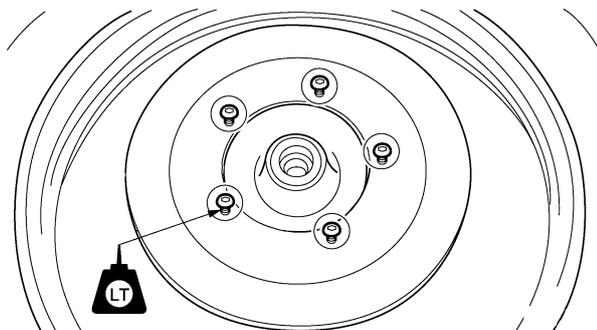
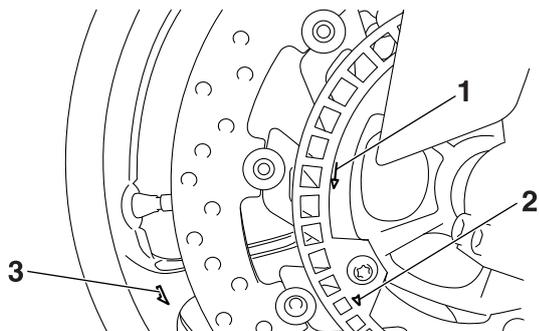
NOTICE

Replace the brake disc bolts with new ones.

TIP

- When installing the brake disc and front speed sensor rotor (only on the left side), align the arrow "1" on the brake disc, arrow "2" on the front speed sensor rotor and arrow "3" on the front wheel in the direction of wheel rotation.
- Tighten the brake disc bolts in stages and in a crisscross pattern.

	<p>Brake disc bolt 18 Nm (1.8 m·kgf, 13 ft·lbf) LOCTITE®</p>
---	---



- Measure the brake disc deflection.
- If out of specification, repeat the adjustment steps (a) through (d) until the brake disc deflection is within specification.
- If the brake disc deflection cannot be brought within specification, replace the brake disc.



- Install:
 - Front wheel
 Refer to "FRONT WHEEL" on page 4-17.

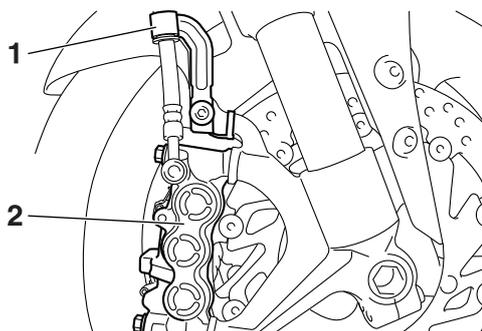
EAS14B1004

REPLACING THE FRONT BRAKE PADS

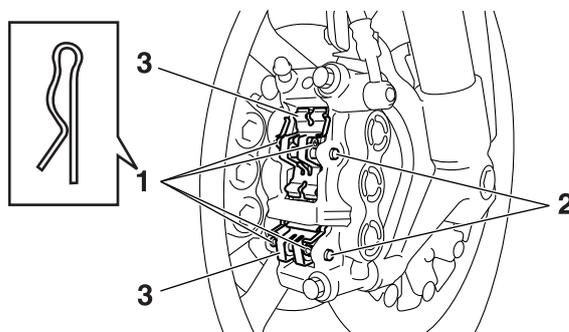
TIP

- When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.
- Remove the front speed sensor first to prevent damage to the front speed sensor.

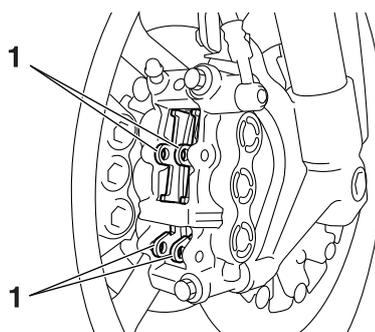
- Remove:
 - Brake hose holder "1"
 - Front speed sensor
 - Brake caliper "2"



- Remove:
 - Brake pad clips "1"
 - Brake pad pins "2"
 - Brake pad springs "3"



- Remove:
 - Brake pads "1"



FRONT BRAKE

8. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-17.

EAS22300

REMOVING THE FRONT BRAKE CALIPERS

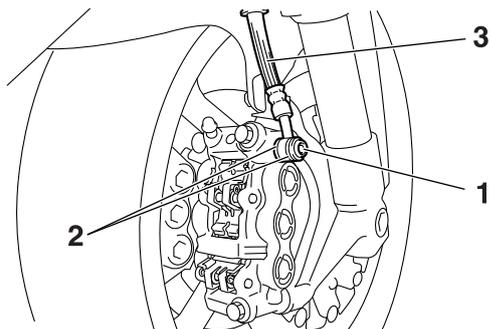
The following procedure applies to both of the brake calipers.

TIP

- Remove the front speed sensor first to prevent damage to the front speed sensor.
- Before removing the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:

- Front speed sensor
- Union bolt “1”
- Washers “2”
- Brake hose “3”



TIP

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

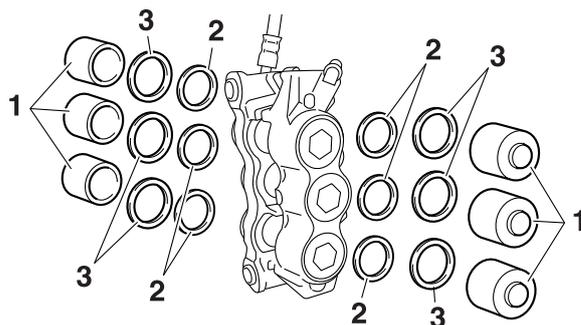
EAS22360

DISASSEMBLING THE FRONT BRAKE CALIPERS

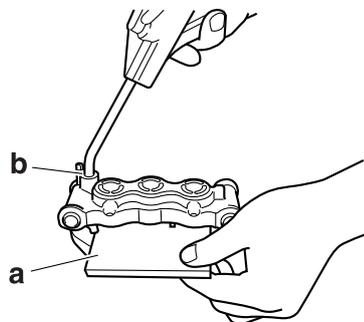
The following procedure applies to both of the brake calipers.

1. Remove:

- Brake caliper pistons “1”
- Brake caliper piston dust seals “2”
- Brake caliper piston seals “3”



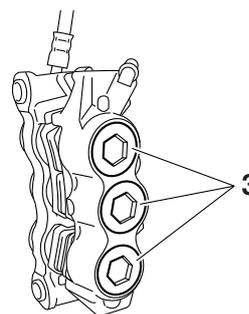
- Secure the right side brake caliper pistons with a piece of wood “a”.
- Blow compressed air into the brake hose joint opening “b” to force out the left side pistons from the brake caliper.



EWA14B1002

⚠ WARNING

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



- Remove the brake caliper piston dust seals and brake caliper piston seals.
- Cover the left piston with a cloth so that air does not leak from it and repeat the above procedure (a)–(c), and then push out the right piston from the brake caliper.



FRONT BRAKE

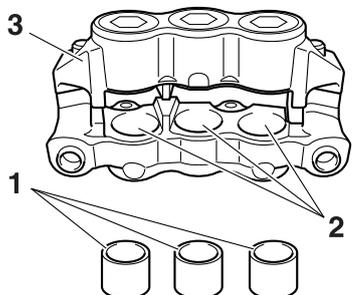
EAS22390

CHECKING THE FRONT BRAKE CALIPERS

Recommended brake component replacement schedule	
Brake pads	If necessary
Piston dust seals and 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.



EWA14B1003

WARNING

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

EAS22410

ASSEMBLING THE FRONT BRAKE CALIPERS

EWA14B1004

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 dust seals and brake caliper piston seals.



Recommended fluid
DOT 4

EAS22450

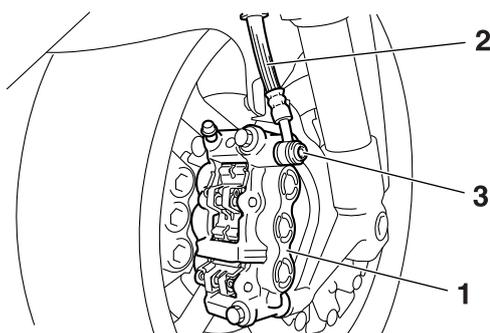
INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

1. Install:
 - Brake pads
 - Brake pad springs
 - Brake pad pins
2. Install:
 - Brake caliper “1”
 - Copper washers **New**
 - Brake hose “2”
 - Union bolt “3”
 - Front speed sensor
 - Brake hose holder



Front brake caliper bolt
35 Nm (3.5 m.kgf, 25 ft.lbf)
Front brake hose union bolt
30 Nm (3.0 m.kgf, 22 ft.lbf)
Front speed sensor bolt
7 Nm (0.7 m.kgf, 5.1 ft.lbf)
Front brake hose holder
6 Nm (0.6 m.kgf, 4.3 ft.lbf)



EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-49.

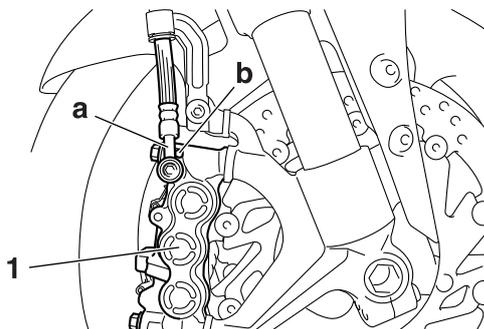
ECA14170

NOTICE

When installing the brake hose onto the brake caliper “1”, make sure the brake pipe

FRONT BRAKE

“a” touches the projection “b” on the brake caliper.



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



EWA13090

WARNING

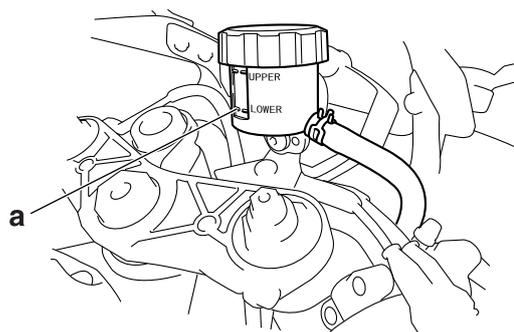
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

NOTICE

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” on page 3-17.
5. Check:
 - Brake fluid level
Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-15.



6. Check:
 - Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-17.

EAS22490

REMOVING THE FRONT BRAKE MASTER CYLINDER

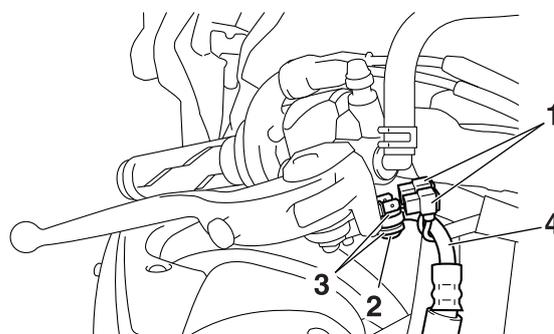
TIP

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

1. Disconnect:
 - Front brake light switch connectors “1” (from the brake switch)
2. Remove:
 - Union bolt “2”
 - Washers “3”
 - Brake hose “4”

TIP

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



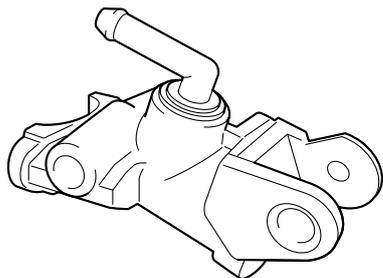
3. Remove:
 - Brake master cylinder holder
 - Brake master cylinder

FRONT BRAKE

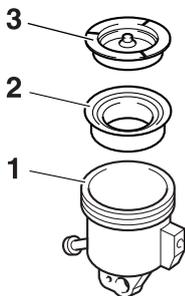
EAS22510

CHECKING THE FRONT BRAKE MASTER CYLINDER

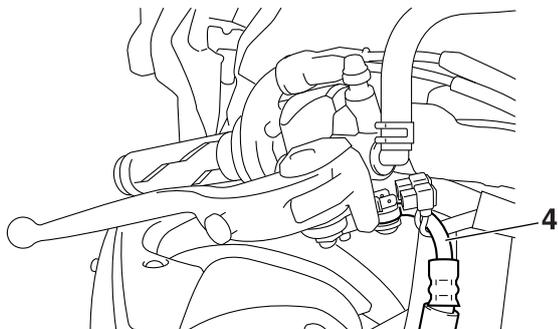
1. Check:
 - Brake master cylinder
Damage/scratches/wear → Replace.
 - Brake fluid delivery passages (brake master cylinder body)
Obstruction → Blow out with compressed air.



2. Check:
 - Brake fluid reservoir tank "1"
Cracks/damage → Replace.
 - Brake fluid reservoir diaphragm "2"
Damage/wear → Replace.
 - Brake fluid reservoir diaphragm holder "3"
Cracks/damage → Replace.



3. Check:
 - Brake hose "4"
Cracks/damage/wear → Replace.



EAS22520

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520

⚠ 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 fluid
DOT 4**

1. Install:
 - Brake master cylinder kit **New**

EAS22540

INSTALLING THE FRONT BRAKE MASTER CYLINDER

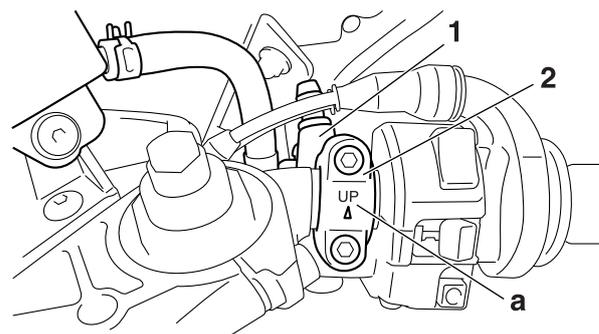
1. Install:
 - Brake master cylinder "1"
 - Brake master cylinder holder "2"



**Front brake master cylinder holder bolt
13 Nm (1.3 m·kgf, 9.4 ft·lbf)**

TIP

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



2. Install:
 - Washers **New**
 - Brake hose
 - Union bolt



**Front brake hose union bolt
30 Nm (3.0 m·kgf, 22 ft·lbf)**

FRONT BRAKE

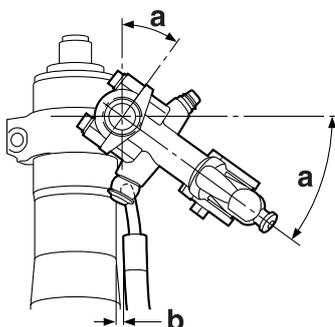
EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-49.

TIP

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



- a. 36°
- b. 3 mm (0.12 in)

3. Fill:

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



EWA13090

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.

ECA13540

NOTICE

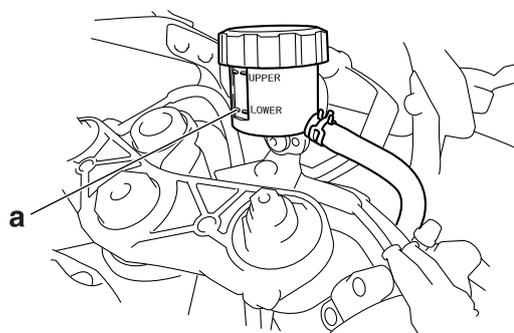
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-17.

5. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-15.



6. Check:

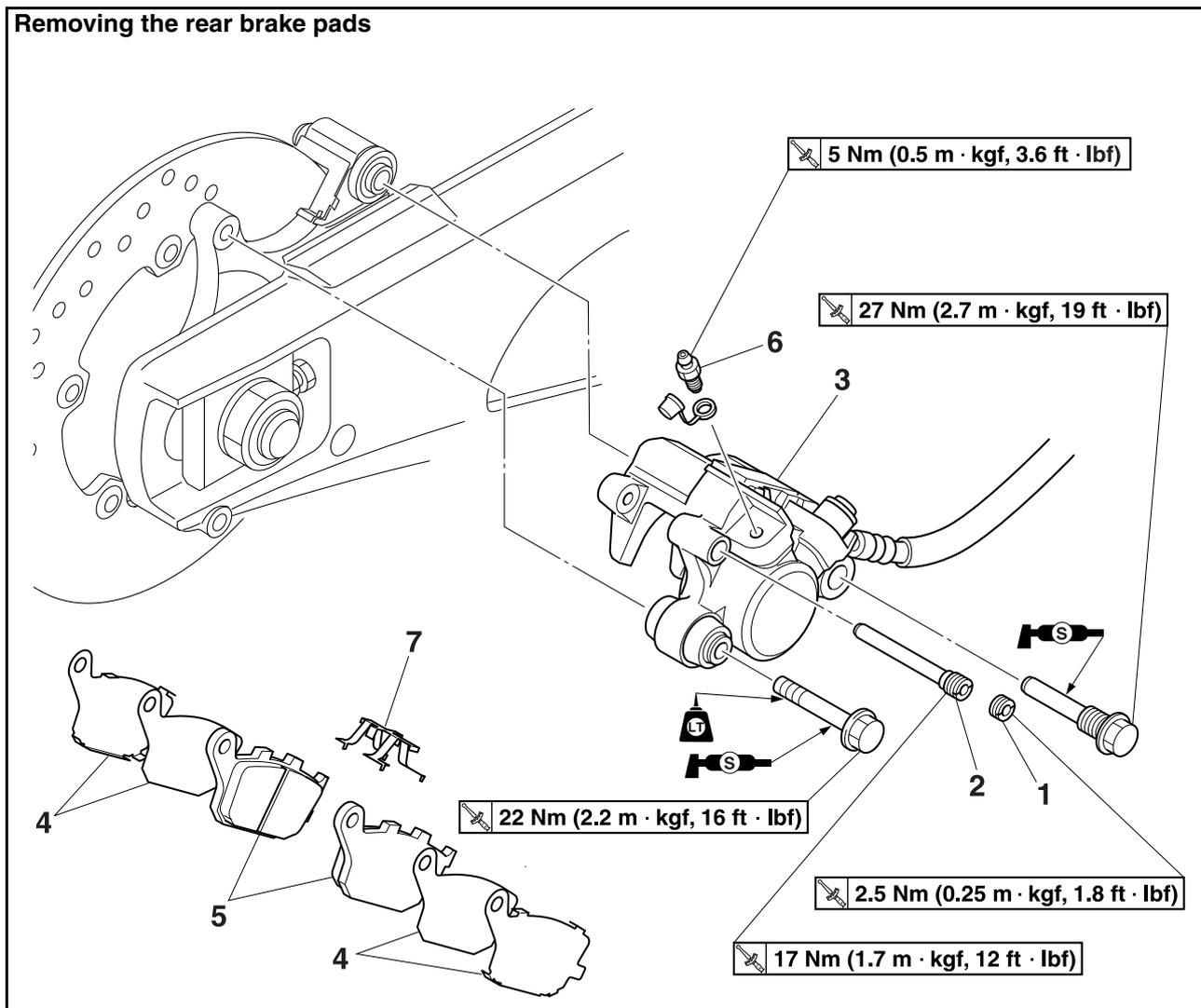
- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-17.

REAR BRAKE

EAS22550

REAR BRAKE

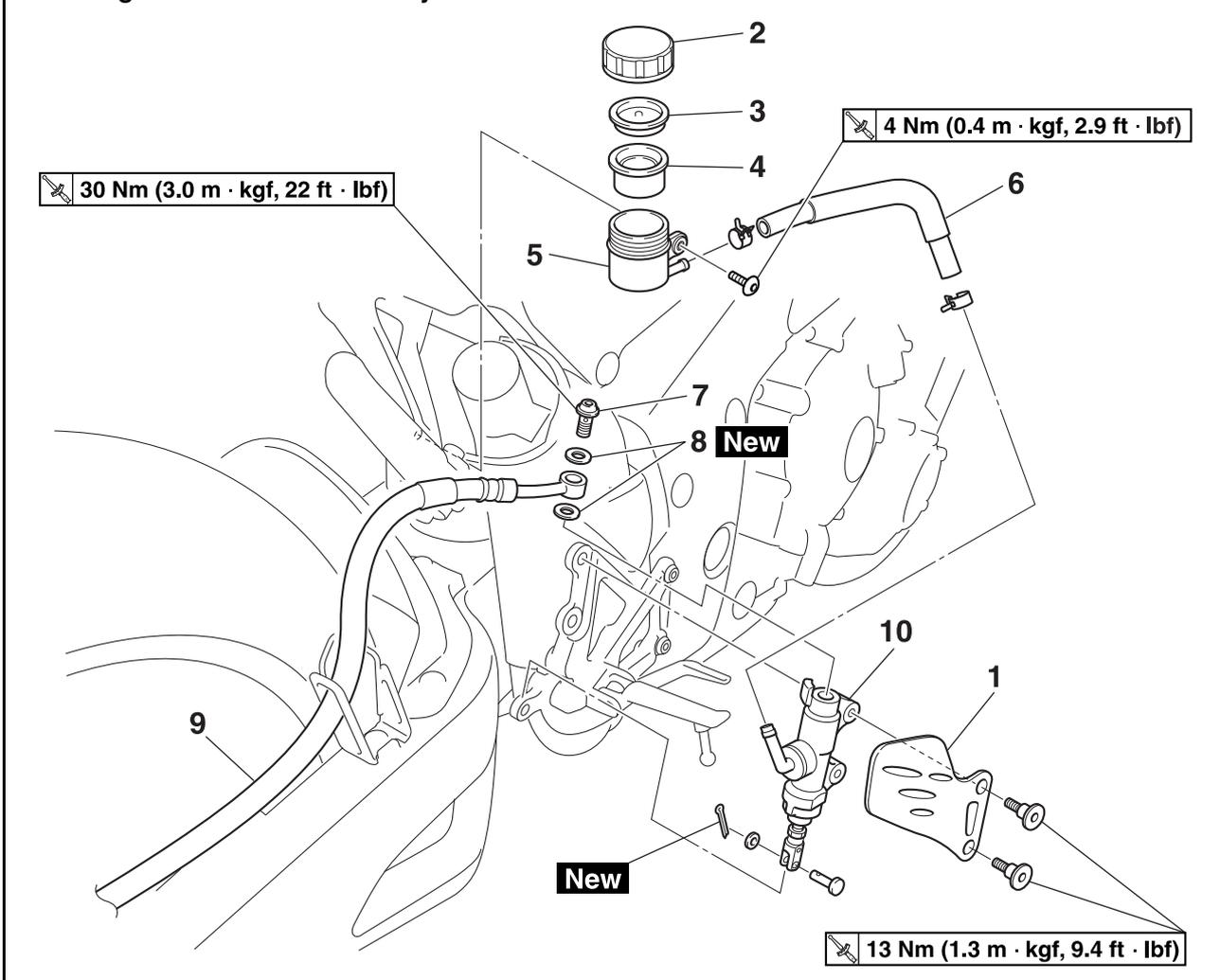
Removing the rear brake pads



Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad pin	1	
3	Rear brake caliper	1	
4	Brake pad shim	4	
5	Brake pad kit	1	
6	Bleed screw	1	
7	Brake pad spring	1	
			For installation, reverse the removal procedure.

REAR BRAKE

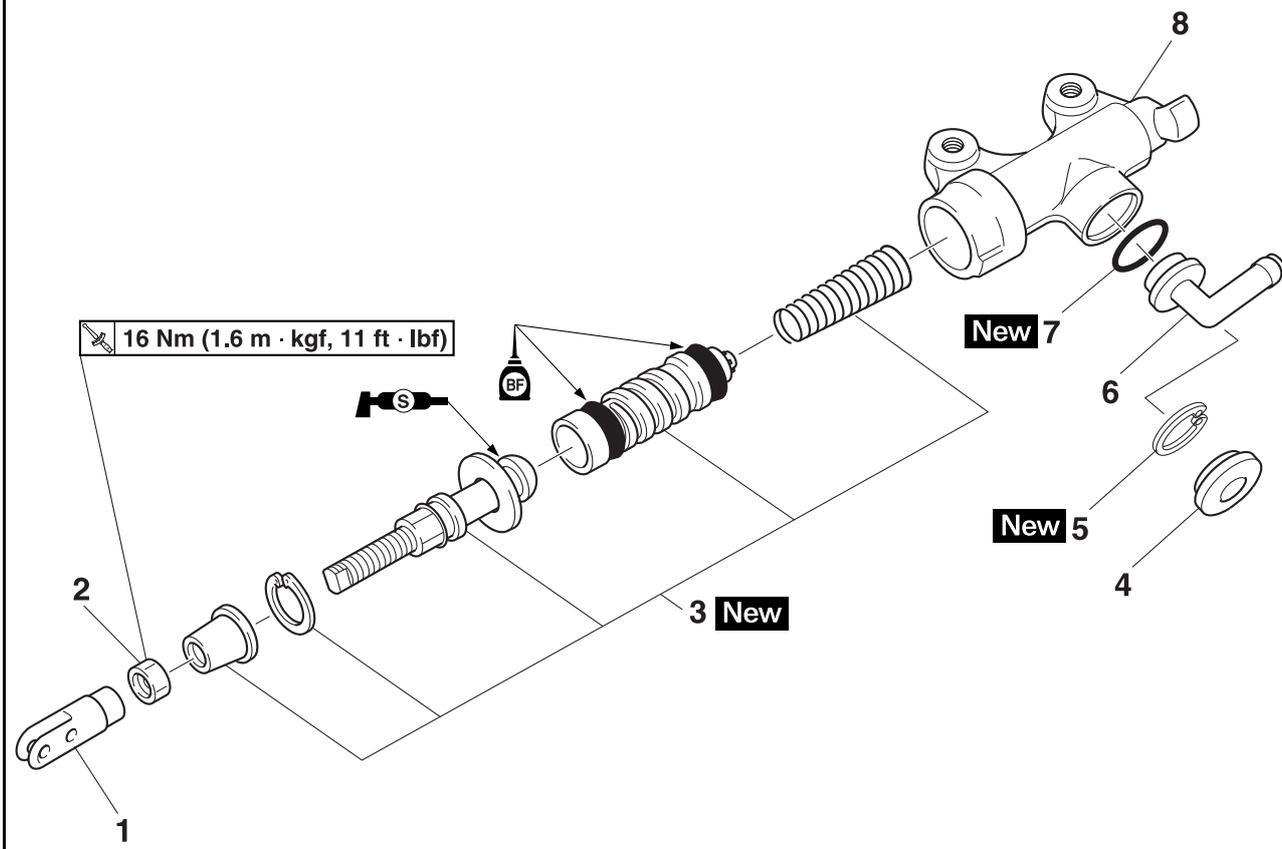
Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-17.
1	Footrest plate	1	
2	Brake fluid reservoir cap	1	
3	Rear brake fluid reservoir diaphragm holder	1	
4	Rear brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir tank	1	
6	Brake fluid reservoir hose	1	
7	Union bolt	1	
8	Washer	2	
9	Brake hose	1	
10	Brake master cylinder	1	
			For installation, reverse the removal procedure.

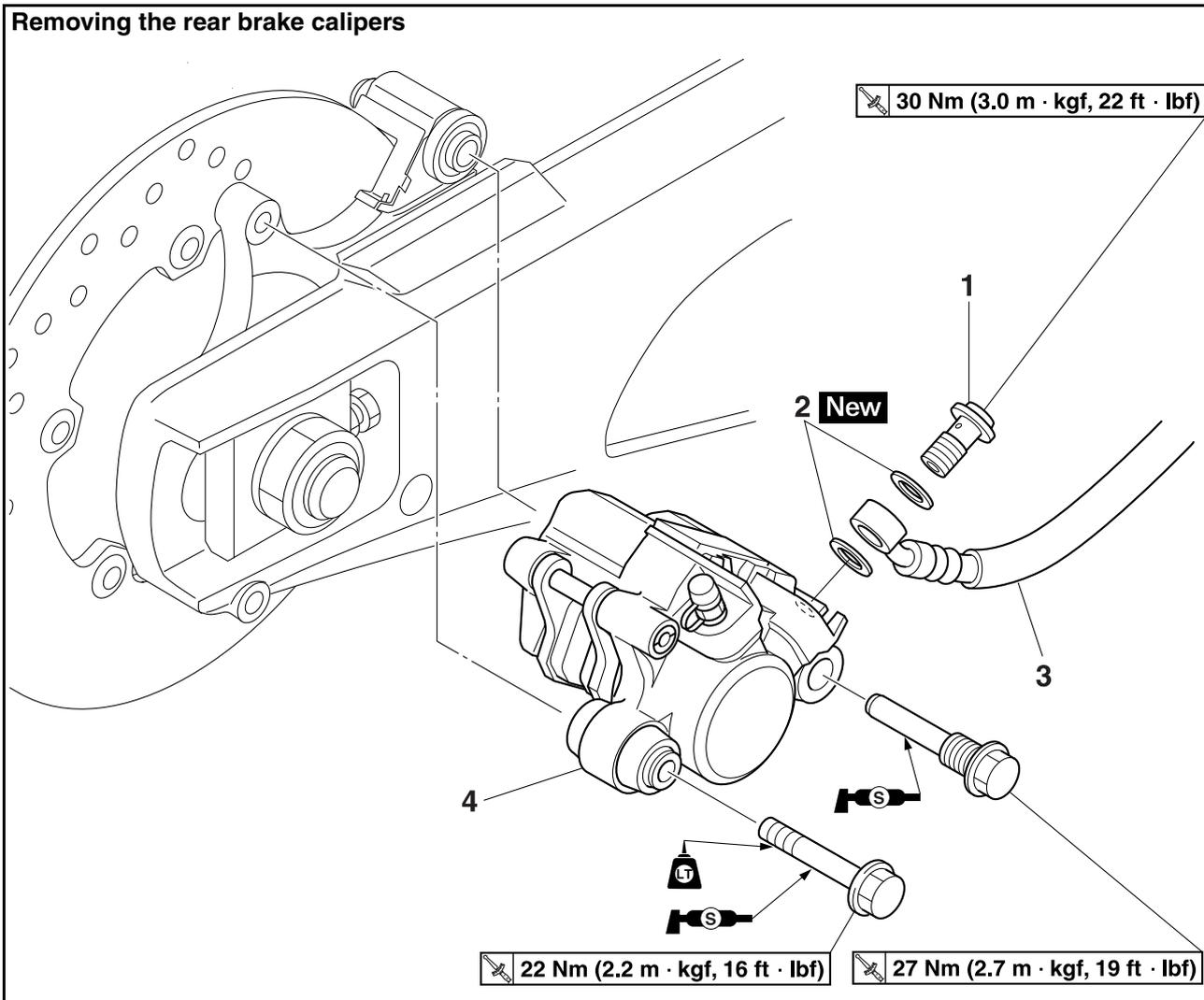
REAR BRAKE

Disassembling the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder yoke	1	
2	Adjusting nut	1	
3	Brake master cylinder kit	1	
4	Dust cover	1	
5	Circlip	1	
6	Hose joint	1	
7	O-ring	1	
8	Brake master cylinder body	1	
			For installation, reverse the removal procedure.

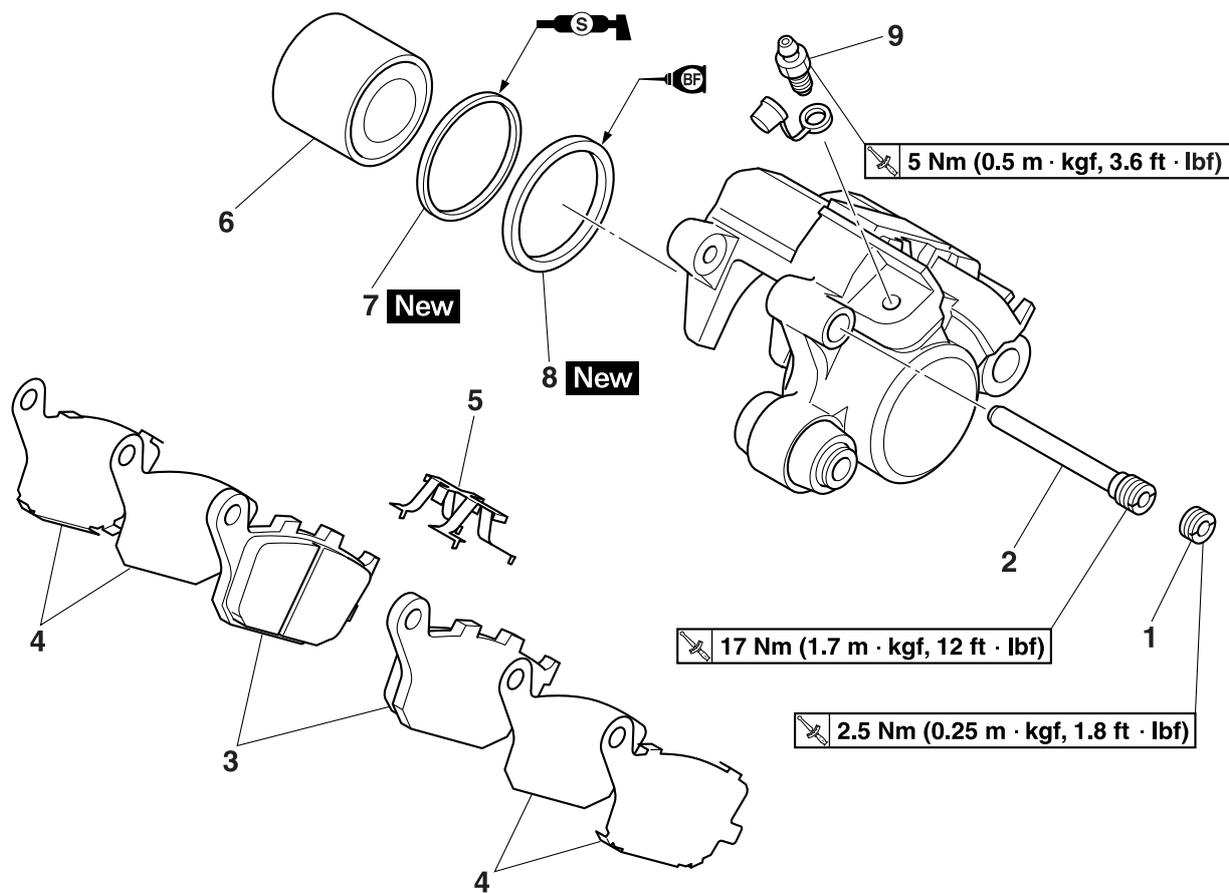
REAR BRAKE



Order	Job/Parts to remove	Q'ty	Remarks
1	Union bolt	1	
2	Washer	2	
3	Brake hose	1	
4	Brake caliper	1	
			For installation, reverse the removal procedure.

REAR BRAKE

Disassembling the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad pin	1	
3	Brake pad kit	1	
4	Brake pad shim	4	
5	Brake pad spring	1	
6	Brake caliper piston	1	
7	Brake caliper piston dust seal	1	
8	Brake caliper piston seal	1	
9	Bleed screw	1	
			For installation, reverse the removal procedure.

REAR BRAKE

EAS22560

INTRODUCTION

EWA14100

WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
- **FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**
- Flush with water for 15 minutes and get immediate medical attention.

EAS22570

CHECKING THE REAR BRAKE DISC

1. Remove:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-25.
2. Check:
 - Brake disc
Damage/galling → Replace.
3. Measure:
 - Brake disc deflection
Out of specification → Correct the brake disc deflection or replace the brake disc.
Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-36.



**Brake disc deflection limit
0.15 mm (0.0059 in)**

4. Measure:
 - Brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.
Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-36.



**Brake disc thickness limit
4.5 mm (0.18 in)**

5. Adjust:
 - Brake disc deflection
Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-36.



**Rear brake disc bolt
30 Nm (3.0 m·kgf, 22 ft·lbf)
LOCTITE®**

6. Install:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-25.

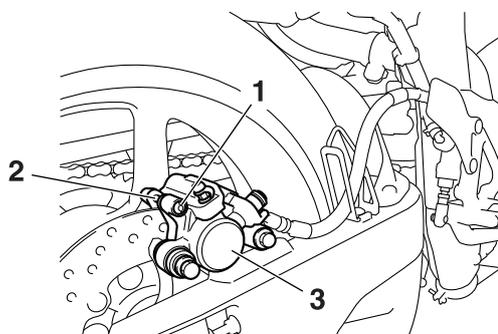
EAS22580

REPLACING THE REAR BRAKE PADS

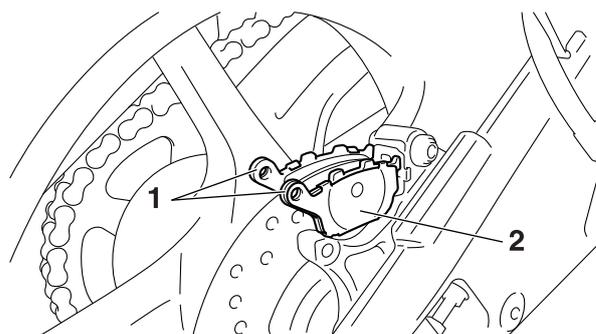
TIP

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

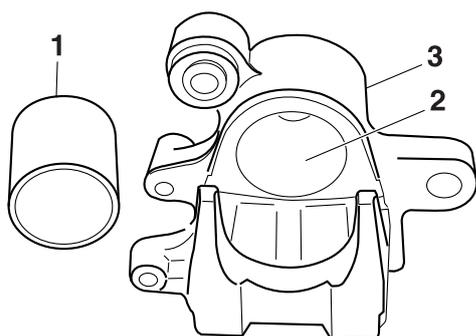
1. Remove:
 - Screw plug "1"
 - Brake pad pin "2"
 - Brake caliper "3"
 - Brake pad spring



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



REAR BRAKE



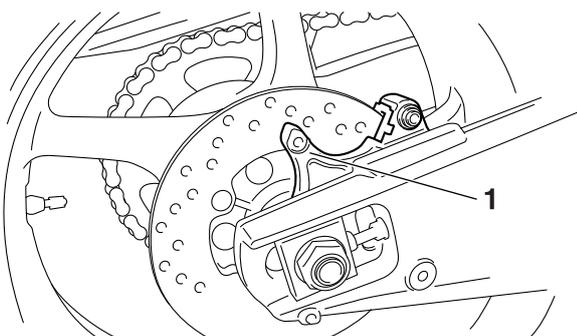
EWA14B1005

WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston dust seal and brake caliper piston seal.

2. Check:

- Brake caliper bracket "1"
Cracks/damage → Replace.



EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA14B1006

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 dust seal and brake caliper piston seal.



Recommended fluid
DOT 4

EAS22670

INSTALLING THE REAR BRAKE CALIPER

1. Install:

- Brake caliper "1"
(temporarily)
- Washers **New**
- Brake hose "2"
- Union bolt "3"



Rear brake hose union bolt
30 Nm (3.0 m·kgf, 22 ft·lbf)

EWA13530

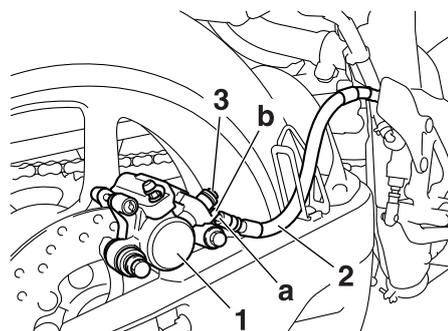
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-49.

ECA14170

NOTICE

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



2. Remove:

- Brake caliper

3. Install:

- Brake pads
(along with the brake pad shims)
- Brake pad spring
- Brake pad pin
- Screw plug
- Brake caliper



Rear brake caliper bolt (front side)
27 Nm (2.7 m·kgf, 19 ft·lbf)
Rear brake caliper bolt (rear side)
22 Nm (2.2 m·kgf, 16 ft·lbf)
LOCTITE®

REAR BRAKE

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



EWA13090

WARNING

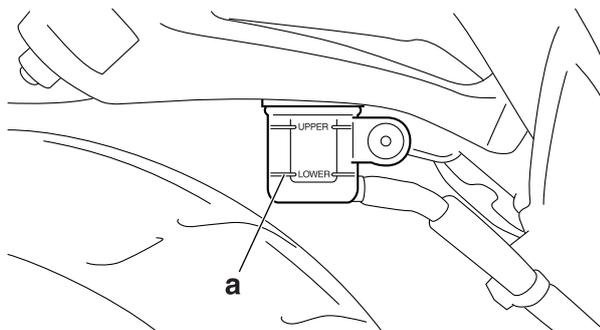
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

NOTICE

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" on page 3-17.
6. Check:
- Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.

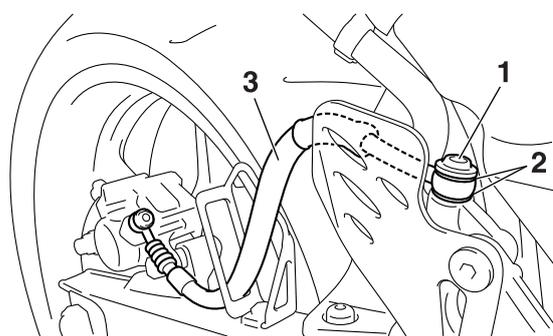


7. Check:
- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-17.

EAS22700

REMOVING THE REAR BRAKE MASTER CYLINDER

1. Remove:
- Union bolt "1"
 - Washers "2"
 - Brake hose "3"



TIP

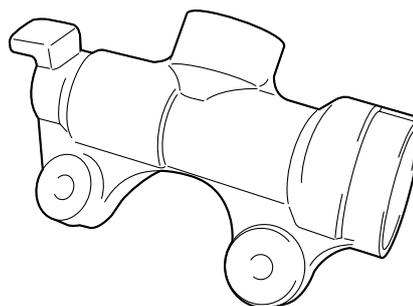
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

2. Remove:
- Brake master cylinder

EAS22720

CHECKING THE REAR BRAKE MASTER CYLINDER

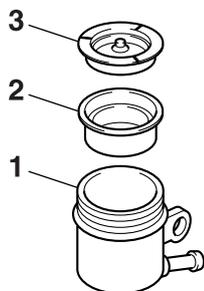
1. Check:
- Brake master cylinder
Damage/scratches/wear → Replace.
 - Brake fluid delivery passages (brake master cylinder body)
Obstruction → Blow out with compressed air.



REAR BRAKE

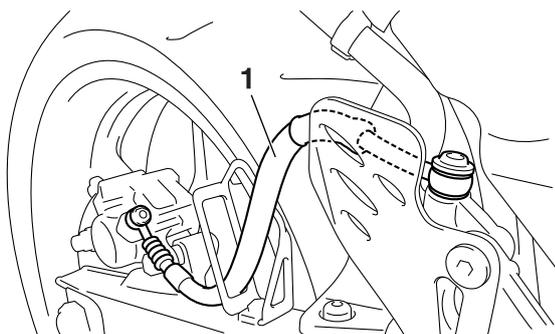
2. Check:

- Brake fluid reservoir tank "1"
Cracks/damage → Replace.
- Brake fluid reservoir diaphragm "2"
Cracks/damage → Replace.
- Brake fluid reservoir diaphragm holder "3"
Cracks/damage → Replace.



3. Check:

- Brake hoses "1"
Cracks/damage/wear → Replace.



EAS22730

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

EWA13520

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 fluid DOT 4
--	------------------------------------

1. Install:

- Brake master cylinder kit **New**

EAS22740

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:

- Washers **New**
- Brake hoses
- Union bolt

	Rear brake hose union bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)
--	--

EWA13530

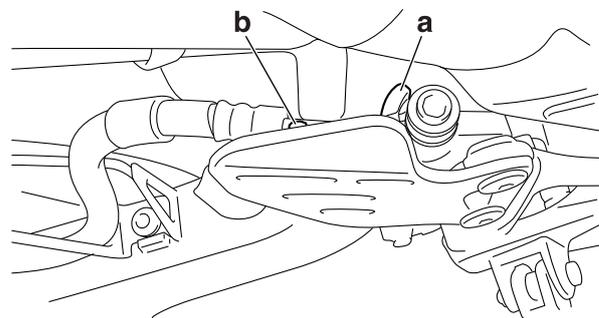
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-49.

ECA14B1004

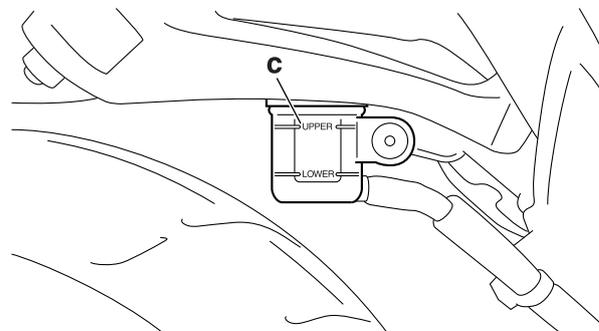
NOTICE

- When installing the brake hose onto the brake master cylinder, make sure the brake pipe touches the projection "a" as shown.
- Face the brake hose paint mark "b" to the rear master cylinder and install so that the paint mark is facing up.



2. Fill:

- Brake fluid reservoir
(to the maximum level mark "c")



REAR BRAKE



Recommended fluid
DOT 4

EWA13090

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.

ECA13540

NOTICE

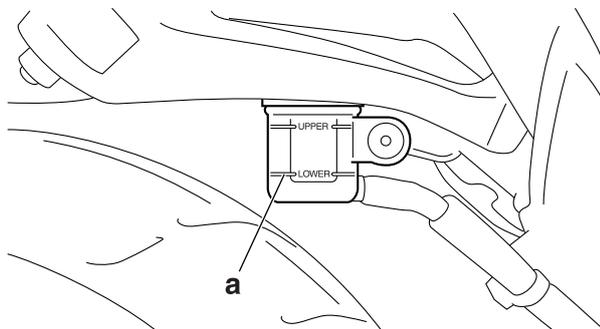
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:

- Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-17.

4. Check:

- Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.



5. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-17.

6. Adjust:

- Brake pedal position
Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-16.



Brake pedal position (from the top of the brake pedal to the center of the bolt mount on the rider footrest bracket)
12–21 mm (0.47–0.83 in)

7. Adjust:

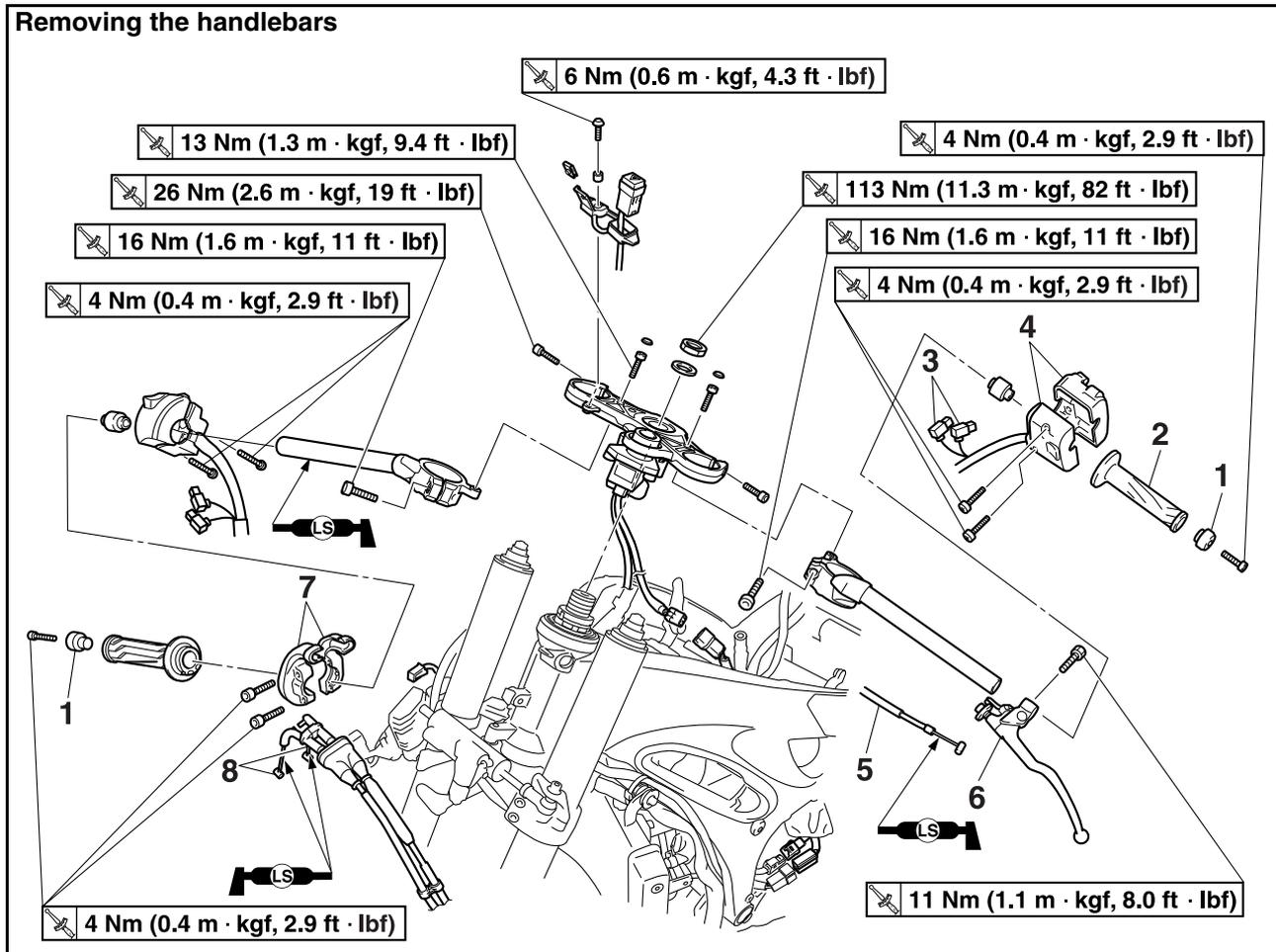
- Rear brake light operation timing
Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-33.

HANDLEBARS

EAS22850

HANDLEBARS

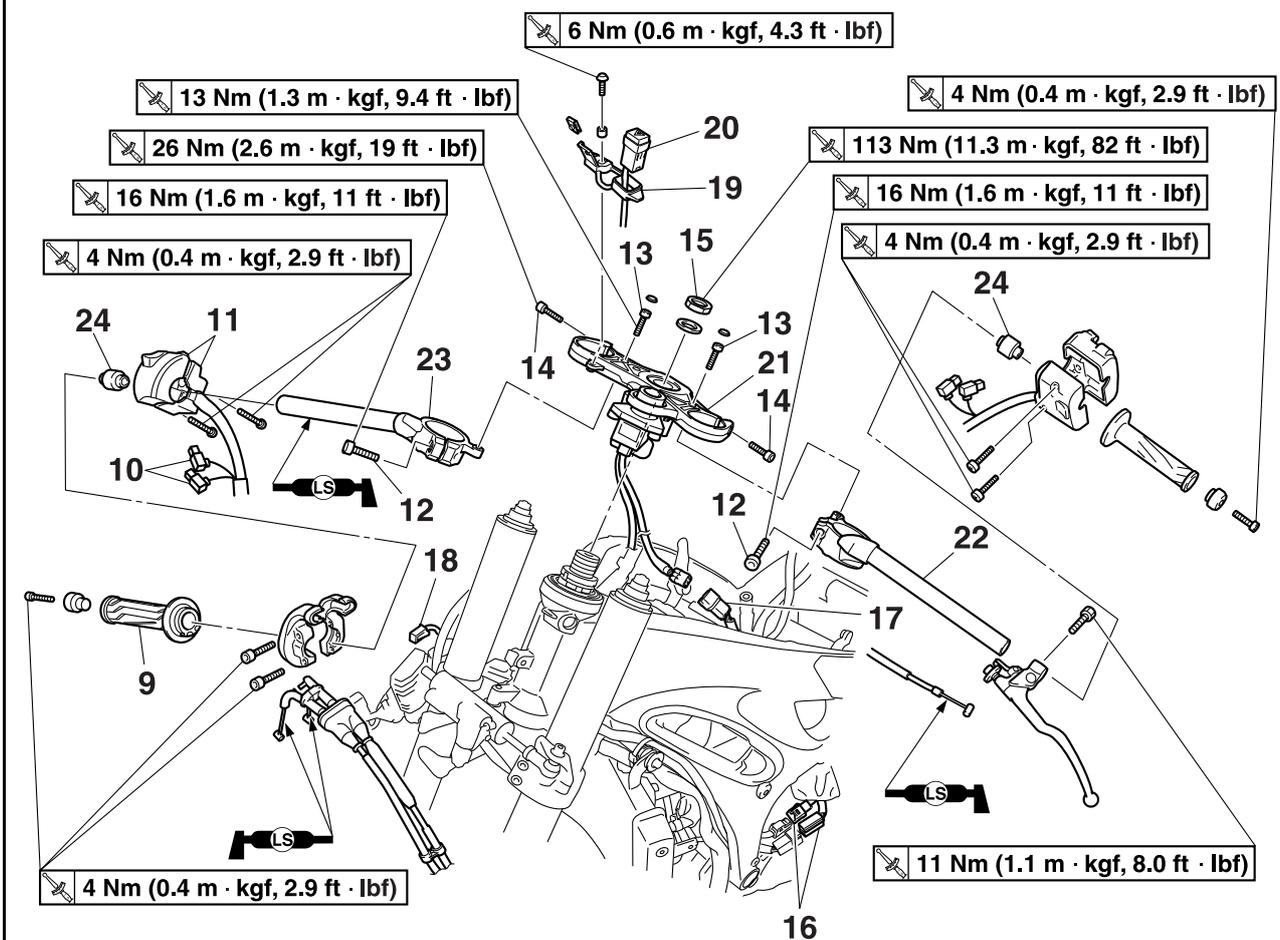
Removing the handlebars



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Air duct		Refer to "GENERAL CHASSIS" on page 4-1.
	Front cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Front brake master cylinder		Refer to "FRONT BRAKE" on page 4-31.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
1	Grip end	2	
2	Handlebar grip	1	
3	Clutch switch connector	2	Disconnect.
4	Left handlebar switch	1	
5	Clutch cable	1	
6	Clutch lever assembly	1	
7	Throttle cable housing	1	
8	Throttle cable	2	

HANDLEBARS

Removing the handlebars



Order	Job/Parts to remove	Q'ty	Remarks
9	Throttle grip	1	
10	Brake switch connector	2	Disconnect.
11	Right handlebar switch	1	
12	Handlebar pinch bolt	2	Loosen.
13	Handlebar bolt	2	Loosen.
14	Upper bracket pinch bolt	2	Loosen.
15	Steering stem nut	1	
16	Main switch coupler	2	Disconnect.
17	Immobilizer unit coupler	1	Disconnect.
18	Hazard switch coupler	1	Disconnect.
19	Clutch cable guide	1	
20	Hazard switch	1	
21	Upper bracket	1	
22	Left handlebar	1	
23	Right handlebar	1	
24	Grip end damper	2	
			For installation, reverse the removal procedure.

HANDLEBARS

EAS22870

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

WARNING

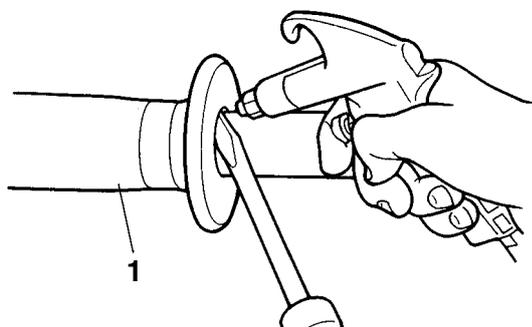
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:

- Grip end
- Handlebar grip "1"

TIP

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

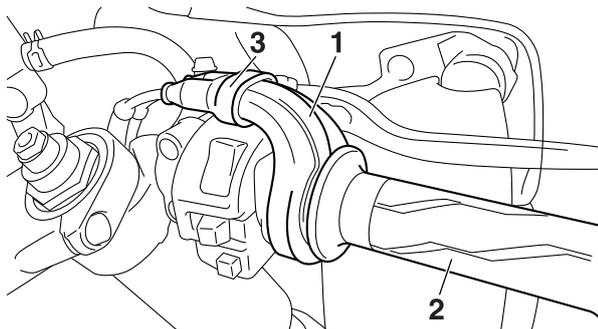


3. Remove:

- Throttle cable housing "1"
- Throttle grip "2"

TIP

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



EAS22890

CHECKING THE HANDLEBARS

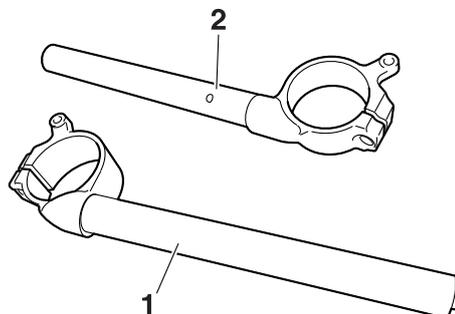
1. Check:

- Left handlebar "1"
 - Right handlebar "2"
- Bends/cracks/damage → Replace.

EWA13690

WARNING

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



EAS22900

INSTALLING THE HANDLEBARS

1. Stand the vehicle on a level surface.

EWA13120

WARNING

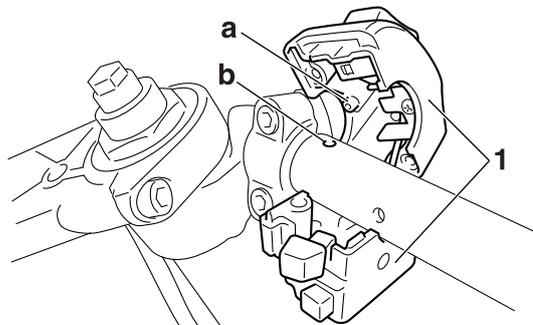
Securely support the vehicle so that there is no danger of it falling over.

2. Install:

- Right handlebar switch "1"

TIP

Align the projection "a" on the right handlebar switch with the hole "b" on the right handlebar.



3. Install:

- Brake master cylinder holder "1"



Front brake master cylinder holder holder bolt
13 Nm (1.3 m.kgf, 9.4 ft.lbf)

ECA14260

NOTICE

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

HANDLEBARS

9. Adjust:

- Throttle cable free play
Refer to "ADJUSTING THE THROTTLE
CABLE FREE PLAY" on page 3-34.



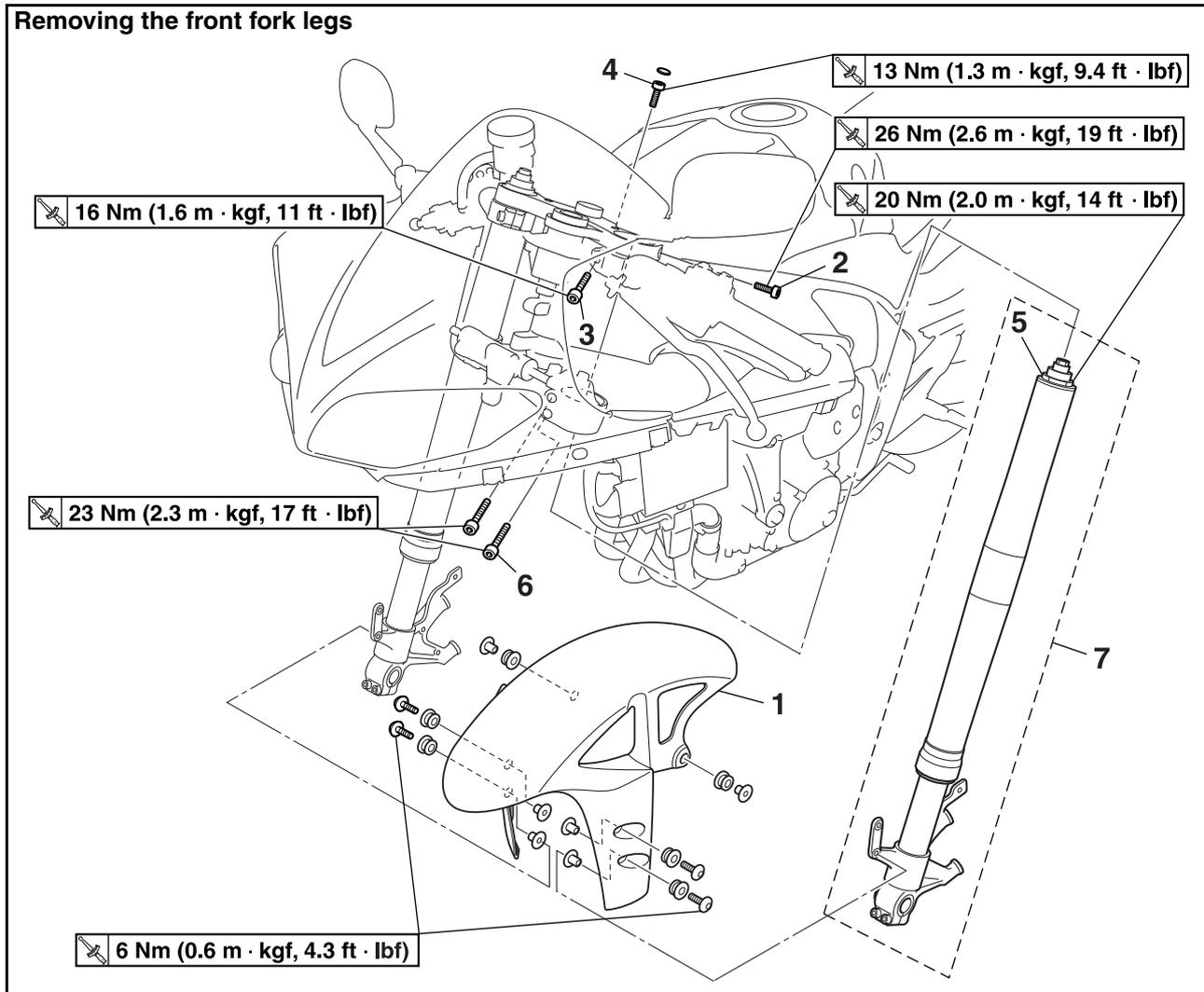
Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

FRONT FORK

EAS22950

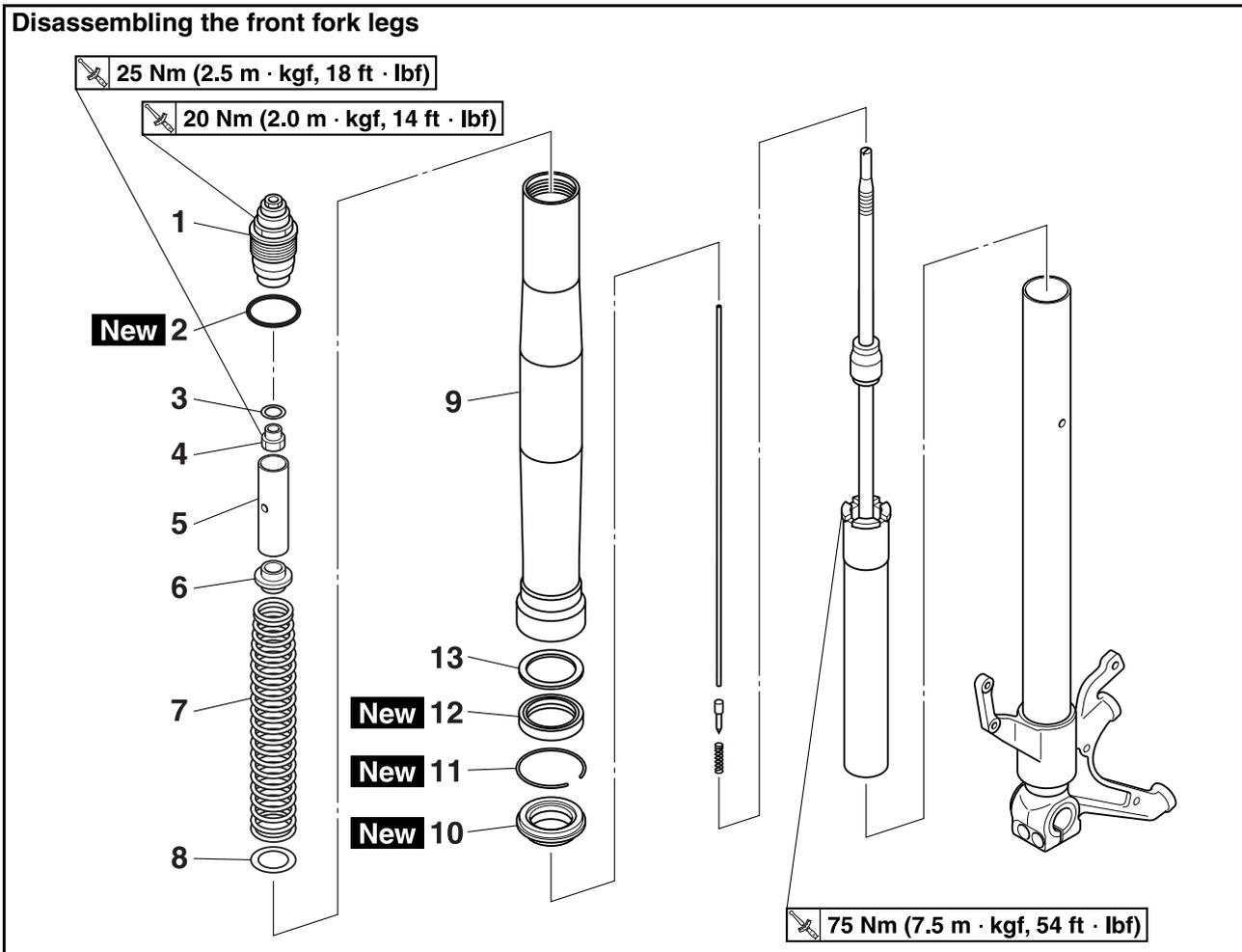
FRONT FORK

Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies both of the front fork legs.
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Front wheel		Refer to "FRONT WHEEL" on page 4-17.
1	Front fender	1	
2	Upper bracket pinch bolt	1	Loosen.
3	Handlebar pinch bolt	1	Loosen.
4	Handlebar bolt	1	Loosen.
5	Cap bolt	1	Loosen.
6	Lower bracket pinch bolt	2	Loosen.
7	Front fork leg	1	
			For installation, reverse the removal procedure.

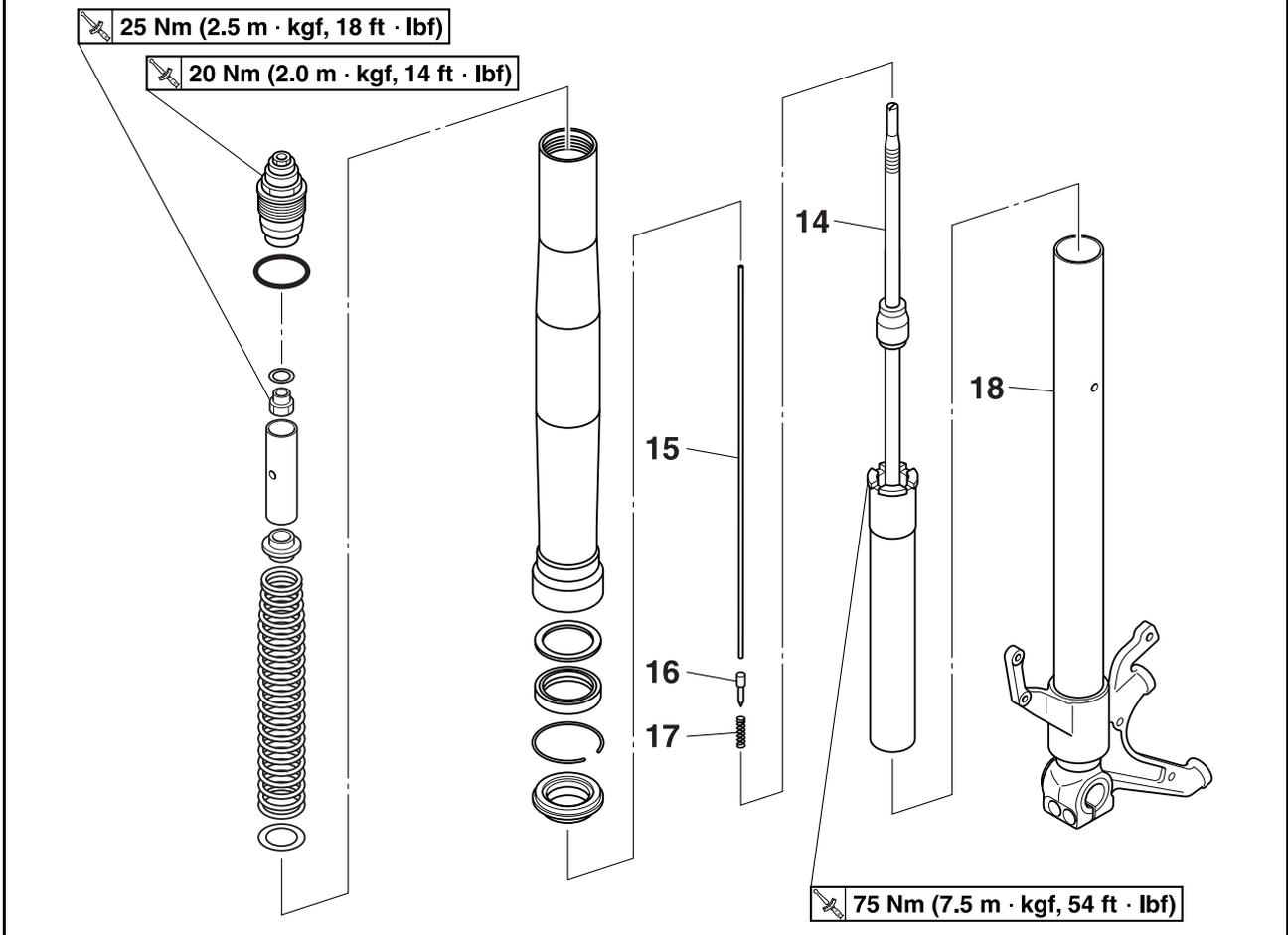
FRONT FORK



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
1	Cap bolt	1	
2	O-ring	1	
3	Washer	1	
4	Nut	1	
5	Spacer	1	
6	Upper spring seat	1	
7	Fork spring	1	
8	Lower spring seat	1	
9	Outer tube	1	
10	Dust seal	1	
11	Oil seal clip	1	
12	Oil seal	1	
13	Washer	1	

FRONT FORK

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
14	Damper rod assembly	1	
15	Damper adjusting rod	1	
16	Damper adjusting valve	1	
17	Damper adjusting valve spring	1	
18	Inner tube	1	
			For installation, reverse the removal procedure.

FRONT FORK

EAS14B1006

REMOVING THE FRONT FORK LEGS

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

TIP

Each front fork leg is equipped with a spring preload adjusting bolt, the right fork leg is equipped with a rebound damping force adjusting screen and left front fork is equipped with a compression damping force adjusting screw. Pay attention not to mistake the right and left.

- Stand the vehicle on a level surface.

EWA14B1008

WARNING

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

TIP

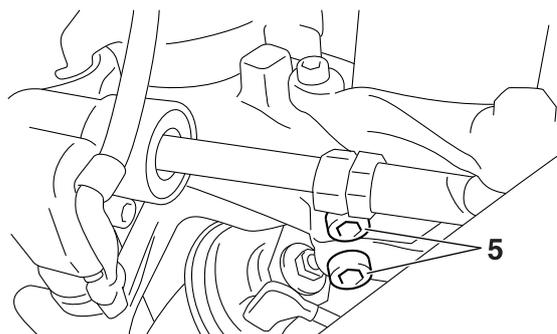
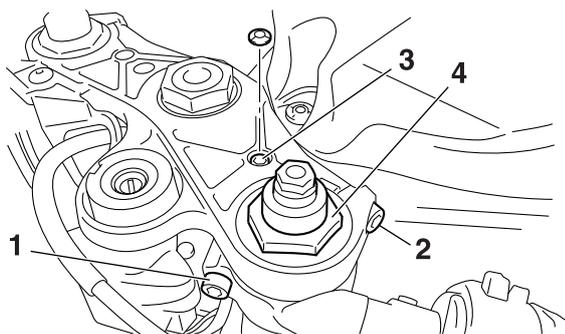
Place the vehicle on a suitable stand so that the front wheel is elevated.

- Remove:
 - Front brake caliper
Refer to "FRONT BRAKE" on page 4-31.
 - Front wheel
Refer to "FRONT WHEEL" on page 4-17.
 - Side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.
- Loosen:
 - Handlebar pinch bolt "1"
 - Upper bracket pinch bolts "2"
 - Handlebar bolt "3"
 - Cap bolt "4"
 - Lower bracket pinch bolts "5"

EWA14B1009

WARNING

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



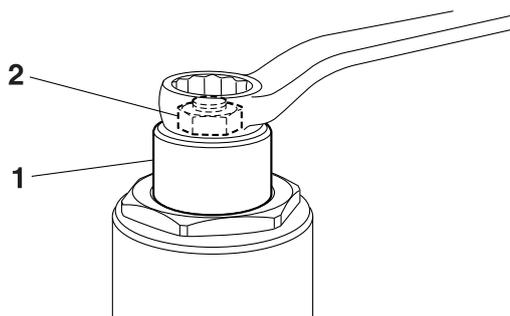
- Remove:
 - Front fork leg

EAS14B1007

DISASSEMBLING THE FRONT FORK LEGS

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

- Position the cap bolt collar "1" as shown in the illustration by turning the spring preload adjusting bolt "2" counterclockwise until it stops.



- Remove:
 - Cap bolt "1"
 - Spacer "2"
 - Nut "3"

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



Fork spring compressor

90890-01441

YM-01441

Rod holder

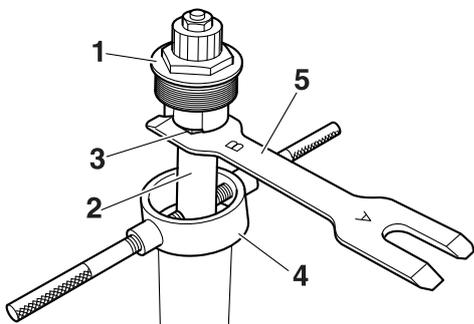
90890-01434

Damper rod holder double ended

YM-01434

FRONT FORK

TIP _____
 Use the side of the rod holder that is marked "B".

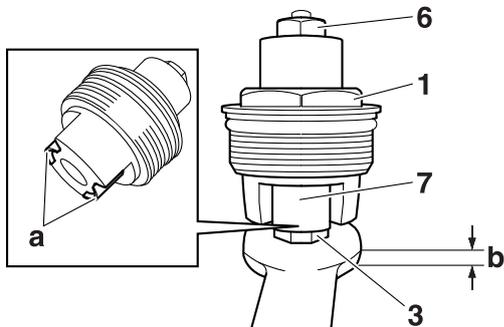


c. Hold the spring preload adjusting bolt "6" and loosen the nut "3".

ECA14B1005

NOTICE _____
When loosening the nut "3", be sure not to break the projections "a" on the cap bolt collar "7" of the cap bolt "1".

TIP _____
 Loosen the nut using a proper tool that has a thickness "b" of 4.0 mm (0.16 in) or less.

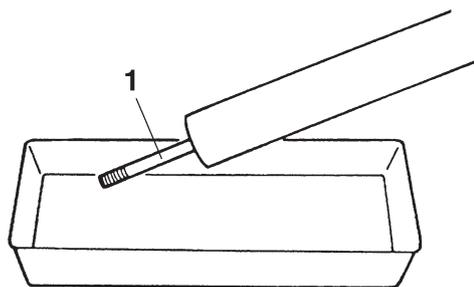


- d. Remove the cap bolt.
- e. Remove the rod holder and fork spring compressor.
- f. Remove the nut and spacer.

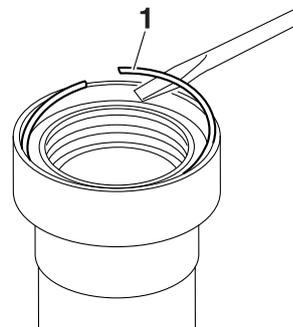


3. Drain:
 • Fork oil

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



4. Remove:
- Dust seal
 - Oil seal clip "1" (with a flat-head screwdriver)
 - Oil seal
 - Washer



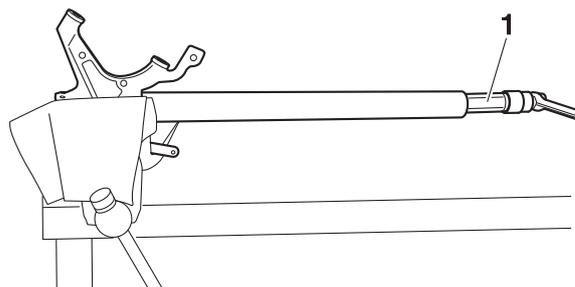
5. Remove:
- Damper rod assembly

ECA14B1048

NOTICE _____
For the damper rod assembly, the right side is used for the rebound operation and left side for the compression. Pay attention not to mistake the right and left.

TIP _____
 Remove the damper rod assembly with the damper rod holder "1".

	Damper rod holder 90890-01506 YM-01506
--	---



FRONT FORK

EAS23010

CHECKING THE FRONT FORK LEGS

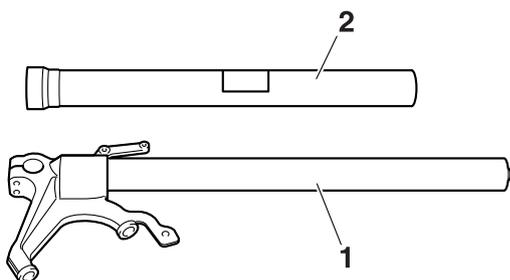
The following procedure applies to both of the front fork legs.

1. Check:
 - Inner tube "1"
 - Outer tube "2"
 Bends/damage/scratches → Replace.

EWA13650

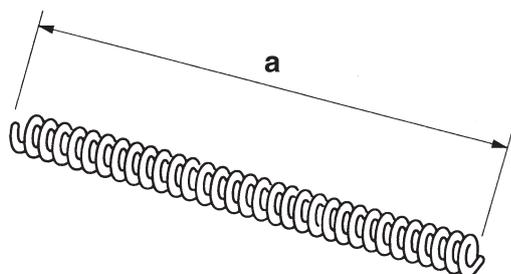
WARNING

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



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

	Fork spring free length
	271.5 mm (10.69 in)
	Limit
	266.1 mm (10.48 in)



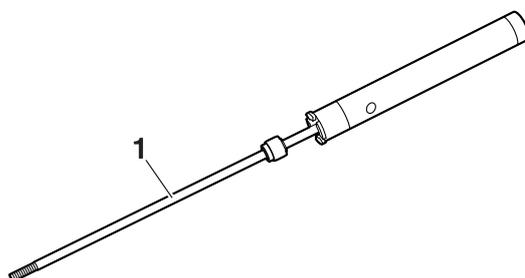
3. Check:
 - Damper rod "1"
 Damage/wear → Replace.
 Obstruction → Blow out all of the oil passages with compressed air.

ECA14200

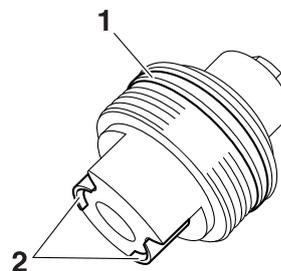
NOTICE

- 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 "1"
 - Cap bolt collar projections "2"
 Cracks/damage → Replace.



EAS14B1008

ASSEMBLING THE FRONT FORK LEGS

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

EWA14B1010

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.

TIP

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

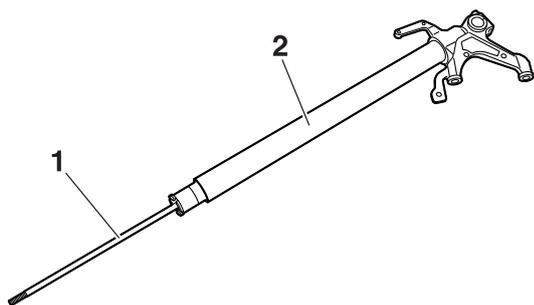
1. Install:
 - Damper rod assembly "1"
 - Inner tube "2"

ECA14B1006

NOTICE

Allow the damper rod assembly to slide slowly down the inner tube "2". Be careful not to damage the inner tube.

FRONT FORK



2. Lubricate:
- Inner tube's outer surface

	<p>Recommended oil Suspension oil M1 or equivalent</p>
--	---

3. Tighten:
- Damper rod assembly

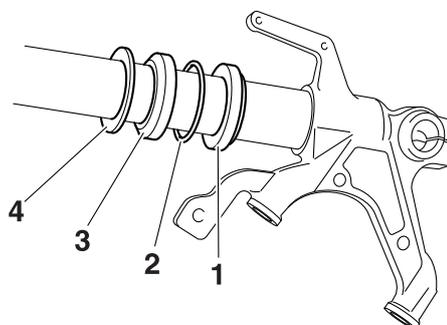
	<p>Damper rod assembly 75 Nm (7.5 m·kgf, 54 ft·lbf)</p>
--	--

TIP
 Tighten the damper rod assembly with the damper rod holder "1".

	<p>Damper rod holder 90890-01506 YM-01506</p>
--	--

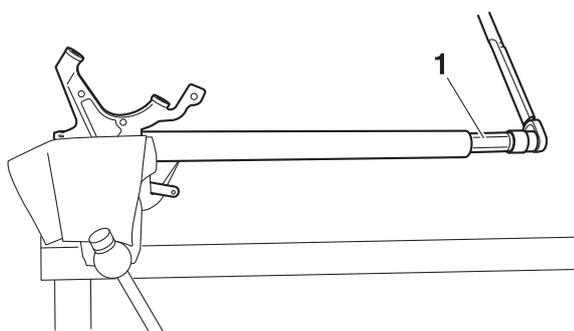
TIP

- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.

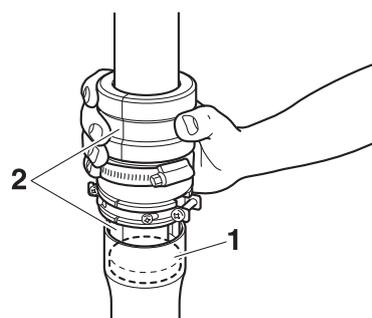


5. Install:
- Outer tube (to the inner tube)
6. Install:
- Washer
 - Oil seal "1" (with the fork seal driver "2")

	<p>Fork seal driver 90890-01442 Adjustable fork seal driver (36-46 mm) YM-01442</p>
--	--



4. Install:
- Dust seal "1" **New**
 - Oil seal clip "2" **New**
 - Oil seal "3" **New**
 - Washer "4"



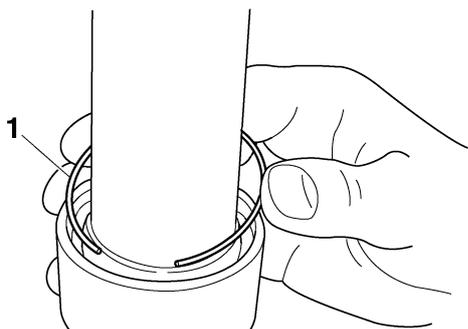
7. Install:
- Oil seal clip "1"

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

ECA14B1007

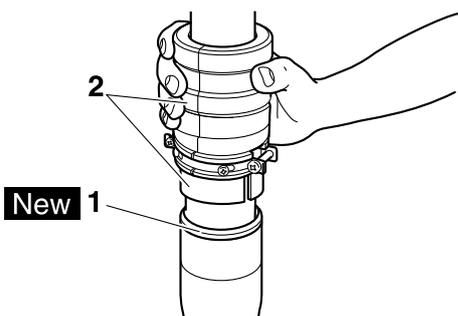
NOTICE
 Make sure the numbered side of the oil seal faces bottom side.

FRONT FORK



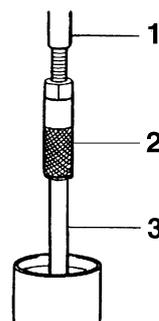
8. Install:
- Dust seal "1"
(with the fork seal driver weight "2")

	<p>Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442</p>
--	--



9. Install:
- Rod puller "1"
 - Rod puller attachment "2"
(onto the damper rod "3")

	<p>Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703 Rod puller attachment (M10) 90890-01436 Universal damping rod bleeding tool set YM-A8703</p>
--	--



10. Fully compress the front fork leg.
11. Fill:
- Front fork leg
(with the specified amount of the recommended fork oil)

	<p>Quantity 528.0 cm³ (17.85 US oz, 18.62 Imp.oz) Recommended oil Suspension oil M1 or equivalent</p>
--	---

ECA14B1008

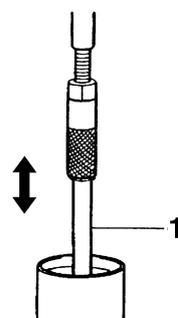
NOTICE

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

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

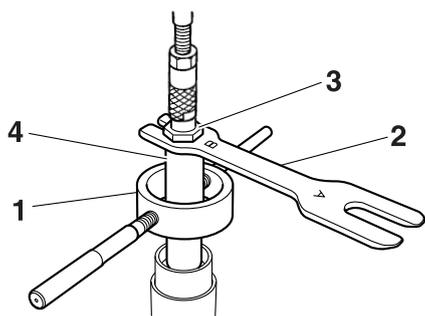
TIP

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

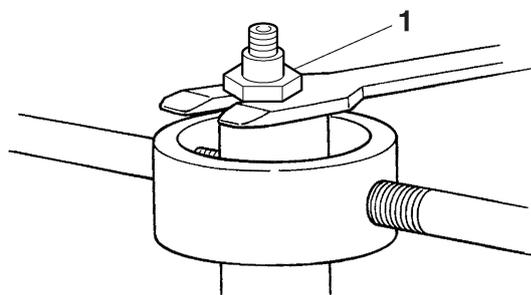


13. Before measuring the fork oil level, wait ten minutes until the oil has settled and the air bubbles have dispersed.

FRONT FORK



- j. Remove the rod puller and rod puller attachment.
- k. Install the nut "1" all the way onto the damper rod assembly.



- l. Install the damper adjusting valve spring, the damper adjusting valve and the damper adjusting rod.
- m. Install the washer and cap bolt, and then finger tighten the cap bolt.
- n. Hold the nut "1" and tighten the spring preload adjusting bolt "2" into the cap bolt to specification.

EWA14B1011

WARNING

Always use a new cap bolt O-ring.

ECA14B1009

NOTICE

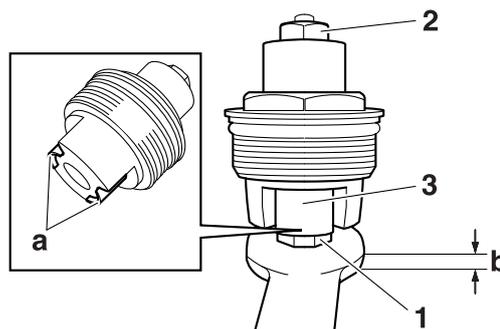
When tightening the spring preload adjusting bolt "2" into the cap bolt, be sure not to break the projections "a" on the cap bolt collar "3".

TIP

Hold the nut "1" using a proper tool that has a thickness "b" of 4.0 mm (0.16 in) or less.



Nut and cap bolt
25 Nm (2.5 m·kgf, 18 ft·lbf)



- o. Remove the rod holder and fork spring compressor.

16. Install:

- Cap bolt (to the outer tube)

TIP

- Temporarily tighten the cap bolt.
- When to tighten the cap bolt to the specified torque is after installing the front fork leg to the vehicle and tightening the lower bracket pinch bolts.

EAS14B1009

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.

EWA14B1012

WARNING

Make sure the brake hoses are routed properly.

TIP

Make sure the outer tube is flush with the top of the upper bracket.

2. Tighten:

- Lower bracket pinch bolts "1" and "2"

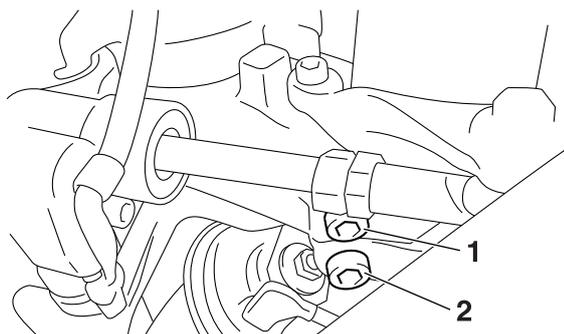


Lower bracket pinch bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)

TIP

Tighten each bolt to 23 Nm (2.3 m·kgf, 17 ft·lbf) in the order pinch bolt "1" → pinch bolt "2" → pinch bolt "1" → pinch bolt "2".

FRONT FORK



3. Tighten:
- Cap bolt "1"

	<p>Cap bolt 20 Nm (2.0 m·kgf, 14 ft·lbf)</p>
--	---

- Handlebar bolt "2"

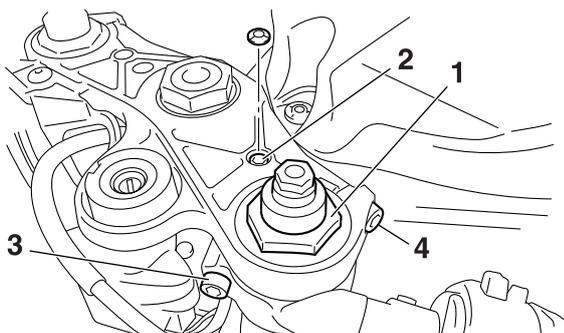
	<p>Handlebar bolt 13 Nm (1.3 m·kgf, 9.4 ft·lbf)</p>
--	--

- Handlebar pinch bolt "3"

	<p>Handlebar pinch bolt 16 Nm (1.6 m·kgf, 11 ft·lbf)</p>
--	---

- Upper bracket pinch bolt "4"

	<p>Upper bracket pinch bolt 26 Nm (2.6 m·kgf, 19 ft·lbf)</p>
--	---



4. Check:
- Cable routing

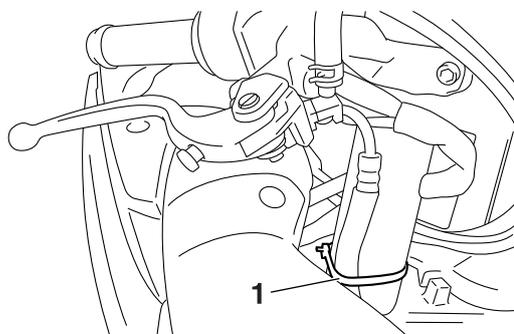
TIP

Make sure the brake hose, throttle cables, clutch cable, and handlebar switch leads are routed properly. Refer to "CABLE ROUTING" on page 2-49.

5. Install:
- Plastic band "1"

TIP

Fasten the front brake hose to the right front fork leg with the plastic locking tie.



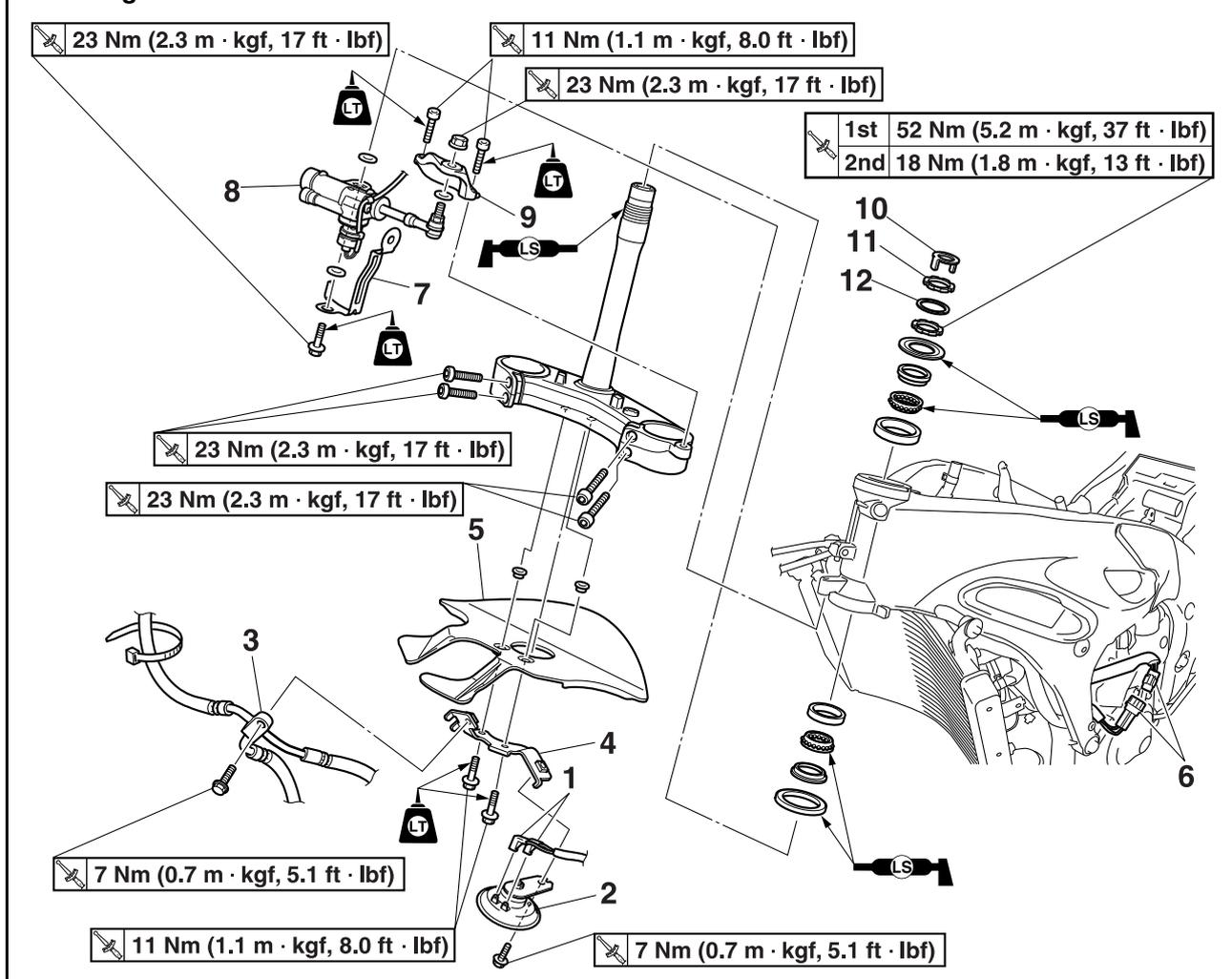
6. Adjust:
- Spring preload
 - Rebound damping
 - Compression damping
- Refer to "ADJUSTING THE FRONT FORK LEGS" on page 3-25.

STEERING HEAD

EAS23090

STEERING HEAD

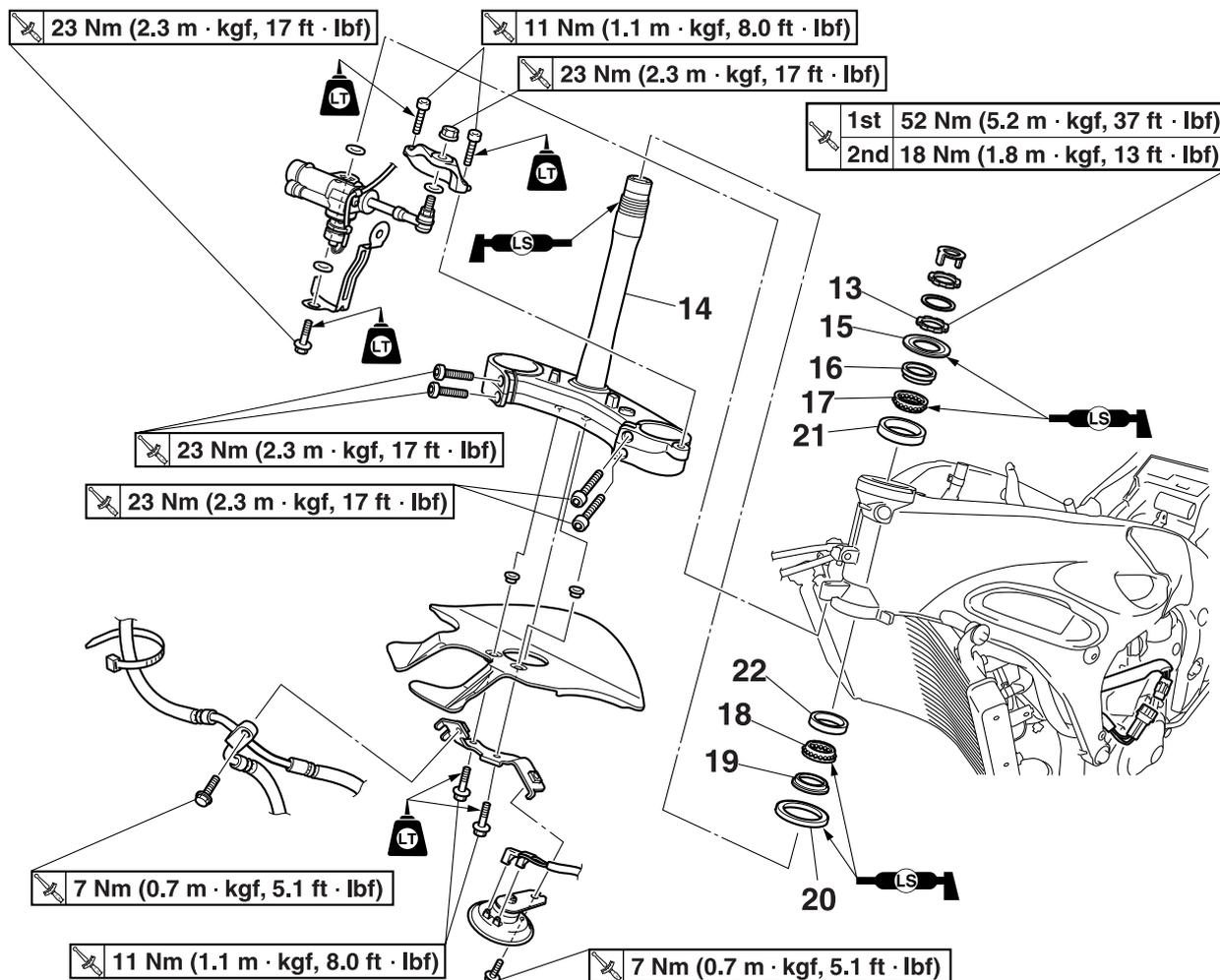
Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Air duct		Refer to "GENERAL CHASSIS" on page 4-1.
	Front speed sensor		Refer to "FRONT WHEEL" on page 4-17.
	Front fork legs		Refer to "FRONT FORK" on page 4-61.
	Handlebars		Refer to "HANDLEBARS" on page 4-56.
1	Horn lead connector	2	Disconnect.
2	Horn	1	
3	Front brake hose joint	1	
4	Front brake hose joint bracket	1	
5	Lower bracket cover	1	
6	Steering damper coupler	1	Disconnect.
7	Cable guide	1	
8	Steering damper	1	
9	Steering damper bracket	1	
10	Lock washer	1	
11	Upper ring nut	1	
12	Rubber washer	1	

STEERING HEAD

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
13	Lower ring nut	1	
14	Lower bracket	1	
15	Upper bearing cover	1	
16	Upper bearing inner race	1	
17	Upper bearing	1	
18	Lower bearing	1	
19	Lower bearing inner race	1	
20	Lower bearing dust seal	1	
21	Upper bearing outer race	1	
22	Lower bearing outer race	1	
			For installation, reverse the removal procedure.

STEERING HEAD

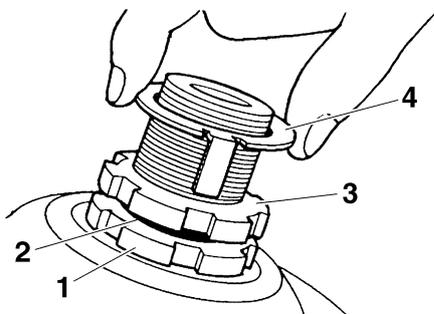
EAS23140

INSTALLING THE STEERING HEAD

1. Lubricate:
 - Upper bearing
 - Lower bearing
 - Bearing races



2. Install:
 - Lower ring nut "1"
 - Rubber washer "2"
 - Upper ring nut "3"
 - Lock washer "4"Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" on page 3-22.



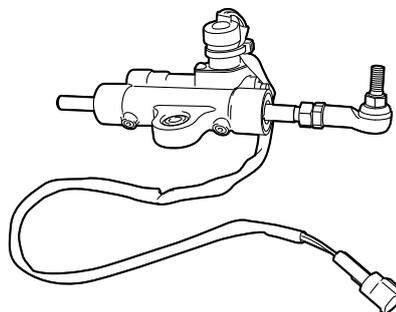
3. Install:
 - Upper bracket
 - Steering stem nutRefer to "HANDLEBARS" on page 4-56.

TIP _____
Temporarily tighten the steering stem nut.

4. Install:
 - Front fork legsRefer to "INSTALLING THE FRONT FORK LEGS" on page 4-70.

TIP _____
Temporarily tighten the upper and lower bracket pinch bolts.

- Bearing
Damage/pitting → Replace.
(It replace with the assembly.)



EAS14B1005

CHECKING THE STEERING DAMPER

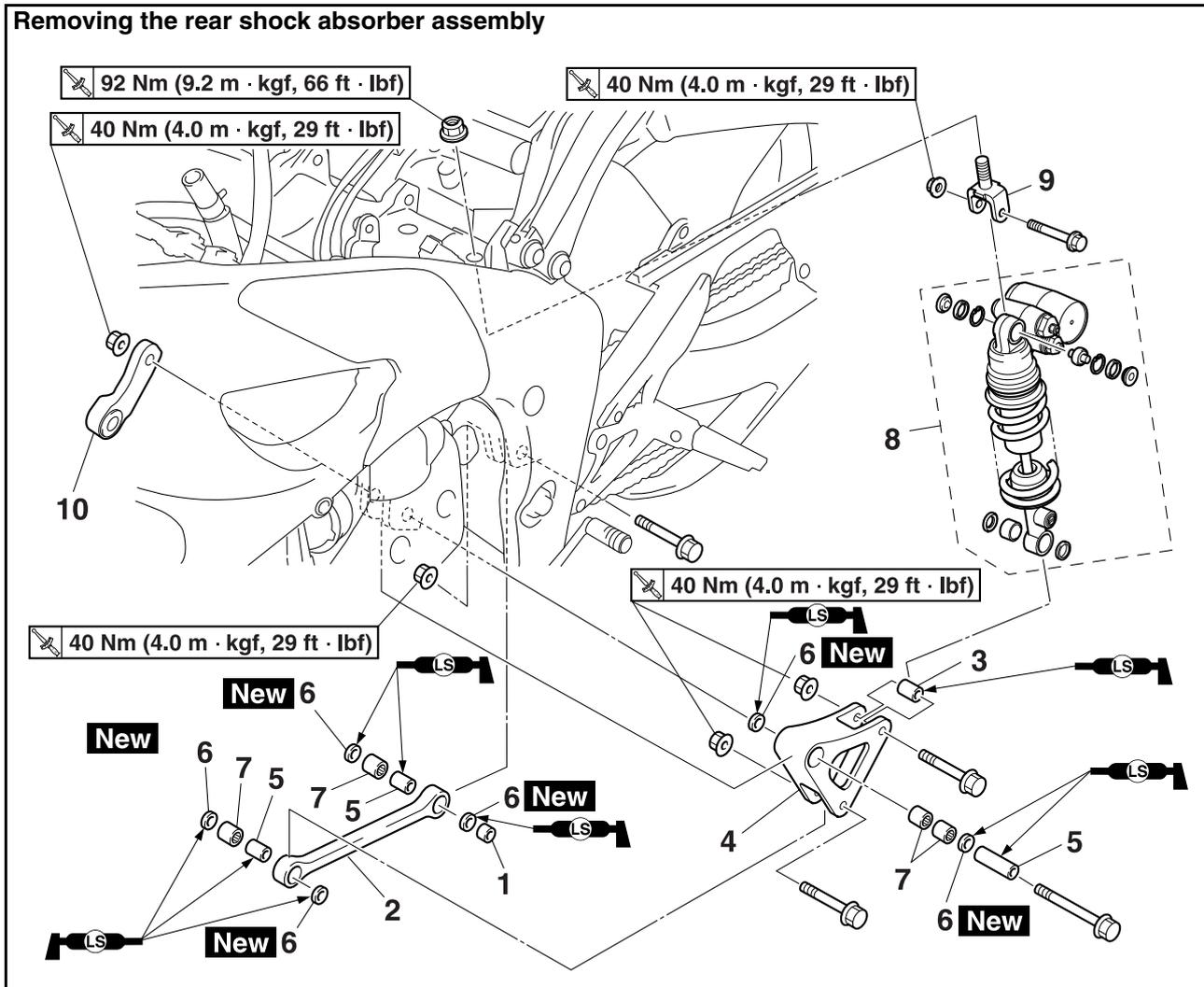
1. Check:
 - Steering damper body
Damage/oil leaks → Replace.
(It replace with the assembly.)
 - Steering damper rod
Bends/scratch → Replace.
(It replace with the assembly.)

REAR SHOCK ABSORBER ASSEMBLY

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Passenger seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-3.
1	Connecting arm collar	1	
2	Connecting arm	1	
3	Relay arm collar	1	
4	Relay arm	1	
5	Collar	3	
6	Oil seal	6	
7	Bearing	4	
8	Rear shock absorber assembly	1	
9	Rear shock absorber assembly bracket	1	
10	Exhaust chamber stay	1	
			For installation, reverse the removal procedure.

REAR SHOCK ABSORBER ASSEMBLY

EAS14B1010

HANDLING THE REAR SHOCK ABSORBER

EWA14B1013

WARNING

This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber, 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.

- Do not tamper or attempt to open the rear shock absorber.
- Do not subject the rear shock absorber 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 in any way. Rear shock absorber damage will result in poor damping performance.

EAS23190

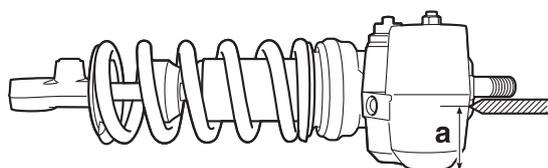
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2.0–3.0 mm (0.08–0.12 in) hole through the rear shock absorber at a point 40 mm (1.57 in) from its end as shown.

EWA13760

WARNING

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



a. 40 mm (1.57 in)

EAS23230

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

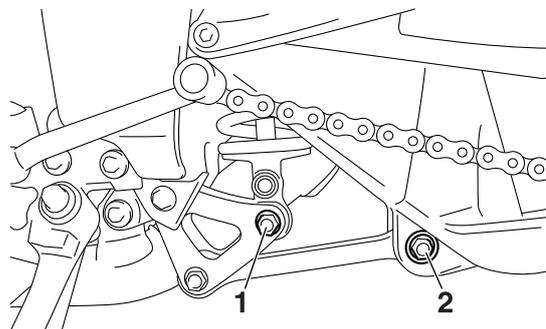
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Rear shock absorber assembly lower bolt "1"
- Connecting arm and swingarm bolt "2"

TIP

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

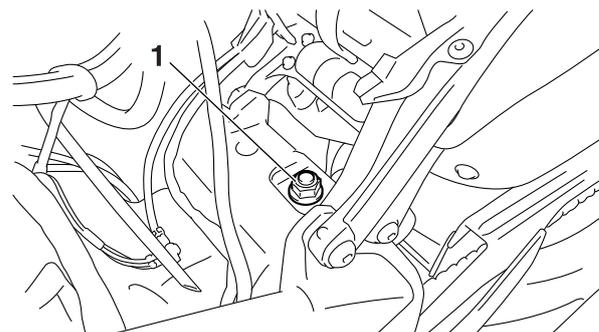


3. Remove:

- Rear shock absorber assembly bracket nut "1"
- Rear shock absorber assembly

TIP

Remove the rear shock absorber assembly from between the swingarm and frame.



EAS23240

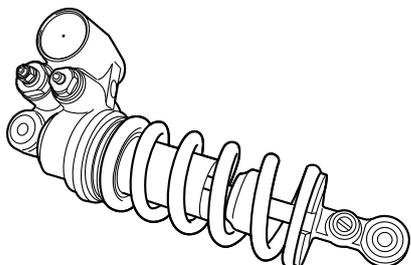
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

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.

REAR SHOCK ABSORBER ASSEMBLY

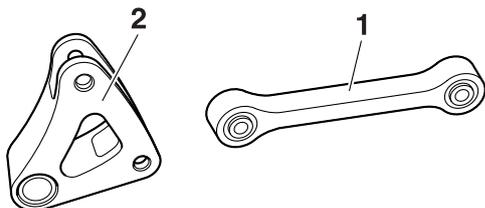
- Spring
Damage/wear → Replace the rear shock absorber assembly.
- Bearing
Damage/wear → Replace.
- Bolts
Bends/damage/wear → Replace.



EAS23260

CHECKING THE CONNECTING ARM AND RELAY ARM

1. Check:
 - Connecting arm "1"
 - Relay arm "2"
 - Damage/wear → Replace.



2. Check:
 - Bearings
Damage/wear → Replace.
3. Check:
 - Collars
Damage/scratches → Replace.

EAS23270

INSTALLING THE RELAY ARM

1. Lubricate:
 - Collars
 - Bearings



2. Install:
 - Bearing "1"
 - Oil seals "2"
(to the relay arm)
 - Relay arm "3"
 - Connecting arm "4"

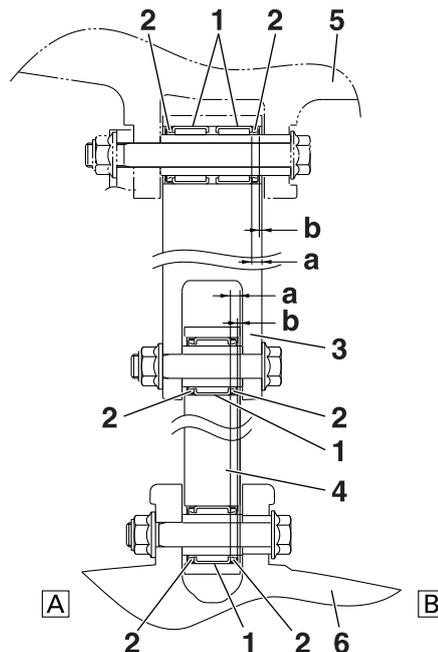


Installed depth of bearing "a"
4.0 mm (0.16 in)

Installed depth of oil seal "b"
1.0 mm (0.04 in)

TIP

When installing the oil seals to the relay arm or connecting arm, face the character stamp of the oil seals outside.



- 5. Frame
- 6. Swingarm
- A. Right side
- B. Left side

EAS23310

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
 - Collars
 - Bearings
2. Install:
 - Rear shock absorber assembly

TIP

Install the rear shock absorber assembly lower bolt from the left.

3. Tighten:
 - Rear shock absorber assembly bracket nut

REAR SHOCK ABSORBER ASSEMBLY



**Rear shock absorber assembly
bracket and frame nut**
92 Nm (9.2 m·kgf, 66 ft·lbf)

- Rear shock absorber assembly lower nut



**Rear shock absorber assembly
lower nut**
40 Nm (4.0 m·kgf, 29 ft·lbf)

4. Install:

- Connecting arm

TIP

When installing the connecting arm, lift up the swingarm.

5. Tighten:

- Connecting arm and swingarm nut



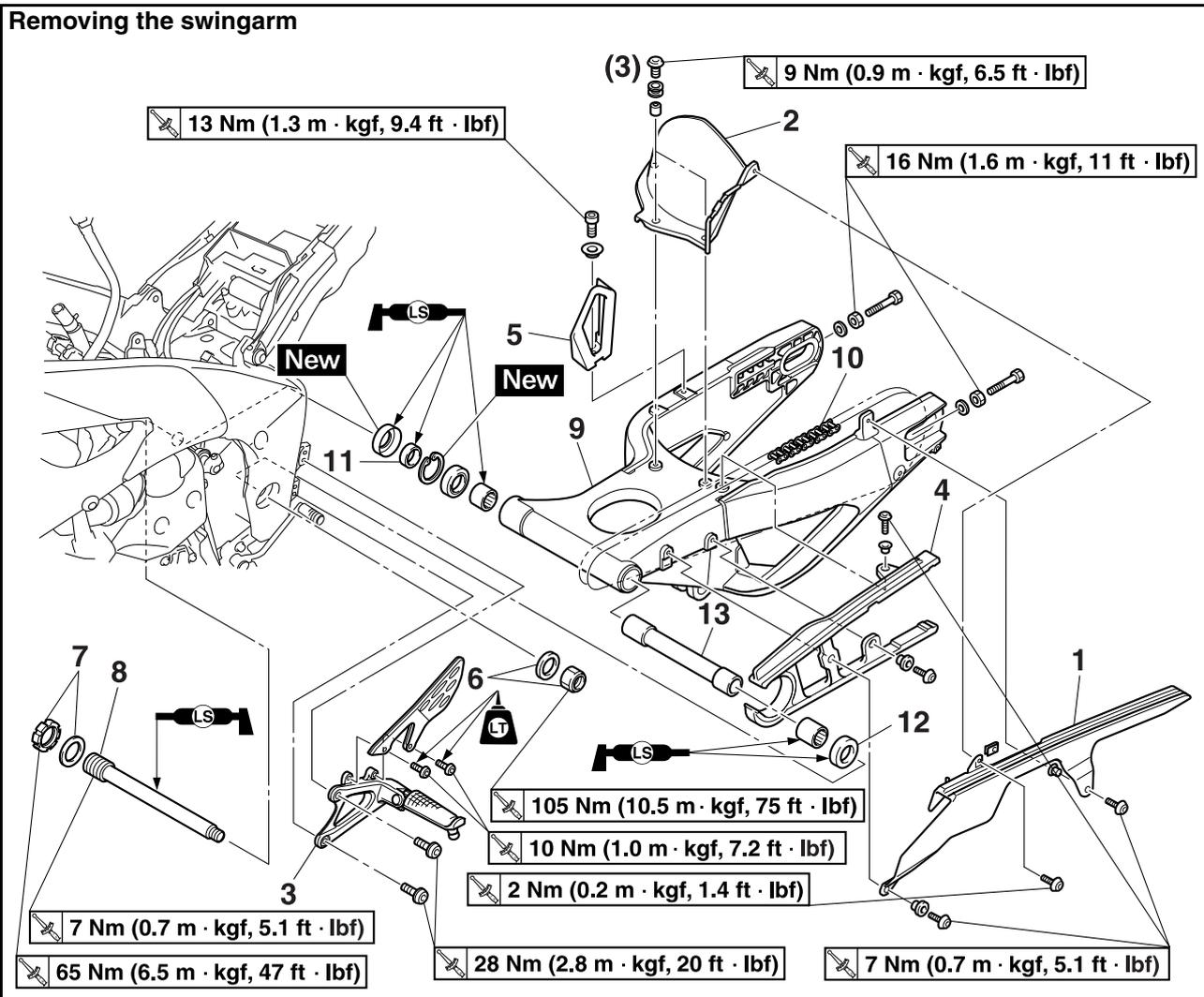
**Connecting arm and swingarm
nut**
40 Nm (4.0 m·kgf, 29 ft·lbf)

SWINGARM

EAS23330

SWINGARM

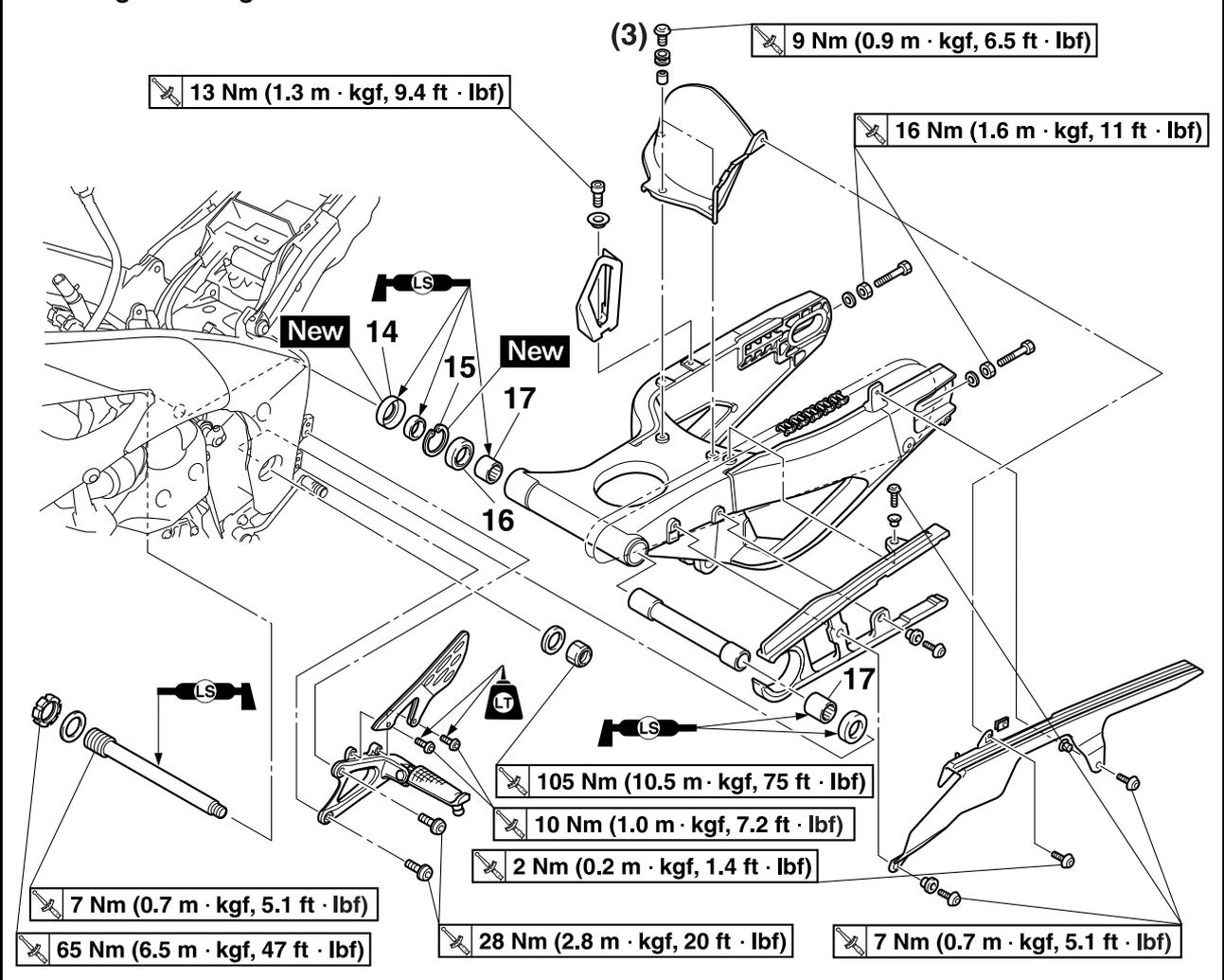
Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-25.
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-76.
1	Drive chain guard	1	
2	Rear fender	1	
3	Left footrest	1	
4	Drive chain guide	1	
5	Brake hose holder	1	
6	Pivot shaft nut/washer	1/1	
7	Pivot shaft ring nut/washer	1/1	
8	Pivot shaft	1	
9	Swingarm	1	
10	Drive chain	1	
11	Collar	1	
12	Dust cover	1	
13	Spacer	1	

SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
14	Oil seal	1	
15	Circlip	1	
16	Bearing	1	
17	Bearing	2	
			For installation, reverse the removal procedure.

SWINGARM

EAS23350

REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

TIP

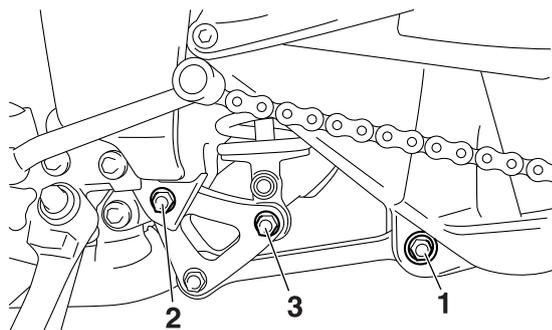
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Connecting arm and swingarm bolt "1"
- Relay arm bolt "2"
- Rear shock absorber assembly lower bolt "3"

TIP

When removing the connecting arm and swingarm bolt, hold the swingarm so that it does not drop down.



3. Measure:

- Swingarm side play
- Swingarm vertical movement

a. Measure the tightening torque of the pivot shaft nut, pivot shaft ring nut, and pivot shaft.

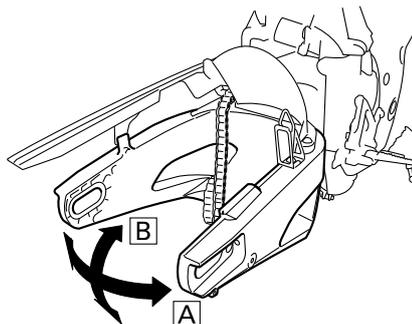
	Pivot shaft nut
	105 Nm (10.5 m·kgf, 75 ft·lbf)
	Pivot shaft ring nut
	65 Nm (6.5 m·kgf, 47 ft·lbf)
	Pivot shaft
	7 Nm (0.7 m·kgf, 5.1 ft·lbf)

- 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 spacer, bearings, collar and dust cover.



Swingarm side play (at the end of the swingarm)
1.0 mm (0.04 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 spacer, bearings, collar and dust cover.



4. Remove:

- Drive chain
Refer to "REMOVING THE DRIVE CHAIN" on page 4-86.

5. Remove:

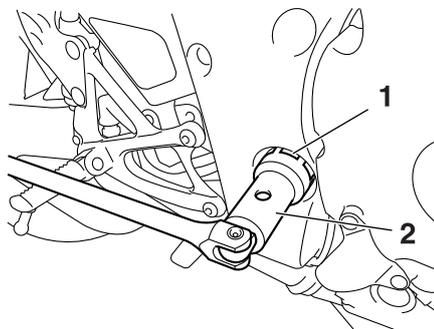
- Pivot shaft nut
- Pivot shaft ring nut "1"

TIP

Loosen the pivot shaft ring nut with the ring nut wrench "2".



Ring nut wrench
90890-01507
YM-01507



6. Remove:

- Pivot shaft "1"

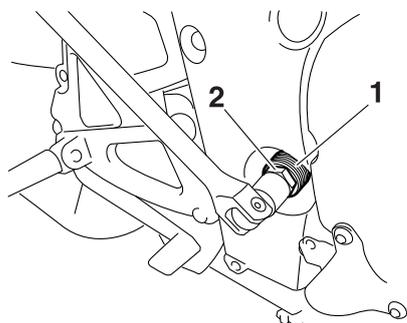
TIP

Loosen the pivot shaft with the damper rod holder (22 mm) "2".

SWINGARM



**Damper rod holder (22 mm)
90890-01365**

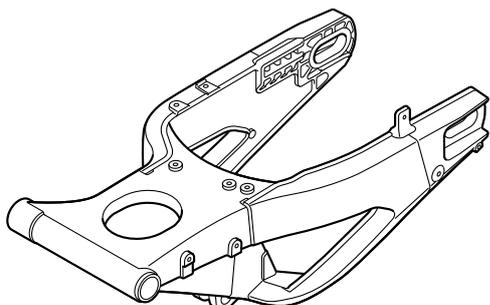


EAS23360

CHECKING THE SWINGARM

1. Check:

- Swingarm
Bends/cracks/damage → Replace.



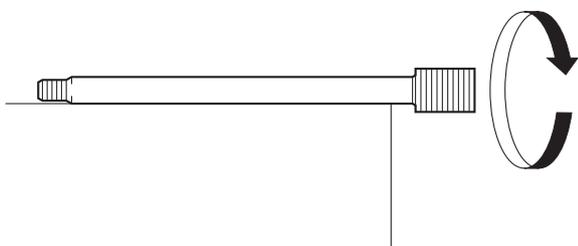
2. Check:

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

EWA13770

WARNING

Do not attempt to straighten a bent pivot shaft.



3. Wash:

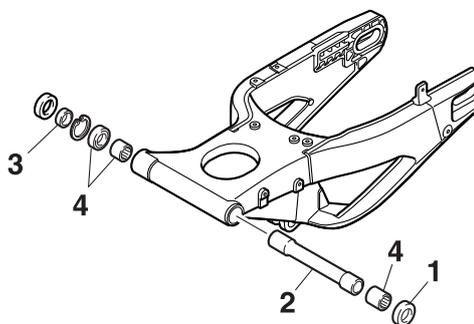
- Pivot shaft
- Dust cover
- Spacer
- Washers
- Bearings



**Recommended cleaning solvent
Kerosene**

4. Check:

- Dust cover "1"
 - Spacer "2"
 - Collar "3"
 - Bearings "4"
- Damage/wear → Replace.

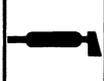


EAS14B1011

INSTALLING THE SWINGARM

1. Lubricate:

- Bearings
- Dust cover
- Pivot shaft



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

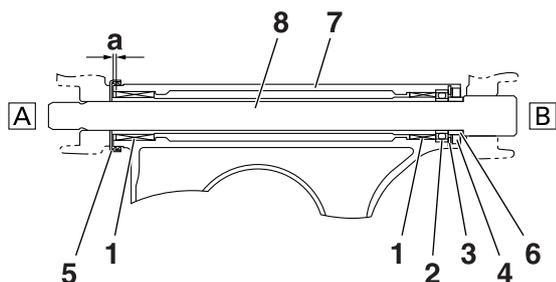
2. Install:

- Bearings "1"
- Bearing "2"
- Circlip "3"
- Oil seal "4"



**Installed depth of bearing "a"
0–1.0 mm (0–0.04 in)**

SWINGARM



- 5. Dust cover
- 6. Collar
- 7. Swingarm
- 8. Pivot shaft

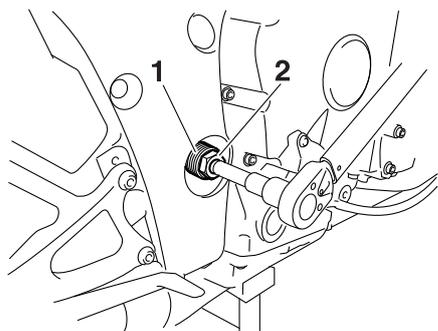
- A. Left side
- B. Right side

3. Install:
- Pivot shaft "1"

	Pivot shaft 7 Nm (0.7 m·kgf, 5.1 ft·lbf)
---	---

TIP
Tighten the pivot shaft with the damper rod holder (22 mm) "2".

	Damper rod holder (22 mm) 90890-01365
---	--

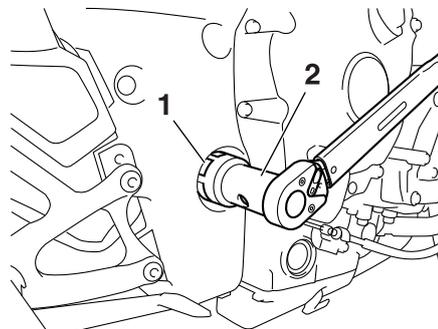


4. Install:
- Pivot shaft ring nut "1"

	Pivot shaft ring nut 65 Nm (6.5 m·kgf, 47 ft·lbf)
---	--

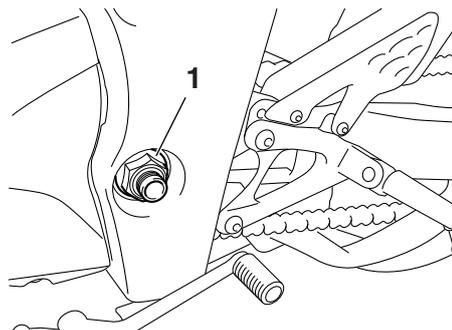
TIP
Tighten the pivot shaft ring nut with the ring nut wrench "2".

	Ring nut wrench 90890-01507 YM-01507
---	---



5. Install:
- Pivot shaft nut "1"

	Pivot shaft nut 105 Nm (10.5 m·kgf, 75 ft·lbf)
---	---



6. Adjust:
- Drive chain slack
Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-21.

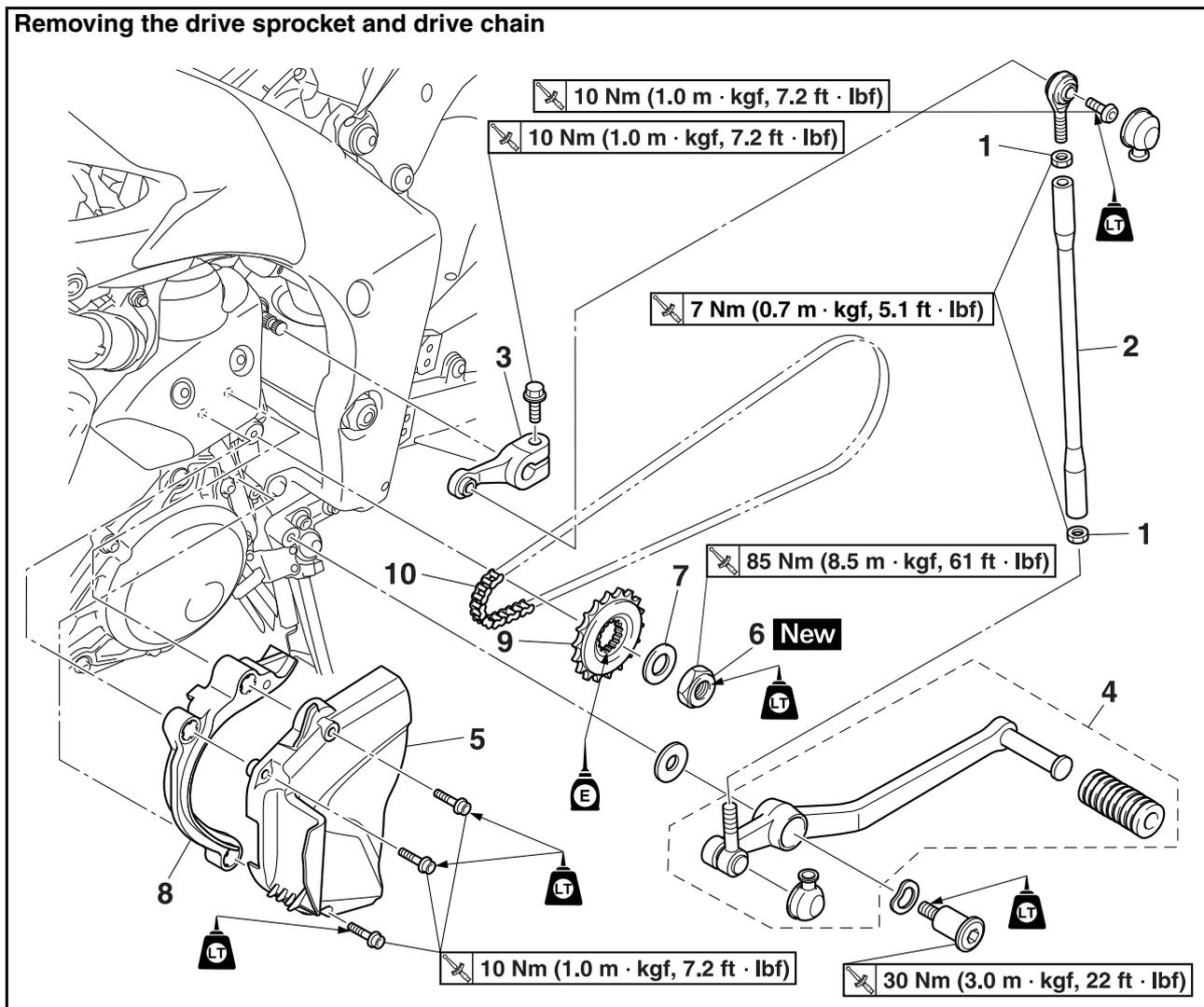
	Drive chain slack (when adjusting the drive chain) 25.0–35.0 mm (0.98–1.38 in) Drive chain slack (when replacing the drive chain and sprocket) 20.0–30.0 mm (0.79–1.18 in)
---	---

CHAIN DRIVE

EAS23400

CHAIN DRIVE

Removing the drive sprocket and drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Drive chain		Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-21.
1	Locknut	2	
2	Shift rod	1	
3	Shift arm	1	
4	Shift pedal	1	
5	Drive sprocket cover	1	
6	Drive sprocket nut	1	
7	Washer	1	
8	Drive chain guide (drive sprocket side)	1	
9	Drive sprocket	1	
10	Drive chain	1	
			For installation, reverse the removal procedure.

CHAIN DRIVE

EAS23410

REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

2. Remove:

- Drive chain

TIP

Cut the drive chain with the drive chain cut & rivet tool.



Drive chain cut & rivet tool
90890-01550
YM-01550

EAS14B1012

CHECKING THE DRIVE CHAIN

1. Measure:

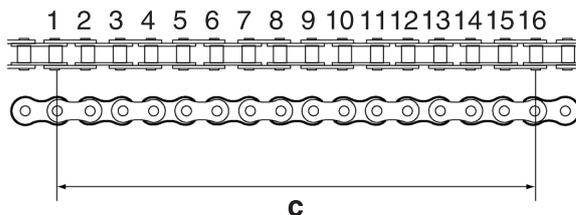
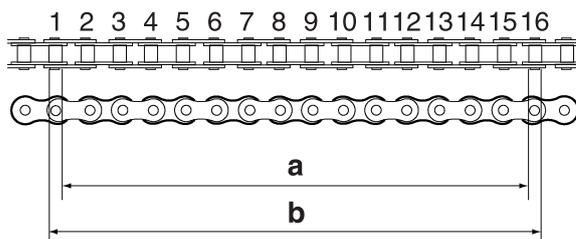
- Measure the dimension between 15-links on the inner side “a” and outer side “b” of the roller and calculate the dimension between pin centers.
- Dimension “c” between pin centers = (Inner dimension “a” + Outer dimension “b”)/2
- 15-link section “c” of the drive chain Out of specification → Replace the drive chain, drive sprocket and rear wheel sprocket as a set.



15-link length limit
239.3 mm (9.42 in)

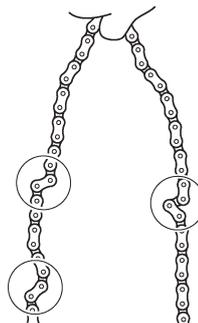
TIP

- While measuring the 15-link section, push down on the drive chain to increase its tension.
- Perform this measurement at two or three different places.



2. Check:

- Drive chain Stiffness → Clean and lubricate or replace.



12510204

3. Clean:

- Drive chain



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

ECA14B1010

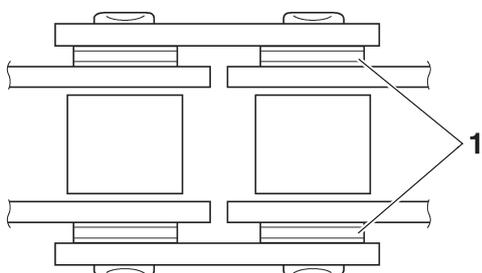
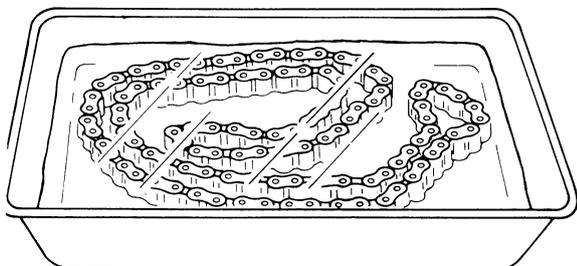
NOTICE

- This vehicle 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,

CHAIN DRIVE

use only kerosene to clean the drive chain.

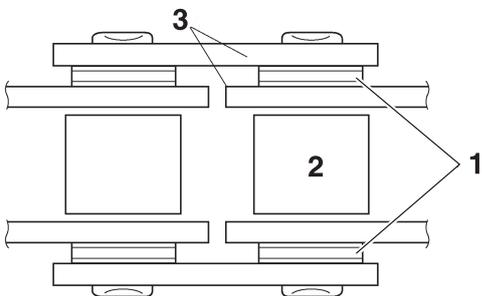
- Do not soak the drive chain in kerosene for more than ten minutes, otherwise the O-rings can be damaged.



I2510201

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/cracks → Replace the drive chain.



I2510201

5. Lubricate:

- Drive chain

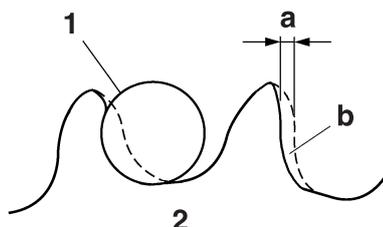
	<p>Recommended lubricant Chain lubricant suitable for O-ring chains</p>
---	--

EAS23460

CHECKING THE DRIVE SPROCKET

1. Check:

- Drive sprocket
More than 1/4 tooth "a" wear → Replace the drive chain sprockets as a set.
Bent teeth → Replace the drive chain sprockets as a set.



b. Correct

1. Drive chain roller
2. Drive chain sprocket

EAS23470

CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-29.

EAS23480

CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-29.

EAS23490

INSTALLING THE DRIVE CHAIN

1. Install:

- Drive chain

ECA14B1023

NOTICE

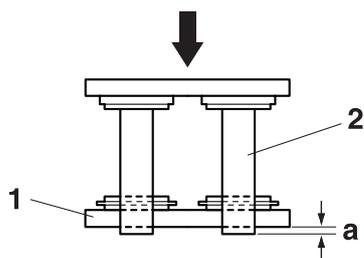
Be sure to put on safety goggles when working.



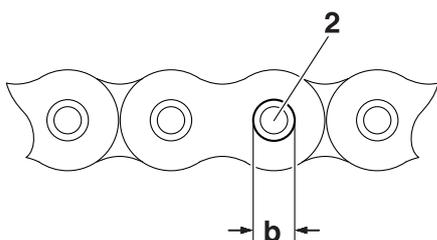
Drive chain cut & rivet tool
90890-01550
YM-01550

- When press fitting the connecting plate "1", make sure the space "a" between the end of the connecting pin "2" and the connecting plate is 1.2–1.4 mm (0.05–0.06 in).

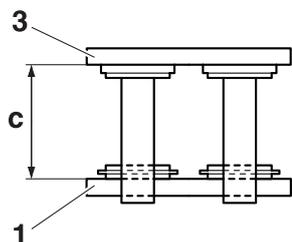
CHAIN DRIVE



b. After riveting, make sure the diameter between the edges "b" of the connecting pin "2" is 5.7–6.0 mm (0.22–0.24 in).



c. After riveting, make sure the space "c", which is inside of the connecting link "3" and inside of the connecting plate "1", is 16.3–16.5 mm (0.64–0.65 in).



2. Lubricate:
• Drive chain



Recommended lubricant
Chain lubricant suitable for O-ring chains

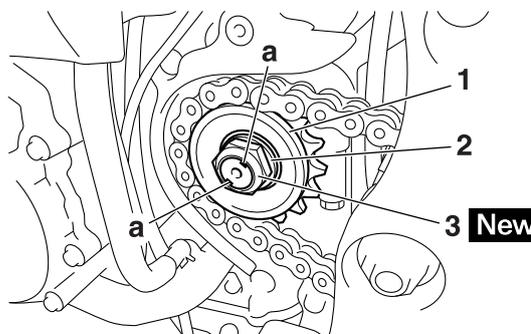
3. Install:
• Drive sprocket "1"
• Washer "2"
• Drive sprocket nut "3"



Drive sprocket nut
85 Nm (8.5 m·kgf, 61 ft·lbf)
LOCTITE®

TIP

- While applying the rear brake, tighten the drive sprocket nut.
- Stake the drive sprocket nut at cutouts, "a" in the drive axle.



ECA14300

NOTICE

Never install a new drive chain onto worn drive chain sprockets; this will dramatically shorten the drive chain's life.

4. Adjust:
- Drive chain slack
Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-21.



Drive chain slack (when adjusting the drive chain)
25.0–35.0 mm (0.98–1.38 in)
Drive chain slack (when replacing the drive chain and sprocket)
20.0–30.0 mm (0.79–1.18 in)

ECA13550

NOTICE

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.

CHAIN DRIVE

ENGINE

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ENGINE INSPECTION

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



7. Install:
- Spark plugs
 - Ignition coils

	<p>Spark plug 13 Nm (1.3 m·kgf, 9.4 ft·lbf)</p>
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8. Install:
- All removed parts

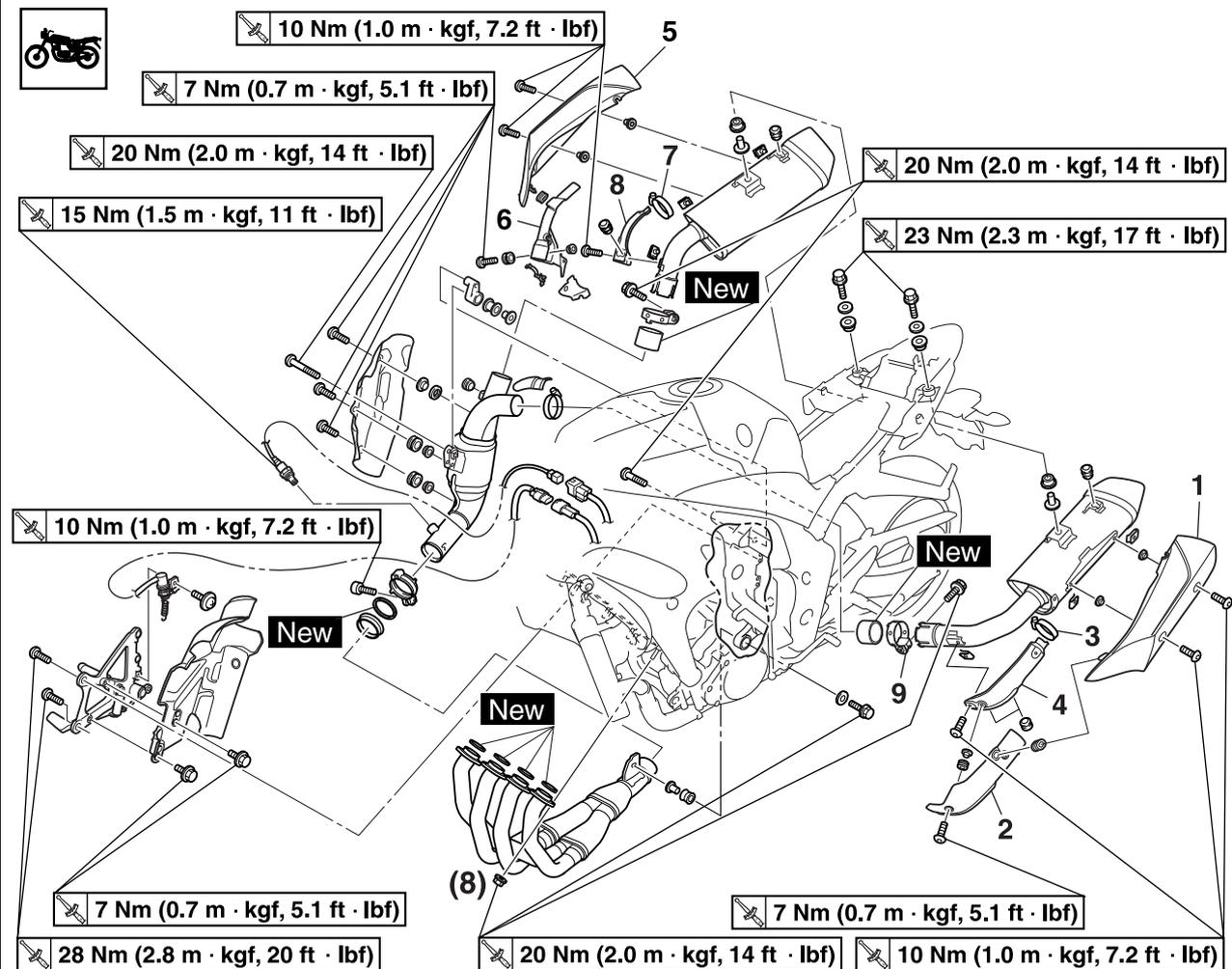
TIP _____
 For installation, reverse the removal procedure.

ENGINE REMOVAL

EAS23711

ENGINE REMOVAL

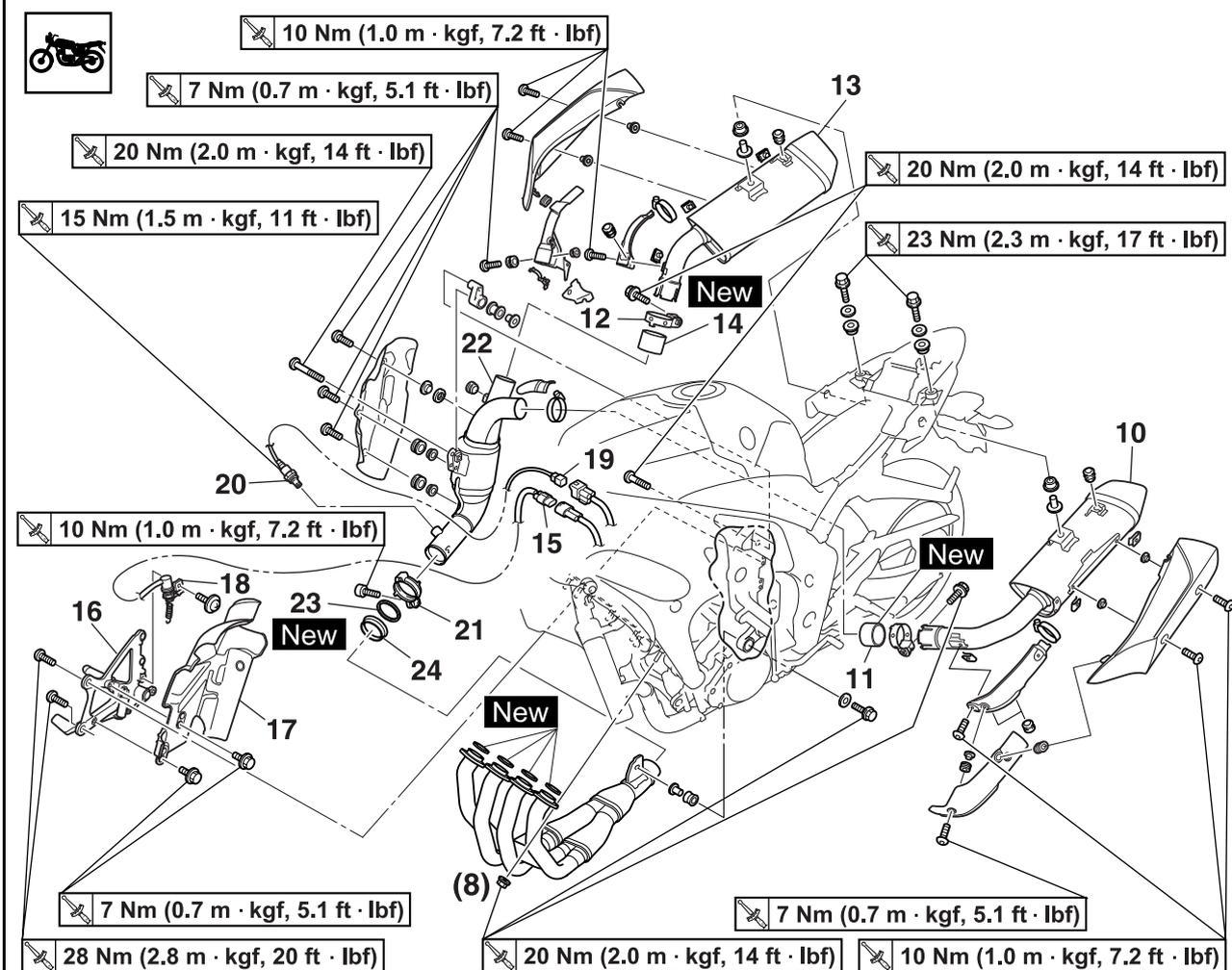
Removing the exhaust pipe and muffler



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Passenger seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Upper tail cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear brake master cylinder		Refer to "REAR BRAKE" on page 4-44.
	Radiator lower bracket		Refer to "RADIATOR" on page 6-1.
1	Left muffler cover	1	
2	Left muffler pipe cover	1	
3	Left muffler pipe protector clamp	1	Loosen.
4	Left muffler pipe protector	1	
5	Right muffler cover	1	
6	Right muffler pipe cover	1	
7	Right muffler pipe protector clamp	1	Loosen.
8	Right muffler pipe protector	1	
9	Left muffler clamp	1	Loosen.

ENGINE REMOVAL

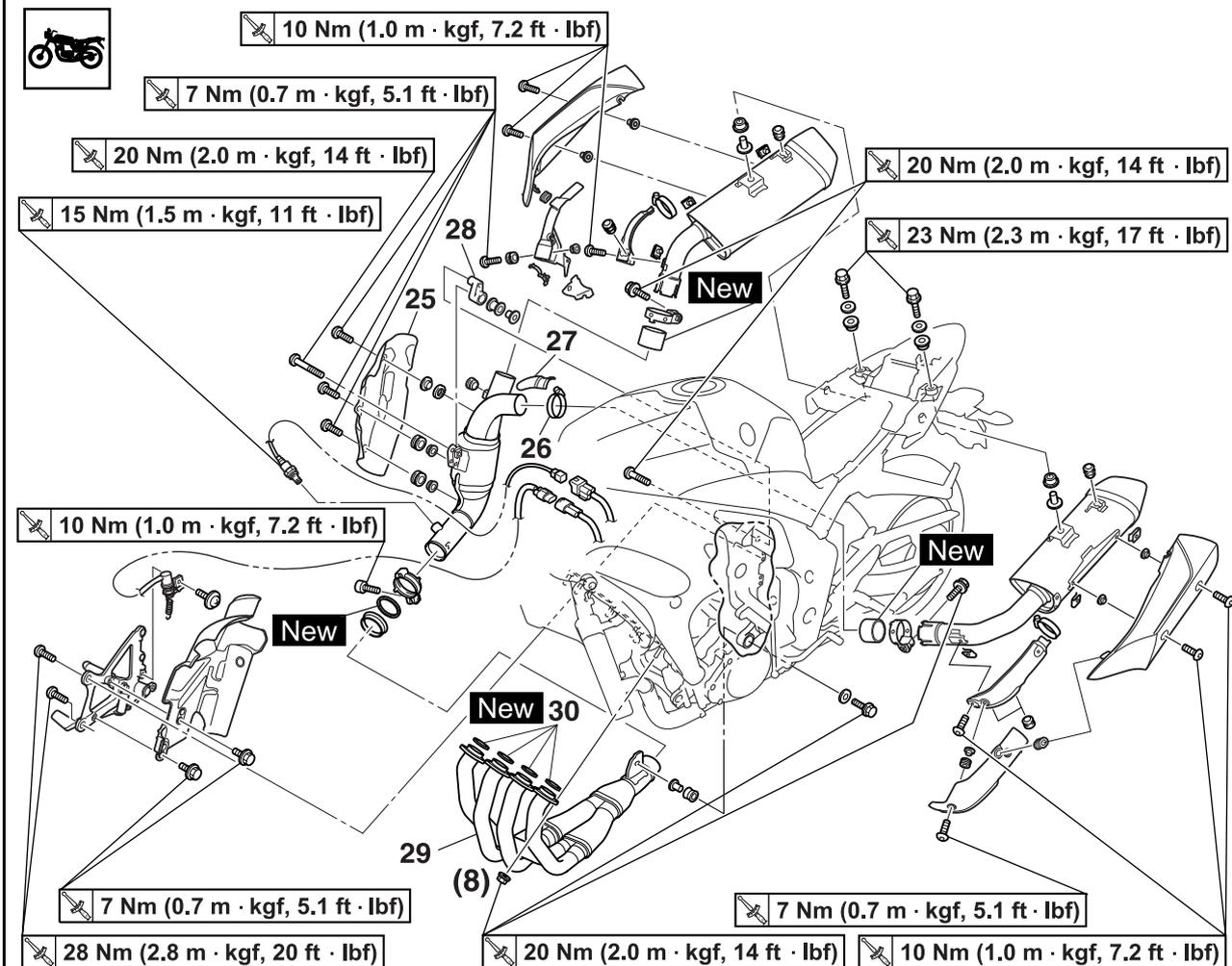
Removing the exhaust pipe and muffler



Order	Job/Parts to remove	Q'ty	Remarks
10	Left muffler	1	
11	Left muffler gasket	1	
12	Right muffler clamp	1	Loosen.
13	Right muffler	1	
14	Right muffler gasket	1	
15	Rear brake light switch coupler	1	Disconnect.
16	Right footrest assembly	1	
17	Exhaust chamber cover	1	
18	Rear brake light switch	1	
19	O ₂ sensor lead coupler	1	Disconnect.
20	O ₂ sensor	1	
21	Exhaust chamber clamp	1	
22	Exhaust chamber	1	
23	Exhaust chamber gasket	1	
24	Collar	1	

ENGINE REMOVAL

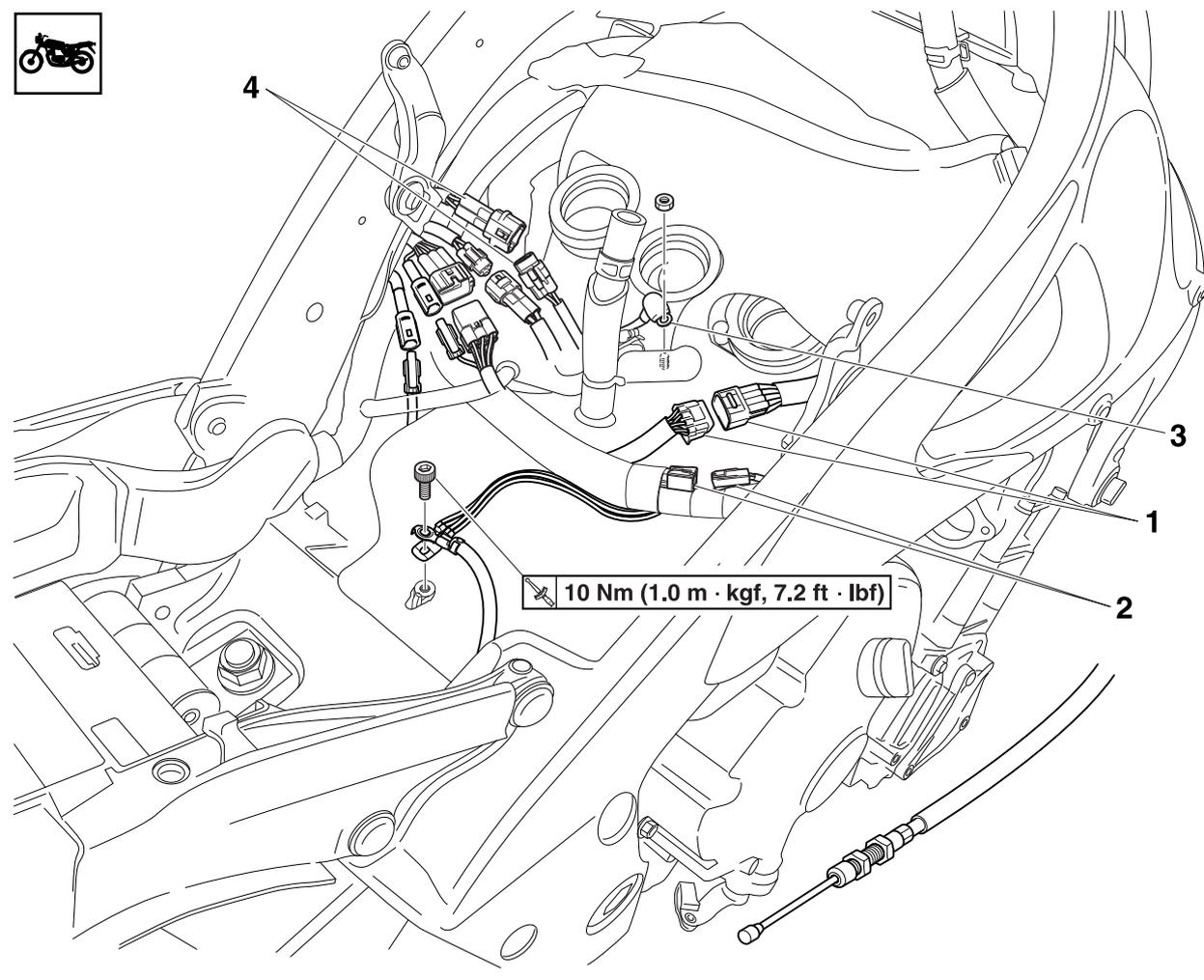
Removing the exhaust pipe and muffler



Order	Job/Parts to remove	Q'ty	Remarks
25	Exhaust chamber protector	1	
26	Exhaust chamber pipe protector clamp	1	Loosen.
27	Exhaust chamber pipe protector	1	
28	Exhaust chamber bracket	1	
29	Exhaust pipe	1	
30	Exhaust pipe gasket	4	
			For installation, reverse the removal procedure.

ENGINE REMOVAL

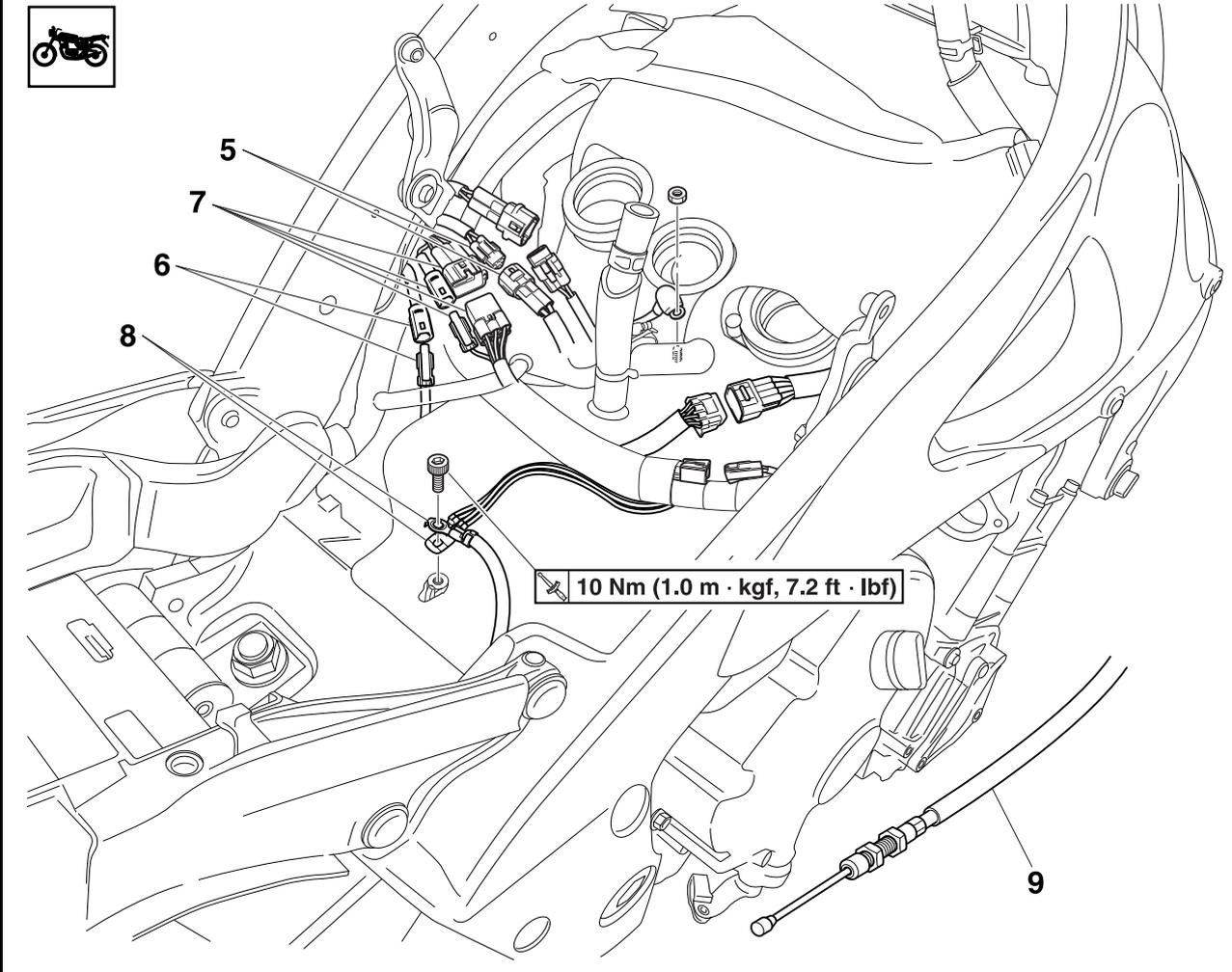
Disconnecting the leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Battery negative lead		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery positive lead		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Side cowling air duct		Refer to "GENERAL CHASSIS" on page 4-1.
	Lower cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
	Air filter case duct		Refer to "AIR INDUCTION SYSTEM" on page 7-21.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Shift pedal		Refer to "CHAIN DRIVE" on page 4-85.
	Drive sprocket		Refer to "CHAIN DRIVE" on page 4-85.
	Throttle body assembly		Refer to "THROTTLE BODIES" on page 7-12.
1	Sub wire harness coupler	1	Disconnect.
2	Crankshaft position sensor coupler	1	Disconnect.
3	Starter motor lead	1	Disconnect.
4	Sidestand switch lead coupler	1	Disconnect.

ENGINE REMOVAL

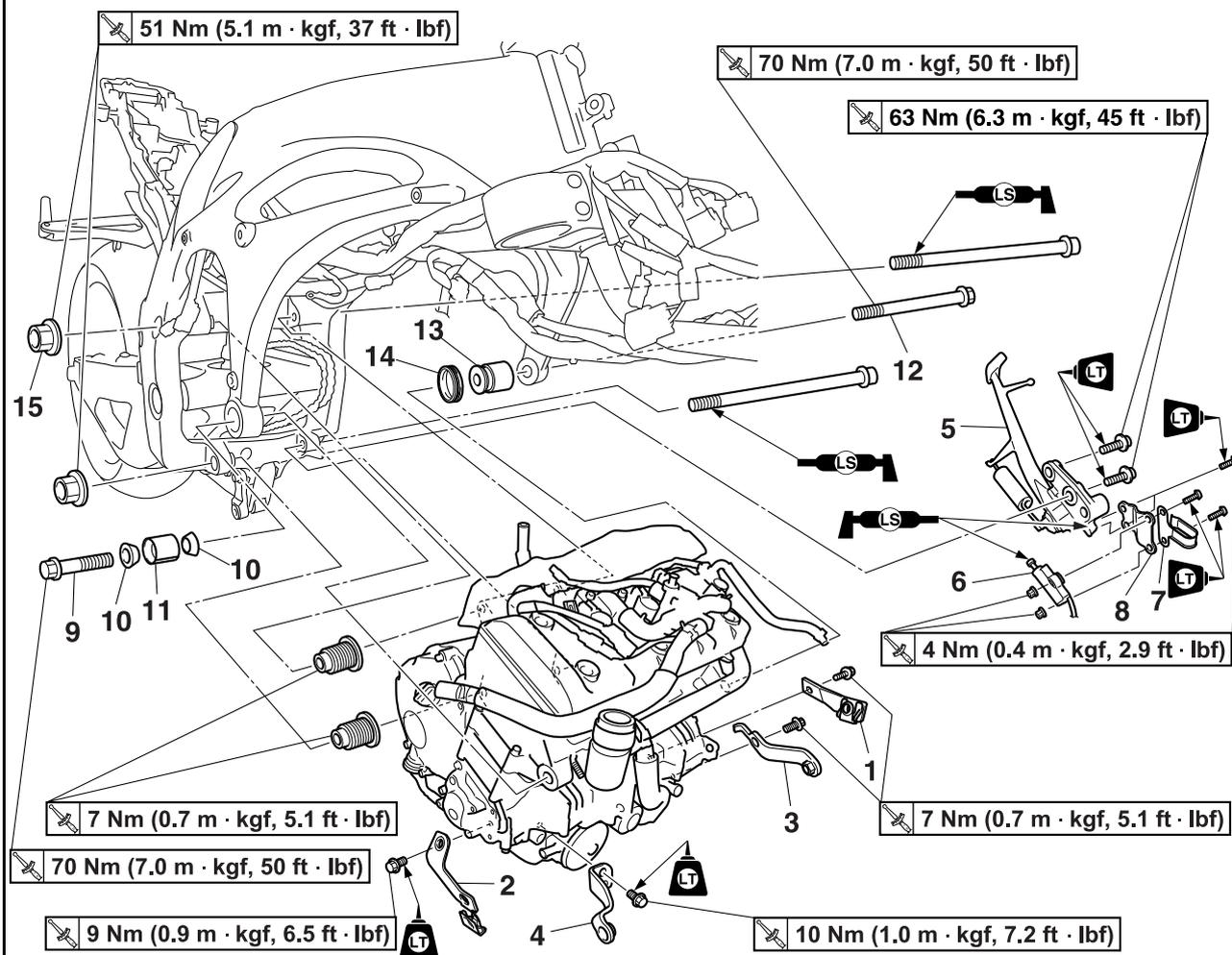
Disconnecting the leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
5	Rear speed sensor lead coupler	1	Disconnect.
6	Oil level switch lead coupler	1	Disconnect.
7	Gear position sensor coupler	2	Disconnect.
8	Engine ground lead	2	Disconnect.
9	Clutch cable	1	Disconnect.
			For installation, reverse the removal procedure.

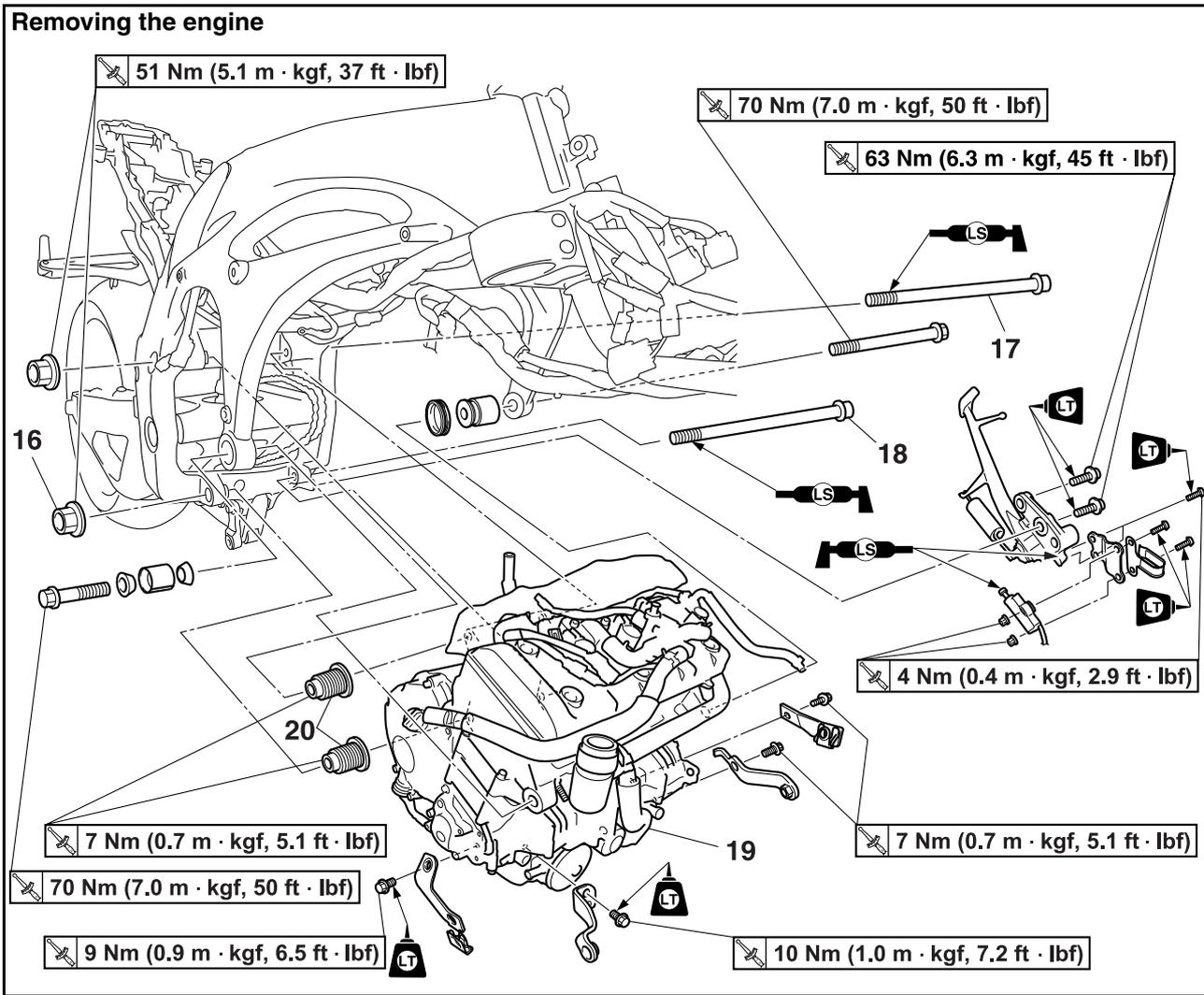
ENGINE REMOVAL

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
1	Left lower cowling bracket	1	
2	Right lower cowling bracket	1	
3	Left inner panel bracket	1	
4	Right inner panel bracket	1	
5	Sidestand assembly	1	
6	Sidestand switch	1	
7	Holder	1	
8	Sidestand switch bracket	1	
9	Engine mounting bolt (front right side)	1	
10	Engine mount collar (front right side)	2	
11	Engine mount collar (front right side)	1	
12	Engine mounting bolt (front left side)	1	
13	Left engine mount collar	1	
14	Left engine mount damper	1	
15	Engine mount nut (rear upper side)	1	

ENGINE REMOVAL



Order	Job/Parts to remove	Q'ty	Remarks
16	Engine mount nut (rear lower side)	1	
17	Engine mount bolt (rear upper side)	1	
18	Engine mount bolt (rear lower side)	1	
19	Engine	1	
20	Engine mount adjusting bolt	2	
			For installation, reverse the removal procedure.

ENGINE REMOVAL

EAS23720

INSTALLING THE ENGINE

ECA14B1021

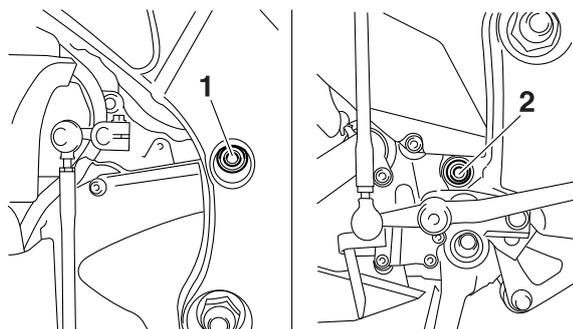
NOTICE

Do not hold the radiator inlet pipe when removing the engine and moving the engine by itself.

1. Install:
 - Engine mounting adjust bolts (temporary tighten)
2. Install:
 - Engine
3. Install:
 - Engine mounting bolt (rear upper side) "1"
 - Engine mounting bolt (rear lower side) "2"
 - Engine mounting nut (rear upper side)
 - Engine mounting nut (rear lower side)

TIP

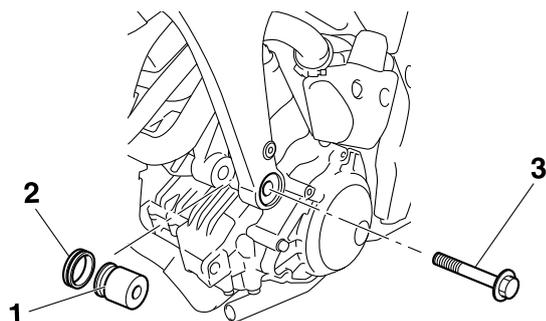
Lubricate the upper and lower engine mounting bolts threads with lithium-soap-based grease.



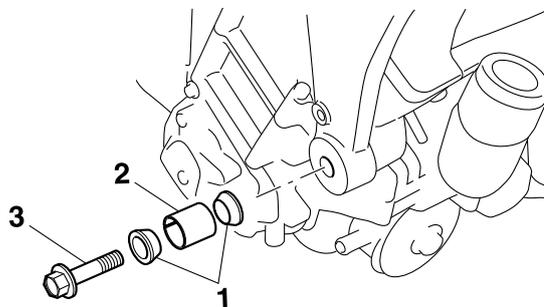
4. Install:
 - Engine mount collar (front left side) "1" (Install together with damper "2".)
 - Engine mounting bolt (front left side) "3" (temporary tighten)

TIP

When installing the engine mount collar (front left side), set the damper toward the engine.



5. Install:
 - Engine mount collars (front right side) "1"
 - Engine mount collar (front right side) "2"
 - Engine mounting bolt (front right side) "3" (temporary tighten)



6. Tighten:
 - Engine mount adjusting bolts



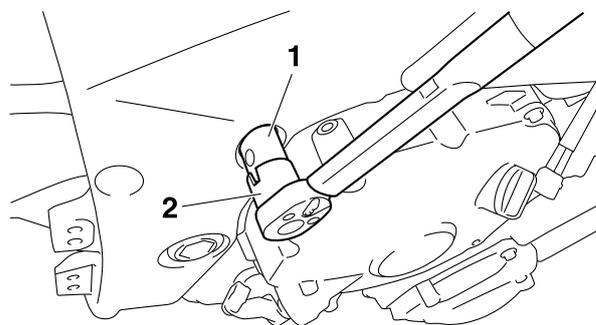
Engine mount adjusting bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

TIP

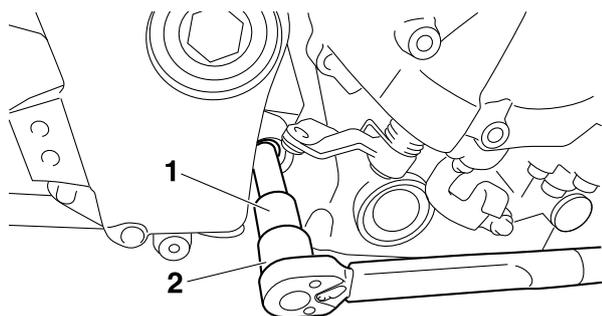
- Use the pivot shaft wrench "1" and pivot shaft wrench adapter "2" to tighten the engine mounting adjust bolts.
- Make sure that surface of the engine and bearing surfaces of the engine mounting adjust bolts are contacting each other.



Pivot shaft wrench
90890-01471
Frame spanner socket
YM-01471
Pivot shaft wrench adapter
90890-01476



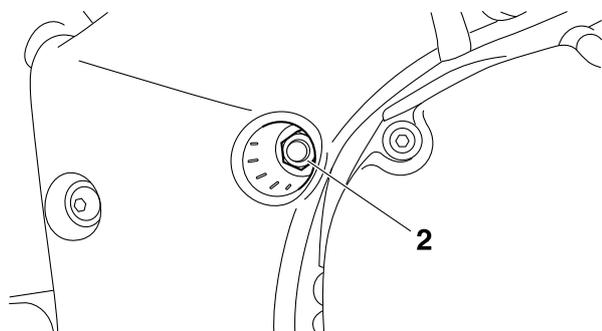
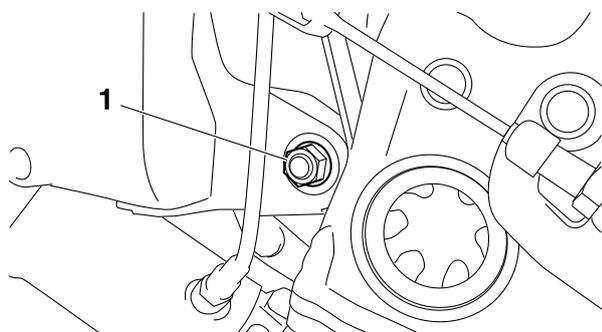
ENGINE REMOVAL



7. Tighten:
- Engine mounting nut (rear lower side) "1"
 - Engine mounting nut (rear upper side) "2"

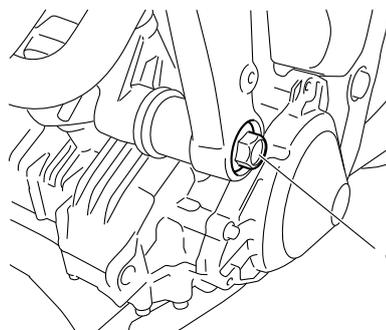
	Engine mounting nut (rear lower side)
	51 Nm (5.1 m·kgf, 37 ft·lbf)
	Engine mounting nut (rear upper side)
	51 Nm (5.1 m·kgf, 37 ft·lbf)

TIP
First tighten the engine mounting nut (rear lower side), and then tighten the engine mounting nut (rear upper side).



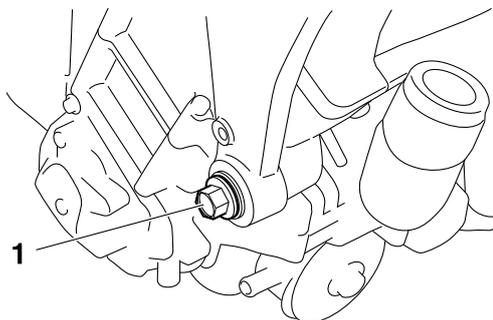
8. Tighten:
- Engine mounting bolt (front left side) "1"

	Engine mounting bolt (front left side)
	70 Nm (7.0 m·kgf, 50 ft·lbf)



9. Tighten:
- Engine mounting bolt (front right side) "1"

	Engine mounting bolt (front right side)
	70 Nm (7.0 m·kgf, 50 ft·lbf)



EAS14B1014
INSTALLING THE EXHAUST PIPE AND MUFFLER

1. Install:
 - Right footrest assembly
Refer to "ADJUSTING THE RIDER FOOTRESTS" on page 4-15.
2. Install:
 - Muffler gasket "1" **New** (to muffler)
 - Muffler

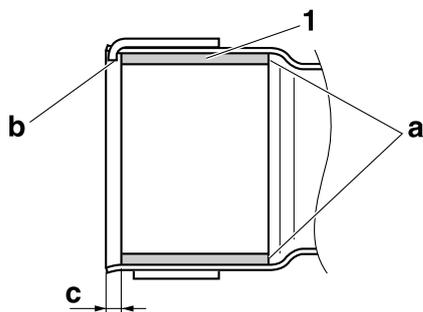
TIP

- When installing the muffler gasket, set the surface "a" with the carbon to the back.
- When installing the catalyst pipe assembly and muffler clamp, tip of the tab "b" should not contact the edge of the muffler gasket.

ENGINE REMOVAL



Installed depth of gasket "c"
3.5 mm (0.14 in)

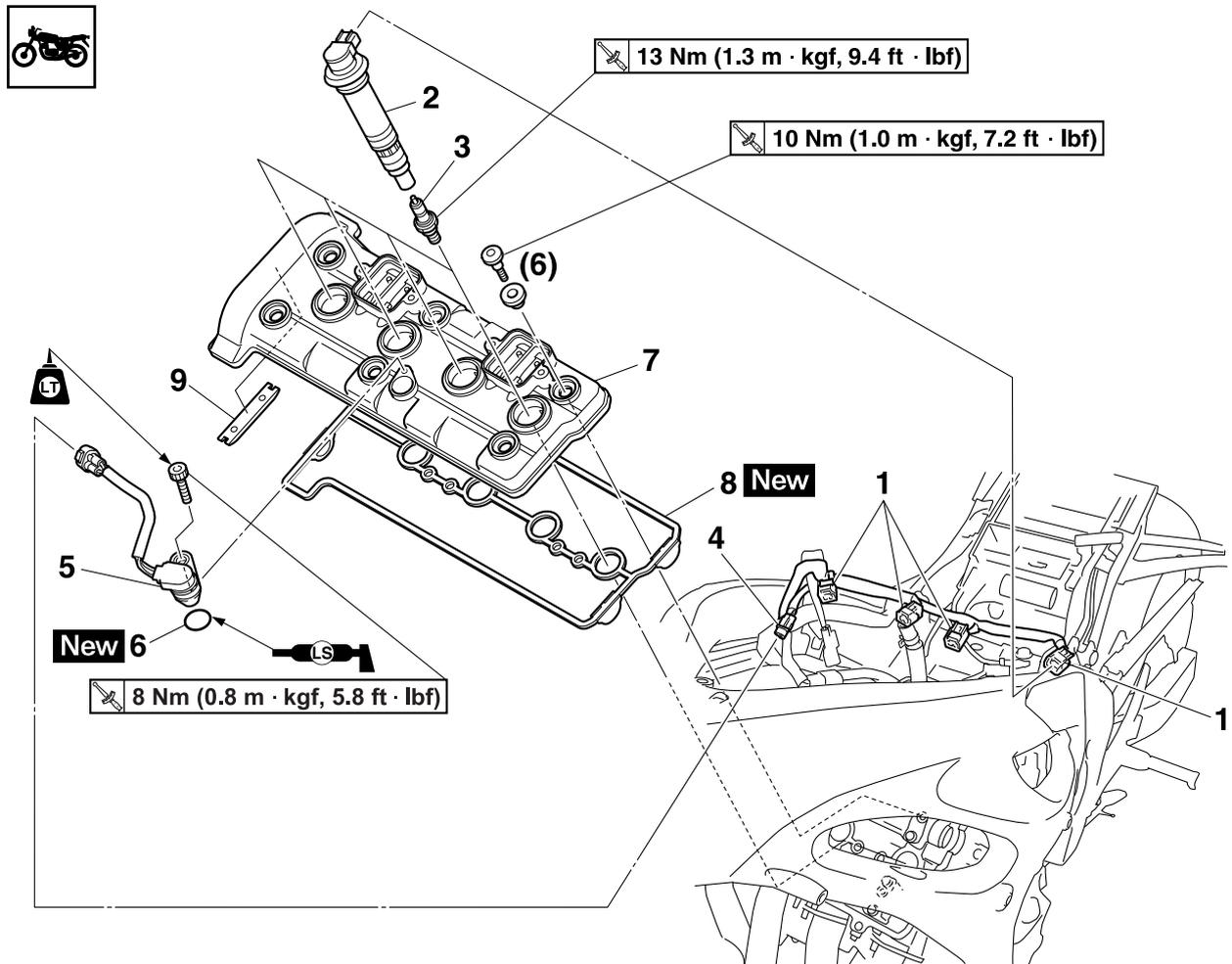


CAMSHAFTS

EAS23760

CAMSHAFTS

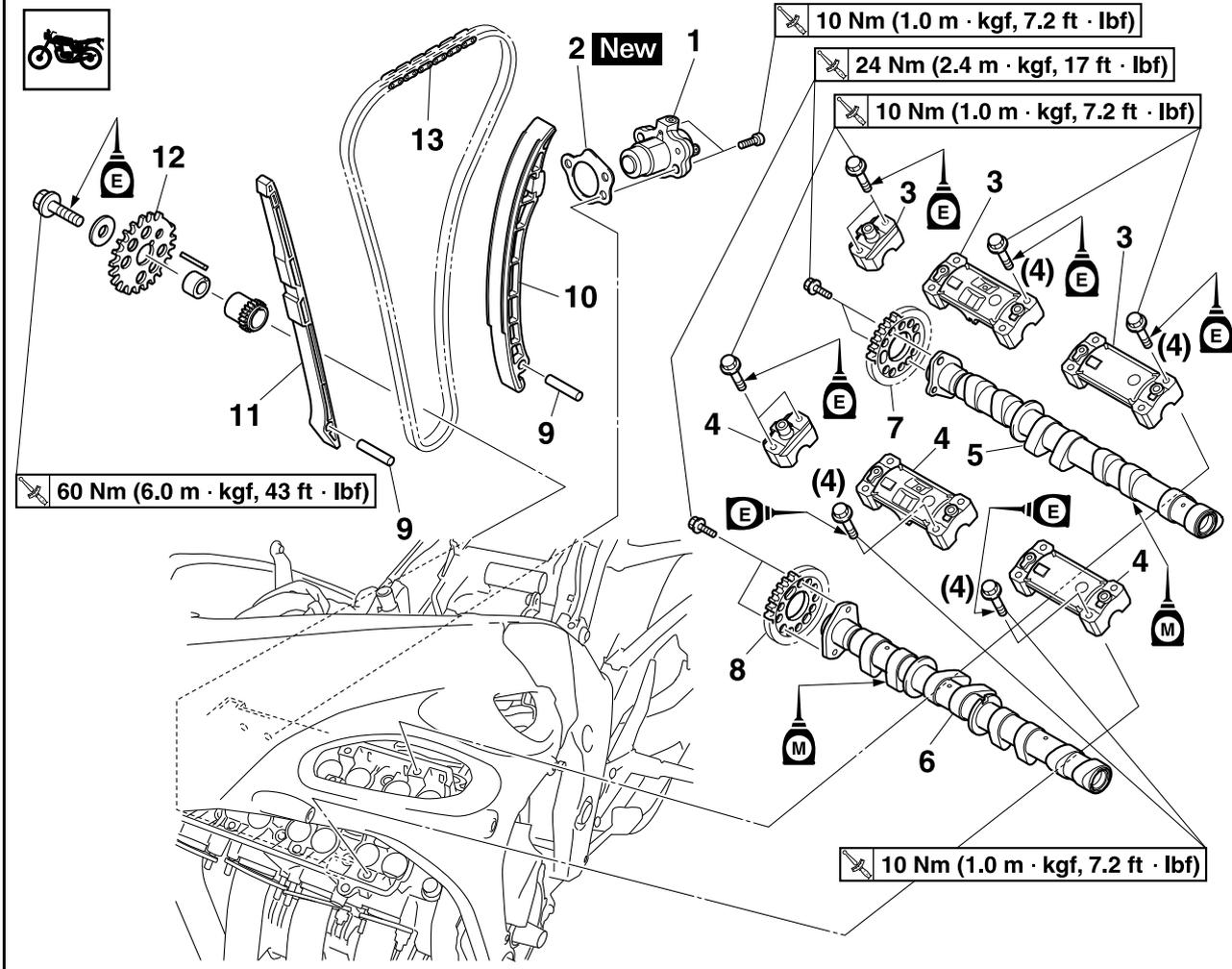
Removing the cylinder head cover



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Reed valve assembly		Refer to "AIR INDUCTION SYSTEM" on page 7-21.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-12.
	Air filter case duct		Refer to "AIR INDUCTION SYSTEM" on page 7-21.
1	Ignition coil coupler	4	Disconnect.
2	Ignition coil	4	
3	Spark plug	4	
4	Cylinder identification sensor coupler	1	Disconnect.
5	Cylinder identification sensor	1	
6	O-ring	1	
7	Cylinder head cover	1	
8	Cylinder head cover gasket	1	
9	Timing chain guide (Top side)	1	
			For installation, reverse the removal procedure.

CAMSHAFTS

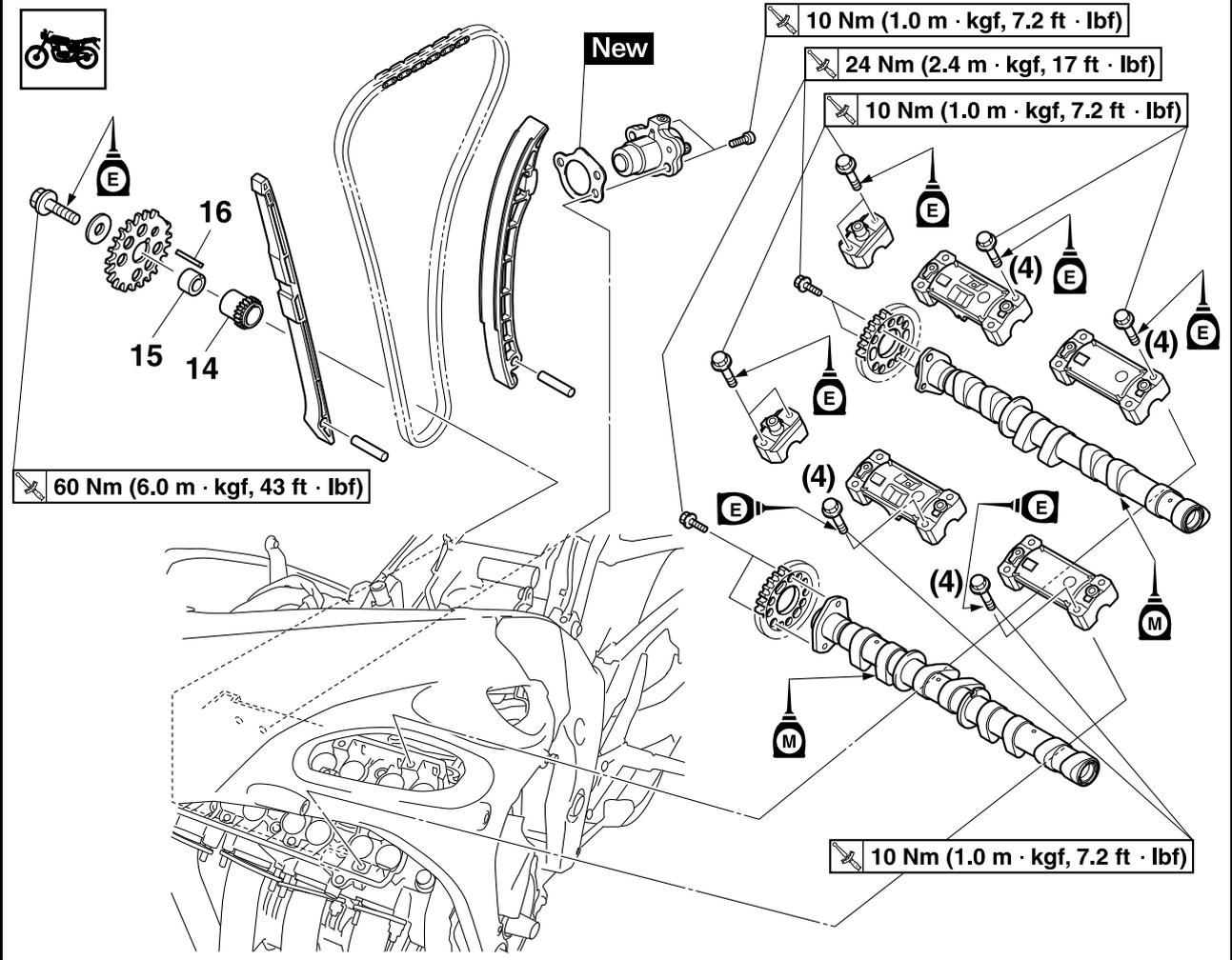
Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
	Pickup coil cover 2		Refer to "PICKUP ROTOR" on page 5-42.
	Generator cover		Refer to "GENERATOR" on page 5-36.
1	Timing chain tensioner	1	
2	Timing chain tensioner gasket	1	
3	Intake camshaft cap	3	
4	Exhaust camshaft cap	3	
5	Intake camshaft	1	
6	Exhaust camshaft	1	
7	Intake camshaft sprocket	1	
8	Exhaust camshaft sprocket	1	
9	Dowel pin	2	
10	Intake side timing chain guide	1	
11	Exhaust side timing chain guide	1	
12	Pickup rotor	1	Refer to "PICKUP ROTOR" on page 5-42.
13	Timing chain	1	

CAMSHAFTS

Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
14	Crankshaft sprocket	1	
15	Collar	1	
16	Straight key	1	
			For installation, reverse the removal procedure.

CAMSHAFTS

EAS23810

REMOVING THE CAMSHAFTS

1. Remove:
 - Pickup rotor cover 2
Refer to "PICKUP ROTOR" on page 5-42.
2. Align:
 - "K" mark "a" on the pickup rotor
(with the crankcase mating surface "b")

ECA14B1034

NOTICE

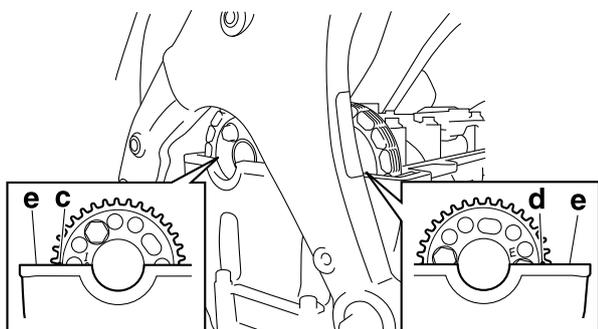
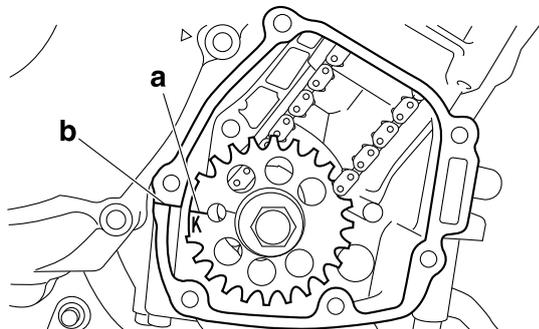
When turning the crankshaft with a tool, remove all the spark plugs.



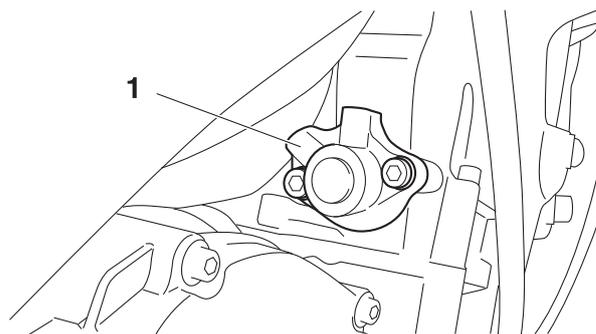
- a. Turn the crankshaft clockwise.
- b. When piston #1 is at BTDC 105° on the compression stroke, align the "K" mark "a" on the pickup rotor with the crankcase mating surface "b".

TIP

You can check that the #1 piston is at BTDC 105° by checking to see that the intake camshaft sprocket timing mark "c" and exhaust camshaft sprocket timing mark "d" are aligned with the cylinder head surface "e".



3. Remove:
 - Timing chain tensioner "1"
 - Gasket

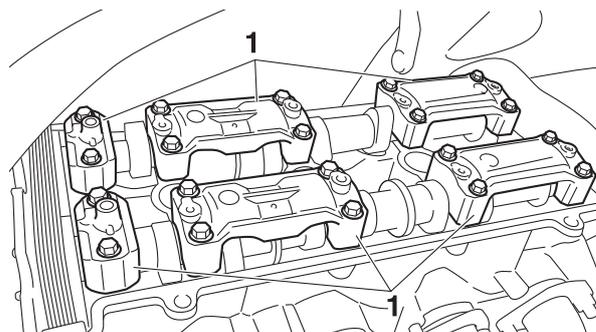


4. Remove:
 - Camshaft caps "1"

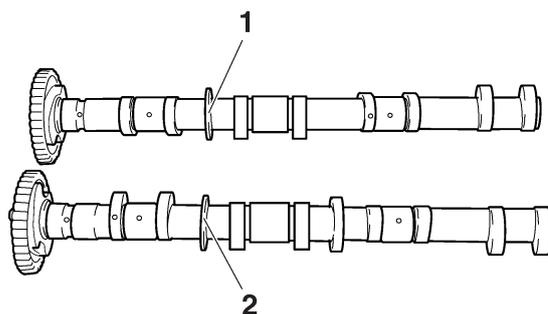
ECA13720

NOTICE

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.



5. Remove:
 - Intake camshaft "1"
 - Exhaust camshaft "2"



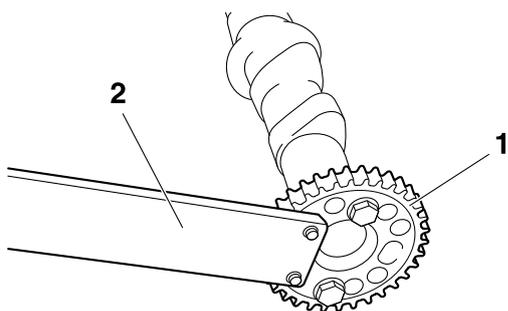
6. Remove:
 - Camshaft sprocket "1"

TIP

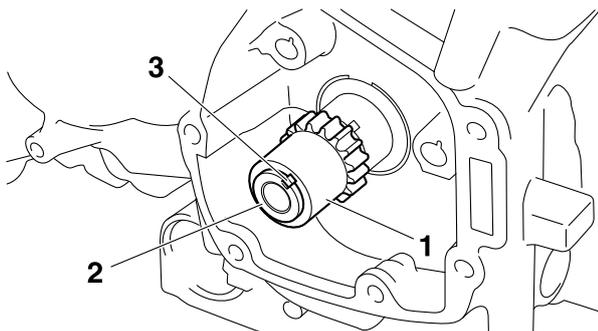
Use the camshaft wrench "2" and loosen the camshaft sprocket bolt.

	<p>Camshaft wrench 90890-04143 YM-04143</p>
---	--

CAMSHAFTS



7. Remove:
 - Dowel pins
 - Timing chain guide (intake side)
 - Timing chain guide (exhaust side)
8. Remove:
 - Pickup rotor
 Refer to "PICKUP ROTOR" on page 5-42.
 - Timing chain
 - Crankshaft sprocket "1"
 - Collar "2"
 - Straight key "3"



Camshaft lobe dimension limit

Intake A

37.350–37.450 mm (1.4705–1.4744 in)

Limit

37.250 mm (1.4665 in)

Intake B

28.034–28.134 mm (1.1037–1.1076 in)

Limit

27.934 mm (1.0998 in)

Exhaust A

36.450–36.550 mm (1.4350–1.4390 in)

Limit

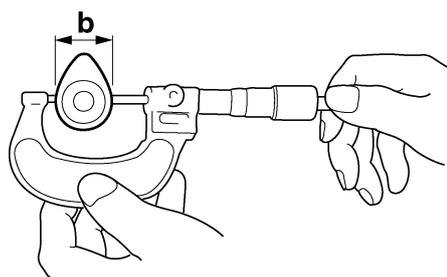
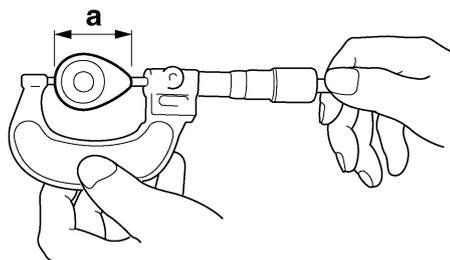
36.350 mm (1.4311 in)

Exhaust B

28.006–28.106 mm (1.1026–1.1065 in)

Limit

27.906 mm (1.0987 in)



EAS23850

CHECKING THE CAMSHAFTS

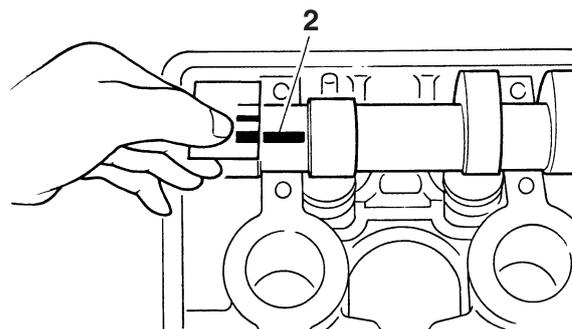
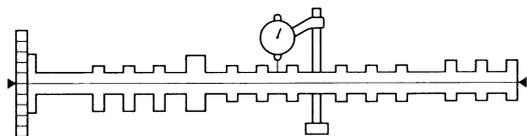
1. Check:
 - Camshaft lobes
Blue discoloration/pitting/scratches → Replace the camshaft.
2. Measure:
 - Camshaft lobe dimensions "a" and "b"
Out of specification → Replace the camshaft.

3. Measure:
 - Camshaft runout
Out of specification → Replace.



Camshaft runout limit
0.030 mm (0.0012 in)

CAMSHAFTS



4. Measure:

- Camshaft-journal-to-camshaft-cap clearance
Out of specification → Measure the camshaft journal diameter.

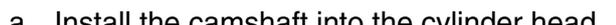
	Camshaft-journal-to-camshaft-cap clearance
	0.028–0.062 mm (0.0011–0.0024 in)



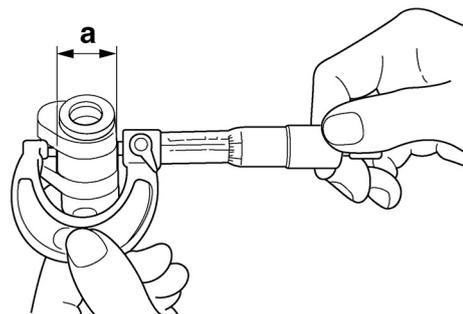
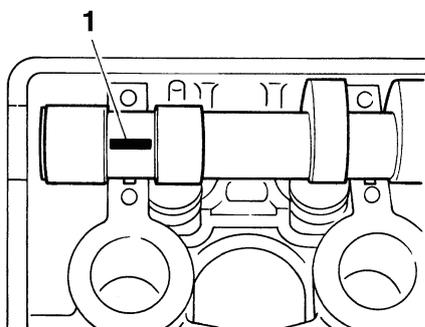
5. Measure:

- Camshaft journal diameter “a”
Out of specification → Replace the camshaft.
Within specification → Replace the cylinder head and the camshaft caps as a set.

	Camshaft journal diameter
	25.459–25.472 mm (1.0023–1.0028 in)



- Install the camshaft into the cylinder head (without the camshaft caps).
- Position strip of Plastigauge® “1” onto the camshaft journal as shown.



- Install the camshaft caps.

TIP

- 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·kgf, 7.2 ft·lbf)

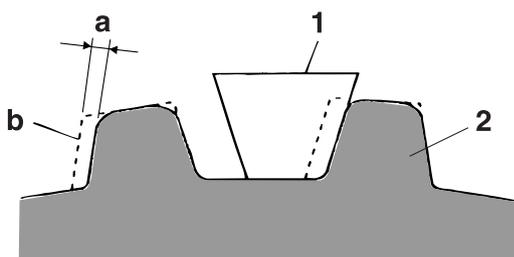
- Remove the camshaft caps and then measure the width of the Plastigauge® “2”.

EAS23870

CHECKING THE TIMING CHAIN AND SPROCKET

- Check:
 - Timing chain
Damage/stiffness → Replace the timing chain, camshaft sprockets and crankshaft sprocket as a set.
- Check:
 - Camshaft sprocket
 - Crankshaft sprocket
More than 1/4 tooth wear “a” → Replace the camshaft sprockets, crankshaft sprocket and timing chain as a set.

CAMSHAFTS

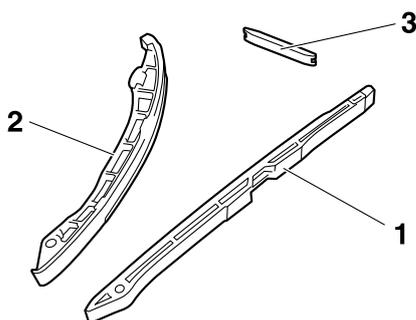


- a. 1/4 tooth
 - b. Correct
1. Timing chain
 2. Camshaft sprocket or crankshaft sprocket

EAS23950

CHECKING THE TIMING CHAIN GUIDES

1. 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).



EAS23960

CHECKING THE TIMING CHAIN TENSIONER

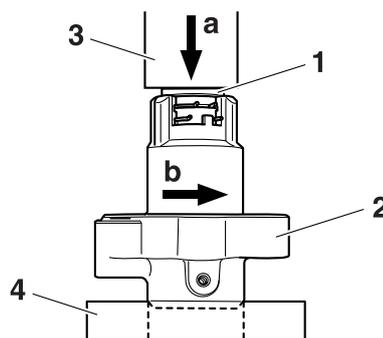
1. Check:
 - Timing chain tensioner
 Cracks/damage → Replace.



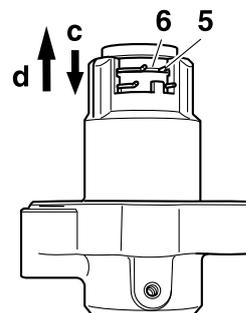
- a. Using a hand press, push and insert timing chain tensioner rod "1" into the timing chain tensioner housing.

TIP _____

Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "2" in direction "b" until it stops.



3. Hand press
 4. Bearing
- b. Keep pressing the timing chain tensioner rod, mount clip "5" into groove "6", and lock the timing chain tensioner rod.
 - c. Push the timing chain tensioner rod in direction "c".
 - d. Make sure that the timing chain tensioner rod can smoothly move out from the timing chain tensioner housing in direction "d". If not smooth, replace the timing chain tensioner assembly.



EAS24000

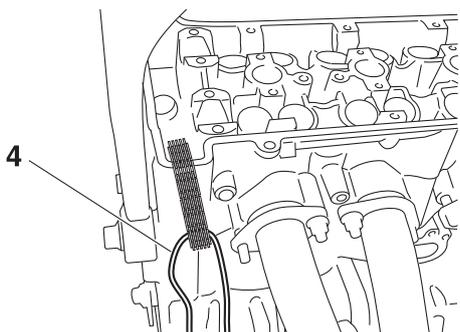
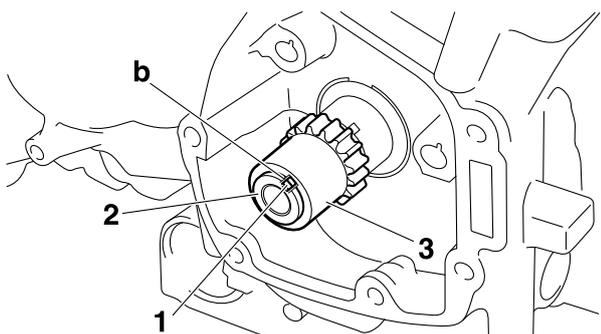
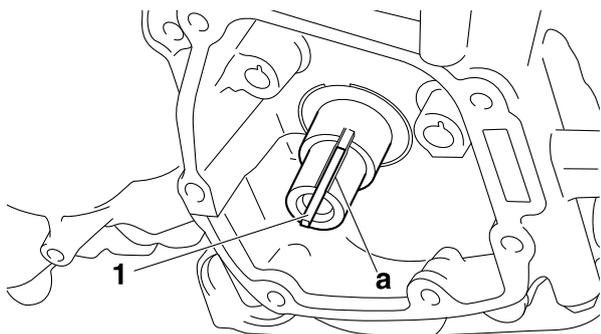
INSTALLING THE CAMSHAFTS

1. Install:
 - Straight key "1"
 - Collar "2"
 - Crankshaft sprocket "3"
 - Timing chain

TIP _____

- Align the straight key to the crankshaft groove "a", collar and crankshaft sprocket groove "b" to the straight key and then install.
- To prevent the timing chain from falling into the crankcase, fasten it with a wire "4".

CAMSHAFTS



2. Install:
- Pickup rotor
- Refer to "PICKUP ROTOR" on page 5-42.

	<p>Pickup rotor bolt 60 Nm (6.0 m·kgf, 43 ft·lbf)</p>
---	--

3. Install:
- Timing chain guide (exhaust side)
 - Timing chain guide (intake side)
 - Dowel pins

4. Align:
- "K" mark "a" on the pickup rotor (with the crankcase mating surface "b")

ECA14B1034

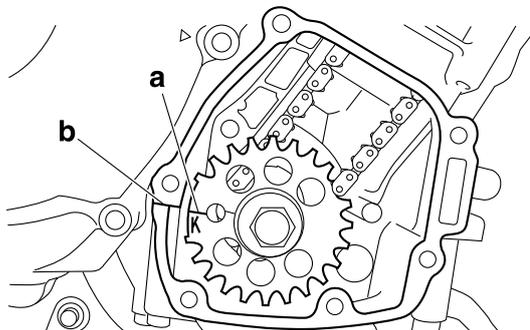
NOTICE

When turning the crankshaft with a tool, remove all the spark plugs.



- a. Turn the crankshaft clockwise.

- b. When position #1 is at BTDC 105°, align the "K" mark "a" with the crankcase mating surface "b".



5. Install:
- Intake camshaft sprocket "1"
 - Exhaust camshaft sprocket "2"

	<p>Camshaft sprocket bolt 24 Nm (2.4 m·kgf, 17 ft·lbf)</p>
---	---

	<p>Camshaft wrench 90890-04143 YM-04143</p>
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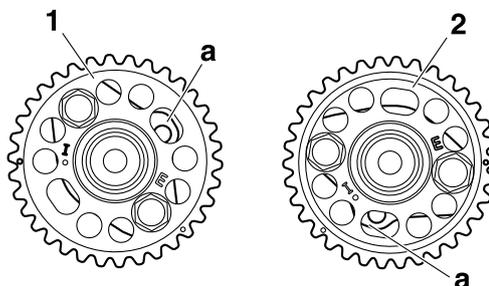
ECA14B1012

NOTICE

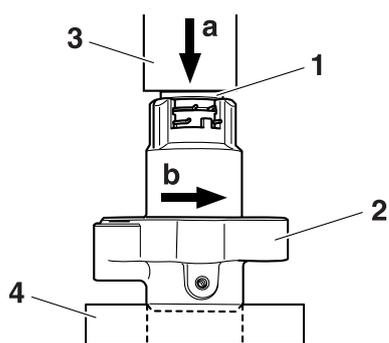
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

TIP

- Install the camshaft projection "a" at the position shown in the illustration.
- Tighten the camshaft sprocket bolt with the camshaft wrench "3".



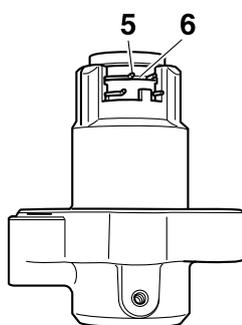
CAMSHAFTS



3. Hand press

4. Bearing

- b. Keep pressing the timing chain tensioner rod, mount clip "5" into groove "6", and lock the timing chain tensioner rod.



- c. In the status of step "b", install the rod assembly in the cylinder block.

TIP _____

Always use a new gasket.

	Timing chain tensioner bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
--	--

- d. Unlock the timing chain tensioner by turning the crankshaft counterclockwise, and tension the timing chain.



10. Turn:

- Crankshaft (several turns clockwise)

ECA14B1034

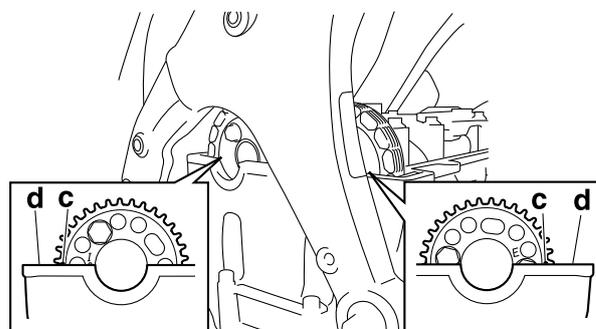
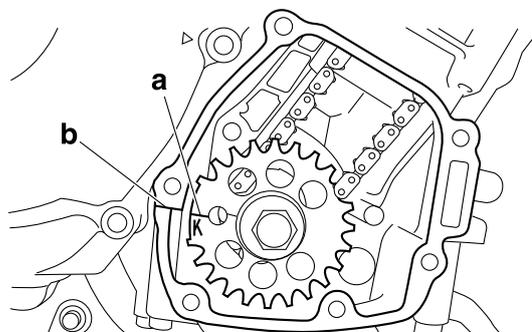
NOTICE _____

When turning the crankshaft with a tool, remove all the spark plugs.

11. Check:

- "K" mark "a"
Make sure the "K" mark on the pickup rotor is aligned with the crankcase mating surface "b".

- Camshaft sprocket timing mark "c"
Make sure the punch mark "c" on the camshaft sprocket is aligned with the cylinder head mating surface "d".
Out of alignment → Adjust.
Refer to the installation steps above.



12. Measure:

- Valve clearance
Out of specification → Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-5.

13. Install:

- Pickup coil rotor cover 2
Refer to "PICKUP ROTOR" on page 5-42.

14. Install:

- Cylinder head cover gasket **New**
- Cylinder head cover

	Cylinder head cover bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
--	---

TIP _____

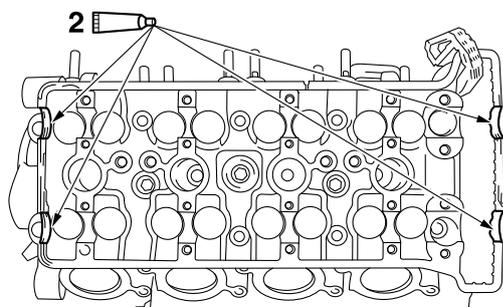
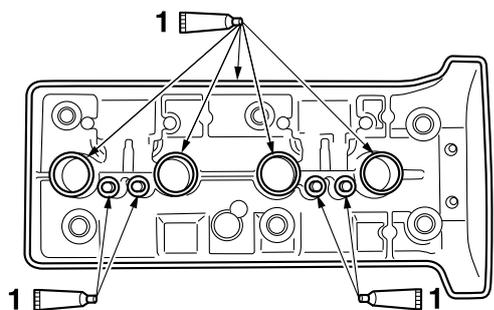
- Apply bond TB1541C® "1" onto the mating surfaces of the cylinder head cover and cylinder head cover gasket.
- Apply bond Yamaha bond No.1215 (Three bond No.1215®) "2" onto the mating surfaces of the cylinder head cover gasket and cylinder head.

CAMSHAFTS

- Tighten the cylinder head cover bolts stages and in a crisscross pattern.



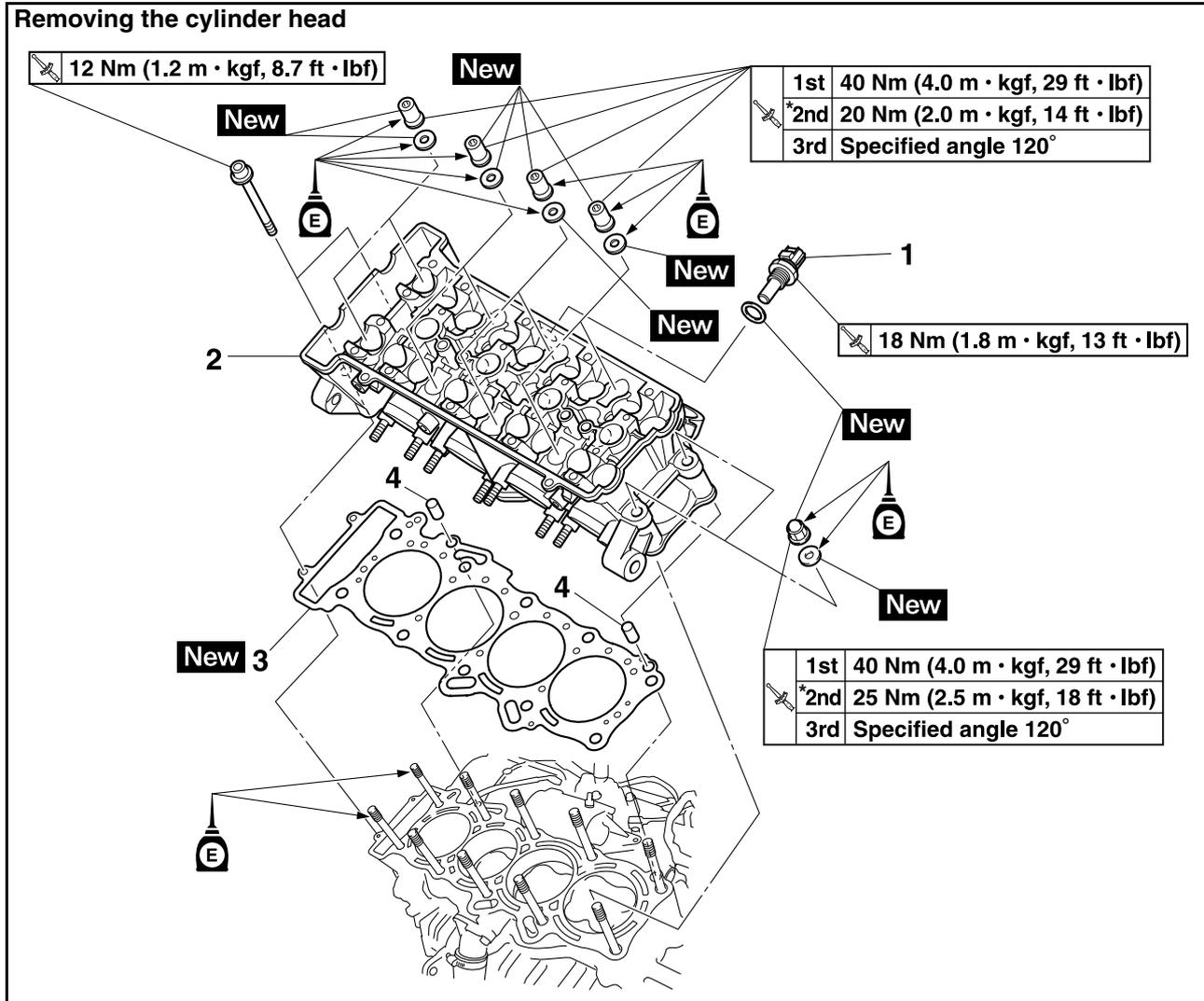
**Yamaha bond No.1215
(Three Bond No.1215®)
90890-85505**



CYLINDER HEAD

EAS24100

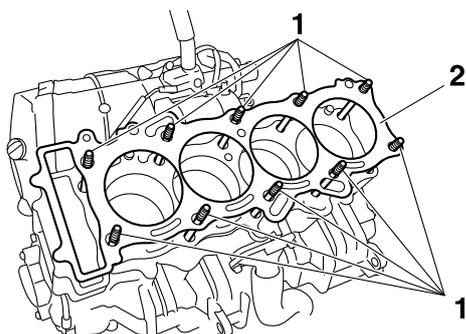
CYLINDER HEAD



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-3.
	Intake camshaft		Refer to "CAMSHAFTS" on page 5-13.
	Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-13.
1	Coolant temperature sensor	1	
2	Cylinder head	1	
3	Cylinder head gasket	1	
4	Dowel pin	2	
			For installation, reverse the removal procedure.

* Following the tightening order, loosen the nut one by one and then retighten it to the specific torque.

CYLINDER HEAD



3. Install:

- Cylinder head
- Washers **New**
- Cylinder head nuts **New**
- Cylinder head bolts

TIP

- Pass the timing chain through the timing chain cavity.
- Lubricate the cylinder head nuts and washers with engine oil.

4. Tighten:

- Cylinder head nuts “1”–“10”
- Cylinder head bolts “11”, “12”



Cylinder head nut

1st: 40 Nm (4.0 m·kgf, 29 ft·lbf)

***2nd: Nut “1”–“7”, “10” 20 Nm**

(2.0 m·kgf, 14 ft·lbf) Nut “8”, “9” 25 Nm (2.5 m·kgf, 18 ft·lbf)

3rd: +120°

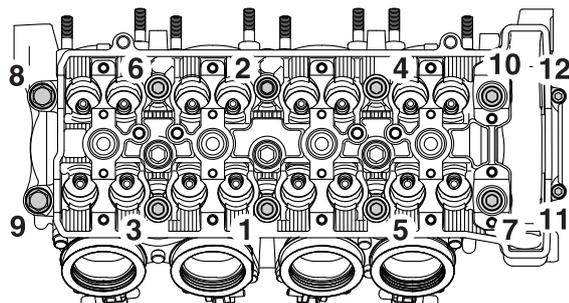
Cylinder head bolt

12 Nm (1.2 m·kgf, 8.7 ft·lbf)

*Following the tightening order, loosen the nut one by one and then retighten it to the specific torque.

TIP

Tighten the cylinder head nuts in the tightening sequence as shown and torque them in 3 stages.



5. Install:

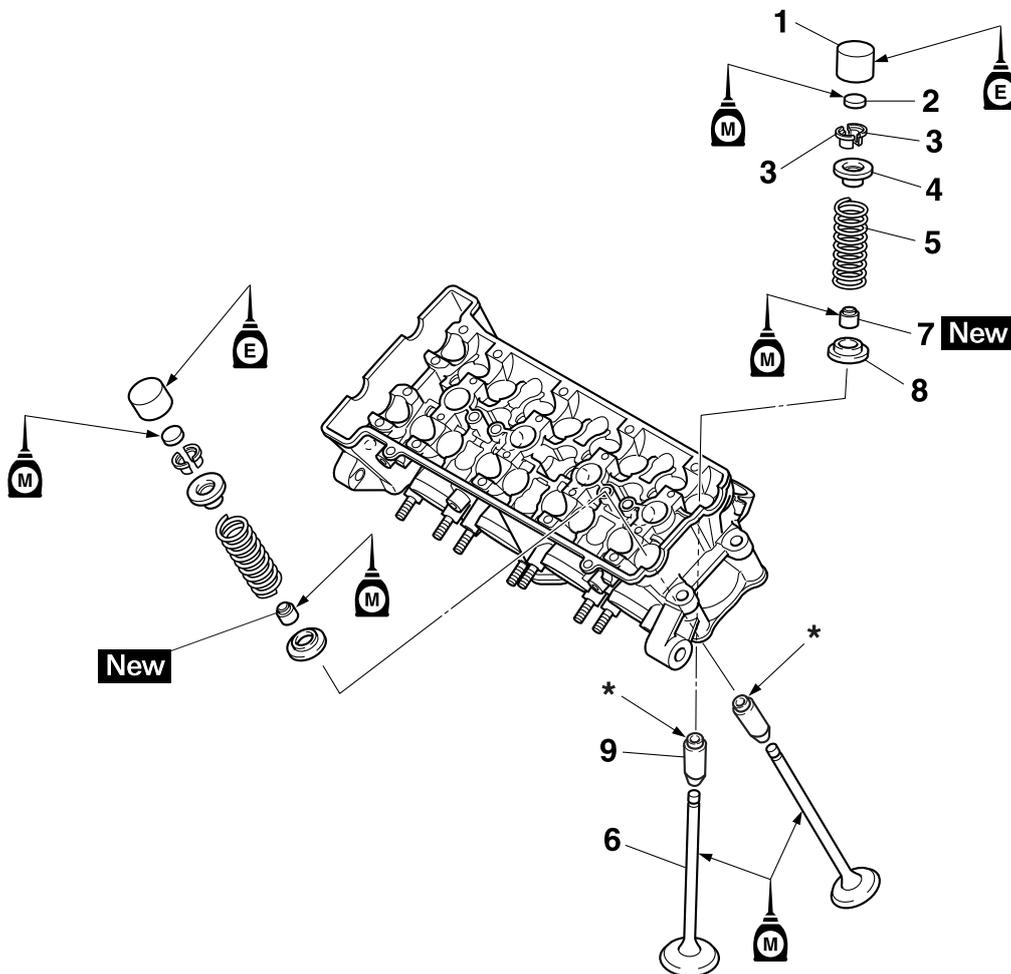
- Exhaust camshaft
 - Intake camshaft
- Refer to “INSTALLING THE CAM-SHAFTS” on page 5-19.

VALVES AND VALVE SPRINGS

EAS24270

VALVES AND VALVE SPRINGS

Removing the valves and valve springs

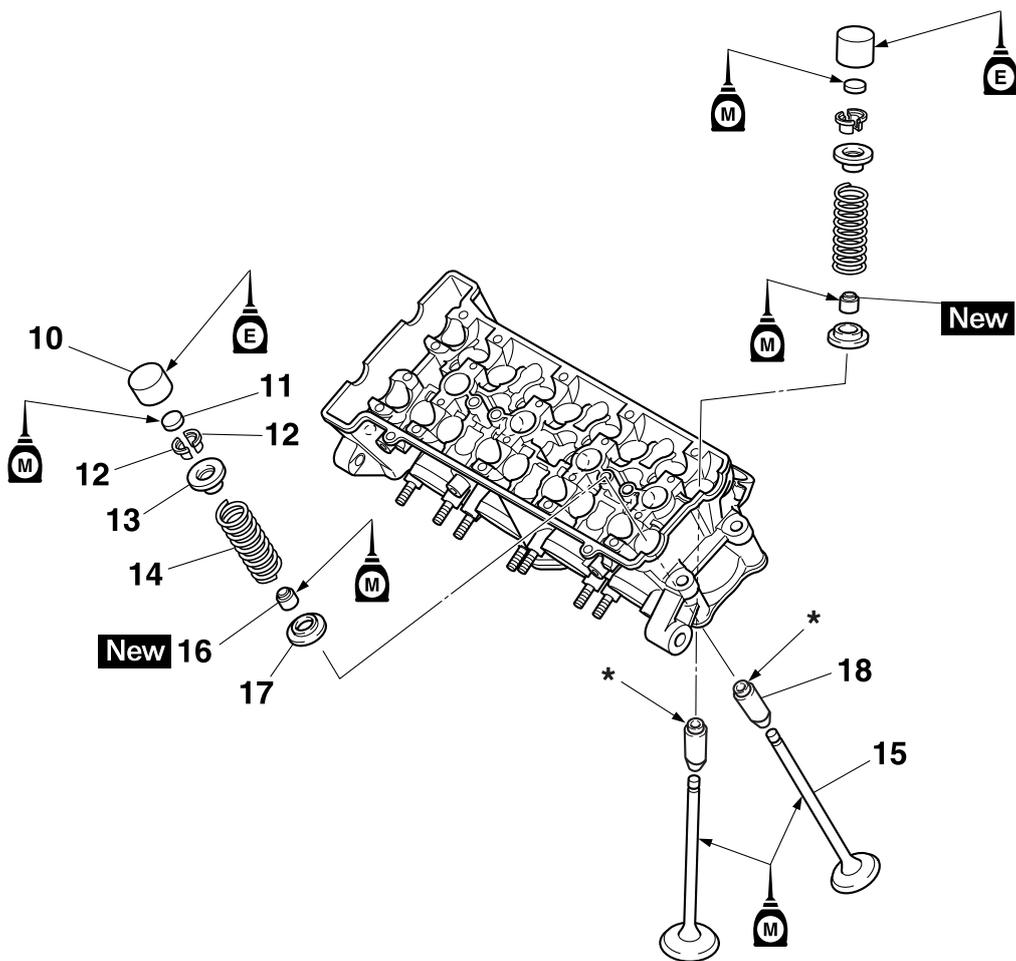


Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-24.
1	Intake valve lifter	8	
2	Intake valve pad	8	
3	Intake valve cotter	16	
4	Intake valve spring retainer	8	
5	Intake valve spring	8	
6	Intake valve	8	
7	Intake valve stem seal	8	
8	Intake valve spring seat	8	
9	Intake valve guide	8	

* Silicon fluid

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
10	Exhaust valve lifter	8	
11	Exhaust valve pad	8	
12	Exhaust valve cotter	16	
13	Exhaust valve spring retainer	8	
14	Exhaust valve spring	8	
15	Exhaust valve	8	
16	Exhaust valve stem seal	8	
17	Exhaust valve spring seat	8	
18	Exhaust valve guide	8	
			For installation, reverse the removal procedure.

* Silicon fluid

VALVES AND VALVE SPRINGS

EAS24280

REMOVING THE VALVES

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

TIP _____

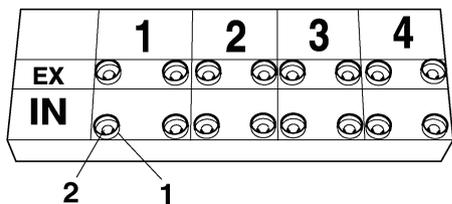
Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

1. Remove:

- Valve lifter "1"
- Valve pad "2"

TIP _____

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:

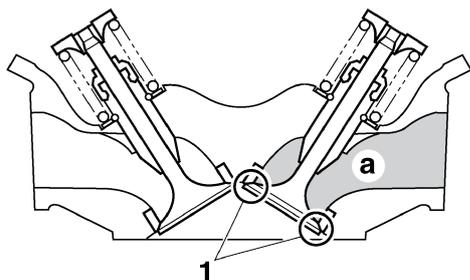
- Valve sealing
Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
Refer to "CHECKING THE VALVE SEATS" on page 5-31.



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

TIP _____

There should be no leakage at the valve seat "1".



3. Remove:

- Valve cotters

TIP _____

Remove the valve cotters by compressing the valve spring with the valve spring compressor "1" and the valve spring compressor attachment "2".



Valve spring compressor
90890-04019

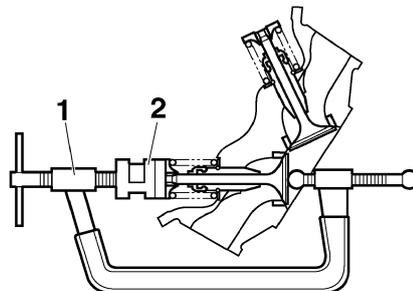
YM-04019

Valve spring compressor attachment
90890-04108

90890-04108

Valve spring compressor adapter 22 mm
YM-04108

YM-04108

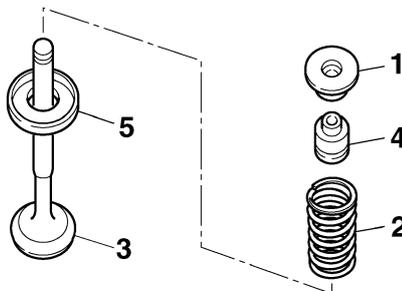


4. Remove:

- Valve spring retainer "1"
- Valve spring "2"
- Valve "3"
- Valve stem seal "4"
- Valve spring seat "5"

TIP _____

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



VALVES AND VALVE SPRINGS

TIP

After replacing the valve guide, reface the valve seat.



- Valve guide remover (ø4.5)**
90890-04116
- Valve guide remover (4.5 mm)**
YM-04116
- Valve guide remover (ø5)**
90890-04097
- Valve guide remover (5.0 mm)**
YM-04097
- Valve guide installer (ø4.5)**
90890-04117
- Valve guide installer (4.5 mm)**
YM-04117
- Valve guide installer (ø5)**
90890-04098
- Valve guide installer (5.0 mm)**
YM-04098
- Valve guide reamer (ø4.5)**
90890-04118
- Valve guide reamer (4.5 mm)**
YM-04118
- Valve guide reamer (ø5)**
90890-04099
- Valve guide reamer (5.0 mm)**
YM-04099

3. Eliminate:

- Carbon deposits
(from the valve face and valve seat)

4. Check:

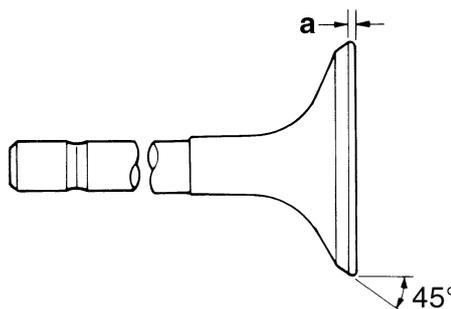
- Valve face
Pitting/wear → Grind the valve face.
- Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.

5. Measure:

- Valve margin thickness “a”
Out of specification → Replace the valve.



- Valve margin thickness**
- Valve margin thickness D (intake)**
1.35–1.75 mm (0.0532–0.0689 in)
- Valve margin thickness D (exhaust)**
0.50–0.90 mm (0.0197–0.0354 in)



6. Measure:

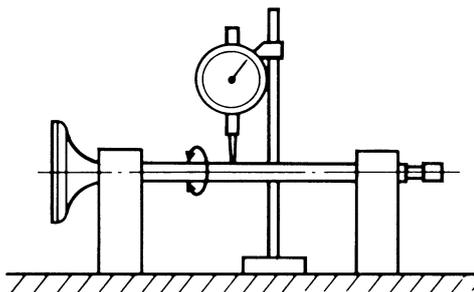
- Valve stem runout
Out of specification → Replace the valve.

TIP

- 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 limit
0.010 mm (0.0004 in)



EAS24300

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.

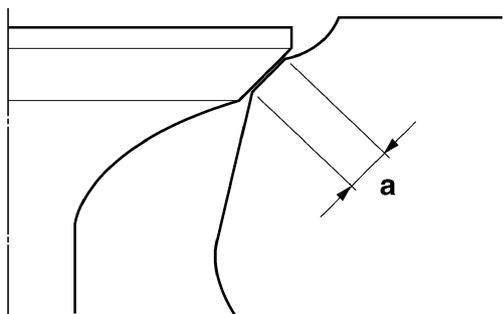
3. Measure:

- Valve seat width “a”
Out of specification → Replace the cylinder head.

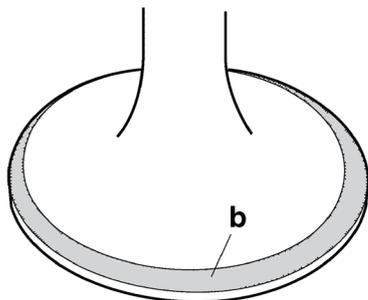
VALVES AND VALVE SPRINGS



Valve seat width
Valve seat width (intake)
 0.90–1.10 mm (0.0354–0.0433 in)
Limit
 1.60 mm (0.06 in)
Valve seat width (exhaust)
 1.10–1.30 mm (0.0433–0.0512 in)
Limit
 1.80 mm (0.07 in)



- a. Apply Mechanic's blueing dye (Dykem) "b" 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.

TIP

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



4. Lap:
 - Valve face
 - Valve seat

TIP

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

ECA14B1031

NOTICE

This model uses titanium intake valves. Titanium valves that have been used to lap the valve seats must not be used. Always replace lapped valves with new valves.

TIP

- When replacing the intake valves, replace the intake valves without lapping the valve seats and valve faces.
- When replacing the cylinder head or intake valve guides, use new valves to lap the valve seats, and then replace them with new intake valves.

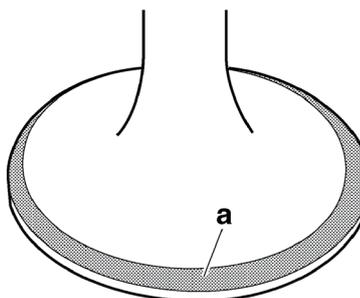


- a. Apply a coarse lapping compound "a" to the valve face.

ECA13790

NOTICE

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

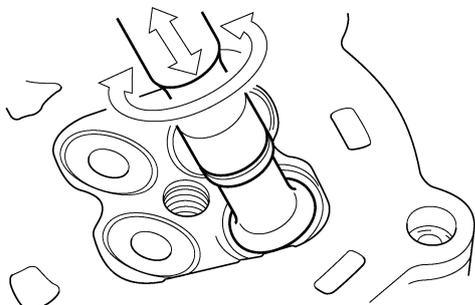


- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

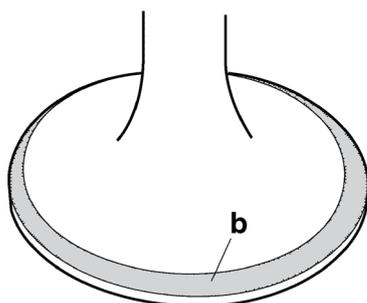
VALVES AND VALVE SPRINGS

TIP

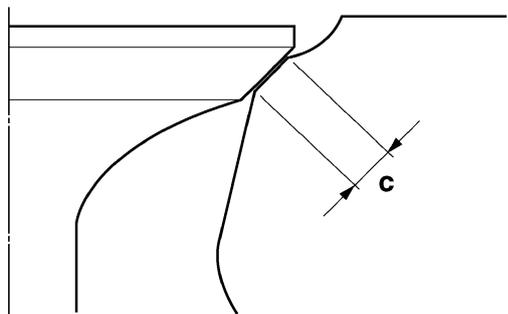
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



- h. Install the valve into the cylinder head.
- i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- j. Measure the valve seat width "c" again. If the valve seat width is out of specification, reface and lap the valve seat.



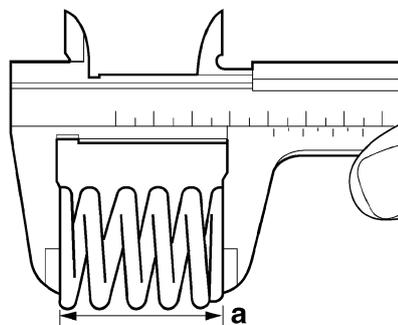
EAS24310

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

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

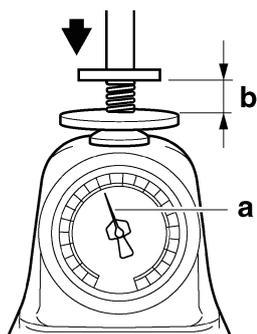
	Valve spring free length
	Free length (intake)
	39.33 mm (1.55 in)
	Limit
	37.36 mm (1.47 in)
	Free length (exhaust)
37.96 mm (1.49 in)	
Limit	
36.06 mm (1.42 in)	



- 2. Measure:
 - Compressed valve spring force "a"
 - Out of specification → Replace the valve spring.

	Installed compression spring force (intake)
	187.00–215.00 N (19.07–21.92 kgf, 42.04–48.33 lbf)
	Installed compression spring force (exhaust)
	185.00–213.00 N (18.86–21.72 kgf, 41.59–47.88 lbf)
	Installed length (intake)
	34.50 mm (1.36 in)
	Installed length (exhaust)
	33.00 mm (1.30 in)

VALVES AND VALVE SPRINGS



b. Installed length

3. Measure:

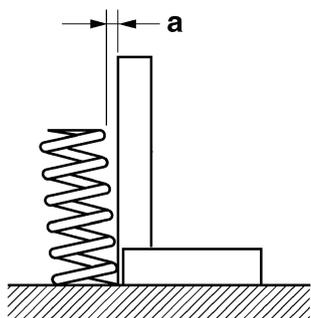
- Valve spring tilt "a"
Out of specification → Replace the valve spring.



Spring tilt limit

Spring tilt (intake)
2.5°/1.7 mm (0.067 in)

Spring tilt (exhaust)
2.5°/1.7 mm (0.067 in)



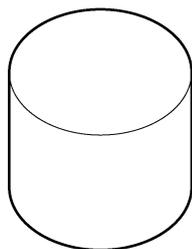
EAS24320

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.



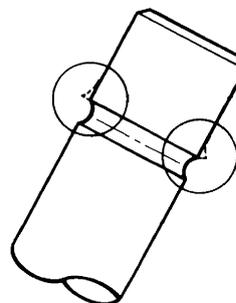
EAS24340

INSTALLING THE VALVES

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

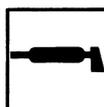
1. Deburr:

- Valve stem end
(with an oil stone)

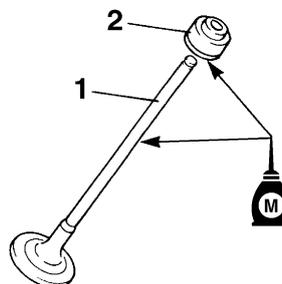


2. Lubricate:

- Valve stem "1"
- Valve stem seal "2"
(with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide oil



3. Install:

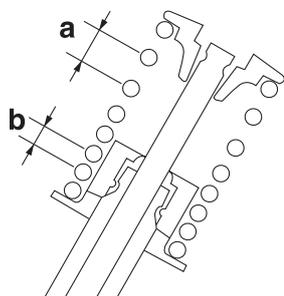
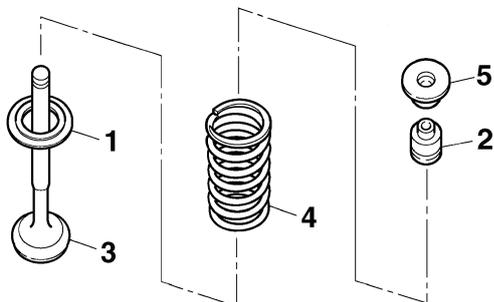
- Valve spring seat "1"
- Valve stem seal "2"
- Valve "3"
- Valve spring "4"
- Valve spring retainer "5"
(into the cylinder head)

TIP

- Make sure each valve is installed in its original place. Refer to the following embossed marks.
Intake valve: Blue paint mark
Exhaust valve: "14B"
- Install the valve springs with the larger pitch "a" facing up.

VALVES AND VALVE SPRINGS

- When installing the valve stem seal to the valve guide, apply silicon fluid to the valve stem seal.



b. Smaller pitch

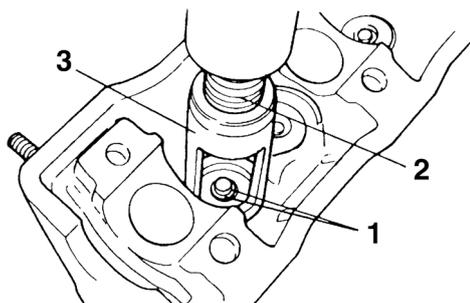
4. Install:
- Valve cotters "1"

TIP

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



Valve spring compressor
90890-04019
YM-04019
Valve spring compressor
attachment
90890-04108
Valve spring compressor
adapter 22 mm
YM-04108

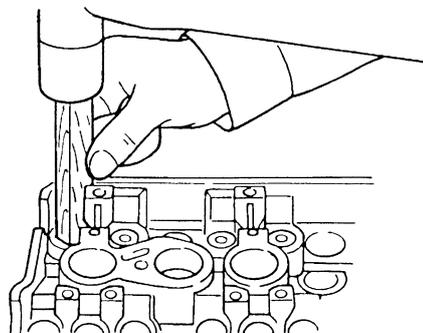


5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

NOTICE

Hitting the valve tip with excessive force could damage the valve.



6. Lubricate:
- Valve pad
 - Valve lifter (with the recommended lubricant)



7. Install:
- Valve pad
 - Valve lifter

TIP

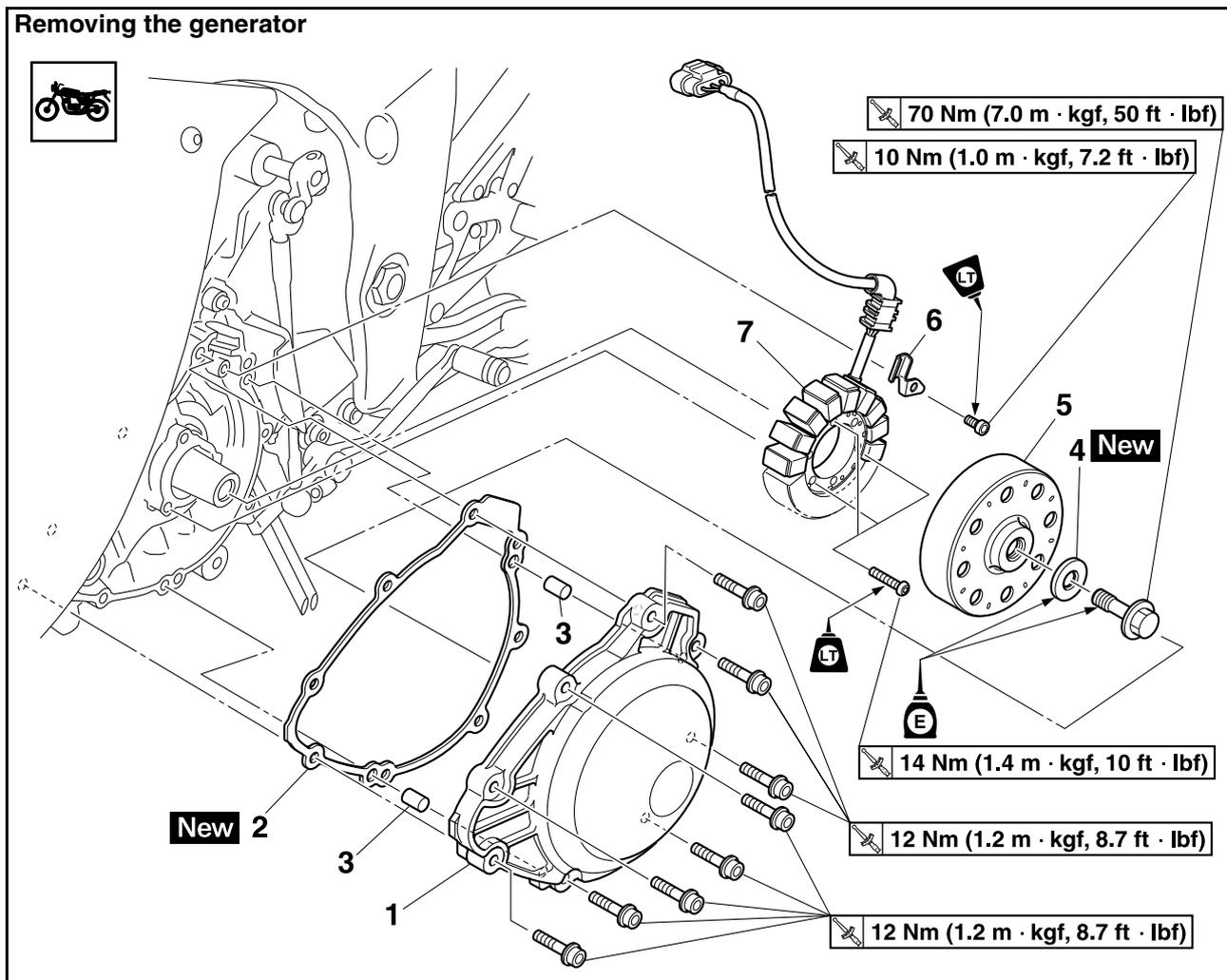
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.

GENERATOR

EAS24480

GENERATOR

Removing the generator



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Stator coil lead coupler		Refer to "GENERAL CHASSIS" on page 4-1.
1	Generator cover	1	
2	Generator cover gasket	1	
3	Dowel pin	2	
4	Washer	1	
5	Generator rotor	1	
6	Stator coil lead holder	1	
7	Stator coil assembly	1	
			For installation, reverse the removal procedure.

GENERATOR

EAS24490

REMOVING THE GENERATOR

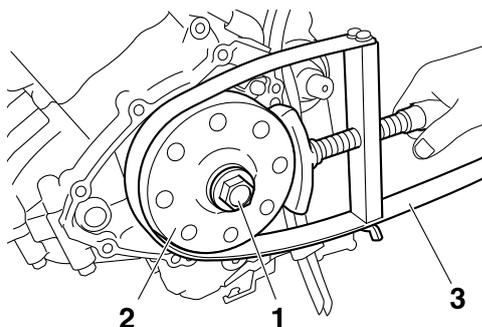
1. Remove:
 - Generator cover
 - Generator cover gasket
 - Dowel pins
2. Remove:
 - Generator rotor bolt "1"
 - Washer

TIP

While holding the generator rotor "2" with the sheave holder "3", loosen the generator rotor bolt.



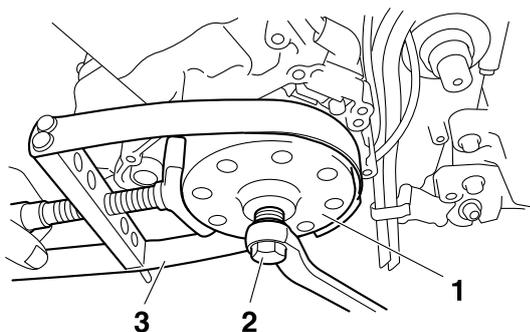
Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



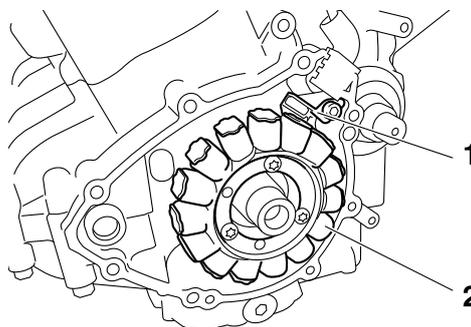
3. Remove:
 - Generator rotor "1"
 - (with the rotor puller "2" and sheave holder "3")



Rotor puller
2K7-85555-00
Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



4. Remove:
 - Stator coil lead holder "1"
 - Stator coil assembly "2"



EAS24500

INSTALLING THE GENERATOR

1. Install:
 - Stator coil assembly
 - Stator coil lead holder



Stator coil assembly bolt
14 Nm (1.4 m.kgf, 10 ft.lbf)
LOCTITE®
Stator coil lead holder bolt
10 Nm (1.0 m.kgf, 7.2 ft.lbf)
LOCTITE®

2. Install:
 - Generator rotor
 - Washer **New**
 - Generator rotor bolt

TIP

- Clean the tapered portion of the crankshaft and the generator rotor hub.
- Lubricate the generator rotor bolt threads and washer mating surfaces with engine oil.

3. Tighten:
 - Generator rotor bolt "1"



Generator rotor bolt
70 Nm (7.0 m.kgf, 50 ft.lbf)

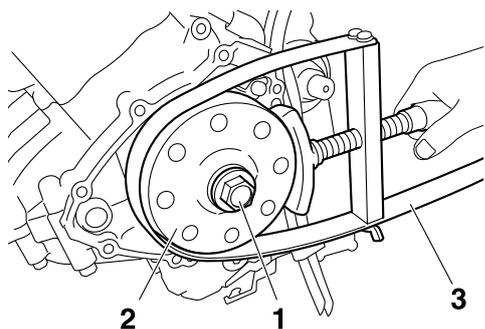
TIP

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



Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

GENERATOR

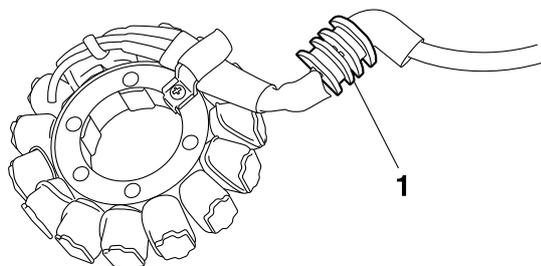


4. Apply:

- Sealant
(onto the stator coil lead grommet "1")



**Yamaha bond No.1215
(Three Bond No.1215®)
90890-85505**

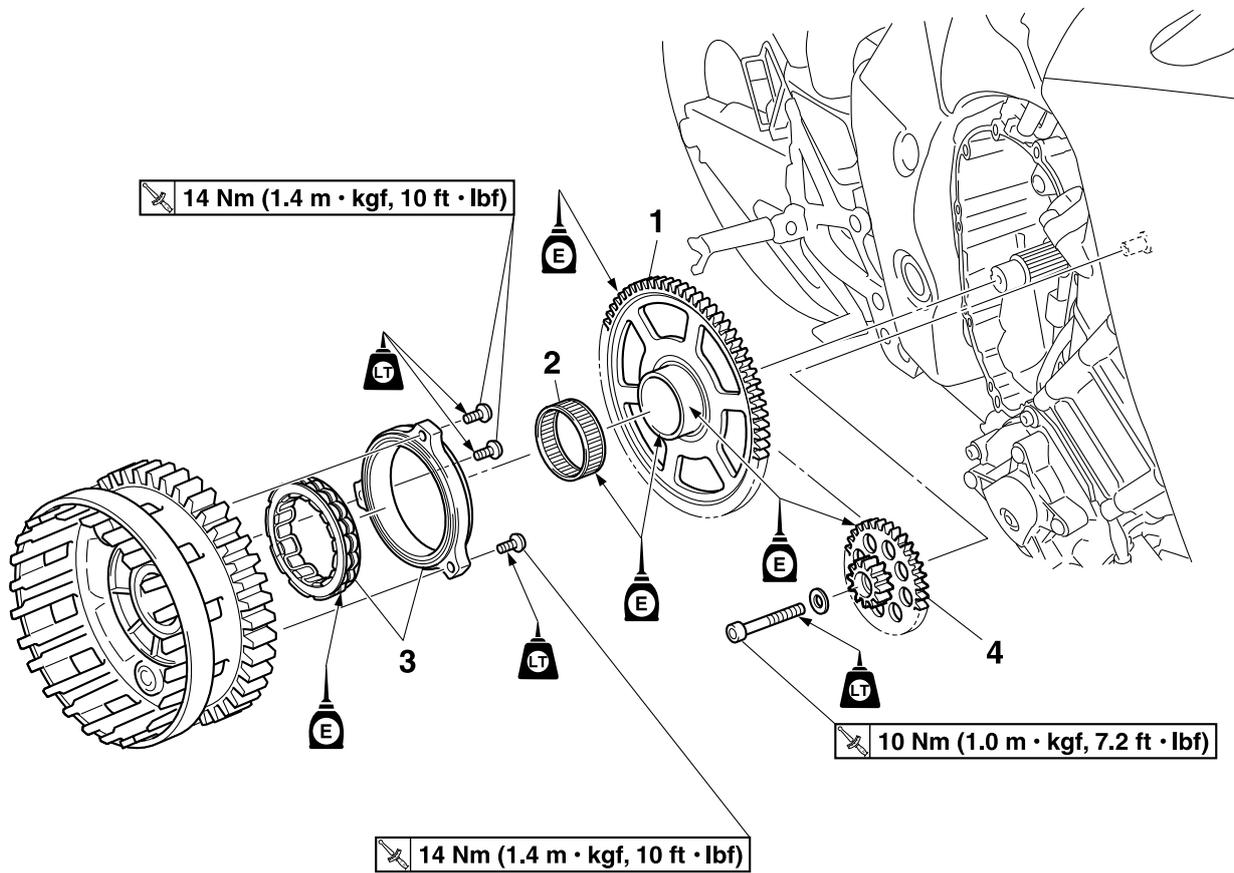


STARTER CLUTCH

EAS24550

STARTER CLUTCH

Removing the starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing assembly		Refer to "CLUTCH" on page 5-58.
1	Starter clutch gear	1	
2	Bearing	1	
3	Starter clutch assembly	1	
4	Starter idle gear	1	
			For installation, reverse the removal procedure.

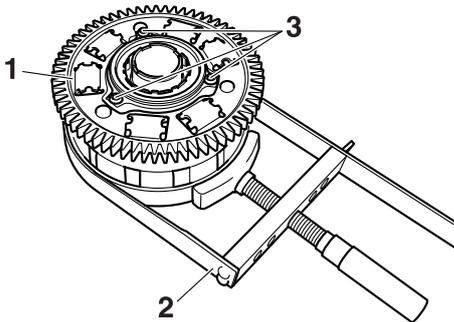
STARTER CLUTCH

TIP

- While holding the clutch housing assembly "1" with the sheave holder "2", tighten the starter clutch holder bolt "3".
- Fix the flat surface of the clutch housing assembly with the sheave holder.



Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

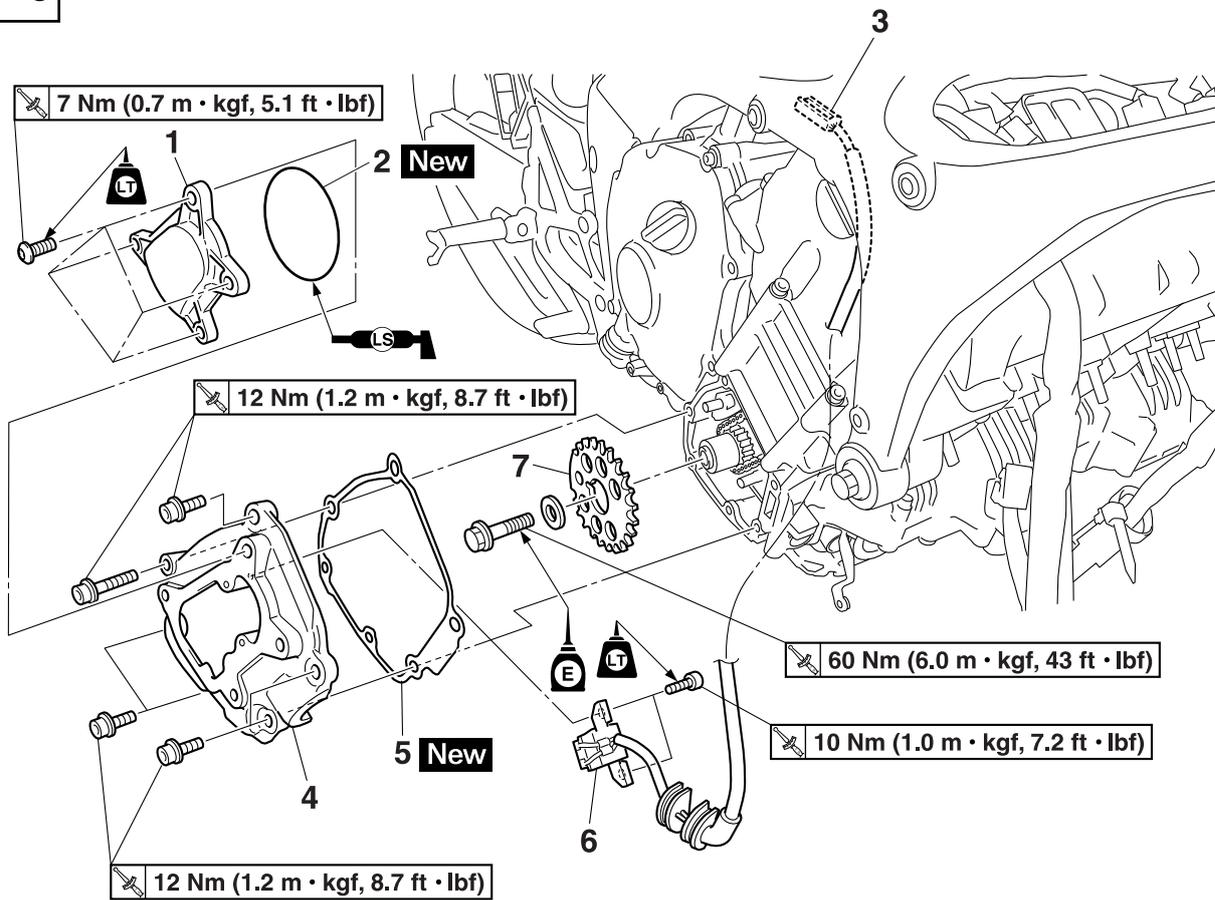


PICKUP ROTOR

EAS14B1058

PICKUP ROTOR

Removing the pickup rotor



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Generator cover		Refer to "GENERATOR" on page 5-36.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
1	Pickup rotor cover 1	1	
2	O-ring	1	
3	Crankshaft position sensor coupler	1	Disconnect.
4	Pickup rotor cover 2	1	
5	Pickup rotor cover 2 gasket	1	
6	Crankshaft position sensor	1	
7	Pickup rotor	1	
			For installation, reverse the removal procedure.

PICKUP ROTOR

EAS14B1059

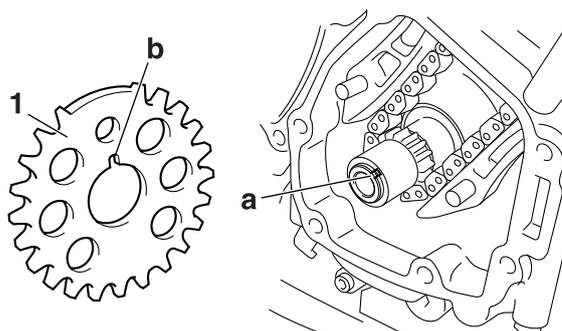
REMOVING THE PICKUP ROTOR

1. Remove:
 - Pickup rotor bolt "1"
 - Washer
 - Pickup rotor

TIP _____

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

	<p>Sheave holder 90890-01701 Primary clutch holder YS-01880-A</p>
---	---



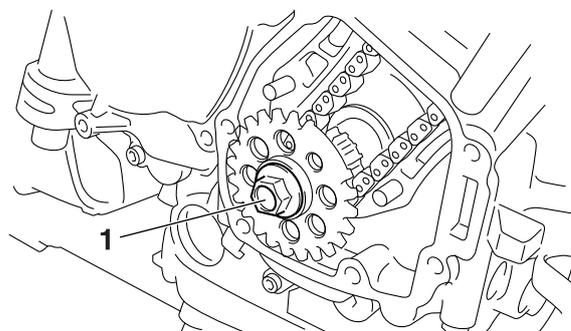
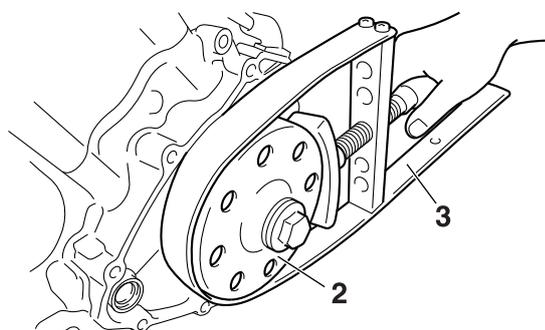
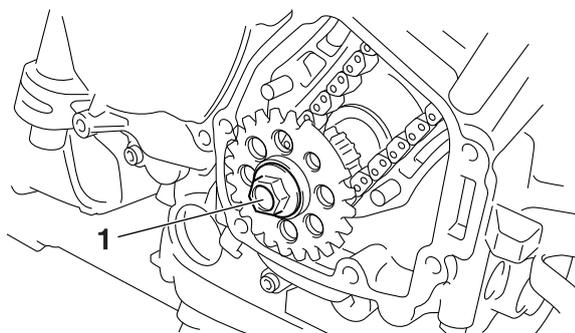
2. Tighten:
 - Pickup rotor bolt "1"

	<p>Pickup rotor bolt 60 Nm (6.0 m.kgf, 43 ft.lbf)</p>
---	--

TIP _____

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

	<p>Sheave holder 90890-01701 Primary clutch holder YS-01880-A</p>
--	---



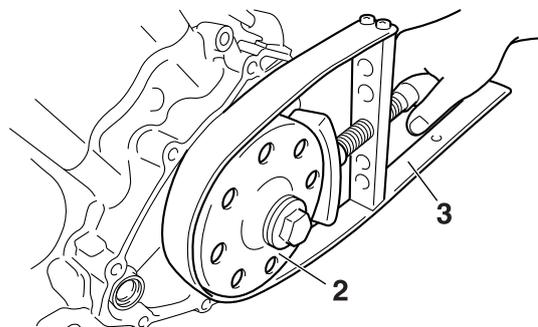
EAS14B1060

INSTALLING THE PICKUP ROTOR

1. Install:
 - Pickup rotor "1"
 - Washer
 - Pickup rotor bolt

TIP _____

- When installing the pickup rotor, align the straight key "a" with the groove "b" on the pickup rotor.
- Face the "K" mark on the pickup rotor outer side of the vehicle and install.

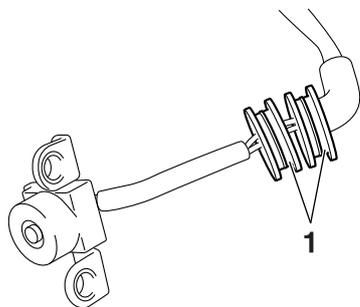


3. Apply:
 - Sealant
(onto the crankshaft position sensor lead grommet "1")

PICKUP ROTOR



**Yamaha bond No.1215
(Three Bond No.1215®)
90890-85505**



ELECTRIC STARTER

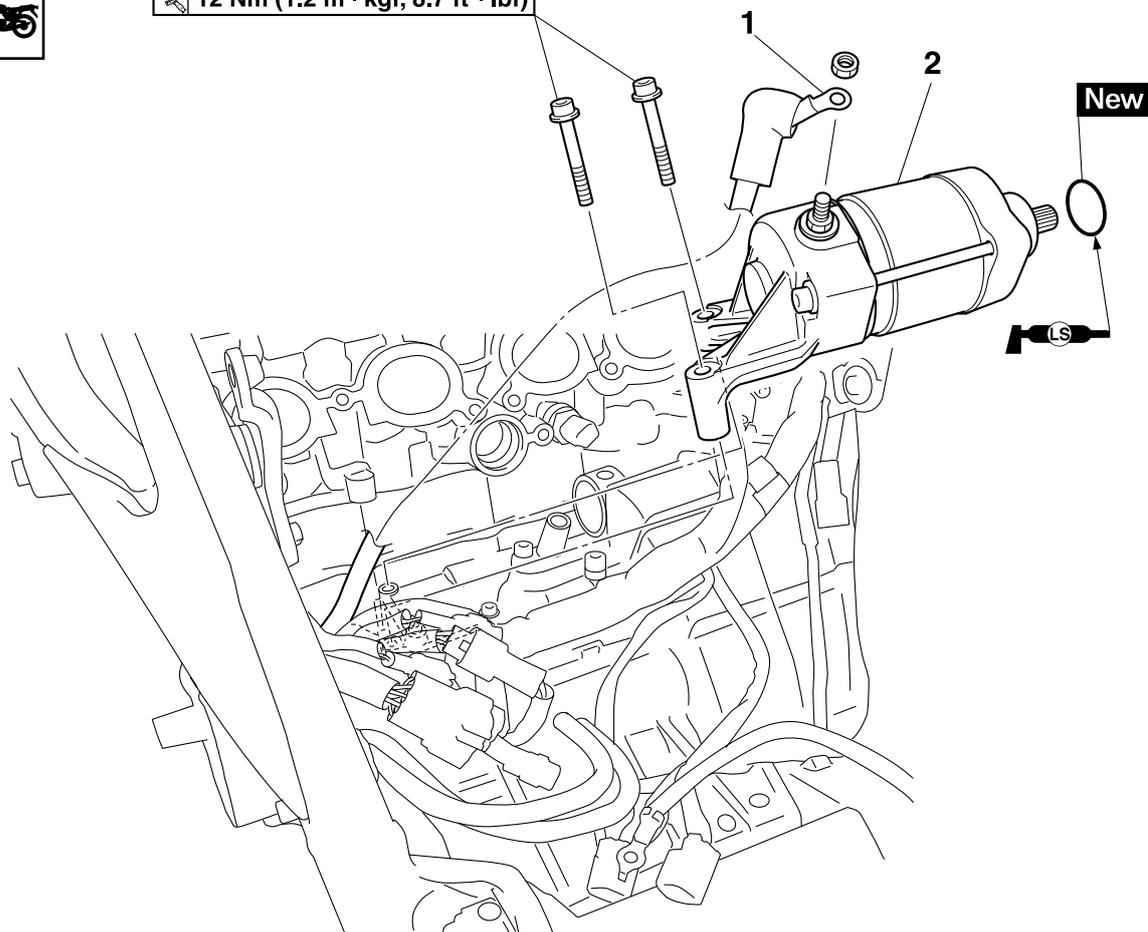
EAS24780

ELECTRIC STARTER

Removing the starter motor

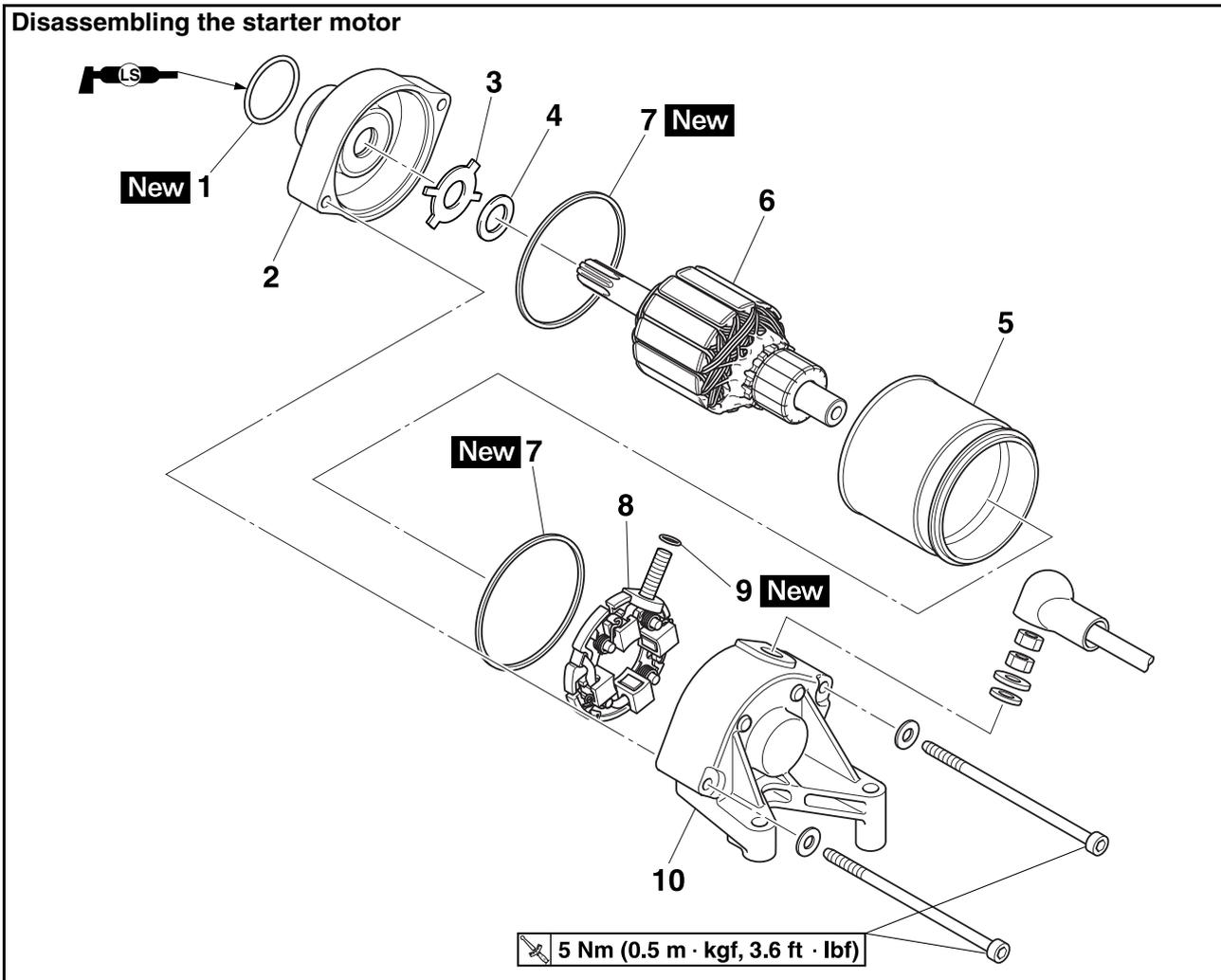


12 Nm (1.2 m · kgf, 8.7 ft · lbf)



Order	Job/Parts to remove	Q'ty	Remarks
	Battery negative lead		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-12.
	Engine outlet pipe		Refer to "THERMOSTAT" on page 6-8.
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	
			For installation, reverse the removal procedure.

ELECTRIC STARTER



Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Front cover	1	
3	Lock washer	1	
4	Washer	1	
5	Starter motor yoke	1	
6	Armature assembly	1	
7	Gasket	2	
8	Brush holder	1	
9	O-ring	1	
10	Rear cover	1	
			For installation, reverse the removal procedure.

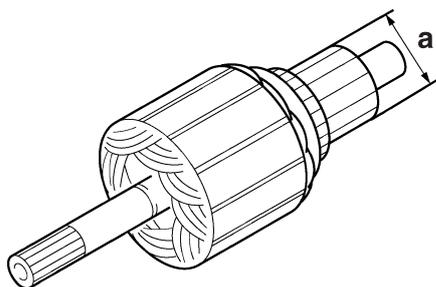
ELECTRIC STARTER

EAS24790

CHECKING THE STARTER MOTOR

1. Check:
 - Commutator
Dirt → Clean with 600 grit sandpaper.
2. Measure:
 - Commutator diameter "a"
Out of specification → Replace the starter motor.

Limit
23.5 mm (0.93 in)



3. Measure:
 - Mica undercut "a"
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut (depth)
1.50 mm (0.06 in)

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator.



4. Measure:
 - Armature assembly resistances (commutator and insulation)
Out of specification → Replace the starter motor.

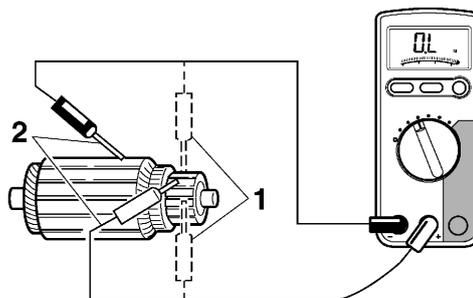


- a. Measure the armature assembly resistances with the digital circuit tester.

Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927

Armature coil
Commutator resistance
0.0090–0.0110 Ω at 20 °C (68 °F)
Insulation resistance
Above 1 MΩ at 20 °C (68 °F)

- b. If any resistance is out of specification, replace the starter motor.

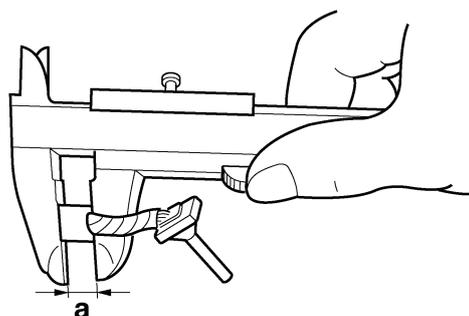


1. Commutator resistance
2. Insulation resistance



5. Measure:
 - Brush length "a"
Out of specification → Replace the brush holder.

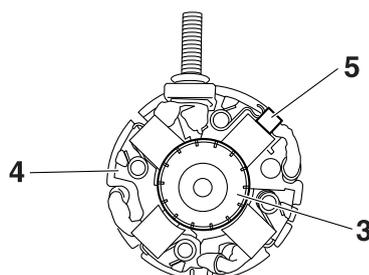
Limit
7.19 mm (0.28 in)



ELECTRIC STARTER

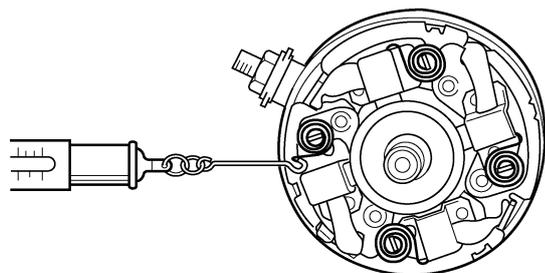
6. Measure:
- Brush spring force
Out of specification → Replace the brush holder.

	Brush spring force
	5.28–7.92 N (538–808 gf,
	19.01–28.51 oz)



2. Install:
- Rear cover "1"

TIP _____
Align the tab "a" on the brush holder "2" with the tab "b" in the rear cover.



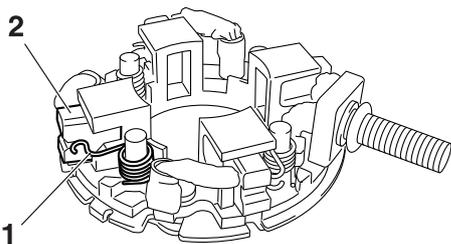
7. Check:
- Gear teeth
Damage/wear → Replace the gear.

EAS24800

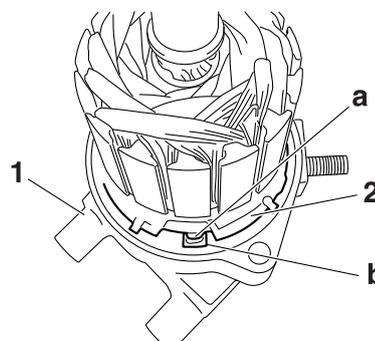
ASSEMBLING THE STARTER MOTOR

1. Install:
- Brush holder
 - Armature assembly
 - O-ring **New**

- a. Pull both the brush spring "1" and the brush "2" outside and hook the brush spring to the groove portion at the side of the brush.

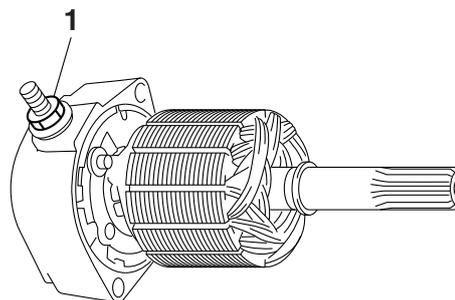


- b. Insert the armature assembly "3" into the brush holder "4" and push the brush "5" inside until it touches the armature assembly.



3. Install:
- Washer
 - Nut "1"

	Nut
	5 Nm (0.5 m·kgf, 3.6 ft·lbf)



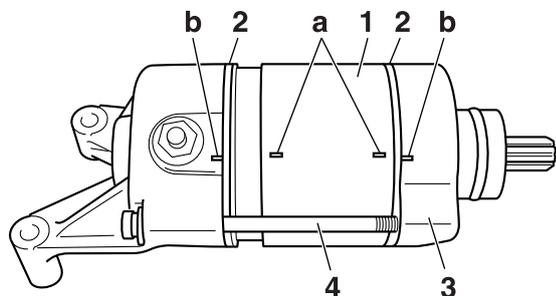
4. Install:
- Starter motor yoke "1"
 - Gaskets "2" **New**
 - Front cover "3"
 - Starter motor assembling bolts "4"

	Starter motor assembling bolt
	5 Nm (0.5 m·kgf, 3.6 ft·lbf)

ELECTRIC STARTER

TIP

Align the match marks "a" on the starter motor yoke with the match marks "b" on the front and rear covers.

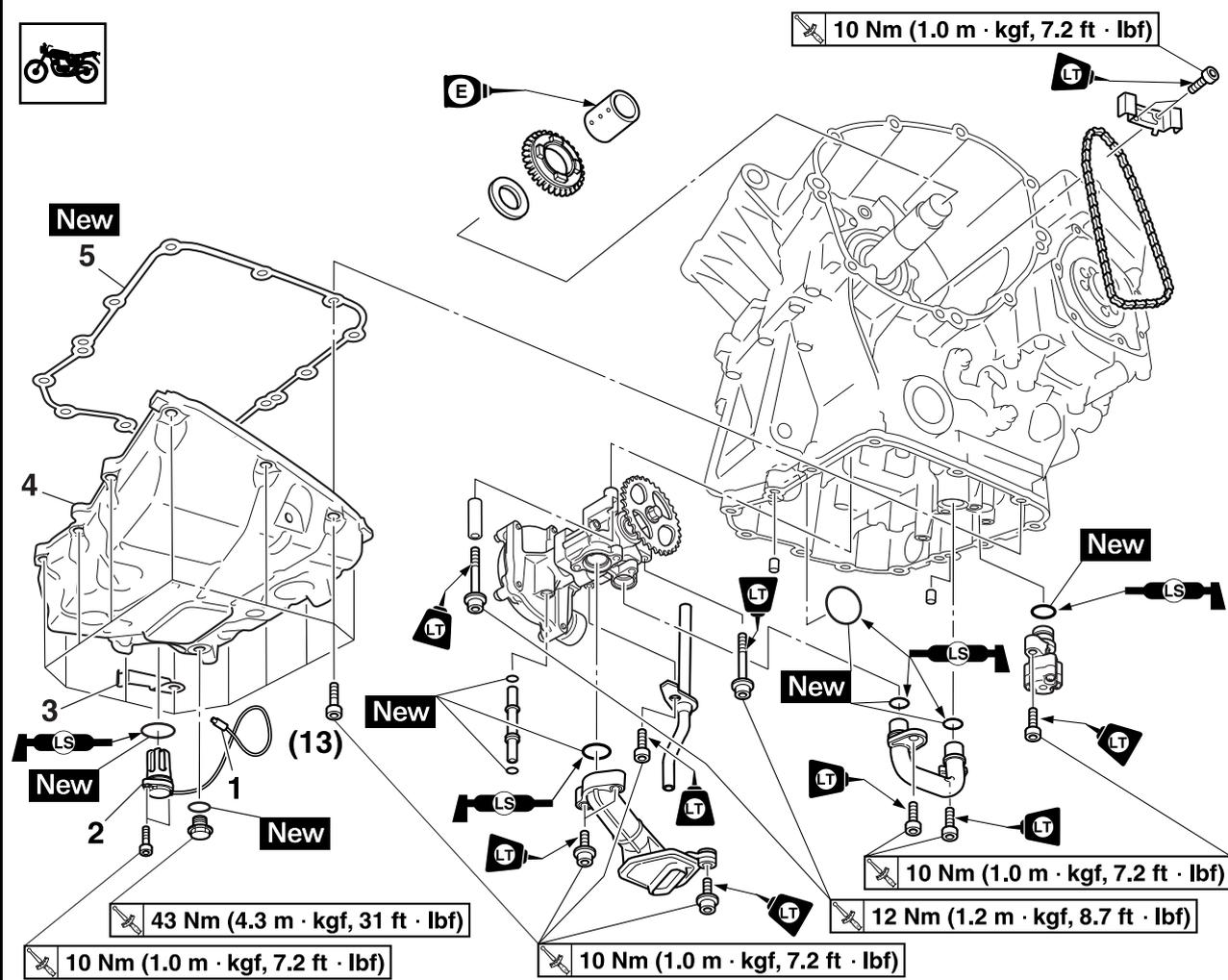


OIL PUMP

EAS24921

OIL PUMP

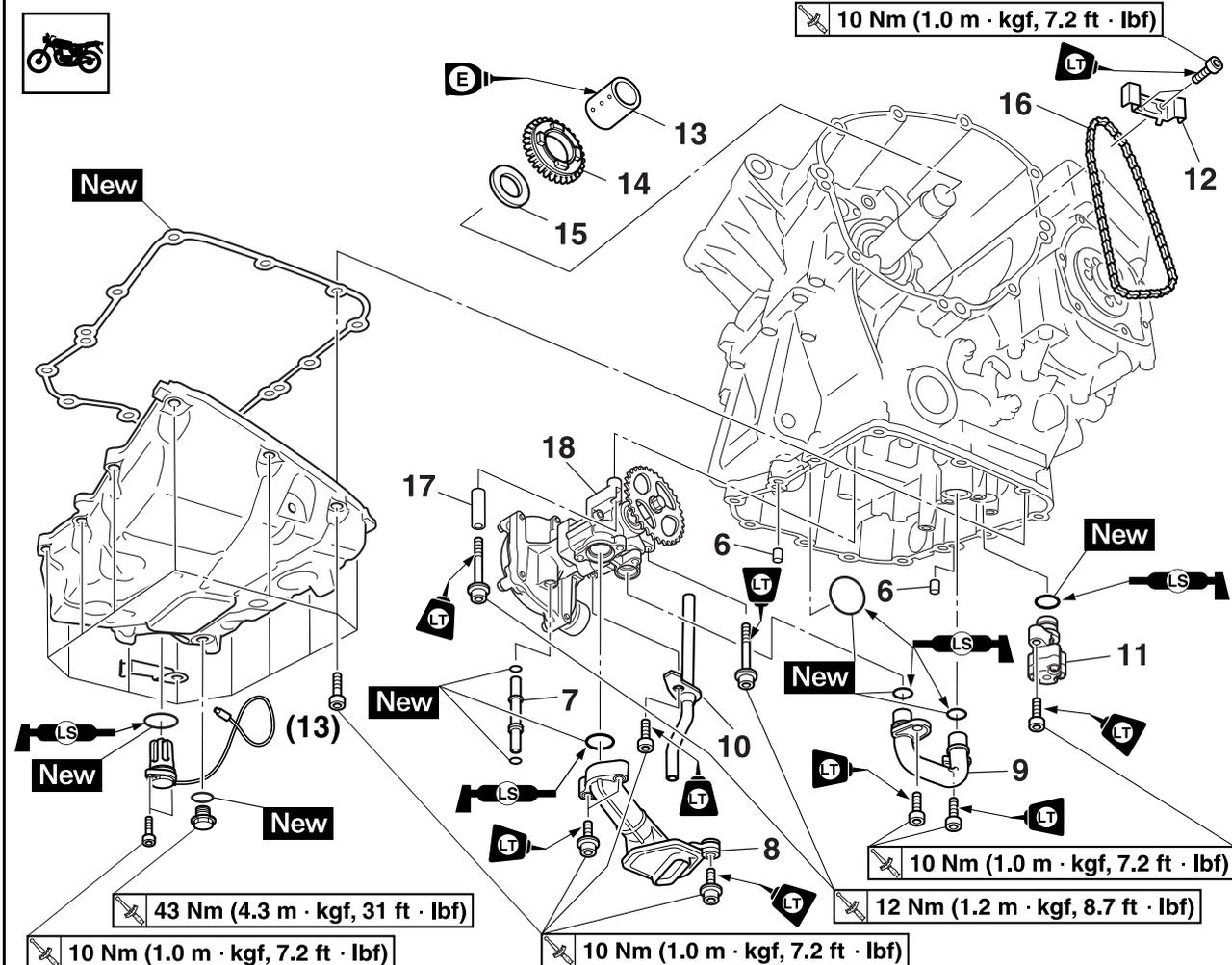
Removing the oil pan and oil/water pump assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Lower cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-29.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant reservoir		Refer to "RADIATOR" on page 6-1.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-3.
	Clutch assembly		Refer to "CLUTCH" on page 5-58.
	Water pump inlet pipe		Refer to "RADIATOR" on page 6-1.
	Water pump outlet pipe		Refer to "OIL COOLER" on page 6-5.
1	Oil level switch lead coupler	1	Disconnect.
2	Oil level switch	1	
3	Oil level switch lead holder	1	
4	Oil pan	1	
5	Oil pan gasket	1	

OIL PUMP

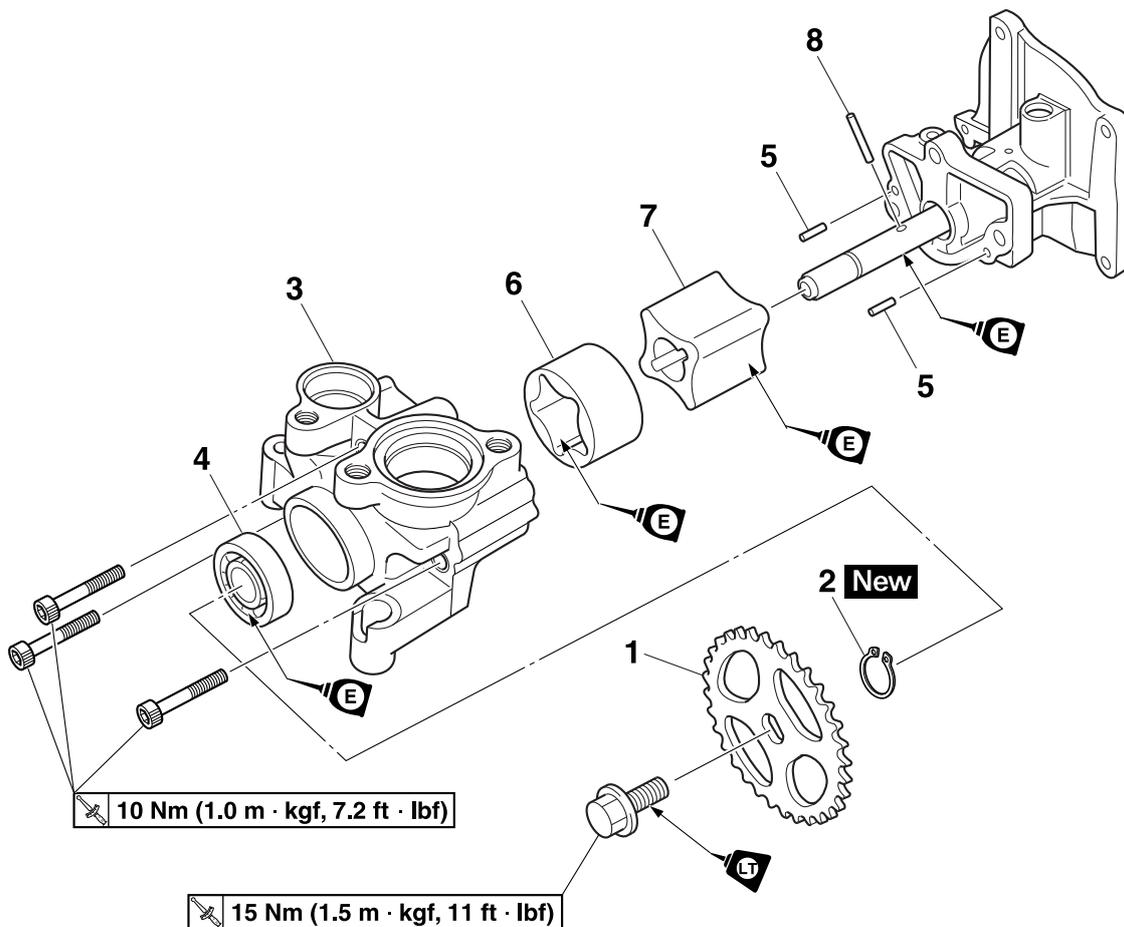
Removing the oil pan and oil/water pump assembly



Order	Job/Parts to remove	Q'ty	Remarks
6	Dowel pin	2	
7	Drain pipe	1	
8	Oil strainer	1	
9	Oil pipe	1	
10	Oil delivery pipe 1	1	
11	Relief valve assembly	1	
12	Oil/water pump assembly drive chain guide	1	
13	Collar	1	
14	Oil/water pump assembly drive sprocket	1	
15	Washer	1	
16	Oil/water pump assembly drive chain	1	
17	Dowel pin	1	
18	Oil/water pump assembly	1	
			For installation, reverse the removal procedure

OIL PUMP

Disassembling the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil/water pump driven sprocket	1	
2	Circlip	1	
3	Oil pump housing	1	
4	Bearing	1	
5	Dowel pin	2	
6	Oil pump outer rotor	1	
7	Oil pump inner rotor	1	
8	Pin	1	
			For installation, reverse the removal procedure.

OIL PUMP

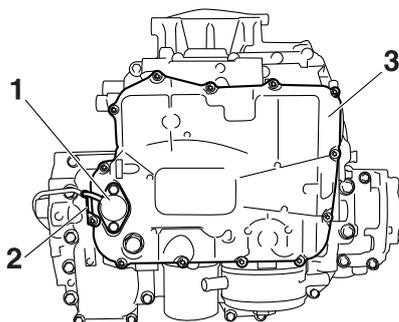
EAS24930

REMOVING THE OIL PAN

1. Remove:
 - Oil level switch "1"
 - Oil level switch lead holder "2"
 - Oil pan "3"
 - Gasket
 - Dowel pins

TIP

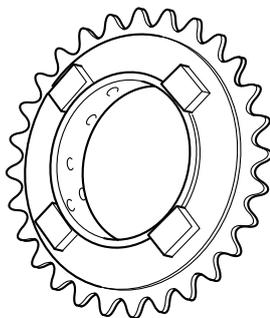
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



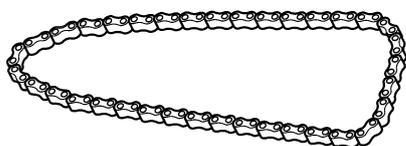
EAS14B1021

CHECKING THE SPROCKET AND CHAIN

1. Check:
 - Oil/water pump assembly drive sprocket
Cracks/damage/wear → Replace.



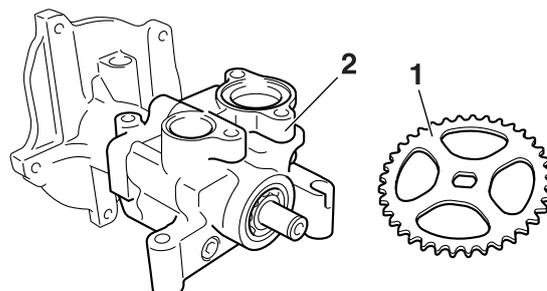
2. Check:
 - Oil/water pump assembly drive chain
Damage/stiffness → Replace the oil/water pump assembly drive chain and oil/water pump assembly drive sprocket as a set.



EAS24960

CHECKING THE OIL PUMP

1. Check:
 - Oil pump driven gear "1"
Cracks/damage/wear → Replace.
 - Oil pump housing "2"
Cracks/damage/wear → Replace the oil/water pump assembly.



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/water pump assembly.



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

Less than 0.12 mm (0.0047 in)

Limit

0.20 mm (0.0079 in)

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

0.090–0.190 mm (0.0035–0.0075 in)

Limit

0.260 mm (0.0102 in)

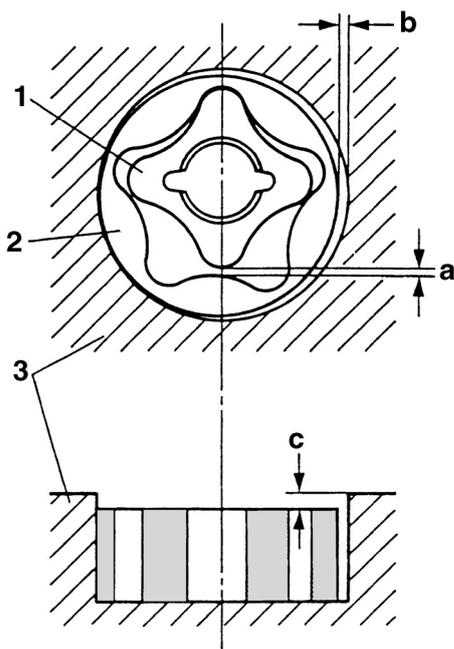
Oil-pump-housing-to-inner-and-outer-rotor clearance

0.06–0.13 mm (0.0024–0.0051 in)

Limit

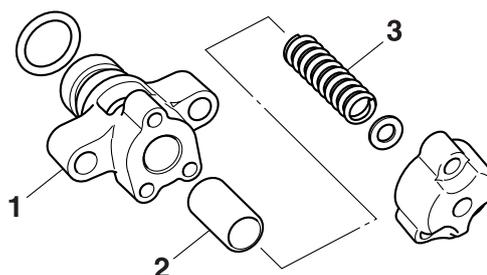
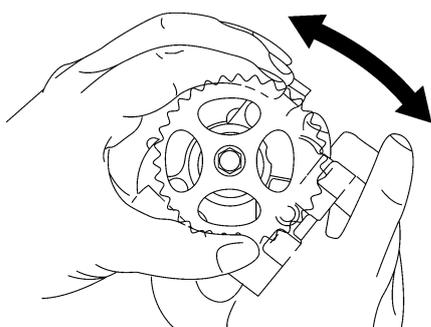
0.200 mm (0.0079 in)

OIL PUMP



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

- 3. Check:
 - Oil pump operation
 - Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

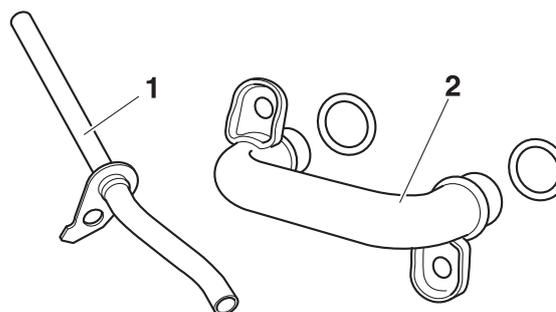


EAS24980

CHECKING THE OIL DELIVERY PIPES

The following procedure applies to all of the oil delivery pipes.

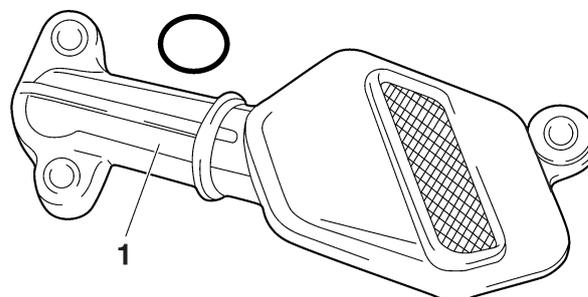
- 1. Check:
 - Oil delivery pipe 1 "1"
 - Oil pipe "2"
 - Damage → Replace.
 - Obstruction → Wash and blow out with compressed air.



EAS24990

CHECKING THE OIL STRAINER

- 1. Check:
 - Oil strainer "1"
 - Damage → Replace.
 - Contaminants → Clean with solvent.



EAS24970

CHECKING THE RELIEF VALVE

- 1. Check:
 - Relief valve body "1"
 - Relief valve "2"
 - Spring "3"
 - Damage/wear → Replace the defective part(s).

OIL PUMP

EAS25010

ASSEMBLING THE OIL PUMP

- Lubricate:
 - Inner rotor
 - Outer rotor
 - Oil pump shaft
(with the recommended lubricant)

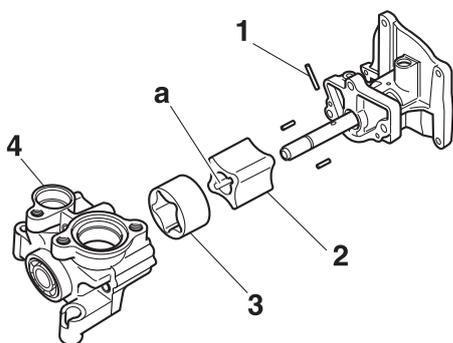
	Recommended lubricant Engine oil
---	---

- Install:
 - Pin "1"
 - Inner rotor "2"
 - Outer rotor "3"
 - Oil pump housing "4"
 - Oil pump housing bolt

	Oil pump housing bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
---	--

TIP

When installing the inner rotor, align the pin "1" in the oil pump shaft with the groove "a" in the inner rotor "2".

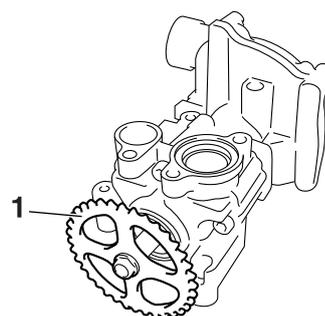


- Install:
 - Oil/water pump driven sprocket "1"

	Oil/water pump driven sprocket bolt 15 Nm (1.5 m·kgf, 11 ft·lbf) LOCTITE®
---	--

TIP

"14B" mark of the oil/water pump driven gear is installed at oil pump side.



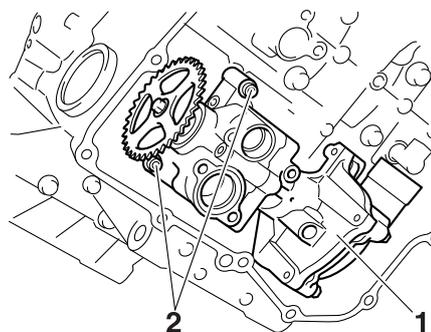
- Check:
 - Oil pump operation
Refer to "CHECKING THE OIL PUMP" on page 5-53.

EAS25030

INSTALLING THE OIL/WATER PUMP ASSEMBLY

- Install:
 - O-ring **New**
(onto the lower crankcase)
 - Oil/water pump assembly "1"
 - Dowel pin
 - Bolts "2"

	Oil/water pump assembly bolt 12 Nm (1.2 m·kgf, 8.7 ft·lbf) LOCTITE®
---	--



- Install:
 - Washer
 - Oil/water pump assembly drive chain "1"
 - Oil/water pump assembly drive sprocket "2"
 - Collar

TIP

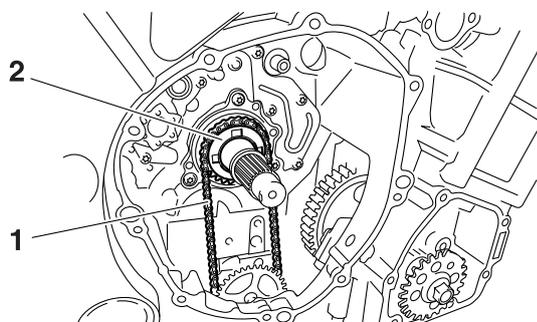
Install the oil/water pump assembly drive chain "1" onto the oil/water pump assembly drive sprocket "2".

OIL PUMP

ECA14B1018

NOTICE

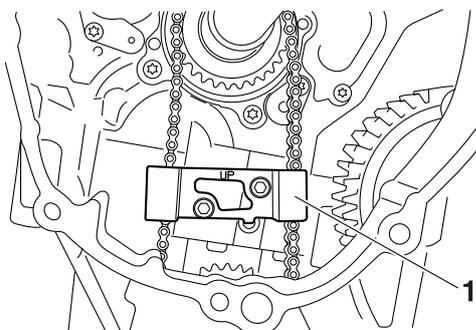
After installing the oil/water pump assembly drive chain and drive sprocket, make sure the oil/water pump turns smoothly.



3. Install:
- Oil/water pump assembly drive chain guide "1"

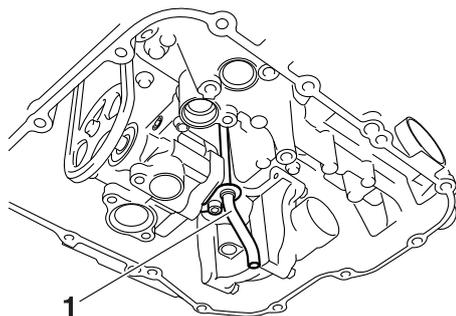
	<p>Oil/water pump assembly drive chain guide bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®</p>
---	---

TIP
 "UP" mark of the oil/water pump assembly drive chain guide is upward.



4. Install:
- Oil delivery pipe 1 "1"

	<p>Oil delivery pipe 1 bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®</p>
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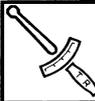
5. Install:
- Relief valve assembly "1"
 - O-ring **New**

	<p>Relief valve assembly bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®</p>
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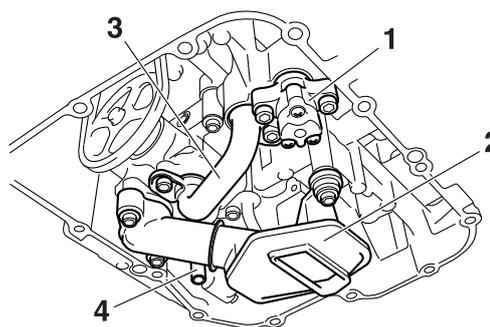
- Oil strainer "2"
- O-ring **New**

	<p>Oil strainer bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®</p>
--	--

- Oil pipe "3"
- O-rings **New**

	<p>Oil pipe bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®</p>
---	--

- Drain pipe "4"
- O-rings **New**



EAS25050

INSTALLING THE OIL PAN

1. Install:
- Dowel pins
 - Oil pan gasket **New**
 - Oil pan
 - Oil level switch lead holder
 - Oil level switch
 - O-ring **New**

OIL PUMP



Oil pan bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
Oil level switch bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

- Engine oil drain bolt
- Gasket **New**



Engine oil drain bolt
43 Nm (4.3 m·kgf, 31 ft·lbf)

TIP _____

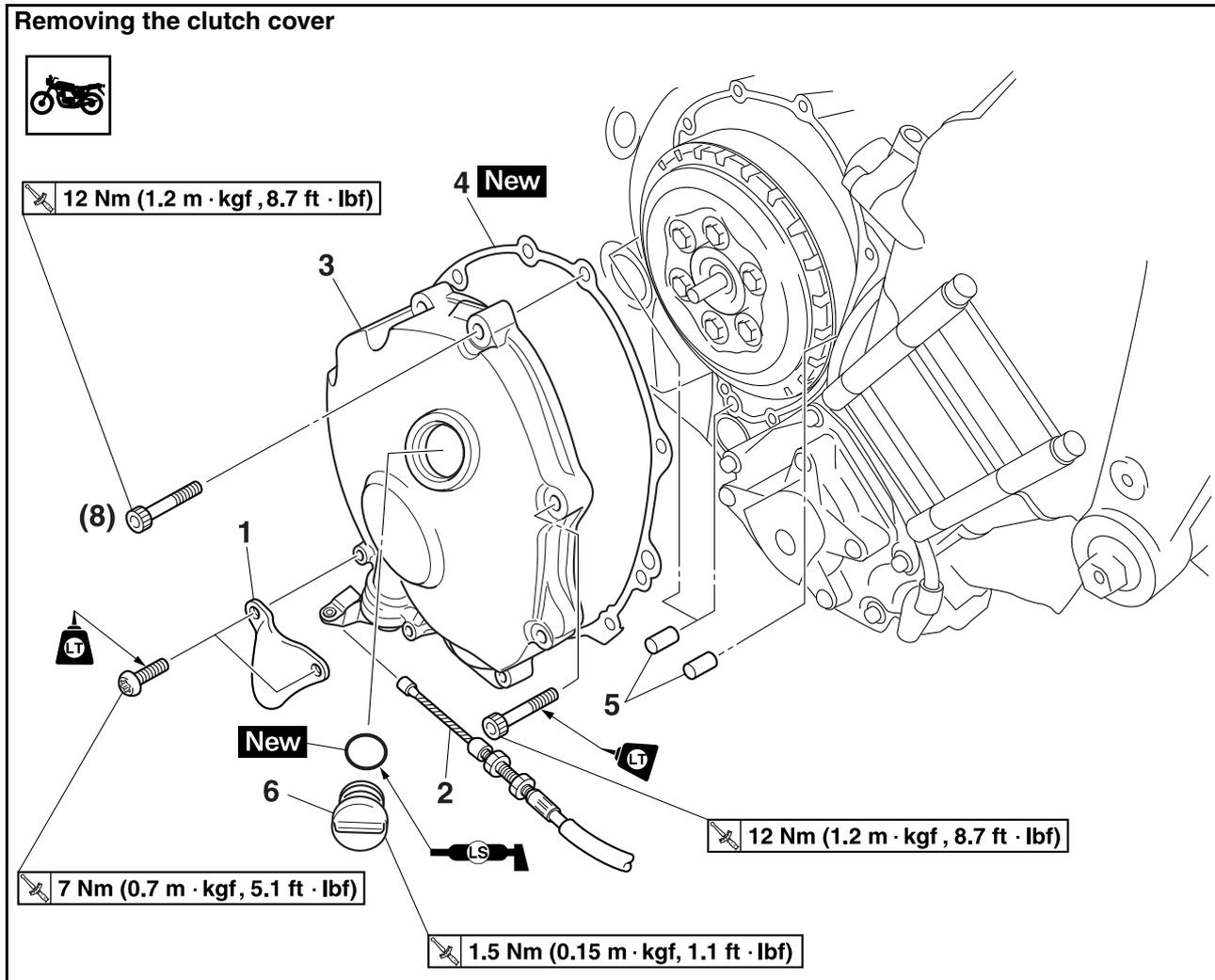
Tighten the oil pan bolts in stages and in a crisscross pattern.

CLUTCH

EAS25061

CLUTCH

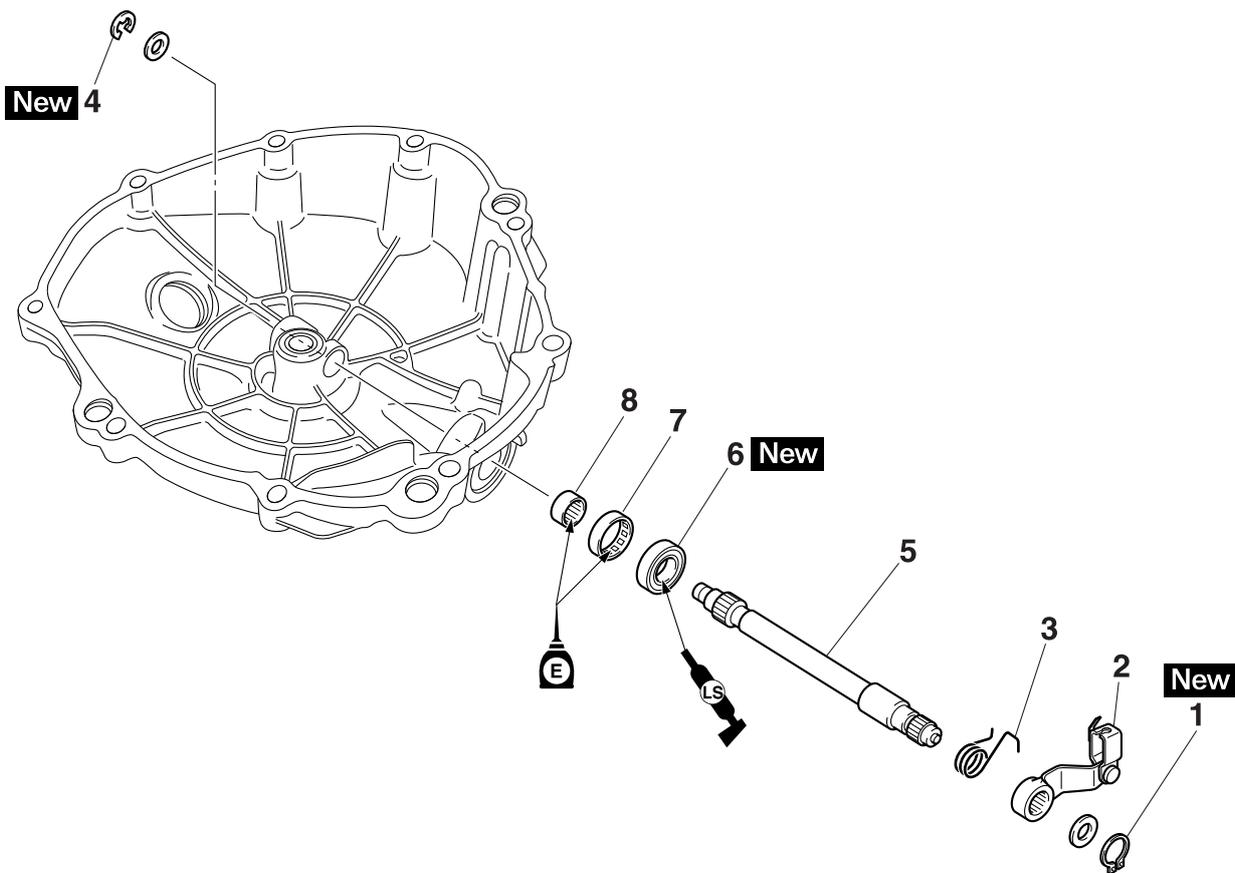
Removing the clutch cover



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain.
1	Pull lever cover	1	
2	Clutch cable	1	Disconnect.
3	Clutch cover	1	
4	Clutch cover gasket	1	
5	Dowel pin	3	
6	Oil filler cap	1	
			For installation, reverse the removal procedure.

CLUTCH

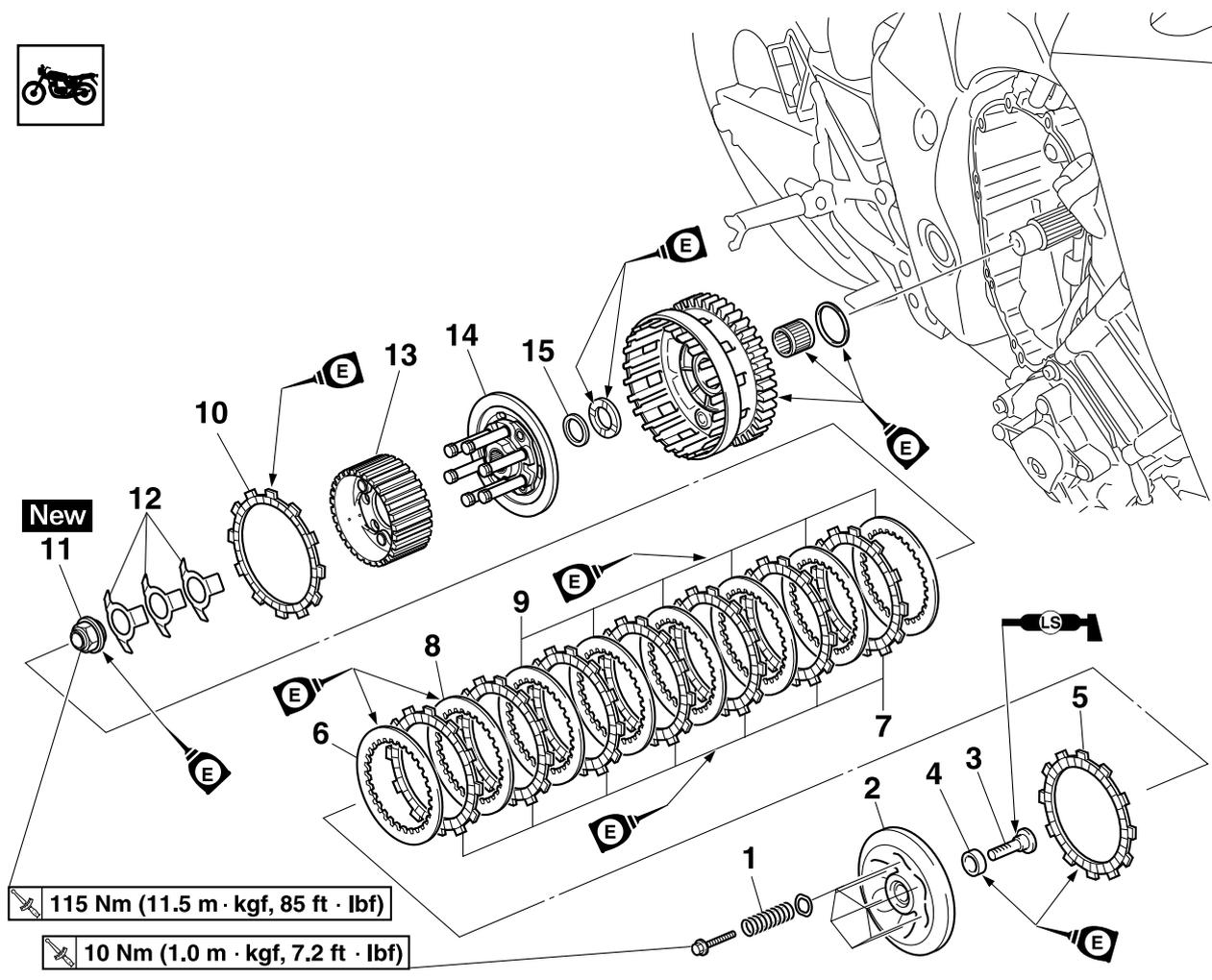
Removing the pull lever shaft



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Pull lever	1	
3	Pull lever spring	1	
4	Circlip	1	
5	Pull lever shaft	1	
6	Oil seal	1	
7	Bearing	1	
8	Bearing	1	
			For installation, reverse the removal procedure.

CLUTCH

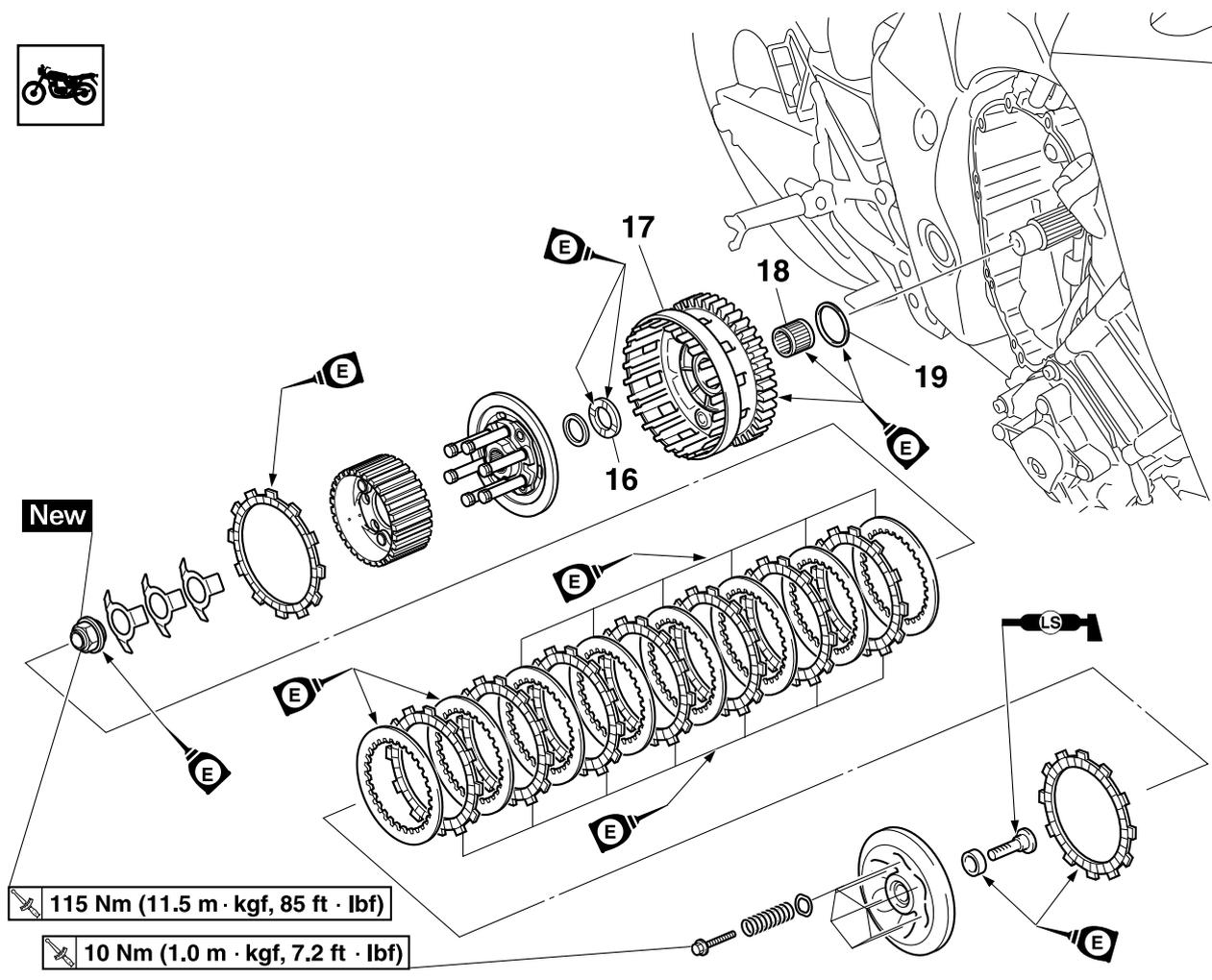
Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Compression spring	6	
2	Pressure plate 1	1	
3	Pull rod	1	
4	Bearing	1	
5	Friction plate 1	1	
6	Clutch plate 1	1	
7	Friction plate 2	7	
8	Clutch plate 2	1	
9	Clutch plate 3	6	
10	Friction plate 1	1	
11	Clutch boss nut	1	
12	Spring	3	
13	Clutch boss	1	
14	Pressure plate 2	1	
15	Conical spring washer	1	

CLUTCH

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
16	Thrust washer	1	
17	Clutch housing assembly	1	
18	Bearing	1	
19	Washer	1	
			For installation, reverse the removal procedure.

CLUTCH

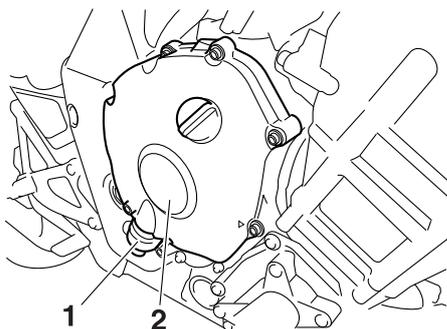
EAS25080

REMOVING THE CLUTCH

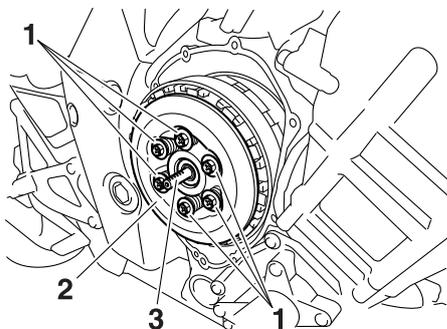
1. Remove:
 - Pull lever cover "1"
 - Clutch cover "2"
 - Gasket

TIP

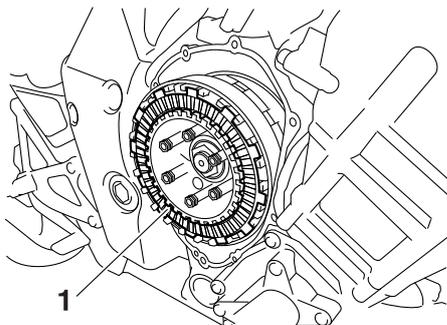
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



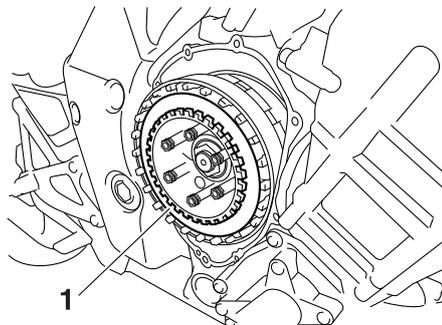
2. Remove:
 - Compression spring bolts "1"
 - Compression springs
 - Pressure plate 1 "2"
 - Pull rod "3"



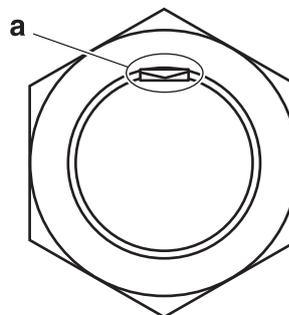
3. Remove:
 - Friction plate 1 "1"



4. Remove:
 - Clutch plate 1 "1"
 - Friction plate 2
 - Clutch plate 2
 - Clutch plate 3



5. Straighten the clutch boss nut rib "a".

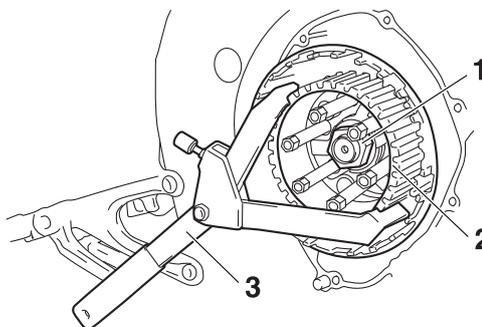


6. Loosen:
 - Clutch boss nut "1"

TIP

While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.

	<p>Universal clutch holder 90890-04086 YM-91042</p>
---	--



CLUTCH

7. Remove:
- Clutch boss nut
 - Springs
 - Clutch boss
 - Pressure plate 2
 - Conical spring washer
 - Thrust washer
 - Clutch housing assembly

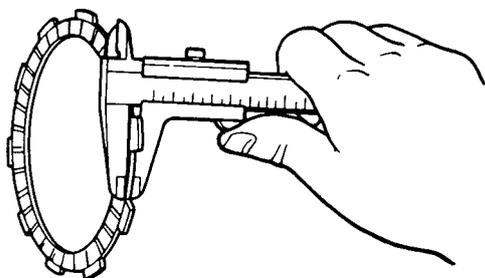
EAS25100
CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

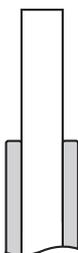
1. Check:
 - Friction plate
Damage/wear → Replace the friction plates as a set.
2. Measure:
 - Friction plate thickness
Out of specification → Replace the friction plates as a set.

TIP
 Measure the friction plate at four places.

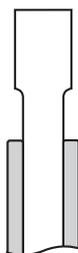
	Friction plate thickness
	2.92–3.08 mm (0.115–0.121 in)
	Wear limit
	2.82 mm (0.111 in)



A



B



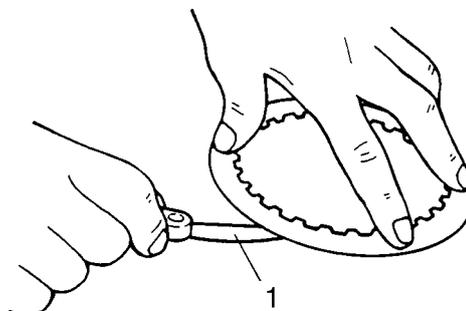
- A. Friction plate 1
 B. Friction plate 2

EAS25110
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.

	Warpage limit
	0.10 mm (0.0039 in)



3. Measure:
 - assembly width "a" of the friction plates and clutch plates
Out of specification → Adjust.

	Assembly width
	42.4–43.0 mm (1.67–1.69 in)

- TIP**
- Perform the thickness measurement without applying the oil.
 - This step should be performed only if the friction plates and clutch plates were replaced.
 - To measure the total width of the friction plates and clutch plates, combine 9 friction plates and 8 clutch plates as shown.

CLUTCH

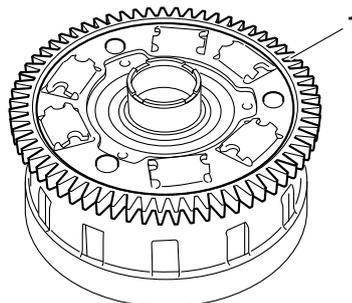
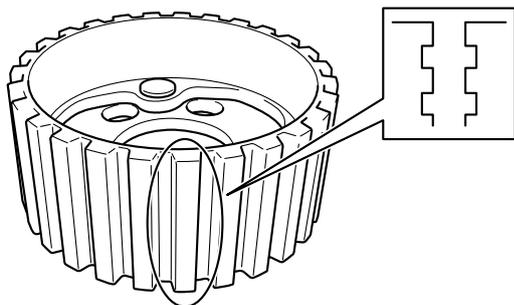
EAS25160

CHECKING THE CLUTCH BOSS

1. Check:
 - Clutch boss splines
Damage/pitting/wear → Replace the clutch boss.

TIP

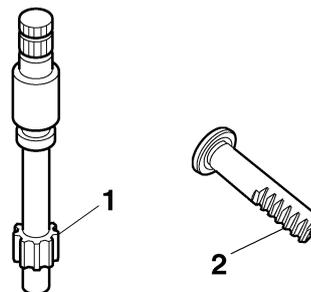
Pitting on the clutch boss splines will cause erratic clutch operation.



EAS25220

CHECKING THE PULL LEVER SHAFT AND PULL ROD

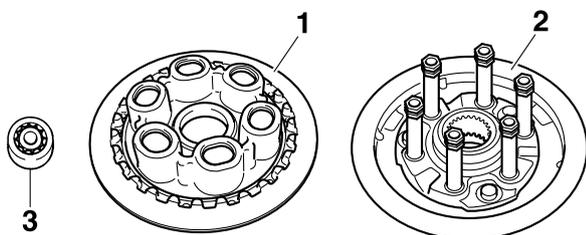
1. Check:
 - Pull lever shaft pinion gear teeth “1”
 - Pull rod teeth “2”
 Damage/wear → Replace the pull rod and pull lever shaft as a set.



EAS25170

CHECKING THE PRESSURE PLATE

1. Check:
 - Pressure plate 1 “1”
 - Pressure plate 2 “2”
Cracks/damage → Replace.
 - Bearing “3”
Damage/wear → Replace.



2. Check:
 - Pull rod bearing
Damage/wear → Replace.

EAS25200

CHECKING THE PRIMARY DRIVE GEAR

1. Check:
 - Primary drive gear
Damage/wear → Replace the crankshaft and clutch housing as a set.
Excessive noise during operation → Replace the crankshaft and clutch housing as a set.

EAS25210

CHECKING THE PRIMARY DRIVEN GEAR

1. Check:
 - Primary driven gear “1”
Damage/wear → Replace the clutch housing and crankshaft as a set.
Excessive noise during operation → Replace the clutch housing and crankshaft as a set.

EAS25240

INSTALLING THE CLUTCH

1. Install:
 - Washer
 - Bearing
 - Clutch housing assembly “1”
 - Thrust washer
 - Conical spring washer

ECA14B1019

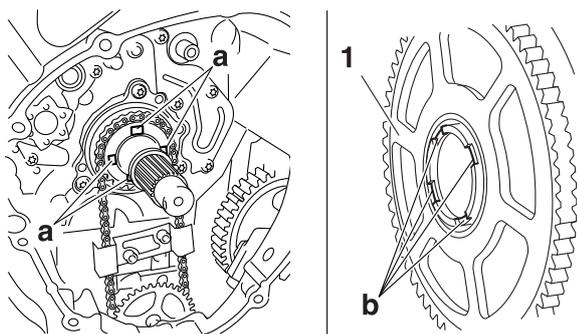
NOTICE

Make sure to fit the projections “a” of the oil pump drive sprocket to the concave “b” of the clutch housing assembly.

TIP

When installing the clutch housing assembly, turn the crankshaft so that the crankshaft web “c” cannot be seen.

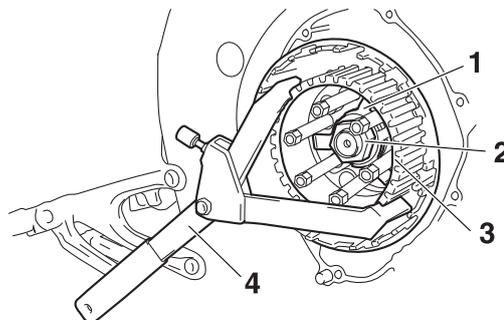
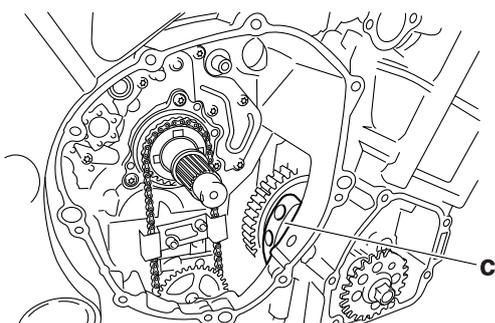
CLUTCH



- Stake the clutch boss nut at a cutout “a” in the main axle.

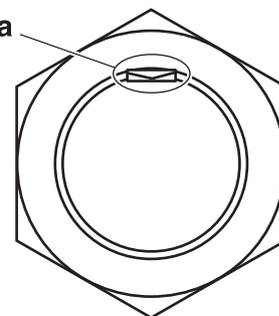


Universal clutch holder
90890-04086
YM-91042



2. Install:

- Pressure plate 2 “1”
- Clutch boss “2”

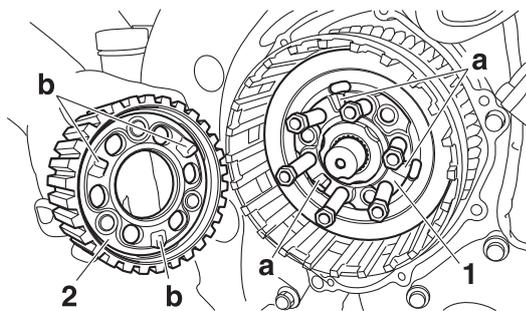


TIP

Fit the groove “a” of the pressure plate 2 to the projection “b” of the clutch boss to assemble.

4. Lubricate:

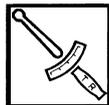
- Friction plates
- Clutch plates
 (with the recommended lubricant)



Recommended lubricant
Engine oil

3. Install:

- Springs “1”
- Clutch boss nut “2” **New**



Clutch boss nut
115 Nm (11.5 m·kgf, 85 ft·lbf)

5. Install:

- Friction plates
- Clutch plates

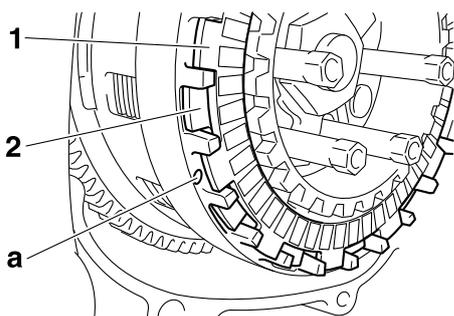
TIP

- First, install a friction plate and then alternate between a clutch plate and a friction plate.
- Install the last friction plate “1” offset from the other friction plates “2”, making sure to align a projection on the friction plate with the punch mark “a” on the clutch housing.

TIP

- Lubricate the clutch boss nut threads with engine oil.
- While holding the clutch boss “3” with the universal clutch holder “4”, tighten the clutch boss nut.

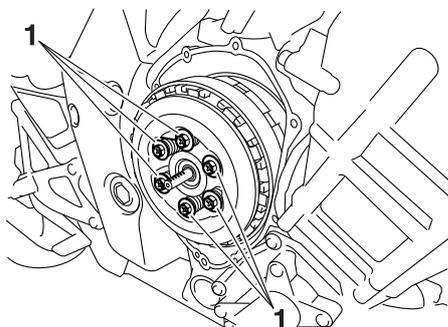
CLUTCH



6. Install:
 - Bearing (into the pressure plate 1)
 - Pull rod
 - Pressure plate 1
7. Install:
 - Clutch springs
 - Clutch spring bolts "1"

	<p>Clutch spring bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)</p>
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TIP
 Tighten the clutch spring bolts in stages and in a crisscross pattern.

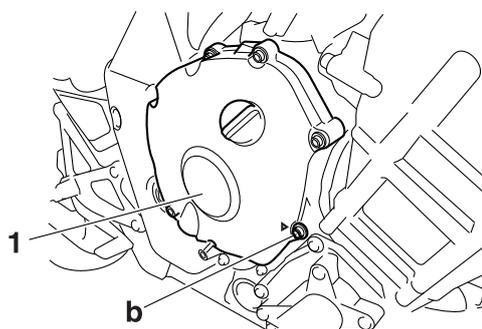
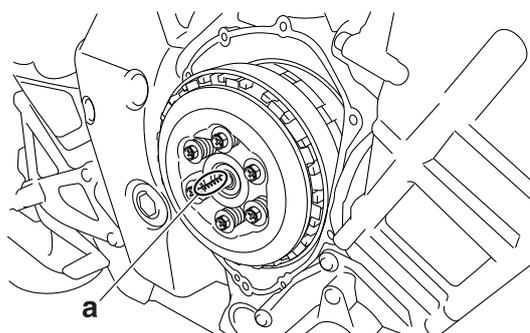


8. Install:
 - Dowel pins
 - Clutch cover gasket **New**
 - Clutch cover "1"

	<p>Clutch cover bolt 12 Nm (1.2 m·kgf, 8.7 ft·lbf)</p>
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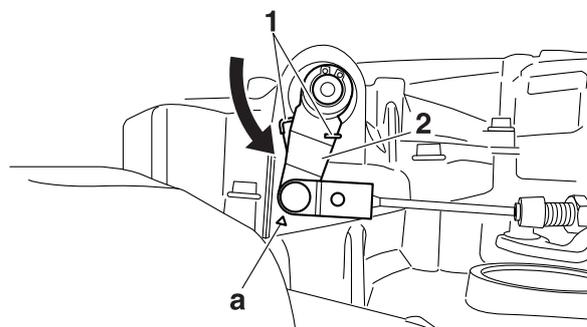
TIP
 • Position the pull rod so that the teeth "a" face towards the rear of the vehicle. Then, install the clutch cover.
 • Apply locking agent (LOCTITE®) to the threads of only the clutch cover bolts "b" shown in the illustration.

- Tighten the clutch cover bolts in stages and in a crisscross pattern.



9. Install:
 - Pull lever spring "1"
 - Pull lever "2"
 - Washer
 - Circlip **New**

TIP
 • The end of the pull lever should be closest to the clutch cover match mark "a" when there is no free play of the pull lever.
 • Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.



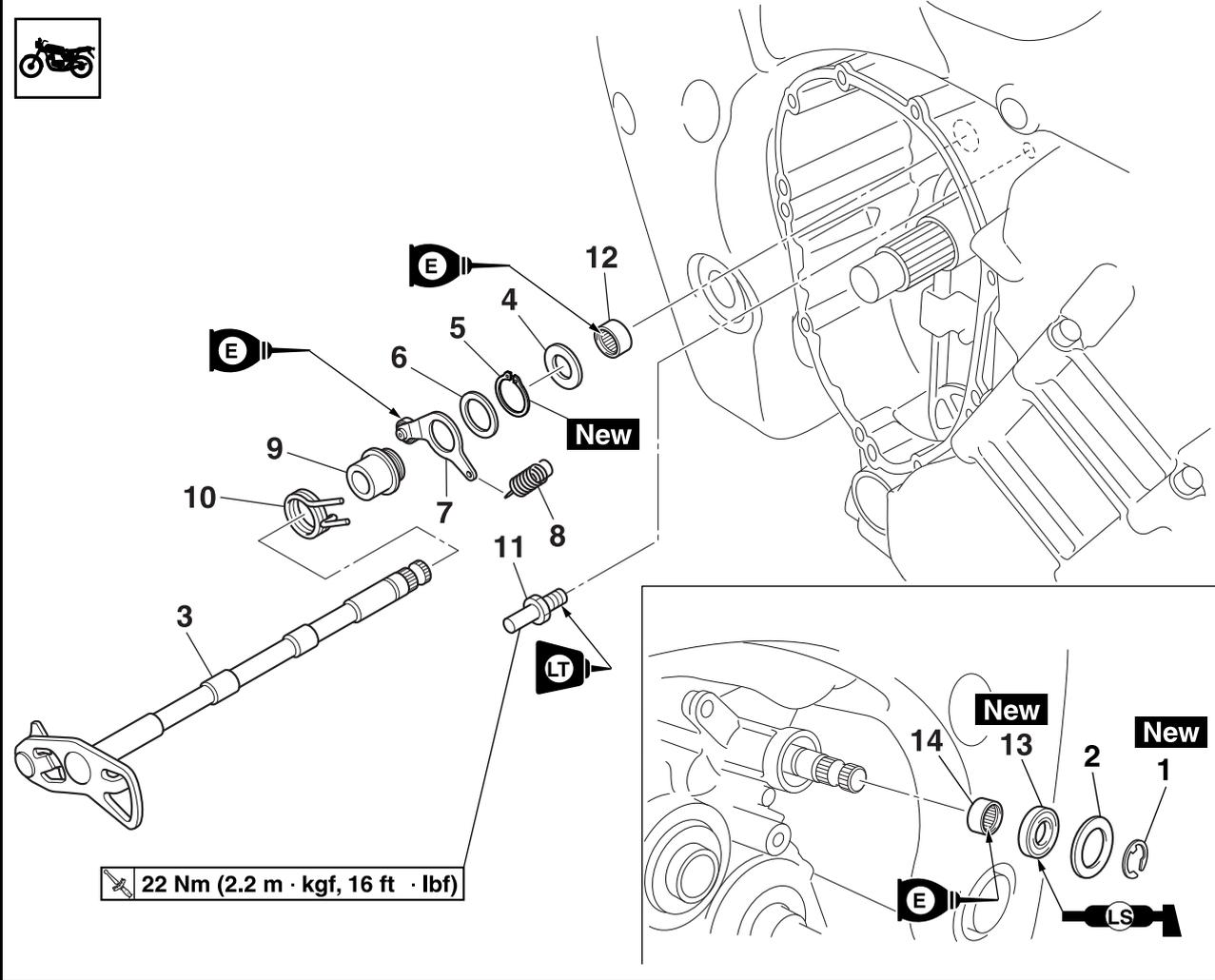
10. Adjust:
 - Clutch cable free play
 Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" on page 3-14.

SHIFT SHAFT

EAS25410

SHIFT SHAFT

Removing the shift shaft and stopper lever



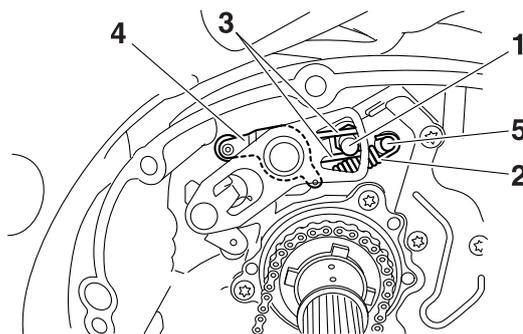
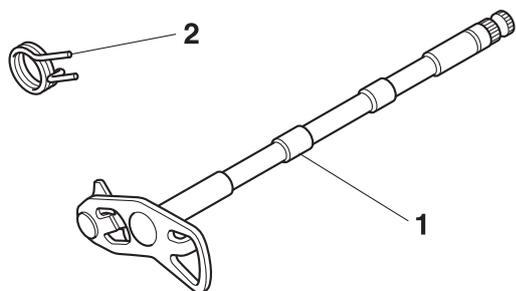
Order	Job/Parts to remove	Q'ty	Remarks
	Shift arm		Refer to "CHAIN DRIVE" on page 4-85.
	Clutch assembly		Refer to "CLUTCH" on page 5-58.
1	Circlip	1	
2	Washer	1	
3	Shift shaft	1	
4	Washer	1	
5	Circlip	1	
6	Washer	1	
7	Stopper lever	1	
8	Stopper lever spring	1	
9	Collar	1	
10	Shift shaft spring	1	
11	Shift shaft spring stopper	1	
12	Bearing	1	
13	Oil seal	1	
14	Bearing	1	
			For installation, reverse the removal procedure.

SHIFT SHAFT

EAS25420

CHECKING THE SHIFT SHAFT

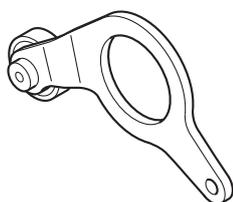
1. Check:
 - Shift shaft "1"
 - Bends/damage/wear → Replace.
 - Shift shaft spring "2"
 - Collar
 - Damage/wear → Replace.



EAS25430

CHECKING THE STOPPER LEVER

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



EAS25450

INSTALLING THE SHIFT SHAFT

1. Install:
 - Shift shaft spring stopper "1"
 - Shift shaft assembly
 - Stopper lever spring "2"



Shift shaft spring stopper
22 Nm (2.2 m.kgf, 16 ft.lbf)
LOCTITE®

TIP

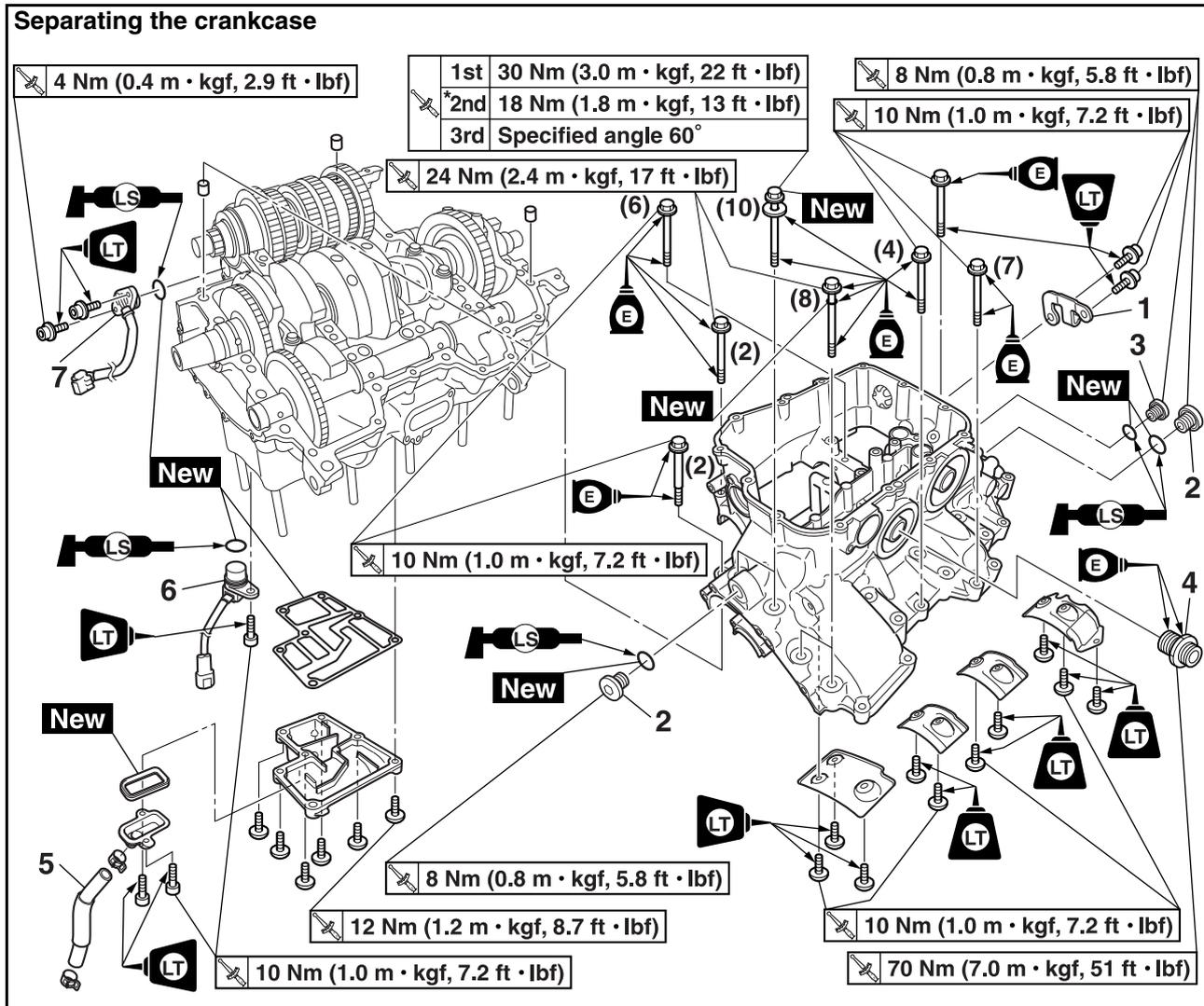
- Lubricate the oil seal lips with lithium-soap-based grease.
- Hook the end of the shift shaft spring "3" onto the shift shaft spring stopper "1".
- Hook the ends of the stopper lever spring "2" onto the stopper lever "4" and the crankcase boss "5".
- Mesh the stopper lever with the shift drum segment assembly.

CRANKCASE

EAS25540

CRANKCASE

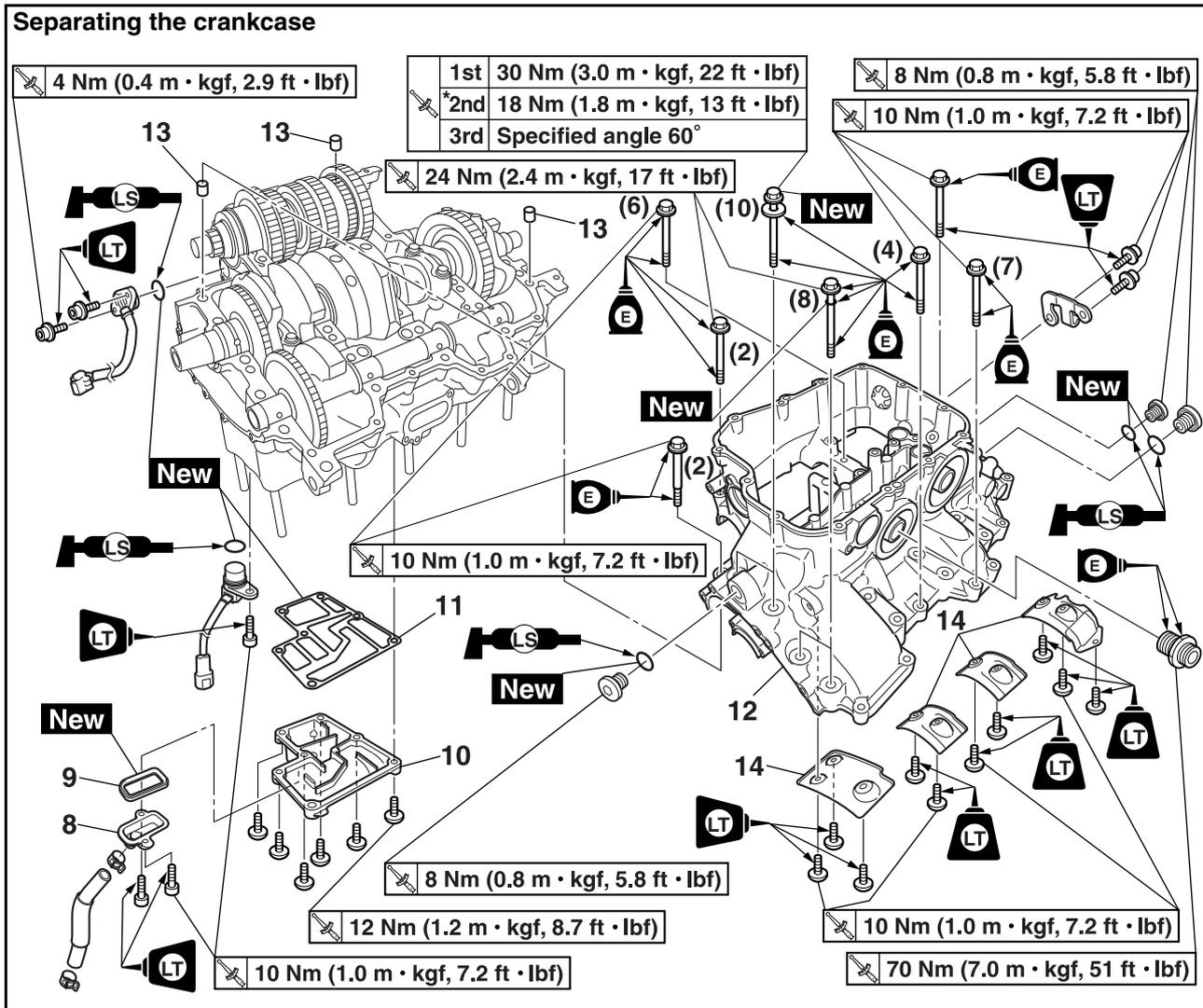
Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-3.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-24.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-45.
	Stator coil assembly		Refer to "GENERATOR" on page 5-36.
	Pickup rotor		Refer to "PICKUP ROTOR" on page 5-42.
	Clutch housing assembly		Refer to "CLUTCH" on page 5-58.
	Shift shaft assembly		Refer to "SHIFT SHAFT" on page 5-68.
	Oil/water pump assembly		Refer to "OIL PUMP" on page 5-50.
1	Clutch cable holder	1	
2	Main gallery plug 1	2	
3	Main gallery plug 2	1	
4	Union bolt	1	
5	Crankcase breather hose	1	
6	Rear speed sensor	1	
7	Gear position sensor	1	

* Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque.

CRANKCASE



Order	Job/Parts to remove	Q'ty	Remarks
8	Crankcase breather cover	1	
9	Crankcase breather cover gasket	1	
10	Crankcase breather case	1	
11	Crankcase breather case gasket	1	
12	Lower crankcase	1	
13	Dowel pin	3	
14	Crankcase baffle plate	4	
			For installation, reverse the removal procedure.

* Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque.

CRANKCASE

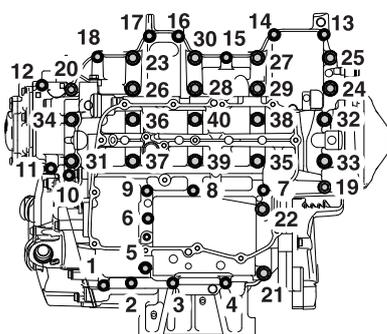
EAS25550

DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. Remove:
 - Crankcase bolts

TIP

- 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 increasing numerical order (refer to the numbers in the illustration).
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.



3. Remove:
 - Lower crankcase

ECA13900

NOTICE

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

4. Remove:
 - Dowel pins

EAS25580

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.

EAS25650

ASSEMBLING THE CRANKCASE

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

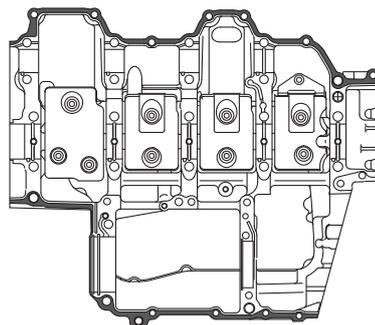
	Recommended lubricant Engine oil
---	---

2. Apply:
 - Sealant
(onto the crankcase mating surfaces)

	Yamaha bond No.1215 (Three Bond No.1215®) 90890-85505
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TIP

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 (0.08–0.12 in) of the crankshaft journal bearings.



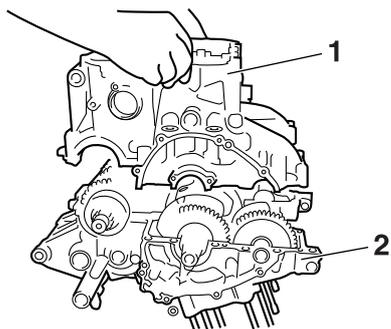
3. Install:
 - Dowel pins
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
 - Lower crankcase “1”
(onto the upper crankcase “2”)

ECA13980

NOTICE

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

CRANKCASE

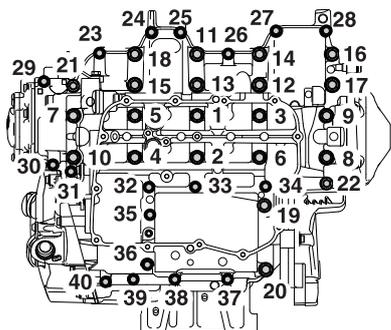


6. Install:
- Crankcase bolts

TIP

- Lubricate the bolts “1”–“10” thread, mating surfaces and washers with engine oil.
- Lubricate the bolts “11”–“18” thread, mating surfaces and O-rings with engine oil.
- Lubricate the bolts “19”–“40” thread and mating surfaces with engine oil (except “31”).
- Apply LOCTITE® to the screw of the bolt “31” and engine oil to the bearing surface.

- M9 × 100 mm bolts with washers: “1”–“10”. **New**
- M8 × 60 mm bolts with new O-rings: “11”–“18”.
- M8 × 60 mm bolts: “19”, “20”.
- M6 × 70 mm bolt: “31”.
- M6 × 65 mm shoulder bolts: “21”, “22”
- M6 × 60 mm bolts: “30”, “32”–“36”.
- M6 × 50 mm bolts: “23”–“25”, “27”–“29”, “40”.
- M6 × 40 mm bolts: “26”, “37”–“39”.



7. Tighten:
- Crankcase bolts “1”–“10”



Crankcase bolts (M9 × 100 mm)
1st: 30 Nm (3.0 m·kgf, 22 ft·lbf)
***2nd: 18 Nm (1.8 m·kgf, 13 ft·lbf)**
3rd: +60°

*Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque.

EWA14B1030

⚠ WARNING

If the crankcase bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the crankcase bolt with a new one and perform the procedure again.

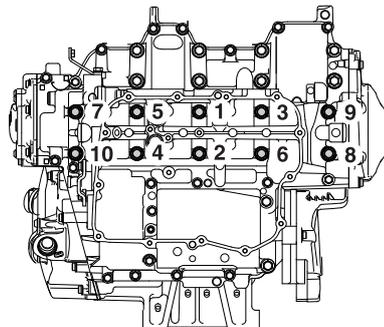
ECA14B1043

NOTICE

Do not use a torque wrench to tighten the crankcase bolt to the specified angle.

TIP

Tighten the bolts in the tightening sequence cast on the crankcase.



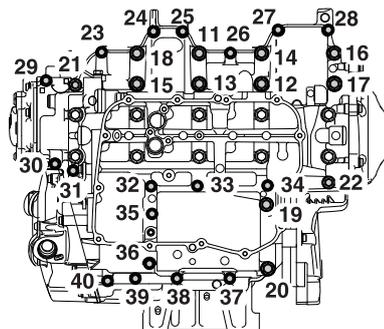
8. Tighten:
- Crankcase bolts “11”–“40”



Crankcase bolts “11”–“20”
24 Nm (2.4 m·kgf, 17 ft·lbf)
Crankcase bolts “21”–“40”
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

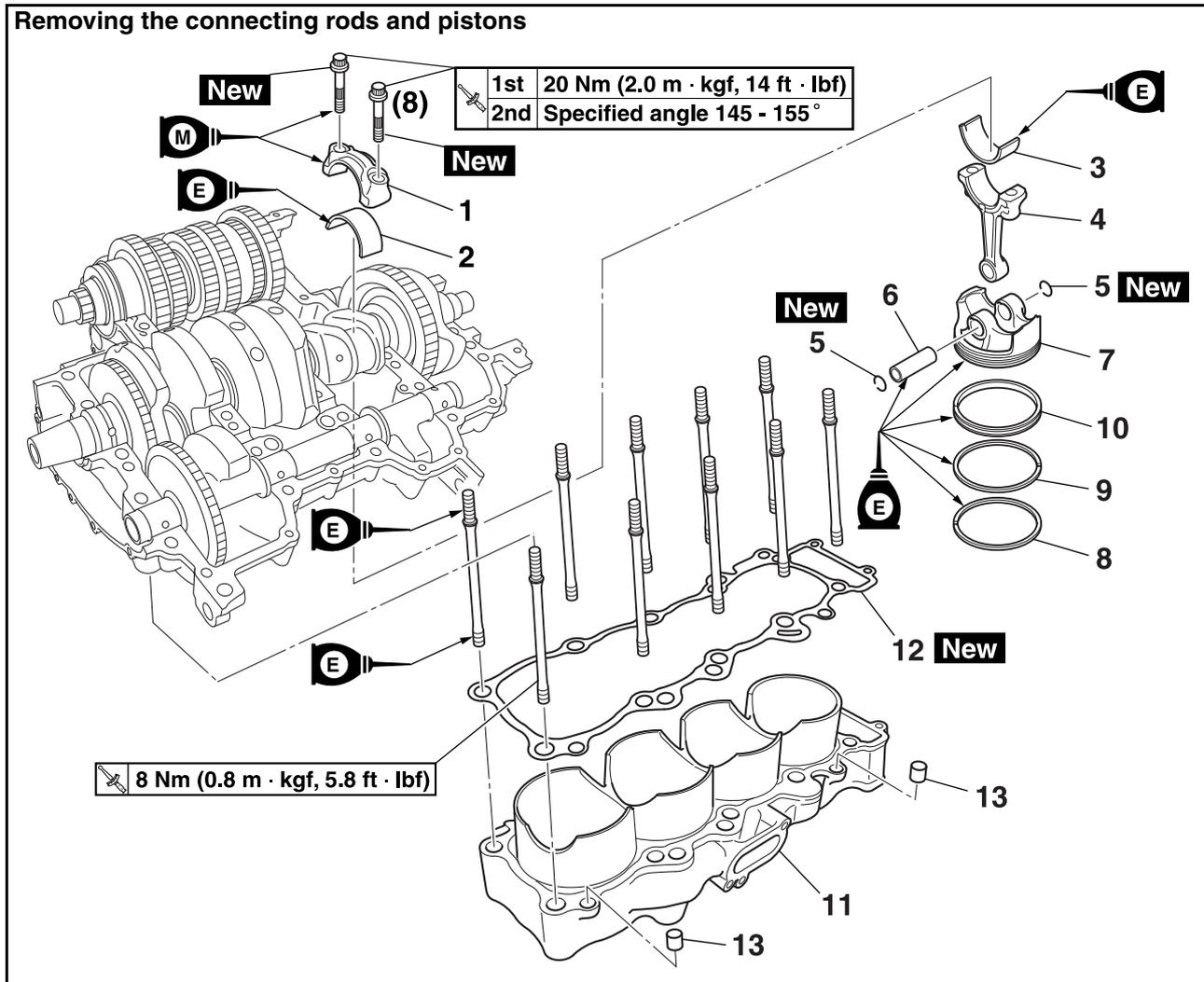
Tighten the bolts in the tightening sequence cast on the crankcase.



CONNECTING RODS AND PISTONS

EAS14B1024

CONNECTING RODS AND PISTONS



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-70.
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Big end upper bearing	4	
4	Connecting rod	4	
5	Piston pin clip	8	
6	Piston pin	4	
7	Piston	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	
11	Cylinder	1	
12	Cylinder gasket	1	
13	Dowel pin	2	
			For installation, reverse the removal procedure.

CONNECTING RODS AND PISTONS

EAS26030

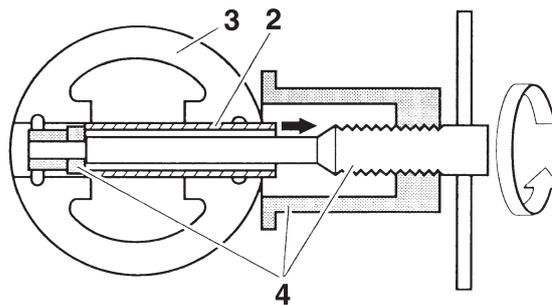
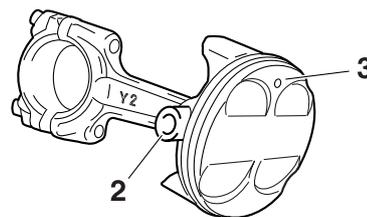
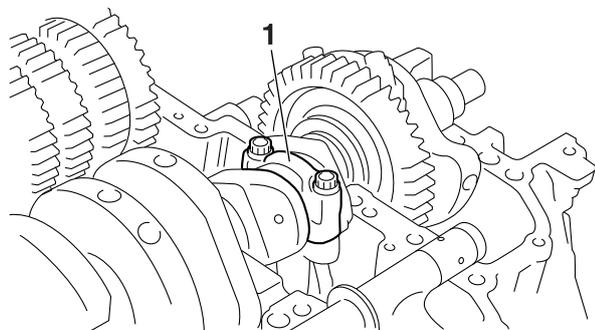
REMOVING THE CONNECTING RODS AND PISTONS

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

1. Remove:
 - Connecting rod cap "1"
 - Connecting rod
 - Big end bearings

TIP

- Identify the position of each big end bearing so that it can be reinstalled in its original place.
- After removing the connecting rods and connecting rod caps, care should be taken not to damage the mating surfaces of the connecting rods and connecting rod caps.



3. Remove:
 - Top ring
 - 2nd ring
 - Oil ring

TIP

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

2. Remove:
 - Piston pin clips "1"
 - Piston pin "2"
 - Piston "3"

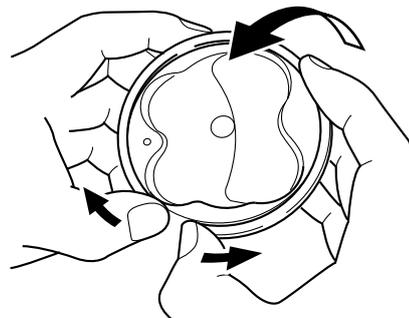
ECA13810

NOTICE

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

TIP

- 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 debarred and the piston pin is still difficult to remove, remove it with the piston pin puller set "4".



4. Remove:
 - Cylinder
 - Cylinder gasket
 - Cylinder stud bolts

EAS24390

CHECKING THE CYLINDER AND PISTON

1. Check:
 - Piston wall
 - Cylinder wall
 Vertical scratches → Replace the cylinder, and replace the piston and piston rings as a set.

	<p>Piston pin puller set 90890-01304 Piston pin puller YU-01304</p>
---	--

CONNECTING RODS AND PISTONS

2. Measure:

- Piston-to-cylinder clearance



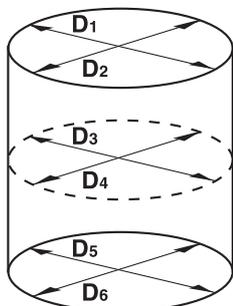
- a. Measure cylinder bore "C" with the cylinder bore gauge.

TIP

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

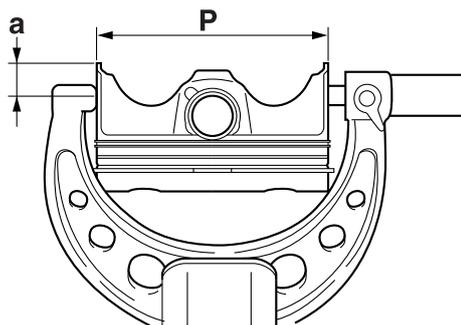
	<p>Bore 78.000–78.010 mm (3.0709–3.0713 in)</p> <p>Taper limit 0.050 mm (0.0020 in)</p> <p>Out of round limit 0.050 mm (0.0020 in)</p>
--	---

"C" = maximum of D ₁ –D ₆
Taper limit = maximum of D ₁ or D ₂ - maximum of D ₅ or D ₆
Out of round limit = 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 replace the piston and piston rings as a set.
- c. Measure piston skirt diameter "P" with the micrometer.

	<p>Piston diameter 77.975–77.990 mm (3.0699–3.0705 in)</p>
--	---



- a. 12 mm (0.47 in) from the bottom edge of the piston
- 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"
--

	<p>Piston-to-cylinder clearance 0.010–0.035 mm (0.0004–0.0014 in)</p> <p>Limit 0.150 mm (0.0059 in)</p>
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- f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.



EAS24430

CHECKING THE PISTON RINGS

1. Measure:

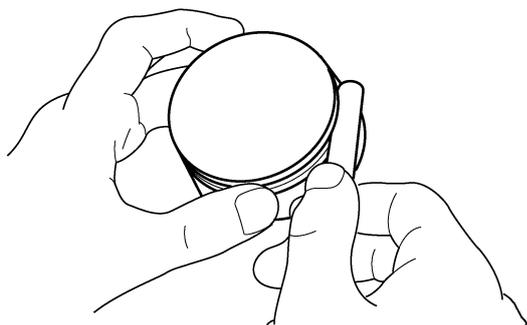
- Piston ring side clearance
 Out of specification → Replace the piston and piston rings as a set.

TIP

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

CONNECTING RODS AND PISTONS

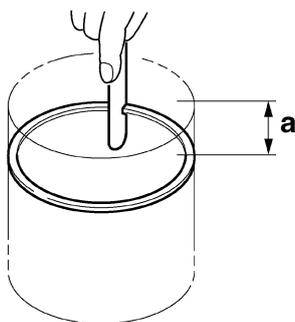
	Piston ring side clearance
	Top ring
	0.030–0.065 mm (0.0012–0.0026 in)
	Limit
	0.115 mm (0.0045 in)
	2nd ring
	0.020–0.055 mm (0.0008–0.0022 in)
	Limit
	0.115 mm (0.0045 in)



2. Install:
- Piston ring (into the cylinder)

TIP

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



a. 10 mm (0.4 in)

3. Measure:
- Piston ring end gap
Out of specification → Replace the piston ring.

TIP

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.

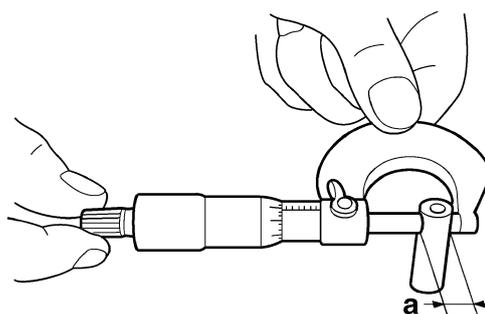
	Piston ring end gap
	Top ring
	0.15–0.25 mm (0.0059–0.0098 in)
	Limit
	0.50 mm (0.0197 in)
	2nd ring
	0.30–0.45 mm (0.0118–0.0177 in)
	Limit
	0.80 mm (0.0315 in)
	Oil ring
	0.10–0.40 mm (0.0039–0.0157 in)

EAS24440

CHECKING THE PISTON PIN

1. Check:
 - Piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
 - Piston pin outside diameter "a"
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 (0.6682 in)

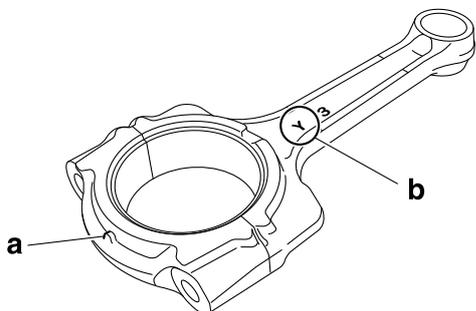


3. Measure:
- Piston pin bore inside diameter "b"
Out of specification → Replace the piston.

	Piston pin bore inside diameter
	17.002–17.013 mm (0.6694–0.6698 in)
	Limit
	17.043 mm (0.6710 in)

CONNECTING RODS AND PISTONS

- After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.

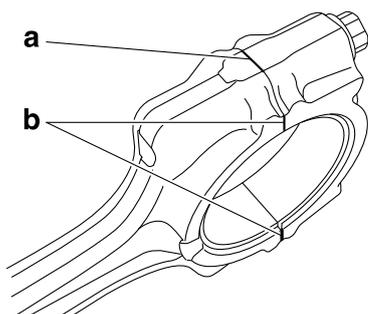


TIP
Install by carrying out the following procedures in order to assemble in the most suitable condition.

- Tighten the connecting rod bolt while checking that the sections shown "a" and "b" are flush with each other by touching the surface.

	Connecting rod bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)
---	--

TIP
To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.

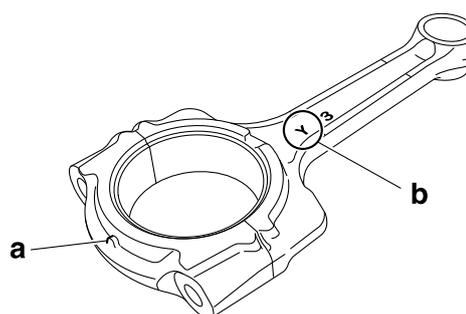


- Side machined face
- Thrusting faces

- Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

TIP

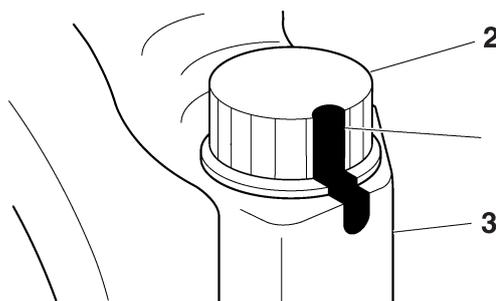
- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Make sure that the projection "a" on the connecting rod cap faces the same direction as the "Y" mark "b" on the connecting rod.
- Make sure the "Y" marks "b" on the connecting rods face towards the left side of the crankshaft.



- Tighten the connecting rod bolts with a torque wrench.

	Connecting rod bolt (1st) 20 Nm (2.0 m·kgf, 14 ft·lbf)
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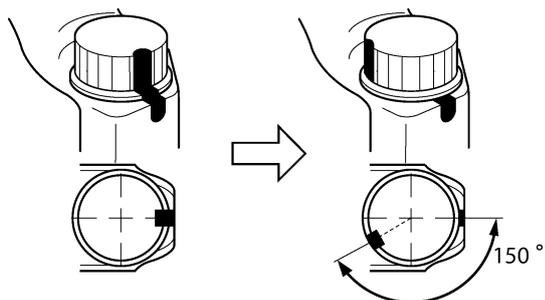
- Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



- Tighten the connecting rod bolts further to reach the specified angle 145°–155°.

	Connecting rod bolt (final) Specified angle 145°–155°
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CONNECTING RODS AND PISTONS



EWA13400

WARNING

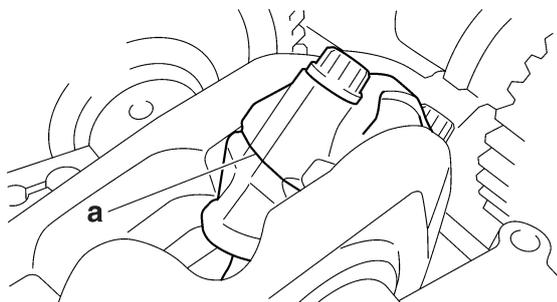
If the connecting rod bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the connecting rod bolt with a new one and perform the procedure again.

ECA13950

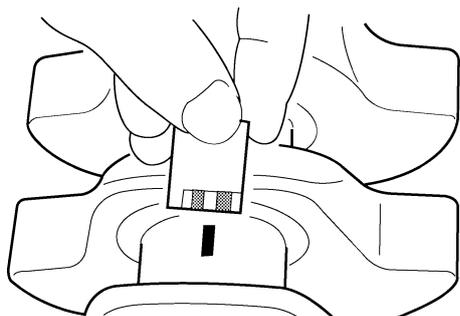
NOTICE

Do not use a torque wrench to tighten the connecting rod bolt to the specified angle.

- j. After the installation, check that the section shown "a" is flush with each other by touching the surface.



- 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.



- 2. Select:
 - Big end bearings (P1–P4)

TIP

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

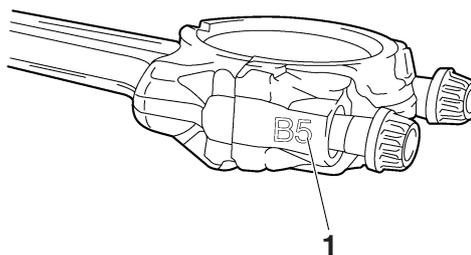
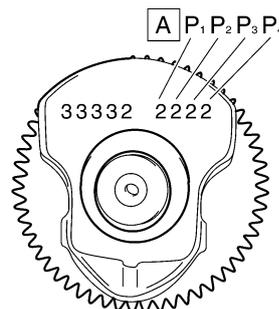
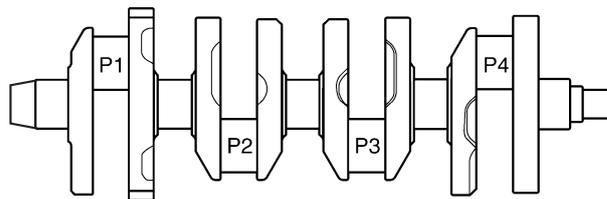
For example, if the connecting rod "P₁" and the crankshaft web "P₁" numbers are "5" and "2" respectively, then the bearing size for "P₁" is:

$$\text{"P}_1\text{" (connecting rod) - "P}_1\text{" (crankshaft) = } 5 - 2 = 3 \text{ (brown)}$$



Bearing color code

- 1. Blue
- 2. Black
- 3. Brown
- 4. Green



CONNECTING RODS AND PISTONS

EAS26190

INSTALLING THE CONNECTING ROD AND PISTON

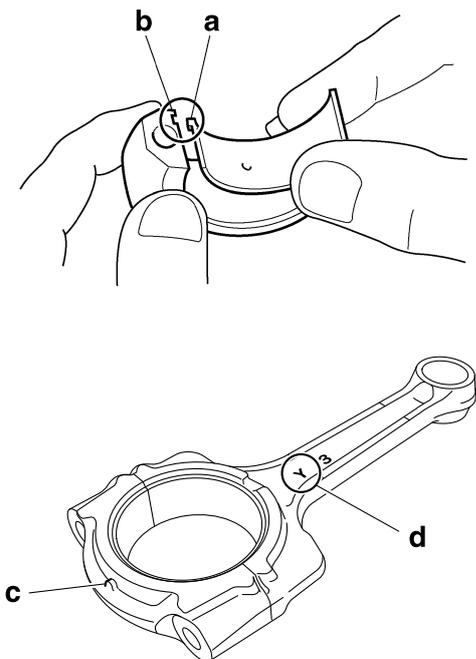
The following procedure applies to all of the connecting rods and pistons.

1. Install:

- Big end bearings
- Connecting rod cap (onto the connecting rod)

TIP

- Be sure to reinstall each big end bearing in its original place.
- Align the projections “a” on the big end bearings with the notches “b” in the connecting rods and connecting rod caps.
- Make sure that the projection “c” on the connecting rod cap faces the same direction as the “Y” mark “d” on the connecting rod.



2. Tighten:

- Connecting rod bolts **New**

ECA14B1042

NOTICE

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

TIP

Install by carrying out the following procedures in order to assemble in the most suitable condition.

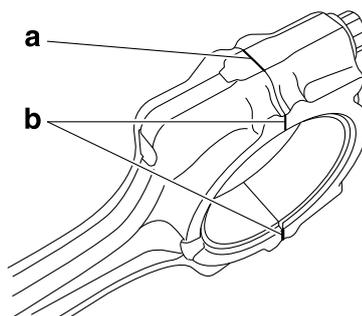


- a. Replace the connecting rod bolts with new ones.
- b. Clean the connecting rod bolts and lubricate the bolt threads and seats with molybdenum disulfide oil.
- c. After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.
- d. Tighten the connecting rod bolt while checking that the sections shown “a” and “b” are flush with each other by touching the surface.

	Connecting rod bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)
---	---

TIP

To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.



- a. Side machined face
 - b. Thrusting faces
- e. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.



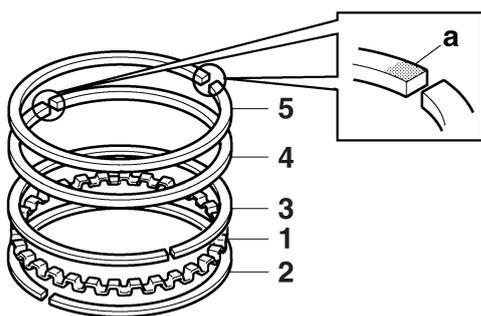
3. Install:

- Oil ring expander “1”
- Lower oil ring rail “2”
- Upper oil ring rail “3”
- 2nd ring “4”
- Top ring “5” (into the piston)

TIP

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

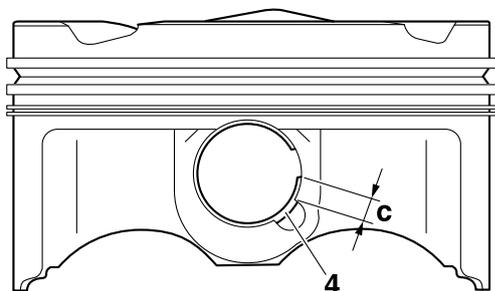
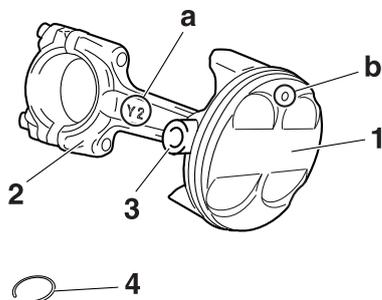
CONNECTING RODS AND PISTONS



4. Install:
- Piston "1"
 - (onto the respective connecting rod "2")
 - Piston pin "3"
 - Piston pin clip "4" **New**

TIP

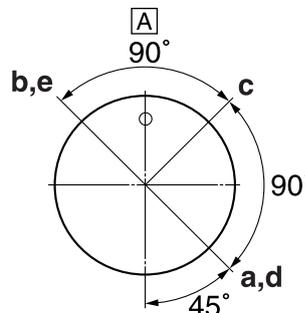
- Apply engine oil onto the piston pin.
- Make sure that the "Y" mark "a" on the connecting rod faces left when the punch mark "b" on the piston is pointing up as shown.
- Install the piston pin clips, so that the clip ends are 3 mm (0.12 in) "c" or more from the cutout in the piston.
- Reinstall each piston into its original cylinder.



5. Lubricate:
- Piston
 - Piston rings
 - Cylinder
 - (with the recommended lubricant)

	Recommended lubricant Engine oil
---	---

6. Offset:
- Piston ring end gaps



- a. Top ring
- b. 2nd ring
- c. Upper oil ring rail
- d. Oil ring expander
- e. Lower oil ring rail

- A. Exhaust side

7. Lubricate:
- Crankshaft pins
 - Connecting rod big end bearing inner surface
 - (with the recommended lubricant)

	Recommended lubricant Engine oil
---	---

8. Check:
- Cylinder stud bolts

	Cylinder stud bolt 8 Nm (0.8 m.kgf, 5.8 ft-lbf)
---	--

9. Install:
- Piston assemblies "1"
 - (into the cylinder "2")

	Piston installing tool 90890-04161 YM-04161
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ECA14B1040

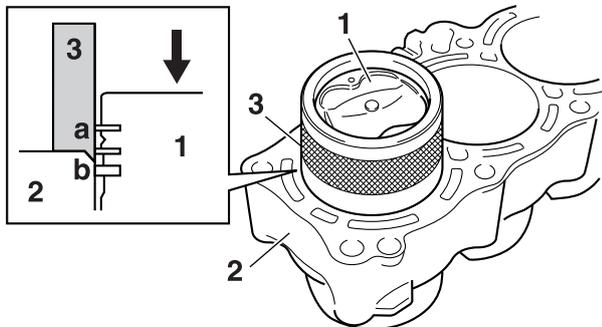
NOTICE

If the projection "a" of the piston installing tool damages, you cannot use it. Please handle with care.

CONNECTING RODS AND PISTONS

TIP

Fit the projection “a” of the piston installing tool “3” and blunt-edged part “b” of the cylinder, fix the position of the piston installing tool, and then push the piston down to the cylinder.

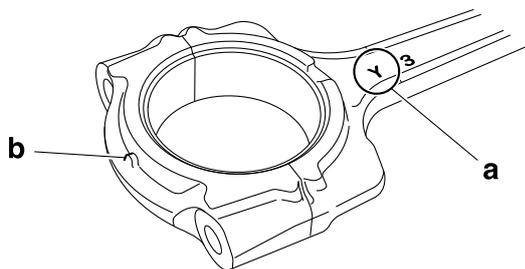


10. Install:

- Cylinder gasket **New**
- Dowel pin
- Cylinder assembly
- Connecting rod caps
- Connecting rod bolts

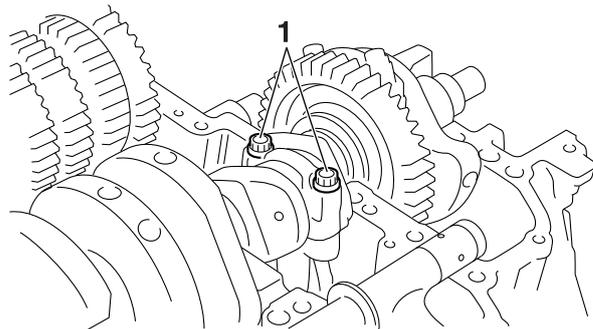
TIP

- Make sure the “Y” marks “a” on the connecting rods face towards the left side of the crankshaft.
- Make sure that the projection “b” on the connecting rod cap faces the same direction as the “Y” mark “a” on the connecting rod.
- Apply Molybdenum disulfide oil to the bolt threads and bearing surface of the connecting rod bolt and connecting rod cap.



11. Tighten:

- Connecting rod bolts “1”



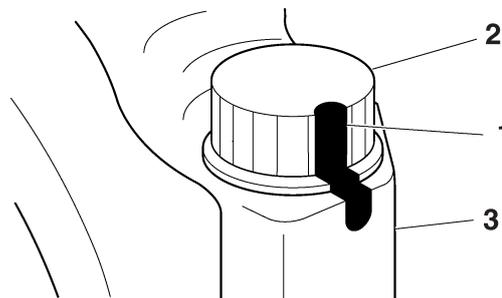
TIP

Tighten the connecting rod bolts using the following procedure.

- a. Tighten the connecting rod bolts with a torque wrench.

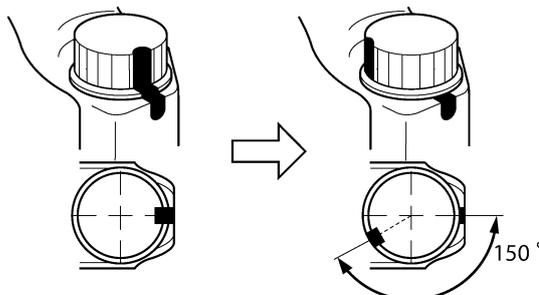
	Connecting rod bolt (1st) 20 Nm (2.0 m.kgf, 14 ft.lbf)
---	---

- b. Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”.



- c. Tighten the connecting rod bolts further to reach the specified angle 145°–155°.

	Connecting rod bolt (final) Specified angle 145°–155°
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CONNECTING RODS AND PISTONS

EWA13400

⚠ WARNING

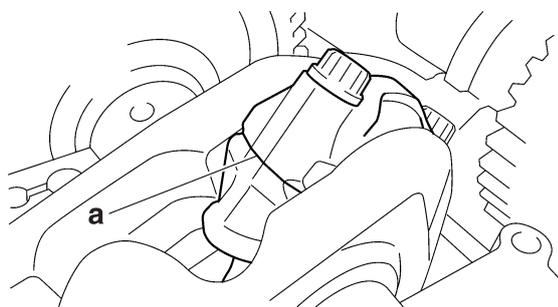
If the connecting rod bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the connecting rod bolt with a new one and perform the procedure again.

ECA13950

NOTICE

Do not use a torque wrench to tighten the connecting rod bolt to the specified angle.

- d. After the installation, check that the section shown "a" is flush with each other by touching the surface.

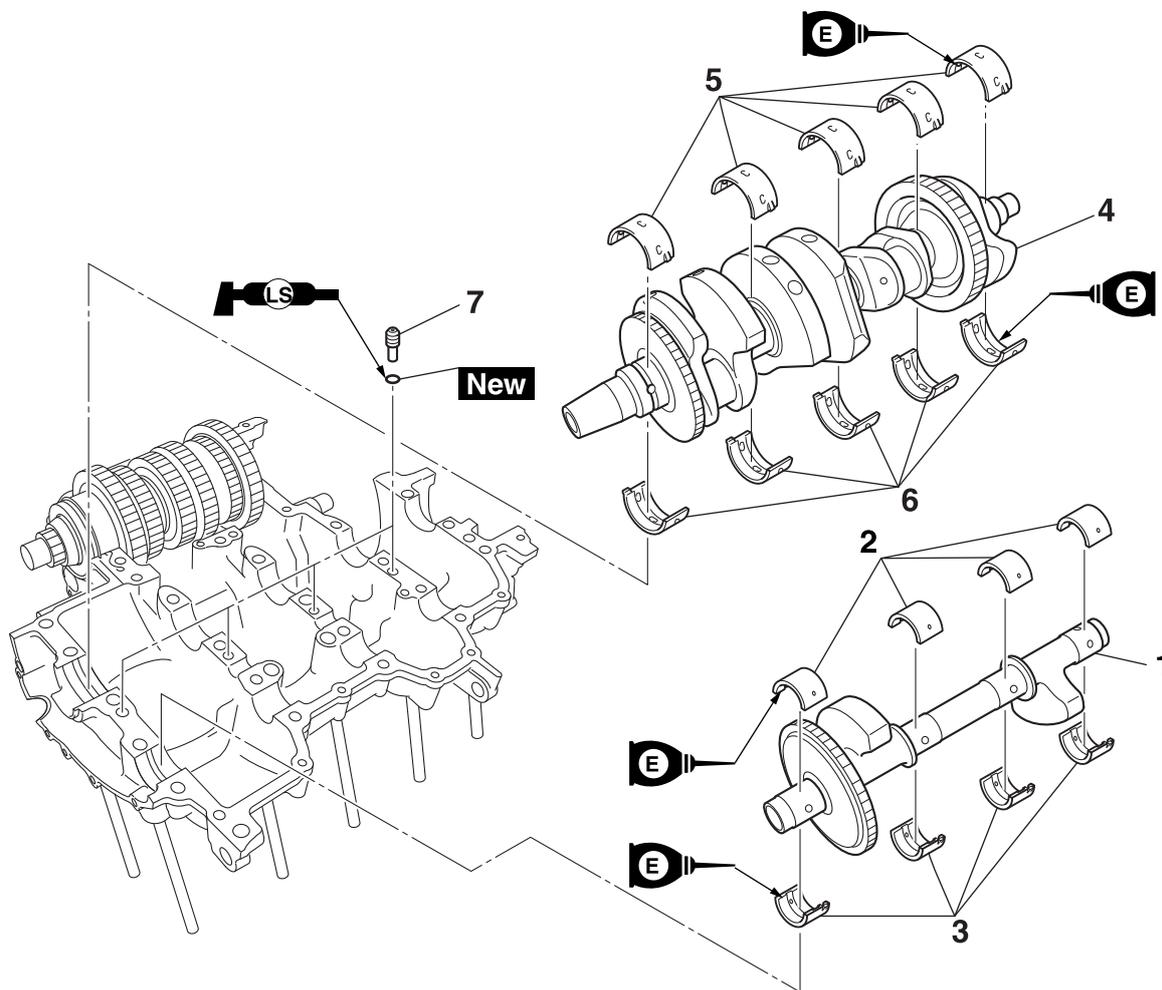


CRANKSHAFT

EAS25960

CRANKSHAFT

Removing the crankshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-70.
	Connecting rod		Refer to "REMOVING THE CONNECTING RODS AND PISTONS" on page 5-75.
1	Balancer shaft	1	
2	Balancer shaft journal lower bearing	4	
3	Balancer shaft journal upper bearing	4	
4	Crankshaft	1	
5	Crankshaft journal lower bearing	5	
6	Crankshaft journal upper bearing	5	
7	Oil nozzle	4	
			For installation, reverse the removal procedure.

CRANKSHAFT

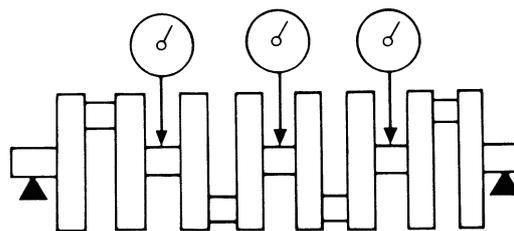
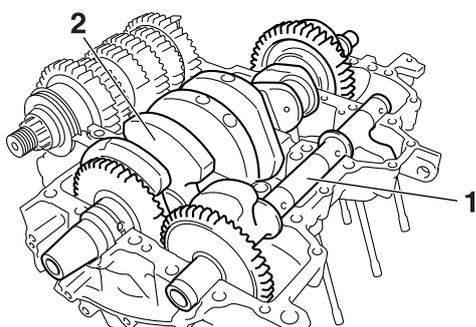
EAS25980

REMOVING THE CRANKSHAFT AND BALANCER SHAFT

1. Remove:
 - Balancer shaft "1"
 - Balancer shaft journal bearings
 - Crankshaft assembly "2"
 - Crankshaft journal bearings

TIP

Identify the position of each balancer shaft journal bearings and crankshaft journal bearings so that it can be reinstalled in its original place.



2. Check:
 - Crankshaft journal surfaces
 - Crankshaft pin surfaces
 - Bearing surfaces
 Scratches/wear → Replace the crankshaft.
3. Measure:
 - Crankshaft-journal-to-crankshaft-journal-bearing clearance
 Out of specification → Replace the crankshaft journal bearings.

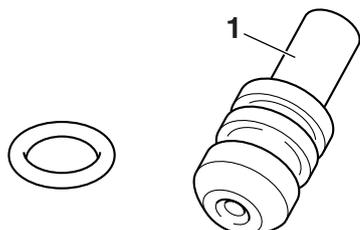
	Journal oil clearance	
	0.004–0.039	mm (0.0002–
	0.0015	in)

EAS14B1025

CHECKING THE OIL NOZZLES

The following procedure applies to all of the oil nozzles.

1. Check:
 - Oil nozzle "1"
 Damage/wear → Replace the oil nozzle.
 - Oil passage
 Obstruction → Blow out with compressed air.



ECA13920

NOTICE

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.

- 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.

TIP

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

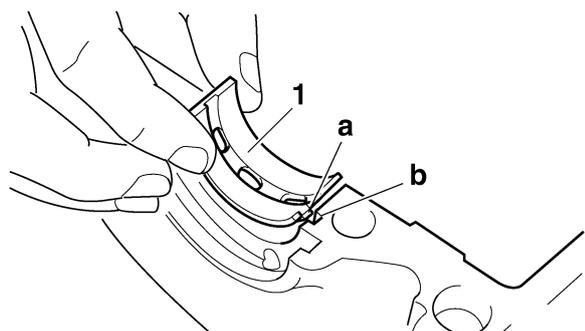
EAS14B1026

CHECKING THE CRANKSHAFT

1. Measure:
 - Crankshaft runout
 Out of specification → Replace the crankshaft.

	Crankshaft runout limit	
	0.030 mm (0.0012 in)	

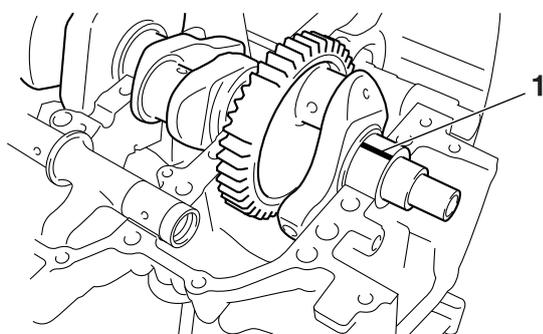
CRANKSHAFT



d. Put a piece of Plastigauge® "1" on each crankshaft journal.

TIP

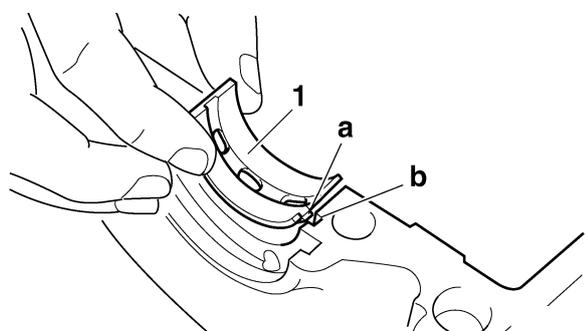
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



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

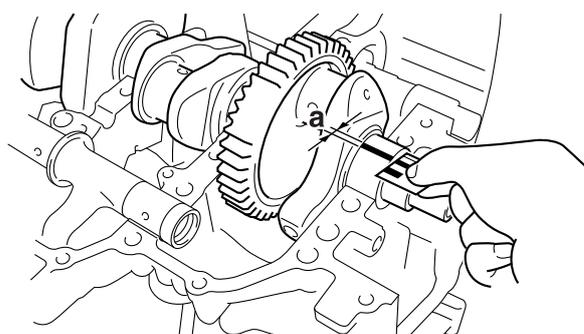
TIP

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



f. Tighten the bolts to specification in the tightening sequence cast on the crankcase. Refer to "CRANKCASE" on page 5-70.

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



4. Select:
- Crankshaft journal bearings (J₁-J₅)

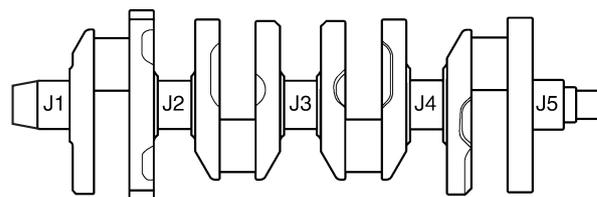
TIP

- The numbers "A" stamped into the crankshaft web and the numbers "B" 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.

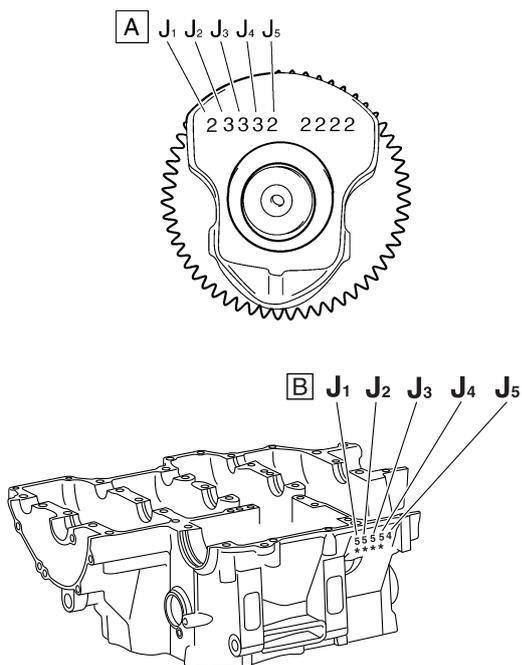
For example, if the crankcase J₁ and crankshaft web J₁ numbers are 5 and 2 respectively, then the bearing size for J₁ is:

$$J_1 \text{ (crankcase)} - J_1 \text{ (crankshaft web)} = 5 - 2 = 3 \text{ (brown)}$$

	Bearing color code		
	1.Blue	2.Black	3.Brown
	4.Green	5.Yellow	



CRANKSHAFT



ECA14B1020

NOTICE

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



- a. Clean the balancer shaft journal bearings, balancer shaft journals, and bearing portions of the crankcase.
- b. Place the upper crankcase upside down on a bench.
- c. Install the balancer shaft journal upper bearings "1" and the balancer shaft into the upper crankcase.

TIP

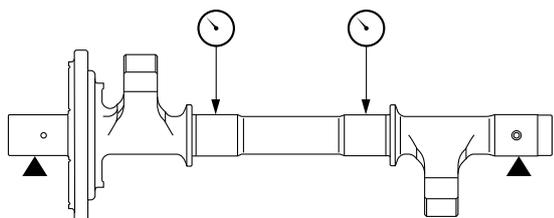
Align the projections "a" on the balancer shaft journal upper bearings with the notches "b" in the upper crankcase.

EAS14B1027

CHECKING THE BALANCER SHAFT

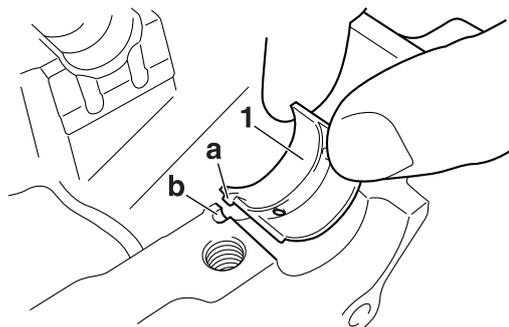
1. Measure:
 - Balancer shaft runout
Out of specification → Replace the balancer shaft.

	<p>Balancer shaft runout limit 0.030 mm (0.0012 in)</p>
--	--



2. Check:
 - Balancer shaft journal surfaces
 - Bearing surfaces
Scratches/wear → Replace the balancer shaft.
3. Measure:
 - Balancer shaft-journal-to-balancer shaft-journal-bearing clearance
Out of specification → Replace the balancer shaft journal bearings.

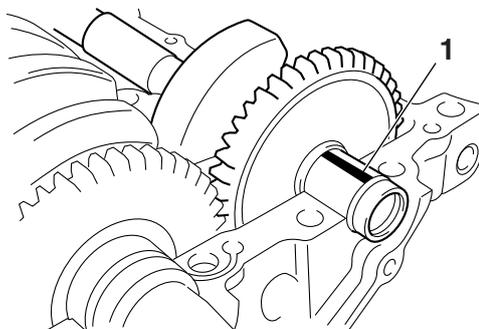
	<p>Journal oil clearance 0.012–0.043 mm (0.0005–0.0017 in)</p>
--	---



- d. Put a piece of Plastigauge® "1" on each balancer shaft journal.

TIP

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

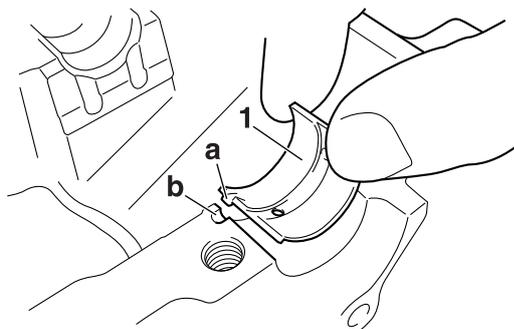


- e. Install the balancer shaft journal lower bearings "1" into the lower crankcase and assemble the crankcase halves.

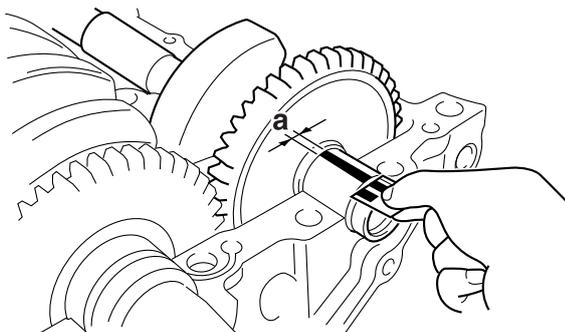
CRANKSHAFT

TIP

- Align the projections “a” of the balancer shaft journal lower bearings with the notches “b” in the lower crankcase.
- Do not move the balancer shaft until the clearance measurement has been completed.



- Tighten the bolts to specification in the tightening sequence cast on the crankcase. Refer to “CRANKCASE” on page 5-70.
- Remove the lower crankcase and the balancer shaft journal lower bearings.
- Measure the compressed Plastigauge® width “a” on each balancer shaft journal. If the balancer shaft-journal-to-balancer shaft-journal-bearing clearance is out of specification, select replacement balancer shaft journal bearings.



4. Select:

- Balancer shaft journal bearings (J₁-J₄)

TIP

- The numbers “A” stamped into the balancer shaft web and the numbers “B” stamped into the lower crankcase are used to determine the replacement balancer shaft journal bearing sizes.
- J₁-J₄ refer to the bearings shown in the balancer shaft illustration.

- If J₁-J₄ are the same, use the same size for all of the bearings.

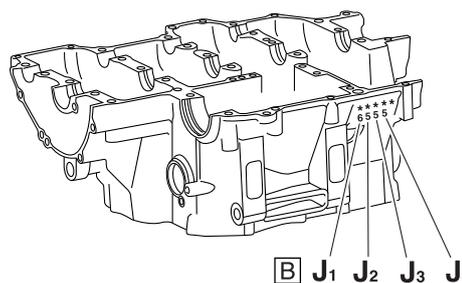
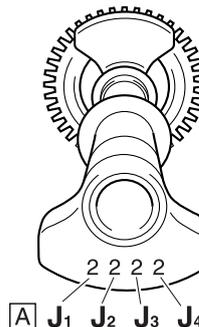
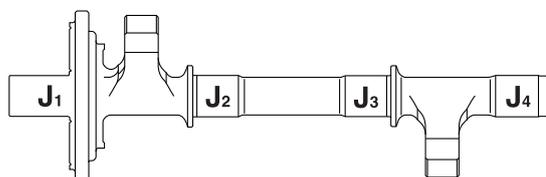
For example, if the crankcase J₁ and balancer shaft web J₁ numbers are 6 and 2 respectively, then the bearing size for J₁ is:

$$J_1 \text{ (crankcase)} - J_1 \text{ (balancer shaft web)} - 1 = 6 - 2 - 1 = 3 \text{ (brown)}$$



Bearing color code

0.White	1.Blue	2.Black
3.Brown	4.Green	5.Yellow
6.Pink		



EAS26200

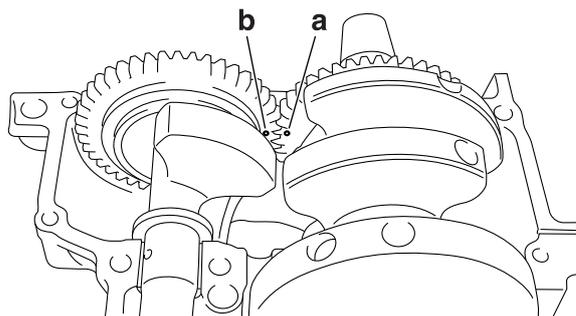
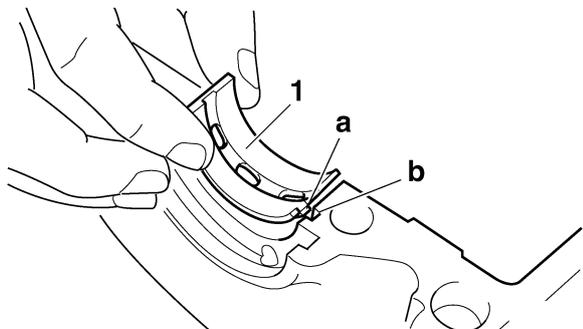
INSTALLING THE CRANKSHAFT

1. Install:
 - Crankshaft journal upper bearings (into the upper crankcase)
 - Crankshaft journal lower bearings (into the lower crankcase)
 - Crankshaft

CRANKSHAFT

TIP

- Align the projections “a” on the crankshaft journal bearings “1” with the notches “b” in the crankcases.
- Be sure to install each crankshaft journal bearing in its original place.



EAS14B1028

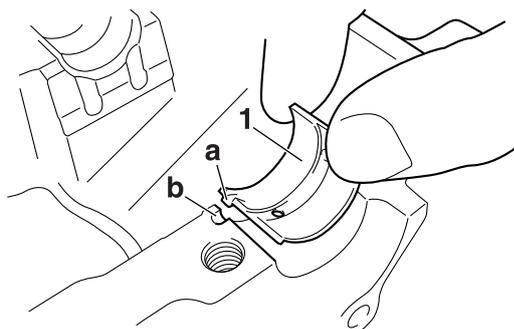
INSTALLING THE BALANCER ASSEMBLY

1. Install:

- Balancer journal upper bearings (into the upper crankcase)
- Balancer journal lower bearings (into the lower crankcase)

TIP

- Align the projections “a” on the balancer journal bearings “1” with the notches “b” in the crankcases.
- Be sure to install each balancer journal bearing in its original place.



2. Install:

- Balancer shaft

TIP

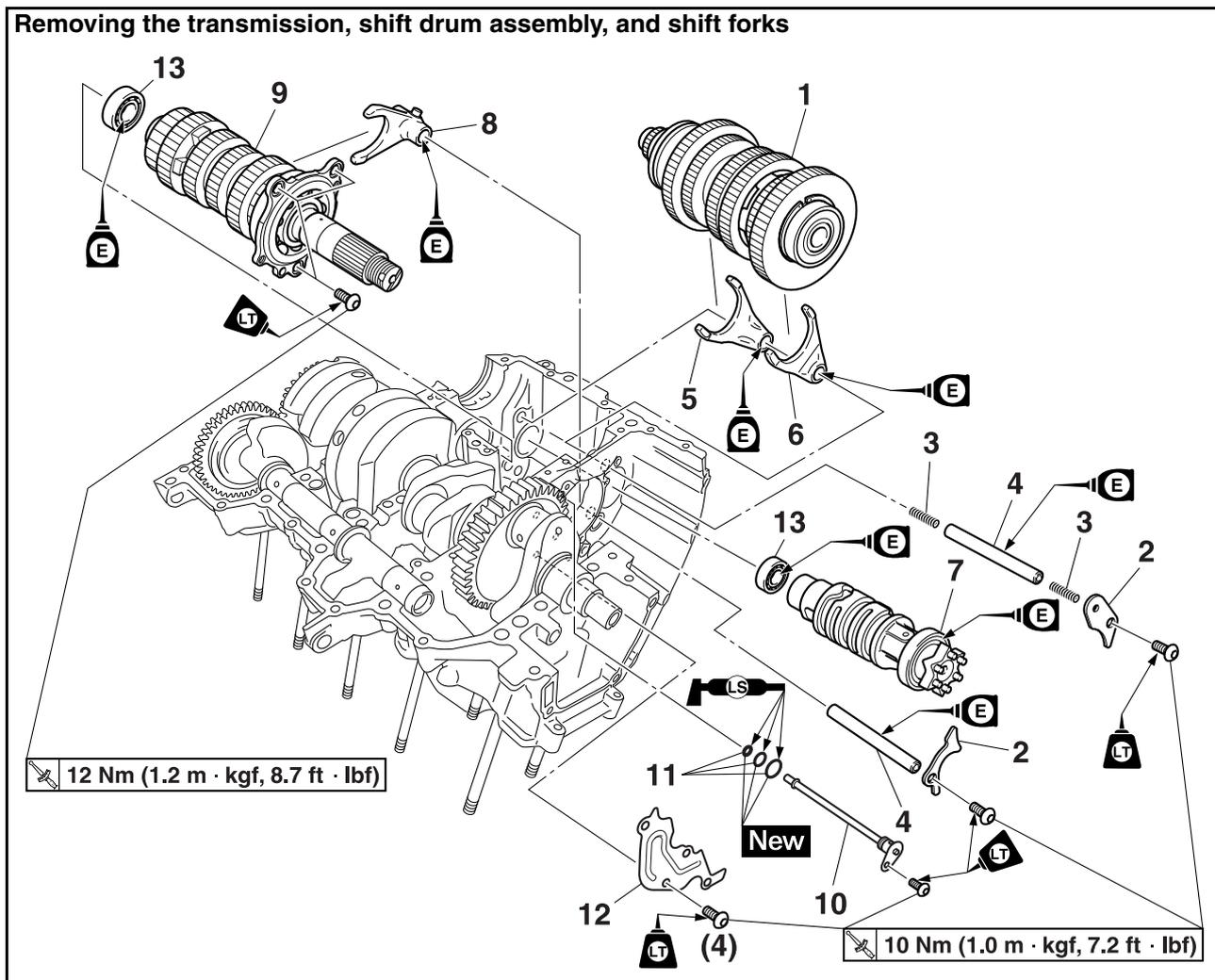
Install by aligning the crankshaft match mark “a” and the balancer shaft match mark “b”.

TRANSMISSION

EAS26241

TRANSMISSION

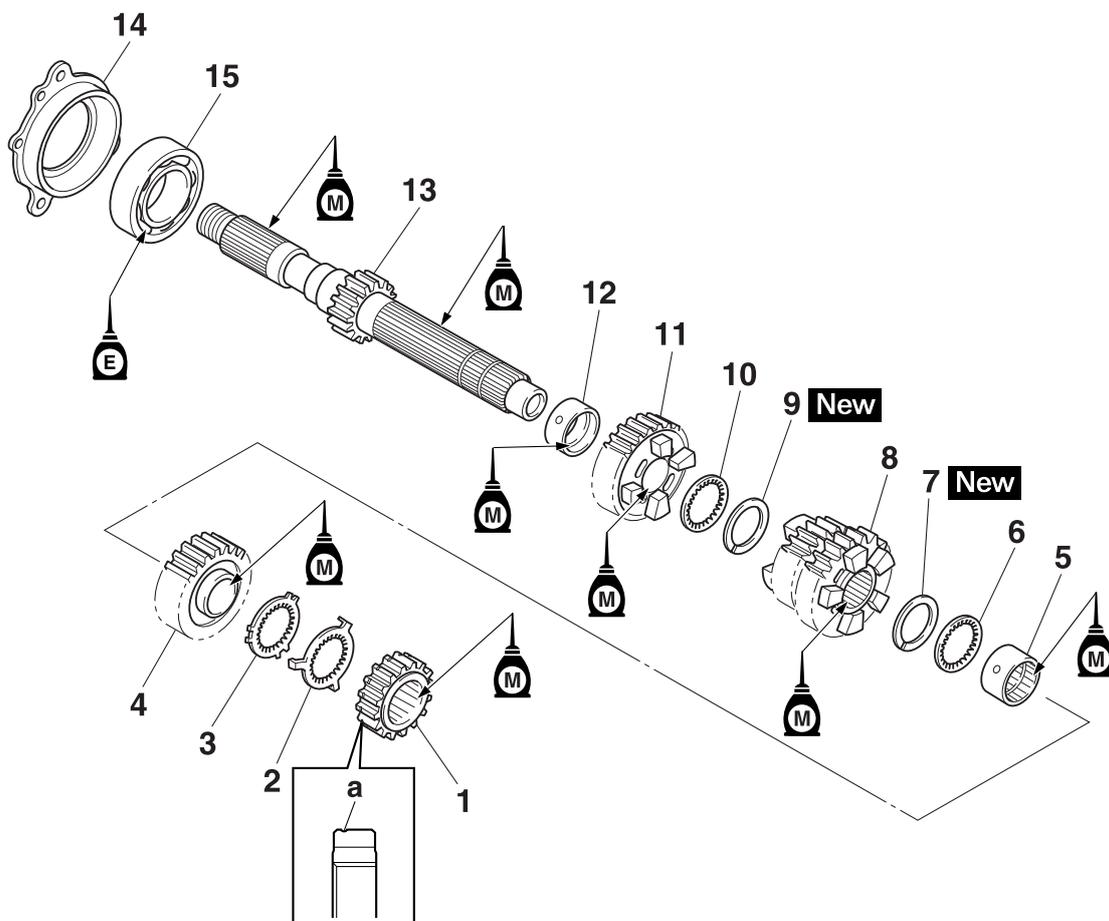
Removing the transmission, shift drum assembly, and shift forks



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Separate. Refer to "CRANKCASE" on page 5-70.
1	Drive axle assembly	1	
2	Shift drum retainer	2	
3	Spring	2	
4	Shift fork guide bar	2	
5	Shift fork-L	1	
6	Shift fork-R	1	
7	Shift drum assembly	1	
8	Shift fork-C	1	
9	Main axle assembly	1	
10	Oil delivery pipe 2	1	
11	O-ring	3	
12	Oil baffle plate	1	
13	Bearing	2	
			For installation, reverse the removal procedure.

TRANSMISSION

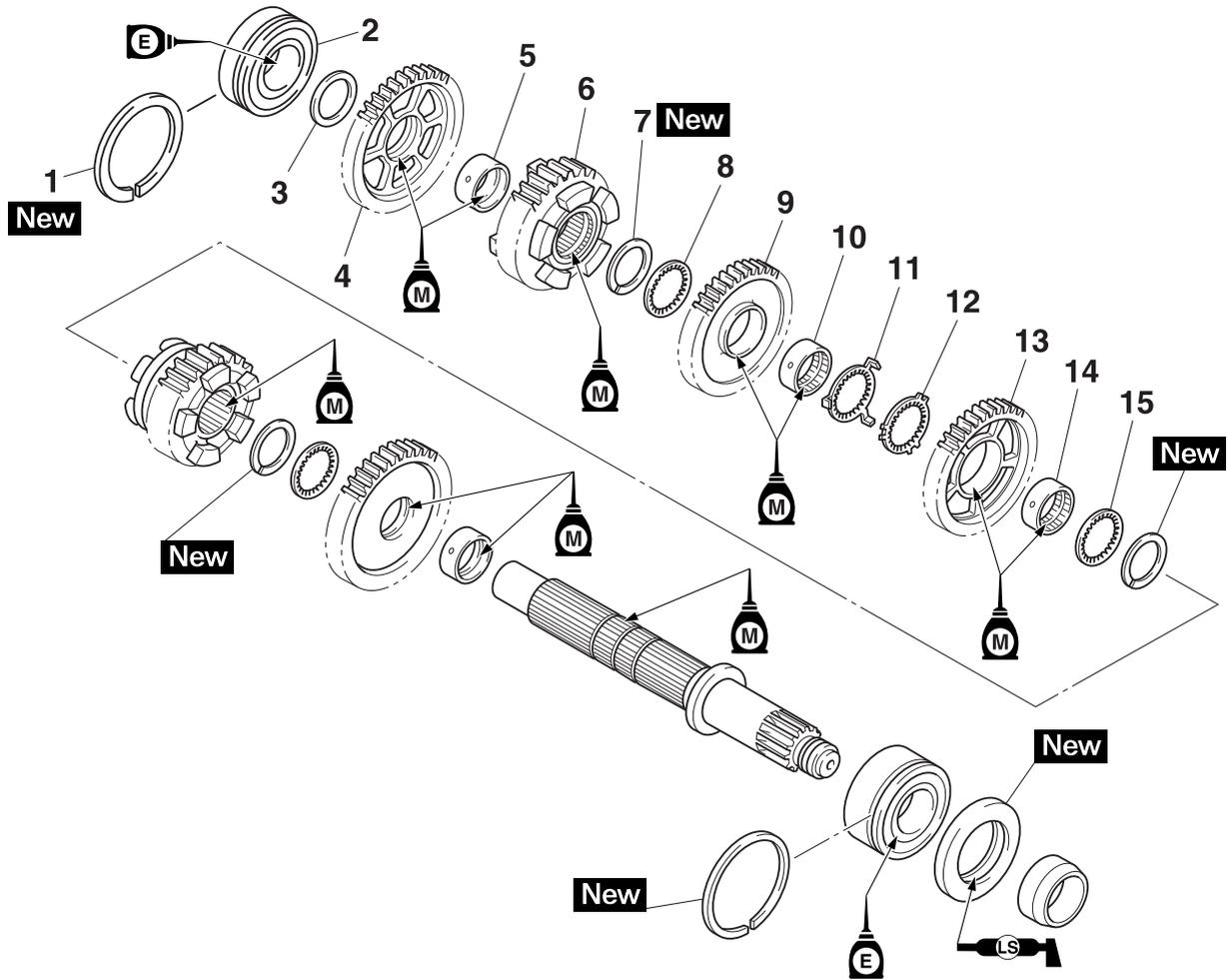
Disassembling the main axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	TIP When installing 2nd pinion gear, install the gear with groove "a" facing to the toothed lock washer.
2	Toothed lock washer	1	
3	Toothed lock washer retainer	1	
4	6th pinion gear	1	
5	Collar	1	
6	Washer	1	
7	Circlip	1	
8	3rd/4th pinion gear	1	
9	Circlip	1	
10	Washer	1	
11	5th pinion gear	1	
12	Collar	1	
13	Main axle	1	
14	Bearing housing	1	
15	Bearing	1	
			For installation, reverse the removal procedure.

TRANSMISSION

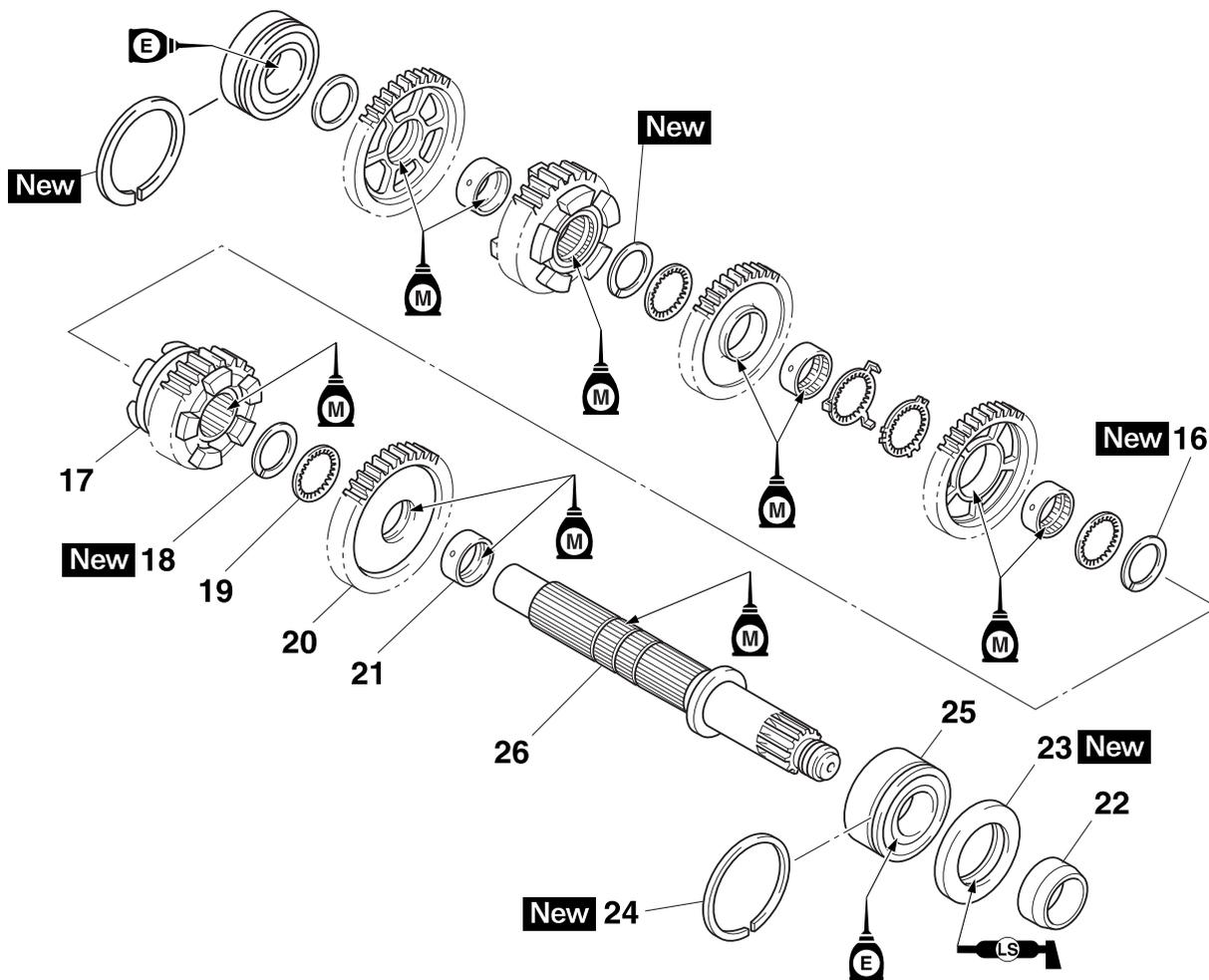
Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Bearing	1	
3	Washer	1	
4	1st wheel gear	1	
5	Collar	1	
6	5th wheel gear	1	
7	Circlip	1	
8	Washer	1	
9	3rd wheel gear	1	
10	Collar	1	
11	Toothed lock washer	1	
12	Toothed lock washer retainer	1	
13	4th wheel gear	1	
14	Collar	1	
15	Washer	1	

TRANSMISSION

Disassembling the drive axle assembly



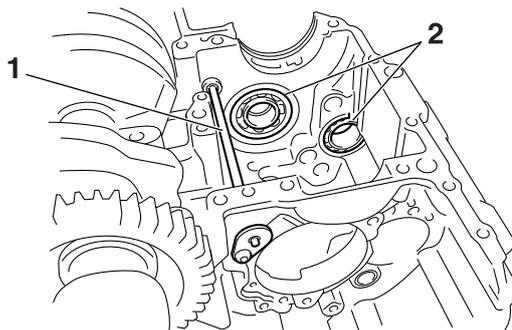
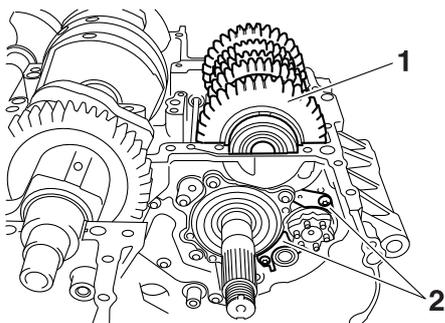
Order	Job/Parts to remove	Q'ty	Remarks
16	Circlip	1	
17	6th wheel gear	1	
18	Circlip	1	
19	Washer	1	
20	2nd wheel gear	1	
21	Collar	1	
22	Collar	1	
23	Oil seal	1	
24	Circlip	1	
25	Bearing	1	
26	Drive axle	1	
			For installation, reverse the removal procedure.

TRANSMISSION

EAS26250

REMOVING THE TRANSMISSION

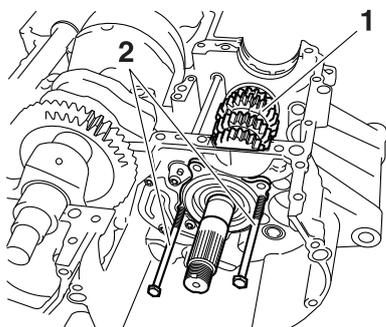
1. Remove:
 - Drive axle assembly "1"
 - Shift drum retainers "2"
 - Shift fork guide bars
 - Shift fork "L" and "R"
 - Shift drum assembly
 - Shift fork "C"



2. Remove:
 - Main axle assembly "1"



- 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.



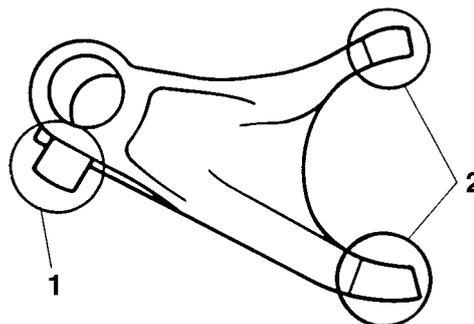
3. Remove:
 - Oil delivery pipe 2 "1"
 - Bearings "2"

EAS26260

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.

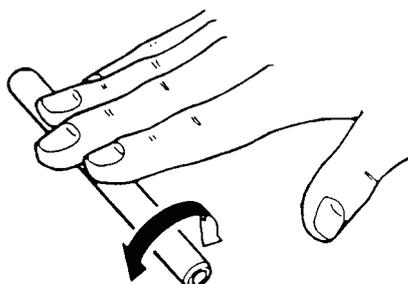


2. Check:
 - Shift fork guide bar
 Roll the shift fork guide bar on a flat surface.
 Bends → Replace.

EWA12840

⚠ WARNING

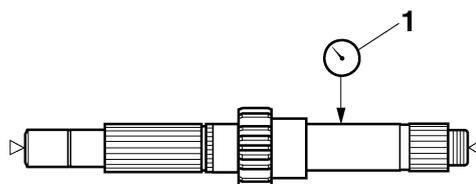
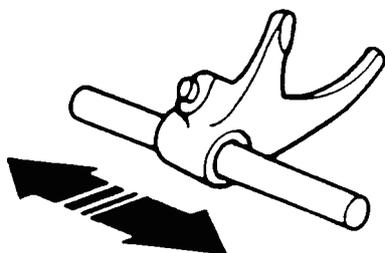
Do not attempt to straighten a bent shift fork guide bar.



TRANSMISSION

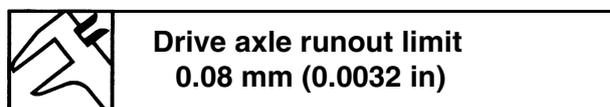
3. Check:

- Shift fork movement
(along the shift fork guide bar)
Rough movement → Replace the shift forks and shift fork guide bar as a set.



2. Measure:

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

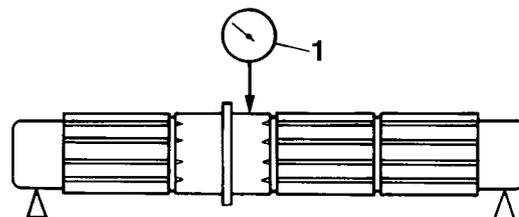
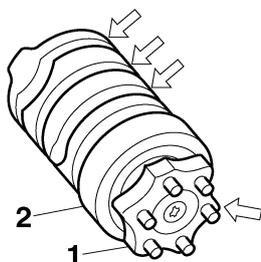


EAS26270

CHECKING THE SHIFT DRUM ASSEMBLY

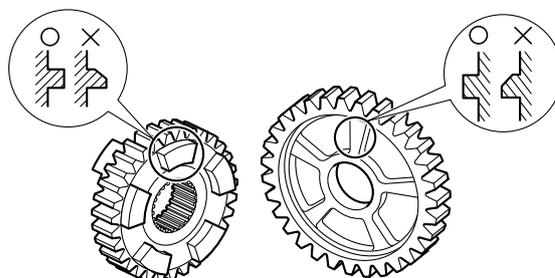
1. Check:

- Shift drum groove
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.



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).

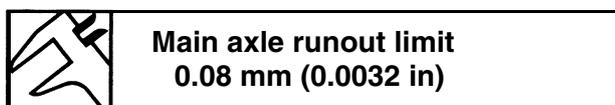


EAS26300

CHECKING THE TRANSMISSION

1. Measure:

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



TRANSMISSION

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.

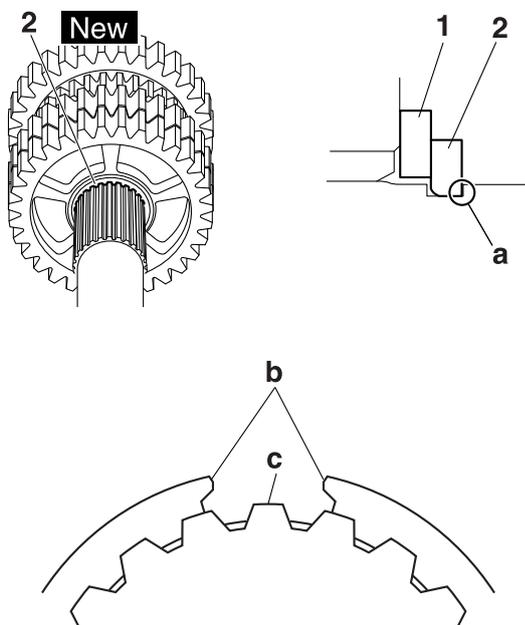
EAS29020

ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

1. Install:
 - Toothed washer "1"
 - Circlip "2" **New**

TIP

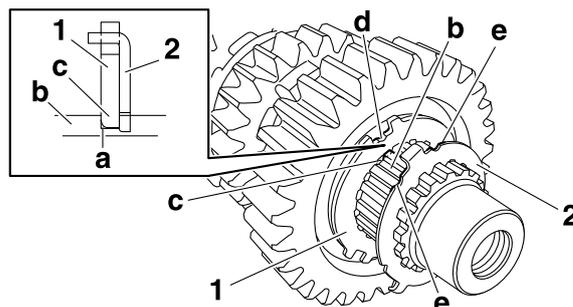
- Be sure the circlip sharp-edged corner "a" is positioned opposite side to the toothed washer and gear.
- Align the opening between the ends "b" of the circlip with a projection "c" of the spline in the axle.



2. Install:
 - Toothed lock washer retainer "1"
 - Toothed lock washer "2"

TIP

- With the toothed lock washer retainer "1" in the groove "a" in the axle, align the projection "c" on the retainer with an axle spline "b", and then install the toothed lock washer "2".
- Be sure to align the projection on the toothed lock washer that is between the alignment marks "e" with the alignment mark "d" on the retainer.



EAS26350

INSTALLING THE TRANSMISSION

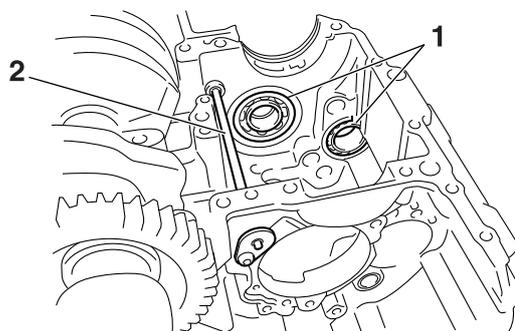
1. Install:
 - Bearing "1"
 - Oil delivery pipe 2 "2"
 - O-rings **New**



Oil delivery pipe 2 bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
LOCTITE®

TIP

Face the seal side of the bearing to the outside and install it close to the right side end of the crankcase.

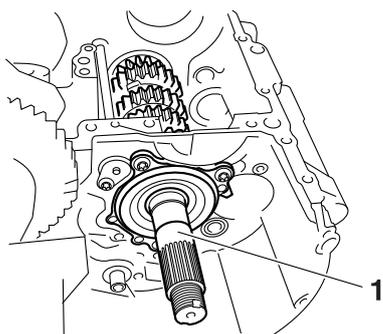


2. Install:
 - Main axle assembly "1"



Bearing housing bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)
LOCTITE®

TRANSMISSION

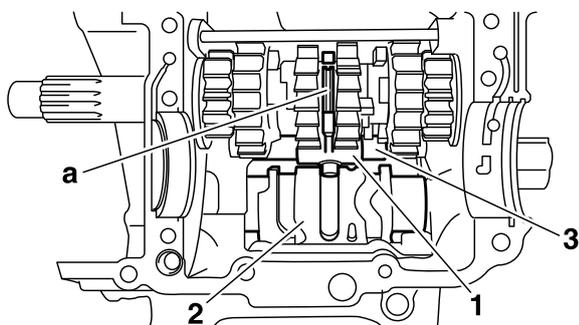


3. Install:

- Shift fork-C "1"
- Shift drum assembly "2"
- Shift fork guide bar "3"

TIP

- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".
- Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install shift fork-C into the groove "a" in the 3rd and 4th pinion gear on the main axle.



4. Install:

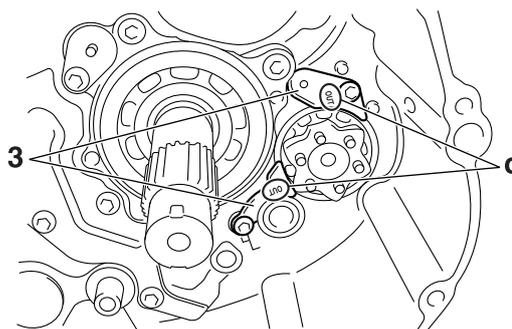
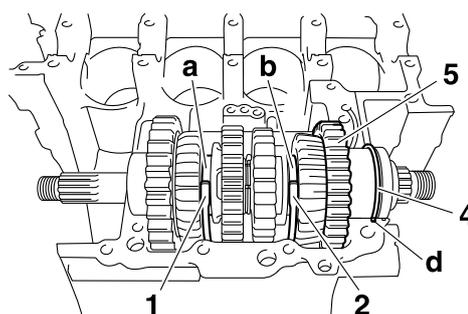
- Shift fork-R "1"
- Shift fork-L "2"
- Shift fork guide bar
- Springs
- Shift drum retainers "3"
- Bearing
- Oil seal **New**
- Circlip "4" **New**
- Drive axle assembly "5"



Shift drum retainer bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)
LOCTITE®

TIP

- Install shift fork-R into the groove "a" in the 5th wheel gear and shift fork-L into the groove "b" in the 6th wheel gear on the drive axle.
- Install the shift drum retainer with its "OUT" mark "c" facing outward.
- Make sure that the drive axle bearing circlip "4" is inserted into the grooves "d" in the upper crankcase.



5. Check:

- Transmission
 Rough movement → Repair.

TIP

Oil each gear, shaft, and bearing thoroughly.

TRANSMISSION

COOLING SYSTEM

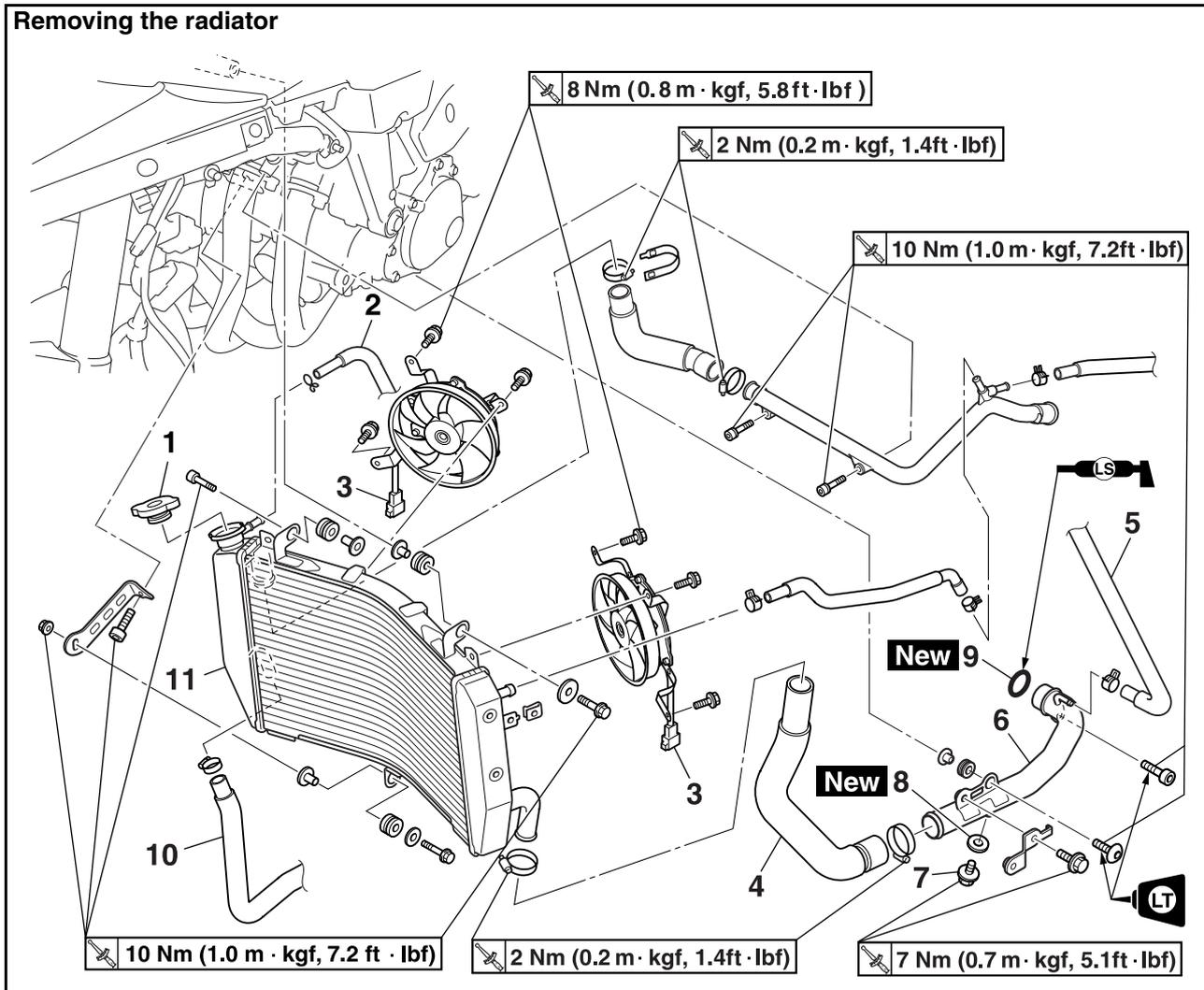
RADIATOR	6-1
CHECKING THE RADIATOR.....	6-3
INSTALLING THE RADIATOR.....	6-3
OIL COOLER	6-5
CHECKING THE OIL COOLER.....	6-7
INSTALLING THE OIL COOLER.....	6-7
THERMOSTAT	6-8
CHECKING THE THERMOSTAT.....	6-10
ASSEMBLING THE THERMOSTAT ASSEMBLY.....	6-10
INSTALLING THE THERMOSTAT ASSEMBLY.....	6-11
WATER PUMP	6-12
DISASSEMBLING THE WATER PUMP.....	6-13
CHECKING THE WATER PUMP.....	6-13
ASSEMBLING THE WATER PUMP.....	6-13

RADIATOR

EAS26380

RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-32.
	ECU		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Rectifier/regulator		Refer to "GENERAL CHASSIS" on page 4-1.
1	Radiator cap	1	
2	Coolant reservoir hose	1	Disconnect.
3	Radiator fan motor coupler	2	Disconnect.
4	Radiator outlet hose	1	
5	Water pump bypass hose	1	Disconnect.
6	Water pump inlet pipe	1	
7	Drain bolt	1	
8	Copper washer	1	
9	O-ring	1	
10	Oil cooler outlet hose	1	Disconnect.
11	Radiator	1	

RADIATOR

Removing the radiator

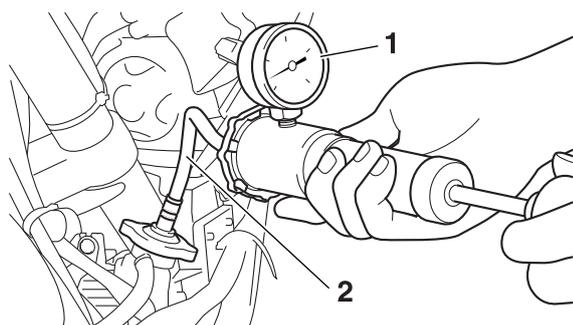
The diagram shows the radiator assembly with the following torque specifications:

- 8 Nm (0.8 m · kgf, 5.8ft · lbf)
- 2 Nm (0.2 m · kgf, 1.4ft · lbf)
- 10 Nm (1.0 m · kgf, 7.2ft · lbf)
- 10 Nm (1.0 m · kgf, 7.2 ft · lbf)
- 2 Nm (0.2 m · kgf, 1.4ft · lbf)
- 7 Nm (0.7 m · kgf, 5.1ft · lbf)

Parts are labeled with numbers 12 through 17. Two O-rings are labeled 'New'. Tools LS and LT are indicated.

Order	Job/Parts to remove	Q'ty	Remarks
12	Radiator bracket	1	
13	Radiator fan	2	
14	Thermostat bypass hose 2	1	Disconnect.
15	Thermostat bypass hose 3	1	
16	Radiator inlet pipe	1	
17	Radiator inlet hose	1	
			For installation, reverse the removal procedure.

RADIATOR



- b. Apply 137.3 kPa (1.37 kgf/cm², 19.9 psi) of pressure.
- c. Measure the indicated pressure with the gauge.



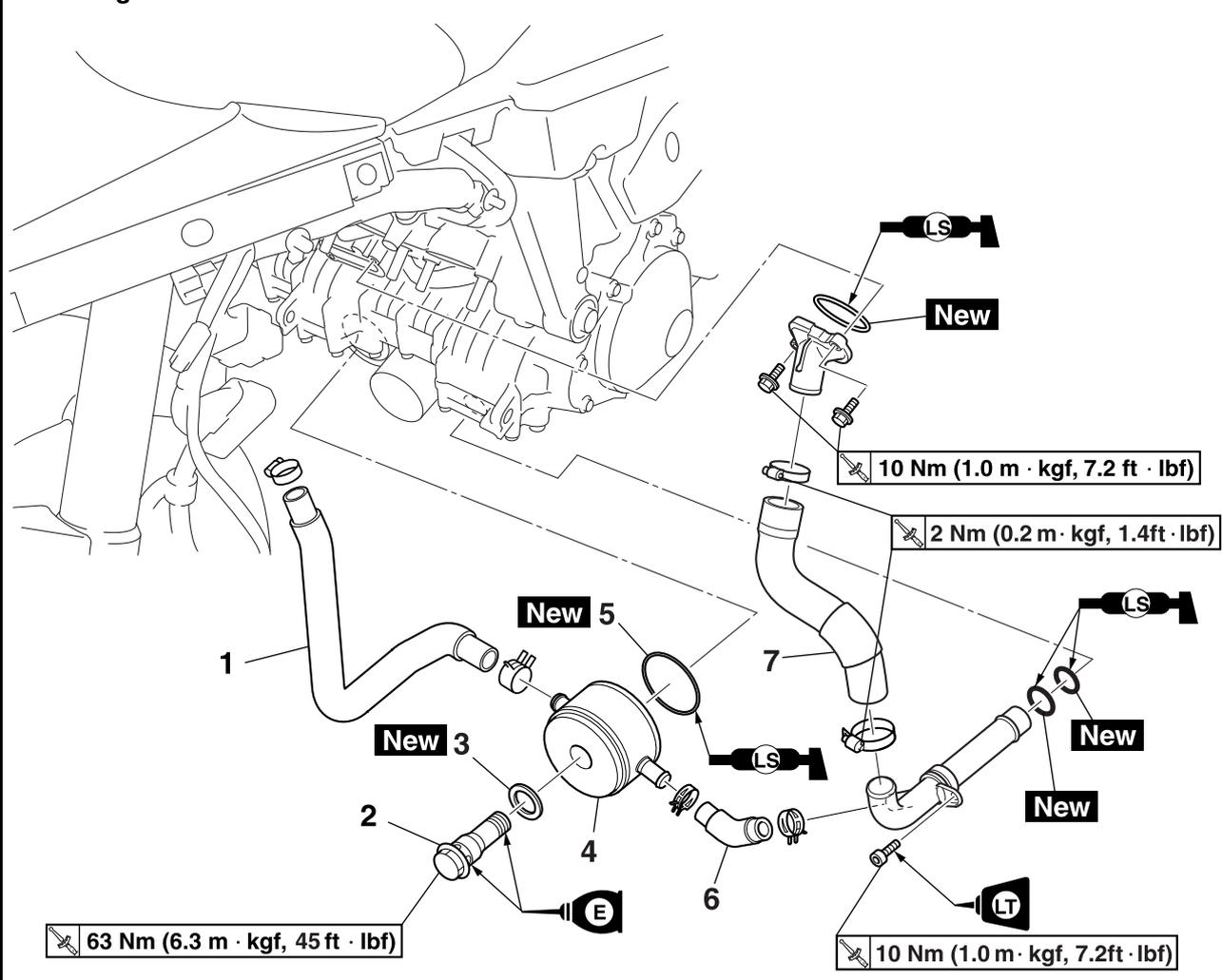
- 3. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-3.

OIL COOLER

EAS26410

OIL COOLER

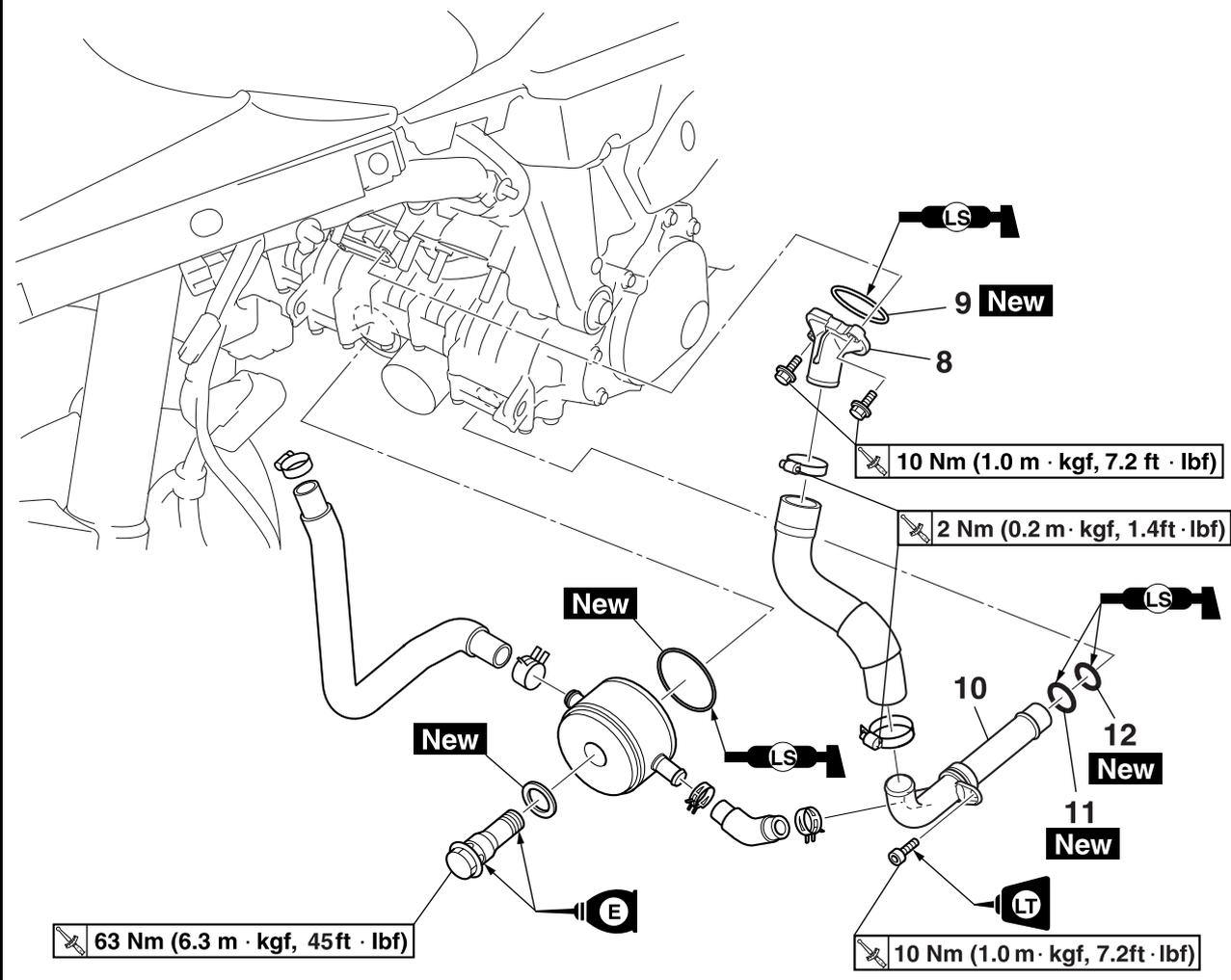
Removing the oil cooler



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-32.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-29.
	Side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Lower cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	ECU		Refer to "GENERAL CHASSIS" on page 4-1.
	Rectifier/regulator		Refer to "GENERAL CHASSIS" on page 4-1.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-3.
1	Oil cooler outlet hose	1	
2	Oil cooler union bolt	1	
3	Gasket	1	
4	Oil cooler	1	
5	O-ring	1	
6	Oil cooler inlet hose	1	
7	Water jacket joint inlet hose	1	

OIL COOLER

Removing the oil cooler



Order	Job/Parts to remove	Q'ty	Remarks
8	Water jacket joint	1	
9	O-ring	1	
10	Water pump outlet pipe	1	
11	O-ring	1	
12	O-ring	1	
			For installation, reverse the removal procedure.

OIL COOLER

EAS26420

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.
3. Check:
 - Water jacket joint inlet hose
 - Water jacket joint
 - Water pump outlet pipe
Cracks/damage/wear → Replace.

EAS26430

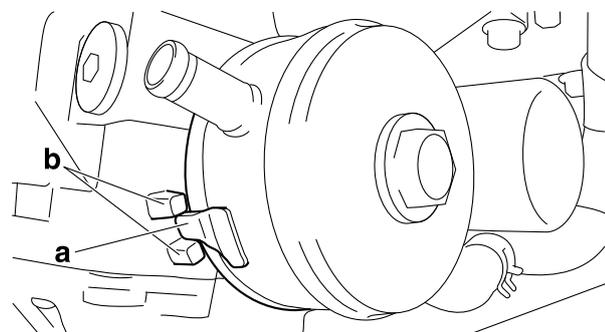
INSTALLING THE OIL COOLER

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

	<p>Oil cooler union bolt 63 Nm (6.3 m.kgf, 45 ft.lbf)</p>
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TIP

- Before installing the oil cooler, apply engine oil lightly to the oil cooler union bolt and apply lithium-soap-based grease to the O-ring.
- Make sure the O-ring is positioned properly.
- Make sure the projection “a” on the oil cooler touches the projection “b” on the crankcase.

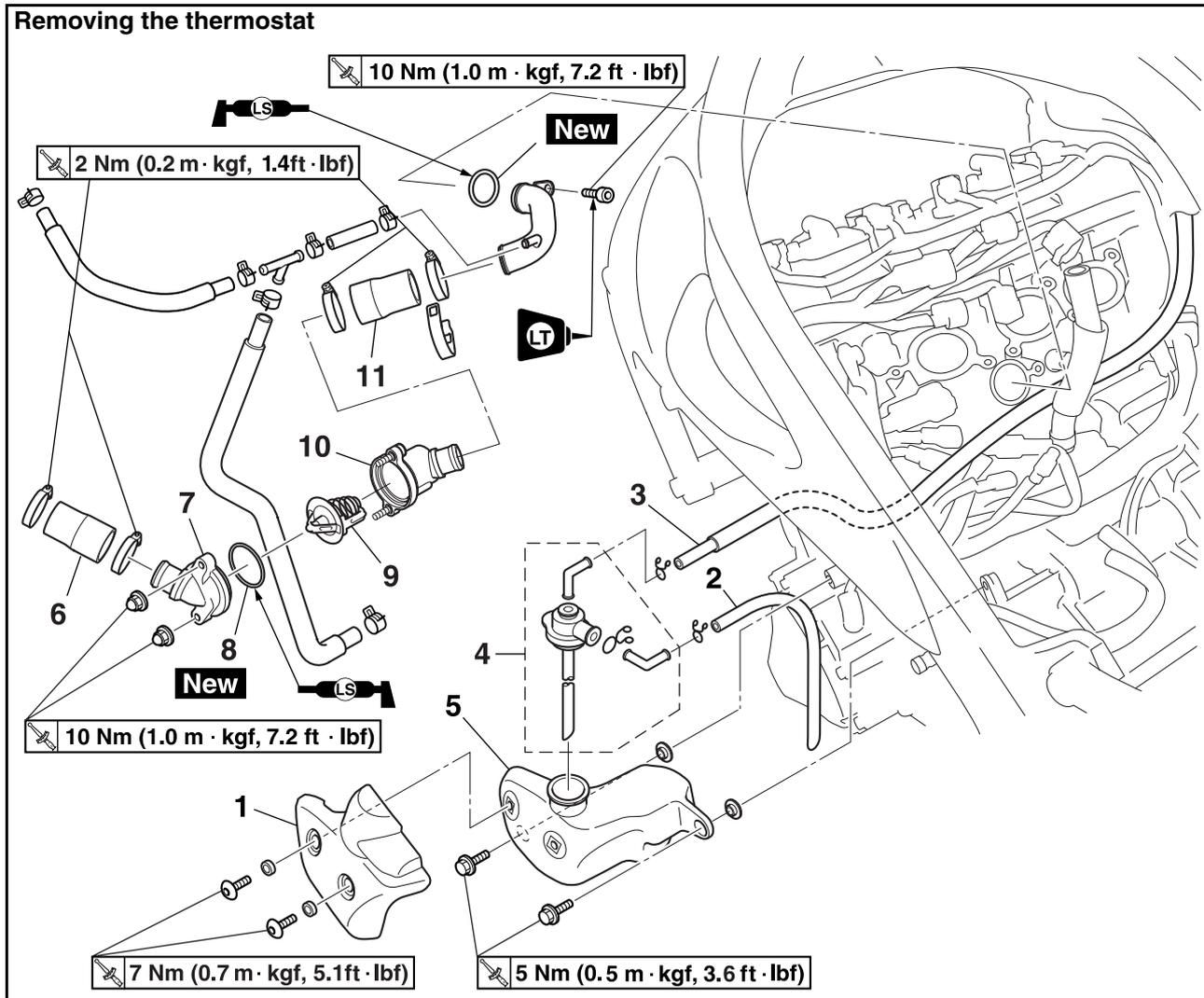


3. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-32.
 - Crankcase
(with the specified amount of the recommended engine oil)
Refer to “CHANGING THE ENGINE OIL” on page 3-29.
4. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.
Refer to “INSTALLING THE RADIATOR” on page 6-3.
5. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-3.

THERMOSTAT

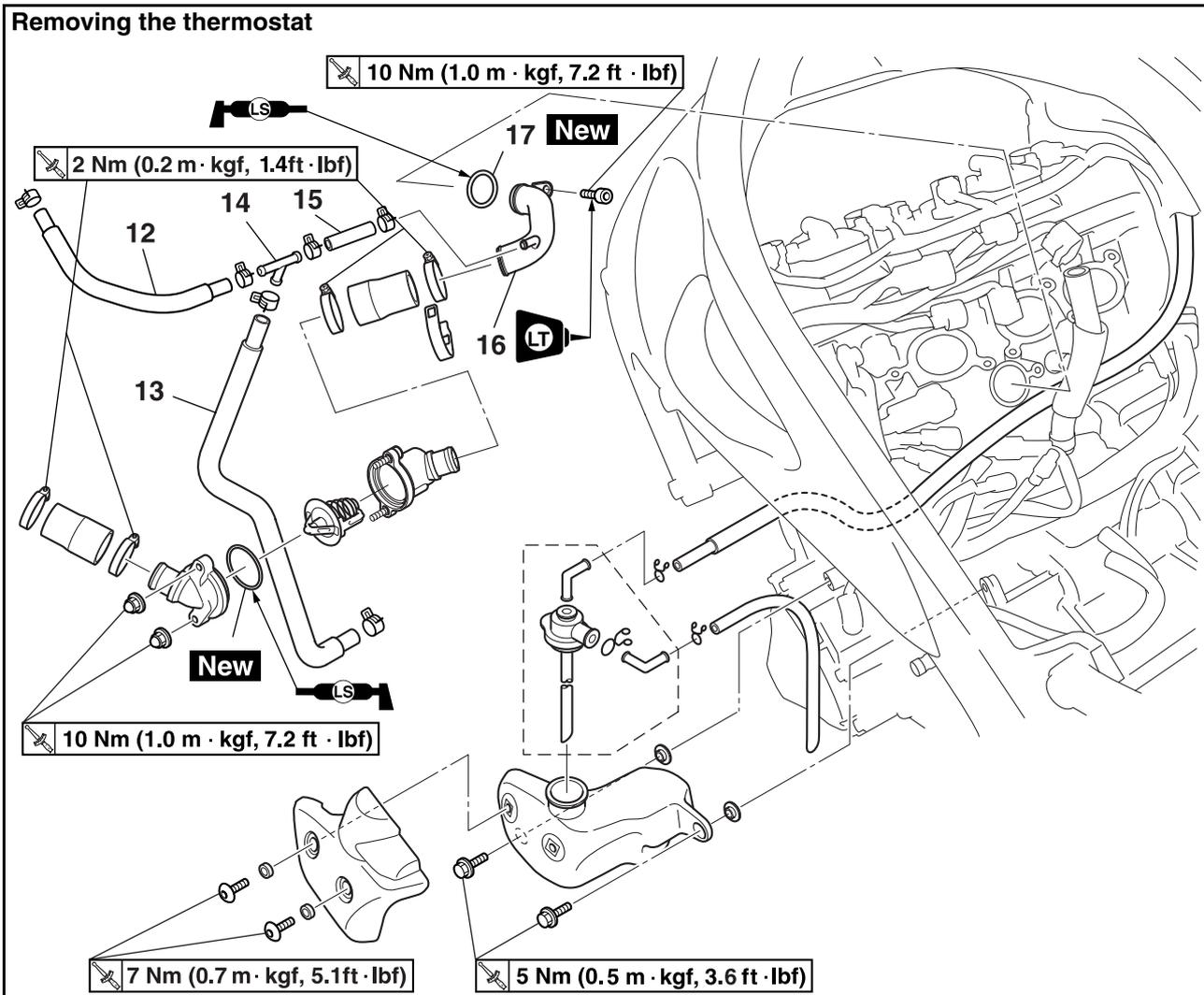
EAS26440

THERMOSTAT



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-32.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-12.
1	Coolant reservoir cover	1	
2	Coolant reservoir breather hose	1	
3	Coolant reservoir hose	1	
4	Coolant reservoir cap	1	
5	Coolant reservoir tank	1	
6	Thermostat outlet hose	1	
7	Thermostat housing cover	1	
8	O-ring	1	
9	Thermostat	1	
10	Thermostat housing	1	
11	Thermostat inlet hose	1	

THERMOSTAT



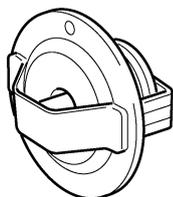
Order	Job/Parts to remove	Q'ty	Remarks
12	Thermostat bypass hose 2	1	
13	Water pump bypass hose	1	
14	Joint	1	
15	Thermostat bypass hose 1	1	
16	Engine outlet pipe	1	
17	O-ring	1	
			For installation, reverse the removal procedure.

THERMOSTAT

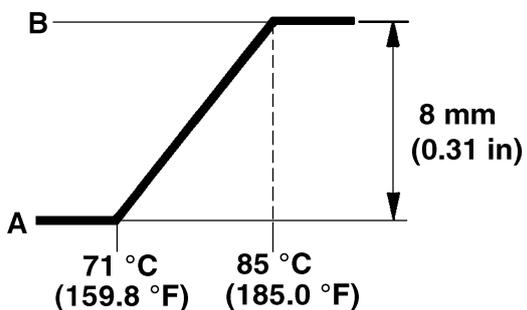
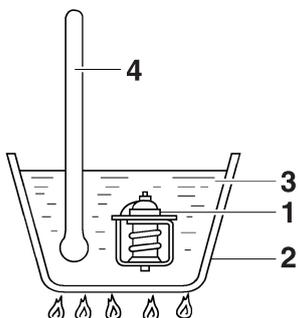
EAS26450

CHECKING THE THERMOSTAT

1. Check:
 - Thermostat "1"
Does not open at 71–85 °C (159.8–185.0 °F) → Replace.



- a. Suspend the thermostat "1" in a container "2" filled with water.
- b. Slowly heat the water "3".
- c. Place a thermometer "4" in the water.
- d. While stirring the water, observe the thermostat and thermometer's indicated temperature.



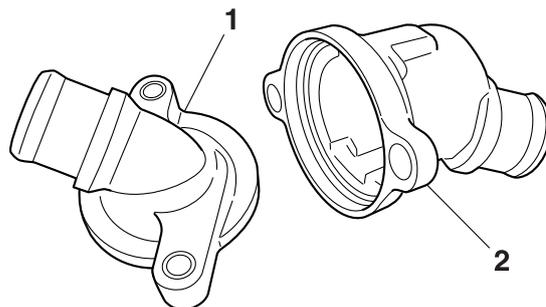
- A. Fully closed
- B. Fully open

TIP

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.



3. Check:
 - Thermostat hoses
 - Thermostat bypass hoses
 - Water pump bypass hose
 - Engine outlet pipe
Cracks/damage → Replace.

EAS26460

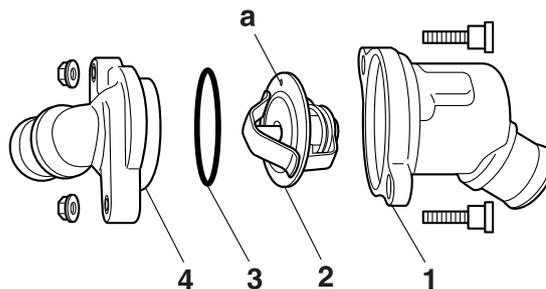
ASSEMBLING THE THERMOSTAT ASSEMBLY

1. Install:
 - Thermostat housing "1"
 - Thermostat "2"
 - O-ring "3" **New**
 - Thermostat housing cover "4"

	Thermostat housing cover nut 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
--	---

TIP

Install the thermostat with its breather hole "a" facing up.



THERMOSTAT

EAS26480

INSTALLING THE THERMOSTAT ASSEMBLY

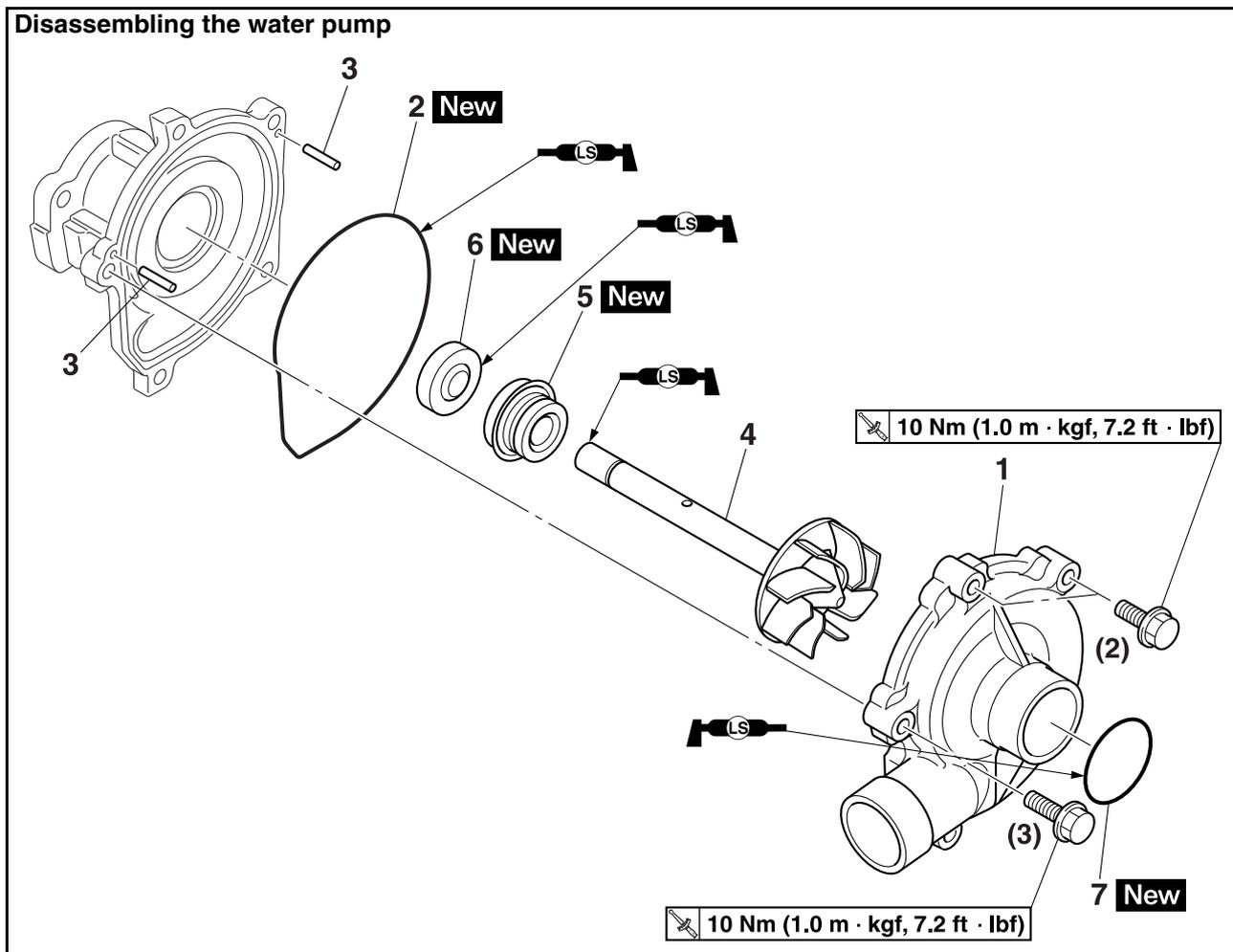
1. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT"
on page 3-32.
2. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.
Refer to "INSTALLING THE RADIATOR"
on page 6-3.
3. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to "CHECKING THE RADIATOR"
on page 6-3.

WATER PUMP

EAS26500

WATER PUMP

Disassembling the water pump



Order	Job/Parts to removes	Q'ty	Remarks
	Oil/water pump assembly		Refer to "OIL PUMP" on page 5-50.
	Oil pump rotor		Refer to "OIL PUMP" on page 5-50.
1	Water pump cover	1	
2	O-ring	1	
3	Pin	2	
4	Impeller shaft (along with the impeller)	1	
5	Water pump seal	1	
6	Oil seal	1	
7	O-ring	1	
			For installation, reverse the removal procedure.

WATER PUMP

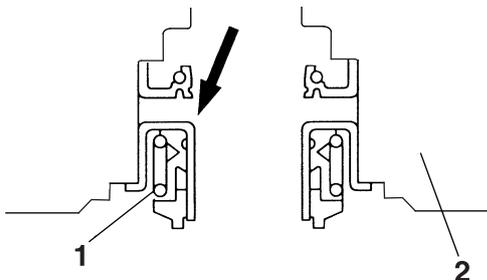
EAS26520

DISASSEMBLING THE WATER PUMP

1. Remove:
 - Water pump seal "1"

TIP _____

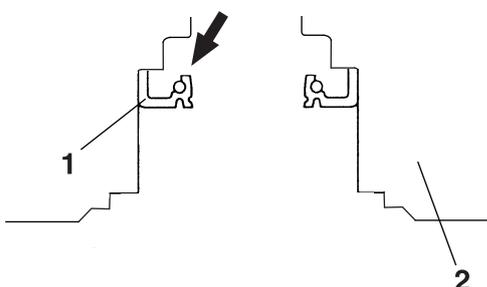
Remove the water pump seal from the inside of the water pump housing "2".



2. Remove:
 - Oil seal "1" (with a thin, flat-head screwdriver)

TIP _____

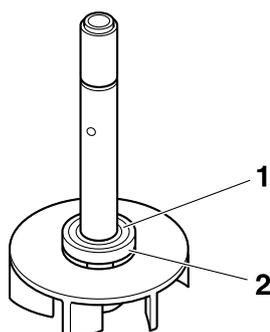
Remove the oil seal from the inside of the water pump housing "2".



3. Remove:
 - Rubber damper holder "1"
 - Rubber damper "2" (with a thin, flat-head screwdriver)

TIP _____

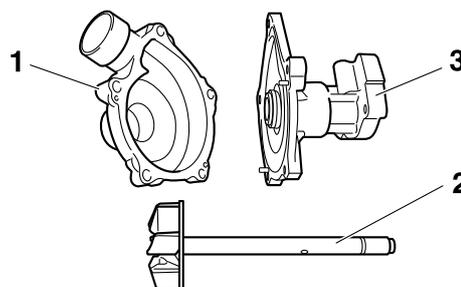
Do not scratch the impeller shaft.



EAS26540

CHECKING THE WATER PUMP

1. Check:
 - Water pump housing cover "1"
 - Impeller shaft "2" Cracks/damage/wear → Replace.
 - Water pump housing "3" Cracks/damage/wear → Replace the oil/water pump assembly.



EAS26560

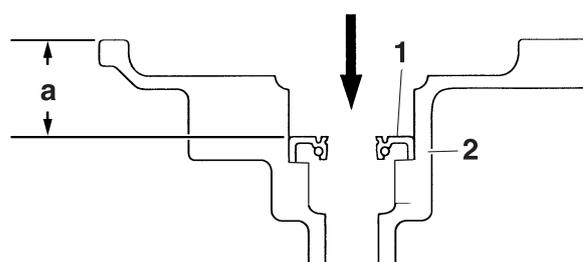
ASSEMBLING THE WATER PUMP

1. Install:
 - Oil seal "1" **New** (into the water pump housing "2")

Installed depth "a"
17.2 mm (0.68 in)

TIP _____

- 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 "1" **New**

ECA14080

NOTICE _____

Never lubricate the water pump seal surface with oil or grease.

TIP _____

- Install the water pump seal "1" with the special tools.

WATER PUMP



Mechanical seal installer
90890-04132
Water pump seal installer
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Bearing driver 40 mm
YM-04058

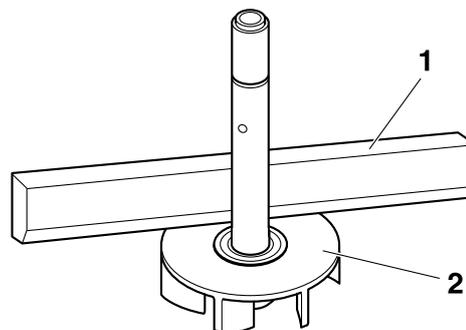
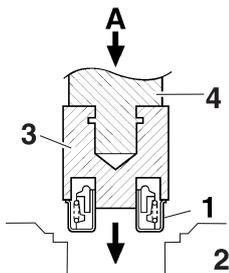
ECA14090

NOTICE

Make sure the rubber damper and rubber damper holder are flush with the impeller.



Impeller shaft tilt limit
0.15 mm (0.006 in)



- 1. Straightedge
- 2. Impeller

- 2. Water pump housing
- 3. Mechanical seal installer
- 4. Middle driven shaft bearing driver

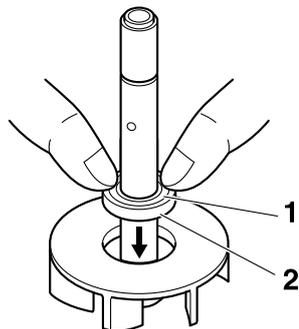
A. Push down

3. Install:

- Rubber damper holder "1" **New**
- Rubber damper "2" **New**

TIP

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).

WATER PUMP

FUEL SYSTEM

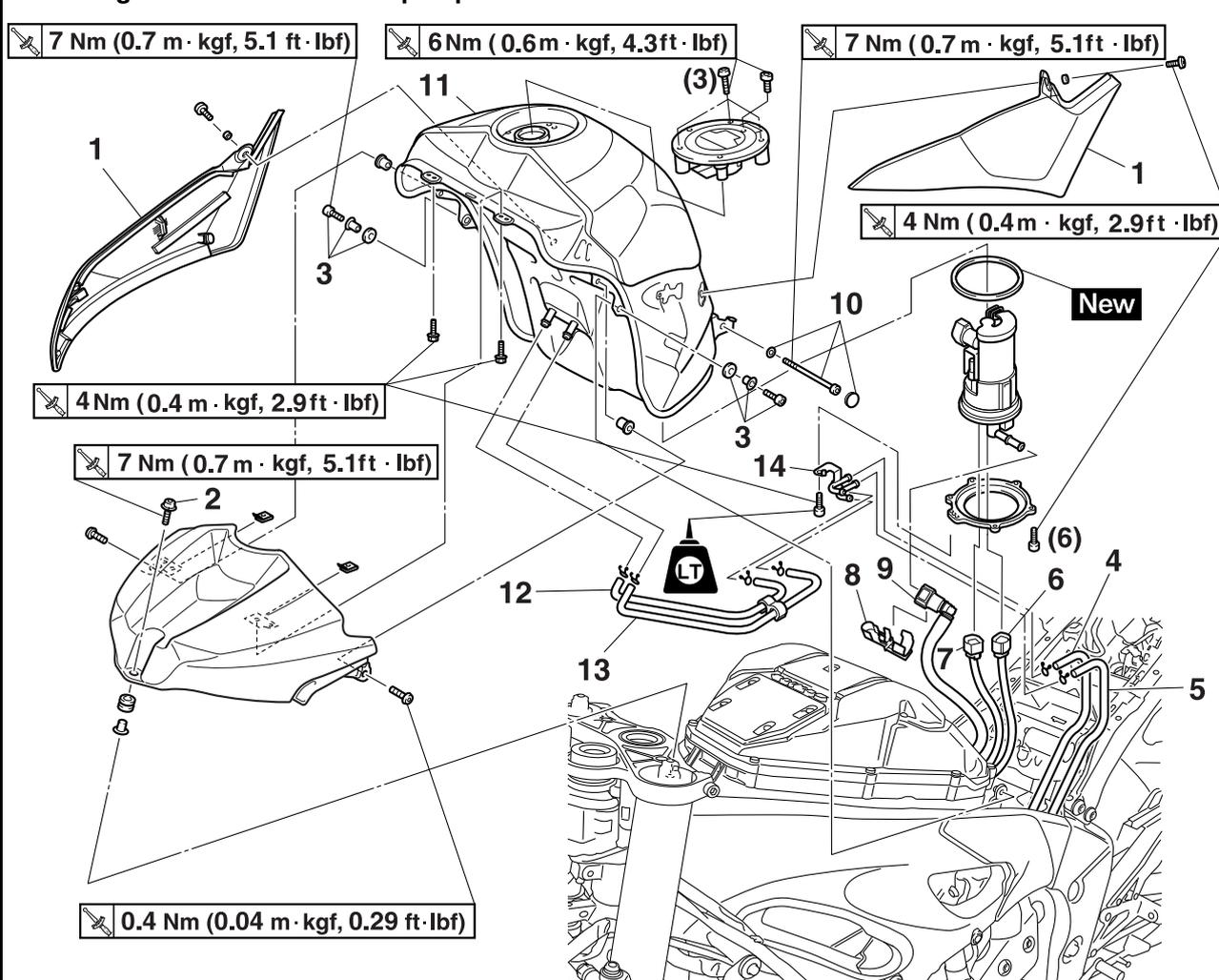
FUEL TANK	7-1
REMOVING THE FUEL TANK SIDE COVERS	7-3
REMOVING THE FUEL TANK	7-3
REMOVING THE FUEL PUMP	7-3
CHECKING THE FUEL PUMP BODY	7-3
CHECKING THE FUEL PUMP OPERATION	7-3
INSTALLING THE FUEL PUMP	7-3
INSTALLING THE FUEL TANK	7-4
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REMOVING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE AND SECONDARY INJECTOR JOINT SIDE)	7-7
REMOVING THE SECONDARY INJECTORS	7-7
REMOVING THE LOWER AIR FILTER CASE	7-8
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CHECKING THE SECONDARY INJECTORS	7-8
CHECKING THE AIR FILTER CASE SEAL	7-9
CHECKING THE INTAKE FUNNEL	7-9
INSTALLING THE INTAKE FUNNEL AND LOWER AIR FILTER CASE	7-9
CHECKING THE INTAKE FUNNEL OPERATION	7-9
INSTALLING THE SECONDARY INJECTORS	7-10
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CHECKING THE PRIMARY INJECTORS (BEFORE REMOVING)	7-15
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CHECKING THE PRIMARY INJECTORS	7-15
CHECKING AND CLEANING THE THROTTLE BODIES	7-15
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CHECKING THE FUEL LINE PRESSURE	7-18
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FUEL TANK

EAS26620

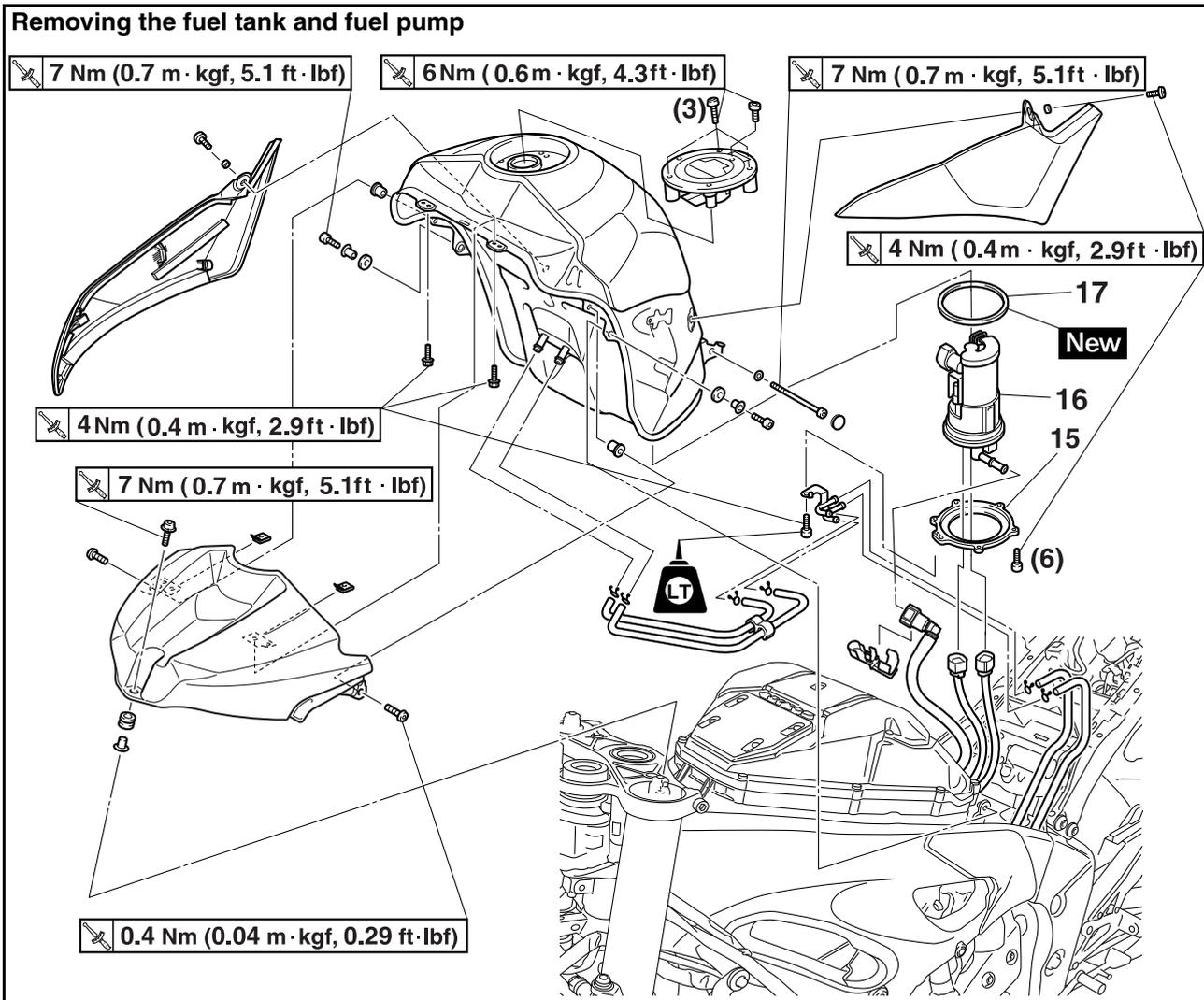
FUEL TANK

Removing the fuel tank and fuel pump



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel tank side cover	2	
2	Bolt	1	
3	Bolt/collar/washer	2/2/2	
4	Fuel tank breather hose	1	Disconnect.
5	Fuel tank overflow hose	1	Disconnect.
6	Fuel pump coupler	1	Disconnect.
7	Fuel sender coupler	1	Disconnect.
8	Fuel hose connector cover	1	
9	Fuel hose (fuel tank side)	1	Disconnect.
10	Cover/bolt/washer	1/1/1	
11	Fuel tank	1	
12	Fuel tank breather hose (fuel tank to hose joint)	1	
13	Fuel tank overflow hose (fuel tank to hose joint)	1	
14	Hose joint	1	

FUEL TANK



Order	Job/Parts to remove	Q'ty	Remarks
15	Fuel pump bracket	1	
16	Fuel pump	1	
17	Fuel pump gasket	1	
			For installation, reverse the removal procedure.

FUEL TANK

EAS14B1078

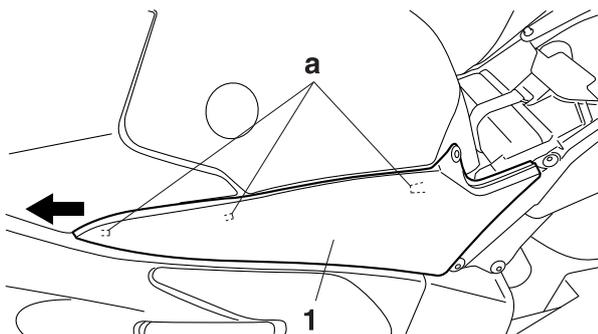
REMOVING THE FUEL TANK SIDE COVERS

The following procedure applies to both of the fuel tank side covers.

1. Remove:
 - Fuel tank side cover “1”



- a. Remove the screw on the fuel tank side cover.
- b. Slide the fuel tank side cover to the front and then remove the three tabs “a”.



EAS26630

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
 - Fuel tank breather hose
 - Fuel tank overflow hose
 - Fuel pump coupler
 - Fuel sender coupler
 - Fuel hose connector cover
 - Fuel hose

EWA14B1001

WARNING

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

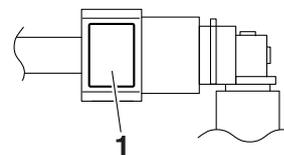
ECA14B1003

NOTICE

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP

- To remove the fuel hose from the fuel pump, press the two buttons “1” on the sides of the connector, and then remove the hose.
- Before removing the hoses, place a few rags in the area under where it will be removed.



3. Remove:
 - Fuel tank

TIP

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.

EAS26640

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel pump

ECA14720

NOTICE

- **Do not drop the fuel pump or give it a strong shock.**
- **Do not touch the base section of the fuel sender.**

EAS26670

CHECKING THE FUEL PUMP BODY

1. Check:
 - Fuel pump body
Obstruction → Clean.
 - Cracks/damage → Replace fuel pump assembly.

EAS26690

CHECKING THE FUEL PUMP OPERATION

1. Check:
 - Fuel pump operation
Refer to “CHECKING THE FUEL LINE PRESSURE” on page 7-18.

EAS26710

INSTALLING THE FUEL PUMP

1. Install:
 - Fuel pump gasket **New**
 - Fuel pump
 - Fuel pump bracket

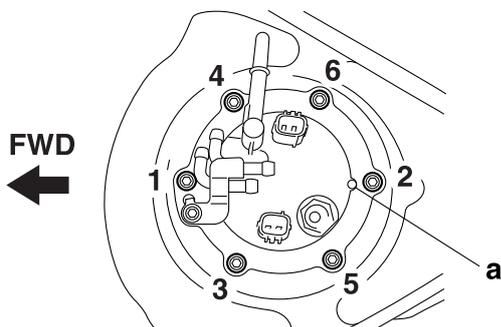


Fuel pump bracket bolt
4 Nm (0.4 m·kgf, 2.9 ft·lbf)

FUEL TANK

TIP

- 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 gasket so that the lip side turns to the inside of the fuel tank.
- Install the fuel pump as shown in the illustration.
- Align the projection “a” on the fuel pump with the slot in the fuel pump bracket.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.

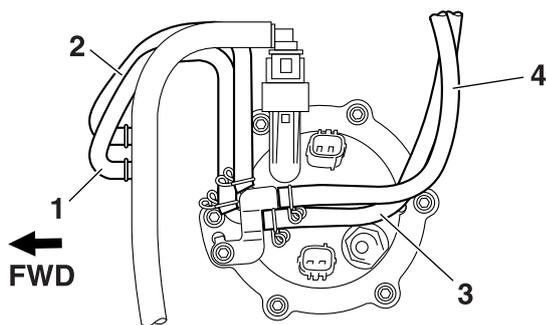


ET2C01010

INSTALLING THE FUEL TANK

1. Connect:

- Fuel tank breather hose (fuel tank to hose joint) “1”
- Fuel tank overflow hose (fuel tank to hose joint) “2”
- Fuel tank breather hose “3”
- Fuel tank overflow hose “4”



2. Connect:

- Fuel hose (fuel tank side)

ECA14B1033

NOTICE

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

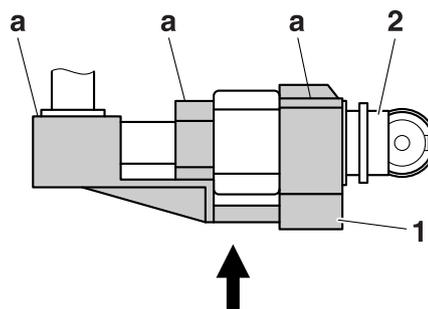
TIP

Install the fuel hose securely onto the fuel pump until a distinct “click” is heard.

- Fuel hose connector cover

TIP

Attach the fuel hose connector cover “1” to the fuel hose connector “2” from the bottom. Make sure that parts “a” are firmly attached to the fuel hose connector “2”.



3. Connect:

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

EAS14B1079

INSTALLING THE FUEL TANK SIDE COVERS

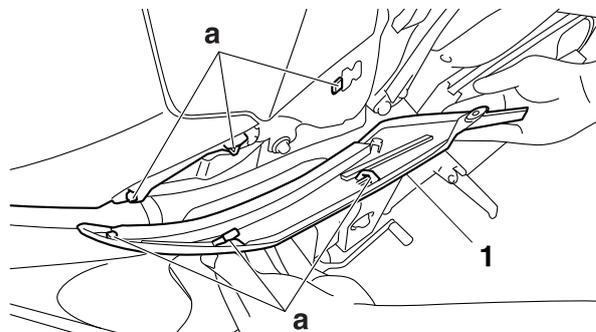
The following procedure applies to both of the fuel tank side covers.

1. Install:

- Fuel tank side cover “1”



- Fit the tabs “a” of the fuel tank side cover.
- Slide the fuel tank side cover to the rear and then fit the tabs.



- Install the screw on the fuel tank side cover.

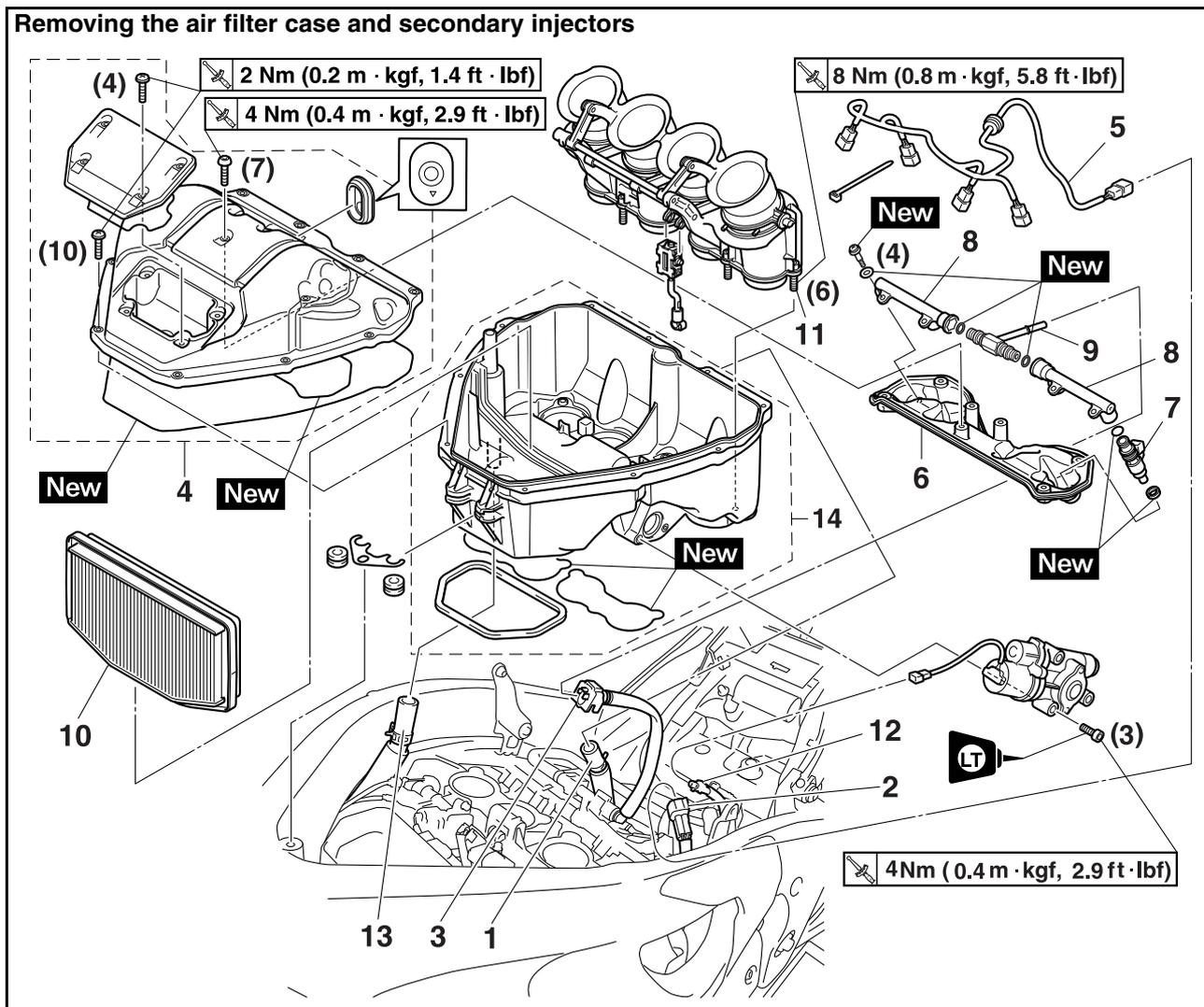


AIR FILTER CASE

EAS14B1062

AIR FILTER CASE

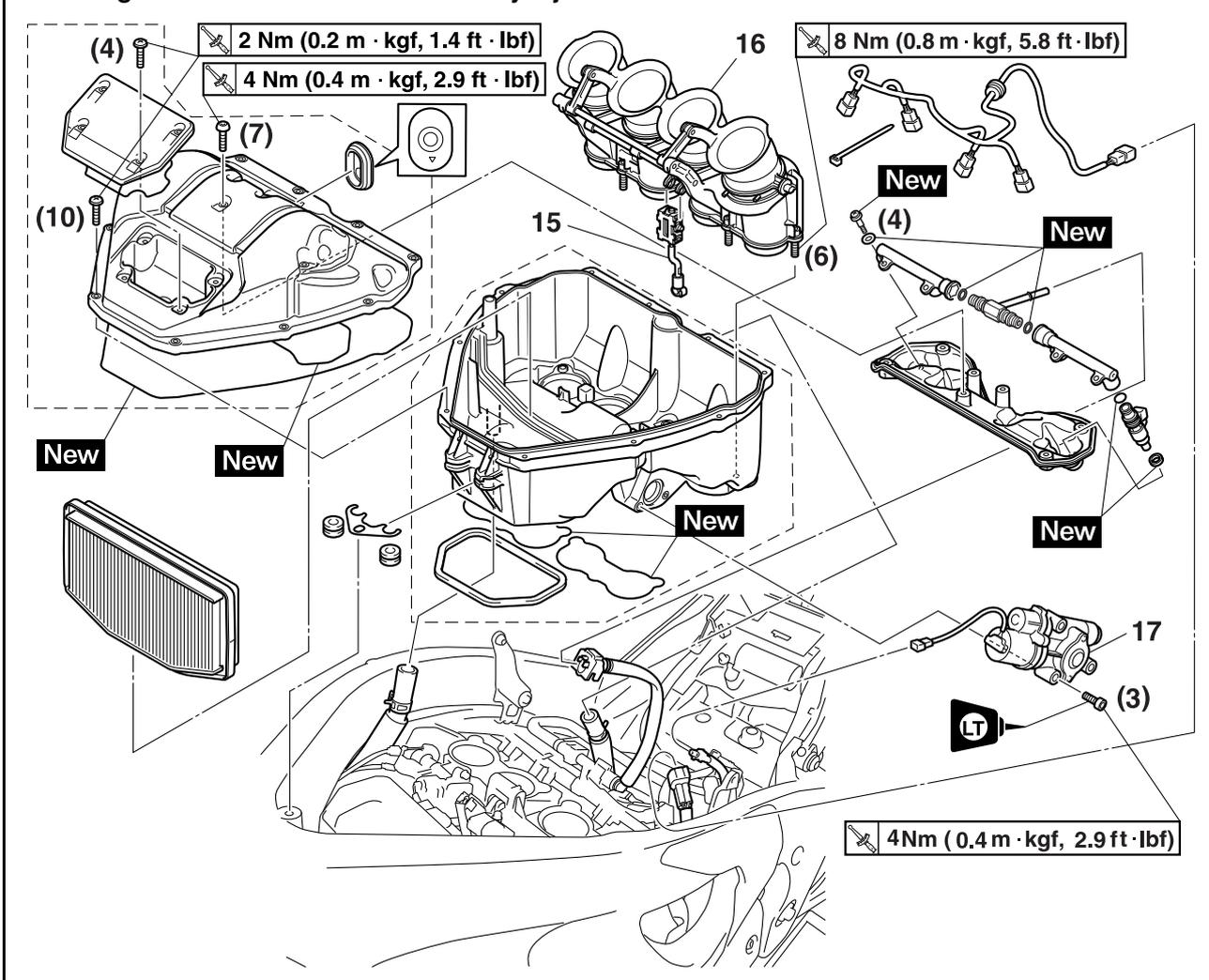
Removing the air filter case and secondary injectors



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Crankcase breather hose	1	Disconnect.
2	Sub-wire harness coupler	1	Disconnect.
3	Fuel hose (secondary injector fuel rail side)	1	Disconnect.
4	Upper air filter case	1	
5	Sub-wire harness	1	
6	Secondary injector holder	1	
7	Secondary injector	4	
8	Fuel rail	2	
9	Secondary injector joint	1	
10	Air filter element	1	
11	Intake funnel joint bolt	6	Loosen.
12	Intake funnel servo motor coupler	1	Disconnect.
13	Air induction system hose (air filter case to air cut-off valve)	1	Disconnect.
14	Lower air filter case	1	

AIR FILTER CASE

Removing the air filter case and secondary injectors



Order	Job/Parts to remove	Q'ty	Remarks
15	Intake funnel servo motor rod assembly	1	
16	Intake funnel assembly	1	
17	Intake funnel servo motor	1	
			For installation, reverse the removal procedure.

AIR FILTER CASE

EAS14B1105

CHECKING THE SECONDARY INJECTORS (BEFORE REMOVING)

1. Check:
 - Injectors
Use the diagnostic code number "D:40–D:43".
Refer to "DIAGNOSTIC MODE" on page 8-38.

EAS14B1063

REMOVING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE AND SECONDARY INJECTOR JOINT SIDE)

1. Remove:
 - Fuel hose (primary injector joint side and secondary injector joint side)

EWA14B1001

⚠ WARNING

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

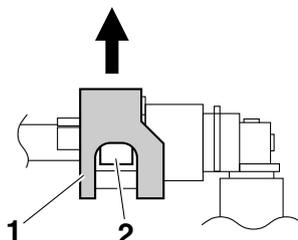
ECA14B1003

NOTICE

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP

- To remove the fuel hose from the secondary injector joint, slide the fuel hose connector "1" on the end of the hose in the direction of the arrow shown, press the two buttons "2" on the sides of the connector, and then remove the hose.
- Before removing the hose, place a few rags in the area under where it will be removed.



EAS14B1106

REMOVING THE SECONDARY INJECTORS

EWA14B1027

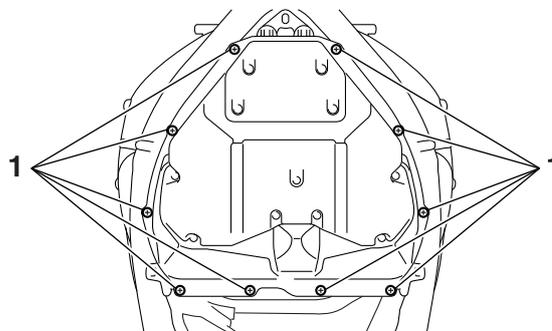
⚠ WARNING

- Check the injectors in a well-ventilated area free of combustible materials. Make sure that there is no smoking or use of electric tools in the vicinity of the injectors.
- Be careful when disconnecting the fuel hoses. Any remaining pressure in the fuel hoses may cause the fuel to spray out. Place a container or rag under the hoses to catch any fuel that spills. Always clean up any spilt fuel immediately.
- Turn the main switch to "OFF" and disconnect the negative battery lead from the battery terminal before checking the injectors.

1. Remove:
 - Fuel tank
 - Fuel hoses
2. Remove:
 - Upper air filter case



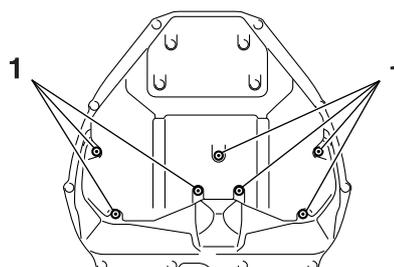
- a. Remove the upper air filter case bolts "1" as shown.



3. Remove:
 - Secondary injector assembly



- a. Remove the secondary injector assembly bolts "1" as shown.

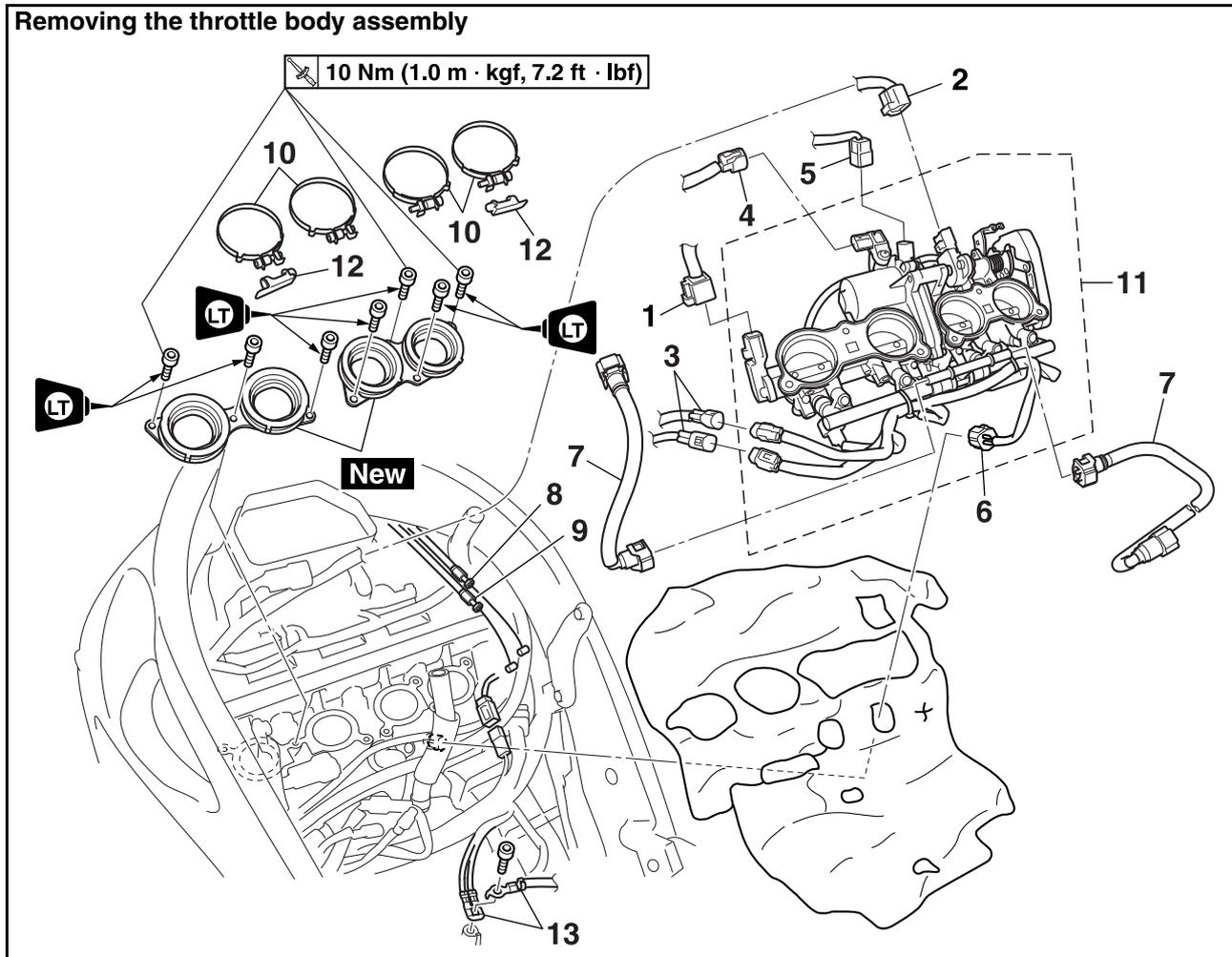


THROTTLE BODIES

EAS26970

THROTTLE BODIES

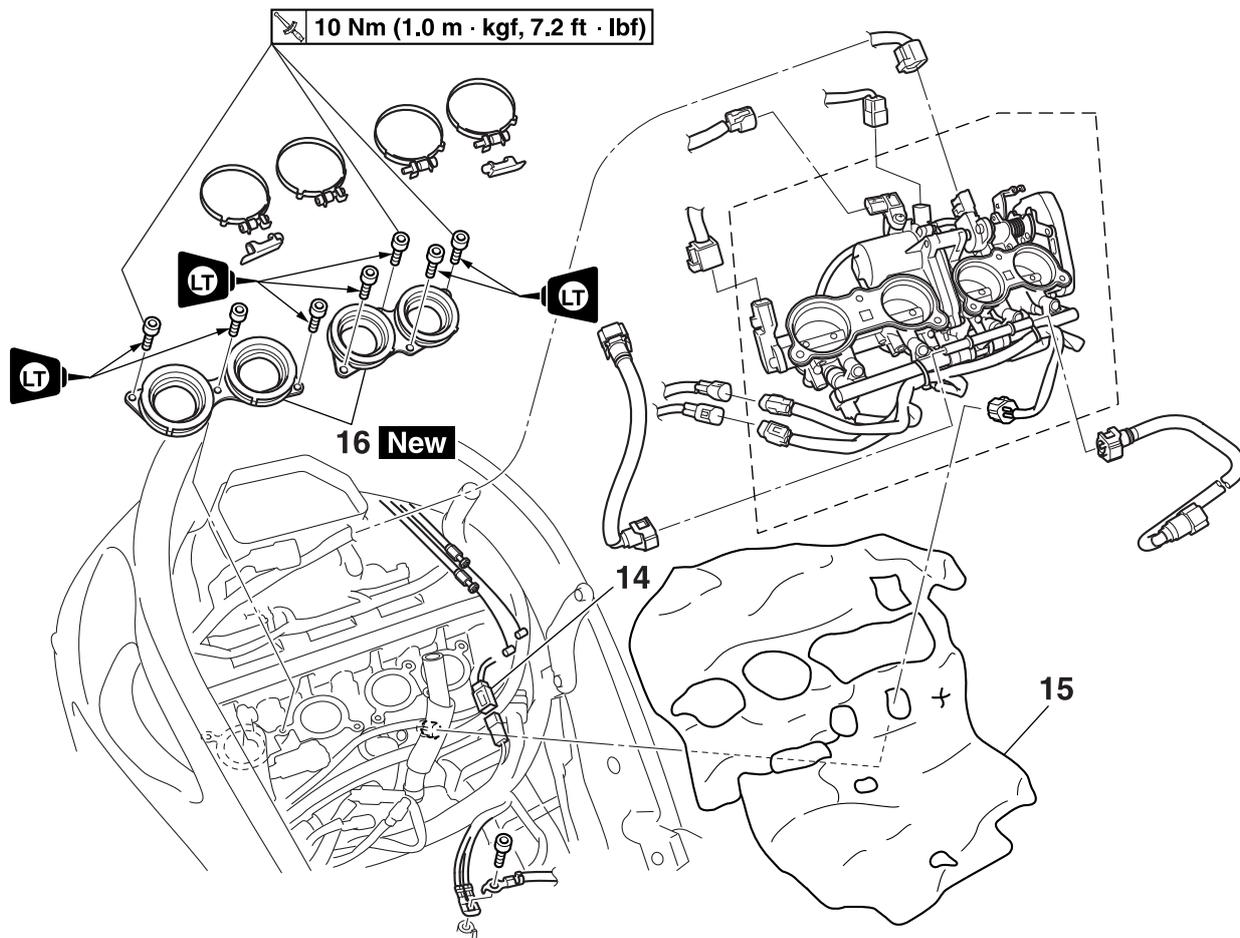
Removing the throttle body assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
1	Throttle position sensor coupler	1	Disconnect.
2	Accelerator position sensor coupler	1	Disconnect.
3	Sub-wire harness coupler	2	Disconnect.
4	Intake air pressure sensor coupler	1	Disconnect. Coupler marked "B"
5	Throttle servo motor coupler	1	Disconnect.
6	Coolant temperature sensor coupler	1	Disconnect.
7	Fuel hose	2	
8	Throttle cable (accelerator cable)	1	Disconnect.
9	Throttle cable (decelerator cable)	1	Disconnect.
10	Throttle body joint clamp	4	Loosen.
11	Throttle body assembly	1	
12	Throttle body joint clamp cap	2	
13	Engine ground lead	2	Disconnect.

THROTTLE BODIES

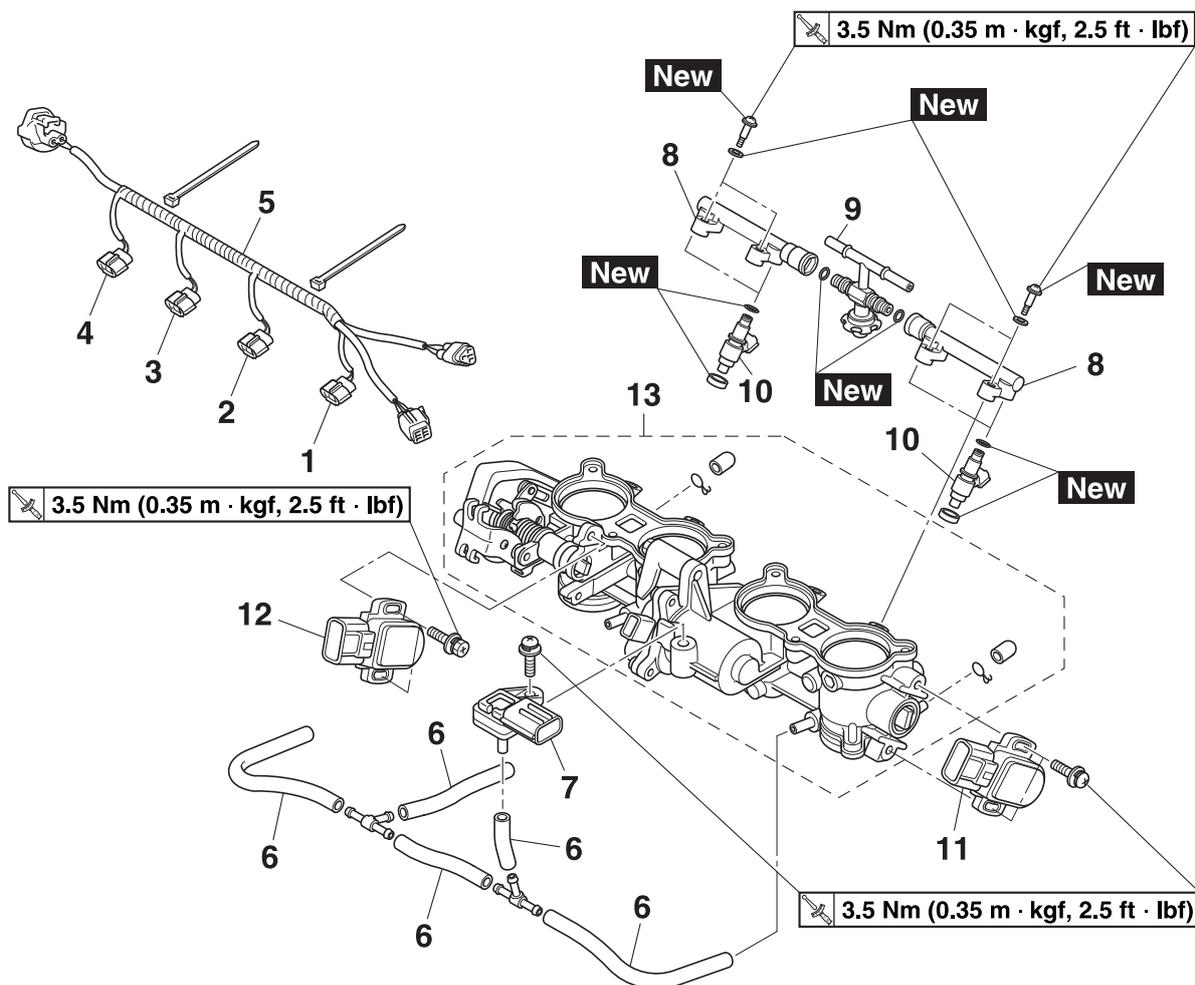
Removing the throttle body assembly



Order	Job/Parts to remove	Q'ty	Remarks
14	Crankshaft position sensor coupler	1	Disconnect.
15	Heat protector	1	
16	Throttle body joint	2	
			For installation, reverse the removal procedure.

THROTTLE BODIES

Removing the primary injectors



Order	Job/Parts to remove	Q'ty	Remarks
1	Primary injector coupler #1	1	Disconnect.
2	Primary injector coupler #2	1	Disconnect.
3	Primary injector coupler #3	1	Disconnect.
4	Primary injector coupler #4	1	Disconnect.
5	Sub-wire harness	1	
6	Intake air pressure sensor hose	5	
7	Intake air pressure sensor	1	
8	Fuel rail	2	
9	Primary injector joint	1	
10	Primary injector	4	
11	Throttle position sensor	1	
12	Accelerator position sensor	1	
13	Throttle bodies	1	
			For installation, reverse the removal procedure.

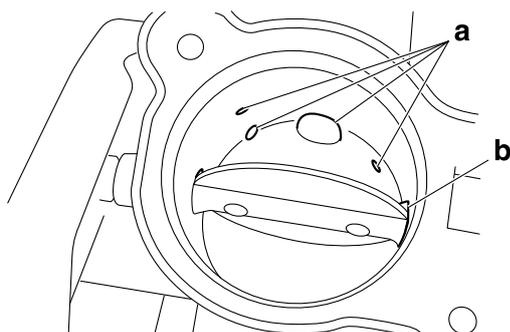
THROTTLE BODIES

ECA14B1029

NOTICE

- Do not use a tool, such as a wire brush, to remove the carbon deposits; otherwise, the inside of the throttle bodies may be damaged.
- Do not allow carbon deposits or other foreign materials to enter any of the passages in each throttle body or in the space between the throttle valve shaft and the throttle body.

- f. After removing the carbon deposits, clean the inside of the throttle bodies with a petroleum-based solvent, and then dry the throttle bodies using compressed air.
- g. Make sure that there are no carbon deposits or other foreign materials in any of the passages "a" in each throttle body or in the space "b" between the throttle valve shaft and the throttle body.



3. Adjust:
- Throttle bodies synchronizing Out of specification → Replace the throttle bodies.
Refer to "SYNCHRONIZING THE THROTTLE BODIES" on page 3-9.

EAS14B1111

INSTALLING THE PRIMARY INJECTORS

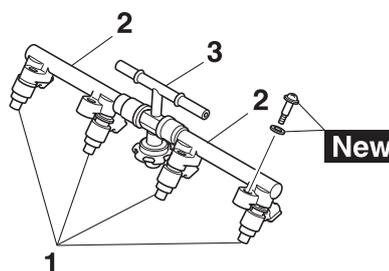
ECA14B1046

NOTICE

- Always use new O-rings.
- When checking the injectors, do not allow any foreign material to enter or adhere to the injectors, fuel rails, or O-rings.
- Be careful not to twist or pinch the O-rings when installing the injectors.
- When installing the injector, install it at the same position as the removed cylinder.

- If an injector is subject to strong shocks or excessive force, replace it.
- If installing the original fuel rails and bolts, remove the white paint marks using a cleaning solvent. Otherwise, paint chips on the bolt seats could prevent the bolts from being tightened to the specified torque.

1. Install a new seal onto the end of each injector.
2. Install the injectors "1" to the fuel rails "2".
3. Install the primary injector joint "3", making sure to install them in the correct direction.



4. Install the injector assemblies to the throttle bodies.

	Fuel rail screw 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)
---	---

5. Check the injector pressure after the injectors are installed to the throttle bodies. Refer to "CHECKING THE INJECTOR PRESSURE" on page 7-17.

EAS14B1112

CHECKING THE INJECTOR PRESSURE

TIP

- After installing the injectors, perform the following steps to check the injector pressure.
- Do not allow any foreign materials to enter the fuel lines.

1. Check:
 - Injector pressure

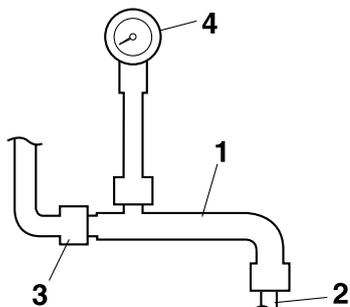


- a. Connect the injector pressure adapter "1" to the primary injector joint "2", and then connect an air compressor "3" to the adapter.
- b. Connect the pressure gauge "4" to the injector pressure adapter "1".

THROTTLE BODIES



Pressure gauge
 90890-03153
 YU-03153
Fuel injector pressure adapter
 90890-03210
 YU-03210



- c. Close the valve on the injector pressure adapter.
- d. Apply air pressure with the air compressor.
- e. Open the valve on the injector pressure adapter until the specified pressure is reached.



Specific air pressure:
 490 kPa (5.0 kgf/cm², 71.1 psi)

ECA14B1037

NOTICE

Never exceed the specified air pressure or damage could occur.

- f. Close the valve on the injector pressure adapter.
- g. Check that the specified air pressure is held at least one minute.
 Pressure drops → Check the pressure gauge and adapter.
 Check the seals and O-rings and then re-install.
 Out of specification → Replace the fuel injectors.



EAS14B1071

CHECKING THE FUEL LINE PRESSURE

- 1. Check:
 - Fuel line pressure
-
- a. Remove the fuel tank bolt and holdup the fuel tank.
 - b. Disconnect the fuel hose "1" from the fuel tank.

EWA14B1001

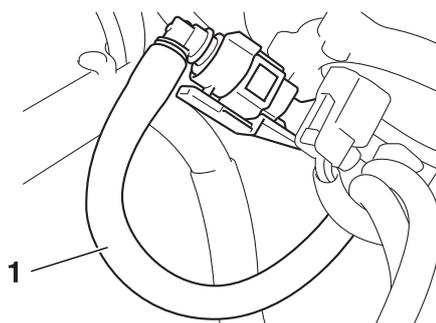
WARNING

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

ECA14B1003

NOTICE

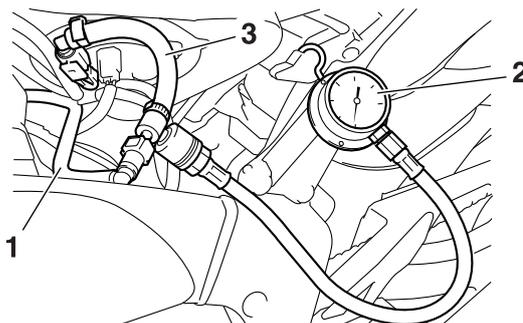
Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.



- c. Connect the pressure gauge "2" and fuel pressure adapter "3" to the fuel hose "1".



Pressure gauge
 90890-03153
 YU-03153
Fuel pressure adapter
 90890-03176
 YM-03176



- d. Start the engine.
- e. Measure the fuel line pressure.



Fuel line pressure (at idle)
 300.0–390.0 kPa (3.00–3.90 kgf/cm², 43.5–56.6 psi)

Faulty → Replace the fuel pump.



THROTTLE BODIES

TIP

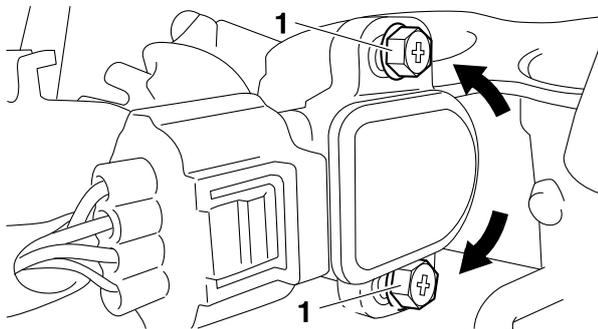
“dIAG” appears on the odometer LCD.

- f. Diagnostic code number “D:14” is selected.
- g. Adjust the position of the accelerator position sensor angle so that 12–22 can appear in the meter.
- h. After adjusting the accelerator position sensor angle, tighten the accelerator position sensor screws “1”.



**Accelerator position sensor
screw**

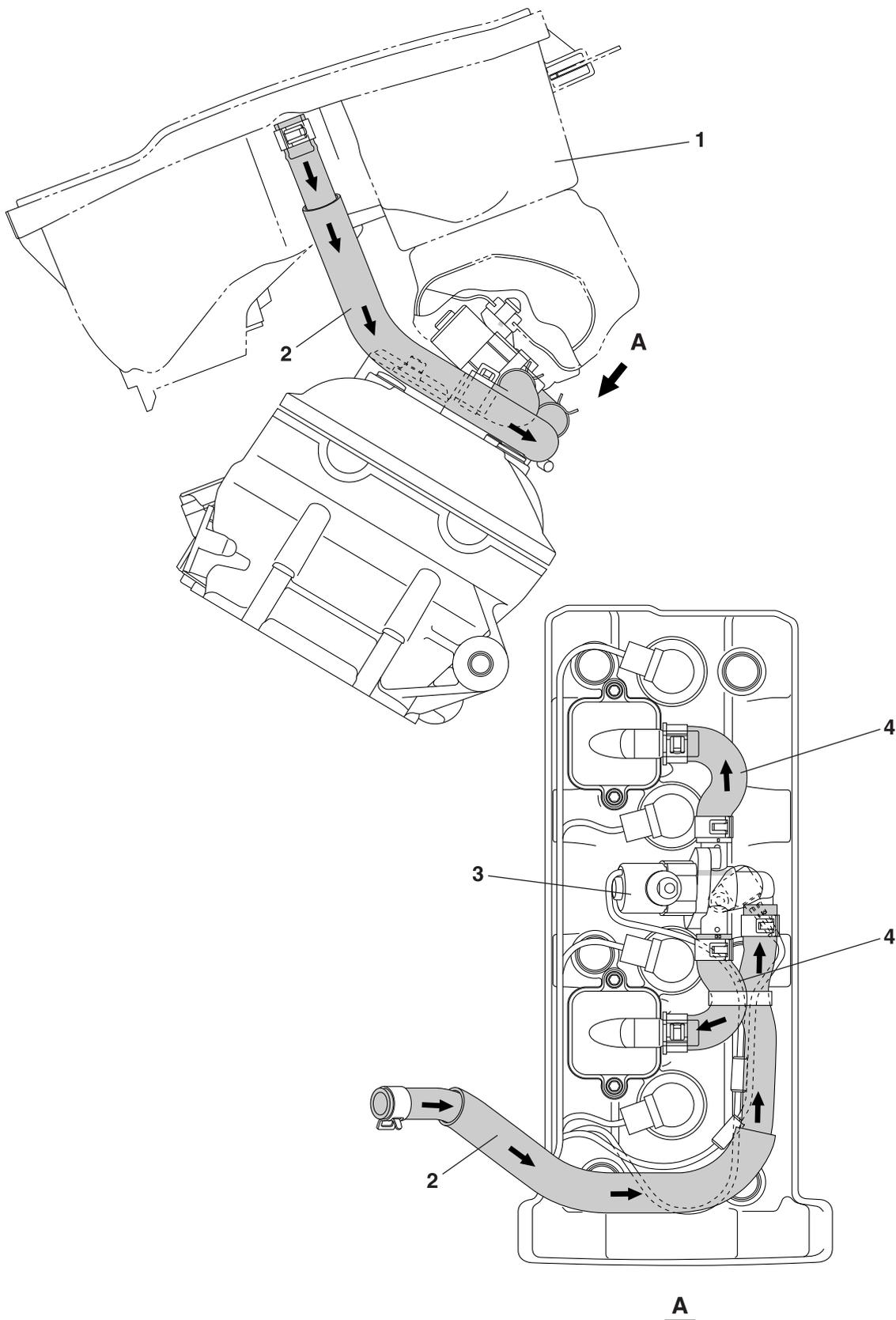
3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)



AIR INDUCTION SYSTEM

EAS27040

AIR INDUCTION SYSTEM

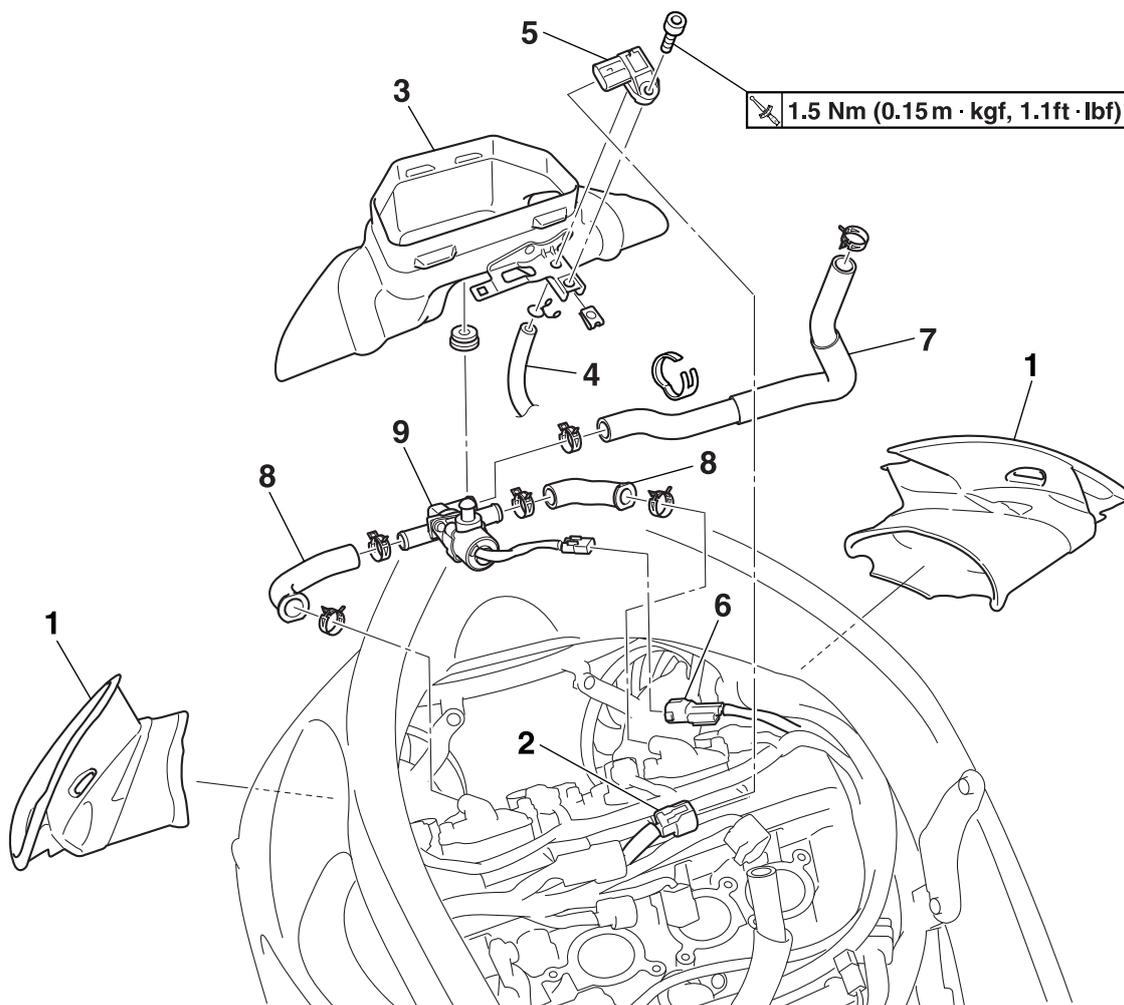


AIR INDUCTION SYSTEM

1. Lower air filter case
2. Air induction system hose (air filter case to air cut-off valve)
3. Air cut-off valve
4. Air induction system hose (air cut-off valve to reed valve cover)

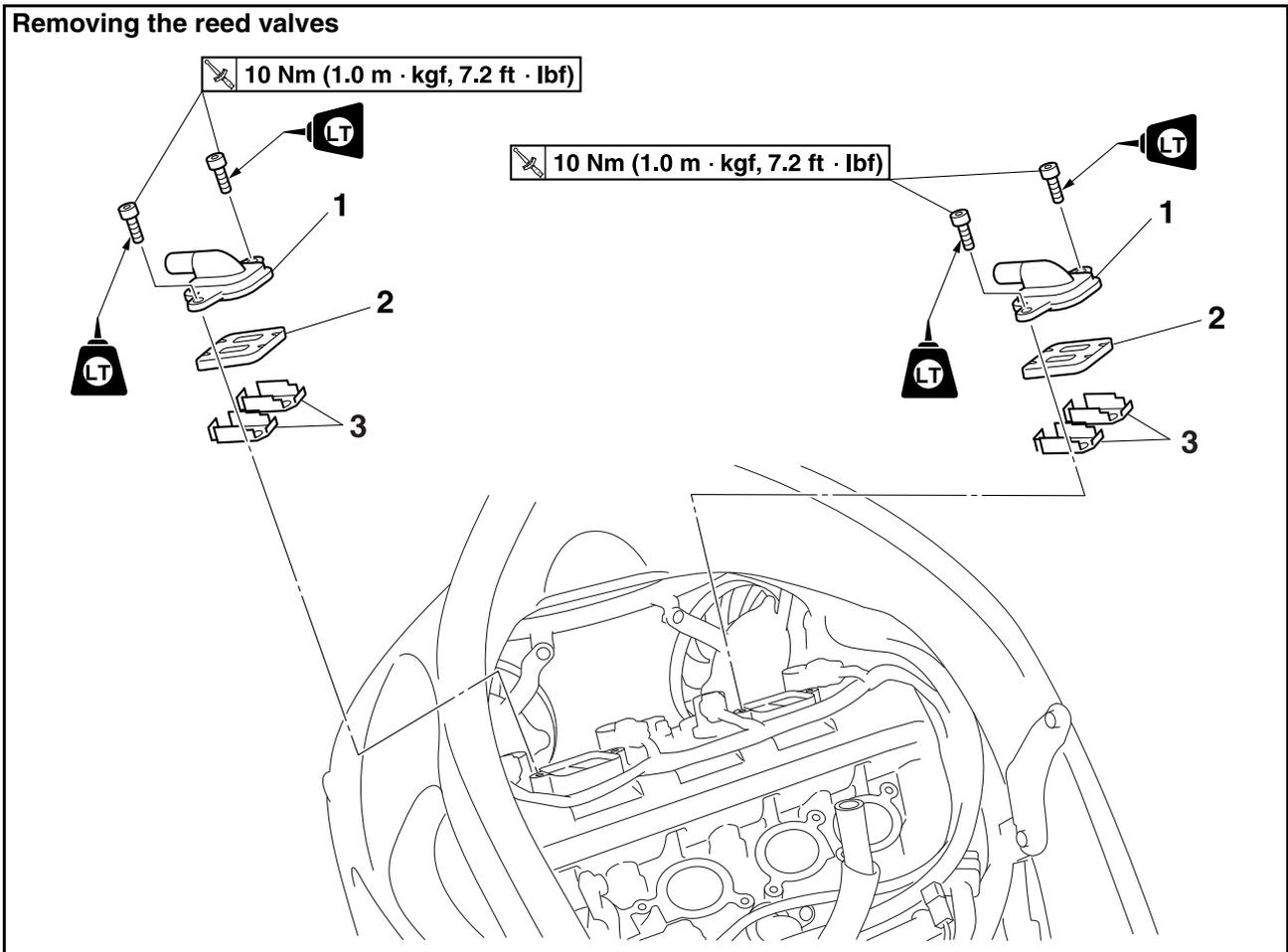
AIR INDUCTION SYSTEM

Removing the air cut-off valve assembly and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-5.
1	Side air filter case duct	2	
2	Atmospheric pressure sensor coupler	1	Disconnect.
3	Air filter case duct	1	
4	Atmospheric pressure sensor hose	1	Disconnect.
5	Atmospheric pressure sensor	1	
6	Air induction system solenoid coupler	1	Disconnect.
7	Air induction system hose (air filter case to air cut-off valve)	1	
8	Air induction system hose (air cut-off valve to reed valve cover)	2	
9	Air cut-off valve	1	
			For installation, reverse the removal procedure.

AIR INDUCTION SYSTEM



Order	Job/Parts to remove	Q'ty	Remarks
1	Reed valve cover	2	
2	Reed valve assembly	2	
3	Reed valve plate	4	
			For installation, reverse the removal procedure.

AIR INDUCTION SYSTEM

EAS27060

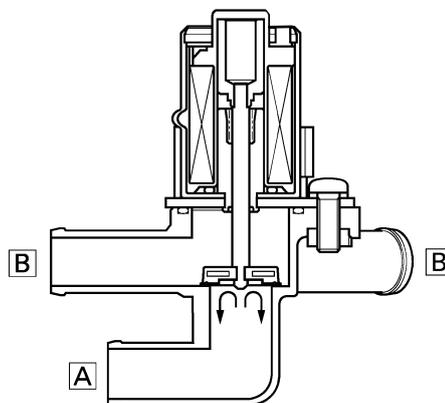
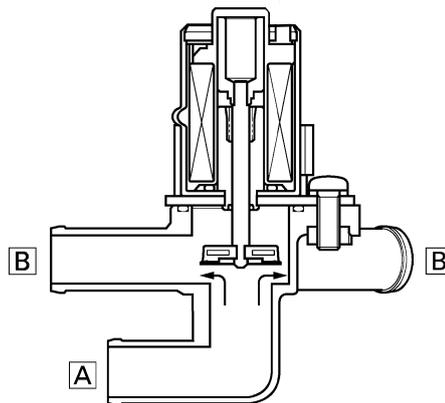
CHECKING THE AIR INDUCTION SYSTEM

Air injection

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons. When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700 °C (1112 to 1292 °F).

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 vehicle 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.



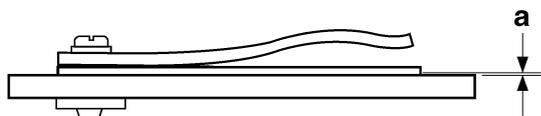
- A. From the air filter case
- B. To the cylinder head

1. Check:
 - Hoses
Loose connections → Connect properly.
Cracks/damage → Replace.
2. Check:
 - Reed valve
 - Reed valve stopper
 - Reed valve base
Cracks/damage → Replace the reed valve assembly.
3. Measure:
 - Reed valve bending limit "a"
Out of specification → Replace the reed valve.



Reed valve bending limit
0.4 mm (0.016 in)

AIR INDUCTION SYSTEM



4. Check:
 - Air cut-off valve
Cracks/damage → Replace.
5. Check:
 - Air induction system solenoid
Refer to “CHECKING THE AIR INDUCTION SYSTEM SOLENOID” on page 8-144.

A. Exhaust side

3. Install:
 - Reed valve cover

	<p>Reed valve cover bolt (air induction system) 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®</p>
---	---

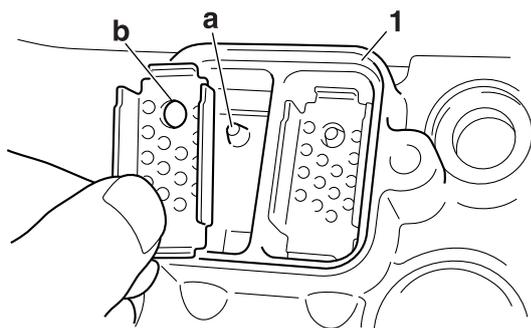
EAS27070

INSTALLING THE AIR INDUCTION SYSTEM

1. Install:
 - Reed valves
 - Reed valve stoppers
 - Reed valve base
2. Install:
 - Reed valve plate

TIP

Align the projection “a” on the cylinder head cover “1” with the hole “b” in the reed valve plate.



- Reed valve assembly

TIP

Install the reed valve assembly so that the open side turns to the exhaust side of the engine.

AIR INDUCTION SYSTEM

ELECTRICAL SYSTEM

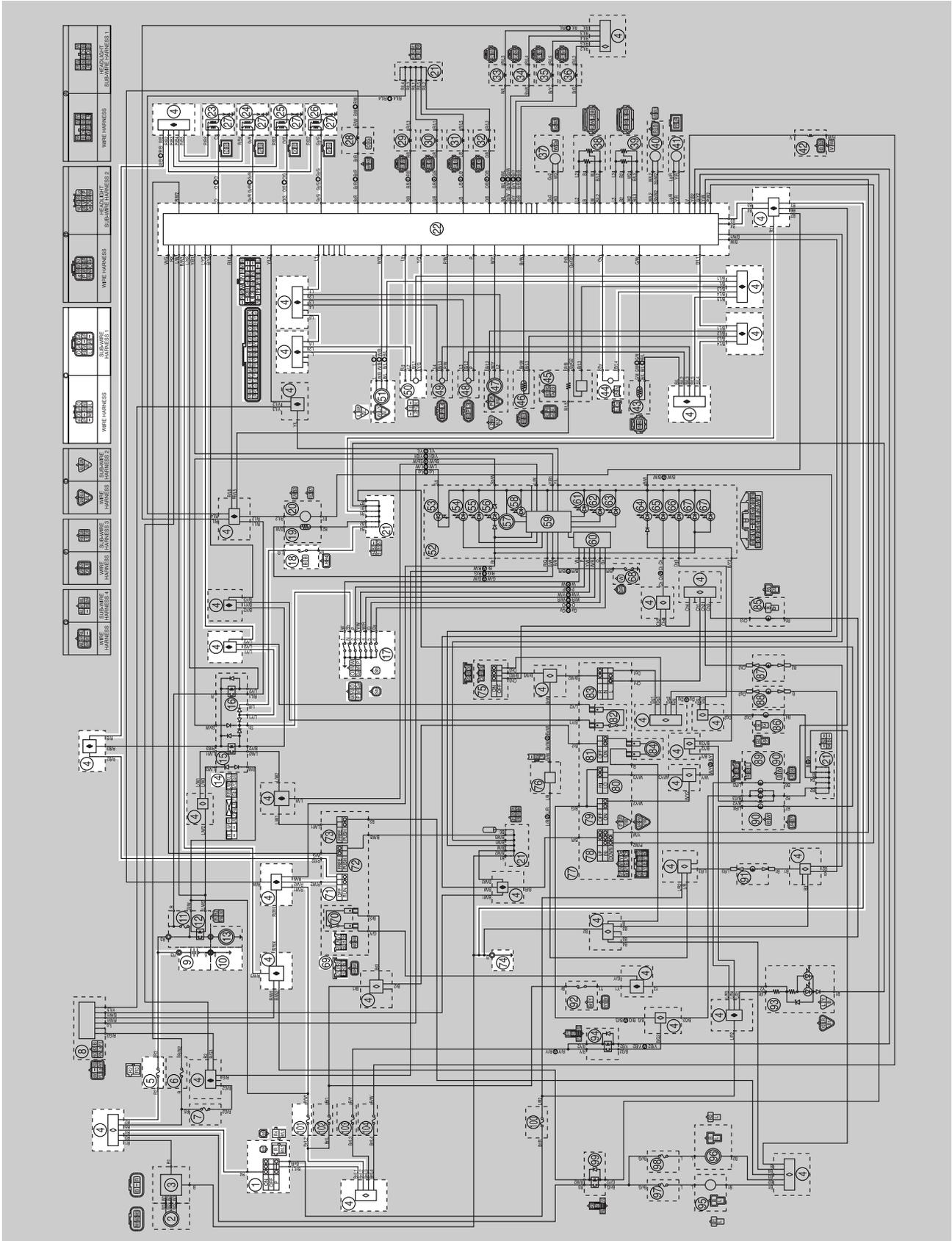
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IGNITION SYSTEM

EAS27090 IGNITION SYSTEM

EAS27110 CIRCUIT DIAGRAM



IGNITION SYSTEM

1. Main switch
4. Joint
5. Main fuse
9. Battery
10. Engine ground
14. Relay unit
17. Gear position sensor
18. Sidestand switch
21. Joint coupler
22. ECU (engine control unit)
23. Ignition coil #1
24. Ignition coil #2
25. Ignition coil #3
26. Ignition coil #4
27. Spark plug
44. Crankshaft position sensor
50. Lean angle sensor
51. Cylinder identification sensor
69. Right handlebar switch
71. Engine stop switch
74. Engine ground
101. Ignition fuse

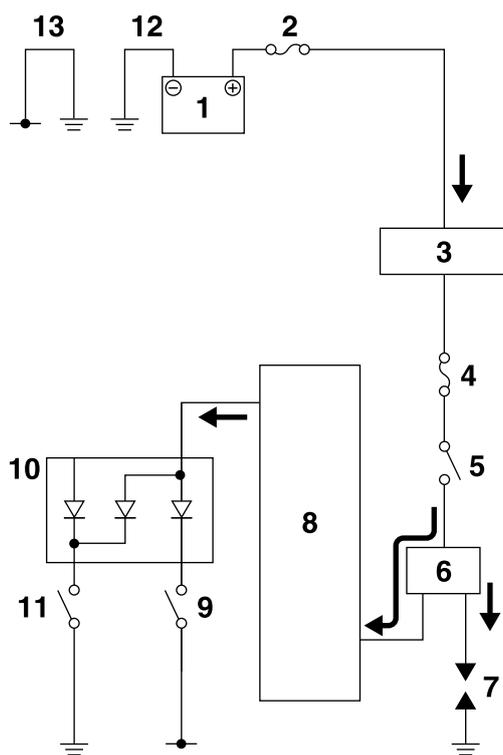
IGNITION SYSTEM

EAS14B1082

ENGINE STOPPING DUE TO SIDESTAND OPERATION

When the engine is running and the transmission is in gear, the engine will stop if the sidestand is moved down. This is because the electric current from the ignition coils does not flow to the ECU when both the neutral switch and sidestand switch are set to "OFF", thereby preventing the spark plugs from producing a spark. However, the engine continues to run under the following conditions:

- The transmission is in gear (the neutral switch circuit is open) and the sidestand is up (the sidestand switch circuit is closed).
- The transmission is in neutral (the neutral switch circuit is closed) and the sidestand is down (the sidestand switch circuit is open).



IGNITION SYSTEM

1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Engine stop switch
6. Ignition coil
7. Spark plug
8. ECU (engine control unit)
9. Sidestand switch
10. Relay unit (diode)
11. Gear position sensor
12. Battery negative lead
13. Engine ground

IGNITION SYSTEM

EAS27150

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Passenger seat
3. Air filter case duct
4. Side cowlings

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-129.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.	NG→	<ul style="list-style-type: none"> Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the spark plugs. Refer to "CHECKING THE SPARK PLUGS" on page 3-4.	NG→	Re-gap or replace the spark plugs.
OK↓		
4. Check the ignition spark gap. Refer to "CHECKING THE IGNI- TION COILS" on page 8-136.	NG→	Ignition system is OK.
OK↓		
5. Check the ignition coils. Refer to "CHECKING THE IGNI- TION COILS" on page 8-136.	NG→	Replace the ignition coils.
OK↓		
6. Check the crankshaft position sen- sor. Refer to "CHECKING THE CRANKSHAFT POSITION SEN- SOR" on page 8-137.	NG→	Replace the crankshaft position sen- sor.
OK↓		
7. Check the cylinder identification sensor. Refer to "CHECKING THE CYLIN- DER IDENTIFICATION SENSOR" on page 8-145.	NG→	Replace the cylinder identification sensor.
OK↓		

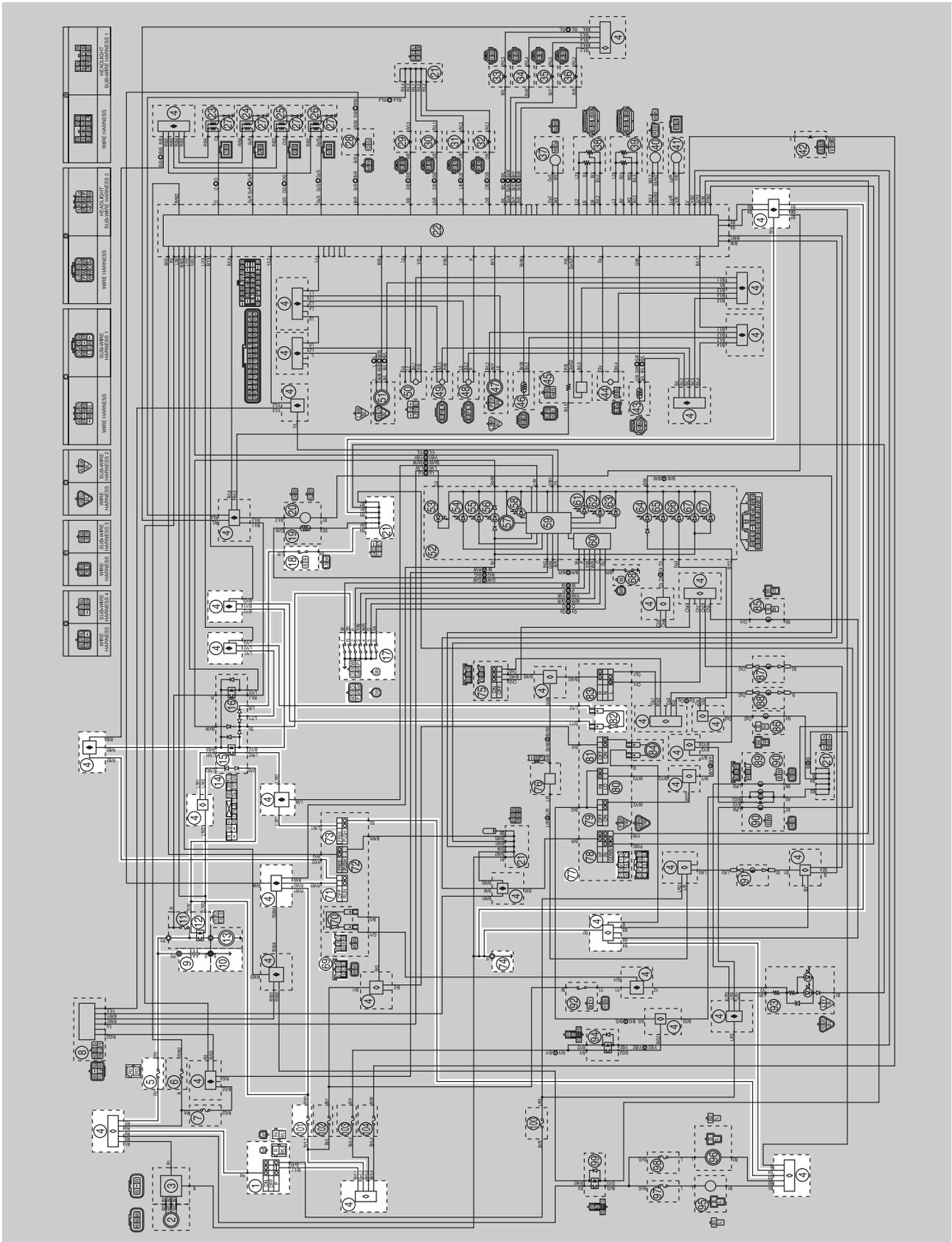
IGNITION SYSTEM

8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the main switch/immobilizer unit assembly.
OK↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the right handlebar switch.
OK↓		
10. Check the gear position sensor. Refer to "CHECKING THE GEAR POSITION SENSOR" on page 8-147.	NG→	Replace the gear position sensor.
OK↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the sidestand switch.
OK↓		
12. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-135	NG→	Replace the relay unit.
OK↓		
13. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-138.	NG→	Replace the lean angle sensor.
OK↓		
14. Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the ignition system's wiring
OK↓		
Replace the ECU.		

ELECTRIC STARTING SYSTEM

EAS27160 ELECTRIC STARTING SYSTEM

EAS27170 CIRCUIT DIAGRAM



ELECTRIC STARTING SYSTEM

- 1. Main switch
- 4. Joint
- 5. Main fuse
- 9. Battery
- 10. Engine ground
- 12. Starter relay
- 13. Starter motor
- 14. Relay unit
- 15. Starting circuit cut-off relay
- 17. Gear position sensor
- 18. Sidestand switch
- 21. Joint coupler
- 69. Right handlebar switch
- 71. Engine stop switch
- 73. Start switch
- 74. Engine ground
- 77. Left handlebar switch
- 82. Clutch switch
- 101. Ignition fuse

ELECTRIC STARTING SYSTEM

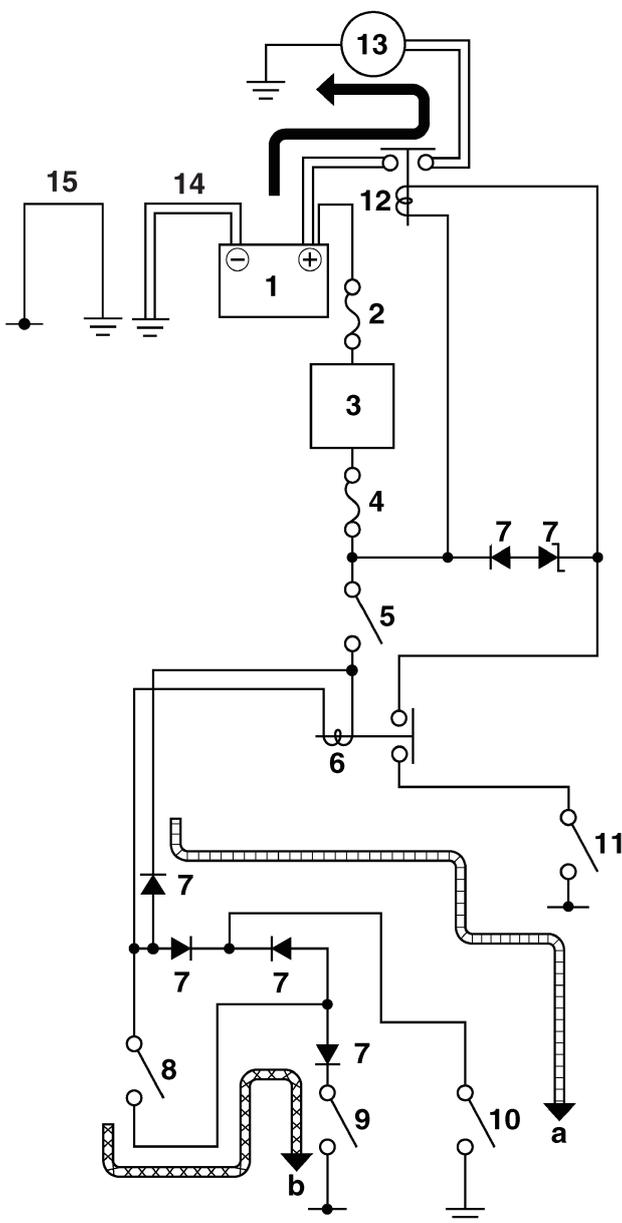
EAS14B1036

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 gear position sensor is neutral position).
- 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.



ELECTRIC STARTING SYSTEM

- a. WHEN THE TRANSMISSION IS IN NEUTRAL
- b. 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. Relay unit (starting circuit cut-off relay)
- 7. Relay unit (diode)
- 8. Clutch switch
- 9. Sidestand switch
- 10. Gear position sensor
- 11. Start switch
- 12. Starter relay
- 13. Starter motor
- 14. Battery negative lead
- 15. Engine ground

ELECTRIC STARTING SYSTEM

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Passenger seat
3. Heat protector
4. Side cowlings

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-129.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.	NG→	<ul style="list-style-type: none"> Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the starter motor operation. Refer to "CHECKING THE STARTER MOTOR OPERATION" on page 8-138.	OK→	Starter motor is OK. Perform the elec- tric starting system troubleshooting, starting with step 5.
NG↓		
4. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-47.	NG→	Repair or replace the starter motor.
OK↓		
5. Check the relay unit (starting circuit cut-off relay). Refer to "CHECKING THE RELAYS" on page 8-133.	NG→	Replace the relay unit.
OK↓		
6. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-135.	NG→	Replace the relay unit.
OK↓		
7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-133.	NG→	Replace the starter relay.
OK↓		

ELECTRIC STARTING SYSTEM

8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the main switch/immobilizer unit.
OK↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the right handlebar switch.
OK↓		
10. Check the gear position sensor. Refer to "CHECKING THE GEAR POSITION SENSOR" on page 8-147.	NG→	Replace the gear position sensor.
OK↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the sidestand switch.
OK↓		
12. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the clutch switch.
OK↓		
13. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the right handlebar switch.
OK↓		
14. Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-7.	NG→	Properly connect or repair the starting system's wiring
OK↓		
The starting system circuit is OK.		

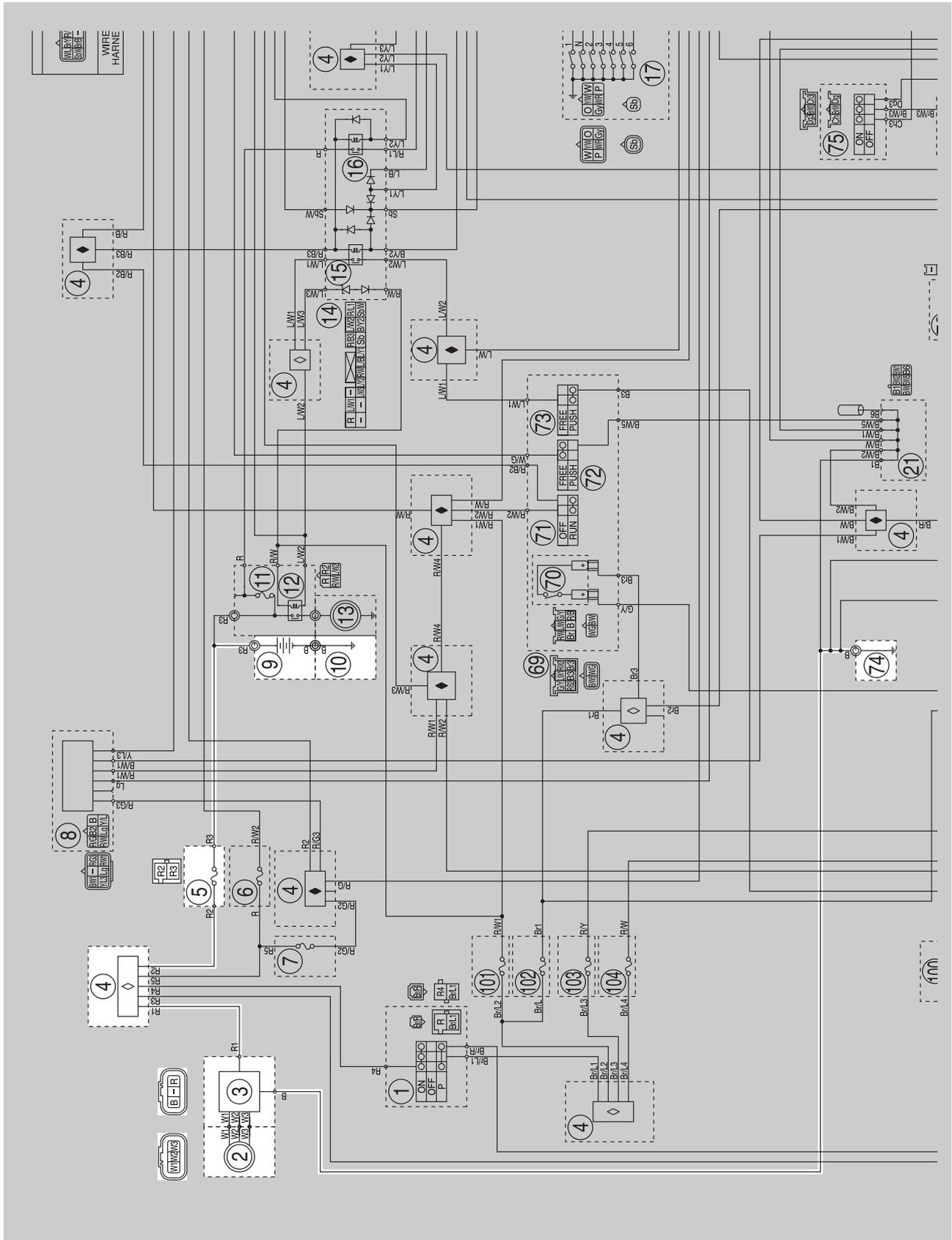
CHARGING SYSTEM

EAS27200

CHARGING SYSTEM

EAS27210

CIRCUIT DIAGRAM



CHARGING SYSTEM

- 2. AC magneto
- 3. Rectifier/regulator
- 4. Joint
- 5. Main fuse
- 9. Battery
- 10.Engine ground
- 74.Engine ground

CHARGING SYSTEM

EAS27230

TROUBLESHOOTING

The battery is not being charged.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Right side cowling

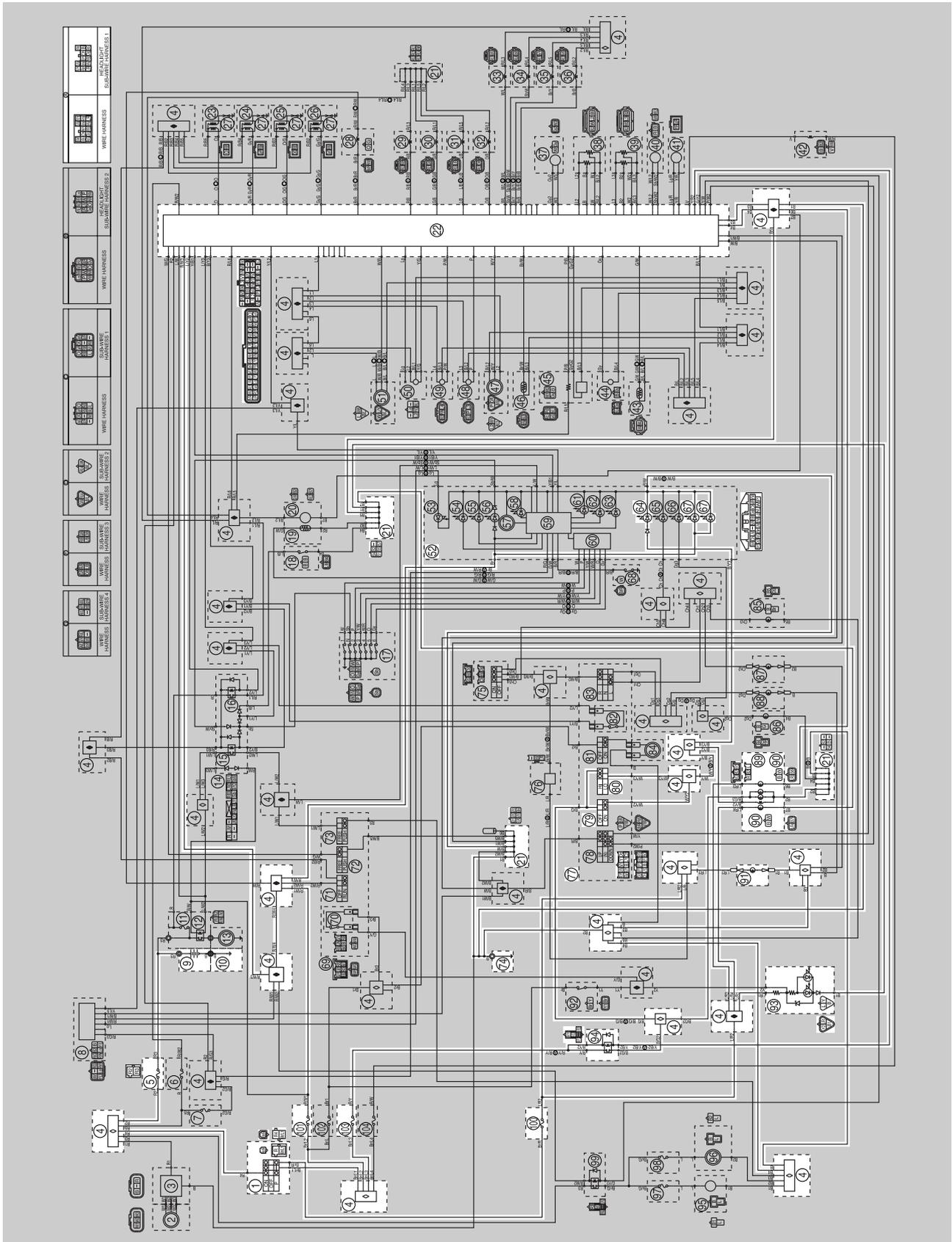
1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-129.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.	NG→	<ul style="list-style-type: none"> Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-139.	NG→	Replace the stator coil assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTI- FIER/REGULATOR" on page 8- 139.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-13.	NG→	Properly connect or repair the charg- ing system's wiring.
OK↓		
The charging system circuit is OK.		

CHARGING SYSTEM

LIGHTING SYSTEM

EAS27240 LIGHTING SYSTEM

EAS27250 CIRCUIT DIAGRAM



LIGHTING SYSTEM

- 1. Main switch
- 4. Joint
- 5. Main fuse
- 9. Battery
- 10.Engine ground
- 21.Joint coupler
- 22.ECU (engine control unit)
- 52.Meter assembly
- 64.High beam indicator light
- 67.Meter light
- 74.Engine ground
- 77.Left handlebar switch
- 79.Pass switch
- 80.Dimmer switch
- 89.Headlight
- 90.Auxiliary light
- 91.License plate light
- 93.Tail/brake light
- 94.Headlight relay
- 100.Turn signal light fuse
- 101.Ignition fuse
- 103.Headlight fuse

LIGHTING SYSTEM

EAS27260

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight or license plate light.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Left side cowling
3. Air intake air duct covers
4. Meter assembly

1. Check the each bulbs and bulb sockets condition. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-128.	NG→	Replace the bulb(s) and bulb socket(s).
OK↓		
2. Check the fuses. (Main, headlight, ignition and turn signal light) Refer to "CHECKING THE FUSES" on page 8-129.	NG→	Replace the fuse(s).
OK↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.	NG→	<ul style="list-style-type: none"> Clean the battery terminals. Recharge or replace the battery.
OK↓		
4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the main switch/immobilizer nut.
OK↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	The dimmer switch is faulty. Replace the left handlebar switch.
OK↓		
6. Check the pass switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	The pass switch is faulty. Replace the left handlebar switch.
OK↓		
7. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 8-133.	NG→	Replace the headlight relay.
OK↓		

LIGHTING SYSTEM

8. Check the entire lighting system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-17.

OK↓

Replace the ECU or meter assembly.

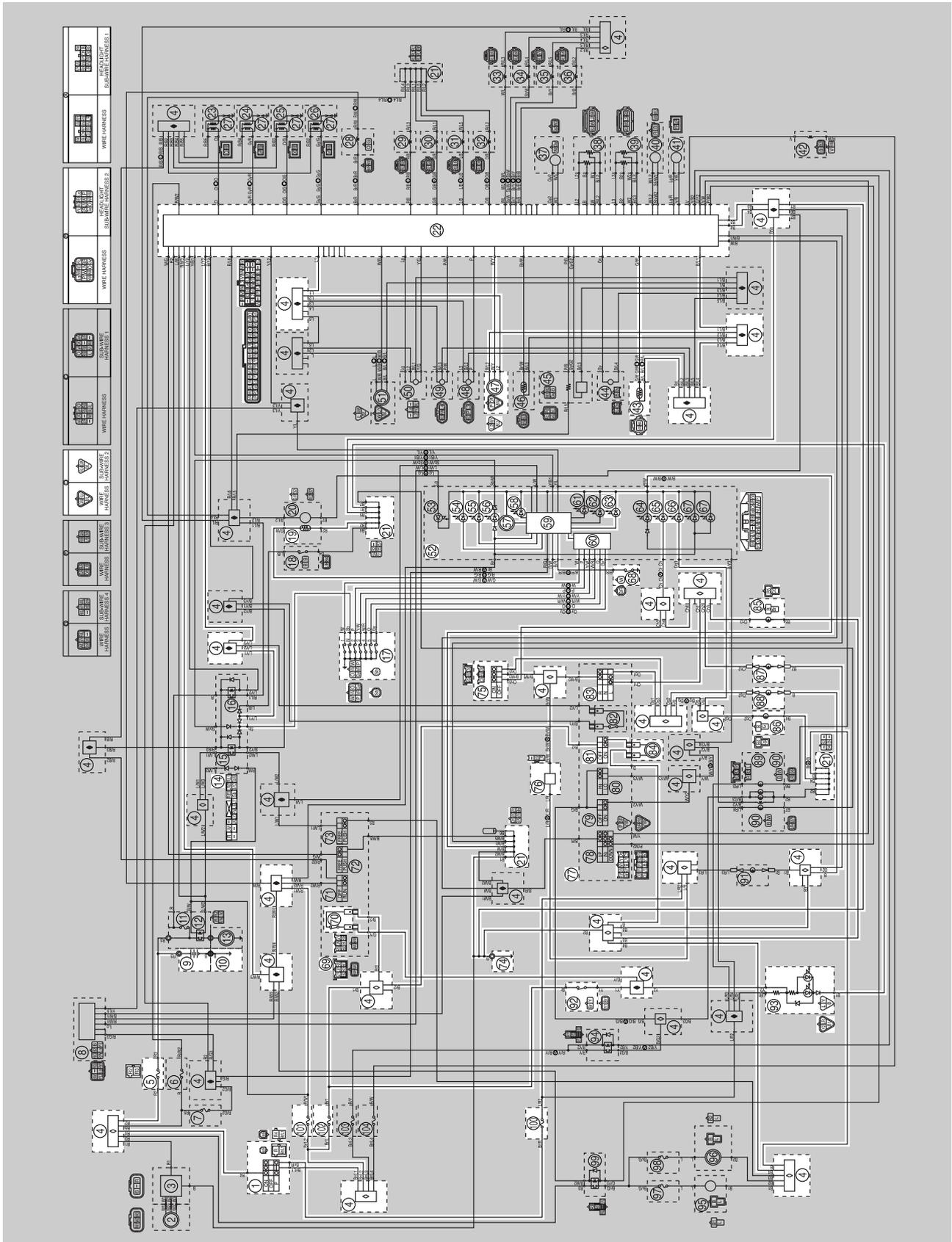
NG→

Properly connect or repair the lighting system's wiring.

SIGNALING SYSTEM

EAS27270
SIGNALING SYSTEM

EAS27280
CIRCUIT DIAGRAM



SIGNALING SYSTEM

1. Main switch
4. Joint
5. Main fuse
9. Battery
10. Engine ground
14. Relay unit
17. Gear position sensor
19. Fuel sender
21. Joint coupler
22. ECU (engine control unit)
43. Coolant temperature sensor
47. Rear speed sensor
52. Meter assembly
54. Fuel level warning light
55. Oil level warning light
56. Neutral indicator light
57. Tachometer
58. Shift timing indicator light
59. Multi-function meter
60. Transmission gear display
63. Coolant temperature warning light
65. Left turn signal indicator light
66. Right turn signal indicator light
68. Oil level switch
69. Right handlebar switch
70. Front brake light switch
74. Engine ground
75. Hazard switch
76. Turn signal/hazard relay
77. Left handlebar switch
81. Horn switch
83. Turn signal switch
84. Horn
85. Front left turn signal light
86. Front right turn signal light
87. Rear left turn signal light
88. Rear right turn signal light
92. Rear brake light switch
93. Tail/brake light
100. Turn signal light fuse
101. Ignition fuse
102. Signaling system fuse

SIGNALING SYSTEM

EAS27290

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.

TIP

- Before troubleshooting, remove the following part(s):
 1. Rider seat
 2. Passenger seat
 3. Fuel tank
 4. Side cowlings
 5. Meter assembly

1. Check the fuses. (Main, ignition, signaling system and turn signal light) Refer to "CHECKING THE FUSES" on page 8-129.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the main switch/immobilizer unit.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		

Check the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the left handlebar switch.
OK↓		
2. Check the horn. Refer to "CHECKING THE HORN" on page 8-140.	NG→	Replace the horn.
OK↓		

SIGNALING SYSTEM

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The tail/brake light fails to come on.

1. Check the front brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-125.

NG→

Replace the front brake light switch.

OK↓

2. Check the rear brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-125.

NG→

Replace the rear brake light switch.

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal light bulbs and sockets.
Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-128.

NG→

Replace the turn signal light bulb(s), socket(s) or both.

OK↓

2. Check the turn signal switch.
Refer to "CHECKING THE SWITCHES" on page 8-125.

NG→

Replace the left handlebar switch.

OK↓

3. Check the hazard switch.
Refer to "CHECKING THE SWITCHES" on page 8-125.

NG→

Replace the left handlebar switch.

OK↓

SIGNALING SYSTEM

4. Check the turn signal/hazard relay.
Refer to "CHECKING THE TURN SIGNAL/HAZARD RELAY" on page 8-134.

NG→

Replace the turn signal/hazard relay.

OK↓

5. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The neutral indicator light fails to come on.

1. Check the gear position sensor.
Refer to "CHECKING THE GEAR POSITION SENSOR" on page 8-147.

NG→

Replace the gear position sensor.

OK↓

2. Check the relay unit (diode).
Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-135.

NG→

Replace the relay unit.

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The oil level warning light fails to come on.

1. Check the oil level switch.
Refer to "CHECKING THE OIL LEVEL SWITCH" on page 8-140.

NG→

Replace the oil level switch.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

SIGNALING SYSTEM

The fuel level warning light fails to come on.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL SENDER" on page 8-141.

NG→

Replace the fuel pump assembly.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The coolant temperature warning light fails to come on.

1. Check the coolant temperature sensor.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-142.

NG→

Replace the coolant temperature sensor.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the ECU or meter assembly.

The speedometer fails to operate.

1. Check the rear speed sensor.
Refer to "CHECKING THE REAR SPEED SENSOR" on page 8-141.

NG→

Replace the rear speed sensor.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the ECU or meter assembly.

SIGNALING SYSTEM

The shift timing indicator light fails to come on.

1. Check that the shift timing indicator light is set to come on and that the brightness level of the light is adjusted properly.
Refer to "FEATURES" on page 1-2.

NG→

Replace the meter assembly.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

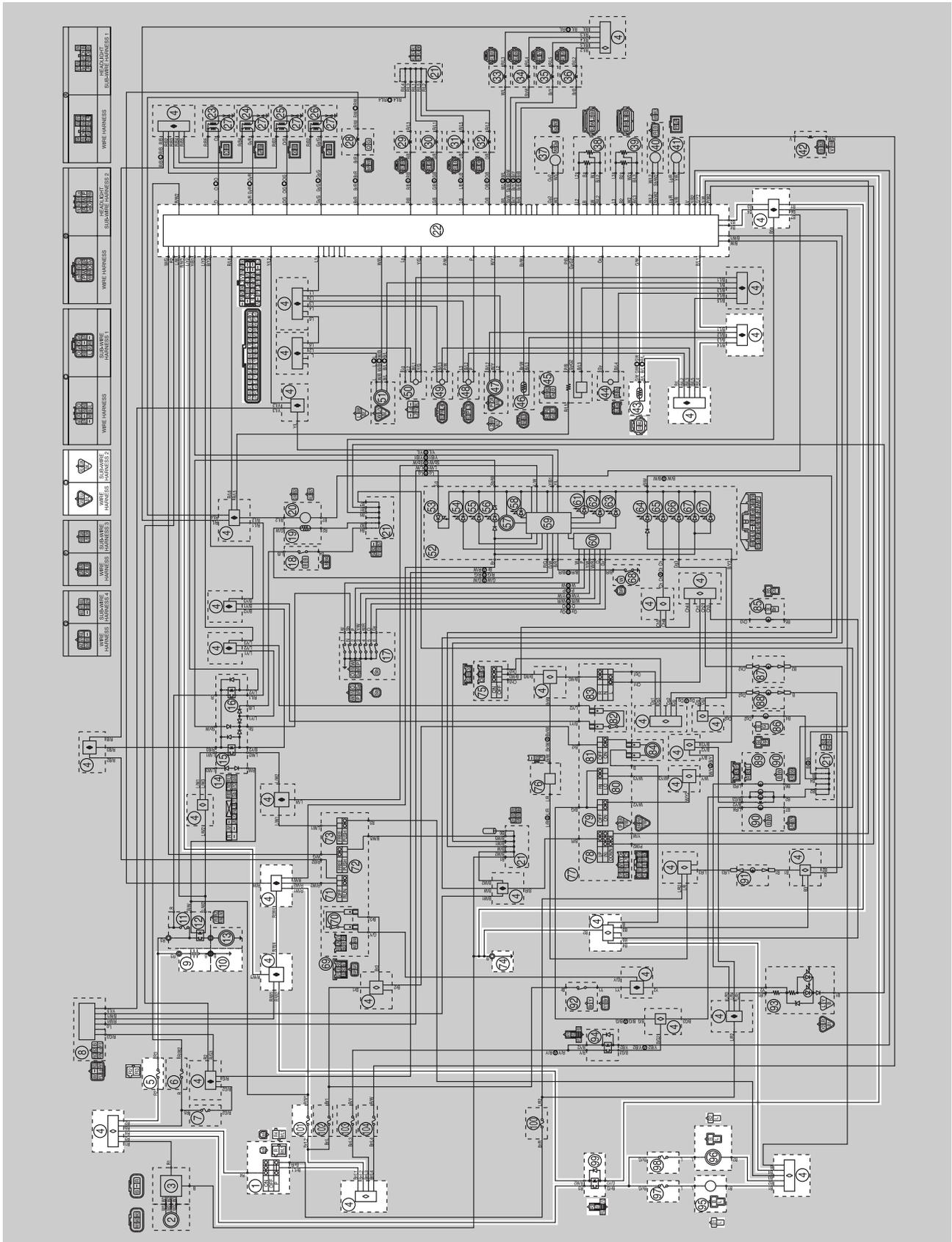
Replace the meter assembly.

SIGNALING SYSTEM

COOLING SYSTEM

EAS27300 COOLING SYSTEM

EAS27310 CIRCUIT DIAGRAM



COOLING SYSTEM

- 1. Main switch
- 4. Joint
- 5. Main fuse
- 9. Battery
- 10.Engine ground
- 22.ECU (engine control unit)
- 43.Coolant temperature sensor
- 74.Engine ground
- 95.Left radiator fan motor
- 96.Right radiator fan motor
- 97.Left radiator fan motor fuse
- 98.Right radiator fan motor fuse
- 99.Radiator fan motor relay
- 101.Ignition fuse

COOLING SYSTEM

EAS27320

TROUBLESHOOTING

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Side cowlings

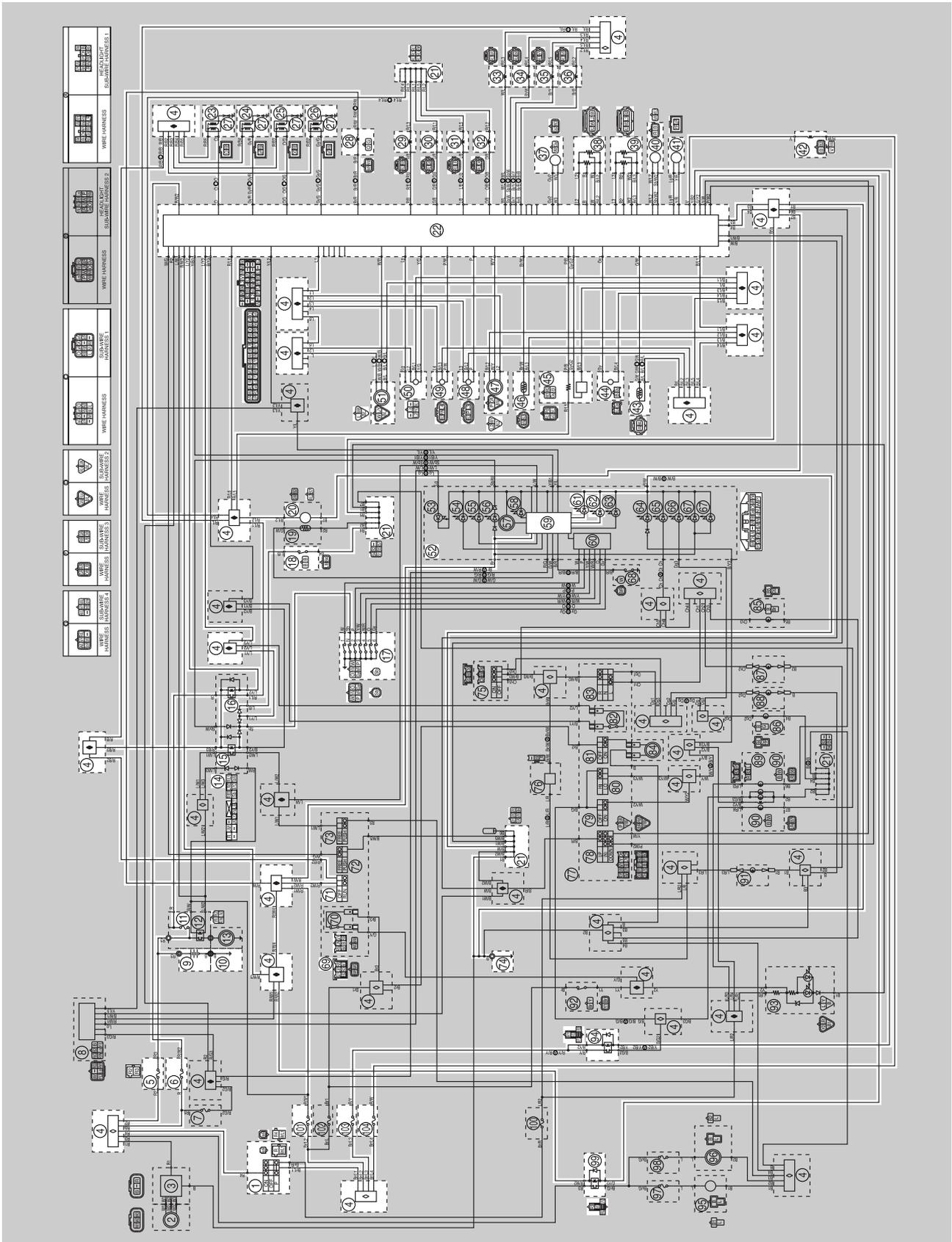
<p>1. Check the fuses. (Main, ignition and radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-129.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.</p>	NG→	<ul style="list-style-type: none"> Clean the battery terminals. Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		
<p>4. Check the radiator fan motors. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-142.</p>	NG→	<p>Replace the radiator fan motor(s).</p>
OK↓		
<p>5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-133.</p>	NG→	<p>Replace the radiator fan motor relay.</p>
OK↓		
<p>6. Check the coolant temperature sensor. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-142.</p>	NG→	<p>Replace the coolant temperature sensor.</p>
OK↓		
<p>7. Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.</p>	NG→	<p>Properly connect or repair the cooling system's wiring.</p>
OK↓		
<p>Replace the ECU.</p>		

COOLING SYSTEM

FUEL INJECTION SYSTEM

EAS27330 FUEL INJECTION SYSTEM

EAS27340 CIRCUIT DIAGRAM



FUEL INJECTION SYSTEM

1. Main switch
4. Joint
5. Main fuse
6. ETV (Electronic Throttle Valve) fuse
9. Battery
10. Engine ground
11. Fuel injection system fuse
14. Relay unit
15. Starting circuit cut-off relay
16. Fuel pump relay
17. Gear position sensor
18. Sidestand switch
20. Fuel pump
21. Joint coupler
22. ECU (engine control unit)
23. Ignition coil #1
24. Ignition coil #2
25. Ignition coil #3
26. Ignition coil #4
27. Spark plug
28. Air induction system solenoid
29. Primary injector #1
30. Primary injector #2
31. Primary injector #3
32. Primary injector #4
33. Secondary injector #1
34. Secondary injector #2
35. Secondary injector #3
36. Secondary injector #4
37. Front speed sensor
38. Accelerator position sensor
39. Throttle position sensor
40. Intake funnel servo motor
41. Throttle servo motor
42. Steering damper solenoid
43. Coolant temperature sensor
44. Crankshaft position sensor
45. O₂ sensor
46. Intake air temperature sensor
47. Rear speed sensor
48. Atmospheric pressure sensor
49. Intake air pressure sensor
50. Lean angle sensor
51. Cylinder identification sensor
52. Meter assembly
59. Multi-function meter
61. Steering damper warning light
62. Engine trouble warning light
69. Right handlebar switch
71. Engine stop switch
74. Engine ground
94. Headlight relay
99. Radiator fan motor relay
101. Ignition fuse
103. Headlight fuse
104. Steering damper fuse

FUEL INJECTION SYSTEM

EAS27350

ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the odometer/tripmeter/fuel reserve tripmeter/instantaneous fuel consumption/average fuel consumption LCD. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

Engine trouble warning light indication and FI system operation

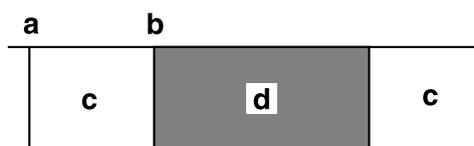
Warning light indication	ECU operation	FI operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Can or cannot be operated depending on the fault code

* The warning light flashes when any one of the conditions listed below is present and the start switch is pushed:

- | | |
|--|--|
| 11: Cylinder identification sensor | 30: Lean angle sensor (latch up detected) |
| 12: Crankshaft position sensor | 41: Lean angle sensor (open or short-circuit) |
| 19: Sidestand switch (open circuit in the wire to the ECU) | 50: ECU internal malfunction (faulty ECU memory) |

Checking the engine trouble warning light

The engine trouble warning light comes on for 1.4 seconds after the main switch has been turned to "ON" and it comes on while the start switch is being pushed. If the warning light does not come on under these conditions, the warning light (LED) may be defective.



- | | |
|-------------------------------------|--|
| a. Main switch "OFF" | d. Engine trouble warning light on for 1.4 seconds |
| b. Main switch "ON" | |
| c. Engine trouble warning light off | |

FUEL INJECTION SYSTEM

ECU detects an abnormal signal from a sensor

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.

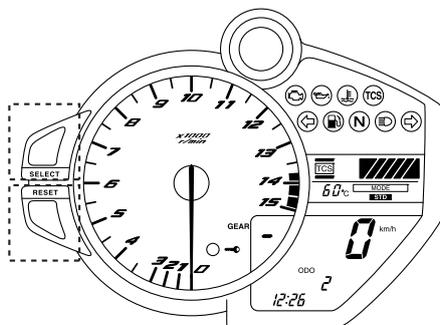
FUEL INJECTION SYSTEM

EAS14B1084

DIAGNOSTIC MODE

Setting the diagnostic mode

1. Turn the main switch to “OFF” and set the engine stop switch to “○”.
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds or more.



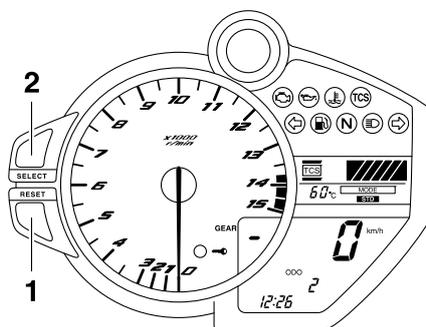
TIP

- All displays on the meter disappear.
- “dIAG” appears on the odometer/trip meter/fuel reserve trip meter/instantaneous fuel consumption/average fuel consumption LCD.

4. Press the “SELECT” switch to select the diagnostic mode “dIAG”.
5. After selecting “dIAG”, simultaneously press the “SELECT” switch and the “RESET” switch for 2 seconds or more to activate the diagnostic mode. The diagnostic code number “d01” appears on the clock/stopwatch LCD.
6. Set the engine stop switch to “⊗”.
7. Select the diagnostic code number corresponding to the fault code number by pressing the “SELECT” and “RESET” switches.

TIP

- To decrease the selected diagnostic code number, press the “RESET” switch “1”. Press the “RESET” switch for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the “SELECT” switch “2”. Press the “SELECT” switch for 1 second or longer to automatically increase the diagnostic code numbers.



8. Verify the operation of the sensor or actuator.
 - Sensor operation
The data representing the operating conditions of the sensor appears on the odometer/trip meter/fuel reserve trip meter/instantaneous fuel consumption/average fuel consumption LCD.
 - Actuator operation
Set the engine stop switch to “○” to operate the actuator.

FUEL INJECTION SYSTEM

TIP

If the engine stop switch is set to “○”, set it to “⊗”, and then set it to “○” again.

9. Turn the main switch to “OFF” to cancel the diagnostic mode.

FUEL INJECTION SYSTEM**Sensor operation table**

Diagnostic code No.	Item	Meter display	Checking method
D:01	Throttle position sensor signal 1 <ul style="list-style-type: none"> Fully closed position Fully opened position 	12–21 97–106 85–94 for FRA/BEL (1KB9/1KBK)	Check with throttle valves fully closed. Check with throttle valves fully open.
D:02	Atmospheric pressure	Displays the atmospheric pressure.	Compare the actually measured atmospheric pressure with the meter display value.
D:03	Pressure difference (atmospheric pressure and intake air pressure)	Displays the intake air pressure.	Set the engine stop switch to “○”, and then push the start switch “⊗”. (If the display value changes, the performance is OK.)
D:05	Intake air temperature	When engine is cold: Displays temperature closer to air temperature When engine is hot: Air temperature + approx. 20°C (68 °F)	Compare the actually measured intake air temperature with the meter display value.
D:06	Coolant temperature	When engine is cold: Displays temperature closer to air temperature When engine is hot: Displays current coolant temperature	Compare the actually measured coolant temperature with the meter display value.
D:07	Rear wheel vehicle speed pulses	0–999 Displays the cumulative value of the rear wheel vehicle speed pulses.	Rear wheel stops: make sure that the indication value is constant. Rotate the rear wheel by hand several times to enter the rear wheel vehicle speed pulses: the indication value is added.
D:08	Lean angle sensor <ul style="list-style-type: none"> Upright Overturned 	0.4–1.4 3.7–4.4	Remove the lean angle sensor and incline it more than 45 degrees.
D:09	Fuel system voltage (battery voltage)	Approximately 12.0	Set the engine stop switch to “○”, and then compare with the actually measured battery voltage. (If the battery voltage is lower, perform recharging.)

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Meter display	Checking method
D:13	Throttle position sensor signal 2 <ul style="list-style-type: none"> Fully closed position Fully opened position 	9–23 94–108 82–96 for FRA/BEL (1KB9/1KBK)	Check with throttle valves fully closed. Check with throttle valves fully open.
D:14	Accelerator position sensor signal 1 <ul style="list-style-type: none"> Fully closed position Fully opened position 	12–22 97–107	Check with throttle grip fully closed. Check with throttle grip fully open.
D:15	Accelerator position sensor signal 2 <ul style="list-style-type: none"> Fully closed position Fully opened position 	10–24 95–109	Check with throttle grip fully closed. Check with throttle grip fully open.
D:16	Front wheel vehicle speed pulses	0–999 Displays the cumulative value of the front wheel vehicle speed pulses.	Front wheel stops: make sure that the indication value is constant. Rotate the front wheel by hand several times to enter the front wheel vehicle speed pulses: the indication value is added.
D:20	Sidestand switch <ul style="list-style-type: none"> Stand retracted Stand extended 	ON OFF	Set on/off the sidestand switch. (with the transmission in gear)
D:21	Gear position switch and clutch switch <ul style="list-style-type: none"> Gear is in neutral Gear is in other than neutral and not operating clutch Gear is in other than neutral, operating clutch and using sidestand Gear is in other than neutral, operating clutch and storing sidestand 	ON OFF OFF ON	Shift the transmission.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Meter display	Checking method
D:60	EEPROM fault code display <ul style="list-style-type: none"> • No history • History exists 	00 <ul style="list-style-type: none"> • No malfunctions detected (If the self-diagnosis fault code 44 is indicated, the ECU is defective.) 01–04 (Cylinder fault code) <ul style="list-style-type: none"> • (If more than one cylinder is defective, the display alternates every two seconds to show all the detected cylinder numbers. When all cylinder numbers are shown, the display repeats the same process.) 	—
D:61	Malfunction history code display <ul style="list-style-type: none"> • No history • History exists 	00 <p>Fault codes 11–70</p> <ul style="list-style-type: none"> • (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	—
D:62	Malfunction history code erasure <ul style="list-style-type: none"> • No history • History exists 	00 <ul style="list-style-type: none"> • Displays the total number of malfunctions, including the current malfunction, that have occurred since the history was last erased. (For example, if there have been three malfunctions, “03” is displayed.) 	— To erase the history, set the engine stop switch from “” to “”.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Meter display	Checking method
D:63	Malfunction code reinstatement (for fault code No. 24, 40 only) <ul style="list-style-type: none"> • No malfunction code • Malfunction code exists 	00 Fault code 24, 40 <ul style="list-style-type: none"> • (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	— To reinstate, set the engine stop switch from “⊗” to “○”.
D:70	Control number	0–254 [-]	—

Actuator operation table

Diagnostic code No.	Item	Actuation	Checking method
D:30	Cylinder-#1 ignition coil	Actuates the cylinder-#1 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	Check the spark five times. <ul style="list-style-type: none"> • Connect an ignition checker.
D:31	Cylinder-#2 ignition coil	Actuates the cylinder-#2 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	Check the spark five times. <ul style="list-style-type: none"> • Connect an ignition checker.
D:32	Cylinder-#3 ignition coil	Actuates the cylinder-#3 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	Check the spark five times. <ul style="list-style-type: none"> • Connect an ignition checker.
D:33	Cylinder-#4 ignition coil	Actuates the cylinder-#4 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	Check the spark five times. <ul style="list-style-type: none"> • Connect an ignition checker.
D:34	Intake funnel servo motor	Actuates the intake funnels (up position down, position for each 3 seconds). Illuminates the engine trouble warning light.	Check the operating sound of the intake funnel servo motor.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Actuation	Checking method
D:36	Primary injector #1	Actuates the primary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the injector #1 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.
D:37	Primary injector #2	Actuates the primary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the injector #2 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.
D:38	Primary injector #3	Actuates the primary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the injector #3 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.
D:39	Primary injector #4	Actuates the primary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the injector #4 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.
D:40	Secondary injector #1	Actuates the secondary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the secondary injector #1 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.
D:41	Secondary injector #2	Actuates the secondary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the secondary injector #2 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.
D:42	Secondary injector #3	Actuates the secondary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the secondary injector #3 five times. ECA1KB8801 NOTICE _____ Disconnect the fuel pump coupler.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Actuation	Checking method
D:43	Secondary injector #4	Actuates the secondary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the secondary injector #4 five times. ECA1KB8801 NOTICE Disconnect the fuel pump coupler.
D:47	Steering damper solenoid	Set the engine stop switch to ON: Steering damper solenoid is ON. Set the engine stop switch to OFF: Steering damper solenoid is OFF. Illuminates the engine trouble warning light when the engine stop switch is ON.	Check the operating of the steering damper.
D:48	Air induction system solenoid	Actuates the air induction system solenoid five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the air induction system solenoid five times.
D:50	Fuel pump relay	Actuates the fuel pump relay five times at one-second intervals. Illuminates the engine trouble warning light. (The engine trouble warning light is OFF when the relay is ON, and the engine trouble warning light is ON when the relay is OFF).	Check the operating sound of the fuel pump relay five times.
D:51	Radiator fan motor relay	Actuates the radiator fan motor relay for five cycles of five seconds. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light.	Check the operating sound of the radiator fan motor relay five times.
D:52	Headlight relay	Actuates the headlight relay for five cycles of five seconds. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light.	Check the operating sound of the headlight relay five times.

FUEL INJECTION SYSTEM

EAS14B1085

TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the meter. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioning part has been completed, reset the meter display according to the reinstatement method.

Fault code No.:

Code number displayed on the meter when the engine failed to work normally.

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "DIAGNOSTIC MODE" on page 8-38.

Fault code No.	11		
Symptom	Normal signals are not received from the cylinder identification sensor.		
Fail-safe action	Engine startup: Impossible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of cylinder identification sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of ignition system sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. White/Black–White/Black Black/Blue–Black/Blue Blue–Blue	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	11		
Symptom	Normal signals are not received from the cylinder identification sensor.		
Fail-safe action	Engine startup: Impossible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Sensor installation status - Check the mounting section for loose or pinched mounting.	Incorrect installation → Reinstall or repair the sensor.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	Cylinder identification sensor malfunction	Sensor inspection procedure Refer to “CHECKING THE CYLINDER IDENTIFICATION SENSOR” on page 8-145.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

Fault code No.	12		
Symptom	Normal signals are not received from the crankshaft position sensor.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of crankshaft position sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	12		
Symptom	Normal signals are not received from the crankshaft position sensor.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Gray–Gray Black/Blue–Black/Blue	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Sensor installation status - Check the mounting section for loose or pinched mounting.	Incorrect installation → Reinstall or repair the sensor.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Crankshaft position sensor malfunction	Sensor inspection procedure Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 8-137.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

If fault codes 13 and 14 are indicated simultaneously, take the actions specified for fault code 13 first.

Fault code No.	13		
Symptom	Open or short circuit of intake air pressure sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:03		
Meter display	Displays the intake air pressure.		
Checking method	Set the engine stop switch to “○”, and then push the start switch “⊗”. (If the display value changes, the performance is OK.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of intake air pressure sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Pink/White–Pink/White Blue–Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Sensor installation status - Check the mounting section for loose or pinched mounting.	Incorrect installation → Reinstall or repair the sensor.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	13		
Symptom	Open or short circuit of intake air pressure sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:03		
Meter display	Displays the intake air pressure.		
Checking method	Set the engine stop switch to “○”, and then push the start switch “⊕”. (If the display value changes, the performance is OK.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Intake air pressure sensor malfunction	<p>Check in the diagnostic mode (Code No. 03). When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa 1000 m above sea level: Approx. 90 kPa 2000 m above sea level: Approx. 80 kPa 3000 m above sea level: Approx. 70 kPa When engine is cranking: Make sure that the indication value changes. Incorrect indication → Sensor malfunction → Replace the intake air pressure sensor. Sensor inspection procedure Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-146.</p>	<p>Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.</p>
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

If fault codes 13 and 14 are indicated simultaneously, take the actions specified for fault code 13 first.

Fault code No.	14		
Symptom	The intake air pressure sensor has failed (due to clogging of hose or sensor disconnection).		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:03		
Meter display	Displays the intake air pressure.		
Checking method	Set the engine stop switch to “○”, and then push the start switch “⊕”. (If the display value changes, the performance is OK.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	The intake air pressure sensor hose is damaged, disconnected, clogged, twisted or bent.	Repair or replace the sensor hose.	Starting the engine and operating it at idle. Fully close the throttle and check the fault recovery.
2	Intake air pressure sensor malfunction	Check in the diagnostic mode (Code No. 03). When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa 1000 m above sea level: Approx. 90 kPa 2000 m above sea level: Approx. 80 kPa 3000 m above sea level: Approx. 70 kPa When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. → Replace the intake air pressure sensor. Sensor inspection procedure Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-146.	
3	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.		15	
Symptom		Open or short circuit of throttle position sensor lead	
Fail-safe action		Engine startup: Possible under certain conditions	
		Riding: Possible under certain conditions	
Diagnostic monitoring code No.		D:01 D:13	
D:01	Meter display	Throttle position sensor signal 1 <ul style="list-style-type: none"> • 12–21 (fully closed position) • 97–106 (fully opened position) • 85–94 (fully opened position) for FRA/BEL (1KB9/1KBK) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle valve fully closed. • Check with throttle valve fully opened. 	
D:13	Meter display	Throttle position sensor signal 2 <ul style="list-style-type: none"> • 9–23 (fully closed position) • 94–108 (fully opened position) • 82–96 (fully opened position) for FRA/BEL (1KB9/1KBK) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle valve fully closed. • Check with throttle valve fully opened. 	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of throttle position sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue White–White Blue–Blue Black–Black	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Sensor installation status	Check for loose mounting, pinched mounting, or hard mounting. Make sure that the mounting position is correct. Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-19.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		15	
Symptom		Open or short circuit of throttle position sensor lead	
Fail-safe action		Engine startup: Possible under certain conditions	
		Riding: Possible under certain conditions	
Diagnostic monitoring code No.		D:01 D:13	
D:01	Meter display	Throttle position sensor signal 1 <ul style="list-style-type: none"> • 12–21 (fully closed position) • 97–106 (fully opened position) • 85–94 (fully opened position) for FRA/BEL (1KB9/1KBK) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle valve fully closed. • Check with throttle valve fully opened. 	
D:13	Meter display	Throttle position sensor signal 2 <ul style="list-style-type: none"> • 9–23 (fully closed position) • 94–108 (fully opened position) • 82–96 (fully opened position) for FRA/BEL (1KB9/1KBK) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle valve fully closed. • Check with throttle valve fully opened. 	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Supply voltage of throttle position sensor lead	Check the supply voltage. Throttle position sensor signal 1 Black/Blue–White Throttle position sensor signal 2 Black/Blue–Black Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 8-143.	
		Line disconnection points	Output voltage
		Disconnection of ground lead	5 V
		Disconnection of output line	0 V
		Disconnection of power supply line	0 V
Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.			

FUEL INJECTION SYSTEM

Fault code No.		15	
Symptom		Open or short circuit of throttle position sensor lead	
Fail-safe action		Engine startup: Possible under certain conditions	
		Riding: Possible under certain conditions	
Diagnostic monitoring code No.		D:01 D:13	
D:01	Meter display	Throttle position sensor signal 1 <ul style="list-style-type: none"> • 12–21 (fully closed position) • 97–106 (fully opened position) • 85–94 (fully opened position) for FRA/BEL (1KB9/1KBK) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle valve fully closed. • Check with throttle valve fully opened. 	
D:13	Meter display	Throttle position sensor signal 2 <ul style="list-style-type: none"> • 9–23 (fully closed position) • 94–108 (fully opened position) • 82–96 (fully opened position) for FRA/BEL (1KB9/1KBK) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle valve fully closed. • Check with throttle valve fully opened. 	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Throttle position sensor malfunction	Check the throttle position sensor signal 1 diagnostic mode (Code No. 01). When throttle is fully closed: A value of 12–21 is indicated. When throttle is fully opened: A value of 97–106 is indicated. Check the throttle position sensor signal 2 diagnostic mode (Code No. 13). When throttle is fully closed: A value of 9–23 is indicated. When throttle is fully opened: A value of 94–108 is indicated. If the indication is outside of range: Replace the throttle position sensor.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	19		
Symptom	Open or short circuit of ECU input line (Blue/Yellow lead)		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	D:20		
Meter display	Sidestand switch <ul style="list-style-type: none"> • ON (stand retracted) • OFF (stand extended) 		
Checking method	Set on/off the sidestand switch. (with the transmission in gear.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of sidestand switch coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of main switch coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Blue/Yellow–Blue/Yellow	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	19		
Symptom	Open or short circuit of ECU input line (Blue/Yellow lead)		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	D:20		
Meter display	Sidestand switch <ul style="list-style-type: none"> • ON (stand retracted) • OFF (stand extended) 		
Checking method	Set on/off the sidestand switch. (with the transmission in gear.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Sidestand switch malfunction	Diagnostic mode (Code No. 20). Sidestand retracted: ON indication Sidestand extended: OFF indication Indication is incorrect. → Replace the sidestand switch.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.		20	
Symptom		When the main switch is ON, there is a big difference in voltage value of the intake air pressure sensor and atmospheric pressure sensor	
Fail-safe action		Engine startup: Possible	
		Riding: Possible	
Diagnostic monitoring code No.		D:03 D:02	
D:03	Meter display	Displays the intake air pressure.	
	Checking method	Set the engine stop switch to “○”, and then push the start switch “⊗”. (If the display value changes, the performance is OK.)	
D:02	Meter display	Displays the atmospheric pressure.	
	Checking method	Compare the actually measured atmospheric pressure with the meter display value.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Intake air pressure sensor malfunction	<p>Check in the diagnostic mode (Code No. 03).</p> <p>When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa 3000 m above sea level: Approx. 70 kPa Incorrect indication → Sensor malfunction → Replace the intake air pressure sensor. Sensor inspection procedure Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-146.</p>	<p>Place the main switch to the ON position, and check the fault code indication.</p> <p>No fault code indicated. → Recovered.</p> <p>Fault code indicated. → Check the next step.</p>

FUEL INJECTION SYSTEM

Fault code No.		20	
Symptom		When the main switch is ON, there is a big difference in voltage value of the intake air pressure sensor and atmospheric pressure sensor	
Fail-safe action		Engine startup: Possible	
		Riding: Possible	
Diagnostic monitoring code No.		D:03 D:02	
D:03	Meter display	Displays the intake air pressure.	
	Checking method	Set the engine stop switch to “○”, and then push the start switch “⊗”. (If the display value changes, the performance is OK.)	
D:02	Meter display	Displays the atmospheric pressure.	
	Checking method	Compare the actually measured atmospheric pressure with the meter display value.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Atmospheric pressure sensor malfunction	<p>Check in the diagnostic mode (Code No. 02). When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa 3000 m above sea level: Approx. 70 kPa Incorrect indication → Sensor malfunction → Replace the atmospheric pressure sensor. Sensor inspection procedure. Refer to “CHECKING THE ATMOSPHERIC PRESSURE SENSOR” on page 8-145.</p>	<p>Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.</p>
3	ECU malfunction	Replace the ECU.	

* Check the sensor only when the engine is cold.

FUEL INJECTION SYSTEM

Fault code No.	21		
Symptom	Open or short circuit of coolant temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:06		
Meter display	When engine is cold: Displays temperature closer to air temperature When engine is hot: Displays current coolant temperature		
Checking method	Compare the actually measured coolant temperature with the meter display value.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of coolant temperature sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of primary injector sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness Black/Blue–Black/Blue Green/White–Green/White	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Installation status of coolant temperature sensor	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	21		
Symptom	Open or short circuit of coolant temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:06		
Meter display	When engine is cold: Displays temperature closer to air temperature When engine is hot: Displays current coolant temperature		
Checking method	Compare the actually measured coolant temperature with the meter display value.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Coolant temperature sensor malfunction	Check in the diagnostic mode (Code No. 06). During cold starting: A temperature close to the ambient temperature is indicated. Indication is incorrect. → Replace the coolant temperature sensor.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

* Check the sensor only when the engine is cold.

Fault code No.	22		
Symptom	Open or short circuit of intake air temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:05		
Meter display	When engine is cold: Displays temperature closer to air temperature When engine is hot: Air temperature + approx. 20 °C (68 °F)		
Checking method	Compare the actually measured intake air temperature with the meter display value.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of intake air temperature sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	22		
Symptom	Open or short circuit of intake air temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:05		
Meter display	When engine is cold: Displays temperature closer to air temperature When engine is hot: Air temperature + approx. 20 °C (68 °F)		
Checking method	Compare the actually measured intake air temperature with the meter display value.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Brown/White–Brown/White	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Installation status of intake air temperature sensor	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Intake air temperature sensor malfunction	Check in the diagnostic mode (Code No. 05). Sensor inspection procedure Refer to “CHECKING THE INTAKE AIR TEMPERATURE SENSOR” on page 8-146. During cold starting: A temperature close to the ambient temperature is indicated. Indication is incorrect. → Replace the intake air temperature sensor.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU	

FUEL INJECTION SYSTEM

Fault code No.	23		
Symptom	Open or short circuit of atmospheric pressure sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:02		
Meter display	Displays the atmospheric pressure.		
Checking method	Compare the actually measured atmospheric pressure with the meter display value.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of atmospheric pressure sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Pink–Pink Blue–Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	23		
Symptom	Open or short circuit of atmospheric pressure sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:02		
Meter display	Displays the atmospheric pressure.		
Checking method	Compare the actually measured atmospheric pressure with the meter display value.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Atmospheric pressure sensor malfunction	Check in the diagnostic mode (Code No. 02). Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa 1000 m above sea level: Approx. 90 kPa 2000 m above sea level: Approx. 80 kPa 3000 m above sea level: Approx. 70 kPa Incorrect indication → Sensor malfunction → Replace the atmospheric pressure sensor. Sensor inspection procedure Refer to "CHECKING THE ATMOSPHERIC PRESSURE SENSOR" on page 8-145.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	24		
Symptom	The O₂ sensor does not operate.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	O ₂ sensor installation status	Check the sensor for a loose mounting or a pinch	Either start and warm up the engine, and then racing it, or reset it with diagnostic code 63. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of O ₂ sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Either start and warm up the engine, and then racing it, or reset it with diagnostic code 63. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Either start and warm up the engine, and then racing it, or reset it with diagnostic code 63. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Black/Blue–Black/Blue Pink/Black–Pink/Black Red/Blue–Red/Blue Gray/Green–Gray/Green	Either start and warm up the engine, and then racing it, or reset it with diagnostic code 63. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Check the fuel line pressure.	Refer to “CHECKING THE FUEL LINE PRESSURE” on page 7-18.	Either start and warm up the engine, and then racing it, or reset it with diagnostic code 63. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	24		
Symptom	The O₂ sensor does not operate.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	O ₂ sensor malfunction	Check the O ₂ sensor for an abnormality. Refer to "ENGINE REMOVAL" on page 5-3. O ₂ sensor malfunction → Replace the O ₂ sensor	Either start and warm up the engine, and then racing it, or reset it with diagnostic code 63. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

Fault code No.	30		
Symptom	Turnover of vehicle		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	D:08		
Meter display	Lean angle sensor • 0.4–1.4 (upright) • 3.7–4.4 (overturned)		
Checking method	Remove the lean angle sensor and incline it more than 45 degrees.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Turnover of vehicle	Raise the vehicle to the upright position	Place the main switch to the ON position. (however, the engine cannot be restarted unless the main switch is first turned OFF) No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Sensor installation status	Check for a loose mounting, pinched mounting, or sensor mounting direction (up or down). Make sure that the mounting position is correct.	Place the main switch to the ON position. (however, the engine cannot be restarted unless the main switch is first turned OFF) No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	30		
Symptom	Turnover of vehicle		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	D:08		
Meter display	Lean angle sensor • 0.4–1.4 (upright) • 3.7–4.4 (overturned)		
Checking method	Remove the lean angle sensor and incline it more than 45 degrees.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
3	Lean angle sensor malfunction	Diagnostic mode (Code No. 08). Sensor inspection procedure Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-138. In vertical position: 0.4–1.4 V When turned over: 3.7–4.4 V Indication is incorrect. → Replace the lean angle sensor.	Place the main switch to the ON position. (however, the engine cannot be restarted unless the main switch is first turned OFF) No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	ECU malfunction	Replace the ECU.	

Fault code No.	33		
Symptom	Ignition coil #1 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:30		
Meter display	Actuates the cylinder-#1 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ignition coil coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	33		
Symptom	Ignition coil #1 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:30		
Meter display	Actuates the cylinder-#1 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of ignition system sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Orange–Orange	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Ignition coil installation status	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	33		
Symptom	Ignition coil #1 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:30		
Meter display	Actuates the cylinder-#1 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Ignition coil malfunction (Check the resistance of ignition coil #1.)	Refer to "CHECKING THE IGNITION COILS" on page 8-136. Ignition coil inspection method	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Check in the diagnostic mode (Code No. 30). If not ignited, replace the defective ECU.	

Fault code No.	34		
Symptom	Ignition coil #2 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:31		
Meter display	Actuates the cylinder-#2 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ignition coil coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	34		
Symptom	Ignition coil #2 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:31		
Meter display	Actuates the cylinder-#2 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of ignition system sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Gray/Red-Gray/Red	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Ignition coil installation status	Check the connection of the coupler is secure. Make sure that the mounting position is correct.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	34		
Symptom	Ignition coil #2 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:31		
Meter display	Actuates the cylinder-#2 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Ignition coil malfunction (Check the resistance of ignition coil #2.)	Refer to "CHECKING THE IGNITION COILS" on page 8-136. Ignition coil inspection method	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Check in the diagnostic mode (Code No. 31). If not ignited, replace the defective ECU.	

Fault code No.	35		
Symptom	Ignition coil #3 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:32		
Meter display	Actuates the cylinder-#3 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ignition coil coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	35		
Symptom	Ignition coil #3 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:32		
Meter display	Actuates the cylinder-#3 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of ignition system sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Orange/Green–Orange/Green	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Ignition coil installation status	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	35		
Symptom	Ignition coil #3 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:32		
Meter display	Actuates the cylinder-#3 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Ignition coil malfunction (Check the resistance of ignition coil #3.)	Refer to "CHECKING THE IGNITION COILS" on page 8-136. Ignition coil inspection method	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Check in the diagnostic mode (Code No. 32). If not ignited, replace the defective ECU.	

Fault code No.	36		
Symptom	Ignition coil #4 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:33		
Meter display	Actuates the cylinder-#4 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ignition coil coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	36		
Symptom	Ignition coil #4 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:33		
Meter display	Actuates the cylinder-#4 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of ignition system sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Gray/Green–Gray/Green	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Ignition coil installation status	Check the connection of the coupler is secure. Make sure that the mounting position is correct.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	36		
Symptom	Ignition coil #4 primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	D:33		
Meter display	Actuates the cylinder-#4 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.		
Checking method	Check the spark five times. • Connect an ignition checker.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Ignition coil malfunction (Check the resistance of ignition coil #4.)	Refer to "CHECKING THE IGNITION COILS" on page 8-136. Ignition coil inspection method	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Check in the diagnostic mode (Code No. 33). If not ignited, replace the defective ECU.	

FUEL INJECTION SYSTEM

Fault code No.		39	
Symptom		Open or short circuit of primary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:36 D:37 D:38 D:39	
D:36	Actuator operation	Actuates the primary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #1 five times.	
D:37	Actuator operation	Actuates the primary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #2 five times.	
D:38	Actuator operation	Actuates the primary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #3 five times.	
D:39	Actuator operation	Actuates the primary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Locate the malfunction	Check in the diagnostic mode (Code No. 36, 37, 38, 39). Refer to "CHECKING THE FUEL INJECTORS" on page 8-148.	—
2	Connection of primary injector coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine and let it idle for approximately 5 seconds, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Primary injector malfunction	Refer to "CHECKING THE FUEL INJECTORS" on page 8-148. Fuel injection inspection method.	Start the engine and let it idle for approximately 5 seconds, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		39	
Symptom		Open or short circuit of primary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:36 D:37 D:38 D:39	
D:36	Actuator operation	Actuates the primary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #1 five times.	
D:37	Actuator operation	Actuates the primary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #2 five times.	
D:38	Actuator operation	Actuates the primary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #3 five times.	
D:39	Actuator operation	Actuates the primary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine and let it idle for approximately 5 seconds, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Connection of primary injector sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking)	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine and let it idle for approximately 5 seconds, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		39	
Symptom		Open or short circuit of primary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:36 D:37 D:38 D:39	
D:36	Actuator operation	Actuates the primary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #1 five times.	
D:37	Actuator operation	Actuates the primary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #2 five times.	
D:38	Actuator operation	Actuates the primary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #3 five times.	
D:39	Actuator operation	Actuates the primary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the primary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Continuity of wire harness	Open or short circuit → Replace the wire harness. Primary injector #1 Red/Blue–Red/Blue Red/Black–Red/Black Primary injector #2 Red/Blue–Red/Blue Green/Black–Green/Black Primary injector #3 Red/Blue–Red/Blue Blue/Black–Blue/Black Primary injector #4 Red/Blue–Red/Blue Orange/Black–Orange/Black	Start the engine and let it idle for approximately 5 seconds, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.		40	
Symptom		Open or short circuit of secondary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:40 D:41 D:42 D:43	
D:40	Actuator operation	Actuates the secondary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #1 five times.	
D:41	Actuator operation	Actuates the secondary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #2 five times.	
D:42	Actuator operation	Actuates the secondary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #3 five times.	
D:43	Actuator operation	Actuates the secondary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Locate the malfunction	Check in the diagnostic mode (Code No. 40, 41, 42, 43). Refer to "CHECKING THE FUEL INJECTORS" on page 8-148.	—
2	Connection of secondary injector coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Check the injector's operating noise by the diagnostic mode (Code No.40–43). Injector's operating noise → Reset with the diagnostic code 63. Recovered. No injector's operating noise → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		40	
Symptom		Open or short circuit of secondary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:40 D:41 D:42 D:43	
D:40	Actuator operation	Actuates the secondary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #1 five times.	
D:41	Actuator operation	Actuates the secondary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #2 five times.	
D:42	Actuator operation	Actuates the secondary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #3 five times.	
D:43	Actuator operation	Actuates the secondary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
3	Secondary injector malfunction	Refer to "CHECKING THE FUEL INJECTORS" on page 8-148. Fuel injection inspection method.	Check the injector's operating noise by the diagnostic mode (Code No.40-43). Injector's operating noise → Reset with the diagnostic code 63. Recovered. No injector's operating noise → Check the next step.
4	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Check the injector's operating noise by the diagnostic mode (Code No.40-43). Injector's operating noise → Reset with the diagnostic code 63. Recovered. No injector's operating noise → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		40	
Symptom		Open or short circuit of secondary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:40 D:41 D:42 D:43	
D:40	Actuator operation	Actuates the secondary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #1 five times.	
D:41	Actuator operation	Actuates the secondary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #2 five times.	
D:42	Actuator operation	Actuates the secondary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #3 five times.	
D:43	Actuator operation	Actuates the secondary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Connection of secondary injector sub-wire harness coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking)	Poor connection → Connect it securely, or repair/replace the wire harness.	Check the injector's operating noise by the diagnostic mode (Code No.40–43). Injector's operating noise → Reset with the diagnostic code 63. Recovered. No injector's operating noise → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		40	
Symptom		Open or short circuit of secondary injector lead	
Fail-safe action		Engine startup: Possible (depending on the number of failed cylinders)	
		Riding: Possible (depending on the number of failed cylinders)	
Diagnostic monitoring code No.		D:40 D:41 D:42 D:43	
D:40	Actuator operation	Actuates the secondary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #1 five times.	
D:41	Actuator operation	Actuates the secondary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #2 five times.	
D:42	Actuator operation	Actuates the secondary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #3 five times.	
D:43	Actuator operation	Actuates the secondary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Checking method	Check the operating sound of the secondary injector #4 five times.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Continuity of wire harness	Open or short circuit → Replace the wire harness. Secondary injector #1 Red/Blue–Red/Blue White/Blue–White/Blue Secondary injector #2 Red/Blue–Red/Blue Sky blue/White–Sky blue/ White Secondary injector #3 Red/Blue–Red/Blue Brown/Yellow–Brown/Yellow Secondary injector #4 Red/Blue–Red/Blue Brown/Black–Brown/Black	Check the injector's operating noise by the diagnostic mode (Code No.40–43). Injector's operating noise → Reset with the diagnostic code 63. Recovered. No injector's operating noise → Check the next step.
7	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	41		
Symptom	Open or short circuit of lean angle sensor lead		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	D:08		
Meter display	Lean angle sensor <ul style="list-style-type: none"> • 0.4–1.4 (upright) • 3.7–4.4 (overtuned) 		
Checking method	Remove the lean angle sensor and incline more than 45 degrees.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of lean angle sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the harness.	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Yellow/Green–Yellow/Green Blue–Blue	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	41		
Symptom	Open or short circuit of lean angle sensor lead		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	D:08		
Meter display	Lean angle sensor • 0.4–1.4 (upright) • 3.7–4.4 (overturned)		
Checking method	Remove the lean angle sensor and incline more than 45 degrees.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Lean angle sensor malfunction	Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-138.	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.		42
Symptom		A. Normal signals are not received from the rear speed sensor.
		B. Open or short circuit of gear position sensor lead
		C. Normal signals are not received from the clutch switch.
A	Fail-safe action	Engine startup: Possible Riding: Possible
	Diagnostic monitoring code No.	D:07 (Rear speed sensor)
	Meter display	Vehicle speed pulses: 0–999
	Checking method	Make sure that the indication value increases when the rotation speed of the rear wheel increases. This value is cumulative and is not reset each time the wheel is prevented from rotating.
B	Fail-safe action	Engine startup: Possible Riding: Possible
	Diagnostic monitoring code No.	D:21 (Gear position sensor)
	Meter display	Gear position switch • ON (neutral) • OFF (in gear)
	Checking method	Shift the transmission and clutch lever.
C	Fail-safe action	Engine startup: Possible Riding: Possible
	Diagnostic monitoring code No.	D:21 (Clutch switch)
	Meter display	ON (Gear is in other than neutral, operating clutch and storing sidestand.) OFF (Gear is in other than neutral, operating clutch and using sidestand.)
	Checking method	Shift the transmission, clutch lever and sidestand.
	Checkpoints	Inspection method
	Locate the malfunction.	Check in the diagnostic mode (Code No. 07). Rotate the rear wheel and make sure that the indication value increases. Malfunction → Go to the “Rear speed sensor system malfunction” section below. Check in the diagnostic mode (Code No. 21). When the gear is in neutral position: ON indication When the gear is not in neutral position: OFF indication Malfunction → Go to the “Gear position sensor system malfunction” section below.

FUEL INJECTION SYSTEM**A. Rear speed sensor system malfunction**

	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of rear speed sensor (meter) coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Blue–Blue White/Yellow–White/Yellow	Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Rear speed sensor malfunction Refer to “CHECKING THE REAR SPEED SENSOR” on page 8-141.	Replace the rear speed sensor.	Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Malfunction of the ECU or speedometer.	Replacement of the ECU or speedometer.	

FUEL INJECTION SYSTEM

B. Gear position sensor system malfunction

	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of gear position sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Reconnect or repair the coupler.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of wire harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Reconnect or repair the coupler.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of leads between gear position sensor and relay unit coupler	Open short circuit → Replace the wire harness. Sky blue–Sky blue	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Gear position sensor malfunction Refer to “CHECKING THE GEAR POSITION SENSOR” on page 8-147.	Replace the gear position sensor.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Shift drum (that detects the neutral position) malfunction	Check the gear shift drum (that detects the neutral position). Refer to "CHECKING THE SHIFT DRUM ASSEMBLY" on page 5-96. Malfunction → Replace the shift drum.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	Malfunction of the ECU or speedometer.	Replacement of the ECU or speedometer.	

C. Clutch switch system malfunction

	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Adjusting the clutch lever free play	Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" on page 3-14.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of clutch switch coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Reconnect or repair the coupler.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Continuity of wire harness	Open short circuit → Replace the wire harness. Black/Yellow–Black/Yellow Blue/Yellow–Blue/Yellow	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Clutch switch malfunction	Check the clutch switch. Refer to “CHECKING THE SWITCHES” on page 8-125.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	Malfunction of the ECU or speedometer.	Replacement of the ECU or speedometer.	

Fault code No.	43		
Symptom	Incorrect voltage supplied to the fuel injector and fuel pump		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:50		
Meter display	Approximately 12.0		
Checking method	Set the engine stop switch to “○”, and then compare with the actually measured battery voltage. (If the battery voltage is lower, perform recharging.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of relay unit coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 30 seconds. Then, check the fault code indication. No fault indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	43		
Symptom	Incorrect voltage supplied to the fuel injector and fuel pump		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:50		
Meter display	Approximately 12.0		
Checking method	Set the engine stop switch to “○”, and then compare with the actually measured battery voltage. (If the battery voltage is lower, perform recharging.)		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 30 seconds. Then, check the fault code indication. No fault indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness between the battery, relay unit, ECU and fuel injectors coupler	Open or short circuit → Replace the wire harness. Red-Red Red/Blue-Red/Blue	Start and idle the engine for approximately 30 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Fuel injection system relay malfunction	Check in the diagnostic mode (Code No. 50). No operation sound of fuel injection system relay is heard. → Replace the relay unit.	Start and idle the engine for approximately 30 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	44		
Symptom	An error is detected while reading or writing on EEP-ROM		
Fail-safe action	Engine startup: Under certain conditions		
	Riding: Under certain conditions		
Diagnostic monitoring code No.	D:60		
Meter display	<p>The in self diagnostic code 44 detected EEP-ROM errors are indicated.</p> <p>If there are multiple errors, they are indicated in 2 seconds intervals</p> <p>00 indication: Normal status</p> <p>01 indication: CO concentration adjusted for cylinder #1</p> <p>02 indication: CO concentration adjusted for cylinder #2</p> <p>03 indication: CO concentration adjusted for cylinder #3</p> <p>04 indication: CO concentration adjusted for cylinder #4</p>		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Locate the malfunction.	Diagnostic mode (Code No. 60) 00 indication: Check number 6. 01 indication: Check number 2. 02 indication: Check number 3. 03 indication: Check number 4. 04 indication: Check number 5.	—
2	“01” is indicated in Diagnostic mode (Code No. 60) EEP-ROM data error for adjustment of CO concentration of cylinder #1	Change the CO concentration of cylinder #1, and rewrite in EEP-ROM. After this adjustment is made, the memory is not recovered when the main switch is turned OFF and ON again. → Replace the ECU.	Place the main switch to the ON position. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	“02” is indicated in Diagnostic mode (Code No. 60) EEP-ROM data error for adjustment of CO concentration of cylinder #2	Change the CO concentration of cylinder #2, and rewrite in EEP-ROM. After this adjustment is made, the memory is not recovered when the main switch is turned OFF and ON again. → Replace the ECU.	Place the main switch to the ON position. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	44		
Symptom	An error is detected while reading or writing on EEP-ROM		
Fail-safe action	Engine startup: Under certain conditions		
	Riding: Under certain conditions		
Diagnostic monitoring code No.	D:60		
Meter display	<p>The in self diagnostic code 44 detected EEP-ROM errors are indicated.</p> <p>If there are multiple errors, they are indicated in 2 seconds intervals</p> <p>00 indication: Normal status</p> <p>01 indication: CO concentration adjusted for cylinder #1</p> <p>02 indication: CO concentration adjusted for cylinder #2</p> <p>03 indication: CO concentration adjusted for cylinder #3</p> <p>04 indication: CO concentration adjusted for cylinder #4</p>		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	<p>“03” is indicated in Diagnostic mode (Code No. 60)</p> <p>EEP-ROM data error for adjustment of CO concentration of cylinder #3</p>	<p>Change the CO concentration of cylinder #3, and rewrite in EEP-ROM.</p> <p>After this adjustment is made, the memory is not recovered when the main switch is turned OFF and ON again. → Replace the ECU.</p>	<p>Place the main switch to the ON position.</p> <p>Then, check the fault code indication.</p> <p>No fault code indicated. → Recovered.</p> <p>Fault code indicated. → Check the next step.</p>
5	<p>“04” is indicated in Diagnostic mode (Code No. 60)</p> <p>EEP-ROM data error for adjustment of CO concentration of cylinder #4</p>	<p>Change the CO concentration of cylinder #4, and rewrite in EEP-ROM.</p> <p>After this adjustment is made, the memory is not recovered when the main switch is turned OFF and ON again. → Replace the ECU.</p>	<p>Place the main switch to the ON position.</p> <p>Then, check the fault code indication.</p> <p>No fault code indicated. → Recovered.</p> <p>Fault code indicated. → Check the next step.</p>
6	ECU malfunction	Replace the ECU	

FUEL INJECTION SYSTEM

Fault code No.	46		
Symptom	Incorrect voltage is supplied to the ECU.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Continuity of wire harness	Open or short circuit → Replace the wire harness. Between the battery and main switch Red–Red Between the main switch and ignition fuse Brown/Blue–Brown/Blue Between the ignition fuse and ECU Red/White–Red/White	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Battery malfunction	Check the battery voltage. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-129. Battery malfunction → Recharge or replace the battery.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Stator coil malfunction	Check the stator coil output. Refer to “CHECKING THE STATOR COIL” on page 8-139. Stator coil malfunction → Replace the stator coil.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	50		
Symptom	ECU memory malfunction		
Fail-safe action	Engine startup: Under certain conditions		
	Riding: Under certain conditions		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	ECU malfunction	Replace the ECU.	Place the main switch to the ON position. Then, check that no fault code indicated.

Fault code No.	59		
Symptom	Open or short circuit of accelerator position sensor lead		
Fail-safe action	Engine startup: Possible under certain conditions		
	Riding: Possible under certain conditions		
Diagnostic monitoring code No.	D:14 D:15		
D:14	Meter display	Accelerator position sensor signal 1 • 12–22 (fully closed position) • 97–107 (fully opened position)	
	Checking method	• Check with throttle grip fully closed. • Check with throttle grip fully open.	
D:15	Meter display	Accelerator position sensor signal 2 • 10–24 (fully closed position) • 95–109 (fully opened position)	
	Checking method	• Check with throttle grip fully closed. • Check with throttle grip fully open.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of accelerator position sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		59	
Symptom		Open or short circuit of accelerator position sensor lead	
Fail-safe action		Engine startup: Possible under certain conditions	
		Riding: Possible under certain conditions	
Diagnostic monitoring code No.		D:14 D:15	
D:14	Meter display	Accelerator position sensor signal 1 • 12–22 (fully closed position) • 97–107 (fully opened position)	
	Checking method	• Check with throttle grip fully closed. • Check with throttle grip fully open.	
D:15	Meter display	Accelerator position sensor signal 2 • 10–24 (fully closed position) • 95–109 (fully opened position)	
	Checking method	• Check with throttle grip fully closed. • Check with throttle grip fully open.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue White–White Blue–Blue Black–Black	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Sensor installation status	Check for loose mounting, pinched mounting, or hard mounting. Make sure that the mounting position is correct. Refer to “ADJUSTING THE ACCELERATOR POSITION SENSOR” on page 7-19.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.		59	
Symptom		Open or short circuit of accelerator position sensor lead	
Fail-safe action		Engine startup: Possible under certain conditions	
		Riding: Possible under certain conditions	
Diagnostic monitoring code No.		D:14 D:15	
D:14	Meter display	Accelerator position sensor signal 1 <ul style="list-style-type: none"> • 12–22 (fully closed position) • 97–107 (fully opened position) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle grip fully closed. • Check with throttle grip fully open. 	
D:15	Meter display	Accelerator position sensor signal 2 <ul style="list-style-type: none"> • 10–24 (fully closed position) • 95–109 (fully opened position) 	
	Checking method	<ul style="list-style-type: none"> • Check with throttle grip fully closed. • Check with throttle grip fully open. 	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Supply voltage of accelerator position sensor lead	Check the supply voltage. Accelerator position sensor signal 1 Black/Blue–White Accelerator position sensor signal 2 Black/Blue–Black Refer to “CHECKING THE ACCELERATOR POSITION SENSOR” on page 8-143.	
		Line disconnection points	Output voltage
		Disconnection of ground lead	5 V
		Disconnection of output line	0 V
		Disconnection of power supply line	0 V
Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.			

FUEL INJECTION SYSTEM

Fault code No.		59	
Symptom		Open or short circuit of accelerator position sensor lead	
Fail-safe action		Engine startup: Possible under certain conditions	
		Riding: Possible under certain conditions	
Diagnostic monitoring code No.		D:14 D:15	
D:14	Meter display	Accelerator position sensor signal 1 • 12–22 (fully closed position) • 97–107 (fully opened position)	
	Checking method	• Check with throttle grip fully closed. • Check with throttle grip fully open.	
D:15	Meter display	Accelerator position sensor signal 2 • 10–24 (fully closed position) • 95–109 (fully opened position)	
	Checking method	• Check with throttle grip fully closed. • Check with throttle grip fully open.	
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Accelerator position sensor malfunction	Check the accelerator position sensor signal 1 diagnostic mode (Code No. 14). When throttle is fully closed: A value of 12–22 is indicated. When throttle is fully opened: A value of 97–107 is indicated. Check the accelerator position sensor signal 2 diagnostic mode (Code No. 15). When throttle is fully closed: A value of 10–24 is indicated. When throttle is fully opened: A value of 95–109 is indicated. If the indication is outside of range: Replace the accelerator position sensor.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	60		
Symptom	Defect Found in YCC-T Drive		
Fail-safe action	Engine startup: Possible under certain conditions		
	Riding: Possible under certain conditions		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of throttle servo motor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or replace the harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Check the ETV (Electronic Throttle Valve) fuse.	Abnormality → Replace the ETV (Electronic Throttle Valve) fuse.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Light green/Red–Light green/Red Yellow/Red–Yellow/Red	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Throttle servo motor malfunction	Refer to “CHECKING THE THROTTLE SERVO MOTOR” on page 8-144. Throttle servo motor malfunction → Replace the throttle body.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	60		
Symptom	Defect Found in YCC-T Drive		
Fail-safe action	Engine startup: Possible under certain conditions		
	Riding: Possible under certain conditions		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	Throttle body malfunction	Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-19. Throttle body malfunction → Replace the throttle body.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
7	ECU malfunction	Replace the ECU.	

Fault code No.	66		
Symptom	Open or short circuit of steering damper solenoid lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:47		
Meter display	The steering damper warning light lights up.		
Checking method	The engine warning light flashes according to the ON/OFF switching.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of steering damper solenoid coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or replace the harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	66		
Symptom	Open or short circuit of steering damper solenoid lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	D:47		
Meter display	The steering damper warning light lights up.		
Checking method	The engine warning light flashes according to the ON/OFF switching.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
3	Check the steering damper fuse.	Abnormality → Replace the steering damper fuse.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. Red/White–Red/White Violet–Violet	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Steering damper solenoid malfunction	Refer to “CHECKING THE STEERING DAMPER SOLENOID” on page 8-147.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	69		
Item	Normal signals are not received from the front speed sensor.		
Fail-safe system	Engine startup: Possible		
	Riding: Possible		
Diagnostic code No.	D:16		
Meter display	Vehicle speed pulses: 0–999		
Checking method	Make sure that the indication value increases when the rotation speed of the front wheel increases. This value is cumulative and is not reset each time the wheel is prevented from rotating.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	<p>Connection of front speed sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).</p>	<p>Poor connection → Connect it securely, or repair/replace the wire harness.</p>	<p>Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.</p>
2	<p>Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).</p>	<p>Poor connection → Connect it securely, or repair/replace the wire harness.</p>	<p>Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.</p>
3	<p>Continuity of wire harness</p>	<p>Open or short circuit → Replace the wire harness. Gray–Gray White–White</p>	<p>Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.</p>

FUEL INJECTION SYSTEM

Fault code No.	69		
Item	Normal signals are not received from the front speed sensor.		
Fail-safe system	Engine startup: Possible		
	Riding: Possible		
Diagnostic code No.	D:16		
Meter display	Vehicle speed pulses: 0–999		
Checking method	Make sure that the indication value increases when the rotation speed of the front wheel increases. This value is cumulative and is not reset each time the wheel is prevented from rotating.		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Front speed sensor malfunction Refer to “MAINTENANCE OF THE FRONT SPEED SENSOR AND SENSOR ROTOR” on page 4-20 and “INSTALLING THE FRONT WHEEL (FRONT BRAKE DISCS)” on page 4-23.	Replace the front speed sensor.	Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h). Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

Fault code No.	70		
Symptom	Engine has been left idling. (The ECU automatically stops the engine after 20 minutes if it is left idling.)		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
	Engine idling stop		

FUEL INJECTION SYSTEM

Fault code No.	Er-1		
Symptom	No signal is received from the ECU.		
Fail-safe action	Engine startup: Possible, Impossible if ECU Failure		
	Riding: Possible, Impossible if ECU Failure		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue–Yellow/Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Abnormal meter unit operation	Replace the meter unit.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU	

FUEL INJECTION SYSTEM

Fault code No.	Er-2		
Symptom	No signal is sent from ECU.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue–Yellow/Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Abnormal meter unit operation	Replace the meter unit.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	Er-3		
Symptom	Correct data cannot be received from the ECU.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue–Yellow/Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Abnormal meter unit operation	Replace the meter unit.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

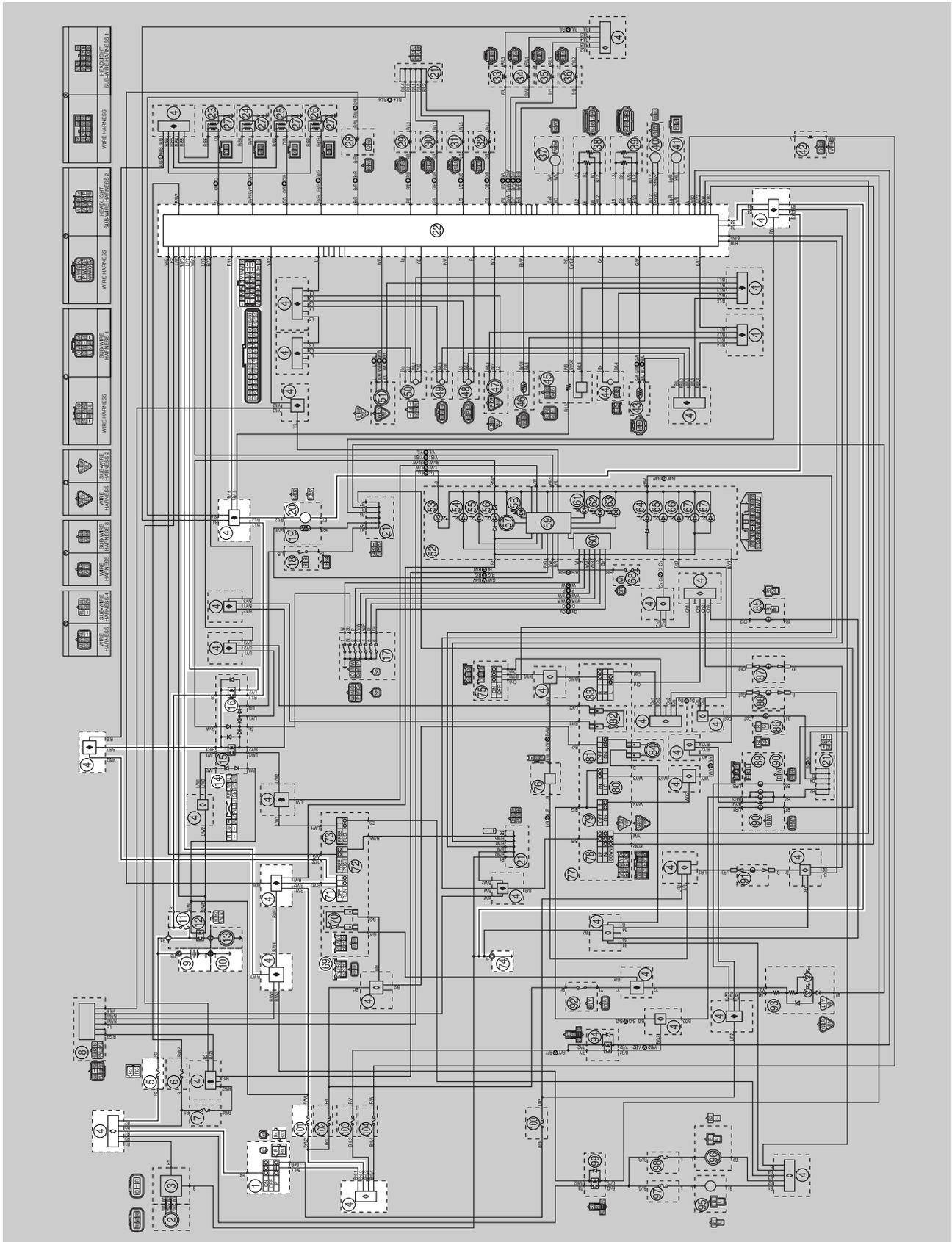
Fault code No.	Er-4		
Symptom	No registration data can be received from the meter unit.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue–Yellow/Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Abnormal meter unit operation	Replace the meter unit.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

FUEL PUMP SYSTEM

EAS27550 FUEL PUMP SYSTEM

EAS27560 CIRCUIT DIAGRAM



FUEL PUMP SYSTEM

- 1. Main switch
- 4. Joint
- 5. Main fuse
- 9. Battery
- 10. Engine ground
- 11. Fuel injection system fuse
- 14. Relay unit
- 16. Fuel pump relay
- 20. Fuel pump
- 22. ECU (engine control unit)
- 69. Right handlebar switch
- 71. Engine stop switch
- 74. Engine ground
- 101. Ignition fuse

FUEL PUMP SYSTEM

EAS27570

TROUBLESHOOTING

If the fuel pump fails to operate.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Passenger seat
4. Left side cowling

<p>1. Check the fuses. (Main, ignition and fuel injection system) Refer to "CHECKING THE FUSES" on page 8-129.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.</p>	NG→	<ul style="list-style-type: none"> Clean the battery terminals. Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		
<p>4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-125.</p>	NG→	<p>Replace the right handlebar switch.</p>
OK↓		
<p>5. Check the relay unit (fuel pump relay). Refer to "CHECKING THE RELAYS" on page 8-133.</p>	NG→	<p>Replace the relay unit.</p>
OK↓		
<p>6. Check the fuel pump. Refer to "CHECKING THE FUEL LINE PRESSURE" on page 7-18.</p>	NG→	<p>Replace the fuel pump.</p>
OK↓		

FUEL PUMP SYSTEM

7. Check the entire fuel pump system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-107.

OK↓

Replace the ECU.

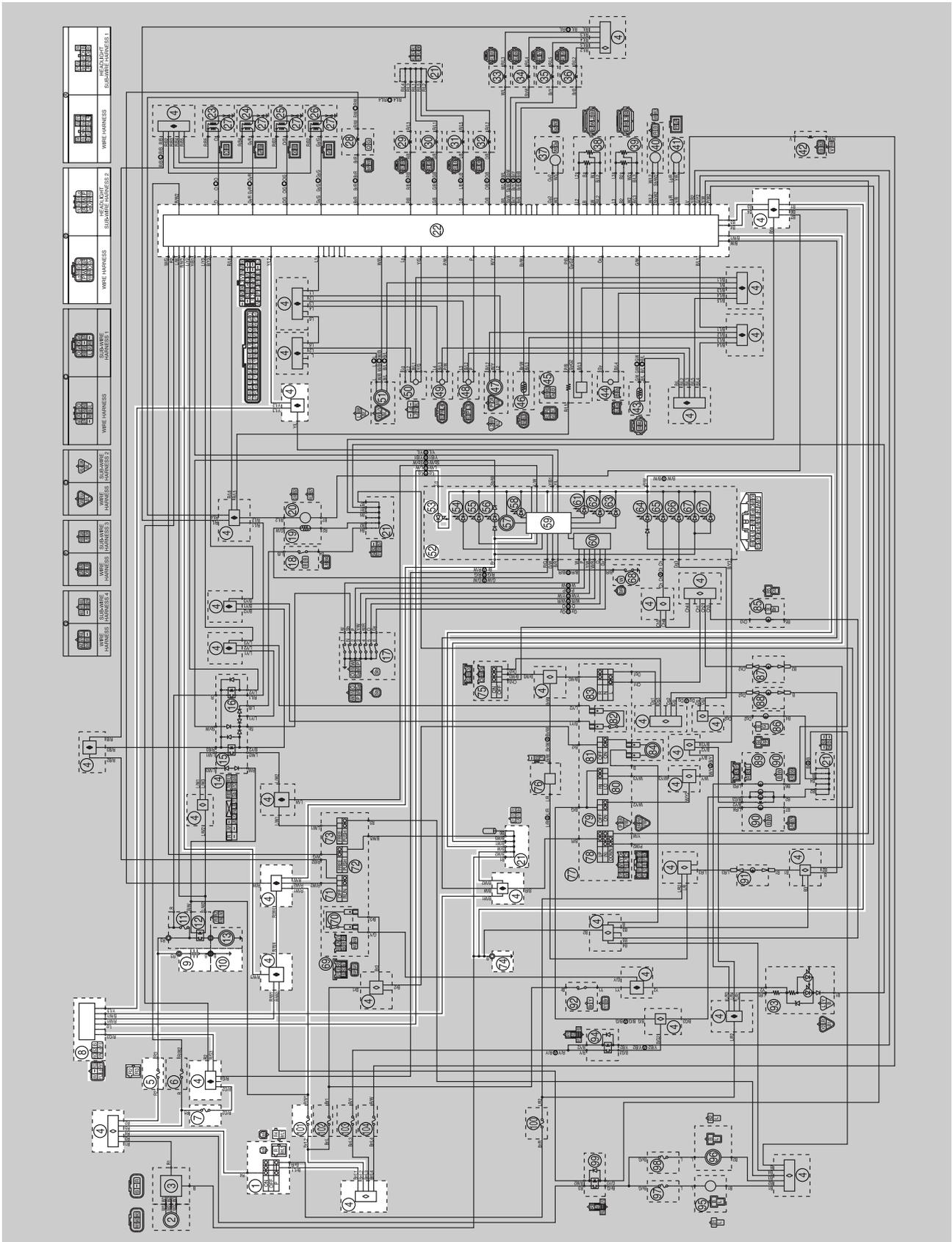
NG→

Properly connect or repair the fuel pump system's wiring.

IMMOBILIZER SYSTEM

EAS27640 IMMOBILIZER SYSTEM

EAS27650 CIRCUIT DIAGRAM



IMMOBILIZER SYSTEM

- 1. Main switch
- 4. Joint
- 5. Main fuse
- 7. Backup fuse
- 8. Immobilizer unit
- 9. Battery
- 10.Engine ground
- 21.Joint coupler
- 22.ECU (engine control unit)
- 52.Meter assembly
- 53.Immobilizer system indicator light
- 59.Multi-function meter
- 74.Engine ground
- 101.Ignition fuse

IMMOBILIZER SYSTEM

EAS27671

GENERAL INFORMATION

This vehicle is equipped with an immobilizer system to help prevent theft by re-registering codes in the standard keys. This system consists of the following:

- A code re-registering key (with a red bow)
- Two standard keys (with a black bow) that can be re-registered with new codes
- A transponder (installed in the red key bow)
- An immobilizer unit
- The ECU
- An immobilizer system indicator light

The key with the red bow is used to register codes in each standard key. Do not use the key with the red bow for driving. It should only be used for re-registering new codes in the standard keys. The immobilizer system cannot be operated with a new key until the key registered with a code. If you lose the code re-registering key, the ECU and main switch (equipped with the immobilizer unit) need to be replaced.

Therefore, always use a standard key for driving. (See caution below.)

TIP

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

ECA14971

NOTICE

- **DO NOT LOSE THE CODE RE-REGISTERING KEY!** If the code re-registering key is lost, registering new codes in the standard keys is impossible. The standard keys can still be used to start the vehicle. However, if code re-registering is required (e.g., if a new standard key is made or all keys are lost) the entire immobilizer system must be replaced. Therefore, it is highly recommended to use either standard key for driving, and to keep the code re-registering key in a safe place.
 - Do not submerge the keys in water.
 - Do not expose the keys to excessively high temperatures.
 - Do not place the keys close to magnets (this includes, but is not limited to, products such as speakers, etc.).
 - Do not place heavy items on the keys.
 - Do not grind the keys or alter their shape.
 - Do not disassemble the key bows.
 - Do not put two keys of any immobilizer system on the same key ring.
 - Keep the standard keys as well as other immobilizer system keys away from the code re-registering key.
 - Keep other immobilizer system keys away from the main switch as they may cause signal interference.
-

IMMOBILIZER SYSTEM

EAS27691

PART REPLACEMENT AND KEY CODE REGISTRATION REQUIREMENTS

In the course of use, you may encounter the following cases where replacement of parts and registration of code re-registering/standard keys are required.

TIP

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

	Parts to be replaced					Key registration requirement
	Main switch/ immobilizer unit		Standard key	ECU	Acces- sory lock* and key	
	Main switch	Immobi- lizer unit				
Standard key is lost			√			New standard key
All keys have been lost (including code re-registering key)	√		√	√	√	Code re-registering key and standard keys
ECU is defective				√		Code re-registering key and standard keys
Immobilizer unit is defective		√				Code re-registering key and standard keys
Main switch is defective	√		√	√	√	Code re-registering key and standard keys
Accessory lock* is defective					√	Not required

* Accessory locks mean the seat lock and fuel tank cap.

Code re-registering key registration:

When the immobilizer unit or ECU is replaced, the code re-registering key must be registered to the unit.

To register a code re-registering key:

1. Turn the main switch to "ON" with the code re-registering key.

TIP

Check that the immobilizer system indicator light comes on for one second, then goes off. When the immobilizer system indicator light goes off, the code re-registering key has been registered.

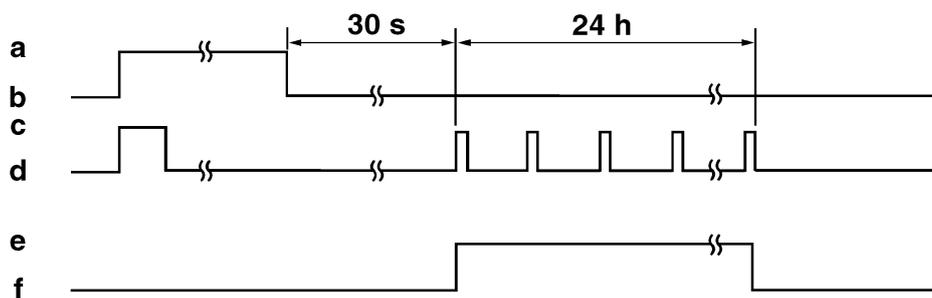
2. Check that the engine can be started.
3. Register the standard key, following the instructions in the section below.

Standby mode:

To enable the immobilizer system, turn the ignition key to "OFF". 30 seconds later, the indicator light will start flashing continuously in the standby flashing mode pattern for up to 24 hours. After that time, the indicator light will stop flashing, but the immobilizer system is still enabled.

IMMOBILIZER SYSTEM

Standby mode



- | | |
|----------------------|---------------------|
| a. Main switch "ON" | d. LED off |
| b. Main switch "OFF" | e. Standby mode on |
| c. LED on | f. Standby mode off |

Standard key registration:

Standard key registration is required when a standard key is lost and needs to be replaced, or when the code re-registering key is re-registered after the immobilizer unit or ECU are replaced.

TIP

Do not start the engine with a standard key that has not been registered. If the main switch is turned "ON" with a standard key that has not been registered, the immobilizer system indicator light flashes to indicate fault code "52". (Refer to "SELF-DIAGNOSIS FAULT CODE INDICATION" on page 8-118).

1. Check that the immobilizer system indicator light signals the standby mode.
2. Using the code re-registering key, turn the main switch to "ON", then "OFF", and then remove the key within 5 seconds.
3. Insert the first standard key to be registered into the main switch, then turn the key to "ON" within 5 seconds to activate the key registration mode.

TIP

The existing standard key code is erased from the memory when the key registration mode is activated. When the key registration mode is activated, the immobilizer system indicator light flashes rapidly.

4. While the indicator light is flashing, turn the main switch to "OFF", remove the key, and within 5 seconds, insert the second standard key to be registered into the main switch.

TIP

If the immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the registration mode is deactivated. If this occurs, the second standard key cannot be registered, and steps 2 to 4 need to be repeated to register both standard keys.

5. Turn the main switch to "ON".

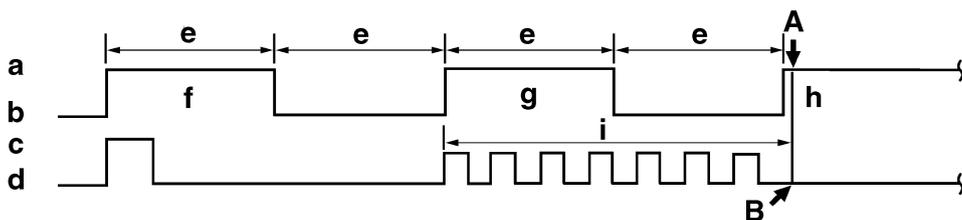
TIP

When the indicator light goes off, the registration is complete.

6. Check that the engine can be started with the two registered standard keys.

IMMOBILIZER SYSTEM

Standard key registration

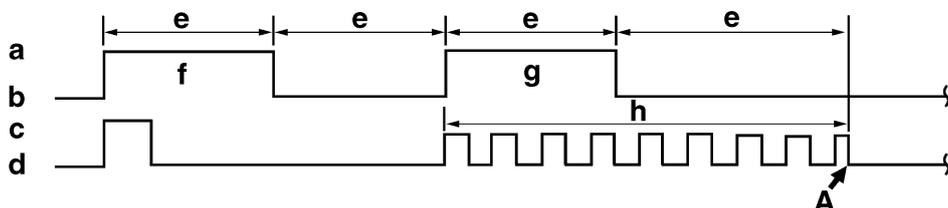


- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. First standard key
- h. Second standard key
- i. Registration mode
- A. Registration of the second standard key is complete.
- B. Immobilizer system indicator light stops flashing when the registration of the second standard key is complete.

Voiding the standard key code:

If a standard key has been lost, it is possible to disable its use by re-registering the remaining standard key. Standard key registration erases the stored standard key code from the memory, thus disabling the lost standard key. To re-register, refer to "Standard key registration".

Standard key code voiding method



- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. Remaining standard key
- h. Registration mode
- A. If the immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the second standard key cannot be registered.

IMMOBILIZER SYSTEM

EAS27701

TROUBLESHOOTING

When the main switch is turned to "ON", the immobilizer system indicator light does not come on nor flashes.

1. Check the fuses. (Main, ignition and backup) Refer to "CHECKING THE FUSES" on page 8-129.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-129.	NG→	<ul style="list-style-type: none">• Clean the battery terminals.• Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-125.	NG→	Replace the main switch/immobilizer unit.
OK↓		
4. Check the entire immobilizer sys- tem wiring. Refer to "CIRCUIT DIAGRAM" on page 8-111.	NG→	Properly connect or repair the immobi- lizer system wiring.
OK↓		
<ul style="list-style-type: none">• Check the condition of the each immobilizer system circuits. Refer to "SELF-DIAGNOSIS FAULT CODE INDICATION" on page 8-118.		

IMMOBILIZER SYSTEM

EAS27721

SELF-DIAGNOSIS FAULT CODE INDICATION

When a system failure occurs, the error code number is indicated in the LCD display of meter and the immobilizer system indicator light blinks at the same time. The pattern of blinking also shows the error code.

Fault code	Part	Symptom	Cause	Action
51	IMMOBILIZER UNIT	Code cannot be transmitted between the key and immobilizer unit.	<ol style="list-style-type: none"> 1. Radio wave interference caused by objects around the keys and antennas. 2. Immobilizer unit malfunction. 3. Key malfunction. 	<ol style="list-style-type: none"> 1. Keep magnets, metal objects, and other immobilizer system keys away from the keys and antennas. 2. Replace the main switch/immobilizer unit. 3. Replace the key.
52	IMMOBILIZER UNIT	Codes between the key and immobilizer unit do not match.	<ol style="list-style-type: none"> 1. Signal received from other transponder (failed to recognize code after ten consecutive attempts). 2. Signal received from unregistered standard key. 	<ol style="list-style-type: none"> 1. Place the immobilizer unit at least 50 mm away from the transponder of other vehicles. 2. Register the standard key.
53	IMMOBILIZER UNIT	Codes cannot be transmitted between the ECU and the immobilizer unit.	<p>Noise interference or disconnected lead/cable.</p> <ol style="list-style-type: none"> 1. Interference due to radio wave noise. 2. Disconnected communication harness. 3. Immobilizer unit malfunction. 4. ECU malfunction. 	<ol style="list-style-type: none"> 1. Check the wire harness and connector. 2. Replace the main switch/immobilizer unit. 3. Replace the ECU.
54	IMMOBILIZER UNIT	Codes transmitted between the ECU and the immobilizer unit do not match.	<p>Noise interference or disconnected lead/cable.</p> <ol style="list-style-type: none"> 1. Interference due to radio wave noise. 2. Disconnected communication harness. 3. Immobilizer unit malfunction. 4. ECU failure. (The ECU or immobilizer unit was replaced with a used unit from another vehicle.) 	<ol style="list-style-type: none"> 1. Register the code re-registering key. 2. Check the wire harness and connector. 3. Replace the main switch/immobilizer unit. 4. Replace the ECU.

IMMOBILIZER SYSTEM

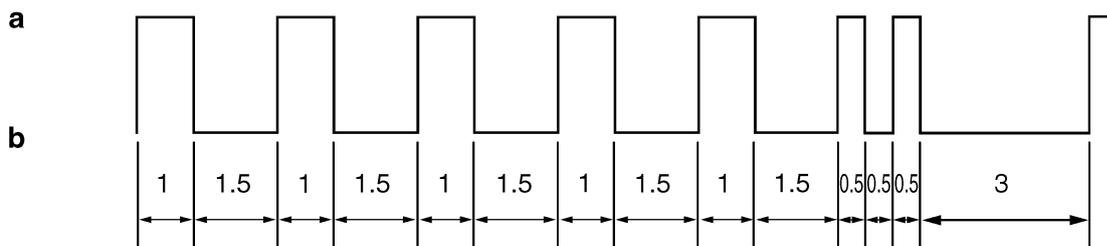
Fault code	Part	Symptom	Cause	Action
55	IMMOBILIZER UNIT	Key code registration malfunction.	Same standard key was attempted to be registered two consecutive times.	Register another standard key.
56	ECU	Undefined code is received.	Noise interference or disconnected lead/cable.	<ol style="list-style-type: none"> 1. Check the wire harness and connector. 2. Replace the main switch/ immobilizer unit. 3. Replace the ECU.

Immobilizer system indicator light fault code indication

Digit of 10 : Cycles of 1 sec. ON and 1.5 sec. OFF.

Digit of 1 : Cycles of 0.5 sec. ON and 0.5 sec. OFF.

Example: fault code 52



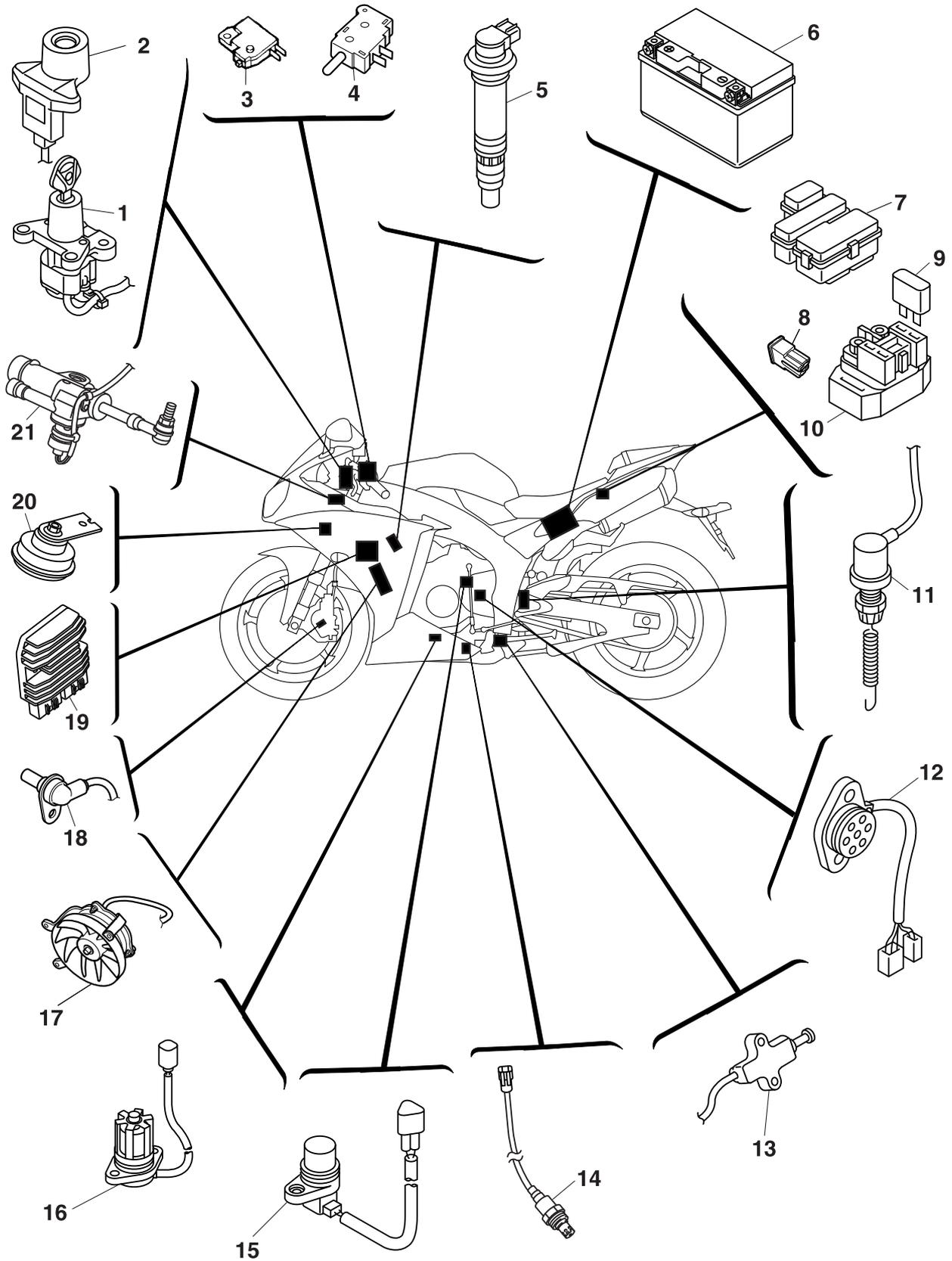
- a. Light on
- b. Light off

IMMOBILIZER SYSTEM

ELECTRICAL COMPONENTS

EAS27972

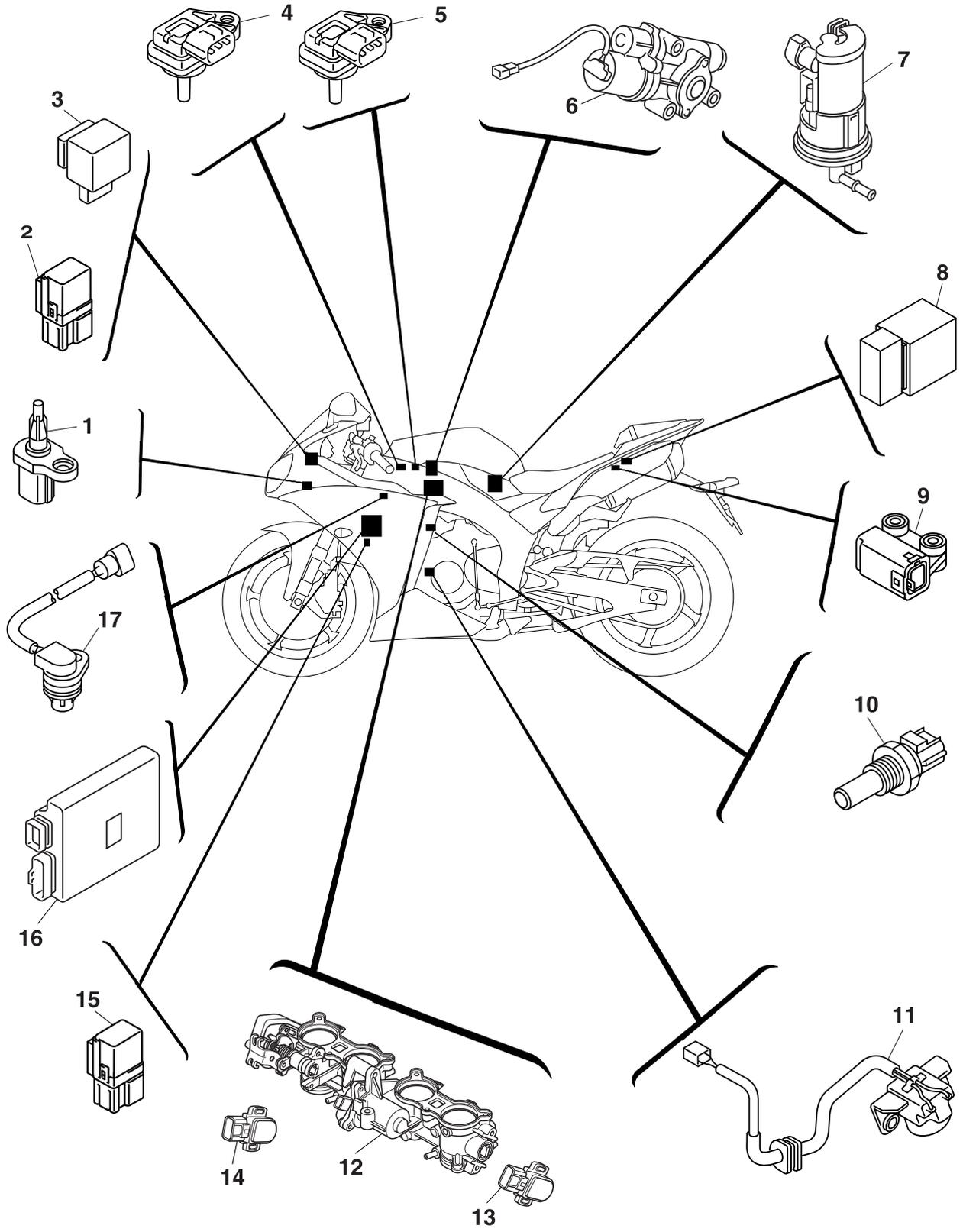
ELECTRICAL COMPONENTS



ELECTRICAL COMPONENTS

1. Main switch
2. Immobilizer unit
3. Front brake light switch
4. Clutch switch
5. Ignition coil
6. Battery
7. Fuse box
8. Main fuse
9. Fuel injection system fuse
10. Starter relay
11. Rear brake light switch
12. Gear position sensor
13. Sidestand switch
14. O₂ sensor
15. Rear speed sensor
16. Oil level switch
17. Radiator fan motor
18. Front speed sensor
19. Rectifier/regulator
20. Horn
21. Steering damper

ELECTRICAL COMPONENTS



ELECTRICAL COMPONENTS

1. Intake air temperature sensor
2. Headlight relay
3. Turn signal/hazard relay
4. Atmospheric pressure sensor
5. Intake air pressure sensor
6. Intake funnel servo motor
7. Fuel pump
8. Relay unit
9. Lean angle sensor
10. Coolant temperature sensor
11. Crankshaft position sensor
12. Throttle servo motor
13. Throttle position sensor
14. Accelerator position sensor
15. Radiator fan motor relay
16. ECU (engine control unit)
17. Cylinder identification sensor

ELECTRICAL COMPONENTS

1. Horn switch
2. Clutch switch
3. Main switch
4. Dimmer switch
5. Pass switch
6. Turn signal switch
7. Traction control system switch
8. Sidestand switch
9. Gear position sensor
10. Oil level switch
11. Hazard switch
12. Front brake light switch
13. Engine stop switch
14. Start switch
15. Rear brake light switch

ELECTRICAL COMPONENTS

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.

ECA14370

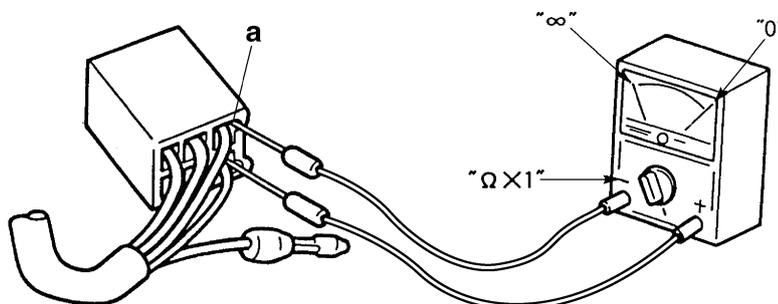
NOTICE

Never insert the tester probes into the coupler terminal slots "a". Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

	<p>Pocket tester 90890-03112 Analog pocket tester YU-03112-C</p>
---	---

TIP

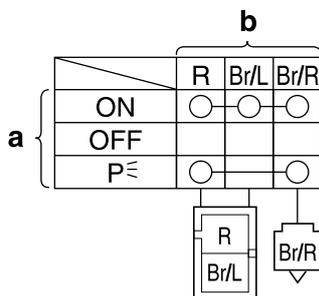
- Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " range.
- When checking for continuity, switch back and forth between the switch positions a few times.



The switches and their terminal connections are illustrated as in the following example of the main switch.

The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row.

The continuity (i. e., a closed circuit) between switch terminals at a given switch position is indication by "○—○". There is continuity between red, brown/blue, and brown/red when the switch is set to "ON" and between red and brown/red when the switch is set to "P \leq ".



ELECTRICAL COMPONENTS

TIP

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.



- a. Install a good bulb into the bulb socket.
- b. Connect the pocket tester probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.



EAS28000

CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA13680

NOTICE

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

1. Remove:
 - Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.
2. Check:
 - Fuse



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

TIP

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

	<p>Pocket tester 90890-03112 Analog pocket tester YU-03112-C</p>
---	--

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



3. Replace:
 - Blown fuse



- 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
Headlight	20 A	1
Signaling system	7.5 A	1
Ignition	15 A	1
Right radiator fan motor	10 A	1
Left radiator fan motor	10 A	1
Turn signal light	7.5 A	1
Fuel injection system	15 A	1
Steering damper	7.5 A	1
Backup	7.5 A	1
ETV (Electronic Throttle Valve)	7.5 A	1
Spare	20 A	1
Spare	15 A	2
Spare	10 A	1
Spare	7.5 A	1

EWA13310

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.



4. Install:
 - Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS28030

CHECKING AND CHARGING THE BATTERY

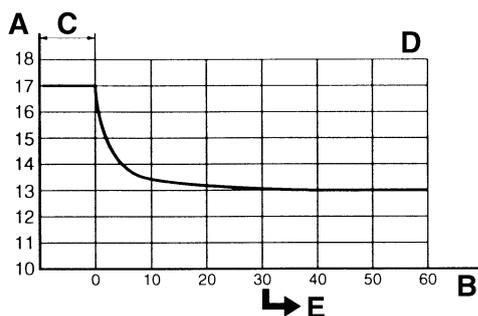
EWA13290

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.**

ELECTRICAL COMPONENTS



- A. Open-circuit voltage (V)
- B. Time (minutes)
- C. Charging
- D. Ambient temperature 20 °C (68 °F)
- E. Check the open-circuit voltage.



Charging method using a variable-current (voltage) charger

- a. Measure the open-circuit voltage prior to charging.

TIP _____

Voltage should be measured 30 minutes after the engine is stopped.

- b. Connect a charged and ammeter to the battery and start charging.

TIP _____

Set the charging voltage at 16–17 V. If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.

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

TIP _____

If the current is lower than the standard charging current written on the battery, set the charging voltage adjust dial at 20–24 V and monitor the amperage for 3–5 minutes to check the battery.

- Reach the standard charging current: Battery is good.
- Does not reach the standard charging current: Replace the battery.

- d. Adjust the voltage so that the current is at the standard charging level.
- e. Set the time according to the charging time suitable for the open-circuit voltage.
- f. 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.
- g. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.4 V or more --- Charging is complete.
 12.3 V or less --- Recharging is required.
 Under 12.0 V --- Replace the battery.



Charging method using a constant voltage charger

- a. Measure the open-circuit voltage prior to charging.

TIP _____

Voltage should be measured 30 minutes after the engine is stopped.

- b. Connect a charger and ammeter to the battery and start charging.
- c. Make sure that the current is higher than the standard charging current written on the battery.

TIP _____

If the current is lower than the standard charging current written on the battery, This type of battery charger cannot charge the VRLA (Valve Regulated Lead Acid) battery. A variable voltage charger is recommended.

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

TIP _____

Set the charging time at 20 hours (maximum).

- e. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.4 V or more --- Charging is complete.
 12.3 V or less --- Recharging is required.
 Under 12.0 V --- Replace the battery.



ELECTRICAL COMPONENTS

6. Install:
 - Battery seat
 - Battery
7. Connect:
 - Battery leads
(to the battery terminals)

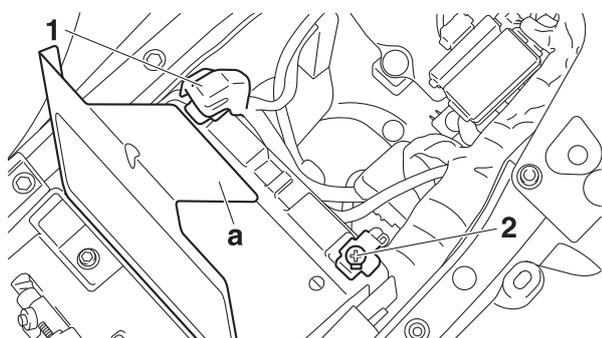
ECA13630

NOTICE

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

TIP

Set the battery seat end “a” proper position.



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

	Recommended lubricant Dielectric grease
--	--

10. Install:
 - Battery cover
 - Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS28040

CHECKING THE RELAYS

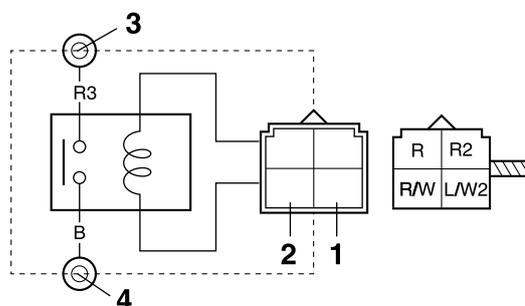
Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
--	--

1. Disconnect the relay from the wire harness.

2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown. Check the relay operation. Out of specification → Replace.

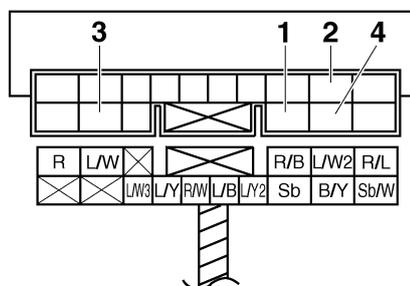
Starter relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

	Result Continuity (between “3” and “4”)
--	--

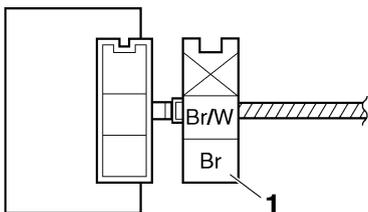
Relay unit (starting circuit cut-off relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

	Result Continuity (between “3” and “4”)
--	--

ELECTRICAL COMPONENTS



EAS28050

CHECKING THE RELAY UNIT (DIODE)

1. Check:
 - Relay unit (diode)
 Out of specification → Replace.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP _____
 The pocket tester or the analog pocket tester readings are shown in the following table.

- b. Turn the main switch to “ON”.
- c. Measure the turn signal/hazard relay input voltage.



2. Check:
 - Turn signal/hazard relay output voltage
 Out of specification → Replace.

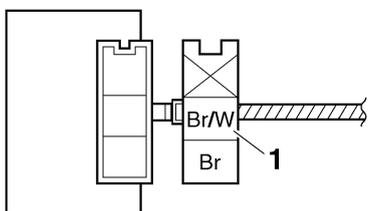
Turn signal/hazard relay output voltage
DC 12 V



- a. Connect the pocket tester (DC 20 V) to the turn signal/hazard relay terminal as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
Brown/White “1”
- Negative tester probe
Ground



- b. Turn the main switch to “ON”.
- c. Measure the turn signal/hazard relay output voltage.



ELECTRICAL COMPONENTS

2. Check:

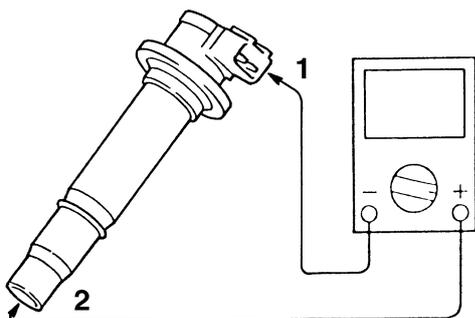
- Secondary coil resistance
Out of specification → Replace.

	Secondary coil resistance 8.50–11.50 kΩ
--	---

a. Connect the pocket tester ($\Omega \times 1 \text{ k}$) to the ignition coil as shown.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
--	--

- Negative tester probe
Red/Black “1”
- Positive tester probe
Spark plug terminal “2”



b. Measure the secondary coil resistance.

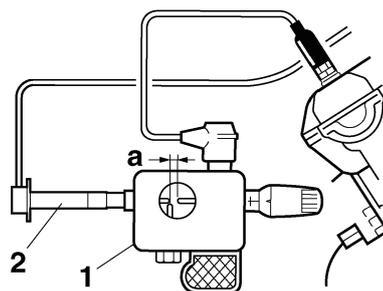
3. Check:

- Ignition spark gap
Out of specification → Replace.

	Minimum ignition spark gap 6.0 mm (0.24 in)
--	---

a. Connect the ignition checker “1” as shown.

	Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487
--	---



2. Ignition coil

- Turn the main switch to “ON” and engine stop switch to “O”.
- Measure the ignition spark gap “a”.
- Crank the engine by pushing the start switch “S” and gradually increase the spark gap until a misfire occurs.

EAS28120

CHECKING THE CRANKSHAFT POSITION SENSOR

- Disconnect:
 - Crankshaft position sensor coupler
(from the wire harness)
- Check:
 - Crankshaft position sensor resistance
Out of specification → Replace the crankshaft position sensor.

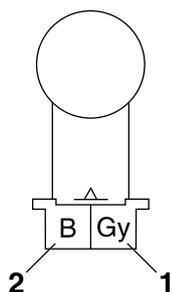
	Crankshaft position sensor resistance 248–372 Ω at 20 °C (68 °F)
--	---

a. Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
--	--

- Positive tester probe
Gray “1”
- Negative tester probe
Black “2”

ELECTRICAL COMPONENTS



b. Measure the crankshaft position sensor resistance.



EAS28130

CHECKING THE LEAN ANGLE SENSOR

1. Remove:
 - Lean angle sensor (from the battery box 2)
2. Check:
 - Lean angle sensor out put voltage
Out of specification → Replace.

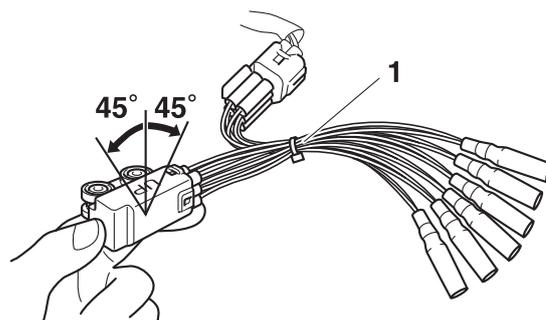
Lean angle sensor output voltage
 Less than 45°: 0.4–1.4 V
 More than 45°: 3.7–4.4 V



- a. Connect the test harness-lean angle sensor (6P) “1” to the lean angle sensor and wire harness as shown.
- b. Connect the pocket tester (DC 20 V) to the test harness-lean angle sensor (6P).

Pocket tester
 90890-03112
Analog pocket tester
 YU-03112-C
Test harness-lean angle sensor (6P)
 90890-03209
 YU-03209

- Positive tester probe
Yellow/Green (wire harness color)
- Negative tester probe
Black/Blue (wire harness color)



- c. Set the main switch to “ON”.
- d. Turn the lean angle sensor to 45°.
- e. Measure the lean angle sensor output voltage.



EAS28940

CHECKING THE STARTER MOTOR OPERATION

1. Check:
 - Starter motor operation
Does not operate → Perform the electric starting system troubleshooting, starting with step 4.
Refer to “TROUBLESHOOTING” on page 8-11.

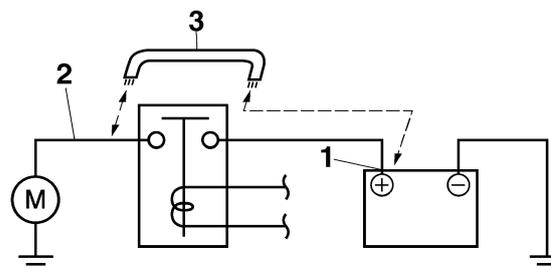


- a. Connect the positive battery terminal “1” and starter motor lead “2” with a jumper lead “3”.

EWA13810

⚠ 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.

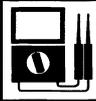


- b. Check the starter motor operation.



ELECTRICAL COMPONENTS

2. Check:
- Rectifier/regulator output voltage
Out of specification → Replace the rectifier/regulator.

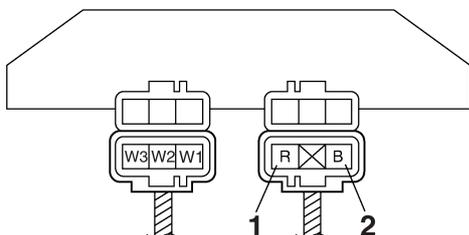
	Rectifier/regulator output voltage 14.2–14.8 V
---	---



- a. Set the engine tachometer to the ignition coil of cylinder #1.
- b. Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
---	--

- Positive tester probe
Red "1"
- Negative tester probe
Black "2"



- c. Start the engine and let it run at approximately 5000 r/min.
- d. Measure the rectifier/regulator output voltage.



EAS28180
CHECKING THE HORN

1. Check:
- Horn resistance
Out of specification → Replace.

	Coil resistance 1.07–1.11 Ω at 20 °C (68 °F)
---	---

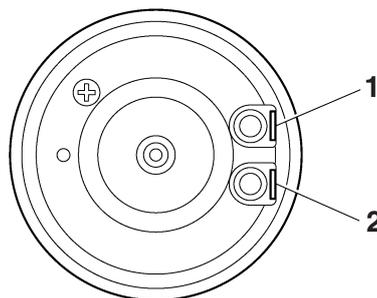


- a. Disconnect the horn leads from the horn terminals.

- b. Connect the pocket tester ($\Omega \times 1$) to the horn terminals.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
---	--

- Positive tester probe
Horn terminal "1"
- Negative tester probe
Horn terminal "2"



- c. Measure the horn resistance.



2. Check:
- Horn sound
Faulty sound → Replace.

EAS28190
CHECKING THE OIL LEVEL SWITCH

1. Drain:
- Engine oil
2. Remove:
- Oil level switch
(from the oil pan)
3. Check:
- Oil level switch resistance
Out of specification → Replace.

	Oil level switch Maximum level position resistance 484–536 Ω Minimum level position resistance 114–126 Ω
---	---



- a. Connect the pocket tester ($\Omega \times 100$) to the oil level switch terminal as shown.

ELECTRICAL COMPONENTS



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

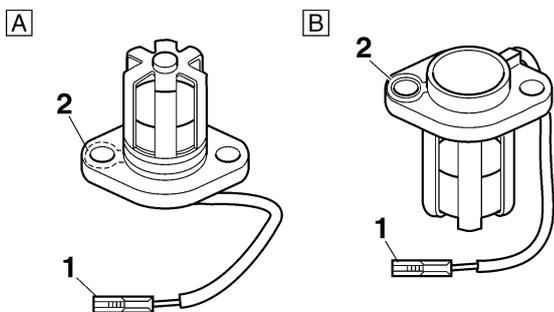
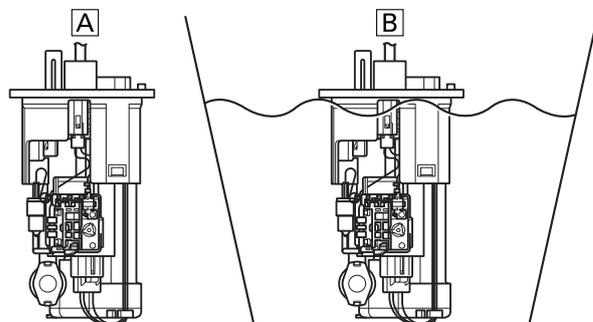
Minimum level position "A"

- Positive tester probe Connector (White) "1"
- Negative tester probe Body earth "2"

Maximum level position "B"

- Positive tester probe Connector (White) "1"
- Negative tester probe Body earth "2"

Fuel pump is atmosphere "A"
 → Fuel level warning light is come on
 Fuel pump is soaked in fuel "B"
 → Fuel level warning light is goes off



b. Measure the oil level switch resistance.



EAS1KB8801

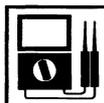
CHECKING THE FUEL SENDER

1. Disconnect:
 - Fuel pump coupler
 - Fuel sender coupler (from the wire harness)
2. Remove:
 - Fuel tank
3. Remove:
 - Fuel pump (from the fuel tank)
4. Connect:
 - Fuel sender coupler
5. Turn the main switch to "ON".
6. Check:
 - Fuel level warning light
 Out of specification → Replace the fuel pump.

EAS28240

CHECKING THE REAR SPEED SENSOR

1. Check:
 - Rear speed sensor output voltage
 Out of specification → Replace.



Output voltage reading cycle
0.6 V to 4.8 V to 0.6 V to 4.8 V

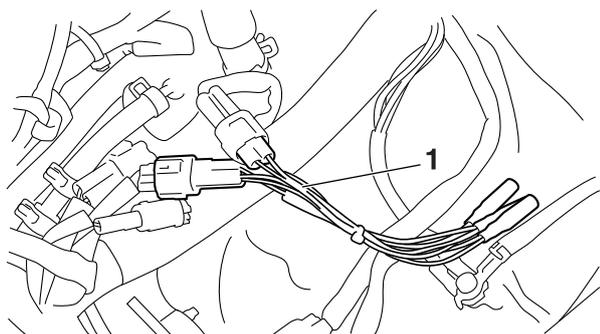
- a. Connect the test harness-speed sensor (3P) "1" to the rear speed sensor coupler and wire harness as shown.
- b. Connect the pocket tester (DC 20 V) to the test harness-speed sensor (3P).



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C
Test harness-speed sensor (3P)
90890-03208
YU-03208

- Positive tester probe
 White/Yellow (wire harness color)
- Negative tester probe
 Black/Blue (wire harness color)

ELECTRICAL COMPONENTS



- c. Turn the main switch to "ON".
- d. Elevate the rear wheel and slowly rotate it.
- e. Measure the voltage. 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.



EAS28250

CHECKING THE RADIATOR FAN MOTOR

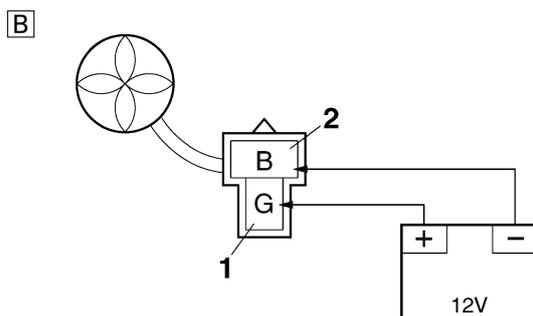
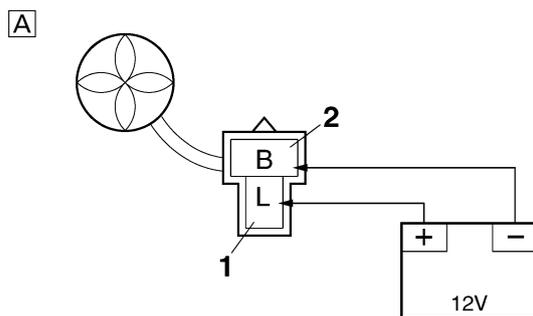
1. Check:

- Radiator fan motor
Faulty/rough movement → Replace.



- a. Disconnect the radiator fan motor coupler from the wire harness.
- b. Connect the battery (DC 12 V) as shown.

- Positive tester probe
Blue or Green "1"
- Negative tester probe
Black "2"



- A. Right side
- B. Left side

c. Measure the radiator fan motor movement.



EAS28260

CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:

- Coolant temperature sensor
Refer to "CYLINDER HEAD" on page 5-24.

EWA14130

⚠ 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.

2. Check:

- Coolant temperature sensor resistance
Out of specification → Replace.

Coolant temperature sensor resistance

5.21–6.37 kΩ at 0 °C (32 °F)

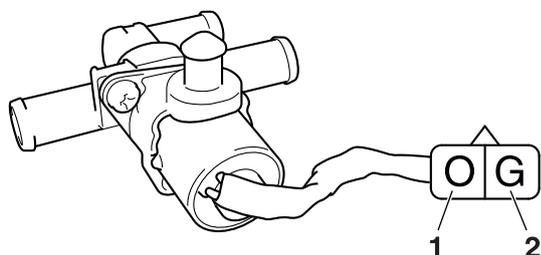
2.45 kΩ at 20 °C (68 °F)

290–354 Ω at 80 °C (176 °F)

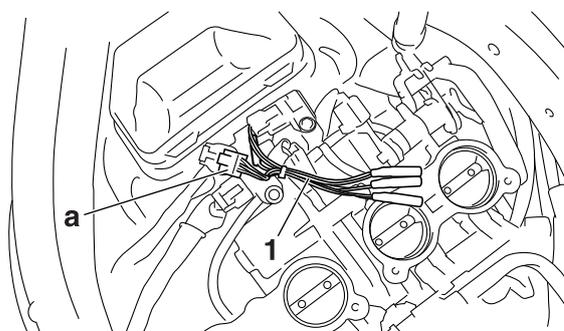
ELECTRICAL COMPONENTS

- Positive tester probe
Orange "1"
- Negative tester probe
Green "2"

- Positive tester probe
Pink (wire harness color)
- Negative tester probe
Black/blue (wire harness color)



c. Measure the air induction system solenoid resistance.



- c. Turn the main switch to "ON".
d. Measure the atmospheric pressure sensor output voltage.

EAS28380
CHECKING THE ATMOSPHERIC PRESSURE SENSOR

1. Check:
- Atmospheric pressure sensor output voltage
Out of specification → Replace.



Atmospheric pressure sensor output voltage
3.57–3.71 V at 101.32 kPa

a. Connect the test harness S-pressure sensor (3P) "1" to the atmospheric pressure sensor and wire harness as shown.

ECA14B1035

NOTICE

Pay attention to the installing direction of the test harness S-pressure sensor (3P) coupler "a".

b. Connect the digital circuit tester (DCV) to the test harness S-pressure sensor (3P).



Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927
Test harness S-pressure sensor (3P)
90890-03207
YU-03207

EAS28390

CHECKING THE CYLINDER IDENTIFICATION SENSOR

1. Remove:
- Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-5.
 - Air filter case duct
Refer to "AIR INDUCTION SYSTEM" on page 7-21.
2. Check:
- Cylinder identification sensor output voltage
Out of specification → Replace.



Cylinder identification sensor output voltage (ON)
More than 4.8 V
Cylinder identification sensor output voltage (OFF)
Less than 0.8 V

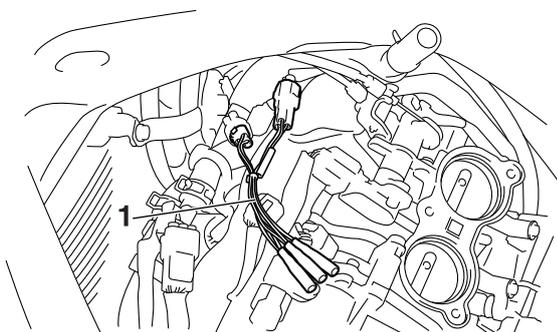
- a. Connect the test harness-speed sensor (3P) "1" to the rear speed sensor coupler and wire harness as shown.
b. Connect the pocket tester (DC 20 V) to the test harness-speed sensor (3P).

ELECTRICAL COMPONENTS



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C
Test harness-speed sensor (3P)
90890-03208
YU-03208

- Positive tester probe
White/Black (wire harness color)
- Negative tester probe
Black/Blue (wire harness color)



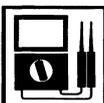
- Turn the main switch to "ON".
- Rotate the crankshaft.
- Measure the voltage. With each full rotation of the crankshaft, the voltage reading should cycle from 0.8 V to 4.8 V to 0.8 V to 4.8 V.



EAS28410

CHECKING THE INTAKE AIR PRESSURE SENSOR

- Check:
 - Intake air pressure sensor output voltage
Out of specification → Replace.



**Intake air pressure sensor out-
 put voltage**
3.57–3.71 V at 101.32 kPa



- Connect the test harness S-pressure sensor (3P) "1" to the intake air pressure sensor and wire harness as shown.

ECA14B1035

NOTICE

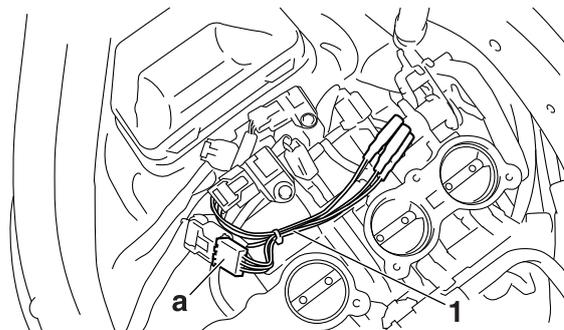
Pay attention to the installing direction of the test harness S-pressure sensor (3P) coupler "a".

- Connect the digital circuit tester (DCV) to the test harness S-pressure sensor (3P).



Digital circuit tester
90890-03174
Model 88 Multimeter with
tachometer
YU-A1927
Test harness S-pressure sensor
(3P)
90890-03207
YU-03207

- Positive tester probe
Pink/White (wire harness color)
- Negative tester probe
Black/Blue (wire harness color)



- Turn the main switch to "ON".
- Measure the intake air pressure sensor output voltage.



EAS28420

CHECKING THE INTAKE AIR TEMPERATURE SENSOR

- Remove:
 - Intake air temperature sensor
(from the headlight assembly.)

EWA14110

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.

- Check:
 - Intake air temperature sensor resistance
Out of specification → Replace.

ELECTRICAL COMPONENTS



Intake air temperature sensor resistance

5.4–6.6 k Ω at 0 °C (32 °F)
290–390 Ω at 80 °C (176 °F)

- a. Connect the pocket tester ($\Omega \times 100$) to the intake air temperature sensor terminal as shown.



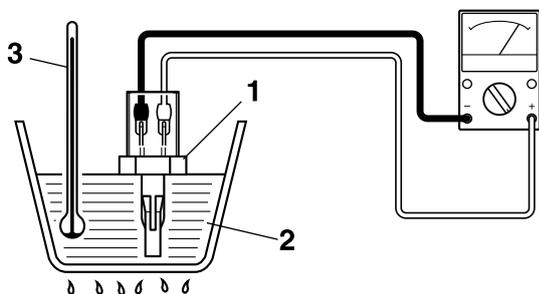
Pocket tester 90890-03112 Analog pocket tester YU-03112-C

- b. Immerse the intake air temperature sensor “1” in a container filled with water “2”.

TIP

Make sure that the intake air temperature sensor terminals do not get wet.

- c. Place a thermometer “3” in the water.
d. Slowly heat the water, then let it cool down to the specified temperature.
e. Measure the intake air temperature sensor resistance.



3. Install:

- Intake air temperature sensor



Intake air temperature sensor screw 1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)

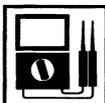
EAS14B1020

CHECKING THE STEERING DAMPER SOLENOID

1. Remove:
- Left side cowling
Refer to “GENERAL CHASSIS” on page 4-1.

2. Check:

- Steering damper solenoid resistance
Out of specification → Replace the steering damper assembly.



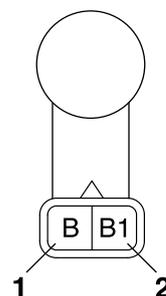
Steering damper solenoid resistance 49.82–56.18 Ω at 20 °C (68 °F)

- a. Disconnect the steering damper lead coupler from wire harness.
b. Connect the pocket tester ($\Omega \times 1$) to the steering damper lead coupler.



Pocket tester 90890-03112 Analog pocket tester YU-03112-C

- Positive tester probe
Black “1”
- Negative tester probe
Black “2”



- c. Measure the steering damper solenoid resistance.

EAS14B1055

CHECKING THE GEAR POSITION SENSOR

1. Remove:
- Fuel tank
Refer to “FUEL TANK” on page 7-1.
 - Gear position sensor
Refer to “CRANKCASE” on page 5-70.
2. Check:
- Gear position sensor
Out of specification → Replace the gear position sensor.

ELECTRICAL COMPONENTS

TROUBLESHOOTING

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TROUBLESHOOTING

EAS28451

TROUBLESHOOTING

EAS28460

GENERAL INFORMATION

TIP

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.

EAS28470

STARTING FAILURES

Engine

1. Cylinder(s) and cylinder head
 - Loose spark plug
 - Loose cylinder head or cylinder
 - Damaged cylinder head gasket
 - Damaged cylinder gasket
 - Worn or damaged cylinder
 - Incorrect valve clearance
 - Improperly sealed valve
 - Incorrect valve-to-valve-seat contact
 - Incorrect valve timing
 - Faulty valve spring
 - Seized valve
2. Piston(s) and piston ring(s)
 - Improperly installed piston ring
 - Damaged, worn or fatigued piston ring
 - Seized piston ring
 - Seized or damaged piston
3. Air filter
 - Improperly installed air filter
 - Clogged air filter element
4. Crankcase and crankshaft
 - Improperly assembled crankcase
 - Seized crankshaft

Fuel system

1. Fuel tank
 - Empty fuel tank
 - Clogged fuel filter
 - Clogged fuel strainer
 - Clogged fuel tank overflow hose
 - Deteriorated or contaminated fuel
2. Fuel pump
 - Faulty fuel pump
 - Faulty fuel pump relay
3. Throttle body(-ies)
 - Deteriorated or contaminated fuel
 - Sucked-in air

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Fuse(s)
 - Blown, damaged or incorrect fuse
 - Improperly installed fuse
3. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
4. Ignition coil(s)
 - Cracked or broken ignition coil body
 - Broken or shorted primary or secondary coils
5. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Faulty cylinder identification sensor
6. Switches and wiring
 - Faulty main switch
 - Faulty engine stop switch
 - Broken or shorted wiring
 - Faulty gear position sensor
 - Faulty start switch
 - Faulty sidestand switch
 - Faulty clutch switch
 - Improperly grounded circuit
 - Loose connections
7. Starting system
 - Faulty starter motor
 - Faulty starter relay
 - Faulty starting circuit cut-off relay
 - Faulty starter clutch

EAS28490

INCORRECT ENGINE IDLING SPEED

Engine

1. Cylinder(s) and cylinder head
 - Incorrect valve clearance
 - Damaged valve train components
2. Air filter
 - Clogged air filter element

Fuel system

1. Throttle body(-ies)
 - Damaged or loose throttle body joint
 - Improperly synchronized throttle bodies
 - Improper throttle cable free play
 - Flooded throttle body
 - Faulty air induction system

TROUBLESHOOTING

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
3. Ignition coil(s)
 - Broken or shorted primary or secondary coils
 - Cracked or broken ignition coil
4. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Faulty cylinder identification sensor

EAS28520

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURES" on page 9-1.

Engine

1. Air filter
 - Clogged air filter element
 - Faulty YCC-T and YCC-I

Fuel system

1. Fuel pump
 - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to "Clutch drags".

EAS28540

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

EAS28550

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

EAS28570

FAULTY CLUTCH

Clutch slips

1. Clutch
 - Improperly assembled clutch
 - Improperly adjusted clutch cable
 - Loose or fatigued clutch spring
 - Worn friction plate
 - Worn clutch plate
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (low)
 - Deteriorated oil

Clutch drags

1. Clutch
 - Unevenly tensioned clutch springs
 - Warped pressure plate
 - Bent clutch plate
 - Swollen friction plate
 - Bent clutch pull rod
 - Damaged clutch boss
 - Burnt primary driven gear bushing
 - Match marks not aligned
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (high)
 - Deteriorated oil

EAS28600

OVERHEATING

Engine

1. Clogged coolant passages
 - Cylinder head and piston(s)
 - Heavy carbon buildup

TROUBLESHOOTING

2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity
 - Inferior oil quality

Cooling system

1. Coolant
 - Low coolant level
2. Radiator
 - Damaged or leaking radiator
 - Faulty radiator cap
 - Bent or damaged radiator fin
3. Water pump
 - Damaged or faulty water pump
 - Thermostat
 - Thermostat stays closed
4. Oil cooler
 - Clogged or damaged oil cooler
5. Hose(s) and pipe(s)
 - Damaged hose
 - Improperly connected hose
 - Damaged pipe
 - Improperly connected pipe

Fuel system

1. Throttle body(-ies)
 - Faulty throttle body(-ies)
 - Damaged or loose throttle body joint
2. Air filter
 - Clogged air filter element

Chassis

1. Brake(s)
 - Dragging brake

Electrical system

1. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
2. Ignition system
 - Faulty ECU

EAS28610

OVERCOOLING

Cooling system

1. Thermostat
 - Thermostat stays open

EAS28620

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

EAS28650

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
- 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

EAS28680

UNSTABLE HANDLING

1. Handlebars
 - Bent or improperly installed right handlebar
 - Bent or improperly installed left handlebar
2. Steering head components
 - Improperly installed upper bracket
 - Improperly installed lower bracket (improperly tightened ring nut)
 - Bent steering stem
 - Damaged ball bearing or bearing race
3. 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
4. Swingarm
 - Worn bearing or bushing
 - Bent or damaged swingarm
5. Rear shock absorber assembly(-ies)
 - Faulty rear shock absorber spring
 - Leaking oil or gas

TROUBLESHOOTING

6. Tire(s)
 - Uneven tire pressures (front and rear)
 - Incorrect tire pressure
 - Uneven tire wear
7. Wheel(s)
 - Incorrect wheel balance
 - Deformed cast wheel
 - Damaged wheel bearing
 - Bent or loose wheel axle
 - Excessive wheel runout
8. Frame
 - Bent frame
 - Damaged steering head pipe
 - Improperly installed bearing race

Turn signal blinks quickly

- Incorrect turn signal bulb
- Faulty turn signal/hazard 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

EAS28710

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 or dimmer 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

Turn signal does not come on

- Faulty turn signal switch
- Faulty turn signal/hazard 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/hazard relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal remains lit

- Faulty turn signal/hazard relay
- Burnt-out turn signal bulb

EAS28740

WIRING DIAGRAM

YZF-R1(B)

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Joint
5. Main fuse
6. ETV (Electronic Throttle Valve) fuse
7. Backup fuse
8. Immobilizer unit
9. Battery
10. Engine ground
11. Fuel injection system fuse
12. Starter relay
13. Starter motor
14. Relay unit
15. Starting circuit cut-off relay
16. Fuel pump relay
17. Gear position sensor
18. Sidestand switch
19. Fuel sender
20. Fuel pump
21. Joint coupler
22. ECU (engine control unit)
23. Ignition coil #1
24. Ignition coil #2
25. Ignition coil #3
26. Ignition coil #4
27. Spark plug
28. Air induction system solenoid
29. Primary injector #1
30. Primary injector #2
31. Primary injector #3
32. Primary injector #4
33. Secondary injector #1
34. Secondary injector #2
35. Secondary injector #3
36. Secondary injector #4
37. Front speed sensor
38. Accelerator position sensor
39. Throttle position sensor
40. Intake funnel servo motor
41. Throttle servo motor
42. Steering damper solenoid
43. Coolant temperature sensor
44. Crankshaft position sensor
45. O₂ sensor
46. Intake air temperature sensor
47. Rear speed sensor
48. Atmospheric pressure sensor
49. Intake air pressure sensor
50. Lean angle sensor
51. Cylinder identification sensor
52. Meter assembly
53. Immobilizer system indicator light
54. Fuel level warning light

55. Oil level warning light
56. Neutral indicator light
57. Tachometer
58. Shift timing indicator light
59. Multi-function meter
60. Transmission gear display
61. Traction control system indicator/warning light
62. Engine trouble warning light
63. Coolant temperature warning light
64. High beam indicator light
65. Left turn signal indicator light
66. Right turn signal indicator light
67. Meter light
68. Oil level switch
69. Right handlebar switch
70. Front brake light switch
71. Engine stop switch
72. D-Mode switch
73. Start switch
74. Engine ground
75. Hazard switch
76. Turn signal/hazard relay
77. Left handlebar switch
78. Traction control system switch
79. Pass switch
80. Dimmer switch
81. Horn switch
82. Clutch switch
83. Turn signal switch
84. Horn
85. Front left turn signal light
86. Front right turn signal light
87. Rear left turn signal light
88. Rear right turn signal light
89. Headlight
90. Auxiliary light
91. License plate light
92. Rear brake light switch
93. Tail/brake light
94. Headlight relay
95. Left radiator fan motor
96. Right radiator fan motor
97. Left radiator fan motor fuse
98. Right radiator fan motor fuse
99. Radiator fan motor relay
100. Turn signal light fuse
101. Ignition fuse
102. Signaling system fuse
103. Headlight fuse
104. Steering damper fuse

Gy	Gray
L	Blue
Lg	Light green
O	Orange
P	Pink
R	Red
Sb	Sky blue
V	Violet
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/B	Brown/Black
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
Br/Y	Brown/Yellow
G/B	Green/Black
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
Lg/R	Light green/Red
O/B	Orange/Black
O/G	Orange/Green
O/R	Orange/Red
P/B	Pink/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/G	White/Green
W/L	White/Blue
W/R	White/Red
W/Y	White/Yellow
Y/R	Yellow/Red
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/W	Yellow/White

EAS28750

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green



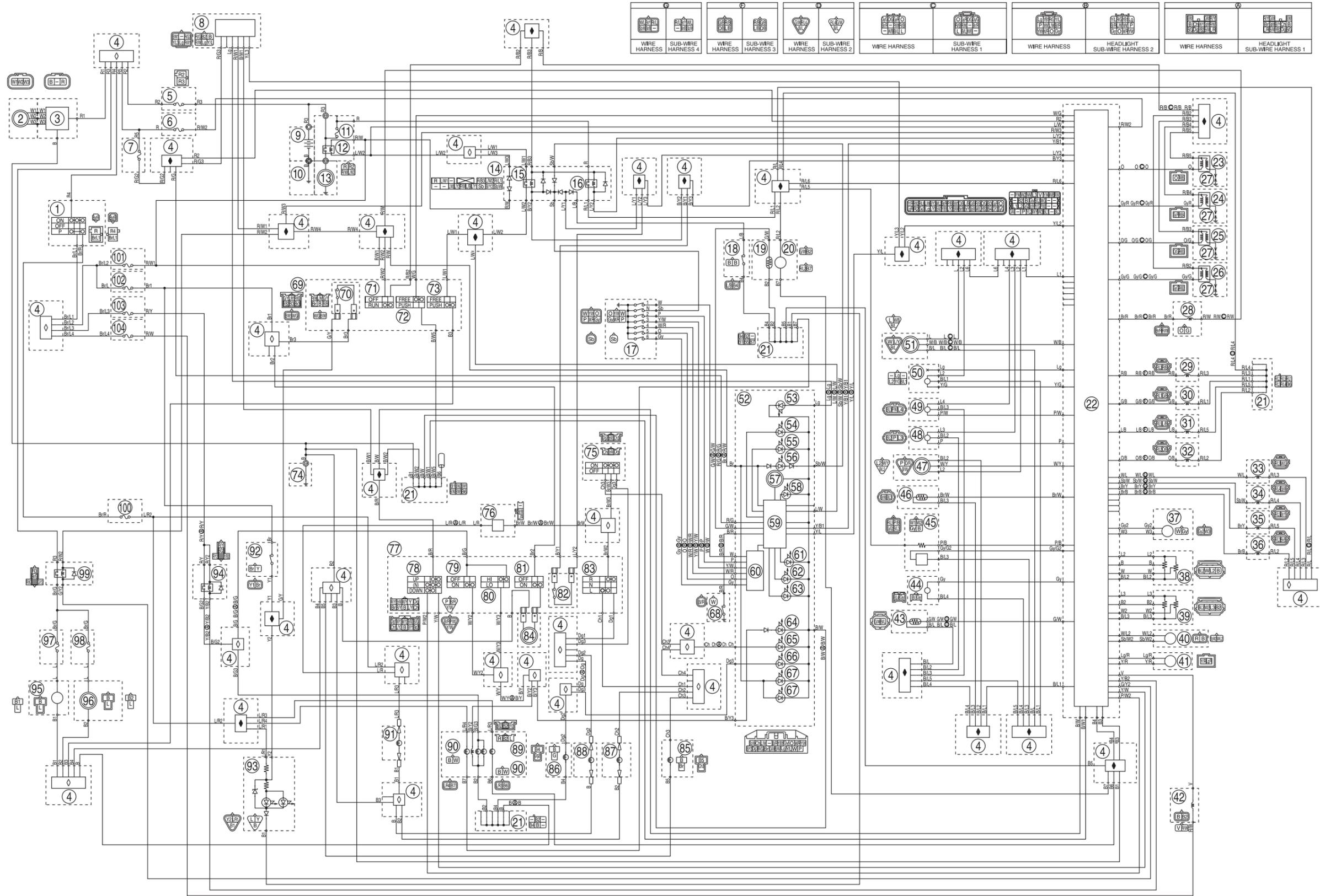
**WIRING DIAGRAM
YZF-R1(B)**

**SCHEMA DE CABLAGE
YZF-R1(B)**

**SCHALTPLAN
YZF-R1(B)**

**SCHEMA ELETTRICO
YZF-R1(B)**

**DIAGRAMA DE CONEXIONES
DE YZF-R1(B)**



**WIRING DIAGRAM
YZF-R1(B)**

**SCHEMA DE CABLAGE
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